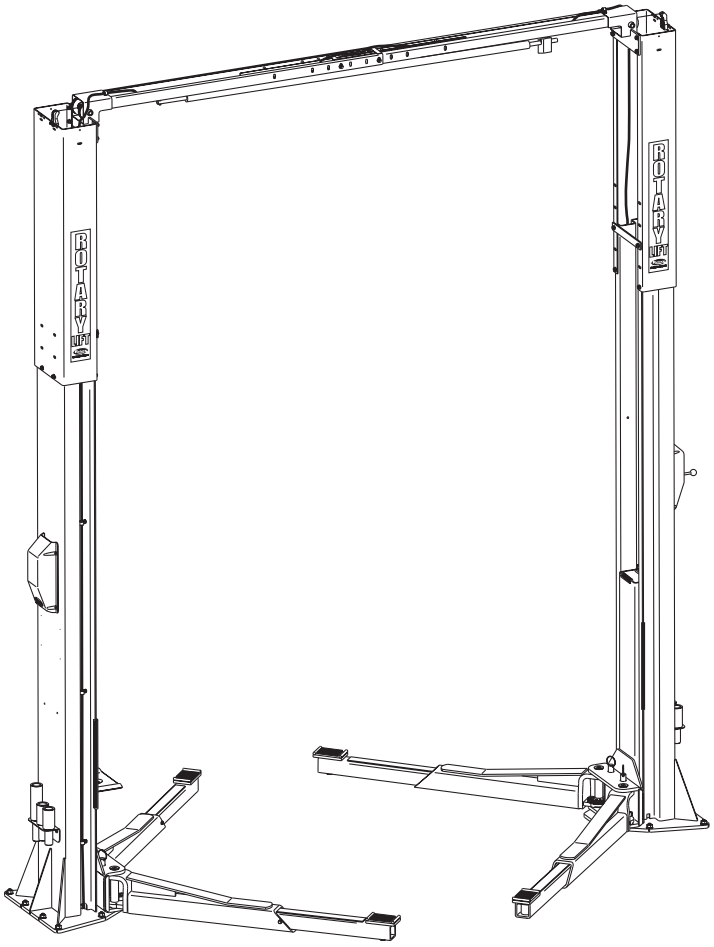
World Leader in Lift Productivity

SPO12

(410 Series)

Two Post Surface Mounted Frame Engaging Lift



INSTALLATION INSTRUCTIONS

LP20054

IN20161

Rev. B 06/13/2003

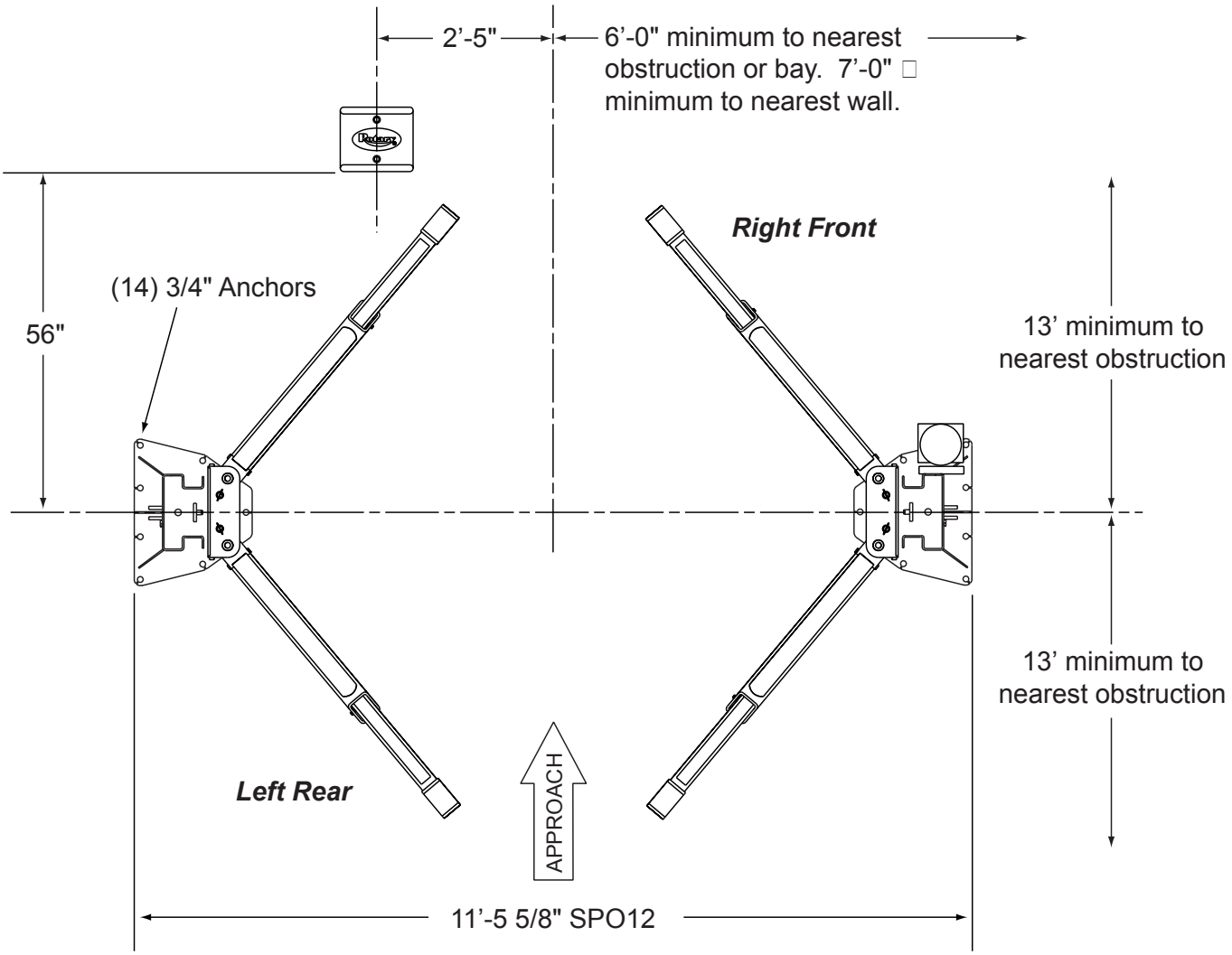

2'-5"
6'-0" minimum to nearest obstruction or bay. 7'-0" minimum to nearest wall.
Right Front
(14) 3/4" Anchors
56"
13' minimum to nearest obstruction
13' minimum to nearest obstruction
Left Rear
APPROACH
11'-5 5/8" SPO12

Fig. 1

1. Lift Location: Use architects plan when available to locate lift. Fig. 1 shows dimensions of a typical bay layout.

2. Lift Height: See Fig. 4 for overall lift height of each specific lift model. Add 1" min. to overall height to lowest obstruction.

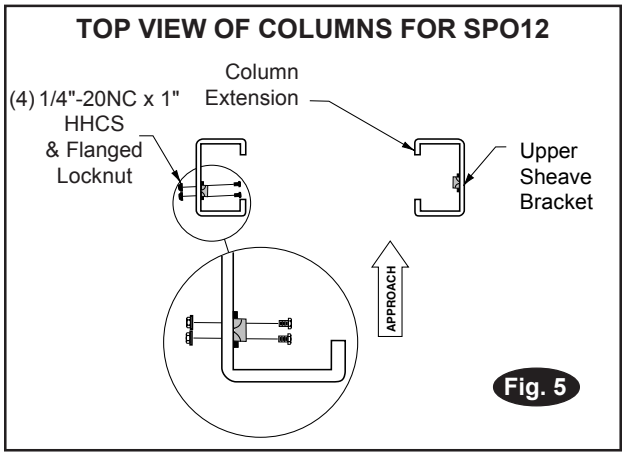
⚠WARNING DO NOT install this lift in a pit or depression due to fire or explosion risks.

2. Latch Cable Guide: While still on the ground, install latch cable guides to column extensions with (4) 1/4"-20NC x 1" lg. HHCS and Flanged Locknuts, Fig.5 & Fig. 9d.

NOTE: Latch cable guide must be toward approach side of the column extension. Coat the cable contact surface with a light grease such as "TUFOIL".

