

MANITOWOC LIFTS

INSTALLATION INSTRUCTIONS AND PARTS LIST

"SWING-RAIL" SINGLE POST DRIVE THRU LIFT

SEMI-HYDRAULIC LIFTS

A-1AB1A SERIES

FULL HYDRAULIC LIFTS

A-1AB3A SERIES

Recommendations

AIR EXHAUST: Pipe air exhaust outside building when possible or install the MANITOWOC LIFTS silencer furnished with this lift. This eliminates noise and provides a much more satisfactory installation.

PIPING: Use only new pipe. See that threads are perfect. Use only metal-seated unions. Before using the pipe, hammer it to loosen all scale, spelter, and dirt, then wash the interior with kerosene. The pipe should pitch up gradually from the cylinder to the control valve with no traps or low places. Use pipe sealing compound on the male threads of all screw connections, unless your local authorities require the use of some special material. Do not use on the female thread. Verify that all pipe joints are tight, with no leaks prior to backfill and pouring of concrete.

COMPRESSOR: The compressor should be of the two stage type. Operating pressure to be 120 psi. **An air pressure relief valve, set to limit the air supply pressure to no more than 144 psi must be installed.** Air pressure and tank storage size are important as they determine the lifting speed and capacity of the lift.

All piping, fittings, and valves must have a rated burst pressure of not less than 432 psi (Three times the Maximum Operating Pressure). Do not use plastic piping, fittings or valves.

INSTALLATION MUST BE MADE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS AND IN STRICT CONFORMANCE WITH THESE INSTRUCTIONS.

USE ONLY MANITOWOC LIFTS AUTHORIZED REPLACEMENT PARTS

- Warning -

- Do not pressurize system with shipping strap in place! Do not operate until system is properly filled with oil
- The plunger top plate has foolproof pin which must be kept in line with the safety leg. The plunger should not be rotated in the cylinder. If the plunger is removed, it must be oriented as stated above when put back in the cylinder.

- Caution -

If lift will not be installed within one week, fill plunger-cylinder assembly with SAE 10 hydraulic oil. After the plunger assembly is installed and piping has been completed, fill the system with oil to protect the plunger from corrosion until the facility is opened. Do not raise plunger until oil has been added.

THESE INSTRUCTIONS MUST BE THOROUGHLY READ AND FOLLOWED BY INSTALLER DURING INSTALLATION, AND THEN BY THE USER THROUGHOUT THE LIFE OF THE LIFT. THESE INSTRUCTIONS MUST ALSO BE THOROUGHLY READ AND FOLLOWED BY THE AUTHORIZED SERVICE CONTRACTOR DOING SERVICE WORK ON THE LIFT TO ASSURE PROPER ASSEMBLY OR DISASSEMBLY.

FOR PROBLEMS OR QUESTIONS WITH THE INSTALLATION, CALL OUR TOLL FREE HOTLINE: 800-783-5777



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GENERAL INFORMATION

1. MANITOWOC LIFTS products are designed to give many years of trouble free operation if installed correctly and given proper care.
2. An automatic lock leg is shipped disassembled from the plunger and cylinder assembly. This reduces the possibility of shipping damage to these items.
3. The series A-1AB3B lift operates on the full hydraulic principle, which means that the load and lifting assembly are at all times supported and on a continuous column of oil which extends from the cylinder to the oil control valve.
4. The series A-1AB1B lift operates on the semi-hydraulic principle, which means that the load and lifting assembly are raised by air acting directly on the oil in the plunger, the plunger acting as oil reservoir.
5. The models A-1AB1B, A-1AB3B contain low oil control valves. These valves stop operation of the lift when oil level drops to a minimum safe level. Operation of lifts without sufficient oil can be hazardous and damaging to the lift.
6. All semi-hydraulic lifts must be run up full stroke with air valve open and lift topped out for approximately 30 seconds every 4 to 6 partial strokes. This is done to allow automatic bleeding of trapped air in order to avoid blowing oil out of exhaust muffler.

MANITOWOC LIFTS will not assume any responsibility of liability, financial, legal, or otherwise, in connection with the installation of its lifts which goes beyond the stated limitations of the standard instruction sheet or drawings currently applying, at the date of shipment, to individual models of MANITOWOC LIFTS.

In the event MANITOWOC LIFTS representatives consult with contractors, owners, or their employees regarding location of lifts or any other matters such as layout, head room, or floor planning, this consultation shall not be taken as a representation of accuracy, and the Company will not assume any liability or responsibility in any manner whatsoever. It is suggested that an architect be consulted.

LOCATING THE LIFT. Proper location of a lift is essential to insure efficient usage and operation. Therefore a careful study should be made of the area available for installation.

CONSIDER:

- DIRECTION OF TRAFFIC flow.
- APPROACH SPACE to allow adequate maneuverability of the car.
- WORKING AREA required around car.
- FLOOR SLOPE - 1/8" per ft. drainage slope away from lift recommended. Floor slope must provide sufficient clearance so that swing rails are free to move with lift in "Down" position.
- HEADROOM above lift. Provide ceiling clearance for your highest vehicle when the lift is raised.

The sketches below show two types of installation: - one showing a lift perpendicular or parallel to a wall, and the other, a lift at an angle to a wall. (The latter used when sufficient approach space is not available).

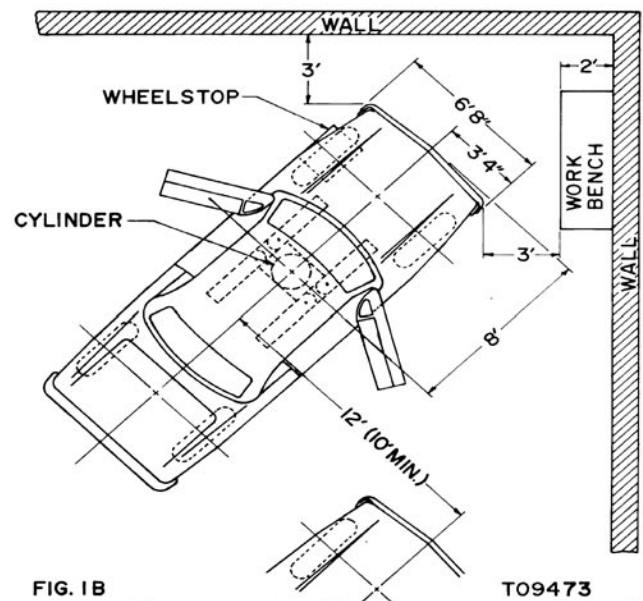
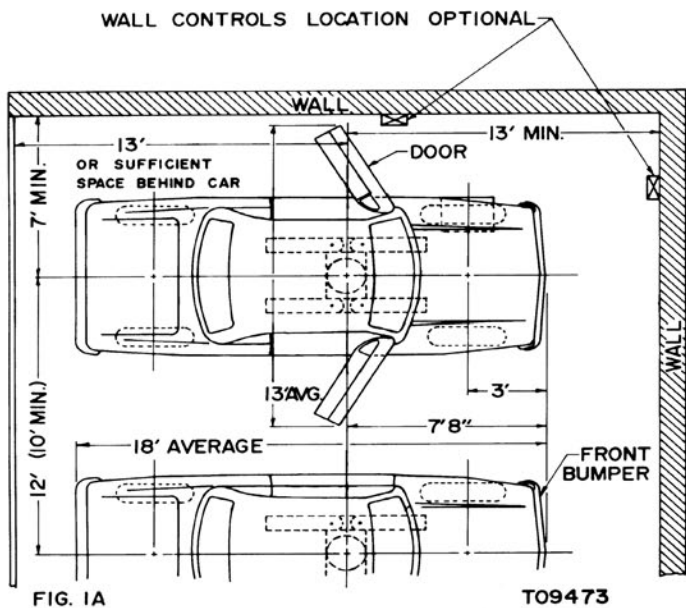
Note recommended 3 ft. minimum clearance aisle and space for a work bench provided in front of car. (Fig. 1B)

Note clearance required on either side of car for opening doors.

When two or more lifts are installed adjacent to one another, they should be set with a recommended distance of 12 ft. between center lines of lifts. It is possible to locate adjacent lifts 10 ft. apart, but this spacing should be used only when absolutely necessary.

Location of the lift control valve is optional to some extent and must be determined to best suit the installation. Controls should be located to give the operator a clear unobstructed view of the lift.

NOTE: Dimensions indicated in sketches are recommended minimum only.



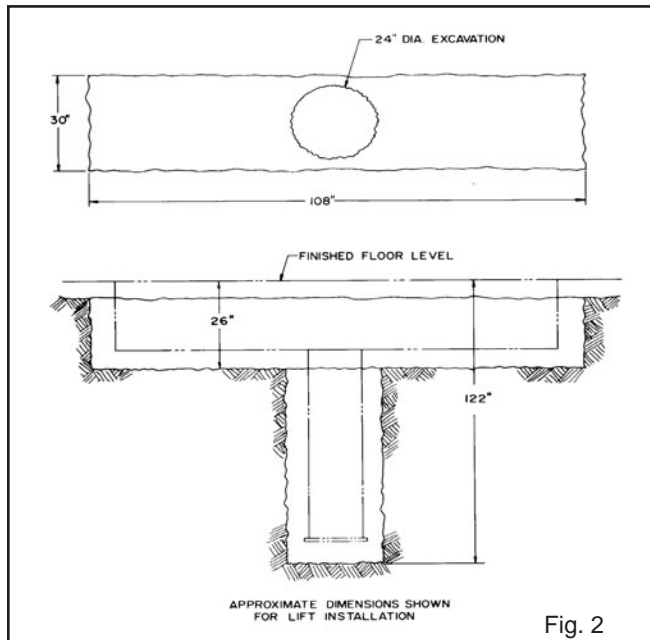
FLOOR CONDITIONS

Determine what floor conditions exist or will exist where the lift is to be installed. Under no circumstances should the Service Station floor be sloped toward the lift plunger. This condition will result in

rusted and pitted cylinders and leakage at the packing. When a frame lift is installed in an existing Station where the floor slope cannot be controlled, it is recommended that a drain be installed.

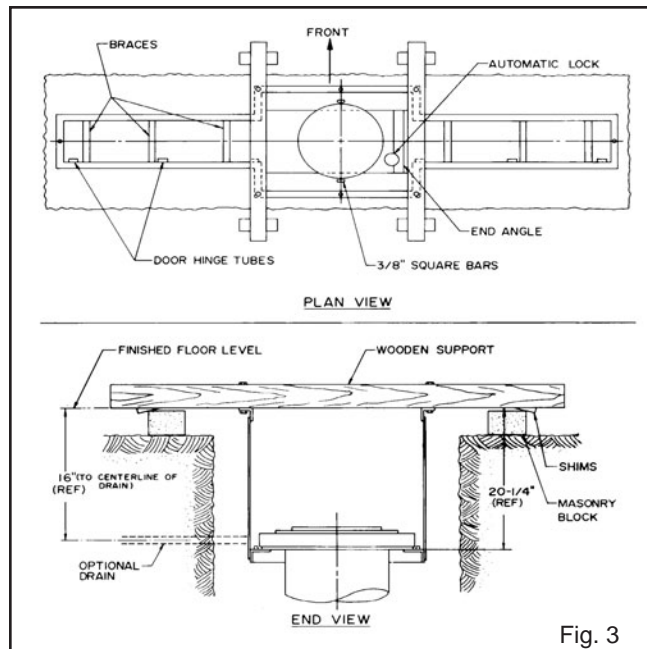
INSTALLATION INSTRUCTIONS SERIES A-1AB3A (FULL HYDRAULIC)

1. LOCATION. Determine lift location and make certain that proper working space and clearance is available as outlined in previous section "Locating the Lift".
2. Excavate hole for trench box assembly as shown in Fig. 2. If oil tank is to be buried, excavate a minimum diameter of 24" to a depth of 74" below finished floor level. Dig trench for oil and air lines from tank to controls.



