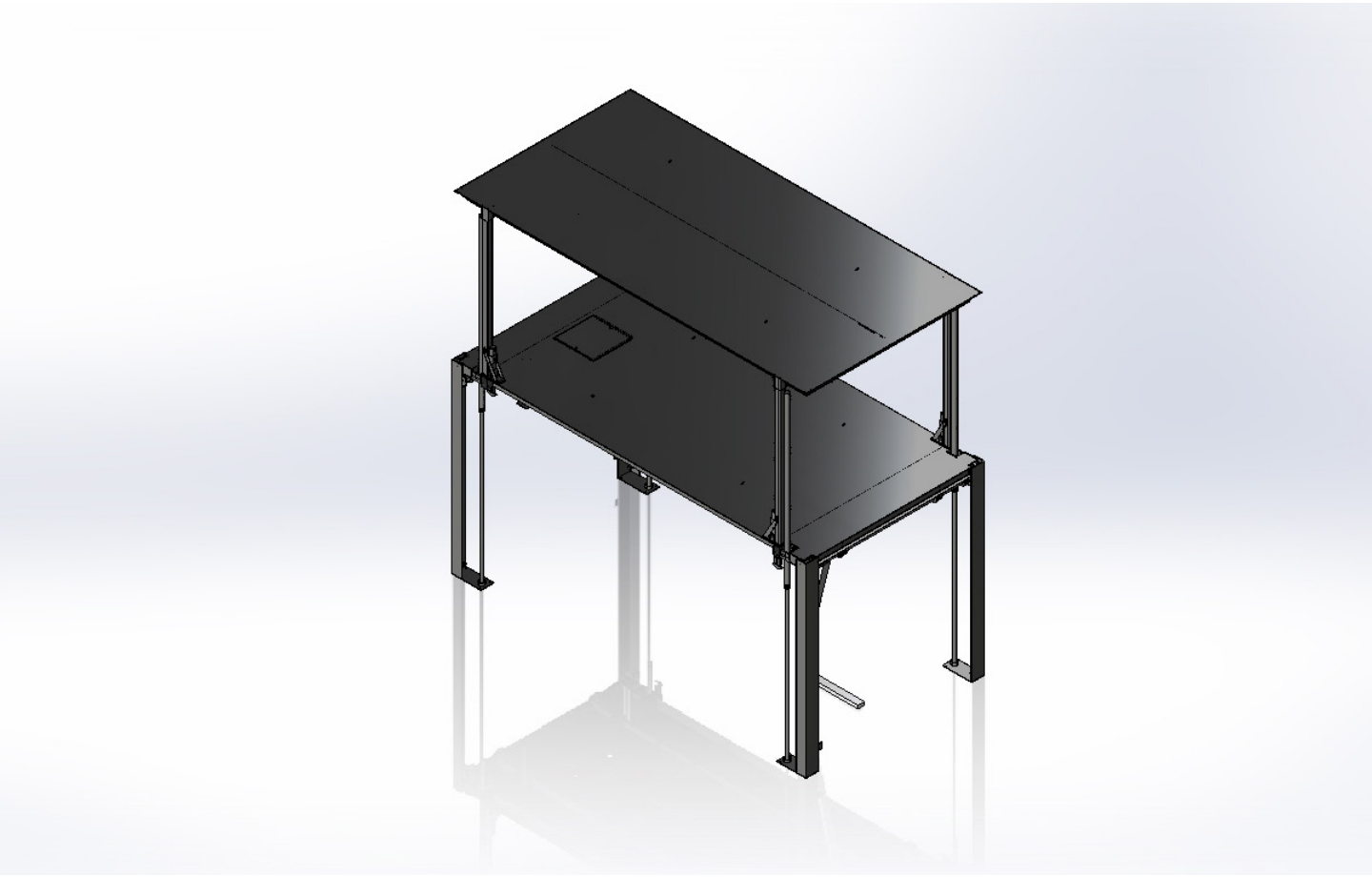
Vasari
INSPIRED PARKING

Installation & Service Manual

Subterranean 4-Post Parking Lift



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IMPORTANT

Please read and understand this manual prior to operation of your 4-Post Parking Lift. Failure to do so could lead to property damage and/or serious personal injury. If any questions should arise, call a local representative or *Autoquip Corporation* at 1-888-811-9876 or 405-282-5200.

Please record the following information and refer to it when calling your dealer or Autoquip. Reference the metal nameplate on the side of the canopy for model & serial number.

Model Number:_____Serial Number: _____

Installation Date _____/_____/____

INTRODUCTION

Autoquip Corporation has manufactured this product to move vehicles between floors or levels safely and efficiently. It has been built to provide many years of dependable service. Proper installation of this equipment is vital to both the efficiency of the unit and the ultimate satisfaction of the end user. **It is vital for the installers to read and understand this manual**! These instructions have been prepared and organized to assist the installers and it is important for these individuals to carefully follow the steps in the order they are presented!

Situations may arise which are not covered in these installation instructions. If you have questions, please call *Autoquip* Customer Service at (405) 282-5200 or 1-888-811-9876.

NOTE: Unless otherwise stated, mechanical installation does not include unloading, permits, seismic calculations, or extensive acceptance testing. The requirements of each contract should be carefully reviewed for possible conflicts of interpretation.

UPON DELIVERY OF THE EQUIPMENT

Upon receipt of the shipment, check for exposed damage or shortages and make note of it on the trucking company Bill of Lading or the Shipping Papers. Reports of concealed damage to items contained in crates must be reported within 48 hours. DO NOT destroy the crating while opening it to inspect the contents. If damage is suspected or found, report it directly to the carrier. DO NOT contact *Autoquip Corporation*!! All shipments are FOB from the Autoquip plant. **Any claims for damage must be filed with the carrier. Any parts shipped from *Autoquip* that are intended to replace damaged or lost items will be invoiced to the ordering party.**

Assuming no damage has occurred to the crate, check the components against the packing list. This will provide assurance that every item shipped has been received. Everything needed for the installation should be available. If not, report any shortages to *Autoquip Corporation* within 10 days. (*Autoquip* is not responsible for parts lost, stolen or damaged during transportation, storage, installation, or during any other circumstances or conditions that may be beyond corporate control.)

PLANNED MAINTENANCE PROGRAM

A local *Autoquip* representative provides a Planned Maintenance Program (PMP) for this equipment using factory-trained personnel. Call a local representative or *Autoquip Corporation* at 1-888-811-9876 or 405-282-5200 for more information.

RESPONSIBILTY OF OWNERS/USERS

DEFLECTION

Deflection is normal and is to be expected when the lift is placed under load. It is the responsibility of the user/purchaser to advise the manufacturer where deflection may be critical to the application.

INSPECTION & MAINTENANCE

The lift shall be inspected & maintained in proper working order in accordance with Autoquip's operating/maintenance (O&M) manual and safe operating practices.

REMOVAL FROM SERVICE

Any lift not in safe operating condition such as, but not limited to, excessive leakage, missing pins, or fasteners, any bent or cracked structural members, cut or frayed electric, hydraulic, or pneumatic lines, damaged or malfunctioning controls or safety devices, etc. shall be removed from service until it is repaired to the original manufacturer's standards.

REPAIRS

All repairs shall be made by qualified personnel in conformance with Autoquip's instructions.

OPERATORS

Only trained personnel and authorized personnel shall be permitted to operate the lift.

BEFORE OPERATION

Before using the lift, the operator shall have:

- Read and/or have explained, and understood, the manufacturer's operating instructions and safety rules.
- Inspect the lift for proper operation and condition. Any suspect item shall be carefully examined and a determination made by a qualified person as to whether it constitutes a hazard. All items not in conformance with Autoquip's specification shall be corrected before further use of the lift.

DURING OPERATION

The lift shall only be used in accordance with Autoquip's O&M manual.

- Do not overload the lift.
- Ensure that all safety devices are operational and in the stowed position.

MODIFICATIONS OR ALTERATIONS

Modifications or alterations to subterranean lifting equipment shall be made only with written permission of Autoquip. Autoquip does not foresee and does not anticipate unauthorized modifications, and these changes or alterations are grounds for voiding all warranties.

PRE-INSTALLATION SITE VISIT

SITE CONDITIONS

Whenever possible, make a pre-installation visit or call someone at the site. Installers must be familiar with everything relative to proper installation of this equipment. Some concerns are listed below, though listing every affecting contingency is impossible. It is the installer's responsibility to check the site for problems and work out solutions with the appropriate people. Some of the areas of concern are:

1. Is the site accessible to large delivery & cartage vehicles?

2. Can the lift components get through the existing doorways & floor openings?

3. How will the unit be raised, set into position, and accessed?

4. Can a chain fall be hooked to an available overhead support?

5. Is there a forklift or other cartage equipment available?

6. Is there adequate building structure to support vertical guides?

7. Look for problem areas such as bracing and overhead interference with ceilings, joists, pipes, etc..

It is always best to be prepared, so do as much pre-planning as possible before the installation procedure actually begins. Learn about the site, the equipment, and the installation process.

SAFETY SIGNAL WORDS

SAFETY ALERTS (Required Reading!)

The following SAFETY ALERTS are intended to create awareness of owners, operators, and maintenance personnel of the potential safety hazards and the steps that must be taken to avoid accidents. These same alerts are inserted throughout this manual to identify specific hazards that may endanger uninformed personnel. Identification of every conceivable hazardous situation is impossible. Therefore, all personnel have the responsibility to diligently exercise safe practices whenever exposed to this equipment.

DANGER!

Identifies a hazardous situation which, if not avoided, will result in death or severe personal injury.

WARNING!

Identifies a hazardous situation which, if not avoided, could result in death or serious personal injury.

CAUTION!

Identifies a hazardous situation which, if not avoided, may result in minor or moderate personal injury.

NOTICE

Identifies a potentially hazardous situation which, if not avoided, may result in property or equipment damage.

SAFETY PRACTICES

WARNING!

ABSOLUTELY NO RIDERS! Parking Lifts are not vehicle elevators and do not meet the requirements of ASME A17.1 – *Safety Code for Elevators and Escalators*. Parking lifts are designed for the sole purpose of transporting vehicles between floor elevations. At no time should it be used to transport people. Death or serious injury could result.

DANGER!

High voltage! Repairs should only be performed by a qualified service/control technician.

DANGER!

Never go under the lower platform! Parking Lifts are not vehicle maintenance lifts and do not meet the requirements of ANSI/ALI ALCTV:2006 – *Safety Requirements for Automotive Lifts*. To avoid personal injury or death, always be sure the load has been removed from the platform and that it has been blocked per the specified "Blocking Instructions" section of the Installation & Service Manual.

DANGER!

Qualified personnel only. Only qualified service personnel should perform maintenance and troubleshooting procedures.

DANGER!

Be sure of equipment stability. To avoid personal injury or death, check for stability. If the unit seems unstable, do not operate! Contact *Autoquip* immediately.

SAFETY PRACTICES

DANGER!

Turn off power during inspection & maintenance. To avoid personal injury or death, be sure the power is off and is locked per OSHA Lock-out, Tag-out procedures.

DANGER!

Practice field safety procedures. To avoid personal injury or death, utilize all applicable precautions for steel erection and equipment assembly in addition to OSHA regulations for lock-out, tag-out, etc.

DANGER!

Secure platform and cylinders! Do not remove or disconnect the power unit unless the platform and cylinders have been secured and all hydraulic pressure has been relieved. See “Blocking Instructions” section.

WARNING!

Never run the unit with the gates or doors open! Do not operate unit with doors open or with the interlocks or other safety devices and sensors “defeated” (bypassed)! Serious injury or death could result.

WARNING!

Velocity fuse lock-up requires factory help! Contact your local Vehicle Lift representative or call Autoquip Service Department if hydraulic velocity fuses should lock up.

SAFETY PRACTICES

WARNING!

Secure unit before making static inspections! Make sure the platform is fully lowered and the power is turned off (disconnected at the safety disconnect switch) before performing static inspections. Place signs at all gates, doors, controls, etc. indicating the system is temporarily out of service for routine maintenance per OSHA requirements for Lock-Out, Tag-Out.

WARNING!

Never operate unit when parts are defective! Do not operate this equipment when damaged, substandard or defective parts are in use. Contact an Autoquip Service Representative to rectify all such situations.

WARNING!

Use high pressure hydraulic components only! Never use fittings or hoses that are not properly rated for 3,000 psi service.

WARNING!

Use approved or prescribed procedures only! If any procedure prescribed in this manual cannot be followed or adhered to for any reason, IMMEDIATELY cease what is being done and contact an Autoquip Service Representative for assistance. Autoquip can not foresee the possible misuses of this equipment caused as a result of not following prescribed installation, operation, and maintenance procedures.

SAFETY PRACTICES

WARNING!

The velocity fuse (VF) must be properly installed! The VF is attached directly to the rod port of the cylinder. If the VF is installed improperly, it will not lock up in the event of a catastrophic hydraulic line break.

CAUTION!

Do not run carriage until limit switch is set! If the electrical work is not complete, do not run the carriage all the way to the top until the limits are set.

NOTICE

Use appropriate fluids! Do not use automatic transmission fluid (ATF), hydraulic jack oil, hydraulic fluids, or brake fluids in the power unit or hosing system. Use 5W30 motor oil or other approved fluids only.

NOTICE

Keep power unit filled! Do not run the hydraulic power unit dry. Damage to the pump and motor may result.

NOTICE

Do not operate motor at relief pressure! The motor should not be operated for more than a few seconds when the unit is operating at relief pressure. Longer running times could result in damage to the pump.

NOTICE

Avoid air in the system! The presence of air in the system can lead to a lock-up of the velocity fuses. (Air reacts like a spring when it is compressed.)

SAFETY FEATURES

There are several primary active safety features and devices to help protect personnel, property, and the equipment.

HYDRAULIC VELOCITY FUSES

Each hydraulic cylinder has a hydraulic velocity fuse (HVF) installed in the cylinder port. These HVFs are installed in the predetermined hydraulic oil flow velocity as the oil returns to the reservoir. They do not affect incoming oil. Should a catastrophic rupture or breach occur in the hydraulic system and oil flows through the breach that exceeds the HVF rating, the HVF will trigger and lock up. This lock up will occur with one to two inches of downward movement of the platform carriage.

NOTE: Air in the system will also cause a lock up. Air acts like a spring when compressed. To remove air from the system, see “Air Bleeding Procedures” in the General Maintenance section.

NOTE: Small fitting or hose leaks will not trigger the HVFs. In an air-free system, the breach must be large enough to cause an uncontrolled or destructive lowering speed. Should a triggering and lock-up occur, it can only be released by applying hydraulic flow and pressure to a functional system.

SAFETY RELEASE BYPASS VALVE (SRBV)

The SRBV is a part of the hydraulic system. Should the system pressure exceed the predetermined pressure setting, the SRBV will bypass the pump output back to the oil reservoir. The SRBV is factory set to the proper pressure, which will prevent damage to the mechanical, hydraulic, and electrical systems due to overloading, obstruction, or other circumstances.

MOTOR STARTER OVERLOADS (MSO)

These are current sensing devices that are located in the two legs of the electric motor primary power circuit (208/230 volt). They protect the motor from excessive current draw if it becomes overloaded, experiences low line voltage, or has a short circuit. Should either leg sense an over-current situation the element will heat up and trip the heat sensitive device housed in the motor starter coil circuit. Power is removed to the coil and the two line power contacts are opened in the motor primary power circuit. This will stop the motor from rotating until the overloads are reset and/or the fault is cleared which caused the trip condition.

NOTE: The MSO will only affect the “UP” circuit. The platform carriage can be lowered if the MSO trips.

SAFETY FEATURES

POWER SUPPLY SECONDARY FUSE

This fuse is attached to the electrical power supply and protects the 24 volt control circuit from damage should a fault occur which would result in excessive electric current flow. Should the fuse activate (blow) it will prevent the operation in either direction and the interlock circuit will not operate (doors won't lock). These fuses are located in the control enclosure.

DANGER!

High voltage! Repairs should only be performed by a qualified electrician or service technician and OSHA requirements for Lock-Out, Tag-Out must be followed!!

SAFETY INTERLOCKS/LATCHES-GATES OR DOORS
(optional – used where applicable)

These are electro/mechanical devices that prevent operation of the vehicle lift when the gates or doors are left open on any level. They also prevent the gates or doors from being opened whenever the lift is in motion.

WARNING!

Never run the unit with the gates or doors open! Do not operate unit with doors open or with the interlocks "defeated" (bypassed)!

BEVELED TOE GUARDS (BTG)

Fixed mechanical toe guards are welded around the perimeter of the top canopy at an angle of approximately 30 degrees from vertical to protect toes during operation as this deck descends past the edge of the garage floor into home position.

KEY LOCK-OUT STATION

Separate electrical device which requires a key to turn the control system "On". This station is shipped loose and is wired in the control voltage circuit to prevent unauthorized operation of the lift.

E-STOP STATION

Emergency Stop "panic" button which, when pushed, removes electrical power from the control circuit and immediately stops lift movement. E-Stop stations can be located at upper or lower level locations, and must be manually reset to continue operation.

SAFETY FEATURES

DIGITAL KEY PAD SECURITY STATION

A key pad security station which requires a code to turn the control system “On”. This station is shipped loose and is wired in the control voltage circuit to prevent unauthorized operation of the lift. Authorized code times out after 5 minutes and must be re-entered.

PLATFORM MOVEMENT ALARM

An audible and/or visual signaling device which will activate any time the “UP” or “DOWN” push button is pressed to notify anyone in the area that the lift is being operated. It will continue to signal alarm if the platform is left in any position other than the fully raised or fully lowered positions for more than five seconds.

MOTION DETECTION

Sensors are mounted above and just outside each unprotected edge of the lift platform to detect motion in the lift operating zone outside the line of site of the operator. If any motion is detected, an electrical contact opens in the control circuit and the operator will not be able to operate the lift until the timer resets after 2 minutes.

REMOTE CAMERAS

Digital cameras are mounted at the lower level to give the operator a complete view of the lift operating zone which is outside his/her line of sight. One (1) monitor is located at the operator station to be able to watch all zones during lift operation.

VEHICLE-PRESENT SENSORS

(optional)

This state of the art sensor is mounted underneath the canopy and senses when a vehicle is on the canopy. If a vehicle is sensed, the sensor opens a contact in the control circuit and operator will not be able to activate the “UP” button to raise the deck .

ADJUSTABLE WHEEL STOPS

(optional)

These mechanical devices can be adjusted to help ensure that a vehicle being parked on the lower deck for storage is located completely within the perimeter of the deck so as to prevent damage to the vehicle or the lift as the vehicle is lowered from the upper level to the lower level.

ULTRASONIC VEHICLE POSITION INDICATOR

(optional)

This simple, electronic device mounts to a wall in front of the lift and can be adjusted to ensure that a vehicle being parked on the lower deck for storage is located completely within the perimeter of the deck so as to prevent damage to the vehicle or the lift as the vehicle is lowered from the upper level to the lower level.

LABEL IDENTIFICATION

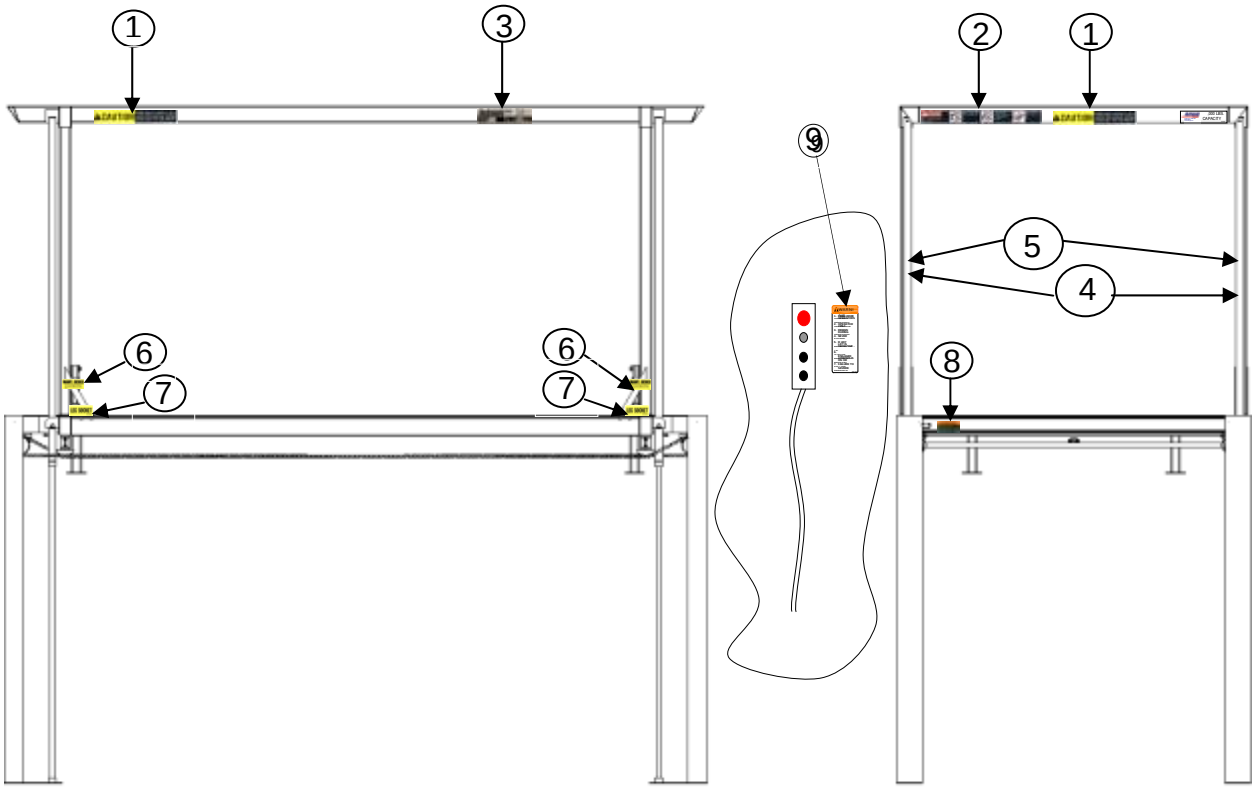


Figure 1 Label Placement Diagram

4-Post Subterranean Lift			
Item No.	**Qty**	**Description**	**Part No.**
1	4	Caution! Familiarize Yourself With Operators Manual	36401487
2	2	Danger – Do Not Put Hands or Feet…	36430050
3	2	*Autoquip* Serial Number Nameplate	36401560
4	4	*Vasari* Logo	36420260
5	4	*Vasari* Capacity	36420270
6	4	Maintenance Device	36400257
7	4	Maintenance Device Socket	36400265
8	1	WARNING! Do Not Tamper	36405695
9	2	Operator Warning Placard (shipped loose)	36403993

LABEL IDENTIFICATION

Note: Labels shown here are not actual size.