Overhead Mounting Bracket: Install Mounting Brackets to column extensions as shown, Fig. 5

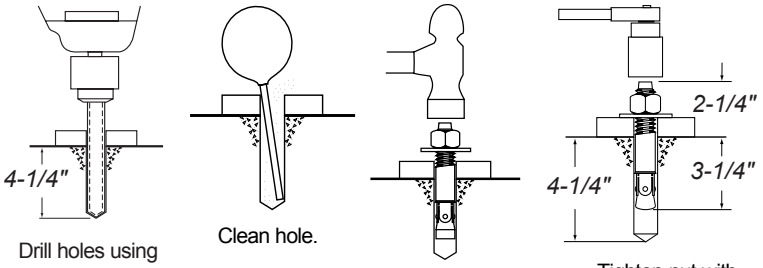
3. Column Extensions: While column is on the ground, install column extensions using (4) 3/8"-16NC x 1/2" lg. Flanged HHCS, Fig. 4. Use (2) 3/8"-16NC x 3/4" lg. Flanged HHCS to attach the tie bar and the column extension together at the column's uppermost holes, Fig. 4. The tie bar is positioned on the outside of the column extension. Adjust the column extensions plumb.



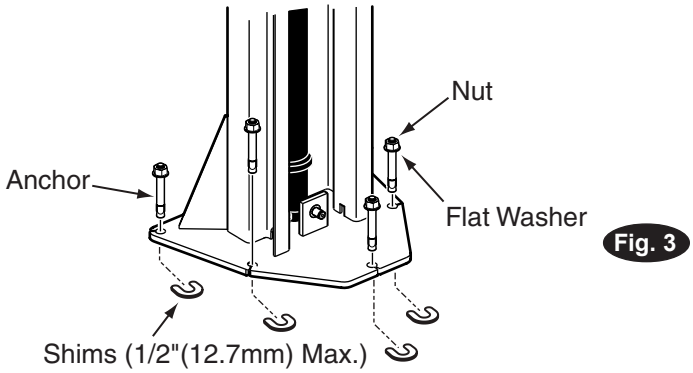
4. Lift Setting: Position columns in bay using dimensions shown in Fig. 1. Place column with power unit mounting bracket on vehicle passenger side of lift. Both column base plate backs must be square on center line of lift. Notches are cut into each base plate to indicate center line of lift.

Use appropriate equipment to raise carriage to first latch position. Be sure locking latch is securely engaged.

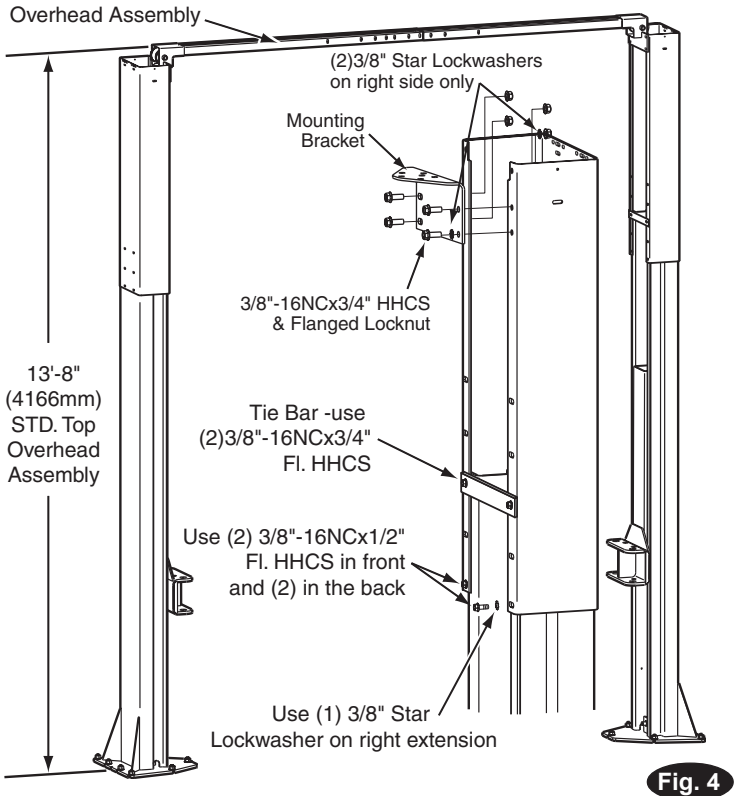
Concrete and Anchoring: Concrete shall have a compression strength of at least 3,000 PSI and a minimum thickness of 4-1/4" in order to achieve a minimum anchor embedment of 3-1/4".



Installation torque of 150 ft-lbs. is required for all anchor bolts.

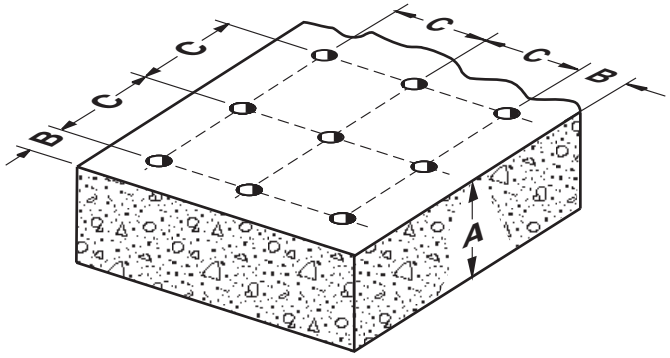


NOTE: If more than 2 horse shoe shims are used at any of the column anchor bolts, pack non-shrink grout under the unsupported area of the column base. Insure shims are held tightly between the baseplate and floor after torquing anchors.



IMPORTANT: All star washers are to be mounted on the right side column to ensure grounding of overhead limit switch. Star washers are not needed when mounting to left side column. Notice the column extension mounting, Fig. 4 and overhead limit switch mounting as well in Fig. 4 & Fig. 6.

Drill (14) 3/4" dia. holes in concrete floor using holes in column base plate as a guide. See diagrams for hole depth, hole spacing, and edge distance requirements.



A) Concrete Thickness & Hole Depth 4-1/4" (108mm)
B) Edge Distance 4-3/4" (121mm)
C) Hole Spacing 6-1/2" (165mm)

⚠CAUTION DO NOT install on asphalt or other similar unstable surfaces. Columns are supported only by anchors in floor.

5. IMPORTANT: Using the horse shoe shims provided, shim each column base until each column is plumb. If one column has to be elevated to match the plane of the other column, full size base shim plates should be used (Reference Shim Kit). Recheck columns for plumb. Tighten anchor bolts to an installation torque of 150 ft-lbs. Shim thickness MUST NOT exceed 1/2" when using the 5-1/2" long anchors provided with the lift.

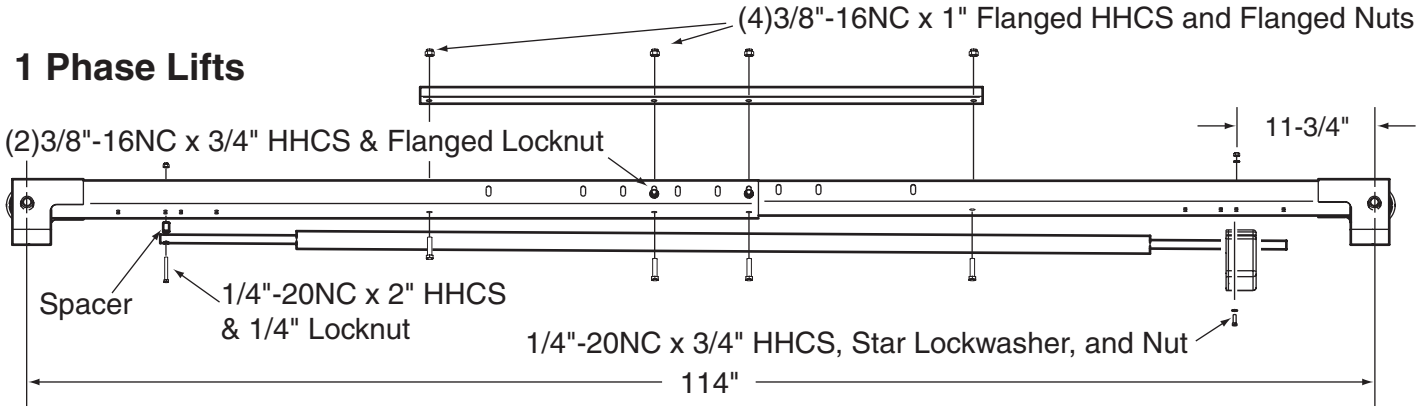
If anchors do not tighten to 150 ft-lbs. installation torque, replace concrete under each column base with a 5' x 5' x 6" thick 3000 PSI minimum concrete pad keyed under and flush with the top of existing floor. Let concrete cure before installing lifts and anchor.