3. INSPECT CYLINDER FOR SHIPPING DAMAGE AND CHECK DRAIN PLUG FOR TIGHTNESS BEFORE CYLINDER ASSEMBLY IS INSTALLED.
4. AUTOMATIC LOCK LEG ATTACHMENT. Match the support channels on the automatic lock leg with the support channels on the cylinder and attach using two 3/8"-16 x 3/4" long hex head bolts.
5. TRENCH BOX ASSEMBLY. The trench box is shipped assembled. There are (2) 1-1/4" angle braces attached to the upper portion of the box. "DO NOT REMOVE THESE BRACES AT THIS TIME." Cut (6) 2 x 4 braces 9-3/8" long and nail them thru the 3/16" diameter holes provided in the sides of the box. Additional braces should be provided at the top of the trench box to maintain 9" box width between angles. "THESE BRACES MUST BE INSTALLED BEFORE BACKFILLING OR POURING CONCRETE IN OR AROUND THE TRENCH BOX IN ORDER TO PREVENT DISTORTION. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLER TO BRACE THE TRENCH BOX SUFFICIENTLY SO THAT NO APPRECIABLE DISTORTION OCCURS."
6. BOX SUPPORTS. Fasten wooden supports securely to top of trench box through holes provided in corners of frame (See Fig. 3). These are to be provided by contractor. DO NOT REMOVE 1-1/4" ANGLE SHIPPING BRACES FROM TOP FRAME.

7. SETTING THE TRENCH BOX. Lower trench box into excavation until supports rest on masonry blocks approximately even with finished floor level. (See Fig. 3)



8. HANGING CYLINDER. Using shipping strap, lower cylinder assembly into trench box.
IMPORTANT: AUTOMATIC LOCK MUST BE ON SIDE OF BOX WITH NOTCH IN END ANGLE AND POSITIONED TOWARD SIDE OF FRAME WHERE DOOR HINGE TUBES ARE WELDED (SEE FIG. 3). **NOTE:** AUTOMATIC LOCK IS NOT CENTERED IN TRENCH BOX. It is rotated 4-1/4" (22-1/2°) from long centerline of the trench box. Be sure that the plunger and cylinder assembly is hanging in the center of the trench box between the two 3/8" square bars on the lower box frame. Place "U" bolt around automatic lock, (See Fig. 8) and secure with nuts to end angle.
9. To prevent accumulation of water in trench box, provision for a drainage should be made by using one or more of the 4 knock-out holes located in center section of box. (See Fig. 3)
10. LEVELING. Level top of trench box in both directions adjusting shims under wooden supports (See Fig. 3). Check top of plunger with level in both directions and readjust shims, if necessary, to make cylinder assembly level and plumb. Pour concrete around sides of cylinder base, work concrete under cylinder. Recheck top of plunger to insure that it has remained level during this operation (See Fig. 5).
11. Complete piping as shown in Fig. 6. Install oil control valve with inlet and outlet ports horizontal and handle oriented vertically upward. Spring loaded handle can be pulled toward the operator to activate the lift. The air-oil tank may be installed below ground if desired, and if local ordinances permit. Piping arrangement applies for either above or below ground installations. Install extension on oil fill opening, so tank may be filled and gauged at floor level. (See Fig. 6)

12. Fill system with oil - The requirements are approximately 55 gals. Use only oil which is recommended by the petroleum manufacturer for hydraulic lifts. Viscosity rating should be approximately 100-125 SSU at 100° F. Most SAE 10 oils (new) are acceptable. Avoid oils which foam under air pressure. A rust inhibitive type oil is recommended.

Follow the steps given below, keeping in mind that the system must be filled and bled gradually.

A. Remove the shipping strap from top of plunger and cylinder assembly by removing the two (2) 7/16-14 x 1-1/2" lg. bolts and discard the strap. Put the same (2) bolts back into the same holes to hold the wiper retaining ring.

IMPORTANT: Six bolts are required to properly hold the wiper retaining ring.

B. Place Air Control Valve handle in exhaust position.

C. Remove oil gauge from oil fill pipe.

WARNING: Serious personal injury could occur if you attempt to remove any oil filler cap with pressure still in the system. Always lower the lift fully, and open the air valve and keep it open until "All" pressure is fully exhausted. Do not position any part of your body over the cap when removing. Remove the cap slowly.

D. Loosen air vent plug (located in top cylinder casing).

E. Fill tank to the full level on the oil gauge.

F. Remove Float Assembly from the loose parts kit and insert through tank fill opening with the hook end up. Check float to be certain it is free and floating. (Ref. Fig. 4)

G. Replace oil gauge and move air control valve handle to "Raise" or supply position.

H. Bleed air from cylinder by gradually admitting oil to cylinder by means of the oil control valve. Air will escape from air vent. When a steady stream of oil flows freely from air vent hole, close oil control valve and tighten air vent plug.

Place air control valve in exhaust position and open oil control valve until plunger is completely lowered. Check oil in tank using the oil gauge. Add sufficient oil in tank to bring the oil level up to the top hole in oil gauge. Replace oil gauge. Repeat bleed and refill procedure until no air escapes from air vent.

13. Imbed base of cylinder in 4" min. of concrete and at least 3" thick around cylinder. (See Fig. 6)

14. After concrete has hardened around base of cylinder, backfill with clean sand to within 26" of finish floor level.

IMPORTANT: Do not use cinders or other corrosive fill materials. Tamp fill solidly, checking regularly to keep plunger exactly plumb in all directions by laying level across top plunger when making backfill. THIS IS VERY IMPORTANT.

WARNING: Under no circumstances should a lift be operated with the float assembly removed. Such operation can result in a potentially hazardous condition should a low oil condition occur. Complete concreting. (See Fig. 5) Recheck top of trench

15. box to insure that it is level in all directions before proceeding further. (12) 1/8" diameter holes are located in the end of the box. These holes indicate the proper concrete level in the box. With the trench box braced, to maintain proper width, pour concrete into box filling area "A" to top of cylinder forming ring and 1/8" dia. holes.

NOTE: DO NOT LET LEVEL OF CONCRETE AT ENDS OF BOX COME ABOVE 1/8" HOLES. (See Fig. 8). Next pour concrete in area "B" to the level of the concrete inside box. Backfill around the box to point where floor concrete will begin.

Float Guide and Oil Gauge Assembly are installed in tank at factory. The Float Assembly, which is packaged in the loose parts package, must be installed during lift installation.

CAUTION: If for any reason the length of the fill pipe is changed, the length of the oil gauge assembly must also be increased or decreased by exactly the same amount. The disc must be re-attached if it is removed to change dip stick length.

INSTALLING LOW OIL CONTROL AND OIL GAUGE ASSEMBLY

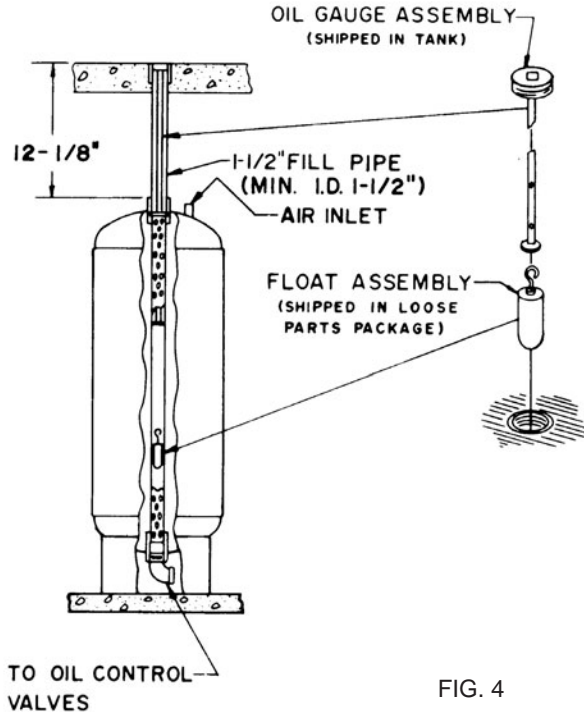


FIG. 4

IMPORTANT: CHECK TO SEE THAT BOX STAYS CENTERED AROUND CYLINDER WHILE BACKFILLING. REMOVE WOODEN SUPPORTS FROM THE BOX. FINISH FLOOR AREA, MAKING SURE THAT THE FLOOR IS FLUSH WITH THE TOP EDGE OF BOX. THE 1-1/4" ANGLE BRACES AND THE 2 X 4 WOODEN BRACES SHOULD NOT BE REMOVED FROM THE BOX UNTIL THE CONCRETE HAS CURED.

16. BALLAST SHOULD BE PROVIDED FOR PLUNGER. This may be accomplished by filling the hollow of the plunger with a mixture of clean oil and sand, (no foundry sand), is recommended. Care should be taken not to let sand get into the packing area by providing a funnel of some type.

17. FINAL ASSEMBLY (See Fig. 8)

A. After concrete has hardened, position the crosshead (A) on the plunger, by first locating the "Fool-Proof Pin" in its proper location in the crosshead. Fasten the crosshead to the plunger, using (6) hex hd. bolts (H).

B. Lubricate both sides of swing arm washers (P) with a multi-purpose grease and position on crosshead anchor plate.

C. Insert swing arm (J) into crosshead anchor plate. (After applying grease to end of arm).

D. Grease and insert pivot bushing (M) and lockwasher (N) into swing arm hole.

E. Secure with bolt (L).

F. Raise lift about two feet.

G. Put lift adapter assembly (K) on swing arm (J). Secure with lockwasher (Q) and bolt (R).

H. With lift still raised two feet, fasten the center post of the automatic lock (MM) with bolt (G), lock washer (PP), and flat washer (QQ), through bolting plate and hand tighten.