Figure 2 Label 36401487

Figure 3 Label 36430050

Figure 4 Label 36401560

Figure 5 Label 36420260

LABEL IDENTIFICATION

Figure 6 Label 36420270

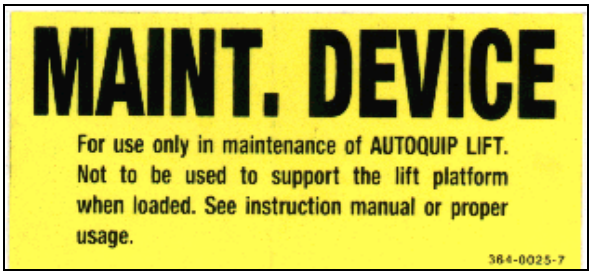


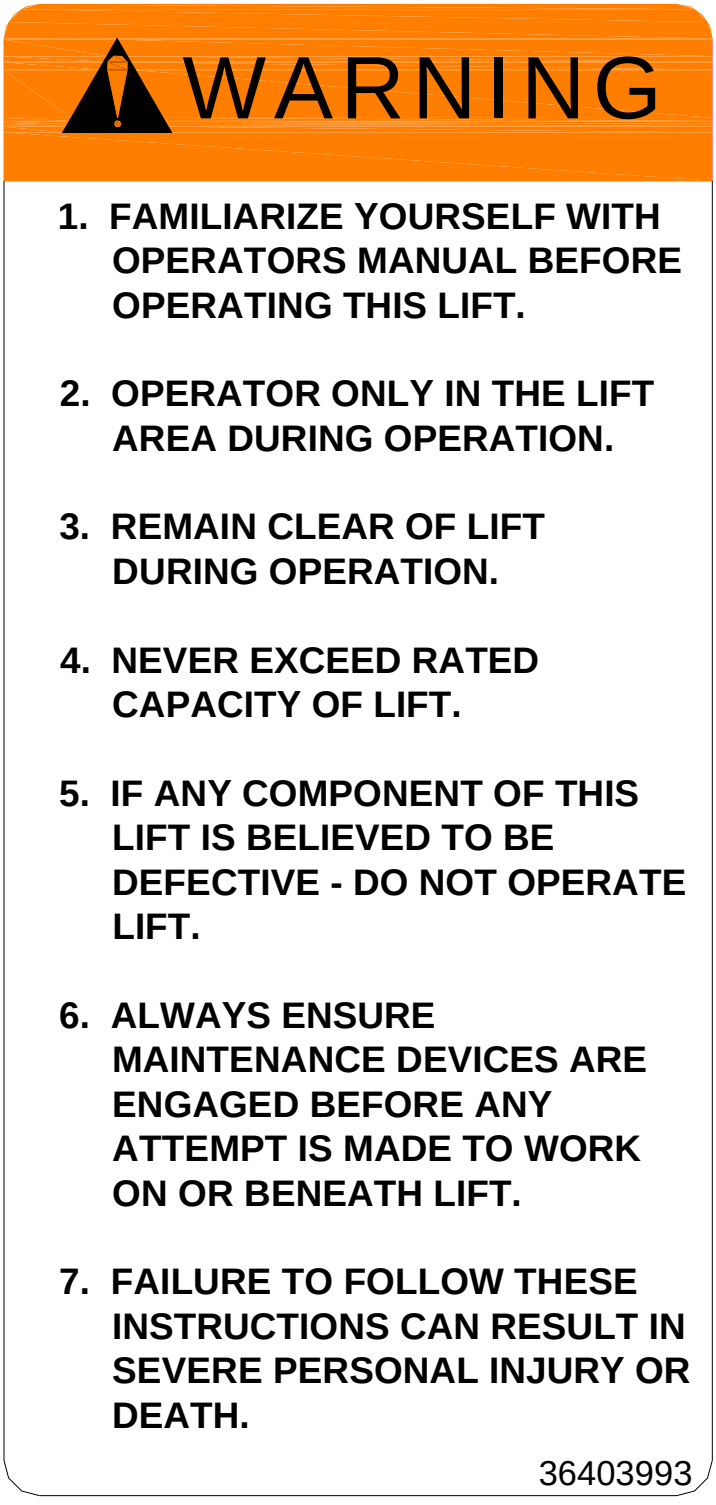
Figure 7 Label 36400257

Figure 8 Label 36400265

Field-locate & apply one "WARNING – Do Not Tamper" label adjacent to (within 6"-12") each sensing device (limit switches, door status switches, door interlocks, etc.) in a location that is visible to the operator.

Figure 9 Label 36405695

LABEL IDENTIFICATION



Field-locate & apply this decal adjacent to the lift at each level, ideally in the vicinity of the operator pushbutton station.

Figure 10 Label 36403993

SPECIFICATIONS

General Specifications:

VL4 – Subterranean 4Post Lift

Model	Travel (in)	Lifting Capacity (lbs.)	Lowered Height (in)	Standard Platform (Vehicle Clearance) (inches)	Maximum Axle Load Over End (lbs)	HP 230V 1ph	Up Speed (sec)	Down Speed (sec)	Maximum Floor Pressure (psi)	Total Shipping Weight (lbs.)
96VL470	96	7,000	24	108 x 216 (100W x 90H)	4,000	5	78	40	111	7,500
108VL470	108	7,000	24	108 x 216 (100W x 102H)	4,000	5	88	46	112	7,600
120VL470	120	7,000	24	108 x 216 (100W x 114H)	4,000	5	86	34	113	7,700
132VL470	132	7,000	24	108 x 216 (100W x 126H)	4,000	5	95	37	114	7,800
144VL470	144	7,000	24	108 x 216 (100W x 138H)	4,000	5	105	53	115	7,900

This lift is designed to accommodate personal vehicles with normal axle loads and weight distributions for such. Standard parking lifts are not designed to withstand single axle loads greater than 4,000 lbs. at the front edge of the lift or a weight distribution that exceeds more than a 60/40 difference in total vehicle weight from front to back.

This lift is not an automobile elevator and is not designed to meet the requirements of ASME A17.1 – *Safety Code for Elevators and Escalators*.

WARNING!

ABSOLUTELY NO RIDERS! Parking lifts are designed for the sole purpose of transporting vehicles between floor elevations. At no time should it be used to transport people. Death or serious injury could result.

BLOCKING INSTRUCTIONS

DANGER!

Never go under a platform! To avoid personal injury or death, always be sure the load has been removed from the platform and that it has been blocked from underneath!

NOTE: The Maintenance Devices are designed to rest on the garage floor at the upper level, therefore maintenance and inspection can be safely performed only with the lift in the fully raised (on the maintenance devices) or fully lowered (on the landing legs) positions.

1. Send the lower deck to the fully raised position, then remove all four (4) maintenance devices from their stored location and place them in the fully engaged position (see **Fig. 11**).

2. Remove all load from the unit.

3. Lower the empty deck until ALL four (4) maintenance devices make contact with the surrounding floor.

4. Lock out and tag the electrical disconnect

5. As an added level of protection when using the locking devices at floor level, it is recommended that a secondary set of stops be placed underneath the lower deck such as four (4) 4" x 4" treated wood posts that have been cut to the appropriate length to place one end on the floor and wedge the other end between each corner guide angle and the lift deck.

DANGER!

To avoid personal injury or death, check the stability of the supports. If there is any chance of the support tipping or otherwise not providing a safe and stable condition, do not go under the platform! Contact an *Autoquip* service representative for assistance!

6. When inspection or repair is complete, remove 4" x 4" timbers from beneath the lift.

7. Unlock electrical disconnect, raise lift to fully raised position.

8. Return maintenance devices to stored position.

BLOCKING INSTRUCTIONS

DANGER!

To avoid personal injury or death, turn off the power and lock out the power at the primary power disconnect switch per OSHA Lock-Out, Tag-Out requirements before service or maintenance is performed.

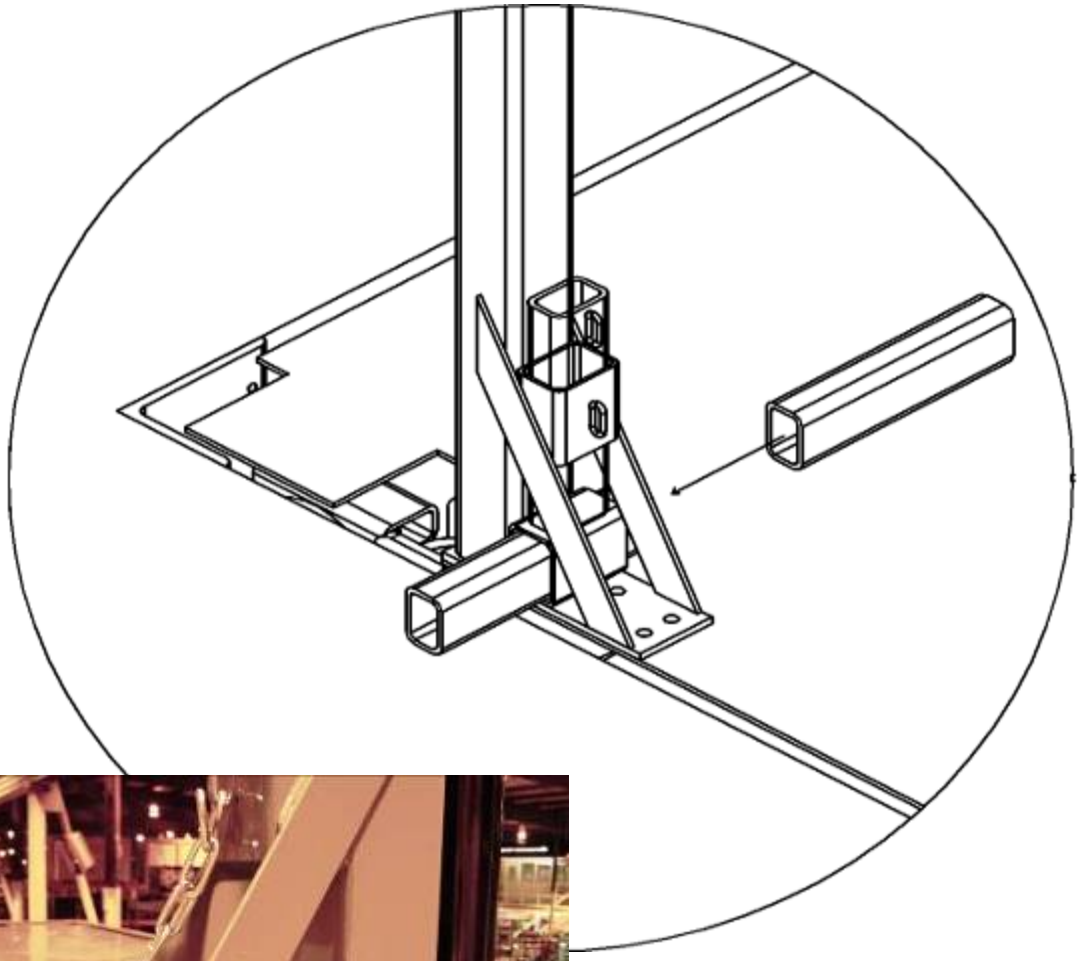


Figure 11 Maintenance Devices – Typical (4) Corners

INSTALLATION INSTRUCTIONS

THE TOOLS REQUIRED FOR INSTALLATION

Listed below are some of the tools typically needed to install a vehicle lift in a professional and prompt manner. Individual site situations and a basic variation in the types of units may dictate the need for additional items.

Welding Machine and Equipment
Cutting Torch with Full Tanks
Fire Extinguisher
Forklift or Small Crane
Nylon Slings
Saw Horses
Cables or Hook Chains with 1,000# Cap.
Disk Grinder
"C" Clamps – Large (18")
Socket Set (1/2" drive, sockets to 1 1/8")
Pinch Bar
Hammer Drill & Bits for 1/4", 3/8" and 1/2" anchors
Extension Cords
Hack Saw, Sawzall, or Portable Band Saw
Chain Pulling Tool
Drill and Drill Bits
Sledge Hammer
Open or box end wrench
Drift Punch
Carpenter's Square
Chalk Line
Plumb Bobs
Laser Level
25' Measuring Tape
Broom
Torque wrench

The following supplies will also be needed:

*Concrete anchors sized for the required minimum pullout of the corner guide floor plates and connection to the garage floor opening. Refer to the approval drawing since the size of the anchors can vary for each installation.

*Shim stock for the guide angle floor mounting & wall mounting

*Hydraulic oil (see oil recommendations and tank capacity in the "General Maintenance" section)

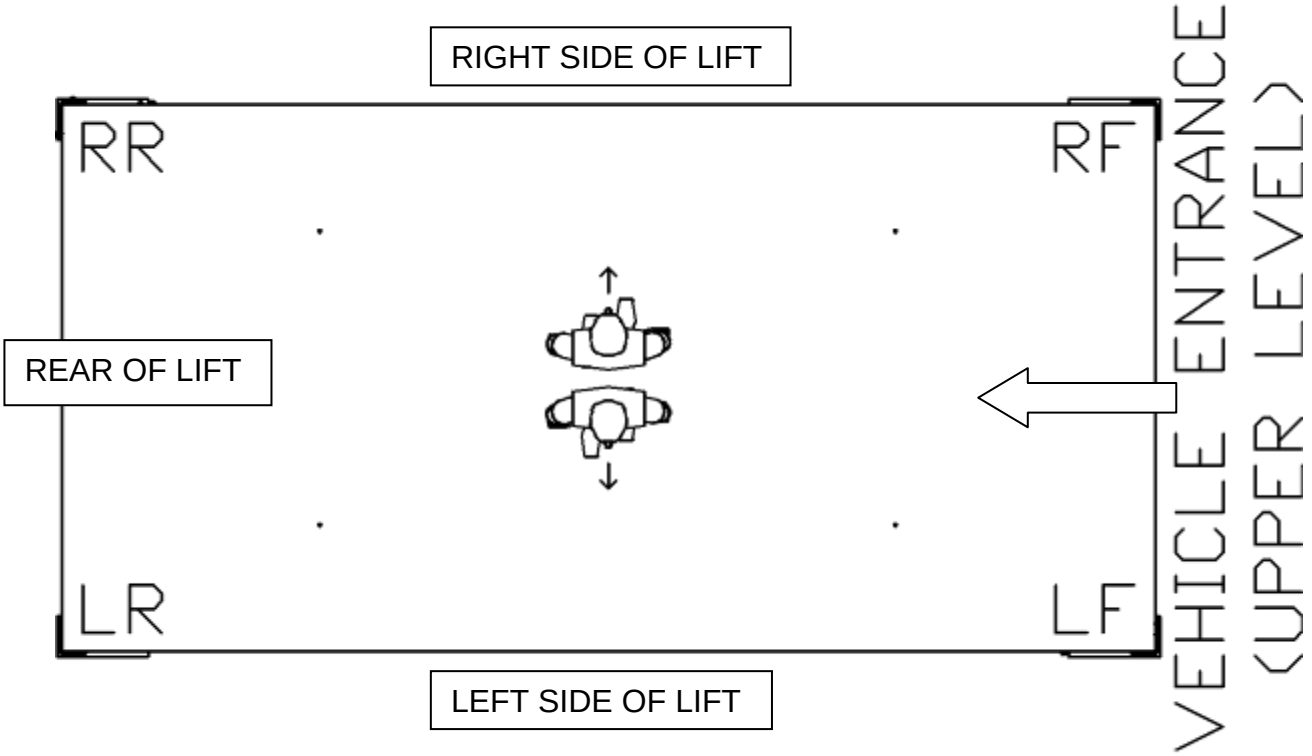


Figure 12 Corner Reference – For Clarity Throughout the Install Process

INSTALLATION INSTRUCTIONS

GENERAL (Reference the General Arrangement Drawing – sent separately)

Please refer to the General Arrangement (GA) or Record Drawings that have been shipped with the lift. **These drawings have notes and measurements that MUST be checked before installation of the lift.** The drawings will show how the lift should be arranged and how it should be installed specifically for this application. **The installation may begin only after all of the measurements have been checked and verified** (floor-to-floor distance, pit width/length/depth, floor opening, overhead clearance, etc.).
NOTE: All illustrations contained in this manual are for reference purposes only. Specific applications and site conditions may require different anchoring and bracing procedures. The ultimate responsibility for the anchoring and bracing rests with the installation crew.

A. MOUNTING THE VERTICAL (CORNER) GUIDE ANGLES (Reference Fig.13)

Items needed for this step:

Qty	Description
4	Corner Guide Weldments

1. Mount each corner guide weldment in its appropriate corner and at the appropriate distances apart as shown in the GA Drawing. These guide angles should **NEVER** protrude above the garage/upper floor level. In the cases where the garage floor may slope down from front to back, always install the back (lower elevation) guide angles so that the top of the angle is flush with the top of floor, and then set the front (higher elevation) angles to match the elevation of the back angles.
   NOTE: Guides angles must NEVER be cut/shortened in the field!! If the guide angles appear to be long, double check the overall depth of the pit – then call the factory for assistance.

2. Double-check all clearances (side-to-side & end-to-end) between the guide angle surfaces, then attach each guide into the wall and floor using the required number of lag bolts for each – sized to withstand the pull-out force specified on the GA drawing. Hand snug these anchor bolts only, do not tighten at this time.

3. Recheck the position of the guides and ensure that they are also plumb, parallel, square, and level (guides must be checked closely for level because pit floors & walls may not be poured level). To maintain proper positioning of the guides throughout lift travel – shim under each foot plate as required to fill any gaps between the foot plate and the floor or the wall plate and the wall which may have been created during the plumb-square-level process.

