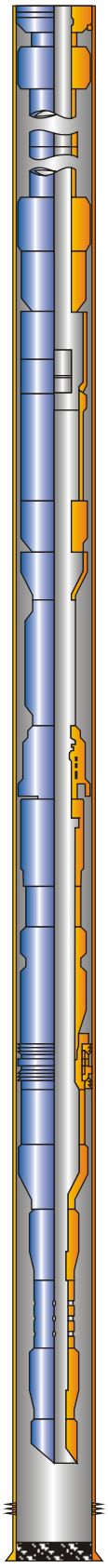
INDEX

9 5/8" - 32.3 - 58 # TYPICAL COMPLETION SCHEMATIC

WELL SCHEMATIC	S.NO	ITEM DESCRIPTION	MODEL TYPE	SIZE	MATERIAL	I.D. IN INCH	O.D. IN INCH
	*	TUBING HANGER	-	-	AISI 4140 / L-80	-	-
	1	FLUTTED SWAGE	-	7"	AISI 4140 / L-80	6.184"	8.12" MAX.
	*	PUP JOINT	-	-	AISI 4140 / L-80	-	-
	*	PRODUCTION TUBING	-	-	AISI 4140 / L-80	-	-
	2	FLUTTED ADAPTER	-	7"	AISI 4140 / L-80	6.184"	8.12" MAX.
	3	FLOW COUPLING 20 FT. LG.	-	7"	AISI 4140 / L-80	6.184"	7.681"
	4	SSSV LANDING NIPPLE(USB-6.000",LSB-5.963")	FRQ	5.963"	INCONAL/AISI 4140/L-80/9CR-1M0	5.963" MIN.	8.12"MAX.(8.35")
	5	SSSV FLAPPER TYPE FOR SL.NO. 4	FXE	5.963"	INCONAL/AISI 4140/L-80/9CR-1M0	-	-
	6	LOCK FOR SSV	RQ	6.00"	INCONAL/AISI 4140/L-80/9CR-1M0	-	-
		SEPARATION SLEEVE WITH `RN' TYPE PROFILE	-	5.963"	INCONAL/AISI 4140/L-80/9CR-1M0	-	-
		RUNNING TOOL/PULLING TOOL SIZE 3.250"	RXN/GR	6.00"	AISI 4140	-	-
		BY PASS BLANKING PLUG	RN	3.250"	AISI 4140	-	-
		RUNNING TOOL/PULLING TOOL	RXN/GR	3.250"/3.500"	AISI 4140	-	-
		RUNNING TOOL/PULLING TOOL FOR PRONG	SB	2.500"	AISI 4140	-	-
	7	FLOW COUPLING 6 FT. LG.	-	7"	AISI 4140 / L-80	6.184"	7.681"
	8	CASING SUB	-	-	AISI 4140 / L-80	4.778"	7.681"
	9	SPM TO ADPT 1.1/2" O.D. VALVE	TP	5.1/2"	AISI 4140 / L-80	4.778"	7.94" MAX.
	9A	CHEMICAL INJECTION VALVE	-	1.1/2"	SS 316/304	-	-
		LATCH	RK	-	SS 316/304	-	-
		POSITION TOOL	HD-TP	5.50"	AISI 4140	-	-
		RUNNING TOOL/PULLING TOOL	RK-1/JDC	-/1.5/8"	AISI 4140	-	-
		DUMMY VALVE	D-14R	1.50"	SS 316/304	-	-
	10	EXPANSION JOINT (SPLINED) 20FT. STROKE	-	5.1/2"	AISI 4140 / L-80	4.746" MIN	7.375" MAX.
	11	SLIDING SIDE DOOR WITH 'AF' PROFILE	PCMD	4.313"	INCONAL/AISI 4140/L-80/9CR-1M0	4.31" MIN	6.075"
	11A	SHIFTING TOOL FOR SL.NO. 11	BO	4.313"	AISI 4140	-	-
		BY PASS BLANKING PLUG	AF TYPE	4.313"	AISI 4140	-	-
		RUNNING TOOL/PULLING TOOL	A/GR	4.313"/4.000"	AISI 4140	-	-
		PULLING TOOL FOR PRONG	SB	4.000"	AISI 4140	-	-
	12	ANCHOR SEAL X 1/2 MULE SHOE	-	-	AISI 4140 / L-80	4.875" MIN.	7.00"
	13	HYDRO SET RETAINER PRODUCTION PACKER (USB-6.000" & LSB-4.750")	DB	9.5/8" - 32.3-58.4#	AISI 4140 / L-80	4.750" MIN.	8.12" MAX.
	14	MILL OUT EXTENSION	-	7"	AISI 4140 / L-80	6.184".	7.00"
	15	CASING SUB	-	-	AISI 4140 / L-80	4.778"	7.681"
	16	LANDING NIPPLE	RPT	3.125"	AISI 4140 / L-80	3.125" MIN.	6.075"
		BY PASS BLANKING PLUG	RPT TYPE	3.125"	AISI 4140 / L-80	-	-
		RUNNING TOOL/PULLING TOOL	RXN/GR	3.125"/3.500"	AISI 4140	-	-
		RUNNING TOOL/PULLING TOOL FOR PRONG	SB	3.500"	AISI 4140	-	-
	17	PERFORATED SPACER TUBE	-	-	AISI 4140 / L-80	4.778"	6.075"
	18	LANDING NIPPLE	RPT	3.00"	AISI 4140 / L-80	3.00" MIN.	6.075"
		INSTRUMENT HANGER	RPT TYPE	3.00"	AISI 4140 / L-80	-	-
		RUNNING TOOL/PULLING TOOL	RXN/GR	3.00"/3.00"	AISI 4140	-	-
	19	RE-ENTRY GUIDE	-	5.1/2"	AISI 4140 / L-80	4.929"	6.075"
	20	CONTROL LINE 1/4" X 300 FT. LONG	-	-	SS 316/K-MONEL	-	-
	21	BANDING STRAP 3/4"	-	-	SS 316/K-MONEL	-	-
	22	SWAGE LOK 1/4" TUB X 1/4" NPT	-	-	SS 316/K-MONEL	-	-
	23	SWAGE LOK 1/4" TUB. X 1/8" NPT	-	-	SS 316/K-MONEL	-	-

Connection can be supplied as per customer requirement.
Metallurgy is decided based on service conditions.

INTRODUCTION

WELL COMPLETION:
The well is the communication channel joining the reservoir for the development of Oil & Gas Fields. It influences cost and economics of exploitation of the reservoir. Therefore, every effort should be made for optimum well design.

The configuration of a well after completion can be seen as a number of conduits, Tubular or Annular isolated from each other by seals at surface and subsurface with provisions for selective inter-communication and safety shutoff.

The flow conduits are Casing & Tubing. Tubing size selection requires evaluation of pressure losses in vertical flow.

In Gas Well erosion velocity is often critical.

COMPLETION METHODS:
There are three basic methods to complete a well.
Open Hole
Cased or perforated hole
Liner Completion

- In open hole, casing is set only to the top of or slightly into the Completion interval.
- In cased hole and perforated completion, casing is set into or through the production formation and cemented.
- In a liner completion, casing is run to the top of the pay zone and a liner is set across the producing formation.

TUBING AND CASING CONFIGURATIONS:
Several configuration are applicable to the completion methods.

TUBINGLESS COMPLETION:
This is the most simple tubular arrangement and may be used in high rate oil & gas wells, where pressures and corrosive fluids are not detrimental to the casing.

TUBING AND PACKER CONFIGURATIONS:
Well completion with Packer permit a number of configurations. Packers are run to isolate the casing from corrosive fluids and or high pressure.

- To stabilize and control flow from pay zones.
- In conjunction with artificial lift system.
- To selectively' produce multiple zones.
- Selective stimulation becomes feasible.
- Wireline and downhole operations become feasible.

ANNULUS/TUBING SEALS:
Apart from Tubing Head, Tubing Connections, sealing between annulus and tubing rests with packer and other equipment, such as, Anchor Seals, Locator Seals, Telescopic Joint, Tubing Seal receptacles and Sliding Sleeves.

CIRCULATION AND COMMUNICATION DEVICES:
These are needed to establish Tubing annulus communication, in order to equalize pressures and circulate fluid. These devices are Sliding Sleeves, Side Pocket Mandrels and Ported Nipples.

SAFETY VALVES:
Safety Valve provides final control of the well, when other controls have ceased to function.

INTRODUCTION

ACT offers full set of downhole well completion strings with all equipment like:

1. Standard hardware items like Fluted Swage, Adapters, Flow Coupling, Blast Joint, Cross Overs, Perforated Joints, Wireline Re-entry Guide, Pump Out Plug etc.,
2. Safety Valve Systems both Tubing and Wireline Retrievable type with all required accessories, tools and wireline operating tools,
3. Expansion joints,
4. Side Pocket Mandrels with all accessories, tools, wireline tools including Gas Lift and chemical injection requirements,
5. Sliding Sleeves with all tools, accessories and wireline tools,
6. All types of Packers Permanent & Retrievable Mechanical, Hydraulic, Wireline setting options with all accessories and setting tools like all types of setting tolls, Locator Anchor Seal assembly with different type of seal systems for Permanent Packers, Pump Out Plug, Mill Out Extension, Seal Bore Extension, Packer Milling and Retrieving Tools,
7. Polished Bore Receptacles, accessories, tools,
8. Landing Nipples both ported (for safety valves) and non-ported with all accessories and tools like Blanking Plugs, Instrument Hangers, with all accessories, tools and wireline tools,
9. All completion accessories like control lines, Banding Strap, Banding Buckles etc.

ACT manufactures and supplies all items under relevant API licenses, in all size, types, lengths, materials and are available for standard and sour services, different pressure and temp. ranges with API and all types of Premium thread connections cut by their authorized licensees, .

ACT has the capability to design and supply completion equipment as per customer's requirement.

FLUTED SWAGE & FLUTED ADAPTERS:
The Fluted Swage and Fluted Adapter are customer specified threaded adapters of short lengths which are run well completion strings near the top to centralize the string in the well. They have ID matching to string ID and are made with fluted design to allow fluid circulation in the well.

FLOW COUPLING & BLAST JOINT:
Flow Coupling and Blast Joints are thick walled tubular components normally utilized in well completions and located near the changes in tubing ID or against the well perforations. The items are provided with a thicker wall to avoid wear and tear due to erosion caused by fluid turbulence or corrosion and avoid failure.

Normally they have connection OD and tubing string ID.

ACT Flow Couplings are normally available in 2', 4', 6', 8', 10', 20' or any customer specified lengths and connections and the ACT Blast Joints are available in 10' or 20' or any customer specified lengths and connections.

CROSS OVERS:
The Cross Over is used in the well completion string to connect different type, size or thread connection completion items and are very important and essential item.

TUBING PUP JOINTS:
The Tubing Pup Joint is a short piece of tubing in any required length and is used in the completion string at any required depth between different items to adjust length and space out items.

PERFORATED JOINT:
The Perforated Joint is a Tubing Pup Joint with specific flow conduit holes made for fluid entry and flow and is used in the Completion String between the Nipples and facilitates well flowing pressure and temp. measurement or acquisition of downhole production data while the well is flowing.

INTRODUCTION

LANDING NIPPLES:
Landing nipples are profiled subs typically run above and / or below retrievable or permanent packers, providing a method of placing various flow control devices in the completion string.

Landing nipples feature an internal seal bore and profile to accept a locking device to anchor flow control accessories. Seal bores and lock profiles are machined to match a variety of connection systems and are available full-opening, or slightly restricted with a no-go feature to provide a positive stop for a flow control device.

Landing nipples are sized to match any tubing sizes, while seal bore sizes are available to match a variety of weights and connection systems. Most type, size, material, API or premium thread connections are available.

ACT provides most common landing nipple profiles like X, R. XN, RN, F, R, RPT etc. and many others on customer request.

SLIDING SLEEVE:
A completion device that can be operated to provide a flow path between the production conduit and the annulus. Sliding sleeves incorporate a system of ports that can be opened or closed by a sliding component that is generally controlled and operated by slickline tool string. These are manufactured elastometric for low pressure and non-elastometric for high pressure.

EXPANSION JOINT / TRAVEL JOINT:
The Expansion Joints are designed to be used in single and dual - string completion to accommodate changes in tubing length caused by variations in pressure, temperature or both. They are capable of maintaining the pressure integrity of tubing while allowing the string to safely expand and contract. The Expansion Joint can be run above Packers. The proper placement and stroke selection of these splined slip joints reduce the chances of over stressing the well tubing during production, acidizing, fracturing and other well operations. Alloy-steel construction gives these joints high body and end-connection tensile strength. Stroke length may be changed in the field. The splines transmit torque through the joint.

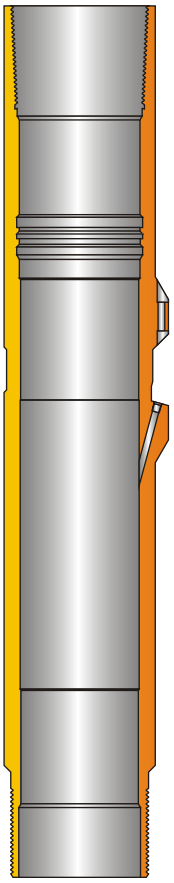
The travel joint consists of a top sub, outer mandrel, inner mandrel and shear sleeve. The packing stack is retained by the retainer cap. An o-ring is installed in the top sub. Sheer pins hold the travel joint in the fully extended, closed or partially open condition and at 1' interval. The travel length of the joints can be 10' or 20'.

ANCHOR LOCATOR SEAL ASSEMBLY:
Anchor Seal Assemblies anchor into the Packer top and seal in the bore of the Packer or Seal Bore Extension below the Packer. The Anchor Seal Assembly transfers tubing forces through the anchor into the packer, the seals are static and are only subjected to pressure differentials.

PUMP-OUT-PLUG:
The Pump Out Plug temporarily seals the bottom of the tubing string to prevent fluid from moving up the tubing while tripping in the hole. The Pump Out Ball Seat can be used as a bridging device to set a hydraulic packer or to hydraulically test the tubing string; the ball seat allows the tubing to fill with fluid while running in the hole. After the specific work requirement is met the, the ball can be pumped out with over pressuring the string fluid and provides a full bore flow.

WIRELINE RE-ENTRY GUIDE:
The Wireline Re-Entry Guide is used for safe re-entry of wireline tools from casing into the tubing string. Threaded on top end only, it is attached to the bottom end of the production string and may be designed to plain end or bevel end, tapered, fluted, half or full mule shoe preparation with a full open internal diameter.

SAFETY VALVE LANDING NIPPLE



SAFETY VALVE LANDING NIPPLE

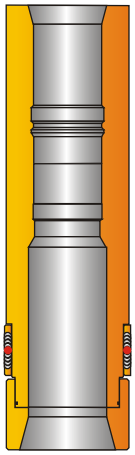
Safety Valve Landing Nipples are used to accommodate ACT model wireline retrievable sub surface safety valves. These nipples have a locking recess and a hydraulic communication port located between the two polished bores. This nipple features an integral control line connection port which operates Sub Surface Safety Valve.

