**OPERATING INSTRUCTIONS MANUAL** 

# MUELLER® GAS

No-Blo® Operations Using D-5 Drilling Machine

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#### 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<sup>®</sup> 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.



#### **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.

### **General Information**

### **Capacity and Use**

The D-5 Drilling Machine is used to install up to 4" Tees, Save-A-Valve Drilling Nipples, and Line Stopper Fittings. This machine is equipped with a boring bar locking mechanism for safe operation, as well as, a test plug feature which allows for stack pressurization.

For complete information on the uses of these machines and the equipment and attachments required, see the latest Mueller Gas Catalog at muellergas.com.

#### Working Pressure and Temperature Rating

- 500psig (3447 kPa) Maximum Working Pressure
- 100° F (38° C) Max. Temp. Rating

The working pressure or temperature rating is reduced accordingly if any attachment, valve, or fitting subjected to pressure or temperature during the drilling operation has a maximum working pressure or temperature rating different than that specified above.

### **Equipment Furnished**

- Metal Storage Chest (580969)
- Reversible Ratchet Handle (85308)
- · Body Gasket (33278)
- Adjustable Wrench (91664)
- Double Open-end Wrench (58196)
- Cutting Grease (88366)
- Operating Instruction Manual



### **Machine Weight Chart**

DESCRIPTION	D-5
Machine & equipment shipped in metal storage chest	60.5 lb (48.5 kg)
MACHINE ONLY	34 lb (30.4 kg)

#### Length of Travel

D-5 Drilling Machine has 14" (356 mm) Boring Bar Travel.

### Mueller No-Blo® Operations performed by the Mueller D-5 Drilling and Stopping Machine:

ITEM				SIZES				NO-BLO OPERATIONS
Mueller No-Blo Service Tees	3/4"	1"	<b>1</b> <sup>1</sup> /4"	<b>1</b> <sup>1</sup> /2"	2"	3"	4"	Drill main, insert or extract completion plug, make stop-off
Mueller No-Blo Service Stop Tees	3/4"	1"	<b>1</b> <sup>1</sup> /4"	_	-	-	-	Drill main, insert or extract stem and bushing, recondition body seat
Mueller No-Blo Curb Stop Tees	3/4"	1"	<b>1</b> <sup>1</sup> /4"	<b>1</b> <sup>1</sup> /2"	2"	-	-	Drill main, insert or extract stem, recondition body seat
Mueller No-Blo Save-A-Valves®	-	1"	<b>1</b> <sup>1</sup> /4"	<b>1</b> <sup>1</sup> /2"	2"	3"	-	Drill main, insert or extract completion plug

### Installing Service Tees, Service Stop Tees and Curb Stop Tees

### **Installation Instructions**

### A–Select The Equipment Required

**1.** Determine the catalog number of the valve to be used. See Gas Catalog.

**2.** Select the proper D-5 tools according to the following:

- a) Size and catalog number of the Tee to be installed
- b) Catalog number of the valve to be used.

The required tools are listed in the Gas Distribution Products Catalog along with the cataloging of the Tees. Each page of Tees includes the corresponding tool numbers.

**3.** Select the drilling tools to be used. The maximum size drilling which can be used is listed in the Gas Distribution Products Catalog.

**4.** Select the proper size of valve. This is listed in the catalog in the same column as the tools.

### **B–Drilling Operations**

**1.** Thoroughly clean the surface to which the Tee is to be attached.

**2. For Service Tees:** Remove completion cap and completion plug **(Pic. A**).

For Service Stop Tees: Remove completion cap and stem and blushing as a unit (**Pic. B**).

For Curb Stop Tees: Remove operating head, cap and stem (**Pic. C**).





**3. For Tees having welding inlet:** Place Tee in desired position and weld to pipe line (**Pic. D**).

For Tees having an outside I.P. thread inlet: Attach Service Clamp at the desired position. Apply nonhardening pipe thread sealant to the inlet threads at the Tee and screw it into the body of the Service Clamp. (**Pic. E**).