   NOTE: Guides must be plumb and parallel within 1/8" before proceeding with installation

4. Tighten all concrete anchors to anchor manufacturer's specs.

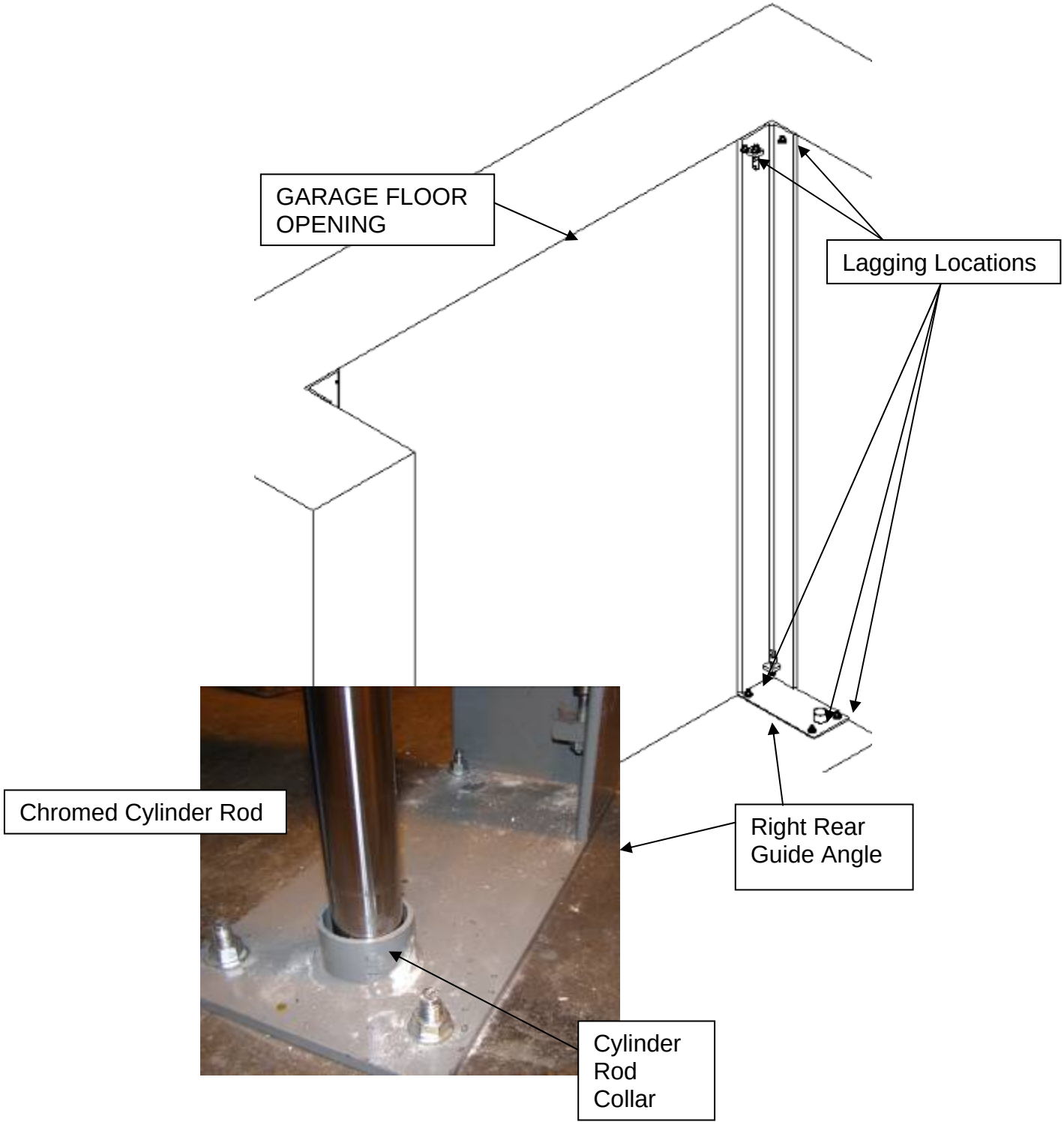


Figure 13 Corner Guide Installation

B. ATTACHING THE CANOPY POSTS (Reference Figure 14)

Items needed for this step:

Qty	Description
4	Square Tube Canopy Post with maintenance device
16	1/2"-13 x 1" Long Hex Head Bolts, Grade 5
16	1/2" Flat Washers
16	1/2" Lock Washers

1. Prior to lowering carriage into floor opening, bolt the four (4) posts into place as shown with the hardware provided. Tighten bolts using 50 ft-lbs of torque.

2. Place the maintenance tubes into their respective maintenance sockets (refer also to "Lift Blocking" section of this manual).

3. Now, the carriage is ready to be lowered into the floor opening, and can safely rest on the surrounding (garage) floor during the remainder of the installation.

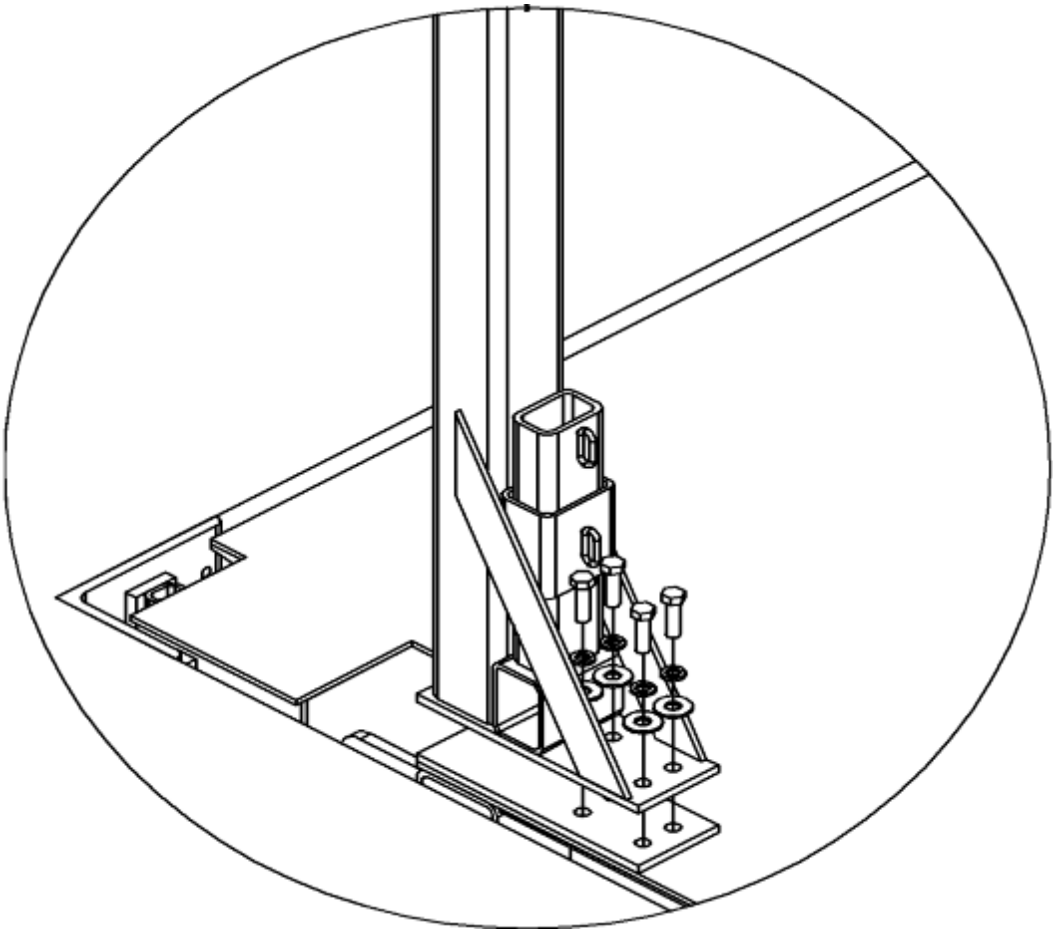


Figure 14 Attaching Canopy Posts – Typical (4) Places

C. PLACING THE LOWER DECK INTO POSITION (Reference Figure 15)

Items needed for this step:

Qty	Description
1	Lower carriage assembly (with sprockets, shafts, bearings, etc.)

1. Place 4 – 6 rigid supports (saw horses, 55 gallon drums, etc.) to adequately support the weight of the carriage and keep it level at an elevation of 2-3 feet above the pit floor to allow adequate access to the underside of the carriage for the remainder of the install process.

2. Using the lifting eye provisions in the deck, lower the carriage slowly into the four corner guides as shown, being careful to keep the carriage level to prevent binding in the guides.

3. Continue to lower until the safety devices are in contact with the supports beneath. Ensure that all supports are stable and that the carriage is centered within the floor opening.

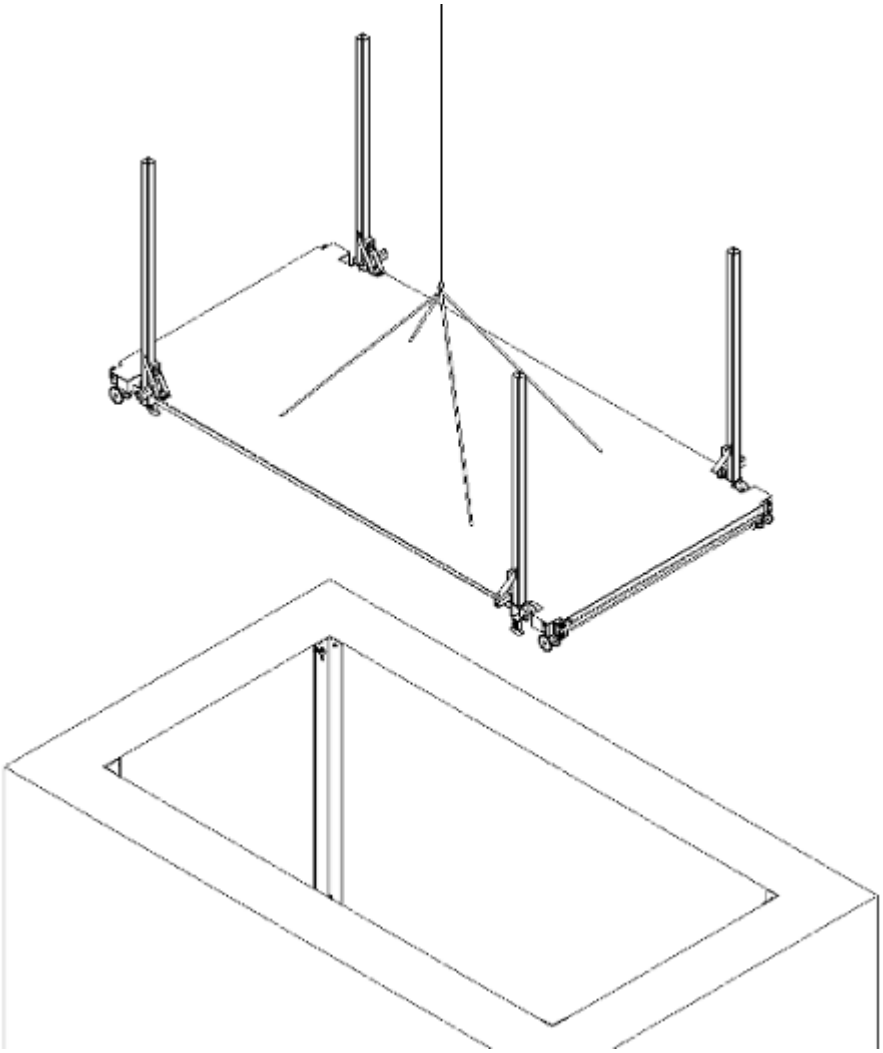


Figure 15 Carriage (Lower Deck) Installation Detail

D. MOUNTING THE LIFTING CYLINDERS (Reference Figures 16)

Items needed for this step:

Qty	Description
4	Ram cylinders with trunnion mounts
8	Trunnion clamp plates
24	3/8"- 24 x 3" Long Socket Head Bolts, Grade 8
24	3/8" Lock Washers

1. While the carriage is being held at grade (garage) level, mount each cylinder by lowering into place from above (with the cylinder rod pointing downward) with the cylinder trunnions in line with the trunnion cut-outs in the carriage clevises. Make sure the cylinder port is facing away from the canopy post.

CAUTION!

You must retain the cylinder rod during this process. When turned rod end down the cylinder rod will extend under gravity and could cause personal injury or equipment damage.

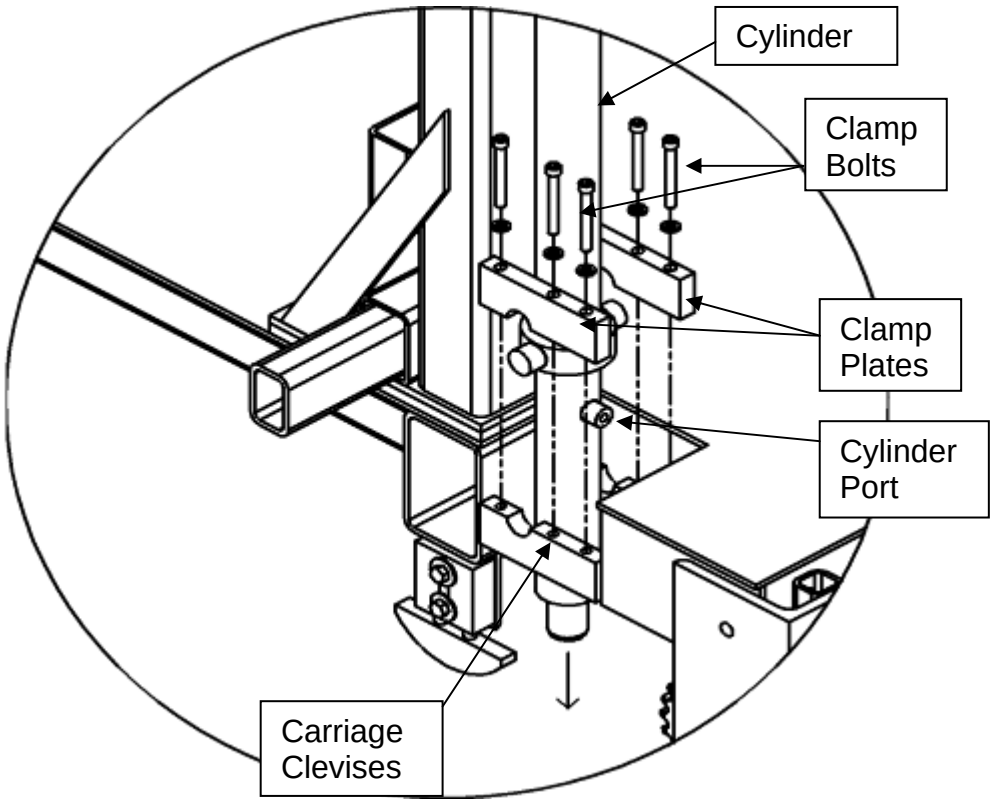


Figure 16A Lowering Cylinders Into Place

2. Once the cylinder trunnions are resting in the carriage clevises, trunnions are clamped into place using the cylinder clamps and hardware provided. Torque clamp bolts to **50** ft-lbs.

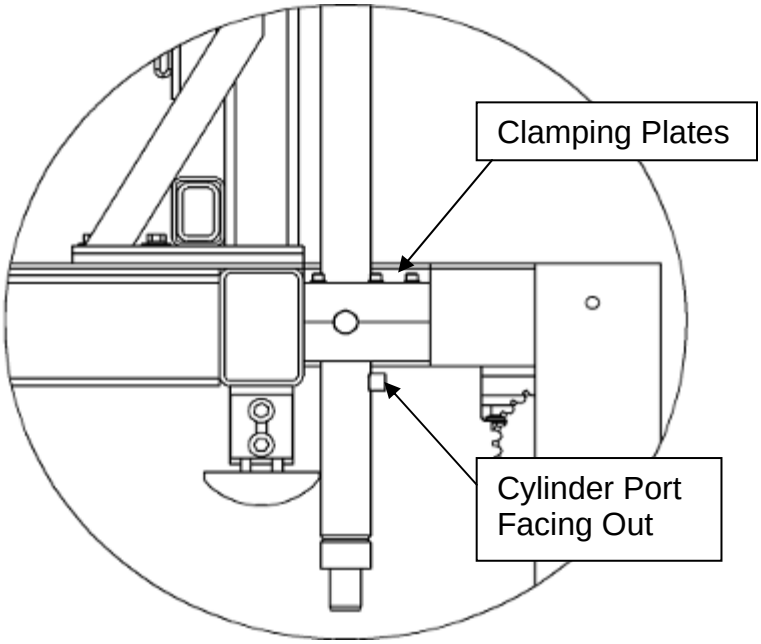


Figure 16B Clamped Cylinder – Side View

3. Remove cylinder retaining clip after cylinder is secured into clevis. After removing bolt from body of cylinder and shipping clip, replace bolt into body of cylinder.

4. Cylinder bleeder screws at top cylinder casings can be loosened (cracked) – but not removed – to allow rods to extend down to basement level and into the collars welded to the corner guide base plates (Ref. **Fig. 13, 24**)

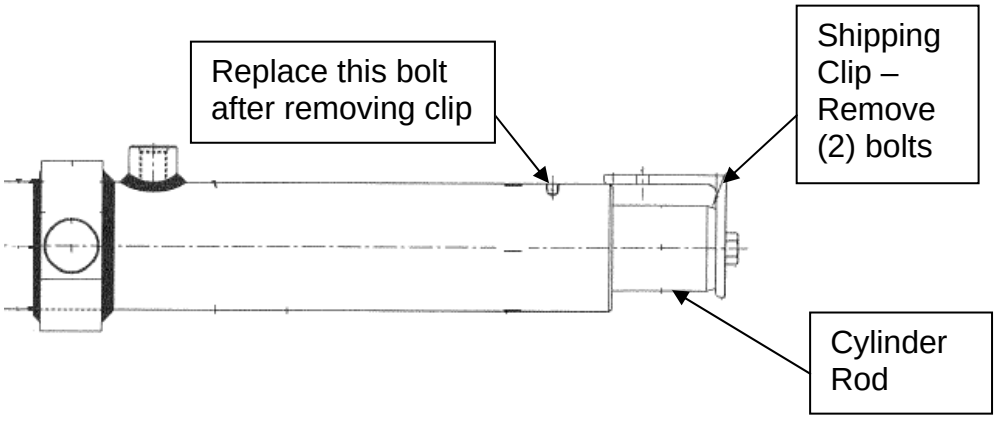


Figure 16C Cylinder Shipping Clip

E. INSTALLING CHAIN EQUALIZATION SYSTEM (Reference Figures 17 - 24)

Items needed from the for this step:

Qty	Description
varies	Boxes of Roller Chain
varies	Master Link Assemblies
8	Chain Tensioning Block
8	1/2" Flat Washers
16	1/2"-13 Hex Nuts

1. **Make sure that the carriage is level before beginning**. If carriage is resting on and/or flush with garage floor, must shim to make level. However, no more than 1" of shimming is allowed – or the sprockets connected to the carriage will travel high enough to interfere with the chain tensioning blocks. If more than 1" of shimming is required to level the carriage at the upper/garage level, the maintenance devices need to be removed and carriage lowered down into the floor opening. Once lowered to an elevation that still leaves working room beneath the carriage, the platform should be blocked level from beneath with rigid supports to provide a safe work environment.

2. Find the boxes of chain & master links, lay out on a clean surface. Assemble/Cut to four (4) equal lengths – then cut each of these in half for splicing when attaching to the lift.

3. Using the hardware provided, attach a chain tensioning block to one end of each half-chain as shown in **Figure 17**.

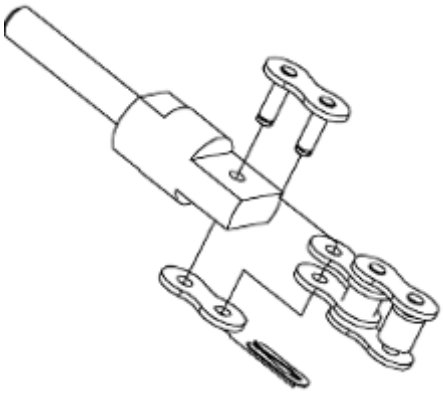


Figure 17 Connecting Chain to Tensioning Block

4. It is recommended that each of the spring loaded chain tensioners mounted beneath the carriage be held in as fully retracted position as possible during the following chain routing procedure (18" C-clamps, etc.).

   OUTSIDE CHAINS (both long sides of lift – refer again to **Figure 12** for orientation)

5. As you turn and face the two long sides of the lift, connect one half-chain each to lower lugs near the BOTTOM of the Right Rear (RR) and Left Front (LF) corner guide assemblies with the hardware provided (refer to **Figure 18**).

Figure 18 Connection to Lower Lug – Outer Chain

6. From the lower lugs, chain must be routed up over the outside sprocket of the double sprocket set mounted to the synchronizing shafts mounted beneath the carriage. Slack must be minimized in this run of chain.

7. Again, as you face the two long sides of the lift, connect one half-chain each to upper lugs near the TOP of the Right Front (RF) and Left Rear (LR) corner guide assemblies with the hardware provided (refer to **Figure 19**).

Figure 19 Connection to Upper Lug – Outer Chain

8. From the upper lugs, chain must be routed down around the outside sprocket of the double sprocket set mounted to the synchronizing shafts mounted beneath the carriage. Slack must be minimized in this run of chain.

9. Route the chains beneath the tensioners as shown in **Figure 20A** while bringing the ends of the chain halves together near the center of the chain path. Remove as many links as possible to maximize tension in the chain – while making sure that Inside and Outside chain paths have an equal number of links between the sprockets.

