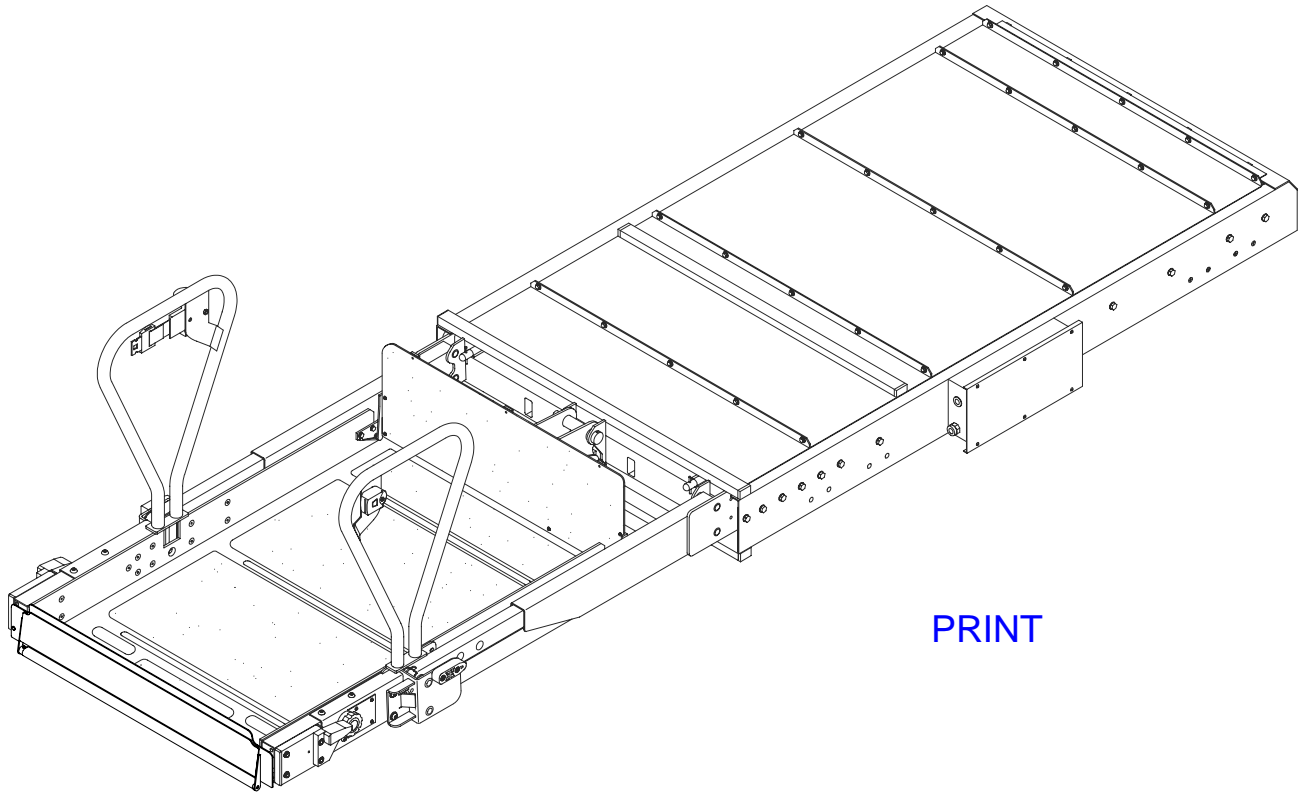




INNOVATION IN MOBILITY™

MIRAGE F9TF DOT - PUBLIC USE LIFT



PRINT

SERVICE MANUAL

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

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

“DOT – Public Use Lift” verifies that this platform lift meets the public use lift requirements of FMVSS no. 403. This lift may be installed on all vehicles appropriate for the size and weight of the lift, but must be installed on buses, school buses, and multi-purpose passenger vehicles other than motor homes with a gross vehicle weight rating (GVWR) that exceeds 10,000 lbs (4,536 kgs).

Revision Record

REV	DATE	PAGES	DESCRIPTION OF CHANGE	ECR/ECO
A	03/09/05	N/A	New release.	

NOTE: Determine whether revisions made to this manual will impact the F9T Equipment Installation Verification checklist (32EIVF9T). Revise the EIV, as necessary.

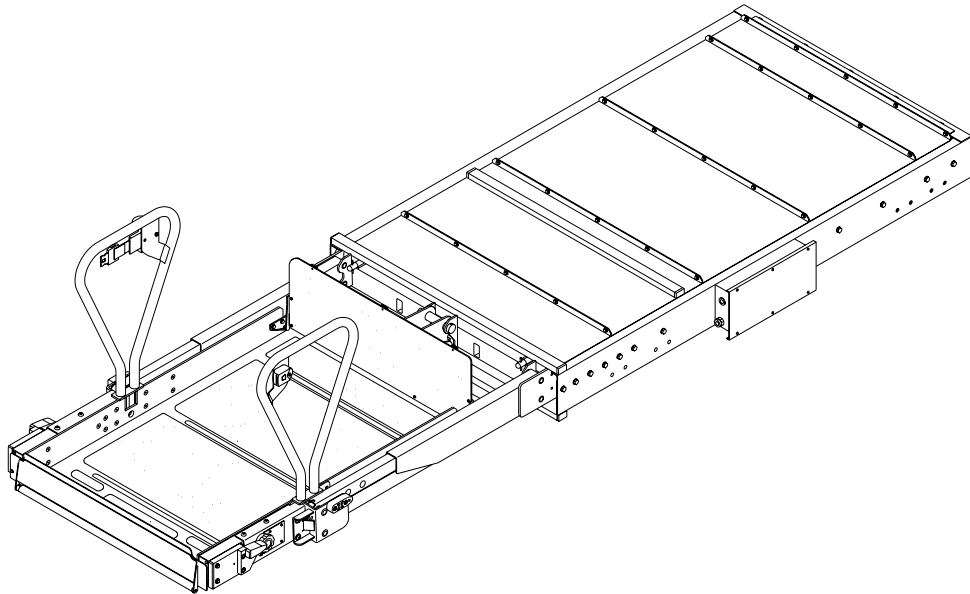
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I. F9TF INTRODUCTION

Safe and easy access to motorcoaches is provided by the Ricon Mirage F9TF Public Use wheelchair and standee lift. The Mirage F9TF is a dedicated entry model, which is intended for installation in a vehicle baggage compartment, or similar location.



An electric-motor driven hydraulic pump provides a maximum platform lifting capacity of 660 pounds (300 kilograms). A trained attendant or the vehicle operator operates it. For a boarding passenger, the operator uses control switches to withdraw the platform from the vehicle (deploy) and lower it to ground level. The passenger is placed on the platform and then lifted to floor height. After the passenger enters the vehicle, the operator lowers the platform and retracts it back into the vehicle (stow). For an exiting passenger, the operator withdraws the platform from the vehicle (deploy) and raises it to floor height. The passenger is placed on the platform and then lowered to the ground. The passenger departs, and the operator returns the platform to the stowed position in the vehicle.

One individual can manually operate the lift when normal power is not present. A manual release mechanism is provided to ease the task of pulling the platform out of its enclosure. The hydraulic pump assembly includes a manually operated back-up pump to raise the platform, and a pressure release valve to lower it. The front platform rollstop, normally power operated, has a manual override knob for back-up use.

A. PRODUCT SUPPORT

This manual contains general installation instructions, a maintenance chapter, a repair chapter, and a spare parts chapter. If you have questions about this manual, or need additional copies, please contact Ricon Product Support at one of the following locations:

Ricon Corporation
7900 Nelson Road
Panorama City, CA 91402
Outside (818) Area Code
World Wide Website

.....(818) 267-3000
.....(800) 322-2884
.....www.riconcorp.com

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

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

B. WARRANTY INFORMATION

RICON MIRAGE F9TF PUBLIC USE WHEELCHAIR LIFT ~ ONE-YEAR LIMITED WARRANTY ~

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

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

If you need to return a product:

Return this product to Ricon, following the Ricon RMA procedure. Please give as much advance notice as possible, and allow a reasonable amount of time for repair.

This warranty does not cover:

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

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



WARNING

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

This Warranty is void If:

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

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

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

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

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

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

C. SHIPMENT INFORMATION

Verify that lift installation kit, if supplied, contains all items listed on kit packing list. Please report any missing items immediately to Ricon Product Support. The warranty and owner registration cards must be completed and returned to Ricon within 20 days to validate warranty.

Sales or Service Personnel must review the Warranty and the Operator Manual with the user to confirm that they know how to safely operate the product. Instruct the user to follow operating instructions without exception.

D. GENERAL SAFETY PRECAUTIONS

Follow the general safety precautions during installation, operation, service, and maintenance:

- Do not attempt maintenance, repairs, or adjustments without the presence of a person capable of rendering aid.
- Take notice of all injuries, regardless of how slight. Administer first aid or seek medical attention immediately.
- Wear protective eye shields and appropriate clothing at all times.
- Work in a properly ventilated area. Do not smoke, or use an open flame, near the battery.
- Exercise caution when operating lift to avoid injury. Be certain that hands, feet, legs and clothing are not in path of the platform as it moves.
- Be cautious when using metallic (conductive) tools near the battery, or heavy gauge wires.
- If battery acid contacts skin, wash area immediately with soap and water.
- Check under vehicle before drilling or cutting to avoid damage to the frame, subframe members, wiring, hydraulic lines, etc.
- Thoroughly understand the operating instructions before attempting to operate lift.
- Inspect lift before each use. Do not operate lift if an unsafe condition is present, or if there are unusual noises or movements.
- Keep others clear during lift operation.

Maintain the lift at its highest level of performance by doing the required maintenance. Ricon recommends a thorough inspection every six months.

E. MAJOR LIFT COMPONENTS

Major components of the Mirage F9TF Public Use Wheelchair and Standee Lift are in **Figure 1-1**. A description of each component is in **Table 1-1**.

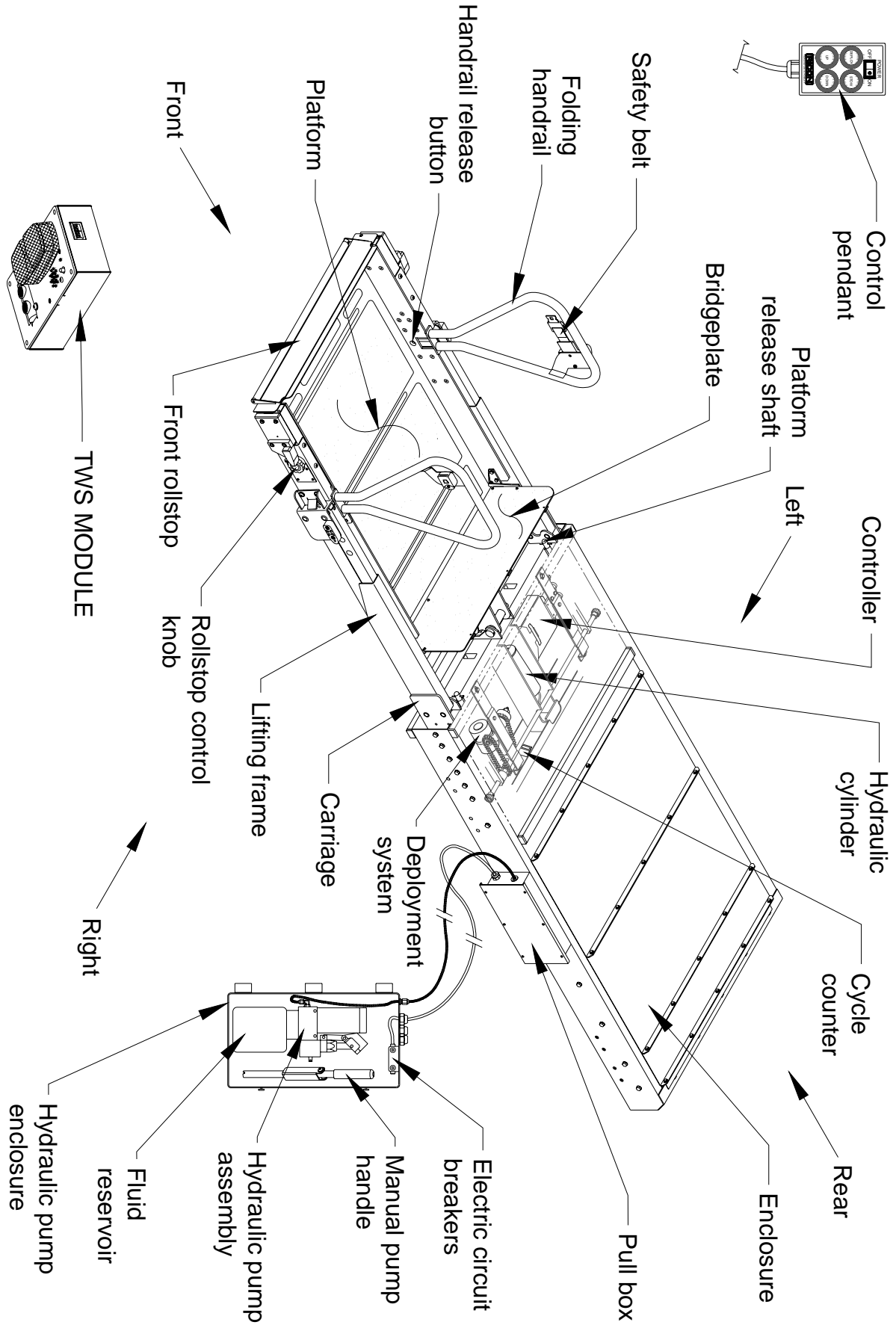


FIGURE 1-1: LIFT COMPONENTS FOR F9TF MODEL

TABLE 1-1: LIFT COMPONENTS FOR F9TF MODEL

NAME	DESCRIPTION
Left, Right, Front, Rear	Reference points from outside vehicle looking inward at lift.
Bridgeplate	Plate bridges gap between platform and vehicle floor when platform is at floor level. Acts as barrier during up and down platform motions to prevent wheelchair from rolling off rear of platform.
Carriage	Part of traveling frame that is mounted on rollers; moves on rails located inside enclosure. Supports lifting frame and platform.
Controller	Receives electrical input signals from pendant and lift sensors and sends control signals to lift electrical and hydraulic components.
Control pendant	Hand-held device used to control platform motions.
Cycle counter	Located on rear frame of carriage. Visible when platform is fully deployed. It records number of times platform has moved from floor to ground and back to floor.
Deployment system	Located within carriage. Employs an electric gear-motor to propel platform out of enclosure, or pull it back into enclosure.
Electric circuit breakers	Prevent over-current damage to lift electrical components. Not used to protect hydraulic pump motor.
Enclosure	Travelling frame housing; rigidly attached to vehicle chassis.
Fluid reservoir	Contains hydraulic fluid used by hydraulic system.
Folding handrail	(left and right) Provides platform occupant with a stable handhold.
Front rollstop	Front barrier prevents wheelchair from inadvertently rolling off the platform during platform movement.
Handrail release button	(left and right) Locks handrail in vertical position. Push inward to release handrail.
Hydraulic pump assembly	Electro-hydraulic unit provides hydraulic pressure used to raise platform. Also mounts components for manual operation.
Hydraulic pump enclosure	Contains lift hydraulic and electrical control components. Also houses manual backup pump handle.
Lifting frame	Upper and lower arms are hinged at front of carriage and at center of platform; raised by single hydraulic cylinder anchored to carriage.
Platform	Curbed area where passenger resides while being raised to vehicle or lowered to ground.
Platform release shaft	(left and right) Used when electric power is not available to lift. Releases platform from enclosure to facilitate manual deployment. Actuated by engaging and rotating either shaft.
Pull box	Houses electrical termination points to lift, and a hydraulic line disconnect point. Also accepts input harness from control pendant.
Pump handle	Used to manually operate hydraulic backup pump and pressure release valve when electrical power is not available. Also used to rotate platform release shafts.
Rollstop control knob	Provides manual control of rollstop if electrical power is not available.
Safety belt	Safety restraint belt that spans between handrails to help confine passenger to platform area.
Travelling frame	(not shown as unit) Assembly comprised of carriage, lifting frame, and platform.
TWS module	Detects presence of a passenger near open doorway when lift is deployed.
END OF TABLE	

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II. F9TF INSTALLATION

The RICON Mirage F9TF Public Use Wheelchair and Standee lift is contained in an enclosure that can be mounted in several possible vehicle locations. Specific information for every possible installation is not provided here due to the wide range of applications.

- The following general procedures apply to most installations.
- Contact Ricon Product Support for information on installations not covered.
- Installation is carried out in four steps:
 1. Mechanical
 2. Electrical
 3. Final adjustments
 4. Installation verification


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.
- ALWAYS WORK IN A PROPERLY VENTILATED AREA. DO NOT SMOKE OR USE AN OPEN FLAME IN THE VICINITY OF BATTERY.
- DO NOT LAY ANYTHING METALLIC ON TOP OF BATTERY.

A. MECHANICAL

1. LIFT POSITIONING NOTES:

Select a location within vehicle to install lift. The exact mounting position is determined by the motion path of the platform, relative to the ground and the interior floor of the vehicle. The lift must move without obstruction through its range of travel.

2. LIFT MOUNTING NOTES:

- Refer to **Figure 2-1**. The mounted weight of lift is received at eight standard attachment points (four on each side of enclosure). There is a 5/16-18 threaded insert at each point.

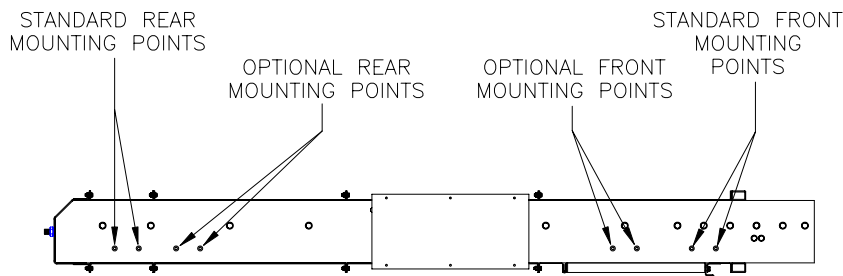


FIGURE 2-1: LIFT MOUNTING POINTS

- Mounting brackets for attachment of lift are not supplied, since lift mounting varies from one application to another. The mounting method must meet the load requirements in **Table 2-1**.

TABLE 2-1: LOAD CAPACITY REQUIREMENTS FOR LIFT MOUNTING BRACKETS		
Loading Direction	Front Supports (total capacity for left and right support points)	Rear Supports (total capacity for left and right support points)
Vertical	4500 lbs	3500 lbs
Longitudinal (perpendicular to drive axle)	3000 lbs	3000 lbs
Lateral (parallel to drive axle)	1500 lbs	1500 lbs
END OF TABLE		

 **CAUTION**

It is important that fasteners used for lift mounting do not protrude into the lift interior. Fasteners that are too long can interfere with movement of carriage.

- Threaded fasteners for mounting lift are 5/16-18, and must be grade 5, or higher. Their length must provide at least 5/16" and no more than 7/16" of thread engagement with threaded inserts.
- If adjustment slots are added to mounting brackets, they must be horizontal. Horizontal slots, rather than vertical, will prevent the lift slipping downward if the hardware loosens.
- Vertical adjustment must be accomplished placing shims between the mounting brackets and vehicle frame. Maximum shim thickness is 1/8".
- Use at least two mounting points at each corner of enclosure to support lift.
- The top four corners of the enclosure must be in the same plane, +/- 1/8". Shim, as required.
- Mounting brackets must be painted or treated to protect against rust and corrosion.

3. HYDRAULIC POWER UNIT

a. Hydraulic Power Unit Mounting Notes

- The hydraulic power unit must be located so that operator has a clear view of platform while operating manual back-up system.
- The load capacity of brackets used to mount hydraulic power unit must meet criteria in **Table 2-2**:

TABLE 2-2: LOAD CAPACITY REQUIREMENTS FOR HYDRAULIC POWER UNIT MOUNTING BRACKETS	
LOAD DIRECTION	BRACKET CAPACITY
Vertical	125 lb
Longitudinal (perpendicular to drive axles)	200 lb
Lateral (parallel to drive axles)	100 lb
END OF TABLE	

- Meeting these criteria assures that the pump mounting will withstand normal loads occurring during transit, and also during manual pump use.
- Be certain pick-up tube is oriented properly when pump assembly is horizontally mounted. Also, be certain breather plug oriented properly (requires elbow fitting).

b. Power Unit to Pull Box Connection

- 1) Connect main hydraulic hose to hydraulic power unit, if not already done.
- 2) Operate manual backup pump until hydraulic fluid flows out open end of hose.
- 3) Connect open end of hose to hydraulic fitting located on side of pull-box.
- 4) Deploy platform and lower to ground.

 **CAUTION**

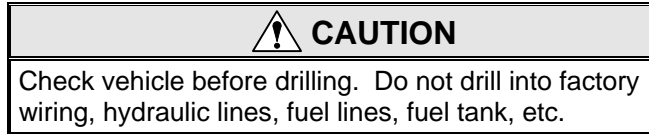
Check and add hydraulic fluid when platform is at **ground** level. Adding fluid with platform raised will cause oil reservoir to overflow when it is lowered.

- 5) Remove temporary plug on top of hydraulic pump reservoir. Verify that hydraulic fluid in reservoir is at FULL level. Add Texaco 01554 Aircraft Hydraulic Oil, or equivalent U.S. mil spec H5606G fluid, if necessary. Replace temporary plug with supplied breather plug.
- 6) Refer to Final Adjustments section in this chapter for hydraulic bleeding procedure.

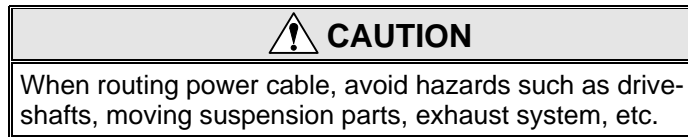
B. ELECTRICAL

Electrical installation is similar for both 12 and 24 VDC electrical systems, whether they are insulated return, or chassis return. Use the following procedure to connect power to lift.

NOTE: A dedicated, insulated 4 AWG return (ground) wire is strongly recommended. In either case, be certain all connections are clean and secure.



1. Mount a circuit breaker (50 amp for 24V application, and 90 amp for 12V) within 12" (30 cm) of battery.
2. Cut one 3/4" (19.5-mm) hole through vehicle floor or wall to gain access to underside of vehicle. Locate hole adjacent to hydraulic pump unit. Deburr hole and install rubber grommet.
3. Crimp a 5/16" ring terminal to end of four gauge, red power cable, then fasten to power cut-off solenoid (located near hydraulic pump unit). Insert other end of red wire through grommet.



4. Route cable along vehicle frame, etc, to circuit breaker location. Make sure cable does not interfere with moving parts or contact anything hot. Secure with cable ties every 18" (45 cm).
5. Cut red wire to an appropriate length for reaching the circuit breaker. Save the discarded wire.
6. Crimp a 1/4" ring terminal to end of red wire, then fasten to circuit breaker AUX terminal.
7. Cut a 12" (30 cm) length of wire from the previously saved heavy red wire, and crimp a 1/4" ring terminal to both ends.
8. Fasten one end of wire to circuit breaker BAT terminal.
9. Fasten other end of wire to positive battery terminal.
10. Connect supplied harness between terminal strip in hydraulic pump enclosure and terminal strip in pull box. Connect harness to pendant (or to pendant extension). Refer to electrical diagrams in **Chapter III**.

C. SAFETY INTERLOCKS



Refer to wiring diagrams in **Chapter III**. A voltage that is sourced from vehicle (12 or 24 VDC) is applied to terminal five of the pump enclosure terminal strip TS1 **WHEN VEHICLE IS SAFELY PARKED**. This complies with ADA interlock requirements.

D. FINAL ADJUSTMENTS

This section contains procedures that might be needed after lift is installed in vehicle. It is not a requirement to perform all procedures after lift installation, but only those that are necessary. Additional adjustment procedures that would normally be needed after maintenance or repair are in **Chapter IV**.



WARNING

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

1. HYDRAULIC BLEEDING

The fluid in hydraulic system will contain air after installation of lift into vehicle. It may also contain air as a result of doing maintenance or repairs. The trapped air must be removed by "bleeding" the hydraulic system.

Two methods are possible. The first is a traditional procedure that requires opening the hydraulic system. The second procedure is quicker and easier because it does not require any disassembly. However, the second procedure will not remove air as thoroughly as the first.

a. Typical Bleeding Procedure

NOTE: The following procedure should be performed by two people, and may spill hydraulic fluid.

- 1) Fully deploy lift.
- 2) Raise platform to floor height, and support.



WARNING

THE SERVICE ACCESS PANEL IS HINGED ALONG THE REAR EDGE AND SHOULD BE HELD UP WHILE REMOVING THE RETAINING SCREWS AT THE FRONT EDGE. THIS WILL PREVENT PANEL FROM FALLING AND CAUSING INJURY OR DAMAGE.

- 3) To gain access to underside of lift, hold service access panel up, remove the two retaining screws and lock-nuts near front edge of panel, and then lower panel.
- 4) Disconnect positive battery cable in vehicle battery compartment.
- 5) Locate air bleeder valve on topside of hydraulic cylinder (cylinder located in carriage). Access to this valve is through a hole in the rear carriage frame channel.
- 6) Remove platform support.



WARNING

THE FOLLOWING STEP OPENS THE HYDRAULIC BLEEDER VALVE AND WILL ALLOW THE PLATFORM TO SLOWLY DROP.

NOTE: The next step will spill hydraulic fluid; have dry rags on hand.

- 7) Open bleeder valve slightly. Let air and hydraulic fluid escape from cylinder.
- 8) Close air bleeder valve.
- 9) Manually lower platform to ground.



CAUTION

Check and add hydraulic fluid when platform is at **ground** level. Adding fluid with platform raised will cause oil reservoir to overflow when it is lowered.


- 10) Remove plug on the top of hydraulic pump tank (reservoir). Make sure that hydraulic fluid in tank is at FULL level. Add only Texaco 01554 Aircraft Hydraulic Oil, or equivalent U.S. mil spec H5606G fluid and reinstall plug.
- 11) Repeat previous five steps until fluid coming out of bleeder valve is free of air.
- 12) Verify that air bleeder valve is fully closed.
- 13) Hold service access panel up, remove two retaining screws and lock nuts at front edge of panel, and then lower panel.
- 14) Connect positive battery cable at vehicle battery compartment.
- 15) Remove platform support and stow platform.

b. Alternate Bleeding Procedure

- 1) Connect hydraulic hose to fitting on pump box, if not already connected.
- 2) Use manual pump to fill hose; fluid should flow from open end.

- 3) Connect open end of hose to fitting on pull box.
- 4) Verify that top of enclosure is about 40" above ground, and that enclosure is level.
- 5) Deploy platform and lower until maximum down travel is obtained.
- 6) Raise platform to floor level.
- 7) Repeat above cycle ten times.

2. PLATFORM VERTICAL TRAVEL LIMIT ADJUSTMENT

 CAUTION
The following procedure measures and sets the platform height at floor level. <u>Adjustments</u> to platform height are made at a lower height to reduce loading on the hydraulic cylinder piston. Do not attempt to rotate hydraulic cylinder piston rod if excessive resistance is felt. Determine cause of resistance, and correct before rotating piston rod.

NOTE: This procedure should be used to adjust vertical travel limit errors of less than 1". Errors greater than 1" must be adjusted by supporting platform, removing keeper plates (2 ea), and rotating the trunnion.

- a. Raise platform until hydraulic cylinder is fully extended.
- b. Measure vertical distance between floor and rear edge of platform. The platform must be 1–1½" above the floor. Note the amount of error, and whether platform needs to be raised or lowered. Continue this procedure, if adjustment is necessary.
- c. Lower the platform to a height about one foot below floor level, and support it.
- d. Loosen jam nut on hydraulic cylinder piston rod.
- e. Rotate piston rod to raise or lower platform the required amount; rotate CW to raise platform and CCW to lower. Do not rotate piston rod more than ¼ turn without checking result.
- f. Return platform to floor height (fully extend hydraulic cylinder), and remeasure the distance between floor and platform. If readjustment is necessary, repeat steps 2) through 6).
- g. Tighten jam nut.

NOTE: Reprogram the stow height (and intermediate height, if lift is installed in baggage bay) if an adjustment was made. Refer to the Platform Stow Height Adjustment section in this chapter.

3. BRIDGEPLATE ACTUATOR ROD ADJUSTMENT

Two actuator rods control Bridgeplate deployment. The length of the rods control the angle of the bridgeplate relative to the platform. Adjust actuator rods so bridgeplate is fully unfolded when platform arrives at floor height.

 WARNING
INCORRECT DEPLOYMENT OF BRIDGEPLATE CAN CREATE A DANGEROUS CONDITION FOR LIFT USER, AND MAY CAUSE DAMAGE TO THE BRIDGE PLATE OR PLATFORM. VERIFY THAT THE BRIDGEPLATE IS ADJUSTED CORRECTLY.

- a. Deploy platform using control pendant (DEPLOY).
- b. Raise platform to floor height and support it.
- c. Disconnect positive battery cable at vehicle battery compartment.
- d. Refer to **Figure 2-2** on following page. Locate rod-end portion of actuator rod assembly at right side of platform (between junction of lifting frame and platform). Loosen rod-end jam-nut.

NOTE: The actuator rod-ends are left-hand threaded. Turning one clockwise will lengthen actuator rod, and counter-clockwise will shorten it; lengthening actuator rod will delay unfolding of bridgeplate and shortening speeds up unfolding.

