

FLOW CONTROLS (ÁRAMLÁS SZABÁLYOZÓK)

CATALOGUE / KATALÓGUS

Producer/Gyártó:

LOG Oiltools Kft.

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Megnevezés: Flow_Controls

Azonosító: LOT-FC-HUN

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Lapszám: 1/56

LF TOP NO-GO AND SELECTIVE SEATING NIPPLES

DESCRIPTION

The LOG model LF Nipple provides a tubing lock profile with premium Unrestricted Seal Bore to locate wireline Flow Control Devices such as Velocity Safety Valves, Blanking Plugs, Chokes, Equalizing Check Valves and Instrument Hangers. Depending on the Seal Bore Size Selection and its Position in the completion, the LF nipple can accept Selective or Top No-Go locking devices attached to flow control accessories.

FEATURES

1. Any number of model LF nipples with the Same Size Seal Bore can be installed in the tubing string to accept flow control devices equipped with Selective Locks.
2. Micro-honed Seal Bore provides an excellent sealing surface.
3. Manufactured for Standard, H₂S and H₂S-CO₂ service.
4. Teflon coated nipples are available for use in corrosive environments.

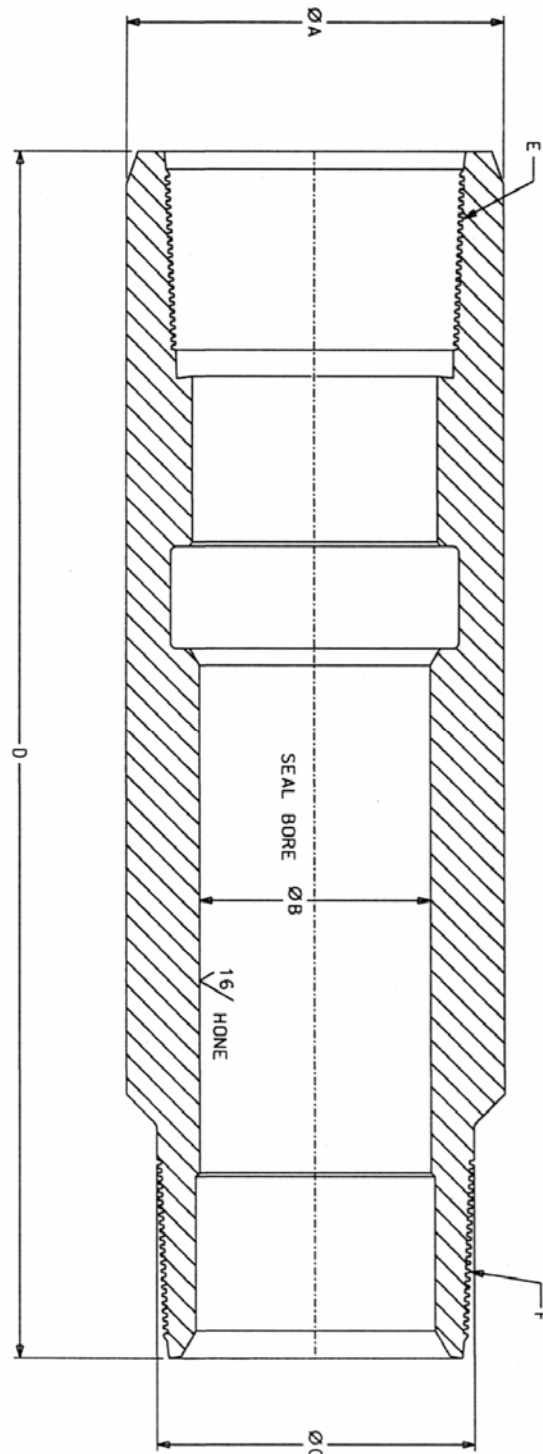
SPECIFICATIONS

TUBING OD-INCHES	NIPPLE			NIPPLE TYPE	
	SEAL BORE- INCHES	SIZE-INCHES	MIN. O.D. INCHES	SELECTIVE	TOP NO-GO
1.900	1.437	1.43	2.109	X	X
	1.500	1.50		X	-
2-1/16	1.562	1.56	2.250	X	X
	1.625	1.62		X	-
2-3/8	1.781	1.78	2.560	X	X
	1.812	1.81		X	X
	1.875	1.87		X	-
2-7/8	2.062	2.06	3.109	X	X
	2.250	2.25		X	X
	2.312	2.31		X	-
3-1/2	2.562	2.56	3.687	X	X
	2.750	2.75		X	X
	2.812	2.81		X	-
4-1/2	3.688	3.68	Coupling OD	X	X
	3.750	3.75		X	X
	3.812	3.81		X	-

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MODEL LA-3 SAFETY VALVE

DESCRIPTION

The LOG Model LA-3 Safety Valve is a wireline run sub surface controlled Sub Surface Safety Valve. The Safety Valve when equipped with a suitable Wireline Lock Mandrel and Equalizing Device can be run and set in a Nipple Profile in the well.

The well production flows through the Safety Valve internal diameter. The Valve's internal Orifice creates a pressure drop that places this force on the Safety Valve's Coil Spring. The force causes the Coil Spring to compress and the Orifice Housing will move upward and allow the Flapper to close. The Flapper and the Flapper Valve Seat form a metal to metal seal.

The Safety Valve closure will occur when the well flow rate exceeds the Valve's preset parameters. The well production will be interrupted until the differential pressure is equalized across the Flapper.

FEATURES AND BENEFITS

- The tool is easy to assemble and tool redress can be done in the field.
- Valve closure can be adjusted by varying spring compression, with the addition or removal of Spacer Rings and also by varying the Orifice size in the Valve.
- The Valve can be installed on a variety of Wireline Lock Mandrels.
- The Safety Valve can be run in existing completions without having to do a well workover.
- The Valve can be reset to the open position without having to pull the assembly from the well.

ORIFICE SIZE AVAILABILITY

2" LA-3 Safety Valve	2 1/2" LA-3 Safety Valve
0.062	0.062
0.125	0.125
0.187	0.187
0.250	0.250
0.312	0.312
0.375	0.375
0.437	0.437
0.500	0.500
0.562	0.562
0.625	0.625
0.687	0.687
-	0.750
-	0.812
-	0.875
-	0.938

In addition to the above standard sizes, the orifices are available in all 64th of an inch size within the range for the Safety Valve.

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SIZING THE SAFETY VALVE ORIFICE AND QUANTITY OF SPACERS

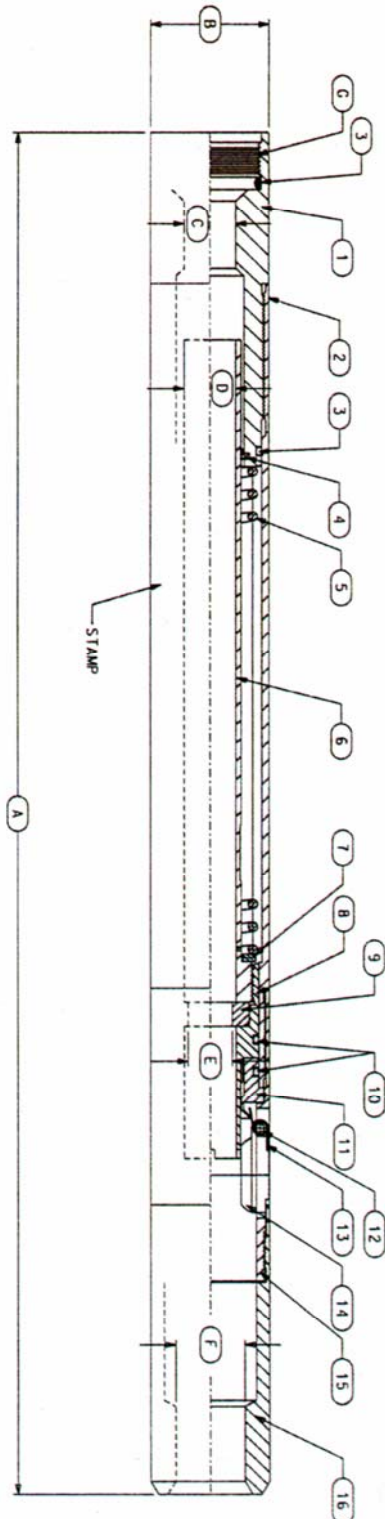
The calculations for determination of the correct size Orifice is complex and requires the data such as the Spring compressive strength, Orifice size, the quantity of Spacers utilized and up to date and accurate well information. Although calculations may be performed, some minor adjustments in the field may be necessary by selection of alternate Orifice sizes.

The Safety Valve should be set up so that the shut in rate is 1.25 times the desired normal production rate. Proper Orifice selection will ensure achieving the flow range that is required and the addition or removal of the Spacer Rings can fine tune the Safety Valve's closing rate.

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Item	Description	Qty
1	Top Sub	1
2	Spring Housing	1
3	O- ring	2
4	Seal Ring	1
5	Coil Spring	1
6	Spring Guide	1
7	Spacer Ring	3
8	Orifice Housing	1
9	Orifice	1
10	O- ring	2
11	Flapper Valve Seat	1
12	Flapper Valve Pin	1
13	Torsional Spring	1
14	Flapper	1
15	Flapper Valve Housing	1
16	Standard Guide	1

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LN LOCK MANDREL

DESCRIPTION

The LOG Model LN Lock Mandrel is designed to lock into LOG Model Top No-Go LF Nipples in the Tubing String. Downward load is held by a No-Go shoulder and upward load is held by collet style locking fingers. A large and smooth inside diameter makes this tool excellent for high volume completions. The LN Lock Mandrel can be run with standard running and pulling tools.

FEATURES

- Large flow area
- Simple and rugged design
- Standard running and pulling tools

RUNNING

The LOG Model LN Lock Mandrel is run with a LOG Model LC-1 Running Tool equipped with a LN-1 Running Shank on a Standard Wireline String.

1. Attach the appropriate LN-1 Running Shank to the LC-1 Running Tool and insert into the Lock Mandrel.
2. Apply downward pressure to compress the Lock's Spring then pin the Fishing Neck to the Running Tool in the upper set of holes. Insert a second set of Pins into the lower set of holes.
3. Run the Lock Mandrel in the Tubing until it locates the desired LF Nipple. Note: if the Lock Mandrel seems to locate the Nipple earlier than expected, it may be that the Lock's Collet Dogs have snapped into another recess in the Tubing. If this happens, lightly jar down to snap the Collet Dogs out of the recess.
4. Jar down to shear the upper Pins in the Running Tool.
5. Pull up to ensure that the Lock Mandrel has been set into the Nipple's Locking Groove then jar up to shear the second set of Pins in the Running Tool and to return to the surface.

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PULLING

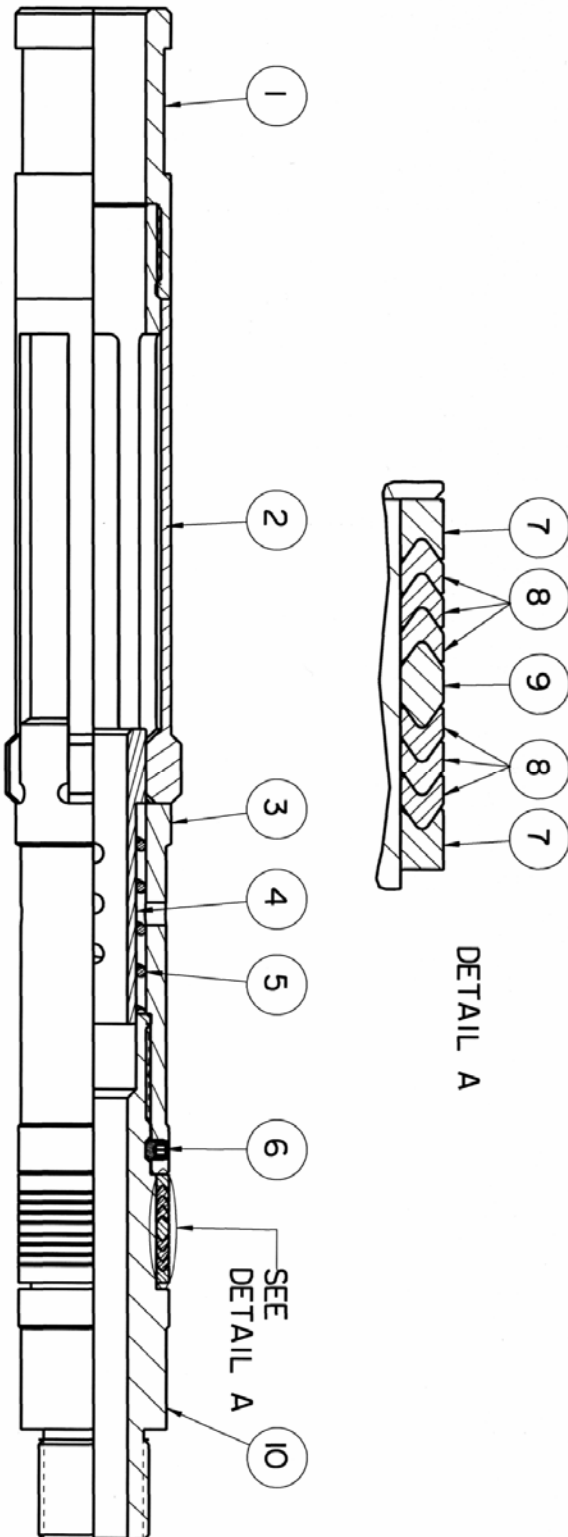
The LOG Model LN Lock Mandrel is pulled with a standard LJD Style Pulling Tool equipped with an appropriate LN-1 Pulling Probe on a Standard Wireline String.

