American Completion Tools

Wireline Surface Pressure Control Equipment & Winch Units /
Coiled Tubing Pressure Control Equipment /
Coiled Tubing Tools / Wireline Tool String Components & Accessories

American Completion Tools

American Completion Tools (ACT) is a joint venture, started by acquiring Allco Services Inc., at Burleson, Texas, to manufacture high quality oilfield equipment in the USA. In 2010, American Completion Tools, Houston, was set up to serve customers more closely the complete line of American Completion Tools products for stock-n-sale.

The Houston office with a warehouse helps in providing quality customer service to their clients by enabling prompt delivery, easy billing and after sales service. Since its inception, American Completion Tools has been providing high quality products worldwide to distributors and service companies.

At American Completion Tools, quality and customer service are given utmost importance.

Flow Product Division Office, at Houston

Houston, TX Office

Opening by March 2015, Plant at Houston

Burleson, TX Office

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Upcoming Plant at Houston by, March 2015:

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Note: Elder, Baker, Alpha, Viton, Aflas, Otis, Go, and/or any other trade name mentioned in this catalogue are for reference purpose only.

American Completion Tools

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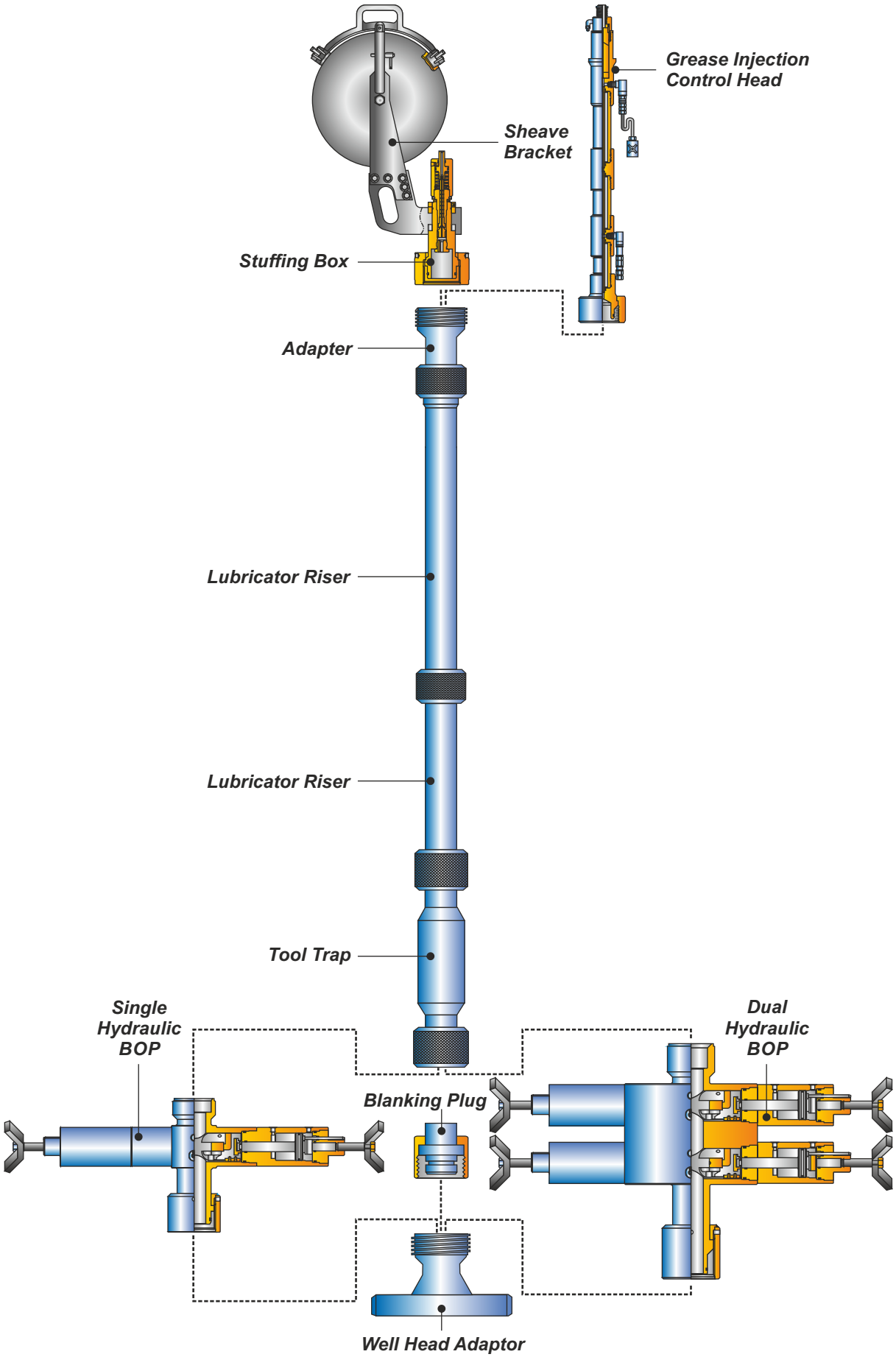
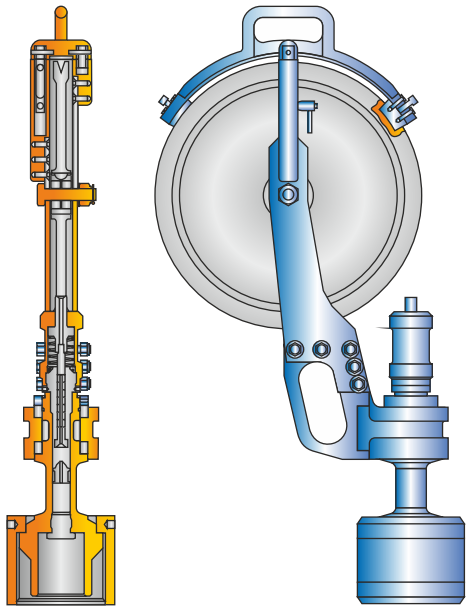
WIRELINE SURFACE PRESSURE CONTROL ASSEMBLY



ACT Ultralight Hydraulic Stuffing Box is specifically designed to seal around a stationary or moving solid wireline. It incorporate a Blow Out Plug to automatically shut-in the well pressure in the event that the wireline breaks. Available in working pressure rating from 5,000 psi to 10,000 psi, with 14" to 20" diameter sheaves & Quick union bottom connections.



Ultralight Stuffing Box

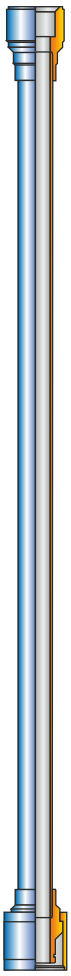
FEATURES

- ACT Stuffing Box is supplied with ultralight composite sheave, bracket sub-assemblies & **high strength alloy aluminum** components which are considerably lighter than normal brackets & components making them easier to carry while rigging up.
- Spring loaded system prevents the wire from jumping out of the sheave and allows the operator to install or remove the wire from the sheave while in service.
- All internal component parts, within the stuffing box are manufactured from brass material to increase the field life of the wire.
- Upper and lower bushings ensure accurate alignment into the center of the packing stack.
- Contains well pressure while the slickline is either moving or stationary.
- Complete with Quick Union thread protectors.

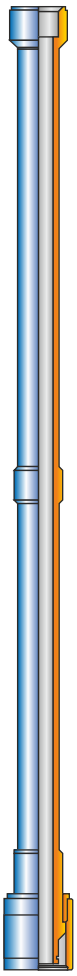
SPECIFICATIONS			
LOWER CONNECTION *	**SHEAVE SIZE**	**W.P.**	**WEIGHT**
5.75- 4 ACME (4.00”) pin with collar	16.00”	10K	46.30 lbs

* Other lower quick union connections are available upon request.

ULTRALIGHT LUBRICATOR



Ultralight Lubricator Special Stainless Steel Material



Ultralight Lubricator Integral Aluminum Alloy Material

The ACT Ultralight Lubricators enable the wireline tool string to be introduced or retrieved from a well bore under pressure. They are normally positioned above the wireline BOP, tool trap or quick test sub. By using high strength stainless steel alloys, (sanicro 28) or **High Strength Aluminium Alloy**, the weight of a lubricator section is reduced by up to 65% with respect to conventional integral lubricators.

The ACT Ultralight Lubricator consists of four basic parts: a quick union collar, a male quick union, a lubricator tube, and a female quick union. The quick unions are manufactured in H2S resistant alloy steel to prevent galling or high strength aluminum alloy to hand carry the lubricators.

ACT Ultralight Lubricators are rated upto 10,000 psi H2S service. The ACT ultralight quick unions have been selected for optimum weight reduction and to prevent unsafe cross-string assembly. Upper and lower adapters are available to connect existing equipment. These are rated 5,000 psi or 10,000 psi depending on the type of connection.

FEATURES

- Corrosion resistant Tube made from high strength NACE Certified Stainless Steel or Corrosion resistant Aluminum Alloy Integral Assembly
- Complete with Quick Union thread protectors

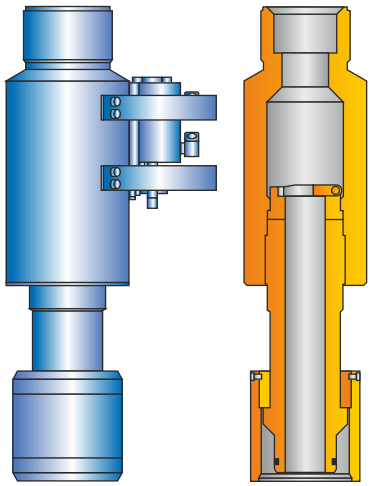
SPECIFICATIONS - 3" I.D. ULTRALIGHT LUBRICATOR (ALUMINUM ALLOY)						
UPPER CONNECTIONS*	**LOWER CONNECTIONS***	**I.D.**	**W.P.**	**SERVICE**	**LT.**	**WT.**
4.75"-4 (3.750") Box	4.75"-4 (3.750") Pin with collar	3"	10k	H2S	4 ft.	51 lbs
4.75"-4 (3.750") Box	4.75"-4 (3.750") Pin with collar	3"	10k	H2S	6 ft.	70 lbs
4.75"-4 (3.750") Box	4.75"-4 (3.750") Pin with collar	3"	10k	H2S	8 ft.	86 lbs
4.75"-4 (3.750") Box	4.75"-4 (3.750") Pin with collar	3"	10k	H2S	10 ft.	105 lbs
5.75"-4 (4.00") Box	5.75"-4 (4.00") Pin with collar	3"	10k	H2S	4 ft.	77 lbs
5.75"-4 (4.00") Box	5.75"-4 (4.00") Pin with collar	3"	10k	H2S	6 ft.	92 lbs
5.75"-4 (4.00") Box	5.75"-4 (4.00") Pin with collar	3"	10k	H2S	8 ft.	110 lbs
5.75"-4 (4.00") Box	5.75"-4 (4.00") Pin with collar	3"	10k	H2S	10 ft.	128 lbs

SPECIFICATIONS - 4.1/16" I.D. UTRALIGHT LUBRICATOR (ALUMINUM ALLOY)						
UPPER CONNECTIONS*	**LOWER CONNECTIONS***	**I.D.**	**W.P.**	**SERVICE**	**LT.**	**WT.**
6.1/8"-4 (4.750") Box (DL)	6.1/8"-4 (4.750") Pin with collar	4.06"	10k	H2S	4 ft.	98 lbs
6.1/8"-4 (4.750") Box (DL)	6.1/8"-4 (4.750") Pin with collar	4.06"	10k	H2S	6 ft.	132 lbs
6.1/8"-4 (4.750") Box (DL)	6.1/8"-4 (4.750") Pin with collar	4.06"	10k	H2S	8 ft.	161 lbs
6.1/8"-4 (4.750") Box (DL)	6.1/8"-4 (4.750") Pin with collar	4.06"	10k	H2S	10 ft.	196 lbs

* Other lower quick union connections are available upon request.

ULTRALIGHT HYDRAULIC TOOL TRAP

ACT Ultralight Hydraulic Tool Trap is designed to be installed at the bottom of a lubricator or wellhead setup and prevents the loss of a wireline tool in case the rope socket is accidentally out. It has an external indicator which shows the position of the flapper.



Ultralight Hydraulic Tool Trap

FEATURES

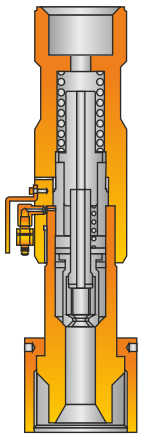
- Main body consists of **corrosion resistant high strength aluminum alloy**.
- Offers 60% weight saving on conventional hydraulic tool trap design.
- External indicator displaying the position of the flapper.

SPECIFICATIONS				
UPPER CONNECTIONS*	**LOWER CONNECTIONS***	**I.D.**	**W.P.**	**WEIGHT**
5.75”-4 (4.00”) Acme Box	5.75”-4 (4.00”) Acme pin with collar	3.00”	10k	101.00 lbs
8.375”-4 (5.250”) Acme Box	8.375”-4 (5.250”) Acme pin with collar	4.00”	10k	138.60 lbs
9.5”- 4 (8.00”) Acme Box	9.5”- 4 (8.00”) Acme pin with collar	6.3/8”	5K	176.00 lbs

* Other upper & lower quick union connections are available upon request.

ULTRALIGHT HYDRAULIC TOOL CATCHER

ACT Ultralight Hydraulic Tool Catcher is a safety device designed to catch the tool string when it is pulled too quickly in to the top of the lubricator and the wire is stripped from the rope socket. The tool catcher engages the uppermost fishing neck and prevent the loss of tool string in to the well bore. It is designed to be fail-safe because it is permanently in the catched position and requires hydraulic pressure to release. The hydraulic tool catcher is available for 1.00” to 2.313” fishing necks. The multi catch option is also available in two ranges: 1.00” to 1.750” and 1.375” to 2.313”. The main body is made from High Strength Aluminum Alloy.



Ultralight Hydraulic Tool Catcher

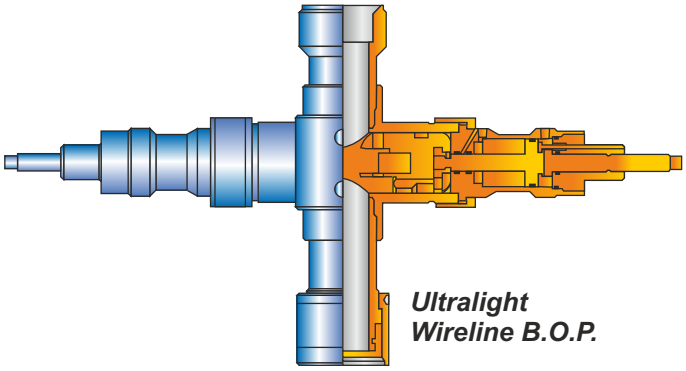
SPECIFICATIONS			
UPPER CONNECTION *	**LOWER CONNECTION ***	**W.P.**	**WEIGHT**
5.75”-4 ACME (4.00”) BOX	5.75”-4 ACME (4.00”) PIN WITH COLLAR	10K	60 lbs

* Other upper & lower quick union connections are available upon request.

ULTRALIGHT WIRELINE B.O.P.

The ACT Ultralight Wireline BOP is available in 3" and 4" I.D. and upto 10,000 psi working pressure, H2S service, in either single or dual configurations. The ACT Ultralight Wireline BOP gives positive protection during well service operations, when operating with slickline and wireline.

All ACT Ultralight Wireline BOPs are made of alloy steel & are up to 50% lighter than previous generation wireline BOPs



Ultralight Wireline B.O.P.

FEATURES

- Compact size, allowing shorter rig-up heights
- Back-up manual closure
- Threaded quick unions, allowing the use of any Bowen, Otis type union without changing the body
- Ram position indicator rods
- Manifold blocks with integral equalization
- Maximum working pressure 10,000 psi H2S service
- Maximum hydraulic working pressure 3,000 psi of hydraulic cylinders
- API 6A and NACE compliant, with Third Party Design Approval
- "Multiline" inner seal accommodating a range of wireline sizes from slickline to 5/16"
- Complete with Quick Union thread protectors
- Provided with lift cum test cap

SPECIFICATIONS - 3" I.D. ULTRALIGHT BOP (SINGLE)					
UPPER CONNECTIONS*	**LOWER CONNECTIONS***	**I.D.**	**W.P.**	**SERVICE**	**WEIGHT**
4.75"-4 (3.750") Box	4.75"-4 (3.750") Pin	3"	10k	H2S	149 lbs
5.75"-4 (4.00") Box	5.75"-4 (4.00") Pin	3"	10k	H2S	187 lbs

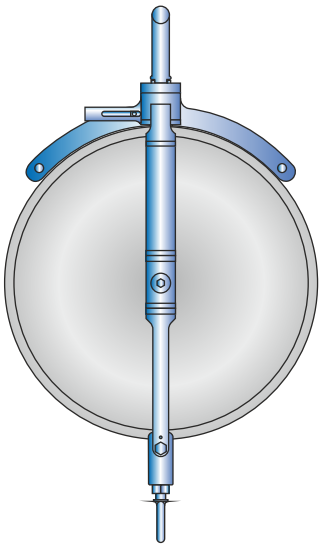
SPECIFICATIONS - 4.1/16" I.D. ULTRALIGHT BOP (SINGLE)					
UPPER CONNECTIONS*	**LOWER CONNECTIONS***	**I.D.**	**W.P.**	**SERVICE**	**WEIGHT**
6.125"-4 (4.750") Box (DL)	6.125"-4 (4.750") Pin	4.06"	10k	H2S	319 lbs
8.375"-4 (5.250") Box	8.375"-4 (5.250") Pin	4.00"	10k	H2S	418 lbs

* Other upper & lower quick union connections are available upon request.

Note: Bowen, Otis and/or any other trade name mentioned in this catalogue are for reference purpose only.

ULTRALIGHT HAY PULLEY

ACT Ultralight Hay Pulley is used to bring the wireline down from the Stuffing box into horizontal position for the wireline winch drum. It consists of a heavy duty aluminum alloy arms and an aluminum or composite sheave. Wire is introduced through a loading gate, preventing it from jumping out during operation. Available with line wiper also.



Ultralight Hay Pulley

FEATURES

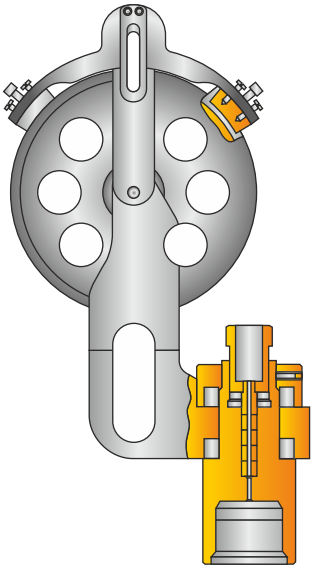
- Available upto 20" sheave size
- Features a loading gate to prevent the wire from jumping out of the sheave during operation
- Made of aluminum alloy
- The hole in the frame of the hay pulley is to permit a line wiper attachment to be fitted to apply lubricant corrosion inhibitor
- A 16" Hay Pulley weigh around 7kgs.
- Material of Pulley, Aluminum or Nylatron

Note: Bowen, Otis and/or any other trade name mentioned in this catalogue are for reference purpose only.

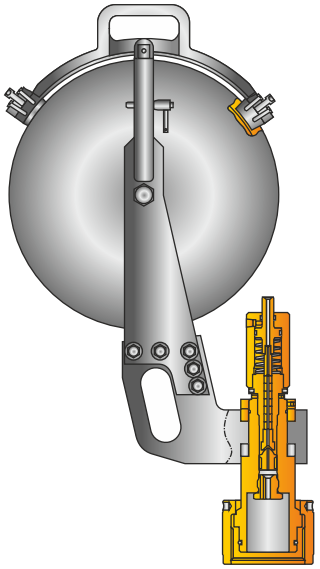
WIRELINE STUFFING BOXES

Features & Advantages:

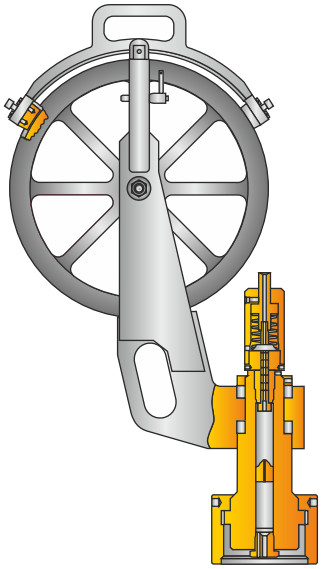
- It seals around stationary or moving solid wireline (slickline) for pressures up to 15,000 psi.
- It is light weight with aluminium or composite material pulley. Line size determine size of sheave and glands.
- Manual and hydraulic packing nut to give optimum compression around wireline.
- It has blow out plug to seal, in case of line fouling or breaking.
- Sheave bracket can swivel around. It has adjustable wire guides to keep wireline in the sheave groove, preventing line jumping.
- Hydraulic pumps, fittings, hoses and accessories are also available.
- Lightweight body, sheave bracket, aluminium pulley, composite material pulley.



Light Wt. Stuffing Box



Light Wt. Stuffing Box With Composite Pulley



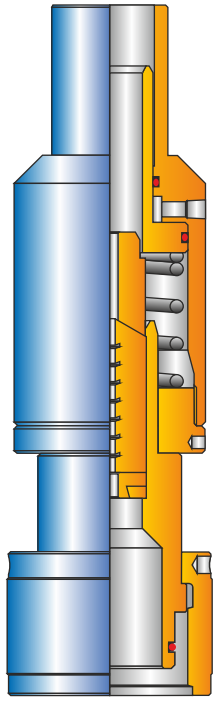
Light Wt. Hydraulic Stuffing Box With Aluminium Pulley

WIRELINE STUFFING BOXES			
Sheave	**Working Pressure (psi)**	**Manual Part No.**	**Hydraulic Part No.**
10"	5,000	12510	12510-H
	10,000	12110	12110-H
	15,000	12410	12410-H
14"	5,000	12540	12540-H
	10,000	12140	12140-H
	15,000	12440	12440-H
16"	5,000	12570	12570-H
	10,000	12170	12170-H
	15,000	12470	12470-H
20"	5,000	12520	12520-H
	10,000	12120	12120-H
	15,000	12420	12420-H

Refer to the Quick Union identification chart on page no. 5 & 6 for end connection.

HYDRAULIC LINE WIPERS

ACT Hydraulic Line Wipers are used to remove excess grease from braided cable when retrieving tools from the well. Line wipers are supplied with quick union or tubing connections at bottom.



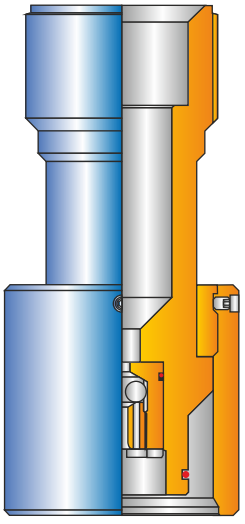
Hydraulic Line Wiper

HYDRAULIC LINE WIPERS		
Working Pressure (PSI)	**Service**	**Part No.**
3,000	H2S	210-35XX
5,000	H2S	210-55XX

*Please specify cable size when ordering.
*Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

CHECK VALVE UNIONS

ACT Check Valve Unions are designed to seal off well pressure in the event of the wireline parting from the tool string. The steel ball is forced against the metal sealing area by the well pressure from below. The check valve unions are manufactured as one piece body and are assembled below the stuffing box or grease injection control head. The internal check valve assembly can also be fitted as an integral part of the stuffing box or grease injection control head. This helps to reduce the height of lubricator assembly.



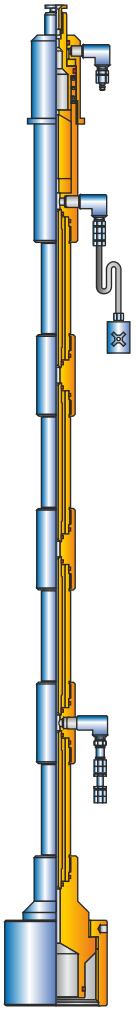
Check Valve Union

CHECK VALVE UNIONS		
Working Pressure (PSI)	**Service**	**Part No.**
5,000	H2S	09-1254-XX
10,000	H2S	09-1214-XX

*Please specify wire/cable size when ordering.
*Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

GREASE INJECTION CONTROL HEADS

Grease Injection Control Head is required to obtain a seal when using braided cable.



Grease Injection Control Head

Principle of Operation: Grease is injected at a pressure higher than the well pressure (approximately 20% higher). The grease fills the interstitial grooves between the braided line strands. The most critical components of the grease injection head are the 'flow tubes'. These should be approximately 0.010" ID larger than the measured outside diameter of the line. A seal is effected by pumping grease at slightly above the well pressure. This action causes pressure drop to occur across each tube. The pack off at the top is closed fully in order to gain control of the pressure before running the cable.

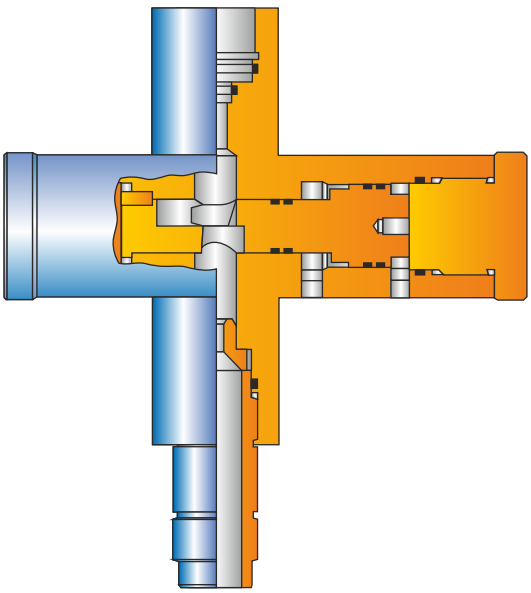
Ancillary Equipment:

The following equipment is required to operate the grease injection system

- Grease control head
- Compressor (Back-up system essential in high pressure situations)
- Grease reservoir
- Grease pump
- Connection hoses
- Dual BOP system

GREASE INJECTION CONTROL HEADS		
W.P. (PSI)	**Lower Conn.**	**Part No.**
5,000	TO SELECT FROM QUICK	095XX
10,000	UNION IDENTIFICATION	091XX
15,000	CHART PAGE NO. 16 & 17	094XX

GREASE HEAD CABLE CUTTER



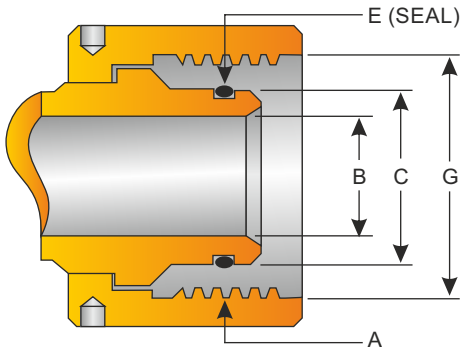
Grease Head Cable Cutter

ACT Grease Head Cable Cutter is designed to cut the cable in the event of cable becoming jammed in the grease injection flow tubes, preventing it's movement. The Cable Cutter allows the operator to cut the stuck cable cleanly and quickly well above the BOP, thus allowing an easier recovery. The clean cut allows for easier fishing operation in stranded armour situations. ACT Grease Head Cable Cutter is hydraulically operated and positioned in the lubricator string immediately below the grease injection head and above the tool catcher.

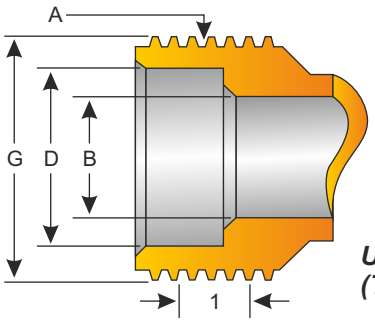
QUICK UNIONS

ACT Quick Union Connections are used to assemble lubricators and related equipment and they are designed to be assembled by hand. Otis type and Bowen type designs are commonly used.

An O-ring on the pin section forms the seal when made up into the box. The collar has internal ACME threads to match the external threads on the box. The connection can be made up by hand.



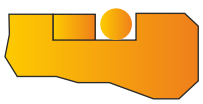
Union Pin And Nut



Union Box (TPI = F)

QUICK UNION IDENTIFICATION CHART

A	W.P.(PSI)	SERV	B	C	D	E	F	G	PART NO.
5.000"-4 ACME TYPE O	5000	STD	2.50" 3.00"	3.494"	3.500"	50236	4	5.000"	440100
5.000"-4-ACME TYPE O	10,000	STD	2.50" 3.00"	3.494"	3.500"	50338	4	5.000"	440120
5.000"-4 ACME TYPE O	15,000	STD	2.50"	3.494"	3.500"	50338*	4	5.000"	440101
5.750"-4 ACME TYPE O	5,000 10,000	H2S	2.50" 3.00"	3.994"	4.000"	50342*	4	5.750"	440200
6.250"-4 ACME TYPE O	15,000	H2S	2.50"	3.994"	4.000"	50342*	4	6.250"	440301
6.500"-4 ACME TYPE O	5,000 10,000	STD	4.00"	4.744"	4.750"	50348	4	6.500"	440400
7.500"-4 ACME TYPE O	15,000	H2S	3.00"	5.494"	5.500"	50354*	4	7.500"	440701
8.250"-4 ACME TYPE O	5,000 10,000	STD	5.00"	6.182"	6.188"	50435	4	8.250"	440800
8.375"-A ACME TYPE O	5,000 10,000	H2S	4.00"	5.244"	5.250"	50427	4	8.375"	440900
8.750"-4 ACME TYPE O	5,000	STD	6.38"	7.494"	7.500"	50441	4	8.750"	441100
9.000"-4 ACME TYPE O	5,000 10,000	H2S	5.00"	6.744"	6.750"	50438	4	9.000"	441200
9.500"-4 ACME TYPE O	15,000	H2S	4.00"	6.244"	6.250"	50435*	4	9.500"	441601
9.500"-4 ACME TYPE O	5,000	H2S	6.38"	7.994"	8.000"	50443	4	9.500"	441400
11.500"-4 ACME TYPE O	10,000	H2S	6.38"	8.244"	8.250"	50444	4	11.500"	441800
12.000"-4 ACME TYPE O	5,000	H2S	9.00"	10.306"	10.312"	50448	4	12.000"	442100
12.250"-4 ACME TYPE O	15,000	H2S	5.00"	6.994"	7.000"	50439	4	12.250"	442201

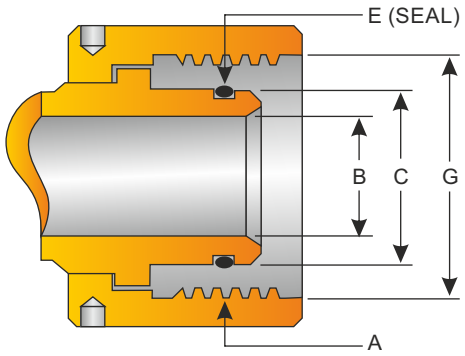


**** Seal Groove Will Have This Configuration***

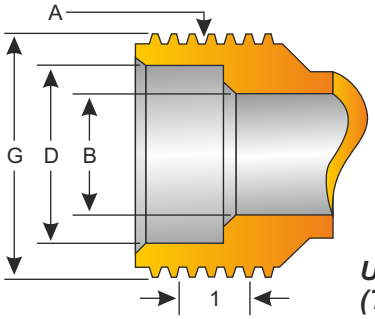
Type O Union Are Interchangeable With Otis Union

* OTIS & BOWEN trade name is given for reference only.

