

# **QUIC-LIFT™ HORIZONTAL LADDER ACCESS SYSTEM**

## **MODEL HLAS**

### **PARTS AND INSTRUCTION MANUAL**

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## **I. SYSTEMS AVAILABLE**

Systems for ladders are made to order according to the ladders to be carried. In order to provide the System you require, we need to know the manufacturer, model number and length of ladders to be carried. The following models are available according to the nested depth of the ladder combinations:

- HLAS-975            Complete for 9-3/4" ladder combo
- HLAS-1200        Complete for 12" ladder combo

Systems for portable water tanks are designed for tanks up to 30" high. Specify the following model number:

- HPTS

**NOTE: The following restrictions apply to both Systems**

- **Systems are designed for ladders not exceeding 35' in length.**
- **Systems are not designed for ladders with bangers or poles.**
- **Maximum weight of ladders and other equipment carried on the ladder rack is not to exceed 300 pounds.**

The Systems are designed to operate in the following manner:

A. The power switch on the ladder control panel should be turned to the "on" position. The green light will come on indicating power to the System. Press and hold down, on the "down" switch, to lower the System. The latch (9) will open freeing the booms to be lowered. The latch is controlled by an electric actuator (11). Press down on the control switch until the ladders are in the full down position, parallel to the vehicle. The electrical actuator will close the latch at the end of the cycle.

B. To raise the unit, push "up" on the control switch and the booms will be raised. At the end of the cycle the latch will snap into place locking the booms in the closed position.

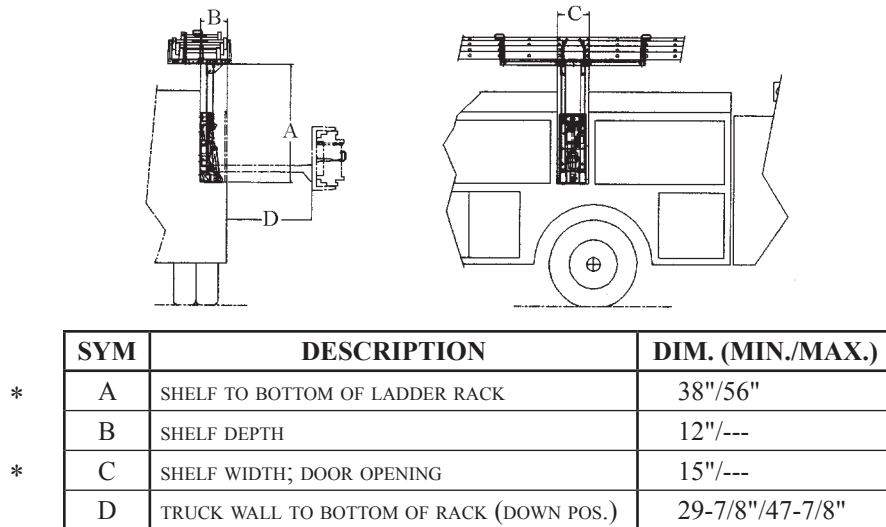
C. The power switch should be turned to the "off" position (to conserve electrical power) when the ladders are not required.

**NOTE: For all part numbers in parenthesis, refer to Figure 17, page 25 through Figure 20, page 28 and Listing Chart 1, page 24.**

## II. INSTALLING THE LADDER ACCESS SYSTEM

### A. Preparation for Mounting

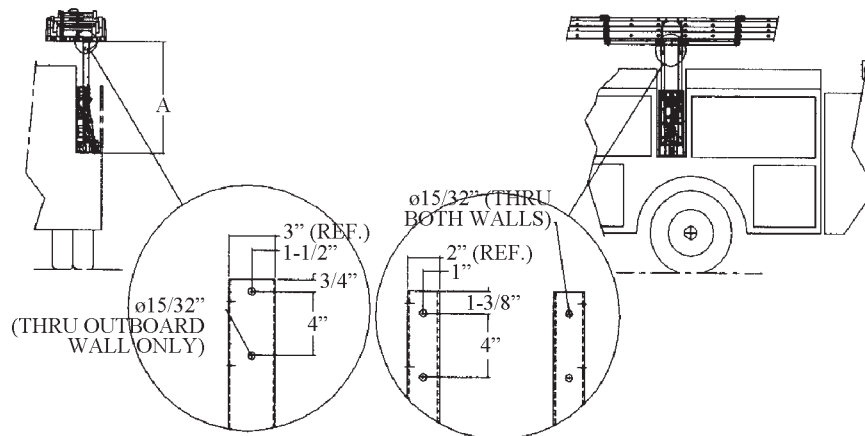
The System has been tested at the factory prior to shipping. No additional adjustments should be required. However, the overall height of the unit, including the booms, is 56". The booms may need to be cut down in length for your application. A can of touch-up paint is available for this purpose. See drawings below to determine the required dimensions.



\*CUSTOMER TO CUT BOOM TO LENGTH REQUIRED TO OBTAIN PROPER TRUCK CLEARANCE.

**FIGURE 1  
REQUIRED DIMENSIONS  
HLAS SYSTEM**

Holes will need to be drilled in both booms to attach the boom extension weldments (left and right). See Figure 2.



BOOM TOTAL LENGTH = DIM "A" - 4/18"  
 DIM "A" = TRUCK SHELF TO BOTTOM OF RACK  
 (FORMULA FOR REFERENCE USE ONLY)

**FIGURE 2  
HOLE LOCATIONS  
TOP OF BOOMS**

### **A. Preparation for Mounting (continued)**

Plan and lay out the entire installation before making any cuts or drilling holes in the body of the fire apparatus. This will keep "out of service" time to a minimum and also help to minimize mistakes.

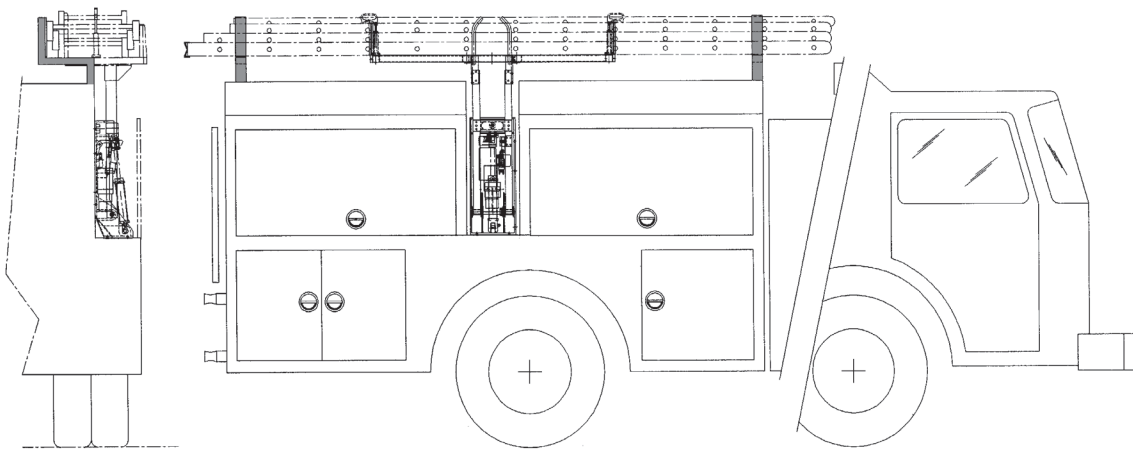
Position the unit on the shelf of the apparatus and clamp it in place so that you can determine where the holes will be required for the mounting bolts. Also check to be sure there is an integral component of the body structure to attach the mounting bolts through. If there is no main frame member, you may have to add a 1/2" thick aluminum mounting plate and attach it to a main frame member. Place the ladders on top of the ladder rack.

When the ladder is raised and lowered in this position, it should clear protruding objects on the apparatus, such as emergency light, hand rails, etc. Make sure that when the ladders are in the up position they do not obstruct cross lays on hose reels.

In the event that the booms come into contact with the stiffening rib at the top of the vertical hose bed wall, you may have to notch out the stiffening rib to recess the HLAS System. If the stiffening rib must be notched, the exposed metal surfaces should be painted and covered with an edge guard material. In addition, if the stiffening rib is notched, you may wish to add a backing plate on the inside surface of the hose bed wall. The plate will reinforce the hose bed wall and provide a good mounting support for the vertical mounting holes, if used. The edges of the mounting plate should be rounded off on the side next to the hose, and flat head bolts should be used to mount the plate.

Bolts 3/8", or larger, should be used to mount the base castings to the fire apparatus. When the unit will only be mounted to the hose bed wall or only to the shelf deck, 1/2" bolts should be used with substantial backing plates or attached to an integral component of the body structure.

A ladder stop must be provided which will prevent the ladders from swaying when in the stored position. The stop may be fabricated using the top of the body panel as a starting point. The actual "stop" will be up to the body manufacturer to fabricate unless the optional Zico HLAS Stop, HLAS-OS, is ordered with your unit (optional stop shown in upper left of Figure 20).



**FIGURE 3  
LADDER STOP**

#### **A. Preparation for Mounting (continued)**

A mechanism for opening the door panel in front of the unit must also be fabricated by the apparatus manufacturer. The actual mechanism will depend on whether the door opens down or to the side. Contact the factory for suggestions.

#### **B. Electrical System**

Now that you are sure of your mounting position, and the boom has been cut to the proper length, you may begin to lay out the electrical wiring (see Figure 4, page 6 and Figure 5, page 7). At this time it is a good idea to remove the unit from the apparatus shelf and clamp it to a work bench so that the booms can swing out away from the bench when lowered. Unit should be mounted the same distance back from the edge of the table as it would be on the shelf of your apparatus. Be sure the table is secured by adding a counterweight to the other side before lowering the unit. Determine where the wires can be run so they will not be visible from the outside of the apparatus. We recommend all electrical connections be soldered as this method is superior to crimp connections. We further recommend that a terminal block or quick disconnect be attached to the base casting. Wires from the hydraulic power unit (7), latch actuator (11) and limit switch (89) should go into the terminal block. This would facilitate service to these items if required. Measure the required run lengths of the wires. (See Figure 4, page 6 and Figure 5, page 7 for proper wire diameter.)

Make up a wiring harness using wires longer than the required run lengths. Temporarily make all wire connections so you can test the system. With the table properly secured, you should be able to operate the unit with the ladders in place. Be sure the ladders will clear the edge of the table before drilling any holes in the apparatus.

The flashing light kit (model HLAS-FLK) must be installed. The wiring diagram and parts lists for the flashing lights may be found on pages 8 and 9, Figures 6 and 7.

#### MODE OF OPERATION

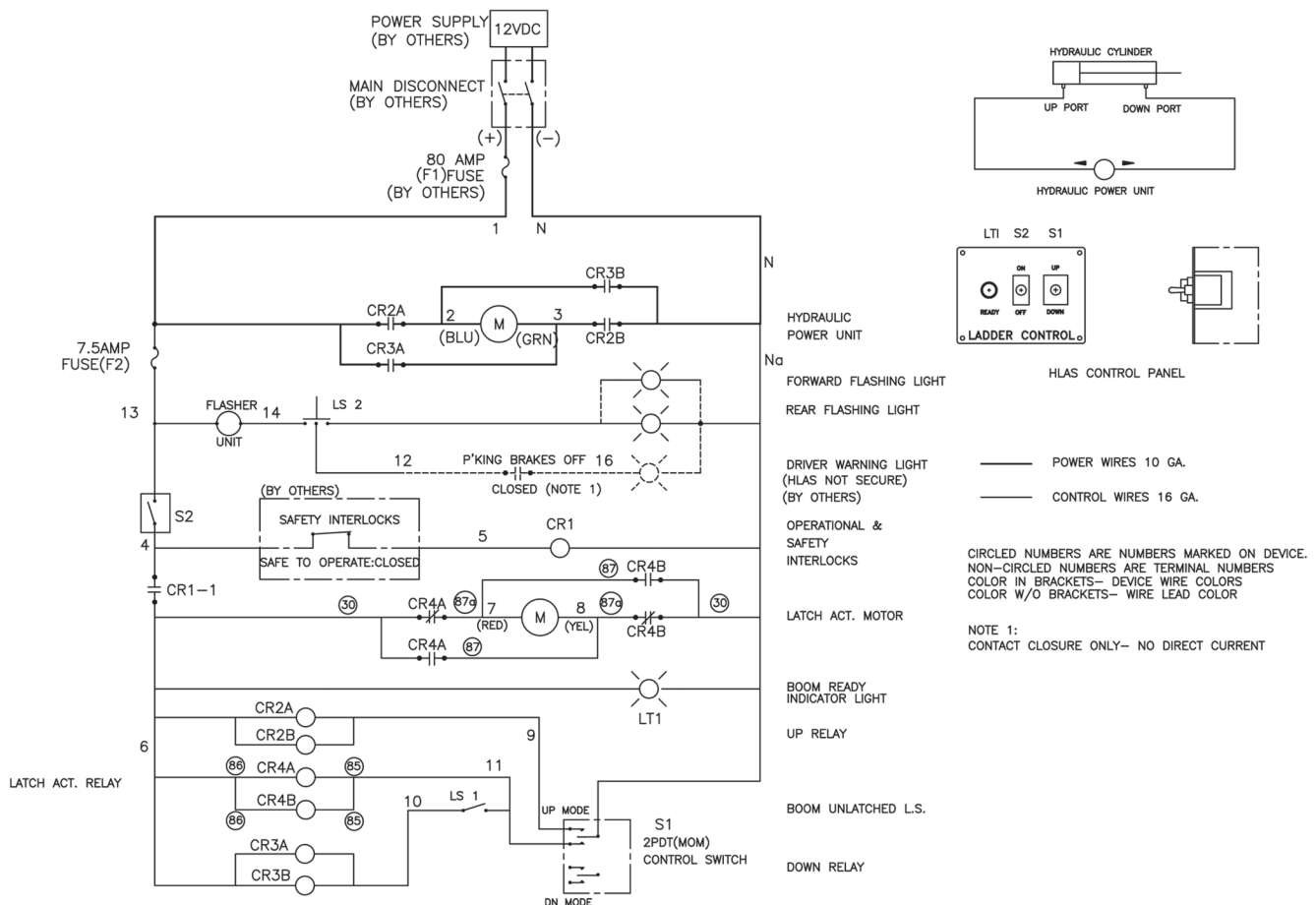
- \* TURN POWER ON TO HLAS CONTROL CIRCUIT- (S2).
- \* CLOSE ALL INTERLOCKED DOORS .  
(LADDER DEVICE WILL NOT OPERATE/STOP ANYTIME AN INTERLOCK IS BROKEN.)