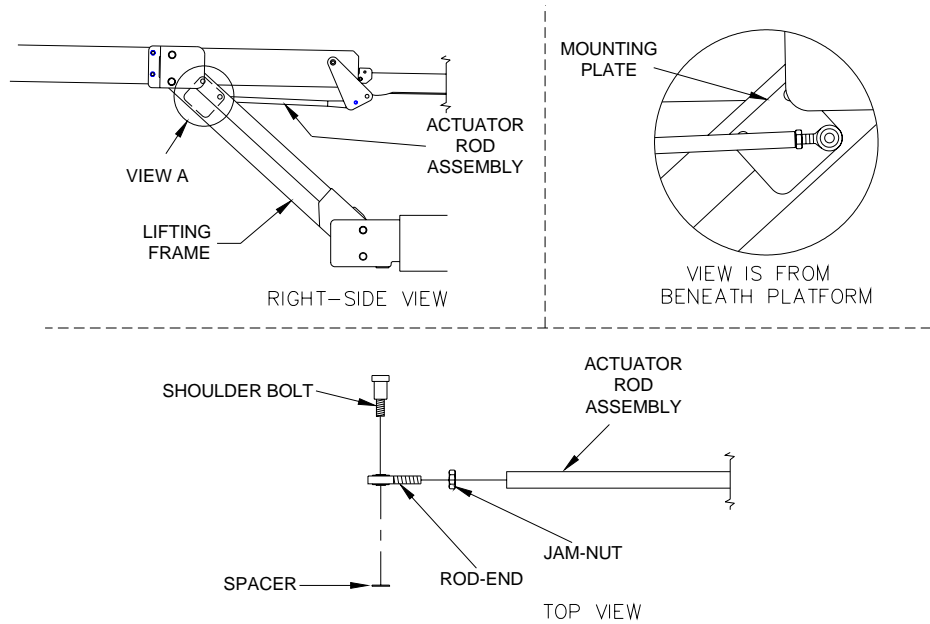


FIGURE 2-2: BRIDGEPLATE ACTUATOR ROD ASSEMBLY

- e. Remove shoulder bolt that fastens actuator rod-end to mounting plate (on traveling frame); catch spacer as it falls.
- f. Locate rod-end portion of actuator rod assembly at left side of platform (between the junction of the traveling frame and platform). Loosen rod-end jam-nut.
- g. Remove shoulder bolt that fastens actuator rod-end to mounting plate (on traveling frame); catch spacer as it falls. Lower bridgeplate to floor by hand.
- h. Refer to **Figure 2-3**. Turn left-side rod-end to achieve a clearance of $1/8'' - 3/16''$ between bridgeplate cam and bridgeplate cam follower when shoulder bolt and spacer are installed. Tighten shoulder bolt, then tighten rod-end jam-nut.

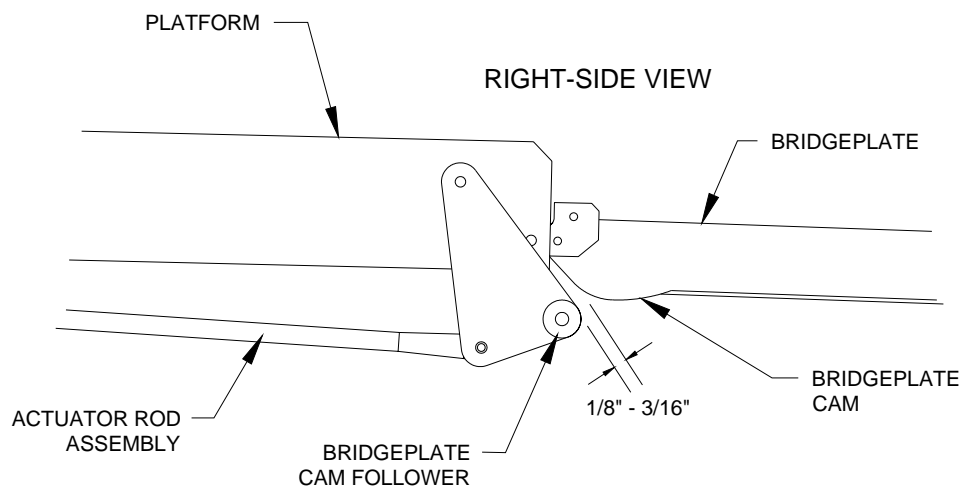


FIGURE 2-3: BRIDGEPLATE ADJUSTMENT

- i. Verify that bridgeplate is resting flat against floor. Adjust right-side rod-end so that shoulder bolt can be installed without altering bridgeplate position. Install spacer and shoulder bolt, and then tighten rod-end jam-nut.
- j. Reconnect positive battery cable at vehicle battery compartment.
- k. Remove platform support and operate lift to verify that bridgeplate deploys correctly. Readjust actuator rod assemblies, if necessary.

4. PLATFORM STOW AND INTERMEDIATE HEIGHT ADJUSTMENTS

The height of platform prior to being pulled into enclosure is referred to as “stow height”. When this height is properly set, the platform will easily enter enclosure without hanging-up. The stow height is factory set and normally does not require resetting after lift installation, except when major lift disassembly is done. However, if the vertical travel limit has been adjusted, then stow height must be reprogrammed.

Most dedicated entry models have an additional platform position referred to as “intermediate height”. This height is generally a few inches below floor height, and is also factory-set. The height may be reprogrammed for specific applications, or after major repair work. Some dedicated entry models move the platform from the ground directly to floor height, without an intermediate stop.

An optional programming switch kit is available to program the stow and intermediate heights into the controller memory. It is Ricon part number 17885.

NOTE: The stow and intermediate height values are stored indefinitely in the controller memory. Programming the controller will clear the present value and store a new value.

a. To Program Stow Height:

- 1) Deploy platform.
- 2) Use manual back-up pump in combination with manual pressure release valve to position top the surface of the platform lifting arms at the same height as the top surface of carriage. This alignment assures that platform can be pushed into enclosure without difficulty.
- 3) Refer to **Figure 2-4**. Release manual platform lock, and then hand-push platform into enclosure. Stop pushing when front face of white stow guide block (tear-drop shaped plastic block) is adjacent to front edge of enclosure. The stow guide block will be visible from front of lift.

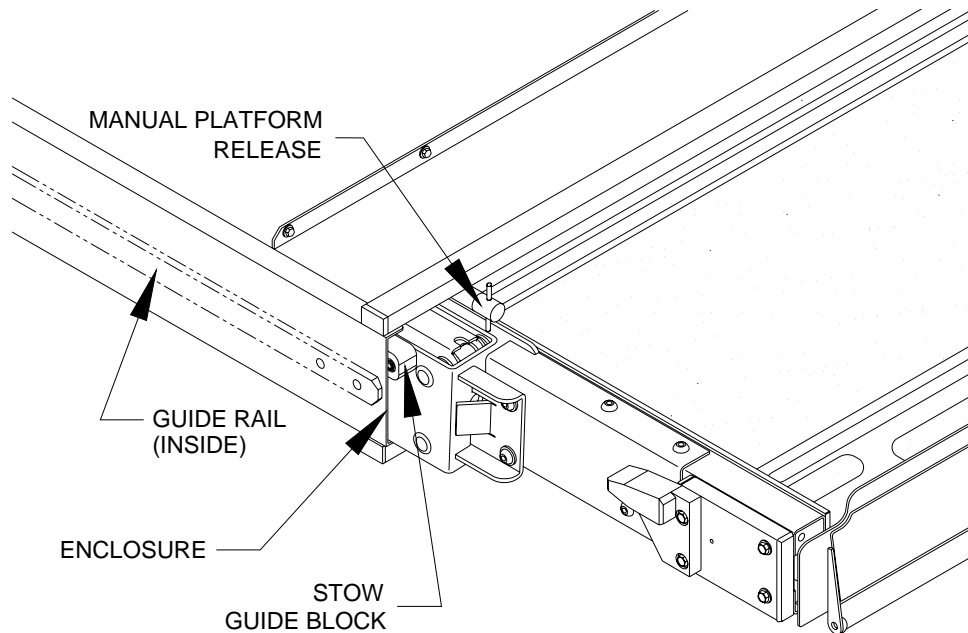


FIGURE 2-4: STOW GUIDE BLOCK ALIGNMENT

- 4) Lower platform by opening manual pressure release valve (located on pump assembly), and let stow guide blocks (left side and right side) settle on guide rails. Close valve.
- 5) Raise platform with manual back-up pump so that both left and right side stow guide blocks are approximately 1/32 inch above guide rails.
- 6) Hand-pull platform completely out of enclosure; the platform must lock in place to assure accurate data entry. Check lock by attempting to push platform into enclosure; it must not move.

- 7) Refer to **Figure 2-5**. The mating connector for the programming switch is attached to the underside of the controller bracket. The connector is protected with a removable plug. Connect programming switch to connector.

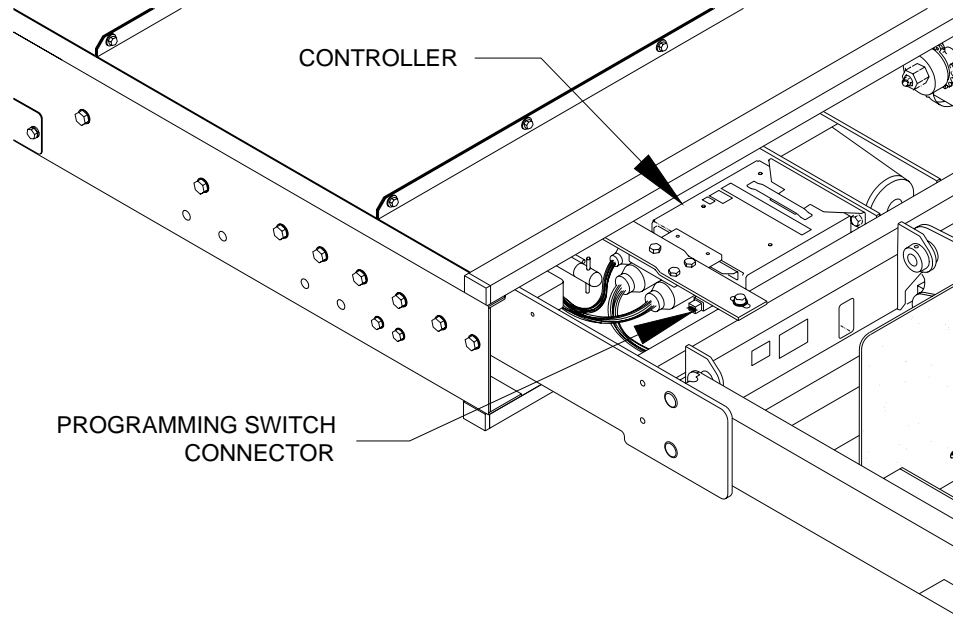


FIGURE 2-5: PROGRAMMING SWITCH CONNECTOR

- 8) Press the DEPLOY button three times (DEPLOY button is in the upper left corner of control pendant). Press the programming switch button for approximately ten seconds to program stow height. Disconnect programming switch and replace plug.

NOTE: The programming switch is enabled for a period of 5 minutes after the DEPLOY button is pressed three times. The programming mode is ended when any other button is used during this period.


NOTE: The following two steps might lower the platform to a point slightly below the programmed stow height, which is acceptable.

- 9) Use pendant to raise platform at least one foot above stow height.
10) Stow platform from this raised position and stop its movement when platform has entered enclosure approximately six inches.

NOTE: The following two steps might raise platform to a point slightly above the programmed stow height, which is acceptable.

- 11) Use pendant to deploy platform and lower it at least one foot below stow height.
12) Stow platform from this lowered position and stop its movement when platform has entered enclosure approximately six inches.
13) Repeat steps nine and ten.

b. Program the Intermediate Height (Dedicated Entry model, only)

 CAUTION
Ricon recommends that stow height be programmed <u>before</u> intermediate height.

NOTE: This procedure may require use of manual back-up pump to raise platform because the UP button (on pendant) may be disabled. The DOWN button can be used to lower platform.

- 1) Use pendant to deploy platform.

NOTE: The platform must be fully deployed before controller can accept an intermediate height value.

- 2) Raise platform to height preferred for intermediate position; this height must be at least two feet above stow height.
3) Refer to **Figure 2-5**. The mating connector for the optional programming switch is attached to the underside of the controller bracket. The connector is protected with a removable plug. Connect programming switch to connector.
4) Press the DEPLOY button three times (DEPLOY button is in the upper left corner of control pendant). Press the programming switch button for approximately ten seconds to program intermediate height. Disconnect programming switch and replace plug.

NOTE: After the DEPLOY button is pressed three times, there is a time period of 5 minutes during which the programming switch is enabled. Programming will be disabled if any other button is used during this period.

- 5) Verify that programmed intermediate position is correct by stowing platform, then deploying and raising it to intermediate height.

NOTE: It is acceptable for the intermediate position to vary +/- 1/2 inch from the programmed height.

5. ANTI-STOW PRESSURE SWITCH ADJUSTMENT

An adjustable, pressure sensing, electrical switch is installed in the hydraulic line that is connected to the hydraulic cylinder. The switch will detect the presence of a 75 lb. load, or greater, on the deployed platform. Correct adjustment of anti-stow switch inhibits horizontal movement of loaded platform, providing an element of safety for lift users.

CHECK:

- a. Refer to **Figure 2-6**. The pressure switch adjusting screw is located at the top of the body, between the two lead wires. There is a locking setscrew above the adjusting screw, which must be removed to carry out pressure switch adjustments.

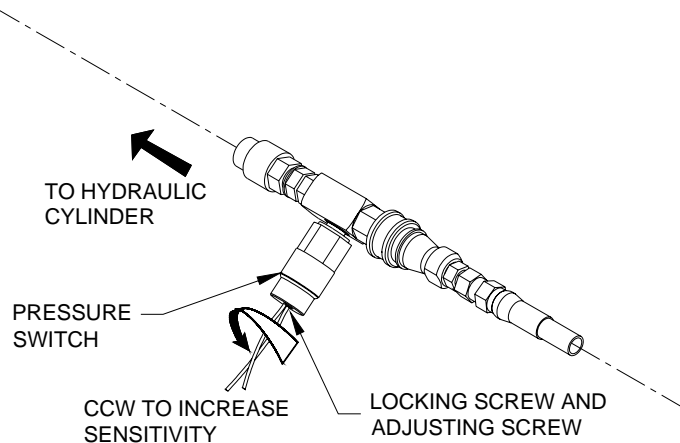


FIGURE 2-6: ANTI-STOW PRESSURE SWITCH

- b. Apply power to lift and deploy platform.
- c. Lower platform to ground, and place a 75 lb. weight in center of platform.
- d. Press STOW button until platform reaches STOW height. Platform should stop at stow height and not enter enclosure. Proceed to next step if platform attempts to enter enclosure.

ADJUST:

- a. Remove locking setscrew (requires hex key) and turn adjusting screw 1/8 turn CCW to increase sensitivity. Repeat above steps until the 75 lb. weight inhibits stowing of platform. Repeat test from floor height; platform should stop at stow height and not enter enclosure.
- b. Remove test weight and then check platform stow function from ground height and from floor height. Platform should stow properly from either level. Replace locking setscrew.

NOTE: Normal platform operation may not occur if pressure switch adjustment is too sensitive (inhibits stow function when a weight that is significantly less than 75 lb. is present). Turn adjusting screw CW to decrease sensitivity.

Also, erratic platform movement may occur if setting of pressure switch is marginal. Correct this by turning adjusting screw 1/16 turn in appropriate direction.

6. ROLLSTOP ADJUSTMENT

Correct operation of the outer rollstop is essential to user safety. The rollstop is adjusted at the factory and should not require further adjustment after delivery and installation. Rollstop adjustment is not affected by the configuration of the installation. If there is any doubt about the rollstop operation, refer to "Rollstop Maintenance" in the "Travelling Frame" section of chapter four.

7. THRESHOLD WARNING SYSTEM (TWS) ADJUSTMENT


Refer to installation instructions 32ii354e (supplied with lift) for procedures related to adjustment of the TWS module. There are three sections presented in this document. The first section adjusts where the acoustic beam is pointed, the second tests the accuracy of the adjustment, and the third provides a procedure for adjusting the timing of the sensors.

Adjustment of the sensor timing is done at the factory and should not need to be repeated in the field. Readjustment should only be considered if the sensor aiming could not be adjusted to ignore both the wheelchair in the aisle and the platform during its normal movement.

E. VERIFY INSTALLATION

Lifts that are installed for the first time in a new application, or installations carried out by technicians with limited experience, must be checked by a representative of Ricon Applications Engineering. The check is based on the items listed on Ricon document 32EIVF9T (Equipment Installation Verification checklist for F9T).

- Be certain there is no interference with operation of 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 vehicle during transit.

 CAUTION
<ul style="list-style-type: none">• Do not operate lift during load test. the load test is intended to test lift installation mounting points, not lifting capacity. remove test weight immediately after test.• When test weight is placed on platform, the vehicle suspension will compress and vehicle will lean. if weighted platform touches ground, remove weight, raise platform, and retest.

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


F. CUSTOMER ORIENTATION


IMPORTANT ~ Customer Orientation ~ Ricon Sales or Service personnel must review the Warranty and the Operator Manual with the customer to confirm that they understand the safe operation of the lift. Instruct customer to follow operating instructions without exception.

The installing service technician must attach the F9TF series normal operating and manual operating instructions decals to vehicle in a location clearly visible to operator. Attach parking restriction decals to vehicle, if provided with lift.

III. F9TF MAINTENANCE

Regular maintenance of the Ricon Mirage F9TF Public Use wheelchair and standee lift is essential for optimum performance, and will reduce the need for repairs. This chapter contains a maintenance schedule, plus electrical and hydraulic diagrams.

 CAUTION
This Ricon product is highly specialized. Maintenance and repair work must be performed by a Ricon authorized service technician, using Ricon replacement parts.

 WARNING
MODIFYING OR FAILING TO PROPERLY MAINTAIN THIS PRODUCT WILL VOID THE WARRANTY AND MAY RESULT IN UNSAFE OPERATING CONDITIONS.

A. MAINTENANCE SCHEDULE

Climate (weather), frequency of use, and lift age (vehicle mileage) combine to determine the regularity of lift maintenance.

Ricon recommends carrying out the inspection items listed in the Maintenance Checklist. Maintenance should be done at the interval prescribed on the appropriate Maintenance Frequency Chart.

Select the Maintenance Frequency Chart that contains the combination of lift usage (low, normal, high) and climate type (mild, average, severe) that applies to your vehicle. Do maintenance at the cycle interval above your vehicle type (stepwell or dedicated entry). The lift cycle counter is mounted inside the carriage, on the rear frame member, just to the right of the hydraulic cylinder (refer to Figure 1-1 in Chapter I). The counter advances each time the platform moves through a complete cycle, which consists of the platform moving from the vehicle floor to the ground and back to the floor.

- A stepwell model lift is installed in the bottom step riser; most of the lift is exposed to the weather.
- A dedicated entry model lift is installed within a compartment; the lift is sheltered from the weather.
- Refer to the Maintenance Checklist in this chapter. Copy the checklist for routine use.

1. MAINTENANCE FREQUENCY CHARTS

Low Usage in Mild and Average Climates:

1200 cycles	1800 cycles
Stepwell (exposed to environment)	Dedicated Entry (protected from environment)
Low usage (0 - 180 cycles per month)	Low usage (0 - 180 cycles per month)
Mild & average climates (little or no snow)	Mild & average climates (little or no snow)

Low to Normal Usage in Mild to Average Climates:

1000 cycles	1300 cycles
Stepwell (exposed to environment)	Dedicated Entry (protected from environment)
Normal usage (180 – 360 cycles per month)	Normal usage (180 – 360 cycles per month)
Mild and average climates (little or no snow)	Mild and average climates (little or no snow)

Low, Average, and High Usage in Severe Climate:

300 cycles	400 cycles
Stepwell (exposed to environment)	Dedicated Entry (protected from environment)
Low, normal, and high usage (0 – 360+ cycles per month)	Low, normal, and high usage (0 – 360+ cycles per month)
Severe climate (medium to heavy snow or marine exposure)	Severe climate (medium to heavy snow or marine exposure)

High Usage in Mild Climate:

750 cycles	1000 cycles
Stepwell (exposed to environment)	Dedicated Entry (protected from environment)
High usage (360+ cycles per month)	High usage (360+ cycles per month)
Mild climate (little or no snow)	Mild climate (little or no snow)

High Usage in Average Climate:

600 cycles	800 cycles
Stepwell (exposed to environment)	Dedicated Entry (protected from environment)
High usage (360+ cycles per month)	High usage (360+ cycles per month)
Average climate (light snow)	Average climate (light snow)

2. MAINTENANCE CHECKLIST



**MAINTENANCE CHECKLIST
F9TF MIRAGE**

Date:	Vehicle #:	Lift serial #:
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Checked safety issues require repairing before vehicle is returned to service.

Suggested solvents, cleaners, and lubricants: Zep Formula 50 R.T.U, part #599A or equivalent;
(use to clean decals and platform)
Zep I.D. Red, part #399C or equivalent;
(use to clean carriage assembly)
Zep PLS, part #497C or equivalent;
(use to lubricate carriage assembly)

	Initial boxes as appropriate →	OK	Requires repair	Repair at next service	Repair before returning to service
	Enable pendant by turning power switch on. Verify that power switch and four push buttons have illuminated.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety issue	Disable vehicle interlock by shifting transmission out of neutral or releasing parking brake. Verify that platform cannot be deployed. Enable vehicle interlocks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Deploy platform and lower to ground. Verify that front rollstop opens when platform contacts ground.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Verify that platform is clean and non-skid strips are attached and in good condition.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety issue	Verify that bridgeplate (rear barrier) is up (at 90 degrees to platform) before platform lowers to ground.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Check operation of front rollstop manual control knob.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Check manual pump operation and hydraulic fluid level. Use Texaco No.1554 aircraft hydraulic fluid (or equivalent U.S. mil spec H5606G oil).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety issue	Raise both handrails and push downward. Verify they are locked in place by pulling upward; they must not move.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety issue	Raise platform; verify that outboard roll stop is closed and locked by pulling against it. Verify that bridgeplate is up.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety issue	Raise platform to floor level; verify that bridgeplate remains up during transition from ground to floor, and that it overlaps floor 1"– 2".	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Safety issue	Verify that TWS operates properly. Lower platform about two inches and then stand on vehicle floor near doorway; light must flash and buzzer must sound.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Safety issue	Stow platform from floor level. Platform must stow completely, without binding. Verify that vehicle transmission, parking brake, etc. are enabled by interlock system.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Rotate manual platform release and pull platform out <u>completely</u> . Platform must lock in place (cannot be pushed back in). Rotate manual release and push platform in <u>completely</u> . Platform must lock in place (cannot be pulled out).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Check all decals. Decals should be readable and attached securely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		OK	Requires repair	Repair at next service	Repair before returning to service
	Check cylinder, hydraulic lines, and connections for leaks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Clean carriage assembly with Zep I.D. Red degreaser.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Inspect and lube four carriage rollers and torque limiting clutch assembly. Remove excess grease.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Inspect primary and secondary drive chains. Adjust, if needed. Lube with Zep PLS lubricating spray.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Check hydraulic cylinder for leaks; spray trunnion and center pivot pin with Zep PLS lubricating spray.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Spray eight pins on lifting frame with Zep PLS lubricating spray.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Remove rollstop covers from both sides of platform; clean rollstop pivot points with Zep I.D. Red degreaser. Replace covers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NOTES:		Print name: _____			
		Signature: _____			

B. TROUBLESHOOTING CHART

Reference is made in the troubleshooting chart to connector pins located on harness connectors and components. Refer to the Wheelchair Lift Electrical Wiring Diagram in Figures 3-1 and 3-2 for identification and location of these components and connectors.

NOTE: Figures referenced in the troubleshooting chart are located either in this chapter or other chapters in this manual.

NOTE: Verify that the 24 VDC power supplied to the wheelchair lift by the vehicle is present, and is capable of supplying sufficient electrical current. Also, verify that vehicle interlock requirements are met.

TABLE 3-1: WHEELCHAIR AND STANDEE LIFT TROUBLESHOOTING CHART			
SYMPTOM	PROBABLE CAUSE	TESTS AND CHECKS	CORRECTIVE ACTION
Platform does not deploy.	24 vdc power is not available to lift.	Check for 24 vdc at 50A circuit breaker.	Switch lift power on (at dashboard).
	Lift 50 A circuit breaker is tripped.	Check for 24 vdc at power cut-off solenoid.	Reset breaker.
	24 vdc power is not present in lift.	Check for 24 vdc at 30A circuit breaker (in pump box).	If voltage is not present, replace power cut-off solenoid.
		1. Check for 24 vdc at pin 7 of P2. 2. Check 10A fuse at pin 1 of P2.	Replace 10A fuse, if bad.
	Lift 30 A circuit breaker is tripped.	Check for 24 vdc at pin 1 of TS1 (in pump box).	Reset breaker if voltage is not present.
	Main harness connector to controller is loose.		Verify secure connection of P2 to controller.
	Carriage/platform harness connector to controller is loose.		Verify secure connection of P5 to controller.
	Obstruction in enclosure.	Look inside enclosure for foreign objects and check for twisting of main harness.	Remove obstruction; check for related damage.
	"Deploy" button failure (on control pendant).	Verify 24 vdc at pin 7 of P1.	If voltage is not present, check current path back to controller.
		Verify 24 vdc at pin 6 of P1 with "Deploy" button pressed.	If voltage is not present, replace "Deploy" button (section F-1 of chap 4).
	TWS PCB failure.	Verify 24 vdc at terminals 3 and 14 of TS2 when Deploy button is pressed.	If either voltage is not present, replace TWS PCB (located in pullbox).
	Controller failure.	Verify 24 vdc at pins 3 and 18 of P2 when Deploy button is pressed.	If both voltages are present, replace controller.
		Verify 24 vdc across pins 10 and 15 of P5 when Deploy button is pressed.	If voltage is not present, replace controller.
In/Out motor failure.	Check for 24 vdc across In/Out motor (moves carriage) with "Deploy" button pressed.	If voltage is present, replace In/Out motor.	
Platform does not lower.	Platform not fully deployed.	Check for 24 vdc at pin 5 of P5.	Press "Deploy" button on control pendant. If 24 vdc is still not present, check or replace "Deployed Indicator" switch.

TABLE 3-1: WHEELCHAIR AND STANDEE LIFT TROUBLESHOOTING CHART



SYMPTOM	PROBABLE CAUSE	TESTS AND CHECKS	CORRECTIVE ACTION
	Hydraulic quick-disconnect hose fitting to cylinder is not secure.		Verify that quick-disconnect connector is fully engaged.
	Down valve failure (part of hydraulic pump assembly).	Check for 24 vdc at pin 4 of TS1 when Down button is pressed. Check for ground on other side of down valve.	If voltage is present, replace down valve.
	Down button (on control pendant) failure.	Verify 24 vdc at pin 7 of P1.	If voltage is not present, check current path back to controller.
		Check for 24 vdc at pin 4 of P1.	If voltage is not present, replace Down button (section F-1 of chap 4).
	TWS PCB failure.	Verify 24 vdc at terminal 14 of TS2 when Down button is pressed.	If voltage is not present, replace TWS PCB (located in pullbox).
	Bridgeplate switch	Check for 24 vdc at pin 18 of P2 with Down button pressed.	If voltage is not present, check Bridgeplate switch and circuit. Replace switch, if necessary.
	Controller failure.	Check for 24 vdc at pin 18 of P2 with Down button pressed.	If voltage is not present, replace controller.
Debris in hydraulic system.	Open manual release valve.	If platform lowers with valve open, flush hydraulic system.	
Platform does not lower manually.	Hydraulic quick-disconnect hose fitting to cylinder is loose.		Verify that quick-disconnect connector is fully engaged.
	Debris in flow control valve (located at cylinder).	Open manual release valve.	If platform lowers with valve open, flush hydraulic system.
	 CAUTION Verify that 24 vdc power to lift is OFF before opening this hydraulic line. Support platform if deployed.		
	Manual pressure release valve failure.	Loosen fitting on the hydraulic line connected to pump assembly.	If platform lowers, replace release valve.
Rollstop doesn't open when platform contacts ground.	Obstruction of rollstop release latch.	Raise platform and actuate latch manually.	If latch does not move, remove left rollstop cover (Fig 3-3 in chapter 4) and inspect for debris.
	Rollstop "Ground Contact" switch not actuating.	Check for 24 vdc at pin 14 of P5 with platform on ground.	Verify switch adjustment; readjust as necessary (section C.1.b of chapter 4).
	Connector for rollstop switches is loose.		Verify secure connection of P6 to J6. Connectors are behind right rollstop cover (Fig 3-3 in chapter 4).
	Connector for rollstop motor is loose.		Verify secure connection of P7 to J7. Connector is behind right rollstop cover (Fig 3-3 in chapter 4).
	Carriage-platform harness connector on controller is loose.		Verify secure connection of P5 to controller.
	Rollstop "Ground Contact" switch failure.	Check for 24 vdc at pin 14 of P5 with platform on ground.	If voltage is not present, replace switch (section F-1 of chap 4).

TABLE 3-1: WHEELCHAIR AND STANDEE LIFT TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	TESTS AND CHECKS	CORRECTIVE ACTION
	Controller failure.	Check for 24 vdc across pins 1 and 7 of P5 with platform on ground.	If voltage is not present, replace controller.
	Rollstop motor failure.	Check for 24 vdc between pins A and B of J7 with platform on ground.	If voltage is present, replace rollstop motor. Refer to Fig 3-4 in chapter 4.
	Rollstop adjustable link is misadjusted.	Look for a gap between the closed rollstop and the bumper it contacts.	If any gap is seen, verify adjustment (Fig 3-6 in chapter 4).
Platform rises, but then lowers when “Up” button is released.	Hydraulic manual release valve is open.	Look for fluid returning to pump reservoir.	Close manual release valve; do not over-tighten!
	Down valve is actuated.	Check for 24 vdc at terminal 4 of TS1 (located in pump enclosure).	If voltage is present, replace controller.
	Down valve failure.	Verify that 24 vdc is not on terminal 4 of TS1 (located in pump enclosure). Verify that fluid is returning to reservoir.	If voltage is not present and fluid is returning, replace down valve.
	Debris in hydraulic system.	Look for fluid returning to pump reservoir after button is released.	If fluid is seen, flush hydraulic system.
Rollstop does not close when “Up” button is pressed.	“Deployed” indicator switch misadjusted.	Check for 24 vdc at pin 5 of P5.	If voltage is not present, verify adjustment (switch is located at right rear of carriage, with its plunger protruding through right side).
	Connector for rollstop switches is loose.		Verify secure connection of P6 and J6 (connector is behind left rollstop cover; Fig 3-3 in chapter 4).
	Up button (on control pendant) failure.	Verify 24 vdc at pin 7 of P1.	If voltage is not present, check current path back to controller.
		Check for 24 vdc at pin 3 of P1 with “Up” button pressed.	If voltage is not present, replace button (section F-1 of chap 3).
	“Rollstop Closed” switch failure.	Check for 24 vdc at pin 13 of P5.	If voltage is not present, replace switch (section F-1 of chap 4).
Rollstop motor failure.	Check for 24 vdc between pins A and B of J7.	If voltage is present, replace rollstop motor.	
Platform does not stow when Stow button is pressed.	A load of 75 lbs, or greater, is on platform.	Check for presence of an object on platform.	Remove object.
	Main harness connector on controller is loose.		Verify secure connection of P2 to controller.
	Carriage-platform harness connector on controller is loose.		Verify secure connection of P5 to controller.
	Stow button failure (on control pendant).	Verify 24 vdc at pin 2 of P2 when Stow button is pressed.	If voltage is not present, check current path back to controller.
		Check for 24 vdc at pin 2 of P1 with Stow button pressed.	If voltage is not present, replace Stow button (section F-1 of chap 4).
	In/Out motor failure.	Check for 24 vdc across In/Out motor when Stow button is pressed.	If voltage is present, replace In/Out motor.
Controller failure.	Check for 24 vdc at pin 2 of P2 with Stow button pressed.	If voltage is present, replace controller.	

