

MUELLER[®] GAS

Line Stopper Unit No. 3[™]

⚠ WARNING:

1. Read and follow instructions carefully. Proper training and periodic review regarding the use of this equipment is essential to prevent possible serious injury and/or property damage. The instructions contained herein were developed for using this equipment on fittings of Mueller manufacturer only, and may not be applicable for any other use.
2. Do not exceed the pressure ratings of any components or equipment. Exceeding the rated pressure may result in serious injury and/or property damage.
3. Safety goggles and other appropriate protective gear should be used. Failure to do so could result in serious injury.
4. Pressure test, check for and repair leaks in all fittings and components each time one is installed or any joint or connection is broken. Failure to find and repair a leak from any source in the fittings, by-pass lines or equipment could result in an explosion and subsequent serious injury and/or property damage.
5. MUELLER[®] Drilling Machines and Equipment have been carefully designed and engineered to work together as a unit. The use of equipment manufactured by someone other than Mueller Co. may cause excessive wear or a malfunction of the MUELLER machines.

Mueller Co.

Reliable Connections[™]

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All warranties, expressed or implied, for Mueller Drilling Machines are rendered null and void if the machines are used with shell cutters or equipment manufactured by someone other than Mueller Co.

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MAINTENANCE INSTRUCTIONS

Keep all machined and threaded surfaces of machines and equipment well lubricated with oil at all times. DO NOT USE OIL TO LUBRICATE RUBBER STOPPERS.

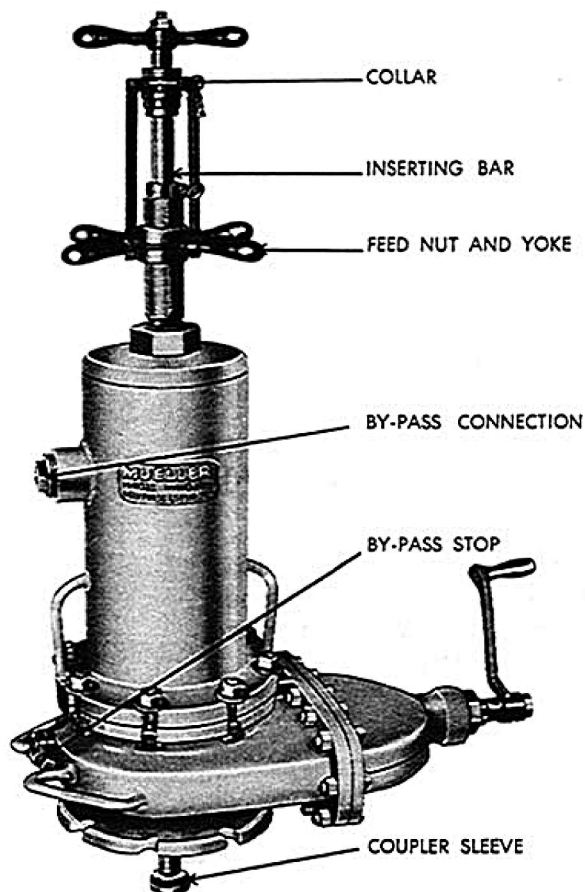
Examine rubber stoppers and replace rubbers if excessively worn or damaged. Lubricate the inside and all metal parts of rubber stoppers with a semi-liquid mixture of graphite and glycerin. When not in use, store stoppers away from sunlight in a cool, damp location.

To Disassemble Stoppers

1. Remove cap nut at the bottom of by-pass and solid rubber stoppers and the cotter pin at the top. (Remove cotter pin and nut at the bottom of deferred completion stopper.)
2. Insert retaining screw wrench at the bottom of stopper and unscrew retaining screw.
3. Stopper may now be taken apart for cleaning and lubrication or for replacement of rubber plug.

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS



H-17335 STOPPING MACHINE



H-17345 COMPLETION MACHINE



100 p.s.i. Maximum Working Pressure;

250° F. Maximum Temperature Rating.

The line pressure and temperature must not exceed these amounts during the use of this equipment. The line pressure and temperature may be increased to the maximum working pressure and temperature of the fitting after it is fully installed with the completion plug and completion cap in place.

The equipment required for installing and stopping off 6" and 8" Line Stopper Fittings consists of the following:

One Mueller CC-36, C1-36, or CH-6 Drilling Machine

Two H-17335 Stopping Machines

One H-17345 Completion Machine

One set of Unit No. 3 Attachments

Line Stopper Fittings are often used in pairs to isolate a section of pipe line. For this reason, Unit No. 3 consists of machines and attachments for stopping-off two Line Stopper Fittings at the same time. Only one set of attachments is required for drilling the pipe line, inserting the completion plug, and extracting the completion plug since these operations can be done on one fitting at a time. The H-17335 Stopping Machine includes a special 9" gate valve and necessary bolts and gaskets.

The H-17345 Completion Machine (latest design) includes the following:

Plug Alignment Tool
(part no.83519)

E-Z Release Plug Inserting Tool*
(part no. 83517)

E-Z Release Plug Extracting Tool*
(part no. 83518)

Completion Plug Wrench
(part no. 36424)

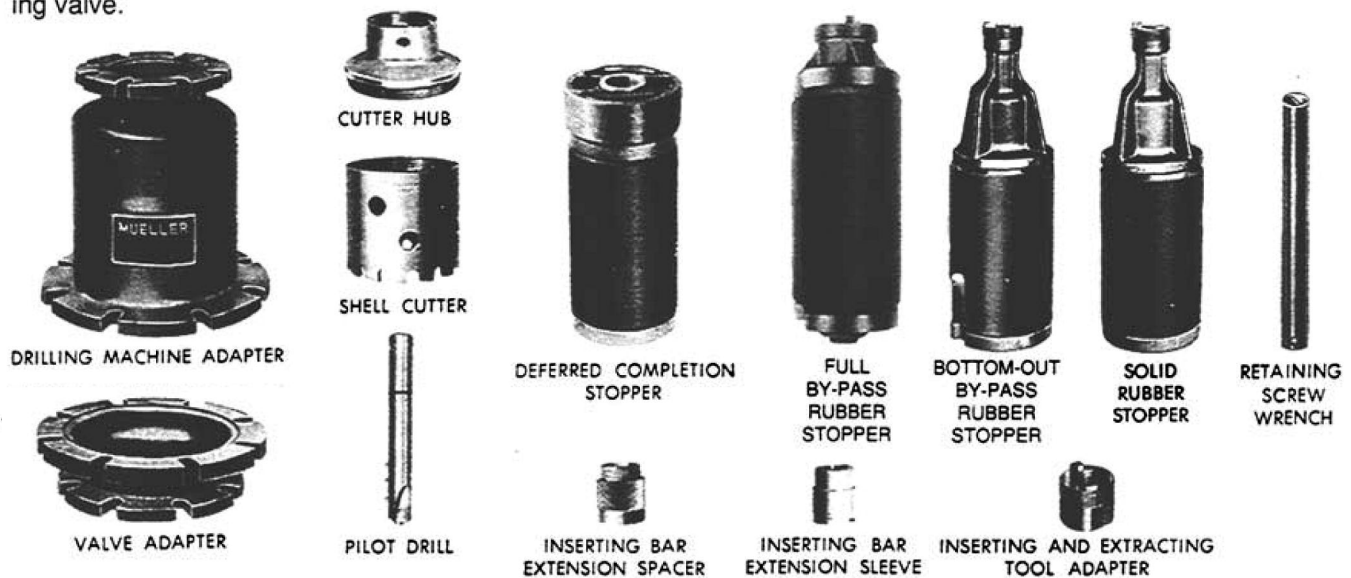
*E-Z Release type tools are attached to the inserting bar of the H-17345 Completion Machine (latest design) by means of a loose coupler sleeve. These tools cannot be used with the H-17345 Completion Machine previously furnished. However, tools previously furnished can be used with the latest design H-17345 Completion Machine.

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

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Line Stopper Fittings 3" in size and larger as now furnished have a completion plug with an "O" ring seal at the top of the thread and a pressure equalizing valve located in the center of the plug. E-Z Release type tools are now furnished with H-17345 Completion Machine. They are recommended for use with fittings having an equalizing valve in the completion plug. They are entirely satisfactory for use with fittings without an equalizing valve.

Plug inserting tool part number 36558 and plug extracting tool part number 88618 previously furnished with H-17345 Completion Machine are satisfactory for use with fittings not having an equalizing valve. With certain precautions, these tools may also be used with fittings having an equalizing valve.



Name of Attachment	Quan. Req.	Size and Catalog Number of Line Stopper Fitting											
		6"		8"		6"		8"		6"		8"	
		H-17255 H-17260 H-17265 H-17266 H-17270 H-17275 H-17276 H-17277 H-17278 H-17280	H-17281 H-17282 H-17283 H-17286 H-17287 H-17285 H-17288(4") H-17251 H-17252	H-17255 H-17260 H-17265 H-17266 H-17270 H-17275 H-17276 H-17277 H-17280	H-17281 H-17282 H-17283 H-17286 H-17287 H-17285 H-17288(6") H-17251 H-17252	H-17256 H-17257 H-17261 H-17264 H-17271 H-17272		H-17256 H-17257 H-17261 H-17264 H-17271 H-17272		H-17258		H-17258 H-17269	
Drilling Machine		CC-36 or C1-36	CH-6	CC-36 or C1-36	CH-6	CC-36 or C1-36	CH-6	CC-36 or C1-36	CH-6	CC-36 or C1-36	CH-6	CC-36 or C1-36	CH-6
Valve Adapter	2	501223	501223	---	---	501224	501224	502289	580821	501225	501225	502290	580822
Drilling Machine Adapter	1	36545	83631	36545	83631	36545	83631	36545	83631	36545	83631	36545	83631
Cutter Hub or Arbor	1	54501	83648	54653	580820	54501	83648	54653	580820	54501	83648	54653	580820
Shell Cutter	1	36548	83647	36521	580823	36548	83647	36521	580823	36548	83647	36521	580823
Pilot Drill	1	580585	83639	580586	83675	580585	83639	580586	83675	580585	83639	580586	83675
Solid Rubber Stopper	2	88760	88760	88699	88699	88760	88760	88699	88699	88760	88760	88699	88699
Rubber Only	---	37202	37202	37208	37208	37202	37202	37208	37208	37202	37202	37208	37208
By-Pass Rubber Stopper	2	88625	88625	88626	88626	88625	88625	88626	88626	88625	88625	88626	88626
Rubber Only	---	36553	36553	36528	36528	36553	36553	36528	36528	36553	36553	36528	36528
Bottom-out By-Pass Rubber Stopper*	2	80686	80686	83556	83556	80686	80686	83556	83556	80686	80686	83556	83556
Rubber Only	---	36553	36553	36528	36528	36553	36553	36528	36528	36553	36553	36528	36528
Full By-Pass Rubber Stopper	2	680516	680516	680517	680517	680516	680516	680517	680517	680516	680516	680517	680517
Rubber Only	---	509449	509449	509450	509450	509449	509449	509450	509450	509449	509449	509450	509450
Deferred Completion Stopper**	2	6" H-17185 or H-17186	6" H-17185 or H-17186	8" H-17185 or H-17186	8" H-17185 or H-17186	6" H-17185 or H-17186	6" H-17185 or H-17186	8" H-17185 or H-17186	8" H-17185 or H-17186	6" H-17185 or H-17186	6" H-17185 or H-17186	8" H-17185 or H-17186	8" H-17185 or H-17186
Inserting Bar Extension Spacer	2	---	---	---	---	36991	36991	36991	36991	36991	36991	36991	36991
Inserting Bar Extension Sleeve	2	---	---	---	---	36992	36992	36992	36992	36992	36992	36992	36992
Tool Adapter	2	37197	37197	37197	37197	37197	37197	37197	37197	37197	37197	37197	37197
Retaining Screw Wrench	1	88475	88475	88475	88475	88475	88475	88475	88475	88475	88475	88475	88475
Thread Cleaning Tool	1	89318	89318	89318	89318	89318	89318	89318	89318	89318	89318	89318	89318

* Use with H-17260, H-17261, H-17264, H-17269, H-17270, H-17271, H-17272, H-17280, H-17281, H-17282, H-17283, H-17286, and H-17287. Fittings only.

** Use H-17185 with Fittings having Completion Plug without "O"-Ring Seal. Use H-17186 with Fittings having Completion Plug with an "O"-Ring Seal.

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

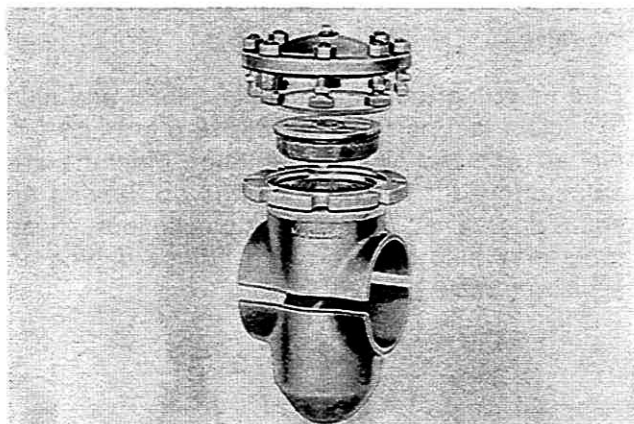


FIGURE 1

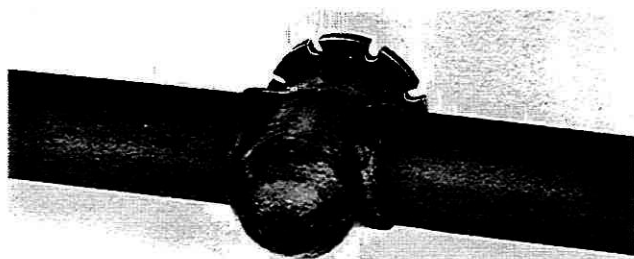


FIGURE 2

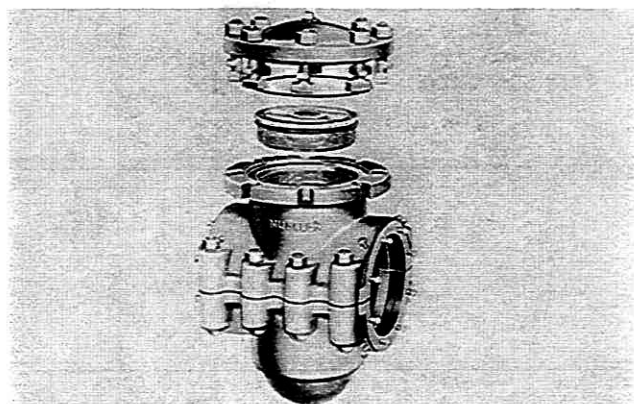


FIGURE 3

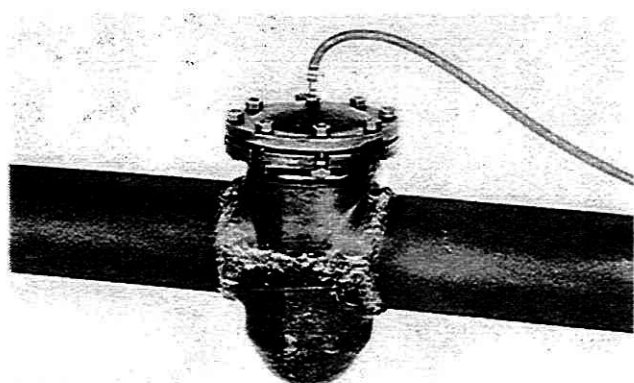


FIGURE 4

A—SELECT THE ATTACHMENTS REQUIRED

1. From the chart, page 5, select the attachments required according to the size and catalog number of the fitting to be used, Drilling Machine to be used and the type of stopper to be used. See instruction "H" page 12 for arrangement of piping.

B—INSTALL A LINE STOPPER FITTING*

TO INSTALL A WELDING LINE STOPPER FITTING (**Figure 1**) FOLLOW INSTRUCTIONS 1 THROUGH 8.

1. Thoroughly clean the pipe on which the fitting is to be attached.
2. Remove completion cap.
3. Remove completion plug from the fitting.
4. Place the two halves of the fitting around the pipe. Block up under the bottom half and lower the top half onto the bottom half. Check to be sure the two halves are in exact alignment with each other.
5. Tack weld the four corners together with enough space between the two halves so that they can be rotated around the pipe.
6. Weld both halves of fitting together but free of pipe. The fitting can be rotated so that the side welding is done horizontally on top of pipe. **Figure 2.**
7. Locate the fitting in the desired position and weld each end permanently to the pipe.
8. When using Bottom-Out Fittings, weld new piping to the bottom openings of the fittings.

TO INSTALL A MECHANICAL JOINT LINE STOPPER FITTING (**Figure 3**) FOLLOW INSTRUCTIONS 9 THROUGH 16.

9. Thoroughly clean the pipe on which the fitting is to be attached.
10. Remove completion cap. (For protection during shipment, the end screws are placed under completion cap of fitting.)

*IMPORTANT—The horizontal center line of the fitting must be concentric with the center line of the pipe. The fitting should be installed in a vertical position if possible; however, it may be rotated around the pipe to any angle as long as it remains concentric with the axis of the pipe.

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

11. Separate top and bottom halves of fitting by running off the side bolt nuts only. Do not remove end gaskets, end gasket followers, side bolts, or side gaskets.
12. Back out pipe gripping set screws.
13. Lubricate rubber gaskets with soapsuds (add glycerin in freezing weather.)
14. Place two halves of fitting on pipe and tighten side bolts evenly by pulling up each one a small amount at a time until completely tightened to 75 foot-pounds. This is the torque an average man might apply with a wrench having a 12" handle.
15. Locate the fitting in the desired position. Insert and tighten end screws with a small wrench. Start at the top and work around the fitting tightening each one a little at a time until all are evenly tightened to 17 foot-pounds.
16. Tighten pipe gripping set screws to same torque to hold fitting firmly in place.

C—TEST THE INSTALLATION—Figure 4

1. Bolt completion cap to fitting being sure gasket is in good condition and in place. Remove test plug and attach air hose. (The completion cap of previously designed fittings does not have a test plug. Use separate test cap which is tapped.)
2. Apply air pressure and test for leaks with soapsuds (add glycerin in freezing weather) or bubble type leak detection fluid.
3. Remove completion cap or test cap.
4. Replace test plug in completion cap.

D—ATTACH GATE VALVE

Instructions 5-17 apply only to latest design of completion plugs having "O" ring seals.

1. The gate valve is a special 9" MUELLER gate valve for use with 6" and 8" and 6" H-17268 Line Stopper Fittings and must be installed with the rubber faced disc up since the pressure aids in seating the gate and keeping it tight when closed.
2. Attach gate valve or gate valve and adapter to fitting.
 - a. When using an 8" fitting (except 8" H-17256, 8" H-17257, 8" H-17258, 8" H-17261, 8" H-17269 or 8" H-17271), bolt the gate valve to the fitting. (8" Line Stopper Fittings having Class 150 flanges do not require a valve adapter between the fitting and the valve.) **Figure 5.**

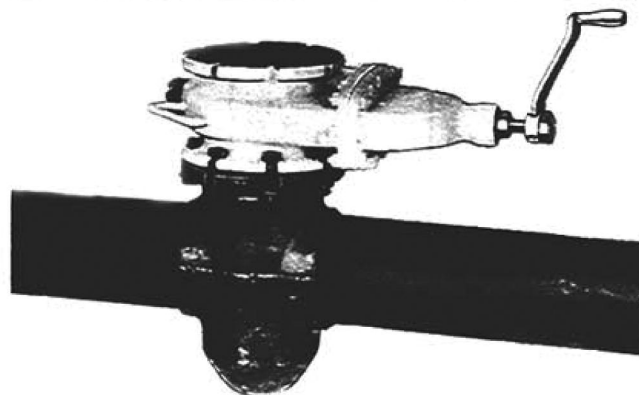


FIGURE 5



FIGURE 6

At both of these flange joints check to be sure the gasket is in good condition and in place. The bolt nuts should be loose at this point to permit the gate valve to be shifted slightly if necessary.*

- b. With all 6" fittings, with both H-17268 fittings, and with 8" H-17256, 8" H-17257, 8" H-17258, 8" H-17261, 8" H-17269, or 8" H-17271 fittings, bolt the proper valve adapter to the fitting, then bolt the gate valve to the adapter. (All 6" Line Stopper Fittings and 8" Line Stopper Fittings having Class 300, 400 or 600 flanges require a valve adapter between the fittings and the valve.) **Figure 6.** At both of these flanged joints check to be sure that gasket is in good condition and in place. The bolt nuts for both joints should be loose at this point to permit gate valve and gate valve adapter to be shifted slightly if necessary.*

3. Inspect the gate, then open gate valve, check to be sure it is **fully open**. (Approximately 30 turns to open.)

*If fitting being used does not have the latest design completion plug with an equalizing valve and "O" ring seal, the bolt nuts should be tightened at this point.

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

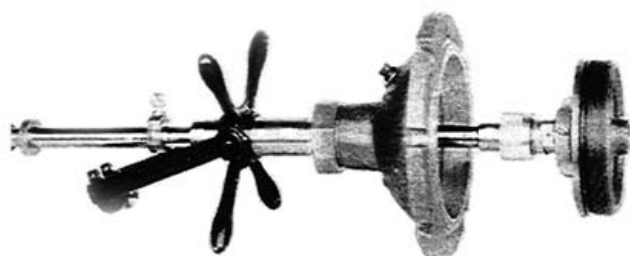
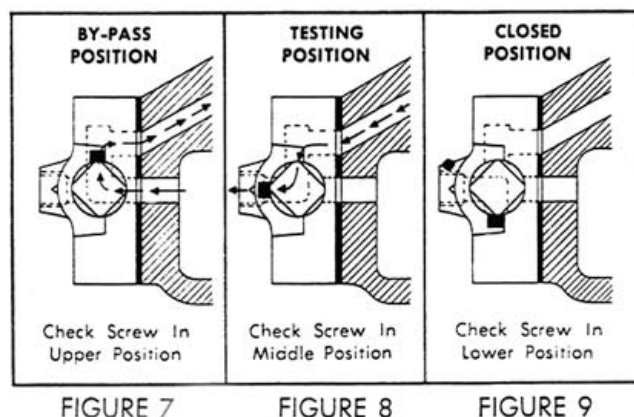


FIGURE 10

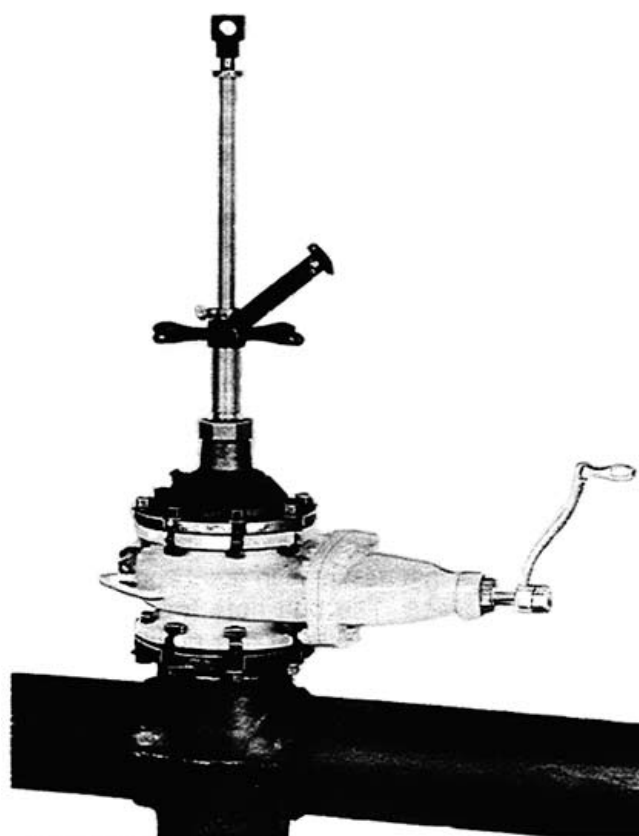


FIGURE 11

4. Turn by-pass stop on gate valve to by-pass position (check screw in upper position). **Figure 7.***
5. Attach plug alignment tool (part no. 83519) to completion plug.
 - a. Push fork to rearmost position and tighten thumb screw.
 - b. Screw end of tool into inside threads in top of completion plug.
 - c. Loosen thumb screw so that the fork lugs will engage with the slots in the completion plug.
6. Attach plug alignment tool, with the completion plug assembled to it, to inserting bar of Completion Machine. **Figure 10.**
 - a. Insert lug on top of plug alignment tool into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to plug alignment tool threads.
7. Withdraw inserting bar to rearmost position and tighten clamping collar on inserting bar at top of machine to prevent plug alignment tool and completion plug from falling while being placed on valve.
8. Attach completion machine to gate valve. **Figure 11.** It is not necessary to use all the bolts at this point.
9. Hold back on handle of inserting bar, then loosen clamping collar and slowly advance inserting bar until the completion plug contacts fitting threads. — **DO NOT LET THE INSERTING BAR DROP.**
10. At this point it may be necessary to slightly shift the gate valve on the fitting and possibly the completion machine on the gate valve to align the completion plug threads with the fitting threads.
11. Rotate inserting bar **clockwise** until completion plug threads are engaged with fitting threads six turns.
12. Securely bolt gate valve to fitting or gate valve to valve adapter and valve adapter to fitting. Tighten bolts from the bottom up, using alternating sequence in order to tighten as evenly as possible.
13. Rotate inserting bar **counter-clockwise** until completion plug is unscrewed from fitting. Withdraw inserting bar to rearmost position and tighten clamping collar.

*A 1 1/4" pipe nipple can be threaded into the outlet of the by-pass stop, and a length of rubber hose used to vent gas while the by-pass stop is in the testing position.