#### DOWN MODE:

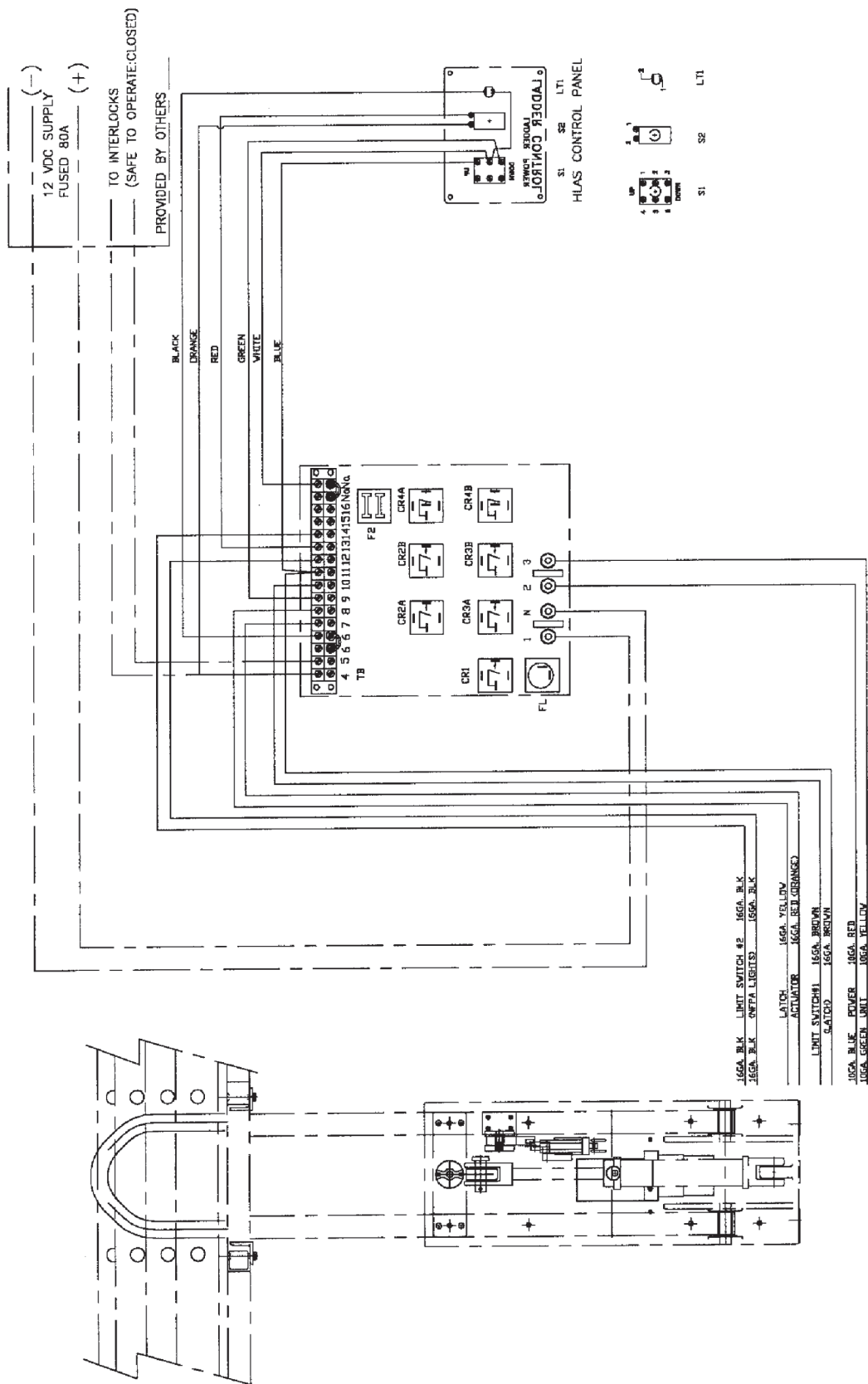
- \* ACTUATE SWITCH AND HOLD IN THE DOWN POSITION-(S1).
- (THIS WILL CAUSE LATCH ACTUATOR TO UNLOCK BOOM.)
- \* WHEN UNLATCH IS COMPLETE BOOM WILL PROCEED TO GO DOWN.
- \* AT END OF STROKE RELEASE SWITCH.(LATCH ACTUATOR WILL RETURN TO THE LATCHED POSITION).

#### UP MODE:

- \* ACTUATE SWITCH AND HOLD IN THE UP POSITION (S1).
- BOOM WILL START TO MOVE UP.
- AT FULL UP POSITION THE SPRING LOADED LATCH WILL LOCK THE BOOM IN PLACE.
- \* AT END OF STROKE RELEASE SWITCH.
- \* VISUALLY ENSURE THAT LATCH IS SECURELY IN PLACE BEFORE TURNING OFF SWITCH S2.

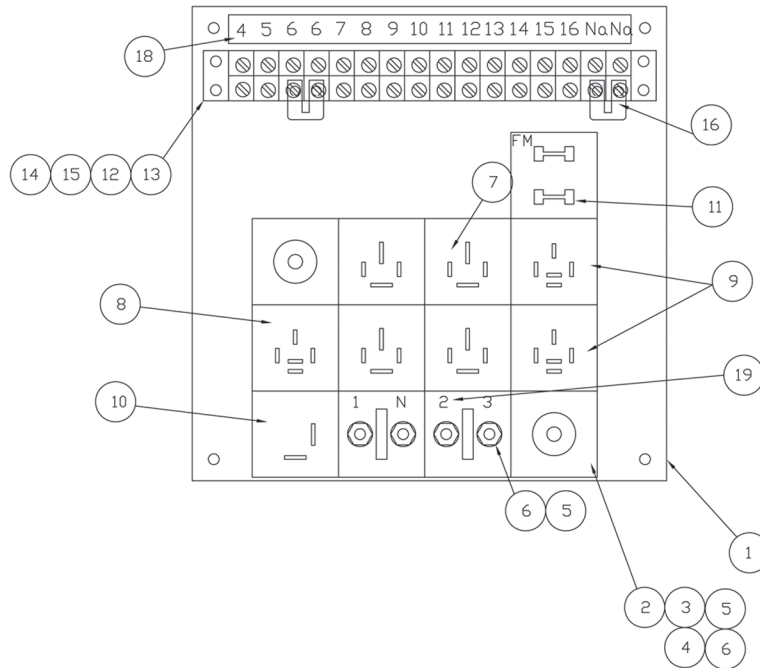


**FIGURE 4**  
**WIRING DIAGRAM**  
**ELECTRIC/HYDRAULIC SYSTEM**



**FIGURE 5**  
**FIELD WIRING DIAGRAM**  
**ELECTRIC/HYDRAULIC SYSTEM**

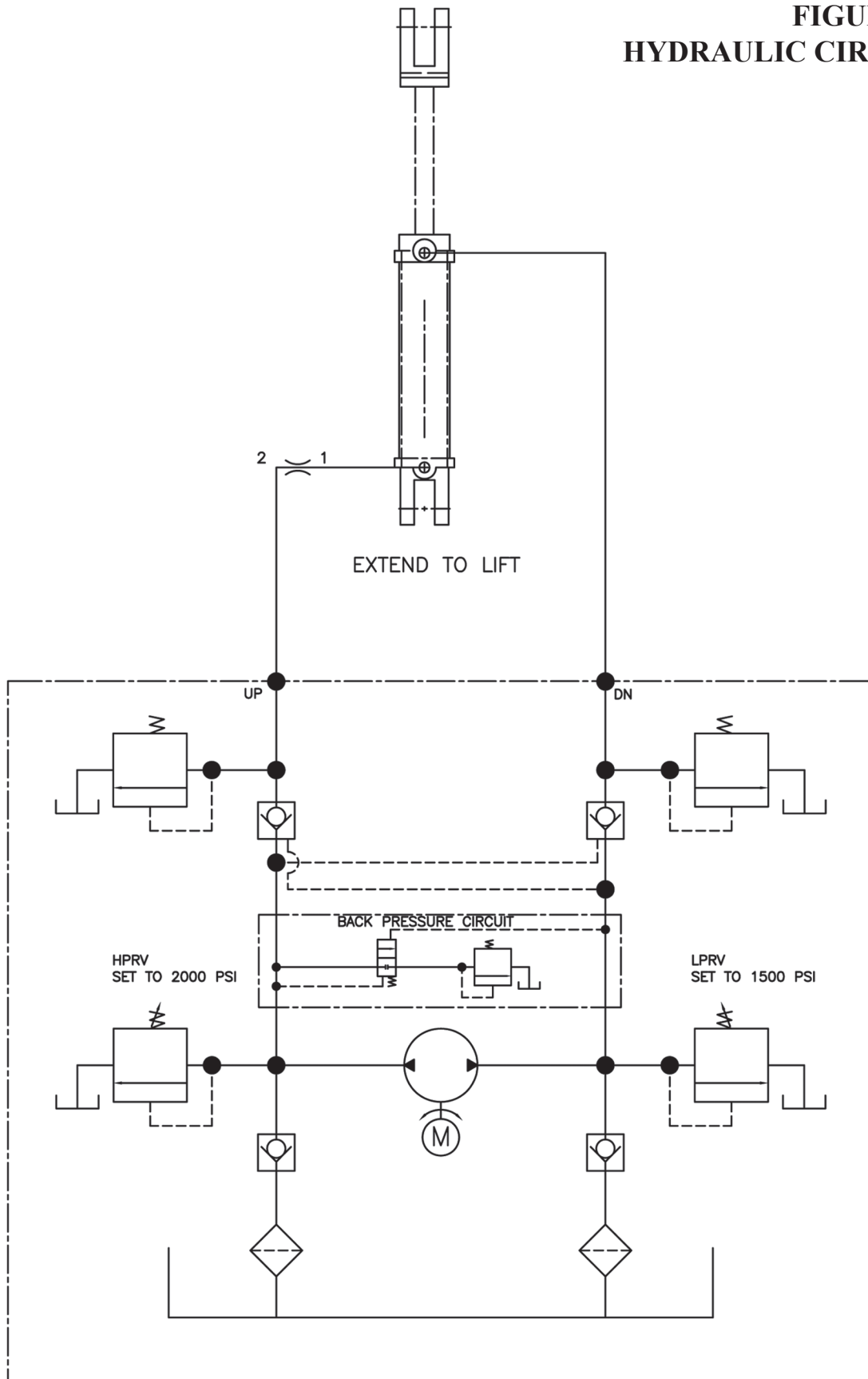
PART NUMBER	DESCRIPTION	SOURCE	QTY.
3097-500-150	Sub-Panel, 8-1/4 x 8-1/4		1
3097-500-151	Power Relay CR2A, CR2B, CR3A, CR3B	Pokorny # R2624	4
3097-500-155	Door Interlock Relay CR1	Pokorny # R2629	1
3094-005-156	Control Relay CR4A, CR4B	Pokorny # R2622	2
3097-270-109	Flasher	552/536LL	1
3097-500-181	Term. Block, 16 POS, Cinch 141 Series	Newark # 28F881	1

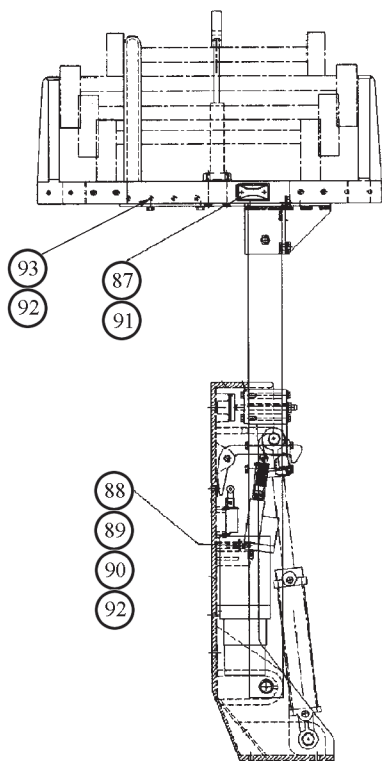


ITEM	PART NUMBER	DESCRIPTION	QTY.
1	3097-500-150	SUB-PANEL; 8 1/4 x 8 1/4	1
2		DIL-BLOX MODULE	1
3		STANDOFF #74096	2
4		SCREW, 10-32 x 1 1/2 PH	2
5		LOCKWASHER #10	10
6		HEX NUT, 10-32	10
7	3097-500-151	POWER RELAY CR2A, CR2B, CR3A, CR3B	4
8	3097-500-155	DOOR INTERLOCK RELAY CR1	1
9		CONTROL RELAY CR4A, CR4B	2
10	3097-270-109	FLASHER	1
11		FUSE 7.5A	1
12		LOCKWASHER #6	4
13		HEX NUT, 6-32	4
14	3097-500-181	TERM. BLOCK; 16 POS. CINCH 141 SERIES	1
15		SCREW; 6-32 x 5/8 RD. HD.	4
16		TERM. JUMPER CINCH TYP 141J	2
17		WIRING SET	1
18		TERMINAL LABEL	1
19		TERMINAL MARKING	1