TABLE 3-1: WHEELCHAIR AND STANDEE LIFT TROUBLESHOOTING CHART

SYMPTOM	PROBABLE CAUSE	TESTS AND CHECKS	CORRECTIVE ACTION
		Check for 0 vdc across pins 13 and 14 of P3 when there is no load present on platform.	If a voltage is present, replace platform load pressure sensing switch.
Manual backup pump does not raise platform.	Hydraulic manual release valve is not closed.		Close manual release valve; do not over-tighten.
	 CAUTION Verify 24 vdc power to lift is off before opening this hydraulic line. Support platform if deployed.		
	Manual backup pump failure.	Loosen the fitting on hydraulic line that is connected to pump assembly, and then operate backup pump.	If fluid does not flow, replace manual backup pump.
	Hydraulic hose or fitting leak.	Check for an oil accumulation in bottom of enclosure, or in pump box.	Tighten hydraulic fittings or replace hydraulic hose.
Down valve is leaking.	Look for fluid returning to reservoir when backup pump is operated.	Remove down valve, check for internal debris or damage, and clean or replace.	
END OF TABLE			

C. HYDRAULIC SYSTEM DIAGRAM

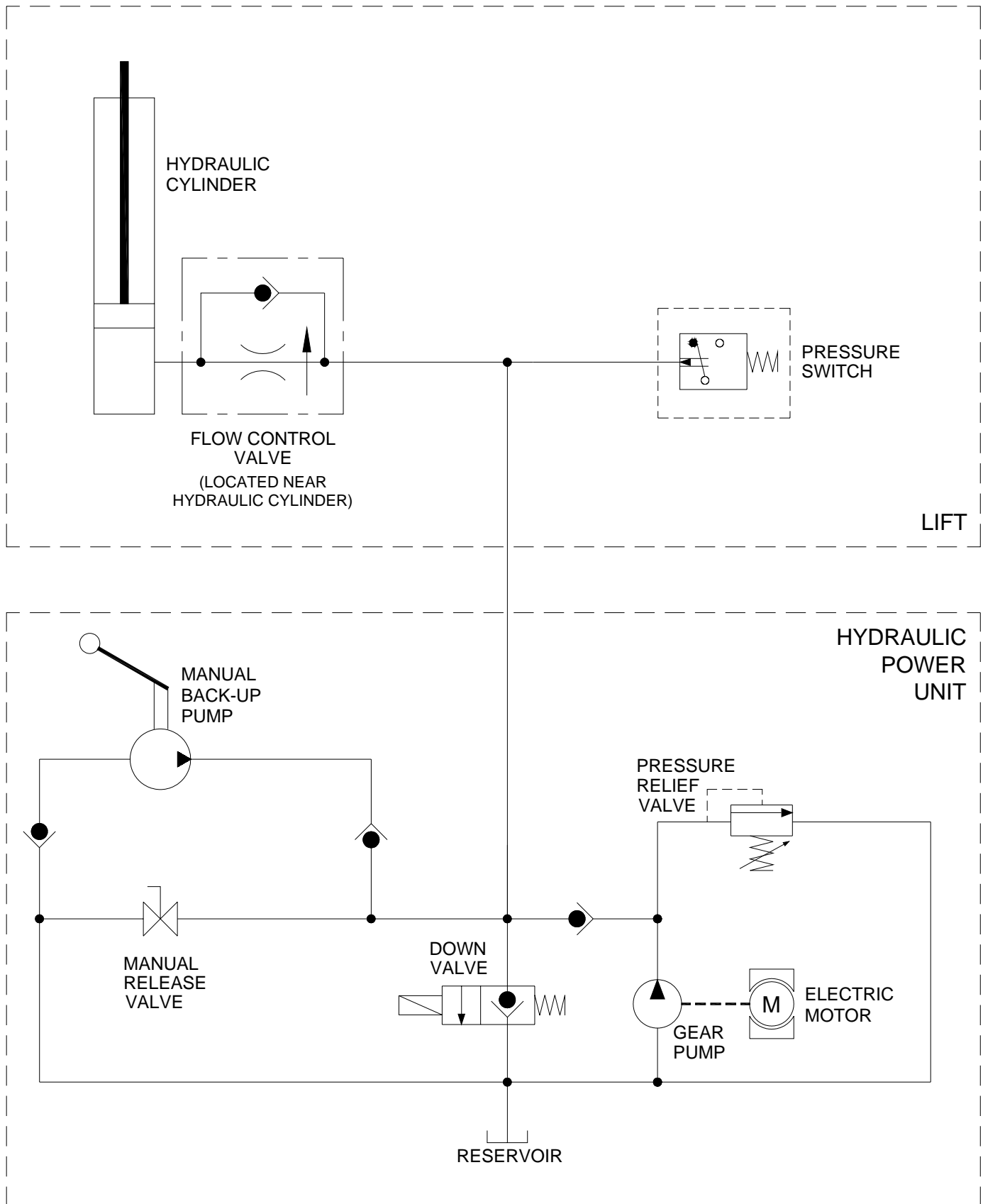


FIGURE 3-1: F9TF HYDRAULIC SYSTEM

D. ELECTRICAL WIRING DIAGRAM

1. DIAGRAM LEGENDS

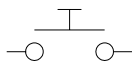
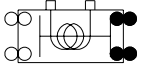
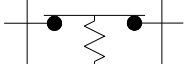

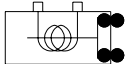
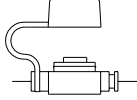

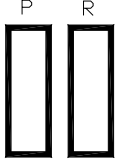
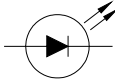
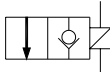
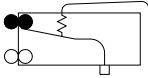


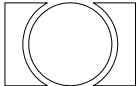
a. Color codes used on diagram

TABLE 3-2: WIRE COLOR CODES			
LETTER	COLOR	LETTER	COLOR
BLK	Black	RED	Red
BLU	Blue	VIO	Violet
BRN	Brown	GRY	Gray
GRN	Green	WHT	White
ORG	Orange	YEL	Yellow
END OF TABLE			

b. Electrical signal codes used on diagram

24V	24VDC controller output to switches
BIT 0	Word logic signal to vehicle
BIT 1	Word logic signal to vehicle
CS	Stow switch #2 normally open
CS=	Stow switch #2 common
CTR	Signal from counter to controller
DC	Door closed signal from vehicle
DEPLOY	Signal from control pendant to controller
DO	Door open signal from vehicle
DOWN	Signal from control pendant to controller
DPYD	Deploy switch input to controller
DWNVLV	Down valve solenoid actuation signal
GND	Electrical ground (common)
I/O M I	IN/OUT motor in - power to IN/OUT motor (stows platform when positive)
I/O M O	IN/OUT motor out - power to the IN/OUT motor (deploys platform when positive)
KEY 0	Multiplex pendant signal to controller
KEY 1	Multiplex pendant signal to controller
POT -	Hydraulic cylinder potentiometer ground
POT +	Hydraulic cylinder potentiometer positive
POT =	Hydraulic cylinder potentiometer wiper
POWER	Pendant power
PUP	Pump motor solenoid actuation signal
RSMC	Power to rollstop motor - closes rollstop when positive
RSTPC	Rollstop closed signal to controller
RSMO	Power to rollstop motor - opens rollstop when positive
RSTPO	Rollstop opened signal to controller
STOW	Signal from control pendant to controller
STWD	Stow switch input to controller
TWS I/F	Threshold Warning System interface signal to vehicle
UP	Signal from control pendant to controller
+VDC 30A	30A supply voltage to controller

c. **Electrical Symbols used on diagram**

 <p>MOMENTARY PUSH-BUTTON SWITCH</p>	 <p>CONTACTOR- DOUBLE POLE</p>	 <p>PRESSURE SENSOR SWITCH</p>
 <p>CIRCUIT BREAKER</p>	 <p>CONTACTOR- SINGLE POLE</p>	 <p>FUSE HOLDER</p>
 <p>RESISTOR</p>	 <p>HARNESS CONNECTOR</p>	<p>SWITCH CONTACTS:</p> <ul style="list-style-type: none"> □ - COMMON ● - NORMALLY CLOSED ○ - NORMALLY OPEN
 <p>LED</p>	 <p>HYDRAULIC VALVE</p>	 <p>SPDT LIMIT SWITCH</p>
 <p>CRIMP SPLICE</p>	 <p>SPADE CONNECTOR</p>	 <p>ELECTRIC MOTOR</p>

WIRING DIAGRAM

Refer to the following pages for the electrical schematic. It is divided across two pages.

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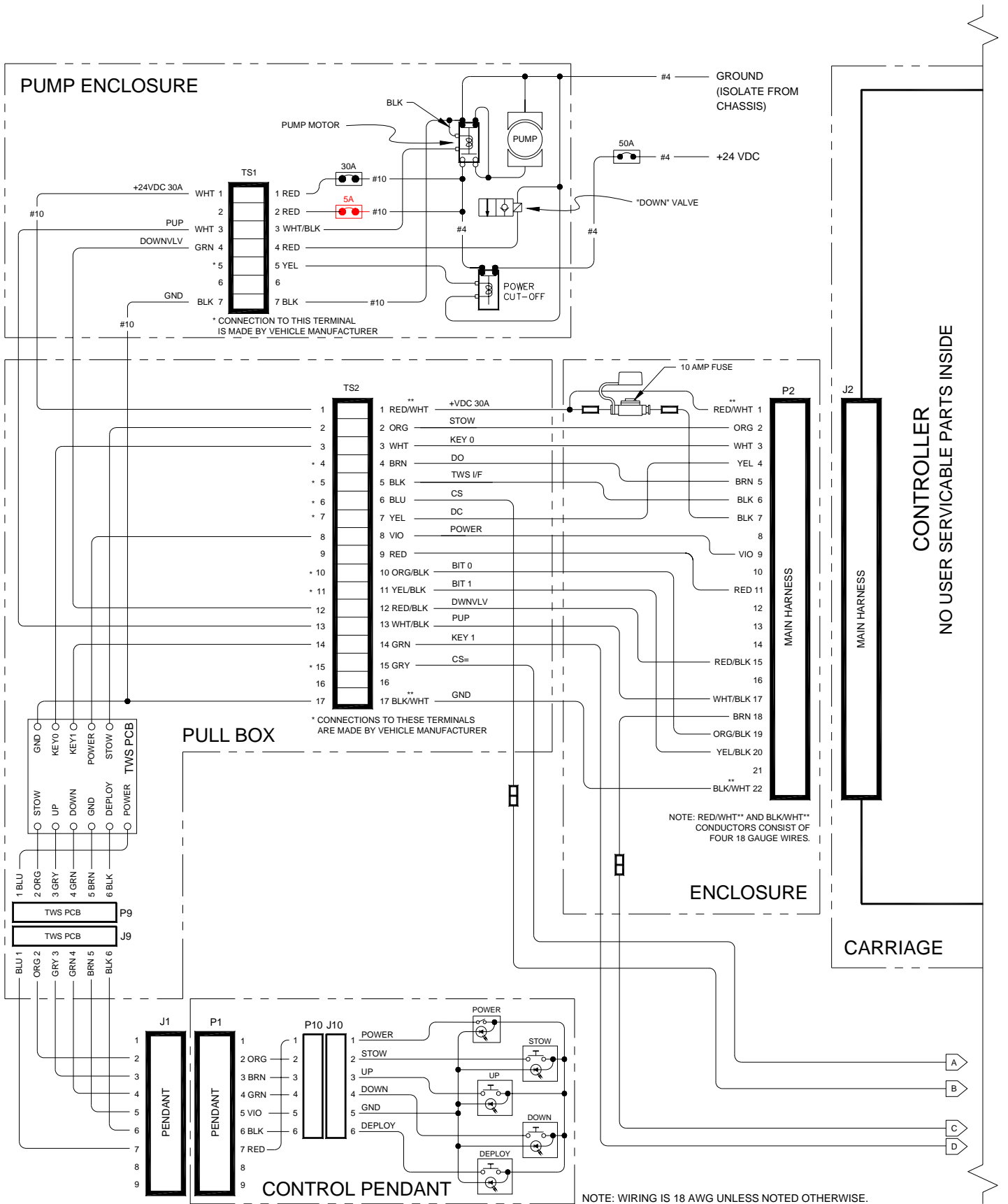


FIGURE 3-2: F9TF DEDICATED ENTRY ELECTRICAL DIAGRAM—SHEET 1

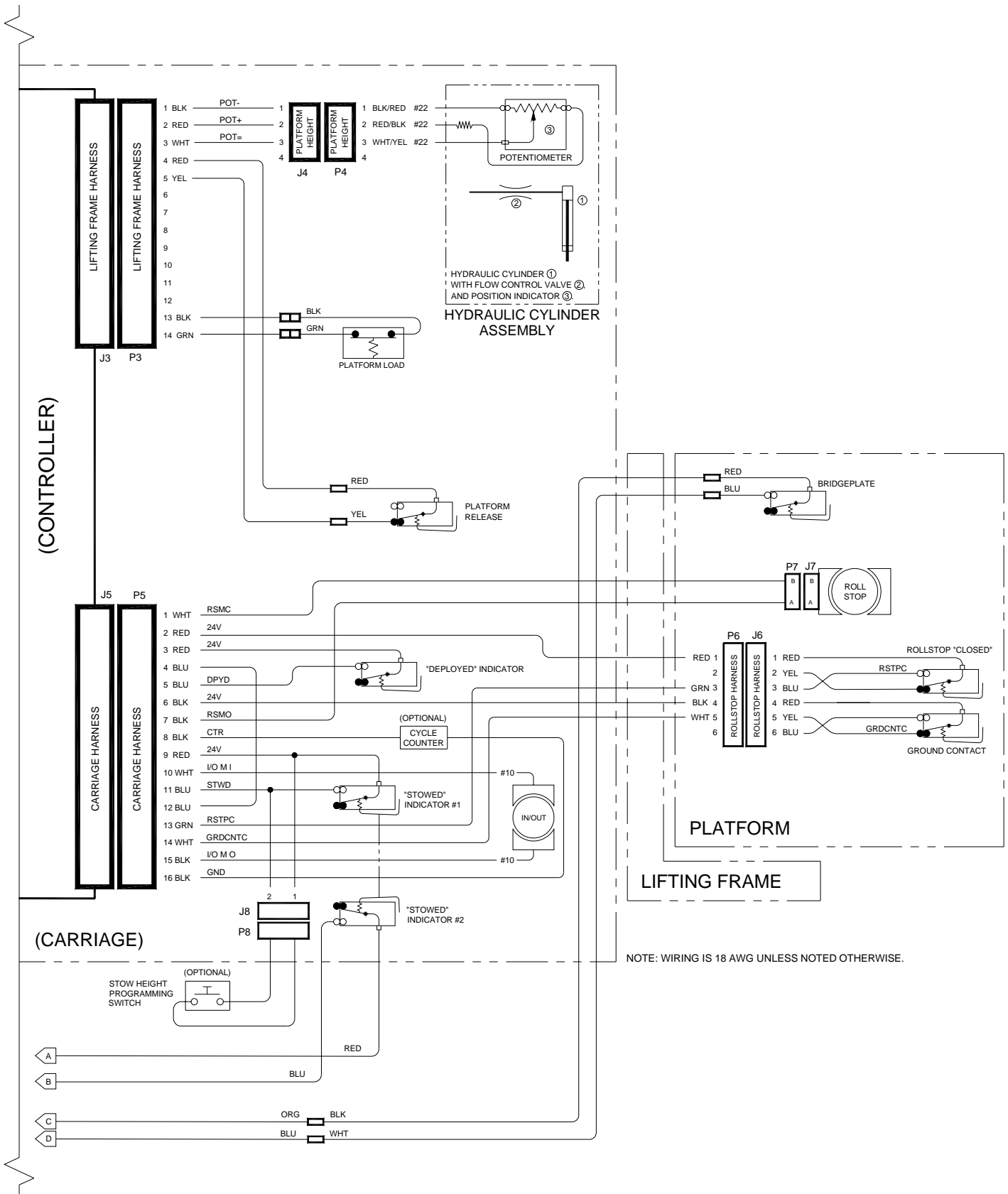


FIGURE 3-3: F9TF DEDICATED ENTRY ELECTRICAL DIAGRAM—SHEET 2

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IV. F9TF MAJOR COMPONENT SERVICE

This chapter provides instructions for major system repairs, system adjustments, and parts replacement on the RICON Mirage F9TF Series Public Use wheelchair and standee lift.


- Maintain the lift at its highest level of performance by doing the required maintenance. Ricon recommends a thorough inspection every six months.
- A specific repair task might not require completion of all listed steps in a procedure.
- Additional component illustrations are available in the **Spare Parts** chapter.


A. GENERAL SAFETY PRECAUTIONS

 WARNING
THIS RICON PRODUCT IS HIGHLY SPECIALIZED. AN AUTHORIZED RICON SERVICE TECHNICIAN MUST PERFORM MAINTENANCE AND REPAIRS USING RICON REPLACEMENT PARTS. MODIFYING OR NOT PROPERLY MAINTAINING THIS PRODUCT WILL VOID THE WARRANTY, AND MAY RESULT IN UNSAFE OPERATING CONDITIONS.

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

- Do not attempt maintenance, repairs, or adjustments without the presence of a person capable of rendering first-aid.
- Take notice of all injuries, regardless of how slight. Administer first aid or seek medical attention immediately.
- Wear protective eye shields and appropriate clothing at all times.
- Work in a properly ventilated area. Do not smoke, or use an open flame, near the battery.
- Exercise caution when operating lift to avoid injury. Be certain that hands, feet, legs and clothing are not in path of the platform as it moves.
- Be cautious when using metallic (conductive) tools near the battery, or heavy gauge wires.
- If battery acid contacts skin, wash area immediately with soap and water.
- Check under vehicle before drilling or cutting to avoid damage to the frame, subframe members, wiring, hydraulic lines, etc.
- Thoroughly understand the operating instructions before attempting to operate lift.
- Keep others clear during lift operation.

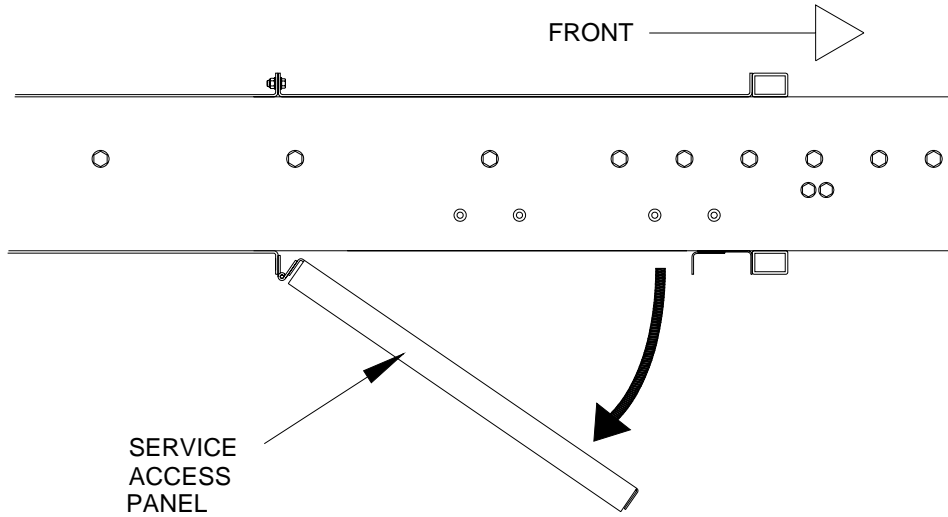
 WARNING
C WEAR PROTECTIVE CLOTHING AND EYE PROTECTION AT ALL TIMES. BATTERIES CONTAIN ACID THAT CAN BURN. IF ACID COMES INTO CONTACT WITH SKIN, IMMEDIATELY FLUSH AFFECTED AREA WITH WATER AND WASH WITH SOAP.
C WORK IN A PROPERLY VENTILATED AREA. DO NOT SMOKE OR USE AN OPEN FLAME IN THE VICINITY OF BATTERY.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

 WARNING
THE SERVICE ACCESS PANEL IS HINGED ALONG THE REAR EDGE AND SHOULD BE HELD UP WHILE REMOVING THE RETAINING SCREWS AT THE FRONT EDGE. THIS WILL PREVENT PANEL FROM FALLING AND CAUSING INJURY OR DAMAGE.

B. LIFT ACCESS FOR SERVICE

Access to internal lift components is from beneath the enclosure. A hinged access panel is located on the bottom of the enclosure, near the front.

1. Deploy platform using control pendant (DEPLOY) and support.
2. Disconnect positive battery cable at vehicle battery compartment.
3. Refer to **Figure 4-1**. The service access panel pivots on a hinge along its rear edge. Remove the two retaining screws and lock-nuts at front edge of panel, and lower panel as shown.



NOTE: VIEW OF ENCLOSURE IS FROM THE LEFT SIDE.

FIGURE 4-1: SERVICE ACCESS PANEL - OPEN

C. TRAVELLING FRAME AND ROLLSTOP

Refer to **Figure 4-2**. The carriage, lifting frame, and platform are referred to as a “travelling frame” when assembled together.

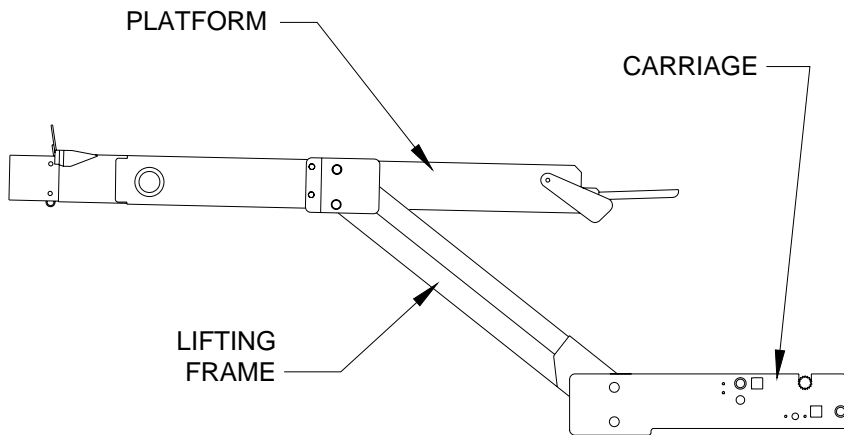


FIGURE 4-2: TRAVELLING FRAME

1. ROLLSTOP MAINTENANCE

a. Rollstop Lubrication

- 1) Deploy platform using control pendant (DEPLOY) and then support.
- 2) Disconnect positive battery cable at vehicle battery compartment.
- 3) Refer to **Figure 4-3**. Remove manual release cover plate from right side (four screws).

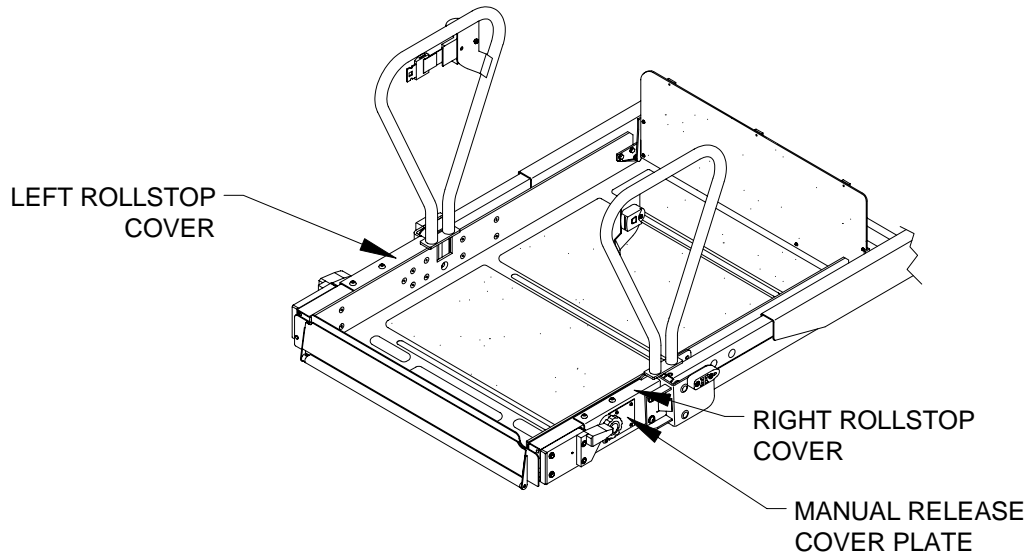


FIGURE 4-3: ACCESS COVERS FOR ROLLSTOP MECHANISM

 CAUTION
The manual rollstop control knob is made from a brittle material. Handle accordingly.

- 4) Use a 1/8" punch to remove retaining pin from manual rollstop control knob. Remove control knob.
- 5) Remove left and right rollstop covers (five screws and washers, each side).
- 6) Refer to **Figure 4-4**. Lubricate rollstop pivot points and gears (both sides of platform) using light grease (ZEP PLS, p/n 497C, Curtisol® Red Grease p/n 88167, or equivalent). Wipe off excess grease.

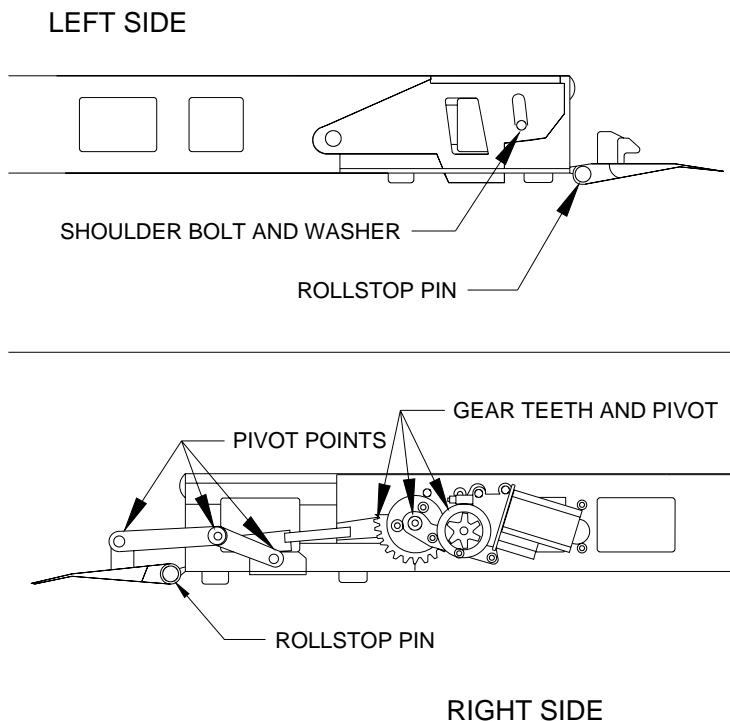


FIGURE 4-4: ROLLSTOP LUBRICATION POINTS

- 7) Re-install right rollstop actuator bracket and left rollstop release bracket.
- 8) Re-install right and left rollstop covers.
- 9) Re-install manual rollstop control knob.
- 10) Reconnect positive battery cable at vehicle battery compartment.

b. Rollstop "Open" Switch Adjustment

NOTE: Refer to Electrical Controls section if replacement of rollstop "Open" switch is necessary.

- 1) Deploy platform using control pendant (Deploy), and then support.
- 2) Disconnect positive battery cable at vehicle battery compartment.
- 3) Remove left rollstop cover (four screws and washers).
- 4) Remove left rollstop release bracket.
- 5) Refer to **Figure 4-5**. Loosen actuator cam retaining screws, and pivot actuator cam away from switch activating wheel (roller).

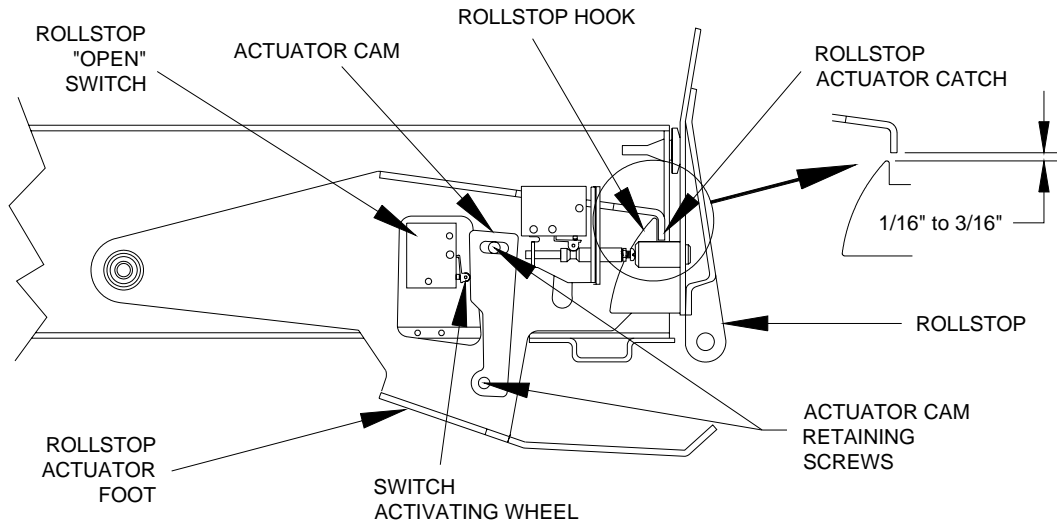


FIGURE 4-5: ROLLSTOP ACTUATION COMPONENTS

- 6) Manually raise rollstop actuator foot until its catch has a clearance above rollstop hook of 1/16" to 3/16". Hold foot at this gap.
- 7) Move cam toward switch activating wheel until a faint click is heard from the rollstop "Open" switch. The change of state is also marked by the switch contact resistance becoming zero (short) when measured at pins four and five of the rollstop switch harness. Tighten cam retaining screws.
- 8) Release rollstop actuator foot.
- 9) Re-check adjustment by raising actuator foot and observing the click or resistance change. Actuation must occur as described above. Move cam away from switch if switch does not change state. Repeat, as necessary.
- 10) Re-install left rollstop cover and left rollstop release bracket.
- 11) Reconnect the positive battery cable at the vehicle battery compartment.

c. Rollstop Closed Position Adjustment

- 1) Deploy platform using control pendant (OUT), and then support.
- 2) Disconnect positive battery cable at vehicle battery compartment.
- 3) Remove right rollstop cover (four screws and washers) and cover spacers.

 CAUTION
The manual rollstop control knob is made from a brittle material. Handle accordingly.

- 4) Use a 1/8" punch to remove retaining pin from manual rollstop control knob. Remove control knob.
- 5) Remove right rollstop actuator bracket.

