MUELLER®

INSTALLATION INSTRUCTIONS FOR

MUELLER
INSERTING VALVES

MUELLER CO.

MAIN OFFICE and PLANT
500 West Eldorado Street
Decatur, Illinois 62525

HYDRANT AND VALVE PLANT and SALES OFFICE
1401 Mueller Avenue
Chattanooga, Tennessee 37406

WEST COAST PLANT and SALES OFFICE
630 Lambert Road
Brea (Los Angeles), California 92621

CANADIAN SUBSIDIARY
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Sarnia, Ontario

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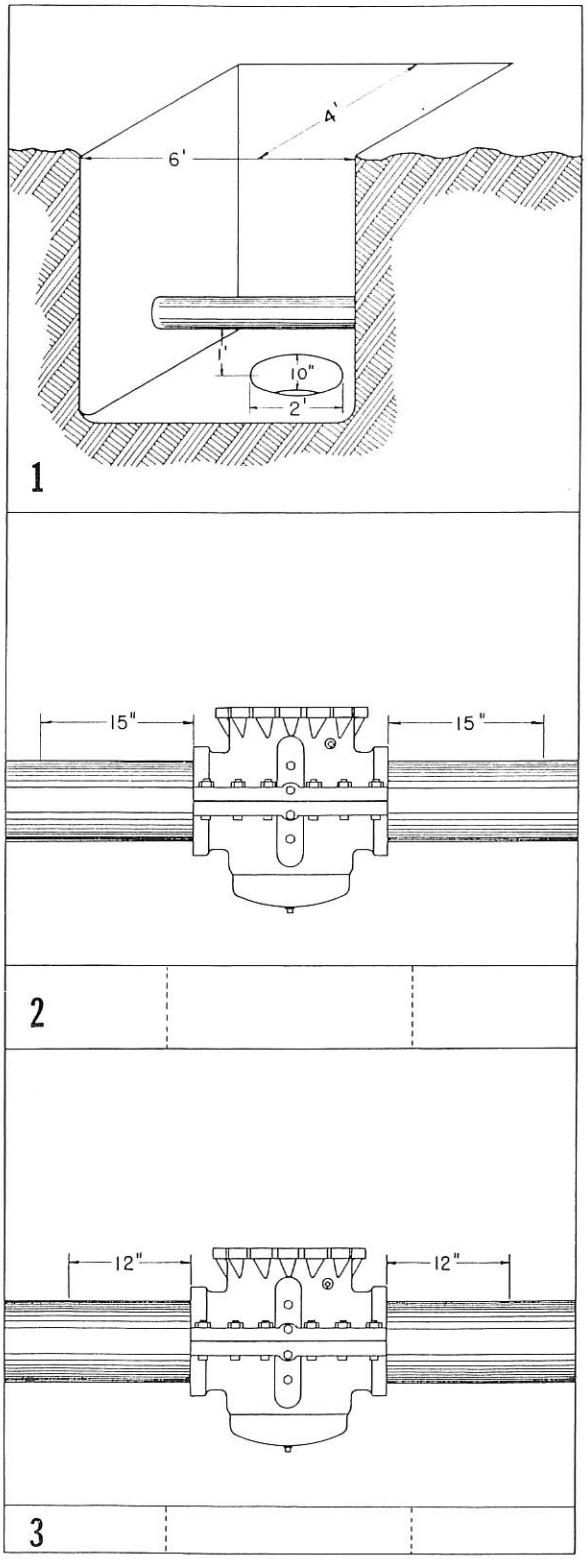
INSTALLATION INSTRUCTIONS

FOR 4", 6" & 8" INSERTING VALVES



200 PSI WORKING PRESSURE

1. SIZE OF HOLE REQUIRED:

For all three sizes of valves, a hole 6 ft. long parallel with the main and 4 ft. wide evenly distributed on each side of the main is recommended. Smaller openings than this may be used when necessary by digging away the side walls at the points required.

The bottom of the hole should be 1 ft. under the bottom of the main and a sump hole 2 ft. in diameter and 10" deep should be dug under the point where the valve is to be located.

2. SELECTING THE LOCATION OF THE VALVE:

Where possible the valve should be located in a straight run piece of main without bell ends or obstructions for a distance of 15" on each end of the valve. This is to allow plenty of room for putting on the main brace clamps and for caulking. All inserting valves are installed in a vertical position only and cannot be installed at an angle.

The ends of the valves must be kept at least 15" from obstructions such as walls or cross mains but may be placed much closer to ordinary bell ends when necessary. The following dimensions will aid in the selection of location of the valve.

SIZE OF VALVE	LENGTH OF VALVE
4"	15⅞"
6"	19⅛"
8"	22⅛"

Recommended Length Straight Run Pipe	Minimum Length Straight Pipe
46"	27"
50"	30"
53"	33"

3. PREPARING THE MAIN:

Clean the main thoroughly for a distance 1 ft. longer than the valve by scraping all dirt, rust, and corrosion from the main and finishing with a wire brush.

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4. PLACING THE VALVE SLEEVE ON THE MAIN:

The valve sleeve comes bolted together. It should be taken apart on top of the ditch. The spline packings and spline packing screws are shipped in a burlap bag stapled to the inside of the valve plug box. Remove them from the bag and assemble as follows:

TOP HALF OF VALVE SLEEVE:

1. Thread spline forcing screws into top threaded holes on each side of upper half of valve sleeve until end of screws are flush with inside of sleeve casting.
2. Thread **special** spline holding screws into lower threaded holes on each side of upper half of valve sleeve and attach spline packing to these screws. Retract special spline holding screws to rearmost position. This operation brings the spline packings into proper position and retains them.
3. Retract pressure sealing lock nuts to rearmost position on **all** spline screws.

LOWER HALF OF VALVE SLEEVE:

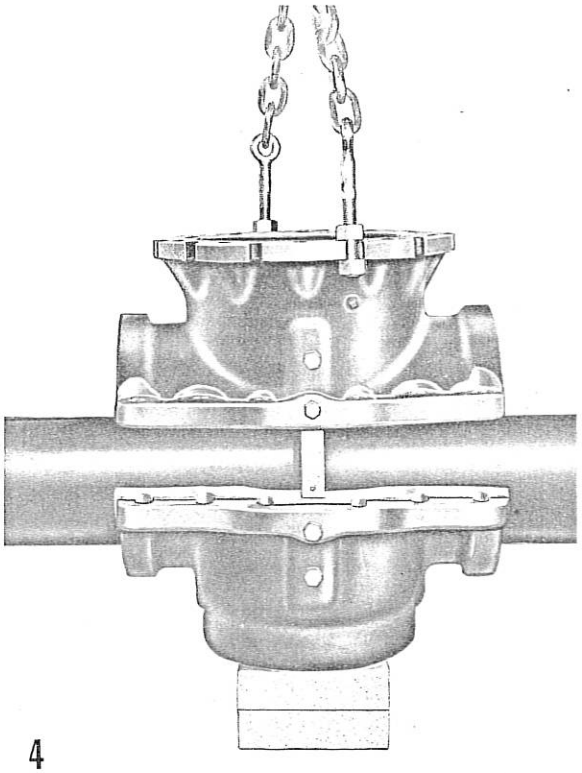
1. Thread spline forcing screws into threaded holes on each side of lower half of valve sleeve until end of screws are flush with inside of sleeve casting.
2. Retract pressure sealing lock nuts to rearmost position on **all** spline screws.

The two halves are lowered into the ditch either by hand or with a tripod and chain hoist. The lower section of the sleeve should be blocked up under the main with the gasket surfaces upward as shown in Fig. 4. The lead gaskets are then placed on the gasket surfaces of the lower section being sure that the inner edge of the gasket is flush with the inner edge of the casting. The gaskets may be locked in place by bending their ends down on the casting.

Lower the upper section of the sleeve onto the lower section guiding the spline packings into place (Fig. 4). Place the four corner bolts in the sleeve and pull them up just firmly. Be sure that the lead gaskets are still flush with the inner edge of casting.

Remove the blocking under the sleeve and rotate it on the main until one edge is up. Put in the rest of the bolts and pull them up snugly. Rotate the sleeve and repeat this operation on the other side. (See Fig. 5.)

Now pull all the bolts on one side up an even amount and rotate the sleeve and repeat on the other side. Continue pulling up the bolts first on one side and then on the other until the lead gaskets have been forced completely into the grooves of the gasket surface. CAUTION: FOR A SATISFACTORY INSTALLATION IT IS ABSOLUTELY NECESSARY THAT THE BOLTS BE PULLED UP EVENLY AND A LITTLE AT A TIME UNTIL THEY FEEL SOLID.