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

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14. Turn the by-pass stop to the test position and test the flanges of the stack by inserting pressure through the by-pass stop.
15. Close the gate valve (approx. 30 turns). Turn the by-pass stop to the closed position and remove air testing source. Now turn the by-pass stop to the test position. This will relieve pressure above the gate to ensure the valve does not leak.
16. Turn the by-pass stop to the by-pass position to equalize pressure above the gate. This will determine that the by-pass valve is working properly.
17. Open gate valve (approx. 30 turns) and once again lower the completion plug and inserting bar down into fitting and thread 6 turns.
18. Mark the position of the stopping machine flange in relation to the gate valve flange. Do this in 2 places, 90° from each other. This will prevent tilting of the machine during inserting of plug. This is for reference so that the stopping machine can be properly positioned for the final installation of the completion plug when the job is finished.
19. Remove completion machine from gate valve.
20. Loosen clamping collar and advance inserting bar until completion plug and plug alignment tool are exposed.
21. Remove completion plug and plug alignment tool from inserting bar.
22. Remove plug alignment tool from completion plug.

E—ATTACH AND OPERATE DRILLING MACHINE

(For detailed instructions see OPERATING INSTRUCTIONS FOR CC-36, C1-36, or CH-6 DRILLING MACHINES.)

1. Sharpen shell cutter and pilot drill before each cut by honing the front edge of the cutter teeth. If the shell cutter is very dull, it should be returned to Mueller Co., Decatur, Illinois, for reconditioning. Check pilot drill detents to be sure they are operating correctly.
2. Bolt drilling machine adapter to the front of the drilling machine. Check to be sure that gasket is in good condition and in place.

NOTE: MAKE CERTAIN MACHINED RECESS ON ADAPTER AND LIP ON MACHINE FLANGE MATE PROPERLY. VISUALLY CHECK ADAPTER FLANGE AND MACHINE FLANGE TO BE SURE THEY ARE FLUSH.

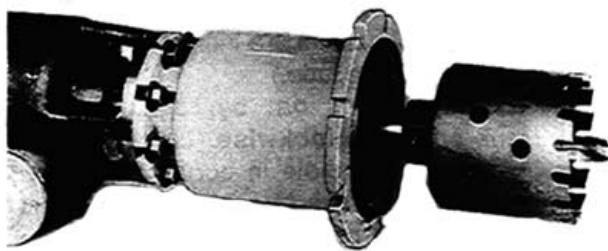


FIGURE 12

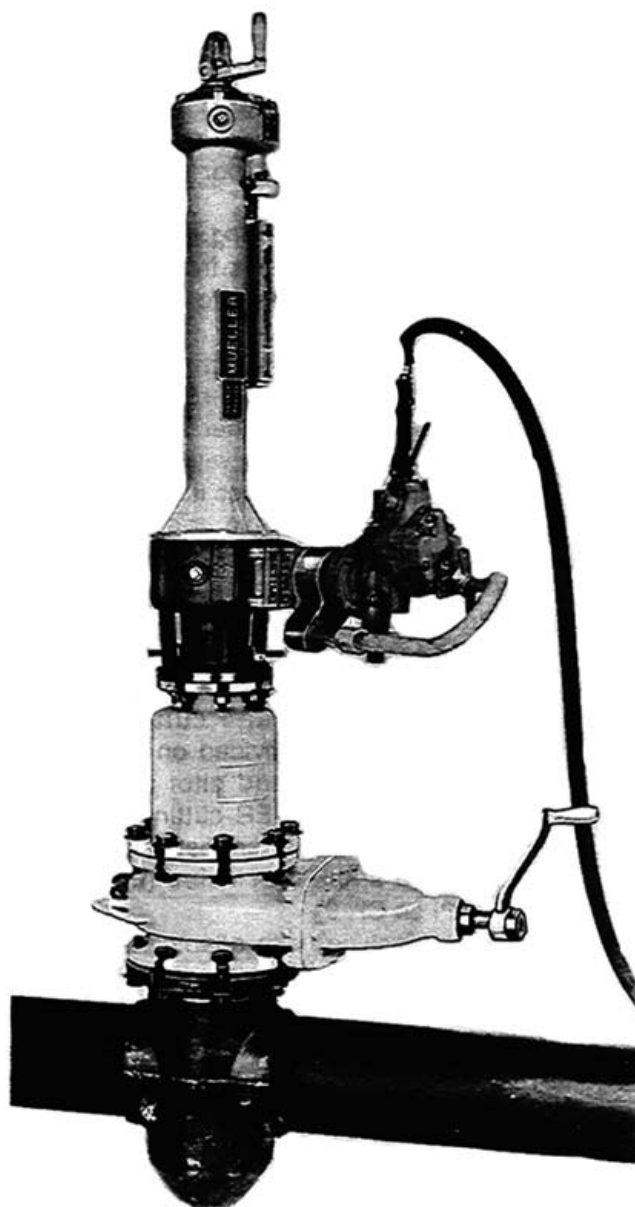


FIGURE 13

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

3. Release automatic feed by pulling out automatic feed knob. Push feed knob in on CH-6. (Directions are indicated on panel on rear of torque tube.)
4. Advance boring bar by rotating feed crank **counter-clockwise** (**clockwise** on CH-6) until bolt hole in boring bar is exposed beyond face of adapter. (Directions are indicated on panel on rear cover of torque tube.) Remove hub retaining bolt.
5. Assemble drilling equipment.
 - a. When using CC-36 or C1-36 drilling machines, assemble the shell cutter and cutter hub. Insert the shank of pilot drill into the socket in the boring bar. Slide cutter hub and shell cutter over the end of the boring bar. Align holes in the cutter hub, boring bar, and pilot drill and attach to boring bar with hub retaining bolt. **Fig. 12.**
 - b. When using CH-6 drilling machines, remove retaining screws from cutter arbor. Insert cutter arbor into socket in the boring bar. Align holes in cutter arbor and boring bar. Replace retaining screw by inserting it through hole in boring bar and into cutter arbor tapped hole. Tighten securely with screw driver. **NOTE:** If cutter arbor is E-Z release type, tighten Allen head cap screws so that the backing ring is rigid with the cutter arbor. Lubricate cutter arbor threads and attach shell cutter, threading it into arbor hand tight. Lubricate pilot drill, threaded shank end, and screw it securely into cutter arbor. Wrench flats are provided on pilot drill. Coat shell cutter and pilot drill thoroughly with MUELLER cutting grease.
6. Retract boring bar to rearmost position by rotating feed crank **clockwise** (**counter-clockwise** on CH-6).
7. Place the machine (with adapter and drilling equipment assembled) in drilling position on gate valve and bolt adapter solidly to valve flange. **Fig. 13.** Check to be sure that the gasket is in good condition and in place.

NOTE: MAKE CERTAIN MACHINE PROJECTION ON ADAPTER AND MACHINED RECESS ON GATE VALVE MATE PROPERLY. VISUALLY CHECK ADAPTER FLANGE AND GATE VALVE FLANGE TO BE SURE THEY ARE FLUSH.

8. Be sure that the welded fitting is cooled before cut is started.
9. Rotate feed crank **counter-clockwise** (**clockwise** on CH-6) to advance boring bar until pilot drill contacts the pipe, counting the turns (refer to chart below). Turn feed crank **clockwise** (**counter-clockwise** on CH-6) $\frac{1}{4}$ turn which retracts the boring bar slightly to release tension between pilot drill and the pipe. (1 revolution of the feed crank moves the boring bar $\frac{1}{8}$ of an inch — 6 revolutions equals 1 inch.)

Catalog Number of Fitting	Approximate Number of Turns of Feed Crank Required for Pilot Drill to Contact Pipe	
	6"	8"
H-17255	109	77
H-17256	111	102
H-17257	111	102
H-17258	117	111
H-17260	109	77
H-17261	111	102
H-17264	111	—
H-17265	105	77
H-17266	105	77
H-17268	120*	—
H-17269	—	111
H-17270	109	77
H-17271	111	102
H-17272	111	—
H-17275	111	112
H-17276	111	112
H-17277	111	112
H-17278	111	112
H-17280	111	112
H-17281	111	112
H-17282	111	112
H-17283	111	112
H-17285	112	114
H-17286	111	112
H-17287	111	112

*H-17268 4" — 118 Turns

NECESSARY TRAVEL TO COMPLETE CUT

Size and Kind of Pipe	From Point of Pilot Drill Contact on pipe	From Point of Shell Cutter Contact on Pipe
6" Steel	8 $\frac{5}{8}$ "	6 $\frac{7}{8}$ "
6" Cast Iron	9"	7 $\frac{1}{4}$ "
8" Steel	10 $\frac{5}{8}$ "	8 $\frac{7}{8}$ "
8" Cast Iron	11 $\frac{1}{8}$ "	9 $\frac{3}{8}$ "

Above dimensions include $\frac{1}{4}$ " of overtravel.

10. Set feed indicator to zero. Mark the point on feed indicator shield that the arrow will reach to complete the cut. (On the CH-6 Machine, the required travel is set on the automatic feed indicator, and when the machine reaches this travel, the indicator will indicate 000.)

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

11. Engage automatic feed by pushing in on automatic feed knob. Pull feed knob out on CH-6.
12. Operate the drilling machine.
 - a. When using the CC-36 Machine: Place ratchet handle on machine so that it cuts when ratchet handle is pushed toward pipe. Observe note on ratchet casting and arrow on drive box boss. Always operate the machine according to instructions with one person only on ratchet handle and using automatic feed to assure correct drilling rate. If cut becomes too difficult for one person, **DO NOT FORCE MACHINE**, as this may cause damage to cutter or machine. See detailed instructions for the CC-36 Machine.
 - b. When using the C1-36 or CH-6 Machine and the MUELLER H-600 Air Motor: Loosen the pivot set screw. This permits pivot pin to be removed so that air motor holder may be attached to the holder pivot on the drive box of the Drilling Machine. Position air motor holder and replace pivot pin. Tighten the pivot set screw and latch the small hook on the air motor holder to the pin on the machine drive box to prevent movement of the air motor holder. Examine air motor on ground with air pressure on. Position throttle lever for forward operation, this will turn drive spindle **clockwise**. Place air motor in holder; open throttle slightly. Spindle will turn until square in motor spindle aligns with square on drive spindle. Motor will then drop into place. Screw feed screw in top of motor back into countersink in top of holder. Slide hook clamp into position on air motor torque handle and tighten. Open air motor throttle fully so that motor is operating at proper speed (50 to 60 rpm). **IMPORTANT—MAINTAIN PRESSURE OF 90 P.S.I. WE RECOMMEND THE USE OF A GAGE AT THE THROTTLE TO DETERMINE THE ACTUAL PRESSURE OF AIR AT THE AIR MOTOR.** If cutting becomes difficult and motor stalls, see detailed instructions for the C1-36 Machine or CH-6 Machine.

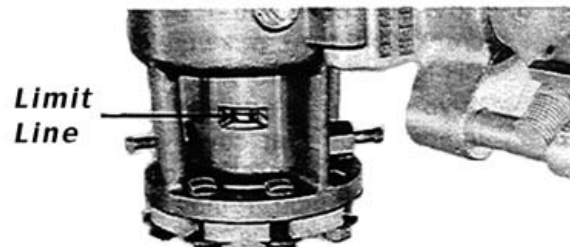


FIGURE 14

- c. When drilling through bottom-out fittings, purge air from new bottom-out line by opening the downstream gate valve slightly when the pilot drill penetrates the pipe through the upstream fitting. The by-pass stop on the gate valve should be in the closed position.
13. Continue the cutting operation until the pipe is cut completely through and the arrow reaches the point marked on the feed indicator shield, or until the cutter stops cutting. If power is being used, shut off motor.
14. Check completion of cut by releasing automatic feed and attempting to advance cutter by rotating feed crank **counter-clockwise** (**clockwise** on CH-6). If it does not advance easily, the cut is not completed, and automatic feed knob must be pushed in for further cutting (pulled out on CH-6). **CAUTION: STOP ADVANCING THE BORING BAR WHEN THE LIMIT LINE ON THE BORING BAR BECOMES VISIBLE THROUGH THE DRIVE BOX DRAIN HOLE. Figure 14.**
15. When cut is completed, release automatic feed and retract cutter to its rearmost position by rotating feed crank **clockwise** (**counter-clockwise** on CH-6).

F—REMOVE DRILLING MACHINE

1. Close gate valve. (Approximately 30 turns required to completely close the valve.)
2. Do not force valve closed, as that may destroy the rubber seat of the valve.
3. Turn by-pass stop to the test position (check screw in middle position). See **Figure 8**. This exhausts the pressure above the gate and also indicates whether or not the gate is shut tightly.
4. Remove bolts from the joint between the gate valve flange and the drilling machine adapter flange. Remove the drilling machine and drilling machine adapter from the gate valve as a unit.

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

5. Advance boring bar by rotating feed crank **counter-clockwise** (**clockwise** on CH-6) until hub retaining bolt is exposed beyond face of adapter. (Directions are indicated on rear cover of torque tube.)
6. The drilling operation cuts completely through the pipe, removing 2 sections of pipe. One section is removed from the top

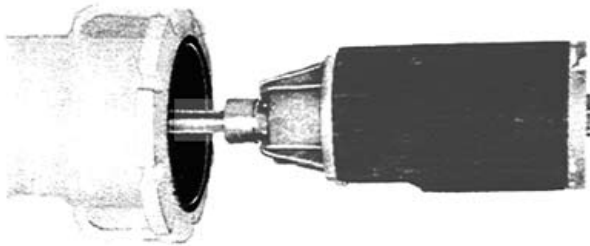


FIGURE 15

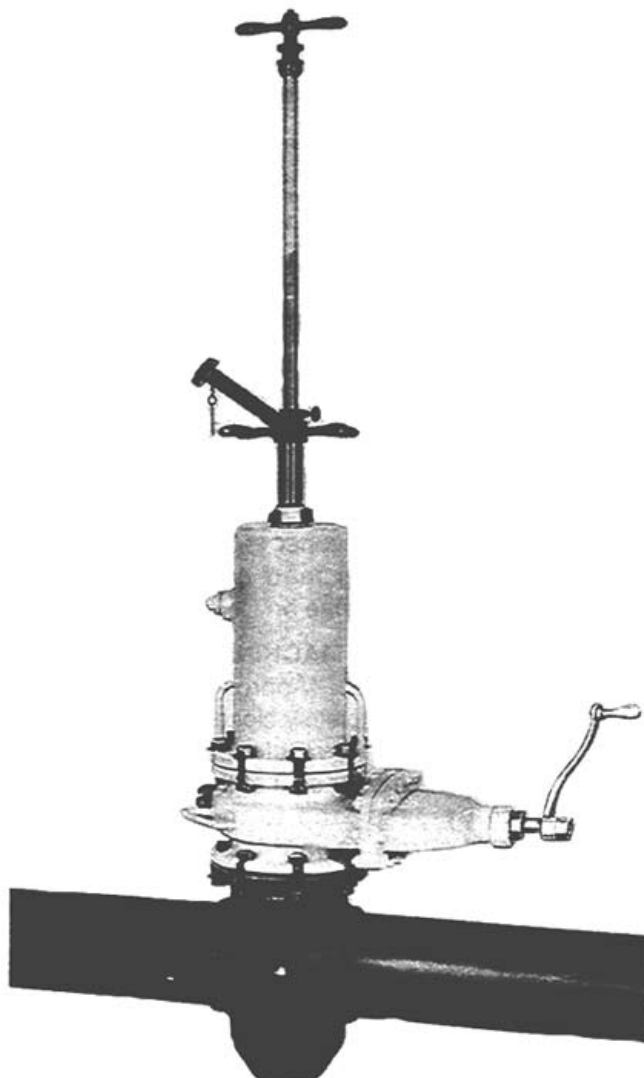


FIGURE 16

- of the pipe, and a second section is removed from the bottom of the pipe. These two cut-out sections of pipe are held inside the shell cutter by the pilot drill. Remove hub retaining bolt, cutter hub, and pilot drill from the boring bar of the machine.
7. Remove the pilot drill from the cut-out section of the pipe.
8. Remove the cut-out sections of pipe from inside the shell cutter by sliding them straight forward one at a time. Insert two screw drivers in the holes in the shell cutter and pry evenly against the cut-out sections of pipe to aid in sliding them forward. (If the cut-out section tilts it may bind on the inside of the cutter.)
9. See page 24 for using the H-17619 Inspection Flange.

G—ATTACH STOPPER TO STOPPING MACHINE

Type of stopper to be used (by-pass, solid, or deferred completion stopper) depends on the type of piping to be attached to the by-pass connection of the stopping machine body. See paragraphs "H-2," "H-3," "H-4," and "H-5." If using a deferred completion stopper, see instructions "R" and "S" on pages 22 and 23.

1. Loosen clamping collar and advance inserting bar of the stopping machine.
2. Attach stopper (by-pass or solid) to inserting bar of stopping machine. **Figure 15.**
 - a. Insert lug on top of stopper into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to stopper threads.
NOTE: For 6" and 8" H-17256, H-17257, H-17258, H-17261, H-17264, H-17269, H-17271 and H-17272 fittings, it is necessary to increase the effective length of the stopping machine inserting bar. See special instructions "1-a" through "1-c" on page 25. When using a by-pass stopper, check to be sure the by-pass in the stopper is on the opposite side from the arrow or the word "stopped" on the handle at the top of the inserting bar.
3. Lubricate stopper with MUELLER rubber stopper lubricant.
4. Withdraw inserting bar to the rearmost position and tighten clamping collar to prevent stopper from falling while being placed on the gate valve.

INSTRUCTIONS FOR INSTALLING
AND STOPPING OFF 6" AND 8"
LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

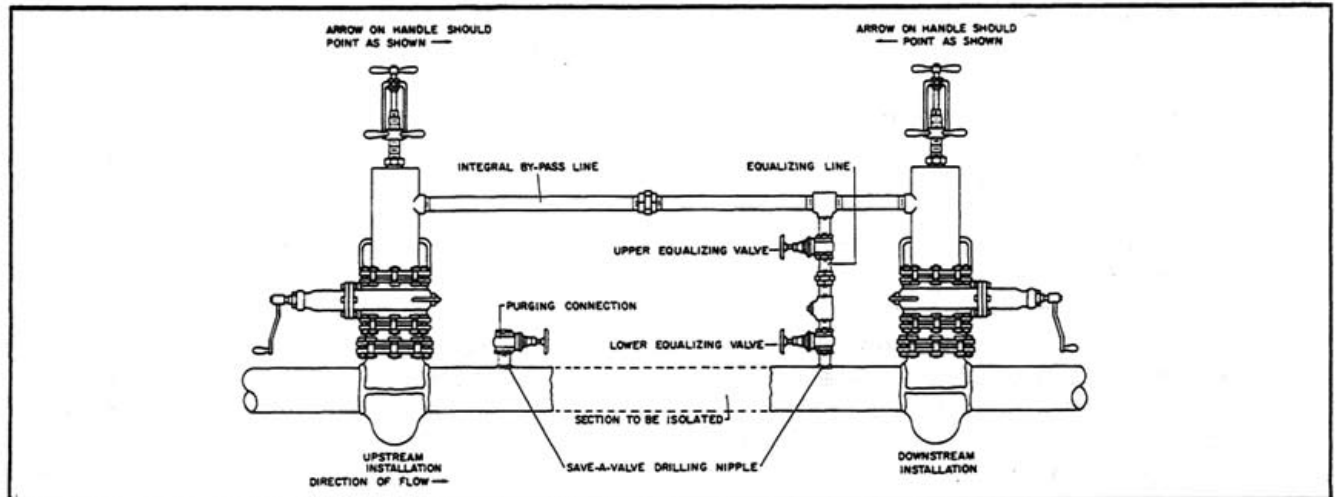


FIGURE 17

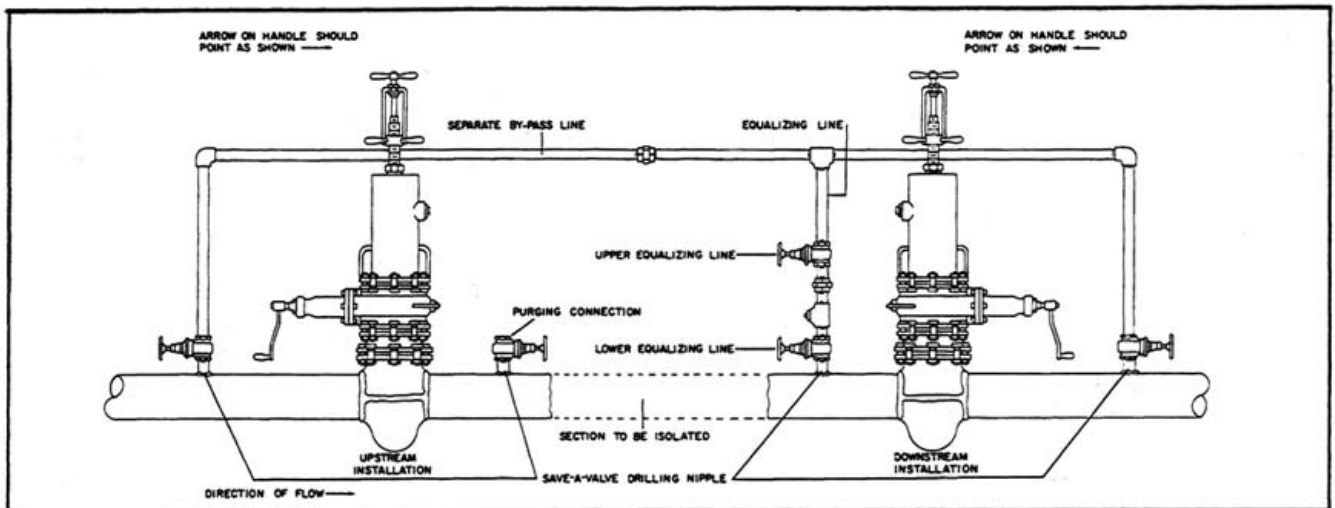


FIGURE 18

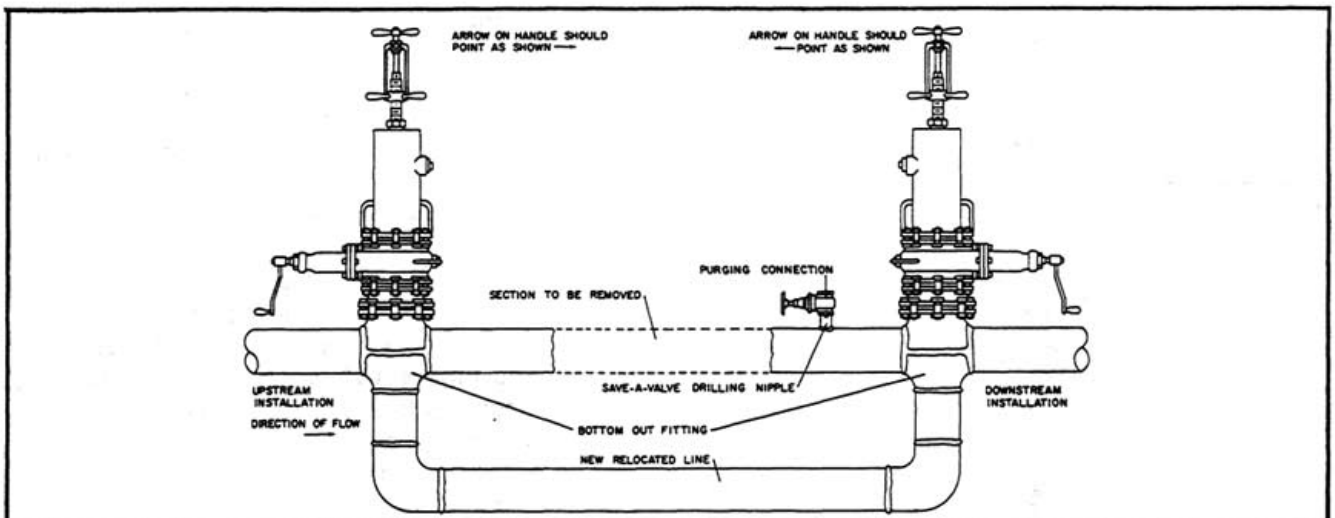


FIGURE 18A

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

H—ATTACH STOPPING MACHINE TO GATE VALVE—Figure 16

1. Position stopping machine on gate valve so that the by-pass connection is located in the desired position. Bolt stopping machine solidly to gate valve with gasket between valve and stopping machine.
2. See **Figure 17** when using two stopping machines to isolate a section of pipe and using an integral by-pass line to maintain service. Also see chart on page 53 for flow data through this type of by-pass. Use a separate by-pass of adequate size if there is any doubt as to whether or not an integral by-pass will provide sufficient and consistent flow and pressure for downstream requirements.
- a. When assembling the stoppers (para-

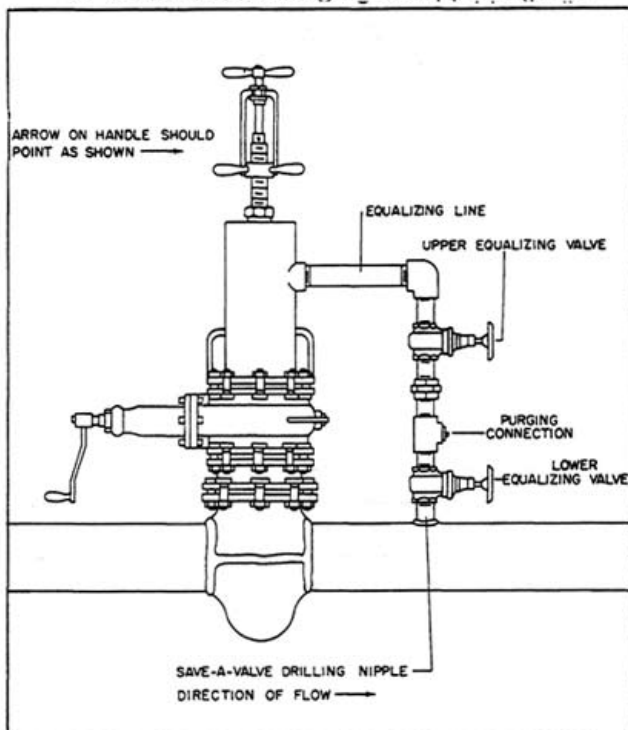


FIGURE 19



FIGURE 20

- graph G-2) use a by-pass rubber stopper in each stopping machine.
- b. Assemble a by-pass line between the by-pass connections of the stopping machines.
- c. Install a Save-a-Valve Drilling Nipple to the section of pipe to be stopped-off near the upstream stopping machine. (Stopping machine near the source of pressure.) This is a purging connection.
- d. Install a second Save-a-Valve Drilling Nipple to the section of pipe to be stopped off near the downstream stopping machine. (Stopping machine away from the source of pressure.) Connect an equalizing line between this nipple and the by-pass line.
3. See **Figure 18** when using two stopping machines to isolate a section of pipe and using a separate by-pass line to maintain service.
 - a. When assembling the stoppers (paragraph G-2), use a solid rubber stopper or a deferred completion stopper in each stopping machine.
 - b. Install a Save-a-Valve Drilling Nipple to the pipe on the pressure side of each stopping machine. Connect these two nipples to form a by-pass line around the two stopping machines and the section of pipe to be isolated.
 - c. Install a third Save-a-Valve Drilling Nipple to the section of pipe to be stopped off near the upstream stopping machine. (Stopping machine near the source of pressure.) This is a purging connection.
 - d. Install a fourth Save-a-Valve Drilling Nipple, to the section of pipe to be stopped off, near the downstream stopping machine. (Stopping machine away from the source of pressure.) Connect an equalizing line between this nipple and the by-pass line.
 - e. Tighten the plugs in the by-pass connections of the stopping machine bodies.
4. See **Figure 18A** when using two stopping machines to isolate a section of pipe using bottom-out fittings and bottom-out line.
 - a. When assembling the stoppers (paragraph G-2), use the by-pass stoppers.
 - b. Install a Save-a-Valve Drilling Nipple to the isolated section of pipe to use to blow down this section before removing.