QUICK UNIONS



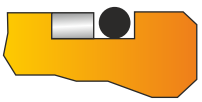
Union Pin And Nut



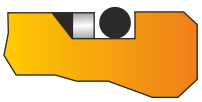
Union Box (TPI = F)

QUICK UNION IDENTIFICATION CHART									
A	W.P. (PSI)	SERV.	B	C	D	E	F	G	PART NO
4.750"-4 ACME TYPE B	5,000	STD H2S	2.50" 3.00"	3.744"	3.750"	50340	4	4.750"	440110
4.750"-4 ACME TYPE B	10,000	STD	2.50" 3.00"	3.744"	3.750"	50340*	4	4.750"	440111
5.500"-4 ACME TYPE B (DL)	5,000	STD H2S	3.00"	4.369"	4.375"	50345*	4	5.500"	440211
5.500"-4 ACME TYPE B (DL)	10,000	STD	3.00"	4.369"	4.375"	50345*	4	5.500"	440211
6.312"-4 ACME TYPE B	10,000	H2S	2.50" 3.00"	4.369"	4.375"	50345**	4	6.312"	440311
6.312"-4 ACME TYPE B	15,000	STD	2.50"	4.369"	4.375"	50345*	4	6.312"	440312
6.312"-4 ACME TYPE B	15,000	H2S	2.50"	3.744"	3.750"	50340**	4	6.312"	440412
7.000"-5 SA TYPE B	5,000	STD H2S	4.00"	5.244"	5.250"	50427	5	7.000"	440510
7.093"-4 ACME TYPE B	15,000	STD H2S	3.00"	4.744"	4.750"	50348**	4	7.093"	440612
8.250"-4 ACME TYPE B (DL)	10,000	STD H2S	4.00"	5.994"	6.000"	50358*	4	8.250"	440811
8.250"-4 ACME TYPE B (DL)	5,000	STD H2S	5.00"	6.744"	6.750"	50438	4	8.250"	440710
8.875"-4 ACME TYPE B (DL)	10,000	STD H2S	5.00"	6.494"	6.500"	50437	4	8.875"	441320
9.875"-4 ACME TYPE B (DL)	5,000	STD H2S	6.38"	7.994"	8.000"	50447	4	9.875"	440910

Type B Unions are interchangeable with Bowen Unions.



**** Seal Groove Will Have This Configuration***



***** Seal Groove Will Have This Configuration***

* BOWEN trade name is given for reference only.

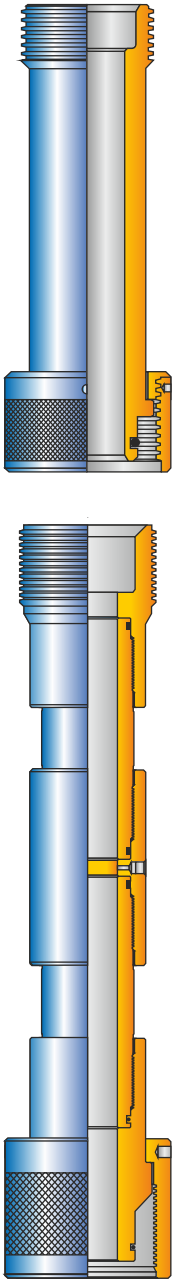
LUBRICATOR RISERS

ACT Lubricator Risers are used to allow the wireline tool string to be raised above the wellhead valve prior to and after wireline operations and enable the wellhead valve to be opened and closed allowing entry and exit of the toolstring from the well bore.

An 'O' ring on the pin section forms the seal when made up into the box. The internal thread on the collar matches the external thread on box and makes up quickly by hand.

ACT Lubricator Risers are available in standard lengths from 4 feet through 12 feet, and 2-1/2" through 6.38" bores. Standard end connections include a union box up and union pin and collar (nut) down. Bleed off valves are available in all models upon request. Working pressure ranges for these risers are from 5,000 PSI through 15,000 PSI.

ACT also supplies **Light Weight Risers** in low alloy steel and 28 chrome stainless steel. Integral designs are also available for high pressures up to 15,000 PSI.

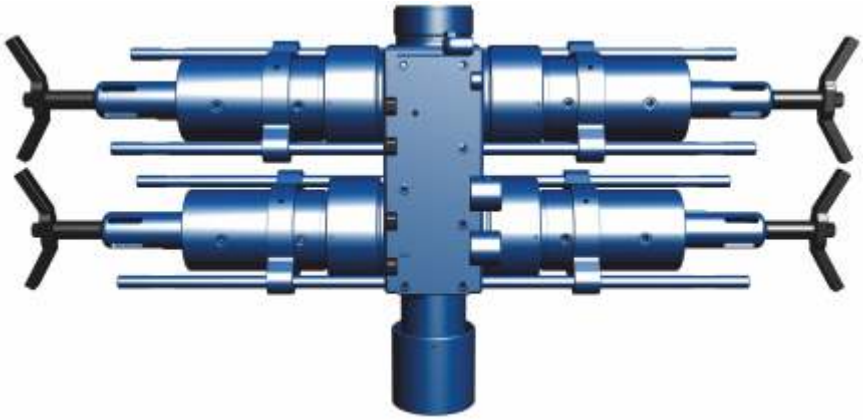


Lubricator Riser

LUBRICATOR RISERS						
			Part No.			
Service	I.D. in.	W.P. (PSI)	4 Feet	6 Feet	8 Feet	10 Feet
STD	2.50	5,000	042553X1	042555X1	042557X1	042559X1
STS	3.00	5,000	043553X1	043555X1	043557X11	0435591X1
STD	2.50	10,000	042152X1	042155X1	042157X1	042159X1
STD	3.00	10,000	043153X1	043155X1	043157X1	043159X1
H2S	2.50	5,000	042553X0	042555X0	042557X0	042559X0
H2S	3.00	5,000	0423553X0	043555X0	043557X0	043559X0
H2S	2.50	10,000	042153X0	042155X0	042157X0	042159X0
H2S	3.00	10,000	043153X0	043155X0	043157X0	043159X0
STD	2.50	15,000	042453X1	042455X1	042457X1	042459X1
H2S	2.50	15,000	042453X0	042455X0	042457X0	042459X0
H2S	3.00	15,000	043453X0	043455X0	043457X0	043459X0
STD	4.00	5,000	044553X1	044555X1	044557X1	044559X1
H2S	4.00	5,000	044553X0	044555X0	044557X0	044559X0
STD	4.00	10,000	044153X1	044153X1	044157X1	044159X1
H2S	4.00	10,000	044153X0	044155X0	044157X0	044159X0
H2S	4.00	15,000	044453X0	044455X0	044457X0	044459X0
STD	5.00	5,000	045553X1	045555X1	045557X1	045559X1
STD	5.00	10,000	045153X1	045155X1	045157X1	045159X1
H2S	5.00	5,000	045553X0	045555X0	045557X0	045559X0
H2S	5.00	10,000	045153X0	045155X0	045157X0	045159X0
STD	6.38	5,000	049553X1	049555X1	049557X1	049559X1
H2S	6.38	5,000	049553X0	049555X0	049557X0	049559X0
H2S	6.38	10,000	049153X0	049155X0	049157X0	049159X0

Notes:
* Other sizes available on request
* Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

WIRELINE BOP



Wireline BOP With 'C' Black Manifold

The wireline valve is a hydraulic compact valve to give positive protection with 'C' block manifold. It is used in service operations, when operating with slickline, braided wireline & electric line. It is available in full range of size & working pressure, from 2.1/2" to 6.3/8" bore size, & 5,000 psi to 15,000 psi working pressure. Additional size are available on request.

Feature

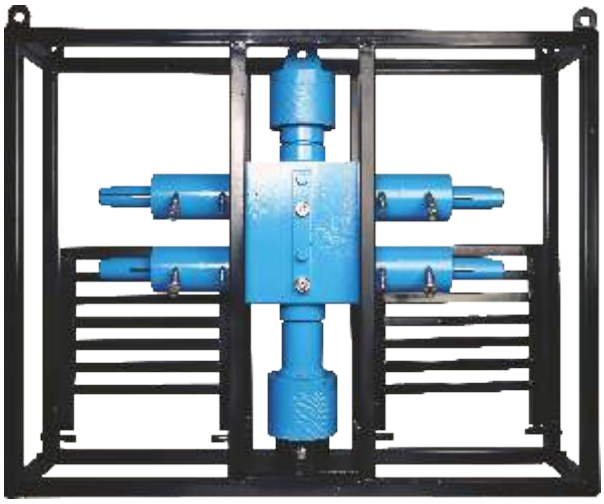
1. Compact in design, allowing short rig-up size (single / dual / triple RAM BOP)
2. Compact short hydraulic cylinder
3. Manual back-up stems fitted as back-up to hydraulic systems
4. Non rising / rising manual back-up stems
5. Easy RAM inner & outer seal change out with guide rod
6. Larger cross section RAM seals
7. All inner seal & outer seal are interchangeable
8. Key less RAM design with integral guide
9. Manifold block with integral equilisation, glycol & grease injection facility with internal check valve
10. Indication facility for opening & closing of RAM
11. Multiline inner seal accommodating a range of wire size
12. Standard & H2S service

HYDRAULIC CONTROL UNIT

ACT Hydraulic control unit is designed and constructed to operate surface pressure control equipment such as BOP, Grease injection head, Stuffing box, hydraulic tool catcher, Tool trap, Line wiper and test line etc. It is also used to operate Surface controlled Sub surface safety valves.

These units are available for 5,000 psi 10,000 psi and 15,000 psi operating pressures.

BLOWOUT PREVENTERS



ACT Blowout Preventers are designed to give positive protection against blow outs when operating with wireline (slickline) in well services work, by providing a positive seal around the wireline.

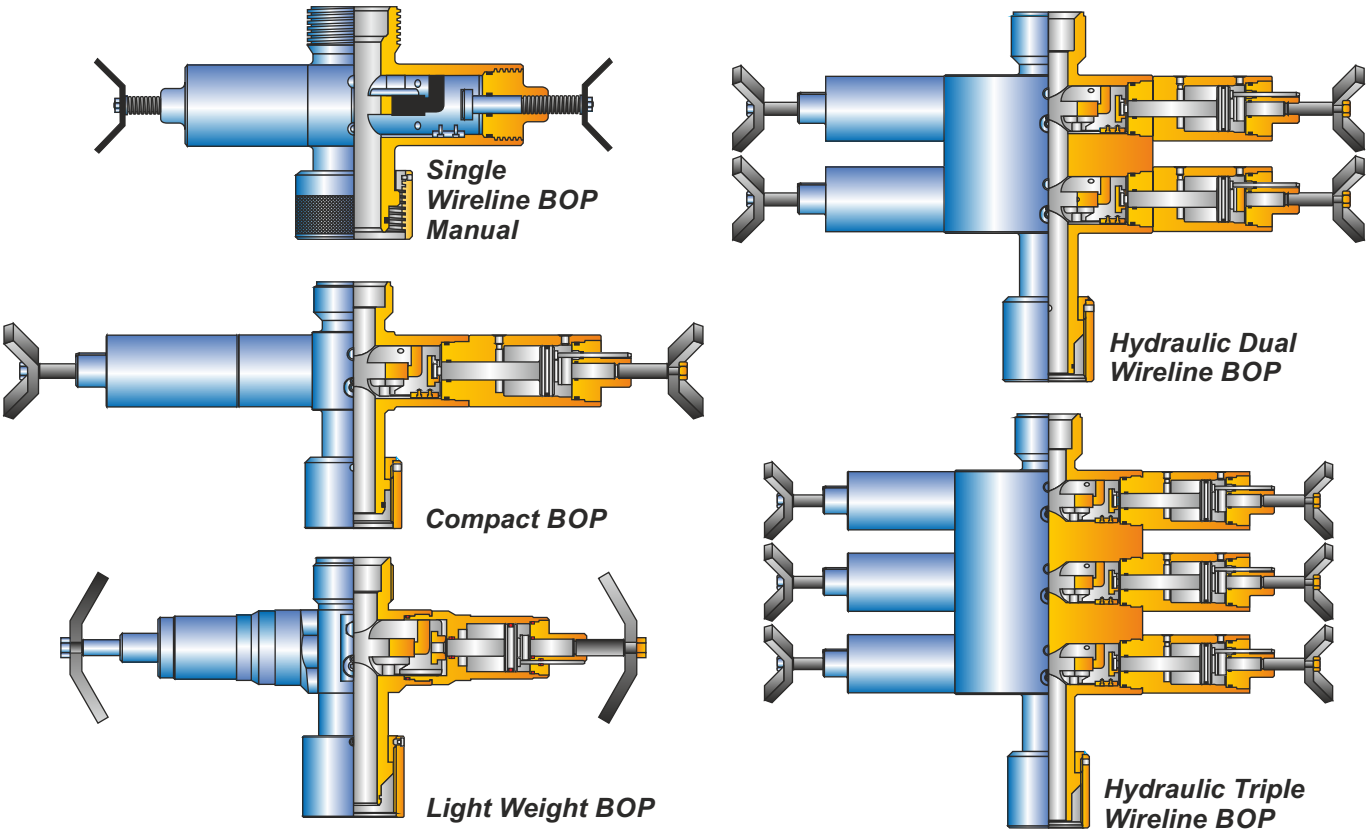
These BOP's are available in two types: hydraulically operated and manually operated, with configurations as desired. An equalizer valve allows the operator to equalize the wellhead pressure with the lubricator pressure.

ACT Blow Out Preventers are available in light weight and compact models, in sizes ranging from 2-1/2" ID through 6-3/8" ID and 3,000 PSI through 15,000 PSI working pressures. Contact the ACT representative for details on pumps, fittings, hoses and other accessories.

MANUAL AND HYDRAULIC BLOWOUT PREVENTERS				
Type	**I.D. in.**	**W.P. (PSI)**	**Part No. (Manual)**	**Part No. (Hydraulic)**
SINGLE	2.50	5,000	012563X-00	012563X-H00
SINGLE	2.50	10,000	012100-X00	012100X-H00
SINGLE	2.50	15,000	-------	012410X-H00
TWIN	2.50	5,000	022563X-00	022563X-H00
TWIN	2.50	10,000	022100X-00	022100X-H00
TRIPLE	2.50	5,000	032563X-00	032563X-H00
TRIPLE	2.50	10,000	032100X-00	032100X-H00
TRIPLE	2.50	15,000	032410X-00	032410X-H00
QUAD	2.50	5,000	042563X-00	042563X-H00
QUAD	2.50	10,000	042100X-00	042100X-H00
SINGLE	3.00	5,000	013500X-00	013500X-H00
SINGLE	3.00	10,000	013137X-00	013137X-H00
TWIN	3.00	5,000	023500X-00	023500X-H00
TWIN	3.00	10,000	023137X-00	023137X-H00
TRIPLE	3.00	5,000	033500X-00	033500X-H00
TRIPLE	3.00	10,000	033137X-00	033137X-H00
QUAD	3.00	5,000	043500X-00	043500X-H00
QUAD	3.00	10,000	043137X-00	043137X-H00
SINGLE	4.00	5,000	014564X-00	014564X-H00
SINGLE	4.00	10,000	014103X-00	014103X-H00

Notes: * Other sizes available on request
* Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

BLOWOUT PREVENTERS



MANUAL AND HYDRAULIC BLOWOUT PREVENTERS				
Type	**I.D. in.**	**W.P. (PSI)**	**Part No. (Manual)**	**Part No. (Hydraulic)**
TWIN	4.00	5,000	024564X-00	024564X-H00
TWIN	4.00	10,000	024103X-00	024103X-H00
TRIPLE	4.00	5,000	034564X-00	034564X-H00
TRIPLE	4.00	10,000	034103X-00	034103X-H00
QUAD	4.00	5,000	044564X-00	044564X-H00
QUAD	4.00	10,000	044103X-00	044103X-H00
SINGLE	5.00	5,000	015565X-00	015565X-H00
SINGLE	5.00	10,000	015111X-00	015111X-H00
TWIN	5.00	5,000	025565X-00	025565X-H00
TWIN	5.00	10,000	025111X-00	025111X-H00
TRIPLE	5.00	5,000	035565X-00	035565X-H00
TRIPLE	5.00	10,000	035111X-00	035111X-H00
QUAD	5.00	5,000	045565X-00	045565X-H00
QUAD	5.00	10,000	045111X-00	045111X-H00
SINGLE	6.38	5,000	700-200-638-2000	700-200-638-1000
TWIN	6.38	5,000	700-300-638-2000	700-300-638-1000
TRIPLE	6.38	5,000	700-200-638-3000	700-200-638-3001
QUAD	6.38	5,000	700-200-638-4000	700-200-638-4001

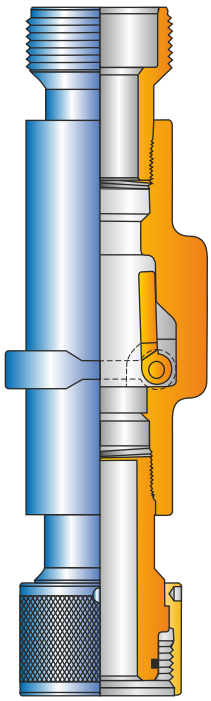
Notes: * Other sizes available on request
* Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

TOOL TRAPS

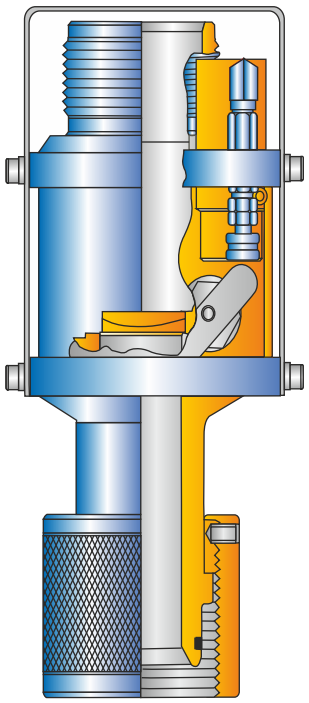
ACT Tool Traps are available in both hydraulically operated and manually operated models. A tool trap is designed to be installed at the bottom of a lubricator or wellhead setup and prevents the loss of a wireline tool in case the rope socket is accidentally stripped out. It has an external indicator which shows the position of the flapper. Contact the ACT representative for details on pumps, fittings, hoses and other accessories.

HYDRAULIC TOOL TRAPS

HYDRAULIC TOOL TRAPS			
Service	**I. D. in.**	**W.P. (PSI)**	**Part No.**
STD	2.50	5,000	06251-H
STD	3.00	5,000	06351-H
H2S	2.50	5,000	06250-H
H2S	3.00	5,000	06350-H
STD	2.50	10,000	601251
STD	3.00	10,000	60448
H2S	2.50	15,000	06240-H
H2S	2.50	10,000	69969
H2S	3.00	10,000	06310-H
STD	4.00	5,000	06451-H
H2S	4.00	5,000	06450-H
H2S	3.00	15,000	06340-H
STD	4.00	10,000	06411-H
H2S	4.00	10,000	06410-H
STD	5.00	5,000	06551-H
STD	5.00	10,000	06511-H
STD	6.38	5,000	06951-H
H2S	5.00	5,000	06550-H
H2S	5.00	10,000	06510-H
H2S	4.00	15,000	06440-H



Manual Tool Trap



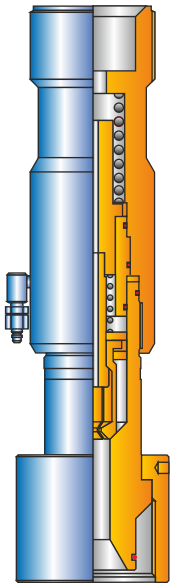
Hydraulic Tool Trap

Notes:
* Other sizes available on request
* Refer to the Quick Union Identification chart on page no. 5 & 6 for end connections.

MANUAL TOOL TRAPS

MANUAL TOOL TRAPS				
Service	**I.D. in.**	**W.P. (PSI)**	**Top & Bottom Conn.**	**Part No.**
STD	2.50	5,000	To select from Q.U. Identification chart page no. 16 & 17	6220
STD	3.00	5,000		62460
STD	4.00	5,000		6600
STD	5.00	5,000		61650
STD	6.38	5,000		06951

HYDRAULIC TOOL CATCHERS



Hydraulic Tool Catcher

ACT Hydraulic Tool Catchers are a safety devices designed to catch the tool string when it is pulled too quickly in to the top of the lubricator and the wire is stripped from the rope socket. The tool catcher will engage the uppermost fishing neck and prevent the loss of tool string in to the well bore. It is designed to be fail-safe because it is permanently in the catched position and requires hydraulic pressure to release. The hydraulic tool catcher is available for 1.00" to 2.313" fishing necks. The multi catch option is also available in two ranges: 1.00" to 1.750" and 1.375" to 2.313"

HYDRAULIC TOOL CATCHERS		
Pressure Rating (PSI)	**Service**	**Part No.**
5,000	H2S	282-50XXX
10,000	H2S	282-10XXX
15,000	H2S	282-40XXX

Notes:

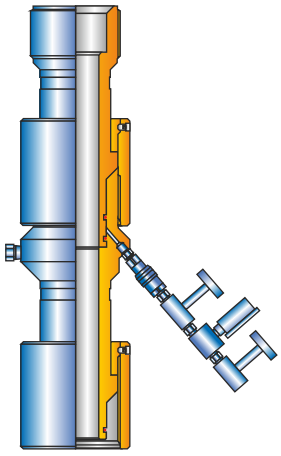
* "XXX" denotes fishing neck size. Please specify while ordering.

* Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

QUICK TEST SUBS

ACT Quick Test Sub is designed to save rig time while pressure testing a lubricator rig up, before exposing it to well pressure. When multiple wireline runs are required, the lubricator has to be tested each time the bottom connection is broken, and much time can be lost. After performing the first pressure testing of the whole string, subsequent pressure test can be made using the Quick Test Sub to verify the integrity of the joint disconnected, rather than testing the whole lubricator assembly. This is done by connecting a small hand pump to the Quick Test Sub and testing the two O-Rings seals from outside.

The Quick Test Sub s installed either above or below the BOP and becomes the joint that is disconnected each time to insert and retrieve tools from the well.



Quick Test Sub

QUICK TEST SUBS			
I.D. (in.)	**W.P. (PSI)**	**Service**	**Part No.**
2.50	5,000 10,000 15,000	H2S	335-250 335-210 335-240
3.00	5,000 10,000 15,000	H2S	335-350 335-310 335-340
4.00	5,000 10,000 15,000	H2S	335-450 335-410 335-440
5.12	5,000 10,000 15,000	H2S	335-550 335-510 335-540
6.38	5,000 10,000 15,000	H2S	335-950 335-910 335-940

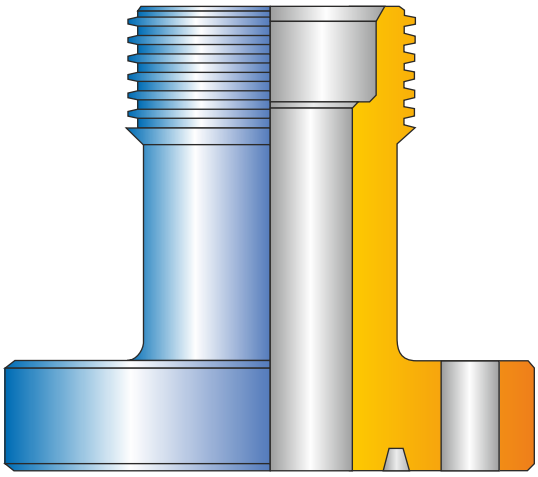
Notes: * Other sizes available on request.

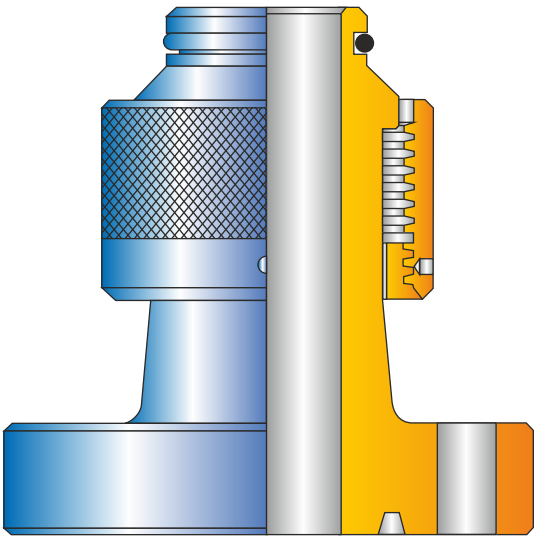
* Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

WELLHEAD FLANGE ADAPTERS

ACT Wellhead Flange Adapters are designed to be used in the upper most position on wellheads and therefore enable wireline and other well service operations to be performed through the wellhead into the well bore.

ACT Wellhead Flange Adapters are available in various bore sizes and with quick union connections compatible with Bowen and Otis type quick unions. Additionally, flange/adapters are supplied for standard or H2S service and working pressures up to 15,000 PSI.





Flange Adapters

WELLHEAD FLANGE ADAPTERS			
Service	**I.D. (inch)**	**W.P. (PSI)**	**Part No..**
H2S	2.06	5,000	5115XX0
STD	2.06	10,000	5111XX1
H2S	2.50	5,000	5125XX0
STD	2.50	10,000	5121XX1
H2S	3.00	5,000	5135XX0
STD	3.00	10,000	5131XX1
H2S	2.56	5,000	51115XX0
STD	2.56	10,000	51111XX1
STD	2.06	15,000	5114XX1
STD	2.50	15,000	5124XX1
H2S	2.06	10,000	5111XX0
H2S	2.50	10,000	5121XX0
H2S	2.56	10,000	51111XX0
H2S	3.00	5,000	5131XX0
H2S	3.06	5,000	51125XX0
H2S	3.12	15,000	51135XX0
H2S	2.06	15,000	5114XX0
H2S	2.50	15,000	5124XX0
H2S	3.00	10,000	5134XX0
H2S	3.06	10,000	51121XX0
H2S	4.00	5,000	5141XX0
STD	2.06	5,000	5115XX1
STD	2.50	5,000	5125XX1
STD	3.00	5,000	5135XX1
STD	3.12	10,000	51135XX1
STD	3.06	5,000	51121XX1
STD	4.00	5,000	5145xx1
STD	4.00	10,000	5141xx1

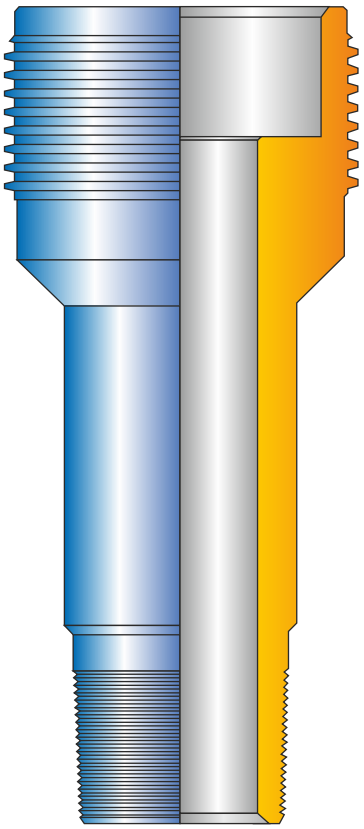
Notes:

- Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.
- Flange sizes & type: Customer to specify as per API 6A
- Other sizes available on request

API THREADED ADAPTERS

ACT API Threaded Adapters have an API pin thread down and a quick box connection up. These adapters are used for lower working pressures. Any combination of end connections are available on request.

API THREADED ADAPTERS				
Service	**I.D. (inch)**	**W.P. (PSI)**	**Bottom Conn.**	**Part No.**
STD	2.44	5,000	2-7/8" EU 8 rd	134-035031
H2S	2.44	5,000	2-7/8" EU 8 rd	134-035030
STD	2.50	5,000	3-1/2" EU 8 rd	134-045041
H2S	2.50	5,000	3-1/2" EU 8 rd	134-045040
STD	2.99	5,000	3-1/2" EU 8 rd	134-055041
H2S	2.99	5,000	3-1/2" EU 8 rd	134-055040
H2S	3.95	5,000	4-1/2" EU 8 rd	134-075060
STD	3.59	5,000	4-1/2" EU 8 rd	134-075061
H2S	4.00	5,000	4-1/2"-8 rd long casing	134-085070
STD	4.00	5,000	4-1/2"-8 rd long casing	134-085071
H2S	4.00	5,000	5-1/2"-8 rd long casing	134-085080
STD	4.89	5,000	5-1/2"-8 rd long casing	134-105081
STD	5.00	3,000	7"-8 rd long casing	134-113091
STD	5.00	5,000	7-5/8"-8 rd long casing	134-115101
H2S	5.00	3,000	7"-8 rd long casing	134-113090
H2S	5.00	5,000	7-5/8"-8 rd long casing	134-115100
STD	5.00	5,000	9-5/8"-8 rd long casing	134-115111
H2S	5.00	5,000	9-5/8"-8 rd long casing	134-115110
STD	6.38	5,000	9-5/8"-8 rd long casing	134-135111
H2S	6.38	5,000	9-5/8"-8 rd long casing	134-135110
STD	6.09	3,000	7"-8 rd long casing	134-123091
H2S	6.09	3,000	7"-8 rd long casing	134-123090

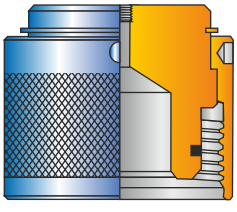


Tubing Pin X Threaded Half

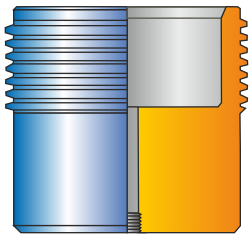
Note: * Other sizes available on request.
* Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

BLANKING CAPS & PLUGS

ACT Blanking Caps and Plugs are used for installing gauges and / or bleed off valve. These are available for use on all Quick Unions, and are equipped with NPT ports.



Blanking Plug

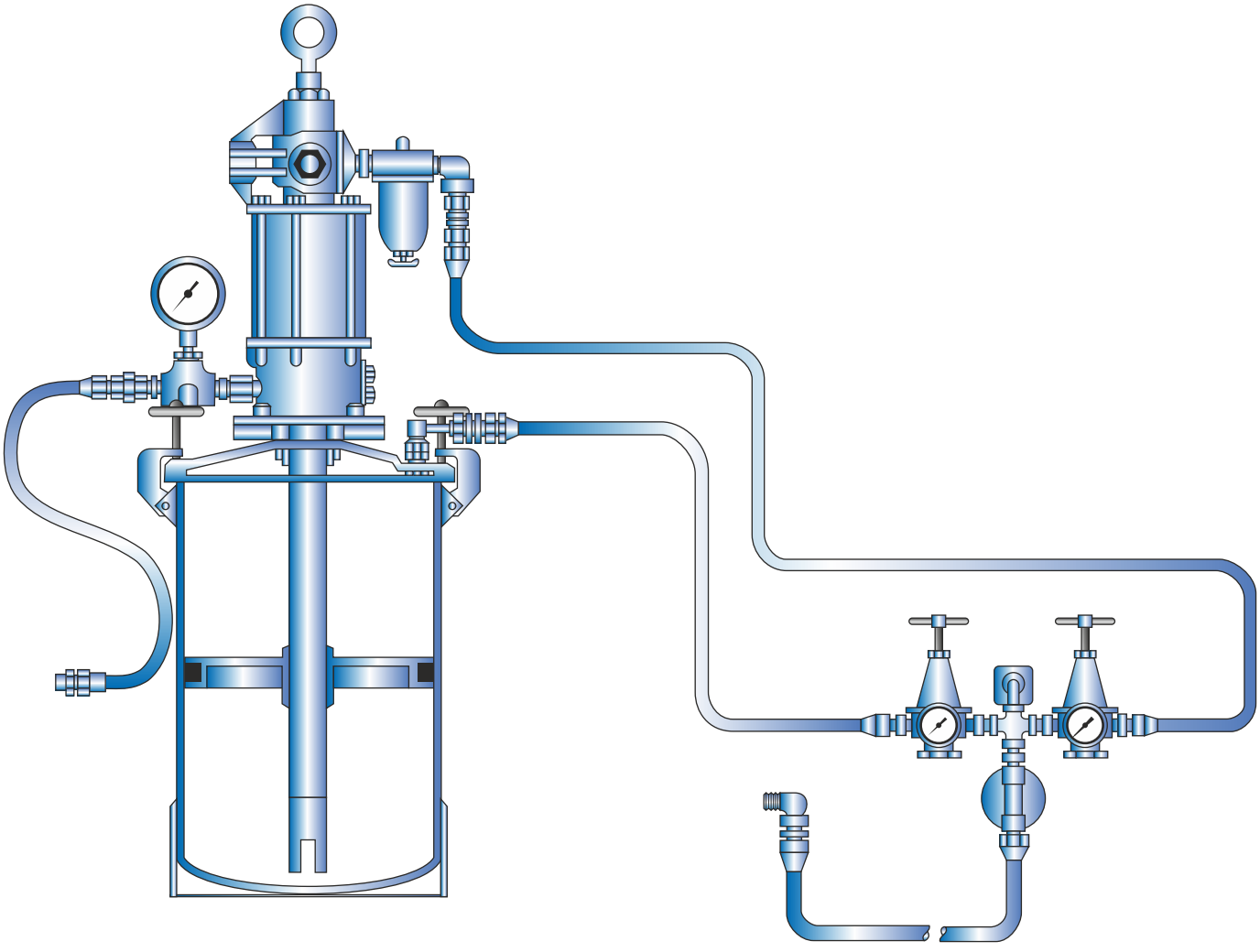


BLANKING CAP

GREASE INJECTION SUPPLY SYSTEM

ACT Grease Injection Supply Systems are used to deliver grease to grease injection control head assemblies, under operating pressures from 2,000 PSI to 15,000 PSI with grease injection and grease return hoses.