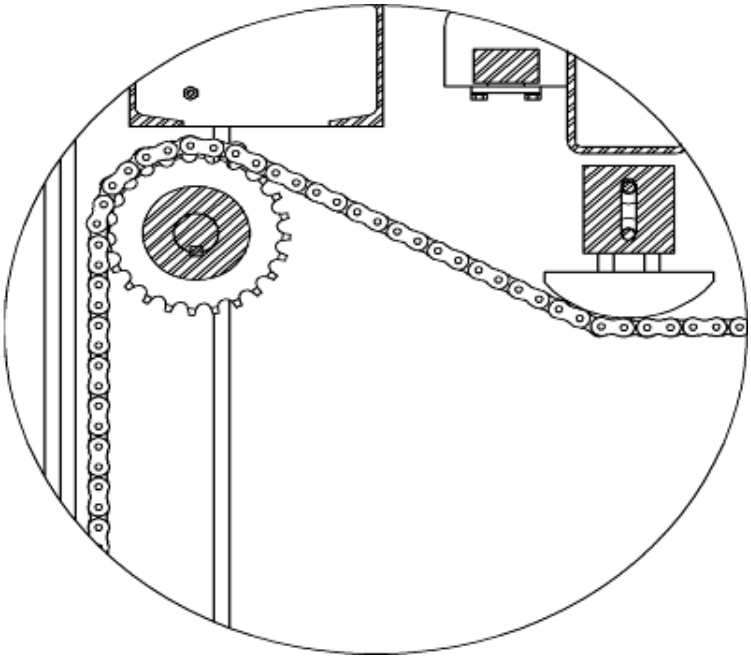


Figure 20A Routing Chain Beneath Spring Tensioner – Outer Chain

10. **(Applicable Only to Carriages longer than 216")** Route the chains over the mid-span tensioning arms for added chain support and to maximize contact of chain with sprockets (see **Figure 20B**). Tighten tensioning arms as needed to remove slack.

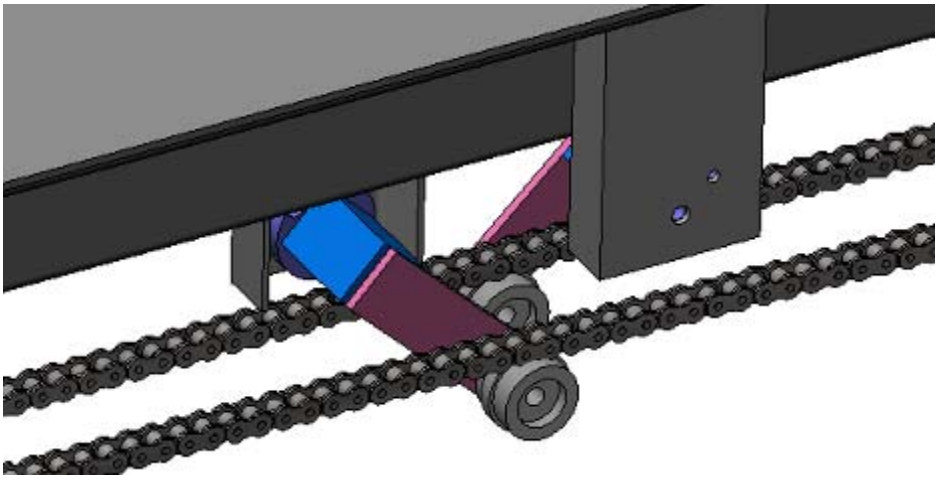


Figure 20B Tensioning Arms – for Mid-Span Support

11. Use a chain puller to bring and hold the two chain halves together while connecting them with chain master links (see **Figure 21**).

Figure 21 Chain Puller – To Connect Chain Halves

INSIDE CHAINS (both long sides of lift – refer again to **Figure 12** for orientation)

12. Basically, repeat steps 5 through 10, except that for the inner chain path - chain attaches to upper lugs located at the TOP of the Right Rear (RR) and Left Front (LF) corner guides (refer to **Figure 22**), and to lower lugs near the BOTTOM of the Right Front (RF) and Left Rear (LR) corner guide assemblies (refer to **Figure 23**). assemblies with the hardware provided

Figure 22 Connection to Lower Lug – Inner Chain

Figure 23 Connection to Upper Lug – Inner Chain

ADJUSTMENTS

13. When complete, the path for both chains should look like **Figure 24**.

14. Remove whatever was holding the spring tensioners closed/retracted, and allow them to extend against the chain.

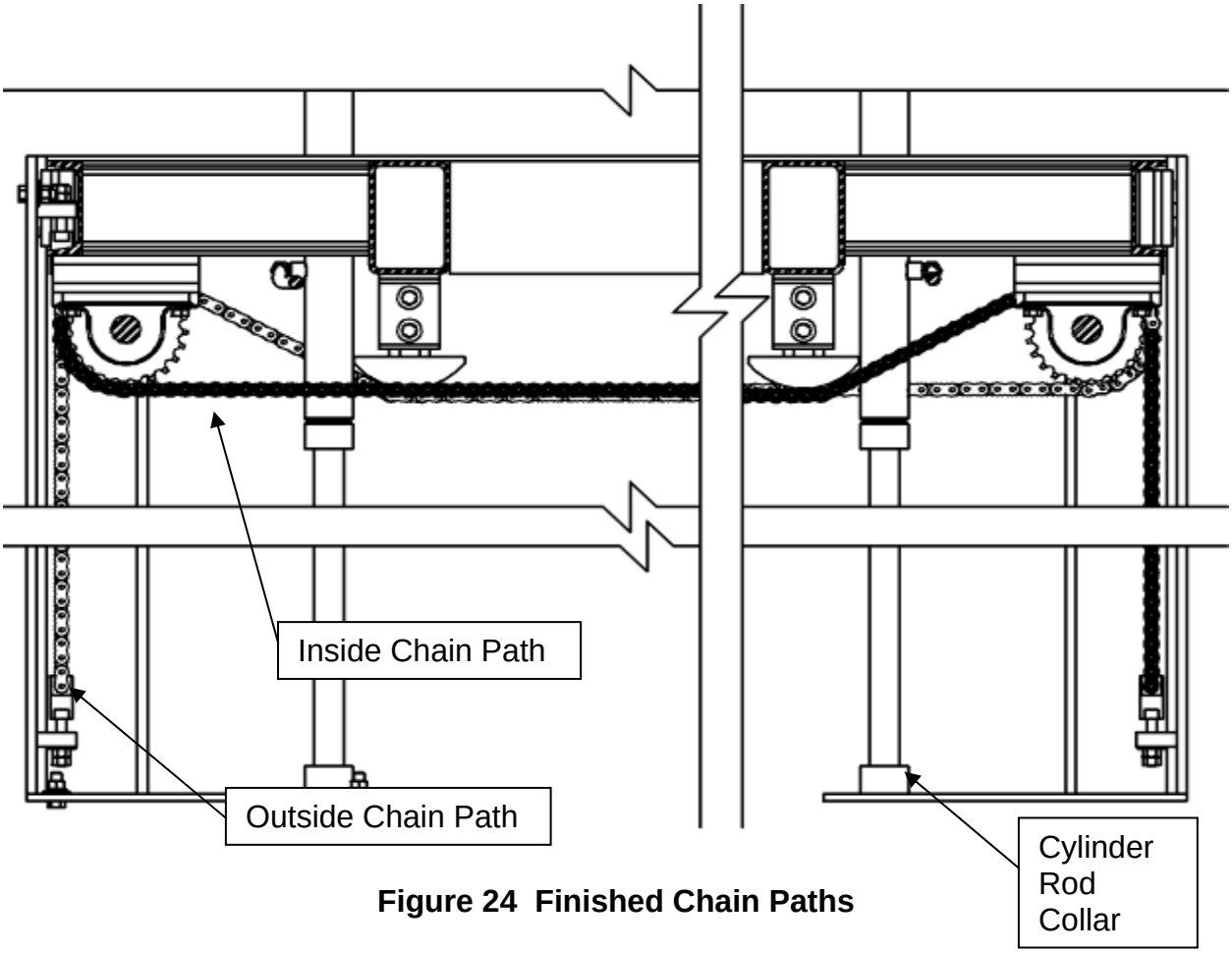


Figure 24 Finished Chain Paths

15. Make sure there is at least 1/8" running space between the cylinder casings and the synchronization chains that run on either side of the cylinders (see **Figure 28**).

16. To adjust proximity of the chains with relation to the cylinder, the sprockets must be moved by using the following procedure.

F. ADJUSTMENT OF SPROCKET LOCATIONS (Reference Figure 25)

TO LOOSEN

1. Loosen and remove both set screws.
2. Take one of the removed screws and thread it into the Push screw threaded location.
3. Loosen bushing by tightening the Push screw down into the set screws.

TO ADJUST

1. Move/gently tap bushing & sprocket along keyway to desired location.

TO TIGHTEN

1. Thread both set screws back into the two set screw holes that are 180 degrees apart from one another.
2. Alternately torque the set screws to **280** in-lbs.
3. As required, hammer large end of bushing (but do not hammer bushing directly – place a piece of wood or other shock absorbent material between hammer and bushing).
4. Repeat steps 2 and 3 until torque wrench reading, after hammering, is the same as before hammering.
5. Fill Push screw hole with grease to prevent rusting of threads.

NOTICE

The use of Anti-Seize lubricant on tapered cone surfaces, or on bolt threads, may result in damage to sprockets and is grounds for voiding all warranties.

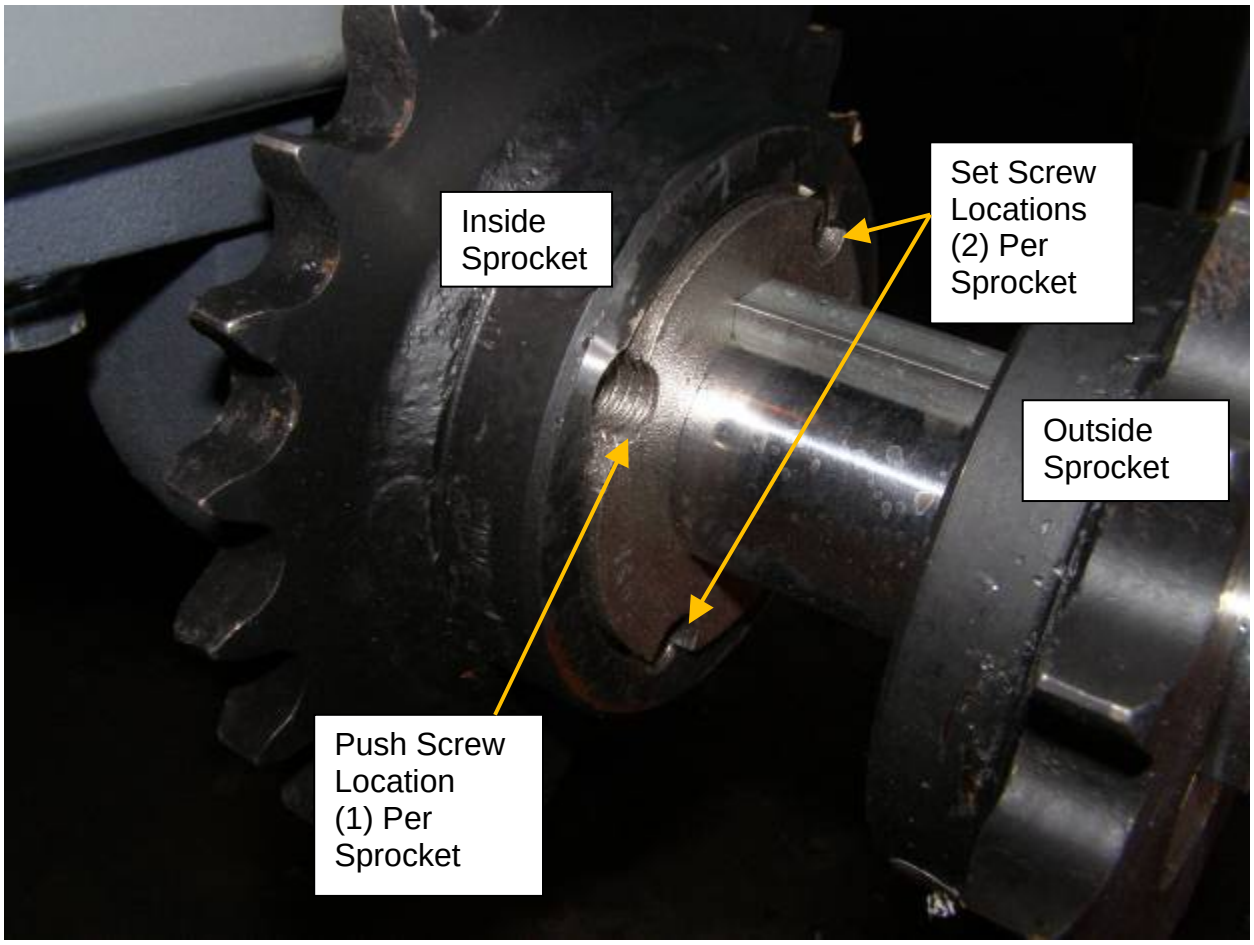


Figure 25 Adjusting Sprocket Location

G. HYDRAULIC INSTALLATION DETAILS (Reference Figures 26 thru 28)

Items needed for this step:

Qty	Description
4	SAE-6 Velocity Fuses
4	SAE-6 X JIC-8 Straight
3	JIC-8 Hydraulic Tee Fittings
1	JIC-8 Female Union
4	#10-24 x 2-3/4"L SHCS and hardware
2	1/2" High Pressure Hose (approx. 54" long – exact length varies)
1	1/2" High Pressure Hose (approx. 36" long – exact length varies)
1	1/2" High Pressure Hose (approx. 78" long – exact length varies)
1	1/2" High Pressure Hose (approx. 186" long – exact length varies)
varies	Hose Loom Clamps and Tek Screws

1. Install a hydraulic velocity fuse onto each cylinder as shown in **Figure 26**.
    a. Inspect cylinder and velocity fuse to ensure that male and female port threads and sealing surfaces are free of burrs, nicks and scratches, or any foreign material.
    b. Lubricate O-ring with light coat of system fluid or a compatible lubricant to help the O-ring slide smoothly into the port and avoid damage.
    c. Back off lock nut as far as possible. Make sure back-up washer is not loose and is pushed up as far as possible.
    d. Screw velocity fuse into port until the back-up washer contacts face of the port. Do not over tighten, **over tightening may damage washer.**
    e. Align the port of the velocity fuse to face inward. Do so by unscrewing the velocity fuse by the required amount, but do not unscrew by more than one full turn.
    f. Using two wrenches, hold velocity fuse in desired position and tighten locknut to 420 in-lbs.
    g. Inspect to ensure that O-ring is not pinched and that washer is seated flat on face of port.

WARNING!

The velocity fuse (VF) must be properly installed! If the VF is installed improperly, it will not lock up in the event of a catastrophic hydraulic line break!

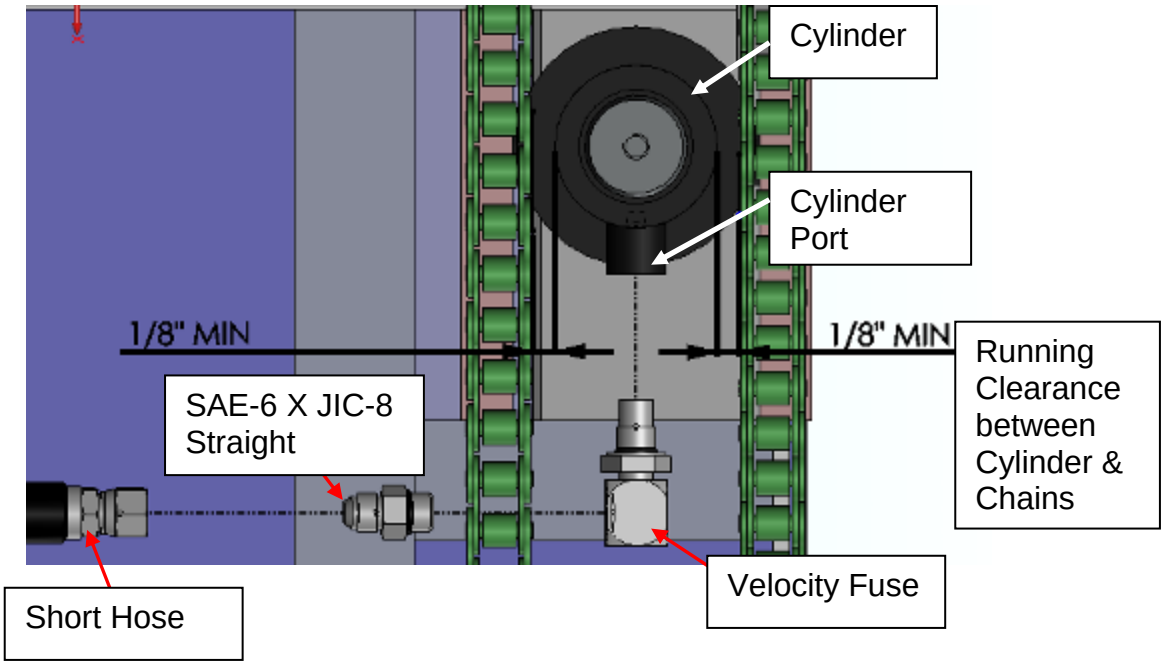


Figure 26 Velocity Fuse Installation – Top View

2. Install SAE-6 X JIC-8 Straight into velocity fuse as shown in **Figure 26**.
   a. Inspect components to ensure that male and female port threads and sealing surfaces are free of burrs, nicks, and scratches, or any foreign material.
   b. Lubricate O-ring with light coating of system fluid or a compatible lubricant to help the O-ring slide past the port entrance corner and avoid damaging it.

   Hold velocity fuse with a wrench and use second wrench to screw fitting into port and tighten to **420** in-lbs.

3. Install the one (1) 186"L (approx.) 1/2" hose and the four (4) shorter 1/2" cylinder hoses beneath the carriage as shown in **Figure 27** using the fittings and hose clamps provided. Install all hoses, tees and union underneath carriage by:
   a. Tighten fitting lightly with a wrench (approximately **30**in-lbs.)
   b. Make reference mark on both fittings.
   c. Tighten fitting by turning two flats or 1/3 of a turn.
   d. Check reference marks to ensure fitting has been turned two flats or 1/3 turn.

   NOTE: A flat is referred to as one side of the hexagonal nut and equates to 1/6 of a turn.

   NOTE: Do not use Teflon tape at connections.

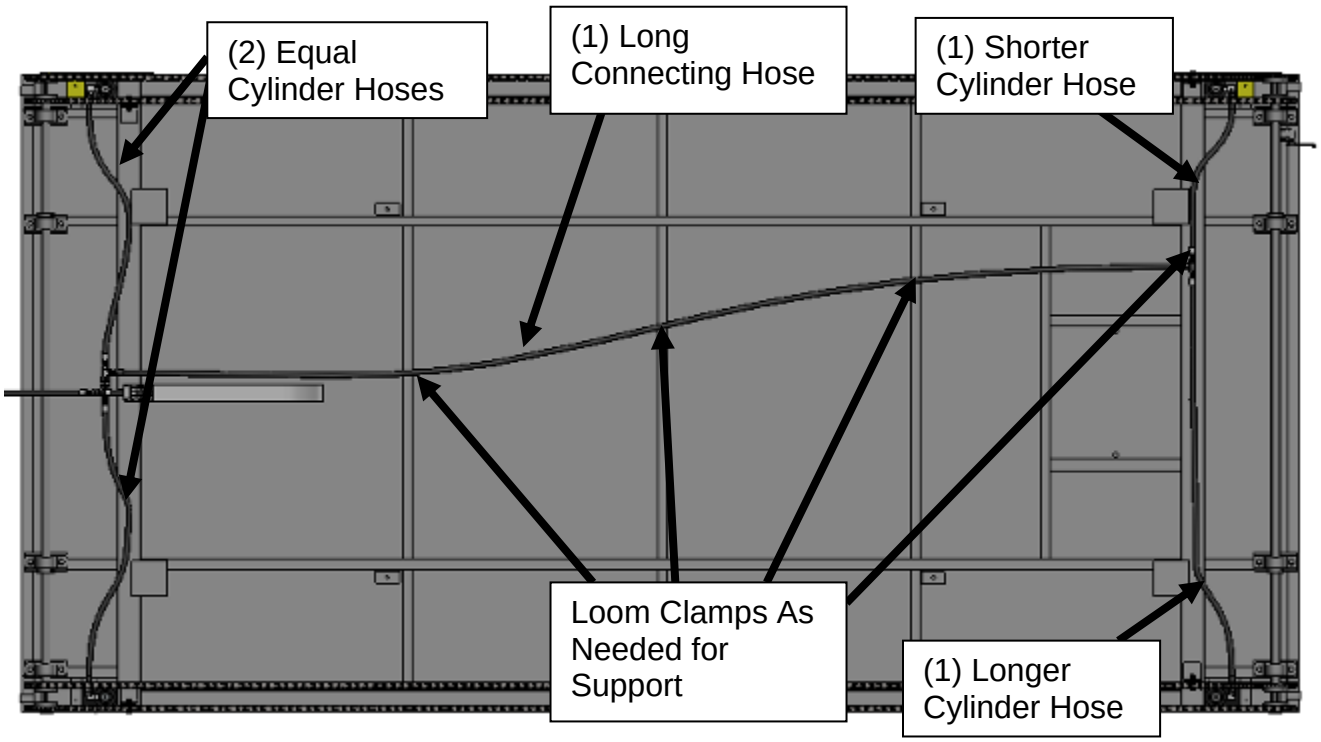


Figure 27 Mounting of Hose Beneath Carriage

4. Attach the flex track to the cross tube using the four (4) supplied #10-24 SHCS and hardware as shown in **Figure 28.**.