FLAPPER-TYPE WIRELINE-RETRIEVABLE SAFETY VALVES

Tubing Size		Landing Nipple Seal bore		* Working Pressure
in.	mm.	in.	mm.	psi
2 3/8	60.33	1.710	43.43	
		1.875	47.63	
2 7/8	73.03	2.125	53.98	
		2.188	55.58	
		2.313	58.75	
3 ½	88.90	2.562	65.07	
		2.750	69.85	5,000
		2.813	71.45	6,000
4	101.60	3.313	84.15	7,500
4 ½	114.30	3.437	87.30	10,000
		3.688	93.68	
		3.813	96.85	
5	127.00	4.125	104.78	
5 ½	139.70	4.562	115.87	
7	177.80	5.750	146.05	
		5.875	149.23	
		5.963	151.46	

* Please check with factory for the metallurgy & pressure rating

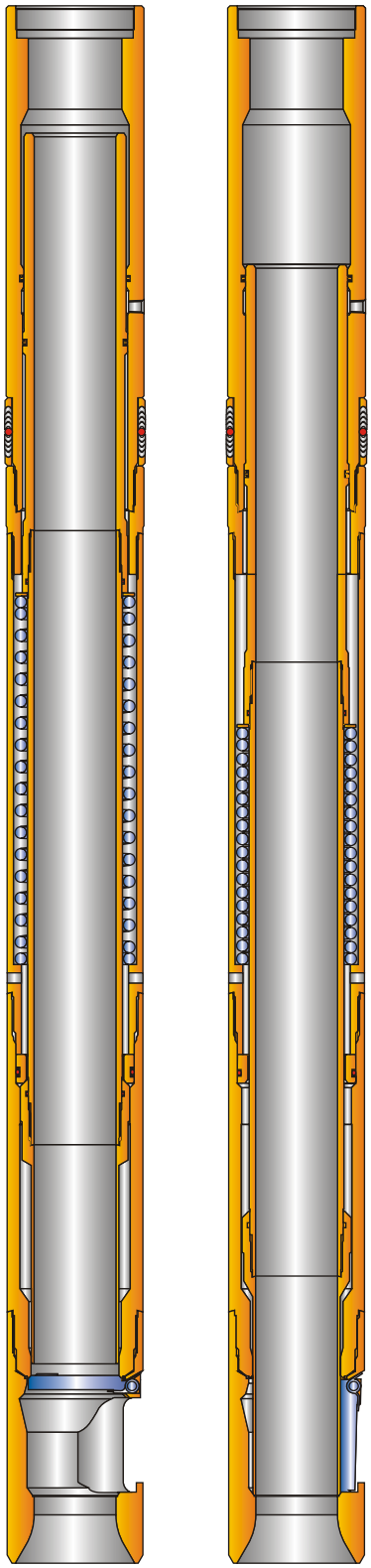
SEPARATION SLEEVE



SEPARATION SLEEVE

ACT Separation Sleeve, when attached to an appropriate lock is a wireline Retrievable Tool, used to isolate the control line port of Safety Valve Landing Nipples.

SURFACE CONTROLLED SUBSURFACE SAFETY VALVES (SSSV)



FLAPPER CLOSED

FLAPPER OPEN

ACT model safety valves are installed in the upper wellbore to provide emergency closure of the producing conduits in the event of an emergency. The safety valve system is designed to be fail safe, so that the wellbore is isolated in the event of any system failure or damage to the surface production control facilities. ACT model safety valve is a self equalizing, wireline retrievable, suface controlled and flapper type.

ACT model Safety Valve are installed in ACT model Landing Nipples.

FEATURES:

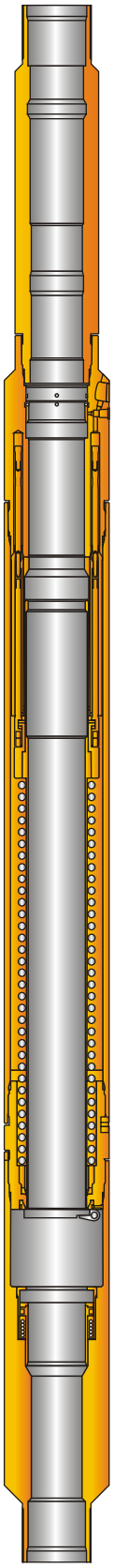
- Self equalizing type
- Working pressure up to 10,000 psi
- Sealing and sealing surfaces are out of flow path, when valve is in the open position
- Solid construction of flapper made from bar stock

FLAPPER-TYPE WIRELINE-RETRIEVABLE SAFETY VALVES

Tubing Size		Landing Nipple Seal bore		Valve ID		* Working Pressure
in.	mm.	in.	mm.	in.	mm.	psi
2 3/8	60.33	1.710	43.43	0.62	15.75	
		1.875	47.63	0.75	19.05	
2 7/8	73.03	2.125	53.98	0.81	20.57	
		2.188	55.58	0.81	20.57	
		2.313	58.75	1.12	28.45	
3 ½	88.90	2.562	65.07	1.00	25.40	
		2.750	69.85	1.50	38.10	5,000
		2.813	71.45	1.50	38.10	6,000
4	101.60	3.313	84.15	1.75	44.45	7,500
4 ½	114.30	3.437	87.30	1.75	44.45	10,000
		3.688	93.68	1.87	47.50	
		3.813	96.85	2.12	53.85	
5	127.00	4.125	104.78	2.38	57.15	
5 ½	139.70	4.562	115.87	2.56	65.02	
7	177.80	5.750	146.05	3.38	85.85	
		5.875	149.23	3.50	88.90	
		5.963	151.46	3.50	88.90	

* Please check with factory for the metallurgy & pressure rating

ACT TUBING RETRIEVABLE SAFETY VALVE



TUBING RETRIEVABLE SAFETY VALVE

Tubing Retrievable Surface Controlled Sub Surface Safety Valves are made up to and from a part of production string. Hydraulic control line extending from the valve to the Wellhead connects to a part on the outside of the valve. The opposite end of the control line connects to the Wellhead. Hydraulic pressure applied through this control line acts on hydraulic pistons within the valve. The force generated moves the flow tube down against a power spring and tubing pressure, causing the flapper to open. Maintaining this hydraulic pressure allows unrestricted well production through the valve. Releasing the hydraulic pressure causes the flow tube to move up by the action of the power spring, thus allowing the flapper to the closed position.

TUBING RETRIEVABLE SAFETY VALVES			
TUBING SIZE (in. [mm])	**Max. OD (in. [mm])**	**Min. ID (in. [mm])**	**WORKING PRESSURE psi**
2.875 [73.0]	5.453 [138.5]	2.224 [56.9]	5,000 / 10,000
3.500 [88.9]	5.750 [146.1]	2.625 [66.8]	
4.500 x 3.500 [114.3 x 88.9]	5.945 151.0]	2.562 [65.0]	
4.500 [114.3]	7.875 [200.0]	3.812 [96.8]	
5.500 [139.7]	8.375 [212.7]	4.562 [115.9]	5,000
7.000 [177.8]	9.437 [239.7]	6.000 [152.4]	

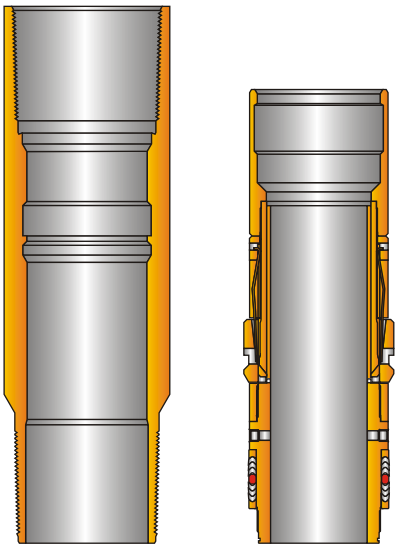
LANDING NIPPLES AND LOCK MANDRELS

ACT X and R Landing Nipples and Lock Mandrels

ACT X and R landing nipples are run into the well on the completion tubing to provide a specific landing location for subsurface flow control equipment. The common internal profiles of these landing nipples make them universal. The ACT X landing nipple is used in standard weight tubing. The ACT R landing nipple is typically used with heavy weight tubing.

The completion can have as many selective nipples with the same ID in any sequence as desired on the tubing string. This versatility results in an unlimited number of positions for setting and locking subsurface flow controls. The flow control, which is attached to the required ACT X or R lock mandrel, is run in the well via the selective running tool on slickline.

The slickline operator using the selective running tool can set the flow control in any one of the landing nipples at the desired depth. If this location is unsatisfactory or if well conditions change, the flow control may be moved up or down the tubing string to another nipple location. These operations can be done by slickline under pressure without killing the well.



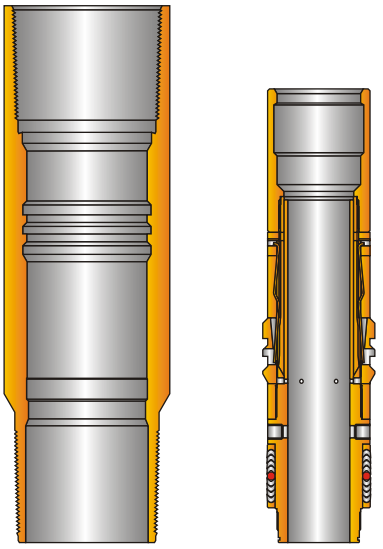
"X" LANDING NIPPLE AND LOCK MANDREL

ACT XN and RN No-Go Landing Nipples and Lock Mandrels

This equipment is designed for use in single nipple installations or as the bottom nipple in a series of ACT X or R landing nipples. These landing nipples have the same packing bore ID for a particular tubing size and weight. ACT X and XN landing nipples are designed for use with standard weight tubing. ACT R and RN landing nipples are designed for use with heavy weight tubing.

(The N designates no-go nipples.)

Applications



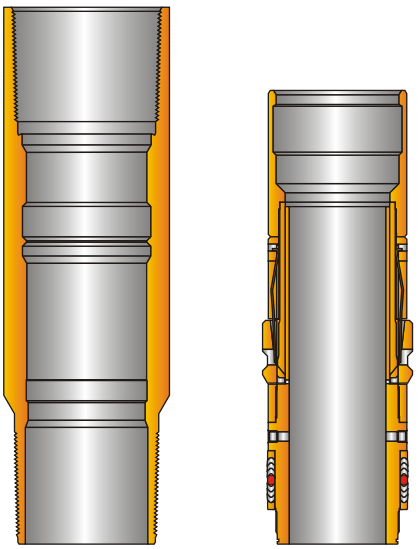
"R" LANDING NIPPLE AND LOCK MANDREL

LANDING NIPPLES AND LOCK MANDRELS

- Gauge hangers for bottomhole pressure/temperature surveys
- Positive locator for straddle systems
- Plugging under pressure
- Almost unlimited locations for setting and locking subsurface flow controls

Features

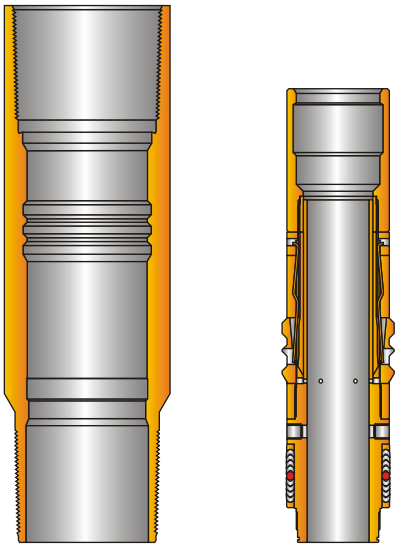
- Landing nipples
  - Large bore for minimum restriction
  - Universal nipple with one internal profile
- Lock Mandrels
  - Retractable locking keys
  - Locks designed to hold pressure from above or below from sudden reversals
- Optional holddown
  - Interference holddown for smaller locks
  - Shear pin holddown for larger locks



"XN" NO-GO LANDING NIPPLE AND LOCK MANDREL

Benefits

- Landing nipples
  - Versatility helps reduce completion and production maintenance costs
  - Simple operation
  - Multiple options when running, setting or retrieving subsurface flow controls
- Lock mandrels
  - Faster slickline service because of the retractable keys
  - Operator control of locating, landing and locking in the selected nipple
  - Inside fishing neck provides large ID to maximize production
  - Optional holddown feature for high flow rates safety valves installations



"RN" NO-GO LANDING NIPPLE AND LOCK MANDREL

'X' AND 'XN' LANDING NIPPLES AND LOCK MANDRELS

TUBING								FOR STANDARD TUBING WEIGHTS							
								X PROFILE		XN PROFILE				LOCK	
								PACKING BORE		PACKING BORE		NO-GO ID		MANDREL ID	
SIZE		WEIGHT		ID		DRIFT									
(in.)	(mm)	lb/ft	(kg/m)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)
1.050	26.67	1.20	1.79	0.824	20.93	0.730	18.54	AVAILABLE ON REQUEST							
1.315	33.40	1.80	2.68	1.049	26.64	0.955	24.26								
1.660	42.16	2.30	3.43	1.380	35.05	1.286	32.66	1.250	31.75	1.250	31.75	1.135	28.83	0.62	15.75
		2.40	3.57	1.380	35.05	1.286	32.66	1.250	31.75	1.250	31.75	1.135	28.83	0.62	15.75
1.900	48.26	2.40	3.57	1.660	42.16	1.516	38.51	1.500	38.10	1.500	38.10	1.448	36.78	0.75	19.05
		2.76	4.11	1.610	40.89	1.516	38.51	1.500	38.10	1.500	38.10	1.448	36.78	0.75	19.05
		2.90	4.32	1.610	40.89	1.516	38.51	1.500	38.10	1.500	38.10	1.448	36.78	0.75	19.05
2.063	52.40	3.25	4.84	1.751	44.48	1.657	42.09	1.625	41.28	1.625	41.28	1.536	39.01	0.75	19.05
2.375	60.33	4.60	6.85	1.995	50.67	1.901	48.29	1.875	47.63	1.875	47.63	1.791	45.49	1.00	25.40
		4.70	7.00	1.995	50.67	1.901	48.29	1.875	47.63	1.875	47.63	1.791	45.49	1.00	25.40
2.875	73.03	6.40	9.53	2.441	62.00	2.347	59.61	2.313	58.75	2.313	58.75	2.205	56.01	1.38	35.05
		6.50	9.68	2.441	62.00	2.347	59.61	2.313	58.75	2.313	58.75	2.205	56.01	1.38	35.05
3.500	88.90	9.30	13.85	2.992	76.00	2.867	72.82	2.813	71.45	2.813	71.45	2.666	67.72	1.75	44.45
		10.30	15.34	2.992	74.22	2.797	71.04	2.750	69.85	2.750	69.85	2.635	66.93	1.75	44.45
4.000	101.60	11.00	16.38	3.476	89.29	3.351	85.12	3.313	84.15	3.313	84.15	3.135	79.63	2.12	53.85
4.500	114.30	12.75	18.99	3.958	100.53	3.833	97.36	3.813	96.85	3.813	96.85	3.725	94.62	2.62	66.55
5.000	127.00	13.00	19.36	4.494	114.15	4.369	110.97	4.313	109.55	4.313	109.55	3.987	101.27	2.62	66.55
5.500	139.70	17.00	25.32	4.892	124.26	4.767	121.08	4.562	115.87	4.562	115.87	4.455	113.16	3.12	79.25