1. Attach the LN-1 Pulling Probe to the LJD Pulling Tool and run in the well until the Lock Mandrel is located. Note: use caution and follow appropriate equalization procedures before proceeding beyond this point.
2. Jar down to grab the Lock's Fishing Neck and to push the Lock's Plunger down with the Probe allowing the Collet Dogs to collapse.
3. The Lock Mandrel can now be pulled to the surface. Note: the Lock's Collet Dogs may snap into recesses on the inside diameter of the tubing. If this occurs, continue to pull up or lightly jar up then pull to the surface.

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Item	Description	Qty
1	Fish Neck	1
2	Collet	1
3	Mandrel	1
4	Plunger	1
5	Spring	1
6	Set Screw	2
7	Female Adaptor	2
8	Packing Ring	6
9	Male Adaptor	1
10	Packing Mandrel	1

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LB EQUALIZING SUB ASSEMBLY

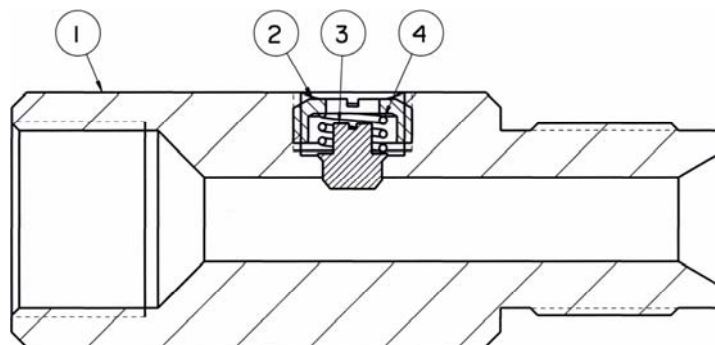
DESCRIPTION

The LB Equalizing Sub Assembly allows pressure equalization between a mandrel's outside and inside diameters. This assembly, used in conjunction with a lock, allows fluid bypass during running and/or pulling of a flow control accessory reducing or removing hydraulic effects.

The LB Equalizing Sub Assembly consists of a mandrel body and a side located spring-loaded plug that opens with an appropriate sized prong. Inserting a running or pulling prong through the inside diameter of the LB Equalizing Sub presses on the spring-loaded dart and lifts it off its seat thereby opening the port. Removing the prong closes the port via the spring and a metal-to-metal seal.

SPECIFICATIONS

SIZE (INCH)	O.D. (INCH)	I.D. (INCH)	THREAD (INCH - TPI)
2	1.750	0.531	1 3/16-14
2 1/2	2.150	0.719	1 9/16-12
3	2.625	1.156	2-12



Item	Description	Qty
1	Body	1
2	Cap	1
3	Dart	1
4	Spring	1

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LKBMG SIDE POCKET MANDREL

DESCRIPTION

LKBMG Side Pocket Mandrels are installed in the Tubing String and are used to accept 1” retrievable valves for use in Gas Lift and other Subsurface Control operations. Valves are set and pulled using an LOK-5 Kickover Tool on a Standard Wireline String.

FEATURES

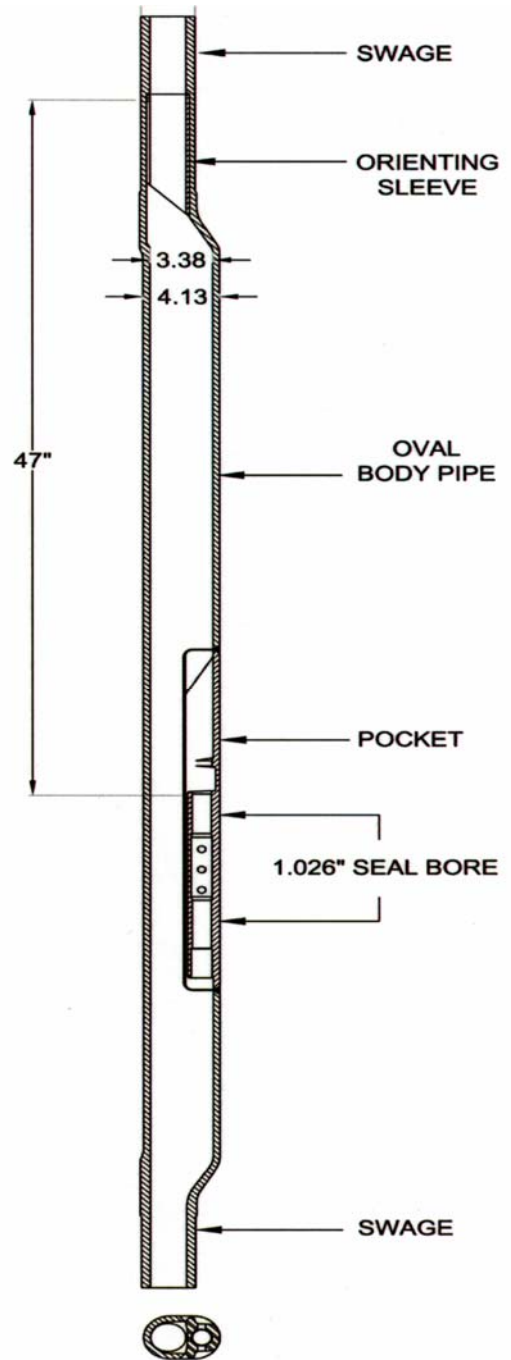
1. Integral guide or orienting sleeve, which rotates the Kickover Tool so that it orients it with the Mandrel pocket.
2. Accepts a variety of 1” valves.

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2 3/8" LKBMG Side Pocket Mandrel



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WIRELINE RETRIEVABLE SPRING LOADED CHEMICAL INJECTION VALVE

DESCRIPTION

The Wireline Retrievable Spring Loaded Chemical Injection Valve is a 1 in. O.D. valve used to control the amount of chemicals or fluids injected into the tubing to control corrosion in wells, treat paraffin, salt and/or hydrate formation. This valve is compatible with other manufacturers' side pocket mandrels.

The valve is designed with an inconel spring which provides the closing force of the valve and allows for setting operating differential pressures up to 4000 psi. The spring controlled test rack opening pressure is easily adjusted from outside of the valve without the need of disassembly. The spring loaded operation of the valve allows accurate function regardless of well temperature.

The Spring Loaded Chemical Injection Valve consists of a seat housing, spring and spring housing, setting and locking screw, stem with tungsten carbide ball, adapter and check housing with reverse flow check dart. The valve is available in either stainless steel or nickel alloys for corrosion resistance in wells with high concentrations of H₂S or CO₂. Packing and elastomeric materials for the valve are available for standard service or special service to suit individual well conditions.

FEATURES

- Tungsten Carbide ball and seat.
- Integral reverse flow check valve.
- Inconel spring.

OPERATION

The Spring (Item 6) is compressed to a predetermined test rack opening pressure and an appropriate top mounted latch is threaded to the top of the valve. This assembly is then installed into a side pocket mandrel using standard wireline tools and methods.

When the valve has been installed in the mandrel pocket, the tubing is isolated from the chemical injection/fluid line by the valve's two sets of packing located above and below the mandrel's injection port.

During operation, the operator can control chemical/fluid flow into the tubing at valve depth. Chemical/fluid volumes, cycles and pressures can be regulated by the operator from the surface. Chemical/fluid can enter through the injection port in the side pocket mandrel from the chemical injection line connected to a chemical injection (CI) side pocket mandrel. This chemical/fluid then enters through the ports in the valve that is located in the seat housing between the two sets of packing and then into the bottom of the seat. Production fluid pressure enters the valve through the Check Housing (Item 17). When the combined pressure of the produced fluid and spring force are overcome by the chemical/fluid hydrostatic head pressure and hydraulic pressure

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from the surface pump, the Spring (Item 6) is further compressed and the Valve Stem (Item 5) and Ball (Item 4) are pushed off the Valve Seat (Item 3) thereby opening the valve.

The chemical/fluid flows down through the Seat (Item 3) and around the Ball (Item 4), down through the center of the Stem (Item 5), through the Check Adapter (Item 12), past the reverse flow Check Dart (Item 15), through the Check Housing (Item 17) and into the Tubing. When the chemical/fluid pressure drops below the spring force, the Spring (Item 6) extends, causing the Ball (Item 4) to engage the Seat (Item 3) and close the valve.

The equation for calculating the surface setting pressure of the Spring Loaded Chemical Injection Valve is:

$$TRO = P_{csg} - P_{tbg} + P_s$$

Where:

TRO = Test Rack Opening Pressure

P_{csg} = Hydrostatic Pressure of Injected Chemical/Fluids at Valve Depth

P_{tbg} = Flowing Tubing Pressure at Valve Depth

P_s = Desired Surface Injection Pump Pressure

The desired surface chemical injection pressure is selected based on the pressure capabilities of the injection pump and on the accuracy of the flowing tubing pressure at valve depth. Once the valve has been set and installed in the well, the surface chemical injection pressure will vary directly with the flowing tubing pressure at valve depth. If the flowing tubing pressure increases, the surface injection pressure will increase by the same amount. Similarly, if the flowing tubing pressure decreases, the surface injection pressure will decrease by the same amount. Therefore, a desired surface chemical injection pressure must be selected to allow a certain amount of latitude, either above or below the desired pressure, so that the surface injection pressure does not become excessive for the system nor does it become a negative value allowing the hydrostatic head of the injection fluids to open the valve. If the flowing tubing pressure at the valve is expected to decrease with time, a relatively high desired surface injection pressure should be selected. If the calculated setting pressure of the valve (TRO) is less than 500 psi, the valve should be set at 500 psi and the required surface pump pressure should be calculated.

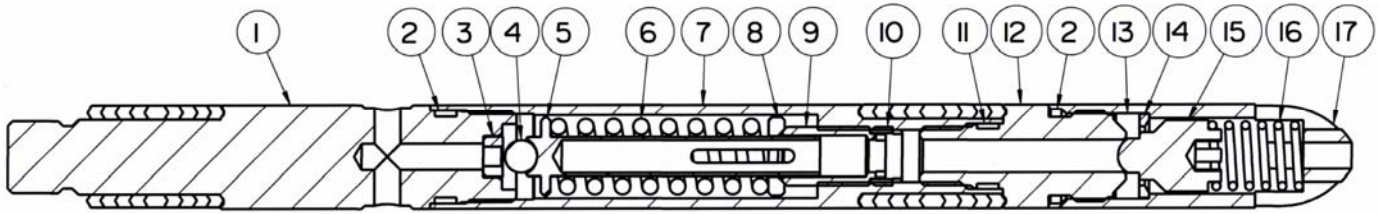
Reverse flow through the valve is prevented by the reverse flow Check Dart (Item 15) in the valve's Check Housing (Item 17). The Check Dart (Item 15) seats against a fixed elastomeric primary seal, the Check Washer (Item 14), with a metal to metal secondary seal.

The Spring Loaded Chemical Injection Valve is available with Ball (Item 4) and Seat (Item 3) size of 1/8 and 3/16 inch.