The basic design consists of a grease reservoir, grease pump, pressure and volume controls, pressure gauges and necessary piping , valves, fittings and other components to power and control the unit.



GREASE INJECTION SUPPLY SYSTEM	
W.P. (PSI)	**Part No.**
2,000	105412
5,000	108909
5,000	109100
10,000	107005
15,000	103442

GREASE & HYDRAULIC CONTROL UNIT

Description: Grease & Hydraulic Control Unit Module is designed to operate pressure control equipment up to 10,000 PSI working pressure. They can operate BOPs, tool catcher, tool trap, stuffing box and line wiper.

General: An air driven hydraulic pump is used to power all hydraulic functions. Back-up hand pumps are provided for the event of an air/hydraulic pump failure. The back-up hand pump has a maximum working pressure of 3,000 PSI. The units also have two independent grease injection circuits to supply grease to BOPs and the grease head. These have a crossover valve allowing one pump to drive either grease injection line. All hoses are mounted on spring loaded reels & hence there is no need for manual operation to wind hoses on the reels.

A panel is designed to layout the controls on a picture format so that the operator can more easily visualize the state of the equipment.

The module is equipped with a Haskel AW25 air operated hydraulic pump for the BOPs, tool trap, tool catcher, line wiper and stuffing box. This pump can produce a fluid pressure of 2,500 psi with 100 PSI air.

One accumulator with a capacity of 9.1 liters is fitted as a back-up for air powered pump. They are normally pre-charged to 1,500 PSI nitrogen.

Two hydraulic hand pumps are provided. The back-up hand pump has a maximum working pressure of 3,000 PSI while the grease ARO 100:1 pump is rated to 10,000 PSI.

Dimensions & Weight:

Length: 1.45 m, Height: 1.55 m, Width: 0.79 m, Capacity of pump first grease tank: 187 liters, Capacity of pump second grease tank: 187 liters, Capacity of hydraulic oil tank: 20 liters, Approx. weight: 750 kgs.

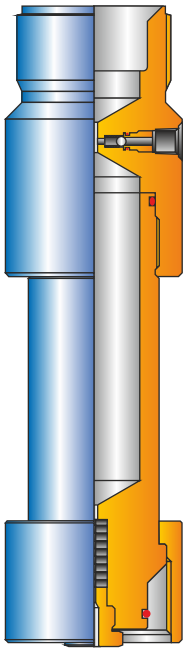
Third Party Inspection /Certification: Unit will be certified by third party BV, DNV, ABS, Lloyds, Vetco Tuboscope, etc. as per the requirements of the customer

Painting: All steel materials are sandblasted to Sa 2 ½ standard and coated using an inorganic zinc primer. All aluminum materials are primed and painted to customer's supplied color code.

Documentation: Operations & the maintenance manuals are provided in a hard copy and a soft copy (in CD format) in English.

Pump - In - Subs and Plug Valves are used to pressurize the lubricator during hydrostatic testing or pumping in to the well bore when that becomes necessary during the course of servicing operations. Models with a working pressure above 5,000 PSI are equipped with specially designed side ports and accept plug valves with integral unions. Plug Valves are available separately and as a component of Pump-in-Subs. Fitted with a variety of Top and Bottom Connections, - Quick Union connections being most common, - these assemblies are available from 2.50 ID. inch through 6.38" ID. with WP from 3,000 PSI through 15,000 psi.

CHEMICAL INJECTION SUBS



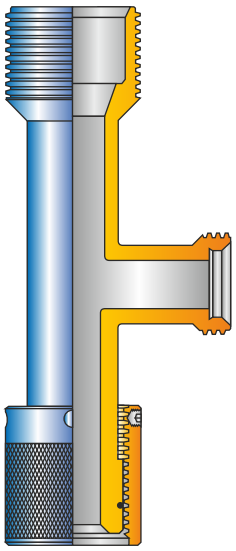
Chemical Injection Sub

ACT Chemical Injection Sub, also known as a liquid chamber, is designed to inject inhibitor, chemicals and de-icing agents on to the wireline during routine operations. It is installed below the stuffing box or grease injection control head and used in wells with an H2S environment, dry gas, or conditions which cause hydrate problems. The Chemical injection sub/liquid chamber incorporates a two litre chamber for fluid which is pumped by using a high pressure hand pump. It utilizes replaceable felt packings to coat the wireline and prevent the chemicals from passing downhole. The injection port is equipped with a check valve to prevent fluids from escaping. The design extends wireline and stuffing box packing life and create a smoother wireline operation.

CHEMICAL INJECTION SUBS		
Pressure Rating (PSI)	**Service**	**Part No.**
5,000	H2S	LCH-50XXX
10,000	H2S	LCH-10XXX
15,000	H2S	LCH-40XXX

Notes:
* "XXX" denotes wire size. Please specify wire size when ordering.
* Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

PUMP IN SUBS



Pump In Sub W/hammer Union On Side Outlet

ACT Pump-In Sub is placed between the wireline BOP and the Wellhead. It is basically used to pump the fluid in to the well when the wireline BOP is closed. Pump-In Sub can also be used for injection of inhibitors and for collecting samples. The top and bottom have quick union connections and a side outlet with a wing union connection.

PUMP IN SUBS		
I.D.	**W.P (PSI)**	**Service**
2.50	5,000	STD
2.50	5,000	H2S
2.50	10,000	STD.
2.50	10,000	H2S
3.00	10,000	STD
3.00	10,000	H2S
4.00	10,000	H2S
5.12	10,000	H2S
6.38	10,000	H2S

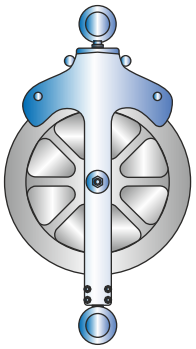
Notes:
* Other sizes available on request
* Refer to the Quick Union identification chart on page no. 5 & 6 for end connections.

LUBRICATOR ACCESSORIES

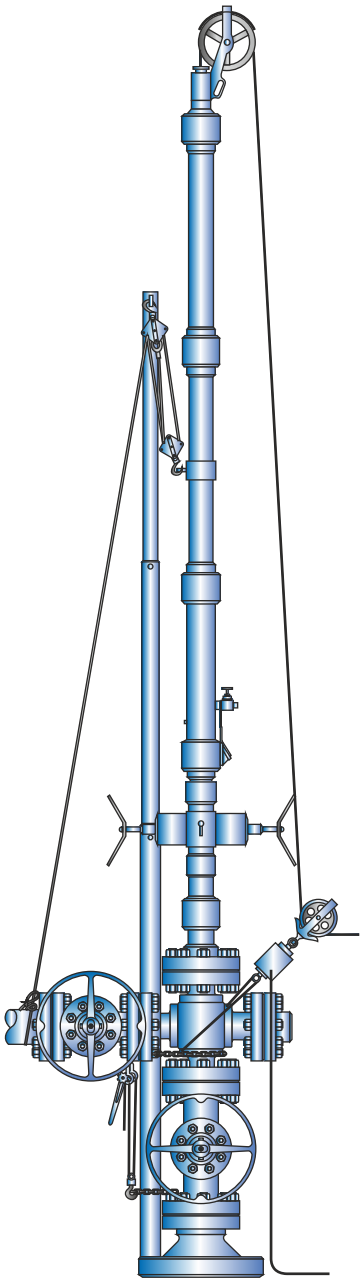
Union Cross Over Adapters are utilized to provide a transition between otherwise incompatible unions made by the same or different manufacturers. These adapters are designed with a Union Box Up and Union Pin & Collar Down and are always rated, both in terms of service and pressure. Any combination of end connections are available.

Floor Block (Hay Pulley) is used to bring the wireline down to a position where it is horizontal from the lubricator tree to the wireline rig. It also shifts the point of wireline pull from the top of lubricator to the base of the lubricator tree and reduces side loading of the lubricator.

Pulleys are available in aluminium or composite material for lighter weight.



Hay Pulleys



HAY PULLEYS				
Pulley Dia (IN)	**Groove Dia**	**Type Connection**	**Safe Working Load (lbs)**	**Part No.**
7	Customer to specify	Swivel Hanger	3,000	330700
10		Swivel Hanger	5,000	331000
12		Swivel Hanger	5,000	331200
14		Swivel Hanger	5,000	331400
16		Swivel Hanger	6,000	331600
20		Swivel Hanger	6,000	332000

A Wireline Clamp is used to clamp the wireline while raising and lowering the lubricator and during fishing operations.

Assembly No.	Description
15XXX00	For all sizes of slickline
15XXX10	For 3/16" and 1/4" braided wireline

A Wellhead Connection is used to connect the bottom of the wireline valve to the top tree connections. The top of the connection fits the bottom of valve and the bottom thread of connection is threaded to screw into the particular threads on top of the tree flange connections.

A Telescopic Gin Pole is used to raise the lubricator to the top of the wireline valve and maintain this position while breaking off or making up wireline tool string.

Assembly No.	Description
38XXX10	Steel for standard weight lubricators
38XXX00	Aluminium for standard weight lubricators
38XXX20	Steel for standard weight, high-pressure lubricators

A Load Binder and Chain are used to bind the gin pole to the tree and to the wireline valve.

Rope Blocks are used to raise and lower the lubricator.

A Lubricator Pick-Up Clamp is used to hook the rope block to pick up the lubricator.

PHGP - 01 HYDRAULIC GIN POLE

Features: The Hydraulic Gin Pole is designed with the ultimate flexibility for performing wireline operations, stand alone & with transportable weight especially for offshore applications.

The Gin Pole is supplied with a transportable container which has four lifting pad eyes and integral forklift pockets for ground handling.

General: The complete system consists of:

A hydraulic cylinder connected with two hose pipes to its control console, which will be connected to the power pack available on platform.

The cylinder is a double acting type equipped with a check valve so that in the event hose pipe breaks while erecting the gin pole, the cylinder will not come down, it will stop at the same position so as to avoid any possibility of accident.

The control console of the cylinder consists of a pressure control valve, a manually operated direction control valve, a flow control valve, a pressure gauge, all required fittings and standard accessories.

A heavy duty portable telescopic gin pole complete with steps, chain block, chain, ratchet type binder, guy lines and other accessories.

Length adequate to support 40 feet of 3" I.D. X 5,000 PSI lubricator

Operation: The gin pole is hydraulically erected

Operator Control Console: The operator console is built with a stainless steel machine engraved hydraulic circuit diagram and is equipped with:

A three positions directional control valve @ 3,000 PSI

A flow control valve for speed adjustment

A pressure relief valve @ 3,000 PSI

A hydraulic system pressure gauge 0-3,000 PSI

Hydraulic: Operation of the gin pole can be done from a standard open-loop hydraulic power pack. A power pack is not included.

Painting: All steel materials are sandblasted to Sa 2 ½ standard and coated using an inorganic zinc primer, then painted to customer's supplied color code.

Documentation: Operations & the maintenance manuals are provided in a hard copy and a soft copy (in CD format) in English.

U WINCH

U Winch is a two piece wireline winch unit comprising power pack module with 84 hp zone II rated diesel engine and enclosed winch operator cabin and winch module. Unit can be transported as a single lift. This compact, versatile, self contained wireline winch unit may be supplied in single or dual drum configuration. The system is suitable for cased hole slickline , braided line and mono conductor operations.

With U wireline winch we can switch between every imaginable well servicing activity without having to have another winch , operator or engineer on the rig , saving the time , money and production down time.

We also manufacture, truck mounted heavy duty winch, survey winch & customised winch.

DIMENSION & WEIGHTS:

Power Pack Module:
(L) 1.17m, (W) 1.65m, (H) 2.425m
Winch Module:
(L) 3.35m, (W) 1.50m, (H) 2.425m
Weights are specific to customer's requirements.

HYDRAULIC DRIVE SYSTEM:

- Powerful 375 bar (5,438 psi) closed loop hydraulic system.
- Variable displacement hydraulic pump and hydraulic motor.
- Capable of stable / logging at ultra low speed.
- Capable of fast acceleration at extremely high speeds for effective jarring.
- Hydraulic tank – 150 liters
- Low maintenance system

SLICKLINE OPERATIONS:

- Max line speed at core – 1600 ft/min
- Max line speed at rim/surface – 2700 ft/min
- Max line pull at core – 9000 lbs
- Max line pull at rim/surface – 5000 lbs

WINCH SYSTEM:

- Drum capacity – 25000 ft
- Designed for super light duty – 0.092" to super heavy duty – 0.140" slickline operations.
- Winch drum is driven by hydraulic motor via planetary gearbox with chain sprocket system.
- Planetary gear box ratio – 5.17:1
- Fail safe spring return brake

DEPTH & TENSION SYSTEM:

- Compact & light weight two or three wheel wrap design and no change of pulleys is required with the change of wire.
- Digital data display and recorder to measure depth, tension and line speed. Data can be downloaded to a USB.
- Overpull shutdown system at desired line pull i.e 80% breaking strength of wire.
- Capable of being folded up and restrained during non – operational time and during mobilization (to avoid damage).
- Hydraulically assisted measuring head spooling system.
- Air cylinder operated shock absorbing balanced measuring head support arm.
- Wire can be removed from measuring head without cutting.

POWER PACK:

- Powerful 4 cylinder JCB diesel engine provide 84 hp @ 2400 RPM.
- Standard starter is mechanical recoil spring starter.
- Control voltage 24 VDC (by self excited alternator)
- Diesel reservoir – 80 liters
- Engine controls – start & stop / RPM meter / monitoring and safety system.

CONTROL PANEL: Ergonomic , safe and responsive operator controls & gauges.

- Hydraulic main pressure gauge
- RPM gauge
- Line tension valve
- Throttle control
- Winch direction and speed control valve
- Air pressure
- Brake control
- Emergency stop button

FEATURES & BENEFITS:

- Powerful water cooled four cylinder diesel engine delivering up to 84 hp.
- One or two drums for well servicing from logging to slickline and heavy duty fishing.
- Comfortable cabin in a compact foot print.
- Ergonomic, safe and responsive operator controls.
- Minimum servicing requirements equals maximum availability.
- Superior sound and thermal insulation exceed industry compliance requirements.
- Reliable closed loop hydraulic system for smooth control and extremely slow logging speeds.
- Optional slickline sophisticated control system for safe, high precision automatic operation.
- Customizing options as per customer's different needs.

OPTIONS:

- Light weight aluminum frame.
- Open loop/closed loop hydraulic system.
- Air conditioner
- Slickline Hoistman's Touch Screen Panel.

PRS - 02 SPOOLING UNIT

Features: Spooling Unit is designed with the ultimate flexibility, robust, stand alone operation & with transportable weight.

Dimension & Weight: Length = 2.03 m (6.66 FT)
Width = 2.51 m (8.25 FT)
Height = 1.42 m (4.66 FT)

General: Spooling unit is constructed with steel tubing.

Unit has four lifting points for crane handling, integral forklift pockets for ground handling & 4 anchoring points for floor fixing. A hinged door at the rear side and a vertical safety window protect the operator that stands behind the unit. The capstan wheel is controlled by manual wheel at the rear side of the unit.

this Spooling unit is used for drawing old wireline from a wireline unit drum and for spooling new wireline on the wireline unit drum under tension.

Operation of spooler is done by hydraulic source from open-loop hydraulic power pack.

The function of unit is hydraulically driven arbour on which the new drum (shipping drum) is placed, and the wire tensioning device.

The hydraulically driven spooler arbour will accept all standard wire shipping drums from small slickline 0.092” to large 7/32” wire drums upto 41.35” diameter.

Hydraulic tension during spooling is controlled from remote control panel

Tensioning Unit (TRS - 02): The wire tension assembly traverses freely on sealed linear bearing and tensioning is done by two brake bands acting on the circumference of the tensioning wheel.

Braking is controlled by means of a hand wheel in front of the tensioning head.

A spring loaded pressure wheel is positioned at the top of the tensioner wheel to hold wire in place. A set of guide rollers are set in front of the head which function to keep the tensioner head in line with the wire.

Application: Slickline / Braided line

Operator Control Panel: The operator console is built with stainless steel machine engraved English letters coded and is equipped with: Wire speed control, Back tension control, Counter meter, Emergency stop, Pneumatic stop, Hydraulic system pressure gauge, Over speed/fault indicator.

Third Party Inspection /Certification: Unit will be certified by third party BV, DNV, ABS, Lloyds, Vetco Tuboscope etc as per the requirement of customer.

Painting: All steel materials are sandblasted to Sa 2 ½ standard, inorganic zinc primer coated and all aluminum materials are primed, painted to customer supplied color code.

Signs & Decals: Wherever applicable signs & decals required will be placed.

Unit daily checklist Starting procedure

Safety instructions

All hydraulic connections will be tagged with proper identification

SWL of the unit

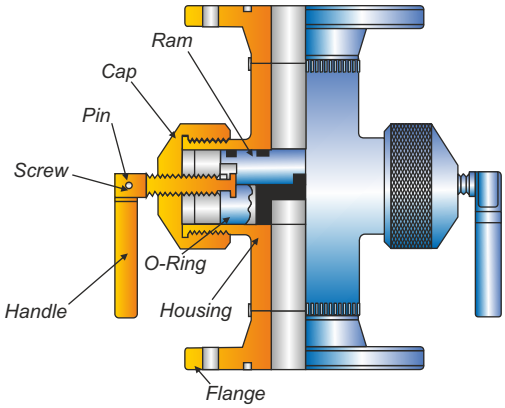
Documentation: Operations & Maintenance Manual provided in hard copy and soft copy (in CD format) for complete set unit in (English).

SUCKER ROD BLOWOUT PREVENTERS

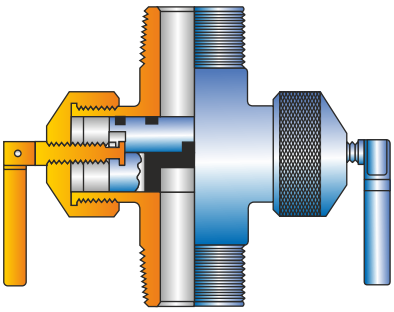
The ACT Sucker Rod Blowout Preventers are designed to give positive protection against blowouts when operating with sucker rods in well service work by providing a positive seal around the sucker rods.

They may be permanently installed between the tubing head and the pumping tee or between the tee and the stuffing box. The BOP can also be used to pack off a pumping well by sealing on the polished rod or on the sucker rods.

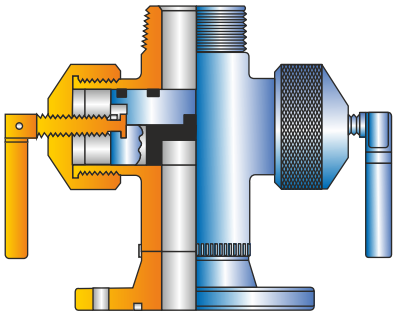
These BOP's are available with a wide selection of ram sizes and in a variety of pressure ratings with the choice of flanged or threaded end connections (thread sizes range from 1-1/2" NU to 7" API casing). Manual and hydraulic options are available.



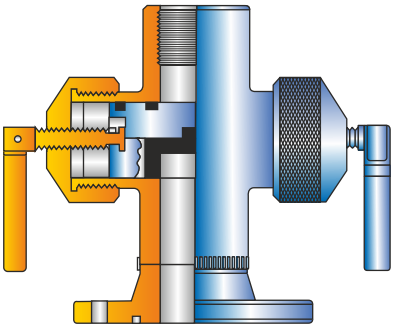
Flanged - Both Ends



Thread - Both Ends



Flanged - Male Thread



Flanged - Female Thread

SUCKER ROD BLOWOUT PREVENTERS		
Connections	**Vertical Bore (in)**	**Working Pressure (PSI)**
2-3/8” NU	1.90	2,000
2-7/8”, 3” LP & 2-9/16" FLANGED	2.44	2,000
2-7/8” EUE	2.44	5,000
3” LP, 3-1/2” NU & FLANGED	3.00	3,000
3-1/2” EUE	2.99	5,000
4” LP & FLANGED	4.00	3,000

* Other sizes available on request.

COILED TUBING QUAD BOP & COMBI BOP

Quad BOP

Light Weight Quad BOP

Single Combi BOP

FEATURES

This Quad BOP is designed primarily for use with coiled tubing operations. Modifications can be made for use in wireline operations. Contact the factory regarding the necessary modifications for any non-standard uses.

Quad BOP's are available with internal or external hydraulics in bore sizes from 2-9/16" to 6-3/8" and working pressures from 5,000 PSI to 15,000 PSI for standard or sour service. Coiled tubing size ranges from 0.75” to 3.50”.

Blind Rams: Designed to seal the pressure from below with nothing between the rams.

Shear Rams: Designed to shear coiled tubing of max. dia. of 2.88” leaving a clean end for circulating fluids or easy fishing. It shears the coiled tubing and seals the well in one operation.

Slip Rams: Designed as two-way grippers and to support a string of coiled tubing or prevent the coiled tubing from stripping out due to well pressure. Specially designed slip inserts are available for coiled tubing.

Pipe Rams: Designed to centralize and seal around the coiled tubing.

Manual Locking Actuators: Each ram actuator is equipped with a manual locking handle. After the rams are hydraulically closed, they can be locked in closed position with the manual handle. Should the hydraulics fail, the rams can be manually closed. The hydraulic must be re-established and used to re-open the rams.

Ram Position Indicators: Designed to give positive indication of ram position.

Equalizing Valves: Designed to prevent seal damage when opening either the blind or pipe rams with differential pressure present.

Options:

- Single Combi BOP available in combination of: Shear - Seal or Pipe-slip
- Dual Combi BOP available in combination of: Shear - Seal or Pipe-slip

SIDE LOADING STRIPPER PACKER

FEATURES

The ACT coiled tubing Side Loading Stripper/Packer is designed for use with injectors built by various manufacturers. The significant single feature of the ACT Side Loading Stripper/Packer is that it offers field replacement of the interlock packer, non- extrusion ring, and bushings through the side door, below the injector and with tubing in the well.

Additional features:

1. The union sub and nut are field interchangeable.
2. The union nut can be 'latched up', while stabbing the union sub into the BOP union.
3. Optimum tubing column support with tubing sizes 1.00, 1.25,1.50, and 1.75 available.
4. A unique three point tie rod arrangement provides a significantly greater working space within the side loading door clearance opening for enhanced field replacement of the vital sealing components and bushings.
5. The piston "close" and "open" ports are NPT and both are located below the door clearance opening.
6. Key components are 17-4 PH stainless steel or alloy steel for optimum strength and corrosion resistance. Bushings are of aluminium bronze.
7. Below the door energizer piston arrangement does not move the critical upper tubing bushings. This unique arrangement provides continuous, non-changing tubing column support.
8. Convenient NPT gauge / injection port.
9. Interlock packer and non - extrusion ring are interchangeable with competitors. Various materials are available to suit specific well /service conditions.
10. Glass - filled teflon non - extrusion ring provide an optimum interlock packer support / reliability.
11. The four hydraulic control supply ports are of NPT which require no special fittings.
12. A unique "breach lock" style lock flange provides reliable safety of door closure yet offers easy field operation.
13. The piston is situated below the packer element. Having the piston in this position will decrease the amount of hydraulic pressure required to pack-off around the Coiled tubing.

Side Loading Stripper Packer

OPERATING PARAMETERS

Assembly Working Pressure	:	10,000 PSI
Test Pressure	:	15,000 PSI
Hydraulic Operating Pressures		
Piston Close (Packing - off)	:	5,000 PSI Max
Piston Open (Relaxing Packer)	:	5,000 PSI Max
Door Close	:	3,000 PSI Max
Door Open	:	3,000 PSI Max

CONVENTIONAL COILED TUBING STRIPPER PACKER

ACT conventional coiled tubing stripper / packers are available to accommodate tubing sizes from 3/4" through 2-3/8".

Conventional Coiled Tubing Stripper Packer

TANDEM SIDE LOADING STRIPPER PACKER

FEATURES

The ACT Tandem Side Loading Stripper Packer is designed to be used in tandem with standard side loading stripper packer. It is installed below the side loading stripper packer with a quick union connection.

In normal operations, the upper stripper packer, which is mounted below the injector, will be the primary packer, with the lower tandem stripper packer in reserve. If the upper packer wears away, the second (tandem) packer can be put in to service, or the upper packer element can be replaced, and the operation can be continued. In a high pressure well, the two stripper packers can be operated simultaneously or individually by their separate hydraulic connections.

The additional feature of tandem stripper packer is a chemical injection system installed in the upper part of the packer, through which a wide variety of ant-corrosion chemicals or lubricating oils can be injected on to the outer surface of the coiled tubing.

Additional Features:

1. The union sub and nut are field interchangeable.
2. The union nut can be 'latched up', while stabbing the union sub into the BOP union.
3. A unique three point tie rod arrangement provides a significantly greater working space within the side loading door clearance opening for enhanced field replacement of the vital sealing components and bushings.
4. The piston "close" and "open" ports are NPT and both are located below the door clearance opening.
5. Key components are 17-4 PH stainless steel or alloy steel for optimum strength and corrosion resistance. Bushings are of aluminium bronze.
6. Below the door energizer piston arrangement does not move the critical upper tubing bushings. This unique arrangement provides continuous, non-changing tubing column support.
7. Convenient NPT gauge / injection port.
8. Interlock packer and non - extrusion ring are interchangeable with competitors. Various materials are available to suit specific well /service conditions.
9. Glass - filled teflon non - extrusion ring provide an optimum interlock packer support / reliability.
10. The four hydraulic control supply ports are of NPT which require no special fittings.
11. A unique "breach lock" style lock flange provides reliable safety of door closure yet offers easy field operation.
12. The piston is situated below the packer element. Having the piston in this position will decrease the amount of hydraulic pressure required to pack-off around the Coiled tubing.

Tandem Side Loading Stripper Packer

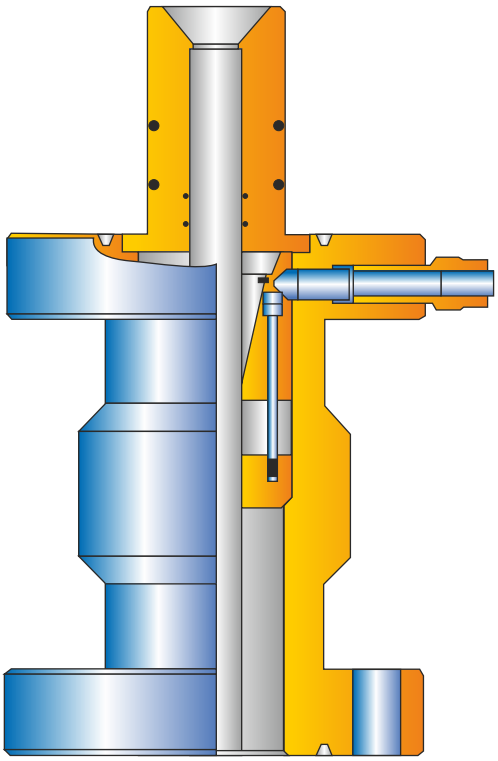
OPERATING PARAMETERS

Assembly Working Pressure	:	10,000 PSI
Test Pressure	:	15,000 PSI

COILED TUBING HANGER

Features

- Designed to support heavy duty coiled tubing down hole tool strings.
- Rugged hanger body for safe working during high well pressures.
- Suitable for tubing sizes up to 3 1/2" O.D.
- Flanged side outlet provided at user's requirement.
- Available in all API 6B & 6BX flanged connections and working pressure.
- Provided with a wireline entry sub to guide wireline tools into the bore of the tubing. This sub provides secondary annulus seal and prohibits upward movement of the tubing.



Coiled Tubing Hanger

COILED TUBING HANGER				
Size	**1"**	**1. 1/4"**	**1. 1/2"**	**1. 3/4"**
2. 1/16" 5 M	206A-21654065	206B-21654065	206C-21654065	206D-21654065
2. 9/16" 5 M	206A-21614065	206B-21614065	206C-21614065	206D-21614065
2. 9/16" 10 M	206A-29614065	206B-29614065	206C-29614065	206D-29614065
3. 1/16" 10 M	206A-31614065	206B-31614065	206C-31614065	206D-31614065
4. 1/16" 5 M	206A-40654065	206B-40654065	206C-40654065	206D-40654065
4. 1/16" 10 M	206A-40614065	206B-40614065	206C-40614065	206D-40614065

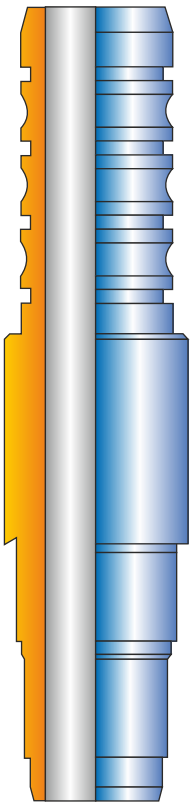
ROLL-ON CONNECTOR

Application

- The Roll-On Connector allows the attachment of coiled tubing to the tool string. The coiled tubing is attached to the roll-on connector by crimping the O.D. of the coiled tubing.

Features

1. A flush OD allows easy spooling.
2. O-ring seals ensure pressure integrity of the coiled tubing.
3. Relatively large I.D. allows flow through the connector and the plugs, darts, or process balls.
4. One piece design.
5. Simple installation.

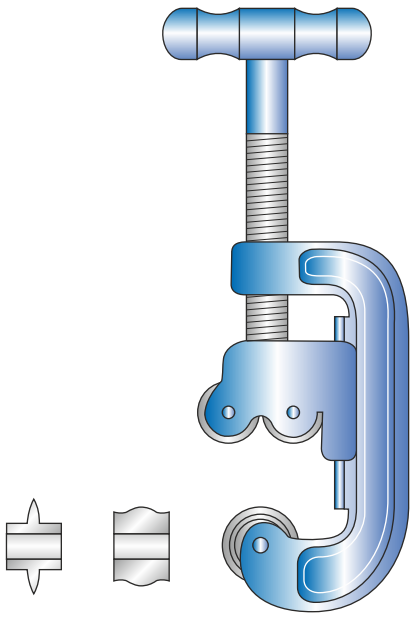


Roll-On Connector

DOUBLE ROLL-ON CONNECTOR			
Coiled Tubing Diameter	**Max. OD / ID / Threads**	**Make-Up Length**	**Internal Ball Clearance**
1-1/4”	Customer to specify	8.00”	Customer to specify
1-1/2”		8.00”	
1-3/4”		8.00”	
2”		8.00”	
2-3/8”		8.00”	

ROLL-ON CONNECTOR CRIMPING TOOL

The Roll-On Connector Crimping Tool ensures easy field installation of the PCE roll-on connector to the coiled tubing. The crimping tool has two interchangeable wheels, one of which is used to swage the coiled tubing into the roll-on connector. The other is a cutting wheel which can be used to cut the coiled tubing.