NOTE: When using a Tee having a threaded inlet, it may be necessary to reduce the working pressure and temperature to that of the clamp or fitting which the Tee is attached.

**4.** Connect service pipe to the outlet of the Tee and extend this piping to the first shut-off in the service line such as a curb stop or meter stop. Close this curb stop or meter stop.

**5.** If installing a  ${}^{3}/{}^{a}$ , 1" or  ${}^{1}/{}^{a}$ " Service Tee or Service Stop Tee, the H-17615 Center Locating Punch may be used to punch mark the pipe in the center of the Tee to aid in starting the drill. Screw the Center Locating Punch into the Tee and strike the head of the pin a solid blow (**Pic. F**).







### Installing Service Tees, Service Stop Tees and Curb Stop Tees

### **C–Test The Installation**

1. Screw test cap on Tee.

**2.** Apply air pressure and test for leaks with soapsuds (add glycerin in freezing weather) or bubble type leak detection fluid (**Pic. G**).

### 3. Remove test cap.



### **D–Attach Control Valve**

**1.** Attach control valve to top of Tee (**Pic. H**). (If installing a  ${}^{3}/{}^{4}$ " Service Tee, first attach the  $1{}^{1}/{}^{4}$ " x 1" bushing to the Tee and then attach the valve to the bushing.)

### 2. Open valve fully.



E-Attach Drilling Machine NOTE: When using the D-5 Machine with small size Tees (as shown in accompanying illustration) it is necessary to attach the tools to the boring bar before attaching the machine adapter nipple to the machine. It is also necessary to remove the machine adapter nipple from the machine before removing tools from the boring bar. **1.** Attach machine adapter nipple to the body of the machine. Be sure the gasket is in good condition and in place.

2. Assemble proper size drill and drill holder, combined drill and holder or shell cutter, cutter arbor and pilot drill to the boring bar of the machine. When using a combined drill and holder, a boring bar adapter must be used between the combined drill and holder and the boring bar.

**3.** Apply a small amount of Mueller Cutting Grease to the leading edge of cutting tool (**Pic. I**).

**4.** Retract boring bar to its rearmost position.





**5.** Place the drilling machine on valve and tighten machine adapter nipple into valve (**Pic. J**).

### F-Drill The Main

**1.** Slowly advance boring bar until point of drill contacts the pipe. Then retract boring bar a slight amount.

**2.** Adjust feed tube and yoke so that the yoke engages the collar on boring bar. Tighten clamping collar against top of feed yoke.

3. Drill the hole by operating the ratchet handle **clockwise** and turning the feed tube and yoke **clockwise** a little at a time (**Pic. K**). Use a light even feed at the start, then a heavier feed and finish with a light even feed. To prevent over-feeding when drilling small holes and also when starting to drill larger hoes, apply the feed by gripping the knurled section of the feed tube instead of the feed handles.

**4.** Continue drilling until a hole is drilled in the pipe. This can be determined by the feel of the feeding mechanism and the pull of the ratchet handle.



### Installing Service Tees, Service Stop Tees and Curb Stop Tees

### G–Remove The Drilling Machine

**1.** When the drilling operation is completed, retract the boring bar to its rearmost position. Be sure the point of the drill is above the valve.

CAUTION: DO NOT reverse the rotation of the ratchet handle when retracting the boring bar. Pressure inside the D-5 Drilling machine will tend to raise the boring bar. Hold down on boring bar or use the feed yoke to control the upward motion of the boring bar thereby preventing shock or damage to the drilling machine.

2. Close valve.

**3.** Remove drilling machine and machine adapter nipple from valve as a unit.

- 4. Advance boring bar.
- 5. Remove drilling tools.