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

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- c. Tighten the plugs in the by-pass connections of the stopping machine bodies.
5. See **Figure 19** when using one stopping machine to stop off a pipe.
 - a. When assembling stopper (paragraph **G-2**), use a by-pass rubber stopper.
 - b. Install a Save-a-Valve Drilling Nipple to the pipe on the stopped-off side of the stopping machine. Connect an equalizing line between this nipple and the by-pass connection of the stopping machine.

I—INSTALLATION OF SAVE-A-VALVE DRILLING NIPPLES - 3" IN SIZE AND SMALLER - **Figure 20**. (See MUELLER GAS DISTRIBUTION PRODUCTS CATALOG for machines and equipment needed to perform this operation.)

For installation of Save-A-Valve Drilling Nipples, 4" in size, see OPERATING INSTRUCTIONS for LINE STOPPER UNIT No. 2. For installation of Save-A-Valve Drilling Nipples, 6" and 8" in size, see page 40.

1. Clean surface where nipple is to be welded or service clamp attached.
2. Remove plug and cap before welding operation.
3. Place nipple in position and weld to line or attach service clamp to line and then attach nipple to clamp.
4. Screw test cap on nipple, apply air pressure and test for leaks with soapsuds.
5. Remove test cap.
6. Attach MUELLER gate valve and open gate valve **fully**. Check to be sure gate valve is open.
7. Attach proper size machine adapter nipple and drilling tools to MUELLER "T-W," "E-4," "E-5," "EH-1," "D-4," "D-5," or "DH-2" drilling machine. For detailed instructions, see operating instructions for these machines.
8. Apply MUELLER cutting grease to drill.
9. Place drilling machine and drilling machine adapter nipple on gate valve and tighten drilling machine adapter nipple into gate valve.
10. Advance boring bar until drill contacts pipe. Retract boring bar a small amount.
11. Start drilling operation. When hand operating the drilling machine, begin with a light, even feed, then a heavier feed, then finish drilling the hole with a light, even feed.

12. Continue drilling until hole is drilled. (This can be determined by feel of feeding mechanism, the pull on ratchet handle, or by measuring the advance of boring bar.)
13. After drilling is completed retract the boring bar to its rearmost position so that the drill safely clears the gate valve.
14. Close gate valve.
15. Remove drilling machine and drilling machine adapter from gate valve as a unit.

J—PLACE BY-PASS LINE IN OPERATION

1. If integral by-pass line is being used between two stopping machines, (**Figure 17**) the air is purged from the by-pass line by:
 - a. Remove the plug from tee in equalizing line.
 - b. Turn by-pass stop on downstream stopping machine gate valve to closed position (check screw in lower position). See **Figure 9**.
 - c. Turn by-pass stop on upstream stopping machine gate valve to by-pass position (check screw in upper position). See **Figure 7**.
 - d. Open upstream stopping machine gate valve slightly.
 - e. Open upper valve in equalizing line until all air has been purged from by-pass line, then close upper valve in equalizing line.
 - f. Turn by-pass stop on downstream stopping machine gate valve to test position momentarily to purge air from stopping machine (check screw in middle position). See **Figure 8**. When air is purged from machine, turn by-pass stop to by-pass position (check screw in upper position). Pressure will now build up in by-pass line.
 - g. Open both stopping machine gate valves **fully**. By-pass line is now in operation.
2. If separate by-pass line is being used (**Figure 18**) the air is purged from the by-pass line by:
 - a. Remove the plug from the tee in the equalizing line.
 - b. Open gate valve on upstream by-pass connection slightly.
 - c. Open upper valve in equalizing line until all air is purged from upstream section of by-pass line, then close upper valve in equalizing line. Close gate

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Catalog Number of Fitting	Approximate Distance Inserting Bar Must Travel for Stopper to Contact Bottom of Fitting*	
	6"	8"
H-17251**		
H-17255	25-5/8"	23-1/4"
H-17256	27-7/8"	27-3/8"
H-17257	27-7/8"	27-3/8"
H-17258	26-7/8"	28-3/4"
H-17260	25-5/8"	23-1/4"
H-17261	27-7/8"	27-3/8"
H-17264	27-7/8"	—
H-17265	25-5/8"	23-1/4"
H-17266	25-5/8"	23-1/4"
H-17268***	23-1/4"	—
H-17269	—	28-3/4"
H-17270	25-5/8"	23-1/4"
H-17271	27-7/8"	27-3/8"
H-17272	27-7/8"	—
H-17275	27-7/8"	27-3/8"
H-17276	25-5/8"	27-3/8"
H-17277	27-7/8"	27-3/8"
H-17278	27-7/8"	27-3/8"
H-17280	27-7/8"	27-3/8"
H-17281	27-7/8"	27-3/8"
H-17282	27-7/8"	27-3/8"
H-17283	27-7/8"	27-3/8"
H-17285	25-5/8"	23-1/4"
H-17286	27-7/8"	27-3/8"
H-17287	27-7/8"	27-3/8"

* Dimensions do not include travel needed to expand stopper

** Data for this fitting is used with Extension Stopper Fitting

Instructions starting on page 26.

*** Note: H-17268 4" – 118 turns.

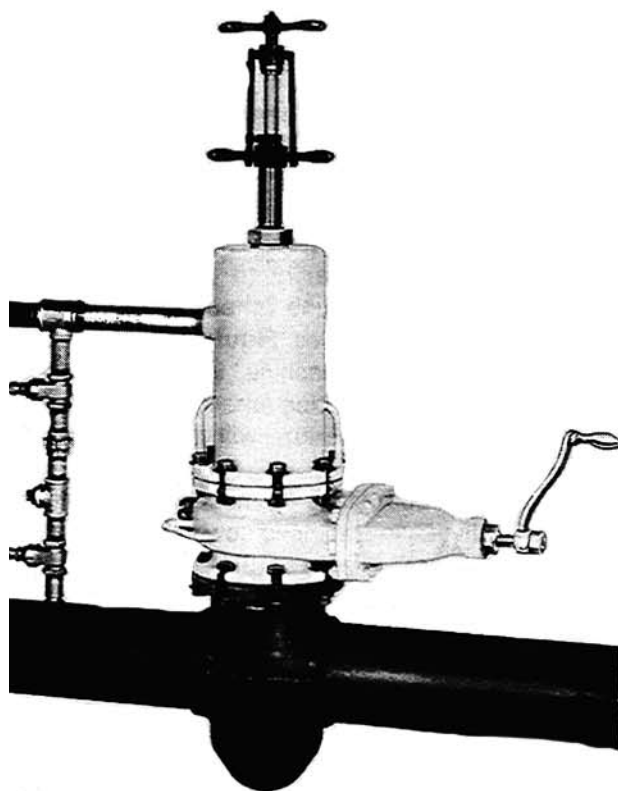


FIGURE 21

valve on upstream by-pass connection.
d. Open gate valve on downstream by-pass connection slightly.

e. Open upper valve in equalizing line until all air is purged from downstream section of by-pass line and close upper valve in equalizing line. Pressure will now build up in by-pass line.

f. Open gate valves **fully** on both upstream and downstream by-pass connections. By-pass line is now in operation.

- If using bottom-out fittings and bottom-out line (**Figure 18A**), the new bottom-out line serves as the by-pass line and is already purged of air and in operation.

K—INSERT STOPPER INTO FITTING

NOTE: When using a by-pass line to maintain service around a section of pipe to be isolated by two stopping machines, it is advisable to insert and expand the upstream stopper first.

- Turn by-pass stop on gate valve to by-pass position (check screw in upper position). **Figure 7.**
- Turn the "T" handle on the top of the machine so the arm having the arrow with the word "stopped" on it, points toward the section of pipe to be stopped off. This locates the by-pass on the stopper in the proper position. See **Figures 17, 18, 18A and 19.**
- Open stopping machine gate valve fully (approx. 30 turns). Release clamping collar and advance inserting bar of stopping machine until the rubber stopper contacts the bottom of the fitting.
- Hold inserting bar in this position by placing yoke of the machine in the collar of the inserting bar and securing with pin. **Figure 21.** Do not rotate inserting bar.

L—EXPAND STOPPER IN FITTING

- Turn feed nut and yoke of stopping machine **clockwise** 1/2 turn at a time with a short pause after each turn. Continue to expand the stopper in this manner until the line is stopped off. This can be tested by use of the purging connection or any other opening that may be available in the section of pipe that is stopped off.

NOTE: Unnecessary damage can be done to the stopper by too much expansion. We recommend not expanding the 6" stopper

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

by more than 2" downward travel of the inserting bar and with the 8" stopper, not more than 1³/₄" downward travel of the inserting bar.

2. With both stoppers expanded, open the gate valve on Save-a-Valve Drilling Nipple used as a purging connection to blow down the stopped off section of pipe. Stopper tightness will be indicated at this point.
3. Proceed with the work to be done on the stopped off section of pipe.

NOTE: When cutting or welding near line stopper fittings containing rubber stoppers, it is recommended that the minimum distance between the face of the stopper and the cutting or welding operation on the 6" fitting be 14" and the 8" fitting distance should be 16". Where it is not possible to maintain this minimum distance, cooling means such as wet burlap or rags should be placed around the fitting to keep temperature down.

4. When using bottom-out fittings, cut out the isolated section of pipe and weld caps to the stub ends of the pipe.

M—CONTRACT STOPPER IN FITTING

1. When all desired work has been done on the stopped-off section of pipe, check to be sure that all welded joints are cool.
2. Replace plug in tee in equalizing line.
3. Open both valves in equalizing line.
4. Open gate valve on purging connection until all air has been purged from stopped-off section. Close this gate valve.
5. Test all joints when pressure has built up in section that was stopped-off.
6. The pressure must be equal on both sides of the stopper before contracting and removing it from the fitting. After pressure in stopped-off section of pipe is equalized, contract stoppers by turning feed nut and yoke of stopping machine **counter-clockwise** 1/2 turn at a time with a short pause after each turn until the stoppers are fully released.
7. Close both valves in equalizing line.

N—EXTRACT STOPPER FROM FITTING

1. Remove pin and then remove feed yoke from collar on inserting bar and slowly withdraw the inserting bar to the rear-most position. Tighten clamping collar.

CAUTION: WHEN THIS MACHINE IS UNDER PRESSURE, CONTROL THE PISTON ACTION OF THE BORING BAR TO

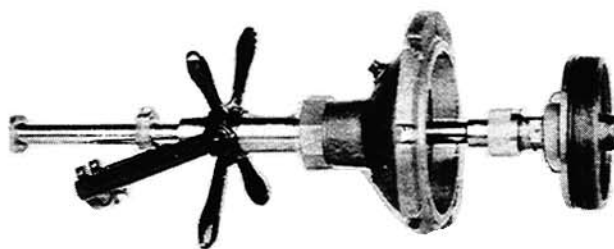


FIGURE 22

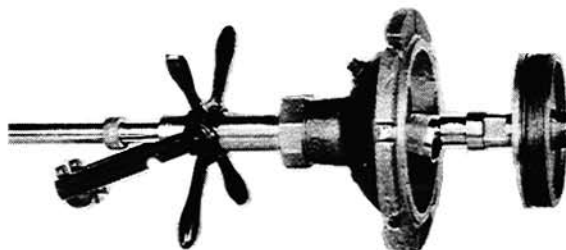


FIGURE 23

PREVENT BODILY INJURY OR DAMAGE TO THE MACHINE.

2. Close stopping machine gate valves (approx. 30 turns).
3. Turn by-pass stops on gate valves to test position (check screw in middle position). **Figure 8.** Flow from by-pass stops will blow down by-pass line. For a rapid blow-down, remove plug from tee in equalizing line and open upper equalizing valve.
4. Remove by-pass lines, equalizing line, and stopping machine.

O—PLUG AND CAP THE DRILLING NIPPLES

(See MUELLER GAS DISTRIBUTION PRODUCTS CATALOG for machines and equipment needed to perform this operation.)

1. Screw drilling nipple completion plug on the inserting tool of the "E-4," "E-5," "EH-1," "D-4," "D-5" drilling machine or H-17145 completion machine, or directly on the boring bar of the "T-W" drilling machine or H-17045 completion machine. Lubricate these threads and check to be sure that these threads screw together freely without binding.
2. Attach drilling or completion machine to valve.
3. Open valve, advance boring bar, and screw completion plug into drilling nipple securely by rotating boring bar **clockwise**.
4. Remove inserting tool from plug by turning handle **counter-clockwise** to take up slack and by striking handle of the machine

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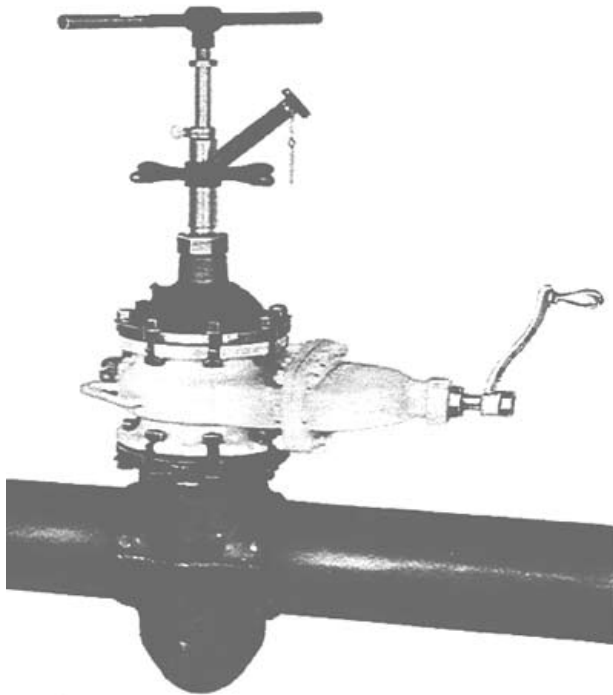


FIGURE 24

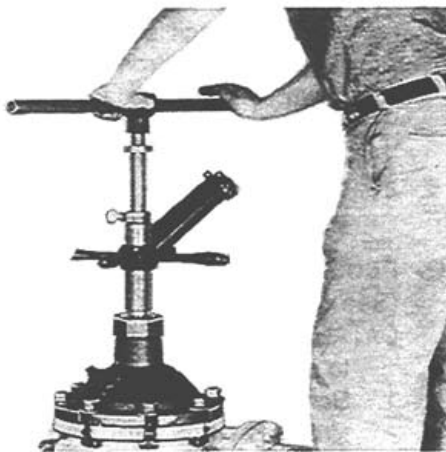


FIGURE 25



FIGURE 26

a sharp blow **counter-clockwise**. Boring bar should now be free to turn.

5. Rotate **counter-clockwise** until inserting tool is free from plug.
6. Remove drilling machine (or completion machine) and gate valve.
7. Tighten plug with wrench.
8. Apply pipe thread 'dope' to completion cap threads and screw cap tightly on nipple. Test for leaks with soapsuds (add glycerin in freezing weather).

P—INSTALL COMPLETION PLUG IN LINE STOPPER FITTING

NOTE: Latest design of completion plugs have an "O" ring seal and a pressure equalizing valve in the center of the completion plug. See page 5. The end of either inserting tool (part no. 83517 or 36558) will open the equalizing valve.

1. Loosen clamping collar and advance inserting bar of completion machine.
2. When using an E-Z Release type plug inserting tool (part no. 83517):
 - a. Attach plug inserting tool to the completion plug.
 - (1) Push fork to rearmost position.
 - (2) Hold fork in this position and screw the end of the tool into the inside threads in the top of the completion plug.
 - (3) Release fork so that the fork lugs will engage with the slots in the completion plug.
 - b. Attach plug inserting tool, with completion plug assembled to it, to the inserting bar of completion machine.
3. When using the plug inserting tool (part no. 36558) previously furnished with H-17345 Completion Machine:
 - a. Screw the end of the tool **hand tight only** into the inside threads in the top of the completion plug. **IMPORTANT—Check to be sure these threads screw together freely without binding.**
 - b. Screw tool **tightly** into the right hand inside threads of the inserting bar. The

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

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coupler sleeve is not used with this plug inserting tool. **Figure 23. IMPORTANT—** The connection between the inserting tool and the inserting bar must be as tight as possible.

4. Check to be sure threads on completion plug and fitting are clean. Coat the "O" ring on the completion plug with a light lubricant.
5. Withdraw inserting bar to rearmost position and tighten clamping collar so that the completion plug will not fall while the completion machine is being placed on the gate valve.
6. Place completion machine on gate valve in same position as marked in paragraph "D-18." With the gasket in place, bolt the completion machine to the gate valve. See **Figure 11.**
7. Tighten plug in completion machine body.
8. Turn by-pass stop on gate valve to the by-pass position (check screw in upper position). See **Figure 7.**
9. Open gate valve (approx. 30 turns).
10. Advance inserting bar (hold inserting bar down with feed yoke if desired) and screw completion plug into fitting securely by rotating inserting bar **clockwise**. (Place a pipe or rod through the bar head of the inserting bar to aid in tightening the plug.) **Figure 24.**
11. Remove plug inserting tool from completion plug by turning the inserting bar **counter-clockwise**. When using plug inserting tool (part no. 36558) previously furnished with H-17345 Completion Machine, first turn the inserting bar **counter-clockwise** to take up slack and strike bar a sharp blow **counter-clockwise**. **Figure 25.** Inserting bar should now be free to turn.
12. Rotate inserting bar **counter-clockwise** until plug inserting tool is free from completion plug.
13. Turn by-pass stop to test position (check screw in middle position) to determine tightness of plug. See **Figure 8.**
14. Unbolt and remove gate valve and completion machine from fitting as a unit.
15. Completion plugs furnished with an "O" ring will be tightened to their seat by the machine with no further tightening needed. For plugs without "O" rings, tighten completion plug with completion plug wrench (part no. 36424). Place a pipe or rod through the



FIGURE 27



FIGURE 28

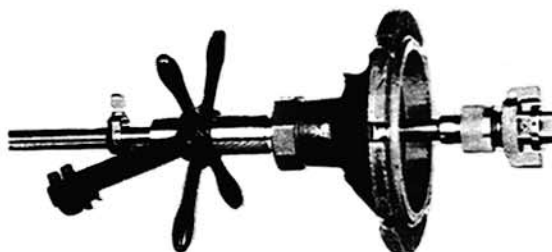


FIGURE 29

wrench to aid in tightening the completion plug.

16. Place gasket in fitting recess and put completion cap in place.
17. Bolt cap solidly to fitting flange. **Figure 26.**
18. Test fitting again with soapsuds.
19. Refill trench.

Q—FUTURE REMOVAL OF COMPLETION PLUG

1. Remove completion cap.
2. Examine the completion plug to determine whether or not it has an equalizing valve. The equalizing valve is located in center recess. **Figure 27** shows plug with

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

equalizing valve, and **Figure 28** shows plug without equalizing valve.

3. If completion plug does not have an equalizing valve, loosen the plug slightly using completion plug wrench (part no. 36424). FOLLOW INSTRUCTIONS "Q-4" THROUGH "Q-37" WHEN USING AN E-Z RELEASE TYPE EXTRACTING TOOL.
4. When using an 8" fitting (except 8" H-17256, 8" H-17257, 8" H-17258, 8" H-17261, 8" H-17269, or 8" H-17271), bolt the gate valve to the fitting. See **Figure 5**. With all 6" fittings, and 8" H-17256, 8" H-17257, 8" H-17258, 8" H-17261, 8" H-17269, or 8" H-17271 fittings, bolt the valve adapter to the fitting, then bolt the gate valve to the adapter. See **Figure 6**. Be sure all gaskets are in good condition and in place. Bolt nuts should be loose at this point to permit gate valve to be shifted if necessary.
5. Tighten plug in completion machine body.
6. Inspect the gate, then open gate valve **fully** (Approx. 30 turns).
7. Turn by-pass stop to test position (check screw in middle position). See **Figure 8**.
8. Attach plug alignment tool (part no. 83519) to inserting bar or completion machine. **Figure 29**.
 - a. Insert lug on top of plug alignment tool into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to plug alignment tool threads.
 - c. Push the fork on plug alignment tool to rearmost position and tighten thumb screw to hold the fork in this position.
9. Withdraw inserting bar to rearmost position and tighten clamping collar.
10. Attach completion machine to gate valve. See **Figure 11**. It is not necessary to use

all the bolts at this point.

11. Loosen clamping collar and advance inserting bar until plug alignment tool contacts the completion plug.
12. At this point it may be necessary to slightly shift the gate valve on the fitting or the completion machine on the gate valve to align the plug alignment tool with the completion plug threads.
13. Rotate inserting bar **clockwise** 6 turns until plug alignment tool threads are engaged with threads in the completion plug.
14. Securely bolt gate valve to fitting, or gate valve to valve adapter and valve adapter to fitting. Tighten bolts from the bottom up, using alternating sequence in order to tighten as evenly as possible.
15. Rotate inserting bar **counter-clockwise** until plug alignment tool is unscrewed from threads in the completion plug.
16. Withdraw inserting bar to its rearmost position and tighten clamping collar.
17. Turn the by-pass stop to the test position and test the flanges of the stack by inserting pressure through the by-pass stop.
18. Close the gate valve (approx. 30 turns). Turn the by-pass stop to the closed position and remove air testing source. Now turn the by-pass stop to the test position. This will relieve pressure above the gate to ensure the valve does not leak.
19. Turn the by-pass stop to the by-pass position to equalize pressure above the gate. This will determine that the by-pass valve is working properly.
20. Open gate valve (approx. 30 turns) and once again lower the alignment tool and inserting bar into plug and thread 6 turns.
21. Mark the position of the stopping machine flange in relation to the gate valve flange. Do this in 2 places, 90° from each other. This will prevent tilting of the machine during inserting of plug. This is for reference so that the stopping machine can be properly positioned for the final installation of the completion plug when the job is finished.
22. Remove completion machine from gate valve.
23. Loosen clamping collar and advance inserting bar until plug alignment tool is exposed.
24. Remove plug alignment tool from inserting bar.

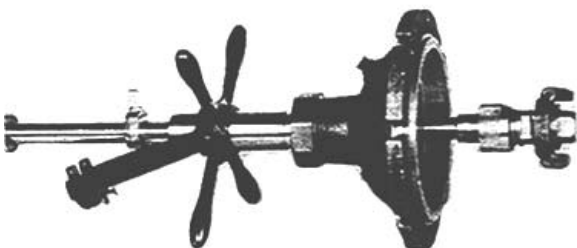


FIGURE 30

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

NOTE: FIGURE NUMBERS 31 AND 32 ARE UNUSED IN THIS MANUAL.

25. Attach E-Z Release type of plug extracting tool (part no. 83518) to inserting bar of completion machine. Figure 30.
 - a. Insert lug on top of plug extracting tool into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to plug extracting tool threads.
26. Withdraw inserting bar to rearmost position and tighten clamping collar.
27. Place completion machine on gate valve in same position as marked in paragraph "Q-21" on this page. With gasket in place, bolt the completion machine to the gate valve.
28. Loosen clamping collar and slowly advance inserting bar until plug extracting tool contacts the completion plug.
29. Rotate inserting bar **clockwise** until plug extracting tool firmly engages the threads in the top of the completion plug.
30. If the completion plug has an equalizing valve, it will be opened by the end of the extracting tool. Flow from the by-pass stop on gate valve will indicate that equalizing valve is open. Turn by-pass stop to by-pass position (check screw in upper position). See Figure 7. **DO NOT ATTEMPT TO REMOVE COMPLETION PLUG HAVING EQUALIZING VALVE UNTIL PRESSURE IS EQUALIZED.**
31. Rotate inserting bar **counter-clockwise** until completion plug is unscrewed from the fitting.