- 6) Refer to **Figure 4-6**. Loosen jam-nut and adjust the link length by turning the center section. Adjust link so that rollstop closes to within 1/32" of rubber bumper (that rollstop contacts). Rotating the center section counterclockwise (viewed from rollstop) shortens the link, and turning it clockwise lengthens it.

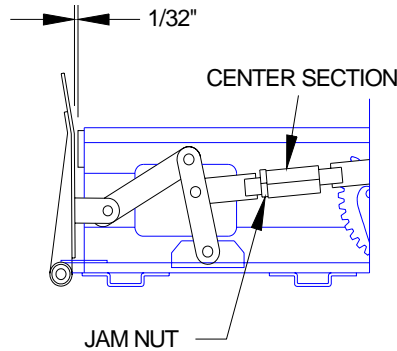


FIGURE 4-6: CLOSED ROLLSTOP ADJUSTMENT

- 7) Re-install right rollstop cover and manual rollstop control knob.
- 8) Reconnect positive battery cable at vehicle battery compartment.

d. Rollstop “Closed” Switch Adjustment

Refer to Electrical Controls section if replacement of rollstop “Closed” switch is necessary.

- 1) Deploy platform using control pendant (DEPLOY), and then support.
- 2) Disconnect positive battery cable at vehicle battery compartment.
- 3) Remove left rollstop cover (four screws and washers).
- 4) Remove left rollstop release bracket.
- 5) Have an assistant hold rollstop actuator foot up (**Figure 4-5**). Open rollstop with rollstop manual control knob (other hand assisting rollstop).
- 6) Refer to **Figure 4-7**. Adjust “Closed” switch by loosening jam-nut and turning adjustment screw that protrudes from end of plunger. The enlarged view shows plunger position when rollstop is open. The plunger should move to position shown in upper view when rollstop is closed. Adjust screw so that switch roller is on outside diameter of plunger when rollstop is closed. Retighten jam-nut.

NOTE: The plunger may need to be held with a small pair of pliers to turn screw. Do not scratch outside surface of plunger with pliers; this could cause plunger to seize in its bore.

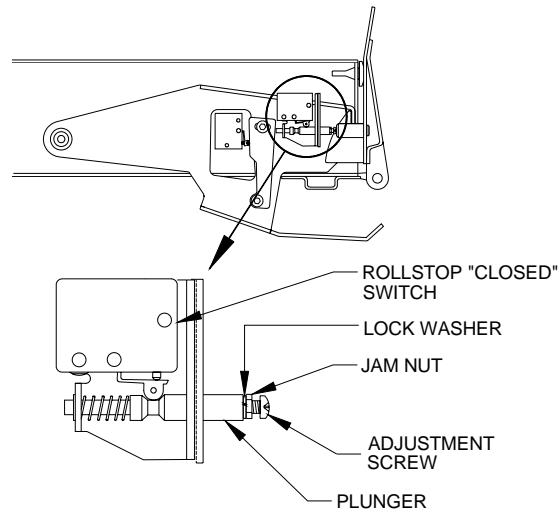


FIGURE 4-7: “CLOSED” SWITCH ADJUSTMENT

- 7) Close rollstop.
- 8) Re-install left rollstop cover and left rollstop release bracket.
- 9) Reconnect positive battery cable at vehicle battery compartment.

2. BRIDGEPLATE MAINTENANCE

a. Bridgeplate Lubrication

- 1) Deploy platform using control pendant (DEPLOY) and support.
- 2) Disconnect positive battery cable at vehicle battery compartment.
- 3) Refer to **Figure 4-8**. Lubricate the points indicated in the figure with light grease (ZEP PLS, p/n 497C, Curtisol® Red Grease p/n 88167, or equivalent). Wipe off excess grease. Repeat for other side of bridgeplate.

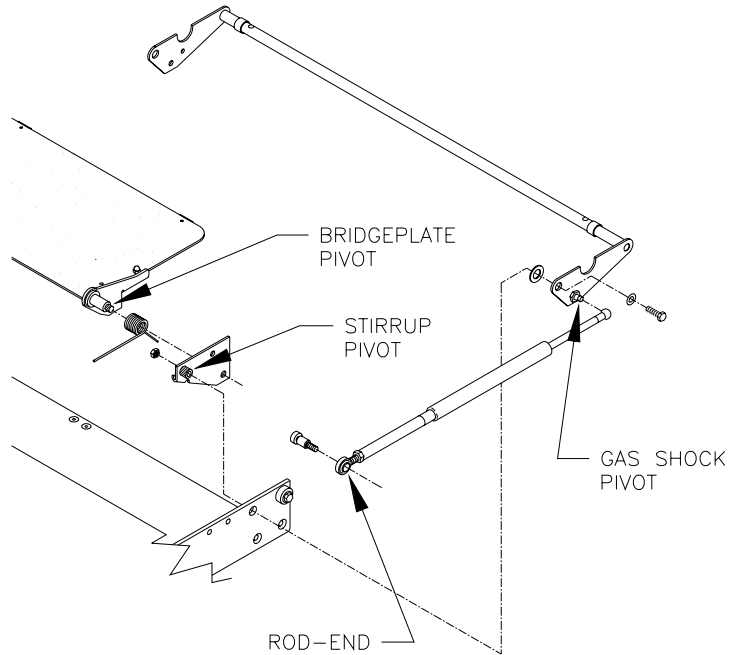


FIGURE 4-8: BRIDGEPLATE LUBRICATION POINTS

- 4) Reconnect positive battery cable at vehicle battery compartment.

b. Bridgeplate Actuator Rod Adjustment

Two actuator rods unfold the bridgeplate. The rod lengths control the angle of the bridgeplate relative to the platform. Adjust actuator rods so bridgeplate is fully unfolded when platform arrives at floor height. Refer to the Bridgeplate Actuator Rod Adjustment section in Chapter II for adjustment procedure.

3. CARRIAGE MAINTENANCE

Refer to **Figure 4-9**. There are two large carriage rollers on each side of the carriage, and four small guide rollers on the top. These rollers require lubrication on a periodic basis, dependant upon usage and climate. Refer to the appropriate Mechanic Maintenance Checklist in the Maintenance chapter.

The large side rollers carry the weight of the travelling frame. They have grease fittings and must be lubricated with Aeroshell #22, or equivalent.

The guide rollers can be lubricated by spraying a light grease (ZEP PLS, p/n 497C, Curtisol® Red Grease p/n 88167, or equivalent) into the interior of the roller.

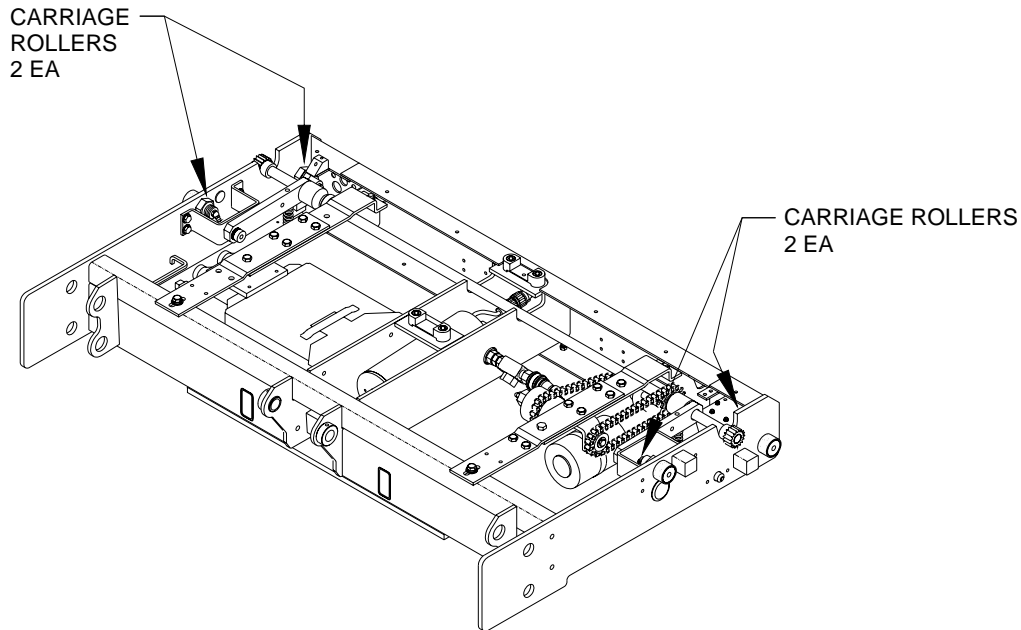


FIGURE 4-9: CARRIAGE ROLLER LUBRICATION

4. PLATFORM REMOVAL

Refer to end of this section for re-installation notes.

- a. Deploy platform using control pendant (DEPLOY).
- b. Refer to **Figure 4-10**. Remove lifting frame and lower arm set screws at left and right sides of platform.

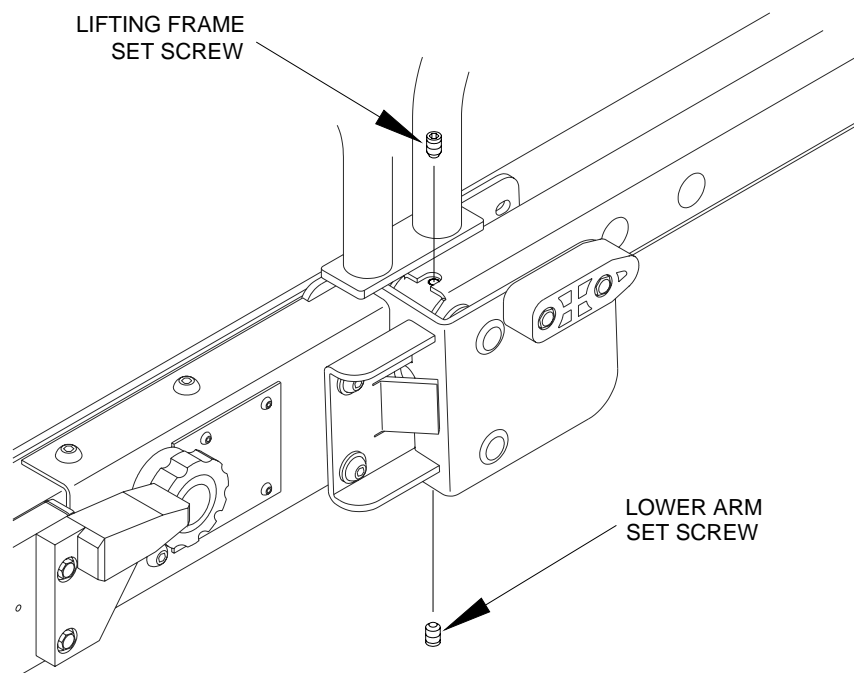


FIGURE 4-10: LIFTING FRAME AND LOWER ARM SET SCREWS

- c. Raise platform to vehicle floor height using control pendant (UP), and then support.
- d. Disconnect positive battery cable at vehicle battery compartment.
- e. Refer to **Figure 4-11**. View A-A is from beneath platform. Locate right-side actuator rod assembly (right-hand side of platform, at top of lifting frame). Loosen rod-end jam-nut.

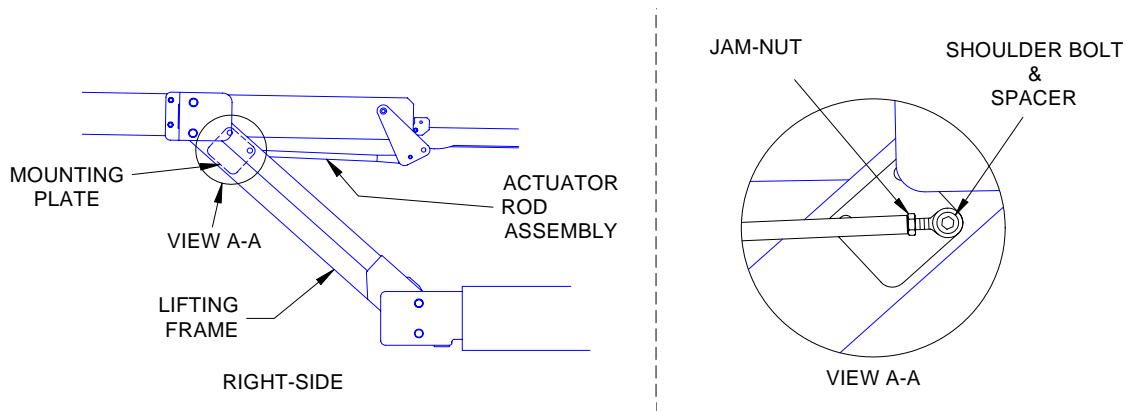



FIGURE 4-11: BRIDGEPLATE ACTUATOR ROD REMOVAL

- f. Remove shoulder bolt fastening actuator rod-end to mounting plate on lifting frame; catch spacer as it falls.
- g. Repeat for left-side actuator rod assembly.
- h. Fold bridgeplate onto lift platform, and rotate actuator arms parallel to platform. Secure bridgeplate and actuator arms to platform with cable ties.
- i. Remove right and left rollstop side covers (four screws and washers) and spacers.
- j. Disconnect electrical harnesses at both sides of platform (rollstop switch harness at left; rollstop motor harness at right). Cut black and white leads to bridgeplate switch; cut leads adjacent to factory-crimped butt splices. Remove cable ties that hold harnesses in place. Remove connectors from harnesses.

NOTE: Record connector pin position for each wire. This data will be used for platform re-installation; refer to wiring diagrams in Chapter 3. Crimp bridgeplate switch leads to harness with new butt splices when re-installing.

 CAUTION	
<ul style="list-style-type: none"> • Double-check platform support before removing lower mounting pins. The platform will be free to rotate after pins are removed. • Do not damage outside surface of pins during removal. A pin should be replaced if its outer surface is pitted or grooved after removal. 	

- k. Refer to **Figure 4-12**. Remove bottom platform mounting pins from platform mounting brackets, and drop lower parallel arms (lower arms can be tied to upper arms for convenience).

NOTE: The platform mounting pins are removed by placing a small pry bar between the outside of platform and inner end of pin. Push pin outward until it is flush with bracket, and then grasp other end of pin and pull it out.

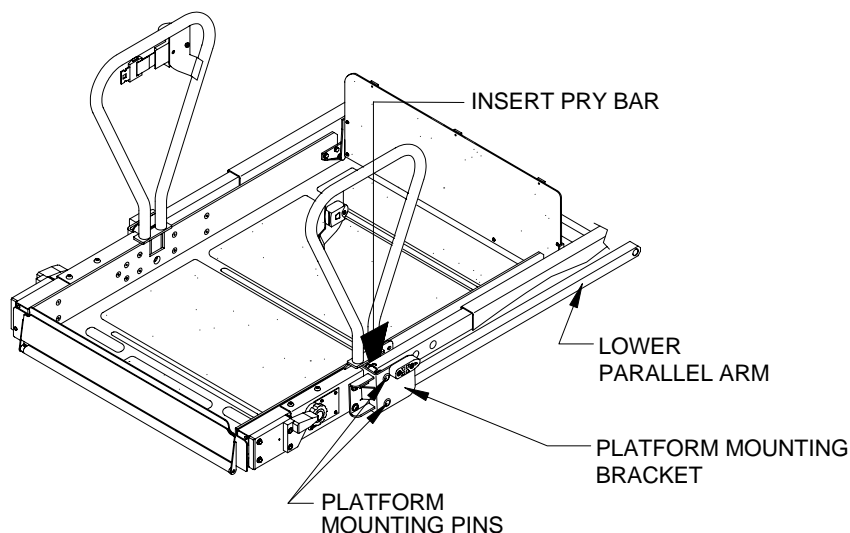


FIGURE 4-12: PLATFORM SEPARATION FROM LIFTING FRAME
32DF9T16.A

- l. Pass free end of electrical harnesses through platform mounting brackets.
- m. Remove upper pins from platform mounting brackets. Remove pins in same manner as lower pins.
- n. Remove platform from lifting frame.
- o. **Platform re-installation:**
Perform re-installation by reversing removal steps, with the following considerations. Verify that platform mounting bracket holes and lifting frame holes are properly aligned, and then drive mounting pins in place using a soft, heavy hammer. Use a thread locker (such as loc-TITE® blue or omniFIT® blue) when re-installing setscrews.

5. LIFTING FRAME REMOVAL

Refer to end of this section for re-installation notes.

- a. Refer to the Platform Removal section and remove platform.
- b. Raise lifting frame as far as possible with manual backup pump (figure does not show frame raised).
- c. Refer to **Figure 4-13**. Remove four setscrews securing lifting frame pivot pins. Remove two setscrews securing center pivot pin.

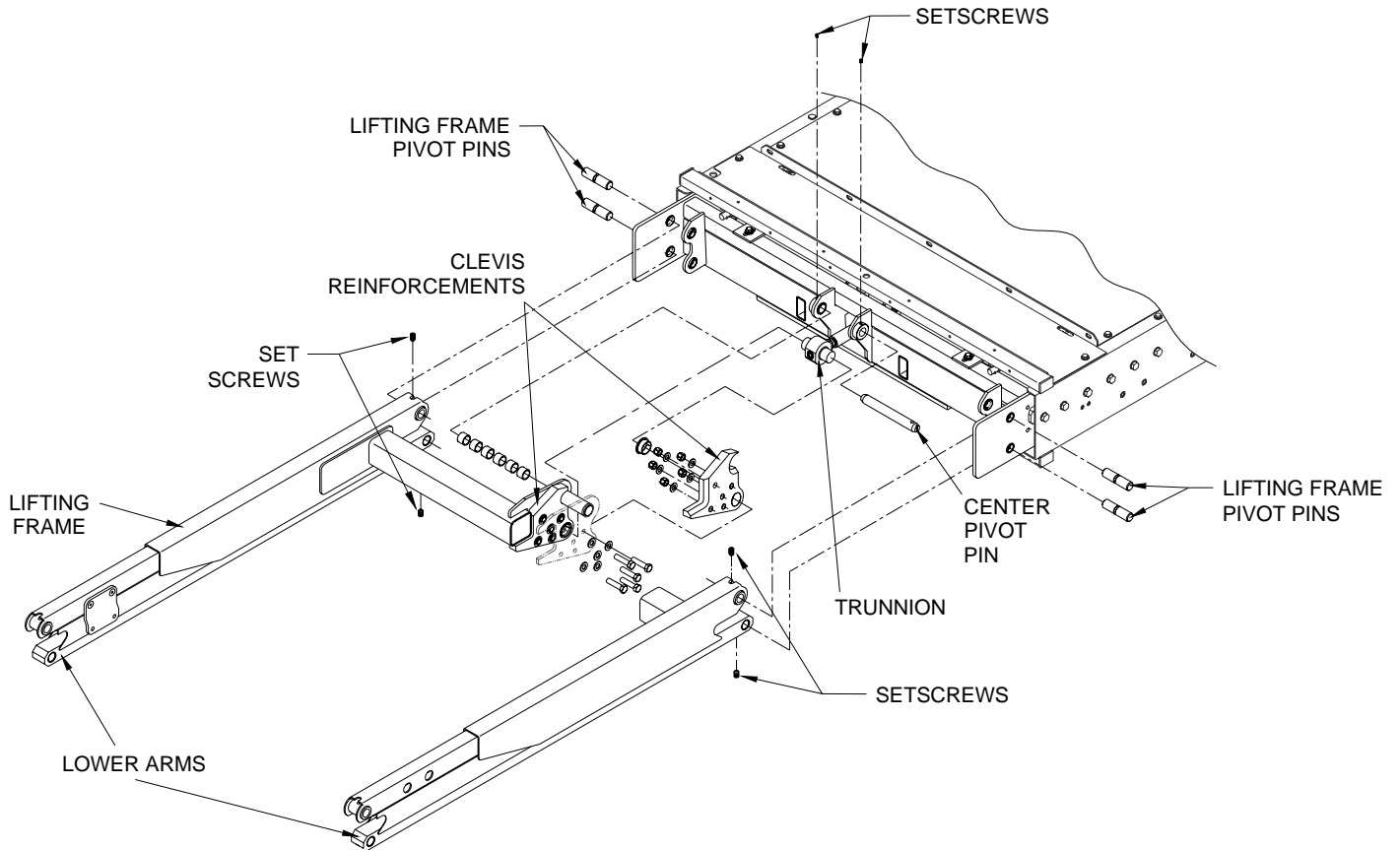



FIGURE 4-13: LIFTING FRAME COMPONENTS

 CAUTION
<p>Do not damage outside surface of pins during removal. A pin should be replaced if its outer surface is pitted or grooved after removal.</p>

- d. Remove two lower lifting frame pivot pins from carriage with a small punch. Remove lower arms.
- e. Remove five screws and nuts from each clevis reinforcement and pivot reinforcements downward. Slide each reinforcement off of trunnion.
- f. Have an assistant raise lifting frame as high as possible.
- g. Remove two upper lifting frame pivot pins and center pivot pin (note that center pivot pin passes through six bushings) from carriage with a small punch and pull lifting frame away from carriage.
- h. **Lifting frame re-installation**
Perform re-installation by reversing removal steps, with the following considerations. Verify that carriage holes and lifting frame holes are properly aligned, and then drive mounting pins in place using a soft, heavy hammer. Use a thread locker (such as loc-TITE® blue or omniFIT® blue) when installing new setscrews.

6. CARRIAGE REMOVAL

The following procedure describes removal of carriage after platform and lifting frame have been removed.

The carriage, lifting frame, and platform are referred to as a “travelling frame”, when assembled together (Refer to **Figure 4-2**). The travelling frame can be removed from enclosure as a unit. Be prepared to handle the combined weight of the carriage, lifting frame, and platform when removing and installing.

Refer to end of this section for re-installation notes.

- a. Deploy platform using control pendant (DEPLOY).
- b. Refer to Platform Removal section and remove platform.
- c. Refer to Lifting Frame Removal section and remove lifting frame.
- d. Verify that positive battery cable is disconnected. Lower access panel by following Lift Service Access instructions at beginning of this chapter.
- e. Refer to **Figure 4-14**. The carriage stop block mounting bolts are accessible from under vehicle, or from the front of enclosure. Remove bolts and both stop blocks.

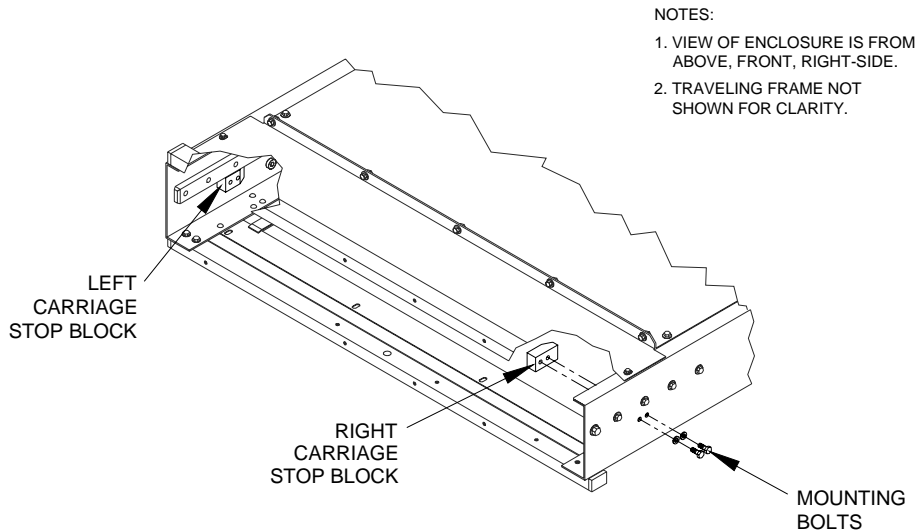


FIGURE 4-14: CARRIAGE STOP BLOCK LOCATIONS

- f. Refer to **Figure 4-15**. Verify that platform release shafts are in the engaged position (rotated in the direction opposite to what is indicated on adjacent decal). Deflect final driveshaft downward to disengage its pinion gears from gear rack. Use nylon tie-wraps, or similar, to hold driveshaft disengaged.

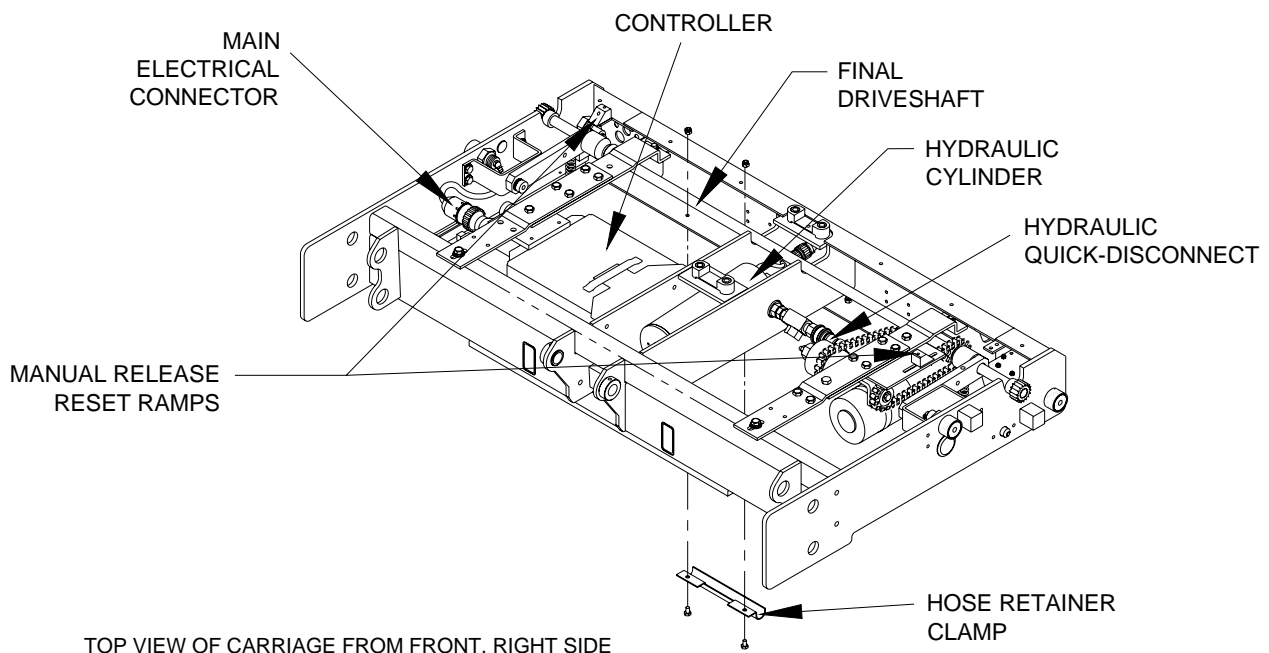


FIGURE 4-15: CARRIAGE COMPONENTS

- g. Remove two nuts fastening hose retaining clamp (located at bottom, rear-center of carriage).

NOTE: The following step will spill hydraulic fluid; have dry rags on hand.

- h. Disconnect hydraulic hose from quick-disconnect.
- i. Disconnect main electrical harness connector from electronic controller.
- j. Position a support stand in front of enclosure to place carriage on.

WARNING
THE CARRIAGE ASSEMBLY IS HEAVY AND REQUIRES TWO PEOPLE TO REMOVE.

- k. Pull carriage out of enclosure, supporting each side, and place on support stand.

NOTE: Care is required while extracting carriage to avoid damage. Watch for possible points of interference, such as the pins on the release shafts catching on the release reset ramps.

- l. Carriage Re-installation

Perform re-installation by reversing removal steps, with the following considerations. Pull hydraulic hose and electrical harness down through service access opening before inserting carriage into enclosure. Route hose and cable back into installed carriage in their original positions.

D. DEPLOYMENT SYSTEM

Refer to **Figure 4-16**. The deployment system propels the traveling frame (carriage, lifting frame, and platform) out of enclosure, or pulls it back in. This section describes major deployment system components, including how they operate, how to remove and replace them, and how to perform adjustments.

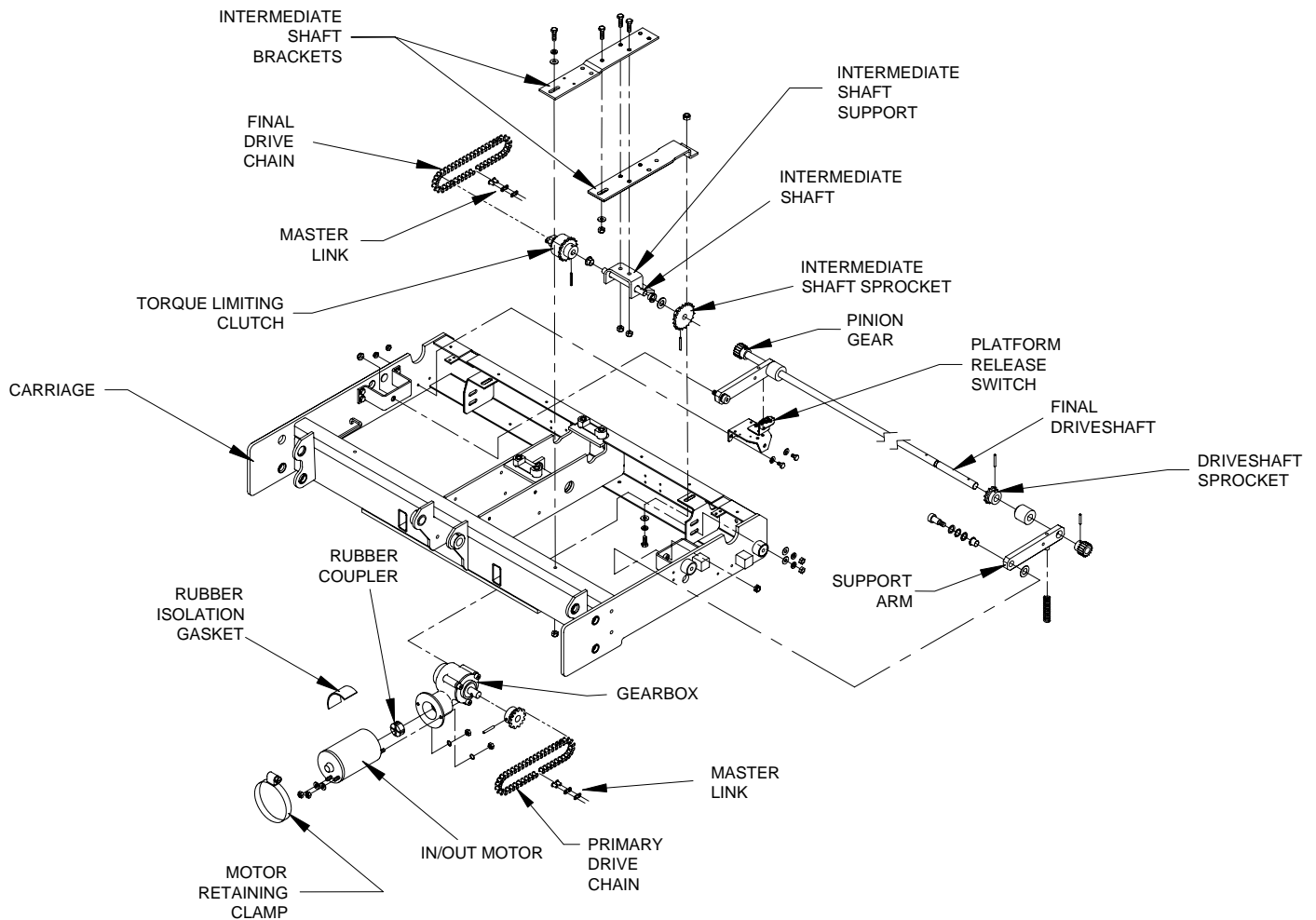


FIGURE 4-16: DEPLOYMENT SYSTEM COMPONENTS

1. IN/OUT MOTOR AND GEARBOX

The in/out motor drives the deployment system. The motor receives electric power from the on-board electronic controller; voltage polarity determines the direction of motor rotation (which determines whether platform is deployed or stowed). The motor drives the gearbox, reducing the motor speed and increasing torque. The gearbox drives the primary drive chain.

a. In/Out Motor and Gearbox Removal

- 1) Deploy platform using control pendant (DEPLOY).
- 2) Lower access panel by following Lift Service Access instructions at beginning of chapter.
- 3) Position primary drive chain master-link at bottom-center of its travel by moving carriage in or out of enclosure.
- 4) Support platform.
- 5) Disconnect positive battery cable at vehicle battery compartment.
- 6) Refer to **Figure 4-16**. Loosen two nuts fastening the gearbox to carriage.
- 7) Label motor electrical leads, and then disconnect.
- 8) Remove motor retaining clamp.
- 9) Slide gearmotor assembly toward platform.
- 10) Remove primary drive chain master link; remove chain.
- 11) Remove two nuts and washers fastening gearbox to carriage; support gearmotor assembly.
- 12) Remove rubber isolation gasket from gearmotor, and remove gearmotor assembly from carriage.
- 13) Remove nuts and washers fastening motor to gearbox.
- 14) Separate motor from gearbox; do not damage or lose rubber coupler.