7. Overhead Assembly: Adjust overhead to 114" between centerline of sheave pins, Fig. 6. Install (4) 3/8"-16NC x 3/4" Flanged HHCS & Flanged Locknuts, do not tighten. Install overhead stiffener angle inside center of overhead using (4) 3/8"-16NC x 1" Flanged HHCS and Flanged Locknuts, see Fig. 6. Slide switch box over switch bar ensuring lockout holes face the power unit column. Use (2) 1/4"-20NC x 3/4" lg. HHCS, nuts and 1/4" Star Washers to mount switch box to overhead, Fig. 7d.

For single phase lifts: Insert 1/4"-20NC x 2" HHCS through pivot hole in end of switch bar. Insert opposite end of bar through slot in switch mounting bracket. Then secure HHCS and Switch Bar to overhead as shown, Fig. 6, using 3/4" spacer and 1/4"-20NC Locknut. Tighten Hex bolt leaving 1/16" gap between the spacer and the overhead assembly.

For three phase lifts: Place Actuator on switch bar on end opposite of holes, Fig. 7a. Ensure that the long bolt on Actuator is aligned with holes on opposite end of bar. Tighten set screw. Remove Limit Switch cover, Fig. 7c. Insert Actuator end of Switch Bar into slot located inside Limit Switch, Fig. 7c. Insert 1/4"-20NC x 2" HHCS through pivot hole in end of Switch Bar. NOTE which hole to use, Fig. 6. Then secure HHCS and Switch Bar to overhead as shown, using (2) 3/4" spacers and 1/4"-20NC Locknut. Tighten Hex bolt leaving 1/16" gap between the spacer and the overhead assembly, Fig. 6.

1 Phase Lifts



3 Phase Lifts

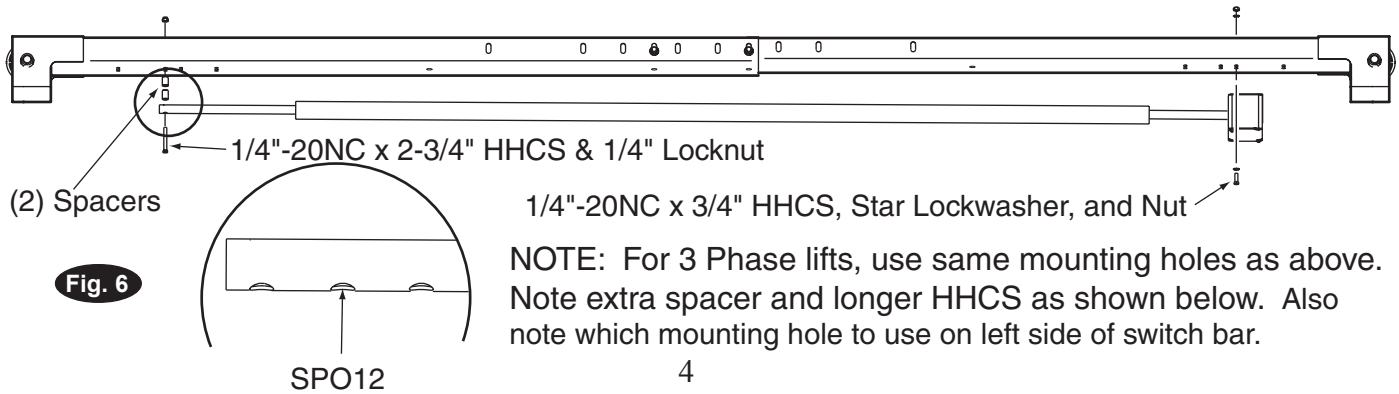


Fig. 6

NOTE: For 3 Phase lifts, use same mounting holes as above. Note extra spacer and longer HHCS as shown below. Also note which mounting hole to use on left side of switch bar.

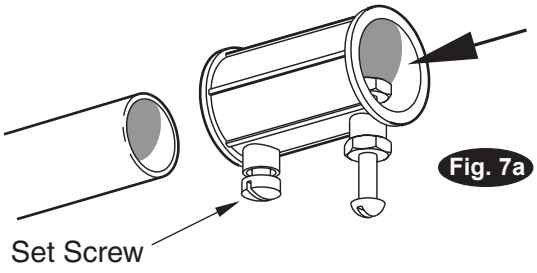


Fig. 7a

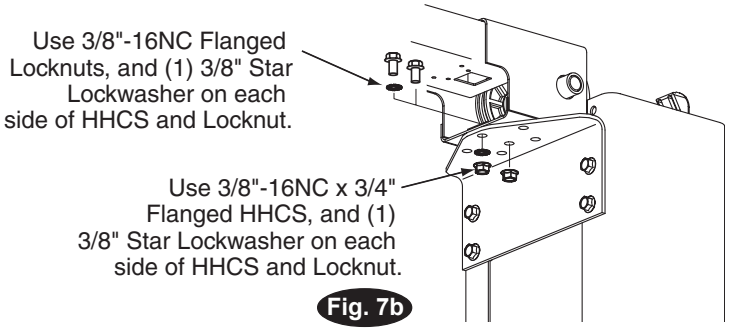


Fig. 7b

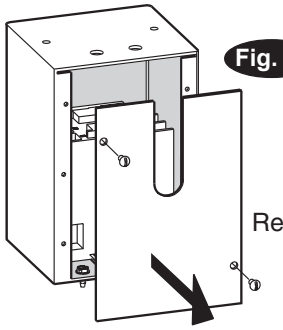


Fig. 7c

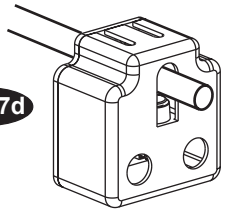
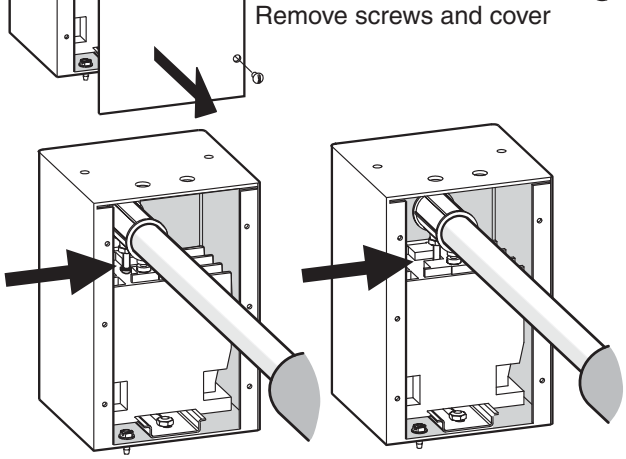


Fig. 7d



8. Overhead: Install overhead assembly to Mounting Bracket with (2) 3/8"-16NC x 3/4" Flanged HHCS, (2) 3/8-16NC flanged locknut, Fig. 7b. Ensure limit switch box is mounted on power unit side. Use (2) 3/8" star washer on Power Unit side, Fig. 5. Tighten bolts at center of overhead assembly.

9. Power Unit: First install (1) star washer onto one of the (4) 5/16"-18NC x 1-1/2" HHCS. *This is very important for grounding.* Put the (4) 5/16"-18NC x 1-1/2" HHCS thru holes in power unit bracket using Push-Nuts to hold in place, Fig. 8a. Mount unit with motor up to column bracket and install (4) 5/16" star washers and 5/16" Nuts. Install and hand tighten Branch Tee to pump until O-ring is seated. Continue to tighten the locknut to 10-15 ft-lbs., or until the nut and washer bottom out against the pump manifold. **NOTE:** You may still be able to rotate the Branch Tee. This is acceptable unless there is seepage at the O-ring. If so, slightly tighten the locknut.