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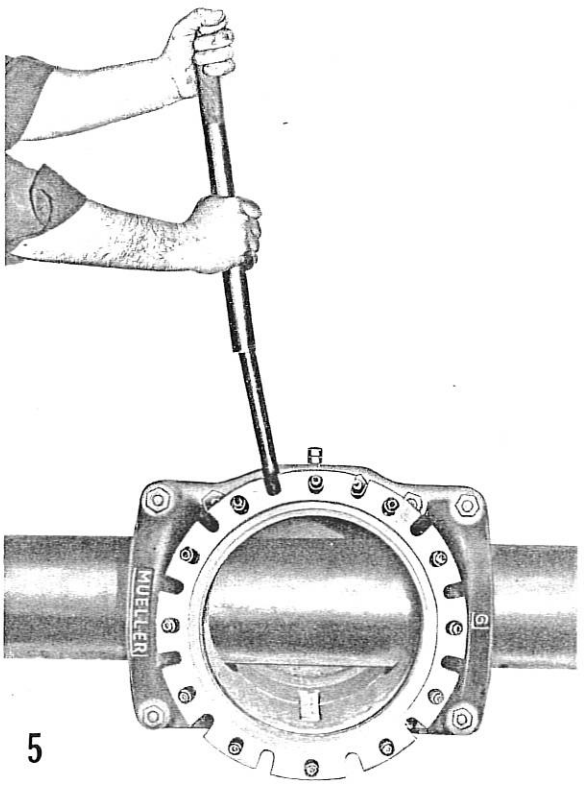

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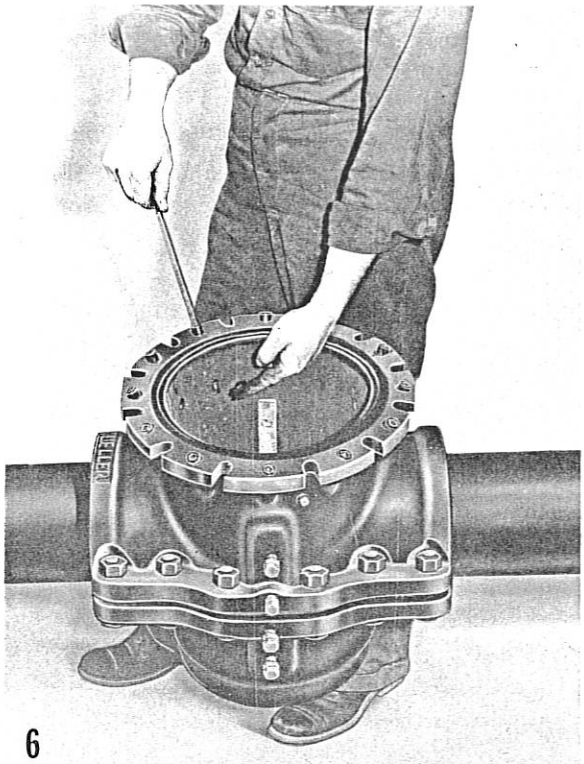
INSTALLATION INSTRUCTIONS

FOR 4", 6" & 8" INSERTING VALVES



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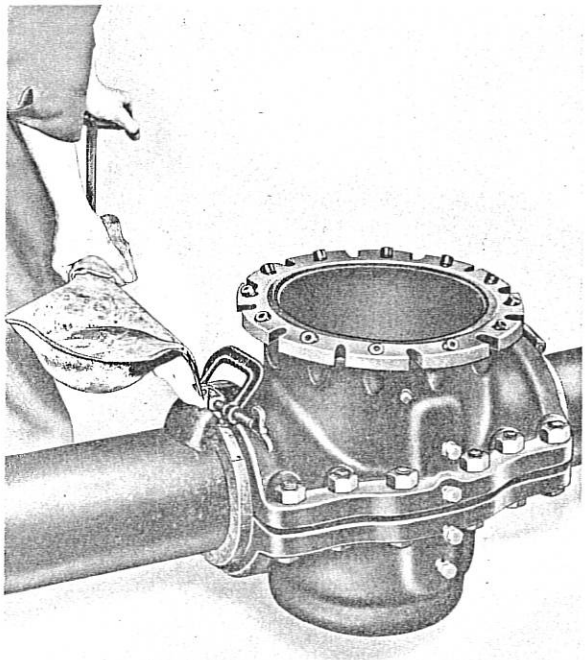

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5. PREPARING THE SLEEVE:

The valve is shipped with the angle packing screws at the top of the sleeve screwed in. These must now be backed out until the inside ends are not protruding into the inside of the sleeve (see Fig. 6). The brace and hexagon wrench is used for this purpose. To avoid temporary leaks out of the screw holes, they should be stopped up on the inside of the sleeve with a small amount of heavy grease that is furnished.

Next, recheck the spline packings and be sure they are not protruding into the sleeve. They should be back in their grooves so they are below flush with the inner surface of the sleeve. In the bottom of the bottom section of the sleeve there is a pipe plug. The plug should be removed and replaced with a pressure release valve which is furnished with the equipment. This valve should be in the closed position.

6. YARNING THE ENDS OF THE SLEEVE:

The cast raised rings on the inside of each end of the sleeve serves to partly center the sleeve on the main and also acts as a backing for the yarn. Rotate the sleeve on the main until the top flange is perfectly horizontal. This may be determined with a level. Yarn each end in the same manner as an ordinary bell end except it must be remembered that the yarn must do the final centering of the sleeve on the main. This is done by starting at the top of the main with the yarn and using enough to raise the sleeve to a central position. Drive the yarn in solidly which will hold the sleeve in place.

NOTE: When installing sleeve on smaller O.D. mains be sure yarn is not driven into the center opening of the sleeve where the valve mechanism is to be installed.

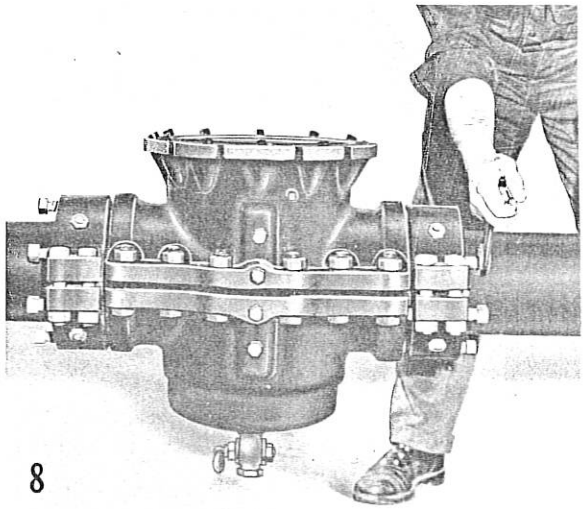
7. POURING AND CALKING THE END JOINTS:

Place a Mueller pipe jointer at the end of the sleeve and make a pouring gate of clay. Pour the end joints in the customary manner, being sure that the lead is hot and that the joints are poured steadily and full. (see Fig. 7). When the lead has cooled remove the jointers and caulk the ends in the regular manner.

CAUTION: IT IS IMPORTANT ON THIS KIND OF A JOB TO CAULK THE ENDS EVENLY STARTING WITH A COLD CHISEL AROUND THE MAIN AND WORKING OUT WITH TOOLS OF INCREASING THICKNESS. USE LIGHT FIRM BLOWS AS CAULKING TOO HEAVILY MAY SPRING THE SLEEVE AND CAUSE LEAKS.

8. INSTALLING THE MAIN BRACE CLAMPS:

To prevent any movement of the main after it has been cut, brace clamps are put on. Back the set screws out of the clamps until the cup point is flush with the edge of the clamps. Remove the bolts from the clamps and place the two halves around the main with the points of the set screws against the end of the sleeve (see Fig. 8). Bolt the clamp together and push it up against the end of the sleeve. Pull the bolts up tightly and then screw the set screws against the sleeve evenly and firmly. Be sure the set screws feel solid and that the clamp does not move when the set screws are pulled up. Add blocking under pipe near sleeve clamps. Blocking is not shown in the accompanying illustrations.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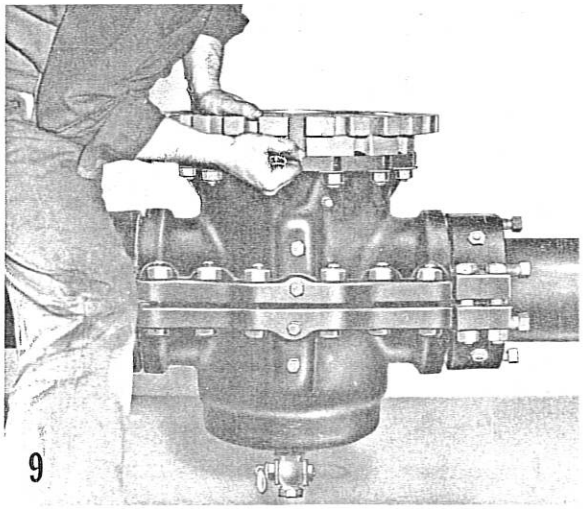
9. PLACING SLIDE VALVE ADAPTER ON 4" or 6" SIZE SLEEVE: (Fig. 9) (6" size shown).