CAUTION: WHEN THIS MACHINE IS UNDER PRESSURE, CONTROL THE PISTON ACTION OF THE BORING BAR TO PREVENT BODILY INJURY OR DAMAGE TO THE MACHINE.
32. Withdraw inserting bar to rearmost position and tighten clamping collar. Check to be sure that the completion plug clears the valve gate.
33. Close gate valve (approx. 30 turns) and test for tightness by turning by-pass stop to test position (check screw in middle position). See Figure 8.
34. Remove completion machine from gate valve.
35. Loosen clamping collar and advance inserting bar until completion plug and plug extracting tool are exposed.
36. Remove completion plug and plug extracting tool from inserting bar.
37. Refer back to instruction "G" and proceed with the use of the fitting.

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

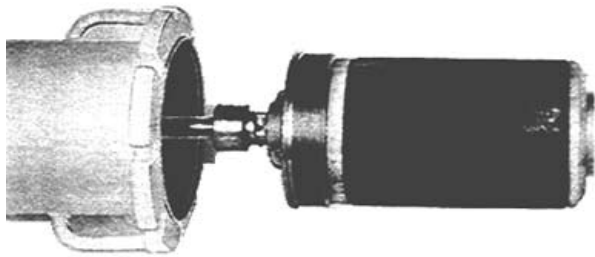


FIGURE 33

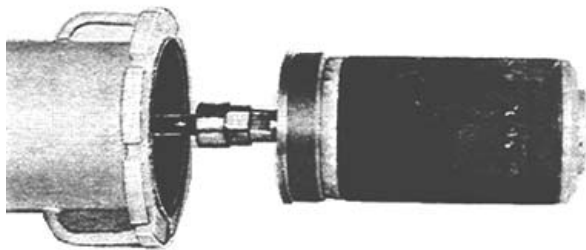


FIGURE 34

R—INSTALL A DEFERRED COMPLETION STOPPER*

A deferred completion stopper is installed in a manner similar to the installation of a completion plug except that an H-17335 stopping machine is used instead of the completion machine. Follow instruction "P" page 17 for installing completion plug without an "O" ring seal and equalizing valve.

Attach the plug inserting tool to the deferred completion stopper instead of to the completion plug. **Figure 33** shows E-Z Release tool being used. **Figure 34** shows part no. 36558 being used.

NOTE: When using plug inserting tool, part no. 36558, it is necessary to use the inserting and extracting tool adapter (part no. 37197) to adapt the tool to inserting bar of the stopping machine. See special instructions "2-a" and "2-b" on page 25

Check to be sure threads on deferred completion stopper and fitting are clean. Lubricate the stopper with MUELLER rubber stopper lubricant. When screwing the deferred completion stopper into the fitting, rotate the inserting bar **clockwise** $\frac{1}{2}$ turn at a time with a short pause after each turn. Continue to expand the stopper in this manner until the line is partially stopped off.

After removing the stopping machine and valve, completely tighten the deferred completion stopper with completion plug wrench (part no. 36424). Turn it a little at a time until a complete shut-off is effected. Make sure the stopper is expanded beyond the shut-off point enough to allow the completion cap to be installed. Install completion cap.

*When using 8" H-17185 deferred stoppers to stop off line stopper fittings made prior to 1938 (line stopper fittings without conical base), leave the extra bottom plate on the deferred stopper. When using the stopper for fittings made after 1938, the extra bottom plate should be removed.

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

S—REMOVE DEFERRED COMPLETION STOPPER

A deferred completion stopper is removed in a manner similar to the removal of a completion plug except that an H-17335 Stopping Machine is used instead of the completion machine. Follow instruction "Q" on page 19 for removal of completion plug without equalizing valve.

After removing the completion cap, loosen deferred completion stopper slightly using completion plug wrench (part no. 36424). Turn it $\frac{1}{2}$ turn at a time with a short pause after each turn.

Attach the plug extracting tool to the deferred completion stopper instead of to the completion plug. (E-Z Release tool attaches to inserting bar of stopping machine.) **Figure 35** shows E-Z Release tool being used. **Figure 36** shows part no. 88618 being used.

NOTE: When using plug extracting tool, part no. 88618, it is necessary to use the inserting and extracting tool adapter (part no. 37197) to adapt the tool to the inserting bar of the stopping machine. See special instruction "2-a" on page 25.

When unscrewing the deferred completion stopper from the fitting, rotate the inserting bar **counter-clockwise** $\frac{1}{2}$ turn at a time with a short pause after each turn. Continue to contract the stopper in this manner until it is completely released from the fitting.

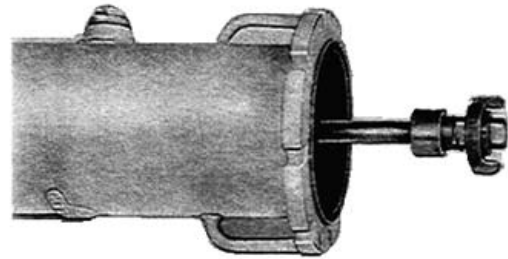


FIGURE 35



FIGURE 36

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

T—USING H-17619 INSPECTION FLANGE

The H-17619 Inspection Flange is for visually determining the condition of the inside of the Line Stopper Fitting and the inside of the pipe after the drilling operation is completed. This may be done under pressure.

1. Bolt drilling machine adapter to gate valve. Check to be sure gasket is in good condition and in place.
2. Bolt H-17619 Inspection Flange to drilling machine adapter. Check to be sure gasket is in good condition and in place. **Figure 37.**
3. Turn by-pass stop to by-pass position (check screw in upper position). See **Figure 7.**
4. Open gate valve **fully** (approx. 30 turns).
5. Visually examine the inside of the fitting by viewing through the plastic window. Use a flashlight or spot light.
6. Use the retrieving rod to locate, raise, and hold above the gate valve any object which might interfere with the operation of the stopper, such as a section of the pipe. The retrieving rod has a ball-joint type of pressure seal permitting it to be raised, lowered, rotated, or moved from side to side.
7. Tighten sleeve screw to hold retrieving rod in raised position.
8. Close gate valve and test for tightness by turning by-pass stop to test position (check screw in middle position). See **Figure 8.**
9. Remove drilling machine adapter and inspection flange.



INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

SPECIAL INSTRUCTIONS

When using certain size fittings, nipples, or tees, it is necessary to increase the effective length of the inserting bar or adapt tools to it as described below:

1. When using an inserting bar extension spacer and inserting bar extension sleeve:
 - a. Place inserting bar extension spacer (part no. 36991) on top of stopper.
 - b. Place inserting bar extension sleeve (part no. 36992) over inserting bar extension spacer and screw the inserting bar extension sleeve to stopper threads. **Figure 38.**
 - c. Attach inserting bar extension sleeve to stopping machine inserting bar by inserting lug of inserting bar extension spacer into matching recess or slot in inserting bar and screwing the coupler sleeve to the extension sleeve threads. **Figure 39.**
2. When using an inserting and extracting tool adapter:
 - a. Attach the inserting and extracting tool adapter (part no. 37197) to the inserting bar by screwing the coupler sleeve to the inserting and extracting tool adapter threads.
 - b. Attach plug inserting tool to inserting and extracting tool adapter. **Figure 40.**



FIGURE 38

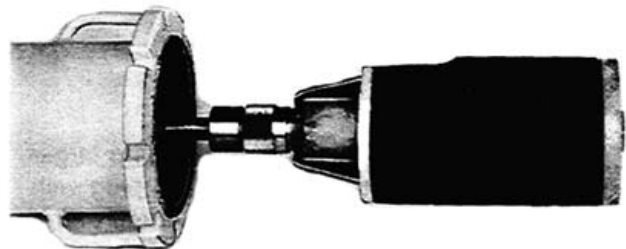


FIGURE 39

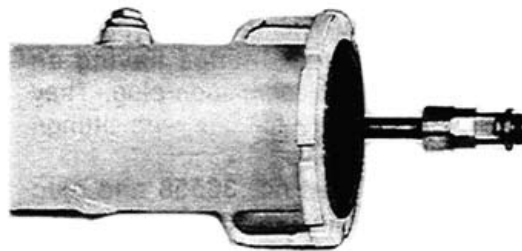


FIGURE 40

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

THESE INSTRUCTIONS APPLY TO H-17251 FITTING WHICH IS INSTALLED IN NEW PIPING AS IT IS LAID.



FIGURE 41 ABOVE SHOWS H-17251 FITTING. FOR DEAD END EXTENSION USE, BEFORE BEING INSTALLED.

Extension stopper Fittings 3" in size and larger as now furnished have a completion plug with an "O" ring seal at the top of the thread and a pressure equalizing valve located in the center of the plug.

*E-Z Release type tools are now furnished with H-17345 Completion Machine. They are recommended for use with fittings having an equalizing valve in the completion plug. They are entirely satisfactory for use with fittings without an equalizing valve.

Plug inserting tool part no. 36558 and plug extracting tool part number 88618, previously furnished with H-17345 Completion Machine, are satisfactory for use with fittings not having an equalizing valve. With certain precautions, these tools may also be used with fittings having an equalizing valve.

**Use H-17186 with fittings having a completion plug with "O" ring seal and with equalizing valve. Use H-17185 with fittings having a completion plug without "O" ring seal and without equalizing valve.

**100 p.s.i. Maximum Working Pressure;
250° F. Maximum Temperature Rating**

The line pressure and temperature must not exceed these amounts during the use of this equipment. The line pressure and temperature may be increased to the maximum working pressure and temperature of the fitting after it is fully installed with completion plug and completion cap in place.

EQUIPMENT REQUIRED FOR STOPPING-OFF THESE FITTINGS

Size of Extension Stopper Fitting	6" H-17251	8" H-17251
Stopping Machine	H-17335	H-17335
Valve Adapter	501223	-
Plug Alignment Tool	*	*
Plug Inserting Tool	*	*
Plug Extracting Tool	*	*
Completion Plug Wrench	36424	36424
Rubber Stopper By-Pass Type Stopper	88625	88626
Full By-Pass Rubber Stopper	680516	680517
Solid Rubber Stopper	88760	88699
Deferred Completion Stopper**	6" H-17186 or 6" H-17185	8" H-17186 or 8" H-17185
Completion Machine	H-17345	H-17345

A—SELECT THE EQUIPMENT REQUIRED

1. From the chart above select the equipment required according to the size of the fitting and the type of stopper to be used. See instruction "H," page 12 for arrangement of piping.

B—REMOVE COMPLETION PLUG

1. Remove completion cap.
2. Examine the completion plug to determine whether or not it has an equalizing valve. The equalizing valve is located in center recess. **Figure 27** shows plug with equalizing valve and **Figure 28** shows plug without equalizing valve.
3. If completion plug does not have an equalizing valve, loosen the plug slightly using completion plug wrench (part no. 36424).

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

THESE INSTRUCTIONS APPLY TO H-17251 FITTING WHICH IS INSTALLED IN NEW PIPING AS IT IS LAID.

FOLLOW INSTRUCTIONS "B-4" THROUGH "B-37" WHEN USING AN E-Z RELEASE TYPE EXTRACTING TOOL.

4. When using 8" H-17251 fitting, bolt the gate valve to the fitting. See **Figure 5**. With 6" H-17251 fitting, bolt the valve adapter to the fitting, then bolt the gate valve to the adapter. See **Figure 6**. Be sure all gaskets are in good condition and in place. Bolt nuts should be loose at this point to permit gate valve to be shifted if necessary.
5. Tighten plug in completion machine body.
6. Inspect the gate, then open gate valve **fully** (approx. 30 turns).
7. Turn by-pass stop to test position (check screw in middle position). See **Figure 8**.
8. Attach plug alignment tool (part no. 83519) to inserting bar of completion machine. See **Figure 29**.
 - a. Insert lug on top of plug alignment tool into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to plug alignment tool threads.
 - c. Push the fork on plug alignment tool to rearmost position and tighten thumb screw to hold the fork in this position.
9. Withdraw inserting bar to rearmost position and tighten clamping collar.
10. Attach completion machine to gate valve. See **Figure 11**. It is not necessary to use all the bolts at this point.
11. Loosen clamping collar and advance inserting bar until plug alignment tool contacts the completion plug.
12. At this point, it may be necessary to slightly shift the gate valve on the fitting or the completion machine on the gate valve to align the plug alignment tool with the completion plug threads.
13. Rotate inserting bar **clockwise** until plug alignment tool threads are engaged with threads in the completion plug 6 turns.
14. Securely bolt gate valve to fitting or gate valve to valve adapter and valve adapter to fitting. Tighten bolts from the bottom up, using alternating sequence in order to tighten as evenly as possible.
15. Rotate inserting bar **counter-clockwise** until plug alignment tool is unscrewed from threads in the completion plug.
16. Withdraw inserting bar to its rearmost position and tighten clamping collar.
17. Turn the by-pass stop to the test position and test the flanges of the stack by inserting pressure through the by-pass stop.
18. Close the gate valve (approx. 30 turns). Turn the by-pass stop to the closed position and remove air testing source. Now turn the by-pass stop to the test position. This will relieve pressure above the gate to ensure the valve does not leak.
19. Turn the by-pass stop to the by-pass position to equalize pressure above the gate. This will determine that the by-pass valve is working properly.
20. Open gate valve (approx. 30 turns) and once again lower the alignment tool and inserting bar down into plug and thread 6 turns.
21. Mark the position of the stopping machine flange in relation to the gate valve flange. Do this in 2 places, 90° from each other. This will prevent tilting of the machine during insertion of plug. This is for reference so that the stopping machine can be properly positioned for the final installation of the completion plug when the job is finished.
22. Remove completion machine from gate valve.
23. Loosen clamping collar and advance inserting bar until plug alignment tool is exposed.
24. Remove plug alignment tool from inserting bar.
25. Attach E-Z Release type of plug extracting tool (part no. 83518) to inserting bar of completion machine. See **Figure 30**.
 - a. Insert lug on top of plug extracting tool into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to plug extracting tool threads
26. Withdraw inserting bar to rearmost position and tighten clamping collar.
27. Place completion machine on gate valve in same position as marked in paragraph "B-21" on page 27. With gasket in place bolt the completion machine to the gate valve.
28. Loosen clamping collar and slowly advance inserting bar until plug extracting tool contacts the completion plug.

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

THESE INSTRUCTIONS APPLY TO H-17251 FITTING WHICH IS INSTALLED IN NEW PIPING AS IT IS LAID.

29. Rotate inserting bar **clockwise** until plug extracting tool firmly engages the threads in the top of the completion plug.
30. If the completion plug has an equalizing valve, it will be opened by the end of the extracting tool. Flow from the by-pass stop on gate valve will indicate that equalizing valve is open. Turn by-pass stop to by-pass position (check screw in upper position). See **Figure 7. DO NOT ATTEMPT TO REMOVE COMPLETION PLUG HAVING EQUALIZING VALVE UNTIL PRESSURE IS EQUALIZED.**
31. Rotate inserting bar **counter-clockwise** until completion plug is unscrewed from the fitting:

CAUTION: WHEN THIS MACHINE IS UNDER PRESSURE, CONTROL THE PISTON ACTION OF THE BORING BAR TO PREVENT BODILY INJURY OR DAMAGE TO THE MACHINE.
32. Withdraw inserting bar to rearmost position and tighten clamping collar. Check to be sure completion plug clears valve gate.
33. Close gate valve and test for tightness by turning by-pass stop to test position (check screw in middle position).

34. Remove completion machine from gate valve.
35. Loosen clamping collar and advance inserting bar until completion plug and plug extracting tool are exposed.
36. Remove completion plug and plug extracting tool from inserting bar.
37. Proceed with the use of these fittings by following the instructions for line stopper fittings beginning with instruction "G" on page 12.

NOTE: Once the fitting has been stopped off, cut off the capped end of the fitting and weld extension of piping to the outlet end of the fitting. **Figure 42.** If cutting with torch and welding, check to be sure that fitting doesn't become too hot. Minimum distance from the face of rubber stopper to cutting or welding operation on 6" fitting is 14"—on 8" fitting distance is 16". Cover fitting with wet burlap or rags to keep temperature down if this minimum distance is not possible.

**INSTRUCTIONS FOR INSTALLING
AND STOPPING OFF 6" AND 8"
LINE STOPPER FITTINGS**

LINE STOPPER UNIT NO. 3

THESE INSTRUCTIONS APPLY TO H-17251 FITTING WHICH IS INSTALLED IN NEW PIPING AS IT IS LAID.

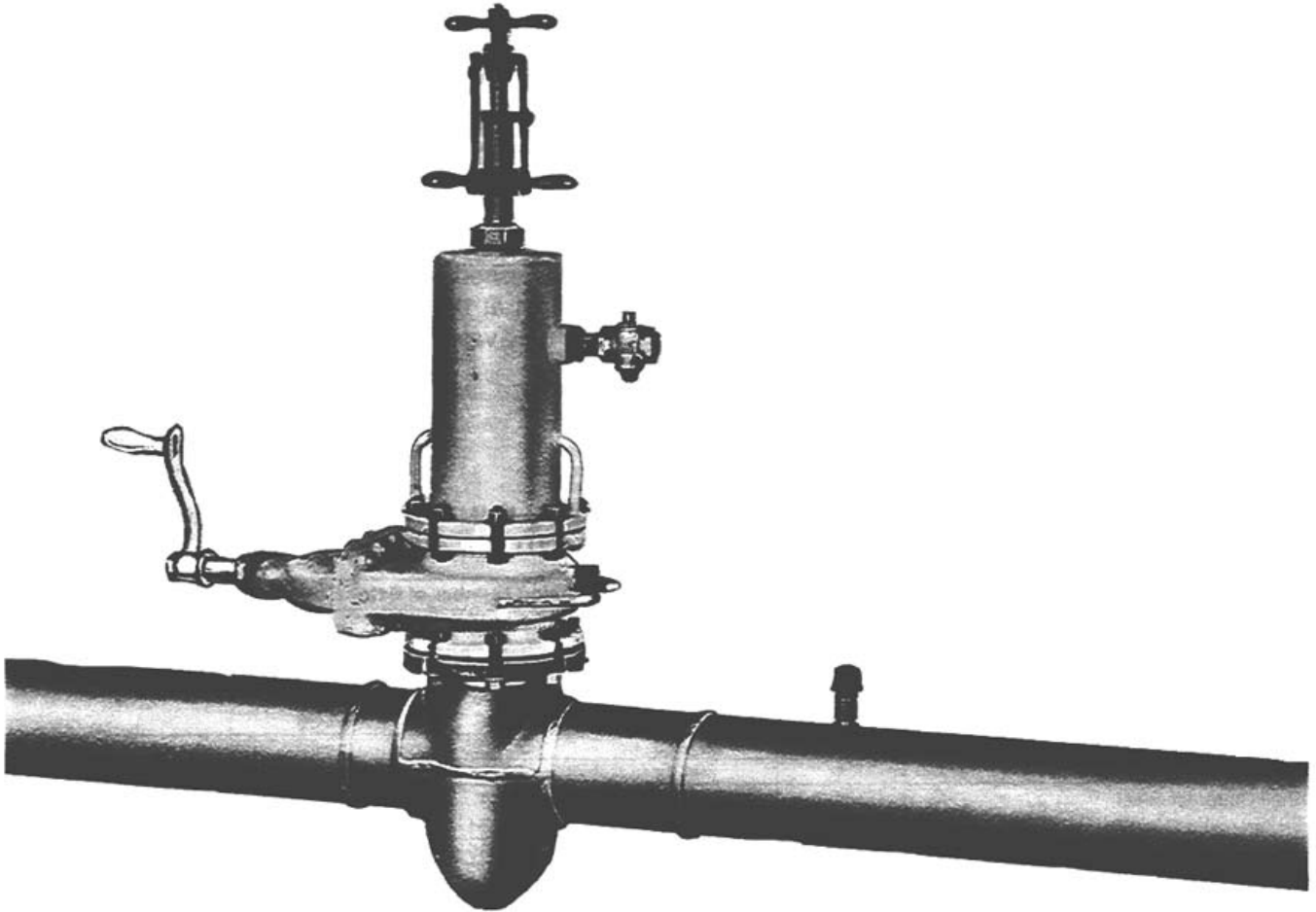


FIGURE 42

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

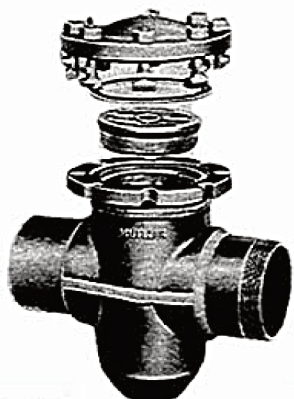


FIGURE 43

100 p.s.i. Maximum Working Pressure;
250° F. Maximum Temperature Rating

The line pressure and temperature must not exceed these amounts during the use of this equipment. The line pressure and temperature may be increased to the maximum working pressure and temperature of the fitting after it is fully installed with completion plug and completion cap in place.

Extension Stopper Fittings 3" in size and larger as now furnished have a completion plug with an "O" ring seal at the top of the thread and a pressure equalizing valve located in the center of the plug.

SELECT ATTACHMENTS ACCORDING TO SIZE AND CATALOG NUMBER OF FITTING AND NUMBER OF DRILLING MACHINE AND TYPE OF SHELL CUTTER AND PILOT DRILL

Name of Attachment	Quan. Req.	Size and Catalog Number of Extension Stopper Fitting			
		6"		8"	
		H-17252		H-17252	
Drilling Machine		CC-36 or C1-36	CH-6	CC-36 or C1-36	CH-6
Valve Adapter	1	501223	501223	---	---
Drilling Machine Adapter	1	89435	83626	89436	580826
Shell Cutter for Steel	1	5 1/2" 36004	5 1/2" 83134	7 1/2" 33999	7 1/2" 83135
Pilot Drill for Steel	1	36005	83639	64244	83675
Cutter Hub	1	63978	---	33996	---
Cutter Arbor	1	---	83640	---	580824
Shell Cutter for C.I.	1	5 1/2" 63787	---	7 1/2" 51897	---
Pilot Drill for C.I.	1	59845	---	64245	---
Cutter Hub	1	63978	---	33996	---
Solid Rubber Stopper or By-Pass Rubber Stopper	1	88760 or 88625	88760 or 88625	88699 or 88626	88699 or 88626
Full By-Pass Rubber Stopper	1	680516	680516	680517	680517
Deferred Completion stopper**	1	6" H-17185 or H-17186	6" H-17185 or H-17186	8" H-17185 or H-17186	8" H-17185 or H-17186
Plug Inserting Tool*	1	83517	83517	83517	83517
Plug Extracting Tool*	1	83518	83518	83518	83518
Plug Alignment Tool*	1	83519	83519	83519	83519
Completion Plug Wrench	1	36424	36424	36424	36424

* E-Z Release type tools are now furnished with H-17345 Completion Machine. They are recommended for use with fittings having an equalizing valve in the completion plug. They are entirely satisfactory for use with fittings without an equalizing valve.

Plug inserting tool part number 36558 and plug extracting tool part number 88618 previously furnished with H-17345 Completion Machine are satisfactory for use with fittings not having an equalizing valve. With certain precautions, these tools may also be used with fittings having an equalizing valve.

** Use H-17186 with fittings having a completion plug with "O" ring seal and with equalizing valve. Use H-17185 with fittings having a completion plug without "O" ring seal and without equalizing valve.

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

A—SELECT THE EQUIPMENT REQUIRED

1. From the chart at the left, select the equipment required according to the size and catalog number of the fitting, the type of stopper to be used, the kind of pipe, and drilling machine to be used. See instruction "H" on page 12 for arrangement of piping.

B—INSTALL AN EXTENSION STOPPER FITTING

1. Thoroughly clean the pipe to which the fitting is to be attached.
2. Remove completion cap.
3. Remove completion plug from the fitting except for old style completion plugs with tapered threads. (Completion plug without "O" ring seal.)
4. Attach the fitting to the line at the point where the lateral connection is to be made. When using an H-17252 fitting (**Fig. 43**) with a welding inlet, shape inlet to fit pipe and place it in the desired position and weld it to the pipe line. Reinforce joint with split reinforcing saddle if desired.

C—ATTACH DRILLING EQUIPMENT

(For detailed instructions, see OPERATING INSTRUCTIONS for CC-36, C1-36, or CH-6 DRILLING MACHINES.)

1. Sharpen shell cutter and pilot drill before each cut by honing the front edge of the cutter teeth. If the shell cutter is very dull, it should be returned to Mueller Co., Decatur, Illinois, for reconditioning. Always check pilot drill detents to be sure they operate correctly.
2. Bolt proper size and type of drilling machine adapter to the front of the drilling machine. Check to be sure that gasket is in good condition and in place.
NOTE: MAKE CERTAIN MACHINED RECESS ON ADAPTER AND LIP ON MACHINE FLANGE MATE PROPERLY. VISUALLY CHECK ADAPTER FLANGE AND MACHINE FLANGE TO BE SURE THEY ARE FLUSH.
3. Release automatic feed by pulling out automatic feed knob, push in on CH-6. (Directions are indicated on panel on rear of torque tube.)
4. Advance boring bar by rotating feed crank **counter-clockwise (clockwise on CH-6)** until bolt hole in boring bar is exposed beyond face of adapter. (Directions are indicated on panel on rear cover of torque tube.) Remove hub retaining bolt.