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Item	Description	Qty
1	Seat Housing	1
2	O- ring	2
3	Carbide Insert	1
4	Carbide Ball	1
5	Valve Stem	1
6	Spring	1
7	Spring Housing	1
8	Spring Washer	1
9	Setting Screw	1
10	Lock Screw	1
11	O- ring	1
12	Check Adapter	1
13	Check Gasket	1
14	Check Washer	1
15	Check Dart	1
16	Check Spring	1
17	Check Housing	1

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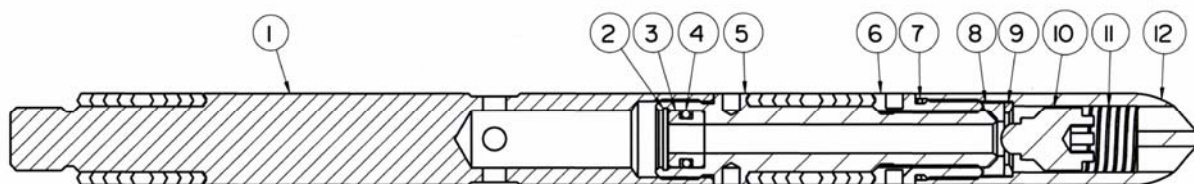
LDKO-2 ORIFICE GAS LIFT VALVE C/W TOP LATCH

DESCRIPTION

The LDKO-2 Equivalent Orifice Gas Lift Valve is a 1" single point injection valve with a top latch used for continuous flow gas lift production. An internal orifice controls the volume of gas through the open valve into the production tubing. A spring loaded reverse flow check valve is incorporated as an integral part of this valve. A feature of the design is a replaceable floating orifice. The LDKO-2 Orifice Gas Lift Valve is typically made up with an LBK series latch and installed in a K series mandrel.

SPECIFICATIONS

- Valve O.D.: 1 in.
- Overall Length: 13.000 in.
- Max Port Size: 0.312 in.
- Latch Type: LBK-2
- Orifice sizes: 1/8, 3/16, 1/4, 5/16, 3/8 in.
- Material: Stainless Steel, NACE as per MR-01-75
- Temperature Rating: 250 degrees F Standard Service



Item	Description	Qty
1	Orifice Top	1
2	Retainer Ring	1
3	Seat	1
4	O- ring	1
5	Seat Housing	1
6	Packing Retainer	1
7	O- ring	1
8	Check Gasket	1
9	Check Washer	1
10	Check Dart	1
11	Check Spring	1
12	Check Housing	1

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LDKO-2 ORIFICE GAS LIFT VALVE C/W BOTTOM LATCH

DESCRIPTION

The LDKO-2 Orifice Gas Lift Valve is a 1 in. single point injection valve with integral bottom latch used for continuous flow gas lift production. An internal orifice controls the volume of gas through the open valve into the production tubing. A reverse flow check valve is incorporated as an integral part of this valve. A feature of the design is a replaceable floating orifice. The LDKO Orifice Gas Lift Valve is typically made up with an LBK series latch and installed in a K series mandrel.

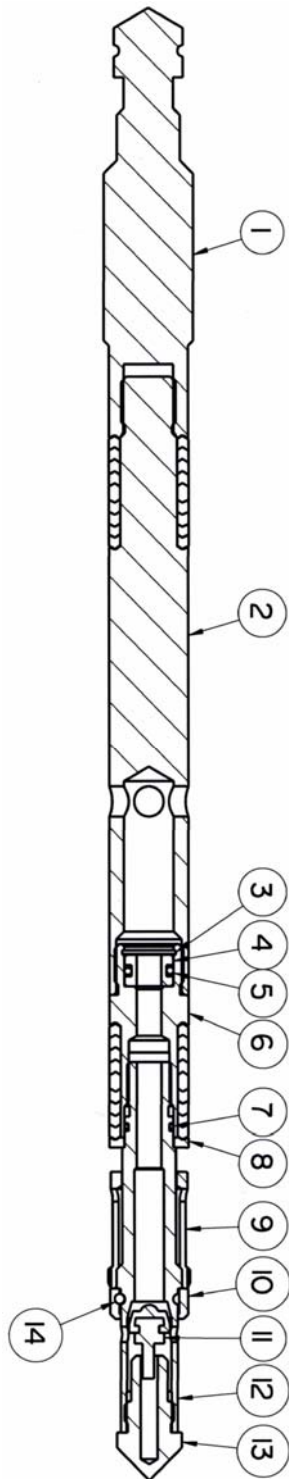
SPECIFICATIONS

- Valve O.D.: 1 in.
- Overall Length: 17.900 in.
- Latch Type: Bottom Latch
- Running Tool: 'GA-2' y
- Pulling Tool: 1 1/4 in. LJDC
- Orifice sizes: 1/8, 3/16, 1/4 in.
- Material: Stainless Steel, NACE as per MR-01-75
- Temperature Rating: 250 degrees F Standard Service

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Item	Description	Qty
1	Running Head	1
2	Orifice Top	1
3	Retainer Ring	1
4	Seat	1
5	O- ring	1
6	Seat Housing	1
7	O- ring	1
8	Packing Ring	1
9	Collet	1
10	Shear Ring	1
11	Check Drop	1
12	Check Body	1
13	Nose	1
14	Shear Pin	1

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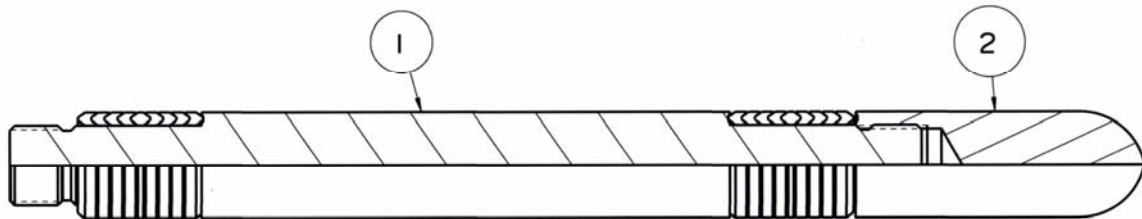
LE DUMMY VALVE

DESCRIPTION

The LE Dummy Valve is a 1" retrievable dummy valve that is typically installed in a K series Side Pocket Mandrels with using a LBK series Latch. This valve blocks communication between the Tubing inside diameter and the annulus by sealing off the Side Pocket Mandrel's ports.

SPECIFICATIONS

- Valve O.D.: 1 in.
- Overall Length: 13.00 in.
- Latch Type: BK
- Running Tool: 1 5/16 in. JK
- Pulling Tool: 1 1/4 in. LJDC
- Material: Stainless Steel Standard/NACE as per MR-01-75
- Temperature Rating: 250 degrees F Standard Service



Item	Description	Qty
1	Body	1
2	Nose	1

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LBK-2 LATCH

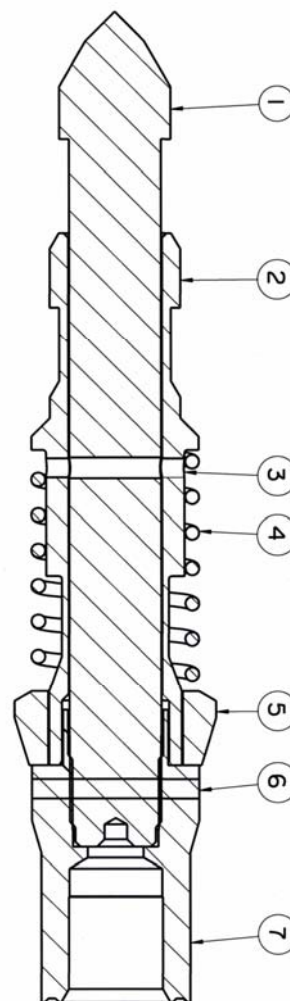
DESCRIPTION

The LBK-2 Latch is used for locking in a KBM series Side Pocket Mandrel. The LBK-2 latch can be used with all 1 inch O.D. retrievable gas lift valves, dummy valves, orifice valves and chemical injection valves that are designed with a top-latch configuration.

SPECIFICATIONS

- Overall Length: 6.68 in.
- Outside Diameter: 1 in.
- Connecting Thread: 011/16 - 16 TPI UNS
- Running Tool: LJK
- Pulling Tool: 1 1/4" LJDC

Item	Description	Qty
1	Post	1
2	Body	1
3	Shear Pin	1
4	Spring	1
5	Ring	1
6	Roll Pin	1
7	Stop	1



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LGL SLIDING SLEEVES

DESCRIPTION

The LOG Model LGL Sliding Sleeve is installed in the production tubing string to allow Selective Communication between the tubing string and the annulus by Shifting an Internal Sleeve with standard wireline methods. Being a versatile design, the Model LGL Sliding Sleeve can function in Top No-Go and Selective seating systems while behaving like a Ported or a Non-Ported Seating Nipple.

FEATURES

1. Closing Sleeve Seals - The internal Closing Sleeve Seals are of special design to accommodate seal expansion, to allow pressure bleed off between the Closing Sleeve and the Outer Housing and to allow opening with moderate force even against severe pressure differential.
2. Collet Lock on Closing Sleeve - Spreads the shifting force uniformly in the locking groove and prevents jamming due to solids.
3. Closing Sleeve Skirt - Places the shifting tool's engaging members below the flow path thus preventing the wireline string from being blown up the tubing when opening.
4. Seal Bores - The Upper Sub, Lower Sub and Outer Housing are manufactured with Micro-honed Seal Bores for maximum sealing performance.
5. Integral Locking Groove
6. Recourse - If for some reason the Closing Sleeve cannot be closed, the ports can be blanked off with the use of a flow control accessory.
7. Versatility - The LGL Sliding Sleeve has a LF nipple profile in the Upper Sub to accept Selective or Top No-Go style Flow Control Equipment. The Lower Sub also has a honed seal bore. With these two seal bores it is possible to either seal off the sleeve ports and allow communication from below, or seal off from below and allow production through the sleeve ports.
8. Material Selection - The LGL Sliding Sleeve is manufactured for Standard, H₂S and H₂S-CO₂ service.

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LICENCED UNDER API SPEC 6D-0743: 602-0001: 11D1-0017

SPECIFICATIONS

TUBING OD INCH	SLIDING SLEEVE		
	SEAL BORE INCH	SIZE INCH	OD INCH
1.900	1.437	1.43	2.375
	1.500	1.50	
2-1/16	1.562	1.56	2.500
	1.625	1.62	
2-3/8	1.781	1.78	2.910
	1.812	1.81	
	1.875	1.87	
2-7/8	2.250	2.25	3.410
	2.312	2.31	
3-1/2	2.750	2.75	4.500
	2.812	2.81	
4-1/2	3.688	3.68	5.500
	3.812	3.81	

SHIFTING

The LGL Sliding Sleeve can be shifted with most standard shifting tools although the LOG Model LD-2 Shifting Tool is specifically designed for the LGL Sliding Sleeve to provide safe, selective and controlled shifts.

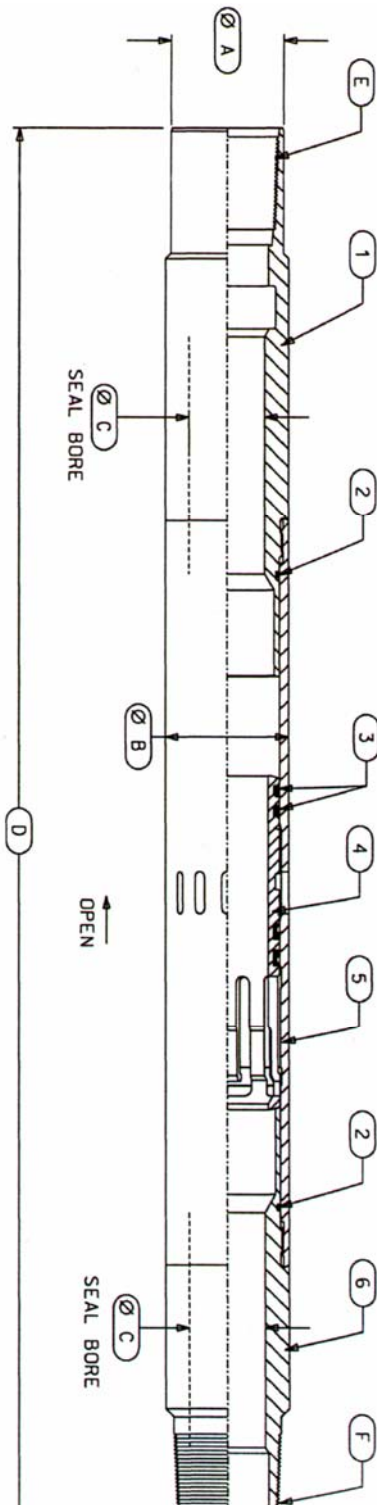
The LD-2 Shifting Tool selectively locates, shifts and indicates all LGL Sliding Sleeves (of one size) in the Tubing String. Shifts are made to prevent seal damage and to prevent the Wireline String from being blown up the tubing.

Please refer to the LD-2 Shifting Tool technical guide for more specific details on the LD-2 Shifting Tool.

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Item	Description	Qty
1	Top Sub	1
2	O- ring	2
3	Seal Ring	2
4	Closing Sleeve	1
5	Seal Housing	1
6	Bottom Sub	1

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LFL ON-OFF CONNECTOR

DESCRIPTION

The LFL & LFR On-Off Connector is run above any packer, which does not require tension or compression to remain set.