Since one size slide valve is used for all sizes of sleeves, it is necessary to use an adapter between the sleeve and slide valve on the 4" and 6" sizes. The 8" size does not require the use of one of these adapters since the slide valve attaches directly on to the sleeve. Place proper gasket in sleeve recess and attach sleeve adapter to sleeve with studs down to attach to sleeve flange.

NOTICE: The spacing of bolts and slots are not all the same on the sleeves, adapter, and slide valve, which makes a definite assembly for proper positioning of the valve plug later. Assemble washers and nuts to studs and tighten evenly and firmly all around.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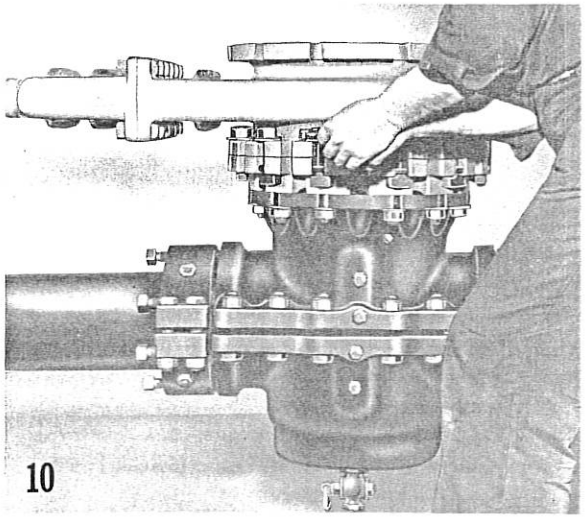
10. PLACING THE SLIDE VALVE ON THE SLEEVE OR SLEEVE ADAPTER: (Fig. 10)

The top face of the slide valve has a gasket recess. The bottom flange has twice as many slots as the top and this flange should be placed in contact with the flange on top of the sleeve or sleeve adapter, being sure that the gasket is in good condition and in place in the sleeve, or sleeve adapter. Place the slide valve on the sleeve so that the handle is parallel with the main and pointing to the end of the ditch which has the most room (see Fig. 10). It will be observed that the extra slots in the bottom flange of the slide valve are for the purpose of exposing the angle packing screws in the top of the sleeve flange of the 6" and 8" sizes. The other slots line up with the bolt slots in the sleeve flange. Install bolts and draw them up evenly and firmly all around.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INSTALLATION INSTRUCTIONS

FOR 4", 6" & 8" INSERTING VALVES

11. PREPARING THE MACHINE FOR MAKING THE CUT

With the machine on top of the ditch, bolt the short adapter to it, making sure that the gasket is in place against the flanged face of the drilling machine.

After the adapter is bolted to the drilling machine, advance the boring bar and attach the proper drilling equipment to it. (For detailed instructions on attachment of drilling equipment, refer to operating instructions for machine being used . . . CL-12, Form 8895, CC-25 and C1-25, Form 8513)

After the proper drilling equipment is attached, lubricate the drilling equipment generously with cutting grease. The boring bar should now be withdrawn to its rearmost position.

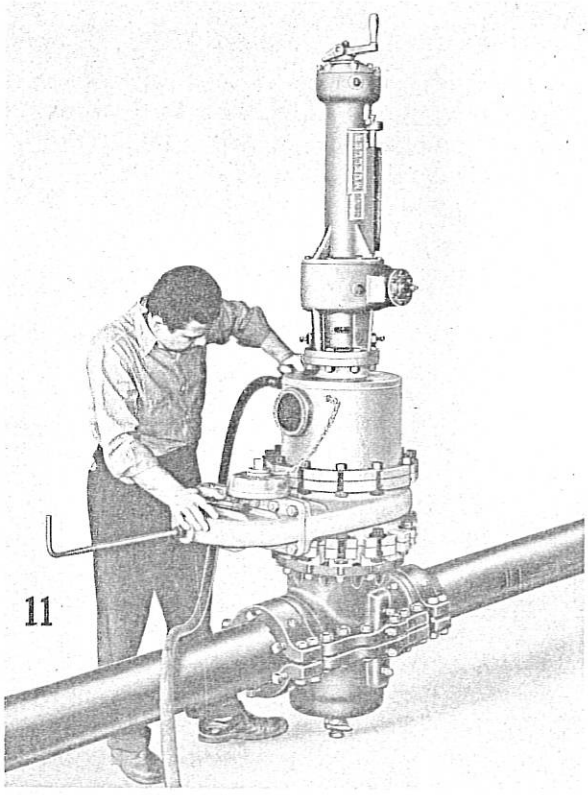
12. BOLTING THE MACHINE TO THE SLIDE VALVE:

Being certain that the gasket is in place in the recess in the top flange of the slide valve, carefully lower the machine until the raised face of the short adapter fits into it. With the hand hole in the short adapter facing the slide valve bonnet, bolt the apparatus securely together with the bolts furnished.

13. OPENING THE SLIDE VALVE:

The slide valve has a cam or eccentric on its operating rod which raises and lowers the gate in relation to its seat. This eccentric is so placed on the slide valve operating rod so as to move the slide gate in the direction the bent handle of the operating rod points.

Thus, to open the valve as is now necessary, turn the handle until it points downward and pull out on it until the slide gate strikes solidly against the slide valve bonnet. It is usually advisable to try this a time or two to be sure that the slide gate is in its extreme open position and is not protruding into the opening. Close the by-pass valve which is a small ground key valve on the opposite end of the slide valve.



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14. TESTING THE ASSEMBLY: (Fig. 11)

It is now advisable to test the entire set up before actually cutting the main to be sure that all joints are tight.

This is done as shown in Fig. 11 by attaching a hose from some convenient source of pressure such as a sill faucet or fire hydrant to the pressure release valve in the top of the short adapter. With the hand hole in the short adapter open, the entire valve sleeve and short adapter may be filled with water, after which the hand hole is closed and the set up tested under pressure.

Slight leaks are nearly always present to some extent at this point in the operation, due to the number of temporary joints which are used during the installation. However, these are eventually removed and unless they are too bad, they may be ignored.

Slight leaks out of the caulked joints at the end of the sleeve, out of the angle packing screws or the spline screws at the side of the sleeve will be fixed at the end of the installation. The main thing to look for on this test is a fundamental defect such as a cracked casting or something which cannot be tightened later.

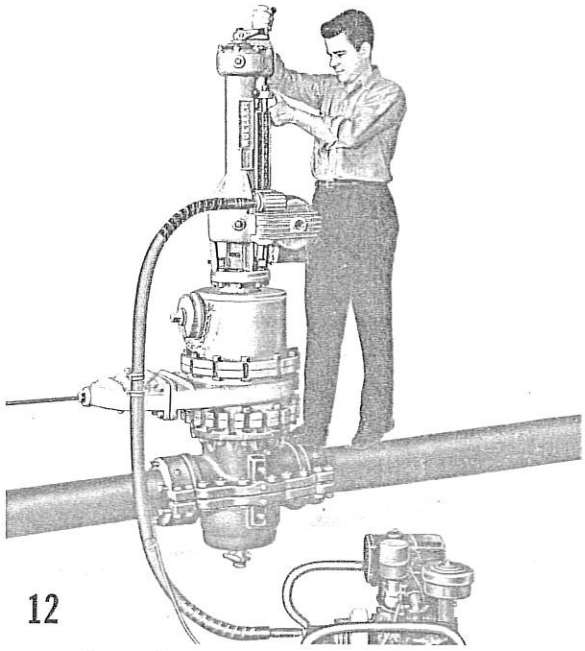
After testing, the pressure release valve should be closed and the hose removed.