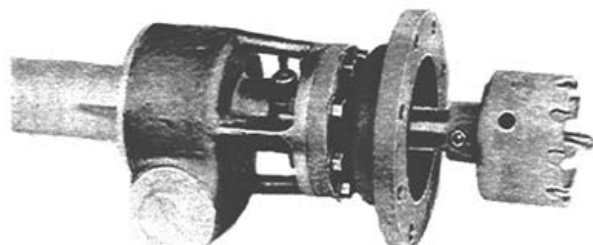


FIGURE 44

5. Assemble drilling equipment.
 - a. When using CC-36 or C1-36 drilling machines, assemble the shell cutter and cutter hub. Insert the shank of pilot drill into the socket in the boring bar. Slide cutter hub and shell cutter over the end of boring bar. Align holes in the cutter hub, boring bar, and pilot drill and attach to boring bar with hub retaining bolt. **Fig. 44.**
 - b. When using CH-6 drilling machine, remove retaining screws from cutter arbor. Insert cutter arbor into socket in boring bar. Align holes in cutter arbor and boring bar. Replace retaining screw by inserting it through hole in boring bar and into cutter arbor tapped hole. Tighten securely with screwdriver.
- NOTE:** If cutter arbor is E-Z Release type, tighten Allen head cap screws so that the backing ring is rigid with the cutter arbor. Lubricate cutter arbor threads and attach shell cutter, threading it into arbor hand tight. Lubricate pilot drill, threaded shank end, and screw it securely into cutter arbor. Wrench flats are provided on pilot drill. Coat shell cutter and pilot drill thoroughly with MUELLER cutting grease.
6. Retract boring bar to rearmost position by rotating feed crank **clockwise (counter-clockwise on CH-6)**.
 7. Place the machine (with adapter and drilling equipment assembled) in drilling position and bolt adapter solidly to fitting.

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.



FIGURE 45

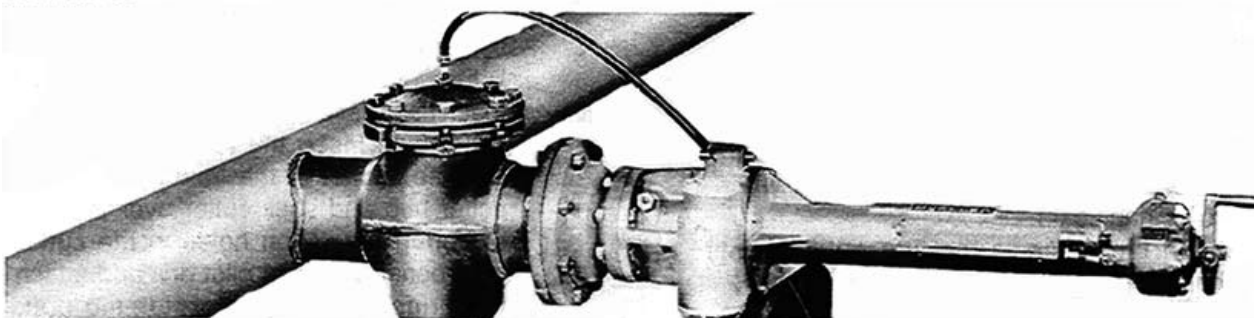


FIGURE 46

Check to be sure the gasket is in good condition and in place.

NOTE: MAKE CERTAIN MACHINED PROJECTION ON ADAPTER AND MACHINED RECESS ON GATE VALVE MATE PROPERLY. VISUALLY CHECK ADAPTER FLANGE AND GATE VALVE FLANGE TO BE SURE THEY ARE FLUSH.

When using an H-17252 fitting, attach the proper size companion flange to the outlet end of the fitting and bolt the adapter solidly to it. **Fig. 45.** Tack weld the companion flange or block the drilling machine to prevent the companion flange from unscrewing.

8. Be sure that the welded fitting is cool before cut is started.
9. Rotate feed crank **counter-clockwise** (clockwise on CH-6) to advance boring bar until pilot drill contacts the pipe. Turn feed crank **clockwise** (counter-clockwise on CH-6) $\frac{1}{4}$ turn which retracts the boring bar slightly to release tension between pilot drill and the pipe. (1 revolution of the feed crank moves the boring bar $\frac{1}{8}$ of an inch—6 revolutions equals one inch.)
10. Set feed indicator to zero. Mark the point on feed indicator shield that the arrow will reach to complete the cut. (On the CH-6 Machine, the required travel is set on the automatic feed indicator and when the machine reaches this travel, the indicator will register 000.) For travel chart, see OPERATING INSTRUCTIONS for CC-36,

C1-36, and CH-6 DRILLING MACHINES.

D—TEST THE INSTALLATION—Fig. 46

1. Remove completion plug, if not already removed.
2. Bolt completion cap to fitting being sure gasket is in good condition and in place. Remove test plug and attach air hose. (The completion cap of previously designed fittings does not have a test plug. Use separate test cap which is tapped.)
3. Apply air pressure and test for leaks with soapsuds (add glycerin in freezing weather) or bubble type leak detection fluid.

E—ATTACH GATE VALVE

Instructions 5 through 17 apply only to latest designs of completion plugs having "O" ring seal.

1. The gate valve (part no. 83953) is a special 9" MUELLER gate valve which is furnished with the H-17335 stopping machine. It must be installed with the rubber faced disc up since the pressure aids in seating the gate and keeping it tight when closed.
2. Attach gate valve or gate valve and adapter to fitting.
 - a. When using an 8" H-17252 fitting, bolt the gate valve to the fitting. (8" fittings with Class 150 flanges do not require a valve adapter between the fitting

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

and the valve.) See Fig. 5. Check to be sure that the gasket is in good condition and in place. The bolt nuts should be loose at this point to permit the gate valve to be shifted slightly if necessary.*

- b. When using a 6" H-17252 fitting, bolt the proper valve adapter to the fitting and then bolt the gate valve to the adapter. (All 6" fittings require a valve adapter between the fitting and the valve.) See Fig. 6. At both of these flanged joints check to be sure that the gasket is in good condition and in place. The bolt nuts for both joints should be loose at this point to permit the gate valve and valve adapter to be shifted slightly if necessary.*

*If the fitting being used does not have the latest design completion plug with an "O" ring seal, the bolt nuts should be tightened at this point.

3. Inspect the gate, then open the gate valve. Check to be sure it is **fully** open (approximately 30 turns to open).
4. Turn by-pass stop on gate valve to by-pass position (check screw in upper position). See Figure 7.
5. Attach plug alignment tool (part no. 83519) to completion plug.
 - a. Push fork to rearmost position and tighten thumb screw.
 - b. Screw the end of the tool into the inside threads in the top of the completion plug.
 - c. Loosen thumb screw so that the fork lugs will engage with slots in the completion plug.
6. Attach plug alignment tool, with the completion plug assembled to it, to inserting bar of Completion Machine. See Figure 10.
 - a. Insert lug on top of plug alignment tool into matching recess in inserting bar.
 - b. Screw coupler sleeve to plug alignment tool threads.
7. Withdraw inserting bar to rearmost position and tighten clamping collar on inserting bar at top of machine to prevent plug alignment tool and completion plug from falling while being placed on valve.
8. Attach completion machine on gate valve. It is not necessary to use all the bolts at this point. Figure 47.
9. Hold back on handle of inserting bar, then loosen clamping collar and slowly advance inserting bar until the completion plug contacts fitting threads.
IMPORTANT—DO NOT LET THE INSERTING BAR DROP.

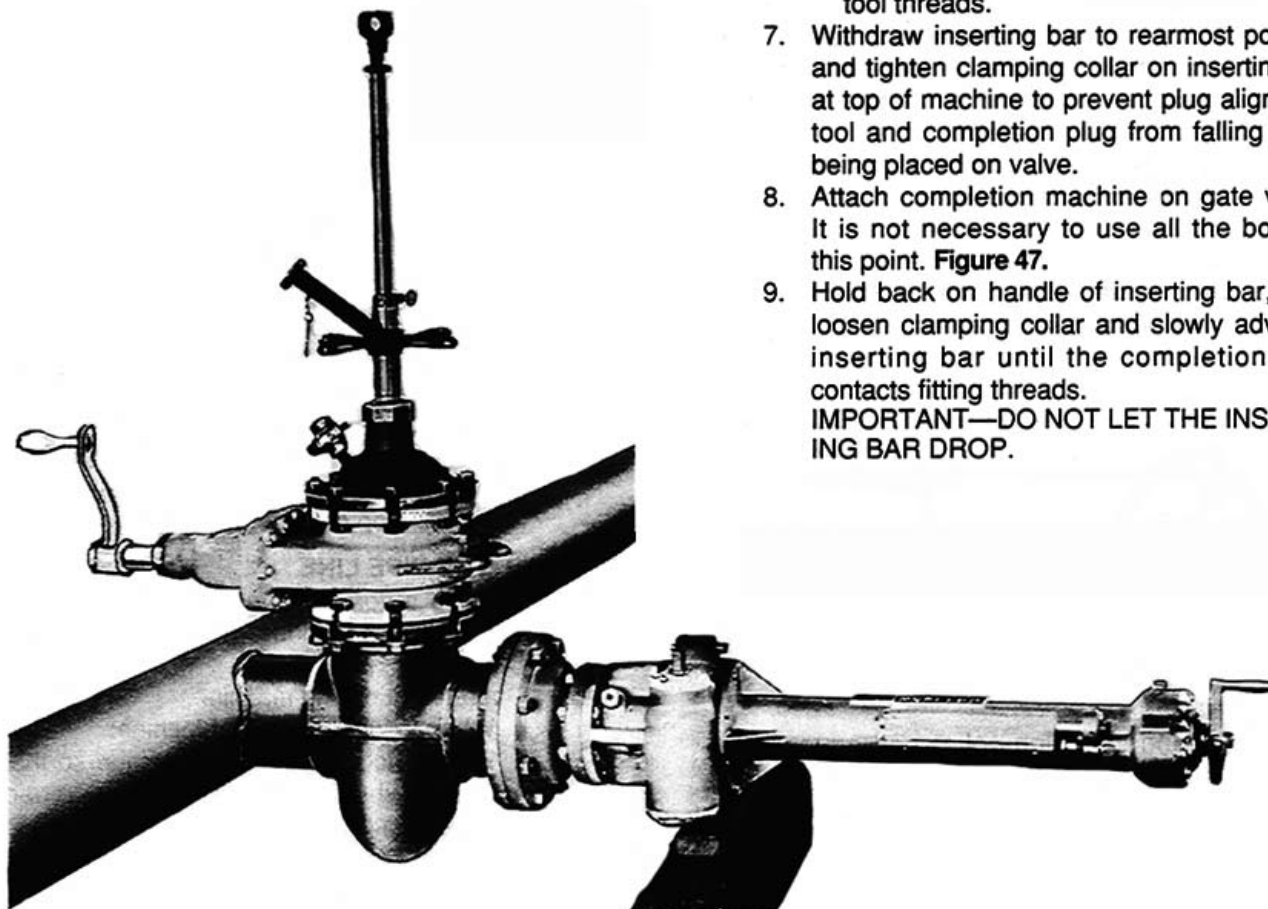


FIGURE 47

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

10. At this point it may be necessary to slightly shift the gate valve on the fitting and possibly the completion machine on the gate valve to align the completion plug threads with the fitting threads.
11. Rotate inserting bar **clockwise** until completion plug threads are engaged with fitting threads 6 turns.
12. Securely bolt gate valve to fitting or gate valve to valve adapter and valve adapter to fitting. Tighten bolts from the bottom up, using alternating sequence in order to tighten as evenly as possible.
13. Rotate inserting bar **counter-clockwise** until completion plug is unscrewed from fitting. Withdraw inserting bar to rearmost position and tighten clamping collar.
14. Turn the by-pass stop to the test position and test the flanges of the stack by inserting pressure through the by-pass stop.
15. Close the gate valve (approx. 30 turns). Turn the by-pass stop to the closed position and remove air testing source. Now turn the by-pass stop to the test position. This will relieve pressure above the gate to ensure the valve does not leak.
16. Turn the by-pass stop to the by-pass position to equalize pressure above the gate. This will determine that the by-pass valve is working properly.
17. Open gate valve (approx. 30 turns) and once again lower the completion plug and inserting bar down into fitting and thread 6 turns.
18. Mark the position of the stopping machine flange in relation to the gate valve flange. Do this in 2 places, 90° from each other. This will prevent tilting of the machine during inserting of plug. This is for reference so that the stopping machine can be properly positioned for the final installation of the completion plug when the job is finished.
19. Remove completion machine from gate valve.
20. Loosen clamping collar and advance inserting bar until completion plug and plug alignment tool are exposed.
21. Remove completion plug and plug alignment tool from inserting bar.
22. Remove plug alignment tool from completion plug.

F—ATTACH STOPPER TO STOPPING MACHINE

Type of stopper to be used (by-pass, solid, or deferred completion stopper) depends on the type of piping to be attached to the by-pass connection of the stopping machine body. See paragraphs "K-5" and "K-6" on page 37. If using a deferred completion stopper see instructions "R" and "S" on pages 22 and 23.

1. Loosen clamping collar and advance inserting bar of stopping machine.
2. Attach stopper (by-pass or solid) to inserting bar of stopping machine. **Figure 15.**
 - a. Insert lug on top of stopper into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to stopper threads. When using a by-pass stopper, check to be sure that the by-pass in stopper is on the opposite side from the arrow or the word "stopped" on the handle at the top of the inserting bar.
3. Lubricate stopper with MUELLER rubber stopper lubricant.
4. Withdraw inserting bar to the rearmost position and tighten clamping collar on inserting bar at the top of machine to prevent stopper from falling while being placed on valve.
5. Position stopping machine on gate valve flange so that the by-pass connection is located in the desired position. Bolt stopping machine solidly to gate valve with gasket between valve and stopping machine. See **Figure 16.**
6. Tighten plug in body by-pass connection if using a solid stopper or deferred completion stopper. Attach stop or valve to by-pass connection if using a by-pass stopper and close this stop or valve.

G—DRILL THE PIPE LINE

1. Engage automatic feed by pushing in on automatic feed knob. Pull out on knob on CH-6.
2. Operate the drilling machine.
 - a. When using the CC-36 Machine:
Place ratchet handle on machine so that it cuts when ratchet handle is pushed toward pipe. Observe note on ratchet casting and arrow on drive box boss. Always operate the machine according to instructions with one person only on

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

ratchet handle and using automatic feed to assure correct drilling rate.

If cut becomes too difficult for one person, DO NOT FORCE MACHINE as this may cause damage to cutter or machine. See detailed instructions for the CC-36 Machine.

- b. When using the C1-36 or CH-6 Machine and the MUELLER H-600 Air Motor:

Loosen the pivot set screw. This permits pivot pin to be removed so the air motor holder may be attached to the holder pivot on the drive box of the Drilling Machine. Position air motor holder and replace pivot pin. Tighten the pivot set screw and latch the small hook on the air motor holder to the pin on the machine drive box to prevent movement of the air motor holder.

Examine air motor on ground with air pressure on. Position throttle lever for forward operation, this will turn drive spindle **clockwise**.

Place air motor in holder, open throttle slightly. Spindle will turn until square in motor spindle aligns with square on drive spindle. Motor will then drop into place. Screw feed screw in top of motor back into countersink in top of holder. Slide hook clamp into position on air motor torque handle and tighten.

Open air motor throttle fully so that motor is operating at proper speed (50 to 60 rpm). **IMPORTANT - MAINTAIN PRESSURE OF 90 P.S.I. WE RECOMMEND THE USE OF A GAGE AT THE THROTTLE TO DETERMINE THE ACTUAL PRESSURE OF AIR AT THE AIR MOTOR.**

If cutting becomes difficult and motor stalls, see detailed instructions for the C1-36 or CH-6 Machine.

3. Continue the cutting operation until the hole is drilled and the arrow reaches the point marked on the feed indicator shield or until the cutter stops cutting. If power unit is being used, shut off motor.
4. Check completion of cut by releasing automatic feed and attempting to advance cutter by rotating feed crank **counter-clockwise** (**clockwise** on CH-6). If it does not advance easily, the cut has not been completed and automatic feed knob must be pushed in for further cutting.

CAUTION: STOP ADVANCING THE BORING BAR WHEN THE LIMIT LINE ON THE BORING BAR BECOMES VISIBLE THROUGH THE DRIVE BOX DRAIN HOLE. See Figure 14.

5. When cut is completed, release automatic feed and retract cutter to its rearmost position by rotating feed crank **clockwise** (**counter-clockwise** on CH-6).

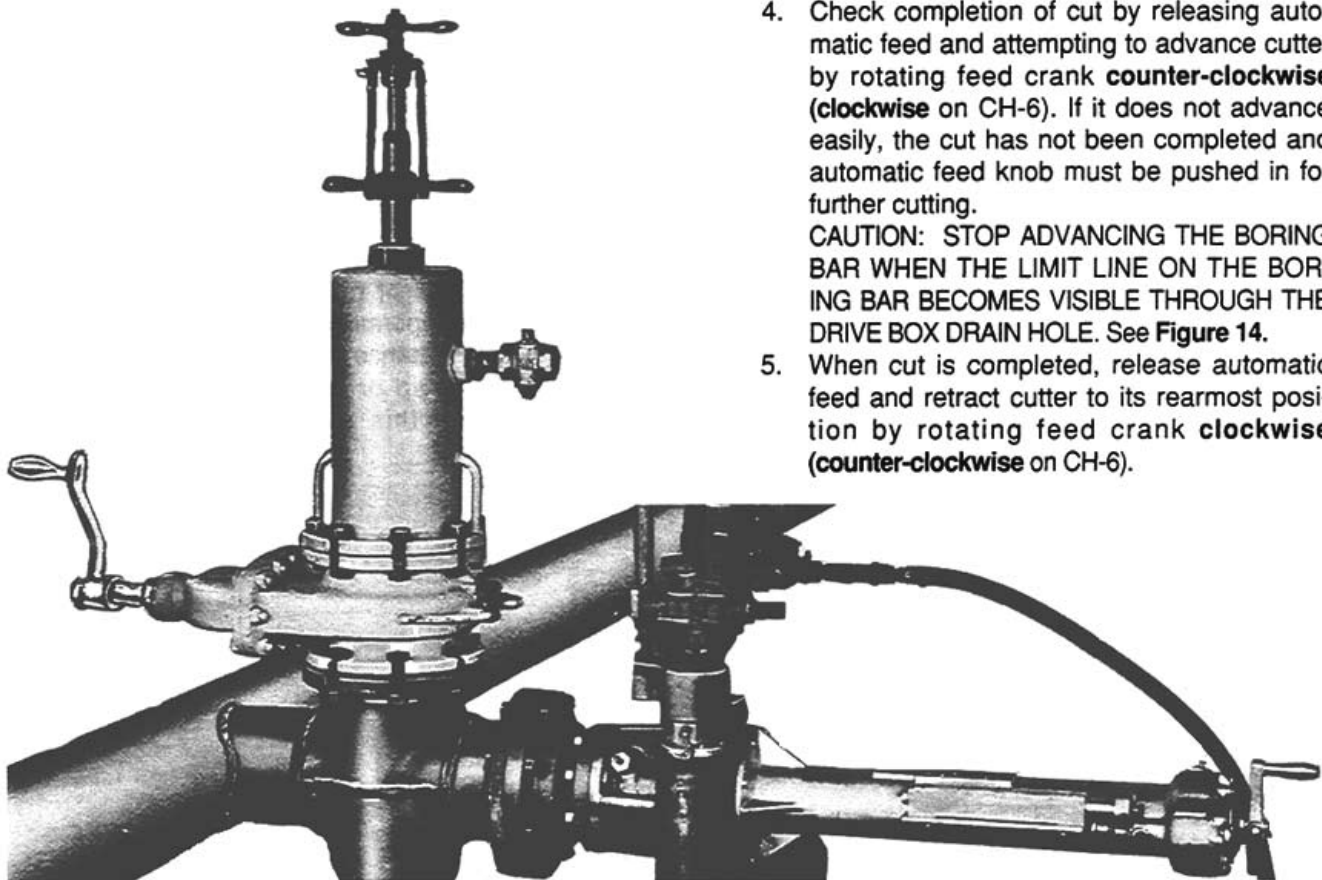


FIGURE 48

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

H—INSERT STOPPER INTO FITTING

1. Turn by-pass stop on gate valve to by-pass position (check screw in upper position). See Figure 7.
2. Turn the "T" handle on the top of the machine so the arm having the arrow with the word "stopped" on it points toward the drilling machine. This locates the by-pass on the stopper in the proper position.
3. Open stopping machine gate valve, release the clamping collar and advance inserting bar of stopping machine until the rubber stopper contacts the bottom of the fitting.

Catalog Number of Fitting Size	Approximate Distance Inserting Bar Must Travel for Stopper to Contact Bottom of Fitting*	
	6"	8"
H-17252	24 ³ / ₈ "	22 ⁷ / ₈ "

*Dimensions do not include travel needed to expand Stopper.

4. Hold inserting bar in this position by placing the yoke of the machine in the collar of the inserting bar and secure with pin. See Figure 48. Do not rotate inserting bar.

I—EXPAND STOPPER IN FITTING

1. Turn feed nut and yoke of the stopping machine **clockwise** 1/2 turn at a time with a short pause after each turn. Continue to expand the stopper in this manner until the fitting is stopped off. Do not rotate inserting bar.

NOTE: Unnecessary damage may be done to the stopper by too much expansion, therefore, we recommend not expanding the 6" stopper by more than 2" downward travel of the inserting bar or the 8" stopper by more than 1³/₄" downward travel of the inserting bar.

J—REMOVE DRILLING EQUIPMENT

With the fitting stopped off, remove bolts between the flange and the drilling machine adapter. Remove the drilling machine and drilling machine adapter from the flange as a unit.

K—ATTACH LATERAL PIPING—Figure 49

1. Remove companion flange.
2. If using threaded connections, attach pipe fitting to outlet threads.
3. If using welding connections, cut off the threaded end of the fitting and weld pipe to outlet end of the fitting. Minimum distance from face of rubber stopper to cutting or welding operation on 6" fitting is 14" - on 8" fitting, distance is 16". Cover the fitting with wet burlap or rags to keep temperature down if this minimum distance is not possible.

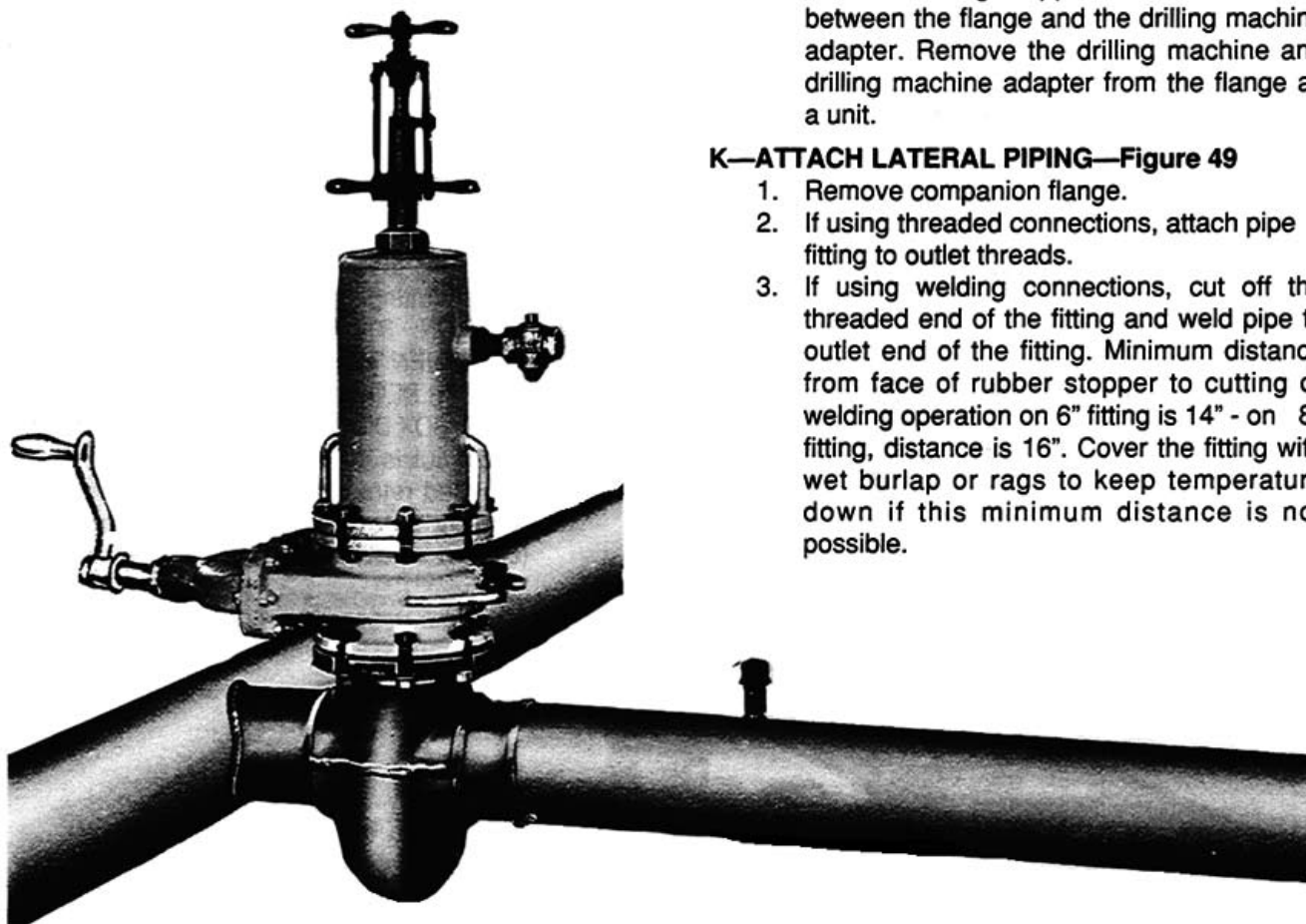


FIGURE 49

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

4. If using mechanical joint connections, attach lateral piping to mechanical joint on outlet end of fitting.
5. If using a by-pass stopper, install a Save-A-Valve Drilling Nipple on the new lateral pipe and connect this nipple with the stop on the by-pass connection in the stopping machine to form an equalizing line. **Figure 50.**
6. If using a solid rubber stopper or deferred completion stopper, install a Save-A-Valve Drilling Nipple on the pipe line which is the source of pressure. Install a Save-A-Valve Drilling Nipple on the new lateral line and connect the two nipples together to form an equalizing line. **Figure 51.**
To install Save-A-Valve Drilling Nipples, see instruction "I" on page 14.