#### H–Insert Plug, Stem and Bushing or Stem (See Note on page 6)

1. Assemble plug-inserting tool to the right hand threads in the end of the boring bar of the drilling machine. When using an E-Z Release Inserting tool, a boring bar adapter must be used between the E-Z Release Inserting tool and the boring bar.

**2. For Service Tees:** Attach the completion plug to the plug-inserting tool. Lubricate the threads on the tool and be sure that they screw together freely. Check to be sure the threads on the plug and Tee are clean. Apply non-hardening pipe thread sealant to the completion plug threads (**Pic. L**).



For Service Stop Tees: Unscrew stem approximately half way out of the bushing, then attach the bushing to the plug-inserting tool. Lubricate

the threads on the tool and be sure they screw together freely. Check to be sure threads on the bushing and Tee are clean. Screw stem into bushing as far as possible by hand then back it out one half of a turn (**Pic. M**).



For Curb Stop Tees. Curb Stop Tees use an E-Z Release typeinserting tool. Lubricate the acme threads between the two parts of this tool and be sure they screw together freely without binding. Screw the end of the tool into the end of the stem and secure in place by lowering the fork over the squared section of the stem (**Pic. N**).



**3.** Retract boring bar to its rearmost position.

- 4. Attach drilling machine to valve.
- 5. Open valve fully.

6. Advance boring bar until the completion plug, bushing or stem (Curb Stop Tee) contacts the top thread in the Tee. Hold the boring bar down with the feed yoke if desired.

7. Rotate the ratchet handle clockwise until the completion plug, bushing or stem (Curb Valve Tee) is firmly screwed in to the Tee.

8. Reverse ratchet and turn the ratchet handle **counter-clockwise** to take up the slack. Hold in this position with one hand and strike the end of the ratchet handle a sharp blow **counter-clockwise** with the other hand (**Pic. 0**).



**9.** Rotate the boring bar **counterclockwise** until the inserting tool is free from the completion plug or bushing. If installing a Curb Stop Tee, the upper part of the E-Z Release Inserting tool will unscrew from the lower part.

**10.** Remove drilling machine and valve.

### 11. For Service Tees (Pic. P).

- a) Tighten completion plug with completion plug wrench.
- b) Apply non-hardening pipe thread sealant to completion cap threads and screw cap tightly on Tee.



### Installing Service Tees, Service Stop Tees and Curb Stop Tees

### For Service Stop Tees (Pic. $\mathbf{Q}$ ).

- a) Tighten bushing with completion plug wrench.
- b) With screw driver, turn stem counter-clockwise to back seat against the bottom of the bushing.
- c) Apply non-hardening pipe thread sealant to completion cap threads and screw cap tightly on Tee.



### For Curb Stop Tee (Pic. R).

- a) Lubricate both O-rings and tighten cap tightly on Tee.
- b) Replace operating head.
- c) Open the valve by turning operating head counterclockwise.

**12.** Test the entire Tee with soapsuds.



#### NOTE: Using A Deferred Completion Stopper

A Deferred Completion Stopper provides stop-off in the threaded Inlet Service Tee and also screws into the top of the Tee. This permits the drilling machine and the valve to be removed while maintaining a stop-off in the line.

The Deferred Completion Stopper may be installed by following instruction H, page 5 using E-Z Release type inserting tool and machine adapter nipple listing for use with Deferred Completion Stopper. Lubricate the rubber with soapsuds (**Pic. S**).



The Deferred Completion Stopper may be removed from the fitting by following instructions J, page 7 for removing completion plug from Service Tees. (Use extracting tool adapter, part no. 36198, **Pic. T**).



- I-To Operate A Service Stop Tee
- 1. Remove completion cap.
- **2.** Screw stem into Tee as far as possible using a 4" screw drier.

**3.** Polish the seat by turning the stem back and forth several times against the sear.

4. Hold the stem in the closed position with the screw driver in one hand and BACK OFF the bronze bushing with a wrench held in the other hand. (DO NOT permit the stem to turn, however, turn the bushing approximately two full turns **counterclockwise**.) Differential threads provide the seating force (**Pic. U**).