15. ADVANCING THE CUTTERS TO THE MAIN (Fig. 12)

Starting with the boring bar at its rearmost position, the necessary number of turns of the feed crank to bring the point of the pilot drill in contact with the main are approximately as follows:

	4" Valve	6" Valve	8" Valve
CC-25 & C1-25	92 turns	86 turns	62 turns
CL-12	80 turns	72 turns	53 turns
CL-12 Travel Indicator	(16.0")	(14.4")	(10.6")

The turns of the feed crank should be counted as this is assurance that the cutter has not struck something else and stopped before reaching the main. It must be remembered, however, that these figures are only approximate and that the actual count may vary several turns from them. The solid stop occasioned when the pilot drill strikes the main is easily recognized. NOTE — Boring bar travel indicator on CL-12 machine may be used in place of counting turns of crank handle. Travel in inches is shown in brackets below crank handle turns.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16. MAKING THE CUT:

For detailed instructions on assembly of power operators and machine operation, refer to operating instructions for machine being used. (CL-12, Form 8895 — CC-25 and C1-25, Form 8513)

With the point of the pilot drill in contact with the main, the following dimensions are approximately correct for completing the cut.*

	4" Valve	6" Valve	8" Valve
CC-25 & C1-25 Machine	8"	9 3/8"	11 1/2"
CL-12 Machine	7.1"	9.1"	11.3"

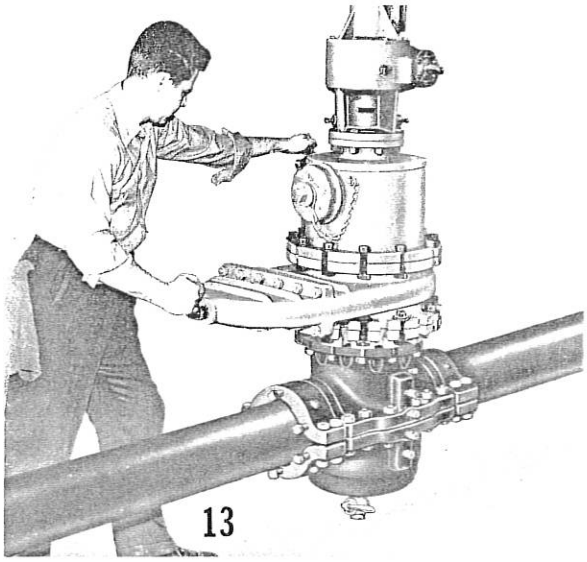
When this distance has been indicated on the feed indicator and it is thought the cut has been completed, a check can be made by releasing the automatic feed and attempting to advance the cutters. If the cutters advance freely, the cut has been completed and the cutters may be withdrawn to the complete rearmost position again. If the cutters do not advance freely, the cut has not been completed and it is necessary to re-engage the feed and continue cutting.

NOTE: Almost all the travel of a standard 25" travel CC or C1 Machine is required for the 4" size cut and extensive damage will result if the machine is advanced past limit line on boring bar of machine. Limit line can be observed through gear box slot. (CL-12 Machine has automatic overtravel protection)

When a check indicates the cut is completed, disengage the automatic feed knob and withdraw the boring bar and cutter to the extreme rearmost position.

17. CLOSING THE SLIDE VALVE: (Fig. 13)

When the cutters have been drawn up into the adaptor above the slide valve, the next step is to close this valve. This is done as shown in Fig. 13. With the handle of the slide valve pointing downward, push it in until the slide gate strikes solidly against the far side of the valve. Rotate the handle upwards which raises the slide gate to its seat. Holding it in this position, open the pressure release valve in the top of the short adapter. There should be a momentary rush of water under pressure after which it should cease and simply drain out the water above this valve. If there continues to be pressure in the chamber above the slide valve, it indicates the slide valve has not been properly closed or the by-pass valve has been left open.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*Dimensions include 1/4" overtravel.

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18. REMOVING THE MACHINE:

When there is no pressure in the chamber above the slide valve, the machine may be removed. Remove the air motor and holder or gas engine gear box. Loosen the bolts between the short adapter flange and the slide valve flange and remove them. Lift the machine straight up off the slide valve and lay it in a horizontal position on top of the ditch. Advance boring bar and remove cutting equipment and cut out section of pipe.

19. PREPARING THE MACHINE TO INSERT THE PLUG:

To the extended drilling machine boring bar attach the boring bar socket to the boring bar in place of the cutters. This is made fast with the pilot drill bolt or hub retaining bolt. The boring bar should again be withdrawn to its extreme rearmost position.

20. BOLTING LONG ADAPTER TO THE SLIDE VALVE:

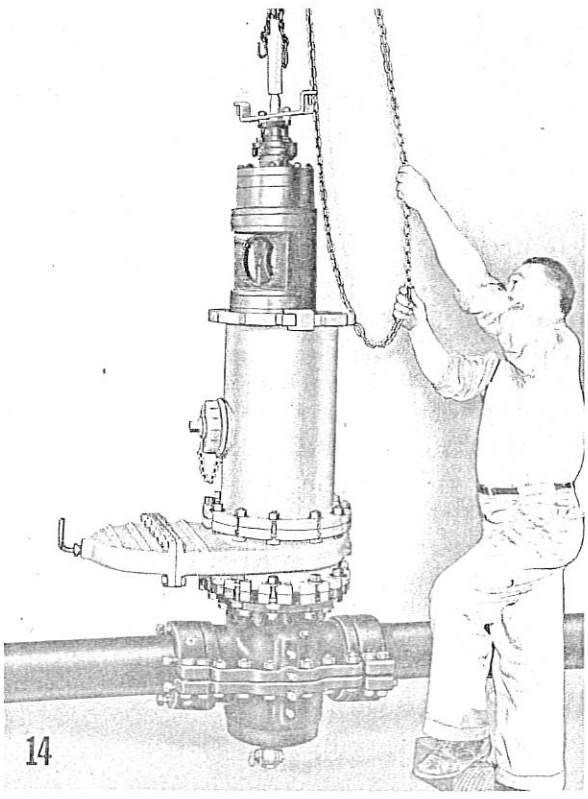
Lower the long adapter in place on top of the slide valve and bolt it to the slide valve flange with the hand hole facing the bonnet of the slide valve. Be sure the gasket is in good condition and in place, and that the raised face on the long adapter is fit into the recess in the slide valve flange. It will be noted that the long guide slots in the adapter are crossways with the main. These guides are for the purpose of guiding the valve plug to its seat and must be at right angles to the main.

21. PREPARING THE VALVE PLUG FOR INSERTION:

The valve plug itself should be carefully examined before attempting to insert it. The most important thing is to lay a straight edge on the side surface of the plug and see that the packing rings are at least flush or below flush with the machined surface.

CAUTION: THIS IS ONE OF THE MOST VITAL POINTS IN THE ENTIRE INSTALLATION AND IT IS VERY ESSENTIAL THAT AT LEAST THE BOTTOM PACKING RING SHOULD NOT PROTRUDE BEYOND THE METAL SURFACE.

The most important packing ring is the bottom one as it is the only one which has to slide past the cut pipe ends. If it is not below or flush with the metal retaining rings, there is a possibility of catching.



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NOTE: Should the bottom packing ring get slightly nicked during installation, and not effect a bottom seal, it is possible to retract the valve mechanism and switch the top and bottom packing ring so that the slightly nicked packing ring is used at the top of the valve plug.

Open the gates of the valve plug. Remove the wrench nut retaining nut and wrench nut from top of the valve stem. Also remove top set of stuffing box nuts.

Bolt the valve guide to the valve plug by placing it on packing gland bolts and securing it with the top set of stuffing box nuts. Be sure the valve guide is at right angles to the waterway through the plug. Also be sure it is installed on the plug with the marking indicating the proper top side up. The 4" and 6" sizes have the bent arms up, while the 8" is attached with the bent arms down.

Attach the proper size inserting screw plug, being sure to screw it on the stem tightly.

22. INSERTING THE VALVE PLUG: (Fig. 14 and 15)

Attach guide supports to top flange of long adapter immediately adjacent to opposite guide grooves.

Lower the valve plug carefully into long adapter, as shown in Figure 14. Lower the plug until the valve guide pins rest in holes of guide supports. With the valve plug resting on top of the long adapter carefully lower the drilling machine, by means of a chain hoist,

onto top of the plug. Be sure that the hand hole in the short adapter is open so that the operator can see thru it to line up to the two pieces of the inserting attachments as the machine is lowered. Continue lowering the machine until the boring bar socket and inserting screw plug are completely together and the bolt hole thru them is lined up. Then reach thru the hand hole and insert the bolt to fasten the boring bar socket and inserting screw plug together, Fig. 15.

Raise the machine and valve plug as a unit, by means of the chain hoist, slightly, so that the plug may be rotated to align the valve guide with the guide grooves, and remove guide supports.

Lower the machine until the flange of the short adapter and that of the long adapter come together. Bolt this joint together in the regular manner, being sure the gasket is in place and that the raised face is fitting in the recess. Close hand holes in both adapters. Open the pressure release valve in the short adapter. Open the by-pass valve on the end of the slide valve which will permit water to flow around the slide valve gate and equalize pressure in the upper chamber so the slide valve can be opened. Leave the pressure release valve open until water starts to flow out of it and then close it to let the water build up pressure. Turn the slide valve handle downward and when pressure has built up in the upper chamber, open the slide valve completely.