'R' AND 'RN' LANDING NIPPLES AND LOCK MANDRELS

TUBING								FOR HEAVY TUBING WEIGHTS							
								R PROFILE		RN PROFILE				LOCK	
								PACKING BORE		PACKING BORE		NO-GO ID		MANDREL ID	
SIZE		WEIGHT		ID		DRIFT									
(in.)	(mm)	lb/ft	(kg/m)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)
1.660	42.16	3.02	4.50	1.278	32.46	1.184	30.07	1.125	28.58	1.125	28.58	1.012	25.70	AVAILABLE ON REQUEST	
1.900	48.26	3.64	5.42	1.500	38.10	1.406	35.71	1.375	34.93	1.375	34.93	1.250	31.75	0.62	15.75
2.375	60.33	5.30	7.89	1.939	49.25	1.845	46.86	1.781	45.24	1.781	45.24	1.640	41.66	0.88	22.35
		5.95	8.86	1.867	47.42	1.773	45.03	1.710	43.43	1.710	43.43	1.560	39.62	0.75	19.05
		6.20	9.23	1.853	47.07	1.759	44.68	1.710	43.43	1.710	43.43	1.560	39.62	0.75	19.05
		7.70	11.47	1.703	43.26	1.609	40.87	1.500	38.10	1.500	38.10	1.345	34.16	0.62	15.75
2.857	73.03	7.90	11.77	2.323	59.00	2.229	56.62	2.199	55.58	2.188	55.58	2.010	51.05	1.12	28.45
		8.70	12.96	2.259	57.38	2.165	54.99	2.125	53.98	2.125	53.98	1.937	49.20	0.88	22.35
		8.90	13.26	2.243	56.97	2.149	54.58	2.125	53.98	2.125	53.98	1.937	49.20	0.88	22.35
		9.50	14.15	2.196	55.75	2.101	53.37	2.000	50.80	2.000	50.80	1.881	47.78	0.88	22.35
		10.40	15.49	2.151	54.64	2.057	52.25	2.000	50.80	2.000	50.80	1.881	47.78	0.88	22.35
		11.00	16.38	2.065	52.45	1.971	50.06	1.875	47.63	1.875	47.63	1.716	43.59	0.88	22.35
		11.65	17.35	1.995	50.67	1.901	48.29	1.875	47.63	1.875	47.63	1.716	43.59	0.88	22.35
3.500	89.90	12.95	19.29	2.750	69.85	2.625	66.68	2.562	65.07	2.562	65.07	2.329	59.16	1.38	35.05
		15.80	23.53	2.548	64.72	2.423	61.54	2.313	58.75	2.313	58.75	2.131	54.13	1.12	28.45
		16.70	24.87	2.480	62.99	2.355	59.82	2.313	58.75	2.313	58.75	2.131	54.13	1.12	28.45
		17.05	25.40	2.440	61.98	2.315	58.80	2.188	55.58	2.188	55.58	2.010	51.05	1.12	28.45
4.000	101.60	11.60	17.28	3.428	87.07	3.303	83.90	3.250	82.55	3.250	82.55	3.088	78.44	1.94	49.28
		13.40	19.96	3.340	84.84	3.215	81.66	3.125	79.38	3.125	79.38	2.907	73.84	1.94	49.28
4.500	114.30	12.75	18.99	3.958	100.53	3.833	97.36	3.813	96.85	3.813	96.85	3.725	94.62	2.12	53.85
		13.50	20.11	3.920	99.57	3.795	96.39	3.688	93.68	3.688	93.68	3.456	87.78	2.38	60.45
		15.50	23.09	3.826	97.18	3.701	94.01	3.688	93.68	3.688	93.68	3.456	87.78	2.38	60.45
		16.90	25.17	3.754	95.35	3.629	92.18	3.437	87.30	3.437	87.30	3.260	82.80	1.94	49.28
		19.20	28.60	3.640	92.46	3.515	89.28	3.437	87.30	3.437	87.30	3.260	82.80	1.94	49.28
5.000	127.00	15.00	22.34	4.408	111.96	4.283	108.79	4.125	104.78	4.125	104.78	3.913	99.39	2.75	69.85
		18.00	26.81	4.276	108.61	4.151	105.44	4.000	101.60	4.000	101.60	3.748	95.20	2.38	60.45
5.500	139.70	17.00	25.32	4.892	124.26	4.767	121.08	4.562	115.87	4.562	115.87	4.455	113.16	2.85	72.39
		20.00	29.79	4.778	121.36	4.653	118.19	4.562	115.87	4.562	115.87	4.455	113.16	2.85	72.39
		23.00	34.26	4.670	118.62	4.545	115.44	4.313	109.55	4.313	109.55	3.987	101.27	2.62	66.55
6.000	152.40	15.00	22.34	5.524	140.31	5.399	137.13	5.250	133.35	5.250	133.35	5.020	127.51	3.50	88.90
		18.00	26.81	5.424	137.77	5.299	134.59	5.250	133.35	5.250	133.35	5.020	127.51	3.50	88.90
6.625	168.28	24.00	35.75	5.921	150.39	5.796	147.22	5.625	142.88	5.625	142.88	5.500	139.70	3.50	88.90
		28.00	41.71	5.791	147.09	5.666	143.92	5.625	142.88	5.625	142.88	5.500	139.70	3.50	88.90
7.000	177.80	17.00	25.32	6.538	166.07	6.431	163.35	5.962	151.43	5.962	151.43	5.750	146.05	3.75	95.25
		20.00	29.79	6.456	163.98	6.331	160.81	5.962	151.43	5.962	151.43	5.750	146.05	3.75	95.25
		23.00	34.26	6.366	161.70	6.241	158.52	5.962	151.43	5.962	151.43	5.750	146.05	3.75	95.25
		26.00	38.73	6.276	159.41	6.151	156.24	5.962	151.43	5.962	151.43	5.750	146.05	3.75	95.25
		29.00	43.20	6.184	157.07	6.059	153.90	5.962	151.43	5.962	151.43	5.750	146.05	3.75	95.25
		32.00	47.66	6.094	154.79	6.969	177.01	5.962	151.43	5.962	151.43	5.750	146.05	3.75	95.25
		35.00	52.13	6.004	152.50	5.879	149.33	5.875	149.23	5.875	149.23	5.750	146.05	3.75	95.25
8.625	219.08	36.00	53.62	7.825	198.76	7.700	195.58	7.450	189.23	7.450	189.23	7.325	186.06	5.250	133.35
		36.00	53.62	7.825	198.76	7.700	195.58	7.250	184.15	7.250	184.15	7.125	180.98	5.250	133.35
		36.00	53.62	7.825	198.76	7.700	195.58	7.050	179.07	7.050	179.07	6.925	175.90	5.250	133.35

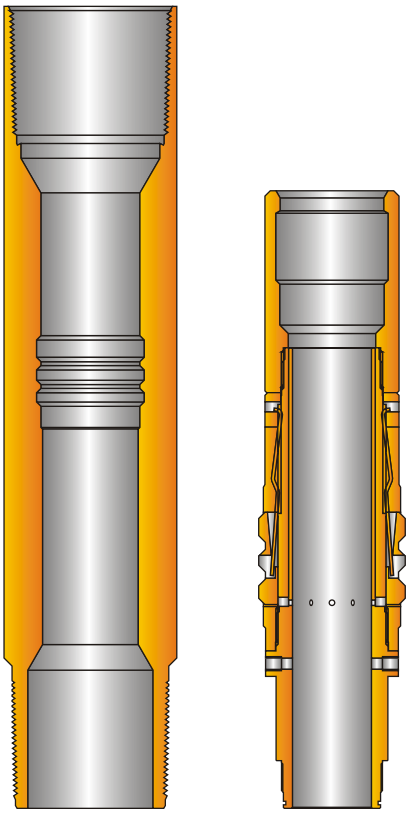
ACT 'RPT' NO-GO LANDING NIPPLE AND LOCK MANDREL

ACT RPT no-go landing nipple system provides a mean of running a series of positive location landing nipples in a tubing string with minimum restriction. ACT RPT no-go landing nipples are designed to accept ACT RPT lock mandrels with a rated working pressure of 10,000 psi (690 bar) differential and greater from above and below.

The ACT RPT no-go lock mandrel locates on top of the nipples polished bore; therefore, there are no secondary restrictions normally accosiated with bottom no-go profiles. This feature makes ACT RPT system well suited for high pressure, high volume, large bore completions. ACT RPT lock mandrels in any given size range are designed to use the same running tool and pulling tool.

Features

- Large bore
- Lock mandrel locates on top of the nipples polished bore
- Landing nipples can accept ACT RPT lock mandrels with a rated working pressure of 10,000 psi (690 bar) differential from above and below
- A series of profile IDs are established for common tubing strings by size and weight



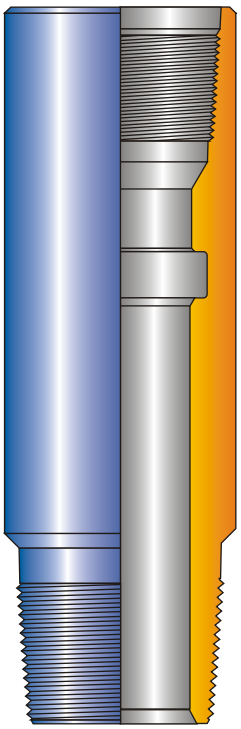
"RPT" TYPE NO-GO LANDING NIPPLE AND LOCK MANDREL

'RPT' LANDING NIPPLES AND LOCK DIMENSIONS

TUBING SIZE		NIPPLE PROFILE SEALBORE (MIN. ID)		LOCK MANDREL ID		LOCK MANDREL OD	
in.	mm	in.	mm	in.	mm	in.	mm
2 3/8	60.33	1.500	38.10	0.75	19.05	1.560	39.62
		1.625	41.28			1.685	42.80
		1.781	45.24			1.841	46.76
		1.875	47.63			1.935	49.15
		2.000	50.80			2.060	52.32
		2.125	53.98			2.185	55.5
2 7/8	73.03	2.000	50.80	1.12	28.45	2.060	52.32
		2.125	53.98			2.185	55.5
		2.188	55.58			2.248	57.10
		2.313	58.75			2.373	60.27
		2.482	63.04			2.542	64.57
3 1/2	88.90	2.562	65.07	1.50	38.10	2.622	66.6
		2.650	67.31			2.710	68.83
		2.750	69.85			2.810	71.37
		2.810	71.45			2.860	72.64
		2.875	73.03			2.935	74.55
4 - 4 1/2	101.6 - 114.3	3.000	76.20	1.75	44.45	3.060	77.72
		3.125	79.38			3.210	81.53
		3.125	79.38	1.94	49.28	3.210	81.53
		3.313	84.15			3.395	86.23
4 1/2 - 5	114.3 - 127	3.437	87.30	1.94	49.28	3.520	89.41
		3.562	90.47			3.650	92.71
		3.688	93.68			3.770*	95.76
		3.750	95.25			3.807	96.70
		3.813	96.85			3.895	98.93
		4.000	101.60			4.090	103.89
5 1/2	139.70	4.188	106.38	2.75	69.85	4.270*	108.46
		4.250	107.95			4.332*	110.03
		4.313	109.55			4.395	111.63
		4.437	112.70			4.520*	114.81
		4.500	114.30			4.550	115.57
		4.562	115.87			4.650	118.11
		4.688	119.08			4.760*	120.90
		4.688	119.08	3.12	79.25	4.760*	120.90
		4.750	120.65			4.825	122.56
		4.813	122.25			4.890	124.21
7	177.80	5.250	133.35	3.68	93.47	5.334	135.48
		5.500	139.70			5.585	141.86
		5.625	142.88			5.710	145.03
		5.750	146.05			5.840*	148.34
		5.813	147.65			5.890*	149.61
		5.875	149.23			5.940	150.88
		5.963	151.46			6.025	153.04
		6.125	155.58			6.180	156.97
		6.250	158.75			6.330	160.78

* NO-GO OD may not be compatible with next larger size nipple.

ACT MODEL 'F' NIPPLE



'F' NIPPLE

The model 'F' nipple provides a tubing lock profile with honed unrestricted seal bore to locate wireline flow control devices such as velocity safety valves, blanking plugs chokes, equalizing check valves and instrument hangers.

The number & location of model 'F' nipple should be carefully considered in the completion design stage to allow maximum versality in position of various flow control devices.

'F' Nipple can accept Selective 'S' or Top No-Go 'W' locking devices attached to flow control accessories.

It is manufactured either from low alloy steel or 9 Cr,1 Mo-steel with controlled hardness for H_2S/CO_2 service. It is available upto 15,000 PSI WP

For ordering please specify:

- Nipple model.
- Top & bottom thread connections.
- Packing ID.
- Working pressure & temperature.
- Type of service
- Tubing size, weight & Grade.

'F' NIPPLE SPECIFICATIONS

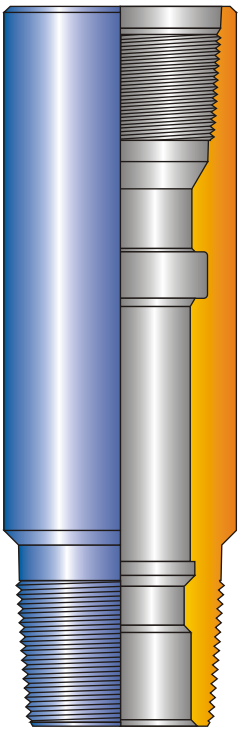
Tubing	Nipple			Nipple Type	
OD-Inches	Seal Bore-Inches	Size-Inches	Min. OD-Inches	Selective	Top No-Go
1.900	1.437	1.43	2.109	x	x
	1.500	1.50		x	-
2.1/16	1.562	1.56	2.250	x	x
	1.625	1.62		x	-
2.3/8	1.781	1.78	2.560	x	x
	1.812	1.81		x	x
	1.875	1.87		x	-
2.7/8	2.062	2.06	3.109	x	x
	2.250	2.25		x	x
	2.312	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	-
5.00	4.000	4.00	Coupling OD	x	x
	4.125	4.12		x	x
	4.312	4.31		x	x
5 1/2	4.437	4.43	Coupling OD	x	-
	4.562	4.56		x	x
	4.750	4.75		x	x

A. Other seal bore sizes are available in the various tubing sizes as per costumer's requirement.

B. Equipment will be provided with OD corresponding to coupling OD for the type of the nipple unless specified otherwise.

C. Available with Premium thread connections also.

ACT MODEL 'R' NIPPLE



'R' NIPPLE

The model 'R' nipple is a bottom no go style nipple that provides a tubing lock profile with a honed seal bore to locate wireline flow control devices in tubing string.

Blanking plugs, chokes, equalizing check valves and instrument hangers which utilize a 'Z' lock may be landed in this type of nipple profile. The no-go shoulder incorporated into the nipple allows positive locating of all flow control equipments used during wireline operations.

ACT nipple is manufactured from low alloy steel/9 CR. 1MO steel with controlled hardness (17-22 HRC) for H_2S/CO_2 application. It is available up to 15,000 PSI WP.

For ordering please specify:

- Nipple model.
- Top & Bottom thread connections.
- Packing ID.
- Working pressure & temperature.
- Type of service.
- Tubing size, weight & Garde.

'R' NIPPLE SPECIFICATIONS

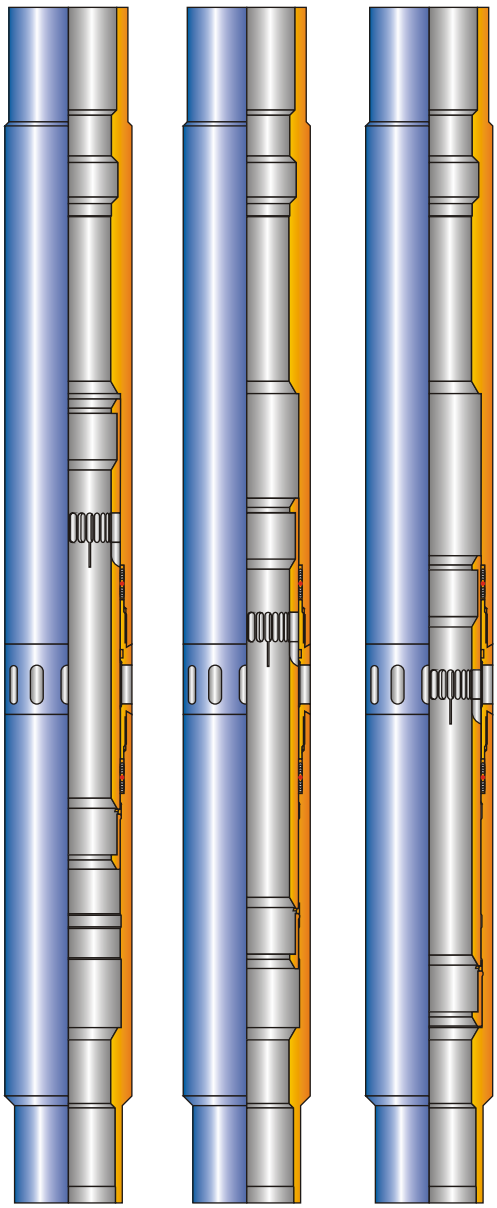
Tubing	Nipple			
OD-Inches	Seal Bore-Inches	Size-Inches	No-Go ID-Inches	Min. OD Inches
1.900	1.437	1.43	1.385	2.109
	1.500	1.50	1.447	
2.1/16	1.562	1.56	1.510	2.250
	1.625	1.62	1.572	
2.3/8	1.781	1.78	1.728	2.560
	1.812	1.81	1.760	
	1.875	1.87	1.822	
2.7/8	2.062	2.06	1.978	3.109
	2.250	2.25	2.197	
	2.312	2.31	2.260	
3.1/2	2.562	2.56	2.442	3.687
	2.750	2.75	2.697	
	2.812	2.81	2.760	
4.1/2	3.688	3.68	3.625	Coupling OD
	3.750	3.75	3.700	
	3.812	3.81	3.759	
5.00	4.000	4.00	3.910	Coupling OD
	4.125	4.12	4.035	
	4.312	4.31	4.223	
5.1/2	4.562	4.56	4.472	Coupling OD
	4.750	4.75	4.660	

A. Other seal bore sizes are available in the various tubing sizes as per costumer's requirement.

B. Equipment will be provided With OD corresponding to coupling OD for the type of thread of the nipple unless specified otherwise.