**FIGURE 6**  
**ELECTRICAL PANEL DIAGRAM**  
**ELECTRIC/HYDRAULIC SYSTEM**

**FIGURE 7**  
**HYDRAULIC CIRCUIT DIAGRAM**

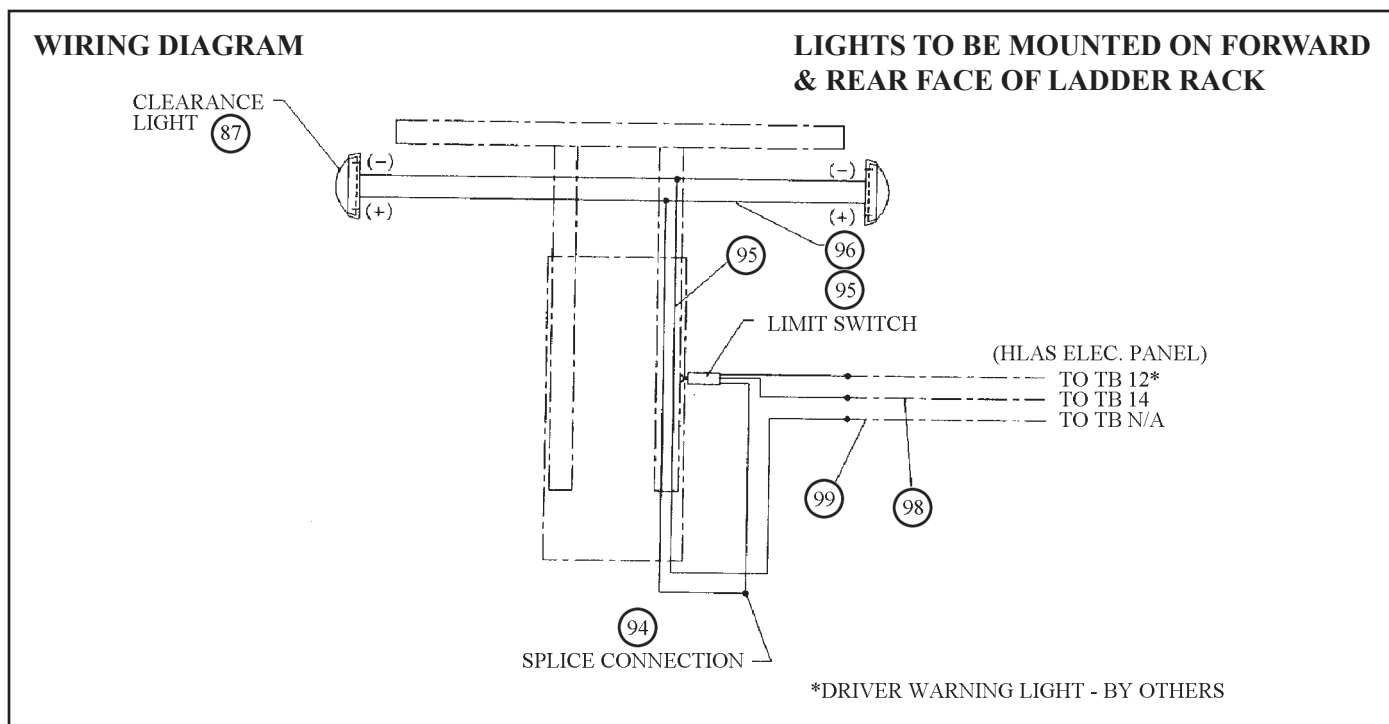




NFPA 1901-96 Standard requires flashing lights be provided, facing front and rear of apparatus. Lights must continue to flash while the device is out of the stored position. Beginning January 1, 1997, all systems are provided with flashing lights. The audio/visual alarm will continue to be offered as an option (see Section 8000 for the audio/visual alarm). Drilled and tapped holes have been provided on QUIC-LIFT Systems shipped after January 1, 1997 to mount the light kits.

ITEM NO.	PART NO.	DESCRIPTION	QTY.
87	3097-270-101	Clearance Light	2
88	3097-270-106	Plate, Limit Switch*	1
89	3097-270-105	Switch, Limit	1
90	3097-270-117	Harness, Limit switch	1
91	9025-191108	Screw, 4-40 x 1/2" Rd. Hd. Phil.	4
92	9025-191308	Screw, 6-32 x 5/16" Rd. Hd. Phil.	4
93	3097-270-111	Cable Tie 6"	2
94	3097-270-113	In Line Splice	7
95	3097-510-110	16-2 Jacketed 2 Cond. Cable	1-6'
96	3097-270-115	Snap Plug Connection*	4
97	3097-500-172	Straight conn., Plastic, 1/2 NPT*	1
98	8005-000-125	16 Ga. Lead Wire-Black	7.5'
99	8005-000-130	16 Ga. Lead Wire-White	7.5'

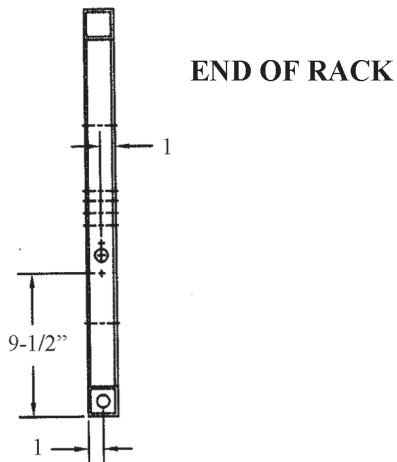
\*Installed on unit



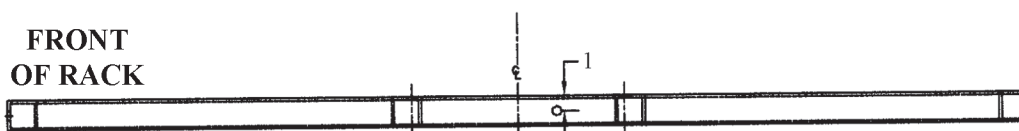
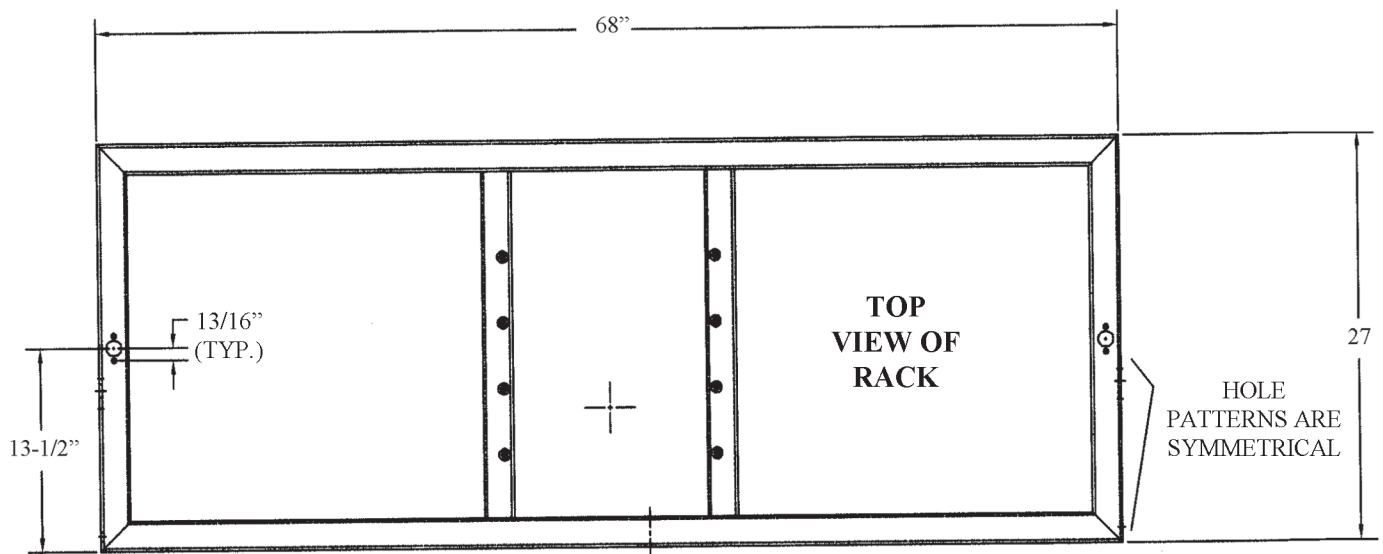
**FIGURE 6**  
**PARTS & WIRING DIAGRAM**  
**FLASHING LIGHT KIT**

## **WIRING SYSTEM:**

1. Lights are to be mounted on forward and rear face of ladder rack.
2. Two six-foot lengths of wire (95) are provided and installed, one for each light. Wires run on the inside of the rack.
3. One six-foot length of wire (95) provided to run from the switch (89) to the light wires (95). This wire should run-up through the right boom.
4. Snap plug connections (96) will be attached to each wire, ready to plug into lights prior to mounting.



**FIGURE 7  
WIRING SYSTEM  
FLASHING LIGHT KIT**



### **C. Mounting Suggestions**

A "WARNING" label (part number 3097-000-110) is supplied with each QUIC-LIFT System. The pressure sensitive or metal label must be mounted in close proximity to the ladder control panel. All apparatus operators must be instructed to keep the area in front of the ladders clear of personnel when the System is being raised or lowered.

Before starting the installation you should make sure you have all necessary tools and materials. This should include matching touch-up paint, edge trim (for cut outs), fender protector cloths and removable tape (to protect paint), necessary hardware, wire connectors, cable ties, burr remover, vacuum cleaner (for metal filings), loom (for wiring), drills, drill gun, wrenches, step ladders, etc. Be sure to allow yourself sufficient time to make a proper installation. You will probably have to remove the hose from the hose bed.

**NOTE: The hydraulic pump is designed for use in the normal operating temperature range of -20 to +160 degrees Fahrenheit. Please review your application with the factory for uses below -20 degrees.**

Following these simple instructions should make your installation easy and professional.

## **III. GENERAL INSTALLATION INFORMATION**

The Ladder Access System was designed for ladders meeting the current NFPA 1931 standard. Systems accommodate most ladder combinations (see Section 1, under "NOTE" for exceptions).

### **A. Mounting Points**

The HLAS unit should be positioned so that an equal number of rungs of the ladder extend on either side of the ladder rack. Mounting holes have been provided on both the vertical and horizontal mounting surfaces of the base casting. Although the device may be securely mounted from the horizontal surface only, it is a great advantage to be able to use mounting bolts on the vertical surface as well. The unit should be attached to an integral structural member of the vehicle. If this is not possible, then a one-half inch thick aluminum backing plate should be used. For mounting, 3/8" bolts should be used.

### **B. Electrical Control Panel**

The electrical control panel should be mounted in a water-proof compartment. Dimensions are provided for locating the mounting holes (see Figure 8, page 11).

Several "Lock Out" circuits may be considered to prevent accidents from occurring. An ideal "Lock Out" system would only permit operation when the ignition switch is on, the transmission is in park, and any obstructing compartment doors are shut. Because of the higher amperage required to operate the System, a separate "Lock Out" circuit should be used. The "Lock Out" circuit should be separated from the QUIC-LIFT System circuit by a relay. This will prevent damage to the existing wiring system. The QUIC-LIFT System circuit should be protected by an 80 amp fuse (see Figure 4, page 6).

### C. Ladder Control Panel

The ladder control panel should be mounted in such a position that the operator has full view of the QUIC-LIFT System and personnel that might come in contact with it (see Figure 9, page 12).

We have extensively tested our QUIC-LIFT System and have found the normal life to be in excess of 6,000 cycles without failure. With reasonable care and maintenance, your System should give you many years of excellent service.

**NOTE: Do not permit personnel to hang, sit or stand on the rack or ladders while they are stored on the QUIC-LIFT System. Permanent damage may result.**

## IV. STANDARD EQUIPMENT

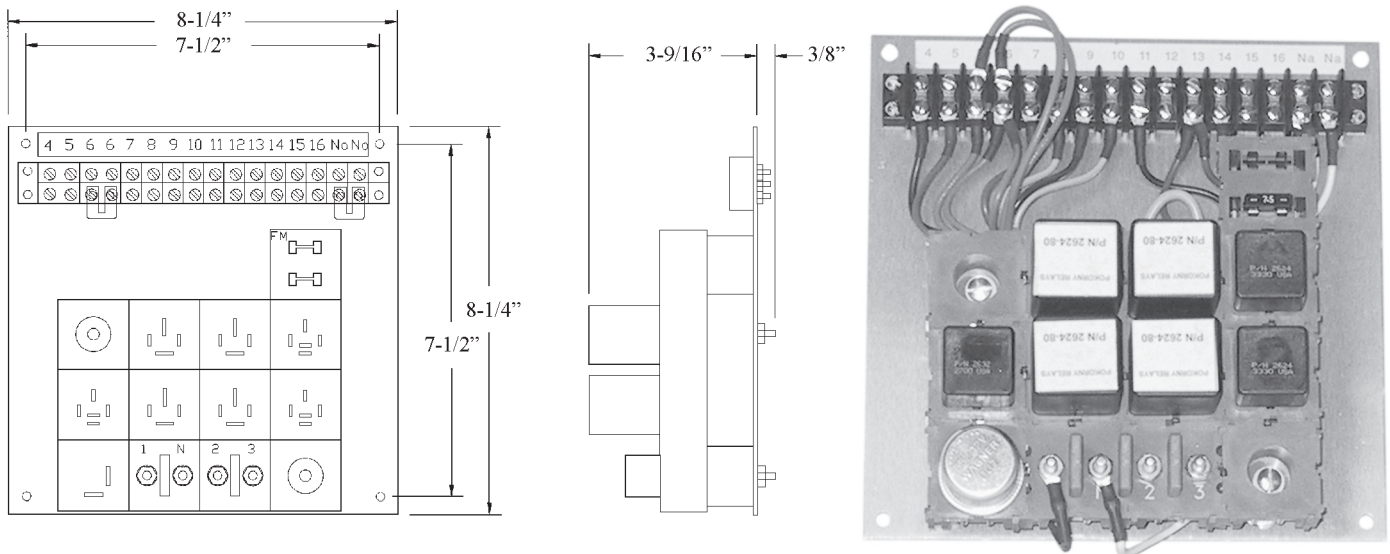
The following items are included with each complete HLAS System:

### A. Instruction Packet

Includes all information required to install a complete System. Wiring diagrams and parts lists are provided.