5. Connect hoses from the Flex Track to the hydraulic tees mounted to the underside of the carriage as shown in **Figure 28.**

6. Final-locate the Flex Track and bolt to the floor in the location & orientation shown in **Figures 29A & 29B** – with the inlet connection facing the hydraulic supply line. This location is critical as it provides the necessary clearance with all structural members beneath the carriage, and allows hosing to be connected without crushing or kinking during lift operation. Final routing of the Flex Track between the carriage and the floor should look like **Figures 29C**.

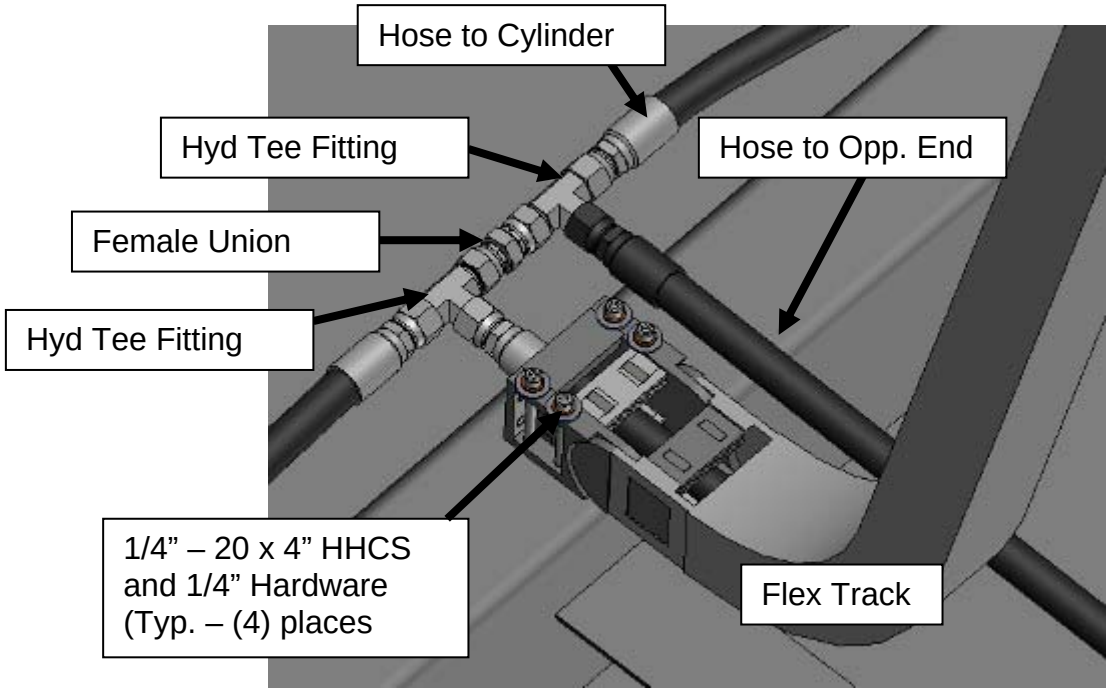


Figure 28 Hosing Between Flex Track and Tee

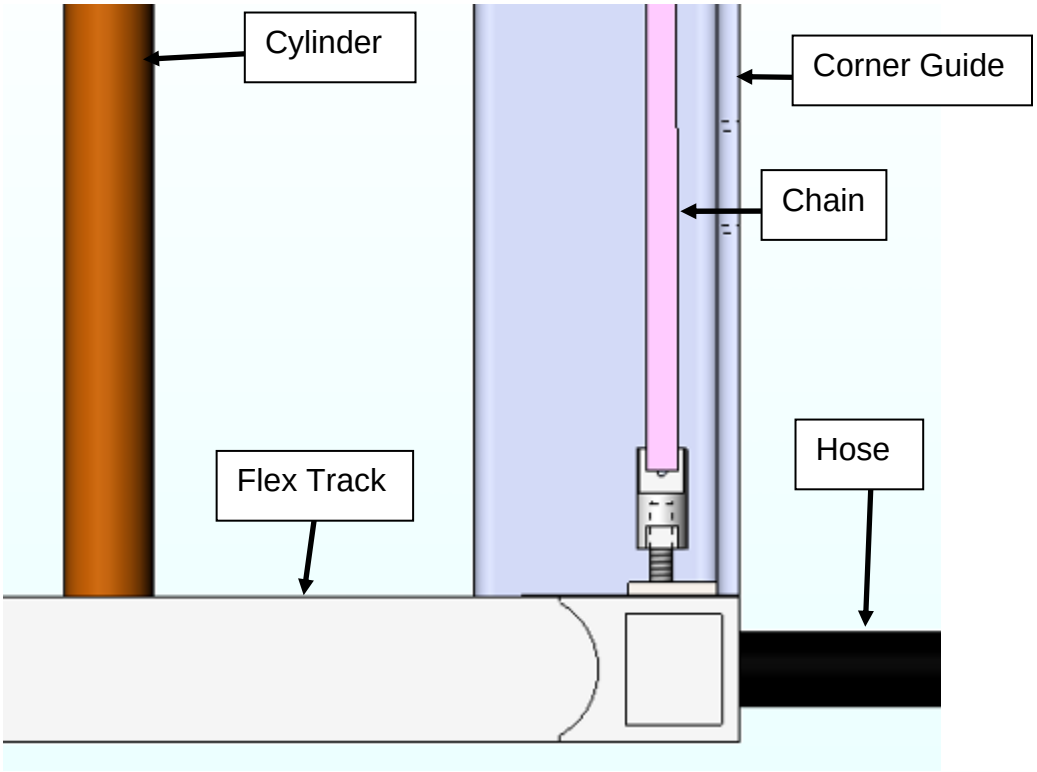


Figure 29A Flex Track Location – Floor (Side View)

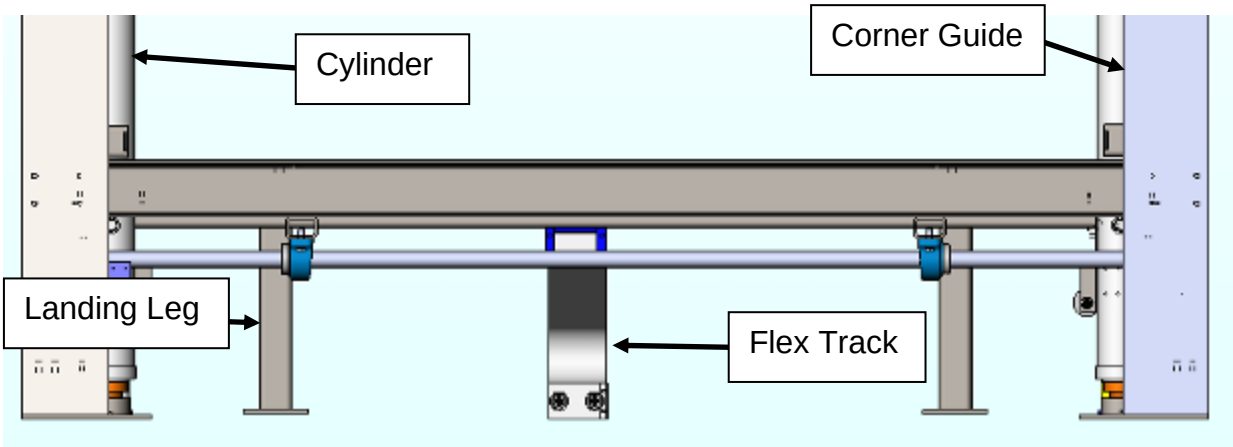


Figure 29B Flex Track Location – Floor (End View)

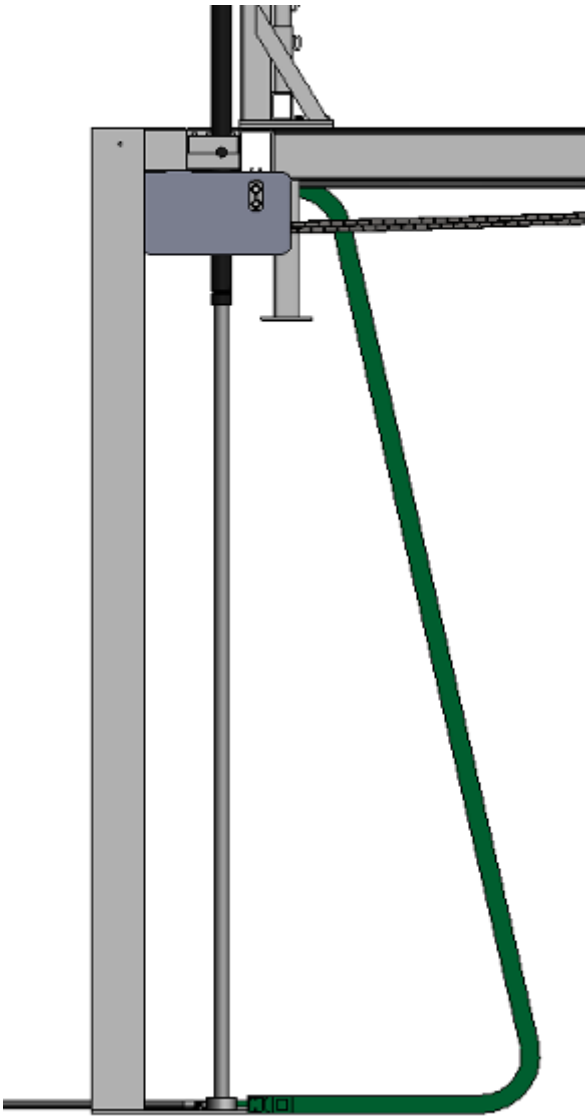


Figure 29C Final Routing of Flex Track

H. MOUNT POWER UNIT & CONNECTING HOSE (Reference Figures 30 & 31)

Items needed for this step:

Qty	Description
1	Hydraulic Power Unit
1	1/2" x 240”L High Pressure Hose
1	JIC-8 Male Union

1. Locate the power unit as close to the lift as possible (while meeting all local building codes), and fill with oil. Do not over-fill! The oil level should be approximately 1-1/2” from the top of the tank (See “Oil Specifications” in the General Maintenance section).

2. Install the 1/2" x 240” high pressure hose from the pressure outlet on the power unit (1/2” JIC fittings) to the flex track on the lower level floor. Use the fittings shown in **Figure 30** to transition from the 1/2" power unit hose to the 1/2” flex track hose.

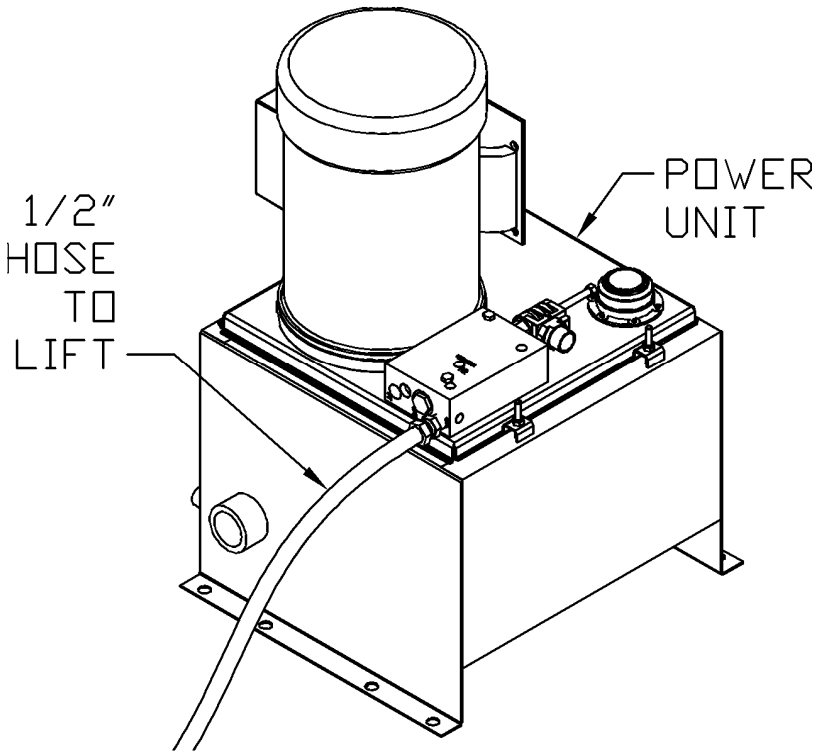


Figure 30 Standard Power Unit – 5HP/230VAC/1ph

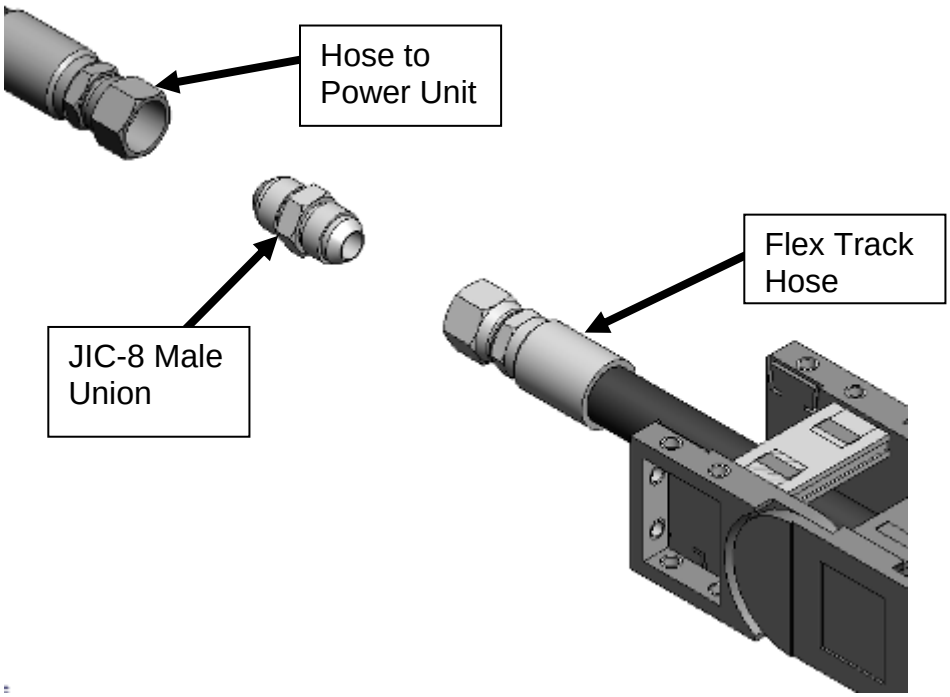


Figure 31 Flex Track Transition Fittings

INSTALLATION INSTRUCTIONS

I. START-UP & LEVELING OF CARRIAGE

DANGER!

Never go under an unsupported platform! To avoid personal injury or death, be sure the platform has been blocked from underneath! See "Blocking Instructions."

1. All cylinder casings should be standing plumb with the rod end sitting in the rod collar on the floor and the cylinder trunnion bolted in place (Ref. **Fig. 13, 24**).

2. "Bump" the UP button to ensure motor rotation is correct and oil is being pumped to the cylinders.
   NOTE: The lower carriage must not travel more than 1" above the upper/garage floor level or the sprockets connected to the carriage will travel high enough to interfere with, and damage, the chain tensioning blocks.

3. Allow air to escape the system through the cracked bleed screw near the top of the cylinder ram casing until clear oil (no bubbles) comes out. Tighten the screw; make sure no oil comes from the screw when it is tightened.

4. Make sure the carriage is free to raise, check to be sure carriage is level and chains are in place and equally tight.

WARNING!

When running the unit before permanent power is run, be prepared to disconnect power on demand. The use of temporary power is NOT recommended for inexperienced installers.

5. Raise the carriage 10-12 inches. Check for binding in the guides, interferences, chain integrity, and unusual noises.

NOTICE

All chains must be fully engaged with the teeth of all chain sprockets before operation begins. Chains which jump the sprockets during tensioning can cause permanent damage to the lift

6. After each of the four cylinders have been bled, continue to raise the carriage in small six (6) inch increments, checking for binding or interference. Make any changes necessary to align guide angle assemblies to allow smooth travel.

7. As the carriage is raised to the upper/garage level, be sure that 1" of horizontal/lateral clearance is present between the carriage and all building structures and other site constraints (floor openings, doors, building columns/beams, piping, etc.).

8. Stop carriage at upper level and check to make sure it is level and that there are the same number of chain links between the sprockets and the lower tensioning lugs.
   NOTE: The lower carriage must not travel more than 1" above the upper/garage floor level or the sprockets connected to the carriage will travel high enough to interfere with, and damage, the chain tensioning blocks.

9. Lower the carriage in small increments. Watch again for adequate clearance throughout the travel, checking for interference or binding of the chain and carriage.

10. When fully landed, hold DOWN button for 10-15 seconds to help bleed air from the system.

11. Make adjustments to chain length or chain tension as required with the carriage supported from beneath. DO NOT attempt to tighten or loosen chain with the carriage in the raised position.

12. While in the full down position, this is a good time to make final adjustments to the landing leg locations and account for any change in elevation in the pit floor. Add shim material as needed beneath the landing legs to ensure that the top of the lower deck is level and matches the lower floor elevation in the fully lowered position (or even with the top of ramp if an approach ramp is used).

J. ATTACHING THE UPPER DECK (Reference Figures 32 & 33)

Items needed for this step:

Qty	Description
1	Canopy deck with beveled toe guards

1. Using nylon straps / hooks and lifting eye provisions in the deck surface, raise the upper/canopy over the four (4) canopy posts, sliding the square collars located beneath the deck over and onto the four posts. Make sure that the deck orientation (location of access hatch – if applicable) matches the GA Drawing and that all four posts are engaged into the platform collars.

2. Lower the lift to full down position to level the canopy with the garage floor. Do not weld canopy to posts yet, further adjustments to the canopy must be made.

2. With the carriage leveled and in the fully lowered position, use the overhead hoist or crane to lift and adjust the slope of the top canopy to be flush with, and match the grade of, the surrounding garage/parking floor (reference **Figure 33**). Weld per General Arrangement drawing once complete.