The connector provides a means of disconnecting the tubing from the packer using a Left or Right Hand J-slot Release.

A Plugging Device may be run into the Nipple Profile incorporated into the Slick Joint to provide complete well control during any work-over operation.

FEATURES/BENEFITS

- The Seal Nipple has a polished outer sealing surface.
- Two rugged external lugs for latch-up.
- The Running Overshot contains a bonded seal for sealing to the seal nipple and an internal jay slot to latch onto external lugs.
- The tool can either be set in a shear up or shear down position.
- Optional left or right hand jay release.
- Multi-use Bonded Seal allows multiple connections with repeatable pressure integrity.
- Safe running through the use of shear pins to prevent accidental disconnects while running.
- Pressure rated at 6,000 PSI internal and 8,000 PSI external.

OPERATION

Shear pin the overshot to the seal nipple in either the up or down shear position. The shear value may be varied by changing the number of shear screws. Caution should be taken when setting the shear value for set down release. In deep hole applications, it may not be possible to get enough weight downhole to shear the pins.

Make up the nipple and overshot on the top of the packer and run to setting depth. Set the packer and shear the pins. Set a plug if desired. Rotate to the left and un-jay from the seal nipple.

Re-engage tubing to seal nipple by rotating to wash down if necessary. Discontinue rotation before contacting nipple to avoid damaging jay pins. Setting down on the seal nipple will automatically engage the jay pins in the jay slots. Pick backup to confirm locking.

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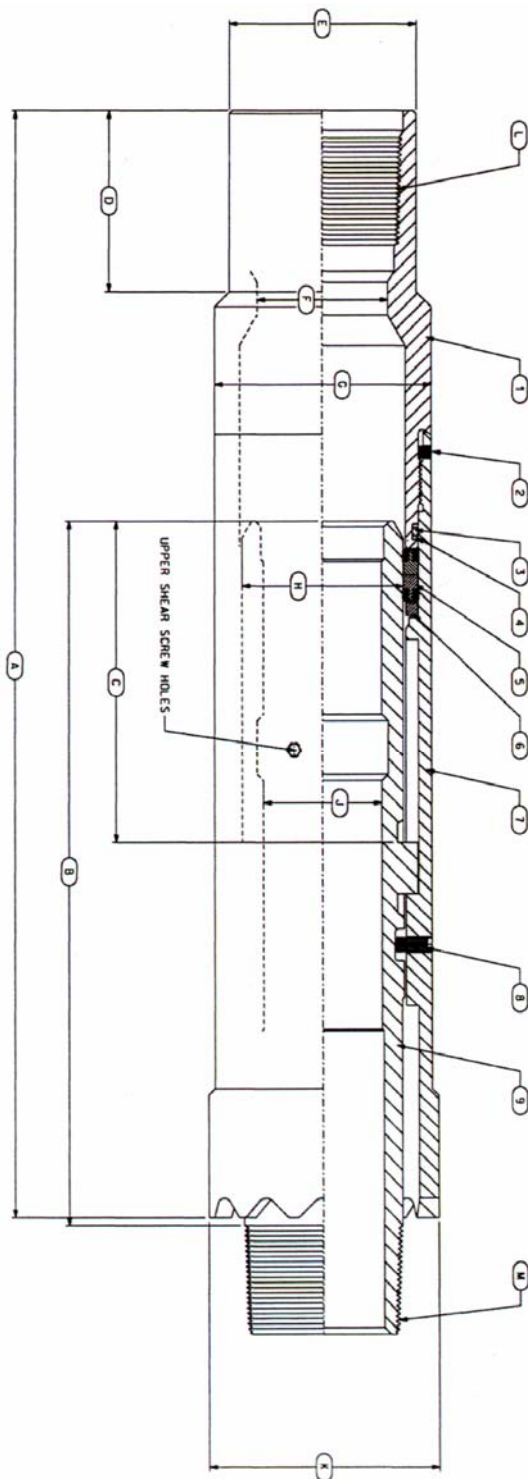
SPECIFICATION

CASING	TUBING	SKIRT OD x TUBING THREAD	SKIRT OD INCH	MAX. PROFILE BORE SIZE INCH	PRESSURE RATING		STANDARD THREAD SPECS (BOX UP & PIN DOWN) SIZE INCH	
					INTERNAL PSI	EXTERNAL PSI		
4 1/2 5	23/8 & smaller	3 3/4 X 23/8	3.75	1.875	6,000	8,000	2 3/8 OD EU 8 RD	
5 1/2	23/8	4 1/2 x 2 3/8	4.50	2.312				
6 65/8	27/8 & smaller	4 1/2 x 27/8					5.50	1.875
7 OR 75/8	23/8	5 1/2 x 23/8	2.312	2 3/8 OD EU 8 RD				
	27/8 & smaller	5 1/2 x 27/8		2 7/8 OD EU 8 RD				
8 5/8	27/8 & smaller	3 1/2 & smaller	5 1/2 x 3 1/2	2.812			3 1/2 OD EU 8 RD	
		6 1/2 x 2 7/8	6.50	2.312			2 7/8 OD EU 8 RD	
	7 1/4 x 27/8	7.25						
	3 1/2 & smaller	6 1/2 x 3 1/2	6.50	2.812			3 1/2 OD EU 8 RD	
7 1/4 x 3 1/2		7.25						

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Item	Description	Qty
1	Top Sub	1
2	Set Screw	2
3	O- ring	1
4	Back-up Ring	2
5	Bonded Seal	2
6	Back-up Ring	1
7	J-slot Housing	1
8	Shear Screw	4
9	Seal Nipple	1

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LFWG BOTTOM BYPASS BLANKING PLUGS

The LOG Model LFWG Bypass Blanking Plugs are wireline run and retrieved Blanking Plugs that hold pressure from above and below when installed into a tubing mounted Nipple Profile.

These Plugs are run in the well for well control during well workovers, to snub tubing in and out of the well, to pressure test the tubing, or to set a Hydraulic Set Packer, and for separating producing zones to prevent commingling and cross flow.

The LFSG Bypass Blanking Plug is designed to set in a LOG Model LF Nipple Profile. It can be run selectively in wells where there are more than one of the same size seal bore LF Nipple Profiles in the well. This Plug can also be run with a Locator Ring on the LC-1 Running Tool to positively locate the upper most LF Nipple of a particular size in the well.

The LFWG Bypass Blanking Plug is a Top No-Go Blanking Plug that is set in a LOG Model LF Nipple Profile. The No-Go on the Lock Mandrel locates and shoulders on the LF Nipple Seal Bore. The plug can be ordered for Standard Service, H₂S and H₂S-CO₂ service.

FEATURES:

- The Plugs have a bypass feature in the running mode to allow fluid bypass while running the Plugs into the various nipple profiles.
- The Plugs can be run and set in the Nipple with one wireline trip into the well. This reduces the amount of time required to run and set the plug. This also ensures that any settling debris in the well completion fluids does not impede the pressure isolation when the Plug is set.
- The pressure differential can be equalized from above and below the Plug by pulling the Plug Equalizing Mandrel. When the pressures have equalized, the Lock Mandrel and Plug Bottom can be retrieved from the well.
- With the availability of various size seal bores in the LF nipples, the well completion can be designed to allow for a tapered Nipple System that allows positive locating of the Nipple Profiles with the various types of Blanking Plugs.

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RUNNING AND SETTING THE LFWG BYPASS BLANKING PLUGS:

The LFWG Bypass Blanking Plugs are run on a LC-1 Running Tool. The LC-1 Running Tool is shear pinned with 2 Brass Shear Pins Below the Lock Mandrel Fish Neck and 1 Aluminum Shear Pin through the Equalizing Mandrel Fish Neck.

Jar the LFWG Bypass Blanking Plugs into the Nipple Profiles until they NoGo. The LFWG Bypass Blanking Plug will No-Go on the top of the LF Nipple Seal Bore.

Upward jarring will shear the two Brass Shear Pins that are attaching the LC-1 Running Tool to the Lock Mandrel Fish Neck allowing the LC-1 Running Tool to move upward and pull the Equalizing Mandrel and Equalizing Mandrel Fish Neck into the isolating position.

EQUALIZING THE LFWG BYPASS BLANKING PLUGS:

Run a proper size LJDC Pulling Tool in the well on a standard Wireline Tool String equipped with Hydraulic Jars. Jar down lightly to engage the Pulling Tool onto the Equalizing Mandrel Fish Neck. Care should be taken when equalizing the Bypass Blanking Plug especially if there is a large pressure differential from below the Plug.

Take a large upstrain on the Wireline Tool String and when the Hydraulic Jars fire, the internal Brass Shear Pin(s) in the Bypass Blanking Plug will shear and the Equalizing Mandrel and the Fish Neck can be retrieved from the well.

Allow adequate time for the pressures to equalize from above and below before retrieving the remaining Lock Mandrel and Plug Bottom.

PULLING THE LFWG BYPASS BLANKING PLUG LOCK MANDREL AND PLUG BOTTOM:

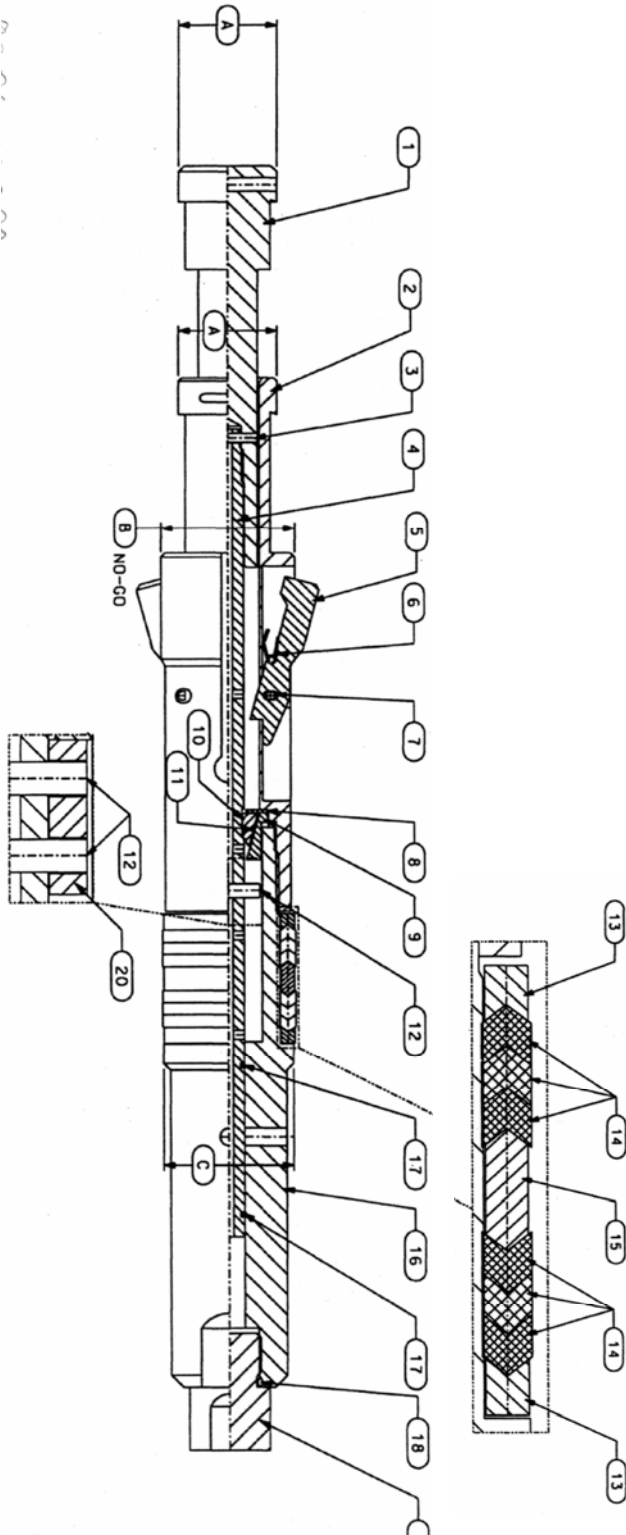
Run a proper size LJDC Pulling Tool equipped with a LB Probe in the well on a standard Wireline Tool String equipped with Hydraulic Jars. Jar down lightly to engage the Pulling Tool onto the Lock Mandrel Fish Neck. The LB Probe will collapse the up facing dogs.

Jar upward to remove the Lock Mandrel and Plug Bottom from the Nipple Profile.