Roll-On Connector Crimping Tool

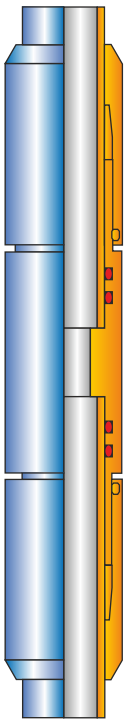
DOUBLE SLIP CONNECTOR

Features

- Connects two sections of coiled tubing.
- High-strength construction makes the connector stronger than the CT string.
- A rotational lock prevents the connector from spinning on the coiled tubing when using small downhole motors or other low-to mid-torque generating assemblies.
- Re-useable connectors offer multiple use.
- The external make-up principle avoids inside diameter (I.D.) restriction of the coiled tubing, allowing unrestricted flow and the use of wiper plugs or process balls.
- Field interchangeable slips.
- Dual O-rings ensure pressure integrity.

DOUBLE SLIP CONNECTOR		
Coiled Tubing Size (in)	**O.D. (in)**	**I.D. (in)**
1	1.600	0.875
1 -1/4	1.850	1.125
1 -1/2	2.188	1.250
1 -3/4	2.375	1.531
2	2.688	1.531

Other sizes are available on request.



Double Slip Connector

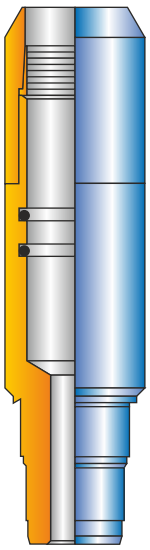
SINGLE SLIP CONNECTOR

Features

- ACT Slip type Coiled Tubing Connector are used to attach coiled tubing to the C.T. tool / workstring.
- With option of internal / external neck.
- High tensile strength.
- Field replaceable slip.
- Dual O-rings ensure pressure integrity.

SINGLE SLIP CONNECTOR		
Coiled Tubing Size (in)	**O.D. (in)**	**I.D. (in)**
1	1.600	0.875
1 -1/4	1.850	1.125
1 -1/2	2.188	1.250
1 -3/4	2.375	1.531
2	2.688	1.531
2 -3/8	3.375	2.000

Other sizes are available on request.



Single Slip Connector

DOUBLE FLAPPER CHECK VALVE

The Double Flapper Check Valve is the standard check valve used in the standard check valve used in the majority of CT operations. It is mounted close to the top of the CT string, below the connector to provide a well control barrier inside the coiled tubing against the wellbore.

Applications:

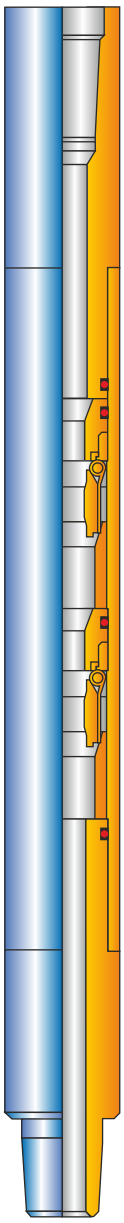
- A standard safety device used on CT operations in all oil, gas and water wells.
- Sweet and sour service (H_2S).

Features:

- Allows unobstructed flow of fluids and nitrogen.
- Prevents back flow of well fluids into the coiled tubing.
- Internal full bore fluid passage for bores, darts and plugs.
- Removable flapper cartridges.
- Dual sealing flapper cartridge (low pressure teflon sealing and high pressure metal to metal sealing).

DOUBLE FLAPPER CHECK VALVE		
O.D. (in)	**I.D.* (in)**	**Length* (in)**
1.500	0.469	17
1.688	0.687	18
2.125	0.891	19
2.375	1.031	20

* As per customers specifications.
Other sizes are available on request.



Double Flapper Check Valve

STRAIGHT BARS & WEIGHT BARS

Applications:

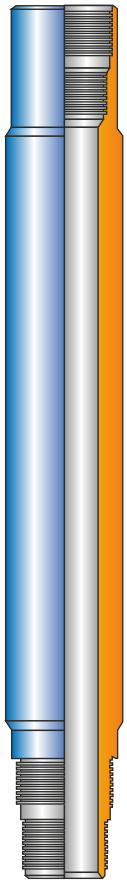
- Cleanout operations.
- Nitrogen lifts.
- Fishing and retrieval operations.
- Sweet and sour service (H_2S).

Features:

- Extends short tool strings to provide a smoother access through restrictions.
- Adds weight between a jar an accelerator.
- Full flow through bore.
- Different lengths and weights available

STRAIGHT BARS & WEIGHT BARS		
O.D. (in)	**I.D.* (in)**	**Length* (ft.)**
1.500	0.688	2, 3, 4
1.688	0.688	2, 3, 4
1.750	0.875	2, 3, 4
2.125	1.250	2, 3, 4
2.568	1.375	2, 3, 4

* Threads as per customers specifications
Other sizes are available on request.



Straight Bars & Weight Bars

WASH SHOES

Applications:

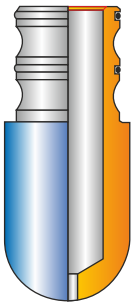
- Used to clean tubing I.D. by pumping fluid through the coiled tubing and out through the wash shoe which creates a jetting action.
- Standard nozzle sub for all CT pumping and nitrogen lift operations
- Sweet and sour service (H_2S)

Features:

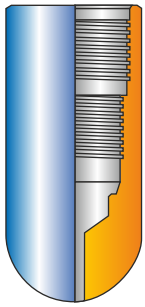
- Available in various sizes, nozzle patterns and diameters to meet operational parameters.
- Several configuration of ports and directions are available.

WASH SHOES			
Description	**Size*(in)**	**Length *(in)**	**Ports *(in)**
Threaded wash shoe	1.25 to 3.75 O.D.	5.00	0.25 to 1.00
Wash shoe with roll-on connection	1.687 to 3.125 coiled tubing	to 8.00	15°, 30° and 45° up, down and 90°

* Customer to specify size, number and direction of ports.



Roll-on Connection Wash Shoe



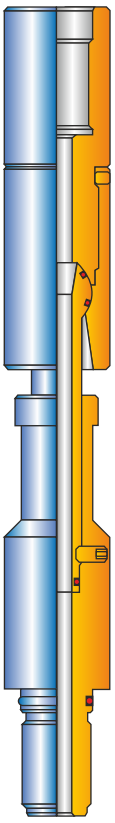
Threaded Wash Shoe

KNUCKLE JOINT

The Knuckle Joint, when incorporated between the jars and the manipulation tool, provides additional flexibility in the tool string.

The Knuckle Joint allows a full 360° rotation of the toolstring and provide a full 15° angular deviation and internal pressure sealing throughout the full rotation of the tool.

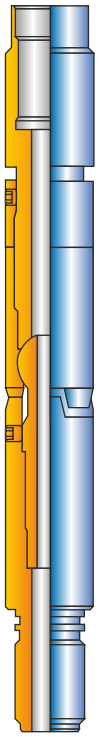
The ball and socket of the knuckle joint provide the rotation and angular deviation of the tool. Seals in the ball provide the sealing capability.



Knuckle Joint

KNUCKLE JOINT					
Maximum O.D. (in)	Minimum I.D. (in)	Tensile Strength (Standard Service)	Make-up Length (in)	Internal Ball Clearance (in)	Angle Of Deviation
1.687	0.500	40,000 LBS	10.461	7/16	15°
1.750	0.500	60,000 LBS	10.461	7/16	15°
2.125	0.500	56,000 LBS	9.260	7/16	15°
2.375	0.750	60,000 LBS	9.604	11/16	15°
3.125	1.000	100,000 LBS	11.000	15/16	15°

TORQUE THRU KNUCKLE JOINT



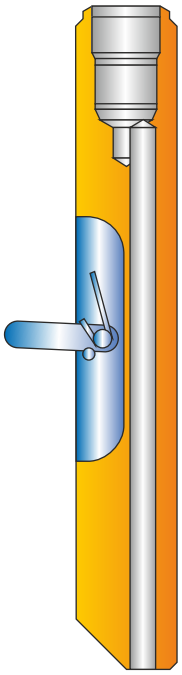
Torque Thru Knuckle Joint

The Torque Thru Knuckle Joint, when incorporated between the jars and the manipulation tool, provides additional flexibility in the tool string.

The torque thru knuckle joint is used when rotation of the tool string is not required. The top sub and housing of the knuckle joint have keys that prevent rotation but still allows full angular movement.

TORQUE THRU KNUCKLE JOINT						
Max. O.D. (in)	Min. I.D. (in)	Tensile Strength (Standard Service)	Make-up Length (in)	Internal Ball Clearance (in)	Angle Of Deviation	Min. Torque FT/LBS
1.687	0.500	40,000 LBS	10.461	7/16	15°	500FT/LBS
1.750	0.500	60,000 LBS	10.461	7/16	15°	500FT/LBS
2.125	0.750	50,000 LBS	10.669	11/16	15°	600FT/LBS
2.250	0.750	55,000 LBS	10.669	11/16	15°	600FT/LBS
2.375	0.750	60,000 LBS	11.115	11/16	15°	600FT/LBS
3.125	1.000	100,000 LBS	12.100	15/16	15°	750FT/LBS

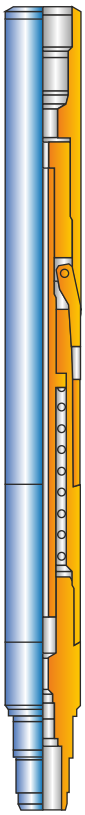
MANUAL TUBING END LOCATOR



Manual Tubing End Locator

ACT Tubing End Locator allows tubing measurement during normal operations. It is similar in design to a wireline tubing end locator. And has a flow through I.D. which allows for circulation while running in the well. The tool locates tubing end by means of a spring loaded shear pinned arm. The arms gives a positive indication of tubing end and over pull will break the shear pin allowing the arm to retract into it's pocket.

MANUAL TUBING END LOCATOR		
MAX O.D.	2.0"	2.875"
RANGE	2.1/8" - 3.0"	3.1/4" - 5.0"
TOTAL LENGTH	13.25"	17.00"
PART NO.	390-20XX-00	390-29XX-00



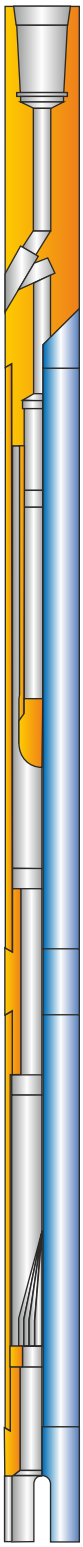
Flow Activated Tubing End Locator

FLOW ACTIVATED TUBING END LOCATOR

ACT flow activated Tubing End Locator has the advantage of multiple tubing measurement as many times as required without the need to retract from the well. The tool is activated by surface pump pressure which will open the locator arm. Bleeding down the pump pressure will retract the arm in its pocket and then can be travelled to next location to repeat the measurement.

FLOW ACTIVATED TUBING END LOCATOR			
MAX O.D.	**1.687"**	**1.75"**	**2.125"**
MIN I.D.	**0.25"**	**0.25"**	**0.25"**
TUBING SIZE	**2.7/8" - 3.1/2"**	**2.7/8" - 3.1/2"**	**3.1/2" - 4.1/2"**
LENGTH	**18.75"**	**18.7/5"**	**18.88"**
OPENING PRESSURE	**500 psi**	**500 psi**	**500 psi**
PART NO.	**391-17XX-00**	**391-18XX-00**	**391-21XX-00**

VENTURI JUNK BASKET



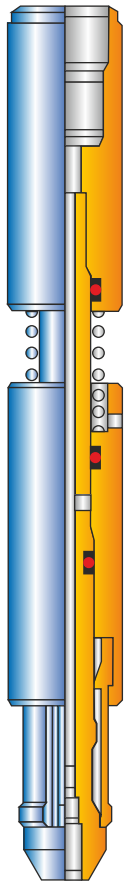
Venturi Junk Basket

ACT Venturi Junk Basket is used to remove junk and debris from well bore. When fluid is pumped through the coiled tubing into the venture junk basket, it passes through the nozzles in the upper portion of the tool. The nozzles direct the flow towards the bottom and a vacuum is created in the venture chamber. The fluid and debris is then sucked into the tool from the bottom. The fluid exit back through the venturi tubes and most of this fluid is mixes with the pressurized fluid and recirculate around the bottom of the tool. The junk and debris is trapped by a catcher at the bottom of the tool. A filter screen above the catcher prevents the debris from recirculating around the nozzles and from blocking the venture tubes.

ACT Venturi Junk Basket can be used with fluids, nitrogenated fluids or gases. The nozzles in the Venturi Junk Basket can be changed to adjust the fluid flow rate and pressure to suite each application.

VENTURI JUNK BASKET		
SIZE	1.11/16"	3.1/8"
MAX O.D.	1.686"	3.25"
LENGTH	35.0"	54.60
PART NO.	307-170-00	307-312-00

FLOW ACTIVATED GS RUNNING / PULLING TOOL

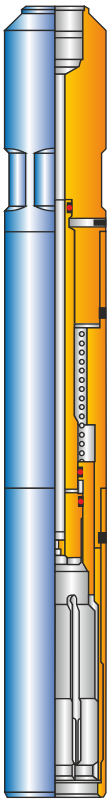


Flow Activated GS Running / Pulling Tool

ACT Flow Activated GS Pulling Tool is designed to run or retrieve downhole tools that have internal fishing necks. It is hydraulically activated and hence does not require a shear pin or drop ball to operate. The differential pressure required to activate the tool is achieved by circulating through a choke insert in the core. Flow Activated GS Pulling Tool is available for all standard internal fishing necks.

FLOW ACTIVATED GS RUNNING / PULLING TOOL						
NOMINAL SIZE	REACH	O.D.	I.D.	LENGTH	REACH	PART NO.
2"	Standard	1.75"	0.125" - 0.250"	15.125"	0.500"	FR-28205-00
2"	Long	1.75"	0.125" - 0.250"	16.250"	1.625"	FR-28200-00
2.1/2"	Standard	2.24"	0.125" - 0.250"	15.125"	0.500"	FR-28225-00
2.1/2"	Long	2.24"	0.125" - 0.250"	16.250"	1.625"	FR-28220-00
3"	Standard	2.72"	0.125" - 0.250"	15.875"	0.500"	FR-28305-00
3"	Long	2.72"	0.125" - 0.250"	16.875"	1.625"	FR-28300-00
4"	Standard	3.62"	0.125" - 0.250"	16.000"	0.500"	FR-28405-00
4"	Long	3.62"	0.125" - 0.250"	17.000"	1.625"	FR-28400-00

FLOW ACTIVATED HD RUNNING / PULLING TOOL



Flow Activated HD Running / Pulling Tool

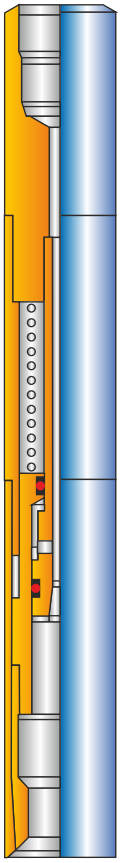
ACT Flow Activated Heavy Duty Running/Pulling Tool is designed to run or retrieve downhole tools that have external fishing necks. This tool engages the fishing neck a full 360 degree and robust in construction. It is hydraulically activated and hence does not require a shear pin or drop ball to operate. Hydraulic activation is achieved by circulating through a choke insert In the core of the tool. Heavy Duty Running/Pulling tools are available for all sizes of standard external fishing necks.

FLOW ACTIVATED HD RUNNING / PULLING TOOL						
MAX O.D.	MIN I.D. (WITHOUT CHOKE)	OVERALL LENGTH	WEIGHT (lbs)	NOMINAL SIZE	FISHING NECK CATCH SIZE	PART NO.
1.875"	0.390"	16.710"	9.81	2"	1.375"	404-187XX-00
2.300"	0.390"	16.700"	14.56	2.1/2"	1.750"	404-230XX-00
2.875"	0.390"	19.600"	21.74	3"	2.313"	404-288XX-00
3.750"	0.390"	23.400"	34.58	4"	3.124"	404-375XX-00

FLOW RELEASE OVERSHOT

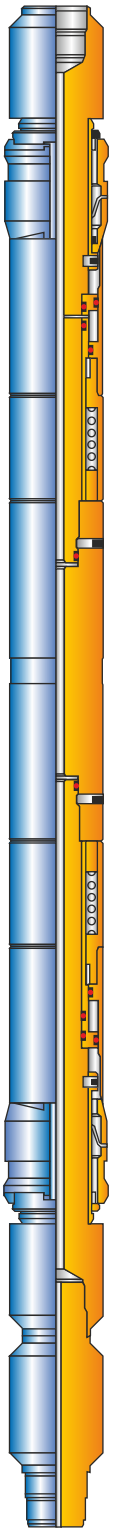
ACT Flow Release Overshot is used to retrieve plain end cylindrical fish or damaged external fishing necks from well bore. The tool is run into the hole until it latches the fish and pulling up will cause the hardened slip teeth to bite into the fish, enabling it to be retrieved. If the fish is irretrievable, the tool can be released from the fish by flow activation and returned to surface.

FLOW ACTIVATED TUBING END LOCATOR		
MAX O.D.	CATCH SIZE	PART NO.
1.850"	1.0" - 1.25" CT	FR3519XX-00
2.125"	1.0" - 1.50" CT	FR3521XX-00
2.250"	1.25" - 1.50" CT	FR3522XX-00
2.625"	1.25" - 1.3/4" CT	FR3526XX-00



Flow Release Overshot

FLOW ACTIVATED SHIFTING TOOL



Flow Activated Shifting Tool

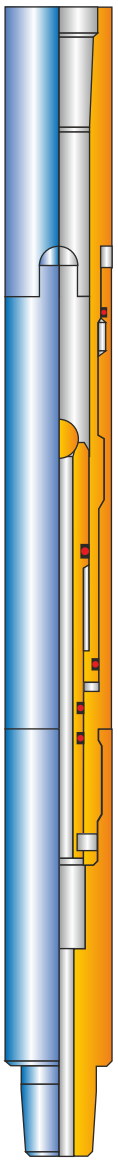
ACT Flow Activated Shifting tool is used to selectively shift sliding sleeves in horizontal well bore. The shifting keys are in normally closed position during running in. When hydraulically activated by surface pump, the keys expand to its shifting position. ACT Flow Activated Shifting Tool can be used to selectively open or close multiple sliding sleeves in a single run.

FLOW ACTIVATED SHIFTING TOOL						
MIN I.D.	O.D. (KEYS EXPANDED)	O.D. (KEYS RETRACTED)	TENSILE STRENGTH (STD. SERVICE)	SSD SIZE	FISHING NECK	PART NO.
0.390"	2.60"	2.15"	56,000 lbs	2.313"	2.313"	393-231XX-00
0.390"	2.97"	2.53"	67,000 lbs	2.562"	2.313"	393-256XX-00
0.390"	3.03"	2.73"	86,000 lbs	2.750"	2.313"	393-275XX-00
0.390"	3.16"	2.72"	90,000 lbs	2.813"	2.313"	393-281XX-00
0.500"	3.48"	3.06"	90,000 lbs	3.125"	2.313	393-312XX-00
0.437"	3.61"	3.25"	94,000 lbs	3.313"	2.313"	393-331XX-00
0.500"	3.93"	3.41"	94,000 lbs	3.437"	2.313"	393-343XX-00
0.437"	4.15"	3.66"	100,000 lbs	3.688"	3.125"	393-368XX-00
0.500"	4.09"	3.75"	100,000 lbs	3.813"	3.125"	393-381XX-00
0.500"	4.36"	3.86"	100,000 lbs	4.125"	3.125"	393-412XX-00
0.500"	4.875"	4.25"	121,000 lbs	4.313"	3.125"	393-431XX-00
0.500"	5.000"	4.52"	121,000 lbs	4.562"	3.125"	393-456XX-00

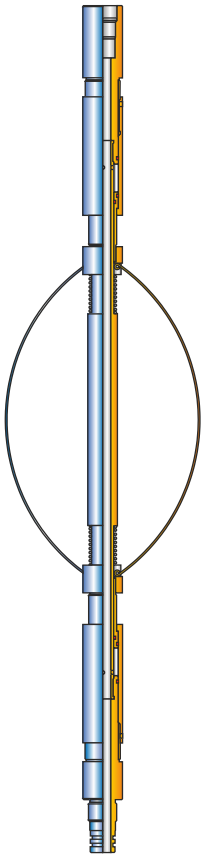
HYDRAULIC DISCONNECT

The Hydraulic Disconnect allows the toolstring to detach at a predetermined point via the deployment of a suitable drop/trip ball through the coiled tubing. The drop ball locates on a piston sleeve creating sufficient back pressure to shear the pins and disconnect the tool. All piston sleeves and drop balls are returned to surface leaving a standard 'GS' internal fish neck for retrieval purposes.

HYDRAULIC DISCONNECT						
Max. O.D. (in)	Min. I.D. (in)	Tensile Strength (Standard Service)	Fish Neck (internal)	Make-up Length (in)	Drop Ball Release (in)	Internal Ball Clearance (in)
1.687	0.438	40,000 LBS	2” 'GS'	18	5/8	7/16
1.750	0.438	45,000 LBS	2” 'GS'	18	5/8	7/16
2.125	0.438	55,000 LBS	2” 'GS'	18	5/8	7/16
2.250	0.750	65,000 LBS	2” 'GS'	18	13/16	3/4
2.375	0.750	70,000 LBS	2-1/2” 'GS'	19	13/16	3/4
2.875	0.750	120,000 LBS	3” 'GS'	21	13/16	3/4
3.125	1.062	150,000 LBS	3” 'GS'	21	1.1/8	1



Hydraulic Disconnect



Flow Activated Bow Spring Centralizer

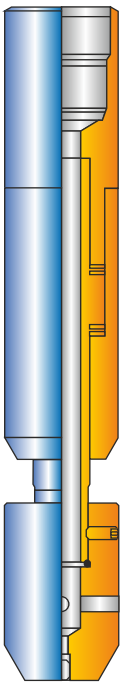
FLOW ACTIVATED BOW SPRING CENTRALIZER

The Flow Activated Bow Spring Centralizer is designed to allow the toolstring or parts of the toolstring to be centralized in the tubing/casing for various operations.

The Flow Activated Bow Spring Centralizer is designed so that its bow springs are normally retracted. The bow springs only expand when a pressure differential is achieved across the tool.

FLOW ACTIVATED BOW SPRING CENTRALIZER			
Tubing/ Casing Size (in)	O.D. Size (in)	I.D. Size (in)	Length Size (in)
3-5/8, 8	1.688	0.563	36.000
3-1/4, 8-1/2	2.125	1.000	36.000
5, 11	2.563	1.375	42.625
5-5/8, 11-1/2	3.125	1.375	44.500

JET SPINNING WASH TOOL



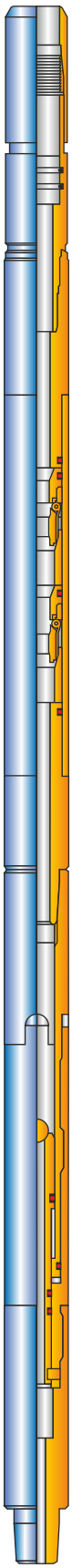
The Jet Spinning Wash Tool is used as a means to permit coiled tubing units to jet clean the internal diameter of tubing, casing, pipelines, etc. The spinning wash tool has four ports on the circumference, which causes the wash shoe to rotate, and one down facing port.

As the pump pressure is increased, rotation of the wash shoe increases. The side ports will jet the pipe walls clean, and the down facing port cleans sand bridges and jet debris from fishing necks etc.

JET SPINNING WASH TOOL		
Maximum O.D. (in)	**Overall Length (in)**	**Jetting Nozzle Inserts**
1.687	13.375	(5) 1/16” NPT x 1-2mm DIA HOLE
1.750	13.375	(5) 1/16” NPT x 1-2mm DIA HOLE
2.125	14.000	(5) 1/16” NPT x 1-2mm DIA HOLE
2.375	14.000	(5) 1/16” NPT x 1-2mm DIA HOLE
3.125	15.500	(5) 1/16” NPT x 1-2mm DIA HOLE

Jet Spinning Wash Tool

MOTOR HEAD ASSEMBLY



Motor Head Assembly

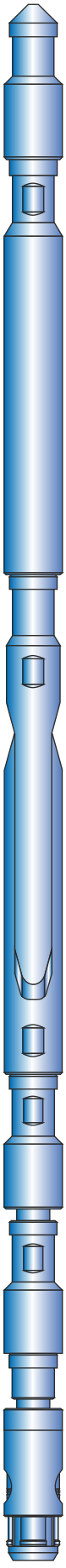
The ACT Motor Head Assembly is used as a multi-function tool and run mainly with a down hole motor in conjunction with coiled tubing connector, dual BPV & hydraulic disconnect.

Running this tool reduces the total length of the tool string and thereby lessens the length of the lubricator.

MOTOR HEAD ASSEMBLY			
Motorhead O.D.	**Double Flapper Check Valve I.D.**	**Hydraulic Disconnect Min. I.D.**	**Hydraulic Disconnect Drop Ball**
1.11/16”	0.72”	0.437”	5/8”
1.3/4”	0.72”	1.035”	1.155”
2.1/8”	1.035”	0.687	13/16”
5/8”	5/8”	13/16”	13/16”

Other sizes available upon request

WIRELINE TOOL STRING



The Wireline Tool String is necessary for the efficient surface control during the running and pulling operations on wireline / slickline of sub surface controlled devices.

An assembly of wireline tools connected to the wireline is used to deliver surface controlled impacts (jar action), either upwards or downwards, to manipulate devices within the well bore.

A standard set of the tool string typically consist of :

Rope Socket for attaching the wireline to the tool string.

Stem / Weight Bar for adding weight to sink the tool in the well bore against the well pressure and different gravity fluids encountered.

Spang Link / Mechanical Jar for securing the hammering effect by upward or downward movement.

Knuckle Joint for obtaining flexibility through the tool string.

Running / Pulling Tool for running and retrieving devices from the well bore.

All tools are available with the following as per the customer's requirements:

- Sucker Rod Threads
- UN Threads
- Quick Lock Connection

Sucker rod threads are machined on the tools as per API 11B.

UN threads are also machined on the tools and are interchangeable with sucker rod threads but are shorter in length.

A quick lock connector as the name suggest is a quick connect and quick disconnect connection, which is used in place of screwed connection. It has many advantages over screwed connection:

- It incorporates a quarter turn connection.
- It is stronger than a screwed connection. It has three impact load bearing surfaces in each direction, which makes it safer for heavy and prolonged operations.
- It is safer and simpler and can be released with a screwdriver.

ROPE SOCKETS

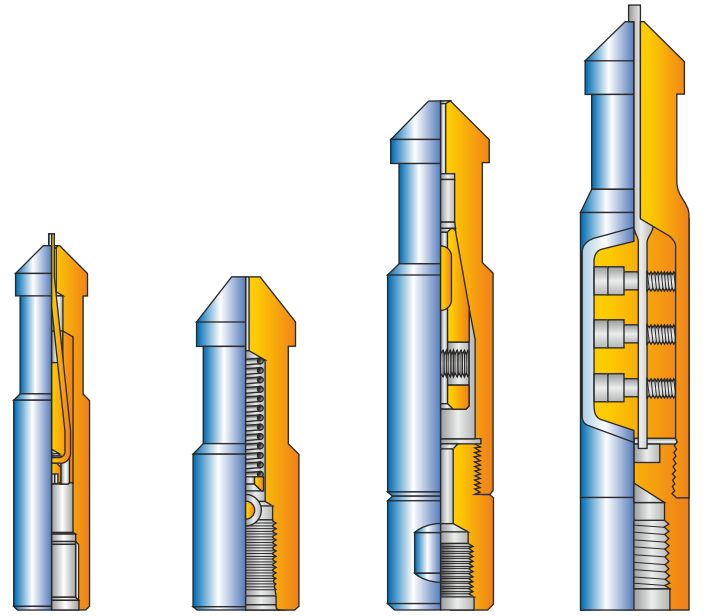
ACT Rope Sockets are used to securely attach wireline / slickline to the tool string. They are available in four types.

1. Wedge Type: The Wedge Type or Pear Drop Type with a sleeve utilises a brass wedge to keep the wireline attached within the Rope Socket. The Rope Socket assembly consists of a body with an external fishing neck, a sleeve and a brass wedge.

2. Spool Type: The Spool Type or Disc and Spring Type consists of a body with an external fishing neck, a spring, a spring support and a disc. The line is fastened to the grooved disc around its circumference.

3. Slip Type: The Slip Type is designed for use with small braided lines up to 5/16". It consists of a body with an external fishing neck, a carriage, slips, a set screw and a bottom sub. The slips are designed to break the line at a specific percentage of the line tensile strength.

4. Clamp Type: The Clamp Type consists of a body with an external fishing neck, a clamp, a set screw and a bottom sub. The line is placed in-between the clamps and secured using set screws.

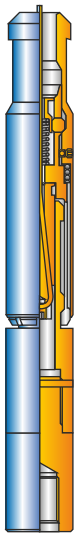


Wedge Type *Spool Type* *Slip Type* *Clamp Type*

ROPE SOCKETS						
Size (in)	**Max. O.D. (in)**	**F/N. O.D. (in)**	**Bottom Connection**	**Wire Size (in)**	**Type**	**Part No.**
1	1.000	0.875	5/8-11 UNC	0.066-0.092	SPOOL	911000-SP
1-1/4	1.250	1.187	15/16-10 UN	0.066-0.092	SPOOL	911211-SP
1-1/2	1.500	1.375	15/16-10 UN	0.066-0.092	SPOOL	911521-SP
2-1/2	2.500	2.312	1-9/16-1O UN	0.092	SPOOL	912546-SP
1-7/8	1.750	1.875	1-1/16-10 UN	0.066-0.092	SPOOL	911932-SP
2-1/8	2.125	1.750	1-1/16-10 UN	0.092	SPOOL	912132 SP
1-1/8	1.125	0.875	5/8-11 UNC	0.066-0.092	WEDGE	911100-W
1-1/2	1.500	1.375	15/16-10 UN	0.092/0.108	WEDGE	911521-W
1-1/2	1.50	1.375	1-1/16-10 UN	0.092/0.125	WEDGE	911522-W
1-7/8	1.875	1.750	15/16-10 UN	0.092/0.125	WEDGE	911931-W
1-7/8	1.875	1.750	1-1/16-10 UN	0.092/0.125	WEDGE	911932-W
2-1/8	2.125	1.750	1-1/16-10 UN	0.092/0.125	WEDGE	912132-W
2-1/2	2.500	2.312	1-9/16-10 UN	0.092/0.125	WEDGE	912546-W
1-1/4	1.250	1.187	15/16-10 UN	0.125	CLAMP	911211-C
1-1/2	1.500	1.375	15/16-10 UN	0.125/0.187	CLAMP	911521-C
1-7/8	1.875	1.750	1-1/16-10 UN	0.187	CLAMP	911932-C
2-1/2	2.500	2.312	1-9/16-10 UN	0.250	CLAMP	912546-C
1-1/2	1.500	1.375	15/16-10 UN	0.187	SLIP	911521-SL
1-7/8	1.875	1.750	1-1/16-10 UN	0.187	SLIP	911936-SL
2-1/8	2.125	1.750	1-1/16-10 UN	0.312	SLIP	912132-SL
2-1/2	2.500	2.312	1-9/16-10 UN	0.312	SLIP	912546-SL

- Other sizes available on request

RELEASABLE ROPE SOCKETS



Releasable Rope Socket

The ACT Releasable Rope Socket is designed to release in the event when a wirline / slickline toolstring cannot be recovered from the wellbore.

The trigger device is activated by a drop bar, which is dropped down the wire in a similar manner to a Go-Devil or wireline snipper. When the drop bar contacts the release trigger, the collet releases the lower fishing neck. The upper housing and drop bar are retrieved to surface leaving a clean fishing neck.

A Releasable Rope Socket is multi-functional in that it can be used with both slickline and braided line merely by changing the internal clamping mechanism.