**5.** The Service Stop Tee is now shut off. Proceed with the work on the service line.

6. To open the Tee, hold the stem in the closed position with the screw driver in one hand and tighten the bushing into the Tee with a wrench held in the other hand. (DO NOT permit the stem to turn, however, turn the bushing as far as it will go **clockwise**.) This relieves the force created by the differential threads.

7. Open Stop by rotating the stem **counter-clockwise** with the screw driver. Continue rotating in this direction until the stem backseats against the bottom of the bushing.

8. Apply non-hardening pipe thread sealant to the completion cap threads and screw cap tightly on Tee.

9. Test the entire Tee with soapsuds.

### **Installing Service Tees, Service Stop Tees and Curb Stop Tees**

#### J-To Remove Completion Plug, Stem and Bushing or Stem (Curb Stop Tee)

**1. For Service Tees:** Remove completion cap and loosen completion plug slightly with the completion plug wrench.

For Service Stop Tees: Remove completion cap, close valve approximately halfway and loosen bushing slightly with completion wrench.

For Curb Stop Tees: Close Stop tightly, remove operating head and remove cap.

**2.** Attach extracting tool to completion plug, bushing or stem (Curb Stop Tee).

NOTE: For certain sizes of Tees it is necessary to place the opened gate valve before attaching the extracting tool to the completion plug, bushing or stem (Curb Stop Tee – **Pic. V**). When using extracting tool adapter (part no. 36198) attach it to the boring bar of the machine.



- a) Move the fork away from the threads on the end of the tool.
- b) Screw the end of the tool into the threads in the top of the completion plug, bushing or stem.
- c) Slide the fork downward so that it bears against the flats on the completion plug, bushing or stem.
- d) If extracting tool has a lock nut, tighten the lock nut against the extracting fork.

**3.** Fully open valve if it has not been necessary to do so previously.

**4.** Attach valve. See instruction D, page 4.

**5.** Attach machine adapter nipple to the drilling machine. See instruction E-1, page 4.

6. Attach drilling machine to valve.

**7.** Lower the boring bar of the drilling machine until it (or the extracting tool adapter) contacts the top of the extracting tool.

8. Rotate the boring bar **counterclockwise**. The boring bar (or the extracting tool adapter) will first engage the left hand threads on top of the extracting tool. When these threads are fully engaged, continue rotating in a **counter-clockwise** direction which will unscrew the plug, bushing or stem from the Tee.

**9.** Retract boring bar to its rearmost position.

CAUTION: The pressure inside the D-5 machine will tend to raise the boring bar. Hold down on the ratchet handle to control the upward motion of the boring bar thereby preventing shock or damage to the drilling machine.

10. Close valve.

**11.** Remove drilling machine from valve.

### 12. Advance boring bar (Pic. W).



**13.** Remove extracting tool from the boring bar.

#### NOTE: Left hand threads between the extracting tool (or extracting tool adapter) and the boring bar.

**14.** Remove the completion plug, bushing or stem (Curb Stop Tee) from the extracting tool.

### K-To Stop-Off Service Tee

A rubber shut-off tool is used to provide a positive shut-off in a service line at the Tee. It should not be used for repair welding on either the inlet or outlet connections of the Tee. (To use a deferred completion stopper to stop-off threaded inlet Service Tees, see NOTE on page 6.)

A steel shut-off tool is used to provide a temporary shut-off in a service line at the Tee. It should be used for repair welding on either the inlet or outlet connections of the Tee.

**1.** Assemble shut-off tool to the boring bar of the drilling machine.

- a) A rubber shut-off tool uses a drill holder between it and the boring bar. Lubricate the rubber with soapsuds (**Pic. X**).
- b) A steel shut-off tool attaches directly to the end of the boring bar or by means of a boring bar adapter (**Pic. Y**).