NOTE: Refer to next section for re-installation.

b. In/Out Motor and Gearbox Installation

- 1) Refer to **Figure 4-16**. Slide rubber coupler onto gearbox input shaft.
- 2) Insert motor output shaft into coupler, and then align motor and gear box:
 - Hold motor with electrical connections pointed at you, and positioned at 5 o'clock.
 - Hold gearbox with its output housing up.
 - Align motor studs with holes in gearbox flange and assemble.
- 3) Install star-washers and nuts on motor studs.
- 4) Place gearmotor assembly in carriage, with gearbox studs inserted in mounting tab slots.
- 5) Install lock washers and nuts on gear box studs. Do not tighten.
- 6) Install motor retaining clamp and vibration isolation gasket; the clamp fits over tab on gearmotor support bracket. Do not tighten clamp.
- 7) Refer to PRIMARY DRIVE CHAIN INSTALLATION section. Install primary drive chain.
- 8) Reconnect two motor electrical leads.
- 9) Raise service access panel, and install two retaining screws and lock-nuts at front edge of panel.
- 10) Reconnect positive battery cable at vehicle battery compartment.

2. DRIVE CHAINS

The drive chains transfer power from gearmotor to final driveshaft. Power is transferred through primary drive chain to torque limiting clutch (mounted on an intermediate shaft), and then to secondary drive chain.

a. Drive Chain Removal

• Final Drive Chain

- 1) Deploy platform using control pendant (DEPLOY).
- 2) Raise platform to a comfortable working height and support.
- 3) To gain access to underside of the lift, hold service access panel up, remove two retaining screws and lock-nuts from front edge of panel, and lower panel.
- 4) Refer to **Figure 4-16**. Position master link at bottom-center of its travel by moving carriage assembly forward or backward (use the DEPLOY and STOW functions).
- 5) Disconnect positive battery cable at vehicle battery compartment.
- 6) Loosen two nuts fastening gearbox to the carriage.
- 7) Loosen two screws fastening intermediate shaft mounting bracket to carriage. The front screw is accessible from top of lift, and rear screw is accessible through service hatch (use an open end wrench above intermediate shaft mounting bracket to hold nut).

- 8) Move gearmotor assembly toward driveshaft to slacken chain; a small pry bar can be inserted between motor and front of carriage for leverage.

NOTE: Do not force the gearmotor. Loosen two nuts further, or loosen motor retaining clamp to obtain more movement.

- 9) Remove master link and final drive chain.

- **Primary Drive Chain**

- 1) Fully deploy lift.
- 2) Raise platform to a comfortable working height and support.
- 3) To gain access to underside of lift, hold service access panel up, remove two retaining screws and lock-nuts from front edge of panel, and lower panel.
- 4) Refer to **Figure 4-16**. Position master link at bottom-center of its travel by moving carriage assembly forward or backward (use the DEPLOY and STOW functions).
- 5) Disconnect positive battery cable at vehicle battery compartment.
- 6) Loosen motor retaining clamp that fastens gearmotor to gearmotor support.
- 7) Loosen two nuts fastening gearbox to carriage.
- 8) Move gearmotor assembly toward driveshaft to slacken chain. A small pry bar may be inserted between motor and front of carriage to gain leverage.

NOTE: Do not force the gearmotor. Further loosen two nuts, or loosen motor retaining clamp to obtain more movement.

- 9) Remove primary drive chain master link and primary drive chain.

b. DRIVE CHAIN INSTALLATION

- **Final Drive Chain**

- 1) Refer to **Figure 4-16**. Verify the two screws fastening the intermediate shaft mounting bracket to carriage are loose.
- 2) Install final drive chain around sprocket on final driveshaft, and around sprocket on intermediate shaft. Install master link.
- 3) Refer to Final Drive Chain Adjustment section and adjust final drive chain.

- **Primary Drive Chain**

- 1) Refer to **Figure 4-16**. Loosen motor retaining clamp that fastens the gearmotor to gearmotor support.
- 2) Loosen nuts fastening gearbox to carriage.
- 3) Install primary drive chain around sprocket on gearbox output shaft, and around clutch sprocket. Install master link.
- 4) Refer to Primary Drive Chain Adjustment section and adjust primary drive chain.

c. DRIVE CHAIN ADJUSTMENT

NOTE: Adjust final drive chain first when adjusting both drive chains. The primary drive chain adjustment is dependent on setting of final drive chain.

- **Final Drive Chain**

- 1) Refer to LIFT SERVICE ACCESS section to deploy platform and open service access panel.

- 2) Refer to **Figure 4-17**. Loosen screws fastening intermediate shaft bracket to carriage. The front screw is accessible from top of lift, and rear screw is accessible through service hatch (use an open end wrench above intermediate shaft mounting bracket to hold nut).

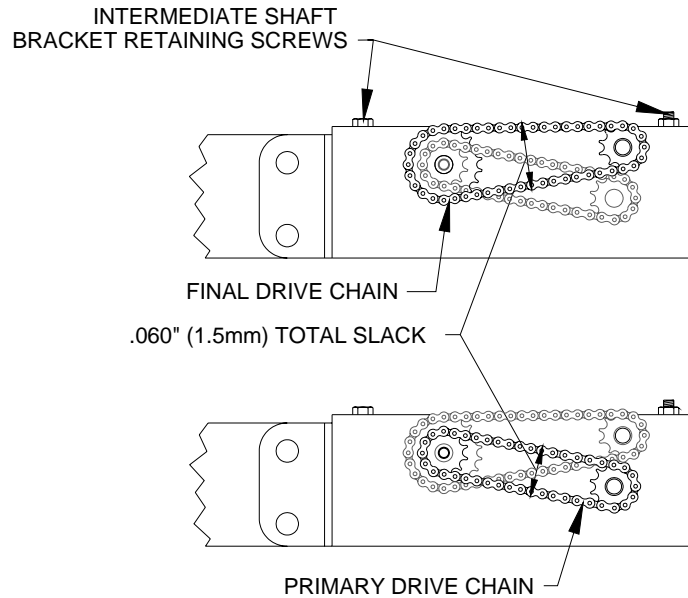


FIGURE 4-17: DRIVE CHAIN SLACK ADJUSTMENT

- 3) Refer to **Figure 4-16**. Loosen the two nuts fastening gearmotor assembly to carriage.
- 4) Verify that motor retaining clamp (fastens gearmotor to gearmotor support) is tight.
- 5) Move gearmotor assembly toward driveshaft to slacken chain; a small pry bar may be inserted between motor and front of carriage for leverage.

NOTE: DO NOT FORCE THE GEARMOTOR. Loosen the two gearmotor nuts further, or loosen motor retaining clamp, to obtain more movement.

- 1) Adjust chain tension to achieve .030" (.8mm) slack on lower span.
- 2) Tighten screws fastening intermediate shaft bracket to carriage.
- 3) Refer to PRIMARY DRIVE CHAIN ADJUSTMENT, if adjusting both chains. Otherwise, continue.
- 4) Raise service access panel, and install two retaining screws and lock-nuts at front edge of panel.
- 5) Reconnect positive battery cable at vehicle battery compartment.

• **Primary Drive Chain**

- 6) Refer to LIFT SERVICE ACCESS section to deploy platform and open service access panel.
- 7) Refer to **Figure 4-16**. Loosen motor retaining clamp.
- 8) Loosen two nuts fastening gearbox to carriage.
- 9) Move gearmotor assembly toward driveshaft to slacken chain; a small pry bar may be inserted between motor and front of carriage for leverage.

NOTE: DO NOT FORCE THE GEARMOTOR. Loosen two gearmotor retaining nuts further, or loosen motor retaining clamp further to obtain more movement.

- 1) Refer to **Figure 4-17**. Adjust chain tension to achieve .030" (.8mm) slack on upper span.
- 2) Tighten nuts fastening gearmotor to carriage.
- 3) Tighten motor retaining clamp.
- 4) Raise service access panel, and install two retaining screws and lock-nuts at front edge of panel.
- 5) Reconnect positive battery cable at vehicle battery compartment.

3. TORQUE LIMITING CLUTCH

The torque limiting clutch prevents stalling of deployment motor when traveling frame reaches either end of its movement. It also disengages deployment motor if traveling frame contacts a foreign object. The torque limiting clutch makes a loud clicking sound when it slips.

a. TORQUE LIMITING CLUTCH REMOVAL

- 1) Refer to LIFT SERVICE ACCESS section to deploy platform and open service access panel.
- 2) Refer to IN/OUT MOTOR AND GEARBOX section and remove gearmotor assembly.

- 3) Refer to DRIVE CHAIN REMOVAL section and remove both drive chains.
- 4) Refer to **Figure 4-16**. Remove screws fastening intermediate shaft bracket to carriage.
- 5) Slide intermediate shaft bracket toward driveshaft, and drop front end of bracket down inside carriage.
- 6) Remove intermediate shaft bracket (with intermediate shaft assembly) from carriage by sliding it forward and twisting (to clear carriage).
- 7) Place intermediate shaft bracket on a workbench, flat side down.
- 8) Remove roll pin that fastens clutch assembly to intermediate shaft.
- 9) Twist and slide clutch assembly off intermediate shaft.

b. TORQUE LIMITING CLUTCH INSTALLATION

NOTE: Perform torque limiting clutch removal described in previous section if a clutch is present.

- 1) Refer to **Figure 4-16**. Slide clutch assembly onto intermediate shaft (mounted to intermediate shaft support), being sure that bushings are installed in support and washer is in place on shaft. Twisting clutch assembly relative to driveshaft will ease installation. Align roll-pin hole in clutch hub with hole on shaft.
- 2) Drive new roll pin into clutch and intermediate shaft.
- 3) Place intermediate shaft brackets, with intermediate shaft assembly, into carriage by inserting assembly up into carriage. This will require twisting bracket assembly (relative to carriage) and inserting rear of bracket over rear of carriage first. Then place front of bracket over front of carriage, and slide assembly forward. Refer to **Figure 4-16** and verify that bracket orientation matches illustration.
- 4) Install screws and lock washers fastening intermediate shaft bracket to carriage.
- 5) Refer to In/Out Motor and Gearbox Installation section to re-install gearmotor assembly.
- 6) Refer to Drive Chain Installation and Adjustment sections and install and adjust both drive chains.
- 7) Refer to Setting Torque Limiting Clutch section and adjust clutch breakaway point.

c. TORQUE LIMITING CLUTCH CHECK AND ADJUSTMENT

The clutch is set at the factory. Re-adjustment is typically required after 500 lift cycles. To provide smooth platform movement:

- The clutch **must not disengage** before platform reaches the end of its stow or deploy travel.
- The clutch **must disengage** when platform reaches the end of its travel.

CHECK:

- 1) Refer to LIFT SERVICE ACCESS section to deploy platform and open service access panel.
- 2) Refer to FINAL DRIVE CHAIN REMOVAL section and remove final drive chain.
- 3) Measure clutch breakaway torque with a torque wrench that will retain a maximum reading (Snap-On "Torqometer" part number TE25FFUA, or equivalent).
- 4) Refer to **Figure 4-17**. Engage final drive chain sprocket (mounted on intermediate shaft) with torque wrench.
- 5) Rotate intermediate shaft until clutch slips. Maximum torque occurs at point where clutch **first begins to slip**. Breakaway must occur between 24–28 ft-lbs.

ADJUST:

- 1) Refer to **Figure 4-18**. Do the following, if clutch adjustment is necessary:

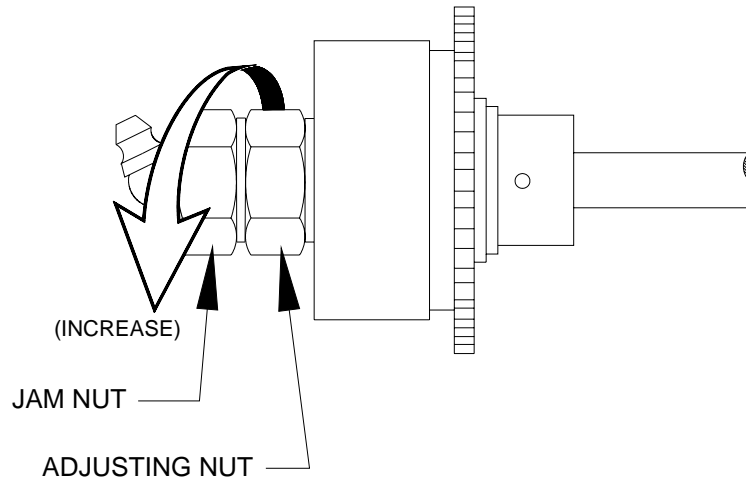


FIGURE 4-18: TORQUE LIMITING CLUTCH ADJUSTMENT

- 2) Loosen 15/16" jam nut.
- 3) Rotate adjusting nut clockwise to increase torque, or counter-clockwise to decrease torque. Adjust in small increments and check breakaway torque each time until desired torque is obtained.
- 4) Hold adjusting nut and tighten jam nut to 40–50 ft-lbs.
- 5) Refer to Drive Chain Installation and Adjustment sections and install both drive chains.

4. INTERMEDIATE SHAFT AND FINAL DRIVESHAFT

The intermediate shaft transfers power from primary drive chain to final drive chain. The final driveshaft transfers power from final drive chain to pinion gears. The pinion gears mesh with the gear track (attached to inside of enclosure).

a. Intermediate Shaft and Final Driveshaft Removal

INTERMEDIATE SHAFT—

- 1) Refer to Torque Limiting Clutch Removal section and remove clutch assembly.
- 2) Refer to **Figure 4-16**. Slide intermediate shaft assembly out of intermediate shaft support.
- 3) Remove washer from shaft. Remove roll pin fastening intermediate shaft sprocket to intermediate shaft, and remove sprocket.
- 4) Remove bushings from intermediate shaft support; replace, if necessary.

FINAL DRIVESHAFT—

- 1) Refer to Carriage Removal section and remove carriage from enclosure.
- 2) Refer to Drive Chain Removal section and remove both drive chains.
- 3) Refer to **Figure 4-16**. Remove two screws fastening intermediate shaft bracket to carriage. Slide intermediate shaft bracket away from final driveshaft (to provide clearance for driveshaft removal).
- 4) Remove two shoulder bolts fastening driveshaft support arms to carriage.
- 5) Remove final driveshaft and support arms from carriage.
- 6) Remove roll pins fastening two pinion gears and one driveshaft sprocket to final driveshaft.
- 7) Twist and slide pinion gears, support arms, and sprocket off final driveshaft.
- 8) Slide spacers and collar off driveshaft.

b. Intermediate Shaft and Final Driveshaft Installation

INTERMEDIATE SHAFT–

NOTE: Refer to Intermediate Shaft Removal section if an intermediate shaft is present.

- 1) Press new bushings into intermediate shaft support, if necessary. Bearing flange is on outside of support.
- 2) Slide intermediate shaft sprocket onto intermediate shaft. Align hole in sprocket hub with corresponding hole in intermediate shaft.
- 3) Drive new rollpin into sprocket hub and intermediate shaft.
- 4) Slide intermediate shaft assembly through bushings of intermediate shaft support. Refer to **Figure 4-16** and verify that orientation of intermediate shaft assembly matches illustration (sprocket is near outside of carriage).
- 5) Refer to Torque Limiting Clutch Installation section. Install and adjust clutch.
- 6) Refer to Carriage Installation section and install carriage into enclosure.

FINAL DRIVESHAFT–

NOTE: Refer to Final Driveshaft Removal section if a final driveshaft is present.

- 1) Refer to **Figure 4-16**. Slide driveshaft sprocket onto driveshaft. Align roll pin-hole in sprocket hub with hole in driveshaft.
- 2) Drive new roll pin into sprocket hub and driveshaft.
- 3) Press new bushings into driveshaft support arms, if necessary. Bearing flange is on inside of support arms

NOTE: Spring retaining pins on driveshaft support arms must point downward.

- 4) Slide collar, spacers, and driveshaft support arms onto driveshaft.
- 5) Slide pinion gears onto driveshaft. Align holes in gear hubs and collar with corresponding holes on driveshaft.
- 6) Drive new rollpins into gear hubs, collar, and driveshaft.
- 7) Position driveshaft assembly in carriage, and fasten support arms with two shoulder bolts and related hardware.
- 8) Locate compression springs over spring retaining pins on carriage. Rotate support arms down onto springs. Verify that both ends of each spring are held by spring retaining pins.
- 9) Locate intermediate shaft bracket (with intermediate shaft assembly) on top of carriage and install screws and lock washers. Tighten sufficiently to lock the washers.
- 10) Refer to Drive Chain Installation section and install the primary and final drive chains.
- 11) Refer to Carriage Removal section and install carriage into enclosure by reversing removal steps. Heed all warnings and precautions.

5. MANUAL PLATFORM RELEASE MECHANISM

Refer to **Figure 4-19**. The travelling frame (carriage, lifting frame, and platform) can be manually disengaged from the enclosure by rotating either platform release shaft. Each release shaft has an eccentric cam that bears against a roller on the driveshaft. Rotating a release shaft pushes the final driveshaft downward (against the force of an engagement spring), disengaging each driveshaft pinion gear from its gear rack (mounted to the inside of the enclosure). Once the deployment system is disengaged, the travelling frame can be moved by hand. The deployment system will automatically re-engage when the platform is moved to the opposite end of its travel (stow or deploy).

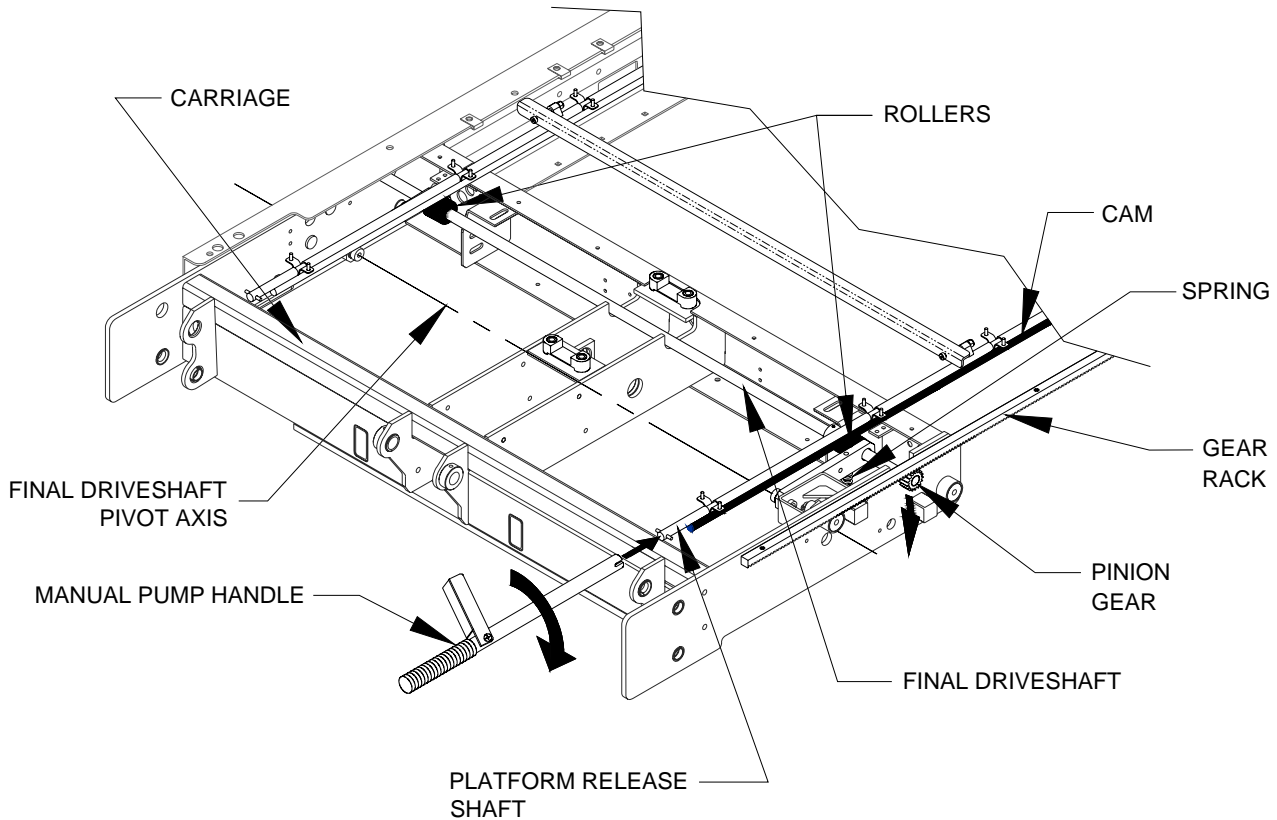


FIGURE 4-19: PLATFORM RELEASE COMPONENTS

a. Reset Ramp Adjustment

Rotating a release shaft disengages the platform from the enclosure. The reset ramps re-engage the deployment system when the platform is moved to the opposite end of its travel. There are two reset ramps; each one is a small, white plastic block. One ramp re-engages platform when it is fully deployed, the other when platform is fully stowed. Both ramps are located at the top, rear of carriage, above the final driveshaft. The adjustment procedure is similar for both ramps.

CHECK:

- 1) Rotate either release shaft to disengage stowed platform, and then pull platform out to the fully deployed position.
- 2) One of the reset ramps engages a pin on one release shaft and rotates the shaft about 90° when platform reaches full deployment. Verify that deployment system has re-engaged by attempting to push platform inward.
- 3) Rotate either release shaft to disengage platform, and then push platform to the fully stowed position.
- 4) The second reset ramp will engage a pin on the second release shaft and rotate that shaft about 90° when platform reaches the fully stowed position. Verify that deployment system has re-engaged by attempting to pull platform outward.

ADJUST:

If either ramp fails to rotate its release shaft properly, the ramp position must be re-adjusted. Loosen the two screws holding ramp in place, and slide ramp towards pin about 1/8 inch. Tighten screws and repeat appropriate test (stow or deploy) to verify that deployment system has re-engaged. Repeat adjustment, if necessary.

b. Release Switch Adjustment

A limit switch is mounted below one driveshaft support arm, and detects the position of the arm. It is adjusted to change states when the pinion gears disengage.

NOTE: Refer to Electrical Controls section if replacement of switch is necessary.

CHECK:

- 1) Refer to LIFT SERVICE ACCESS section to deploy platform and open service access panel.
- 2) Rotate either release shaft 90° in the direction indicated on adjacent decal, using manual back-up pump handle. This disengages pinion gears from gear racks.
- 3) Refer to **Figures 4-16** and **4-20**. Listen to switch as release shaft is rotated. It should click faintly (change state) when the driveshaft support arm contacts the switch roller (as shown in figure). The change of state is also marked by the switch contact resistance becoming infinite (open) when measured at pins four and five of the lifting frame harness.

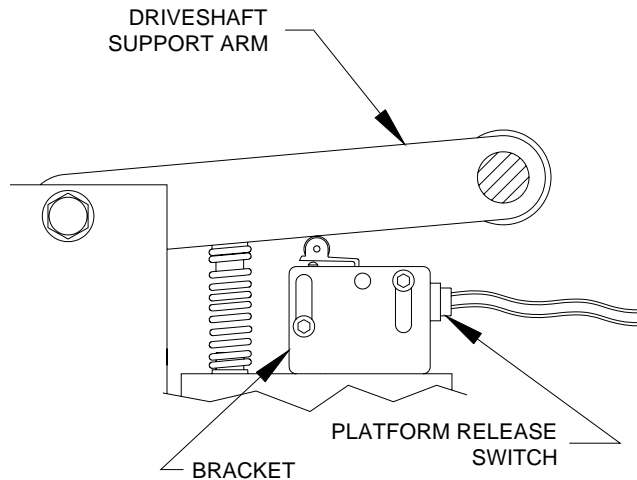


FIGURE 4-20: PLATFORM RELEASE SWITCH SETTING

ADJUST:

- 1) Loosen switch retaining screws, and slide switch downward on its bracket until switch roller loses contact with arm. Slide switch upward until a faint click is heard (or resistance becomes infinite). Tighten screws.
- 2) Rotate release shaft to re-engage pinion gears. A faint click should be heard from switch as it changes state.

NOTE: It is important to verify that switch states are different when gears are engaged and un-engaged.

- 3) Raise service access panel, and install two retaining screws and lock-nuts at front edge of panel.

E. HYDRAULIC POWER SYSTEM

Refer to **Figure 4-21**. The major components of hydraulic system are an electric motor, a gear pump, a hydraulic cylinder, control valves, and a manual back-up pump.

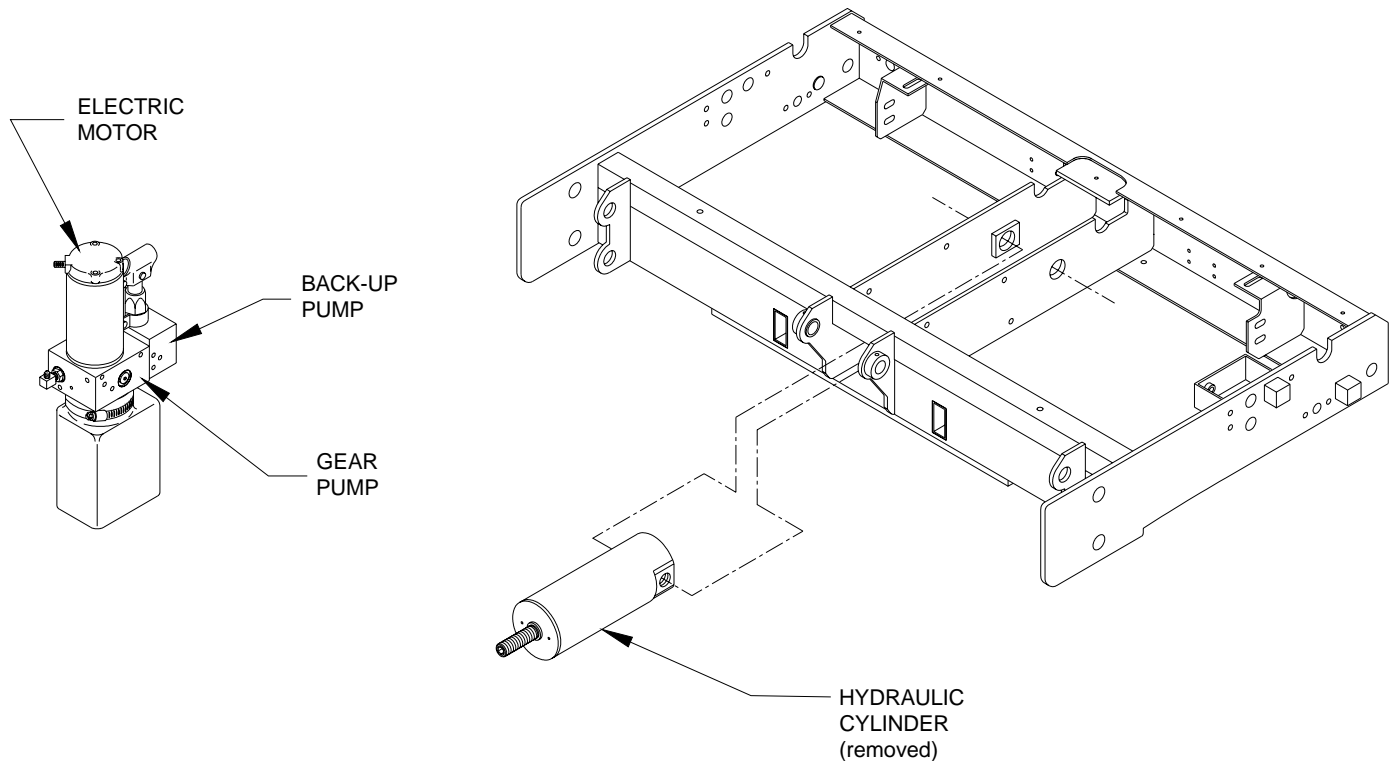


FIGURE 4-21: HYDRAULIC SYSTEM COMPONENTS

1. SYSTEM FLUID RENEWAL

- a. Deploy platform using control pendant (DEPLOY).
- b. Slowly open manual release valve (located on back-up pump) to release hydraulic pressure, and lower platform to ground.
- c. Loosen clamp fastening fluid reservoir to pump.
- d. Carefully pull reservoir from bottom of pump and empty into a proper waste fluid container.
- e. Re-install reservoir on pump and tighten clamp.
- f. Remove fill plug on the top of reservoir. Fill reservoir with Texaco 01554 Aircraft Hydraulic Oil or equivalent U.S. mil spec H5606G fluid.
- g. Close manual release valve.
- h. Raise platform up to floor level, and then lower down to ground level. Repeat cycle three times.
- i. Slowly open manual release valve to release hydraulic pressure.
- j. Repeat steps **c.** through **h.** and then proceed to step **k.**
- k. Close manual release valve.
- l. Refer to HYDRAULIC BLEEDING section in Chapter II and bleed system.