A trigger disassembly tool is supplied which doubles as a gauge confirming correct assembly.

Features:

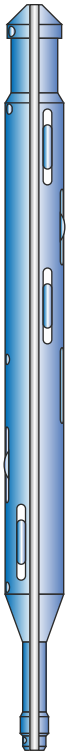
- Secondary fishing neck for recovery
- Roller and standard drop bars available
- Field redressable

Benefits:

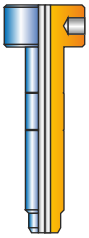
- Eases fishing operations by leaving a clean fishing neck after activation
- Reduces operational cost and risk during wireline operations

Applications:

- Standard and high angle operations



Releasable Rope Socket GO Devil



Releasable Rope Socket Trigger

RELEASABLE ROPE SOCKETS

Part Number	Max. OD (in)	Wire Size (in)	F/N O.D. (in)	Bottom Connection	Trigger Part No.
363-1500-000-121	1.500	0.092/0.108/0.125	1.375	1-1/2" QLS	363-1500-029-018
363-1500-000-122	1.500	3/16	1.375	1-1/2" QLS	363-1500-029-018
363-1500-000-123	1.500	7/32	1.375	1-1/2" QLS	363-1500-029-018
363-1500-000-124	1.500	1/4	1.375	1-1/2" QLS	363-1500-029-018
363-1500-000-125	1.500	0.092/0.108/0.125	1.375	15/16" - 10 UN	363-1500-029-018
363-1500-000-126	1.500	3/16	1.375	15/16" - 10 UN	363-1500-029-018
363-1500-000-127	1.500	7/32	1.375	15/16" - 10 UN	363-1500-029-018
363-1500-000-128	1.500	1/4	1.375	15/16" - 10 UN	363-1500-029-018
363-1875-000-121	1.875	0.092/0.108/0.125	1.750	1-7/8" QLS	363-1875-05-18
363-1875-000-122	1.875	3/16	1.750	1-7/8" QLS	363-1875-05-18
363-1875-000-123	1.875	7/32	1.750	1-7/8" QLS	363-1875-05-18
363-1875-000-124	1.875	1/4	1.750	1-7/8" QLS	363-1875-05-18
363-1875-000-125	1.875	0.092/0.108/0,125	1.750	1-1/16" - 10 UN	363-1875-05-18
363-1875-000-126	1.875	3/16	1.750	1-1/16" - 10 UN	363-1875-05-18
363-1875-000-127	1.875	7/32	1.750	1-1/16" - 10 UN	363-1875-05-18
363-1875-000-128	1.875	1/4	1.750	1-1/16" - 10 UN	363-1875-05-18
363-2125-000-121	2.125	0.092/0.108/0.125	1.750	2-1/8" QLS	363-1875-05-18
363-2125-000-122	2.125	3/16	1.750	2-1/8" QLS	363-1875-05-18
363-2125-000-123	2.125	7/32	1.750	2-1/8" QLS	363-1875-05-18
363-2125-000-124	2.125	1/4	1.750	2-1/8" QLS	363-1875-05-18
363-2125-000-125	2.125	0.092/0.108/0.125	1.750	1-1/16" - 10 UN	363-1875-05-18
363-2125-000-126	2.125	3/16	1.750	1-1/16" - 10 UN	363-1875-05-18
363-2125-000-127	2.125	7/32	1.750	1-1/16" - 10 UN	363-1875-05-18
363-2125-000-128	2.125	1/4	1.750	1-1/16" - 10 UN	363-1875-05-18
363-2400-000-121	2.400	0.092/0.108/0.125	2.313	2-1/2" QLS	363-1875-05-18
363-2400-000-122	2.400	3/16	2.313	2-1/2" QLS	363-1875-05-18
363-2400-000-123	2.400	7/32	2.313	2-1/2" QLS	363-1875-05-18
363-2400-000-124	2.400	1/4	2.313	2-1/2" QLS	363-1875-05-18
363-2400-000-125	2.400	0.092/0.108/0.125	2.313	1-9/16" - 10 UN	363-1875-05-18
363-2400-000-126	2.400	3/16	2.313	1-9/16" - 10 UN	363-1875-05-18
363-2400-000-127	2.400	7/32	2.313	1-9/16" - 10 UN	363-1875-05-18
363-2400-000-128	2.400	1/4	2.313	1-9/16" - 10 UN	363-1875-05-18

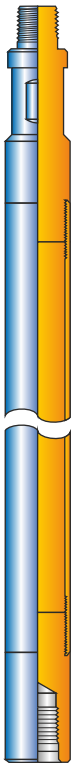
WIRELINE STEMS (WEIGHT BARS)

Wireline Stem (Weight Bar)

ACT Wireline Stems or Weight Bar or sometimes referred as Sinker Bar provides the weight required to deliver impacts in wireline operations and to overcome the force created by well pressure on the cross section of the wireline.

WIRELINE STEMS						
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Part No.		
				2 Ft Long	3 Ft. Long	5 Ft Long
1	1.000	0.875	5/8-11 UNC	16105100	16105200	16105400
1-1/4	1.250	1.187	15/16-10 UN	16125111	16125211	16125411
1-1/2	1.500	1.375	15/16-10 UN	16155121	16155221	16155421
1-7/8	1.875	1.750	1-1/16-10 UN	16195132	16195232	16195432
2-1/8	2.125	1.750	1-1/16-10 UN	16215132	16215232	16215432
2-1/2	2.500	2.312	1-9/16-10 UN	16255145	16255245	16255445

- Other sizes available on request



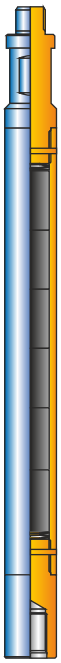
Leaded Stems

LEAD FILLED STEMS

ACT Lead Filled Stems are used to provide additional weight to the tool string, without a change in O.D. & length. These are normally used in well bores with high pressures, to counter the force created by well pressure on the cross section of the wireline. However, these should not be used for heavy jarring operations.

LEAD FILLED STEMS						
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Part No.		
				2 Ft Long	3 Ft. Long	5 Ft Long
1-1/4	1.250	1.187	15/16-10 UN	55125111	55125211	55125411
1-1/2	1.500	1.375	15/16-10 UN	55155121	55155221	55155421
1-7/8	1.875	1.750	15/16-10 UN	55195132	55195132	55195432
2-1/8	2.125	1.750	15/16-10 UN	55215132	55215232	55215432

- Other sizes available on request.



T.C. Filled Stem

TUNGSTEN FILLED STEMS

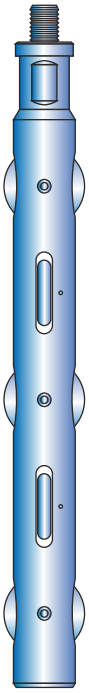
Functionally same as the wireline stem and the lead filled stem, ACT Tungsten filled stem provide more weight than the lead filled stems. However these should not be used for heavy jarring operations.

TUNGSTEN FILLED STEMS						
Size (in)	Max O.D. (in)	F/N O.D. (in)	Connection Pin X Box		Part No.	
				2 Ft	3 Ft	5 Ft
1-1/4	1.250	1.187	15/16 - 10 UN	183-1252	183-1253	183-1255
1-1/2	1.500	1.375	15/16 - 10 UN	183-1502	183-1503	183-1505
1-7/8	1.875	1.750	1-1/16 - 10 UN	183-1882	183-1883	183-1885
2-1/8	2.125	1.750	1-1/16 - 10 UN	183-2122	183-2123	183-2125
2-1/2	2.500	2.313	1-9/16 - 10 UN	183-2502	183-2503	183-2505

- Other sizes available on request

ROLLER STEMS

ACT Roller Stems are used with a tool string in deviated wells. They are used to minimise the friction caused by the tool string sliding on the tubing wall. Roller Stems are conventional wireline stems with slots milled to accommodate simple roller wheels.



Roller Stem

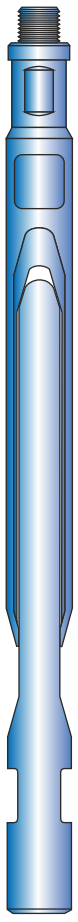
ROLLER STEMS					
Size (in)	**Max. O.D. (in)**	**F/N O.D. (in)**	**Connection Pin X Box**	**No. Of Wheels**	**Part No.**
1-1/2	2.00	1.375	15/16-10 UN	3	52200321
1-7/8	2.50	1.750	1-1/16-10 UN	3	52250332
2-1/2	3.00	2.312	1-9/16-10 UN	3	52300346
1-1/2	2.00	1.375	15/16-10 UN	4	52200421
1-7/8	2.50	1.750	1-1/16-10 UN	4	52250432
2-1/2	3.00	2.312	1-9/16-10 UN	4	52300446

- Other sizes available on request.
- Length available 2', 3', 5'

SPANG LINK JARS / MECHANICAL JARS

ACT Spang Link / Mechanical Jars utilise the weight of the stems connected immediately above to deliver powerful jarring impacts, by manipulating the wireline upwards or downwards. They are composed of two sections linked together which are free to extend or collapse.

The effect of the jarring impact depends on the weight of the stems used, the length of the stroke, tubing size and deviation, fluid viscosity, well pressure acting on the cross section area of wireline and the speed of the wireline movement.



Spang Link Jar

SPANG LINK JARS / MECHANICAL JARS					
Size (in)	**Max. O.D. (in)**	**F/N. O.D. (in)**	**Connection Pin X Box**	**Stroke (in)**	**Part No.**
1	1.000	0.875	5/8-11 UNC	20	11102000
1	1.000	0.875	5/8-11 UNC	24	11102400
1-1/4	1.250	1.187	15/16-10 UN	20	11122011
1-1/4	1.250	1.187	15/16-10 UN	24	11122411
1-1/2	1.500	1.375	15/16-10 UN	20	11152021
1-1/2	1.500	1.375	15/16-10 UN	24	11152421
1-7/8	1.875	1.750	1-1/16-10 UN	20	11192032
1-7/8	1.875	1.750	1-1/16-10 UN	24	11182432
1-7/8	1.875	1.750	1-1/16-10 UN	30	11193032
2-1/8	2.125	1.750	1-1/16-10 UN	30	11213032
2-1/2	2.500	2.312	1-9/16-10 UN	24	11252446

- Other sizes and stroke lengths available on request.

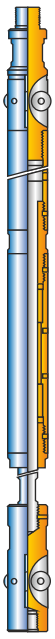
WIRELINE TUBULAR JARS

Tubular Jar

Functionally same as Spang Link Jars, ACT Tubular Jars are used during fishing operations when the jarring action of standard spang link jars could be obstructed by wire, debris or other foreign matter in the tubing. It can also be used in large tubing or casing where conventional spang link jars tend to lock up and buckle.

WIRELINE TUBULAR JARS					
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Stroke (in)	Part No.
1	1.000	0.875	5/8-11 UNC	18	21101800
1-1/8	1.125	0.875	5/8-11 UNC	18	21111800
1-1/4	1.250	1.187	15/16-10 UN	20	21122011
1-1/4	1.250	1.187	15/16-10 UN	24	21122411
1-1/2	1.500	1.375	15/16-10 UN	20	21152021
1-1/2	1.500	1.375	15/16-10 UN	24	21152421
1-3/4	1.750	1.375	15/16-10 UN	20	21172021
1-3/4	1.750	1.375	15/16-10 UN	24	21172421
1-7/8	1.875	1.750	1-1/16-10 UN	20	21192032
1-7/8	1.875	1.750	1-1/16-10 UN	24	21192432
2-1/8	2.125	1.750	1-1/16-10 UN	20	21212032
2-1/8	2.125	1.750	1-1/16-10 UN	24	21212432
2-1/2	2.500	2.312	1-9/16-10 UN	24	21252446
2-1/2	2.500	2.312	1-9/16-10 UN	30	21253046

MULTI-ROLLER WHEEL LINEAR JARS



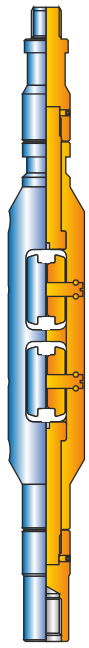
Multi-Roller Wheel Linear Jar

The ACT Multi-Roller Wheel Linear Jar is designed for use in highly deviated wells. The design offers a 360-degree wheel contact which reduces the friction caused by contact with the tubing wall. The Multi-Roller Wheel Linear Jar is a telescoping jar that should be run in conjunction with wireline stems and installed immediately below. The linear bearing creates a frictionless action, allowing the full force of impact from the stem above.

MULTI-ROLLER WHEEL LINEAR JARS		
Body O.D. (in)	Effective O.D. (in)	Assembly No.
1.500	1.750	MR211175
1.875	2.000	MR211200
	2.125	MR211212
	2.250	MR211225
2.125	2.375	MR211237
	2.500	MR211250
	2.625	MR211262
2.500	2.710	MR211271
	2.900	MR211290
	3.000	MR211300
	3.250	MR211325

- Other sizes available on request

SLICKLINE ROLLER GLIDES



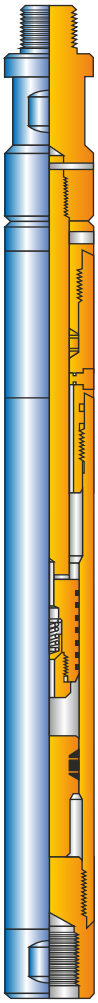
Slickline Roller Glide

Unlike conventional methods, ACT Slickline Roller Glide are placed at strategic points along the whole length of a wireline toolstring to lift the entire assembly off the low side of the tubing. This allows the complete toolstring to be rolled in and out of the well with minimal frictional drag even at a near-horizontal wellbore inclinations. The unique design causes the Roller Glides to align themselves independently as they enter the well bore ensuring that rollers are in contact with the tubing at all times.

Applications:

- For use in all wireline intervention operations using slickline or braided wire
- For use in all tubing sizes, materials and coatings
- Better protection and smoother transportation for gauges during surveys
- More effective jarring when setting and pulling deep-set plugs and other flow control devices

HYDRAULIC JARS

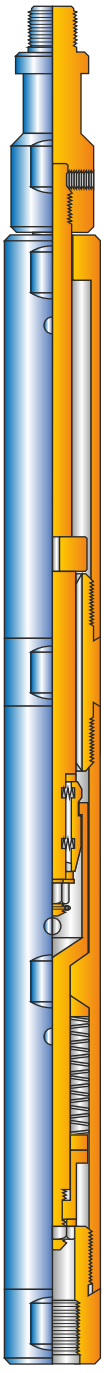


Hydraulic Jar

The ACT Hydraulic Jar is designed to deliver a controlled upward impact load during wireline operations. When a strain is taken on the wireline, the top sub and mandrel are pulled upward, while the piston movement is delayed by the hydraulic fluid in the cylinder. This delaying action allows sufficient strain to be taken on the wireline to strike a blow of desired intensity, when the piston passes from the cylinder bore to a larger bore, the jar is then closed to reset and the operation is repeated. Hydraulic jars are run above a spang link jar.

HYDRAULIC JARS					
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Stroke (in)	Part No.
1-1/8	1.125	0.875	5/8-11 UNC	6.750	081100
1-1/4	1.250	1.187	15/16-10 UN	9.250	081211
1-1/2	1.500	1.375	15/16-10 UN	9.187	081521
1-3/4	1.750	1.375	1-1/16-10 UN	10.00	081722
2-1/8	2.125	1.750	1-3/16-10 UN	11.625	082135

MECHANICAL SPRING JARS



Spring Jar

The ACT Mechanical Spring Jar is designed to deliver a very high upward impact load during wireline operations. It is especially useful when working in high pressure gas wells where hydraulic jars are susceptible to seal failure. The spring jar can be adjusted for a predetermined release force, therefore offering the operator a desired force at the tool. The load setting is done with a calibrated box spanner supplied with the spring jar.

A hydraulic load calibration sub is available as an optional extra to allow the operator to set and test the load rating of this spring jar.

SPRING JARS					
Size (in)	**Max. O.D. (in)**	**F/N. O.D. (in)**	**Connection Pin X Box**	**Stroke (in)**	**Part No.**
1-1/2	1.500	1.375	15/16-10 UN	12	56151221
1-7/8	1.875	1.750	1-1/16-10 UN	12	56181232
2-1/8	2.125	1.750	1-1/16-10 UN	12	56211232
2-1/2	2.500	2.312	1-9/16-10 UN	12	56251246

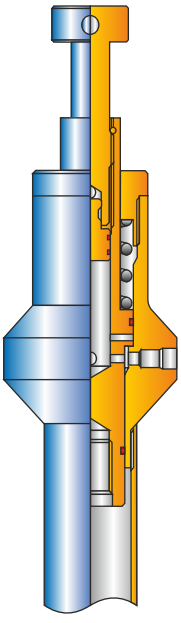
- Other Sizes Available On Request

CALIBRATOR SUBS

The ACT hydraulic load calibration sub is used to test the spring jar's load setting at surface.

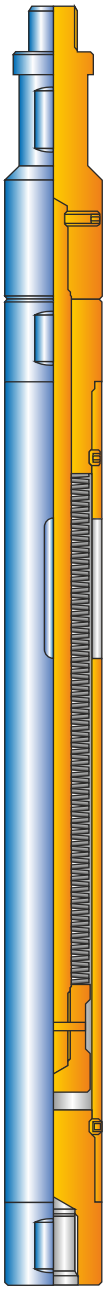
The calibration sub is screwed on to the top sub of the spring jar, with the spring jar in the closed position. When the hydraulic equivalent of the pre-determined force setting of the spring jar has been reached the jar will release.

CALIBRATION SUBS	
Size (in)	**Part Number**
1-1/2	313-150-00
1-7/8, 2-1/8	313-187-00
2-1/2	313-250-00



Calibrator Sub

HEAVY DUTY ACCELERATORS



Heavy Duty Accelerator

ACT Heavy Duty Accelerator is used to run with hydraulic or mechanical spring jar to increase the force generated while jarring upward. Disc springs are used in Heavy Duty Accelerator opposed to helical spring used in conventional accelerator. It delivers a much higher impact force than conventional accelerator. It is installed directly below the Rope Socket.

HEAVY DUTY ACCELERATORS				
Size (in)	Max O.D. (in)	F/N O.D. (in)	Connection Pin X Box	Part No.
1-1/2	1.500	1.375	15/16 - 10 UN	5315221H
1-7/8	1.875	1.750	1-1/16 - 10 UN	53182632H
2-1/8	2.125	1.750	1-1/16 - 10 UN	53213832H
2-1/2	2.500	2.312	1-9/16 - 10 UN	53253546H
3	3.000	2.312	1-9/16 - 10UN	53303846H

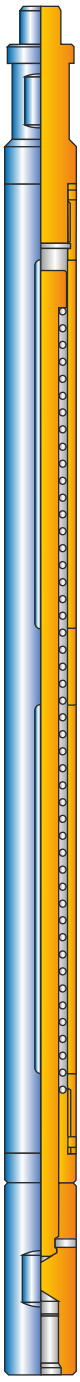
- Other sizes available on request

WIRELINE ACCELERATORS

ACT Wireline Accelerator is used to run with Hydraulic or Mechanical Spring Jar to increase the force generated while jarring upward. Upward tension on the wireline compresses the spring in the accelerator and the stored energy is transferred to the hydraulic or spring jar located down. When the jar fires, the mass of the stem on the tool string is accelerated up to the point of impact. and thus increases the force generated. It is installed in the tool string directly below the Rope Socket.

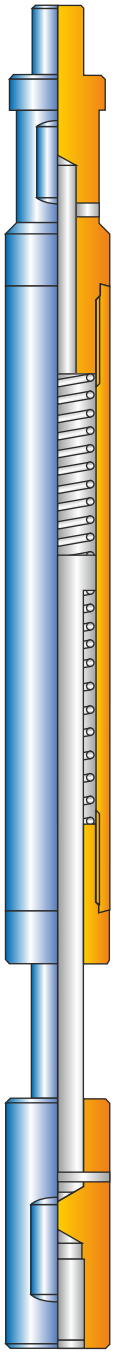
WIRELINE ACCELERATOR					
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Length (in)	Part No.
1-1/2	1.500	1.375	15/16-10 UN	22	53152221
1-7/8	1.875	1.750	1-1/16-10 UN	26	53182632
2-1/8	2.125	1.750	1-1/16-10 UN	38	53213832
2-1/2	2.500	2.312	1-9/16-10 UN	35	53253546
3	3.000	2.312	1-9/16-10 UN	38	53303846

- Other Sizes Available On Request



Wireline Accelerator

SHOCK ABSORBERS



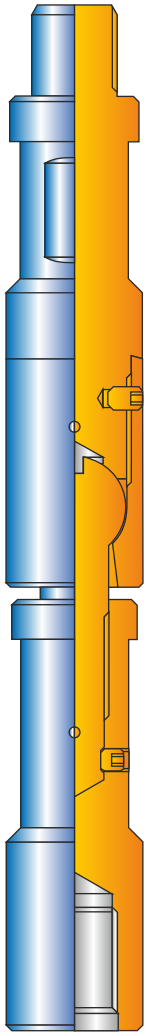
Shock Absorber

The ACT Shock Absorber is designed to reduce the impact shock load transmitted to sensitive downhole instruments, while running in the well during wireline operations.

SHOCK ABSORBERS					
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Top Connection Pin	Bottom Connection Box	Part No.
1-1/2	1.50	1.375	15/16-10 UN	3/4 - 16 UNF	301521
1-3/4	1.75	1.375	15/16-10 UN	3/4 - 16 UNF	301721
2	2.00	1.375	15/16-10 UN	3/4 - 16 UNF	302021

- Other Sizes Available On Request

KNUCKLE JOINTS



Knuckle Joint

ACT Knuckle Joints are used to add flexibility to the tool string and these are especially effective in deviated wells. Whenever a stem and a jar are not aligned these will not move freely, making it difficult to operate tools. Adding a knuckle joint in a string this situation can be avoided. Knuckle joints are run immediately below the mechanical jar. For additional flexibility, an additional knuckle joint can be included between the stem and the jar. The ACT knuckle joint has a built in double fishing neck.

KNUCKLE JOINTS				
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Part No.
1-1/8	1.125	0.875	5/8-11 UNC	071100
1-1/4	1.250	1.187	15/16-10 UN	071211
1-1/2	1.500	1.375	15/16-10 UN	071521
1-7/8	1.875	1.750	1-1/16-10 UN	071932
2-1/8	2.125	1.750	1-1/16-10 UN	072132
2-1/2	2.500	2.312	1-9/16-10 UN	072546

- Other Sizes Available On Request

FORGED KNUCKLE JOINTS

Forged Knuckle Joint

The ACT Forged Knuckle Joint, when made up in a string of wireline tools, provide strong flexible joint to permit angular movement of the string in a deviated hole.
The Forged Knuckle Joint consists of only two parts - a pin section and a box section. The socket of the pin section is formed around the ball of the box section to form an integral unit. If desired, a hole can be drilled lengthwise in the knuckle joint to permit passage of conductors. A 40,000 lb pull test load is applied on each knuckle joint, to ensure integrity of the ball joint connection under repeated usage.

FORGED KNUCKLE JOINTS				
Size (in)	Max O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Part No.
1-1/4	1.250	1.187	15/16 - 10 UN	201211
1-1/2	1.500	1.375	15/16 - 10 UN	201521
1-7/8	1.875	1.750	1-1/16 - 10 UN	201932
2-1/8	2.125	1.750	1-1/16 - 10 UN	202132
2-1/2	2.500	2.312	1-9/16 - 10 UN	202548

- Other Sizes Available On Request

KNUCKLE JARS

Knuckle Jar

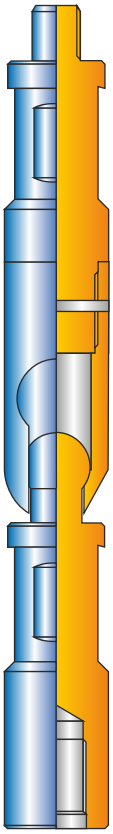
ACT Knuckle Jars serve as a combination of a Knuckle Joint & a Short Tubular Jar. Knuckle Jars can be utilized to jar with short strokes to free a tool string. Like in ACT Knuckle Joints, ACT Knuckle Jar too has a built in double fishing neck.

KNUCKLE JARS					
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Stroke (in)	Part No.
1-1/4	1.250	1.187	15/16-10 UN	2	20120211
1-1/2	1.500	1.375	15/16-10 UN	2	20150221
1-1/2	1.500	1.375	15/16-10 UN	4	20150421
1-7/8	1.875	1.750	1-1/16-10 UN	6	20190632
2-1/8	2.125	1.750	1-1/16-10 UN	6	20210632
2-1/2	2.500	2.312	1-9/16-10 UN	6	20250646

- Other Sizes Available On Request.

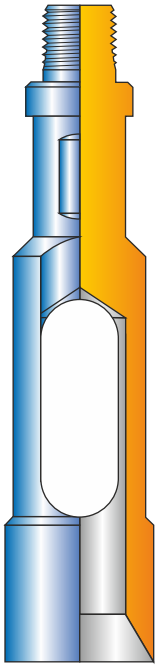
MEMORY GAUGE KNUCKLE JOINT

The ACT Memory Gauge Knuckle Joint is used to facilitate a safe and efficient attachment of memory gauges to the tool string. It is manufactured out of stainless steel to minimize corrosion. It is not recommended when heavy jarring is necessary.



Memory Gauge Knuckle Joint

TUBING GAUGE / PARAFFIN CUTTER



Tubing Gauge / Paraffin Cutter

The ACT Tubing Gauge / Paraffin Cutter is run in the hole before running any sub surface equipment. The tubing gauge / paraffin cutter is used to check if there are any obstruction to passage of the sub surface equipment. The bottom of tubing gauge / paraffin cutter is suitable to cut paraffin, scale or other obstacles in the tubing.

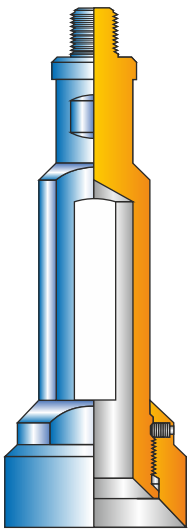
Selection of size :

Example:
Nipple bore = 2.25"
No Go ID = 2.197"
The tubbing gauge cutter should be between these two sizes.

TUBING GAUGE / PARAFFIN CUTTER			
O.D. Range (in) *	**F/N O.D.(in)**	**Top Connection**	**Part No.**
0.905 - 1.575	0.875	5/8 - 11 UNC	831600
1.655 - 2.265	1.375	15/16 - 10 UN	832231
2.323 - 2.520	1.375	15/16 - 10 UN	832521
2.598 - 2.953	1.750	1-1/16 - 10 UN	832932
2.992 - 3.900	2.312	1-1/16 - 10 UN	833942
5.750 - 6.151	2.312	1-9/16 - 10 UN	836146

*Tubing Gauge / Paraffin Cutters are also available in MM. increments within the specified O.D. ranges. When ordering , specify the required O.D. in MM (Inches x 25.4 = MM)

TUBING GAUGE CUTTER RING SET



Tubing Gauge Cutter Ring Set

The ACT Gauge Cutter Ring Set is a wireline service tool designed to operate as a standard gauge cutter, but with the added facility of being able to interchange different size gauge cutters on a standard carrier.

ACT gauge cutter ring set is of primary benefit where an operation requires a number of gauge cutters of diameter in a size range.

This flexibility means that there is no need to keep a large inventory of different size gauge cutters.

TUBING GAUGE CUTTER RING SET			
Size Range (in)	**Fishneck O.D. (in)**	**Top Connection**	**Part No.**
1.0 - 1.5	1.187	15/16 - 10UN	83-150-00
1.5 - 3.0	1.375	15/16 - 10UN	83-300-00
3.0 - 6.0	1.750	1-1/16 - 10UN	83-600-00

SAMPLE BAILERS

Sample Bailer

ACT Sample Bailer is used to collect samples of debris from the well bore creating obstructions. ACT Sample Bailer are available in two basic designs with ball or flapper shoe. The shoe opens when sample bailer assembly is forced in debris and closes when the sample bailer is forced out.

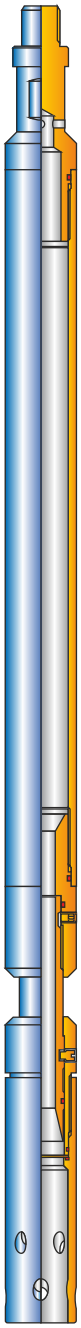
SAMPLE BAILERS				
Size (in)	Max O.D. (in)	F/N O.D. (in)	Top Connection	Part No.
1-1/2	1.50	1.375	15/16-10 UN	051 - 001
1-3/4	1.75	1.375	15/16-10 UN	051 - 002
2	2.00	1.750	1-1/16-10 UN	051 - 003
2-1/2	2.50	2.313	1-1/16-10 UN	051 - 004
3	3.00	2.313	1-1/16-10 UN	051 - 005
4	4.00	2.313	1-9/16-10 UN	051 - 006

DUMP BAILERS

ACT Dump Bailer is designed to carry heavy viscosity liquids e.g. cement and other fluids to a point in the well bore where they are required i.e. Plugs, Check Valves etc. The dump bailer contents are released from within the bailer's cylinder by downward jarring. This shears the shear pins and allows a plunger to rapture a shear disc. The contents are then free to flow through the open ended bailer shoes and its ports. The dump bailer is shear pinned to prevent premature rapture of the shear disc. Variable shear pins are available as per customer's requirement.

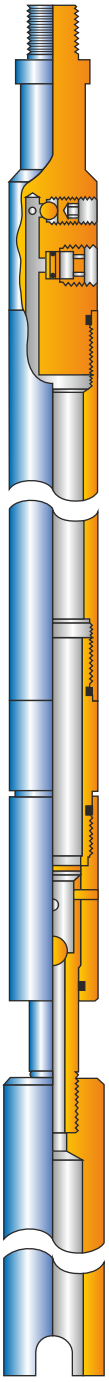
DUMP BAILERS					
Size (in)	Max O.D. (in)	F/N O.D. (in)	Top Connection	Capacity Per Foot*	Part No.
1-3/4	1.750	1.375	15/16 - 10 UN	0.3 Litres	350-175-00
2	2.000	1.750	1-1/16 - 10 UN	0.4 Litres	350-200-00
2-1/4	2.250	1.750	1-1/16 - 10 UN	0.5 Litres	350-225-00
2-1/2	2.500	2.313	1-1/16 - 10 UN	0.6 Litres	350-250-00
3	3.000	2.313	1-1/16 - 10 UN	0.9 Litres	350-300-00
3-1/2	3.500	2.313	1-9/16 - 10 UN	1.3 Litres	350-350-00

* Standard Chamber Length : 5ft.
Bailers can be manufactured to any length required.



Dump Bailer

HYDROSTATIC BAILERS



Hydrostatic Bailer

The ACT Hydrostatic Bailer is used to remove debris which has settled on top of the subsurface equipment, preventing the recovery of the equipment by regular wireline operations. A hydrostatic bailer is used when debris can not be removed from the well with a sand pump bailer.

