

DBML-60/80

Squeeze Tool

OPERATORS MANUAL

Description



The Mustang Model DBML-60/80 Hydraulic squeeze tool has been manufactured since 1995. A Mustang 3 3/4 bore double-acting cylinder producing 41,000 lbs of squeeze-off force is centrally mounted on the tool frame. A Mustang cylinder locking valve is located in the cylinder head cap and provides a safety check in locking the upper jaw in the squeeze-off position. The jaws are mechanically locked using a pair of saddle clamps.

The hydraulic cylinder is identified by having a black cylinder barrel and red head and rod end caps. Both hose quick disconnects are attached to the cylinder using special adapter blocks. A lifting eye is provided on top of the cylinder head cap. Pipe out-of-roundness or non-centered positioning with the tool is compensated for by the floating feature of the upper jaw.

Model 20A Hand Pump

The heart of the hydraulic system is the hand pump. DBML-60/80 tools use a double piston pump including an oil reservoir, 4-way directional control valve, sensitive pressure-relief valve and a down cycle pressure gauge. Beginning in early 2007, the Model DBML-60/80 tool is supplied with the Model 20A two stage hand pump. Prior to this date, the Model 12A single stage pump was used. The pressure relief valve is factory set at 3750 psig. The pump oil reservoir contains sufficient make-up oil using ISO-32 hydraulic oil of SUS 159 viscosity. On pumps prior to Serial Number 98J011-11 dated September 1998, a hex plug on the filler breather cap should be opened and the oil level checked at 1/4" - 1/2" from the top. Replace the hex plug and leave loosened about three turns for air breathing.

On pumps after Serial Number 98J011-11 (Sept. 1998) an automatic venting and pressure release cap has been designed to eliminate the need of loosening the plug for breathing. Also, the knurled filler plug has an oil level gauge that should indicate an oil level between the index grooves. The red knurled plug should be replaced finger tight—do not use a wrench.

Two non-conductive 5000 psig working pressure hoses and hi-flow pressurized quick disconnect couplings complete the circuit between the squeeze tool and pump. Quick disconnect couplings complete the circuit between the squeeze tool and pump. The cylinder is double acting and requires pumping for squeeze-off (**DOWN**) and retraction (**UP**). A cylinder locking valve holds the cylinder in the squeeze-off position and will not release until hydraulic pressure is applied in the retract (**UP**) mode.

The following procedure is recommended before a “live” squeeze is first performed

1. Pump & Hose Assembly

Inspect the pump for damage to the pump components and pressure gauge.

On pumps having a red knurled plug, the oil level is checked using the oil level gauge and the plug replaced finger tight. See Fig. 1

On pre-98 pumps remove the hex filler/breather nut and maintain the oil level 1/4” to 1/2” from the top. Replace the hex plug and leave loose by two or three turns.

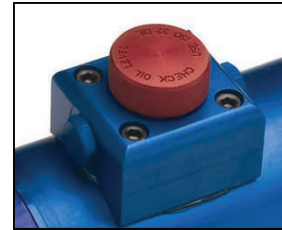
Inspect the 20 ft. hose assembly for surface damage such as cuts, crimps and evidence of abuse. Both hoses are rated for 5000 psig. working pressure and are non-conductive.

Operation of the pump-hose assembly can be checked before attempting a squeeze-off by pressurizing as follows:

- Couple the hoses together and pump several strokes to purge air from the system.
- Un-couple the hoses and screw the dust cap and plug onto their respective couplings. **DO NOT** pressurize the couplings without covering the disconnects openings. If the ball became un-lodged from the coupling body, the results could be fatal. Always direct the hose ends away from personnel.
- Place the 4-way directional control valve in the “DOWN” position and pump until the gauge needle is in the green arc to 3750 psig. maximum.

A constant firm force should be required on the pump handle through out pressurization.

If a spongy or intermittent pumping force is experienced, check the oil level and be sure the **AIR VENT IS OPEN!**



1998– To Present Design

2. Inspect Pump & Squeeze Tool

Inspect the squeeze tool for damage and the hydraulic cylinder-quick disconnect assembly for leaks and cleanliness. Confirm that the lower jaw has the proper gap stops for the PE pipe to be squeezed-off and the upper jaw pivots freely on the cylinder extension shaft. Proceed with the checkout as follows:

- Couple the hoses to the squeeze tool adapter block making sure the threaded sleeves are securely coupled and have been screwed on up to the shoulder. Failure to properly couple the quick disconnects will result in tool operation failure due to blocked oil flow. See Fig. 2
- **REMOVE THE LOWER JAW: DO NOT PRESSURIZE WITH LOWER AND UPPER JAWS IN CONTACT WITH THE GAP STOPS.** Failure to removing the lower jaw could result in a bent upper jaw and possible damage to the gap stop.
- With the 4-way directional control valve in the “DOWN” position, pump the tool through its complete stroke. Pressurize until the gauge needle is in the green arc (3750 psig). Release the pressure by moving the 4-way valve handle “UP” and confirm that the upper jaw has remained in the down and locked position. Continue pumping in the “UP” or retract mode until the locking valve opens and the upper jaw is completely retracted. Any air in the system will be purged upon completion of both cycles.
- A unique feature of the Mustang Hydraulic Squeeze Tool is the pilot operated cylinder-locking valve. This locking valve prevents any loss of hydraulic cylinder pressure on the “DOWN” cycle due to a ruptured hose, accidentally opening the 4-way valve or any loss of pressure during the squeeze-off. After squeeze off has been accomplished, the cylinder remain locked until a retraction or “UP” pressure of 1000-2000