C. Available with Premium thread connections also.

ACT MODEL 'PCMD' AND 'PCMU' SLIDING SLEEVE



CLOSED *EQUALIZED* *OPEN*

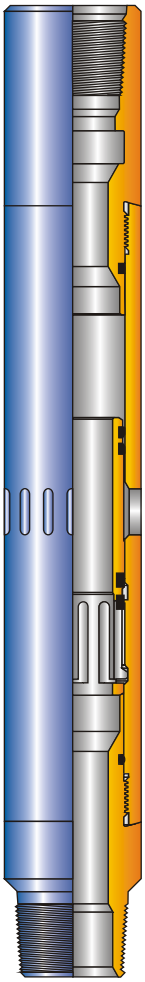
The ACT model PCMD and PCMU sliding sleeve provides a means of communication between the tubing and the annulas. It has internal honed seal bores located in top and bottom housing for placement of flow control devices. The internal sleeve is shifted open or closed by using a B type wireline shifting tool. ACT model PCMD is down shift to open and PCMU is up shift to open sliding sleeve.

ACT PCMD Sliding Sleeve can be converted to PCMU or vice versa by changing the upper and lower subs.

PCMD AND PCMU DATA SHEET

	2.7/8"	2.3/8"	2.7/8"	3.1/2"			4"	4.1/2"		5.1/2"
SEAL BORE	1.81	1.87	2.31	2.56	2.75	2.81	3.31	3.75	3.81	4.43
MAX. OD	3.75	3.080	3.750	4.280	4.280	4.280	5.520	5500		6.500
MIN. ID	1.830	1.990	2.375	2.610	2.775	2.825	3.395	3.895		4.500
TOTAL LENGTH	48.10	48.99	48.63	51.67	52.37	50.00	55.25	54.89	54.30	60.64

ACT MODEL 'L' SLIDING SLEEVE



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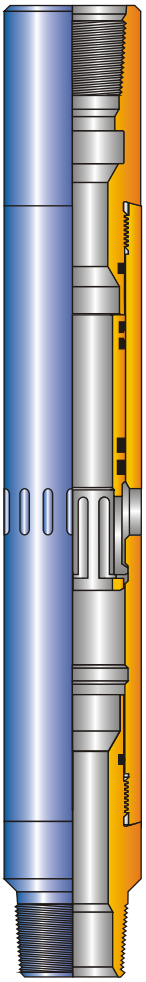


OPEN

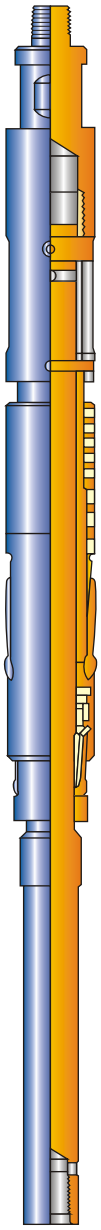
The ACT Model 'L' sliding sleeve is a downhole tool used to establish communication, when desired, between the tubing and annulus. Selective and /or top No-Go locking devices are available for use with the sleeve. It has seal bores above and below the ports, and a top No-Go shoulder and locking groove.

The 'L' sliding sleeve locates, seals and retains flow control accessories that have either top No-Go or selective locks.

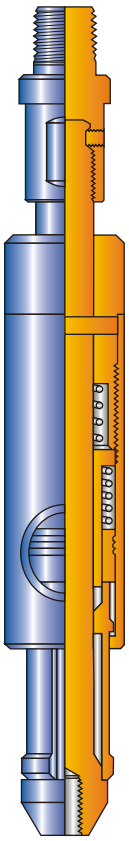
ACT Model 'L' sliding sleeve is manufactured for standard H_2S and H_2S - CO_2 services.

'L' SLIDING SLEEVE SPECIFICATIONS			
Tubing	Sliding Sleeve		
ID-Inches	Seal Bore Inches	Size-Inches	OD-Inches
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	
5.1/2	4.313	4.31	Coupling OD
	4.562	4.56	

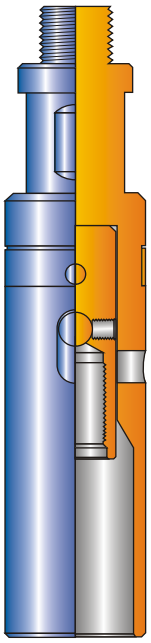
RUNNING / PULLING TOOLS



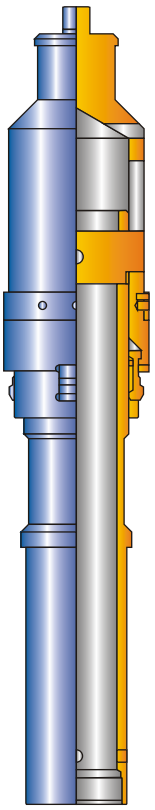
X RUNNING TOOL



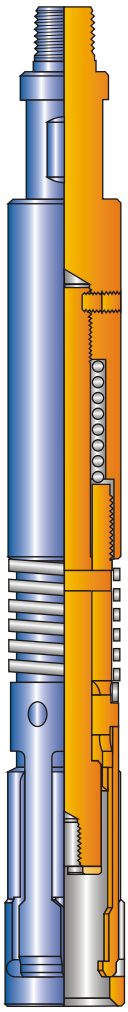
GS PULLING TOOL



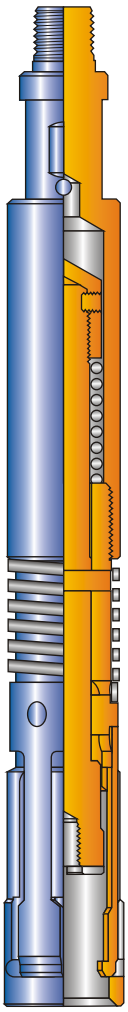
GU SHEAR UP ADAPTER



RXN RUNNING TOOL

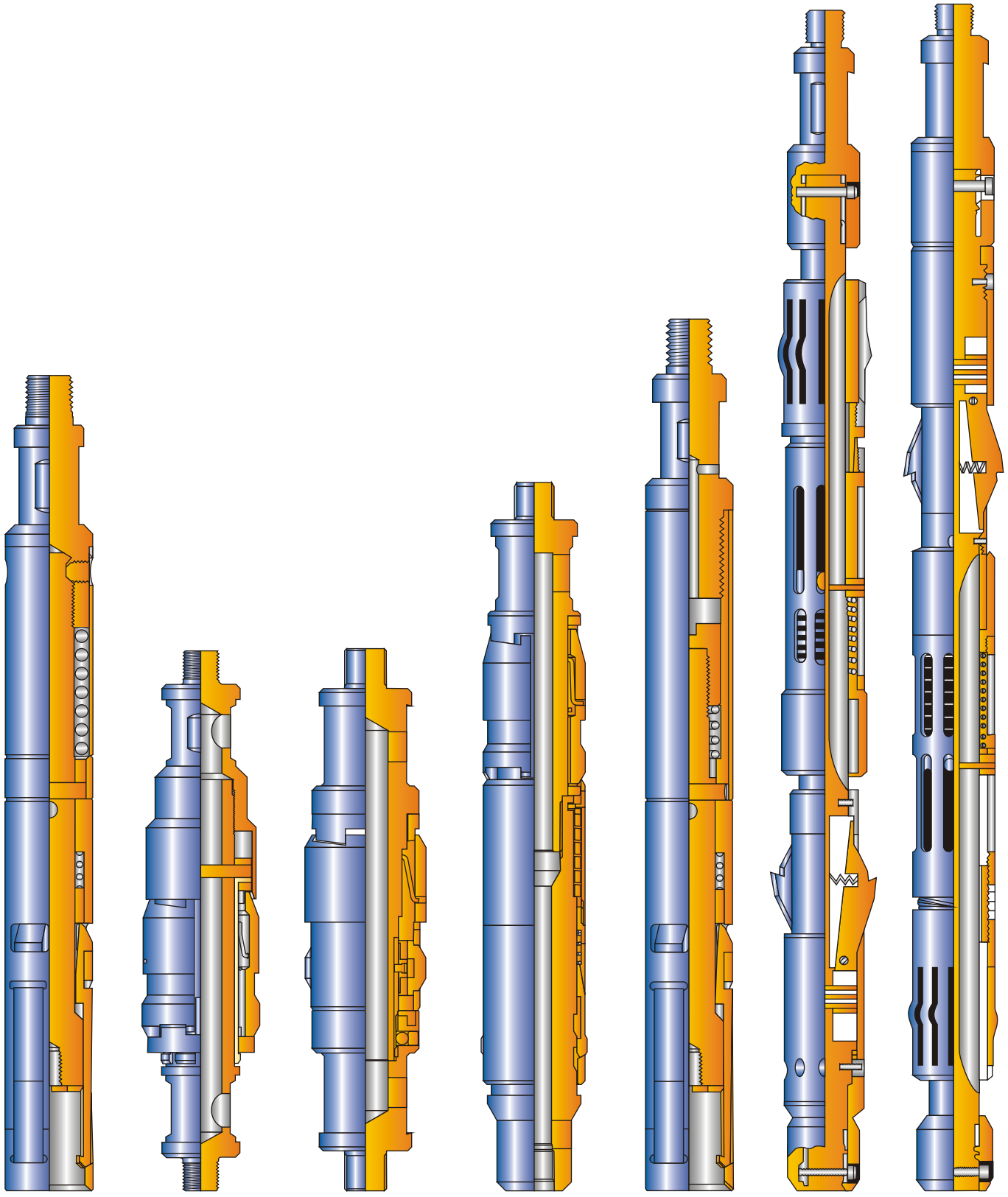


JU PULLING TOOL



JD PULLING TOOL

RUNNING / PULLING TOOLS



R PULLING TOOL

BO POSITIONING TOOL

X SELECTIVE POSITIONING TOOL

BO SELECTIVE POSITIONING TOOL

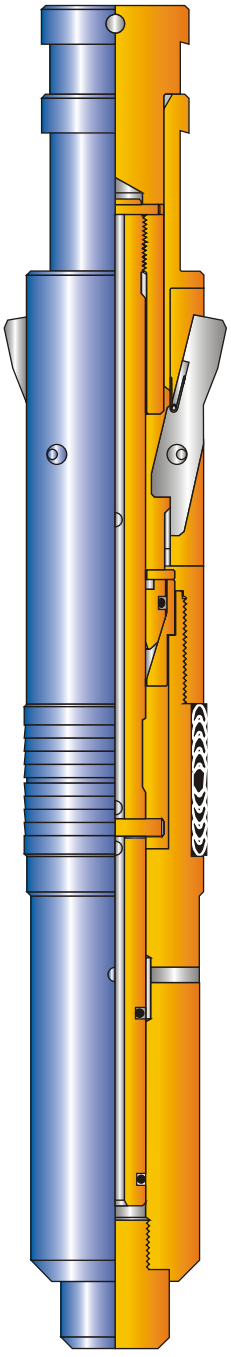
S PULLING TOOL

OPENING POSITION

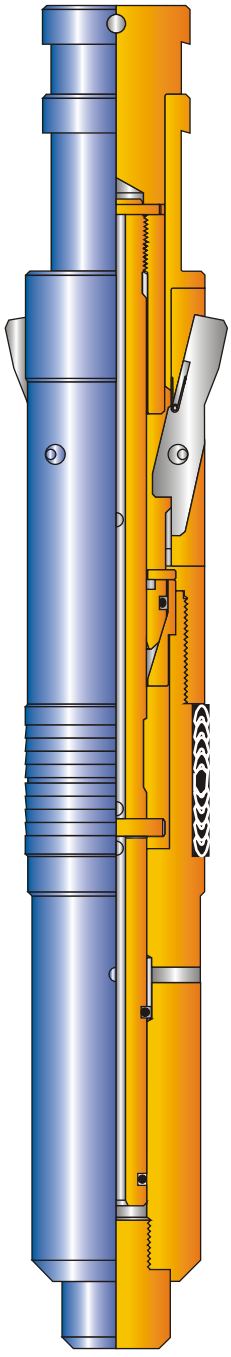
CLOSING POSITION

D-2 SHIFTING TOOL

ACT MODEL 'G' BOTTOM BYPASS BLANKING PLUGS



MODEL 'RZG'



MODEL 'FWG'

The ACT Model 'G' Bottom Bypass Blanking Plugs are available in the following models:

'FSG' -

run in all Model

'F' Nipples

'FWG' -

run in Top No-Go Model

'F' Nipples

'RZG' -

run in Bottom No-Go Model

'R' Nipples

These type of plugs are run in the by pass position to allow the passage of well fluid through the assembly, while landing the equipment in a Nipple Profile. A 'C-l ' Running Tool is used to run the plug.

Once set in the Nipple Profile this group of plugs can hold pressure from above and below.

The pressure is equalized prior to retrieval by pulling the Equalizing Mandrel.

A standard Pulling Tool and proper Probe for the style of Lock is used to pull the plug assembly.

The ACT 'G' Bottom Bypass Blanking Plugs are manufactured for Standard, H_2S-CO_2 service.

Applications:

1. Selected zones can be produced or shut in.
2. To pressure test tubing.
3. To isolate tubing for wellhead repair or removal
4. To set hydraulic actuated packers.
5. To snub tubing in or out of the well.