**2.** Retract boring bar to its rearmost position.

**3.** Attach the drilling machine to the valve.

- 4. Open valve fully.
- 5. Advance boring bar.

### Installing Service Tees, Service Stop Tees and Curb Stop Tees

 a) If using a Service Tee with welding inlet, advance boring bar until the lower end of the shut-off tool contacts the pipe (Pic. Z or Pic. A1).





b) If using a Service Tee with Outside I.P. Thread on inlet, advance boring bar until the lower end of the shut-off tool contacts a ledge or shoulder on the inside and at the bottom of the Tee. A machined groove around the body of the Tee just below the completion cap indicates that the threaded inlet Tee has the ledge on the inside (**Pic. B1**). Previous design threaded inlet Tees did not have the ledge or the identifying groove and require special tools.

**6.** Adjust the feed tube and yoke so that the yoke engages the collar on the boring bar.



**7.** Turn feed yoke handles clockwise until the shut-off tool effectively shuts off the pressure. The boring bar should not rotate during this operation.

**8.** Proceed with the work on the service line.

**9.** When the work on the service line is completed, relax the shut-off tool.

**10.** Turn feed yoke handles counterclockwise, relaxing the downward force on the shut-off tool.

**11.** Disengage the feed yoke and retract boring bar to its rearmost position.

12. Close control valve.

**13.** Remove drilling machine from control valve.

**14.** Advance boring bar and remove shut-off tool.

**15.** Insert completion plug. See instruction H, page 5.

#### L-To Recondition Body Seat In Service Stop Tee or Curb Stop Tee

**1.** Remove stem and bushing from Service Stop Tee or stem from Curb Stop Tee. See instruction J, page 7.

**2.** Attach drill holder to boring bar of drilling machine.



3. Attach reseating reamer to drill holder (**Pic. C1**).

SIZE OF TEE	1"	<b>1</b> <sup>1</sup> / <sub>4</sub> "	2"
Reseating Reamer – Part No.	72240	72241	501754
Drill Holder – Part No.	36998	37032	33555

**4.** Retract boring bar to its rearmost position.

**5.** Attach the drilling machine to valve.

6. Open control valve fully.

**7.** Advance boring bar until the reamer contacts the body seat.

**8.** Adjust the feed tube and yoke so that the yoke engages the collar on the boring bar.

**9.** Rotate the boring bar **clockwise** in continuous circles, and at the same time apply a very light feed by turning the feed handle **clockwise** a very small amount.

**10.** When the reaming operation is completed, disengage the feed yoke, and retract boring bar to its rearmost position.

11. Close control valve.

**12.** Remove drilling machine from valve.

**13.** Advance boring bar and remove reamer and drill holder.

**14.** Insert bushing or stem (Curb Stop Tee). See instruction H, page 5.

### **Reconditioning No-Blo Steel Stops / Installing Save-A-Valve® Drilling Nipples**

### **Reconditiong No-Blo Steel Stops**

These instructions are for doing the following No-Blo® operations using the D-5 Drilling Machine. Also see Operating Instructions for D-5 Drilling Machine.

ITEM	SIZE	NO-BLO OPERATIONS			
No-Blo Steel Stops	1"	Insert Stem, Extract Stem, Recondition Body Seat			



During the reconditioning operations the pressure and temperature must not exceed the amounts indicated in the Gas Products Catalog.

The reconditioning of a No-Blo Steel Stop is the same as corresponding operations for a No-Blo Curb Stop Tee and uses the same equipment (**Pic. D1**).

# A–Select The Equipment Required

**1.** Determine the catalog number of the control valve to be used with the D-5. See Gas Products Catalog.

**2.** Select the proper D-5 Machine tools according to the following:

- a) Size and catalog number of the No-Blo Steel Stop that is to be reconditioned.
- b) Catalog number of the valve to be used with the D-5 Machine.
  - The required tools are listed in the Gas Distribution Products Catalog along with the cataloging of the No-Blo Steel Stops. Each page of No-Blo Steel Stops includes the corresponding tools.