HYDROSTATIC BAILERS				
Size (in)	Max O.D (in)	F/N O.D. (in)	Top Connection	Part No.
1-1/2	1.500	1.375	15/16 - 10 UN	1811521
1-3/4	1.750	1.375	15/16 - 10 UN	1811721
1-7/8	1.875	1.750	1-1/16 - 10 UN	1811832
2	2.000	1.750	1-1/16 - 10 UN	1812032
2-1/2	2.500	2.313	1-9/16 - 10 UN	1812546

SAND PUMP BAILERS

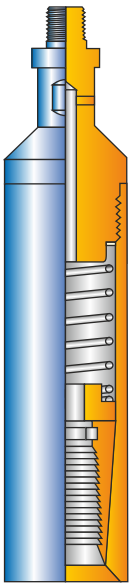
The ACT Sand Pump Bailer is used to remove the sand and other debris which has settled on top of the sub surface equipment preventing recovery of the equipment by regular wireline operations. It is a pump type tool which operates on a conventional lift pump and piston principle. Sand pump bailers are available with the following types of bottom shoes:

1. W/ Flat Bottom : For easy bailing of sand.
2. W/ Angled Bottom : For bailing hard packed sand
3. W/ Flapper Bottom : For bailing metallic particles which cannot pass through ball & seat

SAND PUMP BAILERS				
Size (in)	Max O.D (in)	F/N O.D (in)	Top Connection	Part No.
1-1/2	1.500	1.375	15/16 - 10 UN	581521
1-3/4	1.750	1.375	15/16 - 10 UN	581721
1-7/8	1.875	1.750	1-1/16 - 10 UN	581832
2	2.000	1.750	1-1/16 - 10 UN	582032
2-1/2	2.500	2.313	1-9/16 - 10 UN	582546

Sand Pump Bailer

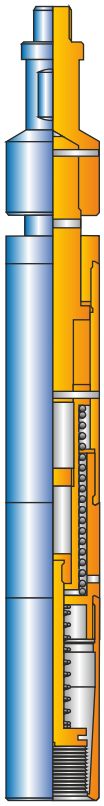
WIRELINE OVERSHOT



Wireline Overshot

ACT Wireline Overshots are used retrieve a fish lost in the well that does not have a conventional fishing neck or a damaged fishing neck on it. The tool is operated by applying the weight of the tool string on to the fish. This will allow the slips to expand around the fish when the tool string is picked up, the slip will engage the fish. These are non releasable type overshots.

WIRELINE OVERSHOTS					
Max O.D. (in)	**Part No.**	**F/N O.D. (in)**	**Top Connection**	**To Catch Dias (in)**	**Part No.**
1.750	351721	1.375	15/16 - 10 UN	0.50 - 0.75	351721 - 07
				0.75 - 1.00	351721 - 10
				1.00 - 1.25	351721 - 12
2.625	352632	1.750	1-1/16 - 10 UN	0.50 - 0.75	352632 - 07
				0.75 - 1.00	352632 - 10
				1.00 - 1.25	352632 - 12
				1.25 - 1.50	352632 - 15
				1.50 - 1.75	352632 - 17
				1.75 - 2.00	352632 - 20
3.800	353846	2.312	1-9/16 - 10 UN	0.50 - 0.95	353846 -09
				0.95 - 1.40	353846 - 14
				1.40 - 1.85	353846 - 18
				1.85 - 2.30	353846 - 23
				2.30 - 2.75	353846 - 27



Releasable Overshot

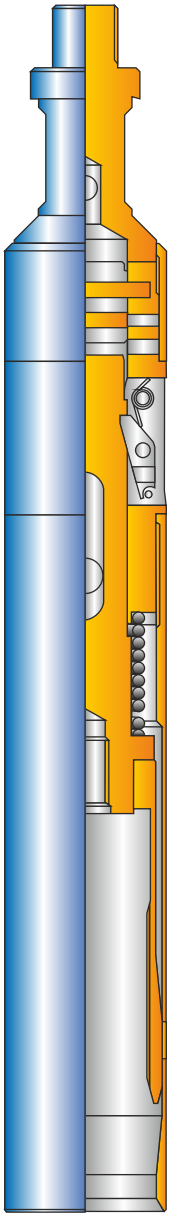
- Each Assembly is complete with one set of slips. Please specify required size when ordering.
- Other sizes available on request.

RELEASABLE OVERSHOTS

ACT Releasable Overshots are used retrieve a fish lost in the well that does not have a conventional fishing neck or a damaged fishing neck on it. The tool is operated by applying the weight of the tool string on to the fish. This will allow the slips to expand around the fish when the tool string is picked up, the slip will engage the fish. Many overshots cannot be released once they are latched. However the slips of the ACT releasable overshots can be released by downward jarring.

RELEASABLE OVERSHOTS				
O.D. (in)	**F/N. O.D. (in)**	**Top Connection**	**Slip Range (in)**	**Part No.**
1.875	1.375	15/16 - 10 UN	0.50-1.50	R351921
2.250	1.375	15/16 - 10 UN	0.50-1.75	R352221
2.625	1.750	1-1/16 - 10 UN	0.50-2.00	R352632
3.800	2.313	1-9/16 - 10 UN	0.50-2.75	R353846

SELF-RELEASING OVERSHOTS



Self Releasing Overshot

ACT Self-Releasing Overshot are used to fish wireline tools that have no fishing neck as well as damaged wireline tools and sucker rods that cannot be fished with a magnet.

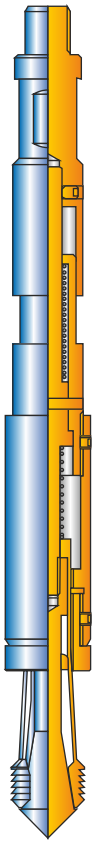
The tool is operated by applying the weight of the tool string on to the fish, which engages the fish. The harder the operator pulls on the overshot, the tighter the grip of the slips on the tool to be fished becomes. Should it proves impossible to free the jammed tool, a safety device permits the overshot to be released by jarring down. Once the overshot has been recovered, it is possible to change the size of the line to obtain a stronger jarring effect.

SELF-RELEASING OVERSHOTS

Tubing Size	Body Assembly				Coupling		Skirt		Slips		
O.D. (in)	O.D. (in)	Top Conn.	F/N O.D. (in)	Part No.	Max. O.D. (in)	Part No.	Max. O.D. (in)	Part No.	Fish O.D. (in)		Part No.
2-3/8	1-3/4	15/16-10	1-3/8	M-169413	No Coupling		1-3/4	M-169872	1/2	3/4	M-169875
									3/4	1	M-169874
									1	1-1/4	M-169873
					1-7/8	M-802877	1-7/8	M-169989	3/4	1	M-169879
									7/8	1-1/8	M-169876
									1-1/8	1-3/8	M-169878
2-7/8	1-3/4	15/16-10	1-3/8	M-169413	2-1/8	M-803990	2-1/8	M-169880	7/8	1-1/8	M-169884
									1-1/8	1-3/8	M-169883
									1-3/8	1-5/8	M-169882
									1-1/4	1-1/2	M-169643
					No Coupling		2.165	M-169994	1-3/8	1-11/16	M-169995
					2-1/4	M-803991	2-1/4	M-169991	1-1/2	1-3/4	M-169988
3-1/2	2-5/8	1-1/16"	1-3/4	M-169271	No Coupling		2-5/8	M-169885	1-3/8	1-5/8	M-169888
									1-5/8	1-7/8	M-169887
									1-7/8	2-1/8	M-169886
									1-1/4	1-1/2	M-169644
					2-13/16	M-802890	2-13/16	M-169889	1-5/8	1-7/8	M-169893
									1-7/8	2-1/8	M-169892
									2-1/8	2-3/8	M-169891
4	2-5/8	1-1/16 10 UN	1-3/4	M-169271	3-5/16	M-802895	3-5/16	M-169894	2-1/8	2-3/8	M-169898
									2-3/8	2-5/8	M-169897
									2-5/8	2-7/8	M-169896

- Other sizes available on request.

WIRELINE SPEARS



Wireline Spear

ACT Wireline Spears are used in fishing operations where wire is bundled up badly and a two prong wireline grab can not engage it.

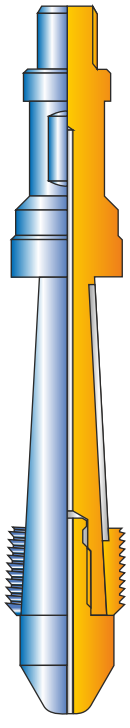
WIRELINE SPEARS					
Size (in)	Max. O.D. (in)	F/N O.D. (in)	Top Connection	To Catch Dias (in)	Part No.
1-1/2	1.500	1.375	15/16 - 10 UN	0.50 - 0.75	60150721
1-1/2	1.500	1.375	15/16 - 10 UN	0.75 - 1.00	60151021
1-1/2	1.500	1.375	15/16 - 10 UN	1.00 - 1.25	60151221
1-1/2	1.500	1.375	15/16 - 10 UN	1.25 - 1.50	60151521
1-3/4	1.750	1.375	15/16 - 10 UN	1.50 - 1.75	60171721
2-1/4	2.250	1.750	15/16 - 10 UN	1.75 - 2.25	60222231
2-3/4	2.750	1.750	1-1/16 - 10 UN	2.25 - 2.75	60272732
3-1/2	3.500	2.312	1-1/16 - 10 UN	2.75 - 3.50	60353542

- Other sizes available on request

BULL DOG SPEARS

ACT Bull Dog Spears are heavy duty fishing tool designed for internal engagement of a tubular item within the well.

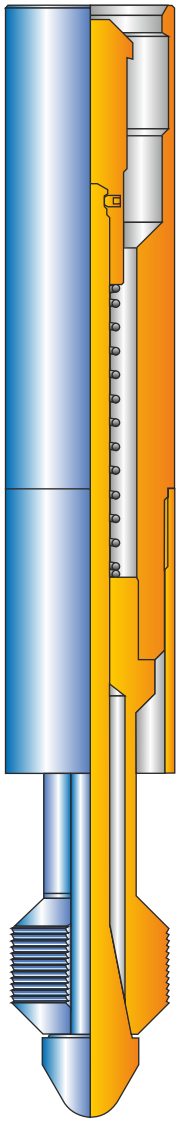
The Bull Dog Spear consists of a top sub body complete with a fishing neck, a pin connection and a tapered key, a mandrel, a slip key(s) and a bottom sub. The hardened slip keys are constructed using a dovetail design, for heavy duty operations. Optional engagement stop rings can be supplied on request.



Bull Dog Spear

BULL DOG SPEARS				
Max. O.D. (in)	Will Engage (in)	No. of Slip Keys	F/N O.D. (in)	Top Connection
1.500	0.500 - 0.750	1	1.375	15/16 - 10 UN
1.500	0.750 - 1.000	1	1.375	15/16 - 10 UN
1.500	1.000 - 1.250	1	1.375	15/16 - 10 UN
1.500	1.250 - 1.500	1	1.375	15/16 - 10 UN
1.750	1.500 - 1.750	2	1.375	15/16 - 10 UN
2.250	1.750 - 2.250	2	1.375	15/16 - 10 UN
2.750	2.250 - 2.750	2	1.750	1-1/16 - 10 UN
3.230	2.750 - 3.250	3	2.313	1-1/16 - 10 UN
4.500	3.250 - 4.500	3	3.125	1-9/16 - 10 UN
6.000	4.500 - 6.000	3	3.125	1-9/16 - 10 UN

RELEASABLE COLLET BULL DOG SPEARS



Releasable Collet Bull Dog Spear

ACT Releasable Collet Bull Dog Spear is a heavy duty fishing tool designed for internal engagement of tubular items within wells.

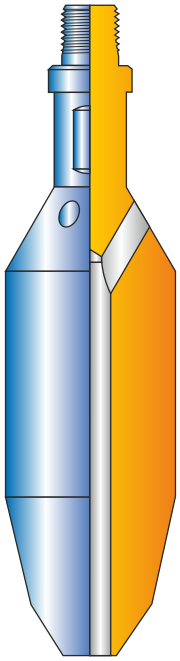
The spear is deployed on a “shear up” pulling tool and engaged into the fish. In the event the fish cannot be pulled, a shear pin located within the pulling tool will shear and release the tool from the spear.

A ‘GR’ pulling tool is then deployed to release and retrieve the spear from the fish. The ‘GR’ tool is used to drive down the central mandrel and engage the internal fishing neck.

The Releasable Collet Bull Dog Spear consists of a top sub complete with an internal fishing neck, a tapered inner mandrel and an inner mandrel top sub complete with an external fishing neck, collet set and spring. Optional engagement stop rings can be supplied on request.

RELEASABLE COLLET BULL DOG SPEARS					
Size (in)	Will Engage (in)	Max. O.D. (in)	Running Neck (in)	Pulling Neck (in)	Part No.
2	0.875 - 1.000	1.850	1.000	1.375	351-18510
2	1.000 - 1.250	1.850	1.000	1.375	351-18512
2	1.250 - 1.375	1.850	1.000	1.375	351-18513
2	1.375 - 1.500	1.850	1.000	1.375	351-18515
2-1/2	1.250 - 1.375	2.280	1.187	1.810	351-22813
2-1/2	1.375 - 1.500	2.280	1.187	1.810	351-22815
2-1/2	1.500 - 1.675	2.280	1.187	1.810	351-22816
2-1/2	1.675 - 1.750	2.280	1.187	1.810	351-22817
2-1/2	1.750 - 1.875	2.280	1.187	1.810	351-22818
2-1/2	1.875 - 2.000	2.280	1.187	1.810	351-22820
3	1.750 - 1.875	2.720	1.375	2.313	351-27218
3	1.875 - 2.000	2.720	1.375	2.313	351-27220
3	2.000 - 2.250	2.720	1.375	2.313	351-27222
3	2.250 - 2.500	2.720	1.375	2.313	351-27225
3-1/2	2.500 - 2.750	3.625	1.750	2.620	351-36227
3-1/2	2.750 - 3.000	3.625	1.750	2.620	351-36230
3-1/2	3.000 - 3.250	3.625	1.750	2.620	351-36232
3-1/2	3.250 - 3.500	3.625	1.750	2.620	351-36235

TUBING SWAGES



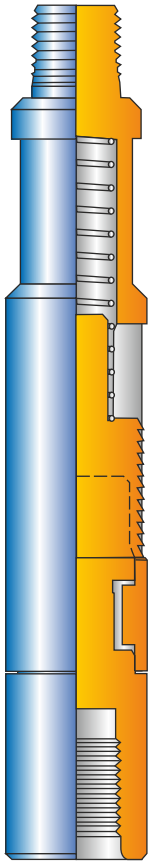
Tubing Swage

ACT Tubing Swage are used to remove large obstructions and restore light collapse in the tubing. This allows smooth running of tool string in well bore. The OD of tubing swage should be equal to tubing drift ID. It should be run with up stroke jar to enable operator to take it out of tubing if swage is jammed.

TUBING SWAGES				
Size (in)	**Max O.D. (in)**	**F/N O.D. (in)**	**Top Connection**	**Part No.**
1-1/2	1.521	1.187	15/16-10 UN	101511
2	1.906	1.375	15/16-10 UN	102021
2-1/2	2.344	1.375	15/16-10 UN	102321
3	2.937	1.750	1-1/16-10 UN	103032
4	3.720	1.750	1-1/16-10 UN	103732

- Other Sizes Available On Request.

QUICK LOCK COUPLINGS



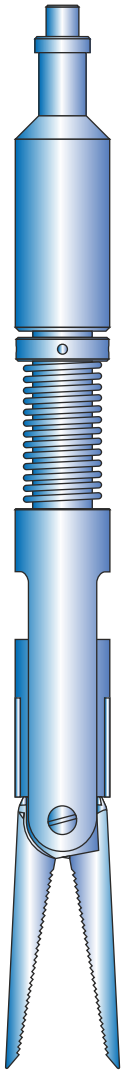
Quick Lock Coupling

ACT Quick Lock Coupling is designed to provide an operator with a fast and safe means of changing over tools without the use of wrenches. By using a spring loaded slide, the quick lock coupling is easily released or secured together.

QUICK LOCK COUPLINGS				
Size (in)	**Max. O.D. (in)**	**F/N. O.D. (in)**	**Connection Pin X Box**	**Part No.**
1-1/4	1.250	1.187	15/16-10 UN	052511
1-1/2	1.500	1.375	15/16-10 UN	051521
1-7/8	1.875	1.750	1-1/16-10 UN	051932
2-1/2	2.500	2.312	1-9/16-10 UN	052456

- Other Sizes Available On Request.

ALLIGATOR GRABS



Alligator Grab

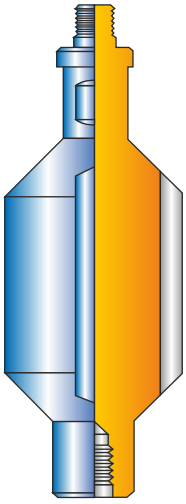
The ACT Alligator Grab is a wireline fishing tool used to catch and retrieve loose objects from within the well bore. The grab is designed to allow the operator to set the amount of jaw pressure required by adjusting the spring tension of the tool prior to running into the well.

Note that the Alligator Grab is not designed to withstand heavy jarring operations in the event that the jaws have gripped onto any 'fish'.

Alligator Grabs are available in various sizes and come with fishing necks and pin threads.

ALLIGATOR GRABS			
Max. O.D. (in)	**F/N O.D. (in)**	**Top Connection**	**Part Number**
1.25	1.187	15/16 - 10 UN	24125
1.50	1.187	15/16 - 10 UN	24150
1.85	1.375	15/16 - 10 UN	24185
2.25	1.750	1-1/16 - 10 UN	24225
2.81	2.313	1-9/16 - 10 UN	24281
3.50	2.313	1-9/16 - 10 UN	24350

FLUTED CENTRALIZERS

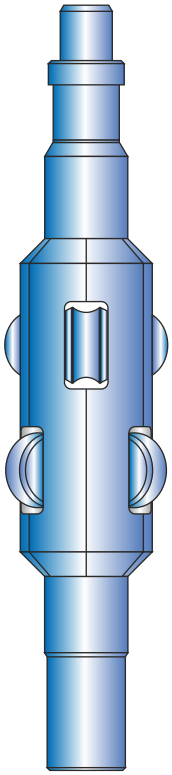


Fluted Centralizer

The ACT Fluted Centralizer is used in deviated wells to ensure that the tool string remains in a centralized position.

FLUTED CENTRALIZERS			
Max. O.D. (in)	**F/N O.D. (in)**	**Connection Pin X Box**	**Part Number**
1.50	1.187	15/16 - 10 UN	641511
2.50	1.750	1-1/16 - 10 UN	642532
3.50	2.312	1-9/16 - 10 UN	643546
6.00	2.312	1-9/16 - 10 UN	646046

SKATE SYSTEM



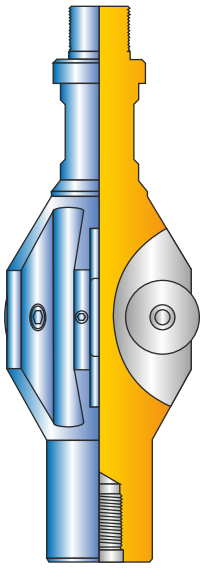
Skate System

The ACT Skate System transports the toolstring into deviated wells. Advantages include continuos wheel contact with the tubing wall in any orientation, and reduced friction.

Features:

- 360-degree roller orientation eliminating the requirements for swivel joints.
- Clearance between wheel and cavity to eliminate the ingress of debris.
- Profiled wheels for easier traversing of tubing wall debris.
- No wheel axle locking screws, seals or pins for easy maintenance.
- Minimum requirement of two skates per toolstring, dependent upon application.

SKATE SYSTEM					
Body Dia. (in)	1.62	1.87	2.13	2.39	2.69
Wheel Dia. (in)	0.619	0.680	0.807	0.852	0.908
	0.682	0.802	0.931	0.971	1.030
	0.746	0.930	1.053	1.094	1.162
	0.804			1.155	1.262
				1.356	1.392
					1.523
Wheel Width (in)	0.51	0.68	0.68	0.75	0.88
Effective Dia. (in)	1.75	2.00	2.25	2.63	2.88
	1.81	2.13	2.37	2.75	3.00
	1.87	2.25	2.50	2.88	3.13
	1.93			3.00	3.25
				3.13	3.37
					3.50
Assembly No.	304-162	304-187	304-213	304-239	304-269



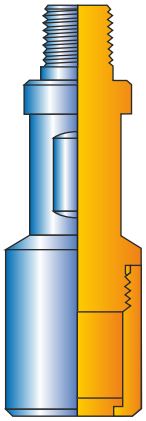
Multi-roller Wheel Fluted Centraliser

MULTI-ROLLER WHEEL FLUTED CENTRALISER

The ACT Multi-Roller Wheel Fluted Centraliser is designed for use in highly deviated wells. The wheels incorporated in the design overcome friction which can be caused by the toolstring scraping against the tubing wall.

MULTI-ROLLER WHEEL FLUTED CENTRALISER			
Body Dia. (in)	**Assembly Number**	**Body Dia. (in)**	**Assembly Number**
2.250	64225-MR	3.750	64375-MR
2.500	64250-MR	4.000	64400-MR
2.750	64275-MR	4.250	64425-MR
3.000	64300-MR	4.500	64450-MR
3.250	64325-MR	4.750	64475-MR
3.500	64350-MR		

WIRELINE FISHING MAGNETS



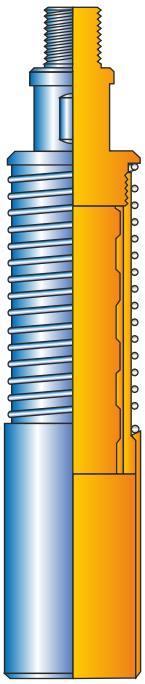
Wireline Fishing Magnet

The ACT Fishing Magnet is used to remove small pieces of metals from the top of tools and also to retrieve metallic scale.

WIRELINE FISHING MAGNETS				
Max. O.D. (in)	F/N O.D. (in)	Top Connection	To Pull (lbs)	Part No.
1.50	1.375	15/16 - 10 UN	11 - 14	991521
1.75	1.375	15/16 - 10 UN	15 - 20	991721
2.25	1.375	15/16 - 10 UN	25 - 50	992221
2.65	1.375	15/16 - 10 UN	50 - 75	992621
3.65	1.750	1-1/16 - 10 UN	150 - 250	993632

- Other sizes available on request.

MAGNETIC FISHING TOOLS



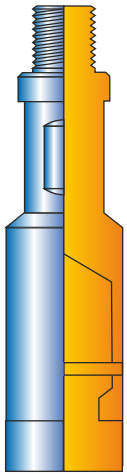
Magnetic Fishing Tool

The ACT Magnetic Fishing Tool is used to remove small pieces of metals from the top of tools.

MAGNETIC FISHING TOOLS				
Size (in)	Max O.D. (in)	F/N O.D. (in)	Top Connection	Part No.
1-1/4	1.23	0.875	5/8 - 11 UNC	131200
1-1/2	1.43	1.187	15/16 - 10 UN	131411
2	1.87	1.375	15/16 - 10 UN	131821
2-1/2	2.18	1.375	15/16 - 10 UN	132221
2-1/2	2.29	1.375	15/16 - 10 UN	132321
3	2.84	2.312	1-1/16 - 10 UN	132842
3-1/2	3.50	2.312	1-1/16 - 10 UN	133542
3-3/4	3.75	2.312	1-1/16 - 10 UN	133742

- Other sizes available on request.

IMPRESSION BLOCKS



Impression Block

The ACT Impression Block is used during fishing operations to check the shape / size of the top of fish and to determine appropriate tool for the fishing operation.

IMPRESSION BLOCKS			
O.D. Range (in)*	F/N O.D. (in)	Top Connection	Part No.
1.000 - 1.230	0.875	5/8 - 11 UNC	921200
1.375 - 1.410	1.187	15/16 - 10 UN	921411
1.750 - 2.250	1.375	15/16 - 10 UN	922221
2.625 - 2.812	1.750	1-1/16 - 10 UN	922832
3.500 - 4.625	2.312	1-9/16 - 10 UN	924646
5.500 - 5.750	2.312	1-9/16 - 10 UN	925746

* Impression Blocks are also available in MM. increments within the specified I.D. Ranges.

BLIND BOX

The ACT Blind Box is used when heavy downward jarring is required to dislodge a fish or push down an obstruction encountered in the tubing string.

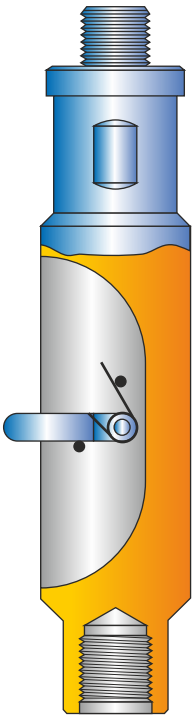
Blind Box

BLIND BOX			
O.D. Range (in) *	**F/N O.D. (in)**	**Top Connection**	**Part No.**
1.187 - 1.250	1.187	15/16 - 10 UN	221211
1.625 - 1.375	1.375	15/16 - 10 UN	222221
2.625 - 2.750	1.750	1-1/16 - 10 UN	222732
3.500 - 4.625	2.312	1-9/16 - 10 UN	224646
5.250 - 5.750	2.312	1-9/16 - 10 UN	225746

* Blind Boxes are also available in MM. increments within the specified O.D. ranges.

TUBING END LOCATOR

The ACT Tubing End Locator is used to locate the end of the tubing. With its spring loaded finger, it can be run in various sizes of tubing ranging from 2-3/8" to 4-1/2".



Tubing End Locator

TUBING END LOCATOR					
Size (in)	**Max O.D. (in)***	**F/N O.D. (in)**	**Top Conn. Pin**	**Bottom Conn. Box**	**Part No.**
2, 2-1/2	1.750	1.375	15/16 - 10 UN	1 - 11.1/2 NPT	421721
3	2.500	1.375	15/16 - 10 UN	1 - 11.1/2 NPT	422521
4	3.750	2.312	1-9/16 - 10 UN	1 - 11.1/2 NPT	423746

* O.D. With Finger Sheared

WIRELINE CUTTER

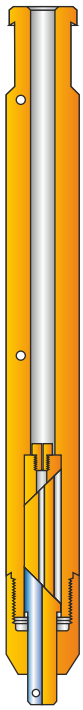
Wireline Cutter

The ACT Wireline Cutter is used to cut the wirline near the rope socket when the down hole tools have become stuck and can't be retrieved from the well. The wireline cutter is run down under its own weight guided by the line. When it strikes the rope socket of the stuck tool, it cuts the wire and wedges it into its body. Subsequently, the wireline cutter will be retrieved along with the cut wire.

WIRELINE CUTTER		
Max. O.D. (in)	F/N O.D. (in)	Part No.
1.500	1.375	79152
1.875	1.375	79182
2.000	1.750	79203

- Specify Wire Size
- Other sizes available on request.

WIRELINE SNIPPER



Wireline Snipper

The ACT Wireline Snipper is used to cut the wirline near the rope socket when the down hole tools have become stuck and can't be retrieved from the well. The wireline snipper is run down under its own weight guided by the line. The snipper will cut the wire when it strikes the rope socket. The wireline snipper is then fished out of the well by standard fishing tools.

WIRELINE SNIPPER			
Max. O.D. (in)	F/N O.D. (in)	Wire Size (in)	Part No.
1.500	1.375	0.092 / 0.108	171-150
1.875	1.750	0.092 / 0.108	171-188
1.875	1.750	0.187 / 0.219	171-189
2.125	1.750	0.092 / 0.108	171-212
2.125	1.750	0.187 / 0.219	171-213
2.500	2.313	0.092 / 0.108	171-250
2.500	2.313	0.187 / 0.219	171-251

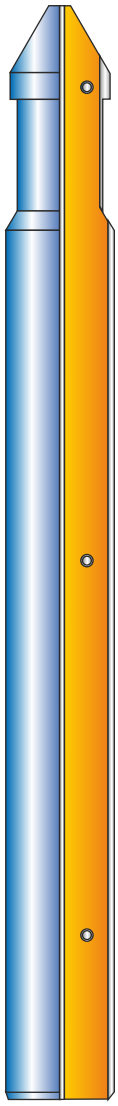
MULTI-ROLLER WHEEL SNIPPER

Multi-Roller Wheel Snipper

The ACT Multi-Roller Wheel Snipper is designed for use in deviated wells. The design offers a 360-degree wheel contact which reduces the friction caused by contact with the tubing wall. A jumbo nose cone is supplied for use in gas lift completions to ensure blade contact is only made at the rope socket and not prematurely at crossovers or side pocket mandrels.

MULTI-ROLLER WHEEL SNIPPER			
Body Dia. (in)	Effective O.D. (in)	Wire Size (in)	Assembly No.
1.500	1.750	0.092 / 0.187	362-175
1.875	2.000	0.092 / 0.187	362-200
	2.125	0.092 / 0.187	362-212
	2.250	0.092 / 0.187	362-225
2.500	2.710	0.092 / 0.218	362-271
	2.900	0.092 / 0.218	362-290
	3.000	0.092 / 0.218	362-300
	3.250	0.092 / 0.218	362-325

GO-DEVIL

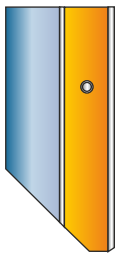


The ACT Go-Devil is used in wireline fishing operations when the wireline is required to be cut from a stuck tool string. These are available in various lengths with flat or angled bottoms.

GO-DEVIL					
Size (in)	Max. O.D. (in)	F/N O.D. (in)	Part No.		
			2 Ft. Long	3 Ft. Long	5 Ft. Long
1-1/2	1.500	1.375	1415512 - A	1415522 - A	1415542 - A
1-7/8	1.875	1.750	1418513 - A	1418523 - A	1418543- A
2-1/8	2.125	1.750	1421513 - A	1421523 - A	1421543 - A
2-1/2	2.500	2.312	1425514 - A	1425524 - A	1425544 - A

- Specify Wire Size
- Other sizes available on request.

GO Devil Flat Bottom



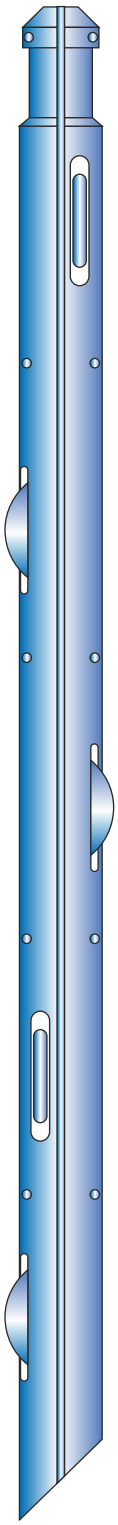
GO Devil 45° Angled Bottom

ROLLER GO-DEVIL

The ACT Roller Go-Devil is used mainly in deviated wells to reduce friction when the tool string is run in the hole. The Roller Go-Devil is similar to Go-Devil with the exception of the rollers. These are available in various lengths with flat or angled bottoms.

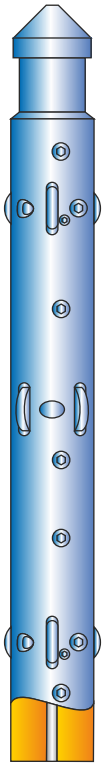
ROLLER GO-DEVIL		
Max. O.D. (in)	F/N. O.D. (in)	Length (ft)
1.500	1.375	2-3-5
1.875	1.750	2-3-5
2.125	1.750	2-3-5
2.500	2.313	2-3-5

- Specify Wire Size
- Other sizes available on request.

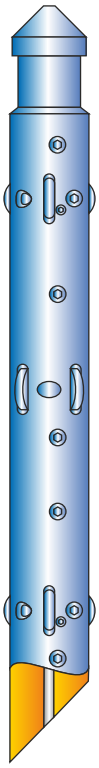


Roller GO Devil/ Roller Drop Bar

MULTI-ROLLER WHEEL GO-DEVIL (FLAT BOTTOM / CUTTER TYPE)



Multi-roller Wheel GO-devil (Flat Bottom)



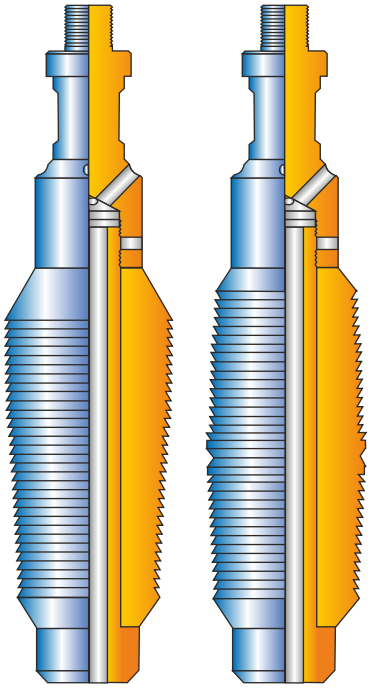
Multi-roller Wheel GO-devil (Cutter Type)

The ACT Multi-Roller Wheel Go-Devil is designed for use in deviated wells. The design offers a 360-degree wheel contact which reduces the friction caused by contact with the tubing wall.