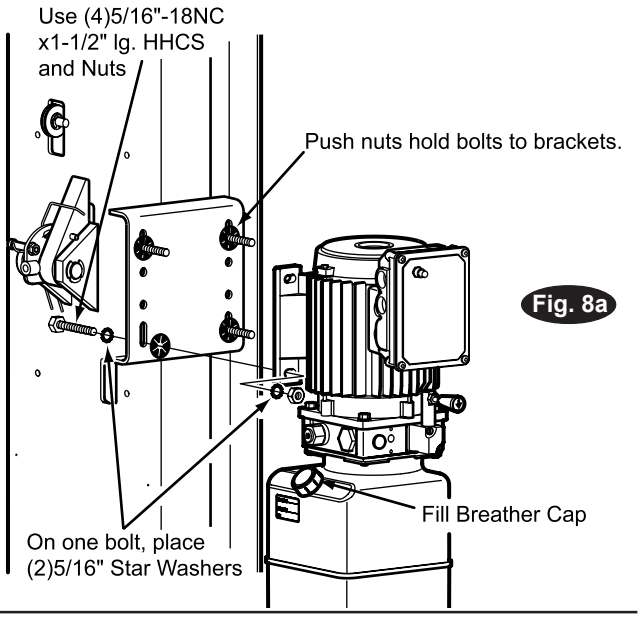


Fig. 8a

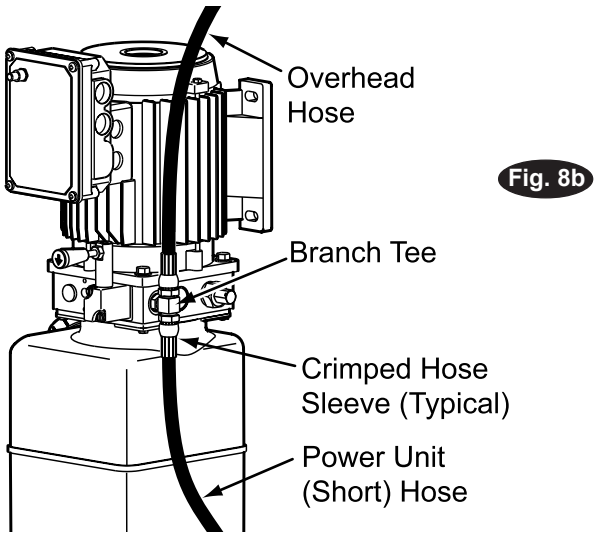


Fig. 8b

⚠CAUTION Over tightening locknut may tear O-ring or distort threads in pump manifold outlet.

10. Hoses: Clean adapters and hose. Inspect all threads for damage and hose ends to be sure they are crimped, Fig. 8b. Install hose and hose clamps, Fig. 9a & Fig. 9d.

Flared Fittings Tightening Procedure

1. Screw the fittings together finger tight. Then, using the proper size wrench, rotate the fitting 2-1/2 hex flats.

IMPORTANT Flare seat MUST NOT rotate when tightening. Only the nut should turn.

2. Back the fitting off one full turn.
3. Again tighten the fittings finger tight; then using a wrench, rotate the fitting 2-1/2 hex flats. This will complete the tightening procedure and develop a pressure tight seal.

⚠CAUTION Overtightening will damage fitting resulting in fluid leakage.

Adapter & Hose Installation (see Fig. 13)

1. Install Pc. (2) with hose clamps, on power unit column side connecting it to the cylinder (1) first.
2. Install Pc. (3) with hose clamps starting at left column cylinder (5) and working toward the right column. All excess hose should be at bends & inside overhead assembly.
3. Install Pc. (4) into power unit.
4. Connect Pc. (2) & Pc. (3) to Tee (4).

NOTE: Route Power Unit hose inside columns using slots provided at column base, Fig. 9b. Route Overhead Hose in column channel on outside of column, Fig. 9c. Overhead hose goes over top end of overhead assembly, Fig. 9d.

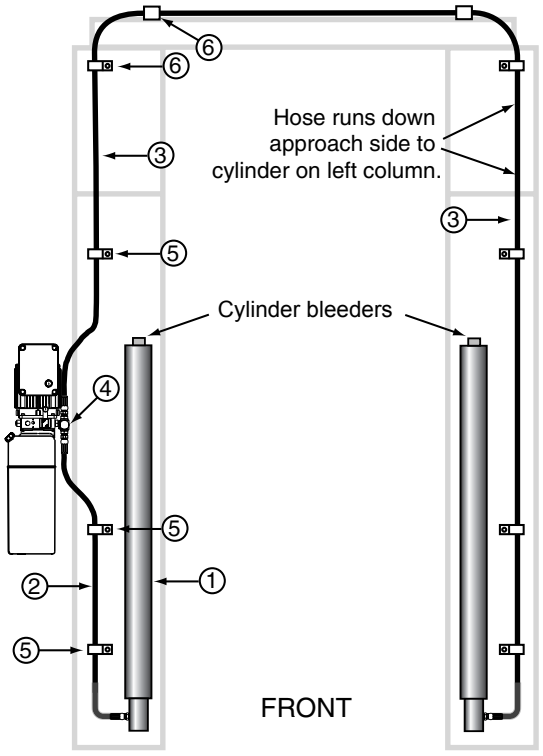


Fig. 9a

NOTE: Overhead hose crosses and runs down approach side of left column to cylinder.

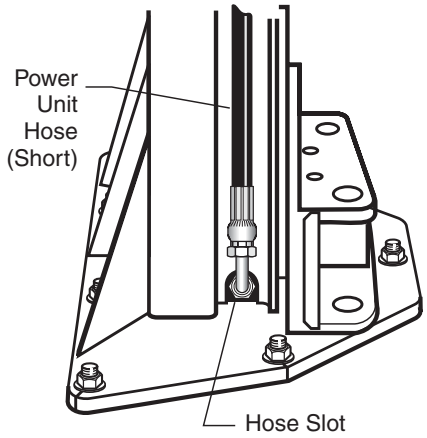


Fig. 9b

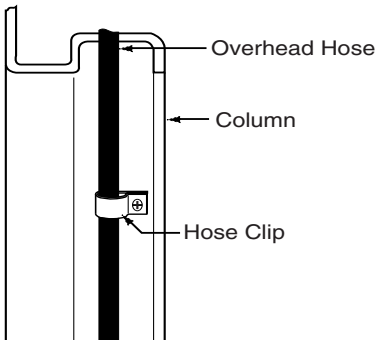


Fig. 9c

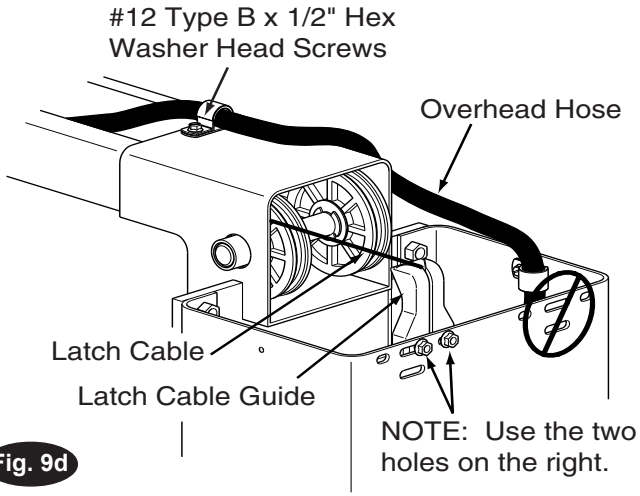


Fig. 9d

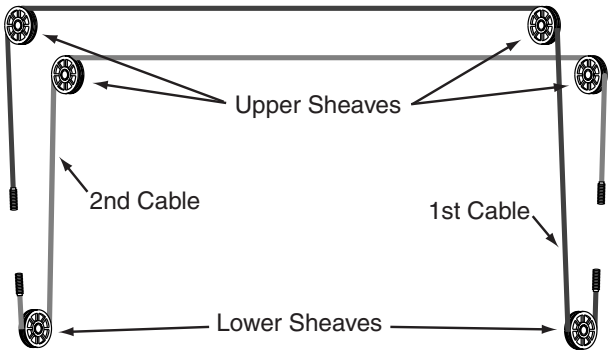


Fig. 10a

ITEM	QTY.	DESCRIPTION
1	2	Hydraulic Cylinder
2	1	Power Unit Hose
3	1	Overhead Hose
4	1	Branch Tee
5	6	Hose Clips
5	6	5/16-18NC x 3/8” lg. PHMS
6	4	Hose Clips
6	4	#12 Type B x 1/2” lg. Slotted HexWasher Head Screw

11. Equalizing Cables

A) Refer to Fig. 10a for the general cable arrangement. First, run a cable end up through the small hole in the lower tie-off plate. Fig. 10b.