2. ELECTRIC PUMP MOTOR

a. Electric Pump Motor Removal

- 1) Deploy platform using control pendant (DEPLOY), and then support.
- 2) Disconnect positive battery cable at vehicle battery compartment.
- 3) Refer to **Figure 4-22**. Disconnect heavy electrical connection to pump.

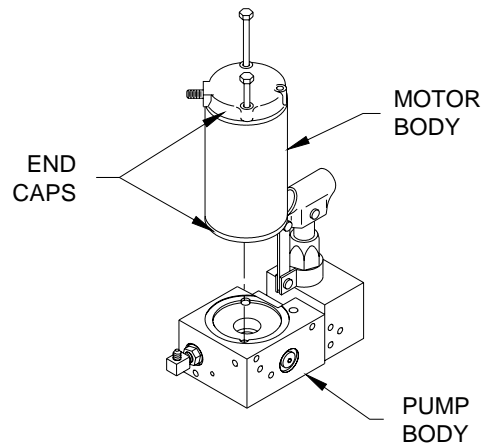


FIGURE 4-22: PUMP MOTOR ORIENTATION

- 4) Remove pump motor assembly from pump body by unthreading two long screws that pass through motor body; do not remove screws. Hold end caps against motor body when removing.

b. Electric Pump Motor Installation

NOTE: This procedure assumes that pump motor has been removed.

- 1) Inspect shaft seal in pump body for signs of leakage; replace, if necessary.
- 2) Refer to **Figure 4-22**. Locate pump motor assembly on pump body (hold motor assembly together).
- 3) Align screw holes in end caps, motor body, and pump body. Insert two long retaining screws and lightly tighten.
- 4) Connect a 12 or 24 VDC, as appropriate, power source to motor assembly. Connect positive lead to motor terminal and negative lead to pump body.
- 5) Carefully tighten retaining screws as motor spins (hold upper end cap). Do not over tighten screws.
- 6) Raise platform to floor level. Repeat steps 4) and 5) if pump motor is noisy.
- 7) Check all hydraulic connections for leaks, and correct as required.
- 8) If seal in pump body was replaced, refer to HYDRAULIC BLEEDING section in Chapter II and bleed system.

3. HYDRAULIC CYLINDER

a. Hydraulic Cylinder Removal

- 1) Deploy platform using control pendant (DEPLOY).
- 2) Raise platform to a comfortable working height and then support.
- 3) To gain access to underside of lift, hold service access panel up, remove two retaining screws and lock-nuts from front edge of panel and lower panel.
- 4) Disconnect positive battery cable at vehicle battery compartment.

WARNING

OPENING THE HYDRAULIC PUMP MANUAL RELEASE VALVE WILL ALLOW THE LIFT PLATFORM TO LOWER. STAND CLEAR AND CHECK FOR OBSTRUCTIONS TO PREVENT INJURY OR DAMAGE.

- 5) Open hydraulic pump manual release valve and leave open.

NOTE: The following step will spill hydraulic fluid; have dry rags on hand.

- 6) Refer to **Figure 4-23**. Disconnect hydraulic hose from quick-disconnect fitting; this could require removing hose retaining clamp.

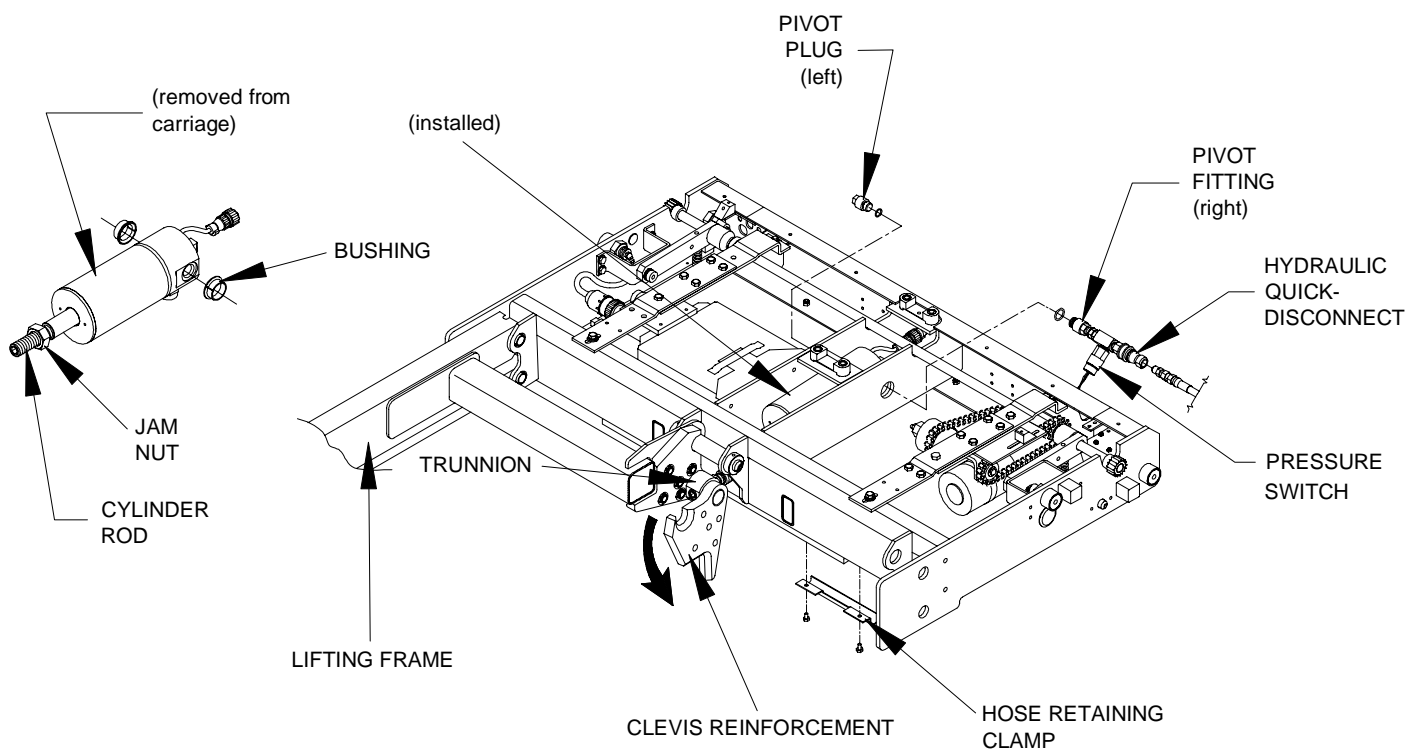


FIGURE 4-23: HYDRAULIC CYLINDER AND RELATED COMPONENTS

- 7) Disconnect electrical harness from cylinder. Protect exposed connectors on harness and cylinder.
- 8) Remove pivot fitting from right side of cylinder. Remove pivot plug from left side of cylinder; this will release cylinder from carriage.
- 9) Remove the five sets of screws, washers, and nuts from both clevis reinforcements. Employ an assistant to raise the lifting frame as far as possible and then pivot each clevis reinforcement downward as shown. Remove clevis reinforcements and bushings from trunnion. Loosen jam nut (located behind trunnion) and remove trunnion.
- 10) Push cylinder assembly upward and towards the rear of the carriage to allow front of cylinder (piston) to drop down. Remove cylinder assembly through bottom of carriage. Remove two bushings from carriage frame.

b. Hydraulic Cylinder Installation

- 1) Refer to **Figure 4-23**. Assemble jam nut and trunnion onto hydraulic cylinder piston rod. Install two cylinder pivot bushings into carriage frame (with flanges towards center of frame).
- 2) Insert rear of hydraulic cylinder up into center of carriage, and push cylinder as far up and back as possible. Swing front of cylinder up into carriage.

- 3) Align cylinder ports with bushings, and install pivot plug through carriage frame bushing and into left side of cylinder.
- 4) Install pivot fitting (with hydraulic Quick-Disconnect) through carriage frame bushing and into right side of cylinder.
- 5) Connect hydraulic hose to Quick-Disconnect fitting. Fasten hose retaining clamp to carriage, if removed.
- 6) Verify that hydraulic pump manual release valve is closed. Thread jam nut and trunnion onto piston rod and then extend trunnion out as far as possible with manual backup pump.
- 7) Install two bushings on trunnion, and then install clevis reinforcements. Employ an assistant to raise the lifting frame as far as possible and then pivot each clevis reinforcement upward until its circular notch engages the short tube on the lifting frame. Fasten reinforcements to lifting frame with the five sets of screws, washers, and nuts.
- 8) Refer to HYDRAULIC BLEEDING section in **Chapter II** and bleed system.
- 9) Raise platform to maximum height possible using manual back-up pump. Compare this height to vehicle floor height and note whether platform needs to be raised or lowered.
- 10) Insert a 3/8" hex wrench, or 3/8" hex drive, into end of cylinder rod. Turn rod clockwise to raise platform, and counterclockwise to lower. Adjust to height needed for entry into vehicle. Tighten jam nut against trunnion.

NOTE: It could be necessary to lift platform **slightly** to make turning of cylinder rod easier.

- 11) Refer to Platform Stow Height Adjustment section in **Chapter II**, and program stow height. Program intermediate height, if necessary.

4. PRESSURE SWITCH ADJUSTMENT

An adjustable, pressure sensing, electrical switch is installed in the hydraulic line connected to the hydraulic cylinder. The switch detects the presence of a load, of 75 lbs or greater, on the deployed platform. Correct adjustment of switch inhibits a loaded platform from stowing into vehicle, providing a safety factor for lift users. Refer to the Pressure Switch Adjustment section in Chapter II after doing major repair or replacement of components in the hydraulic system.

5. HYDRAULIC HOSE AND MAIN ELECTRICAL HARNESS

A single flexible conduit, containing both a hydraulic hose and an electrical harness, is routed inside the enclosure. It is routed between the pull box and carriage. The hydraulic hose is part of a line that connects the hydraulic pump (located in pump box) to the hydraulic cylinder (platform lifting cylinder). The electrical harness provides power to the lift, and also carries pendant and hydraulic pump motor signals to the carriage-mounted electronic controller.

a. Hydraulic Hose and Main Electrical Harness Removal

- 1) Refer to CARRIAGE REMOVAL section and remove platform, lifting frame, and carriage.
- 2) Refer to **Figures 4-23** and **4-24**. Remove hose retaining clamp from bottom of carriage. Remove hose clamp behind pull box (inside enclosure).

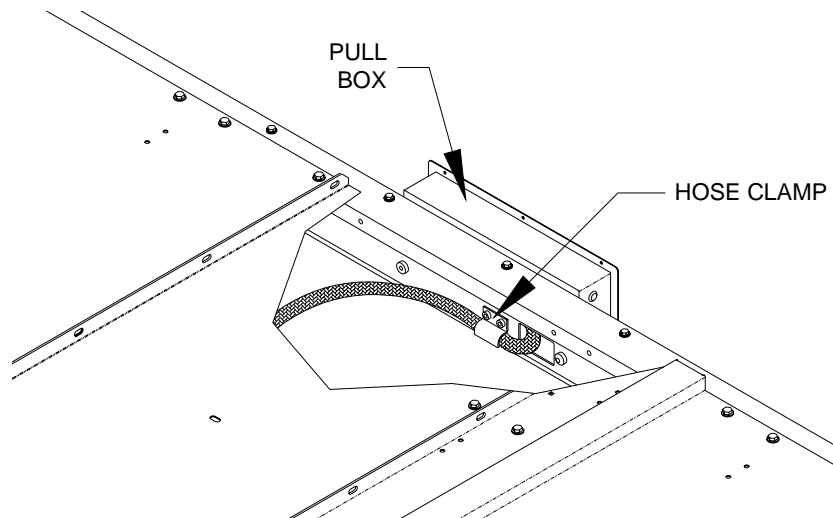


FIGURE 4-24: HOSE CLAMP AT PULL BOX

NOTE: The following step will spill hydraulic fluid; have dry rags on hand.

- 3) Disconnect hydraulic hose from quick-disconnect fitting at lifting cylinder. Disconnect main electrical harness connector from electronic controller (mounted to carriage).

- 4) Disconnect hydraulic hose from fitting inside pullbox. Disconnect main electrical harness from terminal strip inside pullbox. Make a note of wire colors and terminal numbers. Also, note the routing of conduit and how it is secured.
- 5) Remove main electrical harness and hydraulic hose from enclosure (cut tie wraps, where necessary).

b. Hydraulic Hose and Main Electrical Harness Installation

NOTE: This procedure assumes the conduit containing the main electrical harness and hydraulic hose has been removed.

- 1) Refer to CARRIAGE REMOVAL section and remove platform, lifting frame, and carriage, if present.
- 2) Route main electrical harness and hydraulic hose from enclosure pullbox to carriage.
- 3) Connect hydraulic hose to fitting inside pullbox. Connect main electrical harness to terminal strip inside pullbox.
- 4) Route conduit from pullbox to carriage.
- 5) Connect hydraulic hose to quick-disconnect fitting at lifting cylinder. Connect main electrical harness connector to electronic controller (mounted in carriage).
- 6) Position conduit so that it moves freely with carriage; it must not interfere with carriage movement. The conduit must lie flat against the bottom enclosure cover, and must not twist or loop as carriage moves in and out of enclosure. Secure conduit with tie wraps, where necessary.
- 7) Refer to **Figures 4-23** and **4-24**. Install hose retainer clamp on bottom of carriage. Install hose clamp behind pull box (inside enclosure).
- 8) Refer to end of Carriage Removal section for instructions to install carriage.
- 9) Refer to HYDRAULIC BLEEDING section in Chapter II and bleed system.

F. ELECTRICAL CONTROLS


1. GENERAL LIMIT SWITCH REPLACEMENT

There are several limit switches installed in the platform and carriage. The switches are hard-wired to their harnesses at the factory, but can be replaced in the field. Replacement switches are supplied with three wire leads (pigtailed). Use this procedure to wire a replacement switch into a harness.

- a. Disconnect positive battery cable at vehicle battery compartment.
- b. Note colors of wire leads on switch to be replaced (red lead and blue lead, red lead and yellow lead, etc). Cut leads close to switch body. Strip a ¼" of insulation off remaining leads.
- c. Cut wire leads on replacement switch to an appropriate length; cut leads long if unsure of exact length. Strip ends of wires ¼".
- d. Place a 1" length of ¼" shrinkable tubing around each switch wire if you are going to solder the new connections. Slide tubing away from end of wire.
- e. Connect each harness lead to appropriate lead on replacement switch. [Contact Ricon Product Support if replacement switch leads are a different color than switch being replaced.] The leads can be joined with crimp-on butt connectors, or soldered together.
- f. Verify integrity of each connection by attempting to pull it apart.
- g. Slide the shrinkable tubing over soldered connections and shrink with a heat gun.
- h. Cut unused switch lead close to switch body.
- i. Remove original switch from its bracket and mount replacement switch in its place.
- j. Refer to appropriate Switch Adjustment section in this chapter and set switch position.
- k. Reconnect positive battery cable at vehicle battery compartment.

2. ELECTRONIC CONTROLLER REPLACEMENT

The electronic circuitry inside the controller box receives command inputs from the pendant. It also monitors and controls all lift functions. There are no parts in controller that can be replaced in the field; the entire controller must be replaced if at fault. Verify that replacement controller is appropriate for the application being worked on.

 CAUTION
<p>The electronic controllers used in the various Ricon Mirage models are visually similar and physically interchangeable. However, their programming and internal circuitry are different, and they must not be installed in a lift they were not designed for.</p>

- a. Fully deploy lift.
- b. Refer to **Figure 4-23**. The controller is taken out of carriage from below on some models (through access hatch), but can be removed from above on others.

- c. To gain access to underside of lift, hold service access panel up, remove two retaining screws and lock-nuts from front edge of panel, and lower panel.
- d. Disconnect three harness connectors from controller.
- e. Remove two Phillips screws fastening connector-end of controller to its mounting bracket.
- f. Slide rear of controller off of rear bracket and remove controller from carriage.
- g. Position replacement controller inside carriage. Slide loop on top of housing onto rear mounting bracket tab.
- h. Re-install two Phillips screws.
- i. Connect three harness connectors to controller; tighten connectors securely.

NOTE: Each connector is uniquely keyed, and cannot be intermixed. However, do not attempt to force a connector plug onto wrong receptacle.

- j. Raise service access panel, and install two retaining screws and lock-nuts at front edge of panel.
- k. Reconnect positive battery cable at vehicle battery compartment.

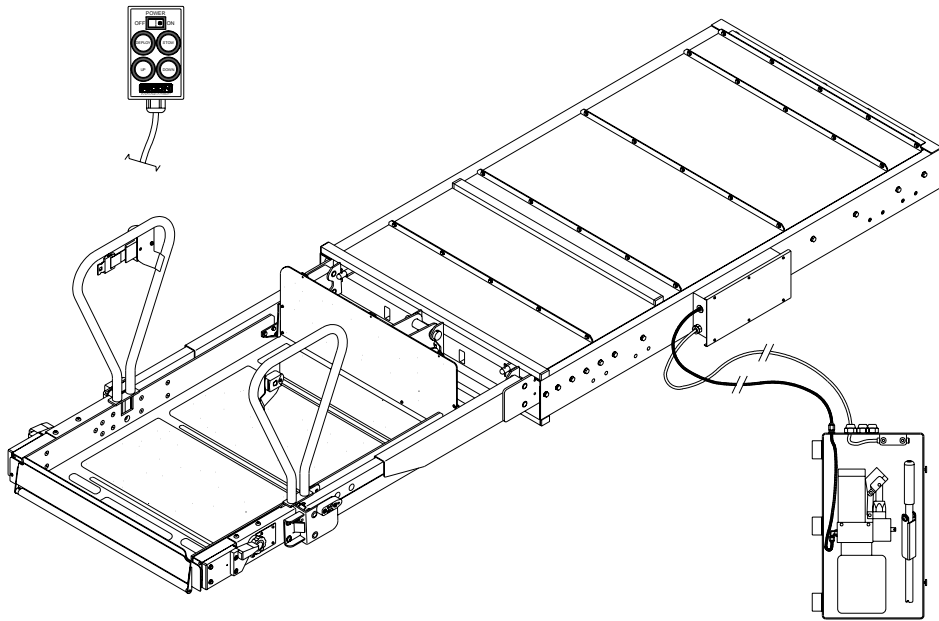
3. HYDRAULIC HOSE AND MAIN ELECTRICAL HARNESS

A single flexible conduit, containing both a hydraulic hose and an electrical harness, is routed inside the enclosure. It is routed between the pull box and carriage. The hydraulic hose is part of a line that connects the hydraulic pump (located in pump box) to the hydraulic cylinder (platform lifting cylinder). The electrical harness provides power to the lift, and also carries pendant and hydraulic pump motor signals to the carriage-mounted electronic controller. Refer to the Hydraulic Hose and Main Electrical Harness paragraph in the Hydraulic Power System section for removal and installation instructions.

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V. F9TF SPARE PARTS

This chapter contains parts illustrations and parts lists for the RICON Mirage F9TF Public Use wheelchair lift. Each exploded view of a major lift assembly shows smaller assemblies, components, and kits referenced with numbers. The accompanying parts list has the part reference number, a part description, the quantity required for one major assembly, and the Ricon part number. Dimensions included in the parts descriptions are in inches, unless otherwise noted.



NOTE: To order a part – locate needed part on an exploded diagram, note its reference number, find this reference number on the associated parts list (following page), and order the part number in the far right column. Most kits contain a single part (plus hardware, if applicable). Therefore, you may need to order more than one kit if the part is used more than once on a major assembly.

SPECIAL PARTS

- Controller Programming Switch17885

PARTS DIAGRAMS		PAGE
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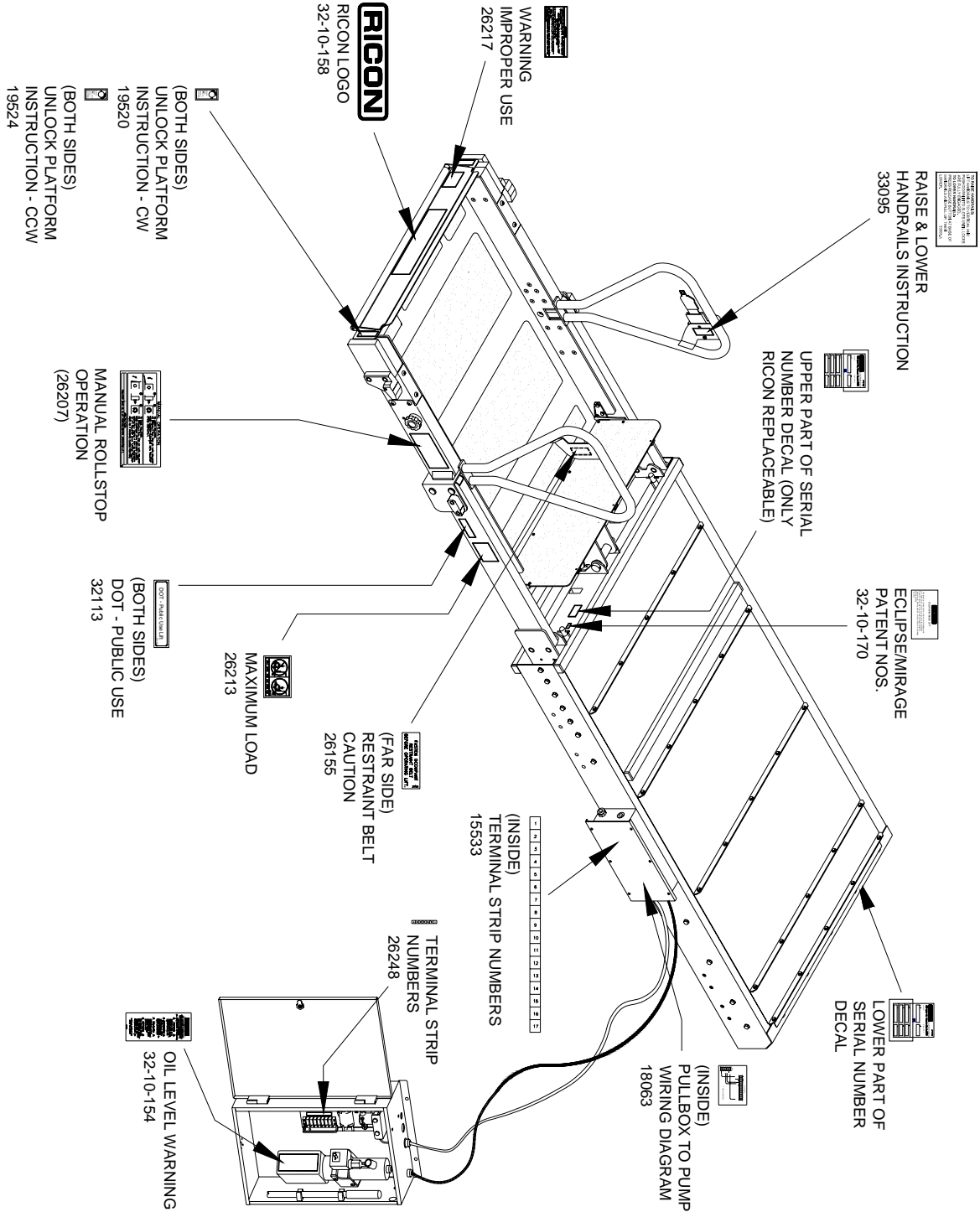
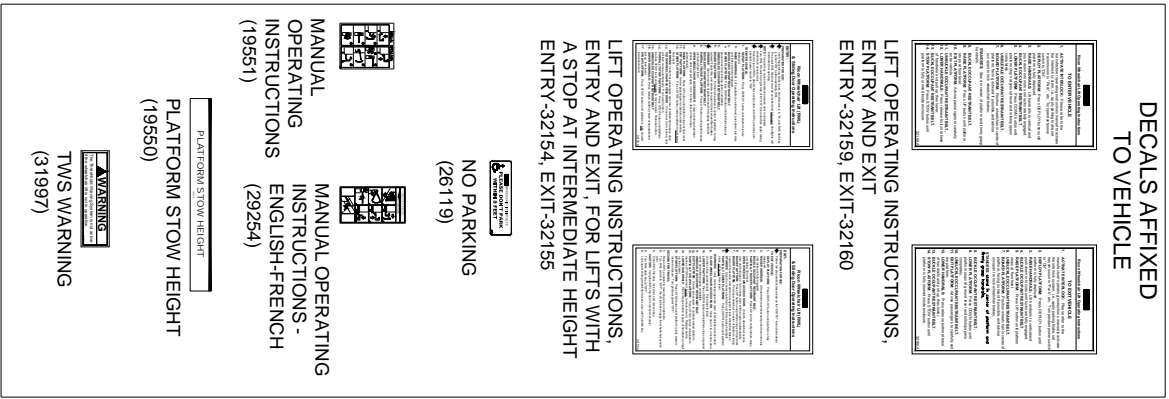


FIGURE 5-1: F9TF DECALS—LOCATIONS AND PART NUMBERS

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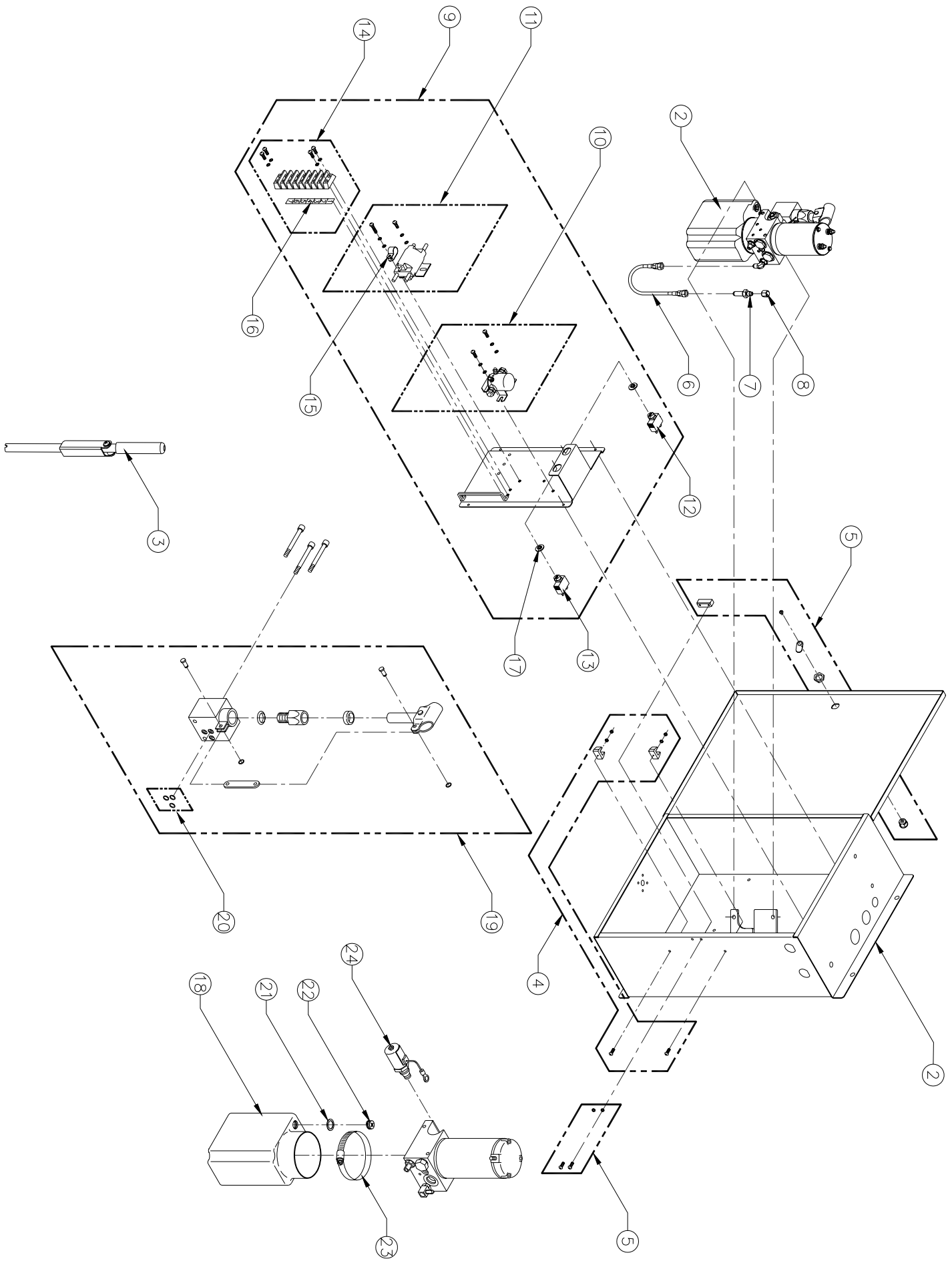


FIGURE 5-2: F9TF-DE001 AND DE002 PUMP BOX ASSEMBLY

FIGURE 5-2: F9TF-DE001 AND DE002 PUMP BOX ASSEMBLY

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	PUMP ENCLOSURE W/COVER	1	19644
2	PUMP ASSY, 2KPSI, 24VDC	1	PM224002007
3	MANUAL BACK-UP PUMP HANDLE	1	20122
4	KIT, TOOL CLIP, PUMP HANDLE	1	01267
5	KIT, PUMP BOX LOCK, W/BLOCK	1	19556
6	HOSE ASSY, HYD, 11" X 1/4JIC X 1/4JIC	1	F9-0333
7	FITTING, BUN, 1/4J, 2.08L	1	V2-SH-981
8	CAP, FITTING, 1/4J, STL	1	V2-SH-13
9	KIT, SOLENOID PLATE ASSY, 24VDC, W/HDWR	1	19677
10	KIT, SOLENOID, 24VDC, SINGLE POLE, W/HDWR	1	20667
11	KIT, SOLENOID, 24VDC, DOUBLE POLE, W/HDWR	1	20669
12	CIRCUIT BREAKER, 8A	1	265108
13	CIRCUIT BREAKER, 30A	1	26510
14	KIT, TERMINAL STRIP	1	20666
15	CLAMP, NYLON, 3/8", BLACK, BAG OF 10	1	19773
16	DECAL, PUMP TERMINAL STRIP	1	26248
17	ADAPTER, .625, D-HOLE	2	V2-ES-059
18	RESERVOIR, HYDRAULIC POWER UNIT, PLASTIC	1	30938
19	BACK-UP PUMP ASSY, MANUAL W/O HANDLE	1	V2-SH-210
20	SEAL KIT, MANUAL BACK-UP PUMP	1	V2-SH-220
21	WASHER, RUBBER, 1"OD X 5/8"ID X 1/8"	1	21602
22	PLUG, BREATHER, RESERVOIR	1	10333
23	CLAMP, RESERVOIR	1	V2-SH-109
24	DOWN VALVE ASSY, 24VDC	1	V2-SH-136
*	WEATHERSTRIP, 1/8 X 1/2	5FT	06-06-107