**3.** Select the size of the valve to be used. This is listed in the catalog.

**4.** Select the reseating reamer and drill holder from the following table.

SIZE OF TEE	1"
Reseating Reamer – Part No.	72240
Drill Holder – Part No.	36998

## B–Remove Stem or Stem and Bushing

1. No-Blo Steel Stops – Close the valve tightly, remove operating head and cap. Remove the stem by following instruction J, page 7 for removing the stem from the Curb Stop Tee.

### **C–Recondition the Stop**

**1.** Recondition the body seat. See instruction L, page 8.

**2.** Replace worn or damaged parts. Every part can be replaced except the body.

3. Lubricate all O-rings.

### **D–Insert Stem or Bushing**

**1. No-Blo Steel Stop** – Follow instruction H, page 5 for inserting stem into Curb Stop Tee. Replace cap and operating head.

### **Installing Save-A-Valve Drilling Nipple**

These instructions are for doing the following No-Blo® operations using the D-5 Drilling Machine. Also see Operating Instructions for the Mueller D-5 Drilling Machine.

ITEM		SIZES				NO-BLO OPERATIONS
Save-A- Valve Drilling Nipples	1"	<b>1</b> <sup>1</sup> /4"	1 <sup>1</sup> /2"	2"	3"	Drill the Pipe, Insert Plug, Extract Plug

# A–Select The Equipment Required

**1.** Determine the catalog number of the valve to be used according to the

working pressure and temperature of the line to which the nipple is to be attached. See Gas Products Catalog.

**2.** Select the proper D-5 Machine Tools according to the following:

- a) Size and catalog number of the Save-A-Valve Drilling Nipple to be installed.
- b) Catalog number of the valve to be used. The required tools are listed in the Gas Distribution Products Catalog, along with the cataloging of the Save-A-Valve Drilling Nipples.

**3.** Select the drilling tools to be used. The maximum size of the drilling tools which can be used is listed in the Gas Distribution Products Catalog.

**4.** Select the proper size of valve. This is listed in the catalog in the same column as the Tools being used.

### **B-Attach the Nipple to the Pipe**

**1.** Thoroughly clean the surface to which the nipple is to be attached.

### Installing Save-A-Valve® Drilling Nipples



2. Remove completion cap and completion plug (**Pic. E1**).

3. Nipples having welding inlet – Place nipple in desired location and weld to pipe line (**Pic.** F1).



### Nipples having threaded inlet -

Attach Service clamp at the desired position. Apply non-hardening pipe thread sealant to the inlet thread of the nipple and screw it into the body of the Service Clamp (**Pic. G1**).



NOTE: When using a Save-A-Valve Drilling Nipple having a threaded inlet, it may be necessary to reduce the working pressure and temperature to that of the clamp or fitting to which the nipple is attached.

### C-Test the Installation

1. Screw test cap on nipple.

**2.** Apply air pressure and test for leaks with soapsuds *(add glycerin in freezing weather)* or bubble-type leak detection fluid (**Pic. H1**).



3. Remove test cap.

**4.** If installing a 1",  $1^{1}/_{4}$ " or  $1^{1}/_{2}$ " nipple, H-17615 Center Locating Punch may be used if desired. See instruction B-5, page 8.

### **D**-Attach Drilling Machine

**1.** Attach control valve to top of nipple. (If installing a 1" nipple, first attach proper bushing to top of nipple and then attach valve to bushing.)

2. Open control valve fully. NOTE: When using the D-5

Machine with small size nipples, See NOTE in instruction E, page 8.