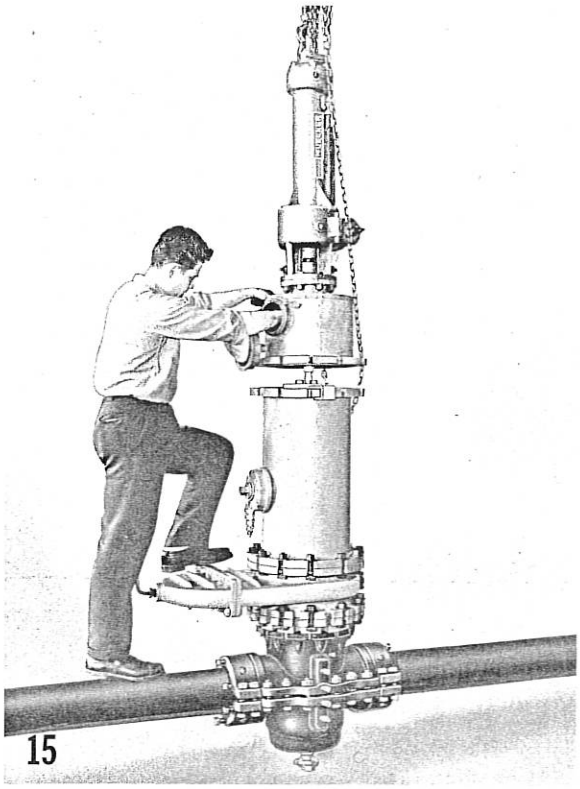
Now with the boring bar of the machine in its extreme rearmost position and with the automatic feed knob released, rotate the feed crank on the rear of the machine to lower the plug into place, Fig. 16.

Be sure to count the revolutions of the feed crank. The following chart shows the approximate number of turns necessary before the bottom of the plug will strike the seating surfaces in the valve sleeve:

	4" Valve	6" Valve	8" Valve
CC-25 and C1-25	130 turns	138 turns	140 turns
CL-12	108 turns	115 turns	117 turns
CL-12 travel indicator	(21.6")	(23.0")	(23.4")

It must be understood that these figures are only approximate and may vary a few turns either way. However, they are close enough for a guide. If the plug stops 5 or more turns before reaching the necessary advancement, it should not be forced and the reason determined.

When you have counted approximately the number of turns given, you should feel the plug strike its seat. If the plug strikes something and gets tight long before this, do not force it more than you can comfortably pull on the feed crank without any extension. Normally,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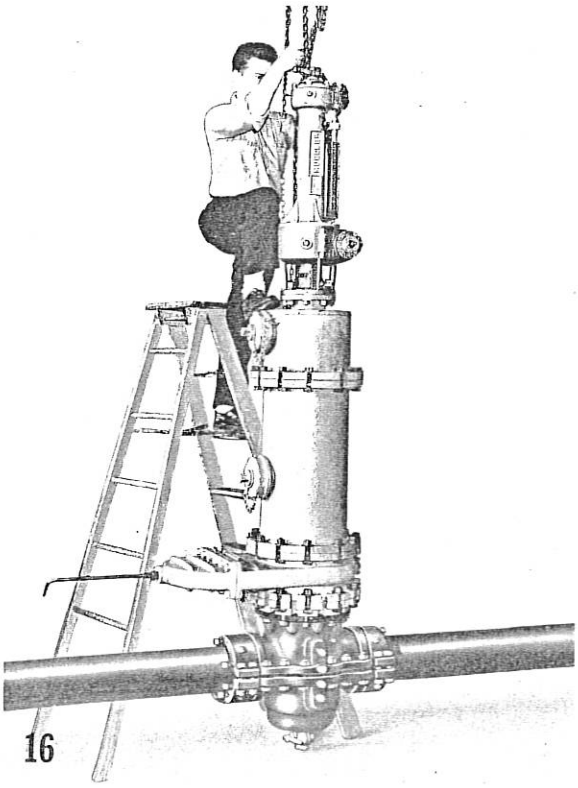
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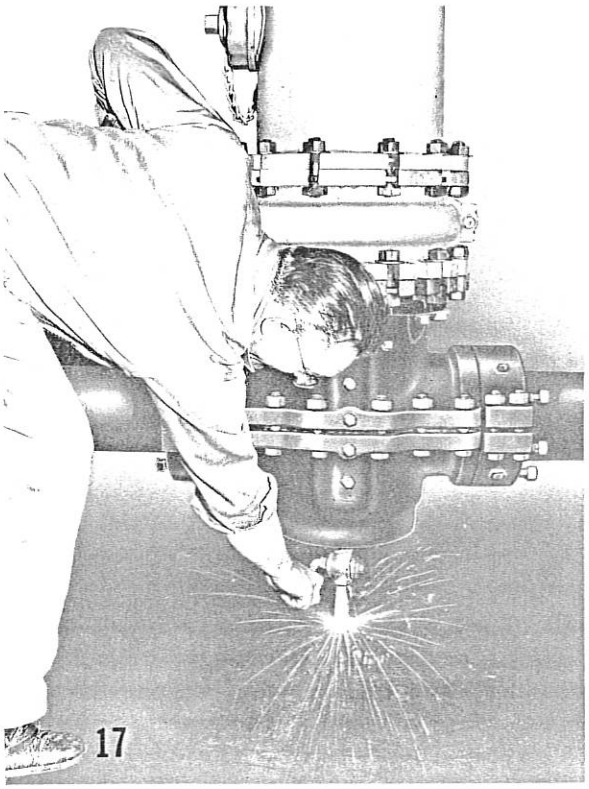
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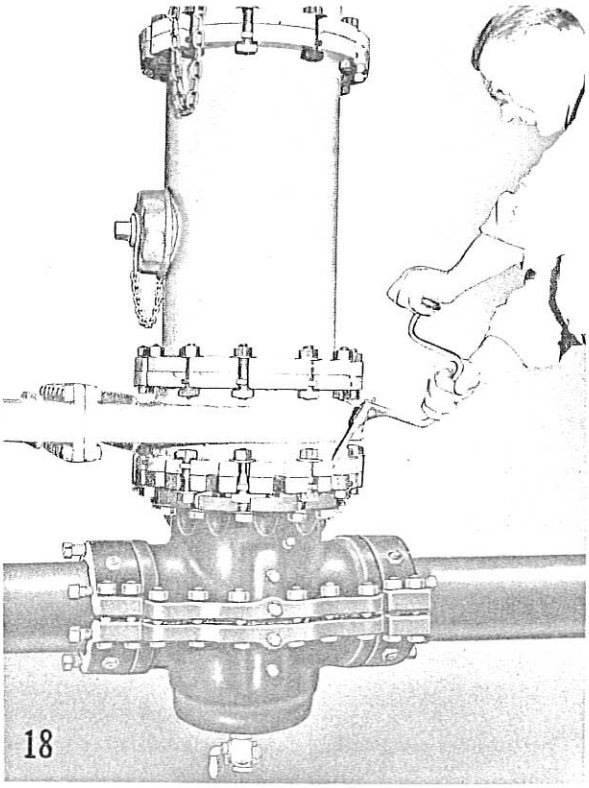
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there will be no difficulty and the plug will go right to its seat but if it does strike something, it is better to withdraw the plug and run the cutters in again. (Always remember that the cutters are larger than the plug and that the plug therefore, has to go thru a hole made by them. On rare occasions, the main will be under such a terrific strain that it will buckle even with the brace clamps on, and in these cases, it is necessary to run the cutters in the second time.) When the bottom of the plug strikes the seat in the sleeve, retract the boring bar about four turns to raise the plug from its seat. This leaves a small space between the bottom of the plug and the seating surface, and this surface is covered with chips from the cutting operation. Now open the pressure release valve in the bottom of the valve sleeve, Fig. 17. There will be a rush of water which will carry the chips off the seating surface of the valve. Allow the water to flow for three or four seconds and then shut off the stop. Now again lower the plug against its seat but this time force it against the seat with as much force as can be comfortably put on the feed crank. Now again open the valve in the bottom of the sleeve. This time there should be just a momentary rush of water which should immediately stop as the plug is carried to a permanent seat by the water pressure. Screw down on the feed crank again to take up the play occasioned when the water pressure seated the plug.

The opening of the bottom valve and the cessation of flow is a certain check on whether the plug is seated or not. When the plug has been seated on the bottom as indicated by the stoppage of flow from the bottom chamber, take the brace or ratchet box wrench (4" size) and hexagon tool and screw down all of the exposed angle packing screws, being sure to take them up evenly and a little at a time, Fig. 18. The few screws under the slide valve bonnet may be ignored for the time being and tightened after the slide valve has been removed. When all of the accessible screws have been screwed down firmly, test the upper packing joint by opening the pressure release valve in the top of the short adapter. There may be a momentary flow but this should soon stop if the top packing joint is tight. When the water stops flowing, it is an indication that the top packing is tight enough to remove the machine.

23. REMOVING THE MACHINE:

Open the hand hole in the long adapter. This should expose the boring bar socket and inserting screw plug and the operator should reach in and remove the bolt which holds them together. (Fig. 19).