### B. Electrical Control Panel (79) P/N 3097-500-148

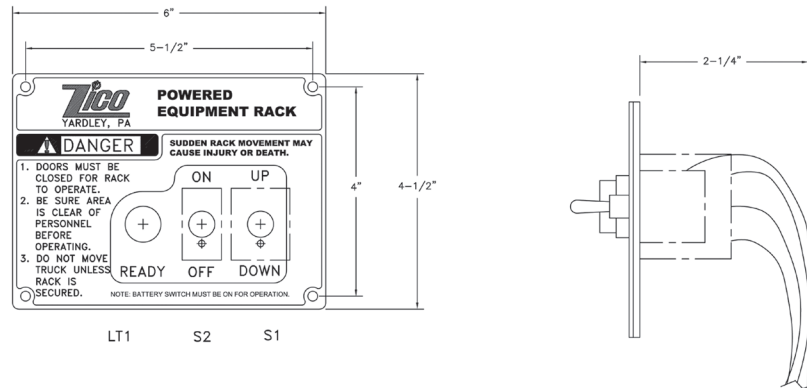
Complete panel ready for mounting.



**FIGURE 8**  
**OVERALL DIMENSIONS AND COMPONENTS**  
**ELECTRICAL CONTROL PANEL**

### C. Ladder Control Panel (80) P/N 3097-500-170

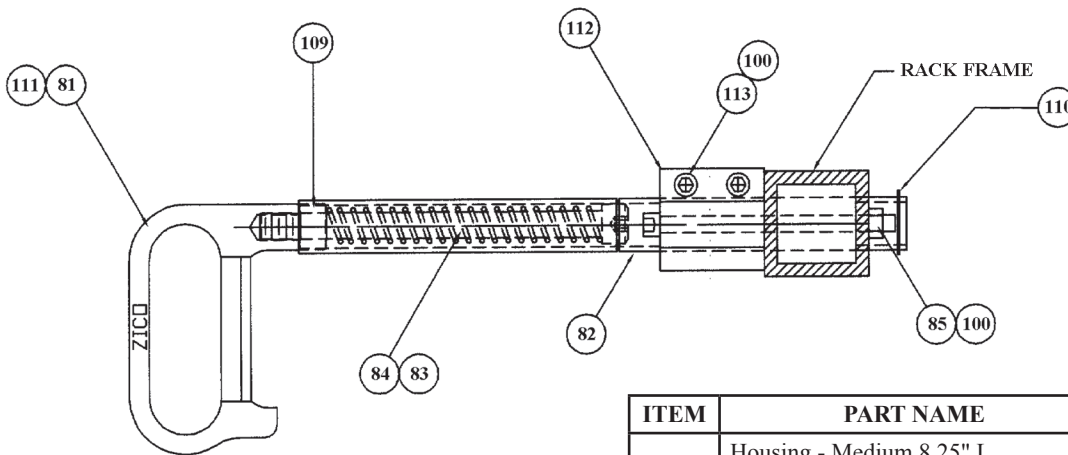
Complete panel with an "on" and "off" switch and indicator light, and an "up" and "down" switch, ready for mounting.



- LT1 = Power Indicator Lamp P/N 3097-500-169  
 S2 = Power Switch P/N 3097-500-157  
 S1 = Control Switch P/N 3097-500-156  
 Boot, Toggle Switch P/N 3097-105-145

Name Plate (red) 3097-500-179  
 Switch Plate (alum.) 3097-500-178

**FIGURE 9**  
**OVERALL DIMENSIONS AND COMPONENTS**  
**LADDER CONTROL PANEL**



**FIGURE 10**  
**HANDLE ASSEMBLY**

ITEM	PART NAME	PART NUMBER	QTY.
82	Housing - Medium 8.25" L	3097-165-125	1
	Housing - Full 10.5" L	3097-145-125	
81	Handle	3097-105-109	1
83	Spring	3097-105-113	1
84	Screw 1/2-13 x 6-1/2 Socket Hd	9010-3350104	1
109	Set Screw - 7/8-14 Hollow Lock	3097-105-118	1
110	Ret. Ring, 1ø Ext. (5100-100)	3097-105-121	1
111	Wear Strip	3097-105-160	1
112	Support, Retainer Handle	3097-105-126	1
113	Screw, 5/16-18 x 2 Socket Hd.	9010-333132	2
85	Screw, 5/16-18 x 4-1/2 Sckt Hd. Gr 8	9018-103172	2
100	Hex Nut, 5/16-18 Self Lock	9013-133100	4

## V. OPTIONAL EQUIPMENT

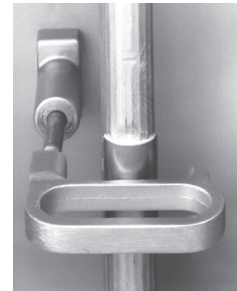
The following items may be added to the HLAS Systems:

### A. **Model LAS-LGK Ladder Guard Kit**

The ladder guard kit contains one tube of epoxy and two stainless steel guards. The guards may be attached to the ladder rung to prevent wear and possible damage as a result of the locking handle's contact with the rung. The new handle assemblies have a replaceable plastic wear pad which should prevent damage to the rungs, but the ladder guard kit may also be required if unnecessary wear is noted.



**Kit contains one tube of epoxy  
and two stainless steel rung  
protectors.**

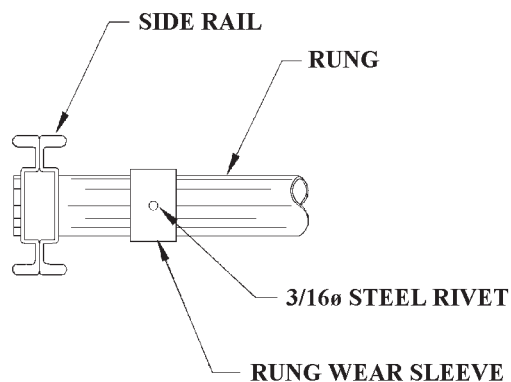


**Rung protector  
installed showing  
proper placement.**

**FIGURE 11  
LADDER GUARD KIT**

### B. **Installation Rung Wear Sleeve**

The small plastic sleeves may be purchased directly from the ladder manufacturer. The sleeves are pop-riveted to the rungs and prevent unnecessary wear on the rungs from constant rubbing on the side rails.



**FIGURE 12  
RUNG WEAR SLEEVE**

## **VI. TROUBLESHOOTING**

All units are tested after final assembly to ensure proper operation and adjustment. No further adjustments should be required unless excess movement is noted.

### **A. Excess Movement of the Rack and Ladders**

If the rack and ladders appear to be moving more than when the System was initially installed, it is probably due to one of the following reasons:

1. Ladders and rack not properly seated against the vehicle mounted ladder stop.

A ladder stop must be provided by the apparatus manufacturer to prevent the ladders from swaying. If the ladder rack is not touching the stop, swaying will occur. Shims may be required to close the gap.

2. Booms move freely when the rack is pushed or pulled by hand.

Use the following procedure for adjusting the hydraulic cylinder (8), bumpers (16) and latch (9). Refer to Figures 13 and 14 on page 15 for numbers in parenthesis.

- a. Remove ladders with the rack in the down position. Raise the unit back up approximately 3/4 of the way and loosen the two bumper lock nuts (65). Turn the bumpers (16) towards the backing plate (6).
- b. Raise the rack up until the cylinder is fully extended and the latch (9) closes. The hydraulic pump will slow down when the cylinder is fully extended.
- c. Pull booms (2 and 3) out by hand to apply load on the cylinder (8).
- d. Check the gap between the inside face of the latch (9) and the outside face of the latch bar (10).

The gap should be around 3/32" when pulling out on the boom assembly by hand to take the free play out of the unit. If the gap is less than 3/32", the overall length of the cylinder has to be lengthened. If the gap is more than 3/32", the overall length of the cylinder has to be made shorter.

- e. The length of the cylinder may be adjusted as follows:

1. Loosen the 3/8" socket head cap screw clamp bolt on the shaft clevis pin.
  2. Lower the rack so the latch (9) opens and the latch bar (10) just clears the latch. This takes the pressure off the cylinder which will make the next step easier.

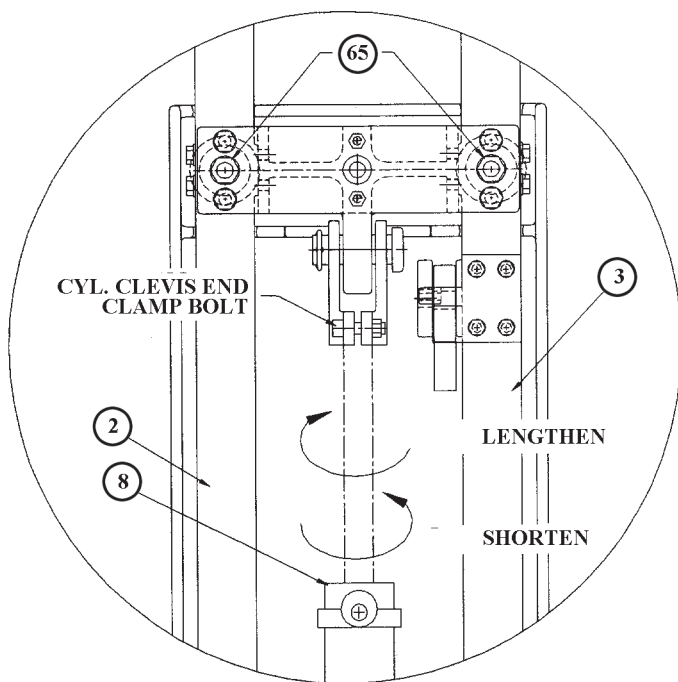
**A. Excess Movement of the Rack and Ladders (continued)**

3. Turn the cylinder shaft in the appropriate direction to lengthen or shorten it.

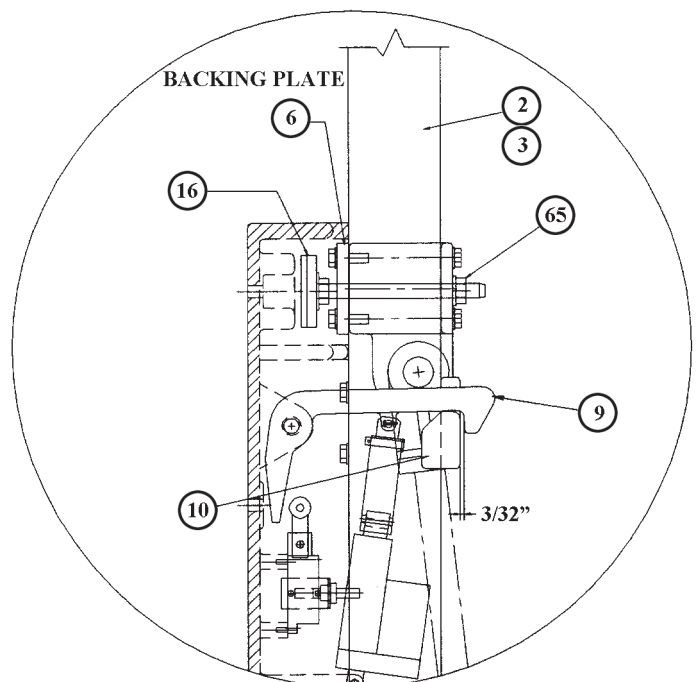
**WARNING:** Do not use a pipe wrench or vise grips. Damage to the cylinder shaft will occur. The shaft will almost always turn by hand. Rubber coated work gloves will increase your grip.

- f. After turning the shaft about 1/4 turn, raise the unit back up. Do not tighten the clevis clamp bolt at this time.

- g. Make sure the cylinder is fully extended and re-check for the 3/32" gap while pulling out on the boom assemblies.



**FIGURE 13  
FRONT VIEW**



**FIGURE 14  
SIDE VIEW**

- h. After the 3/32" gap is achieved, tighten the clevis clamp bolt and turn the bumpers until they are touching the base casting (1). Maintain outward pressure on the boom while you are hand tightening the bumper.

- i. Lower the unit a few inches. Turn the bumpers out one full turn away from the backing plate. Re-tighten the bumper lock nuts (65).

- j. Raise the unit back up to full cylinder extension. Listen for the pump to slow down. The gap between the inside face of the latch (9) and the outside face of the latch bar (10) should now be 1/64" to 3/64" and the unit will be tight.