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Item	Description	Qty
1	Fishing Neck	1
2	Lock Mandrel	1
3	Dowel Pin	1
4	Equalizing Mandrel	1
5	Locking Dog	2
6	Torque Spring	2
7	Dowel Pin	2
8	Washer	1
9	Stop Ring	1
10	Lock Ring Segment	2
11	O- ring	1
12	Shear Pin	1;2
13	Female Adapter	1
14	V- ring	6
15	Male Adapter	1
16	Bottom	1
17	O- ring	2
18	O- ring	1
19	Bottom Plug	1
20	Retainer Ring	1

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LFST CIRCULATING BOTTOM HOLE CHOKES

DESCRIPTION

These styles of chokes are run to restrict well fluid flow in the tubing. in addition they also allow unrestricted circulation down the tubing string when batching Chemicals downhole or during well killing operations. Standard wireline equipment is used to set and retrieve the chokes.

The Model LFST Choke is equipped with a Steel Flow Bean. Choke Bean size circulations can be performed upon request.

The LOG Model LFST Circulating Bottom Hole Chokes are manufactured for Standard, H₂S, and H₂S-CO₂ service.

APPLICATIONS

1. To prevent hydrate formation in upper tubing string and surface facilities.
2. To maintain a back pressure on the reservoir to reduce water or gas coning during production.
3. To reduce production and surface flowing pressures.
4. To reduce gas - oil ratios under certain conditions, by maintaining Bottom Hole flowing pressure above the Bubble Point Pressure.

RUNNING AND SETTING

The Model LFST Circulating Bottom Hole Chokes are run on a LC Running Tool with an appropriate LA Shank and LA Prong. These running accessories keep the down facing dogs of the Lock retracted and also allow maximum flow around the Choke Bean when running into the well. The LC Running tool is shear pinned with 2 Brass Shear Pins in the upper hole and below the Lock Mandrel Fish Neck.

When the Choke is run selectively, for example into a LF Nipple Profile that's below an upper LF Nipple with the same size seal bore, jar the Plug through the upper Nipple Profile. Then, jar the Plug through the second Nipple Profile. Care should be taken to not go lower than the next tubing connection. Pull the Plug back into the Nipple Profile. The up facing Dogs will engage into the LF Nipple Locking Groove. Upward jarring will shear the LC-1 Running Tool's Shear Pins freeing it from the Choke. The LC Running Tool can then be pulled to the surface.

Model LFST Circulating Bottom Hole Choke can also be run with a Locator Ring on the LC Running Tool if it is desirous to positively locate the first LF Nipple Seal Bore of a particular size. The Locator Ring positively locates the LF Nipple Seal Bore and upward jarring will pull the Choke into the LF Nipple Locking Groove. Further upward jarring will shear the LC Running Tool's Shear Pins freeing it from the Choke. The LC Running Tool can then be pulled to the surface.

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When the LA Shank is removed from the Lock Mandrel the downward facing dogs expand securing the Choke in the Nipple.

PULLING AND EQUALIZING

Run a proper size LJDC Pulling Tool in the well on a standard Wireline Tool String equipped with Hydraulic Jars.

For LFST Circulating Bottom Holes Chokes, attach an appropriate LA Probe and LA Prong to the down facing connection of Pulling Tool.

Run the Pulling Tool and accessories in the well and Jar down lightly to open the Choke Bean, to retract the Dogs and to engage the Pulling Tool onto the Lock Mandrel Fish Neck.

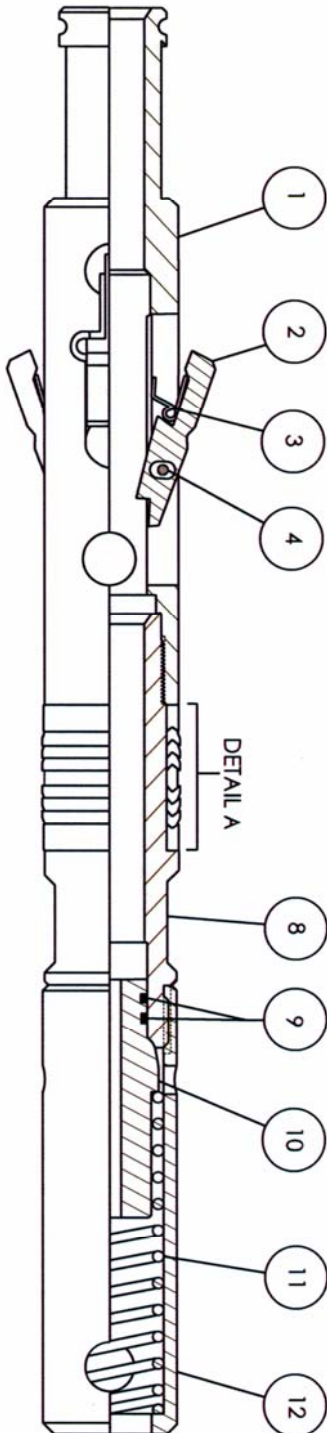
Allow adequate time for the pressures to equalize and then pull to the surface.

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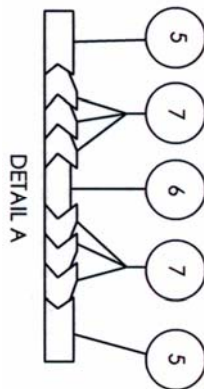


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LFST CIRCULATING BOTTOM HOLE CHOKE



Item	Description	Qty
1	Lock Mandrel	1
2	Dogs	4
3	Springs	4
4	Dowel Pins	4
5	Female Adapters	2
6	Double Male Adapter	1
7	Vee Packing	6
8	Packing Mandrel	1
9	O-ring	2
10	Choke Bean	1
11	Coil Spring	1
12	Flow Cage	1



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LFB-2 EQUALIZING CHECK VALVES

The Model LFB-2 Equalizing Check Valves are complete units, without any Locking Device. They are utilized in the following Tubing Mounted Equipment: LFB-2 - Run in all Model LF Nipples and all Model LGL Sliding Sleeves.

Both Models are run into a Nipple Profile and holds pressure from above only. The LFB-2 model lands on the top of a LF Nipple Profile Seal Bore.

A LC-1 Running Tool is used to run both valve assemblies.

Both models can be equalized prior to retrieval, by shifting open the Equalizing Mandrel Ports.

Standard Pulling Tools are used for retrieval of these valves.

The LFB-2 Equalizing Check Valves are manufactured for Standard, H₂S, and H₂S - CO₂ Service.

APPLICATIONS

- Can be used as a plug to pressure test tubing.
- To set hydraulically actuated packer with the Check Valve positioned below the packer.
- For Gas Lift operations.
- To be used as Standing Valve in wells which have down-hole electric pumps.

ORDERING INFORMATION

Please specify nipple model, seal bore size, check valve model, working pressure and temperature, and percentage of H₂S and CO₂.

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SPECIFICATIONS

TUBING NIPPLE ACCESSORY AVAILABILITY			MAXIMUM CHECK VALVE O.D.
TUBING SIZE (OD IN.)	NIPPLE SEAL BORE (ID IN.)	CHECK VALVE	
1.900	1.437	1.43	1.490
	1.500	1.50	1.552
2-1/16	1.562	1.56	1.615
	1.625	1.62	1.672
2-3/8	1.781	1.78	1.865(1)
	1.812	1.81	1.865
	1.875	1.87	1.905
2-7/8	2.250	2.25	2.302
	2.312	2.31	2.364
3-1/2	2.750	2.75	2.802
	2.812	2.81	2.865
4-1/2	3.688	3.68	3.740
	3.750	3.75	3.802
	3.812	3.81	3.875

RUNNING PROCEDURE

Pin the Check Valve in the Lower Shear Pin hole of the LC-1 Running Tool. Assemble Jars and Stem to the assembly and run in the hole to the Nipple. Jar the Check Valve into the Nipple until it shoulders against the No-Go Shoulder of the Nipple. Continue to Jar down to shear release the Running Tool, and then jar up leaving the Check Valve in the Nipple.

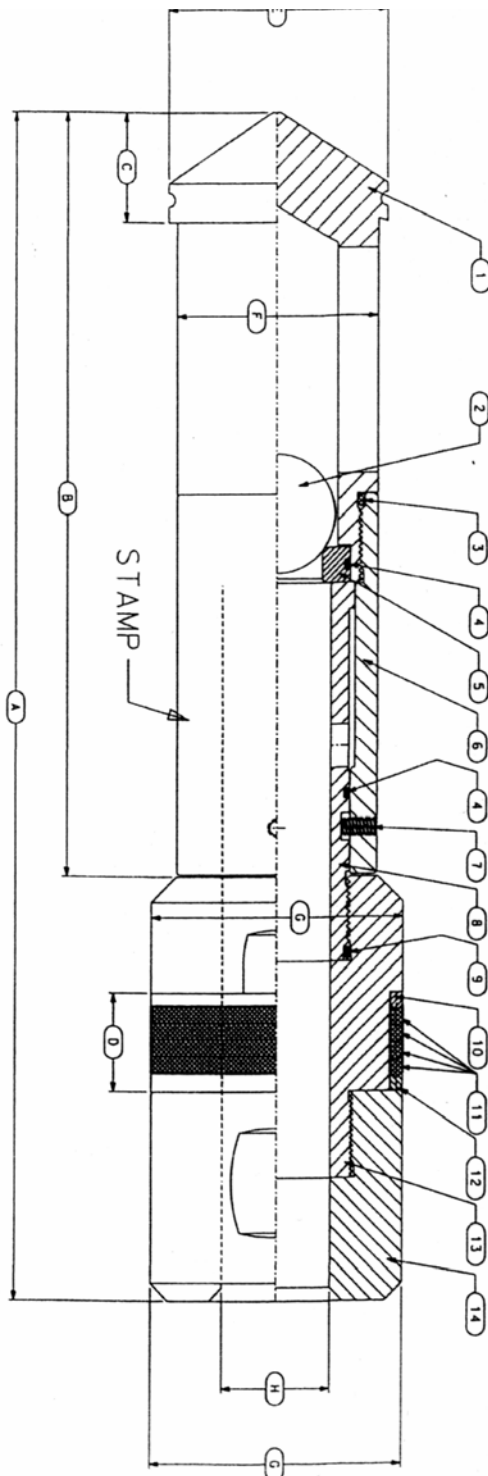
PULLING PROCEDURE

Run the specified Pulling Tool on wireline along with Jars and Stems to the Check Valve. Jar down to engage the Fishing Neck of the Check Valve, then jar up to shear the Brass Shear Screws in Check Valve shifting its Equalizing Sleeve up. Allow time for any pressure above the Check Valve to equalize, then jar the Valve from the Nipple and trip to surface.

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Item	Description	Qty
1	Fish Neck	1
2	Tripping Ball	1
3	O- ring	1
4	O- ring	2
5	Ball Seat	1
6	Equalizing Sleeve	1
7	Shear Screw	4
8	Bypass Mandrel	1
9	O- ring	1
10	Male Adapter	1
11	V- ring	4
12	Female Adapter	1
13	Packing Mandrel	1
14	Retainer Nut	1

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LJ SERIES PULLING TOOLS

DESCRIPTION

The LOG Model LJ Series Pulling Tool is run on the Wireline Tool String and is used to latch on to Flow Control Devices with external fishing necks for retrieval from the well. The tools are available in different length cores to provide a range of reach for latching on to various tool fishing neck lengths.

The LJU Tool has a jar up shear release mechanism and the LJD Tool has a jar down shear release mechanism. C, S, or L are added to the end of the J Series Pulling Tool name to identify the reach of the tool. C denotes a long core or short reach which is designed for shorter fishing necks. S and L refer to short and very short cores that are designed for longer fishing necks or tools that require more reach. See the specification section of this guide for detailed reach lengths.

TD or smaller diameter turned down sizes of the LJ Series Pulling Tool are available for special applications such as running through smaller diameter Nipple seal bores.