Ordering information:

Please specify nipple model, seal bore size, plug model, working pressure and temperature, Percentage of H_2S and Co_2

ACT MODEL 'G' BOTTOM BYPASS BLANKING PLUGS

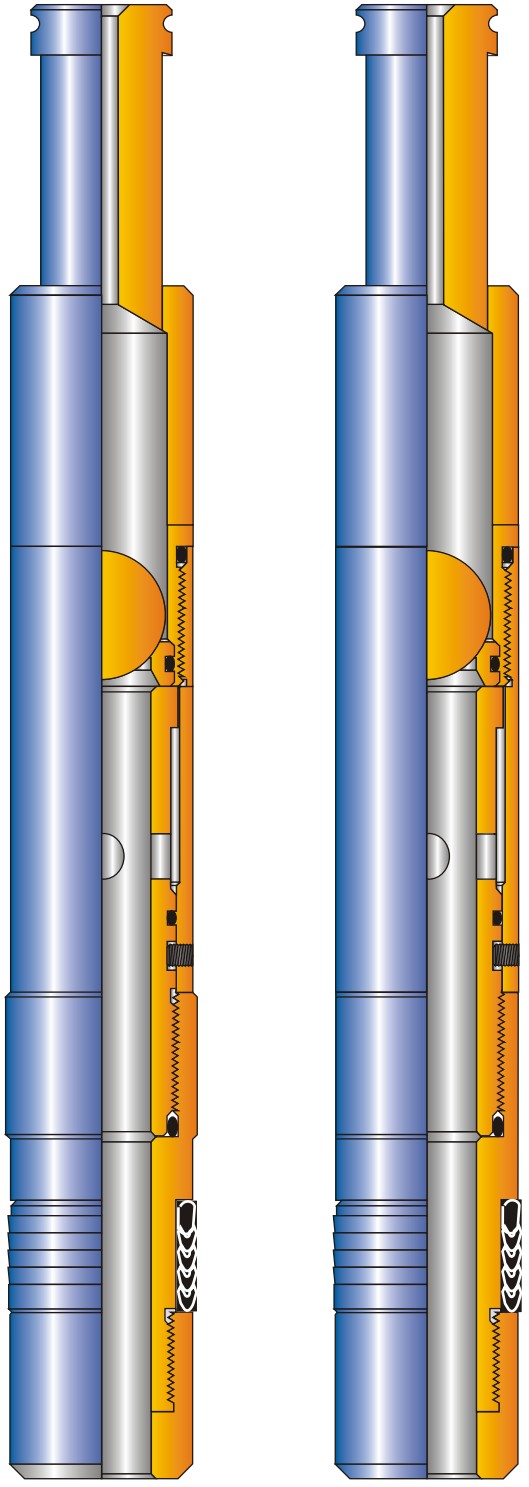
'FWG' BYPASS BLANKING PLUG SPECIFICATIONS

Tubing Nipple Accessory Availability			To Run	To Pull			FWG Dimension Specifications			
			'C-1'	Equalizing		Plug	Equalizing	Plug Lock Mandrel		Maximum
Tubing Size	Nipple Size	Plug Type	Running Tool	Mandrel		Assembly	Mandrel			
ID Inches	Seal Bore Inches	'FWG' Size	Size Inches	Pulling Tool Type		B Probe	Fishing Neck		Fishing Neck ID	Plug OD
				OTIS	CAMCO	Size Inches	OD Inches	OD Inches	ID Inches	OD Inches
1.900	1.437	1.43	1.900	40RB14	JUC15174	1.900				1.490
	1.500	-					1.188	1.188	0.750	-
2.1/16	1.562	1.56	2.1/16	40SB6	JDC15154	2.1/16				1.615
	1.625	-								-
	1.781	1.78		40RB17	JUC15185					1.865
2.3/8	1.812	1.81	2.3/8			2.3/8	1.375	1.375	0.875	1.865
	1.875	-		40SB1	JDC15169					-
	2.062	2.06		40RB18	JUC15189					2.115
2.7/8	2.250	2.25	2.7/8			2.7/8	1.750	1.750	1.188	2.302
	2.312	-		40SB2	JDC15171					-
	2.562	2.56		40RB19	JUC15191					2.625
3.1/2	2.750	2.75	3.1/2			3.1/2	2.313	2.313	1.438	2.802
	2.812	-		40SB9	JDC15181					-
	3.688	3.68		40RB20	JUC15193					3.740
4.1/2	3.750	3.75	4.1/2			4.1/2	3.125	3.125	2.062	3.802
	3.812	-		40SB10	JDC15183					-

'RZG' BYPASS BLANKING PLUG SPECIFICATIONS

Tubing Nipple Accessory Availability			To Run	To Pull			RZG Dimension Specifications			
			'C-1'	Equalizing		Plug	Equalizing	Plug Lock Mandrel		Maximum
Tubing Size	Nipple Size	Plug Type	Running Tool	Mandrel		Assembly	Mandrel			
ID Inches	Seal Bore Inches	'RZG' Size	Size Inches	Pulling Tool Type		B Probe	Fishing Neck		Fishing Neck ID	Plug OD
				OTIS	CAMCO	Size Inches	OD Inches	OD Inches	ID Inches	OD Inches
1.900	1.437	1.43	1.900	40RB14	JUC15174	1.900				1.472
	1.500	1.50					1.188	1.188	0.750	1.490
2.1/16	1.562	1.56	2.1/16	40SB6	JDC15154	2.1/16				1.552
	1.625	1.62								1.615
	1.781	1.78		40RB17	JUC15185					1.771
2.3/8	1.812	1.81	2.3/8			2.3/8	1.375	1.375	0.875	1.802
	1.875	1.87		40SB1	JDC15169					1.865
	2.062	2.06		40RB18	JUC15189					2.052
2.7/8	2.250	2.25	2.7/8			2.7/8	1.750	1.750	1.188	2.240
	2.312	2.31		40SB2	JDC15171					2.302
	2.562	2.56		40RB19	JUC15191					2.552
3.1/2	2.750	2.75	3.1/2			3.1/2	2.313	2.313	1.438	2.740
	2.812	2.81		40SB9	JDC15181					2.802
	3.688	3.68		40RB20	JUC15193					3.678
4.1/2	3.750	3.75	4.1/2			4.1/2	3.125	3.125	2.062	3.740
	3.812	3.81		40SB10	JDC15183					3.802

ACT MODEL 'FB-2' AND 'RB-2' EQUALIZING CHECK VALVES



MODEL 'FB-2'

MODEL 'RB-2'

The ACT Model 'FB-2' and 'RB-2' Equalizing Check Valves are complete equipment units, without any Locking Device. They are utilized in the following Tubing Mounted Equipment:

'FB-2'

run in all Model 'F' Nipples and all Model 'L' Sliding Sleeves

'RB-2'

run in Bottom No-Go 'R' Nipples

Both models are run into a Nipple Profile and hold pressure from above only. The 'FB-2' model lands on the top of a 'F' Nipple Profile seal bore. The 'RB2' model seats on the Bottom No-Go Shoulder of a 'R' Nipple

A 'C-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 Tool is utilized for retrieval of these valves.

The ACT 'FB-2' and RB-2' Equalizing Check Valves are manufactured for Standard, H_2S and H_2S-CO_2 service.

Applications :

1. Can be used as a plug to pressure test tubing.
2. To set hydraulically actuated packer with the check valve positioned below the packer.
3. For gas lift operations.
4. To be used as a standing valve in wells which have downhole electric pumps.

Ordering information :

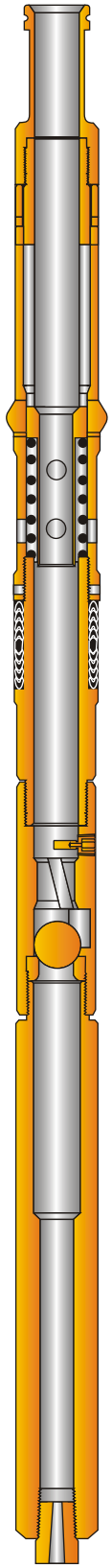
Please specify nipple model, seal bore size, check valve model, working pressure and temperature, percentage of H_2S and Co_2

ACT MODEL 'FB-2' AND 'RB-2' EQUALIZING CHECK VALVES

'FB-2' EQUALIZING CHECK VALVE SPECIFICATIONS								
Tubing Nipple Accessory Availability			To Run			To Pull		
			'C-1'	Jar Down		Pulling Tool type		Maximum
Tubing Size	Nipple Size	Check Valve	Running Tool	Pulling Tool				Check Valve OD
ID-Inches	Seal Bore Inches	'FB-2' Size	Size Inches	OTIS	CAMCO	OTIS	CAMCO	OD Inches
1.900	1.437	1.43	1.900			40RB14	JUC15174	1.490
	1.500	1.50		40SB6	JDC15154			1.552
2.1/16	1.562	1.56	2.1/16			40SB6	JDC15154	1.615
	1.625	1.62						1.672
	1.781	1.78						1.865
2.3/8	1.812	1.81	2.3/8	40SB1	JDC15169	40RB17	JUC15185	1.865
	1.875	1.87				40SB1	JDC15169	1.905
2.7/8	2.250	2.25	2.7/8	40SB2	JDC15171	40RB18	JUC15189	2.302
	2.312	2.31				40SB2	JDC15179	2.364
3.1/2	2.750	2.75	3.1/2	40SB9	JDC15181	40RB19	JUC15191	2.802
	2.812	2.81				40SB9	JDC15181	2.865
	3.688	3.68						3.740
4.1/2	3.750	3.75	4.1/2	40SB10	JDC15183	40RB20	JUC15193	3.802
	3.812	3.81				40SB10	JDC15183	3.875

'RB-2' EQUALIZING CHECK VALVE SPECIFICATIONS								
Tubing Nipple Accessory Availability			To Run			To Pull		
			'C-1'	Jar Down		Pulling Tool type		Maximum
Tubing Size	Nipple Size	Check Valve	Running Tool	Pulling Tool				Check Valve OD
ID-Inches	Seal Bore Inches	'RB-2' Size	Size Inches	OTIS	CAMCO	OTIS	CAMCO	OD Inches
1.900	1.437	1.43	1.900			40RB14	JUC15174	1.427
	1.500	1.50		40SB6	JDC15154			1.490
2.1/16	1.562	1.56	2.1/16			40SB6	JDC15154	1.552
	1.625	1.62						1.615
	1.781	1.78						1.771
2.3/8	1.812	1.81	2.3/8	40SB1	JDC15169	40RB17	JUC15185	1.802
	1.875	1.87				40SB1	JDC15169	1.865
2.7/8	2.250	2.25	2.7/8	40SB2	JDC15171	40RB18	JUC15189	2.240
	2.312	2.31				40SB2	JDC15179	2.302
3.1/2	2.750	2.75	3.1/2	40SB9	JDC15181	40RB19	JUC15191	2.740
	2.812	2.81				40SB9	JDC15181	2.802
	3.688	3.68				40RB20	JUC15193	3.678
4.1/2	3.812	3.81	4.1/2	40SB10	JDC15183	40SB10	JDC15183	3.802

ACT MODEL 'FGK' EQUALIZING CHECK VALVE CHOKE WITH CERAMIC BEAN



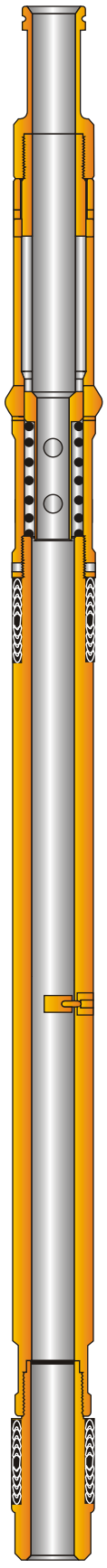
The model 'FGK' equalizing check valve choke is a top No-Go wireline retrievable tool which controls upward flow and prevents downward flow. It is landed and set in the type 'F' landing Nipple. An integral, erosion resistant, ceramic orifice is sized to control the upward flow as desired, while downward flow is checked with a ball and seat device.

Pressure can be equalized across the valve by breaking the equalizing plug.

SPECIFICATION GUIDE (Inches & Metric)

Size Inches	Seal Bore Size	Size	Max O.D. Inches	To Run		To Equalize		To Pull	
				"C-1" Running Tool	"N-1" Shank	'A' Guide	'A' Prong	Pulling Tool	"N-1" Probe
2.3/8	1.78	1,78	1.865	2.3/8		2.3/8	1/2	40RB17 40SB1 JUC-TD15185 JDC-TD15169	2.3/8
	1.812	1.81							
	1.875	1.87	1.928						
2.7/8	2.25	2.25	2.302	2.7/8		2.7/8	1/2	40RB18 40SB2 JUC-TD15189 JDC-TD15171	2.7/8
	2.31	2.31	2.365						
3.1/2	2.75	2.75	2.802	3.1/2		3.1/2	5/8	40RB19 40SB9 JDC15181 JUC15191	3.1/2
	2.812	2.81	2.865						
4.1/2	3.688	3.68	3.740	4.1/2		4.1/2	5/8	40RB20 40SB10 JDC15183 JUC15193	4.1/2
	3.812	3.81	3.875						

ACT MODEL 'LGE' SEPARATION SLEEVE

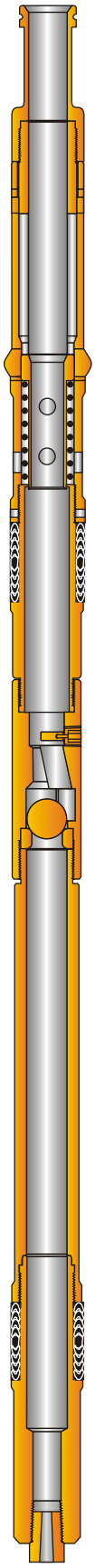


The model 'LGE' Separation Sleeve is a Top No-Go device which is run on wireline and designed to be landed and set in the type 'L' sliding sleeve. These are equipped with two packing assemblies, that seal off the upper and lower seal bore of sliding sleeve, Therefore isolating the sleeve ports. Production can be maintained by producing the well through the inside diameter of the tool. The separation Sleeve is also designed with an internal equalizing plug to equalize pressure before retrieving.

SPECIFICATION GUIDE (Inches & Metric)

Size Inches	Seal Bore Size	Size	Max O.D. Inches	To Run		To Equalize		To Pull	
				"C-1" Running Tool	"N-1" Shank	'A' Guide	'A' Prong	Pulling Tool	"N-1" Probe
2.3/8	1.78	1,78	1.865	2.3/8		2.3/8	1/2	40RB17 40SB1 JUC-TD15185 JDC-TD15169	2.3/8
	1.812	1.81							
	1.875	1.87	1.928						
2.7/8	2.25	2.25	2.302	2.7/8		2.7/8	1/2	40RB18 40SB2 JUC-TD15189 JDC-TD15171	2.7/8
	2.31	2.31	2.365						
3.1/2	2.75	2.75	2.802	3.1/2		3.1/2	5/8	40RB19 40SB9 JDC15181 JUC15191	3.1/2
	2.812	2.81	2.865						
4.1/2	3.688	3.68	3.740	4.1/2		4.1/2	5/8	40RB20 40SB10 JDC15183 JUC15193	4.1/2
	3.812	3.81	3.875						

ACT MODEL 'LGK' EQUALIZING CHECK VALVE CHOKE WITH CERAMIC BEAN



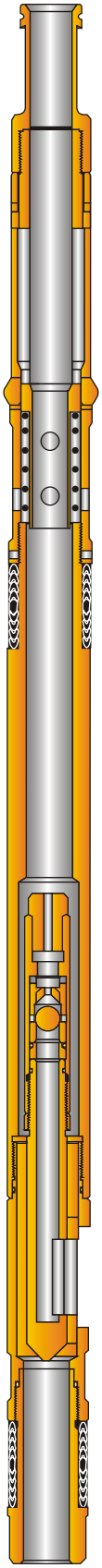
The model 'LGK' equalizing check valve choke is a Top No-Go wireline retrievable tool which controls upward flow and prevents downward flow. It is landed and set in the type 'L' sliding sleeve. An integral, erosion resistant, ceramic orifice is sized to control the upward flow as desired, while downward flow is checked with a ball and seat device.

Pressure can be equalized across the valve by breaking the equalizing plug.