**3.** Attach machine adapter nipple to the body of the machine. Be sure the gasket is in good condition and in place.

4. Assemble proper size drill and drill holder, combined drill and holder or shell cutter, cutter arbor and pilot drill to the boring bar of the machine. When using a combined drill and holder, a boring bar adapter must be used between the combined drill and holder and the boring bar.

5. Apply a small amount of Mueller<sup>®</sup> Cutting Grease to the lead cutting edges (**Pic. 11**).



**6.** Retract boring bar to its rearmost position.

7. Place drilling machine on valve and tighten machine adapter nipple into gate valve (**Pic. J1**)



### E-Drill the Main

**1.** Slowly advance boring bar until point of drill contacts the pipe. Then retract boring bar a slight amount.

**2.** Adjust feed tube and yoke so that the yoke engages the collar on boring bar. Tighten clamping collar against top of feed yoke.

3. Drill the hole by operating the ratchet handle clockwise, and turning the feed tube and yoke clockwise, a little at a time (**Pic. K1**). Use a light, even feed at the start, then a heavier feed and finish with a light, even feed. To prevent over-feeding when drilling small holes and also when starting to drill larger holes, apply the feed by gripping the knurled section of the feed tube instead of the feed handles.

Installing Save-A-Valve® Drilling Nipples



**4.** Continue drilling until a hole is drilled in the pipe. This can be determined by the feel of the feeding mechanism and the pull of the ratchet handle.

### F-Remove the Drilling Machine

1. When the drilling operation is completed, retract the boring bar to its rearmost position. Be sure the point of the drill is above the ball/ gate of the control valve.

CAUTION: DO NOT reverse the rotation of the ratchet handle when retracting the boring bar pressure inside the D-5 machine will tend to raise the boring bar forcefully keep face and body clear of top of boring bar and ratchet handle. Use the feed yoke to control the upward motion of the boring bar, thereby preventing shock or damage to the drilling machine or bodily injury.

2. Close control valve.

**3.** Remove drilling machine and machine adapter nipple as a unit.

- 4. Advance boring bar.
- 5. Remove drilling tools.

6. Attach required piping to valve.

7. Open valve when ready for flow through the Save-A-Valve Drilling Nipple connection.

## G—Insert Completion Plug and Remove Gate Valve

**1.** When flow through Save-A-Valve Drilling Nipple connection is no longer required, close the control valve.

2. Remove piping from control valve.

**3.** Assemble plug inserting tool to the right hand threads in the end of the boring bar of the drilling machine.

**4.** Attach completion plug to the plug inserting tool. Lubricate the tool threads and be sure the tool and plug thread together freely. Check to be sure threads on the plug and nipple are clean. Apply nonhardening pipe thread sealant to the completion plug threads (**Pic. L1**).



5. Retract boring bar to its rearmost position.

6. Attach drilling machine to valve.

7. Open valve fully.

8. Advance boring bar until the completion plug contacts the top thread in the nipple. Hold the boring bar down with the feed yoke, if desired.

**9.** Rotate the ratchet handle **clockwise** until the completion plug is firmly screwed into the nipple.

**10.** Reverse ratchet and turn the ratchet handle **counter-clockwise** to take up the slack. Hold in this position with one hand and strike the end of the ratchet handle a sharp blow **counter-clockwise** with the other hand (**Pic. M1**).

**11.** Rotate the boring bar **counter-clockwise** until the inserting tool is free from the completion plug.



**12.** Remove drilling machine and valve.

**13.** Tighten completion plug with completion plug wrench.

**14.** Apply non-hardening pipe thread sealant to completion cap threads and screw cap tightly on nipple (**Pic. N1**).



**15.** Test the entire nipple with soapsuds.

### H-Plug Inserting Operation

**1.** Remove completion plug. Follow instruction J, page 13 for removing completion plug from Service Tees.

**2.** Attach required piping to control valve.

**3.** Open gate valve when ready for flow through the Save-A-Valve Drilling Nipple connection.



**Reliable Connections** 

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