- I. Lower the lift until the bottom of the crosshead just starts into the trench box. Align crosshead with the trench box and tighten automatic lock leg bolt (G) securely. Lower lift all the way down into box, and check to see that it is properly aligned.
- J. Apply grease to pivot brackets (BB) and insert into the ends of door closing pivot bar (AA). Slide door closing pivot bar (AA), and pivot brackets (BB), into box, on side next to automatic lock. Align pivot brackets (BB) with tapped holes in frame and secure with bolts (E). The pivot brackets are to be centered between bolts (E). The square bars on pivot bar (AA), should now be hanging down into box.
- K. Place washers (DD) on each side of wheel assembly (CC) and insert between bars on pivot bar (AA). Place bolt (EE) thru holes in bar and wheel. Secure with nut (F). Wheel must be free to rotate.
- L. Raise lift approximately two feet. Place door cover (GG), 34" long on same side of trench box as automatic lock. Align hinge tubes, on frame and door. Insert door hinge rod (FF) thru hinge tubes on door and frame. Slide rod thru hinge tubes and secure with cotter pin (JJ).
- M. Place door cover (HH), 3-1/4" long, on opposite end of trench box from automatic lock. Assemble the same as door (GG) above. Lay doors over on square bars of pivot bar (AA).
- N. To align the doors horizontally to the finished floor, loosen the (2) bolts that secure the clamp on the door closing pivot bar. Keeping the wheel against the plunger, rotate the door closing pivot bar up or down. After doors are properly aligned, retighten bolts.
- O. Lower lift slowly into trench box and observe operation of doors and pivot bar.
- P. Raise lift slowly again and observe operation of doors and pivot bar again. Readjust as indicated in paragraph (N) above, if necessary.
- Q. Place cover plate (W) on side of trench box next to wheel. Use bolts (E) and flat washer (X) to attach plate to box.
- R. Place cover plate (LL) on opposite side of trench box. Use bolts (E) and flat washer (X) to attach plate to box.
- S. Next assemble cover door assembly (B). Place door guide bar (C) on the angle, so that the narrow leg is on the straight side of the cover door. Attach with bolts (NN) lockwasher (D), and nut (F).
- T. Place cover door assembly on crosshead. Radius on door should be on same side as cover plate (LL).
- U. Lower lift into trench box.

IMPORTANT.

18. Operating Instructions

The permanent operating instructions along with inspection and maintenance instructions furnished with this lift should be permanently and conspicuously displayed in the lift control area. Automotive lifts should be operated by trained personnel only. If you do not know how to position or lift a vehicle properly, do not guess. Get training. Start by reading the operating instructions, the booklet "Lifting It Right", and the "Automotive Lift Safety Tip Sheet" furnished with the lift. Also refer to the vehicle manufacturer's service manual for proper lift points and lifting procedures.

IMPORTANT.

19. HOW TO ORDER REPLACEMENT PARTS

Be sure to mention the lift model number and serial number in correspondence dealing with service information and when ordering replacement parts. This information is on the top of the plunger and cylinder assembly.

20. **IMPORTANT.**

Underground corrosion takes place in varying degrees throughout the United States and may cause a major problem with lift equipment. To protect underground lift components, MANITOWOC LIFTS recommends that an analysis of local soil conditions be obtained, and that a knowledgeable source be consulted relative to the implementation of an adequate corrosion control system. See MANITOWOC LIFTS warranty.

21. **WARNING:** This lift requires a "Low Oil" Float Assembly and "Deadman Spring Return" oil valve. Do not remove, modify, or defeat these devices or hazardous operation under certain circumstances could occur.

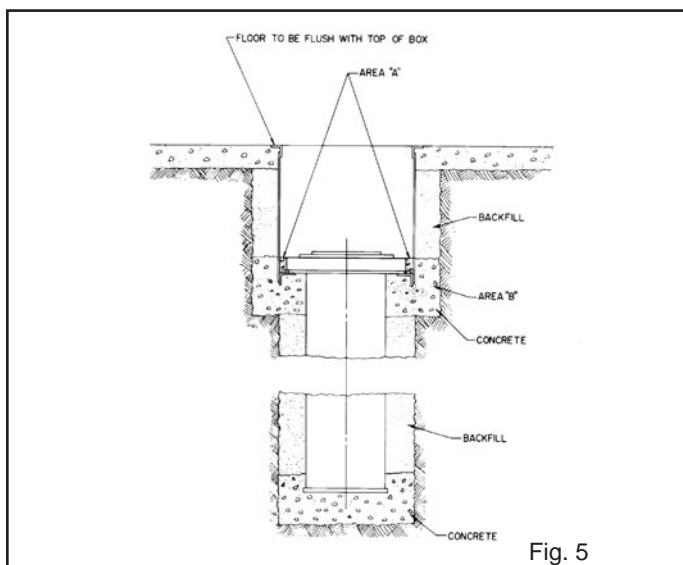


Fig. 5

INSTALLATION INSTRUCTIONS

SERIES A-1AB1A (SEMI-HYDRAULIC)

1. LOCATION. Determine lift location and make certain that proper working space and clearance is available as outlined in previous section "Locating the Lift".
2. Excavate hole for trench box assembly as shown in Fig. 2.

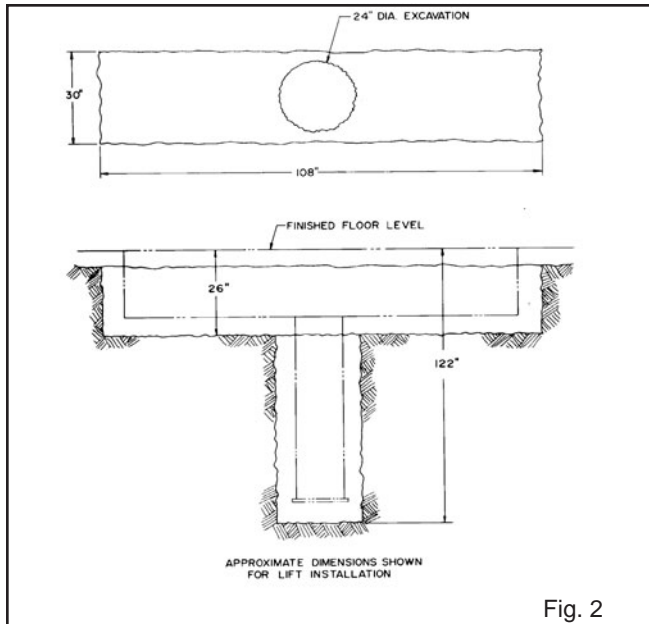


Fig. 2

3. INSPECT CYLINDER FOR SHIPPING DAMAGE.
4. AUTOMATIC LOCK LEG ATTACHMENT. Match the support channels on the automatic lock leg with the support channels on the cylinder and attach using two 3/8"-16 x 3/4" long hex head bolts.
5. TRENCH BOX ASSEMBLY. The trench box is shipped assembled. There are (2) 1-1/4" angle braces attached to the upper portion of the box. "DO NOT REMOVE THESE BRACES AT THIS TIME." Cut (6) 2 x 4 braces 9-3/8" long and nail them thru the 3/16" diameter holes provided in the sides of the box. Additional braces should be provided at the top of the trench box to maintain 9" box width between angles. "THESE BRACES MUST BE INSTALLED BEFORE BACKFILLING OR POURING CONCRETE IN OR AROUND THE TRENCH BOX IN ORDER TO PREVENT DISTORTION. IT SHALL BE THE RESPONSIBILITY OF THE INSTALLER TO BRACE THE TRENCH BOX SUFFICIENTLY SO THAT NO APPRECIABLE DISTORTION OCCURS."
6. BOX SUPPORTS. Fasten wooden supports securely to top of trench box through holes provided in corners of frame (See Fig. 3). These are to be provided by contractor. DO NOT REMOVE 1-1/4" ANGLE SHIPPING BRACES FROM TOP FRAME.
7. SETTING THE TRENCH BOX. Lower trench box into excavation until supports rest on masonry blocks approximately even with finished floor level. (See Fig. 3)
8. HANGING CYLINDER. Using shipping strap, lower cylinder assembly into trench box.

IMPORTANT: AUTOMATIC LOCK MUST BE ON SIDE OF BOX WITH NOTCH IN END ANGLE AND POSITIONED TOWARD SIDE OF FRAME WHERE DOOR HINGE TUBES ARE WELDED (SEE FIG. 3).

NOTE: AUTOMATIC LOCK IS NOT CENTERED IN TRENCH BOX. It is rotated 4-1/4" (22-1/2°) from long centerline of the trench box. Be sure that the plunger and cylinder assembly is

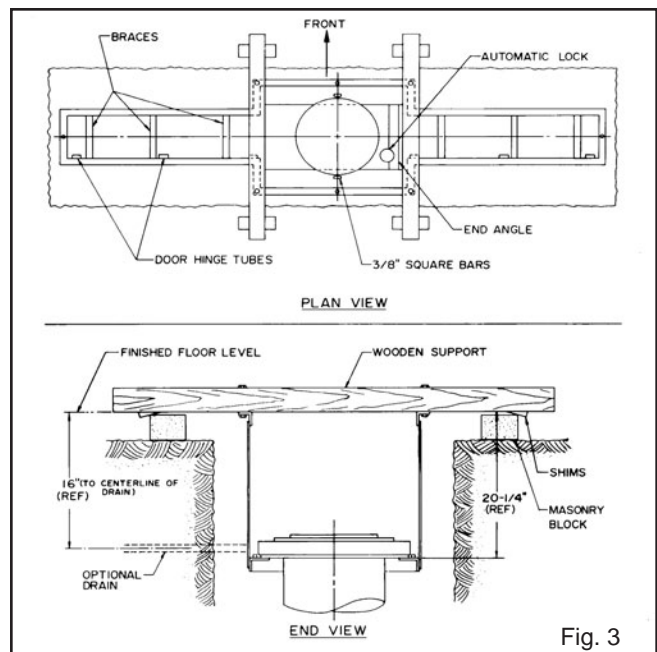


Fig. 3

- hanging in the center of the trench box between the two 3/8" square bars on the lower box frame. Place "U" bolt around automatic lock, (See Fig. 8) and secure with nuts to end angle. To prevent accumulation of water in trench box, provision for
9. a drainage should be made by using one or more of the 4 knock-out holes located in center section of box. (See Fig. 3)
 10. LEVELING. Level top of trench box in both directions adjusting shims under wooden supports (See Fig. 3). Check top of plunger with level in both directions and readjust shims, if necessary, to make cylinder assembly level and plumb. Pour concrete around sides of cylinder base, work concrete under cylinder. Recheck top of plunger to insure that it has remained level during this operation (See Fig. 5).
 11. Run 1/2" pipe to control valve and complete remainder of piping. (See Fig. 7)
 12. Fill system with oil. Remove the shipping strap and the wooden shipping plug located at the upper end of the plunger and cylinder assembly by removing the two (2) 7/16"-14 x 1-1/2" lg. bolts and discard the shipping strap and wooden plug. Put the same (2) bolts back into the same holes to hold the wiper retaining ring. **IMPORTANT:** Six bolts are required to properly hold the wiper retaining ring. Install the pipe plug as shown in Fig. 4. Approximately 42 gals. of oil are required. Use only oil which is recommended by the petroleum manufacture for hydraulic lifts. Viscosity rating should be approximately 100-125 SSU at 100° F. Most SAE 10 oils (new) are acceptable. Avoid oils which foam under air pressure. A rust inhibitive type oil is recommended.
- Follow the steps given below, keeping in mind that the system must be filled and bled gradually.
- Place Air Control Valve handle in exhaust position.
- A. Remove oil fill plug (located in plunger head).
 - B. Loosen air vent plug (located in top cylinder casting).
 - C. Fill plunger with oil to high mark on oil gauge.
 - D. Replace fill plug.
 - E. Tighten air vent plug.
 - F. Carefully admit a small amount of air to system by placing air control valve in supply or raise position and raising plunger NO MORE THAN 3 FEET.
- Place air control valve in neutral position.