SPECIFICATION GUIDE (Inches & Metric)

Size Inches	Seal Bore Size	Size	Max O.D. Inches	To Run		To Equalize		To Pull	
				"C-1" Running Tool	"N-1" Shank	'A' Guide	'A' Prong	Pulling Tool	"N-1" Probe
2.3/8	1.78	1,78	1.865	2.3/8		2.3/8	1/2	40RB17	2.3/8
	1.812	1.81						40SB1	
	1.875	1.87	1.928					JUC-TD15185	
								JDC-TD15169	
2.7/8	2.25	2.25	2.302	2.7/8		2.7/8	1/2	40RB18	2.7/8
	2.31	2.31	2.365					40SB2	
								JUC-TD15189	
								JDC-TD15171	
3.1/2	2.75	2.75	2.802	3.1/2		3.1/2	5/8	40RB19	3.1/2
	2.812	2.81	2.865					40SB9	
								JDC15181	
								JUC15191	
4.1/2	3.688	3.68	3.740	4.1/2		4.1/2	5/8	40RB20	4.1/2
	3.812	3.81	3.875					40SB10	
								JDC15183	
								JUC15193	

ACT MODEL 'LGU' BYPASS CHOKE

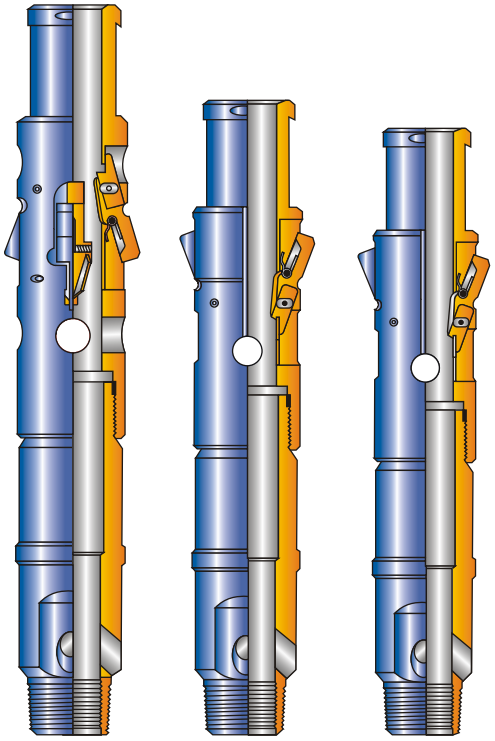


The TYPE "LGU" BY-PASS CHOKE is a Top No-Go device which is run on wireline and designed to be landed and set in the Type "L" Sliding Sleeve ideally suited for commingled production. The BY -PASS CHOKE is equipped with a ceramic flow choke which controls the flow of the zone being produced through the Sliding Sleeve. Production from the other zone flows thru the bypass, but is prevented from back flowing through the choke and the Sliding Sleeve by an API ball and seat back check valve.

SPECIFICATION GUIDE (Inches & Metric)

Size Inches	Seal Bore Size	Size	Max O.D. Inches	To Run		To Pull	
				"C-1" Running Tool	"N-1" Shank	Pulling Tool	"N-1" Probe
2.3/8	1.78	1,78	1.865	2.3/8		40RB17 40SB1 JUC-TD15185 JDC-TD15169	2.3/8
	1.812	1.81					
	1.875	1.87	1.928				
2.7/8	2.25	2.25	2.302	2.7/8		40RB18 40SB2 JUC-TD15189 JUC-TD15171	2.7/8
	2.31	2.31	2.365				
3.1/2	2.75	2.75	2.802	3.1/2		40RB19 40SB9 JDC15181 JUC15191	3.1/2
	2.812	2.81	2.865				
4.1/2	3.688	3.68	3.740	4.1/2		40RB20 40SB10 JDC15183 JUC15193	4.1/2
	3.812	3.81	3.875				

ACT MODEL 'B' DOWNHOLE INSTRUMENT HANGERS



Model 'FSB' Model 'FWB' Model 'RZB'

The ACT Model 'B' Downhole instrument Hangers are available in the following models:

'FSB'

run in all Model
'F' Nipples

'FWB' -

run in Top No-Go Model
'F' Nipples

'RZB'

run in Bottom No-Go
'R' Nipples

These type of hangers are used to hang instruments such as Pressure and Temperature Gauges in a Nipple Profile. Recorders are held securely 'in place when recording data during high production rates. Pressure data is easily correlated between runs, as recorders are always landed at the same depth. The hangers permit simultaneous surveys to be done on several zones at the same time.

Standard wireline equipment is used to set and retrieve all three models.

The ACT Model 'B' Downhole Instrument Hangers are manufactured for Standard H2S and H_2S-CO_2 service.

Ordering information :

Please specify nipple model, seal bore size, hanger model. percentage of H_2S and Co_2

ACT 'FSB' INSTRUMENT HANGER SPECIFICATIONS

Tubing Nipple Accessory Availability			To Run			To Pull			Maximum Tool OD
			'C-1' Running Tool		Running Tool Attachment	Pulling Tool Type		'A' Probe	
Tubing Size	Nipple Size	Instrument Hanger	Running Selective	Locating With NoGo-ring	'A' Shank				
OD Inches	Seal Bore Inches	'FSB' Size	Size-Inches	Size-Inches	Size-Inches	OTIS	CAMCO	Size-Inches	OD Inches
1.900	1.437 1.500	1.43 1.50	1.900	1.468 1.520	1.900	40RB14	JUC15174	1.900	1.427 1.427
2.1/16	1.562 1.625	1.56 1.62	2.1/16	1.593 1.656	2.1/16x4-3/4	40SB6 40RB17	JDC15154 JUC15185	2.1/16	1.552 1.552
2.3/8	1.781 1.812 1.875	1.78 1.81 1.87	2.3/8	1.807 1.843 1.906	2-3/8x5	40SB1	JDC15169	2.3/8	1.771 1.802 1.802
2.7/8	2.062 2.250 2.312	2.06 2.25 2.31	2.7/8	2.093 2.281 2.343	2-7/8x5-5/16	40SB18 40SB2	JUC15189 JDC15181	2.7/8	2.052 2.240 2.240
3.1/2	2.562 2.750 2.812	2.56 2.75 2.81	3.1/2	2.593 2.781 2.843	3.1/2x5-5/16	40RB19 40SB9	JUC15191 JDC15181	3.1/2	2.552 2.740 2.740
4.1/2	3.688 3.750 3.812	3.68 3.75 3.81	4.1/2	3.718 3.781 3.835	4-1/2x7	40RB20 40SB10	JUC15193 JDC15183	4.1/2	3.678 3.740 3.802

ACT MODEL 'B' DOWNHOLE INSTRUMENT HANGERS

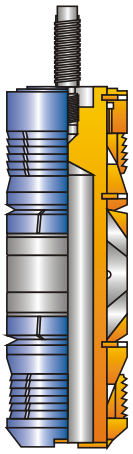
ACT 'FWB' INSTRUMENT HANGER SPECIFICATIONS

Tubing Nipple Accessory Availability			To Run		To Pull			
				Running Tool Attachments	Pulling Tool Type		'B' Probe	Maximum Tool OD
Tubing Size	Nipple Size	Instrument Hanger	'C-1' Running Tool	'A' Shank Dogs Retracted				
OD Inches	Seal Bore Inches	'FWB' Size	Size Inches	Size Inches	OTIS	CAMCO	Size-Inches	OD Inches
1.900	1.437	1.43	1.900	1.900	40RB14	JUC15174	1.900	1.490
	1.500	-						-
2.1/16	1.562	1.56	2.1/16	2.1/16x5-7/8	40SB6	JDC15154	2.1/16	1.615
	1.625	-						-
	1.781	1.78			40RB17	JUC15185		1.865
2.3/8	1.812	1.81	2.3/8	2.3/8x6-1/8			2.3/8	1.865
	1.875	-			40SB1	JDC15169		-
2.7/8	2.062	2.06	2.7/8	2.7/8x6-3/32	40RB18	JUC15189		2.115
	2.250	2.25			40SB2	JDC15171	2.7/8	2.302
	2.312	-						-
3.1/2	2.562	2.56	3-1/2	3-1/2x6-11/16	40RB19	JUC15191		2.625
	2.750	2.75			40SB9	JDC15181	3.1/2	2.802
	2.812	-						-
4.1/2	3.688	3.68	4.1/2	4.1/2x6-1/2	40RB20	JUC15193	4.1/2	3.740
	3.750	3.75			40SB10	JDC15183		3.802
	3.812	-						-

ACT 'RZB' INSTRUMENT HANGER SPECIFICATIONS

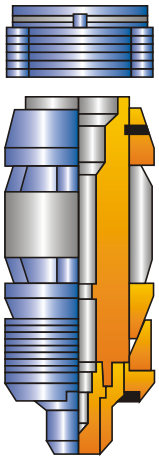
Tubing Nipple Accessory Availability			To Run		To Pull			
				Running Tool Attachments	Pulling Tool Type		'B' Probe	Maximum Tool OD
Tubing Size	Nipple Size	Instrument Hanger	'C-1' Running Tool	'A' Shank Dogs Retracted				
OD Inches	Seal Bore Inches	'RZB' Size	Size Inches	Size Inches	OTIS	CAMCO	Size-Inches	OD Inches
1.900	1.437	1.43	1.900	1.900	40RB14	JUC15174	1.900	1.427
	1.500	1.50						1.490
2.1/16	1.562	1.56	2.1/16	2.1/16x5-7/8	40SB6	JDC15154	2.1/16	1.552
	1.625	1.62						1.615
	1.781	1.78			40RB17	JUC15185		1.771
2.3/8	1.812	1.81	2.3/8	2.3/8x6-1/8			2.3/8	1.802
	1.875	1.87			40SB1	JDC15169		1.865
2.7/8	2.062	2.06	2.7/8	2.7/8x6-3/32	40RB18	JUC15189		2.052
	2.250	2.25			40SB2	JDC15171	2.7/8	2.240
	2.312	2.31						2.302
3.1/2	2.562	2.56	3-1/2	3-1/2x6-11/16	40RB19	JUC15191		2.552
	2.750	2.75			40SB9	JDC15181	3.1/2	2.740
	2.812	2.81						2.802
4.1/2	3.688	3.68	4.1/2	4.1/2x6-1/2	40RB20	JUC15193		3.678
	3.750	3.75			40SB10	JDC15183	4.1/2	3.740
	3.812	3.81						3.802