MULTI-ROLLER WHEEL GO-DEVIL (FLAT BOTTOM / CUTTER TYPE)

Body Dia. (in)	F/N O.D. (in)	Length (ft)	Wire Size (in)	Effective O.D. (in)	Assembly No. Flat Bottom	Assembly No. Cutter Type
1.500	1.375	2	0.092 / 0.125	1.750	296-976F	296-976A
			0.187	1.750	296-988F	296-988A
		3	0.092 / 0.125	1.750	296-974F	296-974A
			0.187	1.750	296-986F	296-986A
		5	0.092 / 0.125	1.750	296-972F	296-972A
			0.187	1.750	296-984F	296-984A
1.875	1.750	2	0.092 / 0.125	2.000	296-200F	296-200A
				2.125	296-212F	296-212A
				2.250	296-225F	296-225A
			0.187 / 0.218	2.000	296-201F	296-201A
				2.125	296-211F	296-211A
				2.250	296-226F	296-226A
		3	0.092 / 0.125	2.000	296-210F	296-210A
				2.125	296-220F	296-220A
				2.250	296-230F	296-230A
			0.187 / 0.218	2.000	296-240F	296-240A
				2.125	296-250F	296-250A
				2.250	296-260F	296-260A
		5	0.092 / 0.125	2.000	296-300F	296-300A
				2.125	296-310F	296-310A
				2.250	296-320F	296-320A
			0.187 / 0.218	2.000	296-330F	296-330A
				2.125	296-340F	296-340A
				2.250	296-350F	296-350A
2.500	2.312	2	0.092 / 0.125	2.710	296-271F	296-271A
				2.900	296-290F	296-290A
				3.000	296-360F	296-360A
				3.250	296-370F	296-370A
			0.187 / 0.218	2.710	296-380F	296-380A
				2.900	296-390F	296-390A
				3.000	296-400F	296-400A
				3.250	296-410F	296-410A
		3	0.092 / 0.125	2.710	296-420F	296-420A
				2.900	296-430F	296-430A
				3.000	296-440F	296-440A
				3.250	296-450F	296-450A
			0.187 / 0.218	2.710	296-460F	296-460A
				2.900	296-470F	296-470A
				3.000	296-480F	296-480A
				3.250	296-490F	296-490A
		5	0.092 / 0.125	2.710	296-500F	296-500A
				2.900	296-510F	296-510A
				3.000	296-520F	296-520A
				3.250	296-530F	296-530A
			0.187 / 0.218	2.710	296-540F	296-540A
				2.900	296-550F	296-550A
				3.000	296-560F	296-560A
				3.250	296-570F	296-570A

TUBING BROACH

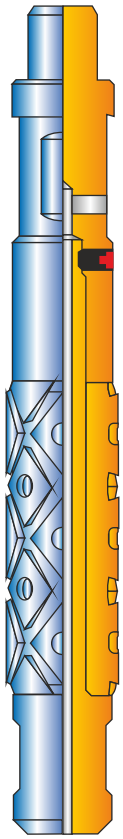


Tubing Broach

The ACT Tubing Broach is used to remove burrs in the tubing left after perforating and broaching through the restrictions in the tubing. Tubing Broach is also used to remove scale, rust etc, from tubing I.D.

TUBING BROACH			
Max. O.D. (in)	F/N. O.D.(in)	Top Conn.	Part No.
1.50	1.375	15/16 - 10 UN	121-150
2.00	1.375	15/16 - 10 UN	121-200
2.50	1.375	15/16 - 10 UN	121-250
3.00	1.750	1-1/16 - 10 UN	121-300
4.00	1.750	1-1/16 - 10 UN	121-400
5.00	2.313	1-1/16 - 10 UN	121-500

- Other sizes available on request.



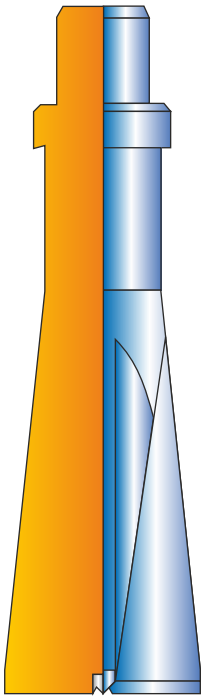
Universal Tubing Broach

UNIVERSAL TUBING BROACH

ACT Universal Tubing Broaches are heavy duty tools with case hardened, diamond shaped cutting edges. Various broaches can be fitted to one mandrel offering greater flexibility. It is used to remove burrs in the tubing left after perforating procedure. Other uses include removal of rust scale or broaching through damaged or other restrictions in the production tubing.

UNIVERSAL TUBING BROACH			
SIZE RANGE	FISHING NECK O.D.	TOP CONNECTION	PART NO.
1.5" - 2.0"	1.375"	15/16" - 10 UN	3671521-00
2.0" - 2.5"	1.375"	15/16" - 10 UN	3672021-00
2.5" - 3.0"	1.750"	1.1/16" - 10 UN	3672532-00
3.0" - 4.0"	1.750"	1.1/16" - 10 UN	3673032-00
4.0" - 5.0"	2.313"	1.1/16" - 10 UN	3674042-00
5.0" - 6.0"	3.125"	1.9/16" - 10 UN	3675056-00

STAR BIT CHISEL



Star Bit Chisel

ACT Star Bit Chisel is a wireline service tool designed to break up sand and other debris that have formed within the completion tubing. Star Bit Chisel enables the operator to jar down heavily to clear any obstructions. This tool should be run in conjunction with ACT tubing broaches and Tubing Gauge cutters to ensure that obstructions has been totally cleared.

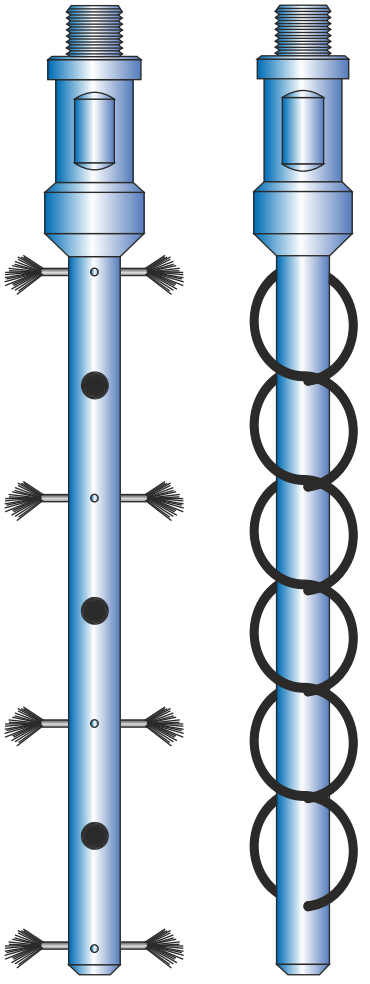
STAR BIT CHISEL			
SIZE RANGE	**FISHING NECK O.D.**	**TOP CONNECTION**	**PART NO.**
1.5" - 2.0"	1.375"	15/16" - 10 UN	3661521
2.0" - 2.5"	1.375"	15/16" - 10 UN	3662021
2.5" - 3.0"	1.750"	1.1/16" - 10 UN	3662532
3.0" - 4.0"	1.750"	1.1/16" - 10 UN	3663032
4.0" - 5.0"	2.313"	1.1/16" - 10 UN	3664042
5.0" - 6.0"	3.125"	1.9/16" - 10 UN	3665056

PARAFFIN SCRATCHERS

The ACT Paraffin Scratcher is used to clean paraffin deposits on the internal diameter of tubing, nipple profile etc.

PARAFFIN SCRATCHER			
Size (in)	**F/N O.D. (in)**	**Top Connection**	**Part No.**
1-1/2, 2-1/16	1.187	15/16 - 10 UN	1002011
2, 2-1/2	1.375	15/16 - 10 UN	1001521
2, 2-1/2	1.750	1-1/16 - 10 UN	1002532
3-1/2	1.750	1-1/16 - 10 UN	1003532

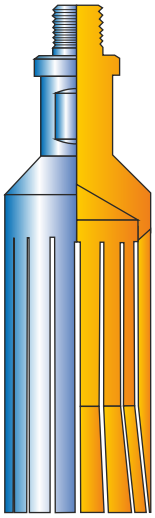
- Other sizes available on request.



Wire Scratcher (Flared Type)

Wire Scratcher

WIRELINE WIREFINDER



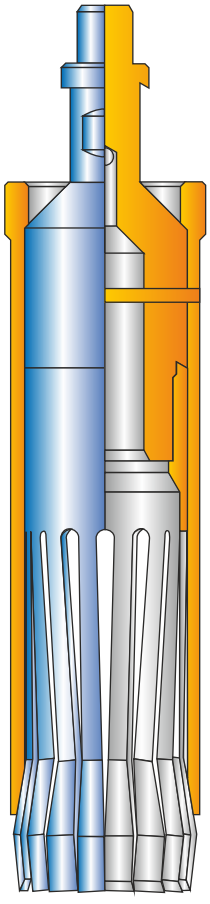
Wireline Wire Finder

The ACT Wireline Finder is used in wireline fishing operations to locate and ball the upper end of broken wireline in the tubing. When the wire finder has located the end of the broken wire (weight loss witnessed) pressing down a minimal distance will ball the broken wire in the well bore. The wireline can than be engaged by a wireline grab and retrieved.

WIRELINE WIREFINDER			
Max. O.D. (in)	F/N. O.D. (in)	Top Connection	Part No.
1.500	1.187	15/16 - 10 UN	541511
2.000	1.375	15/16 - 10 UN	542021
2.500	1.375	15/16 - 10 UN	542521
3.000	1.750	1-1/16 - 10 UN	543032
4.000	1.750	1-1/16 - 10 UN	544032

- Other sizes available on request, please quote the max. O.D. when ordering.

WIRELINE SLEEVED EXPANDING WIRE FINDER

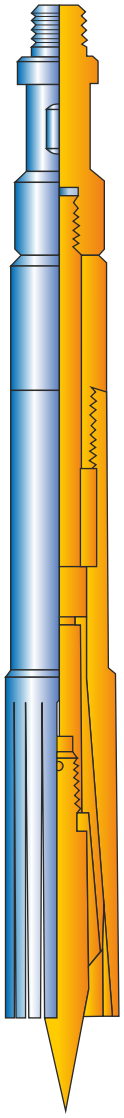


Wireline Sleeved Expanding Wire Finder

ACT Wireline Sleeved Expanding Wire Finder is used to locate and ball the upper end of the broken wireline in the tubing. The ball can then be engaged by a wireline grab and retrieved. This tool is similar in design to the conventional type of wirefinder. It has an external No-Go sleeve that retains the fingers of wirefinder skirt while running in. When the No-Go sleeve is landed and sheared out, the split skirt will move down expanding the fingers. This allows the tool to be used from smaller tubing to a larger one.

WIRELINE SLEEVED EXPANDING WIRE FINDER				
NO GO O.D.	EXPANDED O.D.	FISHING NECK O.D.	TOP CONNECTION	PART NO.
1.87"	2.49"	1.375"	15/16" - 10 UN	380-192521-00
2.30"	2.99"	1.375"	15/16" - 10 UN	380-233021-00
2.75"	3.50"	1.750"	1.1/16" - 10 UN	380-273532-00
3.80"	4.67"	1.750"	1.1/16" - 10 UN	380-384732-00
3.80"	5.90"	1.750"	1.1/16" - 10 UN	380-385932-00
4.31	6.18"	2.313"	1.9/16" - 10 UN	380-436246-00

WIRELINE RETRIEVER



Wireline Retriever

The ACT Wire Finder is used during wireline fishing operations to locate the top of a broken wireline and retrieve it from the well bore. The fingers of the wireline retriever press against the tubing wall and locate the top of the broken wireline, and direct it up inside the finder. As the tool string id picked up, the internal tapper is designed to grip the wireline and retrieve it to the surface.

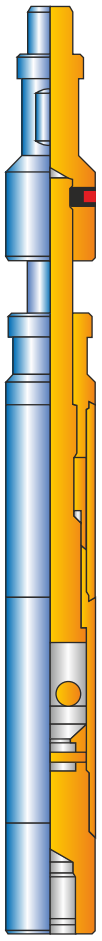
WIRELINE RETRIEVER							
Max. O.D. (in)	To Run In Tubing (in)	Can Be Adapted To Run In (in)	F/N. O.D. (in)	Top Connection	Type	Guide Type	Part No.
1.500	1-1/2	2 - 2-1/16	1.375	15/16 - 10 UN	Slip	Slotted	591521-S
1.500	1-1/2	2-3/8 - 2-7/8	1.375	15/16 - 10 UN	Slip	Plain	591521-P
1.812	2-3/8	2-7/8 - 3-1/2	1.375	15/16 - 10 UN	Slip	Slotted	591821-S

- Specify guide type
- Other sizes available on request

BALL ORIENTING IMPRESSION TOOL

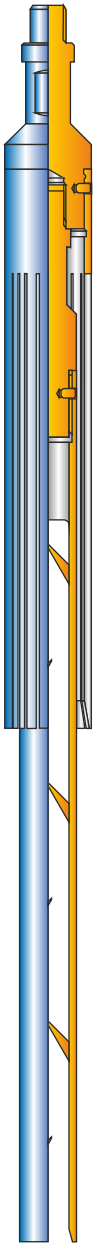
ACT Ball Orienting Impression Tool is an accessory tool used in conjunction with the ACT Lead Impression Block (LIB) during fishing operation. The LIB is used to take impression of foreign objects in the tubing string. The lead impression taken will define the shape and a guide to the position of the obstruction. The Ball Orienting Impression Tool, when used with LIB, provides a more accurate survey of the fish. A secondary lead imprint of a (free moving) ball within the tool is used relative to the main imprint on the LIB. The ball impression provides a datum relative to the fish. By calculating the angle between the two imprints a more accurate picture of the position of the fish can be formed.

BALL ORIENTING IMPRESSION TOOL			
SIZE	FISHING NECK O.D.	TOP CONNECTION	PART NO.
1.500"	1.375"	15/16" - 10 UN	372-1521-00
1.875"	1.375"	1.1/16" - 10 UN	372-1922-00
2.500"	2.313"	1.1/16" - 10 UN	372-2542-00



Ball Orienting Impression Tool

WIRE FINDER GRAB



Wire Finder Grab

The ACT Wire Finder Grab is used in the same way as the standard wireline grab to retrieve broken wireline from the well bore.

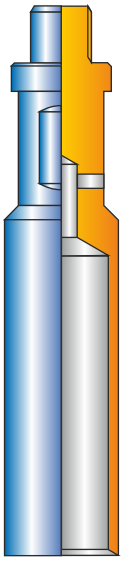
The grab incorporates a skirt which lessens the chance of passing the top of the broken wireline.

WIRE FINDER GRAB			
Max. O.D. (in)	**F/N O.D. (in)**	**Top Connection**	**Part No.**
1.50	1.187	15/16 - 10 UN	167-150
2.00	1.375	15/16 - 10 UN	167-200
2.50	1.375	15/16 - 10 UN	167-250
3.00	1.750	1-1/16 - 10 UN	167-300
4.00	1.750	1-1/16 - 10 UN	167-400

SOLID WIREFINDER

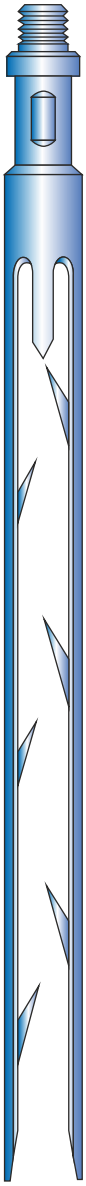
ACT Solid Wirefinder is used to bend or ball the uppermost part of the broken wireline. The wire can then be engaged by a wireline grab and retrieved.

SOLID WIREFINDER			
Size (in)	2	2-1/2	3
Fishneck O.D. (in)	1.375	1.375	1.375
Max. O.D. (in)	1.813	2.300	2.740
Top Connection	15/16 - 10	15/16 - 10	15/16 - 10
Make Up Length	10.938	11.313	10.938
Part Number	54260-S	54250-S	54300-S



Solid Wirefinder

WIRELINE GRAB



Wireline Grab

The ACT Wireline Grab is used in wireline fishing operations to engaged broken wireline from the tubing and retrieve it to the surface. It is available with 2 to 4 prongs depending upon the size of the wireline grab.

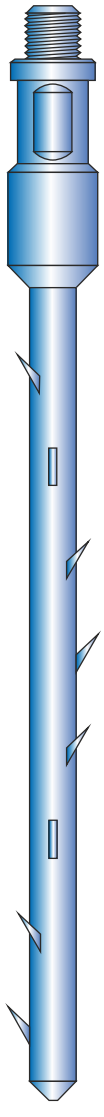
WIRELINE GRAB					
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Top Connection	No. Of	Part No.
1-1/2	1.437	1.187	15/16 - 10 UN	2	5714211
2-2-1/2	1.843	1.375	15/16 - 10 UN	2	5718221
3	2.718	2.312	1-1/16 - 10 UN	3	5727342
4-5-1/2	2.875	2.312	1-1/16 - 10 UN	3	5728342

- Other Sizes Available On Request.

CENTER SPEAR

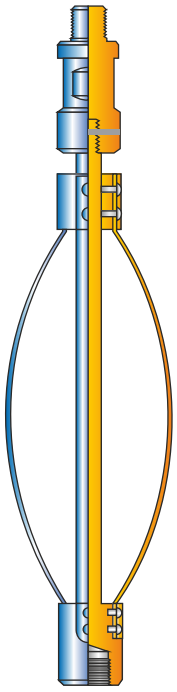
The ACT Center Spear is used to engage broken wireline in the hole when it is in a balled condition. It is used in situations where the broken wire, is badly balled in well bore and can not be engaged by a wireline grab.

CENTER SPEAR				
Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Top Connection	Part No.
1-1/2	1.500	1.375	15/16 - 10 UN	407-1521
1-7/8	1.875	1.750	1-1/16 - 10 UN	407-1932
2-1/2	2.500	2.313	1-9/16 - 10 UN	407-2546



Center Spear

BOW SPRING CENTRALISER

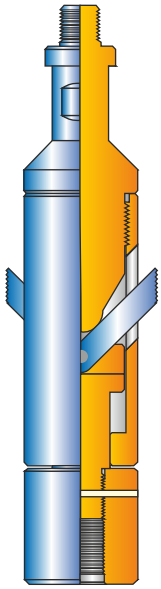


Bow Spring Centraliser

The ACT Bow Spring Centraliser is designed for use with slickline toolstrings while running gauges into a tail pipe assembly ranging from 2" through 4" I.D.

BOW SPRING CENTRALISER			
O.D. Range (in)	**F/N O.D. (in)**	**Connection Pin X Box**	**Part No.**
2 - 4	1.375	15/16 - 10 UN	177 - 400

ANTI BLOW-UP TOOL



Anti Blow-Up Tool

The ACT Anti Blow Up Tool is a wireline service tool designed to be used as part of the toolstring when downhole instruments are to be deployed in a multi zone completion well.

The Anti Blow Up Tool will help to prevent a toolstring being blown up the production string when the flow rates between zones have sufficient force to push the toolstring upwards.

When the lower part of the toolstring starts to lift, two arms of the tool are thrown outward to lock into the tubing wall, stopping any further upward movement. To release the arms, you simply pick up the wireline which lifts the upper body of the tool and closes the arms, releasing the tool.

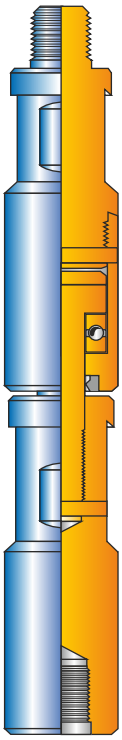
The Anti Blow Up Tool is available to fit tubing sizes from 2-3/8” through to 5-1/2”.

ANTI BLOW-UP TOOL				
Size (in)	**O.D. Dogs Expanded (in)**	**F/N O.D. (in)**	**Connections Pin X Box**	**Part No.**
2-3/8	2.010	1.375	15/16 - 10UN	181-238-00
2-7/8	2.441	1.375	15/16 - 10UN	181-288-00
3-1/2	3.068	1.375	15/16 - 10UN	181-350-00
4-1/2	4.090	1.750	1-1/16 - 10UN	181-950-00
5-1/2	4.892	1.750	1-1/16 - 10UN	181-550-00

WIRELINE SWIVEL JOINT

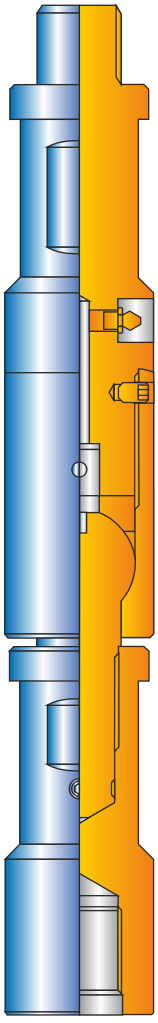
The ACT Swivel Joint is a wireline accessory used to minimize the effect of line twist caused by subsurface devices being run. The swivel joint has a bearing incorporated into its design and is used to minimize rotation whilst running tubing or casing caliper surveys.

The swivel joint has a double fishing neck feature and standard pin and box threads.



Wireline Swivel Joint

WIRELINE SWIVEL JOINT			
Max. O.D (in)	**F/N O.D. (in)**	**Connection Pin X Box**	**Part No.**
1.500	1.375	15/16 - 10 UN	180-150-00
1.875	1.750	1-1/16 - 10 UN	180-188-00
2.500	2.313	1-9/16 - 10 UN	180-231-00



Knuckle Swivel Joint

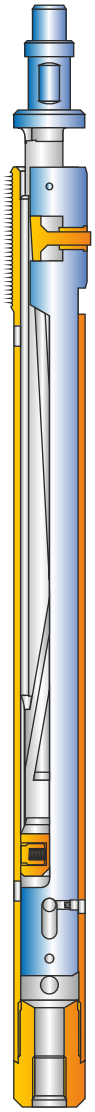
KNUCKLE SWIVEL JOINT

The ACT Knuckle Swivel Joint is designed to allow free rotation of the toolstring to minimise line torque during wireline / slickline deployment.

The knuckle swivel joint can be positioned at any point along the length of the toolstring to suit operational requirements. The knuckle swivel joint incorporates an integral grease nipple to ensure internal components are continuously lubricated.

KNUCKLE SWIVEL JOINT			
Max. O.D. (in)	**F/N O.D. (in)**	**Connection Pin X Box**	**Part No.**
1.250	1.187	15/16 - 10 UN	KSJ18-125
1.500	1.375	15/16 - 10 UN	KSJ18-150
1.750	1.375	15/16 - 10 UN	KSJ18-175
1.875	1.750	1-1/16 - 10 UN	KSJ18-187
2.125	1.750	1-1/16 - 10 UN	KSJ18-212
2.500	2.313	1-9/16 - 10 UN	KSJ18-250

TUBING PERFORATOR PUNCH



Tubing Perforator Punch

The ACT Tubing Perforator Punch is a mechanical device designed to perforate standard and heavy wall tubing under pressure. Deployed into the well by conventional means, the perforator punch requires no explosives, therefore the possibility of perforating the casing is eliminated.

The design benefits include:

- Greater tubing penetration
- Positive indication of perforation on tool removal
- Safety release mechanism, allowing the tool to be retrieved from the well without perforating
- The perforator is designed to withdraw the punch and release automatically after perforating
- Utilizes upward jarring impacts for perforation action

The perforator punch is used in conjunction with a tubing collar or slip type stop, which provides an anchor point to activate the tool.

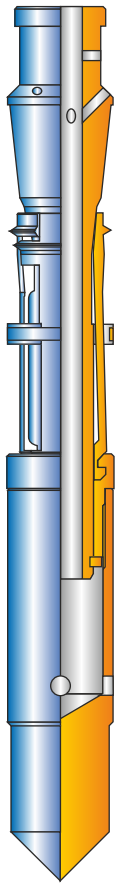
TUBING PERFORATOR PUNCH					
Tubing Size (in)	**Body O.D. (in)**	**Punch Size (in)**	**F/N O.D. (in)**	**Connection Pin X Box**	**Part No.**
1-1/2	1.470	0.370	1.187	15/16 - 10 UN	308-150
2-3/8	1.840	0.375	1.375	15/16 - 10 UN	308-237
2-7/8	2.190	0.375	1.375	15/16 - 10 UN	308-287
3-1/2	2.690	0.433	2.313	1-1/16 - 10 UN	308-350
4-1/2	3.650	0.500	2.313	1-1/16 - 10 UN	308-450

SIDE WALL CUTTER

The purpose of the ACT Side Wall Cutter is to cut the wireline at any desired point in the tubing string. It can also be run all the way to the rope socket of a toolstring which may be stuck in the hole.

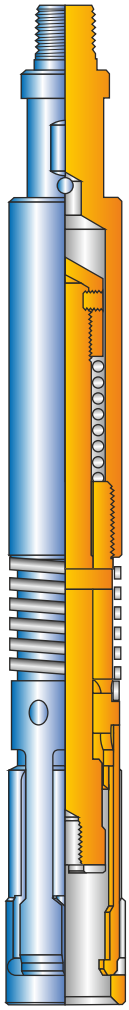
The Side Wall Cutter Running Tool is used to run the Side Wall Cutter to the desired depth.

SIDE WALL CUTTER			
Size (in)	2	2-1/2	3
Fishneck O.D. (in)	1.375	1.750	2.313
Max. O.D. (in)	1.745	2.000	2.688
Knives Retracted (in)	1.745	2.000	2.688
Knives Expanded (in)	2.063	2.500	3.000
Part No.	306-200	306-250	306-300



Side Wall Cutter

PULLING TOOLS ('JD' & 'JU' SERIES)



JD Pulling Tool

The ACT 'JD' & 'JU' Series Pulling Tools are used to engage and retrieve equipment with external fishing necks. The 'JD' series pulling tool is designed to shear and release by downward jarring. This feature allows the 'JD' series pulling tool to be used as a running tool. The 'JU' series pulling tool is designed to shear and release by upward jarring.

These tools are available with three different types of cores:

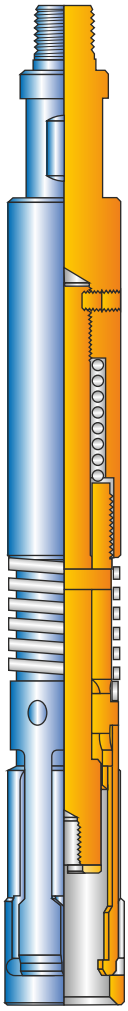
1. JDC/JUC : Long core, short reach.
2. JDS/JUS : Medium core, medium reach.
3. JDL/JUL : Short core, long reach.

Either of the above types can be converted to another type by changing the core. All other parts remain same.

PULLING TOOLS ('JD' & 'JU' SERIES)

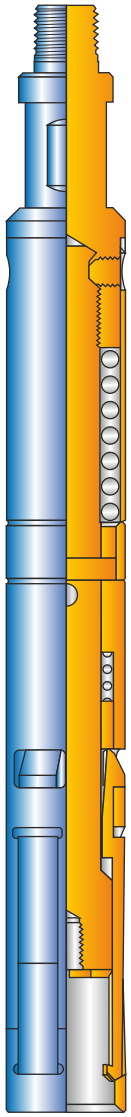
Normal Size (in)	Type	Max O.D. (in)	Pulls Neck O.D. (in)	Reach* (in)	Top Connection (pin)	Prong Connection (box)	F/N O.D. (in)	Part No.
1-1/4	JDC	1.291	0.875	1.937	15/16 - 10 UN	1/4 - 20	1.187	70151
1-1/4	JDS	1.291	0.875	2.687	15/16 - 10 UN	N/A	1.187	70165
1-1/4	JUC	1.250	0.875	1.937	15/16 - 10 UN	1/4 - 20	1.187	71175
1-3/8	JDC	1.375	1.000	1.875	15/16 - 10 UN	N/A	1.187	70153
1-1/2	JDC	1.422	1.187	1.093	15/16 - 10 UN	1/2 - 13	1.187	70154
1-1/2	JDS	1.422	1.187	1.843	15/16 - 10 UN	1/2 - 13	1.187	70166
1-1/2	JUC	1.422	1.187	1.093	15/16 - 10 UN	1/2 - 13	1.187	71174
1-1/2	JUS	1.422	1.187	1.843	15/16 - 10 UN	1/2 - 13	1.187	71194
1-5/8	JDS	1.625	1.187	1.843	15/16 - 10 UN	1/2 - 13	1.187	70155
2	JDC	1.859	1.375	1.437	15/16 - 10 UN	1/2 - 13	1.375	70156
2	JDS	1.859	1.375	2.250	15/16 - 10 UN	1/2 - 13	1.375	70168
2	JDL	1.859	1.375	2.812	15/16 - 10 UN	1/2 - 13	1.375	70164
2	JUC	1.859	1.375	1.437	15/16 - 10 UN	1/2 - 13	1.375	71176
2	JUS	1.859	1.375	2.125	15/16 - 10 UN	1/2 - 13	1.375 7	1196
2-1/2	JDC	2.250	1.750	1.312	15/16 - 10 UN	1/2 - 13	1.375	70158
2-1/2	JDS	2.250	1.750	2.187	15/16 - 10 UN	1/2 - 13	1.375	70170
2-1/2	JUC	2.250	1.750	1.312 1	15/16 - 10 UN	1/2 - 13	1.375	71178
2-1/2	JUS	2.250	1.750	2.187	15/16 - 10 UN	1/2 - 13	1.375	71198
3	JDC	2.796	2.312	1.437	15/16 - 10 UN	1/2 - 13 / 5/8 - 11	1.750	70160
3	JDC	2.796	2.312	0.687	15/16 - 10 UN	5/8 - 11	1.750	70031
3	JDS	2.812	2.312	2.125	15/16 - 10 UN	5/8 - 11	1.750	70172
3	JDL	2.812	2.312	2.609	15/16 - 10 UN	5/8 - 11	1.750	70173
3	JUC	2.812	2.312	1.437	15/16 - 10 UN	5/8 - 11	1.750	71180
3	JUS	2.812	2.312	2.125	15/16 - 10 UN	5/8 - 11	1.750	71200
4	JDC	3.750	3.125	2.312	1-1/16 - 10 UN	1-1/4 - 12	2.312	70162
4	JUC	3.750	3.125	3.375	1-1/16 - 10 UN	1-1/4 - 12	2.312	71182

- Reach is the distance from the core to the engaging shoulder of the dogs.
- Other core length / OD's available on request.



JU Pulling Tool

PULLING TOOL ('R' SERIES)



R Pulling Tool

The ACT 'R' Series Pulling tool is used for jobs in which extensive downward jarring is required. The tool is designed to shear and release by upward jarring. These are available with four different types of cores.

1. RB : Long core, short reach.
2. RS : Medium core, medium reach.
3. RJ : Short core, long reach.
4. RQ : Special core designed to latch a Quick Lock Connection (QLS) connection.

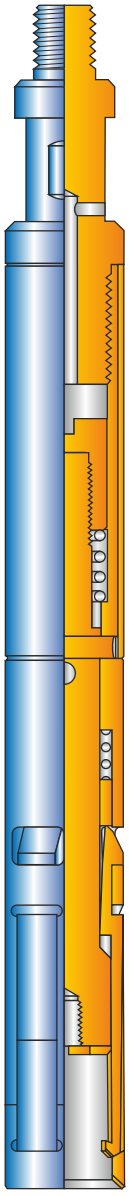
Either of these tools can be changed to other types by changing the core. All other parts remain same.