H. Loosen air vent plug with a screwdriver. Air will escape through air vent plug. When oil starts to escape, tighten vent plug.

Place air control valve in exhaust position until plunger is completely lowered.

Remove oil fill plug and check oil level. Add oil if necessary. K. (See Fig. 4). CAUTION - Always place air control valve in exhaust position before removing pipe plug. Repeat bleed and refill procedure until no air escapes from air vent.

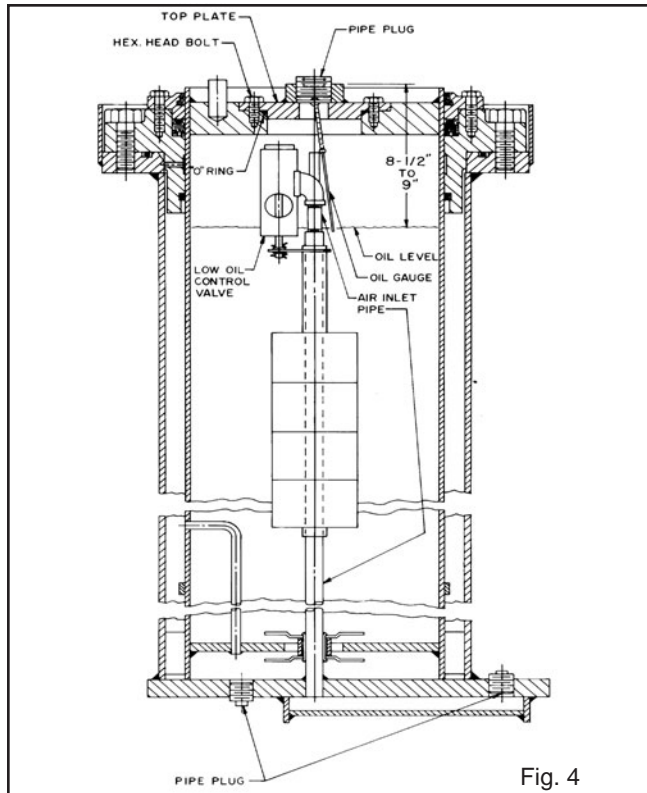


Fig. 4

13. Imbed base of cylinder in 4" min. of concrete and at least 3" thick around cylinder. (See Fig. 7)

14. After concrete has hardened around base of cylinder, backfill with clean sand to within 26" of finish floor level.

IMPORTANT: Do not use cinders or other corrosive fill materials. Tamp fill solidly, checking regularly to keep plunger exactly plumb in all directions by laying level across top plunger when making backfill. THIS IS VERY IMPORTANT.

15. COMPLETE CONCRETING. (See Fig. 5) Recheck top of trench box to insure that it is level in all directions before proceeding further. (12) 1/8" diameter holes are located in the end of the box. These holes indicate the proper concrete level in the box. With the trench box braced, to maintain proper width, pour concrete into box filling area "A" to top of cylinder form ring and 1/8" dia. holes.

NOTE: DO NOT LET LEVEL OF CONCRETE AT ENDS OF BOX COME ABOVE 1/8" HOLES. (See Fig. 8). Next pour concrete in area "B" to the level of the concrete inside box. Backfill around the box to point where floor concrete will begin.

IMPORTANT: CHECK TO SEE THAT BOX STAYS CENTERED AROUND CYLINDER WHILE BACKFILLING. REMOVE WOODEN SUPPORTS FROM THE BOX. FINISH FLOOR AREA, MAKING SURE THAT THE FLOOR IS FLUSH WITH THE TOP EDGE OF BOX. THE 1-1/4" ANGLE BRACES AND THE 2 X 4 WOODEN BRACES SHOULD NOT BE REMOVED FROM THE BOX UNTIL THE CONCRETE HAS CURED.

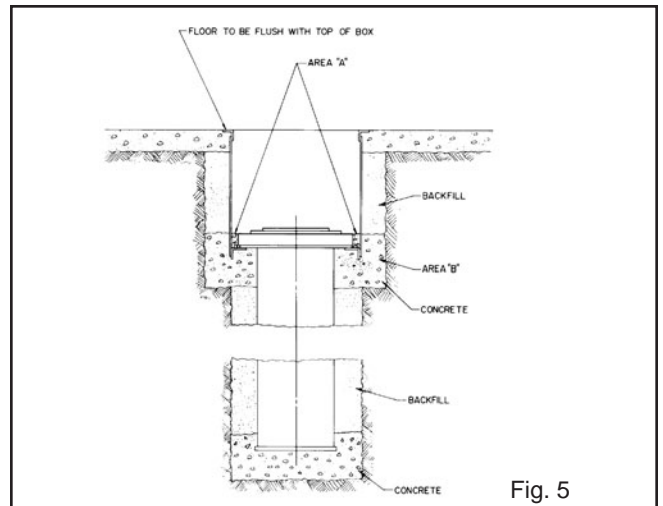


Fig. 5

16. FINAL ASSEMBLY (See Fig. 8)

A. After concrete has hardened, position the crosshead (A) on the plunger, by first locating the "Fool-Proof Pin" in its proper location in the crosshead. Fasten the crosshead to the plunger, using (6) hex hd. bolts (H).

B. Lubricate both sides of swing arm washers (P) with a multi-purpose grease and position on crosshead anchor plate.

C. Insert swing arm (J) into crosshead anchor plate. (After applying grease to end of arm).

D. Grease and insert pivot bushing (M) and lockwasher (N) into swing arm hole.

E. Secure with bolt (L).

F. Raise lift about two feet.

G. Put lift adapter assembly (K) on swing arm (J). Secure with lockwasher (Q) and bolt (R).

H. With lift still raised two feet, fasten the center post of the automatic lock (MM) with bolt (G), lock washer (PP), and flat washer (QQ), through bolting plate and hand tighten.

I. Lower the lift until the bottom of the crosshead just starts into the trench box. Align crosshead with the trench box and tighten automatic lock leg bolt (G) securely. Lower lift all the way down into box, and check to see that it is properly aligned.

J. Apply grease to pivot brackets (BB) and insert into the ends of door closing pivot bar (AA). Slide door closing pivot bar (AA), and pivot brackets (BB), into box, on side next to automatic lock. Align pivot brackets (BB) with tapped holes in frame and secure with bolts (E). The pivot brackets are to be centered between bolts (E). The square bars on pivot bar (AA), should now be hanging down into box.

K. Place washers (DD) on each side of wheel assembly (CC) and insert between bars on pivot bar (AA). Place bolt (EE) thru holes in bar and wheel. Secure with nut (F). Wheel must be free to rotate.

L. Raise lift approximately two feet. Place door cover (GG), 34" long on same side of trench box as automatic lock. Align hinge tubes, on frame and door. Insert door hinge rod (FF) thru hinge tubes on door and frame. Slide rod thru hinge tubes and secure with cotter pin (JJ).

M. Place door cover (HH), 3-1/4" long, on opposite end of trench box from automatic lock. Assemble the same as door (GG) above. Lay doors over on square bars of pivot bar (AA).

N. To align the doors horizontally to the finished floor, loosen the (2) bolts that secure the clamp on the door closing pivot bar. Keeping the wheel against the plunger, rotate the door closing pivot bar up or down. After doors are properly aligned, retighten bolts.

O. Lower lift slowly into trench box and observe operation of doors and pivot bar.

P. Raise lift slowly again and observe operation of doors and pivot bar again. Readjust as indicated in paragraph (N) above, if necessary.

Q. Place cover plate (W) on side of trench box next to wheel. Use bolts (E) and flat washer (X) to attach plate to box.

R. Place cover plate (LL) on opposite side of trench box. Use bolts (E) and flat washer (X) to attach plate to box.

S. Next assemble cover door assembly (B). Place door guide bar (C) on the angle, so that the narrow leg is on the straight side of the cover door. Attach with bolts (NN) lockwasher (D), and nut (F).

T. Place cover door assembly on crosshead. Radius on door should be on same side as cover plate (LL).

U. Lower lift into trench box.

17. **IMPORTANT.**

Operating Instructions

The permanent operating instructions along with inspection and maintenance instructions furnished with this lift should be permanently and conspicuously displayed in the lift control area. Automotive lifts should be operated by trained personnel only. If you do not know how to position or lift a vehicle properly, do not guess. Get training. Start by reading the operating instructions, the booklet "Lifting It Right", and the "Automotive Lift Safety Tip Sheet" furnished with the lift. Also refer to the vehicle manufacturer's service manual for proper lift points and lifting procedures.

18. **IMPORTANT.**

HOW TO ORDER REPLACEMENT PARTS

Be sure to mention the lift model number and serial number in correspondence dealing with service information and when ordering replacement parts. This information is on the top of the plunger and cylinder assembly.

19. **IMPORTANT.**

Underground corrosion takes place in varying degrees throughout the United States and may cause a major problem with lift equipment. To protect underground lift components, MANITOWOC LIFTS recommends that an analysis of local soil conditions be obtained, and that a knowledgeable source be consulted relative to the implementation of an adequate corrosion control system. See MANITOWOC LIFTS warranty.

INSTALLATION INSTRUCTIONS

SERIES A-1AB3A (FULL HYDRAULIC)