* not shown

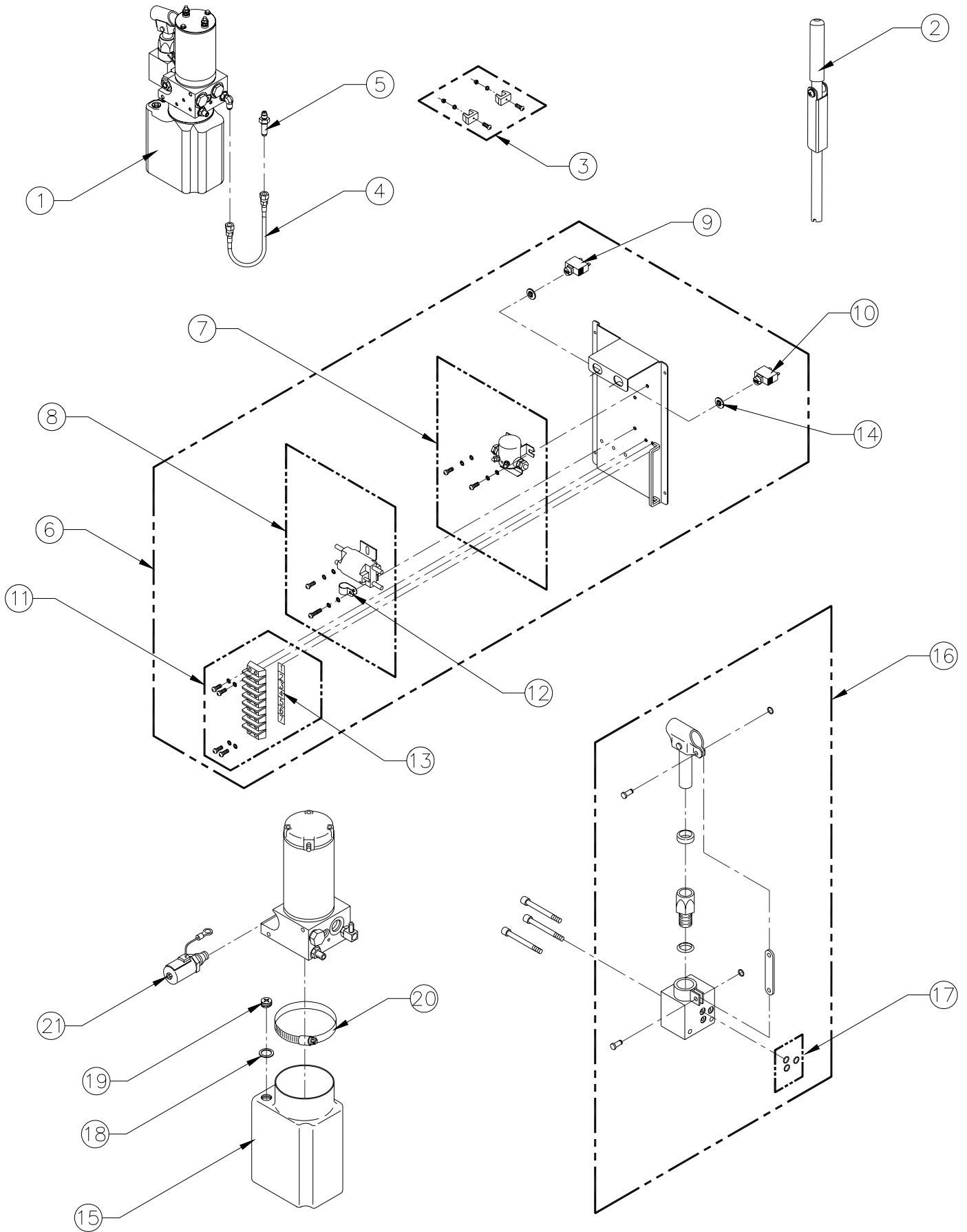


FIGURE 5-3: F9TF-DE004 PUMP AND SOLENOID ASSEMBLY

FIGURE 5-3: F9TF-DE004 PUMP AND SOLENOID ASSEMBLY

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO.
1	PUMP ASSY, 2KPSI, 24VDC	1	PM224162007
2	MANUAL BACK-UP PUMP HANDLE	1	20122
3	KIT, TOOL CLIP, PUMP HANDLE	1	01267
4	HOSE ASSY, HYD, 13.75"	1	28883
5	FITTING, BUN, 1/4J, 2.08L	1	V2-SH-981
6	KIT, SOLENOID PLATE ASSY, 24VDC, W/HDWR	1	19677
7	KIT, SOLENOID, 24VDC, SINGLE POLE, W/HDWR	1	20667
8	KIT, SOLENOID 24VDC, DOUBLE POLE, W/HDWR	1	20669
9	CIRCUIT BREAKER, 8A	1	265108
10	CIRCUIT BREAKER, 30A	1	26510
11	KIT, TERMINAL STRIP	1	20666
12	CLAMP, NYLON, 3/8", BLACK, BAG OF 10	1	19773
13	DECAL, PUMP TERMINAL STRIP	1	26248
14	ADAPTER, .625, D-HOLE	2	V2-ES-059
15	RESERVOIR, HYDRAULIC POWER UNIT, PLASTIC	1	30938
16	BACK-UP PUMP ASSY, MANUAL W/O HANDLE	1	V2-SH-210
17	SEAL KIT, MANUAL BACK-UP PUMP	1	V2-SH-220
18	WASHER, RUBBER, 1"OD X 5/8"ID X 1/8"	1	21602
19	PLUG, BREATHER, RESERVOIR	1	10333
20	CLAMP, RESERVOIR	1	V2-SH-109
21	DOWN VALVE ASSY, 24VDC	1	V2-SH-136

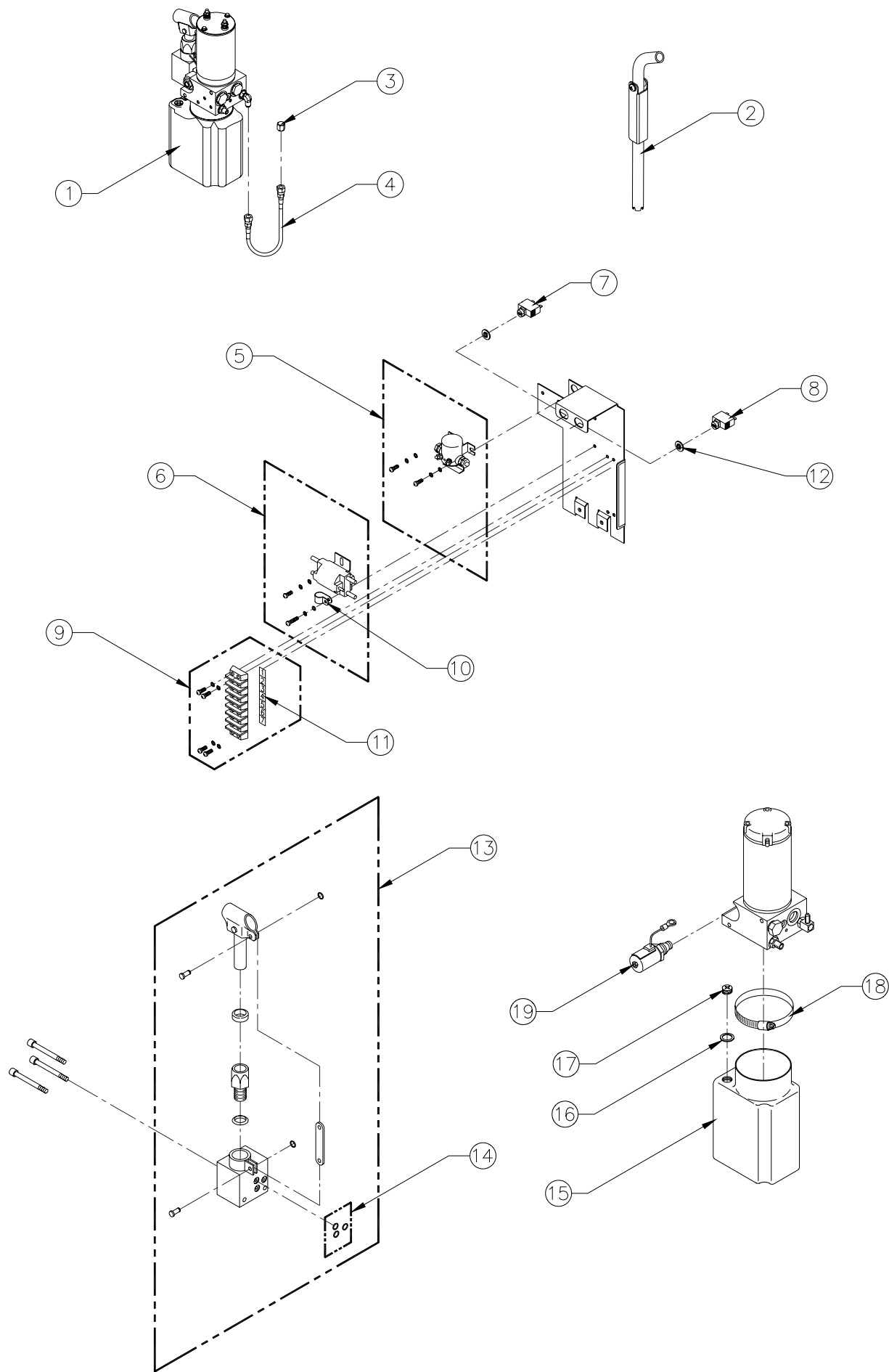


FIGURE 5-4: F9TF-DS001 PUMP AND SOLENOID ASSEMBLY

FIGURE 5-4: F9TF-DS001 PUMP AND SOLENOID ASSEMBLY

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	PUMP ASSY, 2KPSI, 12VDC	1	PM212003007
2	MANUAL BACK-UP PUMP HANDLE, ANGLED	1	20130
3	CAP, FITTING, 1/4J, STL	1	V2-SH-13
4	HOSE ASSY, HYD, 11" X 1/4JIC X 1/4JIC	1	F9-0333
5	KIT, SOLENOID, 12VDC, SINGLE POLE, W/HDWR	1	20668
6	KIT, SOLENOID, 12VDC, DOUBLE POLE, W/HDWR	1	20670
7	CIRCUIT BREAKER, 8A	1	265108
8	CIRCUIT BREAKER, 30A	1	26510
9	KIT, TERMINAL STRIP	1	20666
10	CLAMP, NYLON, 3/8" BLACK, BAG OF 10	1	19773
11	DECAL, PUMP TERMINAL STRIP	1	26248
12	ADAPTER, .625 D-HOLE	2	V2-ES-059
13	BACK-UP PUMP ASSY, MANUAL W/O HANDLE	1	V2-SH-210
14	SEAL KIT, MANUAL BACK-UP PUMP	1	V2-SH-220
15	RESERVOIR, HYDRAULIC POWER UNIT, PLASTIC	1	30938
16	WASHER, RUBBER, 1"OD X 5/8"ID X 1/8"	1	21602
17	PLUG, BREATHER, RESERVOIR	1	10333
18	CLAMP, RESERVOIR	1	V2-SH-109
19	DOWN VALVE ASSY, 12VDC	1	V2-SH-105

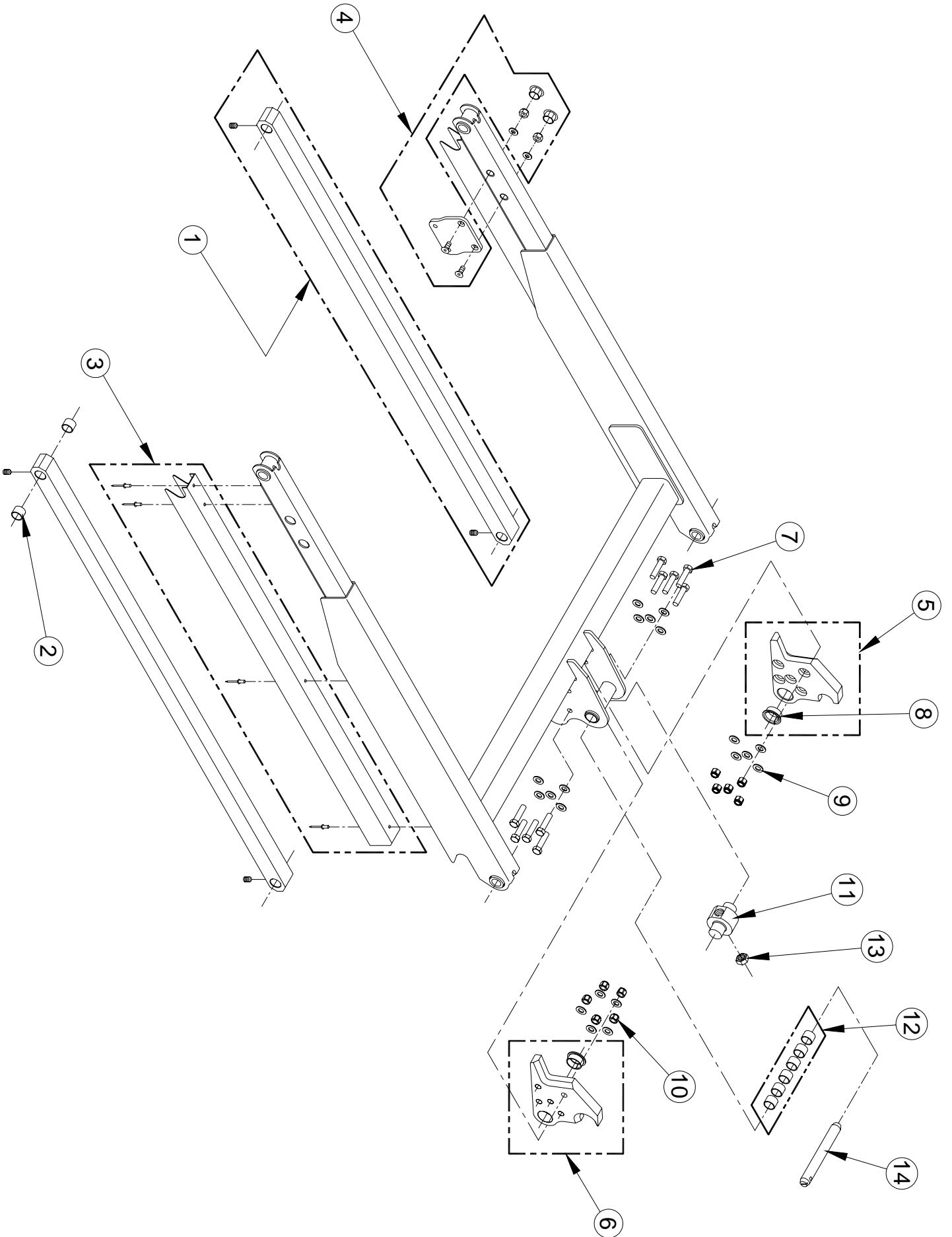


FIGURE 5-5: F9TF LIFTING FRAME ASSEMBLY

FIGURE 5-5: F9TF LIFTING FRAME ASSEMBLY

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	KIT, LOWER ARM	2	19596
2	BUSHING, .88OD X .75ID X .38	4	20261
3	KIT, COVER, LOWER ARM	2	19598
4	KIT, PLATE, BRIDGEPLATE ACTUATOR	2	19599
5	PLATE ASSEMBLY, CLEVIS REINFORCEMENT, LH	1	19879
6	PLATE ASSEMBLY, CLEVIS REINFORCEMENT, RH	1	19880
7	SCREW, HEX, 3/8-16 X 1 ½, SST, BAG OF 10	1	25606
8	BEARING, FLANGED, 1.00ID X .75W	2	27071
9	WASHER, FLAT, .40 X .75 X .06, SST, BAG OF 10	2	32184
10	NUT, ESN, 3/8-16, SST, BAG OF 10	1	25605
11	TRUNNION, SOLID PIN	1	19870
12	KIT, BEARING, .75ID X .875OD X .63W	1	20600
13	NUT, JAM, 3/4-16	1	14-08-110
14	PIN, .75D X 6.0L	1	F8-0041

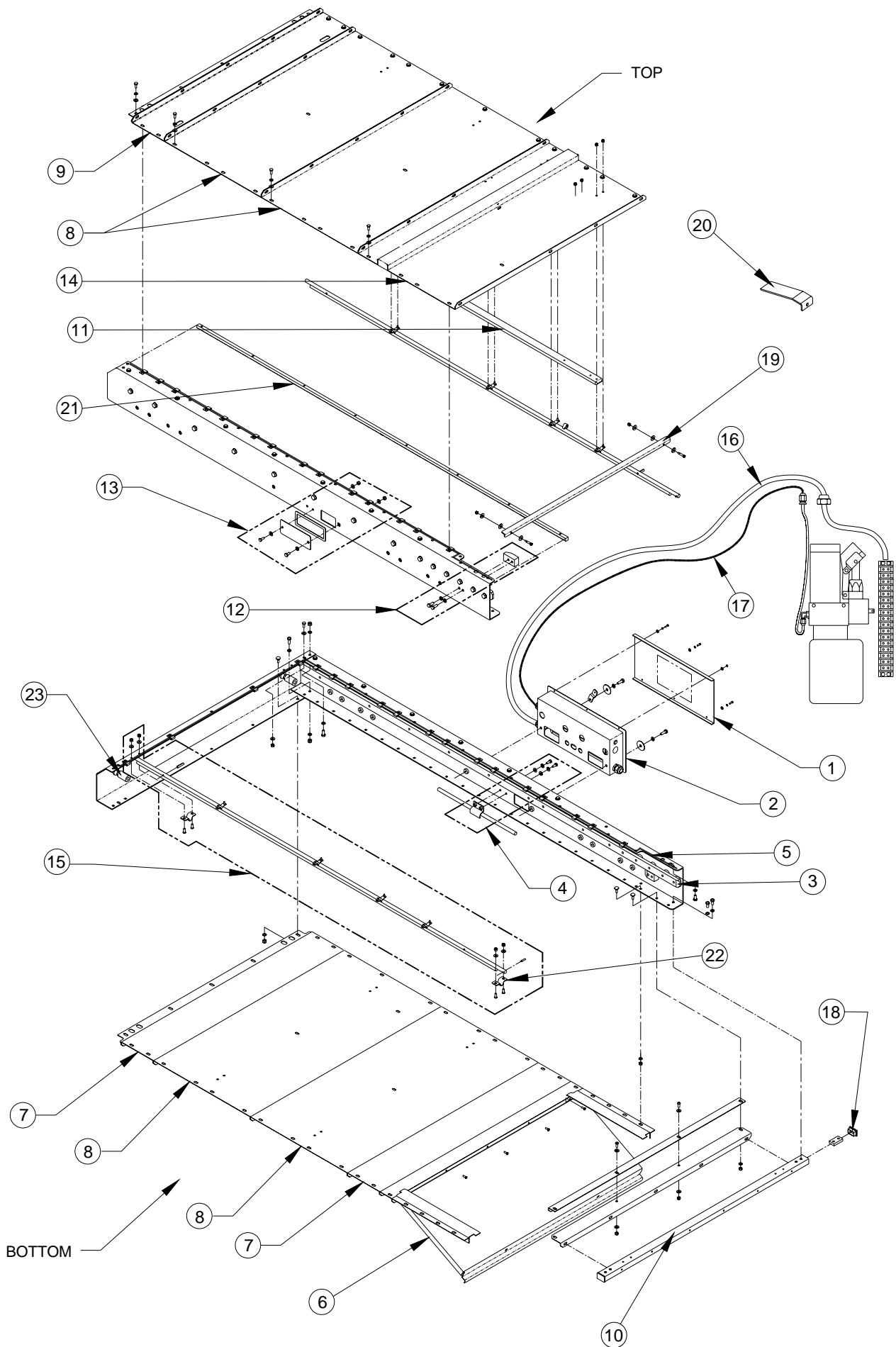


FIGURE 5-6: F9TF ENCLOSURE ASSEMBLY

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FIGURE 5-6: F9TF ENCLOSURE ASSEMBLY

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	KIT, PULLBOX COVER, W/DECAL	1	19562
2	PULLBOX ASSY, W/TERMINAL STRIP, HARNESS, FITTING, AND HDWR	1	33401
3	RAIL, GUIDE, CARRIAGE	2	F9-0101
4	KIT, HOSE CLAMP	1	19564
5	WEATHER STRIP, 1/8 X 1/2 X 100 FEET	1	06-06-107
6	KIT, SERVICE ACCESS PANEL, W/HDWR	1	19565
7	KIT, ENCLOSURE COVER, BOTTOM, W/HDWR, F9TF-DE001, 002, DS-001	2	19570
	KIT, ENCLOSURE COVER, BOTTOM, W/HDWR, F9TF-DE004	2	29610
8	KIT, ENCLOSURE COVER, 19.98" W/HDWR,	4	19566
9	KIT, ENCLOSURE COVER, 6.6" W/HDWR, F9TF-DE001, 002, DS-001	1	19571
9	TUBE, FORWARD CROSSMEMBER	1	F9-0025
10	RAIL, CARRIAGE GUIDE	1	F9-0142
11	KIT, STOP BLOCK	2	19567
12	KIT, BLOCK-OFF PLATE	1	19568
13	KIT, ENCLOSURE COVER, LINKAGE, W/HDWR	1	19569
14	KIT, PLATFORM RELEASE SHAFT, F9TF-DE001, 002, DS001	2	20639
	KIT, PLATFORM RELEASE SHAFT, F9TF-DE004	2	20640
15	HARNESS, PUMP TO PULLBOX, 12FT, F9TF-DE001 & 002	1	18070
	HARNESS, PUMP TO PULLBOX, 23FT, F9TF-DS001	1	19993
16	HYDRAULIC HOSE ASSY, SYNIFLEX, 23', F9TF-DS001	1	F9-HH-23
	HYDRAULIC HOSE ASSY, SYNIFLEX, 12', F9TF-DE001 & 002	1	F9-HH-12
17	PLUG, RECTANGULAR, 1.0 X 1.5, NYLON, BLACK	4	25564
18	TIE BAR, PLATFORM RELEASE SHAFTS	1	19622
19	BRACKET, BRIDGEPLATE GUIDE, F9TF-DE001 & 002, DS001	1	19687
20	GEAR RACK	2	F9-0028
22	BRACKET, PLATFORM RELEASE SHAFT	4	19621
23	BUMPER, CARRIAGE STOP, F9TF-DE001, 002, 004	2	F9-0046
	BUMPER, CARRIAGE STOP, F9TF-DS001	2	F9-0563

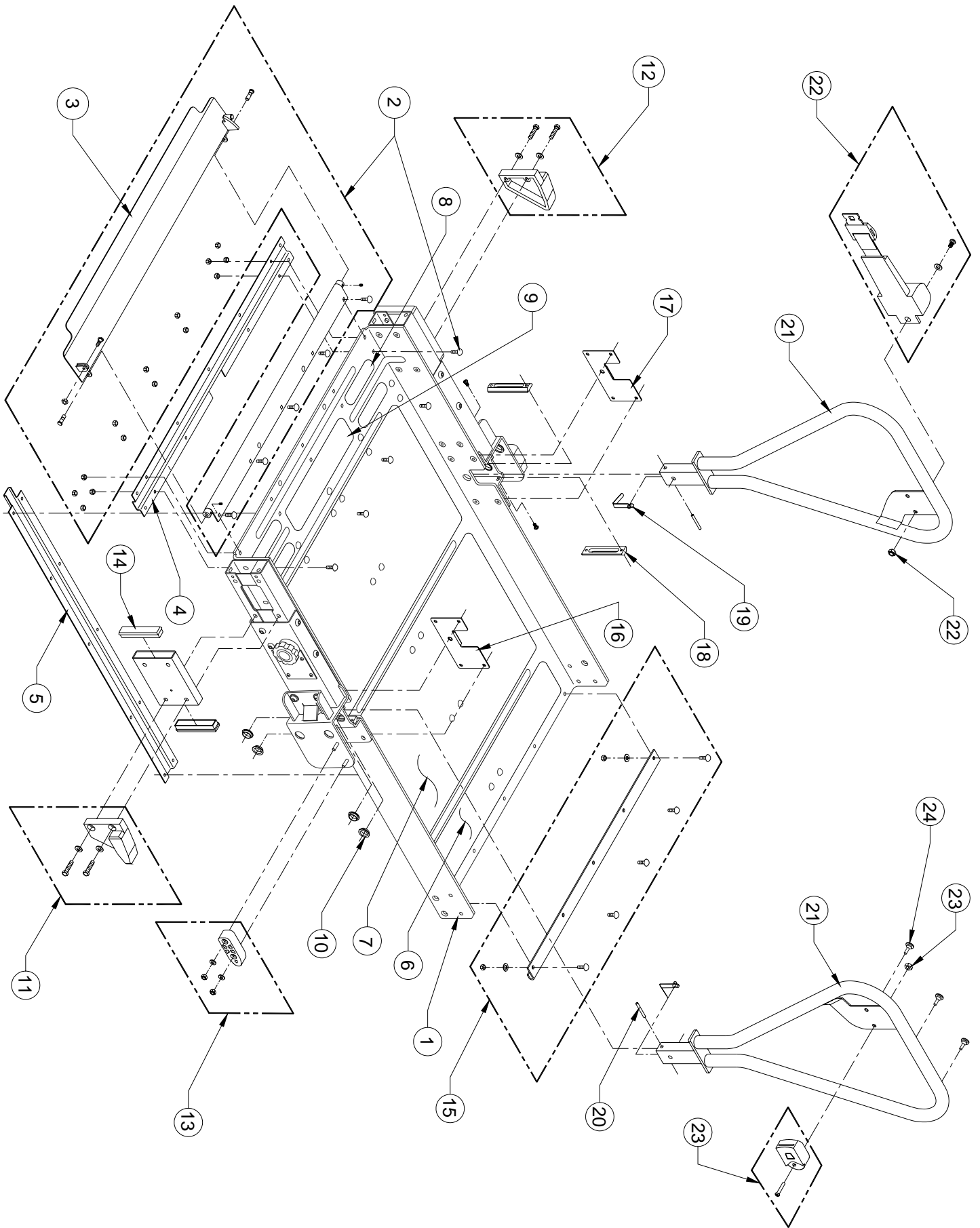


FIGURE 5-7: F9TF PLATFORM ASSEMBLY

FIGURE 5-7: F9TF PLATFORM ASSEMBLY

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	PLATFORM, BARE, 32.25 X 47.00	1	32962
2	KIT, ROLLSTOP ASSEMBLY	1	32168
3	ROLLSTOP, PAINTED	1	33091
4	STIFFENER & HARNESS CONDUIT, NOTCHED	1	33218
5	HARNESS CONDUIT, FRONT TO REAR	1	33217
6	SAFETREAD, 3.0 X 31.0, YELLOW	1	32987
7	SAFETREAD, 16.0 X 31.0, GRAY	1	32986
8	SAFETREAD, 12.75 X 3.0, YELLOW	1	25673
9	SAFETREAD, 5.5 X 1.5, YELLOW	4	25674
10	BEARING, FLANGED, ¾ ID X ¼ W, BAG OF 10	1	19576
11	KIT, PLATFORM GUIDE, FRONT, RH, W/HDWR	1	20624
12	KIT, PLATFORM GUIDE, FRONT, LH, W/HDWR	1	20608
13	KIT, PLATFORM GUIDE, REAR, W/HDWR	2	32176
14	CAP, RECTANGULAR, SNAP-IN	4	22519
15	KIT, STIFFENER, PLATFORM, REAR	1	20626
16	PLATE, PIN LOCK, RH	1	32947
17	PLATE, PIN LOCK, LH	1	32964
18	HANDRAIL GUIDE	4	32940
19	BUTTON, HANDRAIL LOCK	2	33143
20	PIN, HANDRAIL PIVOT	2	32952
21	HANDRAIL, LEFT OR RIGHT	2	32949
22	KIT, SAFETY BELT W/RETRACTOR	1	32178
23	KIT, SAFETY BELT BUCKLE ASSEMBLY	1	32177
24	BUMPER, RUBBER, BAG OF 10	1	32185