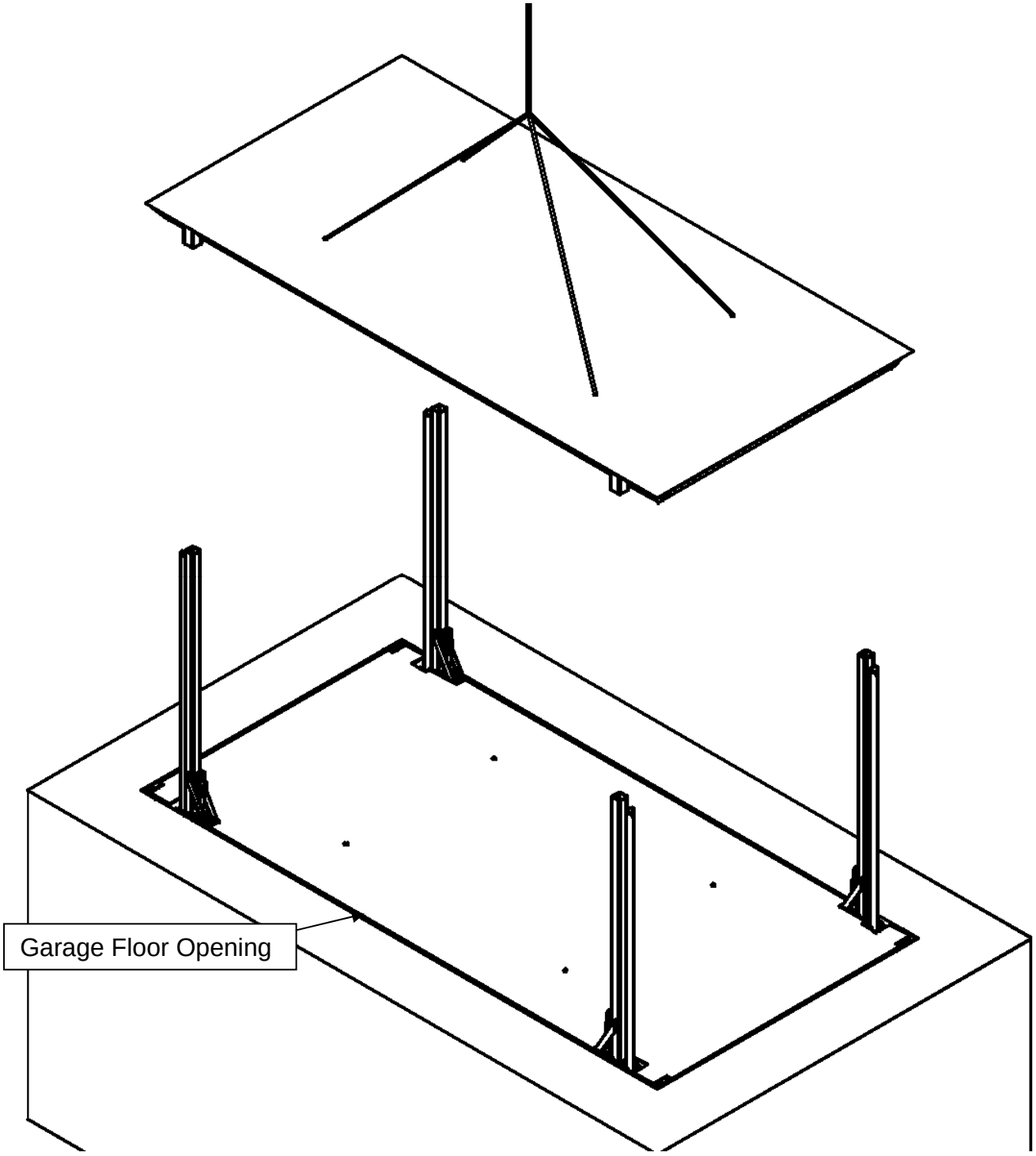


Figure 32 Canopy (Upper Deck) Installation Detail

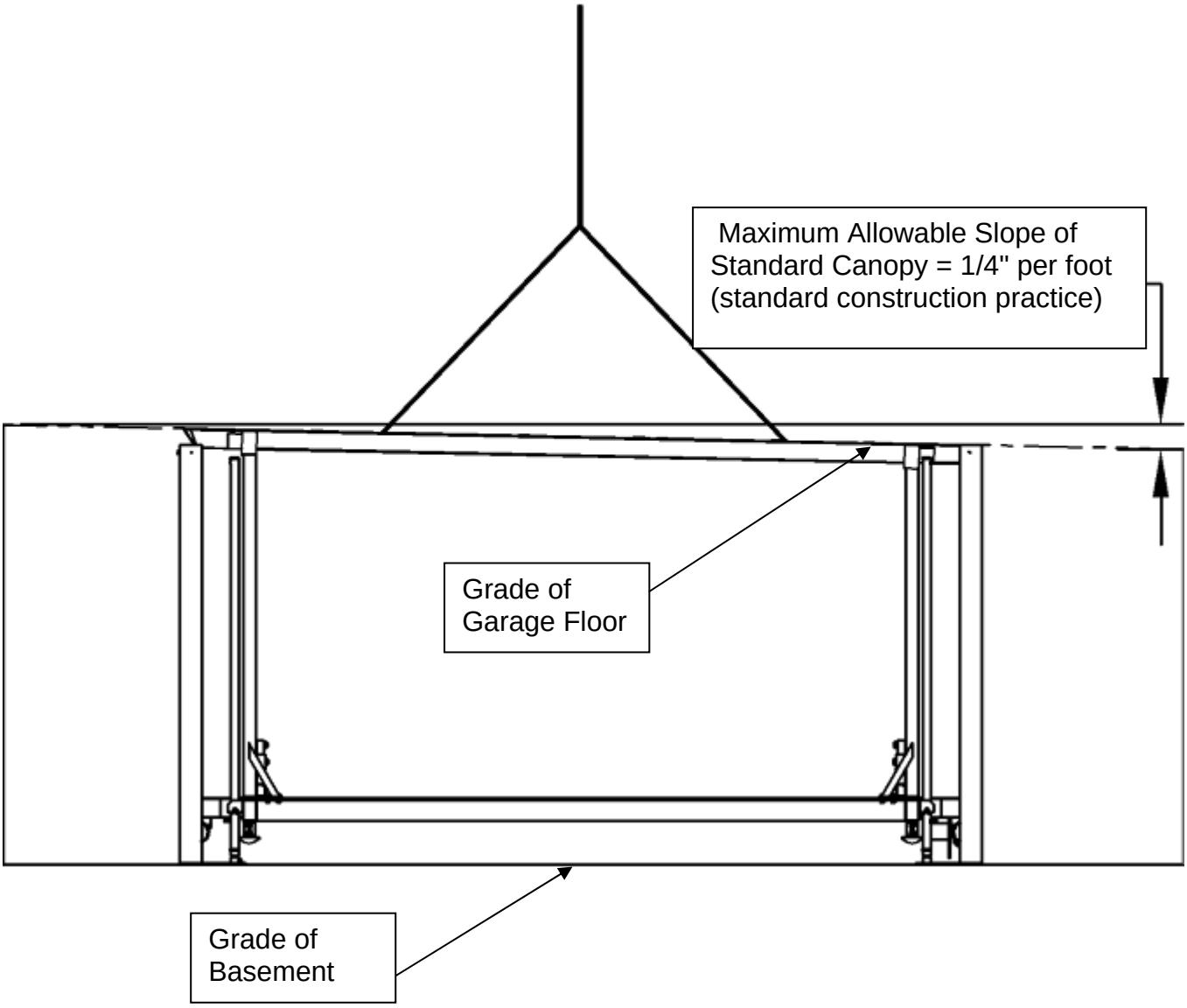


Figure 33 Adjusting Canopy to Match Grade of Garage Floor (Side View)

K. ADJUSTING LEVEL/LIFT STATUS LIMIT SWITCHES

Items needed:

Qty	Description
1	Level Limit Switch Kits

Level limit switches have been attached beneath the carriage for field wiring and adjusting to sense the position of the lift carriage.

UPPER LEVEL (standard on all units)

The upper level switch (reference **Figure 34**) stops the upward movement of the carriage at the desired elevation (there is always some over-travel allowance in the lifting cylinders). This limit switch is positioned to strike a bar on the left front (LF) or right rear (RR) corner guide when full travel is attained.

LOWER LEVEL (standard on all units)

The lower level switch (reference **Figure 35**) senses when the lift is in the fully lowered position. It does not stop the lift, it only senses whether or not the carriage is present at the lower level. This limit switch is positioned to strike against the equalization shaft when the carriage has landed on the basement floor.

ADJUSTMENT

1. The limit switch “targets” are permanent, so all the adjustment must be made with the switches’ lever arm.

2. Using the set screw on the switch, the arm can be rotated to make contact with the striking target at the desired lift elevation.

3. To change the actuation direction of the limit switch, remove the switch head. Change the actuating control knob/mechanism to the desired actuation direction.

DANGER!

Never go under a platform! To avoid personal injury or death, be sure the platform has been blocked from underneath! See “Blocking Instructions.”

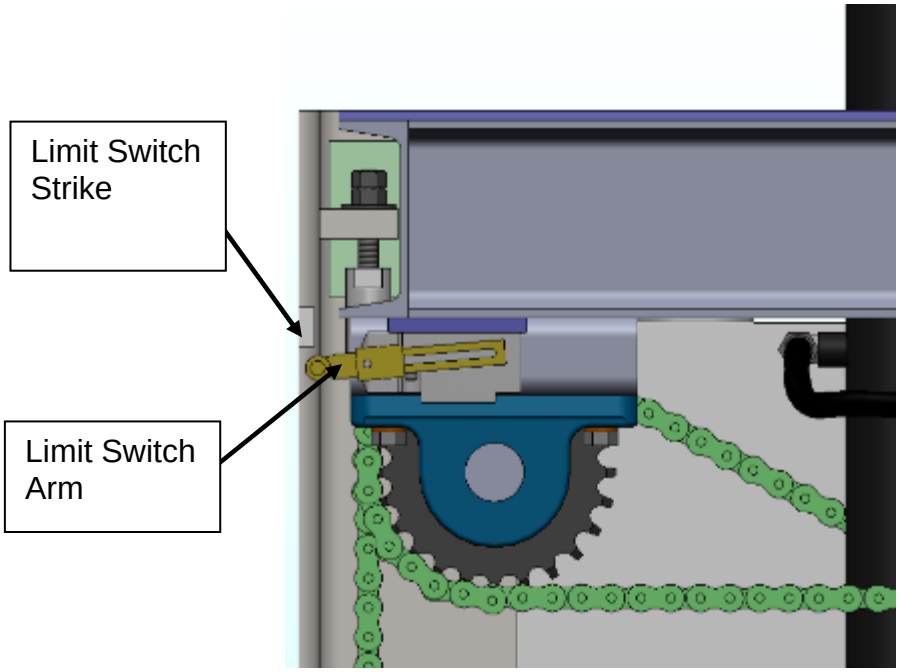


Figure 34 Upper Level Limit Switch and Strike

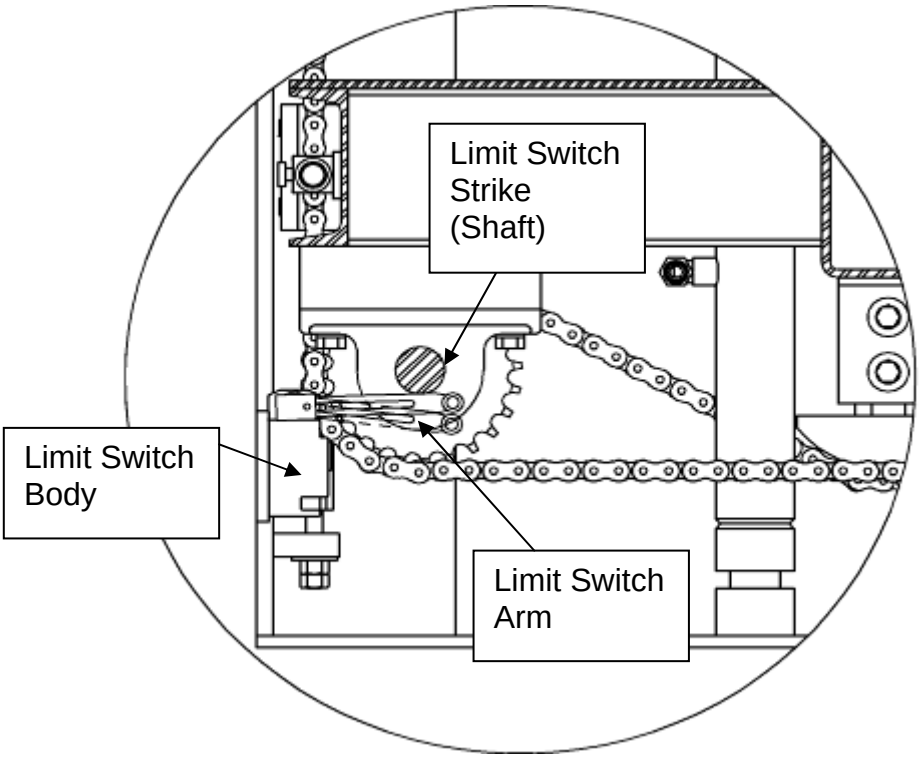


Figure 35 Lower Level Switch and Strike

L. PERMANENT ELECTRICAL INSTALLATION (See job-specific schematic)

A generic electrical schematic for a 4-post Parking Lift installation has been included in the General Maintenance section of this manual. In addition, a job-specific schematic has been shipped separately for reference by the electrical service provider. Refer to this schematic and follow all applicable NEC requirements throughout the electrical installation process.

Autoquip provides all the electrical control and signal devices. All required wire, conduit, and main disconnect for field wiring is supplied by others. Unless specifically included in the contract, the mounting and wiring of control and signal devices is the user's responsibility.

MAIN DISCONNECT:

This should be a fused type disconnect which is to be located within ten (10) feet of the main control panel. THIS ITEM IS NOT SUPPLIED BY AUTOQUIP AND IS REQUIRED BY THE NEC (National Electrical Code), typically with the ability to be locked per OSHA lock-out, tag-out procedures.

MAIN CONTROL PANEL**:**

This panel is supplied and shipped loose by Autoquip and all electrical components will be tied into this panel. Mount this panel as close to the power unit as possible and in accordance with the requirements of local codes and the NEC, connect primary voltage to the motor and secondary voltage to the control valves.

OPERATOR PUSHBUTTON STATION(S):

Autoquip supplies one (1) constant pressure push button station for each installation (under normal conditions). All operator push button stations are wired to the control panel. The operator push button station should be located so as to not be able to operate the lift while standing on the lift.

EMERGENCY STOP ("Panic Button") STATION(S):

Autoquip supplies a minimum of one (1) E-stop station per lift. These ship-loose stations are located in areas outside the operator's line of sight to immediately stop the operation of the lift when pressed (by standers-by). Must be manually reset before lift operation can resume.

DIGITAL SECURITY KEY PAD:

This digital keypad provides keyless security and a means to change codes, etc. to ensure operation of the lift is limited to authorized users only. Usually installed near the operator push button station, lift will not operate unless push buttons are pushed within 5 minutes of entering the correct authorization code. Designed to work in series with a manual key switch station. Refer to device manual for initial set-up, or change to code.

SECURITY KEY SWITCH STATION:

This manual, electrical key switch provides a primary means to ensure that operation of the lift is limited to authorized users only. Lift will not operate unless the key is in place a turned to the “On” position. Designed to work in series with a digital keypad.

LIFT LEVEL LIMIT SWITCHES:

Limit switch(es) have been attached to be field wired and adjusted to sense and stop the lift when the lower deck reaches the upper position and lower position.

MOTION DETECTOR(S): (Refer to **Figure 36**)

A minimum of (1) detector is provided by Autoquip. These PIR sensors have adjustable ranges, and are mounted to the ceiling above and around the lift footprint in areas outside the operator’s direct line of sight. Infrared technology is used to stop lift movement if a change in room occupancy is sensed during operation. Autoquip recommends setting the sensor for a 2 minute re-set period, factory default is 18 minutes. Refer to device manual for timing adjustments.

LIFT IN MOTION AUDIBLE ALARM: (Refer to **Figure 36**)

An alarm provided by Autoquip to be placed in the lift area(s) to provide standers-by an audible warning that the lift is moving and to stand clear to prevent inadvertent contact with the equipment. Alarm begins sounding when an operator push button is pressed, lift motion begins 2 seconds after alarm begins to sound. Volume is adjustable.

REMOTE DIGITAL CAMERA & MONITOR: (Refer to **Figure 36**)

Autoquip provides (2) digital cameras to be mounted along an unprotected edge of the lift carriage in those lift area(s) which are outside the operator’s direct line of sight (typically at the lower level) to aid in the recognition of potential interferences during lift movement. Monitor should be mounted adjacent to the operator push button station.

DOOR STATUS SWITCHES (When Ordered):

Ship-loose limit switch kit(s) are sent to field install to sense whether doors are opened or closed. These limit switches need to be wired to the main control panel to prevent lift operation if any door leading into the lift area is ajar.

INSTALLATION INSTRUCTIONS

OPERATOR COMMAND CENTER (When Ordered):

A brushed stainless steel panel that houses all lift security & operator input components in a single panel – in lieu of mounting these components individually in the lift operating zone (components are pre-mounted in the panel, and fits within 16” wall stud spacing).

DOOR SOLENOID LOCKS (When Ordered):

Ship-loose, electrical solenoid kits are supplied for doors leading into the lift area and are mounted in such way as to lock a closed door any time the lift is in motion.

VEHICLE-PRESENT SENSOR (When Ordered):

A state-of-the-art sensor can be shipped loose for field locating, installing & wiring to sense that there is a vehicle on the top deck and prevent lift from being raised unless the vehicle is removed. Autoquip recommends mounting the sensor on the bottom side of the canopy in a location close to where the engine of a parked vehicle will be.

INTERFERENCE DETECTION (When Ordered):

Photo eye sensor(s) & reflector(s) can be shipped loose for field locating, installing & wiring at either elevation to sense along an entire edge of the lift and stop lift operation if any object gets close enough to the edge to break the photo beam.

MANUAL RESET PANEL (When Ordered):

A manual reset panel and button can be placed near a remote (lower level) door to force the operator to inspect any door which may have been opened into the lift area and caused the lift to stop.

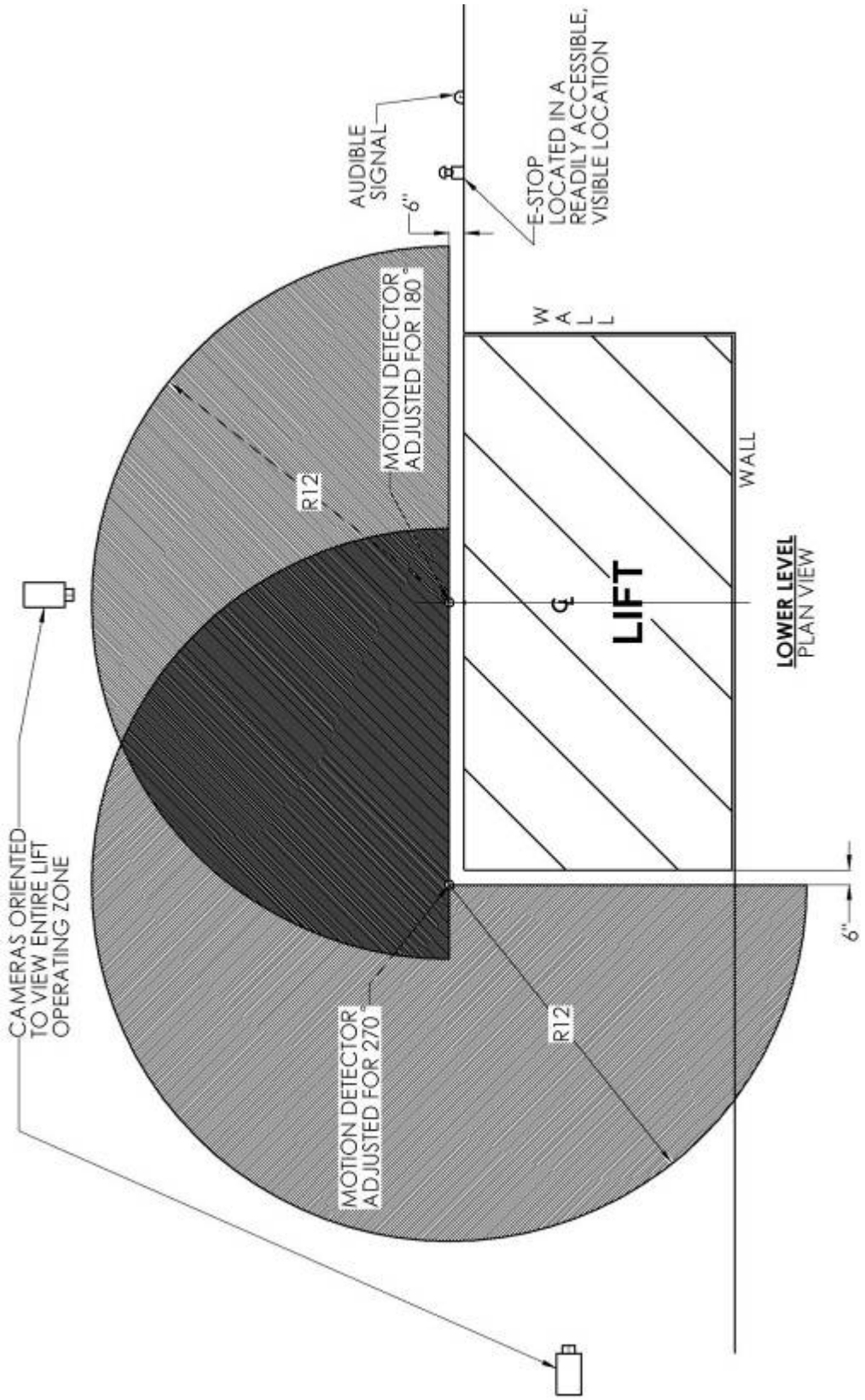


Figure 36 - Component Layout
(installed on the level / landing that is outside the operator's line of sight)

M. FINAL TEST RUN & ADJUSTMENTS

Items needed:

Qty	Description
4	Yellow Chain Guards
12	1/4-20 x 3/4"L bolts
12	1/4 lock washers

DANGER!

Never go under an unsupported platform! To avoid personal injury or death, be sure the platform has been blocked from underneath! See "Blocking Instructions."

1. Activate the down push button and lower the lift. Is the carriage stopping level and flush with the basement/lower elevation?

2. Check that all chains and sprockets are in place and secure on the carriage. Check that chain tensioners are in place and adjusted correctly.

3. All doors accessing the lift area must have door status switches and interlocks to prevent the lift from operating if a door is left open. A door should remain closed & locked while the lift is in motion.

4. Raise the lift 3-6 feet from the fully lowered position. Is everything okay? Any unusual noises? Are the corner guides stable? Is the carriage binding at all in the guides?

5. If you are satisfied with the alignment and structural integrity of the unit, run the carriage higher, continuing to check the clearance and smoothness of operation, chain tension, and integrity of chain termination points.

6. Ensure that the carriage remains level throughout the lift travel.

7. Slowly raise the carriage to the upper/garage level. Be sure that 1" clearance is present between the carriage and all building structures and other site constraints (floor openings, doors, building columns/beams, piping, etc.).

8. Lower the lift a few feet and bring it back up. Run against the limit switch and see if the front of the carriage is flush with the adjacent floor surface. If the carriage is above or below the floor, adjust limit switch arm as needed.

9. Run the system through is paces with the complete electrical system. Make all necessary adjustments to the interlocks, gate status switches, upper & lower level limit switches, and all photo-eye sensors to ensure proper operation of the lift and its safeties as required by the schematic.