**B. Rack Moving in a Jerking Motion or Stops**

1. Check fluid level in the hydraulic pump.
2. Follow filling procedure (VII. B. 2.).

**VII. MAINTENANCE**

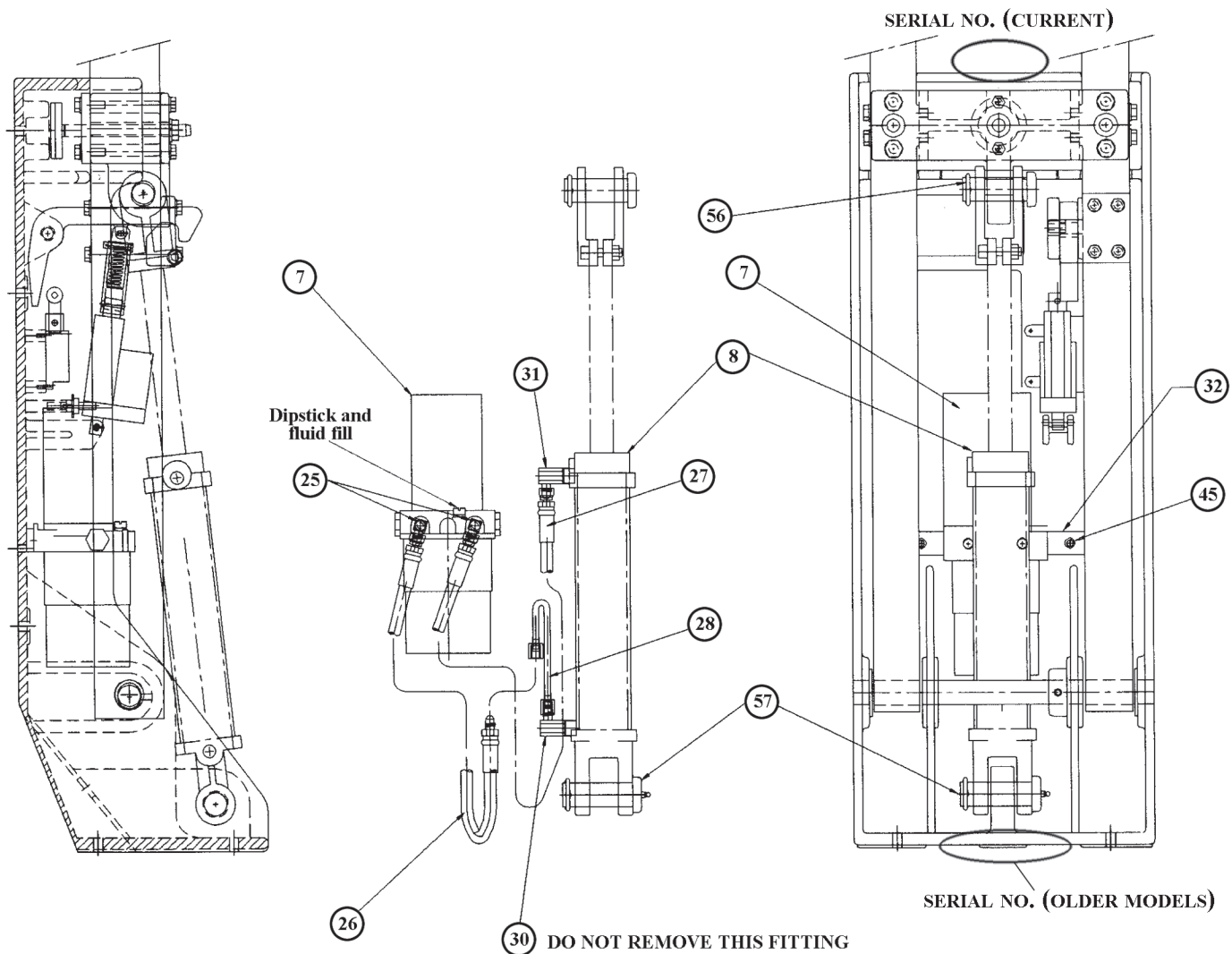
**A. Periodic**

1. Any time the ladder rack and ladders appear to sway, refer to Troubleshooting (VI. A.) and follow suggestions depending upon your specific problem.
2. Visually inspect hydraulic system for leaks indicated by the presence of hydraulic fluid or the accumulation of dirt around a fitting. Refer to Checking Hydraulic Fluid Level (VII. B. 2.) before proceeding.
3. Visually inspect the plastic pads for wear. Pads are located at several points on the ladder rack assembly and are designed to minimize wear to the ladders. Replace as required.

**B. Semi-Annually or at Scheduled Apparatus Lube Service**

The above items under Periodic Maintenance should be checked first and then proceed as follows:

1. Lubricate the following parts as indicated.
  - a. Joints and pivot points should be sprayed with CRC brand Stor&Lub long term lubricant and rust preventative #03032. Excess lubrication should be wiped off.
  - b. Hydraulic ram is self-lubricating and should require no additional lubrication.
  - c. Grease fittings are located on the bottom of the lower shaft (4), one on each side under the booms, and there is one additional grease fitting in the lower cylinder pin (57). Use chassis lube at these three points.
  - d. Latch bar (10) and latch (9) should be lubricated with door jam grease where the two parts come together.



**FIGURE 15  
HYDRAULIC SYSTEM COMPONENTS**

**B. Semi-Annually or at Scheduled Apparatus Lube Service (continued)**

**2. Checking hydraulic fluid level.**

Hydraulic system is a closed loop system. **No one, other than a qualified hydraulic pump technician, should attempt to remove any fittings or hoses from the system. The system contains one orifice which is restricted to .025" (30). Removal of this fitting could cause bodily injury. See location on Figure 14.**

- a. The booms must be lowered to gain access to the dip stick located in the front side of the pump.
- b. Remove dip stick and wipe dry with a clean, dry cloth.

**B. Semi-Annually or at Scheduled Apparatus Lube Service (continued)**

- c. Replace dip stick, placing it in the hole, but do not tighten.
- d. If the oil touches the bottom line of the two "Full" lines, then pump is full. This may be checked by fully tightening the dip stick in place and then removing it. The oil level should be between the two "full" lines.
- e. If oil needs to be added, the pump manufacturer recommends Oildyne hydraulic fluid be used with the system as follows:

ATF, OD18, or other clean hydraulic oil with a viscosity of 150 to 300 SUS at 100 degrees Fahrenheit. System capacity (dry) is 32 ounces.

**C. Replacing Hydraulic Fluid in the Pump**

The whole procedure may take one to two hours. Have replacement seal and 32 ounces of fluid available before starting the job. **Hydraulic fluid in this sytem may be under pressure. Always wear safety glasses and protective clothing and use the following procedure to change the fluid:**

1. Lower the booms and remove the ladder rack and ladders.
2. Slowly remove the hydraulic lines from the fittings on the front side of the pump. See Figure 14.
3. Disconnect the electric wires to the hydraulic pump.
4. Remove the two bolts (45) and lock washers (73) holding the power unit mounting bar (32) to the base casting (1) and remove the power unit (7).
5. Clamp the mounting bar (32) in a vise with the pump held in the vertical position (same as mounted position).
6. With the pump mounted in the vise and a drain pan under the reservoir, loosen and remove the dip stick. Remove the screw in the bottom of the pump reservoir and remove the reservoir. At this time the old oil may be discarded and the reservoir cleaned.
7. Check the two filter screens in the bottom of the pump and clean if necessary.
8. Place the two open hydraulic lines into a receptacle. Raise and lower the booms by hand to blow the fluid from the hydraulic cylinder (8). There should be approximately 12 ounces of fluid.

**CAUTION: Control the raising and lowering of the booms. Do not allow them to drop uncontrolled.**

### C. Replacing Hydraulic Fluid in the Pump (continued)

9. Replace reservoir onto the bottom of the pump using new seals. Replace and tighten screw in bottom of reservoir.
10. Re-attach the pump onto the base casting and re-attach the hydraulic lines and electric power.
11. Put 22 ounces of fresh hydraulic fluid into the pump through the dip stick hole and replace the dip stick.
12. Run the booms up and down three or four times. Wait approximately 5 minutes and, with the booms down, check the fluid level. The fluid level should not show on the stick because approximately 12 ounces of fluid have been replaced into the lines and hydraulic cylinder.
13. Add 10 ounces of fluid and re-check the dip stick. To avoid having to screw the dip stick in all the way while adjusting the fluid level, the lower line of the two "Full" lines may be used for you reading.
14. A couple of more ounces of fluid may have to be added to bring the fluid level to the full mark. When the full level is obtained, screw the dip stick in completely and seat the "O" ring.

### D. Replacing the Hydraulic Cylinder

Elbow adapter fittings (30 & 31) are provided on replacement hydraulic cylinders. **The elbow adapter with restricted orifice (30) should not be removed from the cylinder for any reason.** Wearing safety glasses and protective clothing, you may use the following procedure to change they hydraulic cylinder:

1. Make sure the latch (9) is securely in place. As a precaution, secure the booms to the apparatus so they cannot come down on their own.
2. Remove the fluid lines (see Figure 15, page 17) from the elbow adapter fittings. **Do not remove the elbow fittings from the cylinder.** Place the open ends of the fluid lines into a receptacle to catch the fluid.
3. Loosen the socket head cap screw on the lower side of the top clevis clamp.
4. Remove pin (57) from the lower clevis clamp.
5. Turn the cylinder counterclockwise to remove the cylinder ram from the top clevis clamp yoke.
6. Replace the cylinder and turn clockwise to re-attach the cylinder ram into the top clevis clamp yoke.
7. Replace pin (57) through the lower clevis clamp.

#### **D. Replacing the Hydraulic Cylinder (continued)**

8. Re-tighten the socket head cap screw on the lower side of the top clevis clamp and remove the device used to secure the booms to the vehicle in step 1.
9. Follow steps 12, 13 and 14 under VII. C. "Replacing Hydraulic Fluid in the Pump" (page 18) to add fluid for the new hydraulic cylinder.
10. Check the gap between the latch (9) and latch bar (10). If the gap is 1/64" to 3/64", you are done. If the gap is greater than this range, you will need to follow the steps under VI. A. 2. (page 14) to re-adjust the length of the cylinder ram.

#### **E. Replacing Latch Limit Switch**

The following procedure may be used to replace the latch limit switch:

1. Lower the booms to gain access to the limit switch (12).
2. Remove the old switch. Match the new switch to the old and set the roller follower arm on the same angle.
3. Mount the new switch.
4. With the booms up and the latch actuator retracted, lift up on the front of the latch (9) and listen for the latch limit switch to click. It should click when the bottom front side of the latch is approximately 1/4 to 3/8" above the top surface of the latch bar casting.
5. To adjust the roller follower arm, loosen the Allen cap screw that locks this arm in place. Move this arm until the switch clicks with the 1/4 to 3/8" clearance.

#### **F. Pressure Washing**

Do not operate pressure washer around or near the hydraulic pump. Excessive pressure may allow soap and water to blow past the seal, damaging the hydraulic cylinder.

### **VIII. SERVICE**

If you experience any problems with your Horizontal Ladder Access System, please call us at 800-711-3473 for assistance. Please have the serial number of your system available. This number may be found on metal plate riveted to the base casting.

### **IX. WARRANTY**

A copy of the warranty registration MUST be returned to ZICO to ensure registration of your System (see back cover).

## **X. DRAWINGS, DIAGRAMS AND CHARTS**

### **A. Basic System**

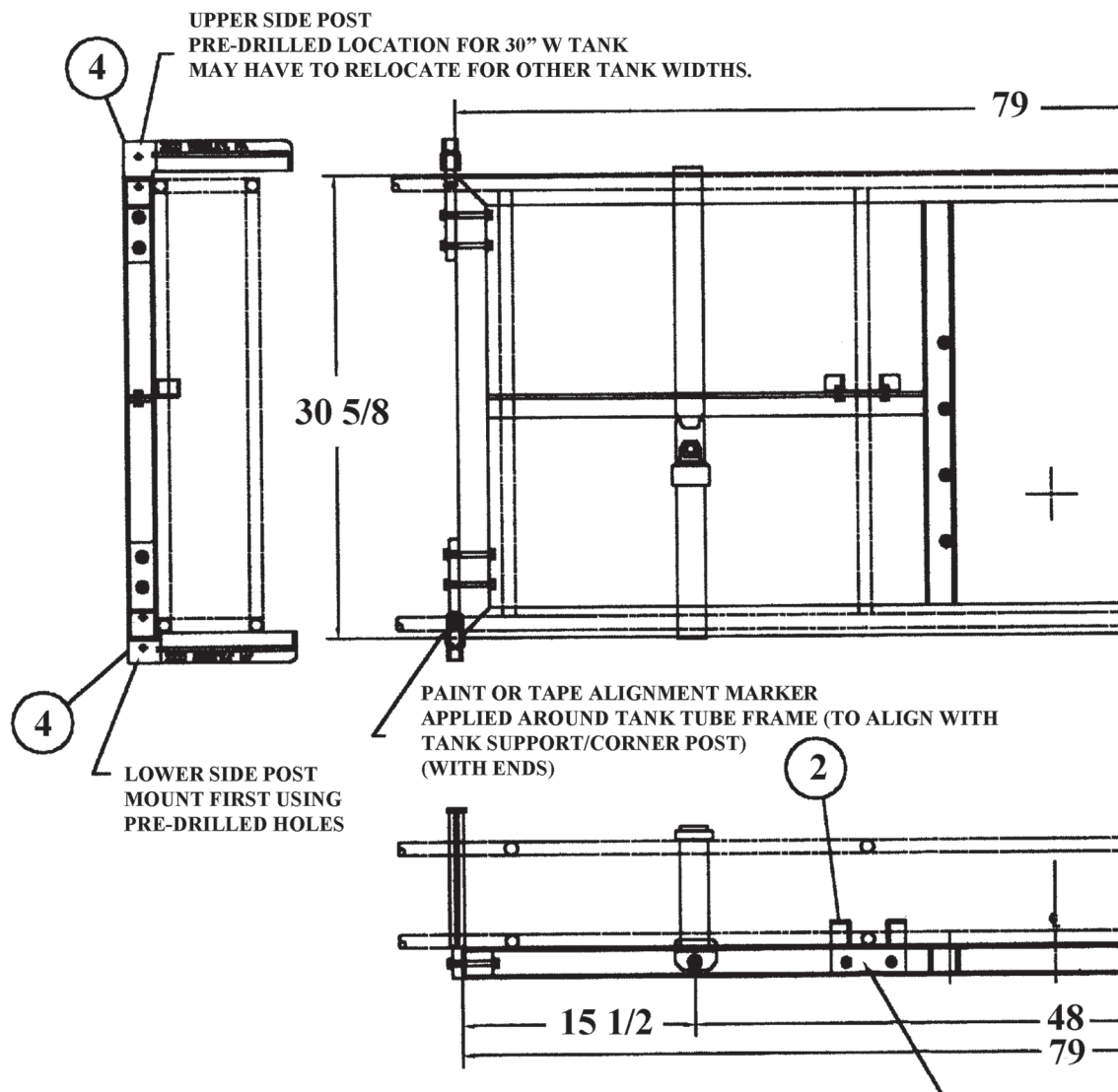
1. Complete parts photos for HLAS (Figure 17, page 25 through Figure 20, page 28)
2. Chart of HLAS component parts (Chart 1, page 24)
3. Complete parts listing and drawing for HPTS (Figure 16, pages 22 and 23)
4. Space requirement for system (Figure 1, page 3)
5. Changing length of booms (Figure 2, page 3)
6. Ladder stop (Figure 3, page 4)
7. Handle assembly (Figure 10, page 12)
8. Ladder guard kit (Figure 11, page 13)
9. Rung wear sleeve (Figure 12, page 13)
10. Adjustment procedure to arrest excessive movement (Figures 13 & 14, page 15)