TOOL TYPE	SUFFIX	DESCRIPTION
LJU (Jar up release)	C	Long Core - Short Reach
	S	Short Core - Long Reach
	L	Very Short Core - Very Long Reach
LJD (Jar down release)	C	See LJUC above
	S	See LJUS above
	L	See LJUL above

TD = Turned Down (Smaller Outside Diameter)

SPECIFICATIONS

SIZE INCH	TYPE	MAXIMUM OD INCH	FISHING NECK OD INCH	ENGAGES FISHING NECK OD INCH	REACH INCH	PIN THREAD
1-1/4	LJDC	1.281	1.188	0.875	1.938	15/16-10
1-1/4	LJDS	1.291	1.188	0.875	2.688	15/16-10
1-3/8	LJDC	1.375	1.188	1.000	1.875	15/16-10
1-1/2	LJDC	1.422	1.188	1.188	1.094	15/16-10
1-1/2	LJDS	1.422	1.188	1.188	1.844	15/16-10
1-1/2	LJUG	1.422	1.188	1.188	1.094	15/16-10
1-1/2	LJUM	1.422	1.188	1.188	1.844	15/16-10
1-1/2	LJUS	1.422	1.188	1.188	1.844	15/16-10
1-5/8	LJDS	1.625	1.188	1.188	1.094	15/16-10

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2	LJDC	1.859	1.375	1.375	1.438	15/16-10
2	LJDL	1.859	1.375	1.375	2.875	15/16-10
2	LJDS	1.859	1.375	1.375	2.125	15/16-10
2	LJUG	1.859	1.375	1.375	1.438	15/16-10
2	LJUL	1.859	1.375	1.375	2.875	15/16-10
2	LJUM	1.859	1.375	1.375	1.438	15/16-10
2	LJUS	1.859	1.375	1.375	2.125	15/16-10
2-1/2	LJDC	2.250	1.375	1.750	1.313	15/16-10
2-1/2	LJDS	2.250	1.375	1.750	2.188	15/16-10
2-1/2	LJUG	2.250	1.375	1.750	1.313	15/16-10
2-1/2	LJUM	2.250	1.375	1.750	2.188	15/16-10
2-1/2	LJUS	2.250	1.375	1.750	2.188	15/16-10
3	LJDC	2.796	1.750	2.313	1.438	15/16-10
3	LJDS	2.796	1.750	2.313	2.125	15/16-10
3	LJDL	2.796	1.750	2.313	2.609	15/16-10
3	LJUC	2.796	1.750	2.313	1.438	15/16-10
3	LJUM	2.796	1.750	2.313	2.125	15/16-10
3	LJUS	2.796	1.750	2.313	2.125	15/16-10
4	LJDC	3.750	2.313	3.125	2.313	1-1/16-10
4	LJUC	3.750	2.313	3.125	3.375	1-1/16-10

OPERATION

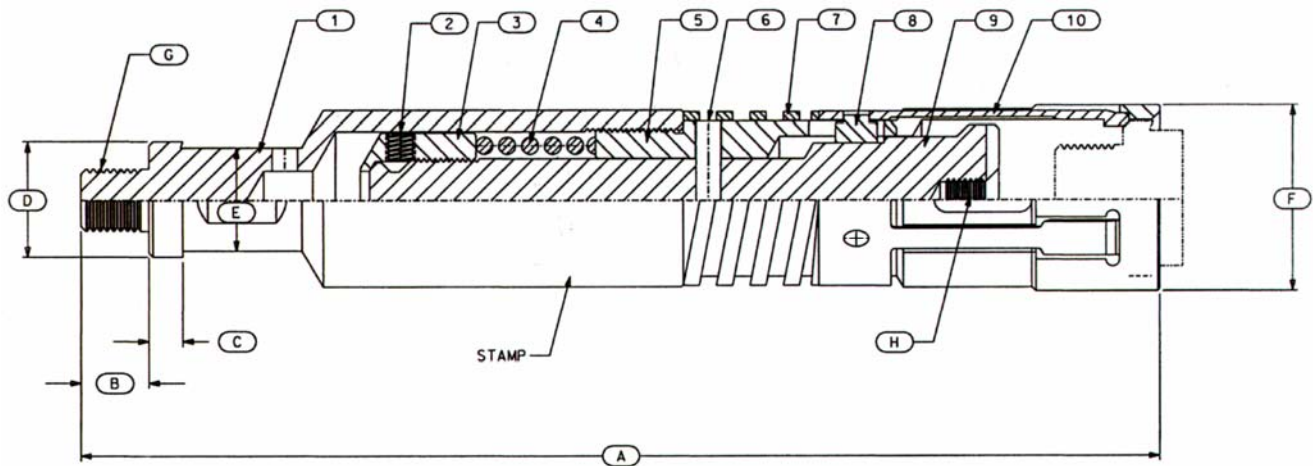
1. Attach the LJ Series Pulling tool to the bottom of a standard wireline string and run it in the well to locate the first fishing neck and mandrel in the completion.
2. Engage the Pulling Tool onto the fishing neck by resting the weight of the Wireline String onto the fishing neck or by lightly jarring down.
3. Once engaged, the fishing neck and mandrel can be jarred up and/or pulled to the surface.
4. If difficulties occur during pulling, the LJD Series Pulling Tool can be released by jarring down to shear its shear pin while the LJU Series Pulling Tool can be released by jarring up. The assembly must be re-pinned before it can engage on another fishing neck.

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LJDC Pulling Tool



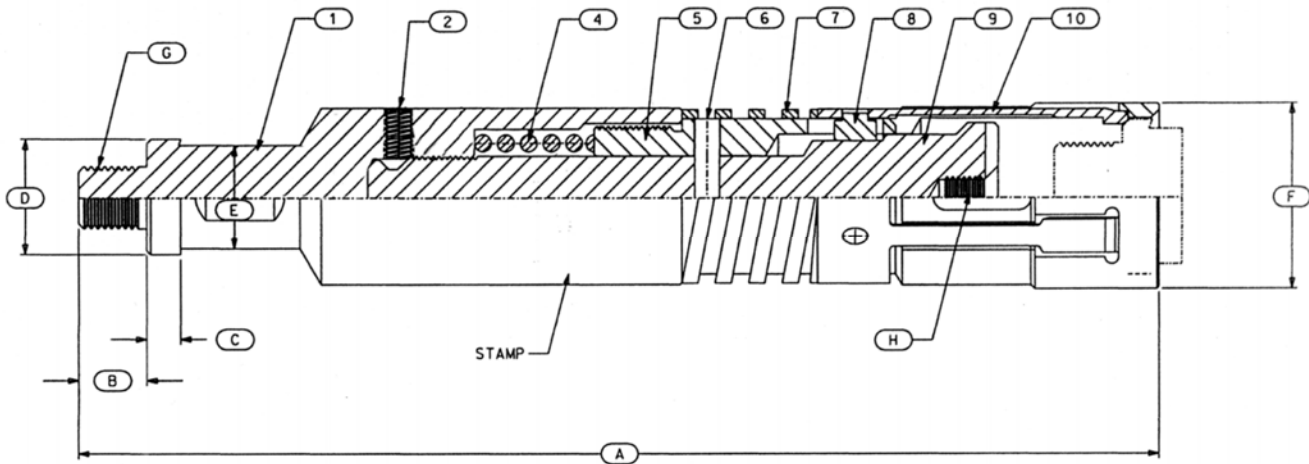
Item	Description	Qty
1	Fishing Neck	1
2	Set Screw	2
3	Core Cap	1
4	Core Spring	1
5	Skirt	1
6	Shear Pin	1
7	Dog Spring	1
8	Pawls	3
9	Core	1
10	Dog	1

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LJUC Pulling Tool



Item	Description	Qty
1	Fishing Neck	1
2	Set Screw	2
4	Core Spring	1
5	Skirt	1
6	Shear Pin	1
7	Dog Spring	1
8	Pawls	3
9	Core	1
10	Dog	1

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LOK-5 KICKOVER TOOL

The LOG LOK-5 Kickover Tools are designed to run and set valves and dummies in the KB series side pocket mandrels. Such kickover tools are capable of functioning in the most highly deviated wells since the mandrel is furnished with an orientating sleeve ensuring that the kickover tool is in the correct position for setting the valve into the mandrel pocket. The 2 1/2" and larger sized LOK-5 Kickover Tools are equipped with two centralizer springs to position the tool in the well tubing and to ensure the correct operation of the locator finger.

RUNNING PROCEDURE

1. Attach the valve or dummy with its running tool to the kickover tool Lower Adapter (item 30).
2. Ensure that the arm assembly (items 13, 21-30) is in running position so that the Arm (item 13) runs parallel to the Housing (item 14). If the Arm (item 13) is extended, tighten the Half Dog Set Screw (item 21) to retract the Arm Adapter (item 23) and push down the arm assembly (items 13, 24-30) to straighten it and to ensure that the detent assemblies (items 23-24 & 28, 30) are locked. The tool is now ready to be run.
3. Make up the LOK-5 Kickover Tool to the bottom of the wireline string.
4. Run the wireline tools into the well until the kickover tool is below the selected mandrel as indicated by the wireline odometer and checked with the well records. The kickover tool can easily pass gas lift mandrels while moving downward because the Locator Finger (item 2) has an angled bottom surface that allows it to be pushed into the Finger Cage (item 9). When exiting a mandrel, the Locator Finger (item 2) springs back out of the Finger Cage (item 9) via force applied by the Leaf Spring (item 18).
5. Raise the LOK-5 Kickover Tool slowly through the tubing until it comes to a stop when Locator Finger (item 2) contacts the camming profile of the lower end of the orienting sleeve at the top end of the mandrel. Continued upward movement will rotate the LOK-5 Kickover Tool and orient the Arm (item 13) with the mandrel pocket.
6. Gently jar upwards to bump the Locator Finger (item 2) against the stop in the mandrel orienting sleeve thereby driving the Finger Housing (item 5) and Release Plunger (item 8) downward with respect to the Finger Cage (item 9). The dog on the lower end of the Release Plunger (item 8) is pushed past the Half Dog Set Screw (item 21) on the Arm Adapter (item 23) so that the Kick Spring (item 12) swings the Arm (item 13) into the kickover position. With the Arm (item 13) swung outward the Half Dog Set Screw (item 21) holds the Release Plunger (item 8) down, preventing its retreat. The Release Plunger (item 8) can only be reset at the surface.
7. Lower the tools slowly until a loss of weight indicates that the valve has contacted the mandrel sidepocket. No weight loss will indicate that the Arm (item 13) is still in the running position, in which case steps 5 and 6 must then be repeated.
8. Jar down gently to unlock the upper and lower detent assemblies (items 23-24 & 28, 30) so that the Arm (item 13) and Lower Adapter (item 30) will rotate on the Lower Arm Pin (item

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- 29) and align the valve with the mandrel pocket. Continue jarring down until the valve has been driven into the pocket and then locked into position.
9. Jar up or down, depending on the running tool employed, to shear the pin securing the running tool to the valve. The running tool is now released.
 10. Pull up the kickover tool until the Locator Finger (item 2) again contacts the stop in the mandrel orientating sleeve. Jar up to shear Shear Pin (item 20), allowing the Locator Finger (item 2) and Finger Housing (item 5) to move downward relative to the Release Plunger (item 8). The Locator Finger (item 2) is forced to swivel inward when it is contacted by the chamfered edge of the Finger Cage (item 9). The kickover tool can now be withdrawn from the mandrel.
 11. Once free of the mandrel the Locator Finger (item 2) is returned to its normal position by the Leaf Spring (item 18) and will locate each mandrel above the one in which the operation was performed. This will verify that the operation was carried out in the selected mandrel.
Note: If for any reason the tool mechanism becomes jammed so that the Locator Finger (item 2) cannot retract, heavy jarring will shear the Finger Shear Pin (item 4) about which the Locator Finger (item 2) swivels causing it to fall into the Finger Housing (item 5). The tool can then be withdrawn.

PULLING PROCEDURE

Pulling operations are similar to running operations except that a pulling tool is attached to the kickover tool instead of a running tool and valve.

1. Attach the correct pulling tool for the selected valve to the kickover tool Lower Adapter (item 30).
2. Repeat steps 2 to 6 of the running procedure.

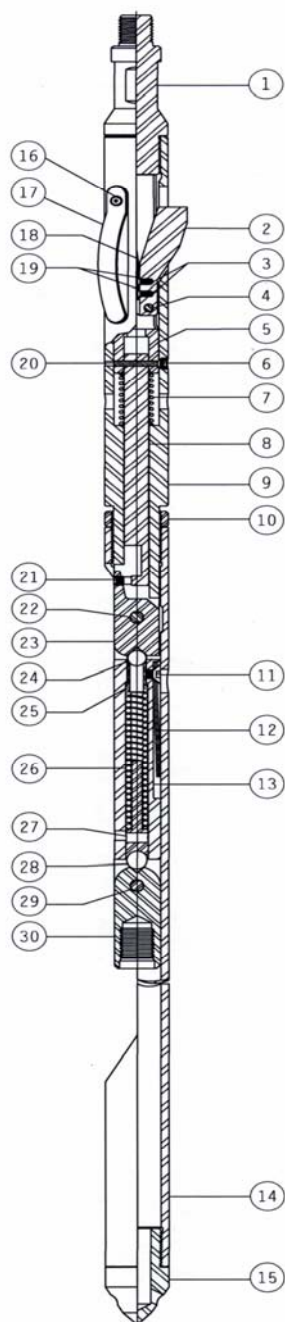
Proceed as follows:

7. Lower the tools slowly until a loss of weight indicates that the pulling tool has located valve. Jar down gently to unlock the upper and lower detent assemblies (items 23-24 & 28, 30) of the Arm (item 13) and to latch the pulling tool to the valve.
8. Jar up to pull the valve from the mandrel sidepocket.
Note: If for any reason it is impossible to pull the valve, upward or downward jarring, depending on the pulling tool, will shear a pin in the pulling tool and release it from the valve. The kickover tool can then be withdrawn from the well.
9. Repeat steps 10 and 11 of the running procedure.
Note: If for any reason the tool mechanism becomes jammed so that the Locator Finger (item 2) cannot retract, heavy jarring will shear the Finger Shear Pin (item 4) about which the Locator Finger (item 2) swivels causing it to fall into the Finger Housing (item 5). The tool can then be withdrawn.