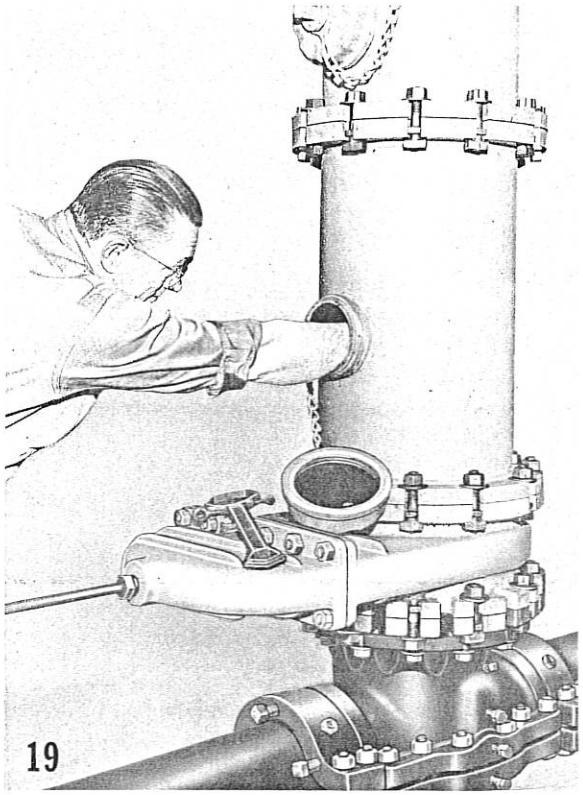
Return the boring bar of the machine to its extreme rearmost position.

Unbolt the joint between the short adapter and the long adapter and remove the machine and short adapter as a unit.

Remove bolts between long adapter and slide valve and remove long adapter.

Remove the valve guide and inserting screw plug from the top of the valve plug and replace valve stuffing box nuts.

Remove the bolts from the bottom flange of the slide valve, or adapter, and lift the slide valve and sleeve adapter, if used, off sleeve.



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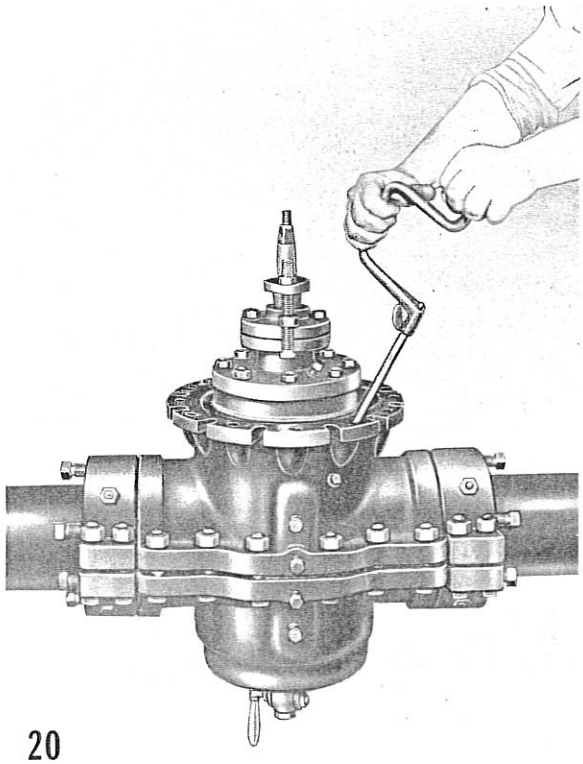
24. TIGHTENING THE ANGLE PACKING SCREWS: (Fig. 20)

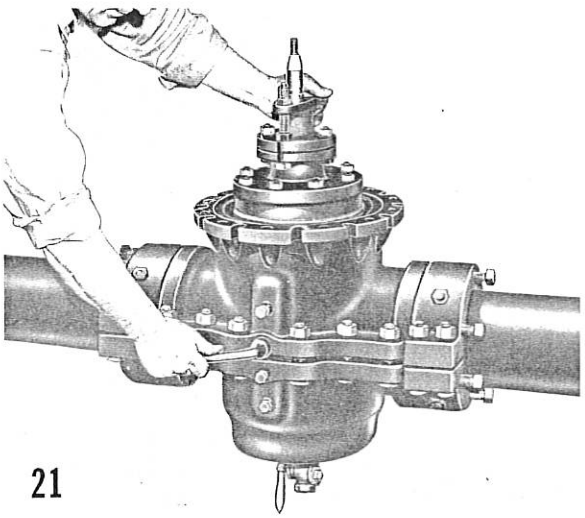
When the equipment has been removed, the angle packing screws on the top of the valve are easily accessible, and the brace and hexagon wrench should be used to pull them all up evenly and as solidly as possible.



20

INSTALLATION INSTRUCTIONS

FOR 4", 6" & 8" INSERTING VALVES



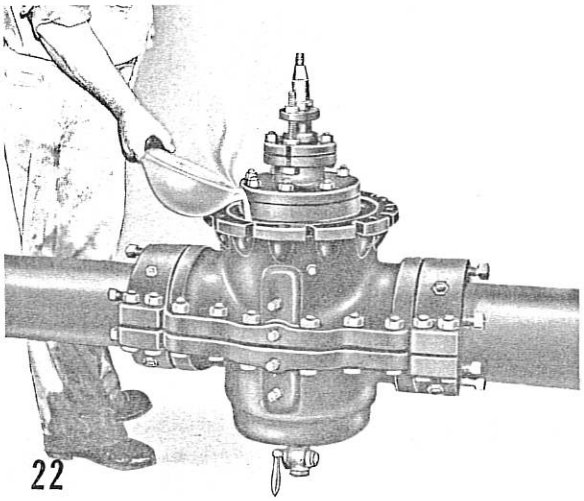
21

25. TIGHTENING THE SPLINE PACKING: (Fig. 21)

After the top and bottom packings are tight, the spline packings should be tightened. A small socket wrench is furnished which just fits the spline screws.

Start by taking up the top screws part of a turn and following with the bottom screws each time. Force the spline packings up evenly and solidly on each side. When these packings strike the plug they should spread out and fill the grooves in which they fit so that no leaks will occur out of the spline screws.

NOTE: All spline screws are equipped with pressure sealing lock nuts. These nuts are to be tightened against side of sleeve body after packing screws are firmly tightened. These sealing lock nuts prevent any seepage around packing screws.



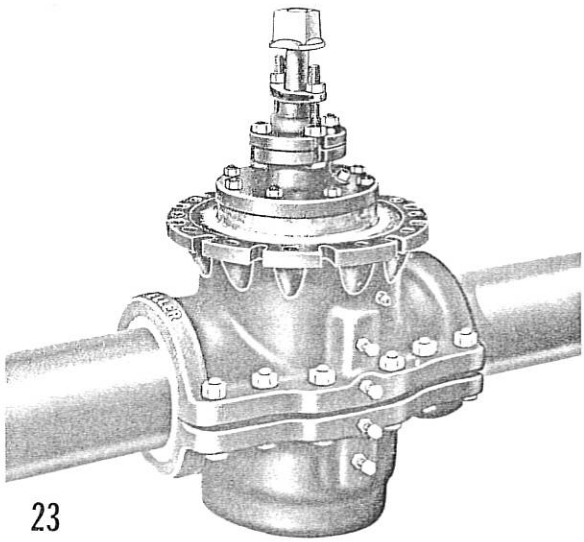
22

26. POURING THE TOP JOINT: (Fig. 22)

Along the side of the valve sleeve underneath the flange will be found a small pipe plug. This should now be removed draining the water from the top pouring space between the plug and the sleeve. When the water has been drained and the top packing inspected, the plug should be replaced. Pour some kerosene in the pouring space and pour this joint in the regular manner. This locks the valve completely in place.

27. REMOVING THE PRESSURE RELEASE VALVE:

Remove the pressure release valve from the bottom of the valve sleeve and replace it with the original pipe plug, screwing in the pipe plug securely as it now becomes a permanent part of the valve.



23

28. REMOVING THE MAIN BRACE CLAMPS:

Remove the main brace clamps at the end of the sleeve by taking out the bolts which hold the two sections together.

29. FINISHING UP THE VALVE:

Replace the original wrench nut retaining nut and wrench nut.

If possible the valve should be permitted to stand for a few hours before permanently covering it up so that any packing leaks will become apparent and may be taken up.

When properly inserted, this valve will be found to be absolutely leak proof after a few hours. The completed installation is shown in Fig. 23.

USE THIS AND FOLLOWING PAGES TO ORDER PARTS FOR MUELLER INSERTING VALVES and EQUIPMENT

ORDERING INSTRUCTIONS

IF PARTS SHOULD ACCIDENTALLY BECOME DAMAGED OR LOST, REPLACEMENT PARTS MAY BE ORDERED FROM THE FOLLOWING THREE PAGES.