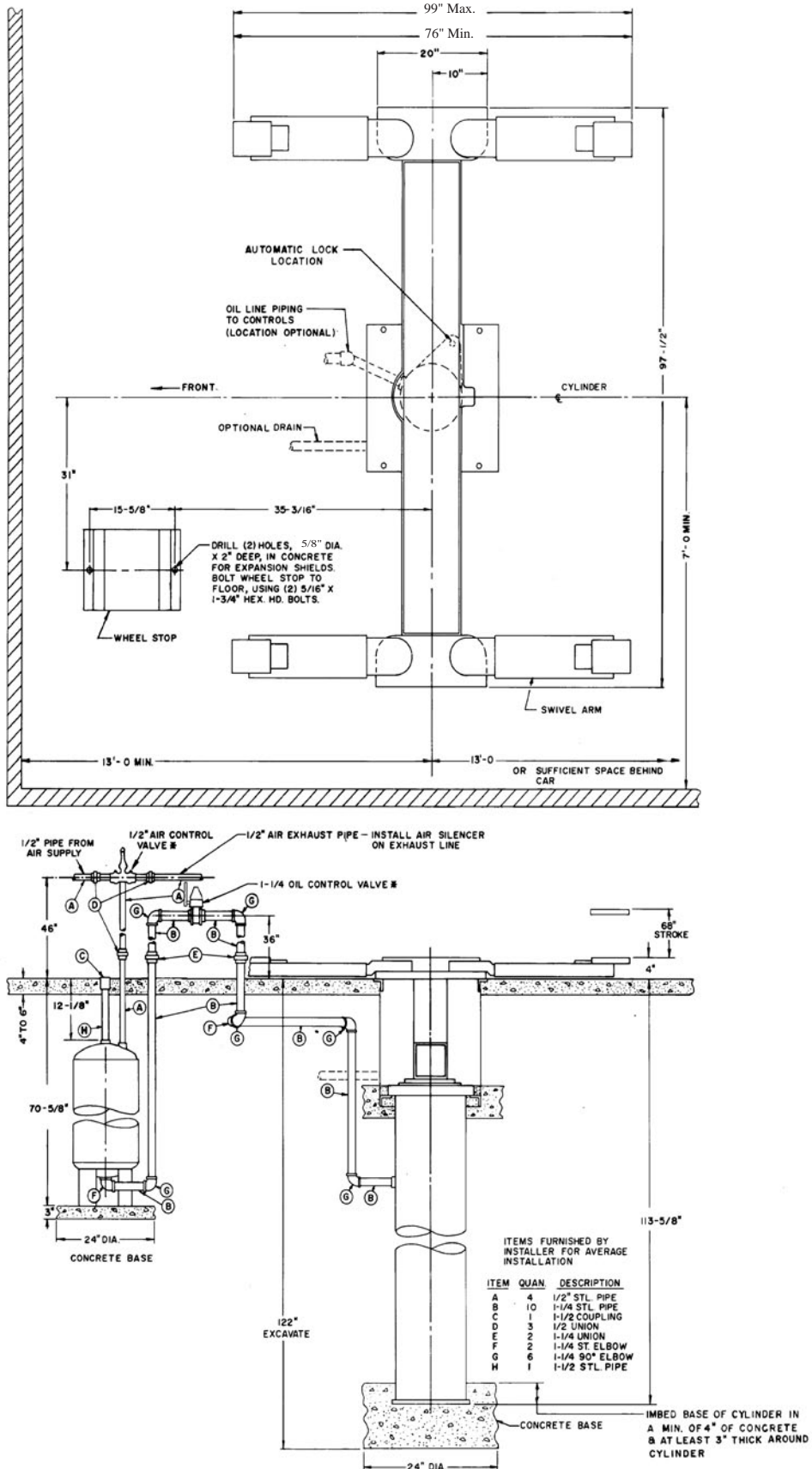


Fig. 6

INSTALLATION INSTRUCTIONS

SERIES A-1AB1A (SEMI-HYDRAULIC)

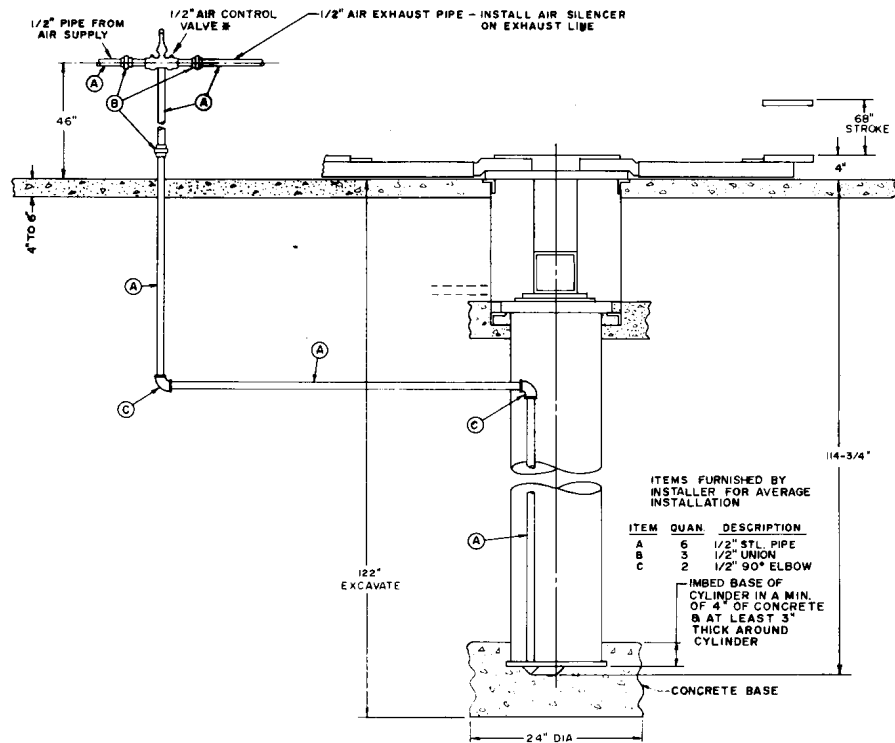
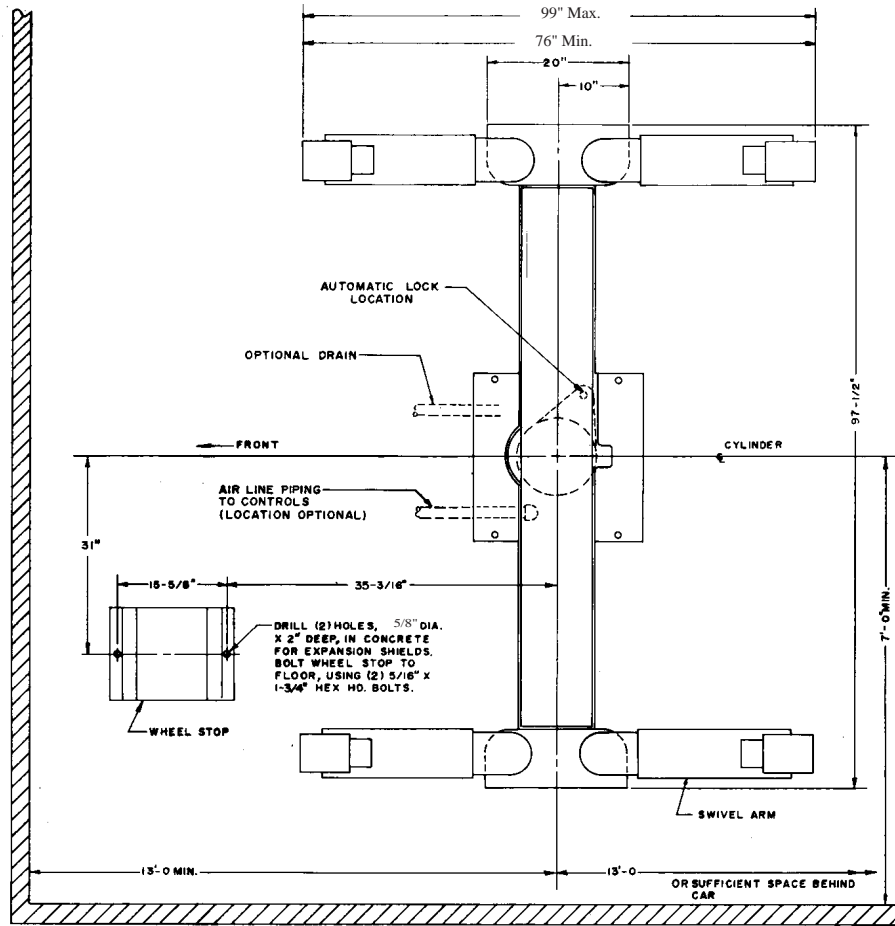
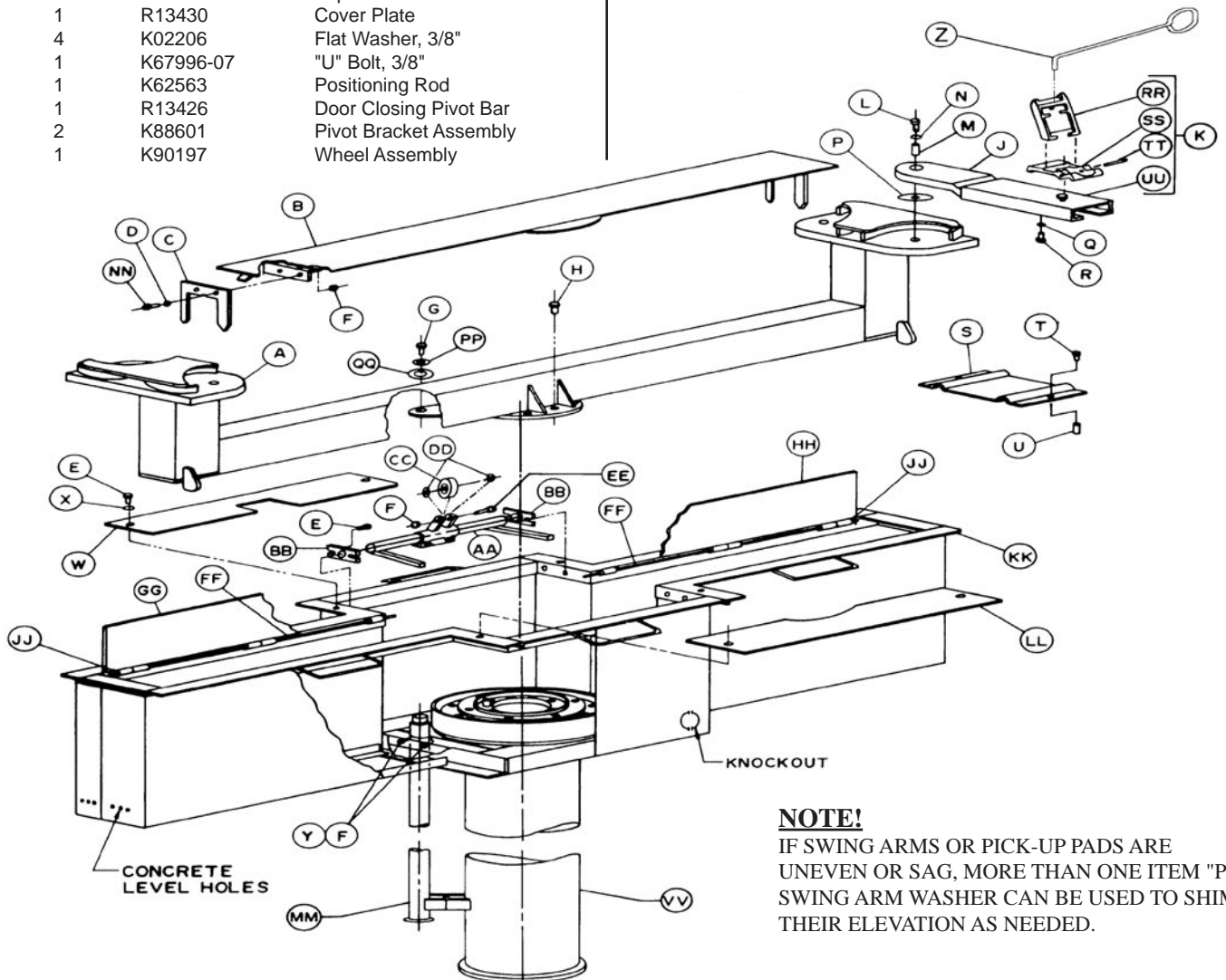


Fig. 7

When ordering replacement parts, always mention lift model number and serial number.

SERIES A-1AB1A (SEMI-HYD.)
SERIES A-1AB3A (FULL-HYD.)