### **B. Electrical System**

1. Electrical control panel with mounting dimensions (Figure 8, page 11)
2. Ladder control panel with mounting dimensions (Figure 9, page 12)
3. Electrical diagrams (Figure 4, page 6 and Figure 5, page 7)
4. Flashing light kit (Figure 6, page 8 and Figure 7, page 9)
5. Latch limit switch (see VII. E., page 20)

### **C. Hydraulic System**

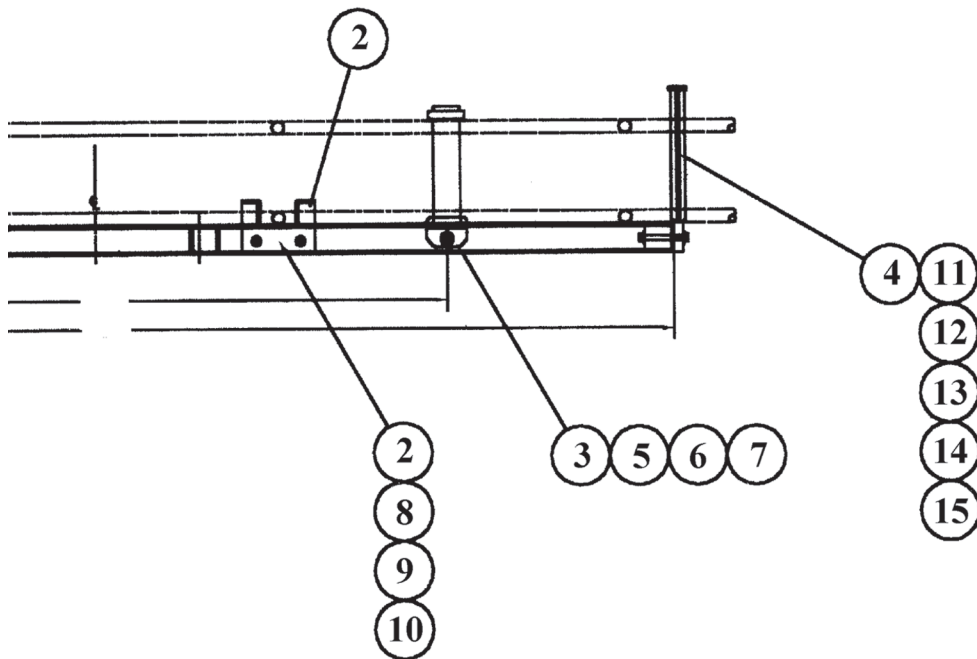
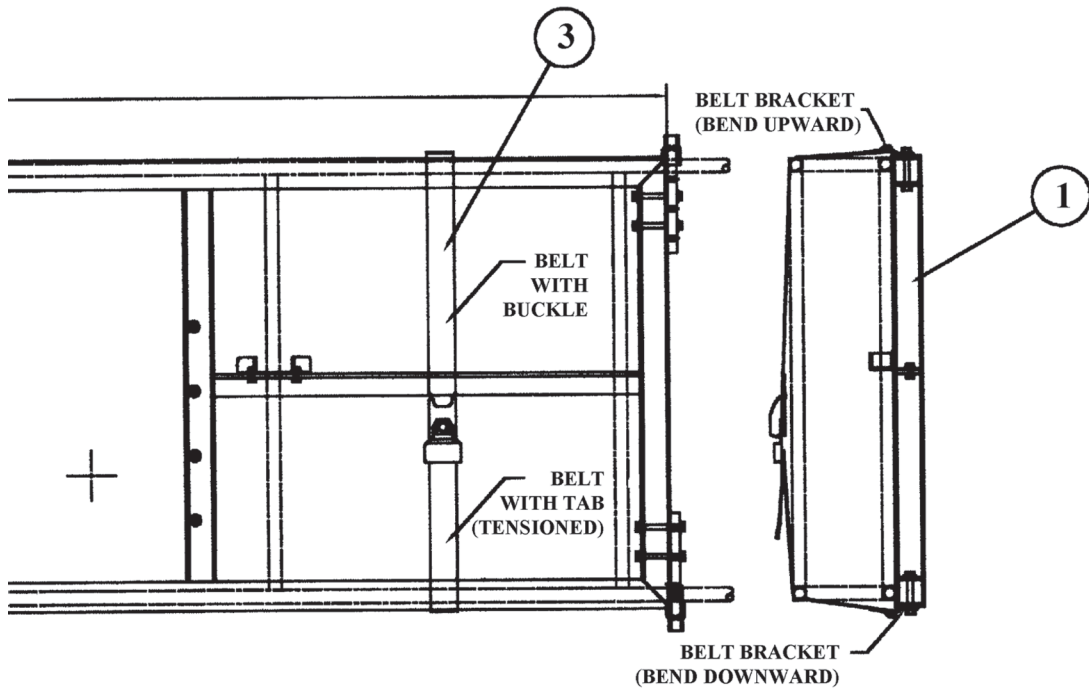
1. Pump and hydraulic system (Figure 15, page 17)
2. Restricted orifice fitting (Figure 15, page 17)



TANK FRAME SAFETY STOP  
LOCATE AFTER POSITIONING TANK ON  
RACK, (2) PLACES  
(POSITION UNDER OUTERMOST TANK  
FRAME CROSS MEMBER POSSIBLE)

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	3098-200-101	Rack Weldment	1
2	3098-200-102	Safety Stop Bracket	2
3	3098-200-104	Quick Release Strap Belt	2
4	3097-500-415	Adjustable Side Guard	4
5	9018-103744	Screw, 3/8-16 x 2 3/4 HH, C/S GR8	4
6	9113-173700	Nut, 3/8-16 Nylon Lock Hex SS	4
7	9114-103700	Flatwasher, 3/8 SS	8
8	9018-102514	Screw, 1/4-20 x 7/8 HH, C/S GR8	4
9	9113-172500	Nut, 1/4-20 Nylon Lock, Hex SS	4
10	9114-102500	Flatwasher, 1/4 SS	8
11	3097-500-421	Upright Wear Sleeves	4
12	9018-103156	Screw, 5/16-18 x 3 1/2, HH GR8	8
13	9014-113100	Flatwasher, 5/16 Nom	16
14	9014-203100	Lockwasher, 5/16 Nom	8
15	9113-103100	Hex Nut, 5/16-18	8

**FIGURE  
COMPONENTS FOR  
PORTABLE TANK**



16  
MODEL HPTS  
SYSTEM

ITEM	PART NO.	DESCRIPTION	QTY.
1	3097-500-101	Base Casting	1
2	3097-500-103	Boom-Left Hand	1
3	3097-500-105	Boom-Right Hand	1
4	3097-500-115	Lower Shaft, Boom	1
5	3097-500-109	Upper Mtg. Block Casting, Cyl.	1
6	3097-500-111	Backing Plate, Upper Mtg. Blk.	1
7	3097-500-137	Power Unit, Hydraulic	1
8	3097-500-123	Hyd. Cyl. 2" x 8" Stroke	1
9	3097-500-193	Latch	1
10	3097-500-121	Latch Bar	1
11	3097-500-185	Actuator, Latch 1ø x 1" Stroke	1
12	3097-500-181	Limit Switch, Latch	1
13	3097-500-187	Latch Spring Housing-Upper	1
14	3097-500-189	Latch Spring Housing-Lower	1
15	3097-500-191	Latch Spring	1
16	3097-500-113	Bumper, Mech. Stop	2
17	3097-500-195	Boom Ext Weldment-Left	1
18	3097-605-196	Boom Ext Weldment-Right	1
19	3097-500-407	Ladder Rack Weldment	1
20	3097-500-419	Safety Loop, 15" O.A.L.	2
	3097-500-420	Safety Loop, 13" O.A.L.	
21	3097-500-424	Sleeve, Safety Loop-28-1/2" Lg.	1
22	3097-500-418	Bracket, Safety Loop	2
23	3097-500-415	Adjustable Ladder Side Guard	4
24	3097-500-421	Upright Wear Sleeves-8-3/4"	4
25	3097-500-135	Elbow, PU to Hose (7/16-20)	2
26	3097-500-133	Hyd Flex Hose-Short - 20 3/4"L	1
27	3097-500-132	Hyd Flex Hose-Long - 29"L	1
28	3097-500-134	1/4 OD Hyd Line Assy.	1
29	3097-500-129	Hydraulic Fluid, 1 Qt. NS	1
30	3097-500-125	Elbow/Adapter w/Orifice	1
31	3097-500-124	Elbow/Adapter	1
32	3097-500-139	Mtg. Bar, Power Unit	1
33	3097-500-162	Spin Drive Grease Fitting-1/4-28	1
34	3097-500-164	Spin Drive Grease Fitting-1/4-28 45°	2
35	9018-104320	Screw, 7/16ø x 1-1/4 HH SZP Gr 8	4
*36	9018-104372	Screw, 7/16ø x 4 HH SZP Grade 8	4
37	NOT PROVIDED	Base Mounting Screws NS	12
38	9010-221310	Screw, #6-32 x 5/8 Pan Hd SZP	2
39	9010-221318	Screw, #6-32 x 1-1/8 Pan Hd SZP	2
40	9010-102524	Screw, 1/4-20 x 1-1/2" Hex Hd	1
41	9018-103156	Screw, 5/16-18 x 3-1/2" Hx Hd SZP Grade 8	8
42	9018-103128	Screw, 5/16-18 x 1-3/4" Hex Hd SZP Grade 8	2
43	9010-163748	Screw, 3/8-16 x 3 FH-Phil SZP	8
44	9018-103744	Screw, 3/8-16 x 2-3/4" Hex Hd SZP Grade 8	4
45	9010-103712	Screw, 3/8-16 x 3/4" Hex Hd SZP	4
46	9010-103716	Screw, 3/8-16 x 1 Hex Hd SZP	4
47	9018-103772	Screw, 3/8-16 x 4-1/2" Hex Hd SZP Grade 8	4
49	9010-103148	Screw, 5/16-18 x 3 Hex Hd SZP	2
50	9010-383108	Setscrew 5/16-18 x 1/2" Cup Pt. Plated	1
52	9080-002516	Clevis Pin, 1/4ø x 1 Lg. SZP	1
53	9080-002520	Clevis Pin, 1/4ø x 1-1/4 Lg. SZP	1
54	9080-002528	Clevis Pin, 1/4ø x 1-3/4 Lg. SZP	1

ITEM	PART NO.	DESCRIPTION	QTY.
55	9080-005040	Clevis Pin, 1/2ø x 2-1/2 Lg. SZP	1
56	3097-500-226	Cylinder Pin, 1"ø (Upper)	1
57	3097-500-126	Cylinder Pin, 1"ø (Lower)	1
58	9070-000608	Cotter Pin, 1/6 x 1/2	3
59	9070-001212	Cotter Pin, 1/8 x 3/4	1
60	9070-001524	Cotter Pin 5/32 x 1-1/2	2
61	9014-114300	Flatwasher, 7/16 ID SZP	8
62	9113-172500	Lock Nut, 1/4-20 SZP	1
63	9013-133100	Hex Nut, 5/16-18 SZP	12
65	9012-105000	Hex Nut, 1/2-13 SZP	4
66	9012-154300	Hex Nut, 7/16-14 SZP	8
67	9014-113100	Flatwasher, 5/16 ID SZP	24
69	9014-115000	Flatwasher, 1/2 ID SZP	4
72	9014-203100	Lockwasher, 5/16 ID SZP	14
73	9014-203700	Lockwasher, 3/8 ID SZP	22
74	9014-205000	Lockwasher, 1/2 ID SZP	2
75	9014-204300	Lockwasher, 7/16 ID SZP	NS 8
77	3097-500-141	Helical Bundling Wrap-21" (8)	1
78	3097-500-145	Latch Act. 2 Wire Harness-7.5' (9)	1
79	3097-500-148	Elec. Panel Assembly	1
80	3097-500-170	Switch Panel Assembly	1
81	3097-105-109	Handle, Ladder Retainer	2
82	3097-165-125	Retainer Housing - Medium - 8.25" L	2
	3097-145-125	Retainer Housing - Full - 10.50"L	
83	3097-105-113	Compression Spring	2
84	9010-3350112	Socket Hd Screw, 1/2-13 x 7	2
85	9018-103172	Screw, 5/16-18 x 4 1/2 Socket Hd, GR 8	4
86	3097-105-116	Wear Pads	8
87	3097-270-101	Clearance Light	NS 2
88	3097-270-106	Plate, Limit Switch	NS 1
89	3097-270-105	Limit Switch	1
90	3097-270-117	Harness, Limit Switch	1
91	9025-191108	Screw, #4-40 x 1/2 Self Tap Rnd Hd (6)	4
92	9025-191305	Screw, #6-32 x 5/16 Self Tap Rnd Hd (6)	2
93	3097-270-111	Cable Tie, 6"	2
94	3097-270-113	In Line Splice	6
95	3097-510-110	16-2 Jacketed 2 Cond Cable	(3) 6'
96	3097-270-115	Snap Plug Connector	NS 4
97	3097-500-172	Straight Conn., Plastic, 1/2 NPT	NS 1
98	8005-000-125	16 Ga Lead Wire - Black	7'
99	8005-000-130	16 Ga Lead Wire - White	7'
100	9013-133100	Nut, Self Locking 5/16-18	10
101	3097-500-160	Ladder Rack Rubber Bumper	NS 2
102	9018-103172	Screw, 5/16-18 x 4 1/2 Hex Hd GR 8	4
103	3097-290-105	Paint, Touch Up, 12 Oz. Can	1
104	3097-500-423	Label, "DANGER, LOSS OF HYD. FLUID"	1
105	3097-500-425	Label, "WARNING, PINCHING OF FINGERS"	NS 1
106	3097-500-427	Label, "WARNING, STRIKING INJURY"	1
107	3097-500-174	Cap, Plastic - 3/4ø Nom.	2
109	3097-105-118	Setscrew, 7/8-14 Hollow Lock	2
110	3097-105-121	Ret. Ring, 1ø Ext.	2
111	3097-105-160	Wear Strip	2
112	3097-105-126	Support, Retainer Handle	2
113	9010-333132	Screw, 5/16-18 x 2 Socket Head	4
114	3097-500-142	Boom End Cap, Plastic	2
115	3097-105-130	Nylon Washer, 1/2 ID x 3/4 OD x .062	2
116	3097-105-162	Label, "TO PREVENT WEAR"	1