10. Install yellow chain guards to all four (4) corners of the lower carriage as shown in **Figure 37** to prevent pinching of hands, fingers, clothing, etc. in between the chain and sprockets or chain tensioners.

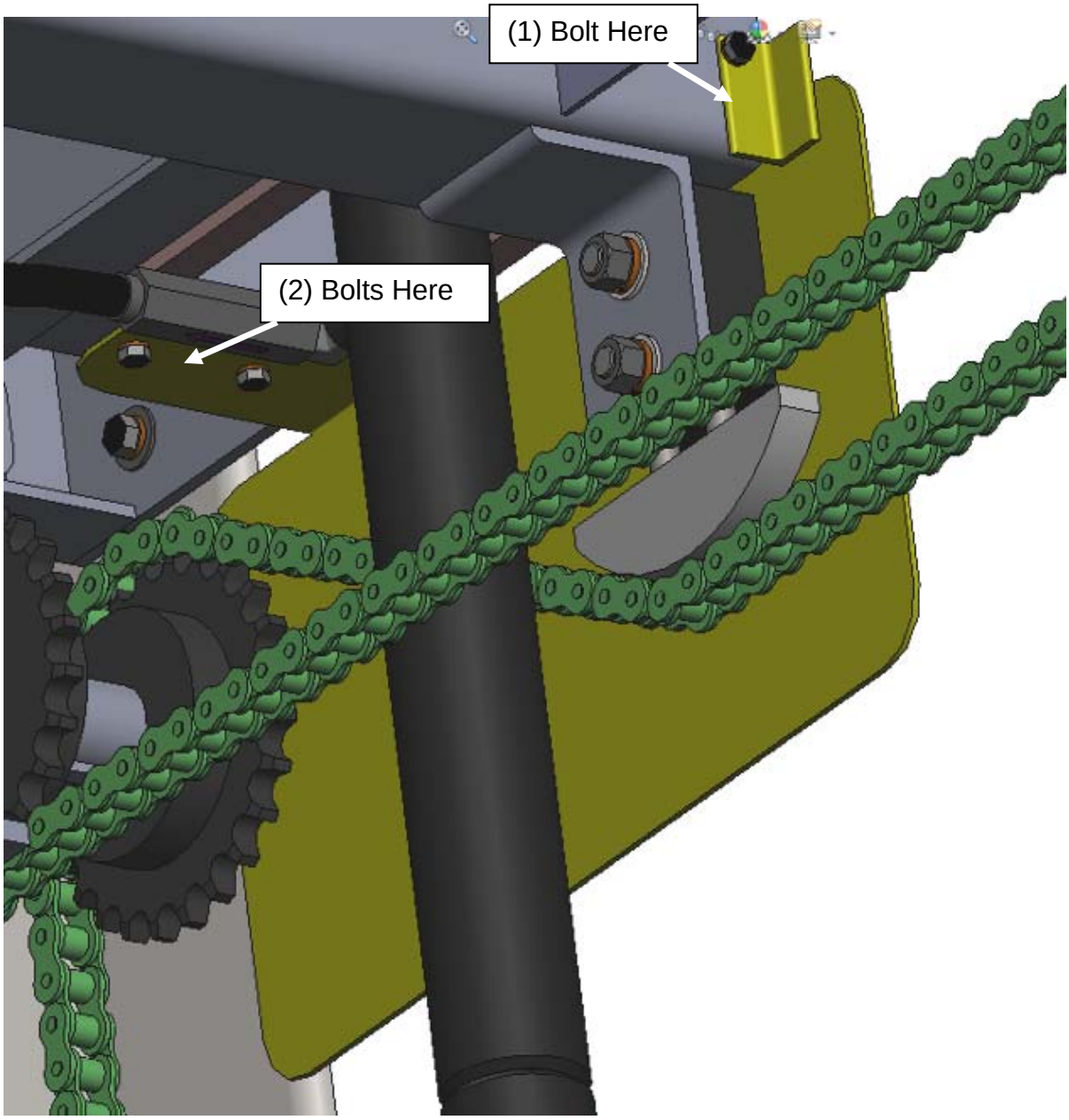


Figure 37 Installing Chain Guards

N. INSTALLATION WRAP-UP

Items needed:

Qty	Description
10 - 12	Ø23mm plastic plugs
1	Plastic warning decal (**Fig.10**)
1	Owners Manual

1. Touch-up the paint as needed.

2. Attach all shipped-loose Decals & Warning Labels per **Figure 1** of this manual (Contact an Autoquip Customer Service Representative if you are missing any required labels).

3. Install the plastic plugs provided in all lifting eye & maintenance hatch holes (**Figure 38**).

4. Clean up area.

5. Train all potential operators to use the lift and to follow all safety procedures.

6. Gather up all the manufacturers manuals which came with the various ship-loose electrical devices (audible alarm, motion detectors, security key pad, remote digital camera, etc) and place them in a see-through plastic bag for the owner to retain for future reference.

7. Ensure that the owner is left with one Owner's Manual per lift (it's a separate manual).

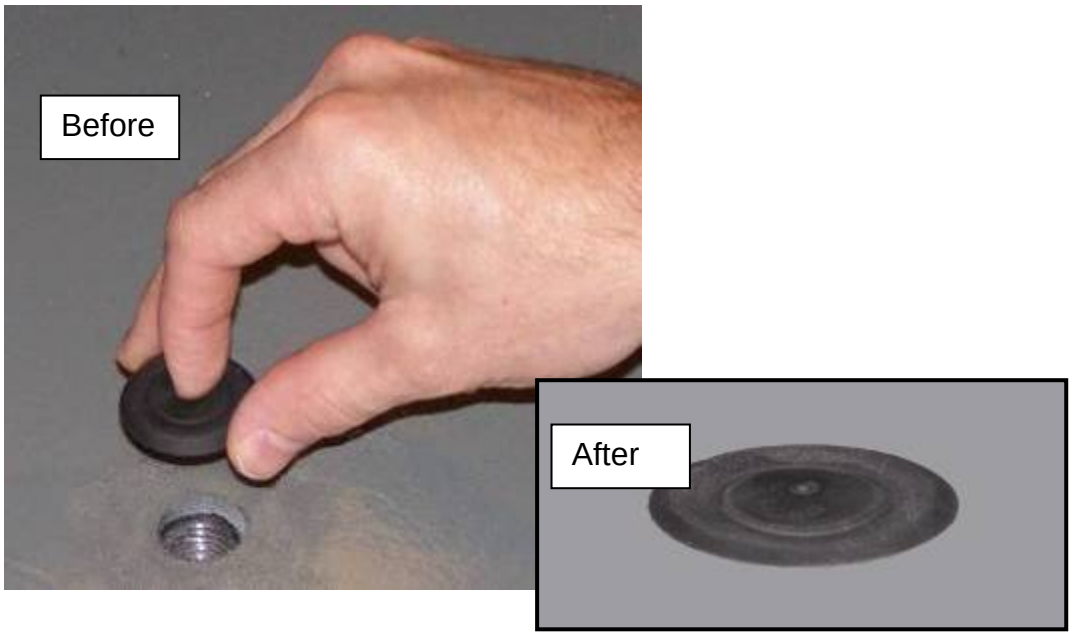


Figure 38 Plugging Holes in Deck

OPERATING INSTRUCTIONS

WARNING!

Familiarize yourself with Operators Manual before operating this lift.

DANGER!

To avoid personal injury or death, do not operate this equipment with damaged, substandard, defective, or missing parts. Contact a local Autoquip service representative if a deficiency is found.

WARNING!

All gates and/or doors accessing the Lift are electrically interlocked and must be closed to permit operation the lift. Do not operate unit with doors open or with the interlocks or other safety devices "defeated" (bypassed)! Serious injury or death could result.

The 4-Post Subterranean Lift is an electric/hydraulic powered lifting platform carriage for moving vehicles vertically from one level to another (normally, garage to basement). This is accomplished by pressing the UP or the DOWN control buttons.

UP

When the UP button is pressed, and all door status switches and other sensor circuits are closed, the coil of the motor starter will close the line contacts permitting the electric power to be applied to the motor. The rotating motor shaft is mechanically coupled to a positive displacement gear pump. The pump will rotate, assuming proper motor rotation direction, drawing oil from the reservoir, pressurizing it, causing flow through the check valve, and split out to the cylinders through directional valves and high pressure hoses.

To displace the incoming volume of oil, the cylinder rods of each ram assembly extend. As the four independent, direct-acting rams extend, the lift is pushed upward. To help ensure that the decks remains level throughout the travel of the lift, a series of equalization chains are routed over shafts with sprockets mounted beneath the carriage – to mechanically synchronize the rams during extension & retraction.

The platform carriage will continue to move upward as long as the motor is running. The platform carriage is guided in the four corner guide angles by wear pads which are captured in the angles. In the "UP" mode, the carriage is wired to strike a level limit switch just below the upper level, the carriage is then sensed to be in the fully raised upper level position & the motor turns off.

When the motor stops, the hydraulic oil in the system is also held in place by the spring loaded check valve (now returned to its seat) thereby blocking back-flow through the pump.

DOWN

Pressing the DOWN button will cause the control power to be applied to the down solenoid coil that is inside the control valve. The coil causes the core plunger to move outward, allowing the down valve to open and oil to flow back to tank. The actual down speed is dictated by the weight of the load placed on the platform carriage, but limited by a fixed flow control valve in the hydraulic circuit. The cylinders retract as the loaded carriage descends under its own weight and oil is forced out of the cylinder casings and back to the oil reservoir.

The carriage will come to a stop when it reaches the lower floor and comes to rest on the landing legs. At this point, there is no pressure remaining in the hydraulic system.

EMERGENCY STOP

Press the red emergency stop button to stop all travel of the lift at any time. After the emergency stop button has been reset (twist), any level button may be pressed to continue travel.

The emergency stop button will interrupt all electrical control functions when it is activated. Movement of the carriage will cease, regardless of its direction.

KEY SWITCH AND KEY PAD STATION

Use the security key and security code, to turn the control system “On”. These stations are shipped loose and wired in the control voltage circuit by others to prevent unauthorized operation of the lift.
NOTE: For liability reasons, it is recommended that the key or code NOT be left in or near the station.

WARNING!

ABSOLUTELY NO RIDERS! Parking Lifts are not vehicle elevators and do not meet the requirements of ASME A17.1 – *Safety Code for Elevators and Escalators*. Parking lifts are designed for the sole purpose of transporting vehicles between floor elevations. At no time should it be used to transport people. Death or serious injury could result.

ROUTINE MAINTENANCE

DANGER!

To avoid personal injury or death, all maintenance procedures described in this section should only be performed by qualified service personnel.

DANGER!

To avoid personal injury or death, do not operate this equipment with damaged, substandard, defective, or missing parts. Contact a local Autoquip service representative if a deficiency is found.

WARNING!

To avoid serious injury or death, GUARDS, INTERLOCKS, and SAFETY DEVICES must be restored to correct operation when installing parts or making repairs.

MAINTENANCE SCHEDULE

The following is a basic inspection schedule designed to help ensure that your parking lift is operating correctly, and to identify potential problem areas that should be inspected further by a qualified service representative. Lift installed in more severe environments - outdoors (rain, ice), near the ocean (salt), etc. – may require more frequent inspection of structural & mechanical components:

Each Month :

- Check hydraulic fluid level. Note: With lift fully lowered, fluid level should be approximately 1-1/2” from top of tank. DO NOT OVERFILL
- Check for hydraulic fluid leaks
- Check all hydraulic hoses and electrical cords for cracks, abrasions, twisting, etc. Small leaks at connections can be remedied by tightening connections or replacing the faulty component.
- Check all bearings for noise and wear.
- Check overall condition of unit (i.e. bends, breaks, loose or missing screws, metal shavings on floor, etc.).
- Check to be sure that all equalization chains beneath the lower platform are properly engaged with their respective drive sprockets. Call a qualified service technician immediately if chains are broken or have come loose from their designated chain path.

ROUTINE MAINTENANCE

Every Six Months :

- Check quality of hydraulic fluid, replace if discolored (oxidized), cloudy, or otherwise contaminated. DO NOT OVERFILL. Always use clean fluid. Never return fluid from drip pans, pit, etc. back to reservoir. Dispose of and handle used fluid as a hazardous material.
- Check lift cylinder rods for scoring and leaking. Wipe any foreign material from cylinders.
- Check all structural and mechanical components for cracked, or broken welds and any distortion caused by collision, overloading, or other misuse.
- Check the plastic wear pads mounted to the outside of each corner of the lower platform. Call a qualified service technician if there is less than 1/4" of pad material remaining.
- Grease the shaft bearings located beneath the lower vehicle platform at the front and rear of the lift with light grease. The grease fittings are located on each bearing housing (total eight – four per end) **as shown in Fig. 39**.

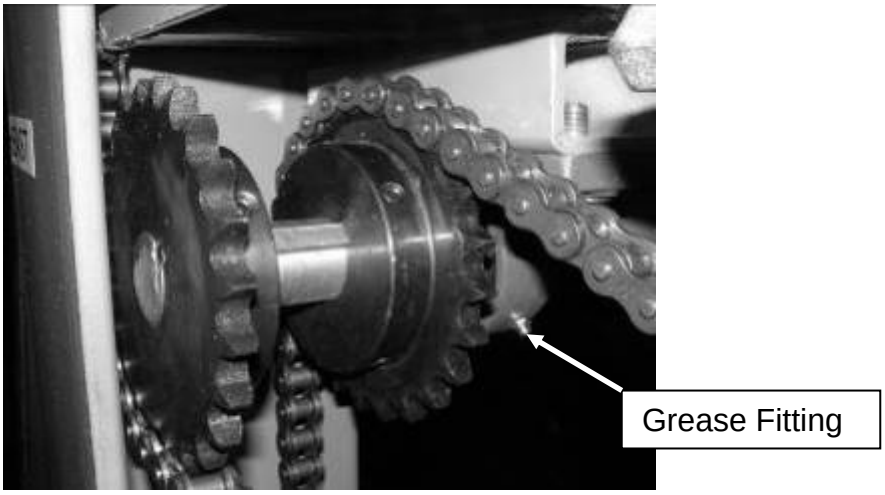


Figure 39 Shaft Bearing Lubrication

When all above checks have been completed start unit and operate through all functions. Inspect all components for signs of noise, vibration, erratic movement, and any other abnormal behavior.

ROUTINE MAINTENANCE

Once per Year :

- Change hydraulic fluid and clean reservoir. Never return fluid from drip pans, pit, etc. back to reservoir. Dispose of and handle used fluid as a hazardous material.
- Replace all filters.
- Raise lift platform approximately 24 inches. Note exact distance from floor level to top of platform (round off to nearest 1/16 inch). Leave idle for 15 minutes. Check distance again. If any movement is measured, call a qualified service technician to make repairs as required.
- Tighten all equalization chains located beneath the lower platform per instructions in the Installation and Maintenance manual.

GENERAL MAINTENANCE

OIL RECOMMENDATIONS

Vehicle Lifts operate efficiently utilizing high quality oil products that are readily available in all areas. These oil products contain additives that are desirable for optimum performance of the equipment. Follow the recommendations below that apply to the circumstances most similar to your installation.

Approximate volume of the hydraulic reservoir is 11 gallons. Oil is provided by others.

Environment (Ambient Temperature)	Recommended Oil
Indoor locations with variable temperatures: 30 - 100 degrees F	5W 30 or 5W 40 Multiviscosity Motor Oil
Indoor locations with constant temperatures: 60 - 80 degrees F	5W 30 or 10W 40 Multiviscosity Motor Oil
Outdoor locations: 30 - 120 degrees F	5W 30 or 10W 30 Multiviscosity Motor Oil
Outdoor locations: 0 - 30 degrees F	5W or 10W Viscosity Motor Oil
Freezing Applications (below 0 degrees F)	Contact local *Autoquip* Representative

NOTE: All oils above are detergent type.

NOTICE

It is very important to use the proper oil in the operation this lift !!

DO NOT USE:

- Automatic Transmission Fluid (ATF)
- Hydraulic Jack Oil
- Hydraulic Fluids
- Brake Fluids

GENERAL MAINTENANCE

OTHER NOTES ON PROPER OIL USEAGE:

1. Industrial hydraulic oils formulated for high pressure uses and of the proper viscosity contain anti-wear, anti-foaming, anti-rust additives making them acceptable. However, it is best to contact ***Autoquip*** Customer Service for advance approval!

2. Use of improper oil will VOID the lift warranty!

NOTICE

Do not run the hydraulic power unit dry. Damage to the pump and motor may result!

3. The unit must be fully lowered to perform the filling operation.

AIR BLEEDING PROCEDURE

1. Press the “UP” button and allow the unit to raise 10 – 12 inches.

2. Slowly crack the bleed screw near the top of the cylinder ram casing until clear oil (no bubbles) comes from the cracked bleed screw. Tighten the screw; make sure no oil comes from the screw when it is tightened.

3. After each of the four cylinders have been bled, raise the lift another short distance – enough to safely remove any maintenance devices which may have been holding the carriage.

1. Ensure nothing is beneath the lift, press the “DOWN” button and lower the lift into the pit. Once the lift lands, continue to press the DOWN button for 10 seconds.

2. Wait 45 seconds and raise the lift approximately 3 feet.

3. Repeat Step 2.

4. Wait 45 seconds, then lower the lift back into the pit. Once the lift lands, continue to press the DOWN button for 10 seconds.

5. Repeat Steps 5 – 7 several times to flush any air that may remain in each line back to the power unit.

6. Clean up any spilled oil. Used oil should be discarded (do not re-use) as it may contain flushed contaminates from the line.

GENERAL MAINTENANCE

CYLINDER AND/OR SEAL REPLACEMENT

Cylinder Removal

1. Press the “UP” button and raise the carriage to place all maintenance devices into position (see “Blocking Instructions” section).

2. Lower the carriage onto the maintenance devices and continue to press the “DOWN” button for an additional 10 seconds in order to bleed the pressure off the system.

3. Disconnect the short hydraulic hose from the cylinder. Drain the oil into a bucket as the cylinders retract and the oil drains from the hose.

4. If the entire ram assembly is to be replaced and the velocity fuses are to be reused, disconnect the fuses from the ram casings. Make note of the orientation for reinstallation (refer to Hydraulic Schematic).

5. Push the piston rod into the casing to eject as much oil as possible into a container.

6. Unbolt the cylinder clamps and from the carriage clevises, lift the cylinder out from between the clevises. NOTE: be careful to hold the rod in the casing during cylinder removal, it will want to extend in the absence of system pressure.

Seal Replacement

1. Lay the ram assembly on its side.

2. To access the seal, push the rod down inside the casing past the seals by threading a 3/8-16 bolt into the end of the rod and simply pushing on the bolt. Take all precautions not to scratch the cylinder rod.

3. Remove the old seal ring and backup ring. Inspect the seal groove for nicks and scratches that could affect the seal. Remove as necessary.

4. Clean the groove thoroughly and install the new seal and backup. Lubricate the seal with **clean** oil or grease.

5. Grasping the bolt in the end of the cylinder rod, pull the rod out of the casing taking precaution against pinching or tearing the seal ring.

Re-Installing the Cylinder

1. Reinstall the ram assembly by following the instructions given in **Section D – "Mounting the Lift Cylinders"**, and by reversing steps 1 through 6 of "**Cylinder Removal**" above.

2. Once the ram assembly is in place and all hydraulic connections are made tight, proceed to bleed air out of the system (see "Air Bleeding Procedure" section above).

3. Check the oil level.

4. Clean up any debris and/or spilled oil from the area.

PIPE THREAD SEALANT

Loctite PST #567 pipe thread sealant or equivalent is recommended. **Do not use Teflon tape.** Tape fragments can cause malfunctioning of the hydraulic system.

VELOCITY FUSE REPLACEMENT

DANGER!

Do not attempt to remove the velocity fuse until the lift is securely supported with the lift blocking devices and all hydraulic pressure has been removed from the lifting cylinders and hydraulic hoses. Failure to follow these instructions could result in personal injury or death!

Never attempt to take a velocity fuse apart and repair it. These are precision devices that are factory assembled under exacting conditions. Velocity fuses should always be replaced.

1. The arrow on the exterior surface of the velocity fuse shows the direction of the restriction to the oil flow. The arrow should always point away from the cylinder.

2. **Do not use Teflon tape on the threaded connections of a velocity fuse**. Tape fragments can cause malfunctioning of the fuse.

3. Check all fitting connections for hydraulic leaks and tighten as necessary.

GENERAL MAINTENANCE

MOTOR WIRING

The following chart should be referenced in connecting these motors to power sources, remembering that all Breaker, Fuse & Wire sizing must comply with NEC.

	208 Volts 3 phase	230 Volts 3 phase	460 Volts 3 phase	230 Volts 1 phase
5HP Full Load Amps	17.5	15.2	7.6	28
7.5HP Full Load Amps	25.3	22	11	40
10HP Full Load Amps	32.2	28	14	50

DANGER!