B) Push the cable up until the stud is out of the carriage top opening.

C) Run a nylon insert locknut onto the cable stud so 1/2" (13mm) of the stud extends out of the locknut.

D) Pull the cable back down. Fig. 10b

E) Run cable around the lower sheave, then up and around overhead sheave and across and down to the opposite carriage. Fig. 10a.

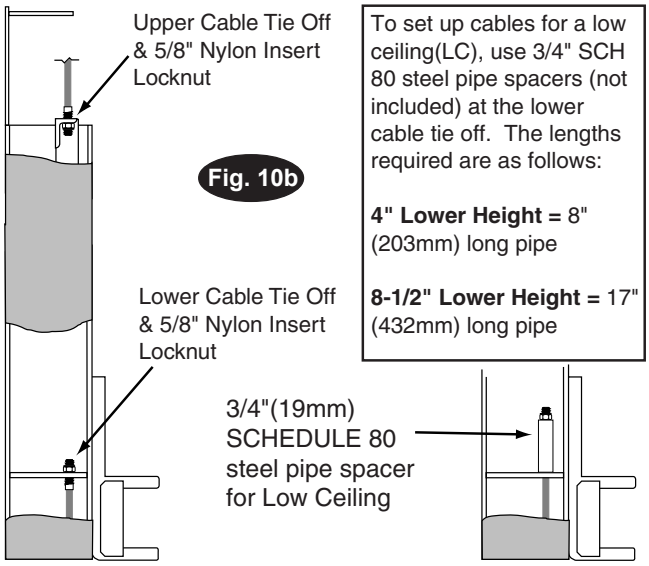


Fig. 10b

To set up cables for a low ceiling(LC), use 3/4" SCH 80 steel pipe spacers (not included) at the lower cable tie off. The lengths required are as follows:

4" Lower Height = 8" (203mm) long pipe

8-1/2" Lower Height = 17" (432mm) long pipe

F) Fasten the cable end to the carriage upper tie-off bracket. Tighten the locknut enough to apply light tension to the cable.

G) Repeat procedure for the second cable. Complete lift assembly. Adjust the tension of both cables during the final adjustments in Paragraph 20.

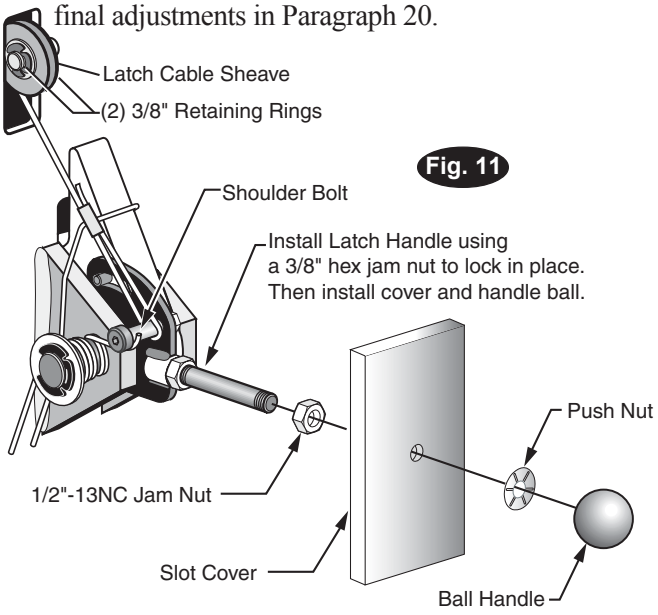


Fig. 11

12. Locking Latch Cable

A) Slip loop end of cable over end of shoulder screw on right side latch control plate, Fig. 11.

B) Feed the other end of the cable through the latch cable sheave slot making sure that the cable is running under the bottom side of the latch cable sheave and inside the right column, Fig. 11.

C) Route cable up inside column and through the latch cable guide, Fig. 12 & Fig. 9d.

D) Continue routing cable to the left column latch cable guide, Fig. 12 & Fig. 9d, routing the cable through the top of the left column latch cable guide, Fig. 9d.

E) Bring the cable down inside the left column and feed the end of the cable through the latch cable sheave slot so that the cable is now back outside the column, Fig. 13.

F) Route cable under the bottom side of the latch cable sheave.

G) At this point you MUST install the latch handle, jam nut, and right column latch cover Fig. 14 & Fig. 11. Install latch handle ball, Fig. 11.

H) Insert cable in cable clamp along one side, loop around shoulder screw and back down, inserting cable along other side of cable clamp, Fig. 13. Place top back on clamp, barely tightening.

I) Next, pull the control plate down, Fig. 13, to eliminate any clearance between the control plate slot and the latch dog pin, Fig. 12.

J) Using Pliers, pull cable tight and secure the clamp close to the shoulder screw. Tighten clamp.

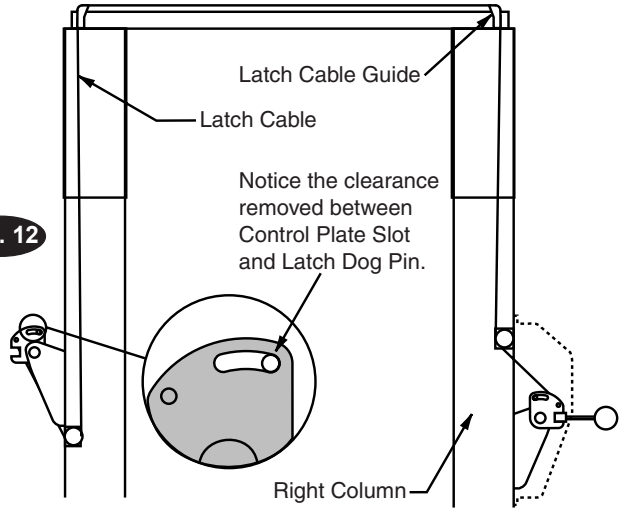


Fig. 12

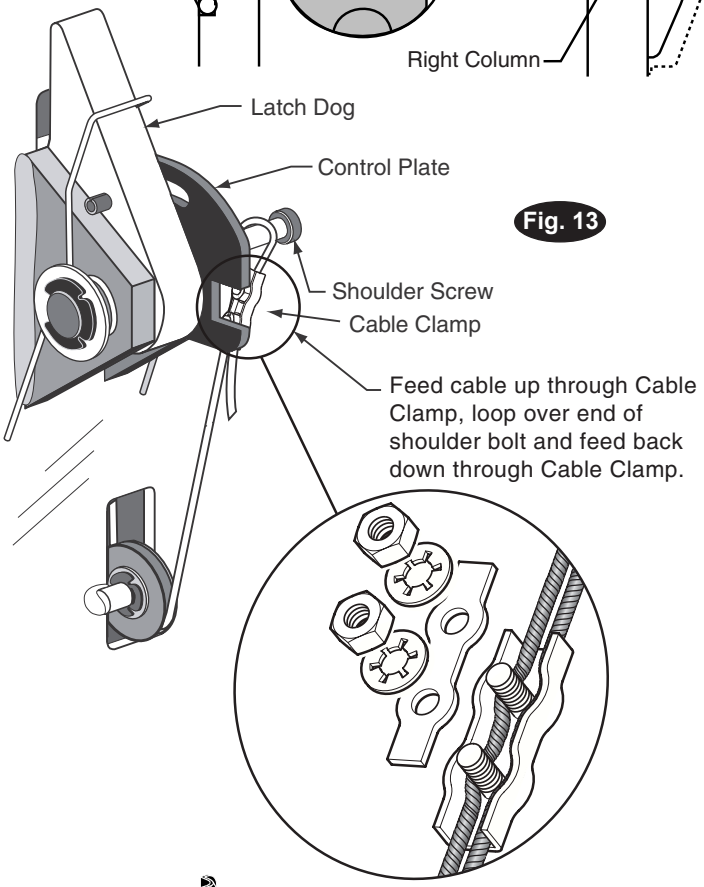


Fig. 13

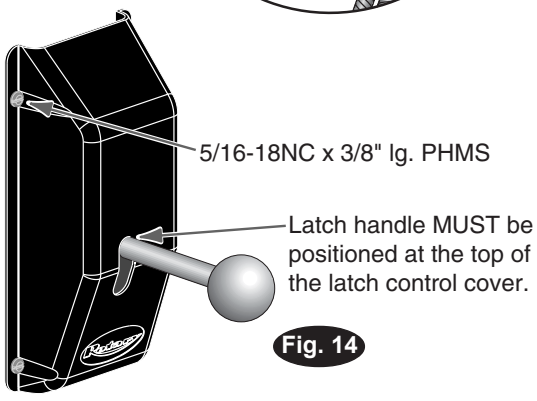
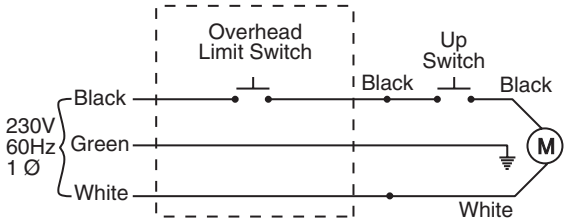