L—PLACE LATERAL LINE IN OPERATION

1. Extend lateral piping to the next valve or shut-off in the line and close this valve.
2. If using a by-pass stopper apply pressure to the lateral by opening the valve on the Save-A-Valve Drilling Nipple and the stop at by-pass connection of the stopping machine. New line may be purged of air from another purging connection (Save-A-Valve Drilling Nipple) installed at extreme end of new lateral line.
3. If using a solid rubber stopper or deferred completion stopper, apply pressure to the lateral by opening the valve on the Save-A-Valve Drilling Nipple installed on the pipe line and then opening the valve on the Save-A-Valve Drilling Nipple installed on the new lateral line. New line may be purged of air from another purging connection (Save-A-Valve Drilling Nipple) installed at extreme end of new lateral line.

M—CONTRACT STOPPER IN FITTING

1. The pressure must be equal on both sides of the stopper before contracting and removing it from the fitting. After pressure in the new section of pipe is equalized, contract stopper by turning feed nut and yoke of stopping machine **counter-clockwise** $\frac{1}{2}$ turn at a time with a short pause after each turn until the stopper is fully released.

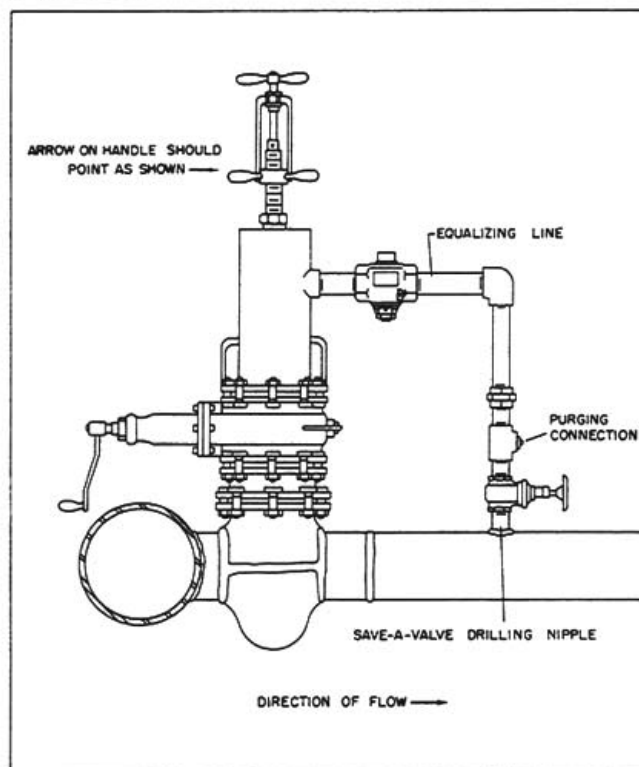


FIGURE 50

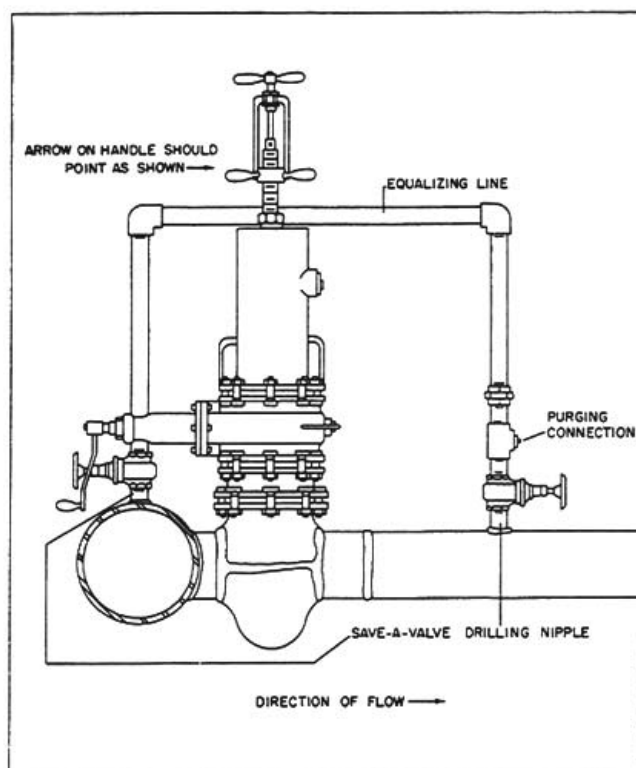


FIGURE 51

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

N—EXTRACT STOPPER FROM FITTING

1. Remove pin and then remove feed yoke from collar on inserting bar and slowly withdraw the inserting bar to the rearmost position. Tighten clamping collar.

CAUTION: WHEN THIS MACHINE IS UNDER PRESSURE, CONTROL THE PISTON ACTION OF THE BORING BAR TO PREVENT BODILY INJURY OR DAMAGE TO THE MACHINE.

2. Close stopping machine gate valve (approx. 30 turns).
3. If using a by-pass rubber stopper, close valve on Save-A-Valve Drilling Nipple and turn by-pass stop on gate valve to test position (check screw in middle position). Flow from by-pass stop will blow down the by-pass or equalizing line.
4. If using a solid rubber stopper or deferred completion stopper, close valves on Save-A-Valve Drilling Nipples. Turn by-pass stop on gate valve to test position. (Check screw in middle position.) Flow from by-pass stop will exhaust gas from the stopping machine.
5. Remove equalizing line and stopping machine.
6. Install completion plug and cap for Save-A-Valve Drilling Nipple. See instruction "O" for Line Stopper Fittings, page 17.

O—INSTALL COMPLETION PLUG IN EXTENSION STOPPER FITTING

NOTE: Latest design of completion plugs have an "O" ring seal and a pressure equalizing valve in the center of the completion plug. The end of either inserting tool (part no. 83517 or 36558) will open the equalizing valve. See page 30.

1. Loosen clamping collar and advance inserting bar of completion machine.
2. When using an E-Z Release type plug inserting tool (part no. 83517):
 - a. Attach plug inserting tool to the completion plug.
 - (1) Push fork to rearmost position.
 - (2) Hold fork in this position and screw the end of the tool into the inside-threads in the top of the completion plug.
 - (3) Release fork so that the fork lugs will engage with the slots in the completion plug.
 - b. Attach plug inserting tool with completion plug assembled to it, to the inserting bar of completion machine. See **Figure 22**.

- (1) Insert lug on top of plug inserting tool into matching recess or slot in inserting bar.

- (2) Screw coupler sleeve to plug inserting tool threads.

3. When using the plug inserting tool (part no. 36558) previously furnished with H-17345 Completion Machine:

- a. Screw the end of the tool **hand tight only** into the inside threads in the top of the completion plug.

IMPORTANT—Check to be sure these threads screw together freely without binding.

- b. Screw tool **tightly** into the right hand inside threads of the inserting bar. The coupler sleeve is not used with this plug inserting tool. See **Figure 23**. **IMPORTANT—The connection between the inserting tool and the inserting bar must be as tight as possible.**

4. Check to be sure threads on completion plug and fitting are clean. Coat the "O" ring on the completion plug with a light lubricant.
5. Withdraw inserting bar to rearmost position and tighten clamping collar so that the completion plug will not fall while the machine is being placed on the gate valve.
6. Place completion machine on gate valve in same position as marked in paragraph "E-18" on page 34. With gasket in place bolt the completion machine to the gate valve. See **Figure 47**.
7. Tighten plug in completion machine body.
8. Turn by-pass stop on gate valve to the by-pass position (check screw in upper position). See **Figure 7**.
9. Open gate valve (approx. 30 turns).
10. Advance inserting bar (hold inserting bar down with feed yoke) and screw completion plug into fitting securely by rotating inserting bar **clockwise**. (Place a pipe or rod through the bar head of the inserting bar to aid in tightening the plug.) See **Figure 24**.
11. Remove plug inserting tool from completion plug by turning the inserting bar **counter-clockwise**. When using plug inserting tool (part no. 36558) previously furnished with H-17345 Completion Machine, first turn the

INSTRUCTIONS FOR INSTALLING AND STOPPING OFF 6" AND 8" LINE STOPPER FITTINGS

LINE STOPPER UNIT NO. 3

THESE INSTRUCTIONS APPLY TO FITTING H-17252. FIGURE 43.

- inserting bar **counter-clockwise** to take up slack and strike inserting bar a sharp blow **counter-clockwise**. See **Figure 25**. Inserting bar should be free to turn.
12. Rotate inserting bar **counter-clockwise** until plug inserting tool is free from completion plug.
 13. Turn by-pass stop to test position (check screw in middle position) to determine tightness of plug. See **Figure 8**.
 14. Unbolt and remove gate valve and completion machine from fitting as a unit.
 15. Completion plugs furnished with an "O" ring will be tightened to their seat by the machine with no further tightening needed. For plugs without "O" rings, tighten completion plug with completion plug wrench (part no. 36424). Place a pipe or rod through the wrench to aid in tightening the completion plug.
 16. Place gasket in fitting recess and put completion cap in place.
 17. Bolt cap solidly to fitting flange. **Figure 52**.
 18. Test fitting again with soapsuds.
 19. Refill trench.

P—TO RE-USE EXTENSION STOPPER FITTING

1. Follow instruction "Q" on page 19.

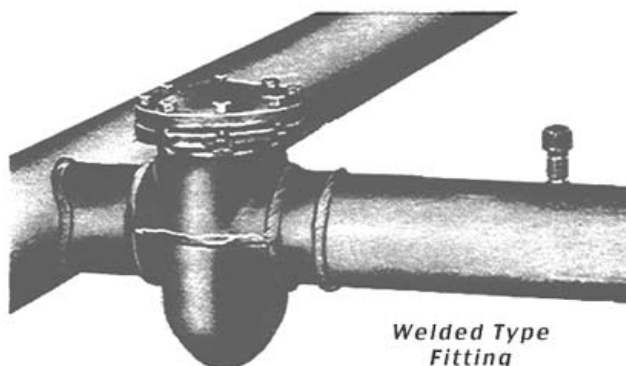


FIGURE 52

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING 6" AND 8" SAVE-A-VALVE DRILLING NIPPLES



FIGURE 53

150 p.s.i. Maximum Working Pressure

The line pressure must not exceed this amount during the use of the completion machine. The line pressure may be increased to a maximum of 230 p.s.i. when used as described in instruction "G" on page 44. The line pressure may be increased to the maximum working pressure of the nipple after it is fully installed with the completion plug and completion cap in place.

Save-A-Valve Drilling Nipples 4" in size and larger as now furnished have a completion plug with an "O" ring seal at the top of the thread and a pressure equalizing valve located in the center of the plug.

SELECT ATTACHMENTS ACCORDING TO SIZE AND CATALOG NUMBER OF NIPPLE AND DRILLING MACHINE TO BE USED

Name of Attachment	Quan. Req.	Size and Catalog Number of Nipple			
		6"		8"	
		H-17497		H-17496	
Drilling Machine		CC-36 or C1-36	CH-6	CC-36 or C1-36	CH-6
Gate Valve Unit #3	1	83953	83953	83953	83953
Valve Adapter	1	501224	501224	502289	580821
Drilling Machine Adapter	1	36545	83631	89632	83631
Shell Cutter	1	5 1/2" 36004	5 1/2" 83134	7 1/2" 33999	7 1/2" 83135
Pilot Drill	1	36005	83639	64244	83675
Cutter Hub	1	63978	---	33996	---
Cutter Arbor	1	---	83640	---	580824
Plug Inserting Tool*	1	83517	83517	83517	83517
Plug Extracting Tool*	1	83518	83518	83518	83518
Plug Alignment Tool	1	83519	83519	83519	83519
Completion Plug Wrench	1	36424	36424	36424	36424
Gate Valve Adapter	1	502289	502289	502289	502289

*E-Z Release type tools are now furnished with H-17345 Completion Machine. They are recommended for use with nipples having an equalizing valve in the completion plug. They are entirely satisfactory for use with nipples without an equalizing valve. Plug inserting tool part number 36558 and plug extracting tool part number 88618 previously furnished with H-17345 Completion Machine are satisfactory for use with nipples not having an equalizing valve. With certain precautions, these tools may also be used with nipples having an equalizing valve.

A—SELECT THE EQUIPMENT REQUIRED

- From the chart above, select the equipment required according to the size and catalog number of the nipple to be used, and drilling machine to be used.
- The work may be scheduled so that much of this equipment will be available for other jobs such as the installation of line stopper fittings. The gate valve (part no. 83953) from the H-17335 stopping machine and the valve adapter (if required) will not be available for other work during the time that the nipple is in use.

B—WELD THE NIPPLE TO THE PIPE—Figure 53

- Clean surface where nipple is to be welded.
- Remove completion cap.
- Remove completion plug from the fitting.
- Locate the nipple in the desired position and weld to the pipe. NOTE: It may be necessary to shape the inlet end of the nipple to fit the pipe when used on larger size pipe. The nipple may be installed in any position, providing that the center line of the nipple is at a right angle to the axial center line of the pipe. A split reinforcing saddle may be used if desired.

INSTRUCTIONS FOR INSTALLING 6" AND 8" SAVE-A-VALVE DRILLING NIPPLES

LINE STOPPER UNIT NO. 3

C—TEST THE WELD—Figure 54

1. Remove completion plug, if not already removed.
2. Bolt completion cap to nipple, being sure gasket is in good condition and in place. Remove test plug and attach air hose. (The completion cap of previously designed nipples does not have a test plug. Use separate test cap which is tapped.)
3. Apply air pressure and test for leaks with soapsuds (add glycerin in freezing weather) or bubble type leak detection fluid.
4. Remove completion cap or test cap.
5. Replace test plug in completion cap.

D—ATTACH GATE VALVE

Instructions 5 through 17 apply only to latest design of completion plugs having "O" ring seal.

1. The gate valve (part no. 83953) is a special 9" MUELLER gate valve which is furnished with the H-17335 stopping machine. It must be installed with the rubber faced disc up since the pressure aids in seating the gate and keeping it tight when closed.
2. Attach gate valve or gate valve and adapter to nipple. When using a 6" H-17497 or 8" H-17496 nipple, bolt the proper valve adapter to the nipple and then bolt the gate valve to the adapter. See Figure 6. At both of these flanged joints check to be sure that the gasket is in good condition and in place. The bolt nuts for both joints should be loose at this point to permit the gate valve and valve adapter to be shifted slightly if necessary.
If the nipple being used does not have the latest design completion plug with an "O" ring seal, the bolt nuts should be tightened at this point.
3. Inspect the gate, then open gate valve. Check to be sure it is **fully** open (approximately 30 turns to open).
4. Turn by-pass stop on gate valve to by-pass position (check screw in upper position). See Figure 7.
5. Attach plug alignment tool (part no. 83519) to completion plug.
 - a. Push fork to rearmost position and tighten thumb screw.
 - b. Screw the end of the tool into the inside threads in the top of the completion plug.
 - c. Loosen thumb screw so that the fork lugs will engage with the slots in the

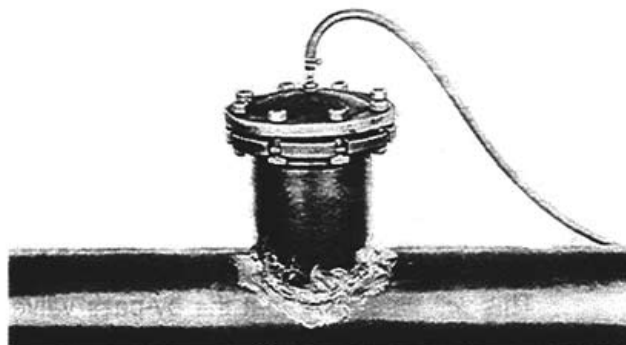


FIGURE 54

- completion plug.
6. Attach plug alignment tool, with the completion plug assembled to it, to inserting bar of completion machine. See Figure 10.
 - a. Insert lug on top of plug alignment tool into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to plug alignment tool threads.
7. Withdraw inserting bar to rearmost position and tighten clamping collar on inserting bar at top of machine to prevent plug alignment tool and completion plug from falling while being placed on valve.
8. Attach completion machine on gate valve with a few bolts. See Figure 11.
9. Hold back on handle of inserting bar, then loosen clamping collar and slowly advance inserting bar until completion plug contacts nipple threads. **IMPORTANT—DO NOT LET THE INSERTING BAR DROP.**
10. At this point it may be necessary to slightly shift the gate valve on the nipple and possibly the completion machine on the gate valve to align the completion plug threads with the nipple threads.
11. Rotate inserting bar **clockwise** until completion plug threads are engaged with nipple threads 6 turns.
12. Securely bolt gate valve to fitting or gate valve to valve adapter and valve adapter to fitting. Tighten bolts from the bottom up, using alternating sequence in order to tighten as evenly as possible.
13. Rotate inserting bar **counter-clockwise** until completion plug is unscrewed from nipple. Withdraw inserting bar to rearmost position and tighten clamping collar.
14. Turn the by-pass stop to the test position and test the flanges of the stack by

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING 6" AND 8" SAVE-A-VALVE DRILLING NIPPLES

- inserting pressure through the by-pass stop.
15. Close the gate valve (approx. 30 turns). Turn the by-pass stop to the closed position and remove air testing source. Now turn the by-pass stop to the test position. This will relieve pressure above the gate to ensure the valve does not leak.
 16. Turn the by-pass stop to the by-pass position to equalize pressure above the gate. This will determine that the by-pass valve is working properly.
 17. Open gate valve (approx. 30 turns) and once again lower the completion plug and inserting bar down into fitting and thread 6 turns.
 18. Mark the position of the stopping machine flange in relation to the gate valve flange. Do this in 2 places, 90° from each other. This will prevent tilting of the machine during inserting of plug. This is for reference so that the stopping machine can be properly positioned for the final installation of the completion plug when the job is finished.
 19. Remove completion machine from gate valve.
 20. Loosen clamping collar and advance inserting bar until completion plug and plug alignment tool are exposed.
 21. Remove completion plug and plug alignment tool from inserting bar.
 22. Remove plug alignment tool from completion plug.

E—ATTACH AND OPERATE DRILLING MACHINE

(For detailed instructions, see OPERATING INSTRUCTIONS for CC-36, C1-36, or CH-6 DRILLING MACHINES.)

1. Sharpen shell cutter and pilot drill before each cut by honing the front edge of the cutter teeth. If the shell cutter is very dull, it should be returned to MUELLER CO., Decatur, Illinois, for reconditioning. Check pilot drill detents to be sure they operate correctly.
2. Bolt drilling machine adapter to front of the drilling machine, check to be sure that gasket is in good condition and in place.
NOTE: MAKE CERTAIN MACHINED PROJECTION ON MACHINE AND MACHINED RECESS ADAPTER MATE PROPERLY. VISUALLY CHECK MACHINE FLANGE AND ADAPTER FLANGE TO BE SURE FLANGES ARE FLUSH.
3. Release automatic feed by pulling out automatic feed knob. Push in on CH-6.

(Directions are indicated on panel on rear of torque tube.)

4. Advance boring bar by rotating feed crank **counter-clockwise (clockwise on CH-6)** until bolt hole in boring bar is exposed beyond face of adapter. (Directions are indicated on panel on rear cover of torque tube.) Remove hub retaining bolt.
5. Assemble drilling equipment:
 - a. When using CC-36 or C1-36 drilling machines, assemble the shell cutter and cutter hub. Insert the shank of pilot drill into the socket in the boring bar. Slide cutter hub and shell cutter over the end of boring bar. Align holes in the cutter hub, boring bar, and pilot drill and attach to boring bar with hub retaining bolt.

Fig. 12.

- b. When using CH-6 drilling machine, remove retaining screws from cutter arbor. Insert cutter arbor into socket in boring bar. Align holes in cutter arbor and boring bar. Replace retaining screw by inserting it through hole in boring bar and into cutter arbor tapped hole. Tighten securely with screw driver.

NOTE: If cutter arbor is E-Z release type, tighten Allen head cap screws so that the backing ring is rigid with the cutter arbor. Lubricate cutter arbor threads and attach shell cutter, threading it onto arbor hand tight. Lubricate pilot drill, threaded shank end, and screw it securely into cutter arbor. Wrench flats are provided on pilot drill. Coat shell cutter and pilot drill thoroughly with MUELLER cutting grease.

6. Retract boring bar to rearmost position by rotating feed crank **clockwise (counter-clockwise on CH-6)**.
7. Place the machine (with adapter and drilling equipment assembled) in drilling position on gate valve and bolt adapter solidly to valve flange. **Fig. 55.** Check to be sure that the gasket is in good condition and in place.
NOTE: MAKE CERTAIN MACHINED PROJECTION ON ADAPTER AND MACHINED RECESS ON GATE VALVE MATE PROPERLY. VISUALLY CHECK ADAPTER FLANGE AND GATE VALVE FLANGE TO BE SURE THEY ARE FLUSH.
8. Be sure that the nipple is cool before cut is started.

INSTRUCTIONS FOR INSTALLING 6" AND 8" SAVE-A-VALVE DRILLING NIPPLES

LINE STOPPER UNIT NO. 3

9. Rotate feed crank **counter-clockwise** (**clockwise** on CH-6) to advance boring bar until pilot drill contacts the pipe, counting the turns. Turn feed crank **clockwise** (**counter-clockwise** on CH-6) $\frac{1}{4}$ turn which retracts the boring bar slightly to release tension between pilot drill and the pipe. (1 revolution of the feed crank moves the boring bar $\frac{1}{6}$ of an inch—6 revolutions equals 1 inch.)

Catalog Number of Fitting Size	Approximate Number of Turns of Feed Crank Required for Pilot Drill to Contact Pipe		
	4"	6"	8"
H-17496	119		148
H-17497		141	

10. Set feed indicator to zero. Mark the point on feed indicator shield that the arrow will reach to complete the cut. (On the CH-6 machine, the required travel is set on the automatic feed indicator and when the machine reaches this travel, the indicator will register 000.) For travel chart, see OPERATING INSTRUCTIONS for CC-36, C1-36, or CH-6 DRILLING MACHINES.
11. Engage automatic feed knob by pushing in on automatic feed knob.
12. Operate the drilling machine:
 - a. When using the CC-36 Machine:

Place ratchet handle on machine so that it is pushed toward the pipe when the cut is made. Observe note on ratchet casting and arrow on drive box boss. Always operate the machine according to instructions with one person only on ratchet handle and using automatic feed to assure correct drilling rate.

If cut becomes too difficult for one person **DO NOT FORCE MACHINE** as this may cause damage to cutter or machine. See detailed instructions for the CC-36 Machine.
 - b. When using the C1-36 or CH-6 Machine and the MUELLER H-600 Air Motor:

Loosen the pivot set screw. This permits pivot pin to be removed so the air motor holder may be attached to the holder pivot on the drive box of the Drilling Machine. Position air motor holder and replace pivot pin, tighten the pivot set screw and latch the small hook on the air motor holder to the pin on the machine drive box to prevent movement of the air motor holder.

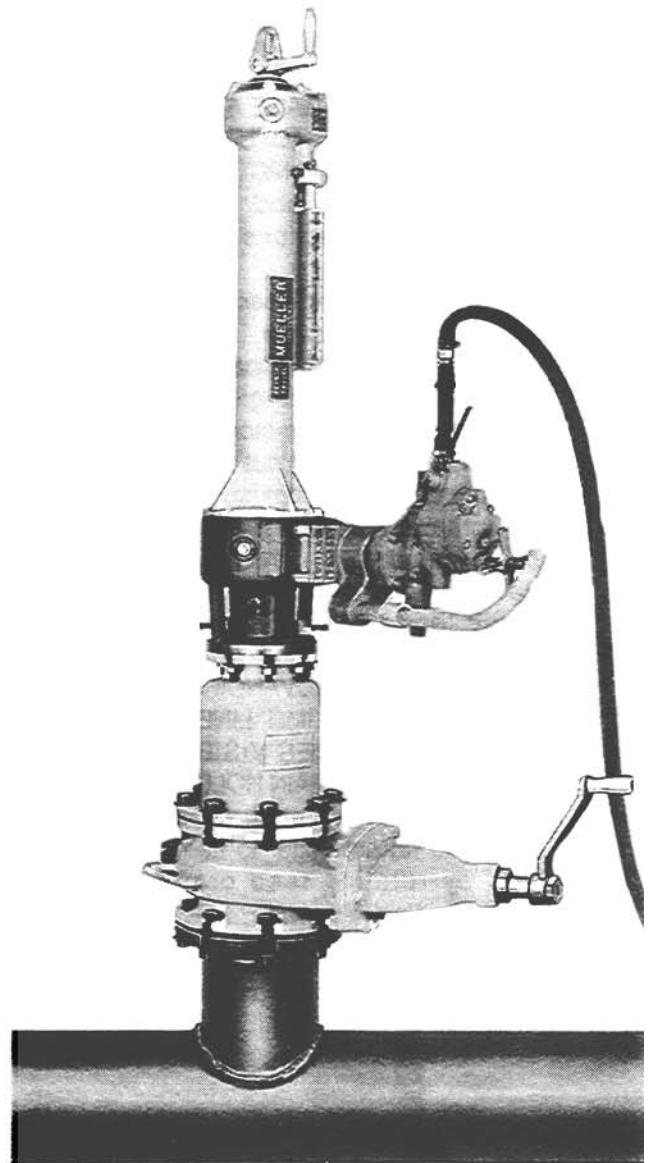


FIGURE 55

Examine air motor on ground with air pressure on. Position throttle lever for forward operation. This will turn drive spindle **clockwise**. Place air motor in holder, open throttle slightly. Spindle will turn until square in motor spindle aligns with square on drive spindle. Motor will then drop into place. Screw feed screw in top of motor back into countersink in top of holder. Slide hook clamp into position on air motor torque handle and tighten. Open air motor throttle **fully** so that

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INSTRUCTIONS FOR INSTALLING 6" AND 8" SAVE-A-VALVE DRILLING NIPPLES

motor is operating at proper speed (50 to 60 rpm). **IMPORTANT - MAINTAIN PRESSURE OF 90 P.S.I. WE RECOMMEND THE USE OF A GAGE AT THE THROTTLE TO DETERMINE ACTUAL PRESSURE OF AIR AT THE AIR MOTOR.** If cutting becomes difficult and motor stalls, see detailed instructions for the C1-36 or CH-6 Machine.