BRIDGE PLUGS, CEMENT RETAINERS

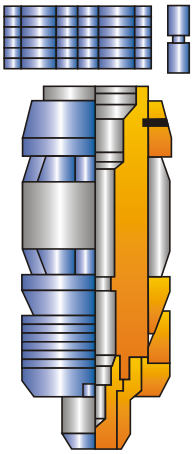


PREMIUM BRIDGE PLUG

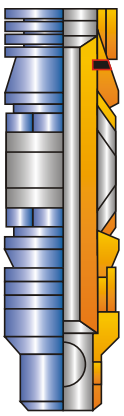
LITE BRIDGE PLUG



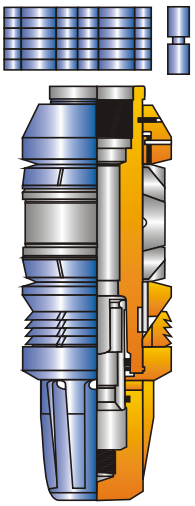
BKR-1 BRIDGE PLUG MECHANICAL SET



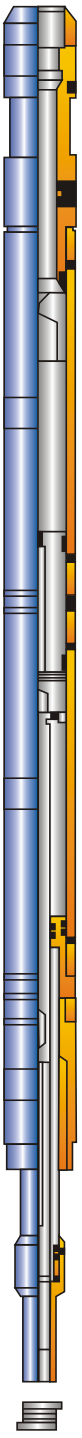
BKR-1 BRIDGE PLUG WIRELINE SET



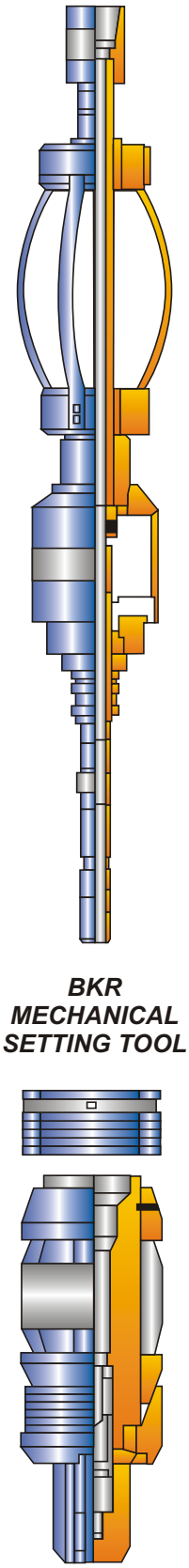
BALL CHECK CEMENT RETAINER



BKR-1 CEMENT RETAINER WIRELINE SET

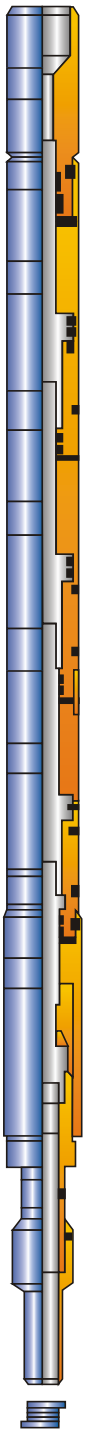


ELECTRIC LINE SETTING TOOL

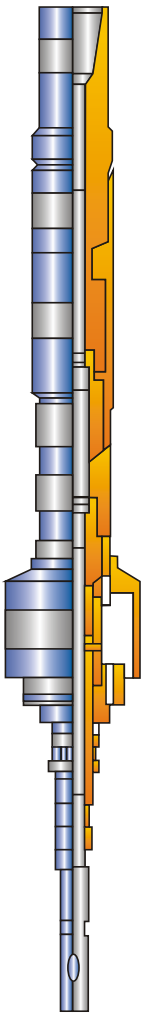


BKR CEMENT RETAINER MECHANICAL SET

BKR MECHANICAL SETTING TOOL

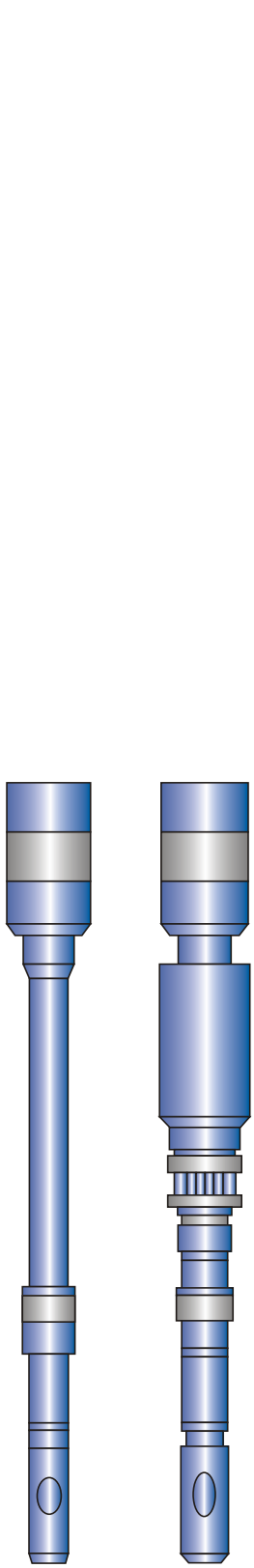


FURY HYDRAULIC SETTING TOOL

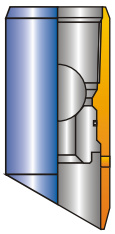


FH & HYDRO MECHANICAL SETTING TOOL

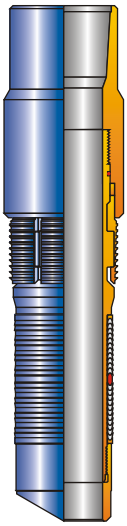
PACKERS, EXPANSION JOINTS, ANCHOR LATCH



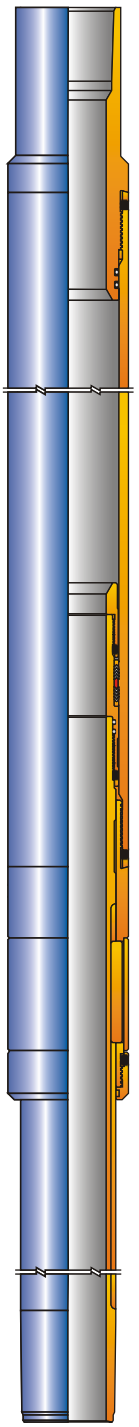
BKR LOCATOR & LATCH TYPE SEAL UNIT



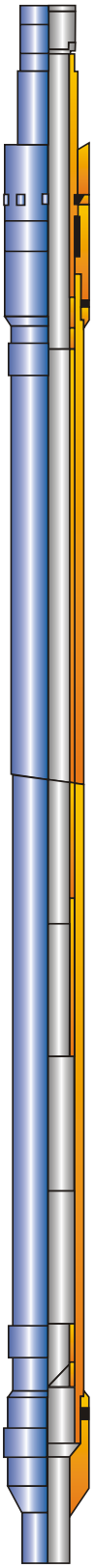
PUMP OUT PLUG



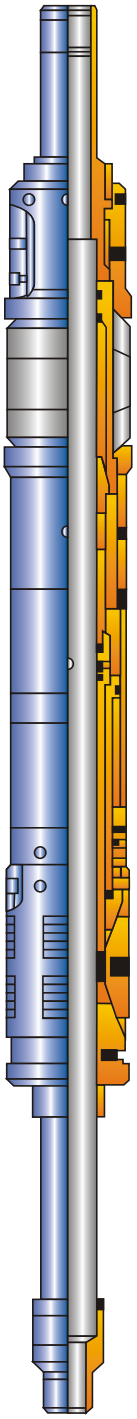
HYDRO SET ANCHOR LATCH SEAL UNIT



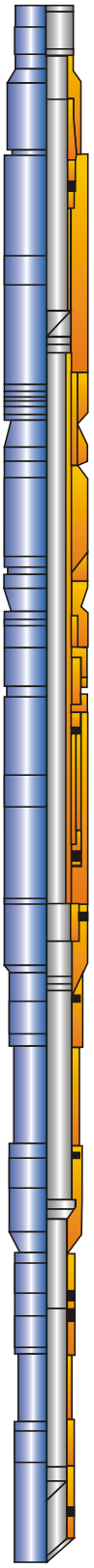
EXPANSION JOINT



PBR POLISHED BORE RECEPTACLE



HYDRO SET SINGLE STRING RETRIEVABLE PACKER



HYDRO SET WIRELINE SET SINGLE BORE DUAL BORE PERMANENT PACKER

INJECTION PRESSURE OPERATED GAS LIFT VALVE

DESCRIPTION

ACT N Series Valves utilize a nitrogen charged dome and bellow configuration designed for either continuous or intermittent flow applications. They are especially suitable for use as unloading and operating valves in areas where high gas lift pressures are available. Since the charge pressure above the bellows is affected by temperature, it is important that the operating temperatures at the valve be known. These valve are available in both wireline-retrievable and conventional installations.

BENEFITS

Vibration protected, 3-ply monel bellow are designed to withstand hydrostatic pressure up to 5000 psi.

Nitrogen dome charge, acting on the O.D. of the bellow, permits bellows to expand uniformly without stacking, thus prolonging bellow's life.

The multiple port size availability, make this valve series appropriate for a wide range of operating conditions.

Reversible seat available in several different materials.

OPERATING PRINCIPLE

The dome nitrogen charge applied to the external area of the bellows provides the downward force, holding the valve on its seat. This dome pressure is preset at the reference temperature and corrected to operating temperature. The opening forces on the valve are the casing pressure acting on the internal area of the bellows (less the area of the seat) and the tubing pressure acting on the seat area. When the combined casing and tubing pressures are sufficient, the valve opens. Once the valve is open, it remains open until the casing pressure is reduced to the predetermined closing pressure. The spread (the difference between opening and closing casing pressure) is controlled by the tubing sensitivity of the valve. The larger the seat port area, the more tubing sensitive the valve is.

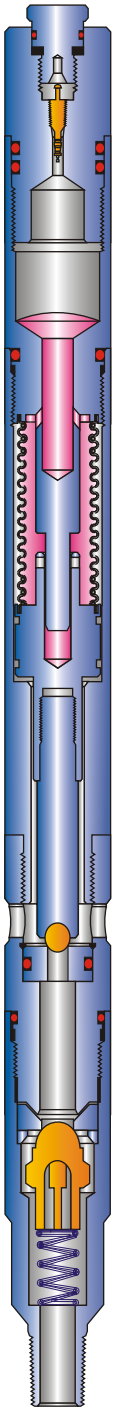
NEW ACT HIGH PRESSURE GAS LIFT VALVE

ACT High Pressure Gas Lift Valve incorporates concept of piston cylinder in true sense, which was not in old Gas Lift Valve available in the market. Bellow is protected in this new design against deformation and remain not only straight but its coil are not also over stressed against high pressure. Due to this bellow's life gets increased and valve functions in a predetermined manner.

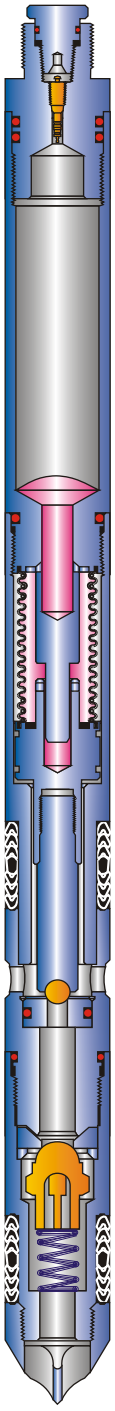
ENGINEERING DATA FOR INJECTION PRESSURE OPERATED VALVES

TYPE	ASSY. NO.	NOMINAL OD (INCH)	PACKING OD (INCH)		PORT SIZE (INCH)		LATCH OR END CONN.	RUNNING TOOL TYPE	PULLING TOOL TYPE	MANDREL TYPE
			UPPER	LOWER	MIN	MAX				
N-90	122-10XX-XXX-XO	1-1/2	–	–	1/8	1/2	1" or 1/2" NPT	–	–	SERIES 15
N-90R	122-10XX-XXX-X1	1-1/2	1-9/16	1-1/2	1/8	1/2	TG, RK, RM, T-2	RTG, TER	PTG, TRP	TP, MM, MMA, MMG
N-90R(H)	122-11XX-320-01	1-1/2	1-9/16	1-1/2	1/8	1/2	TG, RK, RM, T-2	RTG, TER	PTG, TRP	TP, MM, MMA, MMG
NM-90	122-20XX-XXX-XO	1	–	–	1/8	3/8	1/2" NPT	–	–	SERIES 12
NM-90R	122-20XX-XXX-X1	1	1-1/32	1-1/32	1/8	3/8	BK-2, M	MR	MP	TMP, KBM, KBMG, KBG
PBK-1	122-90XX-XXX-X1	1	1-1/32	1-1/32	1/8	3/8	Integral Bottom	GA-2	MP	TMP, KBM, KBMG, KBG

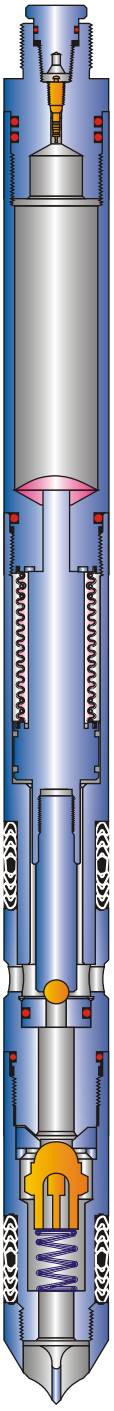
INJECTION PRESSURE OPERATED GAS LIFT VALVE



N-90

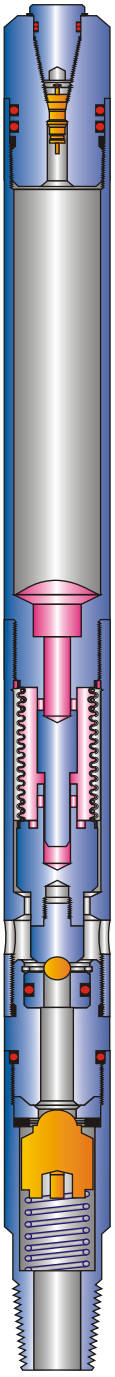


N-90R

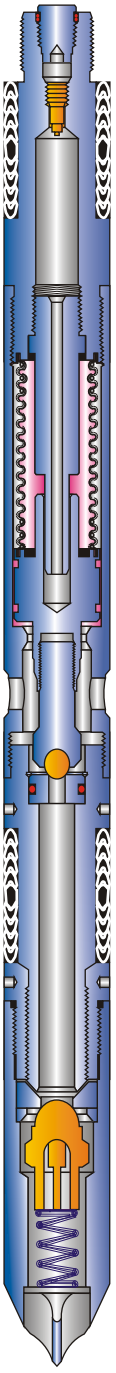


N-90R(H)

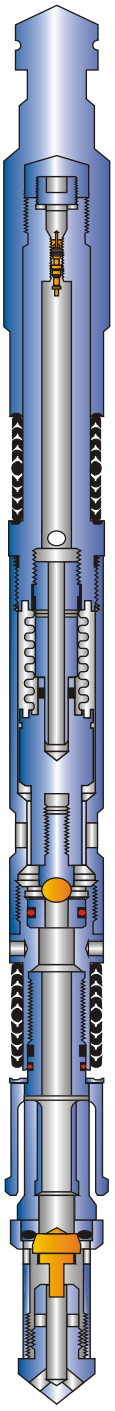
NEW



NM-90



NM-90R



PBK-1

SIDE POCKET MANDREL

TMP and TP Series Side Pocket Mandrel :

ACT TMP and TP Series Side Pocket Mandrels are consisting of forged pocket with integral tool discriminator, oval pipe, swages and orienting sleeves. Its orienting sleeve allows precise and proper alignment during the insertion of positioning devices / tools into the side pocket. Forged tool discriminator guides the proper diameter side pocket devices/tools into the mandrel pocket and deflects larger tools into the tubing bore to prevent damage to the positioning devices/tools.

In Gas Lift applications, high pressure gas injected into the casing annulus flows through the ports of the pocket in the gas lift valve and into the tubing. The standard pocket is ported between the seal bores to communicate with the casing annulus and the gas is circulated down the annulus through the gas lift valve into the tubing. These mandrels are used for tubing flow applications.

Both TMP and TP series feature multiple porting variations for specific applications i.e. annulus flow, chamber lift, fluid injection water flood installations.

TMP and TPC Series Side Pocket Mandrel :

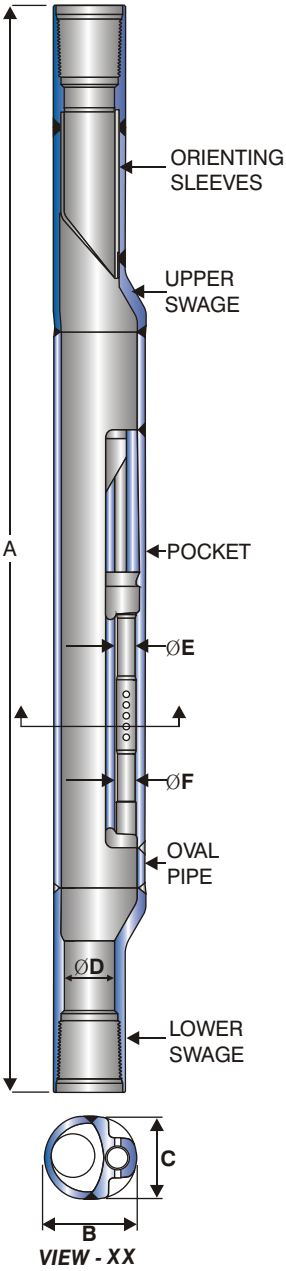
These mandrels are used in annulus flow applications in which a snorkel functions as an exhaust port. Snorkel located at the bottom of the side pocket, extends downward into casing annulus. The holes in the mandrel side pocket directly communicate with the tubing. High pressure gas injected into the tubing flows thru the port between the packing bores into the pocket of the mandrel, then thru the ports into the gas lift valve, downward through the snorkel and then finally into the casing.

TMPE and TPE Series Side Pocket Mandrel :

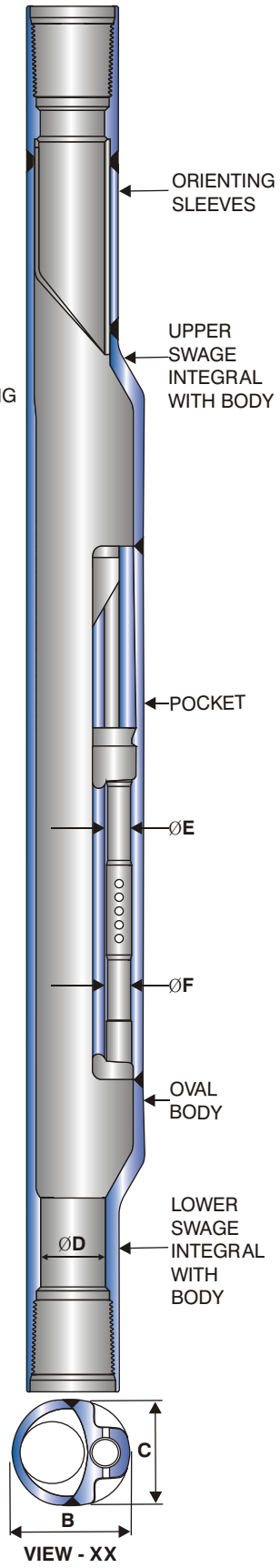
These mandrels mainly used in chamber lift applications. It has no ports in the side pocket for communication with the tubing. Instead of that, an exhaust port is located at the bottom of the side pocket. This port is extended downward into the casing annulus through a ½" pipe connected to the top packer of a chamber lift installation. In gas lift application, high pressure gas is injected into the casing annulus flows through the ports in the side of the mandrel, then through the ports in the gas lift valve and finally downward to the exhaust port.

TMPS and TPS Series Side Pocket Mandrel :

These mandrels are used in single string, multi zone fluid injection water flood installations. The casing exhaust port located at the bottom of the side pocket is used to protect the casing from high velocity turbulence related with water flooding. In water flood operations, water injected into the tubing flows into the mandrel side pocket, thru the water flood flow regulator valve and downward through he exhaust port. A non retrievable check valve can be attached directly to the exhaust port to prevent back flow from the annulus when the water flood regulator valve is removed.



TMP SERIES MANDREL FOR 1" O.D. VALVE (WELDED SWAGES)



TP SERIES MANDREL FOR 1.1/2" O.D. VALVE (INTEGRAL SWAGES)

SIDE POCKET MANDREL

PRESSURE RATING FOR SIDE POCKET MANDRELS								
Tubing Size (Inch)	Valve OD (Inch)	Mandrel Type	Weight Lbs - F* (Kg - F)	Volume (Cubic Ft.)	Test Pressure (PSI)*			
					Standard Services		Corrosive Services	
					Internal	External	Internal	External
2-3/8	1.0	TMP	75.0 (34)	0.47	8000	7000	6000	5500
2-3/8	1.5	TP	130 (59)	0.88	7500	6500	6000	5000
2-7/8	1.0	TMP	121.25 (55)	0.73	8000	7000	6000	5500
2-7/8	1.5	TP	180.77 (82)	1.18	7500	6500	6000	5000
3-1/2	1.0	TMP	150.00 (68)	0.84	8000	6500	6000	5000
3-1/2	1.5	TP	209.4 (95)	1.43	8000	6500	7000	5500
4.0	1.0	TMP	205.0 (92)	1.14	8000	6500	7000	5500
4.0	1.5	TP	236.0 (107)	1.78	8000	6500	7000	5500
4-1/2	1.0	TMP	216.0 (98)	1.38	7500	6000	6000	5000
4-1/2	1.5	TP	242.5 (110)	1.92	7500	6000	6000	5000
5.0	1.5	TP	310.8 (141)	2.84	8500	7000	6500	5500
5-1/2	1.0	TMP	262.3 (119)	2.13	7500	6000	6000	5000
5-1/2	1.5	TP	291.0 (132)	2.20	7500	6000	6000	5000
5-1/2	1.5	TP	297.6 (135)	2.64	8500	7000	6500	5500
7.0	1.0	TMP	405.6 (184)	2.8	7000	5500	5000	4500
7.0	1.5	TP	452.0 (205)	4.17	7000	5500	5000	4500

NOTES:

* Test Pressures given are for mandrels made of AISI-4130 materials heat treated for standard or corrosive environments. Test Pressures may be reduced due to end connection limitations.