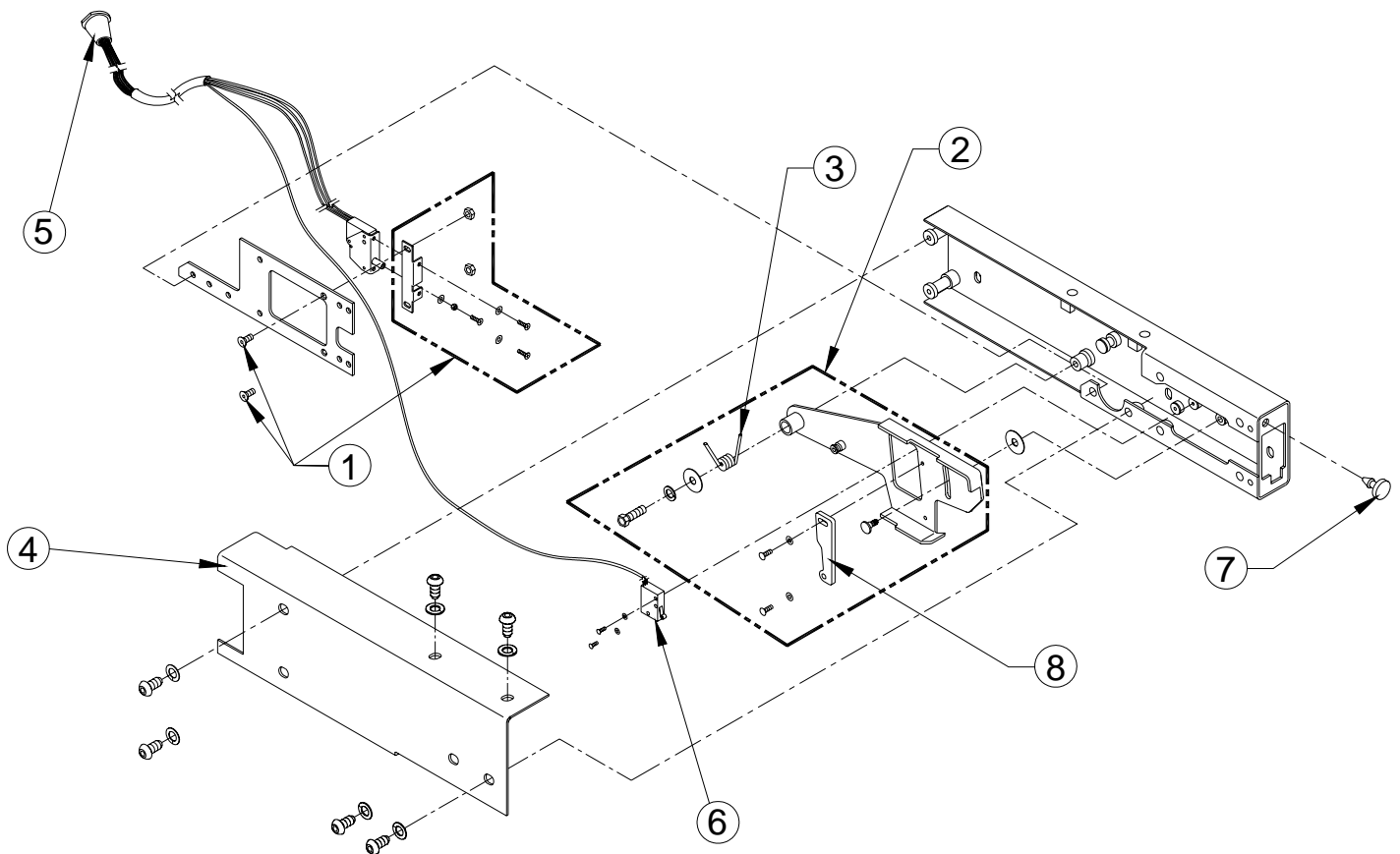


FIGURE 5-8: F9TF PLATFORM ASSEMBLY—LEFT SIDE DETAIL

FIGURE 5-8: F9TF PLATFORM ASSEMBLY — LEFT SIDE DETAIL

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	KIT, MOUNTING BRACKET, LIMIT SWITCH, W/HDWR	1	20605
2	KIT, ACTUATOR FOOT ASSY	1	20607
3	SPRING, ROLLSTOP ACTUATOR	1	UV-SP-002
4	COVER, ROLLSTOP, LH	1	32858
5	HARNESS, W/TWO ROLLSTOP SWITCHES	1	UV-ES-221
6	SWITCH, LIMIT, W/LEADS	1	264104
7	BUMPER, RUBBER, BAG OF 10	1	20653
8	PLATE, ACTUATOR, SWITCH	1	UV-PF-918

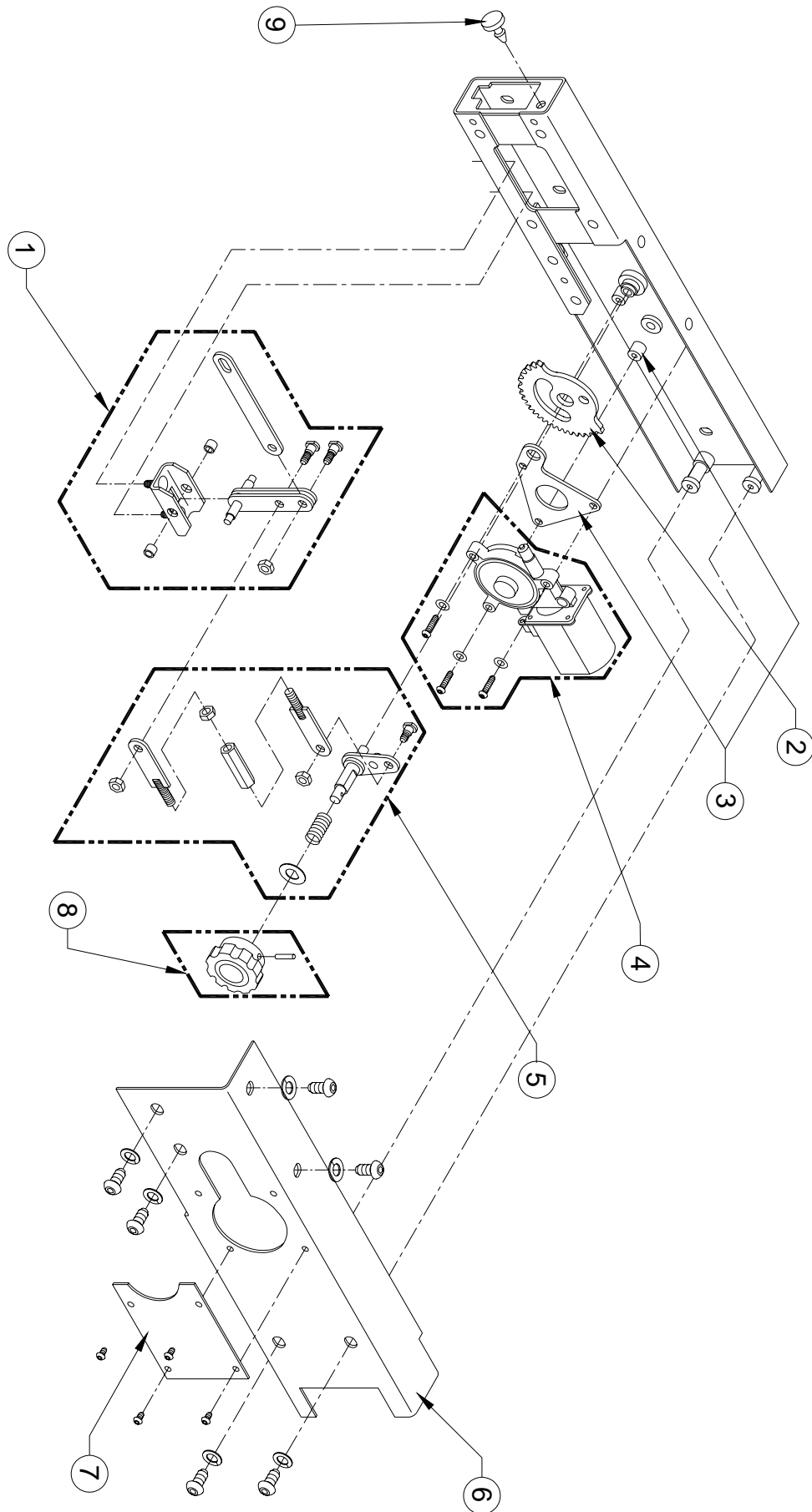


FIGURE 5-9: F9TF PLATFORM ASSEMBLY—RIGHT SIDE DETAIL

FIGURE 5-9: F9TF PLATFORM ASSEMBLY—RIGHT SIDE DETAIL

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	KIT, ROLLSTOP LINKAGE	1	20609
2	KIT, ROLLSTOP GEAR	1	20610
3	KIT, GEAR MOTOR MTG PLATE	1	20611
4	GEAR MOTOR, 24V, W/HDWR	1	20612
5	KIT, GEAR LINKAGE	1	20613
6	COVER, ROLLSTOP, RH	1	32857
7	COVER PLATE, MANUAL RELEASE	1	32866
8	KIT, ROLLSTOP KNOB	1	20616
9	BUMPER, RUBBER (BAG OF 10)	1	20653

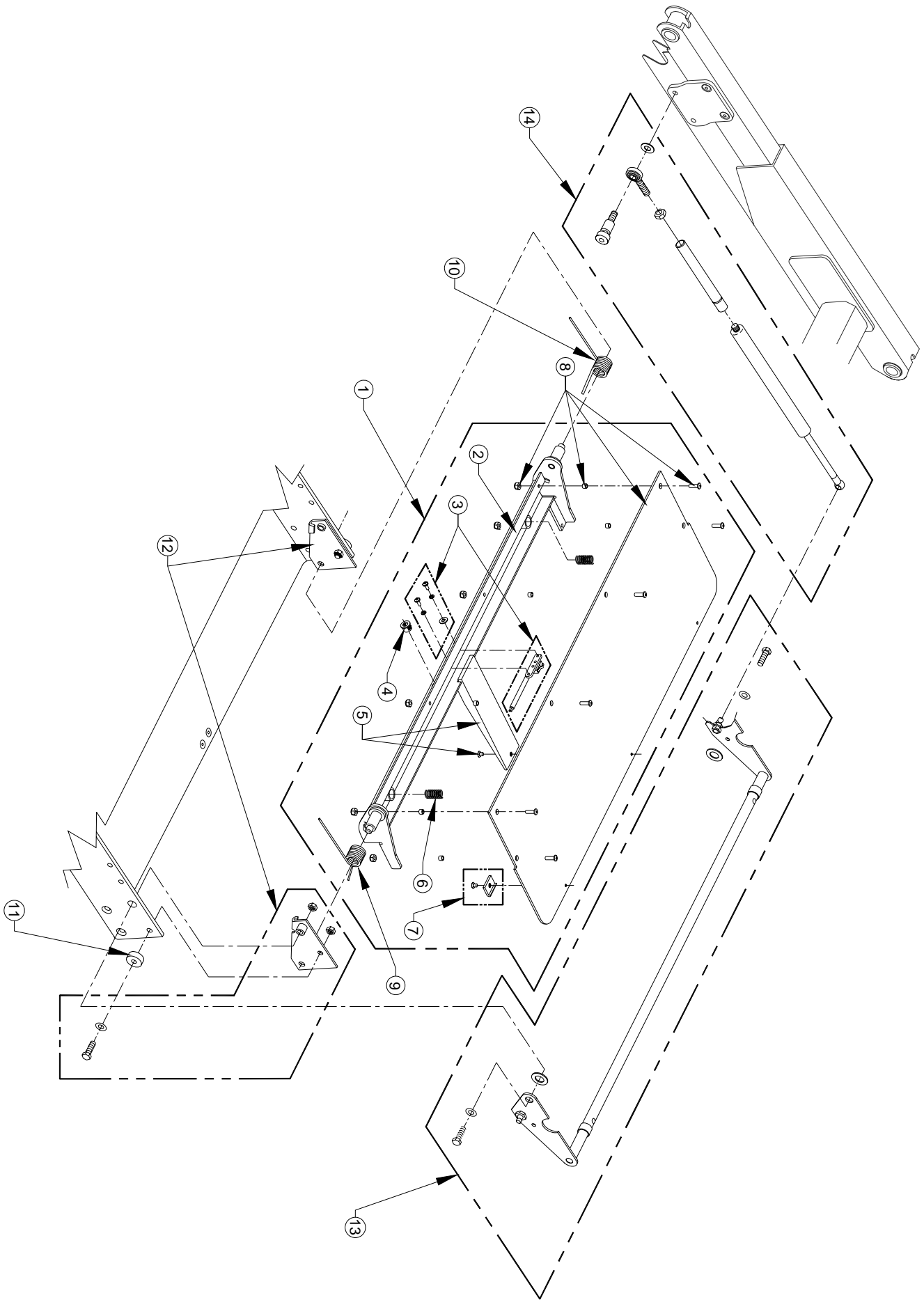


FIGURE 5-10: F9TF BRIDGEPLATE ASSEMBLY

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FIGURE 5-10: F9TF BRIDGEPLATE ASSEMBLY

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	BRIDGEPLATE ASSEMBLY	1	33230
2	FRAME, BRIDGEPLATE	1	33229
3	KIT, SWITCH ASSEMBLY, W/HDWR	1	32180
4	BUSHING, SNAP-IN, 1/2"	1	28-26-075
5	KIT, GUIDE, BRIDGEPLATE, W/SCREW	1	32181
6	SPRING, COMPRESSION, SST, .48OD X .75L	2	33214
7	KIT, SKID, BRIDGEPLATE, BAG OF 10	1	20643
8	KIT, PLATE, BRIDGEPLATE, W/6 SETS OF HDWR	1	32179
9	SPRING, BRIDGEPLATE RETURN, RH	1	UV-SP-011
10	SPRING, BRIDGEPLATE RETURN, LH	1	UV-SP-010
11	BUSHING, .75OD X .32ID, PLASTIC, BAG OF 10	1	20602
12	KIT, MOUNTING BRACKETS, LH AND RH	1	20665
13	KIT, STIRRUP ASSEMBLY	1	20651
14	KIT, ACTUATOR ROD ASSEMBLY, BRIDGEPLATE	2	32182
15	SCREW, FLAT HEAD PHILLIPS, 10-24 X 1/4, UNDERCUT, BAG OF 10	1	13302

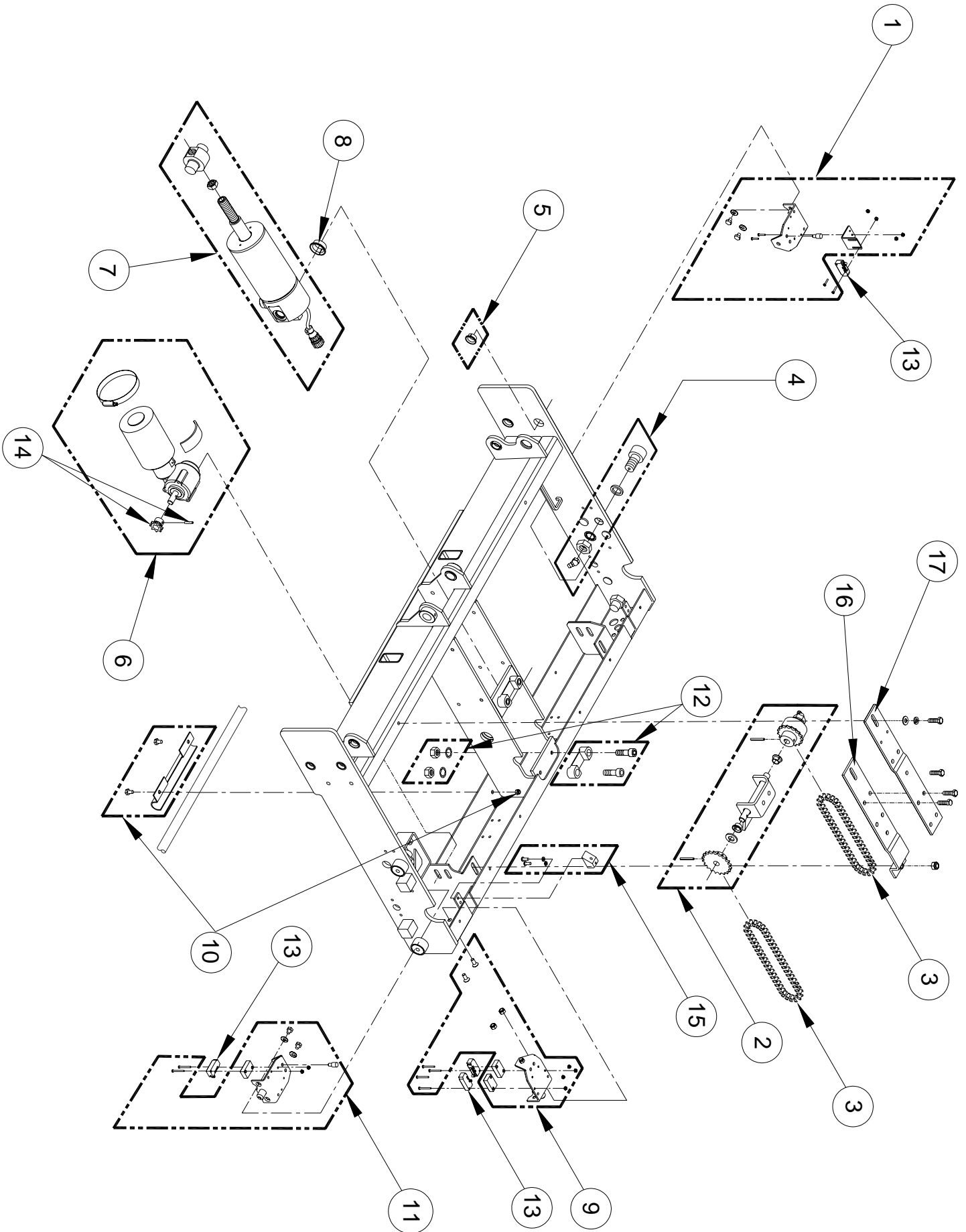


FIGURE 5-11: F9TF CARRIAGE ASSEMBLY—SHEET 1

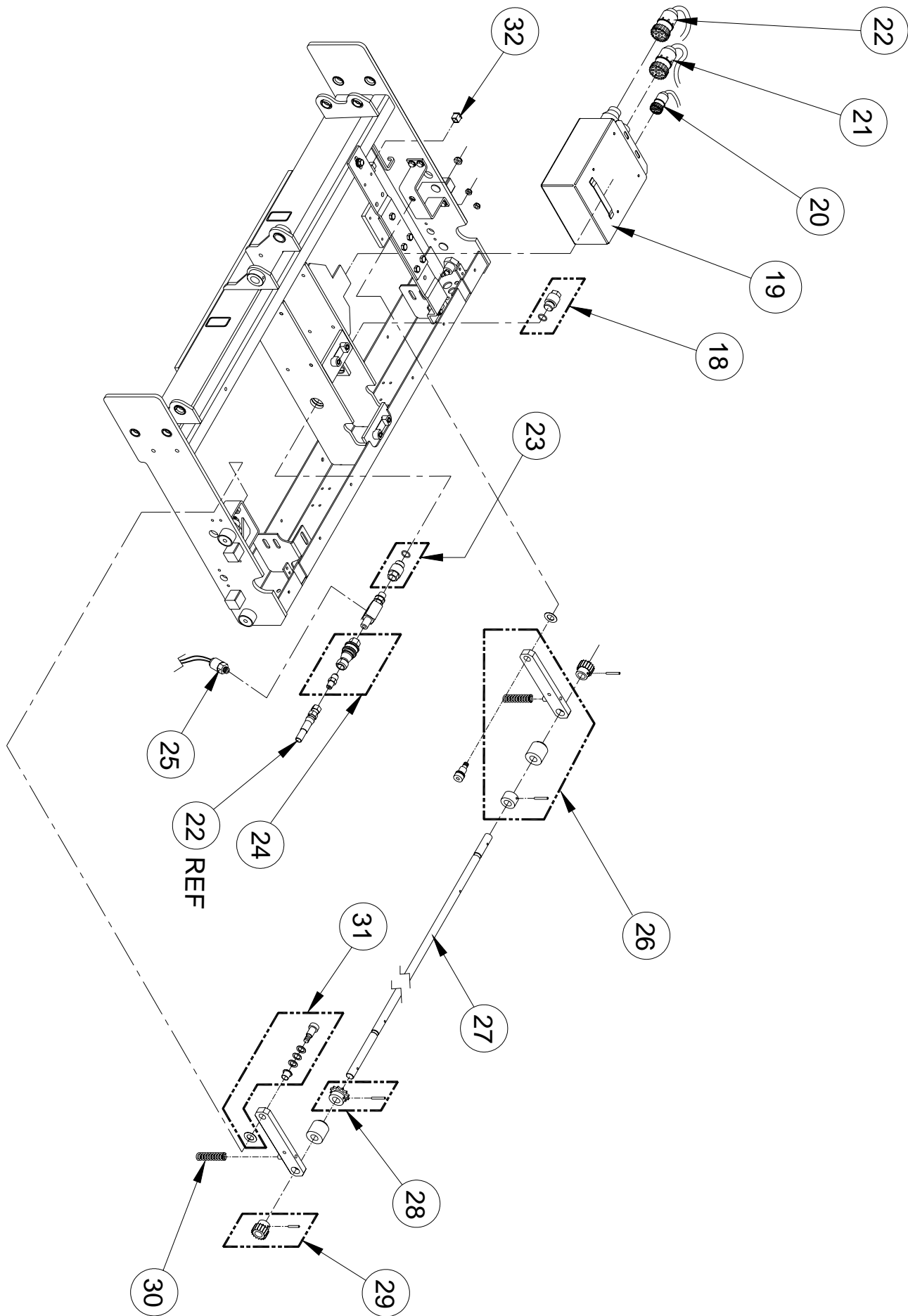


FIGURE 5-12: F9TF CARRIAGE ASSEMBLY—SHEET 2

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FIGURES 5-11 and 5-12: F9TF CARRIAGE ASSEMBLY

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	KIT, PLATFORM RELEASE SWITCH BRACKET	1	19572
2	KIT, INTERMEDIATE SHAFT ASSY	1	19573
3	DRIVE CHAIN	2	19574
4	KIT, CARRIAGE ROLLER, 1 ¼ OD, W/GREASE FITTING	4	22029
5	FLANGED BEARING, ¾ ID, BAG OF 10	1	19576
6	KIT, GEAR MOTOR ASSY, 24V	1	19577
7	HYDRAULIC CYLINDER ASSEMBLY, W/TRUNNION & JAM NUT	1	20178
8	FLANGED BEARING, 1" ID, BAG OF 10	1	19579
9	KIT, STOW SWITCH BRACKET	1	19580
10	KIT, HARNESS CLAMP	1	19581
11	KIT, DEPLOY SWITCH BRACKET	1	19582
12	KIT, GUIDE BLOCKS, CARRIAGE	1	22517
13	SWITCH, LIMIT, W/LEADS	4	264104
14	KIT, SPROCKET, 8T	1	20656
15	KIT, MANUAL RELEASE RESET RAMP	2	20664
16	BRACKET, IDLER SHAFT, REAR	1	F9-0123
17	BRACKET, IDLER SHAFT, FRONT	1	F9-0139
18	KIT, PIVOT CAP, HYDRAULIC CYLINDER	1	20658
19	ELECTRONIC CONTROLLER, 24V, DE001	1	32718
	ELECTRONIC CONTROLLER, 24V, DE002, DE004	1	32720
	ELECTRONIC CONTROLLER, 24V, DS001	1	32721
20	HARNESS, ELECTRICAL, HYDRAULIC CYLINDER	1	17858
21	HARNESS, ELECTRICAL, CARRIAGE	1	32729
22	HARNESS, ELECTRICAL, MAIN, W/HYDRAULIC LINE	1	32730
23	KIT, PIVOT FITTING, HYDRAULIC CYLINDER	1	32183
24	KIT, QUICK DISCONNECT FITTING	1	19587
25	KIT, PRESSURE SWITCH, W/ELECTRICAL TERMINALS	1	19982
26	KIT, DRIVESHAFT LINK ASSY	2	19593
27	DRIVESHAFT, FINAL	1	19594
28	KIT, SPROCKET, 12T	1	19595
29	KIT, PINION GEAR, 18T	2	19592
30	SPRING, COMPRESSION, .609OD X 2.53L	2	20123
31	KIT, BUSHING ASSY, DRIVESHAFT LINK	2	19584
32	DUST CAP, CONTROLLER PROGRAMMING CONNECTOR	1	25955

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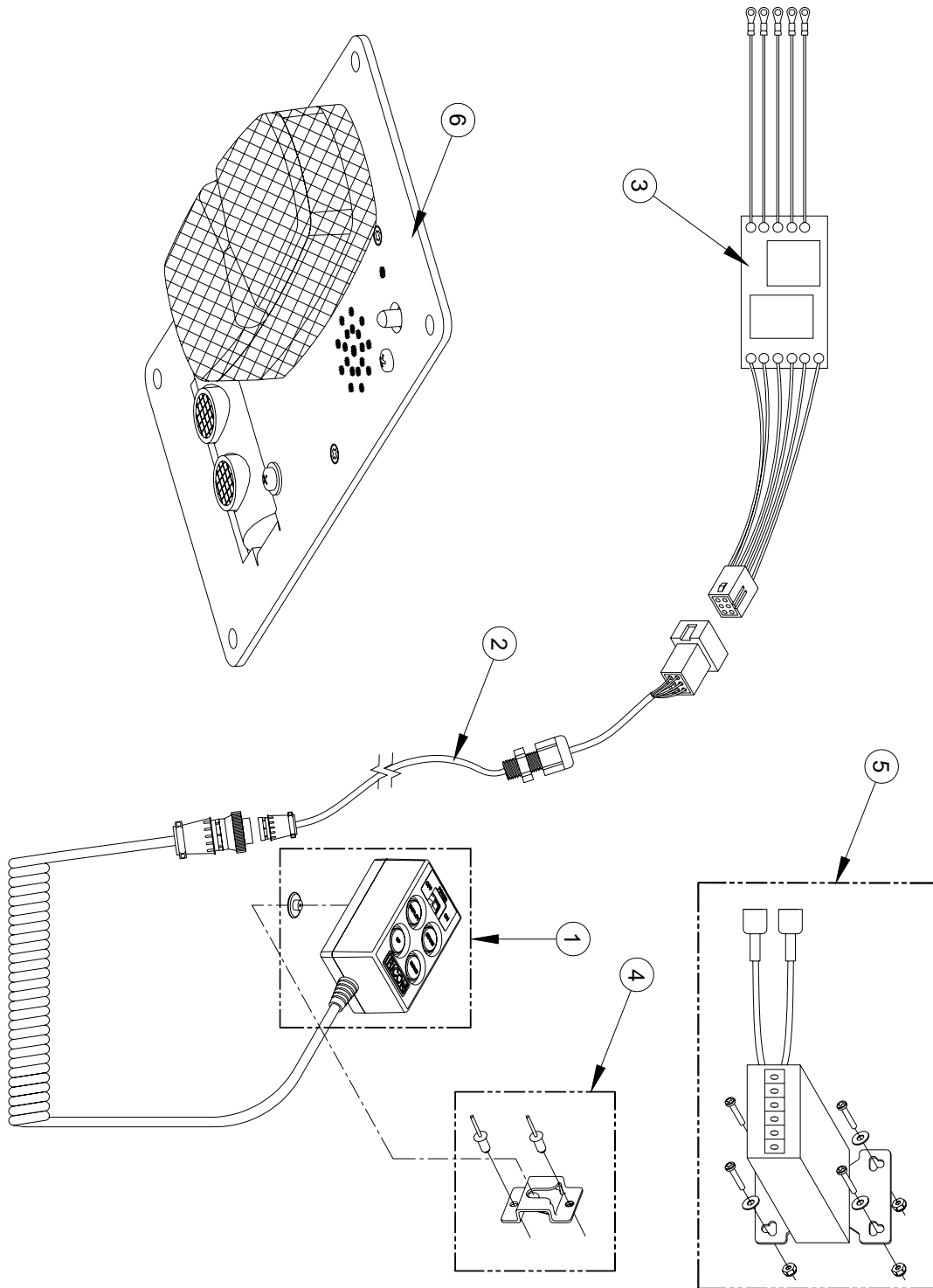


FIGURE 5-13: F9TF PENDANT, COUNTER, & TWS MODULE

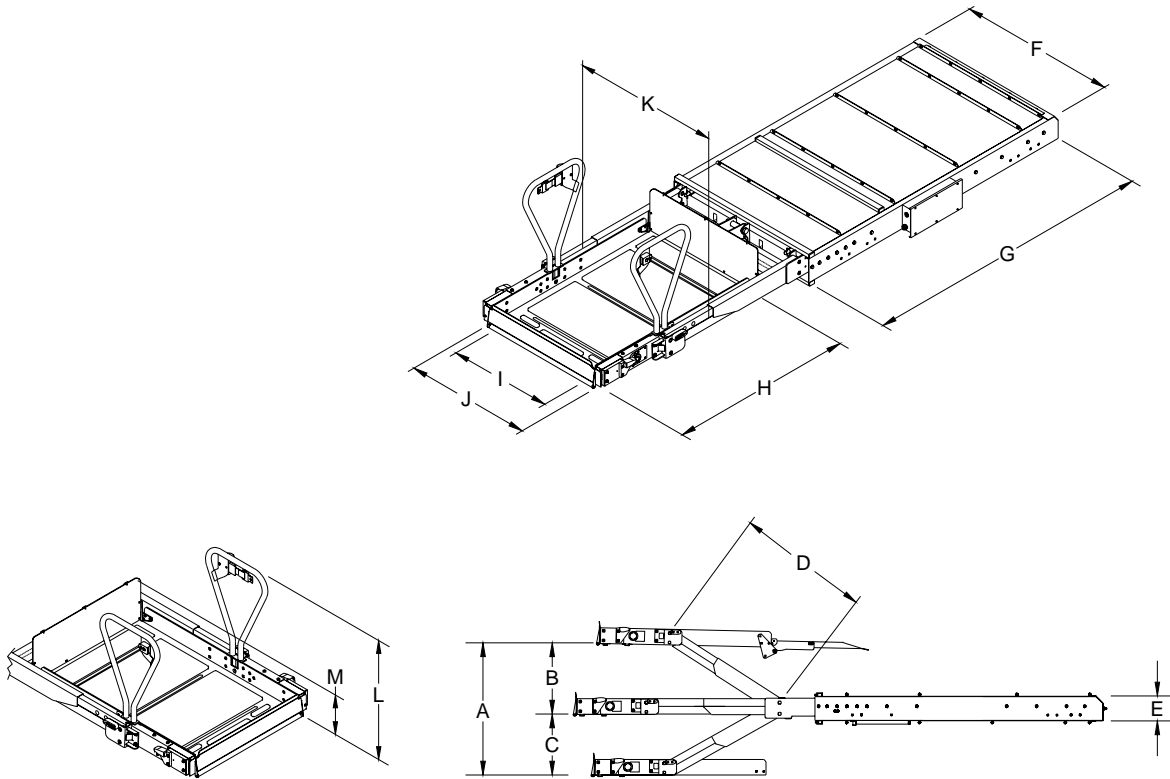
FIGURE 5-13: F9TF PENDANT, COUNTER, & TWS MODULE

REF	ITEM DESCRIPTION	QTY/ASSY	PART NO
1	PENDANT, W/COILED CORD	1	33097
2	HARNESS, PENDANT EXTENSION, PULLBOX TO PENDANT, W/CLIP	1	32713
3	HARNESS, TWS INTERFACE, W/PCB	1	32714
4	KIT, STORAGE BRACKET	1	32713
5	CYCLE COUNTER, W/HDWR	1	01276
6	THRESHOLD WARNING SYSTEM	1	32885

APPENDIX 1

MIRAGE F9TF PUBLIC USE LIFT SPECIFICATIONS

Power.....electro-hydraulic (power-up/gravity-down)	Hydraulic cylinder Ø3.0", single acting
Operating voltage range: 24 VDC 21—27 volts	Rated load capacity660 lbs
Pump rating: @ 24 VDC 1800 psi, 1250 watts	Manual backup - up hand pump
	Manual backup - down pressure release valve
	Lift weightapprox. 700 lbs



DIMENSIONS – inches

	A	B	C	D	E	F	G
Model	Floor to ground travel	Travel above	Travel below	Arm length	Enclosure height	Enclosure width	Enclosure length
F9TF-DE/DS	65.0	17.5	21.8	43.0	9.0	42.0	81.0
	H	I	J	K	L	M	
Model	Usable platform length	Usable platform width	Clear entry width	Width traveling frame	Handrail height	Bridgeplate height	
F9TF-DE/DS	48.0	32.0	30/35.5	41.4	32.0	10.5	