Code No.	No. Req.	Symbol No.	Description	Code No.	No. Req.	Symbol No.	Description
A	1	T13958-01	Crosshead Assembly (Full Hyd)	DD	2	K02208	Flat Washer, 1/2" Std.
A	1	T13958-02	Crosshead Assembly (Semi Hyd)	EE	1	K41353	Hex Hd. Bolt, 3/8"-16 x 3-1/4" Lg.
B	1	T09455	Cover Door Assembly	FF	2	K88603	Door Hinge Rod
C	2	N19654	Door Guide Bar	GG	1	R13429-01	Door, 34" Lg.
D	4	K50775	Lockwasher, 3/8"	HH	1	R13429-02	Door, 39-1/4" Lg.
E	8	K01902	Hex Hd. Bolt, 3/8" x 1" Lg.	JJ	2	K42307	Cotter Pin, 1/8" x 3/4" Lg.
F	7	K01943	Hex Nut, 3/8"	KK	1	T13931	Welded Trench Box Assembly
G	1	K01914-64	Hex Hd. Bolt, 1"-8 x 3" Lg.	LL	1	R13431-01	Cover Plate
H	6	Q10412-01	Hex Hd. Bolt, 3/4"-10 x 2-1/4" Lg.	MM	1	N20268-10	Automatic Lock Assy. (68" Rise)(See Page 14 or 15)
J	4	N20275	Swing Arm	NN	4	K01903	Hex Hd. Bolt, 3/8"-16 x 1-1/4" Lg.
K	4	N20366-02	Lift Adapter Assembly (Includes RR, SS, TT, & UU)	PP	1	K02217-22	Lockwasher, 1"
L	4	K78272	Hex Hd. Bolt, 7/16"-14 x 2-1/4" Lg.	QQ	1	K02212	Flat Washer, 1"
M	4	K85825	Swing Arm Pivot Bushing	RR	4	R16123-02	Pick-up Pad (With Protruded Ends)
N	4	K02215	Lockwasher, 7/16" Std.	SS	4	R12709-02	Swivel Base Pad
P	8	K87033	Swing Arm Washer	TT	4	Q10038-04	Spiral Pin 5/16" Dia. x 4
Q	4	K02455	Lockwasher, 1/2" Std.	UU	4	R12956-02	Sliding Base Assembly
R	4	K01909	Hex Hd. Bolt, 1/2"-13 x 1" Lg.	VV	1	T13952-01	Plunger & Cylinder Assy. (Semi-Hyd.) (68" Rise) (See Page 14.)
S	1	T07915	Wheel Stop	VV	1	T13946-01	Plunger & Cylinder Assy. (Semi-Hyd.) (68" Rise) (See Page 15.)
T	2	K03782	Hex Hd. Bolt, 5/16"-18 x 1-3/4" Lg.				
U	2	K79695	Expansion Shield				
W	1	R13430	Cover Plate				
X	4	K02206	Flat Washer, 3/8"				
Y	1	K67996-07	"U" Bolt, 3/8"				
Z	1	K62563	Positioning Rod				
AA	1	R13426	Door Closing Pivot Bar				
BB	2	K88601	Pivot Bracket Assembly				
CC	1	K90197	Wheel Assembly				



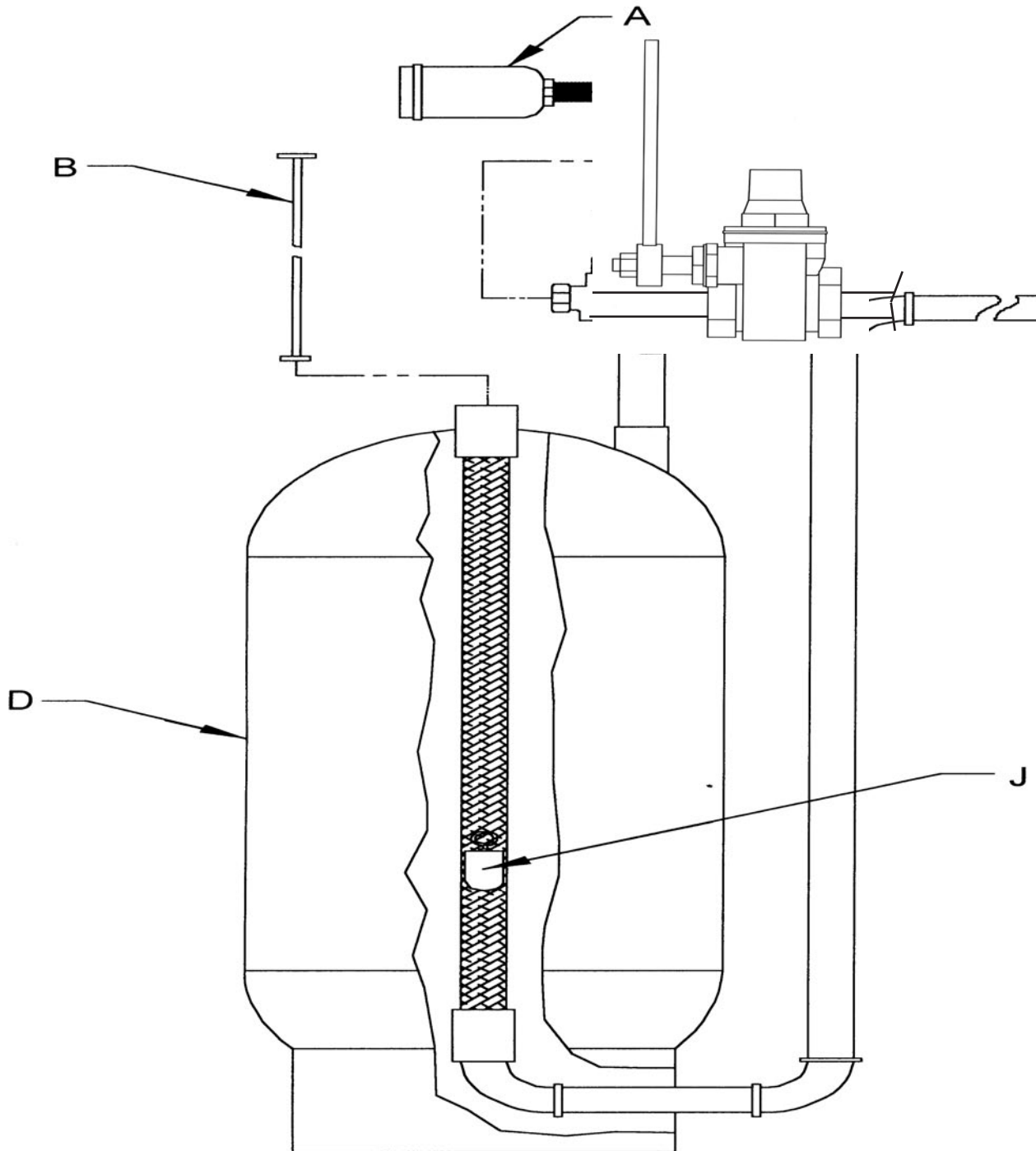
NOTE!
 IF SWING ARMS OR PICK-UP PADS ARE UNEVEN OR SAG, MORE THAN ONE ITEM "P" SWING ARM WASHER CAN BE USED TO SHIM THEIR ELEVATION AS NEEDED.

CROSSHEAD AND TRENCH BOX ASSEMBLY

Fig. 8

When ordering replacement parts, always mention lift model and serial number.

Code No.	No. Req.	Symbol No.	Description
A	1	K81439	Muffler
B	1	N19687-01	Oil Gauge Assy. (1-1/2" Plug)
D	1	R19028-G1	Oil Tank with Oil Gauge Installed
E	1	K68832-01	Two-way Air Valve (See Page 13, Fig.1 & Fig.2)
H	1	N23105	Oil Valve (See Page 13, Fig.3)
J	1	K86957	Float Assy.



OIL TANK, GAUGE, VALVES, ETC.

Fig. 9

When ordering replacement parts, always mention lift model number and serial number.

REPAIR PARTS

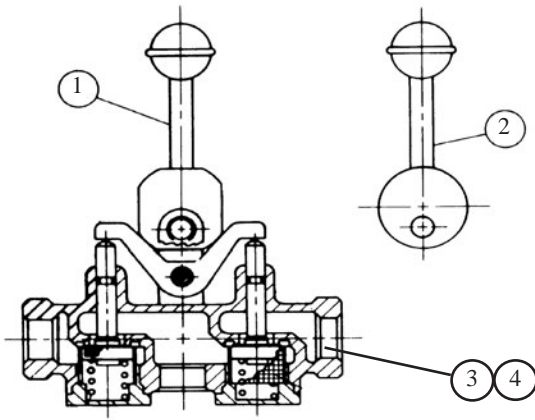


FIG. 1
AIR VALVE

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	K34361	LOCKING HANDLE KIT(CONSISTS OF A CLEVIS PIN, RETAINING RINGS & HANDLE)
2	K34362	DEADMAN HANDLE KIT(CONSISTS OF A CLEVIS PIN, RETAINING RINGS & HANDLE)
3	K68832	LOCKING TYPE AIR VALVE w/ HANDLE (FULL HYDRAULIC WALL CONTROL)
4	K85963	DEADMAN TYPE AIR VALVE w/ HANDLE (SEMI-HYDRAULIC WALL CONTROL)

FOR AIR VALVE REPLACEMENT PARTS, DETERMINE MFG. OF VALVE:
IF MFG. IS KINGSTON, USE PARTS LIST BELOW (FIG. 2)
IF MFG. IS CONSOLIDATED BRASS AND VALVE HAS A TWO-PIECE HANDLE WITH A PLASTIC KNOB, USE PARTS LIST ABOVE (FIG. 1)

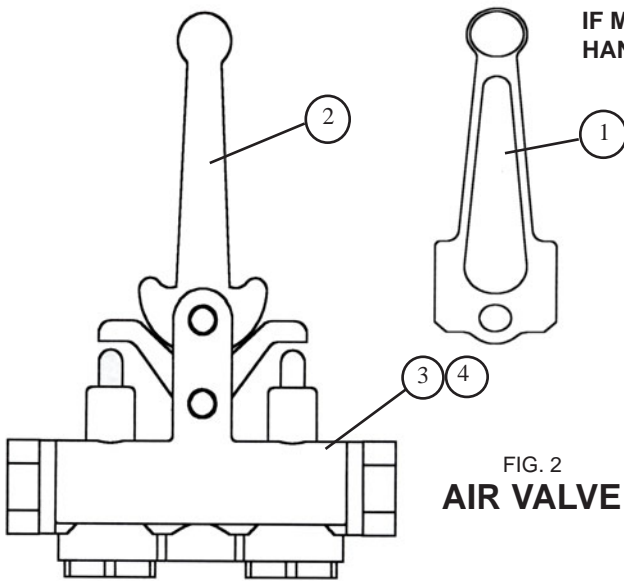


FIG. 2
AIR VALVE

REPAIR PARTS

<u>ITEM</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	K34363	LOCKING HANDLE KIT(CONSISTS OF A CLEVIS PIN, RETAINING RINGS & HANDLE)
2	K34364	DEADMAN HANDLE KIT(CONSISTS OF A CLEVIS PIN, RETAINING RINGS & HANDLE)
3	K68832-01	LOCKING TYPE AIR VALVE w/ HANDLE (FULL HYDRAULIC WALL CONTROL)
4	K85963-02	DEADMAN TYPE AIR VALVE w/ HANDLE (SEMI-HYDRAULIC WALL CONTROL)