13. Continue the cutting operation until the hole is drilled and the arrow reaches the point marked on the feed indicator shield or until the cutter stops cutting. If power unit is being used, shut off motor.
14. Check completion of cut by releasing automatic feed and attempting to advance cutter by rotating feed crank **counter-clockwise** (**clockwise** on CH-6). If it does not advance easily, the cut is not completed and automatic feed knob must be pushed in for further cutting.
CAUTION: STOP ADVANCING THE BORING BAR WHEN THE LIMIT LINE ON THE BORING BAR BECOMES VISIBLE THROUGH THE DRIVE BOX DRAIN HOLE. See Figure 14.
15. When cut is completed, release automatic feed and retract cutter to its rearmost position by rotating feed crank **clockwise** (**counter-clockwise** on CH-6).

F—REMOVE DRILLING MACHINE

1. Close gate valve. (Approximately 30 turns

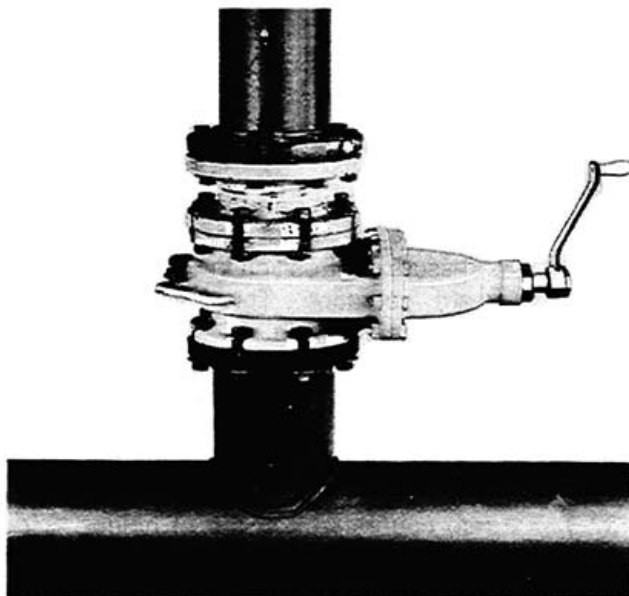


FIGURE 56

required to completely close the valve.)

2. Do not force valve closed as that may destroy the rubber seat of the valve.
3. Turn by-pass stop to test position (check screw in middle position). See **Figure 8**. This exhausts the pressure above the gate and also indicates whether or not the gate is shut tight.
4. Remove bolts from the joint between the gate valve flange and the drilling machine adapter flange. Remove the drilling machine and drilling machine adapter from the gate valve as a unit.

G—ATTACH PIPE TO SAVE-A-VALVE DRILLING NIPPLE—Figure 56

1. Bolt gate valve adapter to gate valve. Check to be sure gasket is in good condition and in place.
2. Bolt pipe or fitting to the outlet end of the adapter. Check to be sure gasket is in good condition and in place.
3. When the piping from the nipple has been completed, turn by-pass stop on gate valve to by-pass position, (check screw in top position). See **Figure 7**.
4. Test all joints for tightness.
5. Allow the pressure to build up in the pipe line and then open the gate valve **fully**.

H—INSTALL COMPLETION PLUG IN SAVE-A-VALVE DRILLING NIPPLE

Latest design of completion plug has an "O" ring seal and a pressure equalizing valve in the center of the completion plug. The end of either inserting tool (part no. 83517 or 36558) will open the equalizing valve. See page 40.

1. When the flow from Save-A-Valve Drilling Nipple is no longer required, close the gate valve.
2. Turn by-pass stop to test position (check screw in middle position). Flow from by-pass stop will blow down the line.
3. Remove pipe or fitting from the adapter and remove the adapter from the gate valve.
4. When using an E-Z Release type plug inserting tool (part no. 83517):
 - a. Attach plug inserting tool to the completion plug.
 - (1) Push fork to rearmost position.
 - (2) Hold fork in this position and screw the end of the tool into the inside threads in the top of the completion plug.

INSTRUCTIONS FOR INSTALLING 6" AND 8" SAVE-A-VALVE DRILLING NIPPLES

LINE STOPPER UNIT NO. 3

- (3) Release fork so that the fork lugs will engage with the slots in the completion plug.
 - b. Attach plug inserting tool with completion plug assembled to it, to the inserting bar of completion machine. See **Figure 22**.
 - (1) Insert lug on top of plug inserting tool into matching recess or slot in inserting bar.
 - (2) Screw coupler sleeve to plug inserting tool threads.
5. When using the plug inserting tool (part no. 36558) previously furnished with H-17345 Completion Machine:
 - a. Screw the end of the tool **hand tight only** into the inside threads in the top of the completion plug.
IMPORTANT—Check to be sure these threads screw together freely without binding.
 - b. Screw tool **tightly** into the right hand inside threads of the inserting bar. The coupler sleeve is not used with this plug inserting tool. See **Figure 23**. **IMPORTANT—The connection between the inserting tool and the inserting bar must be as tight as possible.**
6. Check to be sure threads on completion plug and fitting are clean. Coat the "O" ring on the completion plug with a light lubricant.
7. Withdraw inserting bar to rearmost position and tighten clamping collar so that the completion plug will not fall while the machine is being placed on the gate valve.
8. Place completion machine on gate valve in same position as marked in paragraph "D-18" on page 42. With gasket in place, bolt the completion machine to the gate valve.
9. Tighten plug in completion machine body.
10. Turn by-pass stop on gate valve to the by-pass position (check screw in upper position). See **Figure 7**.
11. Open gate valve **fully** (approx. 30 turns).
12. Advance inserting bar (hold inserting bar down with feed yoke) and screw completion plug into nipple securely by rotating inserting bar **clockwise**. (Place a pipe or rod through the bar head of the inserting bar to aid in tightening the plug.) See **Figure 24**.
13. Remove plug inserting tool from completion plug by turning the inserting bar **counter-**

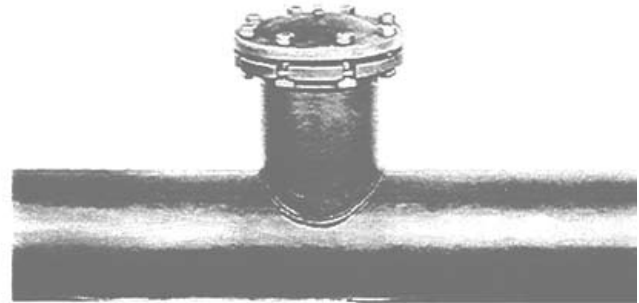


FIGURE 57

- clockwise**. When using plug inserting tool (part no. 36558) previously furnished with H-17345 Completion Machine, first turn the inserting bar **counter-clockwise** to take up slack and strike inserting bar a sharp blow **counter-clockwise**. See **Figure 25**. Inserting bar should now be free to turn.
14. Rotate inserting bar **counter-clockwise** until inserting tool is free from completion plug.
 15. Turn by-pass stop to test position (check screw in middle position) to determine tightness of plug. See **Figure 8**.
 16. Unbolt and remove gate valve and completion machine from nipple as a unit.
 17. Completion plugs furnished with an "O" ring will be tightened to their seat by the machine with no further tightening needed. For plugs without "O" rings, tighten completion plug with completion plug wrench (part no. 36424). Place a pipe or rod through the wrench to aid in tightening the completion plug.
 18. Place gasket in nipple recess and put completion cap in place.
 19. Bolt cap solidly to nipple flange. **Figure 57**.
 20. Test nipple again with soapsuds.
 21. Refill trench.

—TO RE-USE SAVE-A-VALVE DRILLING NIPPLE

1. Remove completion plug by following instruction "Q" on page 19.
2. Then follow instruction "G" on page 44.

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INSTRUCTIONS FOR INSTALLING 6" AND 8" FLANGED TEES



FIGURE 58

**150 p.s.i. Maximum Working Pressure;
250° F. Maximum Temperature Rating**

The line pressure must not exceed this amount during the use of the completion machine. During the stopping-off operation, the line pressure must not exceed 60 p.s.i. maximum working pressure. The line pressure may be increased to the maximum working pressure of the tee after it is fully installed with the completion plug and the completion cap in place.

Flanged Tees 3" in size and larger as now furnished have a completion plug with an "O" ring seal at the top of the thread and a pressure equalizing valve located in the center of the plug.

SELECT EQUIPMENT ACCORDING TO SIZE AND CATALOG NUMBER OF FLANGED TEE

Name of Attachment	Size and Catalog Number of Flanged Tee					
	6" H-17505	8" H-17505	6" H-17506 H-17507	8" H-17506 H-17507	6" H-17508	8" H-17508
Drilling Machine	CC-36 or C1-36	CC-36 or C1-36	CC-36 or C1-36	CC-36 or C1-36	CC-36 or C1-36	CC-36 or C1-36
Stopping Machine	H-17335	H-17335	H-17335	---	H-17335	---
Gate Valve*	83953	83953	83953	83953	83953	83953
Valve Adapter	501223	---	501224	502289	501225	502290
Drilling Machine Adapter	36545	89632	36545	89632	36545	89632
Shell Cutter	5 1/2" 36004	7 1/2" 33999	5 1/2" 36004	7 1/2" 33999	5 1/2" 36004	7 1/2" 33999
Pilot Drill	36005	64244	36005	64244	36005	64244
Cutter Hub	63978	33996	63978	33996	63978	33996
Completion Machine	H-17345	H-17345	H-17345	H-17345	H-17345	H-17345
Plug Inserting Tool**	83517	83517	83517	83517	83517	83517
Plug Extracting Tool**	83518	83518	83518	83518	83518	83518
Plug Alignment Tool	83519	83519	83519	83519	83519	83519
Completion Plug Wrench	36424	36424	36424	36424	36424	36424
Expanding Rubber Stopper	83508	83510	83508	---	83508	---

* Gate valve, part number 83953, is furnished with H-17335 Stopping Machine and need not be duplicated.

** E-Z Release type tools are now furnished with H-17345 Completion Machine. They are recommended for use with tees having an equalizing valve in the completion plug. They are entirely satisfactory for use with tees without an equalizing valve. Plug inserting tool part number 36558 and plug extracting tool part number 88618 previously furnished with H-17345 Completion Machine are satisfactory for use with tees not having an equalizing valve. With certain precautions, these tools may also be used with tees having an equalizing valve.

A—SELECT THE EQUIPMENT REQUIRED

- From the chart above, select the equipment required according to the size and catalog number to the tee to be used.

B—WELD THE TEE (Figure 58) TO THE PIPE

- Clean surface where tee is to be welded.
- Remove completion cap.
- Remove completion plug from the fitting.
- Locate the tee in the desired position and weld to the pipe. NOTE: It may be necessary to shape the inlet end of the tee to fit the pipe when used on larger size pipe. The tee may be installed in any position, providing that the center line of the tee is

at a right angle to the axial center line of the pipe. A vertical position is recommended if conditions will permit. A split reinforcing saddle may be used if desired.

C—ATTACH LATERAL PIPING—Figure 59

- Weld lateral piping to outlet of tee.
- Extend the lateral piping to the next valve or shut-off point and close this valve.

D—TEST THE WELD—Figure 60

- Remove completion plug, if not already removed.
- Bolt completion cap to tee being sure gasket is in good condition and in place.

INSTRUCTIONS FOR INSTALLING 6" AND 8" FLANGED TEES

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Remove test plug and attach air hose. (The completion cap of previously designed tees does not have a test plug. Use separate test cap which is tapped.)

3. Apply air pressure and test for leaks with soapsuds (add glycerin in freezing weather) or bubble type leak detection fluid.
4. Remove completion cap or test cap.
5. Replace test plug in completion cap.

E—ATTACH GATE VALVE

Instructions 5 through 17 apply only to latest design of completion plugs having "O" ring seal.

1. The gate valve (part no. 83953) is a special 9" MUELLER gate valve which is furnished with the H-17335 stopping machine. It must be installed with the rubber faced disc up since the pressure aids in seating the gate and keeping it tight when closed.
2. Attach gate valve or gate valve and adapter to tee.
 - a. When using an 8" H-17505 tee, bolt the gate valve to the tee. (8" tees with Class 150 flanges do not require a valve adapter between the tee and the valve.) See **Figure 5**. Check to be sure that the gasket is in good condition and in place. The bolt nuts should be loose at this point to permit the gate valve to be shifted slightly if necessary. *
 - b. With all 6" tees, and 8" H-17506, 8" H-17507 and 8" H-17508, bolt the proper valve adapter to the tee and then bolt the gate valve to the adapter. See **Figure 6**. At both of these flanged joints check to be sure that the gasket is in good condition and in place. The bolt nuts for both joints should be loose at this point to permit the gate valve and valve adapter to be shifted slightly if necessary. *

*If tee being used does not have the latest design completion plug with an equalizing valve and "O" ring seal, the bolt nuts should be tightened at this point.

3. Inspect the gate, then open gate valve. Check to be sure it is fully open. (Approximately 30 turns to open.)
4. Turn by-pass stop on gate valve to by-pass position (check screw in upper position). See **Figure 7**.
5. Attach plug alignment tool (part no. 83519) to completion plug.
 - a. Push fork to rearmost position and tighten thumb screw.

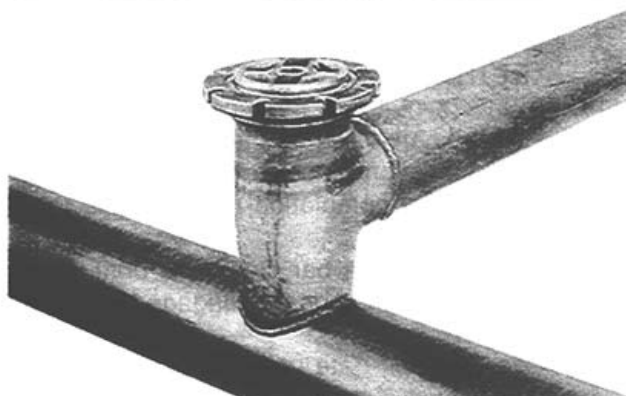


FIGURE 59

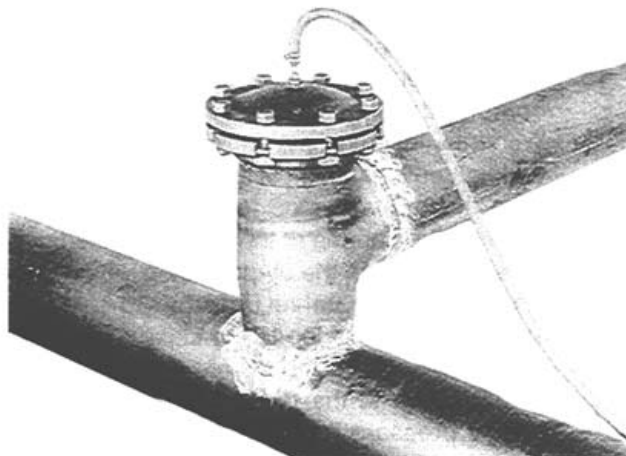


FIGURE 60

- b. Screw the end of the tool into the inside threads in the top of the completion plug.
 - c. Loosen thumb screw so that the fork lugs will engage with the slots in the completion plug.
6. Attach plug alignment tool, with the completion plug assembled to it, to inserting bar of completion machine. See **Figure 10**.
 - a. Insert lug on top of plug alignment tool into matching recess or slot in inserting bar.
 - b. Screw coupler sleeve to plug alignment tool threads.
 7. Withdraw inserting bar to rearmost position and tighten clamping collar on inserting bar at top of machine to prevent plug alignment tool and completion plug from falling while being placed on valve.
 8. Attach completion machine on gate valve with a few bolts. See **Figure 11**.
 9. Hold back on handle of inserting bar, loosen clamping collar and slowly advance

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INSTRUCTIONS FOR INSTALLING 6" AND 8" FLANGED TEES

inserting bar until the completion plug contacts tee threads. **IMPORTANT- DO NOT LET THE INSERTING BAR DROP.**

10. At this point it may be necessary to slightly shift the gate valve on the tee and possibly the completion machine on the gate valve to align the completion plug threads with the tee threads.
11. Rotate inserting bar **clockwise** until completion plug threads are engaged with tee threads 6 turns.
12. Securely bolt gate valve to fitting or gate valve to valve adapter and valve adapter to fitting. Tighten bolts from the bottom up, using alternating sequence in order to tighten as evenly as possible.
13. Rotate inserting bar **counter-clockwise** until completion plug is unscrewed from tee. Withdraw inserting bar to rearmost position and tighten clamping collar.
14. Turn the by-pass stop to the test position and test the flanges of the stack by inserting pressure through the by-pass stop.
15. Close the gate valve (approx 30 turns). Turn the by-pass stop to the closed position and remove air testing source. Now turn the by-pass stop to the test position. This will relieve pressure above the gate to ensure the valve does not leak.
16. Turn the by-pass stop to the by-pass position to equalize pressure above the gate. This will determine that the by-pass valve is working properly.
17. Open gate valve (approx. 30 turns) and once again lower the completion plug and inserting bar down into fitting and thread 6 turns.
18. Mark the position of the stopping machine flange in relation to the gate valve flange. Do this in 2 places, 90° from each other. This will prevent tilting of the machine during inserting of plug. This is for reference so that the stopping machine can be properly positioned for the final installation of the completion plug when the job is finished.
19. Remove completion machine from gate valve.
20. Loosen clamping collar and advance inserting bar until completion plug and plug alignment tool are exposed.
21. Remove completion plug and plug alignment tool from inserting bar.

22. Remove plug alignment tool from completion plug.

F—ATTACH AND OPERATE DRILLING MACHINE

(For detailed instructions see OPERATING INSTRUCTIONS for CC-36 or C1-36 DRILLING MACHINES.)

1. Sharpen shell cutter and pilot drill before each cut by honing the front edge of the cutter teeth. If the shell cutter is very dull, it should be returned to Mueller Co., Decatur, Illinois for reconditioning. Check pilot drill detents to be sure they operate correctly.

2. Bolt drilling machine adapter to front of the drilling machine. Check to be sure that the gasket is in good condition and in place.

NOTE: MAKE CERTAIN MACHINED RECESS ON ADAPTER AND LIP ON MACHINE FLANGE MATE PROPERLY. VISUALLY CHECK ADAPTER FLANGE AND MACHINE FLANGE TO BE SURE THEY ARE FLUSH.

3. Release automatic feed by pulling out automatic feed knob. (Directions are indicated on panel on rear of torque tube.)
4. Advance boring bar by rotating feed crank **counter-clockwise** until bolt hole in boring bar is exposed beyond face of adapter. (Directions are indicated on panel on rear cover of torque tube.) Remove hub retaining bolt.

5. Assemble shell cutter and cutter hub. Insert the shank of pilot drill into the socket in the boring bar. Slide cutter hub and shell cutter over the end of the boring bar. Align holes of the cutter hub, boring bar, and pilot drill and attach to boring bar with hub retaining bolt. **Fig. 61.** Coat shell cutter and pilot drill thoroughly with MUELLER cutting grease.

6. Retract boring bar to rearmost position by rotating crank **clockwise**.

7. Place the machine (with adapter and drilling equipment assembled) in drilling position on gate valve and bolt adapter solidly to valve flange. See **Fig. 55.** Check to be sure gasket is in good condition and in place.

NOTE: MAKE CERTAIN MACHINED PROJECTION ON ADAPTER AND MACHINED RECESS ON GATE VALVE FLANGE MATE PROPERLY. VISUALLY CHECK ADAPTER FLANGE AND GATE VALVE FLANGE TO BE SURE THEY ARE FLUSH.

8. Be sure that the tee is cool before cut is started.

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9. Rotate feed crank **counter-clockwise** to advance boring bar until pilot drill contacts the pipe, counting the turns. Turn feed crank **clockwise** $\frac{1}{4}$ turn which retracts the boring bar slightly to release tension between pilot drill and the pipe. (1 revolution of the feed crank moves the boring bar $\frac{1}{6}$ of an inch - 6 revolutions equals 1 inch.)

Catalog Number of Fitting	Approximate Number of Turns of Feed Crank Required for Pilot Drill to Contact Pipe	
	6"	8"
H-17505	168	187
H-17506	172	188
H-17508	171	

10. Set feed indicator to zero. Mark the point on feed indicator that the arrow will reach when cut will be completed. For travel chart, see OPERATING INSTRUCTIONS for CC-36 and C1-36 DRILLING MACHINES.

11. Engage automatic feed by pushing in on automatic feed knob and rotating crank handle **clockwise** until gearing engages.

12. Operate the drilling machine:

- a. When using the CC-36 Machine:

Place ratchet handle on machine so that it cuts when ratchet handle is pushed toward pipe. Observe note on ratchet casting and arrow on drive box boss. Always operate the machine according to instructions with one person only on ratchet handle and using automatic feed to assure correct drilling rate.

If cut becomes too difficult for one person, **DO NOT FORCE MACHINE** as this may cause damage to cutter or machine. See detailed instructions for the CC-36 Machine.

- b. When using the C1-36 Machine and the MUELLER H-600 Air Motor:

Loosen pivot set screw. This permits pivot pin to be removed so the air motor holder may be attached to the holder pivot on the drive box of the C1-36 Drilling Machine. Position air motor holder and replace pivot pin, tighten the pivot set screw and latch the small hook on the air motor holder to the pin on the machine drive box to prevent movement of the air motor holder.

Examine air motor on ground with air pressure on. Position throttle lever for forward operation, this will turn drive spindle **clockwise**.

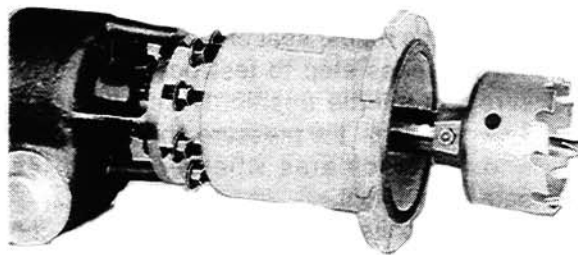


FIGURE 61

Place air motor in holder, open throttle slightly. Spindle will turn until square in motor spindle aligns with square on drive spindle. Motor will then drop into place. Screw feed screw in top of motor back into countersink in top of holder. Slide hook clamp into position on air motor torque handle and tighten. Open air motor throttle fully so that motor is operating at proper speed (50 to 60 rpm). **IMPORTANT - MAINTAIN PRESSURE OF 90 P.S.I. WE RECOMMEND THE USE OF A GAGE AT THE THROTTLE TO DETERMINE THE ACTUAL PRESSURE OF AIR AT THE AIR MOTOR.** If cutting becomes difficult and motor stalls, see detailed instructions for the C1-36 Machine.

13. Continue the cutting operation until the pipe is cut completely through and the arrow reaches the point marked on the feed indicator, or until the cutter stops cutting. Pull out on the automatic feed knob to disengage automatic feed. If power is being used, shut off motor.

14. Check completion of cut by attempting to advance cutter by rotating feed crank **counter-clockwise**. If it does not advance easily, the cut is not completed and automatic feed knob must be pushed in for further cutting.

CAUTION: STOP ADVANCING THE BORING BAR WHEN THE LIMIT LINE ON THE BORING BAR BECOMES VISIBLE THROUGH THE DRIVE BOX DRAIN HOLE. See Figure 14.

15. When cut is completed, release automatic feed and retract cutter to its rearmost position by rotating feed crank **clockwise**.

G—REMOVE DRILLING MACHINE

1. Close gate valve. (Approximately 30 turns required to completely close the valve.)

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING 6" AND 8" FLANGED TEES

2. Do not force valve closed as that may destroy the rubber seat of the valve.
3. Turn by-pass stop to test position (check screw in middle position). See **Figure 8**. This exhausts the pressure above the gate and also indicates whether or not the gate is shut tight.
4. Remove bolts from the joint between the gate valve flange and the drilling machine adapter flange. Remove the drilling machine and drilling machine adapter from the gate valve as a unit.

H—INSTALL COMPLETION PLUG IN FLANGED TEE

NOTE: Latest design of completion plug has an "O" ring seal and a pressure equalizing valve in the center of the completion plug. The end of either inserting tool (part no. 83517 or 36558) will open the equalizing valve. See page 46.