TO ORDER PARTS FOR 4", 6" & 8" VALVES

STATE QUANTITY, SIZE, PART NO. AND DESCRIPTION
STATE WHETHER VALVE OPENS LEFT OR RIGHT

TO ORDER PARTS FOR 4", 6" & 8" INSERTING VALVE EQUIPMENT

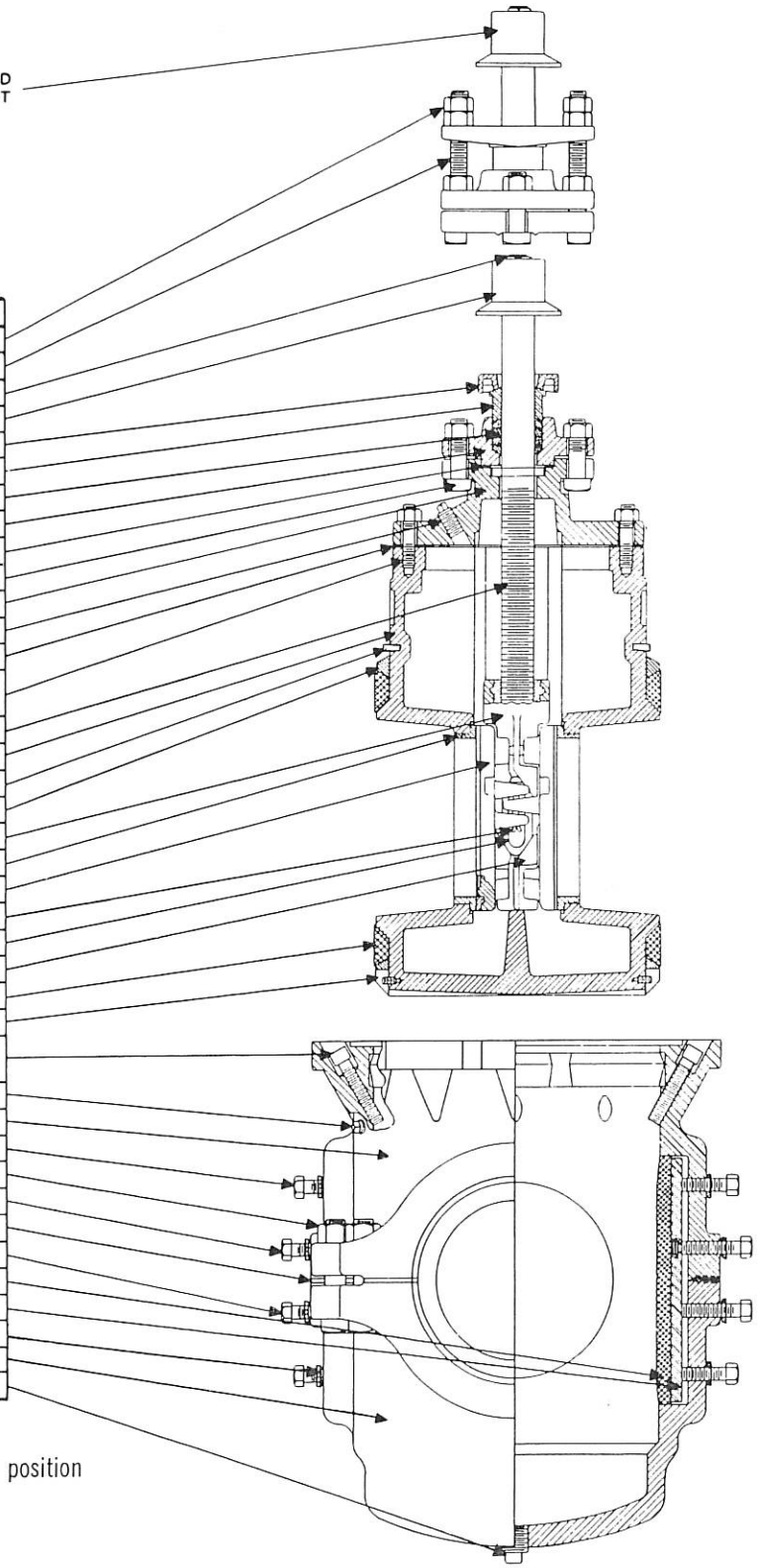
STATE QUANTITY, SIZE, PART NO. AND DESCRIPTION

TO ORDER PARTS FOR DRILLING MACHINES AND POWER UNITS

THIS INFORMATION MAY BE OBTAINED FROM THE LITERATURE WHICH ACCOMPANIES THE DRILLING MACHINES AND POWER UNITS

PARTS ILLUSTRATION OF INSERTING VALVE

FOR 4", 6" & 8" INSERTING VALVES



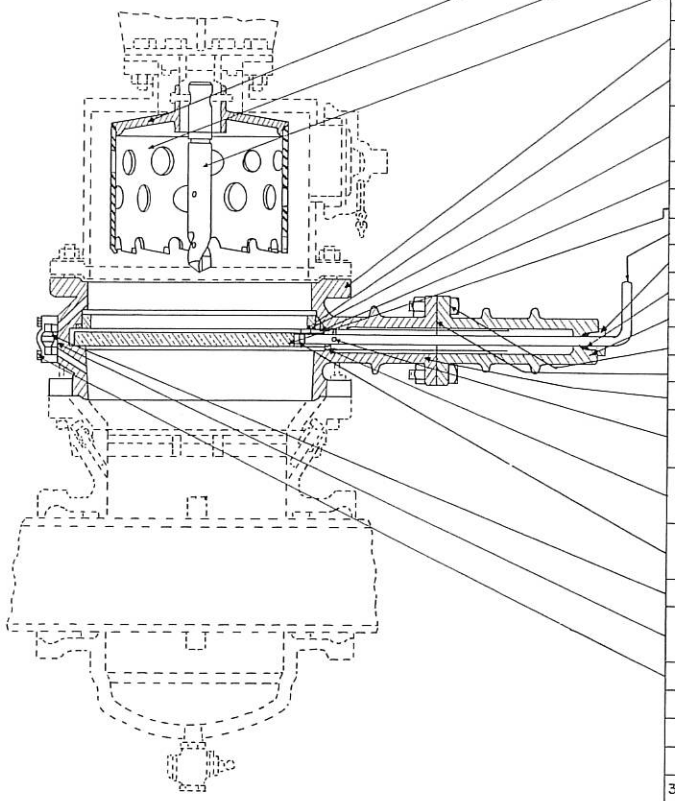
PART NO.	PARTS	No. Req'd.
G-7	GLAND NUTS	6
G-73	GLAND BOLTS	2
G-26	NUT FOR WRENCH NUT	1
G-38	WRENCH NUT	1
G-39	GLAND FLANGE	1
G-28	GLAND	1
G-25	STEM PACKING	4
G-40	STUFFING BOX	1
G-32	STUFFING BOX GASKET	1
G-41	STUFFING BOX BOLTS AND NUTS	2
G-74	BONNET	1
G-78	TEST PLUG	1
G-44	BONNET GASKET	1
G-52	STUDS AND NUTS 4" SIZE FOR BONNET 6"&8" SIZE	6 8
G-36	STEM	1
G-53	BODY	1
G-54	PACKING RING ROLL PINS	8
G-55	TOP PACKING RING	1
G-37	TOP WEDGE NUT	1
G-18	SEAT RING	2
G-19	DISC	2
G-20	DISC PIN	2
G-21	SIDE SPREADER	2
G-22	BOTTOM WEDGE	1
G-56	RING PACKING	2
G-57	BOTTOM PACKING RING	1
G-58	ANGLE 4" SIZE PACKING SCREWS 6"&8" SIZE	10 12
G-59	PIPE PLUG	1
G-60	SLEEVE UPPER SECTION	1
G-61	SPLINE FORCING SCREWS	4
G-62	SLEEVE BOLTS AND NUTS	12
G-63	SPLINE HOLDING SCREWS	2
G-64	SLEEVE PACKING	2
G-65	SPLINE FORCING SCREWS	2
G-66	SPLINE PACKING	2
G-67	SPLINE	2
G-72	PRESSURE SEALING LOCK NUTS	8
G-68	SLEEVE-LOWER SECTION	1
G-69	PIPE PLUG	1

In this drawing the sleeve is shown 90° from its true position with reference to the valve body.