Fig. 14

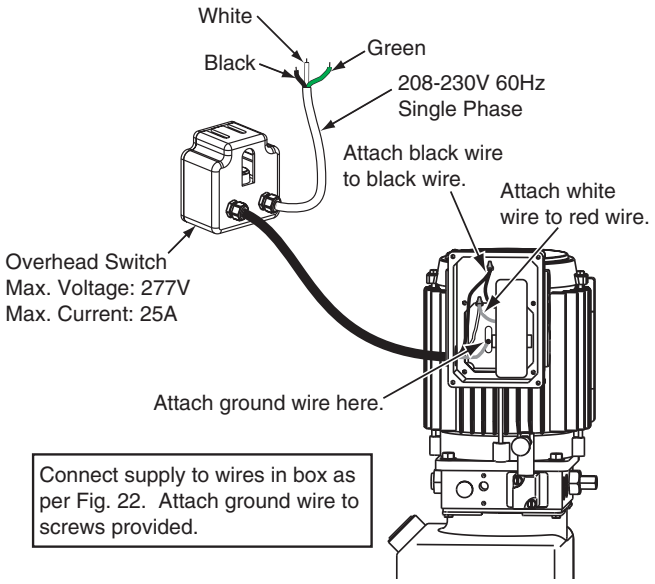
Single Phase Power Unit

MOTOR OPERATING DATA TABLE - SINGLE PHASE	
LINE VOLTAGE	**RUNNING MOTOR VOLTAGE RANGE**
208-230V 50Hz.	**197-253V**
208-230V 60Hz.	**197-253V**



Note: 60Hz. Single phase motor CAN NOT be run on 50Hz. line without a physical change in the motor.

Fig. 22



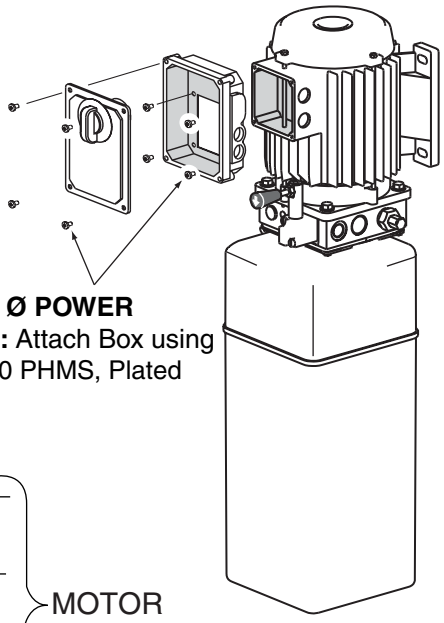
Connect supply to wires in box as per Fig. 22. Attach ground wire to screws provided.

Three Phase Power Unit

MOTOR OPERATING DATA TABLE - THREE PHASE	
LINE VOLTAGE	**RUNNING MOTOR VOLTAGE RANGE**
208-240V 50/60Hz.	**197-253V**
400V 50Hz.	**360-440V**
440-480V 50/60Hz.	**396V-528V**
575V 60Hz.	**518V-632V**

NOTES:

1. Unit not suitable for use in unusual conditions. Contact Rotary for moisture and dust environment duty unit.
2. Control Box must be field mounted to power unit.
3. Motor rotation is counter clockwise from top of motor.



FOR 3 Ø POWER UNITS: Attach Box using M5 x 10 PHMS, Plated

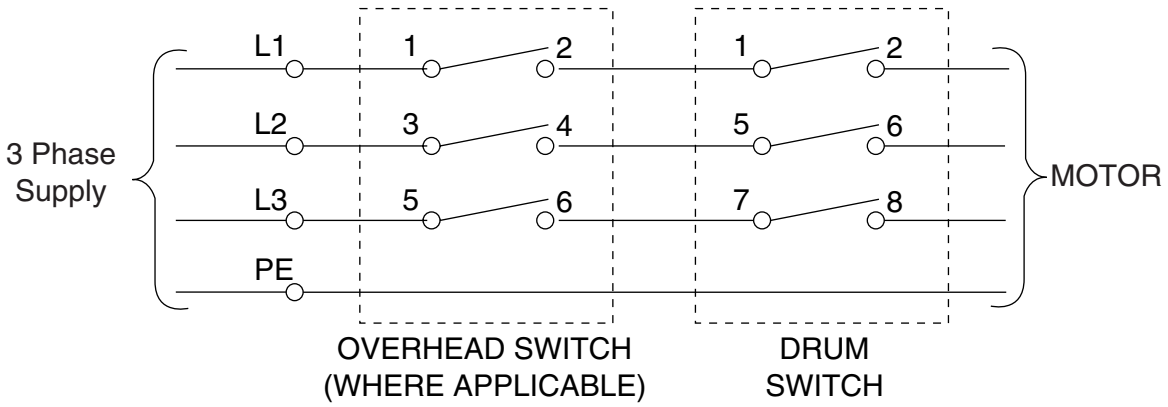
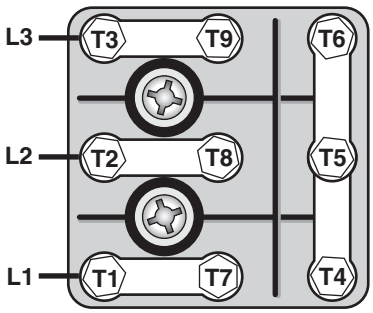
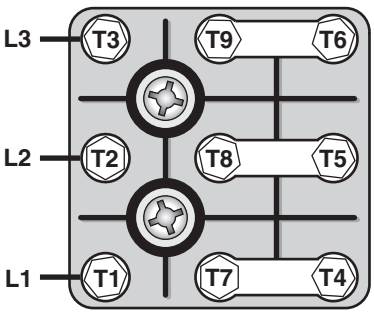