1. Loosen clamping collar and advance inserting bar of completion machine.
2. When using an E-Z Release type plug inserting tool (part no. 83517):
 - a. Attach plug inserting tool to the completion plug.
 - (1) Push fork to rearmost position.
 - (2) Hold fork in this position and screw the end of the tool into the inside threads in the top of the completion plug.
 - (3) Release fork so that the fork lugs will engage with the slots in the completion plug.
 - b. Attach plug inserting tool with completion plug assembled to it, to the inserting bar of completion machine. See **Figure 22**.
 - (1) Insert lug on top of plug inserting tool into matching recess or slot in inserting bar.
 - (2) Screw coupler sleeve to plug inserting tool threads.
3. When using the plug inserting tool (part no. 36558) previously furnished with H-17345 Completion Machine:
 - a. Screw the end of the tool **hand tight only** into the inside threads in the top of the completion plug.

IMPORTANT—Check to be sure these threads screw together freely without binding.
 - b. Screw tool **tightly** into the right hand inside threads of the inserting bar. The

coupler sleeve is not used with this plug inserting tool. See **Figure 23**. **IMPORTANT—The connection between the inserting tool and the inserting bar must be as tight as possible.**

4. Check to be sure threads on completion plug and fitting are clean. Coat the "O" ring on the completion plug with a light lubricant.
5. Withdraw inserting bar to rearmost position and tighten clamping collar so that the completion plug will not fall while the machine is being placed on the gate valve.
6. Place completion machine on gate valve in same position as marked in paragraph "E-18" on page 48. With gasket in place, bolt the completion machine to the gate valve.
7. Tighten plug in completion machine body.
8. Turn by-pass stop on gate valve to the by-pass position (check screw in upper position). See **Figure 7**.
9. Open gate valve (approx. 30 turns).
10. Advance inserting bar (hold inserting bar down with feed yoke) and screw completion plug into tee securely by rotating inserting bar **clockwise**. (Place a pipe or rod through the bar head of the inserting bar to aid in tightening the plug.) See **Figure 24**.
11. Remove plug inserting tool from completion plug by turning the inserting bar **counter-clockwise**. When using plug inserting tool (part no. 36558) previously furnished with H-17345 Completion Machine, first turn the inserting bar **counter-clockwise** to take up slack and strike inserting bar a sharp blow **counter-clockwise**. See **Figure 25**. Inserting bar should now be free to turn.
12. Rotate inserting bar **counter-clockwise** until inserting tool is free from completion plug.
13. Turn by-pass stop to test position (check screw in middle position) to determine tightness of plug. See **Figure 8**.
14. Unbolt and remove gate valve and completion machine from tee as a unit.
15. Completion plugs furnished with an "O" ring will be tightened to their seat by the machine with no further tightening needed. For plugs without "O" rings, tighten completion plug with completion plug wrench (part no. 36424). Place a pipe or rod through the wrench to aid in tightening the completion plug.

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LINE STOPPER UNIT NO. 3

16. Place gasket in tee recess and put completion cap in place.
17. Bolt cap solidly to tee flange. **Figure 62.**
18. Test tee again with soapsuds.
19. Refill trench.

I—TO STOP OFF FLANGED TEE

CAUTION: DURING THE STOPPING-OFF OPERATION, THE LINE PRESSURE MUST NOT EXCEED 60 P.S.I. HIGHER PRESSURE WILL RESULT IN DAMAGE TO THE STOPPING MACHINE.

1. Remove completion plug. Follow Instruction "Q" on page 19.
2. Loosen clamping collar and advance inserting bar of stopping machine.
3. Attach special stopper to inserting bar of stopping machine by screwing coupler sleeve to stopper threads. **Figure 63.**
4. Lubricate stopper with MUELLER rubber stopper lubricant.
5. Withdraw inserting bar to the rearmost position and tighten clamping collar on inserting bar at top of machine to prevent stopper from falling while being placed on valve.
6. Bolt stopping machine solidly to gate valve with gasket between valve and stopping machine. See **Figure 16.**
7. Turn by-pass stop on gate valve to by-pass position (check screw in upper position). See **Figure 7.**
8. Open stopping machine gate valve **fully**, (approx. 30 turns).
9. Release clamping collar and advance inserting bar until the rubber stopper contacts the pipe.
10. Hold inserting bar in this position by placing yoke of the machine in the collar of the inserting bar and securing with pin. See **Figure 21.**
11. Expand stopper in tee by turning feed nut and yoke of stopping machine **clockwise** $\frac{1}{2}$ turn at a time with a short pause after each turn. Continue to expand stopper in this manner until the line is stopped off. Blow down the line. Turn the by-pass stop on gate valve to test position (check screw in middle position). See **Figure 8.** Stopper tightness will also be indicated at this point. For a more rapid test and blowdown, open gate valve on purging connection (Save-A-Valve Drilling Nipple) or any other opening

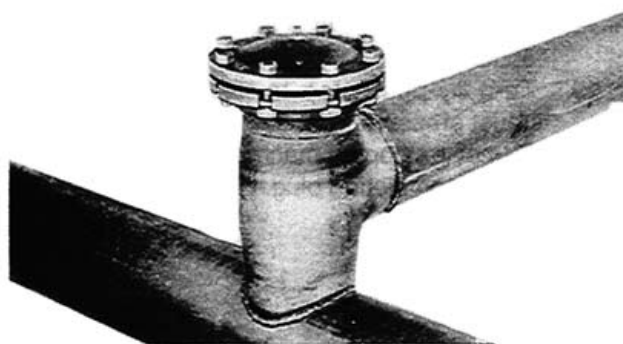


FIGURE 62

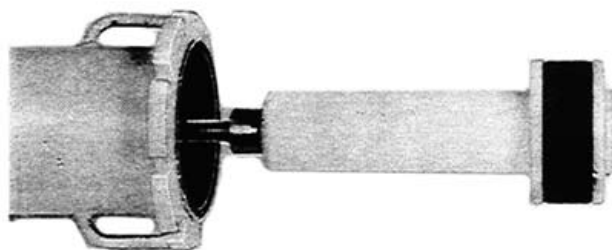


FIGURE 63

that may be available in the section of pipe that is stopped-off.

CAUTION: DURING THE STOPPING-OFF OPERATION, THE LINE PRESSURE MUST NOT EXCEED 60 P.S.I. HIGHER PRESSURE WILL RESULT IN DAMAGE TO THE STOPPING MACHINE.

12. Proceed with work to be done on the stopped-off section of pipe.
13. When the work on the stopped-off section is completed, turn by-pass stop on gate valve to by-pass position.
14. Contract stopper by turning feed nut and yoke **counter-clockwise** a little at a time with a short pause after each turn until stopper is fully released.
15. Open gate valve on purging connection or other available opening at the extreme end of the section that was stopped-off until all air has been purged from stopped-off section. Close this gate valve.
16. Test all joints when pressure has built up in section that was stopped-off.
17. Extract stopper from tee by removing pin and then removing feed yoke from collar on inserting bar. Slowly withdraw the inserting bar to the rearmost position. Tighten clamping collar.

CAUTION: WHEN THIS MACHINE IS UNDER PRESSURE, CONTROL THE PISTON ACTION OF THE BORING BAR TO PREVENT BODILY INJURY OR DAMAGE TO THE MACHINE.

LINE STOPPER UNIT NO. 3

INSTRUCTIONS FOR INSTALLING 6" AND 8" FLANGED TEES

18. Close stopping machine gate valve (approx. 30 turns).
19. Turn by-pass stop to test position to exhaust pressure from above the gate.
20. Remove stopping machine.
21. Install completion plug. Follow Instruction "H" on page 50.

FLOW CHART FOR MUELLER LINE STOPPER FITTINGS

LINE STOPPERUNIT NO. 3

PRESSURE DROP THROUGH MUELLER LINE STOPPER FITTINGS WITH INTEGRAL BY-PASS LINE

Upstream Pressure P.S.I.G.	Flow Rate Cu. Ft. Per Hour of .60 Sp. Gr. Gas At Standard Conditions	Press. Drop Through Up-Stream and Down- Stream Stoppers P.S.I.	Pressure Drop Through 100 Ft. of Pipe—P.S.I.		
			By-Pass Pipe Size		
			2"	3"	4"
6" BY — PASS RUBBER STOPPER					
60	10,000	.11	.214	.03	N
	20,000	.42	.76	.10	N
	40,000	1.67	2.81	.39	.10
	80,000	6.79	11.15	1.52	.39
	120,000	15.73	25.40	3.64	.94
	160,000	29.88	—	8.35	2.14
40	10,000	.23	.29	.04	N
	20,000	.93	1.06	.15	.04
	40,000	3.77	4.04	.56	.16
	80,000	15.73	19.2	2.67	.69
	100,000	26.25	—	5.53	1.42
20	10,000	.47	.46	.063	N
	20,000	1.91	1.015	.241	.06
	40,000	7.94	7.74	1.07	.28
	50,000	12.67	14.25	1.98	.51
10	2,000	.46	.03	N	N
	5,000	.98	.18	N	N
	10,000	2.10	.70	.09	N
	15,000				
5	2,000	.63	.04	N	N
	5,000	2.26	.25	N	N

Where the letter N appears in table, the pressure drop is considered negligible.

To obtain total pressure drop determine the pressure drop as listed in the table for the size of fitting corresponding to the upstream pressure to be maintained, and the maximum flow rate required, and add to the pressure drop in the by-pass line. The by-pass line pressure drops are given for 100 ft. of by-pass line. For pressure loss of actual length used, divide actual length in feet by 100, and multiply this factor into the value in the table.

Example: An eight inch line is to be stopped using 8" By-Pass Rubber Stoppers. A 2" by-pass line, 60 ft. long will be used, connected to the 2"

Upstream Pressure P.S.I.G.	Flow Rate Cu. Ft. Per Hour of .60 Sp. Gr. Gas At Standard Conditions	Press. Drop Through Up-Stream and Down- Stream Stoppers P.S.I.	Pressure Drop Through 100 Ft. of Pipe—P.S.I.		
			By-Pass Pipe Size		
			2"	3"	4"
8" BY — PASS RUBBER STOPPER					
60	10,000	.05	.21	.03	N
	50,000	1.07	4.22	.59	.16
	100,000	4.29	16.05	2.24	.57
	150,000	9.74	43.30	5.12	1.32
	200,000	17.57	—	9.96	2.59
	250,000	28.19	—	18.60	4.76
40	10,000	.08	.29	.04	N
	50,000	2.17	.54	.08	N
	100,000	8.84	24.7	3.43	.878
	150,000	20.74	—	9.85	2.53
20	10,000	.22	.46	.06	N
	50,000	5.81	10.9	1.50	.39
	70,000	11.89	—	3.57	.92
10	10,000	.45	.65	.09	N
	20,000	2.59	2.56	.36	.09
	30,000	4.24	5.97	.83	.21
5	10,000	.78	.835	.116	.03
	20,000	3.23	3.48	.485	.12

Where the letter N appears in table, the pressure drop is considered negligible.

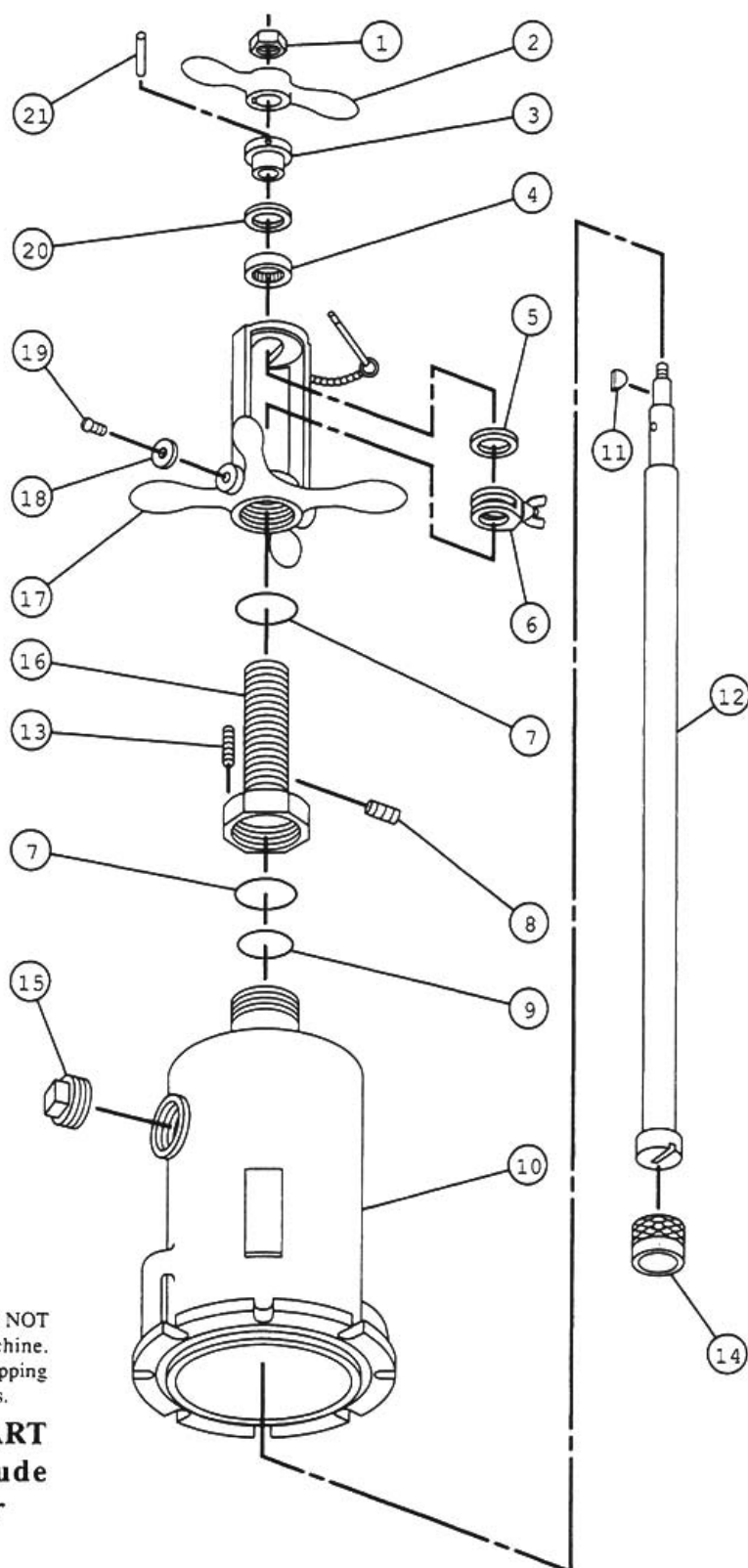
standard by-pass connection. The upstream pressure will be maintained at 40 p.s.i.g., and it is desired to pass a maximum of 50,000 cubic feet per hour during the operation. From the table the pressure drop in the stoppers is 2.17 p.s.i. For 60' of 2" line the by-pass line drop will be $.54 \times \frac{60}{100} = .32$ p.s.i. Total drop = $2.17 + .32 = 2.49$ p.s.i. leaving 37.51 p.s.i.g. available for distribution at outlet end.

Use a separate by-pass of adequate size if **there is any doubt** as to whether or not an integral by-pass will provide sufficient and consistent flow and pressure for downstream requirements.

LINE STOPPER

UNIT NO. 3

Item No.	Part Number	Part Name (quantity)
1	52178	Nut
2	36437	Handle
3	36434	Retaining collar
4	36436	Thrust bearing
5	36433	Thrust collar
6	83544	Clamping collar
7	51458	O-ring (2)
8	41435	Oil plug
9	78827	O-ring
10	80010	Body assembly
11	98941	Key
12	88627	Inserting bar
13	92926	Screw
14	36722	Coupler sleeve
15	52916	Plug
16	501680	Feed sleeve
17	88607	Feed nut and yoke assembly (includes 18 and 19)
	36426	Feed nut only
	36427	Yoke only
	36444	Pin only
	48610	Ring only
	504225	Chain only
	94005	Rivet
18	50133	Washer (2)
19	79745	Sems fastener (2)
20	36483	Bearing collar
21	503715	Retaining pin
Items not shown		
-	304673	Wooden storage chest (not shown)
-	F8571	Operating instruction manual (not shown)

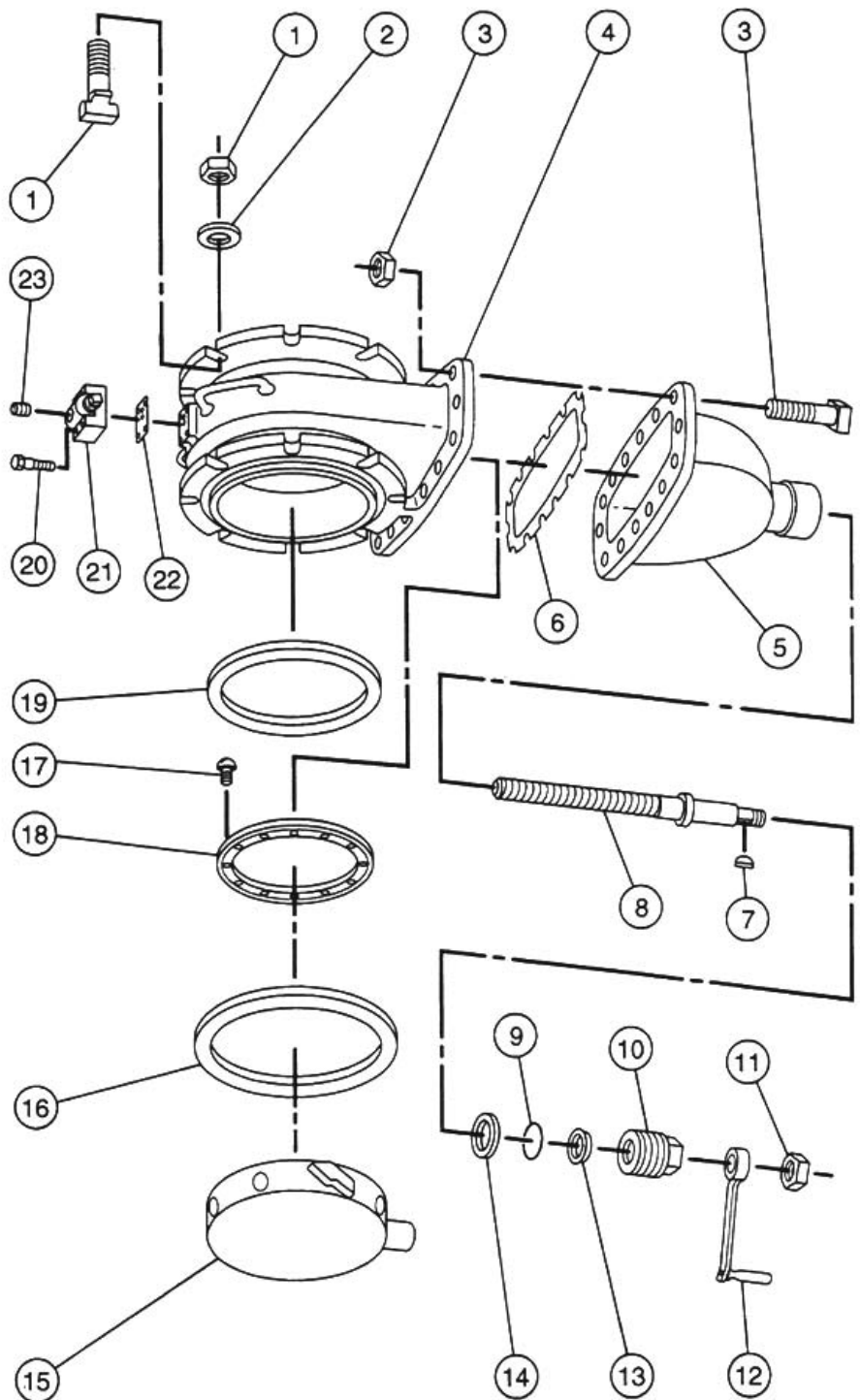


NOTE: These illustrations are for parts identification only. DO NOT use these illustrations for assembly or disassembly of machine. MUELLER CO. offers a machine repair service, and field tapping service. Contact MUELLER® Customer Service Center for details.

TO ORDER SPECIFY QUANTITY, PART NUMBER AND PART NAME (include catalog number and model number machine)

LINE STOPPER UNIT NO. 3

Item No.	Part Number	Part Name (quantity)
1	36446	Flange bolts and nuts (16)
2	92576	Washer (16)
3	54804	Bonnet bolts and nuts (14)
4	83952	Body assembly (includes seat ring)
5	36636	Bonnet
6	36538	Bonnet gasket
7	98229	Key
8	36541	Stem
9	51458	O-ring
10	501296	Packing nut
11	52180	Nut
12	83973	Handle assembly
13	501273	Wiper ring
14	36539	Gasket
15	88622	Gate sub assembly
16	36581	Seat washer
17	52193	Screw (12)
18	36560	Seat washer retainer
19	63094	Flange gasket (2)
20	53969	Screw (4)
21	88621	By-pass stop assembly (includes 20, 22, and 23)
22	36623	Gasket
23	51575	Check screw
	304671	Wooden storage chest (not shown)



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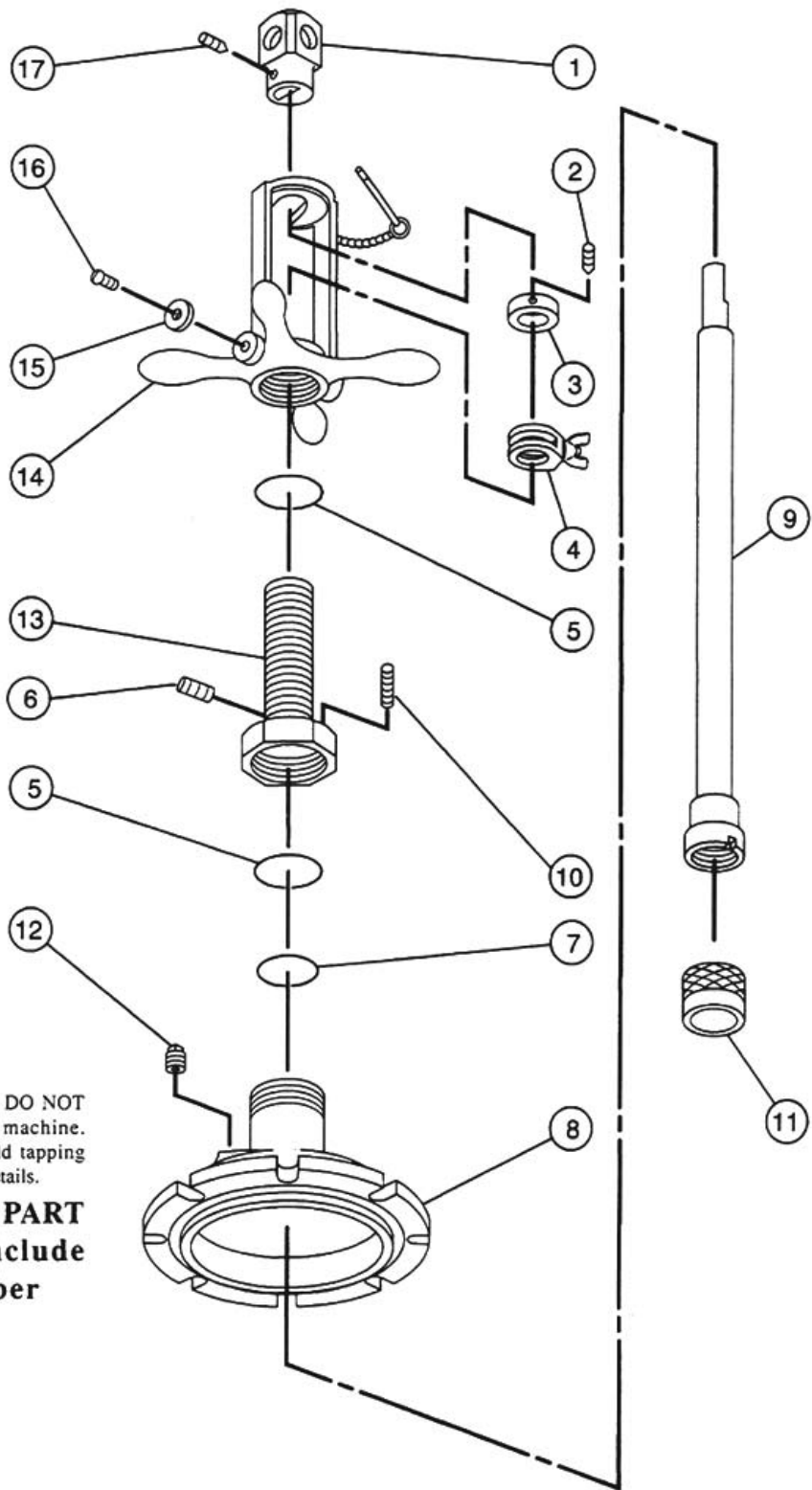
LINE STOPPER UNIT NO. 3

Item No.	Part Number	Part Name (quantity)
1	36677	Bar head
2	40013	Screw (2)
3	36678	Friction collar
4	83544	Clamping collar assembly
5	51458	O-ring (2)
6	41435	Oil plug
7	78827	O-ring
8	36679	Body
9	53512	Inserting bar
10	92926	Screw
11	36722	Coupler nut
12	64134	Plug
13	501680	Feed sleeve
14	88607 *	Feed nut and yoke assembly
15	50133	Washer (2)
16	79745	Sems fastener (2)
17	58458	Screw
-	304666	Wooden storage chest (not shown)
-	F8571	Operating instruction manual (not shown)

* Includes part numbers 15 & 16.

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**TO ORDER SPECIFY QUANTITY, PART
NUMBER AND PART NAME (include
catalog number and model number
machine)**





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