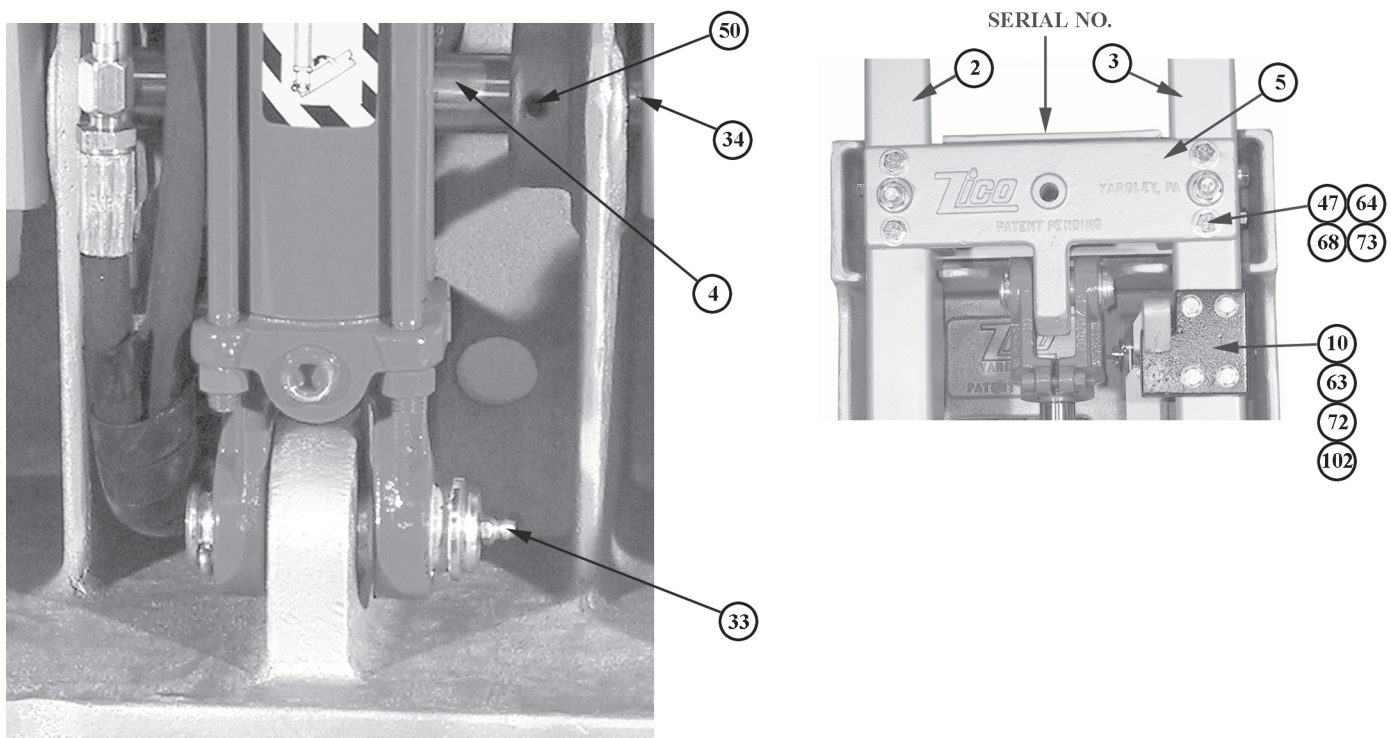
NS - Not Shown on Figures 17 to 20

\*Indicates New Item

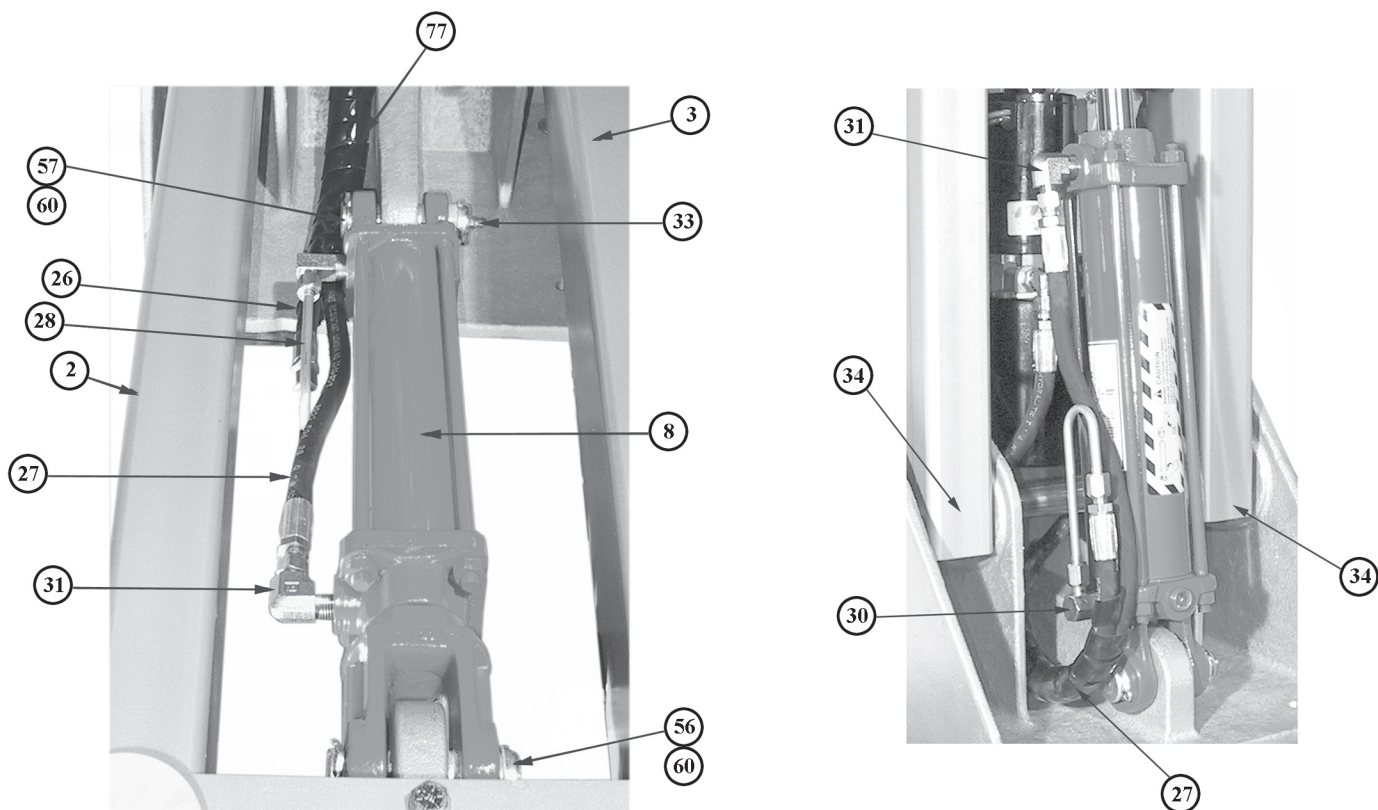
( ) - See Figure \_\_\_\_\_

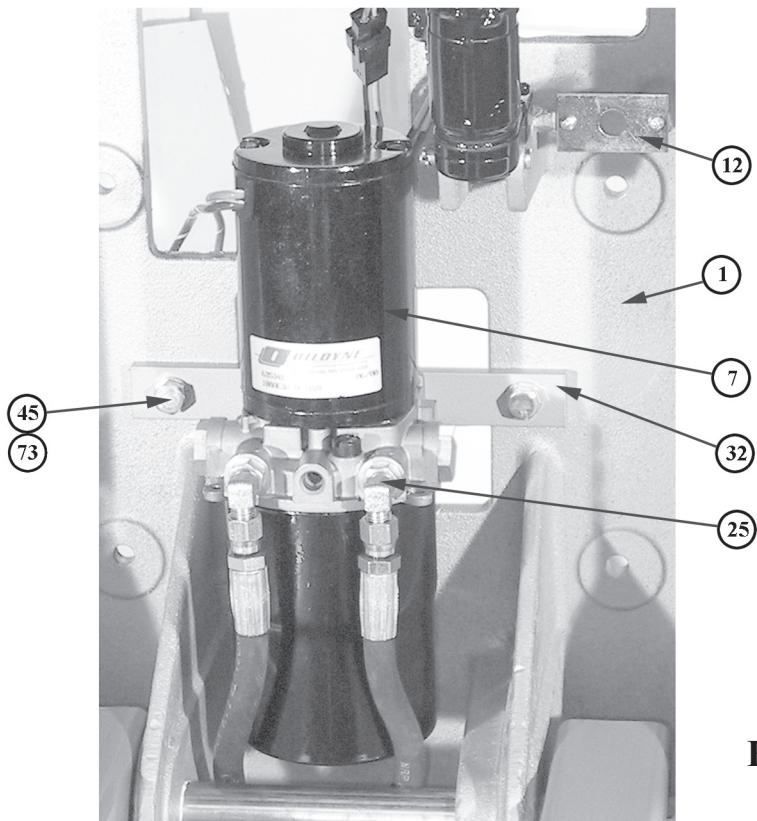
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## CHART 1 HLAS PARTS LISTING



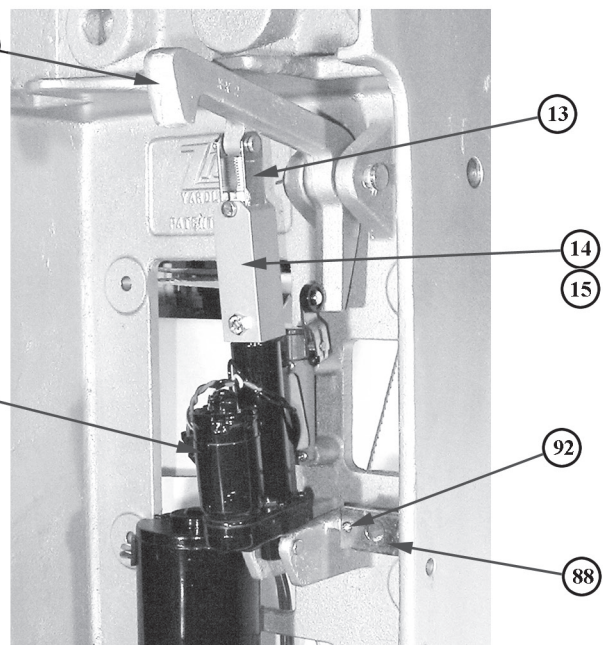
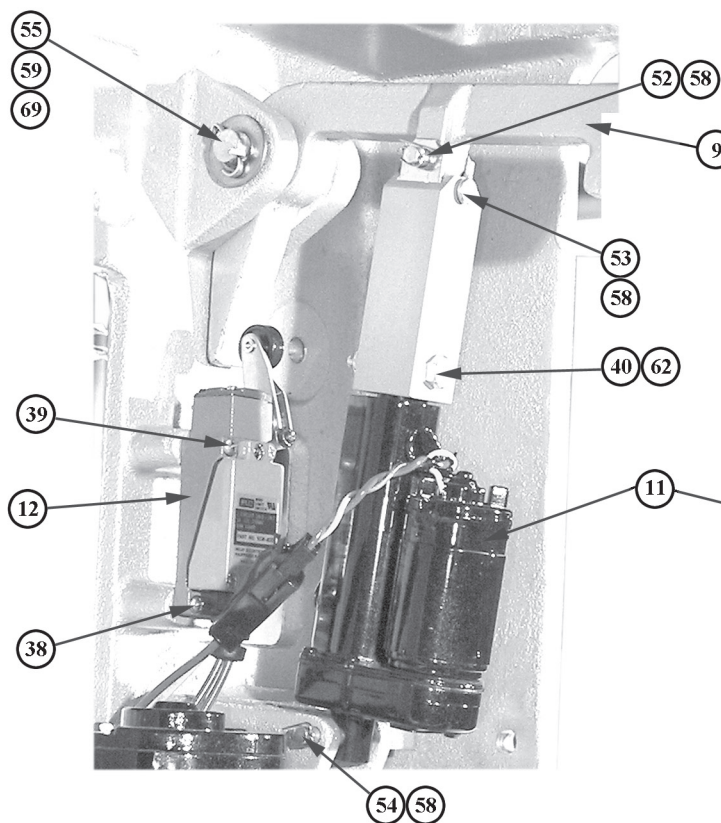
**FIGURE 17**  
**HYDRAULIC COMPONENTS**