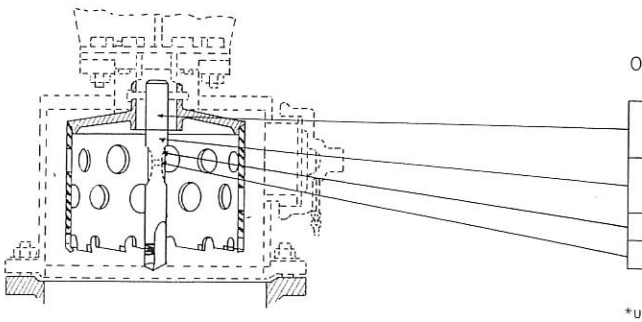
FOR 4", 6" & 8" INSERTING VALVES

PARTS ILLUSTRATION OF INSERTING VALVE EQUIPMENT

CL-12, CC-25, or CI-25 DRILLING MACHINE
(W-103 CATALOG, SECTION 2)



PARTS	4"	6"	8"	NO. REQD
CUTTER HUB	83685*	83682*	83689*	1
	54653	33107	33182	1
SHELL CUTTER	82995	82994	80699	1
PILOT DRILL COMPLETE	89353	Same as 4"	89354	1
	89357*	89358*	89359*	1
SLIDE VALVE COMPLETE	83542	Same as 4"	Same as 4"	1
GATE WASHER RETAINING RING SCREW	52193	"	"	18
GATE WASHER RETAINING RING	79766	"	"	1
GATE WASHER	79767	"	"	1
SLIDE GATE	60184	"	"	1
OPERATING ROD	33197	"	"	1
STUFFING GLAND	33196	"	"	1
OPERATING ROD PACKING	50408I	"	"	1
BONNET	60185	"	"	1
BONNET BOLTS	90165	"	"	14
BONNET GASKET	60186	"	"	1
SLIDE VALVE BODY	83541	"	"	1
OPERATING ROD ECCENTRIC PIN	33192	"	"	1
OPERATING ROD ECCENTRIC	33195	"	"	1
OPERATING ROD RETAINING PIN	63477	"	"	1
BY PASS VALVE	88153	"	"	1
BY PASS VALVE GASKET	33116	"	"	1
CAP SCREW	53969	"	"	4
GREASE	90968	"	"	1 LB.
PIPE JOINTERS	4" H-10728	6" H-10728	8" H-10728	2
MAIN BRACE CLAMPS	88197	88151	88187	2
3/8" & 7/16" RATCHET WRENCH	40233	Same as 4"	Same as 4"	1
3/4" & 13/16" DBL END WRENCH	96536	"	"	1
1 1/16" & 1 1/4" DBL END WRENCH	58196	"	"	1
1 1/4" SOCKET WRENCH	33125	"	"	1
3/4" SOCKET WRENCH	33124	"	"	1
3/8" SHORT HEXAGON WRENCH	40327	"	"	1
3/8" LONG HEXAGON WRENCH	33113	"	"	1
RATCHET BRACE	51953	"	"	1



OLD STYLE** PILOT DRILLS AND REPAIR PARTS

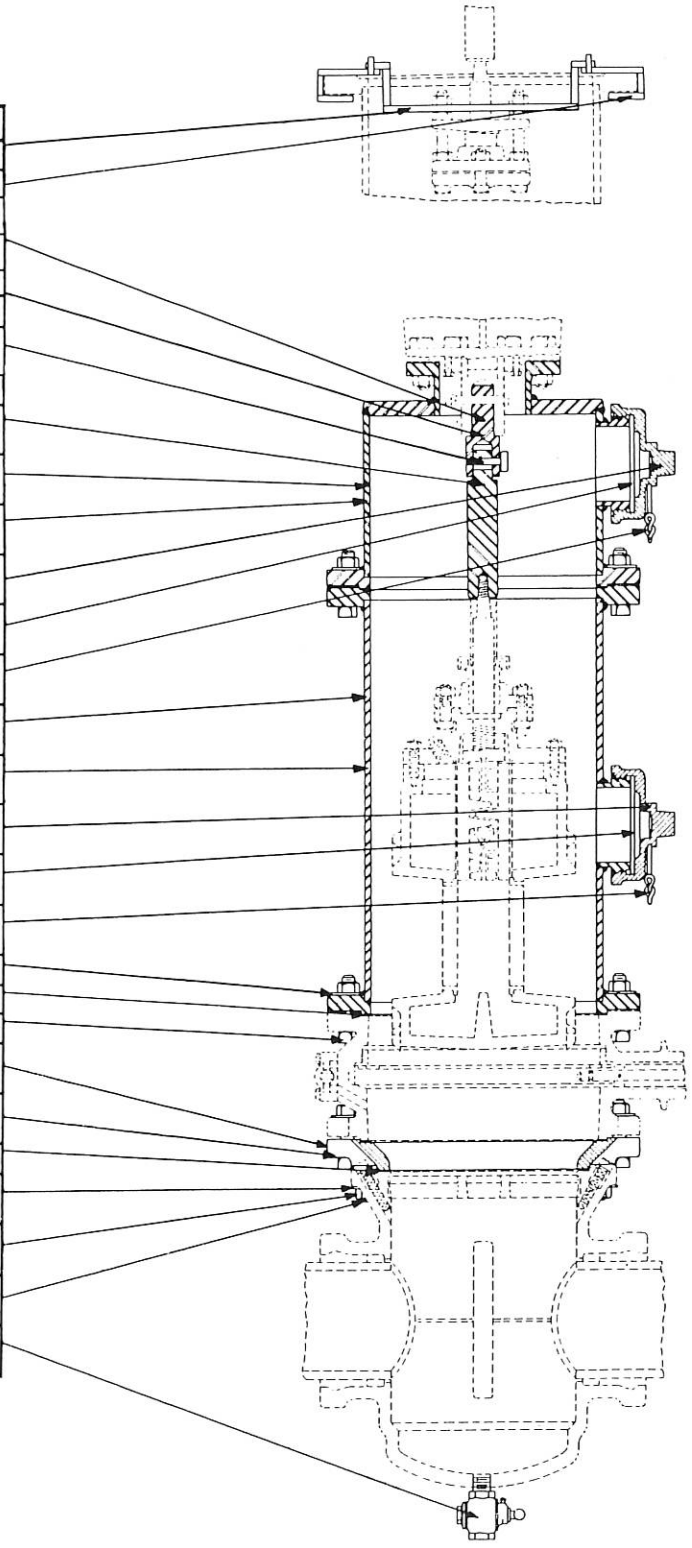
PILOT DRILL COMPLETE	83684*	83687*	83688*	1
	88156	Same as 4"	88189	1
PILOT DRILL BODY	48000*	48004*	48005*	1
	33105	Same as 4"	33190	1
PILOT DRILL SPRINGS	33128	"	Same as 4"	2
PILOT DRILL SCREWS	59830	"	"	2

*USE THESE PARTS WITH THE CL-12 MACHINE ONLY
**WITH SPRING CLIP DETENTS

PARTS ILLUSTRATION
OF INSERTING VALVE EQUIPMENT

FOR 4", 6" & 8" INSERTING VALVES

PARTS	4"	6"	8"	No. Req'd.
VALVE GUIDE	80598	80600	Same As 6"	1
GUIDE SUPPORTS	40280	Same As 4"	Same As 4"	2
BORING BAR SOCKET COMPLETE	83780*	"	"	1
	80601	"	"	1
BORING BAR SOCKET BODY	500534*	"	"	1
	33119	"	"	1
BORING BAR THUMB SCREW	33120	"	"	1
RETAIN. SCREW	54602*	"	"	1
INSERTING SCREW PLUG	79768	79769	79770	1
SHORT ADAPTER COMPLETE	80594	Same As 4"	Same As 4"	1
SHORT ADAPTER BODY	80593	"	"	1
SHORT ADAPTER CAP	45350	"	"	1
SHORT ADAPTER CAP GASKET	192345	"	"	1
SHORT ADAPTER CAP CHAIN	192376	"	"	1
LONG ADAPTER COMPLETE	80592	"	"	1
LONG ADAPTER BODY	80591	"	"	1
LONG ADAPTER CAP	45350	"	"	1
LONG ADAPTER CAP GASKET	192345	"	"	1
LONG ADAPTER CAP CHAIN	192376	"	"	1
FLANGE WASHER	92576	"	"	36
FLANGE GASKET	79740	"	"	3
FLANGE BOLT	36446	"	"	36
SLEEVE ADAPTER COMPLETE	80595	80596	NONE	1
SLEEVE ADAPTER BODY	79755	79756	NONE	1
ADAPTER GASKET	79741	79742	NONE	1
ADAPTER STUD BOLT WASHERS	55409	58321	NONE	4" — 10 6" — 12
ADAPTER STUD BOLT NUTS	51479	Same As 4"	NONE	4" — 10 6" — 12
ADAPTER STUD BOLTS	79760	Same As 4"	NONE	4" — 10 6" — 12
PRESSURE RELEASE VALVE	3/4" H-11055	Same As 4"	Same As 4"	2



*Use these parts with the CL-12 Machine only.