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Item	Description	Qty
1	Fishing Neck	1
2	Locator Finger	1
3	Finger Screw	2
4	Finger Shear Pin	1
5	Finger Housing	1
6	Set Screw	1
7	Core Spring	1
8	Release Plunger	1
9	Finger Cage	1
10	Lock ring	1
11	Kick Spring Screw	1
12	Kick Spring	2
13	Arm	1
14	Housing	1
15	Nose	1
16	Cap Screw	2
17	Centralizer Spring	2
18	Leaf Spring	2
19	Lock Washer	2
20	Shear Pin	1
21	Set Screw	1
22	Upper Arm Pin	1
23	Arm Adapter	1
24	Upper Ball	1
25	Spring Insert	1
26	Detent Spring	1
27	Ball Seat	1
28	Lower Ball	1
29	Lower Arm Pin	1
30	Lower Adapter	1

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LD-2 SHIFTING TOOL

DESCRIPTION

The LOG Model LD-2 Shifting Tool is designed to open and close the LOG Model LGL Sliding Sleeve by upward or downward jarring action of the Wireline Tool String. With this tool, any number of the same size LGL Sliding Sleeves can be shifted into the open or closed position. Upward jarring of the LD-2 Shifting Tool opens the Sliding Sleeve. Inverting the LD-2 Shifting Tool and jarring downward will close it.

FEATURES

1. The tool has a Locating Collet which positively identifies the location of a Sliding Sleeve when it is reached in the tubing string. It also indicates whether the LD-2 Shifting Tool is passing through a Nipple or another Sliding Sleeve.
2. When a closing or opening shift is performed, a repeat of the shifting operation in the same Sleeve will signal a completed shift.
3. The Shifting Dogs are equipped with a shear pin mechanism for emergency release.
4. The Shifting Tool can be deliberately released without shifting the Sleeve even after the tool has been set in the shift mode.

SPECIFICATIONS

LGL SLIDING SLEEVE SIZE (ID-INCH)	SHIFTING TOOL COLLET SIZE (OD-INCH)	TOP THREAD CONNECTION (SIZE-INCH)	FISHING NECK SIZE (OD-INCH)	DIMENSION "D" ADJUSTMENT (LENGTH - INCH)
1.43	1.468	15/16-10	1.188	14.937
1.50	1.531			
1.56	1.593			
1.62	1.656			
1.78	1.807		1.375	15.687
1.81	1.843			
1.87	1.906			
2.25	2.281	1-1/16-10	1.75	16.625
2.31	2.343			
2.75	2.781			
2.81	2.843		2.312	17.125
3.68	3.743			
3.81	3.867			

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OPERATION

LD-2 Shifting Tool is run on a standard wireline string. The spring-loaded Shifting Dogs (Items 9) are held in the closed position when running by the spring-loaded Retractor (Item 11). When the Collet (Item 18) locates on a sliding sleeve shoulder and either slack-off weight (for opening operations) or upstrain (for closing operations) is applied, the Shifting Dogs (Items 9) rotate outwards as the Mandrel Spring (item 12) is compressed and the Retractor (Item 11) moves away from the Shifting Dog (Item 9) pivot. At this point, the Shifting Dogs (Items 9) can engage the Closing Sleeve of the Sliding Sleeve. Jarring down will now close the sleeve and jarring up will open it.

To Close Sleeve

1. Assemble the Shifting Tool in the normal configuration where the Collet (Item 18) is at the bottom of the tool. If the Collet (Item 18) is on the same side of the tool as the Fishing Neck (Item 1) switch the Fishing Neck (Item 1) with the Hex Head Cap Screw (Item 21). Adjust the length of Dimension 'D' according to the tool specifications using the adjustment procedures below.
2. Attach Shifting Tool to a standard wireline string and run in the well. Reduce running speed when tool approaches Sliding Sleeve.
3. When Collet (Item 18) contacts the upper seal bore of the Sliding Sleeve, jar down to push the tool through then repeat for the lower seal bore.
4. Gently pull up on the wireline to engage the Collet (Item 18) with the lower seal bore and continue to pull up to extend the Shifting Dogs (Item 9).
5. Set the Wireline String down (apply slack-off weight) to ensure that Shifting Dogs (Item 9) are out and to engage them with the Closing Sleeve.
6. Jar down to close the Closing Sleeve and the Shifting Dogs (Item 9) will retract when the Closing Sleeve is closed.
7. Verify a successful closing operation by repeating the closing procedure (starting at step4).

To Open Sleeve

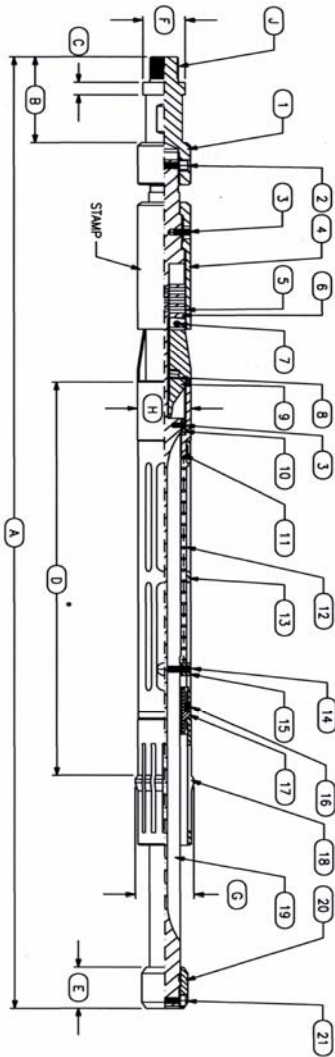
1. Assemble the Shifting Tool in the inverted configuration so that the Collet (Item 18) is at the top end of the tool. If the Collet (Item 18) is on the opposite end of the tool from the Fishing Neck (Item 1) switch the Fishing Neck (Item 1) with the Hex Head Cap Screw (Item 21). Adjust the length of Dimension 'D' according to the tool specifications using the adjustment procedures below.
2. Attach Shifting Tool to a standard wireline string and run in the well. Reduce running speed when tool approaches Sliding Sleeve.
3. When Collet (Item 18) contacts the upper seal bore of the Sliding Sleeve, rest the weight of the Wireline String on the Collet (Item 18) to extend the Shifting Dogs (Item 9).

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4. Pull up to verify that the Shifting Dogs (Items 9) are extended and to engage them with the Closing Sleeve of the Sliding Sleeve.
5. Jar up to open the Closing Sleeve of the Sliding Sleeve and to retract the Shifting Dogs (Item 9) back into the assembly.
6. Verify a successful opening operation by repeating the opening procedure (starting at step3).



Item	Description	Qty
1	Fishing Neck	1
2	Cap Screw	1
3	Set Screw	2
4	Dog Retainer	1
5	Shear Pin	3
6	Key	2
7	Pin	2
8	Dog Spring	2
9	Shifting Dog	2
10	Retainer Sleeve	1
11	Retractor	1
12	Mandrel Spring	1
13	Control Sleeve	1
14	Set Screw	1
15	Nut	1
16	Set Screw	1
17	Connecting Adjuster	1
18	Collet	1
19	Mandrel	1
20	Thread Protector	1
21	Cap Screw	1

LA RUNNING SHANKS

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DESCRIPTION

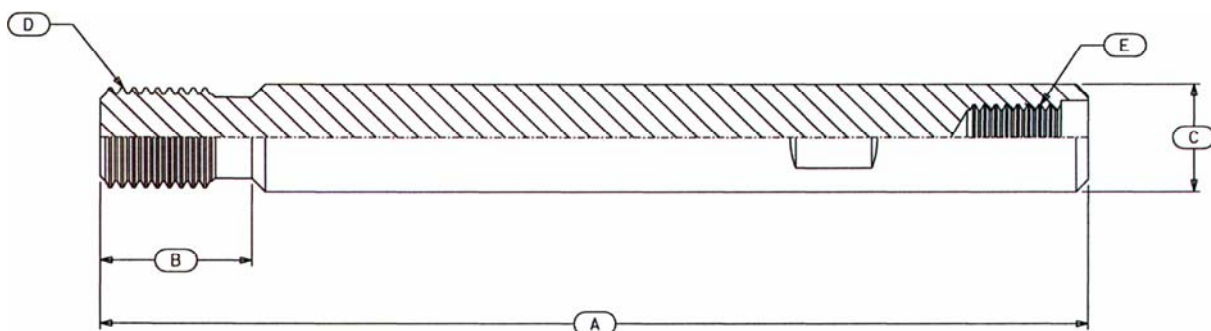
The LOG Model LA Running Shank is used in conjunction with a LC Running Tool as a Prong Carrier for running operations of various Flow Control Devices.

The LA Shank is also used to keep the down facing Dogs retracted when running Locks in certain instances.

The LA Shanks are available in different lengths to allow running Locks with up facing Dogs trailing or retracted.

SPECIFICATIONS

LA SHANK SIZE	ACCESSORY SIZE
SIZE-INCHES	SIZE-INCHES
1.900 -2 1/16	1.43
	1.50
	1.56
	1.62
2-3/8	1.78
	1.81
	1.87
2-7/8	2.06
	2.25
	2.31
3-1/2	2.56
	2.75
	2.81
4-1/2	3.68
	3.75
	3.81



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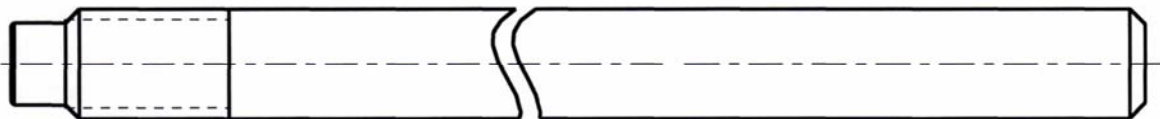
LA RUNNING / PULLING PRONG

DESCRIPTION

The LOG Model LA Running and Pulling Prongs are used in running, equalizing and pulling operations of various Flow Control Devices.

SPECIFICATIONS

ACCESSORY SIZE INCH	PRONG SIZE MAJOR OD X LENGTH INCH	TOP THREAD CONNECTION INCH
1.43-1.62	7/16x Length	7/16-14
1.78-2.06	1/2x Length	1/2 - 14
2.25 - 2.56	1/2x Length	1/2 - 14
2.75 - 2.81	5/8 x Length	5/8-11
3.68 - 3.81	5/8 x Length	5/8-11



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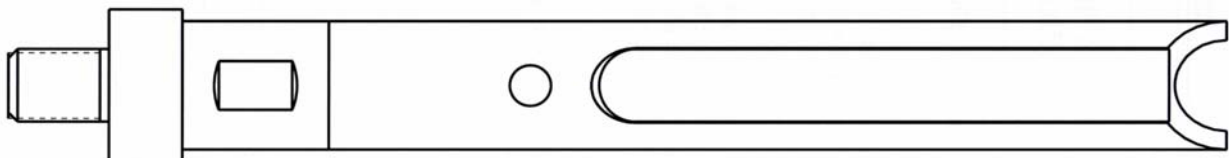
LA AND LAC PULLING PROBES

DESCRIPTION

The LOG Model LA and LAC Pulling Probes are used in conjunction with a Pulling Tool to pull Selective Locks and their attached flow control accessories. The LA Probe is identical to the LAC Probe except that it has an additional down facing connection for the attachment of a Pulling Prong. The LA and LAC Probes work by first locating on the down facing dogs of the Selective Lock Mandrel. When the Probe is pushed down into the Lock Mandrel, the down facing dogs rotate into the slots of the Probe and the up facing dogs are collapsed by the outside diameter of the Probe. When the up facing dogs are retracted, the Lock can be pulled from the Nipple.