WALL CONTROL VALVE

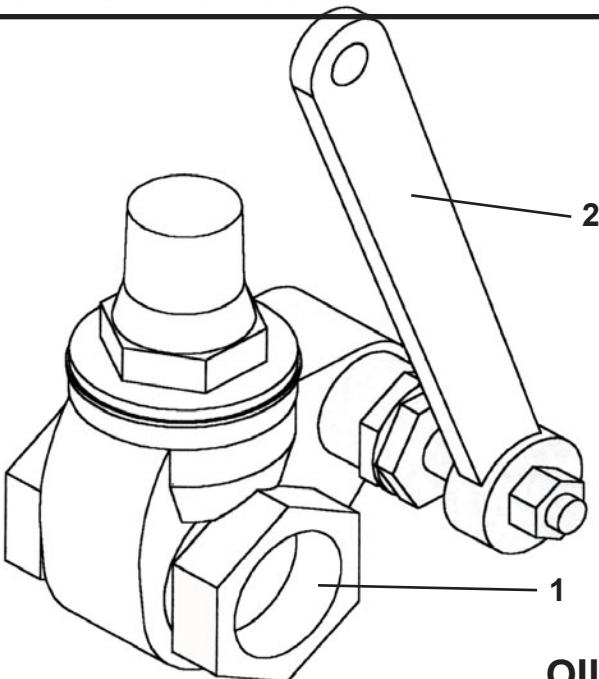


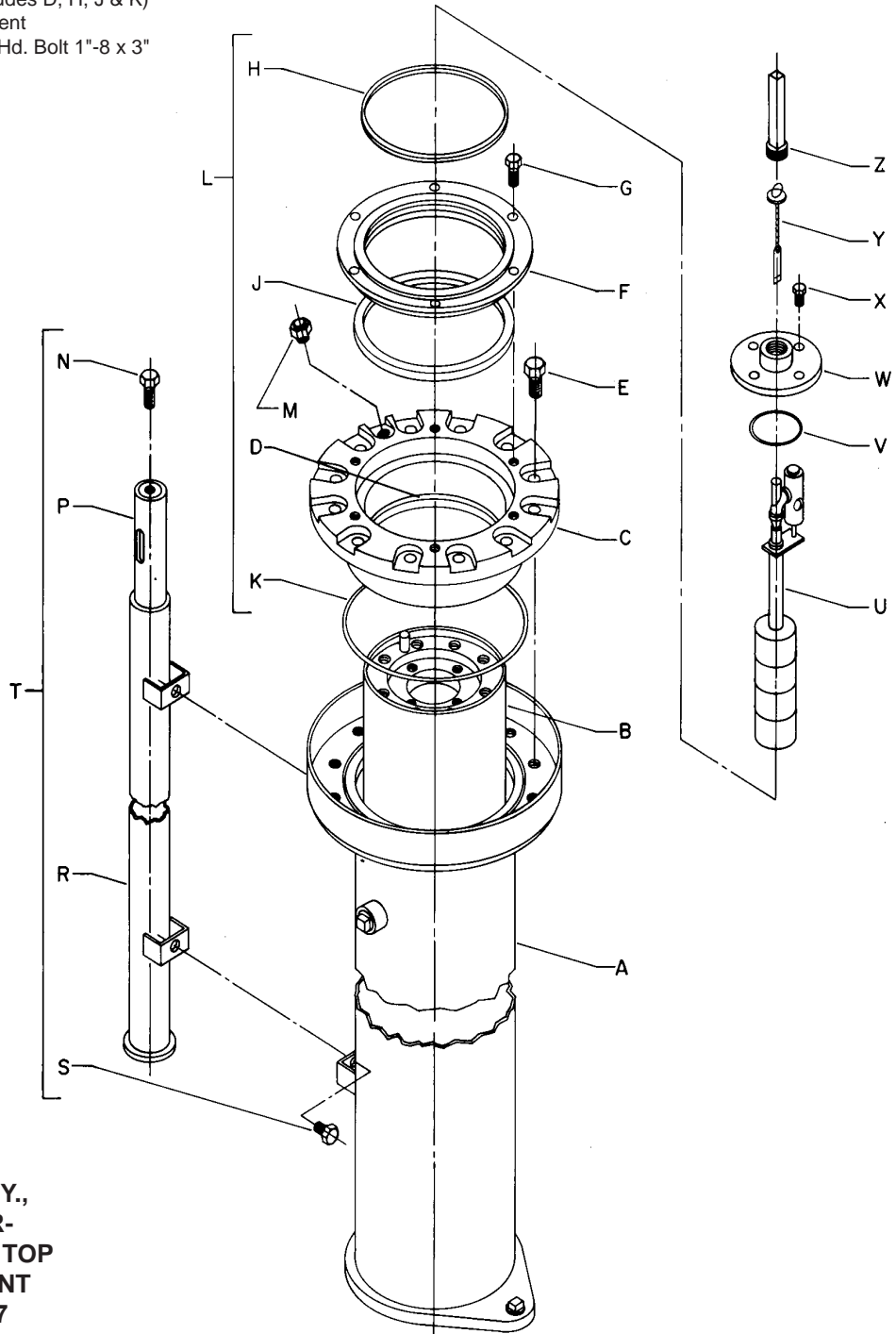
FIG. 3
OIL VALVE

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>PART #</u>
1	OIL VALVE W/HANDLE	N23105
2	REPLACEMENT HANDLE	N23105-01

**PULL HANDLE TO ACTIVATE
SPRING RETURN**

When ordering replacement parts, always mention lift model number and serial number.

Code No.	No. Req.	Symbol No.	Description	Code No.	No. Req.	Symbol No.	Description
A	1	T13952-01	Plunger & Cylinder Assy	P	1	R13470-01	Telescoping Post & Latch Asm.
B	1	T13948-G1	Plunger Assembly (see note)	R	1	R16245-02	Stationary Tube Assembly
C	1	T13943-03	Upper Bearing	S	2	K01901	Hex Hd. Bolt 3/8"-16 x 3/4"
D	1		Felt Wiper	T	1	N20268-10	Automatic Lock Asm. (Includes N, P, R, & S)
E	12	Q10412-01	Hex Hd. Bolt 3/4"-10 x 2-1/4"	U	1	R13365	Low Oil Control
F	1	R18229-02	Wiper Retainer	V	1	Q10068-32	O-Ring
G	6	K01907	Hex Hd. Bolt 7/16"-14 x 1-1/2"	W	1	N18842	Cover
H	1		Wiper	X	4	K47659	Hex Hd. Bolt 3/8"-16 x 7/8"
J	1		Seal	Y	1	N18490-01	Oil Gauge
K	1		O-Ring	Z	1	N19661	Cylinder Plug Assembly
L	1	K34301	Seal Kit (Includes D, H, J & K)				
M	1	N21812-G1	Air Vent				
N	1	K01914-64	Hex Hd. Bolt 1"-8 x 3"				

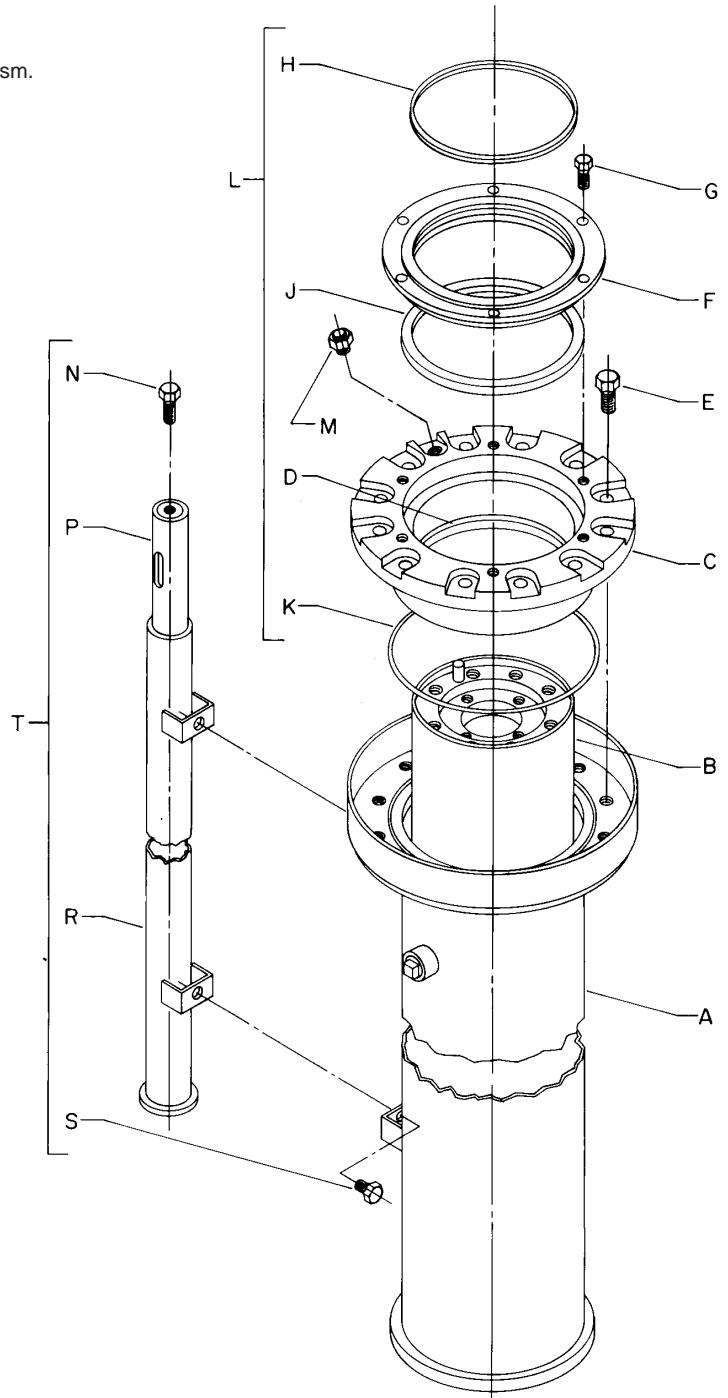


NOTE:
 WHEN ORDERING PLUNGER ASSY.,
 SPECIFY SYMBOL NO. AND BEAR-
 ING CODE LETTER STAMPED ON TOP
 OF PLUNGER. FOR REPLACEMENT
 PLUNGER ORDER KIT NO. K92937

PLUNGER AND CYLINDER ASSEMBLY (SEMI-HYDRAULIC)

When ordering replacement parts, always mention lift model number and serial number.