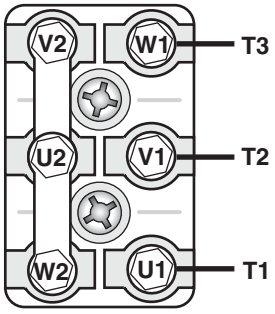
Fig. 23



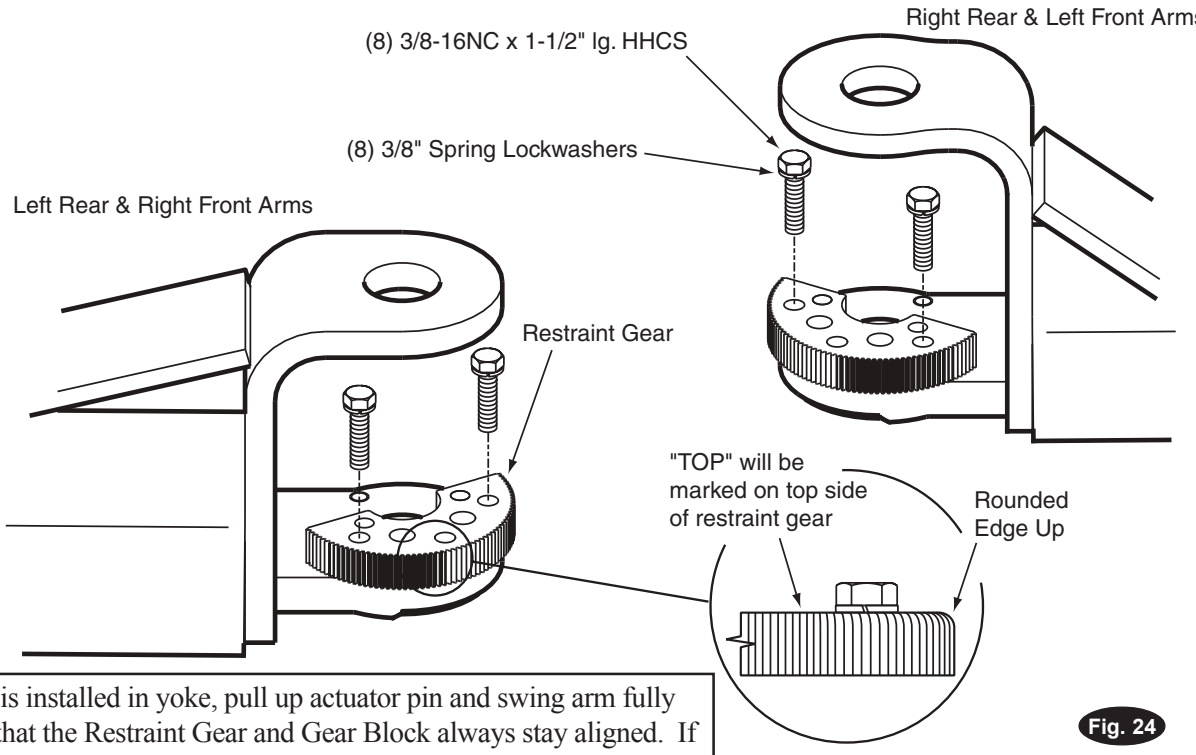
208-240V
50/60Hz. 3Ø



440-480V 50/60 Hz. 3Ø
400V 50 Hz. 3Ø

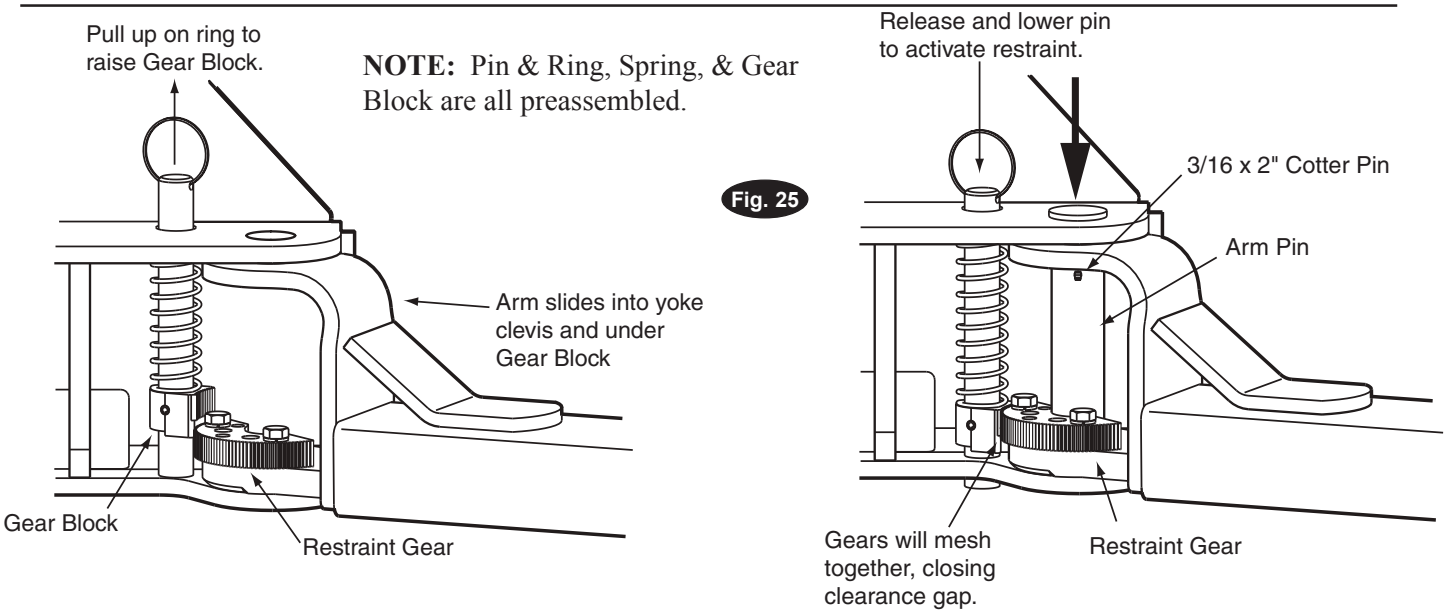


575V 60 Hz. 3Ø



NOTE: Once arm is installed in yoke, pull up actuator pin and swing arm fully around, being sure that the Restraint Gear and Gear Block always stay aligned. If they do not stay aligned, remove restraint gear and install in the opposite position.

Fig. 24



NOTE: Pin & Ring, Spring, & Gear Block are all preassembled.

Fig. 25

NOTE: To check operation of arm restraints, raise carriage 1" min. from full down position. Pull up on pin-ring and adjust arms to desired position. To engage restraint, let pin-ring down allowing gear teeth to mesh together. It may be necessary to rotate arm slightly to engage gear teeth.

13. Electrical: Have a certified electrician run appropriate power supply to motor, Fig. 22 & 23. Size wire for 20 amp circuit. See Motor Operating Data Table.

⚠CAUTION Never operate the motor on line voltage less than 208V. Motor damage may occur.

IMPORTANT: Use separate circuit for each power unit. Protect each circuit with time delay fuse or circuit breaker. For single phase 208-230V, use 20 amp fuse. Three phase 208-240V, use 20 amp fuse. For three phase 400V and above, use 10 amp fuse. For wiring see Fig. 22 & Fig. 23. All wiring must comply with NEC and all local electrical codes.

Note: 60Hz. single phase motor **CAN NOT** be run on 50Hz. line without a physical change in the motor.

14. Overhead switch: Check overhead switch assembly to assure that switch bar is depressing switch plunger sufficiently to actuate the switch. The overhead switch is wired normally open, see Fig. 22 & Fig. 23. Lift will not operate until weight of switch bar is depressing switch plunger. Verify that Power Unit stops working when switch bar is raised, and re-starts when the bar is released.

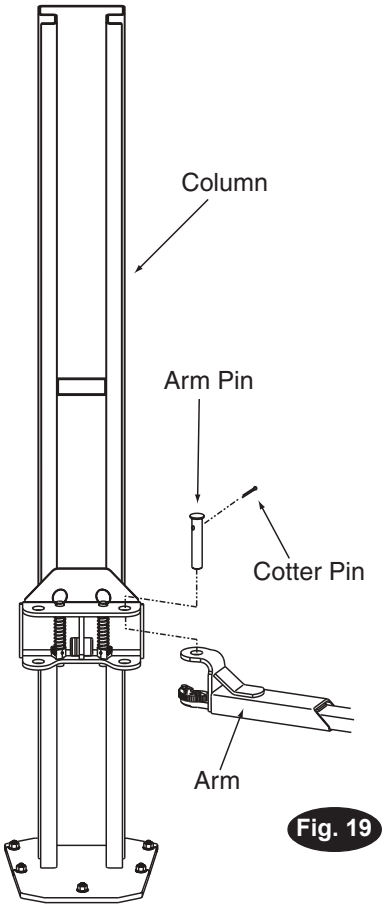


Fig. 19

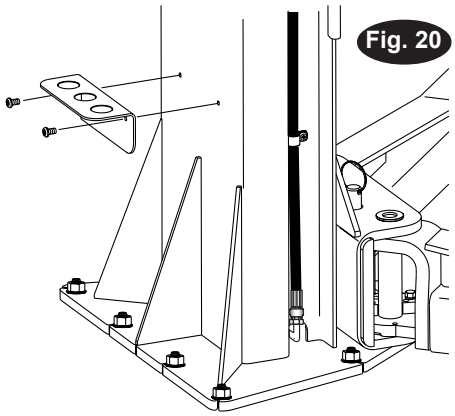


Fig. 20

15. Oil Filling & Bleeding: Use Dexron III ATF or ISOVG32 Hydraulic Fluid. Remove fill-breather cap, Fig. 8a. Pour in (8) quarts of fluid. Start unit, raise lift about 2 ft. Open cylinder bleeders approx. 2 turns, Fig. 9a.