SPECIFICATIONS

LOCK SIZE	LA OR LAC PROBE SIZE
INCH	INCH
1.43	1.900-2 1/16
1.50	
1.56	
1.62	
1.78	
1.81	2-3/8
1.87	
2.06	
2.25	2-7/8
2.31	
2.56	
2.75	3-1/2
2.81	
3.68	4-1/2



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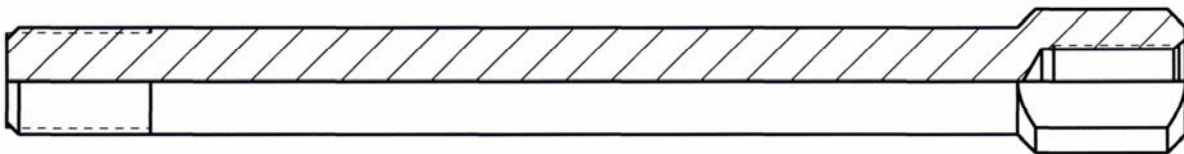
LN-1 RUNNING SHANK

DESCRIPTION

The LOG LN-1 Running Shank is used with a LC-1 Running Tool to run and set LOG Model LN Lock. The LN-1 Shank works by shifting down the plunger that holds the collet dogs in the locked position.

SPECIFICATIONS

NOMINAL SIZE INCH	LENGTH INCH	MAX O.D. INCH	BOX CONNECTION INCH	PIN CONNECTION INCH
2	10.875	0.938	1/2-13	3/4-16
2-1/2	10.813	1.235	1/2-13	1 -14



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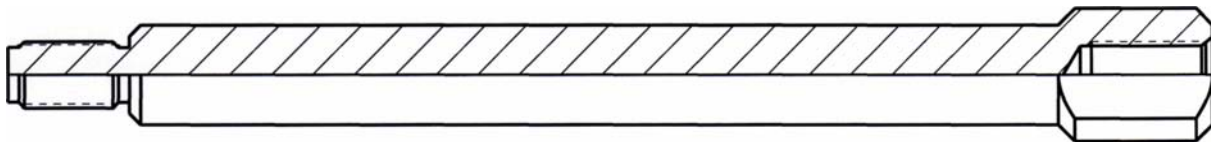
LN-1 PULLING PROBE

DESCRIPTION

The LOG Model LN-1 Pulling Probe is used with a Pulling Tool to pull LOG Model LN Lock. The LN-1 Probe works by shifting down the plunger that holds the collet dogs in the locked position.

SPECIFICATIONS

NOMINAL SIZE INCHES	LENGTH INCHES	MAX O.D. INCHES	BOX CONNECTION INCHES	PIN CONNECTION INCHES
2	11.500	0.938	1/2-13	1/2-13
2-1/2	11.188	1.235	1/2-13	1/2-13



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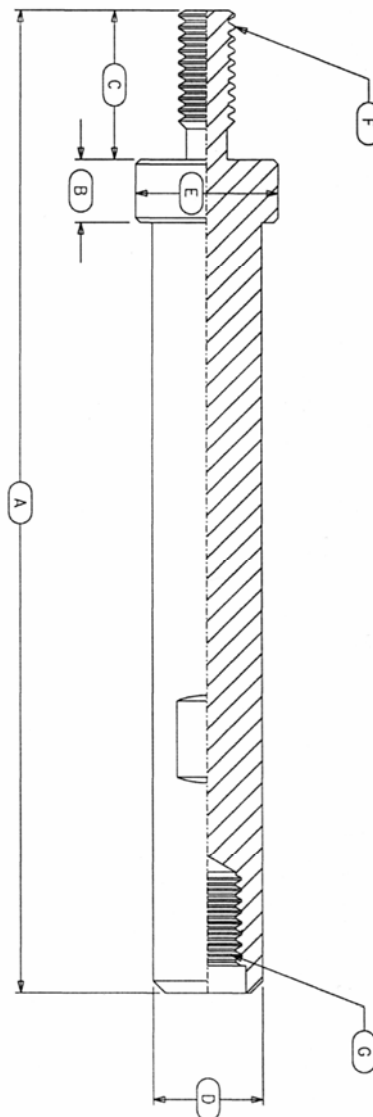
LB PROBES

DESCRIPTION

The LB Probe is used with a standard Pulling Tool to retrieve Locks. The bottom of the Probe is threaded to accept a Prong.

SPECIFICATIONS

LOCK SIZE	LB PROBE SIZE
INCHES	INCHES
1.43	1 1.900-2-1/16
1.50	
1.56	
1.62	
1.78	2-3/8
1.81	
1.87	
2.06	2-7/8
2.25	
2.31	
2.56	3-1/2
2.75	
2.81	
3.68	4-1/2
3.75	
3.81	



LGA-2 RUNNING TOOL

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DESCRIPTION

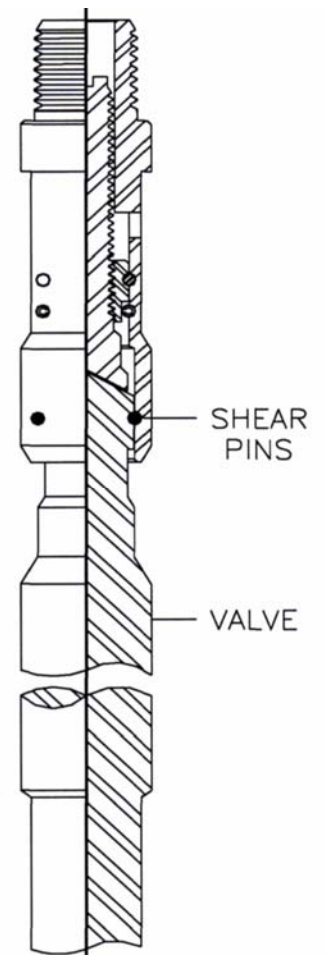
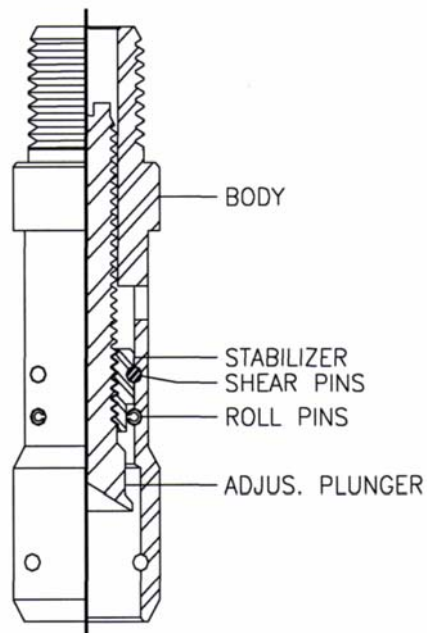
The LGA-2 Running Tool is used in conjunction with the LOK-5 Series Kickover Tools to install 1 in. valves with bottom collet latches in side pocket mandrels. Downward jarring forces the valve into the side pocket and continued downward jarring shears the shear pins to release it from the valve.

The LGA-2 Running Tool has an adjusting plunger inside of it that allows different length valve tops to be run by it. Screwing down on the adjusting plunger takes up the slack between the valve and the running tool. After the shear pins holding the stabilizer are sheared by jarring downwards, the adjusting plunger moves upwards, to let the valve be released by continued jarring downward and shearing the lower shear pins holding the valve.

RUNNING

Pinning the LGA-2 Running Tool to the Valve

Using a screwdriver, move the adjusting plunger up and out of the way to make clearance for the top of the valve to be run. Insert the valve up into the bottom of the running tool and insert the two shear pins to hold it in place. Screw down the adjusting plunger until it sits on top of the valve and takes up the slack between the valve and the running tool.



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Running the LGA-2 Running Tool with LOK-5 Kickover Tool

1. Lower the assembled tool string and kickover tool (with spacer bar if needed) down the tubing until the kickover tool passes below the selected mandrel.
2. Raise the tools slowly up through the tubing until they stop. This will indicate that the locating finger in the kickover tool has contacted the top of the slot in the orienting sleeve of the mandrel.
3. Pull up on the wireline tool string to put tension on the finger and release the plunger in the kickover tool, which will then kick over into position above the side pocket in the mandrel.
4. Lower the tool assembly slowly until a loss of weight is indicated, which means that the tool has kicked over and located the side pocket. If no loss of weight is indicated, repeat steps 2 thru 4.
5. Jar downwards (solid blows) several times. This will drive the valve into the pocket of the mandrel.
6. Continue to jar downwards to shear the shear pins in the running tool and release it from the valve. Do Not jar upwards, this may remove the valve from the pocket.
7. Retrieve the tool string assembly and running tool from the well.

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LC-1 RUNNING TOOLS

DESCRIPTION

The LOG LC-1 Running Tool is used to run Flow Control Devices.

Complete with Thread Protector or Locator Ring, it may be used for Selective or No-Go setting of Flow Control Equipment.

The LC-1 Running Tool has a bottom down female thread connection to accept an optional LA Shank for collapsing the lock's dogs.

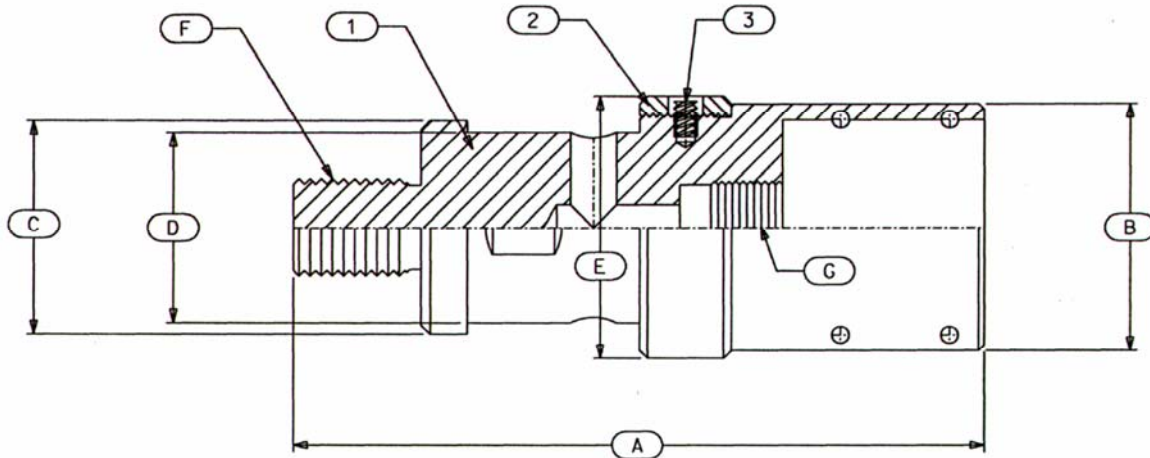
SPECIFICATIONS

TUBING SIZE	NIPPLE SEAL BORE SIZE	ACCESSORY SIZE	RUNNING TOOL SIZE	LOCATING RING SIZE	TOP THREAD CONNECTION	FISH NECK SIZE	SHEAR PIN DIAMETER
OD-INCH	SEAL BORE-INCH	SIZE-INCH	SIZE-INCH	OD-INCH	SIZE-INCH	OD-INCH	OD-INCH
1.900	1.437	1.43	1.900- 2 1/16	1.468	15/16-10	1.188	1/8
	1.500	1.50		1.520			
2 1/16	1.562	1.56		1.593			
	1.625	1.62		1.656			
2-3/8	1.781	1.78	2-3/8	1.807	15/16-10	1.375	3/16
	1.812	1.81		1.843			
	1.875	1.87		1.906			
2-7/8	2.062	2.06	2-7/8	2.093	15/16-10	1.750	3/16
	2.250	2.25		2.281			
	2.312	2.31		2.343			
3-1/2	2.562	2.56	3-1/2	2.593	1-1/16-10	2.312	3/16
	2.750	2.75		2.781			
	2.812	2.81		2.843			
4-1/2	3.688	3.68	4-1/2	3.718	1-1/16-10	3.125	3/16
	3.750	3.75		3.802			
	3.812	3.81		3.835			

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Item	Description	Qty
1	Body	1
2	Locator Ring	1
3	Set Screw	1

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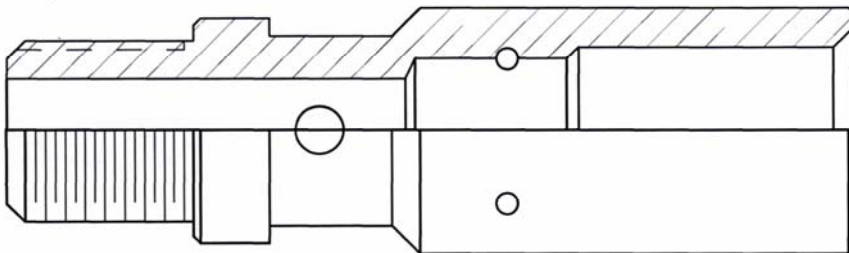
LK RUNNING TOOL

DESCRIPTION

The LOG Model LK Running Tool is used with a Kickover Tool to run and install valves equipped with LBK-2 Latches into side pocket mandrels.

SPECIFICATIONS

FISHING NECK O.D. INCH	PIN CONNECTION INCH	LENGTH INCH	SHEAR PINS INCH	MAX O.D. INCH
1.188	15/16-10	3.550	1/8x1 1/8	1.300



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