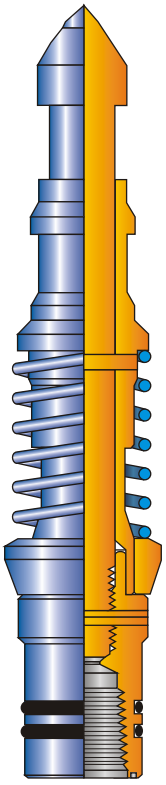
** Weight and Length may vary depending upon end connection etc.

*** For 7” TMP & TP Series other drift sizes can also be provided upon request.

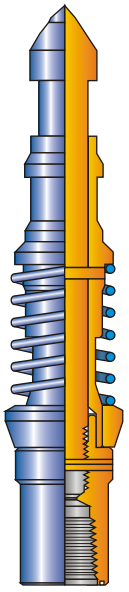
LATCHES

1 ½ inch RK and 1 inch BK-2 Latches are designed for installation in G-type pocket profile side pocket mandrels. They utilize a locking ring which is held in position by spring force. As the latch enters the side pocket profile, the locking ring moves up and into the recessed area of the latch. When the latch seats, the ring is positioned in the locking recess of the pocket. To retrieve the latch, a pin is sheared by upward force allowing the locking ring mandrel to move up and out of the way. The ring is then freed to disengage from the locking recess as the valve and latch are retrieved.

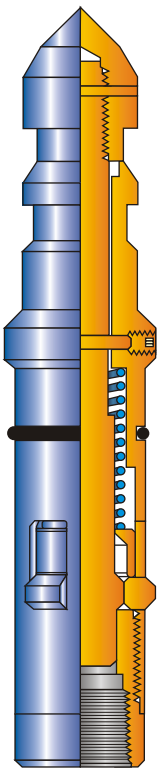
1 ½ inch RM Latches are designed for installation in A-type pocket profile mandrel. They have a set of spring-loaded locking dogs designed to move up into a recessed area on the latch core when run into the latch profile of the mandrel. The valve is lowered into the pocket until the no-go shoulder is reached. The spring force moves the locking ring downward, forcing the dogs to move over and onto the large O.D. of the inner mandrel, thus locking the valve in place. To release the latch, a pin is sheared by upward force which allows the inner mandrel to move up and out of the way. The locking dogs are then free to return to the recess area as the latch and valve are retrieved.



1 1/2 INCH RK LATCH



1 1/2 INCH BK - 2 LATCH

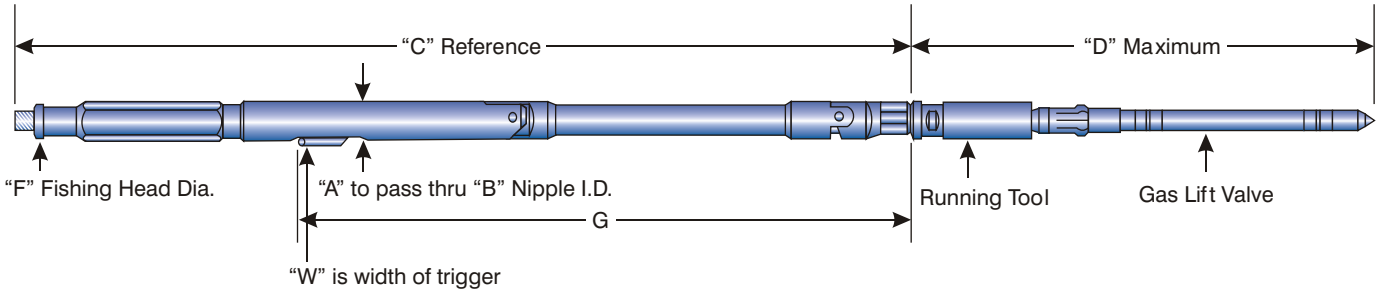


1 1/2 INCH RM LATCH

ENGINEERING DATA FOR LATCHES

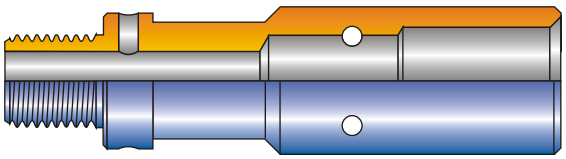
Type	Part No.	Pulling Neck OD (inch)	Running Neck OD (inch)	Max OD (inch)	Side Pocket Accessory OD (inch)	Running Tool	Pulling Type
TG	230-1600-000-01	1.183	0.939	1.795	1.500	RK-1 / RTG	1-5/8 JDS / PTG
RK	230-1200-000-01	1.185	0.936	1.787	1.500	RK-1 / RTG	1-5/8 JDS / PTG
T2	230-0700-000-01	1.375	1.000	1.75	1.500	TER	2” JDC / SM / TRP
RM	230-3000-000-01	1.375	1.000	1.75	1.500	TER	2” JDC / SM / TRP
M	230-0200-000-01	0.875	0.750	1.335	1	MR	1-1/4 JDC / MP
BK-2	230-2400-000-01	0.875	0.750	1.358	1	MR / JK	1-1/4 JDC / MP
WFM	230-0400-000-01	0.875	0.750	1.335	1	MR/JK	1-1/4 JDC / MP

HD-TP/HD-TMP POSITIONING TOOLS

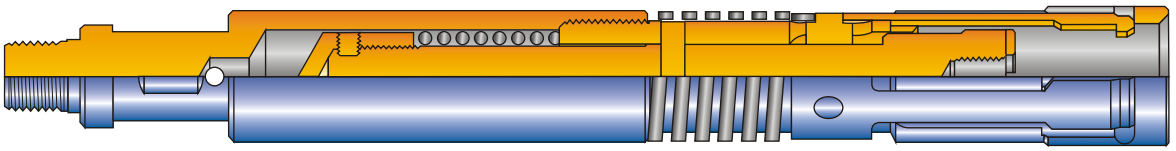


The HD Tools have identical running & pulling procedure as the standard tools.

ENGINEERING DATA FOR HD-TP/HD-TMP POSITIONING TOOLS								
TOOLS	A	B	G	W	C	F	D	PART NUMBER
2.3/8 HD TMP	1.855	1.875	25.73	.55	38.00	1.375	20.50	375-0100-110-00
2.7/8 HD TMP	2.280	2.313	25.88	.55	38.00	1.375	20.50	375-1000-110-00
3.1/2 HD TMP	2.730	2.750	25.57	.55	39.25	1.375	20.50	375-2000-110-00
4.0 HD TMP	3.292	3.313	25.79	.55	40.44	1.750	20.50	375-3000-110-00
4.1/2 HD TMP	3.725	3.750	26.82	.55	40.44	1.750	20.50	375-4000-110-00
2.3/8 HD TP	1.855	1.875	24.22	.55	48.10	1.375	33.00	375-0100-210-00
2.7/8 HD TP	2.280	2.313	24.47	.55	48.57	1.375	33.00	375-1000-210-00
3.1/2 HD TP	2.730	2.750	24.27	.55	46.00	1.375	33.00	375-2000-210-00
4.0 HD TP	3.290	3.310	24.22	.55	38.96	1.750	33.00	375-3000-210-00
4.1/2 HD TP	3.725	3.750	25.80	.55	41.44	2.312	33.00	375-4000-210-00
5.0 HD TP	4.250	4.280	25.80	.55	47.00	2.312	33.00	375-5000-210-00
5.1/2 HD TP	4.480	4.500	27.70	.55	49.00	2.312	33.00	375-6000-210-00



RUNNING TOOL



PULLING TOOL

SLIP LOCK ASSEMBLY

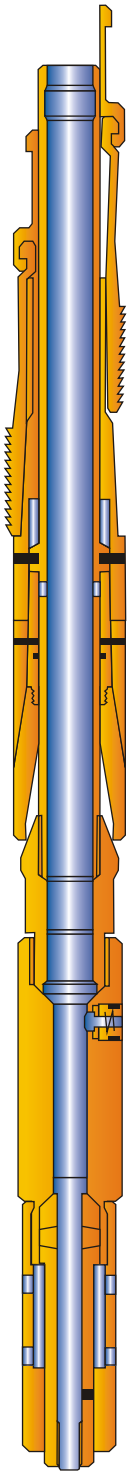
Applications

- ACT Slip Lock Assembly is run to lock downhole controls in tubing string run without landing nipple. The Slip Lock can be set at any department in the tubing.

Advantages

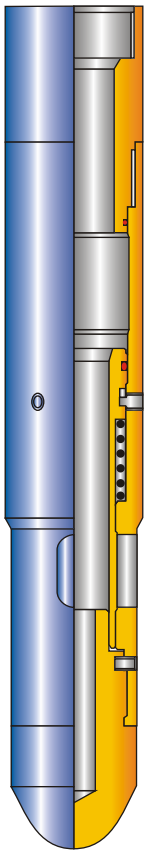
- Run in tubing string without landing nipple
- Operator can set the lock at any desired depth in the tubing

Tubing O.D	O.D Slips Expand	O.D Slips Retract	Min. I.D.	Fishing Neck	Running Tool	Pulling Tool	Thread Connection
2.375”	2.062”	1.859”	0.687”	1.375”	41 WO 13	40 RB 17	1 3/16 x 14
2.875”	2.530”	2.296”	0.875”	1.750”	41 WO 14	40 RB 18	1 9/16 x 12
3.500”	3.080”	2.843”	1.375”	2.312”	41 WO 22	40 RB 19	2 x 12
4.500”	3.500”	3.281”	1.750”	2.750”	41 WO 30	40 RB 30	2 1/4 x 12



SLIP LOCK ASSEMBLY

SURGE TOOL ASSEMBLY



SURGE TOOL ASSEMBLY

Applications

- ACT formation Surge Tool is to be assembled with relevant lock / equalizing assembly. The assembly is to be run in well bore in normal manner and device located in relevant nipple. The running tool is to be retrieved prior to utilizing formation surge tool.

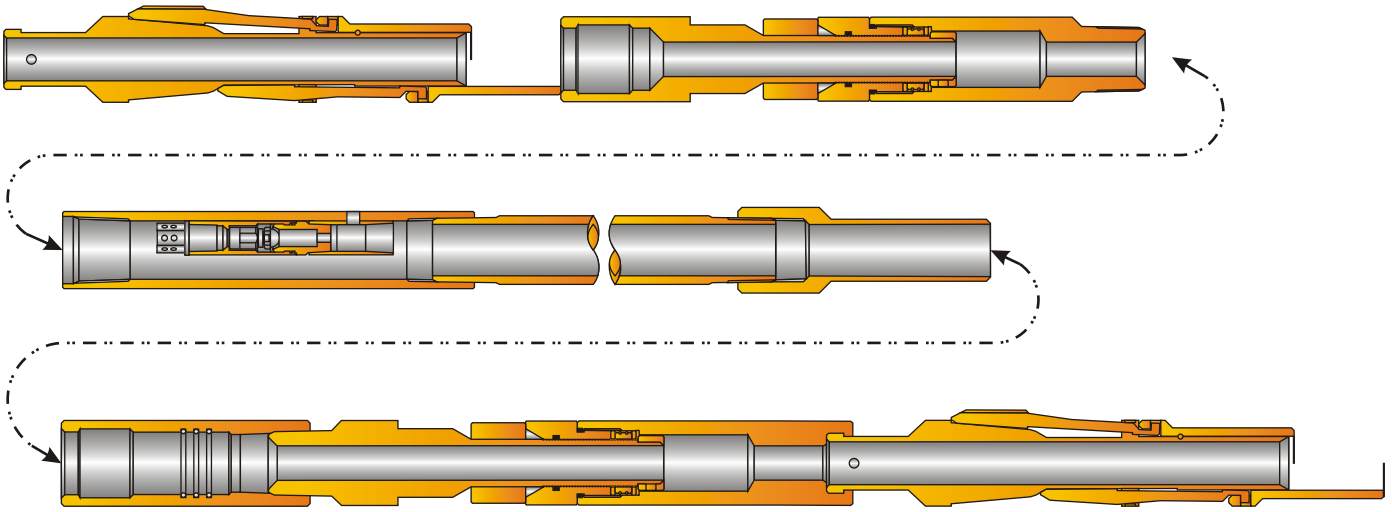
Advantages

- Designed to allow draw-down to be created across the perforations in order to remove debris
- Can be retrieved by conventional wireline operations, after well pressure is stabilized.

Tubing Size	Weight	Surge Tool O.D.	Surge Tool O.D.	Length
2 3/8”	4.7	1.750”	0.885”	14.25”
2 7/8”	6.5	2.150”	1.096”	15.50”
3 1/2”	9.3	2.604”	1.315”	16.00”

ACT TUBING PACK-OFF ANCHOR ASSEMBLY

These anchors are designed to be set anywhere in the tubing string to straddle and pack-off holes or other communication in the tubing string, so that well production can be continued without pulling tubing. Tubing pack-off anchors are run and set by wireline methods.



ACT TUBING PACK-OFF ANCHOR ASSEMBLY

TERMS & CONDITIONS

DESIGN: ACT reserves the right to make changes in design without notice.

CANCELLATION: Orders accepted by ACT are not subject to cancellation by customer except with the consent of ACT and upon terms which will indemnify ACT against loss or damage occasioned by such cancellation.

INSPECTION: Final inspection and acceptance of products must be made at the ACT plant and shall be conclusive except as regards latent defects. Customer's representatives may inspect at the plant during business hours prior to shipment in such manner as will not interfere with operation.

ENGINEERING AND SERVICE: Upon request, ACT may provide engineering and/or technical information about its products and their uses and if feasible may provide personnel to assist purchase in effecting field installation and/or field service, or assistance so provided, whether with or without charges, shall be advisory only, and purchaser agrees to hold ACT harmless from claims for loss from any cause resulting from such advisory or service activity.

WARRANTY: THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OF FITNESS. ACT warrants that all products manufactured by it shall be free of defects in workmanship and material when these products are used within the service and pressure range for which they were manufactured. Such warranty shall be binding upon ACT for a period of one year from and after shipment of such product. If at any time within such period, it is established to the satisfaction of ACT that any product manufactured by ACT was defective at time the of shipment, ACT at its option, shall repair or replace such items F. O.B. place of manufacture or other designated shipping point, or refund the purchase price paid. It is understood that the liability of ACT shall be limited to such repair or replacement and that ACT SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF ANY OBJECTS OR FROM ANY CAUSE WHATSOEVER. This warranty does not cover deterioration by corrosion, including stress corrosion or aging of non-metallic parts, or any other cause of failure other than defects in workmanship and material. Any part or equipment which ACT does not manufacture shall be subject only to the warranties of ACT's vendors. Unless repairs to, alterations of, or work done on said product by the purchaser shall be specifically authorised in writing by ACT, any warranty applicable thereto shall become null and void.

LIABILITY CONSIDERATION: Purchaser will indemnify and hold ACT harmless from all claims including but not limited to subsurface damage and surface damages arising from subsurface damage, including damage to underground mineral pools reservoirs, equipment, deposits, or waste on such deposits, whether owned by purchaser or a third party, resulting from performance of this contract, whether or not due to ACT's negligence.