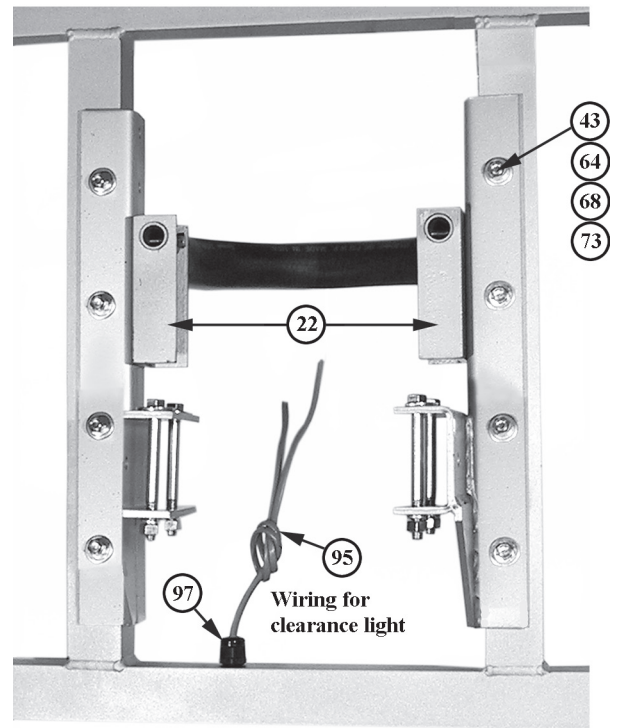
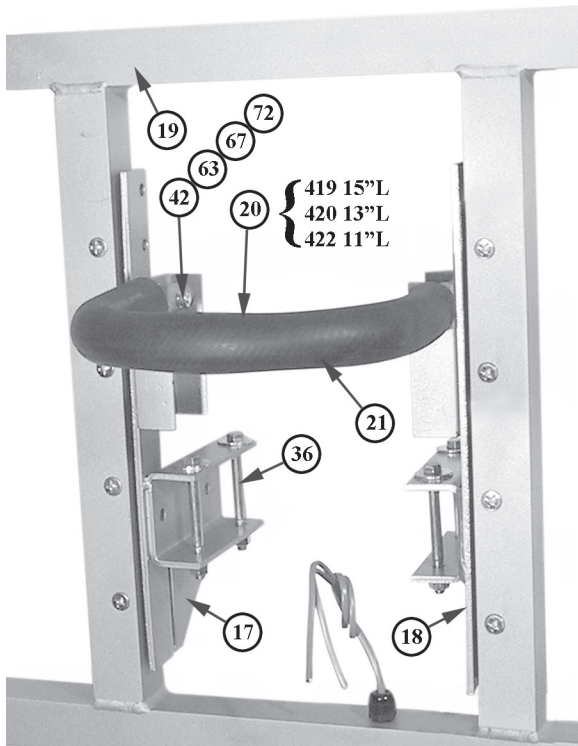




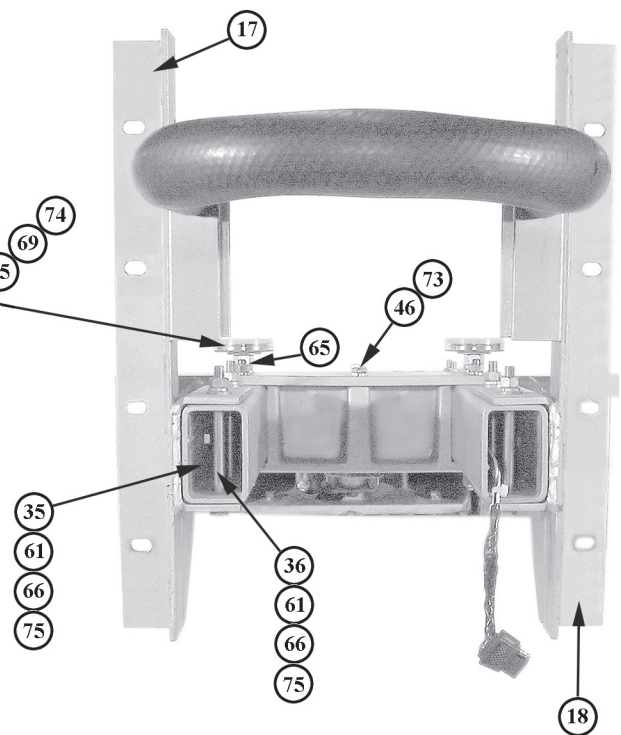
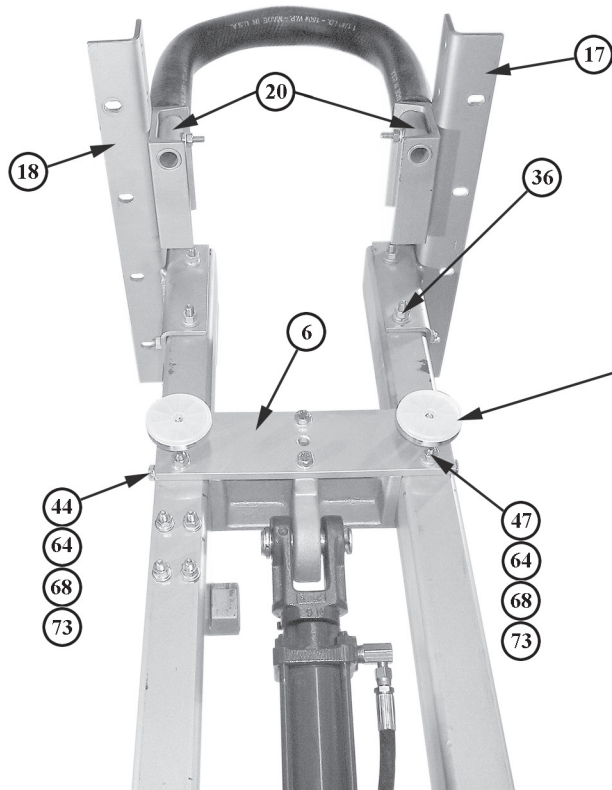
**MODEL HLAS  
COMPONENT PARTS -  
HORIZONTAL LADDER  
ACCESS SYSTEM**

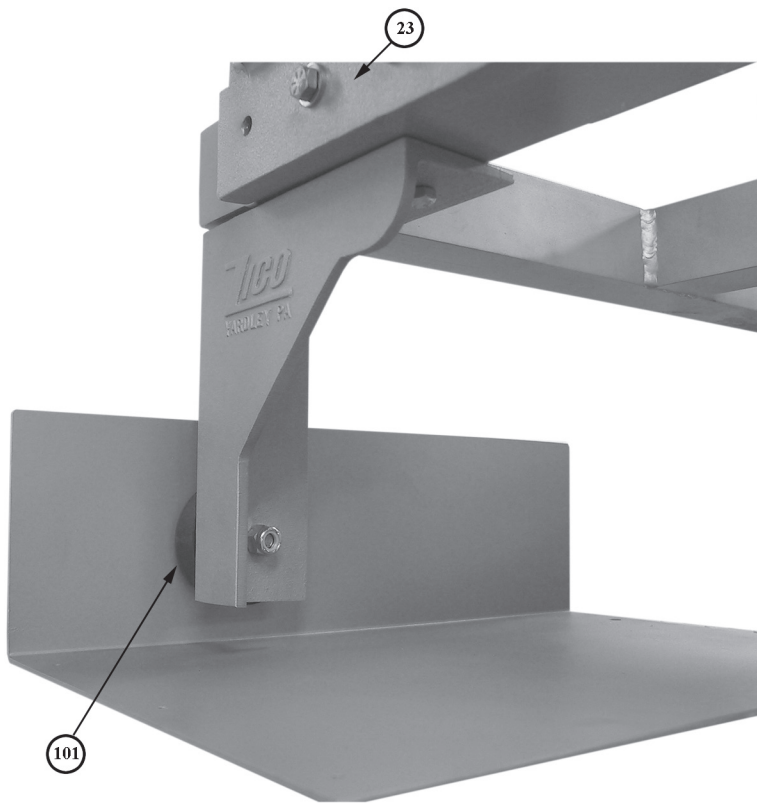
**FIGURE 18  
HYDRAULIC AND ELECTRICAL  
LATCH COMPONENTS**



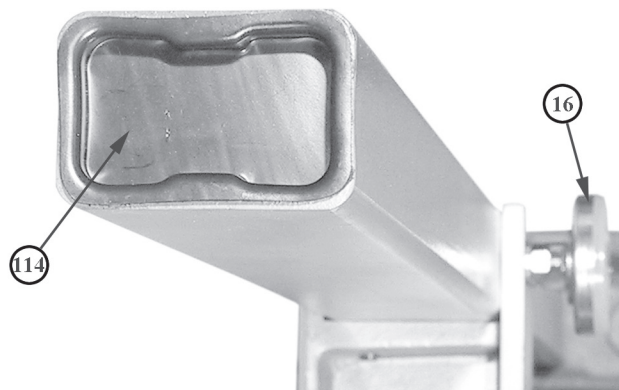
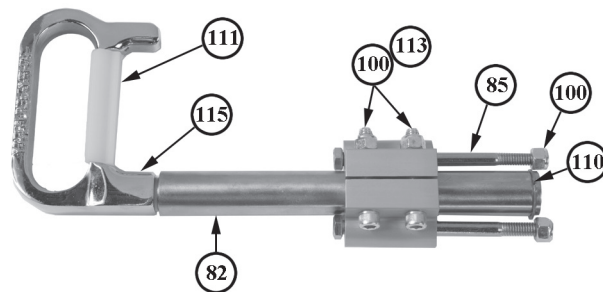
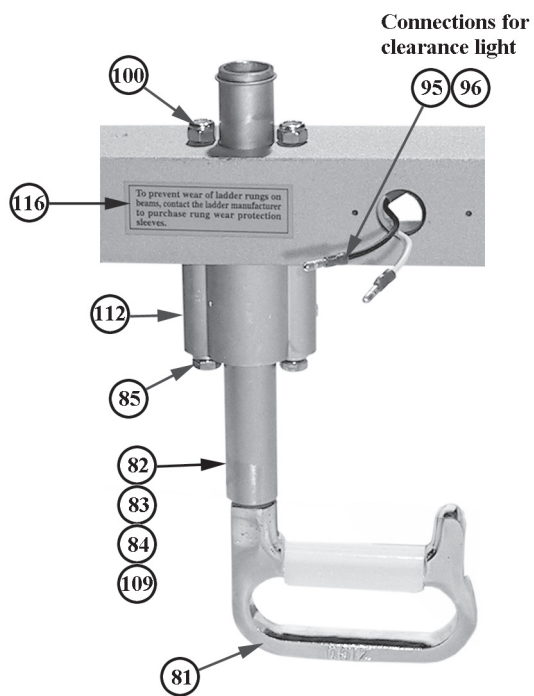
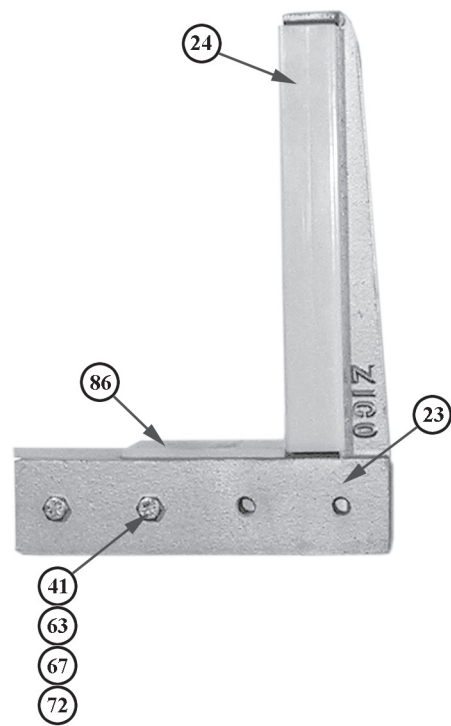


**FIGURE 19  
BOOM COMPONENTS**





**Optional Stop (sold separately)**



**FIGURE 20  
END OF BOOM AND RACK COMPONENTS**



*Ziamatic Corp.*

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[www.ziamatic.com](http://www.ziamatic.com)

TOLL FREE: 800-711-3473

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## WARRANTY REGISTRATION

**PLEASE MAIL OR FAX A COPY TO ZICO TO REGISTER YOUR UNIT**

FIRE DEPARTMENT NAME: \_\_\_\_\_ CONTACT PERSON: \_\_\_\_\_

PHONE NO.: \_\_\_\_\_ FAX NO.: \_\_\_\_\_

STREET ADDRESS: \_\_\_\_\_ P.O. BOX: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE \_\_\_\_\_ ZIP: \_\_\_\_\_

MODEL NO.: (CHECK ONE) \_\_\_\_\_ **HLAS-975** \_\_\_\_\_ **HLAS-1200** \_\_\_\_\_ **HPTS**

SERIAL NO. ON UNIT: (SEE PAGE 25 FOR LOCATION) \_\_\_\_\_

INSTALLED ON: (VEHICLE MFG.) \_\_\_\_\_ DELIVERED: (DATE) \_\_\_\_\_

WAS UNIT INSTALLED ON: \_\_\_\_\_ NEW VEHICLE \_\_\_\_\_ RETROFITTED ONTO EXISTING VEHICLE

LADDERS MOUNTED ON THE UNIT:

DUO SAFETY \_\_\_\_\_ FT. EXTENSION, MODEL \_\_\_\_\_ ALCO LITE \_\_\_\_\_ FT. EXTENSION, MODEL \_\_\_\_\_

DUO SAFETY \_\_\_\_\_ FT. ROOF, MODEL \_\_\_\_\_ ALCO LITE \_\_\_\_\_ FT. ROOF, MODEL \_\_\_\_\_

DUO SAFETY \_\_\_\_\_ FT. \_\_\_\_\_, MODEL \_\_\_\_\_ ALCO LITE \_\_\_\_\_ FT. \_\_\_\_\_, MODEL \_\_\_\_\_

OTHER (MFG.) \_\_\_\_\_

\_\_\_\_\_ FT. EXTENSION, MODEL \_\_\_\_\_

\_\_\_\_\_ FT. ROOF, MODEL \_\_\_\_\_

\_\_\_\_\_ FT. \_\_\_\_\_, MODEL \_\_\_\_\_

WHERE DID YOU HEAR ABOUT OUR PRODUCT?

\_\_\_\_\_ MAGAZINE AD (SPECIFY) \_\_\_\_\_

\_\_\_\_\_ DEALER (SPECIFY) \_\_\_\_\_

\_\_\_\_\_ VEHICLE MFG. (SPECIFY) \_\_\_\_\_

\_\_\_\_\_ ANOTHER DEPARTMENT (SPECIFY) \_\_\_\_\_

\_\_\_\_\_ OTHER (SPECIFY) \_\_\_\_\_