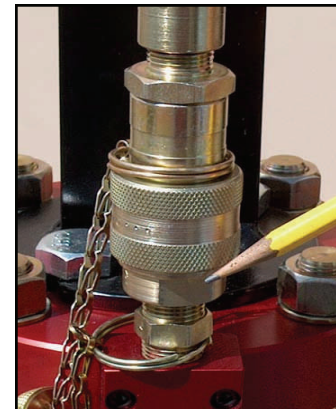


Fig. 2
Quick Disconnect

psig opens the locking valve. A definite release or opening of the valve will be observed and normal pumping will retract the upper jaw to the full open position.

- The squeeze tool and pump assembly is ready for the squeeze-off procedure.

3. Squeeze-Off Procedure

1. Before positioning the squeeze tool on the PE pipe, we recommend a static grounding device be used prior to the tool contacting the pipe surface. Observe your company policy concerning static electric discharge at this phase of the operation.

2. Position the squeeze tool over the pipe. If the tool must be lowered into the trench or bell hole, a sling can be attached to the lifting eye— **DO NOT** fabricate a lifting eye using the hydraulic cylinder cap tie rod nut. The tie rods are factory torqued and any loosening or modifying of the cap or tie rod nuts could result in failure of the cylinder.

3. Insert the lower jaw with the correct gap stops between the upper and lower jaw. The lower jaw cross bar should be contacting the frame thus assuring correct positioning of the stops in relation to the upper jaw. See Fig. 3



Fig. 3

4. Center and square the tool on the pipe and start the squeeze-off. The Model 20A pump is a two stage unit that features a large piston to move the upper jaw into position and a small piston to provide the actual squeeze off pressure, while maintaining a reasonable handle effort. The large piston is identified by an orange colored decal and corresponding orange color band on the gauge. It is important to limit the operation of this large piston to the corresponding pressure range shown on the gauge. Once the pressure has reached the top of the orange arc (approx. 1000 psi) move the smaller (green) piston to fully pressurize and complete the squeeze.

Note if the upper jaw is other than horizontal after contacting the pipe. Pump the tool until the upper jaw has compressed the pipe about 10-15%. The upper and lower jaws should be parallel within 3/8" to 1/2" of slope. If the parallelisms is beyond this range, retract the jaw and reposition the tool



Fig. 4

To compensate and re-squeeze. All pipe has a certain amount of ovality and variation of wall thickness. The hydraulic pressure senses these non-conformities and takes the path of least resistance— See. Fig. 4.

5. Continue pumping until the relief pressure of 3750 psig has been obtained. Squeeze-off usually is accomplished before the upper jaw contacts the gap stops. Allow one minute per pipe diameter-inch for cold flow to stabilize. Double this time factor for below freezing temperatures. Usually a pressure drop will accompany the cold flow process. Re-pump to 3750 psig and maintain.

6. Upon completion of the squeeze-off, the saddle clamps should be installed. The clamps are two pieces, the bottom part has two threaded high-strength bolts and a "window" permitting access for the gap stops on the underside of the lower jaw. Insert the bottom half horizontally under the lower jaw and lift up to the vertical once in place. The bottom halves should be positioned near the lower jaw support blocks thus not interfering with the pipe

Place the clamp upper half over the bolts. Each bolt has a thrust bearing-washer and 1 1/8" hex nut assembly. The thrust bearing surface with the retainer ring showing is the top area that is acted upon by the shoulder relief of the hex nut. Torque the four bolts evenly and with a circular pattern. See Fig. 6

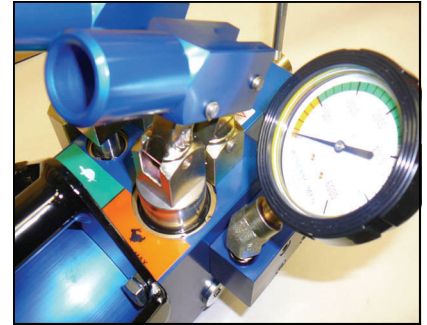


Fig. 5

7. The saddle clamp bolts should be tightened until a drop in hydraulic pressure is observed on the gauge. It is possible to exert a greater squeeze-off force with the clamps than can be achieved hydraulically. A pressure drop of 150-200 psig indicates the clamps have taken over!

Remove the clamps before releasing the hydraulic pressure. Fig. 6



Fig. 6

Supplementary Operations

PE pipe squeeze-off procedures vary considerably from user to user. Our recommended procedure is a guideline that is often modified by the user; the bottom line is to follow your company procedures and maintain safety at all times. Several supplemental operation hints are listed as an optional reference.