Code No.	No. Req.	Symbol No.	Description
A	1	T13946-01	Plunger & Cylinder Assy
B	1	T13935-G1	Plunger Assembly (See Note)
C	1	T13943-03	Upper Bearing
D	1		Felt Wiper
E	12	Q10412-01	Hex Hd. Bolt 3/4"-10 x 2-1/4"
F	1	R18229-02	Wiper Retainer
G	6	K01907	Hex Hd. Bolt 7/16"-14 x 1-1/2"
H	1		Wiper
J	1		Seal
K	1		O-Ring
L	1	K34301	Seal Kit (Includes D, H, J & K)
M	1	N21812-G1	Air Vent
N	1	K01914-64	Hex Hd. Bolt 1"-8 x 3"
P	1	R13470-01	Telescoping Post & Latch Asm.
R	1	R16245-02	Stationary Tube Assembly
S	2	K01901	Hex Hd. Bolt 3/8"-16 x 3/4"
T	1	N20268-10	Automatic Lock Assembly (Includes N, P, R, & S)



NOTE:
WHEN ORDERING PLUNGER ASSY.,
SPECIFY SYMBOL NO. AND BEARING
CODE LETTER STAMPED ON TOP OF
PLUNGER. FOR REPLACEMENT
PLUNGER ORDER KIT NO. K92935

PLUNGER AND CYLINDER ASSEMBLY (FULL HYDRAULIC)

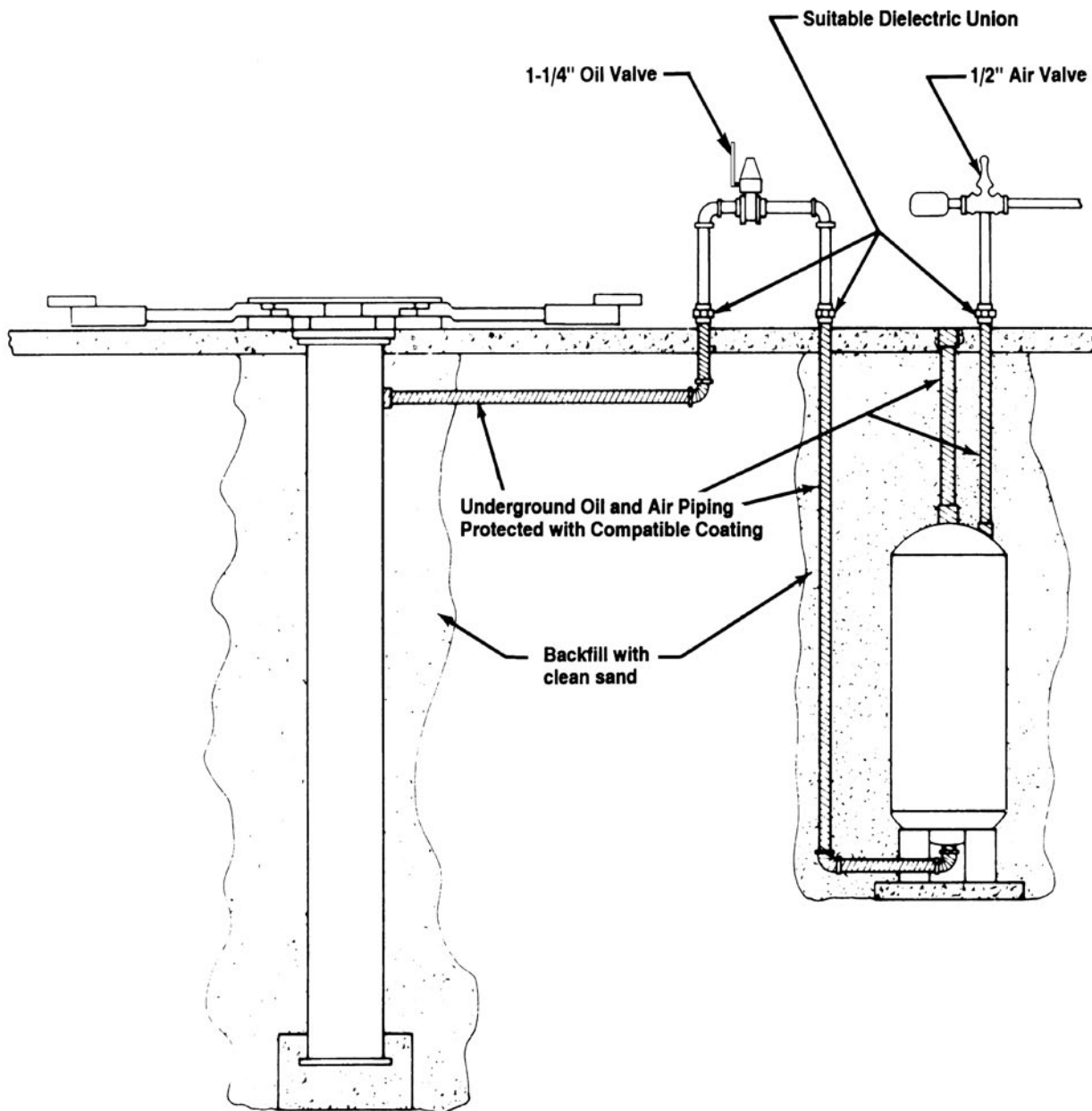
INSTALLATION INSTRUCTIONS FOR ENVIROKOTE COATED LIFT COMPONENTS

The excavation must be free of any material that may damage the Envirokote Coating on the Lift Cylinder and Air/Oil Tank. Equipment for installing these components must be adequate to prevent damage to the coating from dragging or dropping. Similar care must be given to the coated piping. Backfill must consist of clean sand or other suitable fill that is free of organic material, rocks, debris, and other sharp objects. The backfill must be deposited carefully and completely around the buried Air/Oil Tank, Lift Cylinder and Piping. When tamping backfill, care must be taken to avoid damaging the Envirokote Coating.

All underground piping, joints, fittings, and tie-ins to the Envi-

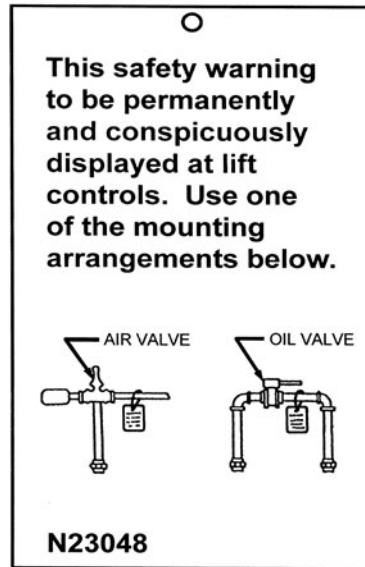
rokote Coated Lift Cylinders and Air/Oil Tanks must be coated with a material compatible with the Envirokote Coating. Make all piping connections in accordance with local, state, or Federal regulations. Suitable Dielectric Unions must be used to isolate protected underground piping from unprotected above ground piping. All bracing and/or supports for unprotected above ground piping must be attached above the Dielectric Unions.

TYPICAL INSTALLATION DETAIL





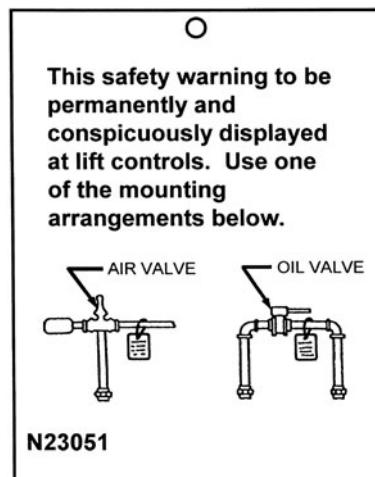
FRONT



BACK



FRONT



BACK

SAFETY WARNING PLACARDS

SAFETY WARNING LABELS FOR INGROUND LIFTS

Lift Owner/User Responsibilities:

- A. This Safety Warning placard **SHALL** be displayed in a conspicuous location in the lift area
- B. Use one of the mounting arrangements illustrated on back of this placard
- C. These Safety Warning labels supplement other documents supplied with the lift.
- D. Be certain all lift operators read and understand these labels, operating instructions and other safety related information supplied with the lift.

▲ WARNING		Do not override self-closing lift controls.
▲ WARNING		DO NOT remove oil fill plug before reading manufacturer's manuals.
▲ WARNING		Position vehicle center of gravity over lift.
▲ WARNING		Remain clear of lift when raising or lowering vehicle.
▲ WARNING		Use lift locking device or 4 stands to support vehicle.
▲ WARNING		Chock wheel to prevent vehicle movement.
▲ WARNING		Avoid excessive rocking of vehicle while on lift.
▲ WARNING		Clear area if vehicle is in danger of falling.
▲ WARNING		Keep feet clear of lift while lowering.

The messages and pictographs shown are generic in nature and are meant to generally represent hazards common to all automotive lifts regardless of specific style.

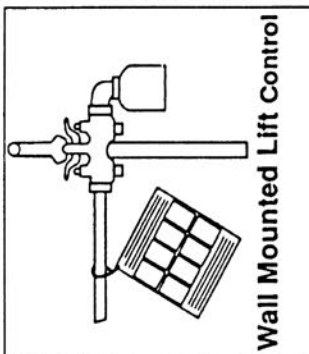
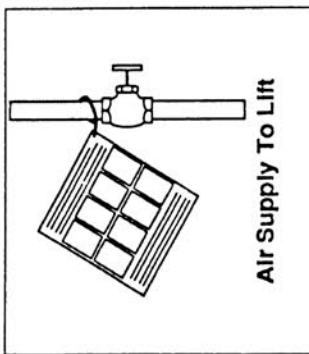
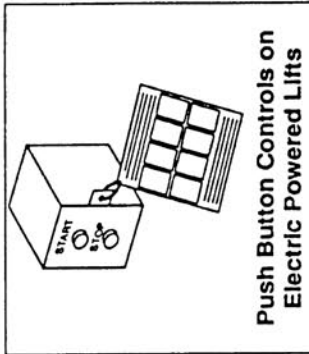
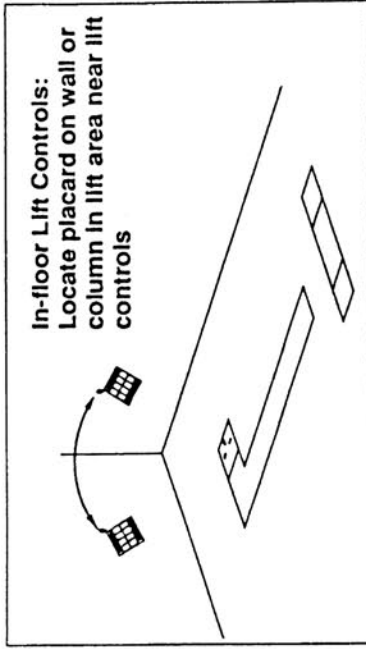
Funding for the development and validation of these labels was provided by the Automotive Lift Institute, PO Box 1519 New York, NY. 10101-1519.

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SAFETY WARNING LABELS

TYPICAL PLACARD LOCATIONS



CAUTION

Use height extenders when necessary to ensure good contact.

CAUTION

Always use safety stands when removing or installing heavy components.

CAUTION

Use vehicle manufacturer's lift points.

CAUTION

Authorized personnel only in lift area.

CAUTION

Lift to be used by trained operator only.

The messages and pictographs shown are generic in nature and are meant to generally represent hazards common to all automotive lifts regardless of specific style.

Funding for the development and validation of these labels was provided by the Automotive Lift Institute, PO Box 1519 New York, NY, 10101-1519.

They are protected by copyright. Set of labels may be obtained from ALI or its member companies.

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SAFETY INSTRUCTIONS

Do not operate a damaged lift.

SAFETY INSTRUCTIONS

Proper maintenance and inspection is necessary for safe operation.

SAFETY INSTRUCTIONS

Read operating and safety manuals before using lift.

CAUTION

Auxiliary adapters may reduce load capacity.

SAFETY WARNING LABELS



MANITOWOC LIFTS



An SVI Brand Product Line

MANITOWOC LIFTS

www.manitowoclifts.com

www.sviinternational.com