HIGH VOLTAGE!! – Disconnect and/or lock out the electrical supply to the power unit prior to any installation or maintenance being performed per OSHA Lock-Out, Tag-out requirements.

WARNING!

To avoid serious injury or death, GUARDS, INTERLOCKS, and SAFETY DEVICES must be restored to correct operation when installing parts or making repairs.

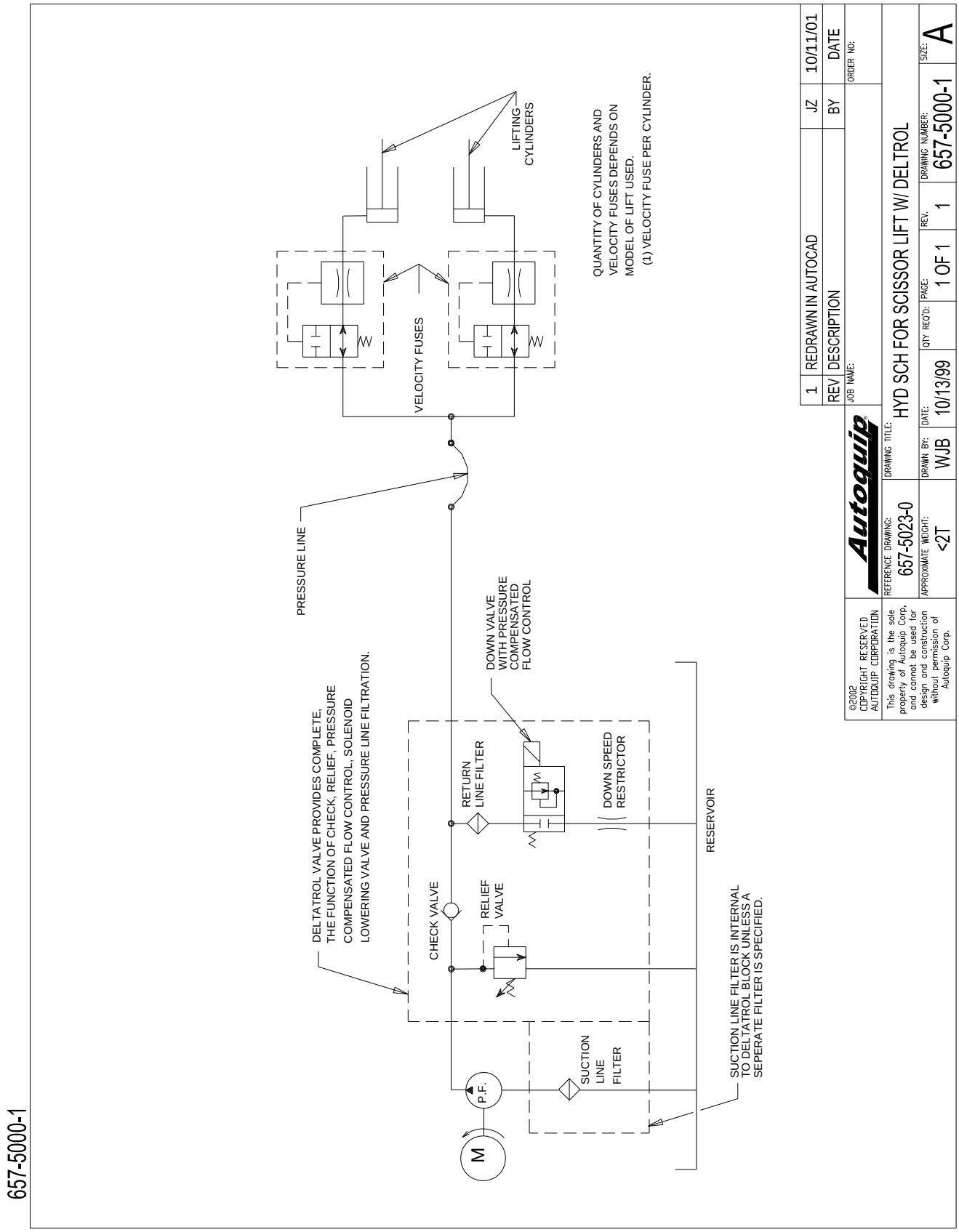


Figure 40 Generic Hydraulic Schematic

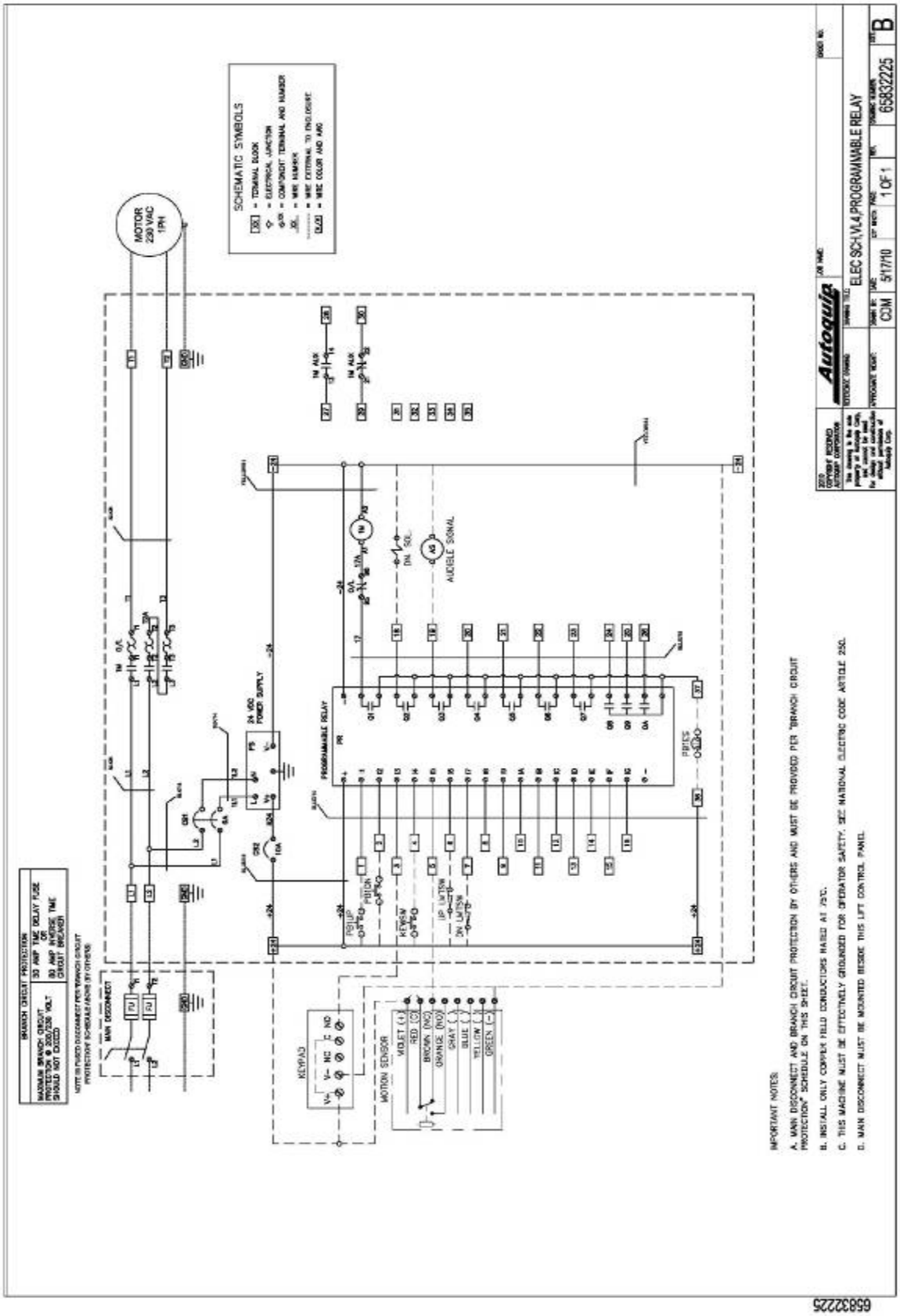


Figure 41 Generic Electrical Schematic
(always refer to the job-specific schematic shipped with the lift)

REPLACEMENT PARTS LIST

QTY	PART NO.	DESCRIPTION
	STD 5HP “VERTICAL” POWER UNIT	
1	64304095	Power unit, 5hp, 208-230V, 1PH, 24CVDC, 2.25gpm
1	…30000670	Motor
1	…20000154	Motor Coupling
1	…20000030	Pump Coupling
1	…20000162	Coupling Insert
1	…40300162	Pump
1	…47700075	Sump Strainer
1	64311570	Power unit, 5hp, 208-230V, 1PH, 24CVDC, 3.5gpm
1	…30601450	Motor
1	…20000154	Motor Coupling
1	…20000030	Pump Coupling
1	…20000162	Coupling Insert
1	…40300290	Pump
1	…47700075	Sump Strainer
1	64311580	Power unit, 5hp, 208-230V, 1PH, 24CVDC, 4.5gpm
1	…30601450	Motor
1	…20000154	Motor Coupling
1	…20000030	Pump Coupling
1	…20000162	Coupling Insert
1	…40300162	Pump
1	…47700075	Sump Strainer
	OTHER ELECTRICAL	
1	35152810	Control Panel, 230VAC/24VDC, 1PH
1	36203800	Push button, UP/DN
1	65900508	Key Switch, OFF/ON
1	36203505	Emergency Stop Button
	36203700	Digital Keypad
	35980260	Security Camera System
	36203707	Motion Detector
	35100907	Up/Dn travel Limit Switch
	35400840	Lift Motion Audible Alarm (24VDC)

REPLACEMENT PARTS LIST

QTY	PART NO.	DESCRIPTION
		HYDRAULIC
1	28008370	Flex Track
1	46162160	Flex Track Hose
		MISCELLANEOUS
VARIES	28000735	#60 Master Link
VARIES	28000081	#60 Roller Chain
8	62870226	#60 Chain Tensioner Lug
VARIES	25160270	Water Tight Plug for Lifting Eye Holes
4	20057700	#60 Chain Tensioner
1	35980140	Ultrasonic Parking Indicator
1	35400760	Lift Motion Flashing Light (24VDC)
VARIES	34320630	Photoeye (Vehicle Present and Side Guard)
VARIES	34320631	Photoeye Reflector
1	34320810	Vehicle Present Sensor (Flat Pack)
1	35106471	Overhead Door Interlock Kit
1	35903630	Overhead Door Interlock Latch
VARIES	35106475	Single Door Interlock
VARIES	35100930	Single Door Status Switch
1	35100920	Overhead Door Status Switch

TROUBLESHOOTING ANALYSIS

DANGER!

To avoid personal injury, NEVER go under the lift platform until it is securely blocked (See "Blocking Instructions" section) and the load is removed.

Troubleshooting and maintenance on the lift should only be performed by qualified service technicians!!

PROBLEM	POSSIBLE CAUSE AND SOLUTION
Unit will not raise (motor <u>not</u> running or “humming”). .	• The emergency stop button may be depressed or jammed. Check all pushbutton stations. Repair as necessary. • The main disconnect switch / distribution panel circuit breaker is tripped or a fuse is blown. Check and reset or replace as necessary. • A door with status switch is open, or switch or interlock is malfunctioning or is out of tolerance. Close door, or check and repair or adjust as required. • The push button / circuit is malfunctioning. Check components and circuit. Repair or replace. • The motor starter overloads (MSO) have tripped. Check and reset. If it trips again, check for cause in the motor circuit. • The control transformer fuse is blown. Check and replace. • Motion detector(s) may have tripped, need to wait approximately 2 minutes for the sensor to reset. • Other sensors which may have been purchased with the lift (“vehicle present” sensor, photo-eye sensor, etc.) may have been tripped. Eliminate the interference which may have caused them to trip. • The digital keypad security station resets itself after 5 minutes, the security code may need to be re-entered.

TROUBLESHOOTING ANALYSIS

PROBLEM	POSSIBLE CAUSE AND SOLUTION
Unit does not raise (motor <u>is</u> running or humming)	• The load may exceed the rating. Remove the excess load. • Check for hydraulic oil leak. Correct if needed. • Check for oil shortage in the reservoir and add oil, if necessary. • Rotation on the 3-phase motor may be reversed. Reverse any two motor electrical leads. • 3-Phase motor may be single-phasing (humming). Check wiring, fuses, etc. • Breather cap on the reservoir may be clogged. Remove and clean. • Suction screen may be clogged. The screen is attached to the suction line in the tank. Remove and clean. Drain and replace oil. • Suction line may be leaking air due to loose fitting, causing cavitation. Check fittings. Bleed air from the system (see Air Bleeding Procedures in the Routine Maintenance Section). • The “DOWN” valve may be energized by faulty wiring or it may be stuck in the open position. Remove the solenoid and check. • The voltage at the motor terminals may be too low to run the pump with the existing load. Check before measuring the voltage at the motor terminals (or as near as possible) while the pump is running under load. Reading the source voltage or pump idling voltage is meaningless. Inadequate or incorrect wiring can starve the motor when the source voltage is ample. Correct as necessary. • The pump may be seized if the motor is humming or blowing fuses or overloads. Remove the pump with the platform in the lowered position. The shaft should be able to be turned by hand. Check for cracks in the housing.

TROUBLESHOOTING ANALYSIS

PROBLEM	POSSIBLE CAUSE AND SOLUTION
Motor labors or heats excessively.	• The voltage may be low. Check at the motor terminals while the pump is running under load. Do not check at the line source or while the pump is idling. Inadequate wiring can starve the motor even when the source voltage is ample. • The wiring may be incorrect. Be sure one leg of the motor line is not connected to the ground prong. This can happen particularly on 3-phase units using twist-lock plugs. • The pump may be binding from oil starvation. This can cause high internal heat. The pump can be irreparably damaged by oil starvation and may have to be replaced.
Unit operates in a “spongy” or jerky fashion.	• The load may exceed the stated capacity of the unit. Remove excess load. • The hydraulic system may have air in it. The unit requires bleeding (see Air Bleeding Procedures in the Routine Maintenance section). • Check for oil starvation. • Guide pads may be binding. Check and repair. • The platform carriage may be binding in the guideways. Check and repair. • The cylinder may be binding internally or externally. Check and repair.

TROUBLESHOOTING ANALYSIS

Unit won't lower - Electrical Circuit	• The emergency stop button may be pressed or jammed. Check and repair. • A door with status switch is open, or switch or interlock is malfunctioning or is out of tolerance. Close door, or check and repair or adjust switch/interlock as required. • Power supply fuse may be blown. Check and replace. • Manually bleed off the hydraulic pressure with the lower valve. If the lift lowers, check the electrical circuit and the down solenoid. If the lift does not lower, see next section below. • The solenoid may be incorrectly wired, burned out, not rated for the voltage, or the line voltage may be excessively low. • Motion detector(s) may have tripped, need to wait approximately 2 minutes for the sensor to reset. • Other sensors which may have been purchased with the lift ("vehicle present" sensor, photo-eye sensor, etc.) may have been tripped. Eliminate the interference which may have tripped them. • The digital keypad security station resets itself after 5 minutes, the security code may need to be re-entered.
Unit won't lower - Hydraulic Circuit	• Check for mechanical obstructions or a binding condition. **NOTE**: Contact a local Autoquip Representative before attempting to repair the following problems. • Check for tripped velocity fuses. • Air in the system will cause a lock up (see Air Bleeding Procedures in the Routine Maintenance section). • Cold temperatures of below 10 degrees F will cause oil to thicken & potentially cause a lockup (see Oil Recommendations in the Routine Maintenance section).

TROUBLESHOOTING ANALYSIS

Unit lowers too slowly with a load.	• Check for a pinched hose or tubing. • The down valve may be malfunctioning. Check and replace control valve. • The down valve solenoid mounting is loose preventing the valve from opening completely. Check and repair. • Oil is extremely heavy for the application or low temperature is causing a thickening of the oil (see Oil Recommendations in the General Maintenance section). • The down valve solenoid may be weak and not pulling in completely (it will usually chatter). Also, check the control voltage. Check and repair or replace. • Check for a partially blocked or malfunctioning flow control valve.
Unit raises, then lowers back slowly.	• The “DOWN” solenoid valve may be energized in the “open” position. Remove the solenoid coil and recheck. If the lift does not hold with the solenoid coil removed, replace the down valve cartridge. • The oil line, hose, or fitting may be leaking. Check and repair. • The hydraulic cylinder rod seal may be leaking. Check to see if hydraulic oil is running down the outside of the cylinder barrels at the rod end. Repair as necessary. **NOTE:** A small amount of oil at the bottom of the rod is normal and desirable for proper lubrication of the cylinder. A leak would cause oil to flow from the rod area when the lift is in the raised position.
The unit does not raise completely to the upper level (press “emergency stop” button to stop motor.)	• There is some sort of interference with the platform carriage. Check and correct. • The load exceeds the capacity of the unit. Lower the unit, unload, and try again. • The oil level in the reservoir may be too low. Check and replace. Determine cause and repair.

GLOSSARY OF TERMS

TERM	DEFINITION
Anchors	Bolts used to fix guides to the floor and walls
ATF	Automatic transmission fluid
Capacity	Maximum allowable load
Canopy	The upper platform assembly that fills the garage floor opening when lowered
Carriage	The lower platform assembly that travels in the guides and holds the canopy
Controls	Any electrical device used in the operation of a lift, which normally includes operator push button stations, control boxes, limit switches, interlocks, etc.
Cylinder	A device which converts hydraulic pressure to linear movement.
Cycle	The lift is considered to have operated one cycle any time the motor starts.
Down solenoid	An electrical mechanical device that, when electrically energized, opens the down valve to allow hydraulic fluid to return to the reservoir under force of gravity.
Enclosure	A structure surrounding the lift to prevent anything from interfering with normal operation of the lift, and to protect personnel.
Gate / Door	A device that opens and closes to allow access to the carriage for loading and unloading. Normally single or bi-part swing style, sometimes fire-rated.
Hydraulic	Operation by movement and force of liquid
Interlock	An electrical mechanical system for doors or gates to prevent operation of the lift if all the gates are not closed or if the lift platform is not at the desired level.
Limit Switch	An electrical device by which the location of the lift may be sensed or detected within predetermined limits.
Load height	The maximum height of the vehicle which a carriage can accommodate.
Motor starter	An electrical controller for accelerating a motor from rest to normal speed.
Platform	The horizontal surface of the deck where the vehicle is parked.
Power unit	An assembly including, but not limited to the motor, pump, reservoir, and the Deltatrol valve.
Pressure relief valve	A valve that can be set to a predetermined pressure. If the pressure is exceeded, the valve will open to prevent damage to the hydraulic system.
Travel	The vertical distance “travelled” by the carriage when measured from its fully lowered to its fully raised position at the garage floor level.

LIMITED WARRANTY

VASARI ™ Parking Lifts

The user is solely responsible for using this Equipment in a safe manner and observing all of the safety guidelines provided in the Owner's Manual and on the warning labels provided with the lift. If you are unable to locate either the manual or the warning labels, please contact Autoquip or access www.vasari-lifts.com for replacement downloads or information.

Autoquip Corp expressly warrants that this product will be free from defects in material and workmanship under normal, intended use for a period of Two (2) Years for all electrical, mechanical, and hydraulic components, parts or devices, and warrants the structure of the lift against breakage or failure for a period of Ten (10) Years. This warranty includes parts and labor for the first year of the warranty period, parts only thereafter. The warranty period begins from the date of shipment. When making a claim, immediately send the dealer who sold you the unit a notice of your claim. All claims must be received within the warranty time period. The maximum liability of Autoquip under this Limited Warranty is limited to the purchase price of the Equipment.

This warranty shall not apply to any VASARI™ lift or parts of VASARI™ lift that have been damaged or broken in transit/shipping, or due directly or indirectly to misuse, abuse, vehicle impact, negligence, faulty installation, fire, floods, acts of God, accidents, or that have been used in a manner contrary to the manufacturer's limitations or recommendations as stated in the Manual, or that have been repaired, altered or modified in any manner outside of Autoquip Corp's manufacturing facility or which have not been expressly authorized by Autoquip.

Autoquip Corp makes no warranty or representation with respect to the compliance of any Equipment with state or local safety or product standard codes, and any failure to comply with such codes shall not be considered a defect of material or workmanship under this warranty. Autoquip Corp shall not be liable for any direct or consequential damages resulting from such noncompliance.

Autoquip Corp's obligation under this warranty is limited to the replacement or repair of defective components at its factory or another location at Autoquip Corp's discretion at no cost to the owner. This is owner's sole remedy. Replacement parts will be warranted for the remainder of the Equipment Warranty period or ninety (90) days, whichever is longer. Except as stated herein, Autoquip Corp will not be liable for any loss, injury, or damage to persons or property, nor for direct, indirect, or consequential damage of any kind, resulting from failure or defective operation of said Equipment. All parts used to replace defective material must be genuine Autoquip parts in order to be covered by this Limited Warranty.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so those limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.