- **Using One Pump for Two Tools**

Using one hydraulic pump to operate two squeeze tools is not recommended, although this practice exists either by choice or chance. The reasons a single pump is not recommended include:

- * The volume of oil to compress pipe using two squeeze tools (dual feed system) is often greater than the oil available in a single pump reservoir. An incomplete squeeze-off using the second tool would result due to oil depletion.

- * Removing a pump from a squeeze tool basically makes that tool inoperative.

- * Two pumps with two squeeze tools is good insurance that you have a back-up if a pump failure occurs from damage or accident.

If it is necessary to use one pump on two tools the hoses should not be removed until the saddle clamps have been installed and torqued. Move the pump 4-way directional control valve to the “UP” position releasing pressure in the hose. Remove the hoses and attach the dust cap and plug to the tool quick disconnect.

Couple the pump/hose assembly to the second tool and determine the oil level visually. If the oil level is below the attach stay bolt centerline a good chance exists that insufficient oil will be available to complete the second squeeze-off. Any oil added will be lost upon retraction of both tools. The filler air vent plug must be open several turns for breathing and an avenue for the escaping excess oil. Failure to have this air vent plug open could allow the reservoir to be pressurized by the excess returning oil and blow the reservoir off the pump resulting in personal injury.

- **Squeeze Release Control Valve (Optional)**

An optional squeeze release control valve can be provided that permits slow, controlled release of the squeeze. The metering valve is installed on the retract circuit on the tool.

Several steps to follow include:

- * Open the release control valve prior to making the squeeze-off. Upon completing the squeeze-off, close the release control valve completely.

- * On squeeze release mode, move the 4-way directional control valve to “UP” and pump several strokes to open the cylinder locking valve. The saddle clamps should be removed at this point.

- * Slowly open the release control valve and observe the rate of retraction. A release rate of 1/2” for the first minute is often used. Once the retraction rate has stabilized, open the valve and pump the upper jaw to the full retract position.

- **Purging**

If controlled purging of the pipe is desired, this can be accomplished effectively as follows:

- * Move the 4-way directional control valve to the “UP” or retract position. The saddle clamps should be left in position, torqued for complete squeeze-off.

- * Pump-retract the upper jaw until the cylinder locking valve releases about 6 or 8 strokes using the low-volume hi-pressure pump plunger.

- * Slowly, loosen the four saddle clamp nuts and control the purge leakage by the amount of clamp release.

- * Completely remove the saddle clamps before retracting the upper jaw to the full open position.

Disclaimer:

Due to the hazard potential of working on pipe under pressure the operator should be certified in company and industry training procedures. The end user of any squeeze tool is responsible for the manner in which the tool is used. This includes but not limited to knowledge of the pipe being squeezed, static electric discharge and maintenance of the equipment.

Negligence or disregard of safety and training can lead to pipe failure, property damage, personal injury or death.

Any concerns or questions regarding Mustang Squeeze Tools should be directed to your local distributor or call (775) 883-0732

Troubleshooting the DBML-60/80 Hyd. Squeeze Tool

Problem	Possible Cause	Remedy
Pump will not pressurize	- No oil/low oil level -Check valve (s) obstructed	<ul style="list-style-type: none"> • Fill to proper level • Remove & clean (call Factory for instructions)
Pump will build pressure but the handle “bounces back” after each stroke	-Obstructed “pressure” check valve	<ul style="list-style-type: none"> • Remove and clean check valve (pressure)
Pumping action feels “spongy” and pressure bleeds off quickly	-Air in system - Filler/Breather Hex plug not loosened for breathing (pre ‘98 models)	<ul style="list-style-type: none"> • Bleed system per operators manual • Loosen plug 1/2 to 1 turn
Pressure builds and stays but not at 3750 psi (either higher or lower)	-Faulty pressure relief valve	<ul style="list-style-type: none"> • Re-adjust or replace valve
Tool pumps down for squeeze off but will not retract	-Return line quick-disconnect not properly coupled	<ul style="list-style-type: none"> • Positively connect both quick disconnects as per operators manual
Tool will not work in either direction	-One or both quick disconnects not properly coupled	<ul style="list-style-type: none"> • Positively connect both quick disconnects as per operators manual
After squeeze-off when retracting tool, upper jaw immediately “jumps” up when pump shifted from “down” to “up”	-Faulty or blocked cylinder locking valve	<ul style="list-style-type: none"> • Remove & inspect/replace locking valve
Pump pressure bleeds off quickly (more than 1000 psi in one minute)	-Blocked or faulty check valve (s) -Oil leakage -Faulty Relief Valve	<ul style="list-style-type: none"> • Remove & inspect/clean check valves • Repair any leaks

NOTE: Care should be taken when removing/replacing internal components. O-ring seals can easily be damaged or cut .

NEVER remove any components while system is under pressure.

OPERATORS MANUAL



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MANUFACTURING**



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