Close when fluid streams. Fully lower lift. Add more fluid until it reaches the MIN_____ mark on the tank. System capacity is (19) quarts. Replace fill-breather cap.

If fill-breather cap is lost or broken, order replacement. Reservoir must be vented.

16. Wheel Spotting Dish: Position wheel spotting dish as illustrated in Fig. 1. Drill (2) 3/8" holes 2-1/2" deep in concrete floor using holes in wheel spotting dish as guide. Drive both anchors, provided, into concrete to secure dish.

17. Arm Restraints & Superstructure: Before installing arms, install arm Restraint Gears as follows: Install Restraint Gear into arm clevis, as shown in Fig. 17, so that the rounded edge (top side) of the gear teeth is facing upward. Then, install the (2) 3/8"- 16NC x 1-1/2" Lg. HHCS (8 total for all 4 arms) and 3/8" Spring Lockwashers into the gear and arm as illustrated in Fig. 17, but do not tighten.

After installing Restraint Gears, raise carriages to a convenient height. Grease swivel arm pins and holes with Lithium grease. Raise Gear Block by pulling upward on pin-ring to allow enough clearance for the Restraint Gear and arm to slide into the yoke clevis and under the teeth of the Gear Block (or gear stop), Fig. 18. Install 1-1/2" diameter arm pin(s) and 3/16" x 2" cotter pin(s), Fig. 19. After installing arm pin, torque the two Restraint Gear bolts to 30-34 ft.-lbs. Let the Gear Block down allowing the teeth of the Restraint Gear and Gear Block to mesh together, Fig. 18.

18. Installation of Rack for Adapter Extensions:
Install racks as shown, Fig. 20, using 5/16”-18NC x 3/8” PHMS.

19. Door Bumper Installation:
1) Press long bumper on column edge, Fig. 21.
2) Press short bumper on top edge of carriage tube, Fig. 21.

20. Latch Cable Adjustment:
A) Check to make sure the latch will properly engage and disengage. ***Slowly*** release the latch handle. A 1/8” gap between the top of the latch dog and the column is allowable.
B) When raising, listen to latches to be sure that both latch dogs fall into latch slots. If they do not, loosen clamp and adjust tension as necessary.
C) Install left latch cover using 5/16-18NC x 3/8” lg PHMS.

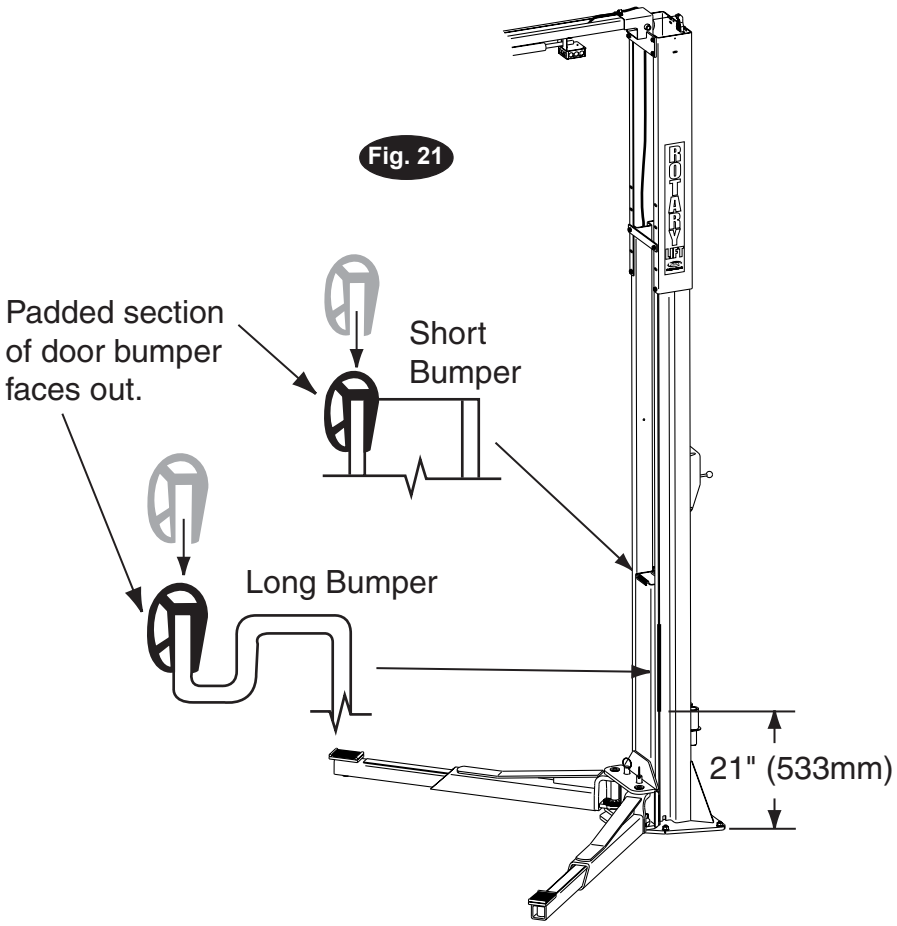


Fig. 21

21. **Pressure Test:** Run lift to full rise and keep motor running for 5 seconds. Stop and check all hose connections. Tighten or reseal if required. Repeat air bleeding of cylinders.

22. **Equalizer Cable Adjustments:** Raise lift to check equalizer cable tension. Below carriage, grasp adjacent cables between thumb and forefinger, with about 15 lbs. effort you should just pull the cables together. Adjust at upper tie-offs Fig. 10b.

23. **Latch Release Decal:** Install latch release decal on cover above latch release handle, Fig. 22.

24. **Pinch Point Decal Location:** Install enclosed pinch point decals. Place (1) decal on each column, Fig. 23.

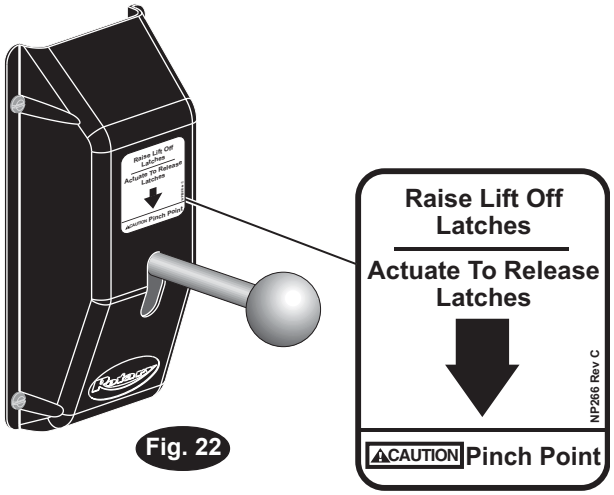


Fig. 22

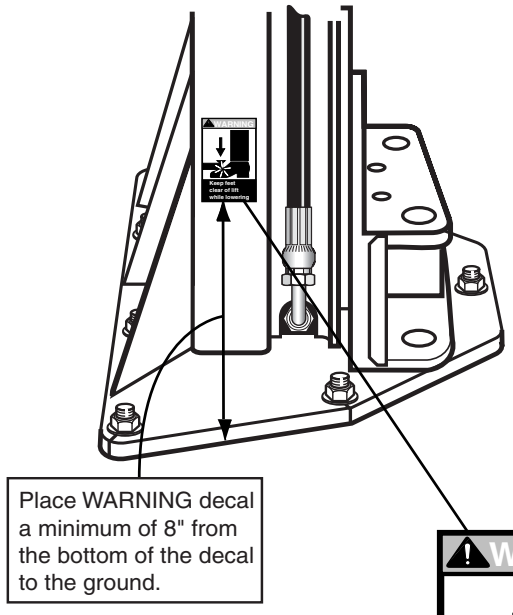


Fig. 23

Installer: Please return this booklet to literature package, and give to lift owner/operator.

Thank You

Trained Operators and Regular Maintenance Ensures Satisfactory Performance of Your Rotary Lift.

Contact Your Nearest Authorized Rotary Parts Distributor for Genuine Rotary Replacement Parts. See Literature Package for Parts Breakdown.

DATE	REV.	CHANGE MADE
02/01/02	-	New (410 Series) instructions. New Universal Overhead.
08/16/02	A	Changed single phase power unit wiring colors.
06/13/03	B	Single phase overhead switch box, new lock release lever slot cover, and new overhead attachment hardware, new overhead mounting bracket attaching hardware.

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