PULLING TOOL ('R' SERIES)							
Nominal Size (in)	Type	O.D. (in)	F/N O.D. (in)	Pulls Neck O.D. (in)	Top Conn.	Reach (in)	Part No.
1-1/4	RB	1.220	1.000	1.000	5/8 - 11 UNC	1.219	127RB10
1-1/4	RS	1.220	1.000	1.000	5/8 - 11 UNC	2.125	127RS10
1-1/4	RJ	1.220	1.000	1.000	5/8 - 11 UNC	1.844	127RJ4
1-1/2	RB	1.430	1.188	1.188	15/16 - 10 UN	1.265	127RB14
1-1/2	RS	1.430	1.188	1.188	15/16 - 10 UN	1.797	127RS5
1-1/2	RJ	1.430	1.188	1.188	15/16 - 10 UN	2.547	127RJ5
1-1/2	RB	1.484	1.188	1.188	15/16 - 10 UN	1.050	127RB21
1-3/4	RS	1.562	1.188	1.188	15/16 - 10 UN	1.797	127RS14
1-3/4	RJ	1.560	1.188	1.188	15/16 - 10 UN	2.550	127RJ10
2	RB	1.770	1.375	1.375	15/16 - 10 UN	1.219	127RB17
2	RS	1.770	1.375	1.375	15/16 - 10 UN	1.984	127RS6
2	RJ	1.770	1.375	1.375	15/16 - 10 UN	2.547	127RJ1
2-1/2	RB	2.180	1.375	1.750	15/16 - 10 UN	1.203	127RB18
2-1/2	RS	2.180	1.375	1.750	15/16 - 10 UN	1.984	127RS7
2-1/2	RJ	2.180	1.375	1.750	15/16 - 10 UN	2.547	127RJ2
3	RB	2.74	2.312	2.312	1-1/16 - 10 UN	1.297	127RB19
3	RS	2.74	2.312	2.312	1-1/16 - 10 UN	2.190	127RS8
3	RJ	2.74	2.312	2.312	1-1/16 - 10 UN	2.609	127RJ3
3-1/2	RB	3.110	2.312	2.75	1-1/16 - 10 UN	1.350	127RB30
3-1/2	RS	3.110	2.312	2.75	1-1/16 - 10 UN	2.100	127RS16
4	RB	3.670	2.312	3.125	1-1/16 - 10 UN	1.49	127RB20
4	RS	3.718	2.312	3.125	1-1/16 - 10 UN	2.156	127RS9
4	RJ	3.660	2.312	3.125	1-1/16 - 10 UN	2.000	127RJ6

PULLING TOOL ('S' SERIES)

The ACT 'S' Series Pulling Tool is used to engage and retrieve equipment with an external fishing neck by upward jarring. The tool is designed to shear and release by downward jarring. With this feature the tool may also be used as a running tool. These are available with three different types of cores.

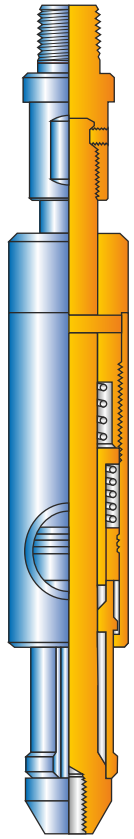
1. SB : Long core, short reach
2. SS : Medium core, medium reach
3. SM : Designed to be used in gas lift operations



S Pulling Tool

PULLING TOOL ('S' SERIES)							
Nominal Size (in)	**Type**	**O.D. (in)**	**F/N O.D. (in)**	**Pulls Neck O.D. (in)**	**Top Conn.**	**Reach (in)**	**Part No.**
1-1/4	SB	1.220	1.000	1.000	5/8 - 11 UNC	1.280	127SB14
1.66	SM	1.188	0.875	0.875	15/16 - 10 UN	1.680	127SM7
1-3/16	SM	1.190	1.188	0.875	15/16 - 10 UN	1.680	127SM7
1-1/2	SB	1.437	1.188	1.188	15/16 - 10 UN	0.688	127SB3
1-1/2	SB	1.437	1.188	1.188	15/16 - 10 UN	1.297	127SB6
1-1/2	SS	1.437	1.188	1.188	15/16 - 10 UN	1.780	127SS3
1-1/2	SM	1.380	1.375	0.875	15/16 - 10 UN	1.578	127SM3
2	SB	1.766	1.375	1.375	15/16 - 10 UN	1.219	127SB1
2	SM	1.766	1.375	1.375	15/16 - 10 UN	1.640	127SM1
2	SS	1.766	1.375	1.375	15/16 - 10 UN	2.030	127SS1
2-1/2	SB	2.188	1.375	1.750	15/16 - 10 UN	1.281	127SB2
2-1/2	SS	2.188	1.375	1.750	15/16 - 10 UN	2.000	127SS2
3	SB	2.734	2.312	2.312	1-1/16 - 10 UN	1.380	127SB9
3	SB	2.844	2.312	2.312	1-1/16 - 10 UN	1.500	127SB7
3	SS	2.844	2.312	2.312	1-1/16 - 10 UN	2.210	127SS4
3-1/2	SB	3.115	2.312	2.750	1-1/16 - 10 UN	1.690	127SB11
4	SB	3.670	2.312	2.750	1-1/16 - 10 UN	1.500	127SB10

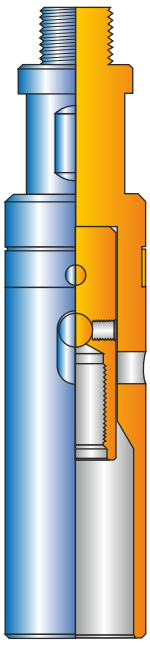
'GS' PULLING TOOL



GS Pulling Tool

The ACT 'GS' Pulling Tool is designed to unlock and pull various downhole equipment with internal fishing necks. These tools can be released from the device by jarring down. By installing a 'GU' Shear Up Adapter, the 'GS' Pulling Tool can be converted to a jar up to release tool ('GR' Pulling Tool).

'GS' PULLING TOOL							
Nominal Size (in)	Prong Conn. Box	Fishing Neck I.D. Guide (in)	Max. O.D. (in)	F/N O.D. (in)	Top Conn.	Reach (in)	Part No.
1-1/4	3/8 - 16	0.880	1.160	1.000	5/8 - 11 UNC	1.08	28125-00
1-1/2 - 1-3/4	1/2 - 13	1.060	1.470	1.187	15/16 - 10 UN	1.62	28150-00
2	1/2 - 13	1.380	1.750	1.375	15/16 - 10 UN	1.62	28200-00
2	1/2 - 13	1.380	1.810	1.375	15/16 - 10 UN	1.62	28200-01
2-1/2	5/8 - 11	1.810	2.160	1.750	15/16 - 10 UN	1.62	28250-00
2-1/2	5/8 - 11	1.810	2.160	1.750	15/16 - 10 UN	1.62	28250-01
3	5/8 - 11	2.310	2.720	2.313	1-1/16 - 10 UN	1.62	28300-00
3-1/2	1-3/8 - 12	2.620	3.110	2.313	1-1/16 - 10 UN	1.62	28350-00
4	2-1/8 - 12	3.120	3.620	2.313	1-1/16 - 10 UN	1.62	28400-00
5	2-1/2 - 10	4.000	4.500	3.125	1-1/16 - 10 UN	1.82	28500-00
6	2-3/4 - 10	4.750	5.560	3.125	1-1/16 - 10 UN	1.86	28600-00
7	3-5/8 - 10	5.250	5.830	3.125	1-1/16 - 10 UN	1.86	28700-00
7	3-5/8 - 10	5.250	5.880	3.125	1-1/16 - 10 UN	1.86	28700-01



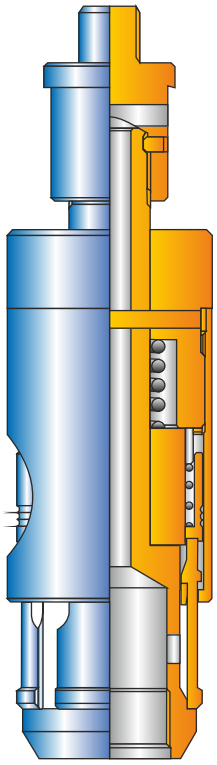
GU Shear Up Adapter

'GU' SHEAR UP ADAPTER

The ACT 'GU' Shear Up Adapter is used to convert a 'GS' (jar down to release) pulling tool to a 'GR' (jar up to release) pulling tool.

'GU' SHEAR UP ADAPTER				
Nominal Size (in)	Max. O.D. (in)	F/N. O.D. (in)	Connection Pin X Box	Part No.
1-1/2	1.470	1.187	15/16-10 UN	170-150
2	1.812	1.375	15/16-10 UN	170-200
2-1/2	2.250	1.750	15/16-10 UN	170-250
3, 3-1/2, 4	2.718	2.312	1-1/16-10 UN	170-400
5	4.000	3.125	1-1/16-10 UN	170-500
6	5.560	3.125	1-1/16-10 UN	170-600
7	5.880	3.125	1-1/16-10 UN	170-700

HEAVY DUTY "GS" PULLING TOOL

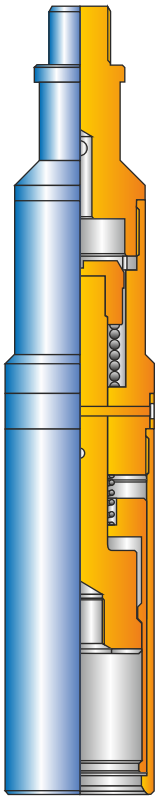


Heavy Duty GS Pulling Tool

The ACT Heavy Duty 'GS' Pulling Tool is a full radial contact pulling tool for heavy jarring and for engaging badly scaled fishing necks. It can also retrieve worn or damaged fishing neck with its 35% greater contact area of the dogs than a standard GS Pulling Tool.

HEAVY DUTY 'GS' PULLING TOOL							
Nominal Size (in)	Prong Conn. Box	Fishing Neck I.D. Guide (in)	Max O.D. (in)	F/N O.D. (in)	Top Connection	Reach (in)	Part No.
2	1/2 - 13	1.380	1.810	1.375	15/16 - 10 UN	1.62	28200-1H
2-1/2	5/8 - 11	1.810	2.160	1.750	15/16 - 10 UN	1.62	28250-0H
2-1/2	5/8 - 11	1.810	2.160	1.750	15/16 - 10 UN	1.62	28250-1H
3	5/8 - 11	2.310	2.720	2.313	1-1/16 - 10 UN	1.62	28300-0H
3-1/2	1-3/8- 12	2.620	3.110	2.313	1-1/16 - 10 UN	1.62	28350-0H
4	2-1/8 - 12	3.120	3.620	2.313	1-1/16 - 10 UN	1.62	28400-0H
5	2-1/2 - 10	4.000	4.500	3.125	1-1/16 - 10 UN	1.82	28500-0H
6	2-3/4 - 10	4.750	5.560	3.125	1-1/16 - 10 UN	1.86	28600-0H
7	3-5/8 - 10	5.250	5.880	3.125	1-1/16 - 10 UN	1.86	28700-0H

HEAVY DUTY RELEASABLE PULLING TOOL



Heavy Duty Releasable Pulling Tool

The ACT Heavy Duty Releasable Pulling Tool is a collet type pulling tool used to latch and retrieve wireline tools with badly damaged external fishing necks.

The Heavy Duty Releasable Pulling Tool is extremely robust in construction and allows a full 360-degree engagement with the fishing neck to be latched.

The fishing socket can be released by jarring downwards provided a solid footing is available for the core to be driven against.

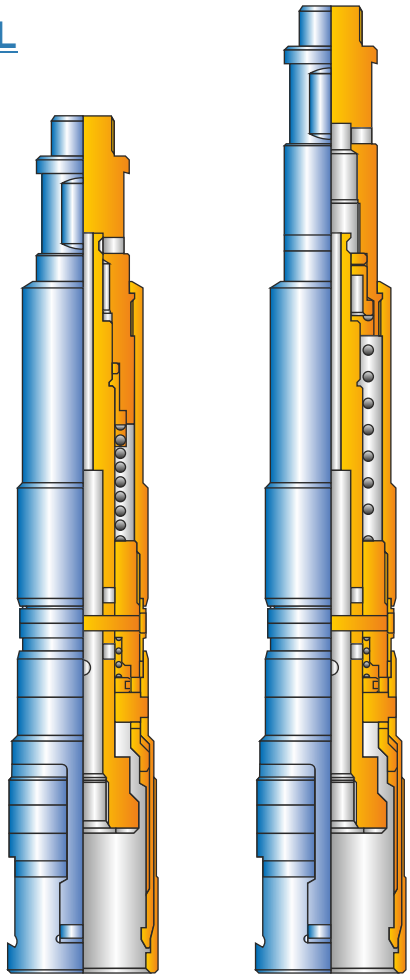
HEAVY DUTY RELEASABLE PULLING TOOL							
Nominal Size (in)	Max. O.D. (in)	To Catch F/N (in)	Reach (in)	Length (in)	F/N O.D. (in)	Top Connection	Part No.
1-1/4	1.285	0.875	2.00	14.60	1.187	15/16 - 10 UN	263-028
1-5/8	1.625	1.000	1.85	15.60	1.1875	15/16 - 10 UN	263-012
1-5/8	1.625	1.187	1.85	15.60	1.1875	15/16 - 10 UN	263-008
2	1.875	1.275	1.84	15.60	1.375	15/16 - 10 UN	263-003
2-1/2	2.300	1.750	1.84	15.60	1.750	1-1/16 - 10 UN	263-022
3	3.250	2.313	1.69	18.60	2.313	1-1/16 - 10 UN	263-014
4	3.800	3.125	2.73	18.60	2.313	1-9/16 - 10 UN	263-007

UNIVERSAL PULLING TOOL

The ACT Universal Pulling Tool is a combination of the conventional shear up and shear down type pulling tools. It is used to engage and retrieve equipment with external fishing necks. This has a universal core which allows the same tool to be able to retrieve devices with fishing necks of different lengths or reach (i.e., short, medium and long reach).

Benefits:

- The tool can be converted from 'shear up' to 'shear down' mode without the need of any additional parts.
- It does the same job of two different types of pulling tools i.e., 'JD' or 'JU' Series, or 'R' or 'S' Series. (See page no. 66-68)
- The universal core can be pinned in the short, medium, or long reach position without the need to purchase additional cores.
- The shear pin can be replaced without disassembly of the pulling tool.

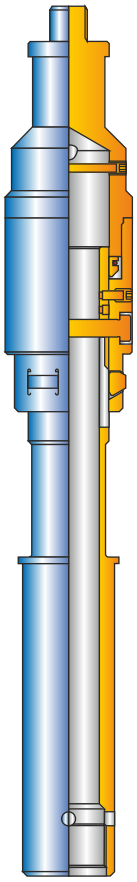


Shear Up Mode ***Shear Down Mode***

Universal Pulling Tool

UNIVERSAL PULLING TOOL								
Nominal Size (in)	**Max. O.D. (in)**	**F/N O.D. (in)**	**Top Connection**	**Reach**	**Length (in) (Shear Up)**	**Length (in) (Shear Down)**	**Pulls Neck O.D. (in)**	**Part No.**
1-1/4	1.290	1.187	15/16 - 10 UN	Medium Long	15.00 15.25	16.75	0.875	165-125
1-1/2	1.437	1.187	15/16 - 10 UN	Medium Long	15.05 15.60	17.04	1.187	165-150
2	1.860	1.375	15/16 - 10 UN	Short Medium Long	19.02 19.82 20.37	22.45	1.375	165-200
2-1/2	2.250	1.375	15/16 - 10 UN	Short Medium Long	20.28 21.08 21.58	23.61	1.75	165-250
3	2.800	1.750	1-1/16 - 10 UN	Short Medium Long	20.55 21.40 21.85	23.75	2.313	165-300
4	3.750	2.313	1-9/16 - 10 UN	Short Medium Long	20.73 21.38 22.00	24.00	3.125	165-400

'RX' RUNNING TOOL

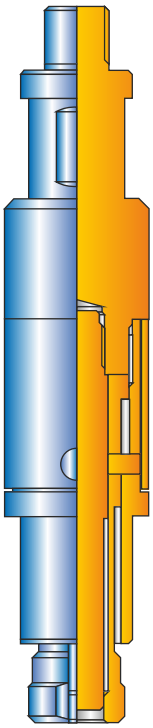


"RX" Running Tool

The ACT "RX" Running Tool sets X, XN, R, RN, and RQ Locking Mandrels in the top type X, XN, R, RN and RQ landing nipples. This tool is generally used for installing safety valves in the uppermost landing nipple. With this tool, the lock mandrel may be run with the keys in the control or locating positions. The lock mandrel keys ACT as a no-go to locate the nipple rather than the dogs on the running tool. When a non-no-go lock is being run, the keys must be run in the locating position and the lock must be set in the first nipple in the bore of that lock. The position of a snap ring in the tool gives a positive indication when the lock is fully set.

'RX' RUNNING TOOL				
Nominal Size (in)	Max. O.D. (in)	F/N O.D. (in)	Top Connection	Part No.
2.313	2.12	1.750	15/16 - 10 UN	RX-2313
2.750	2.62	2.313	1-1/16 - 10 UN	RX-275
3.125	3.09	2.313	1-1/16 - 10 UN	RX-312
3.313	3.09	2.313	1-1/16 - 10 UN	RX-313
3.688	3.62	2.313	1-1/16 - 10 UN	RX-368
3.813	3.62	2.313	1-1/16 - 10 UN	RX-381
4.562	4.50	3.125	1-1/16 - 10 UN	RX-456
5.875	5.80	3.125	1-1/16 - 10 UN	RX-587
5.963	5.81	3.125	1-1/16 - 10 UN	RX-596

'W' RUNNING TOOL



'W' Running Tool

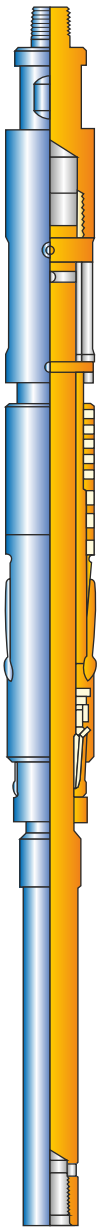
The ACT 'W' Running Tool sets type B, C and W slip type mandrels in the tubing.

The W Running Tool consists of a top sub complete with a fishing neck and sucker rod pin connection, a middle sub, a bottom sub, a collet set and an inner core.

When the desired setting depth has been reached the tools are picked up to set the slips and expand the rubber element. Once set, the pin in the W Running Tool can be sheared and the prong can be withdrawn from behind the collet, allowing the running tool to release from the mandrel.

'W' RUNNING TOOL						
Used to Run	Nominal Size (in)	Max. O.D. (in)	F/N O.D. (in)	Will Engage Fishing Neck (in)	Top Connection	Part Number
	1-1/4	1.190	1.000	0.531	5/8 -11 UNC	257-125
	1-1/2 -1-3/4	1.380	1.187	0.687	15/16 - 10 UN	257-175
Type	2	1.500	1.375	0.812	15/16 - 10 UN	257-200
B, C & W	2-1/2	1.500	1.375	1.000	15/16 - 10 UN	257-250
Mandrels	3	2.250	1.750	2.000	1-1/16 - 10 UN	257-300
	3-1/2	2.620	2.313	1.875	1-1/16 - 10 UN	257-350
	4	3.500	2.313	2.812	1-1/16 - 10 UN	257-400

'X & R' RUNNING TOOL



X & R Running Tool

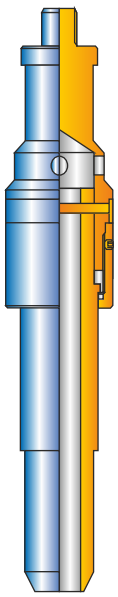
The ACT X and R Running Tools are used to set model 'X', 'XN', 'R', 'RN' and 'RQ' Lock Mandrels in their respective landing nipples. The X and R Running Tool can be set up to run either in selective or non-selective mode. In selective mode the lock mandrel can be run through several landing nipples of the same size and type before selecting the desired nipple to set the lock mandrel. In non-selective mode, the lock mandrel will locate the first corresponding nipple.

'X & R' RUNNING TOOL					
Max. O.D.(in)	To Suit Nipple Bore (in)	F/N O.D. (in)	Top Connection	Part No. 'X'	Part No. 'R'
1.720	1.875	1.375	15/16-10 UN	174-187	275-187
2.171	2.313	1.750	15/16-10 UN	174-231	275-231
2.687	2.750	2.313	1-1/16-10 UN	174-275	275-275
2.843	2.875	2.313	1-1/16-10 UN	174-288	275-288
3.250	3.313	2.313	1-1/16-10 UN	174-331	275-331
3.750	3.813	2.313	1-1/16-10 UN	174-381	275-381
4.500	4.562	3.125	1-1/16-10 UN	174-456	275-456

'X' CHECK SET TOOL

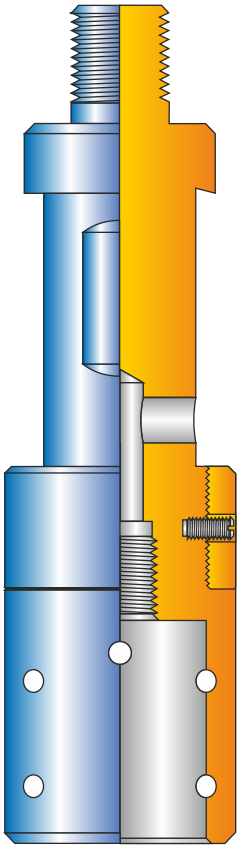
The ACT X Check Set Tool is used to ensure that the 'X' and 'R' Locking Mandrels have been properly set in the appropriate landing nipple. A sheared pin in the tool, after it has been run, indicates that the lock has been properly set. It is lowered downhole to the locking mandrel using standard wireline tools.

'X' CHECK SET TOOL			
Nominal Size (in)	F/N O.D. (in)	Top Connection	Part No.
1-1/2 - 1.710	1.188	15/16 - 10 UN	312170
2	1.375	15/16 - 10 UN	312200
2.125	1.375	15/16 - 10 UN	312212
2.188	1.375	15/16 - 10 UN	312218
2-1/2 - 2.562	1.375	15/16 - 10 UN	312256
3	1.750	15/16 - 10 UN	312300
4	1.750	1-1/16" - 10 UN	312400



X Check Set Tool

MODEL 'C-1' RUNNING TOOL



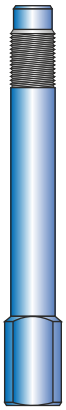
'C-1' Running Tool With Thread Protector

The ACT 'C-1' Running Tool is used to run ACT flow control devices that have an external fishing neck. It has a box down connection for attaching a Model 'A' or 'N-1' shank.

The Model 'A' shank is used to keep the dogs of the Model 'S', 'W', and 'Z' locks in a retracted position while running. The Model N-1 shank is used to keep the dogs retracted in Model 'G' and 'R' locks while running.

The C-1 Running Tool is dressed with a thread protector for applications that do not require a No-Go on the tool itself. To convert the C-1 Running Tool to a No-Go type running tool, a locating ring is installed in place of the thread protector.

Model 'A' Shank

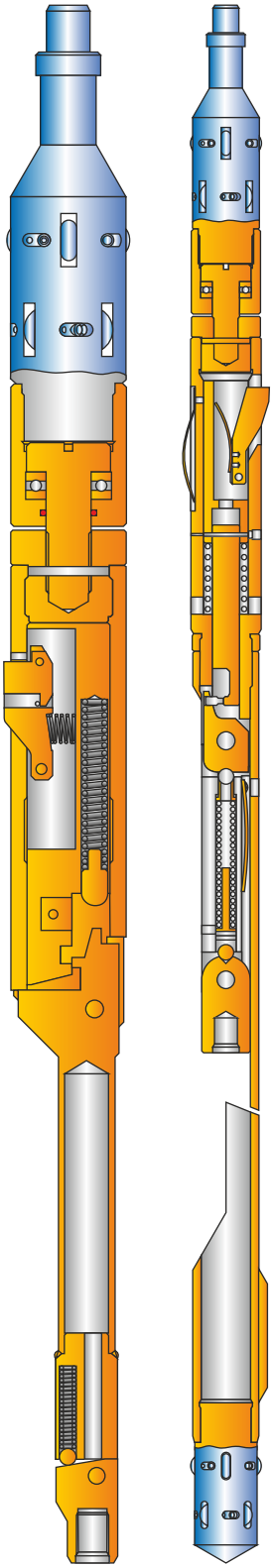


Model 'N-1' Shank

MODEL 'C-1' RUNNING TOOL

Tubing Size (in)	Nipple Seal Bore Size (in)	Accessory Size (in)	Running Tool Size (in)	Locating Ring O.D. (in)	Top Connection	F/N O.D. (in)	'A' & 'N-1' Shank Size (in)
1.900	1.437	1.43		1.468	15/16-10 UN	1.188	1.90
	1.500	1.50	1.900 - 2-1/16	1.520			
2-1/16	1.562	1.56		1.593			2-1/16
	1.625	1.62		1.656			
2-3/8	1.781	1.78	2-3/8	1.807	15/16-10 UN	1.375	2-3/8
	1.812	1.81		1.843			
	1.875	1.87		1.906			
2-7/8	2.062	2.06		2.093			
	2.250	2.25		2.281	15/16-10 UN	1.750	2-7/8
	2.312	2.31	2-7/8	2.343			
3-1/2	2.562	2.56		2.593			
	2.750	2.75	3-1/2	2.781	1-1/16-10 UN	2.312	3-1/2
	2.812	2.81		2.843			
4-1/2	3.688	3.68	4-1/2	3.718	1-1/16-10 UN	3.125	4-1/2
	3.750	3.75		3.802			
	3.812	3.81		3.835			

ROLLER KICKOVER TOOL



The ACT Roller Kickover Tool is designed to run and retrieve gas lift valves in and from highly deviated wells, where it is difficult to rotate and align a standard kickover tool, in a side pocket mandrel. A 360-degree contact top and bottom sub eliminates the contact friction and a swivel joint attached below the top roller sub allows the smooth orientation of the kickover tool within the side pocket mandrel, irrespective of the well deviation.

The ACT Roller Kickover Tool is available in all sizes and models of existing kickover tools.

Roller Kickover Tools

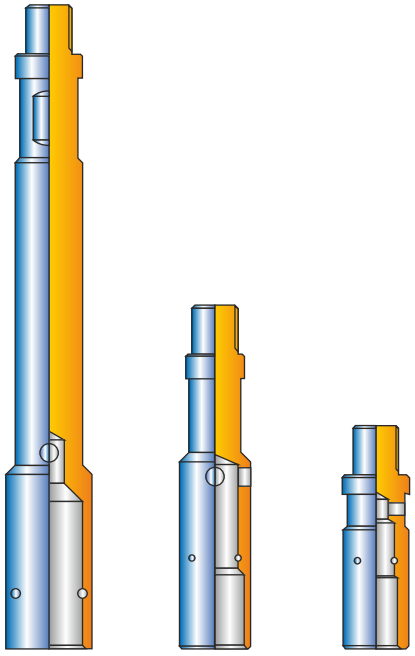
RUNNING TOOLS FOR GAS LIFT ACCESSORIES

The model 'JK', 'RK-1', and 'JC-3' Running Tools with suitable latches are used to install downhole control devices inside selected side pocket mandrels. These running tools are connected to kickover tools.

'JK' Running Tool: The 'JK' running tool is used with BK and BK-2 latches to install 1.00" OD valves and accessories in the appropriate side pocket mandrels.

'RK-1' Running Tool: The 'RK-1' running tool is used with RK, RK-1, RKP latches to install 1.50" OD valves and accessories in the appropriate side pocket mandrels.

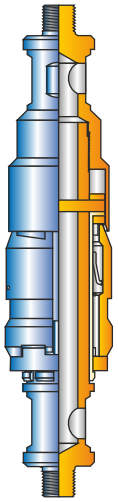
'JC-3' Running Tool: The 'JC-3' running tool is used with R and RA latches to install 1.50" OD valves and accessories in appropriate side pocket mandrels.



JC-3 *RK-1* *JK*

Running Tools

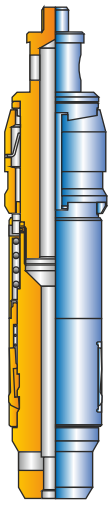
'B' SHIFTING TOOL



'B' Shifting Tool

The ACT 'B' Shifting Tool is used to move the inner sleeve to the closed or opened position in ACT type 'PXD', 'PXU', 'PXA' & 'CMD' sliding sleeves. This tool has two pin connections to permit either opening or closing of the sleeve by inverting the tool.

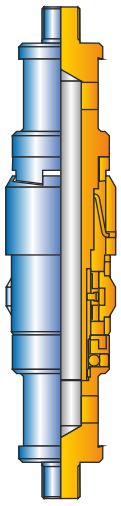
'BO' SELECTIVE SHIFTING TOOL



'BO' Selective Shifting Tool

The ACT 'BO' Selective Shifting Tool is used to selectively shift the inner sleeve of a sliding sleeve to the down position only. These tools are designed for tubing strings with multiple sliding sleeves of the same size so that the desired sleeve can be shifted to the down position without shifting the other sliding sleeves.

'X' SELECTIVE SHIFTING TOOL



'X' Selective Shifting Tool

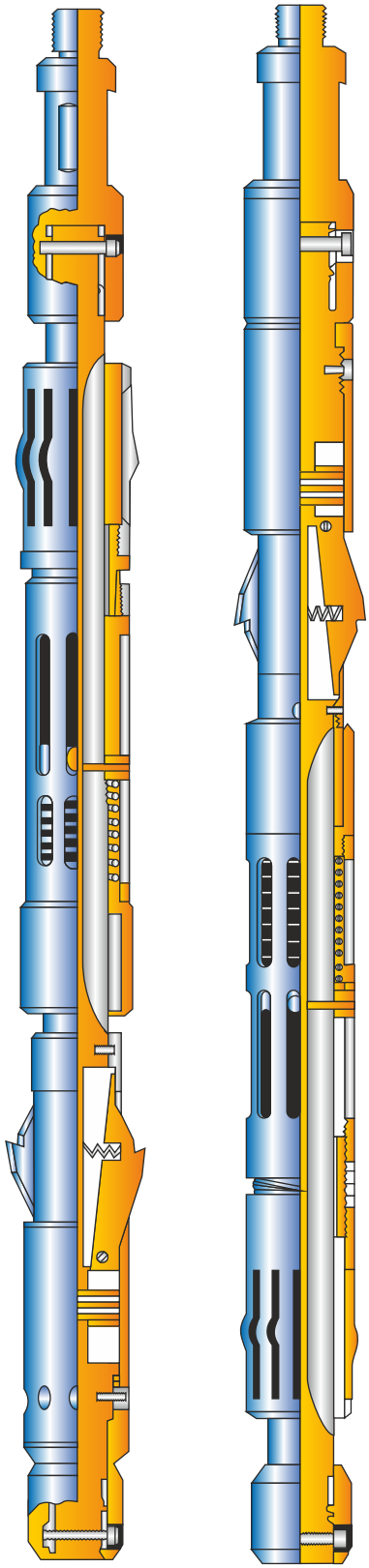
The ACT 'X' Selective Shifting Tool is used to selectively shift the inner sleeve of a sliding sleeve to the opened or closed position. It is changed from the selective to the non-selective position by the up-down movement of the shifting tool through the sleeve. The chosen sliding sleeve can be shifted to open or closed position without shifting the other sleeves.

The dogs can be moved to a position close to the 90-degree shoulder of the key by picking up the tool string, and lowering it again to cycle the tool into a non-latching position.

'B, BO & X' SHIFTING TOOLS

SSD I.D. (in)	F/N O.D. (in)	Connection	Part No. 'B'	Part No. 'BO'	Part No. 'X'
1.375	1.000	5/8 - 11 UNC	175-137	289-137	288-137
1.500	1.187	15/16 - 10 UN	175-150	289-150	288-150
1.625	1.187	15/16 - 10 UN	175-162	289-162	288-162
1.710	1.187	15/16 - 10 UN	175-171	289-171	288-171
1.781	1.375	15/16 - 10 UN	175-178	289-178	288-178
1.875	1.375	15/16 - 10 UN	175-187	289-187	288-187
2.125	1.375	15/16 - 10 UN	175-212	289-212	288-212
2.188	1.750	15/16 - 10 UN	175-218	289-218	288-218
2.313	1.750	15/16 - 10 UN	175-231	289-231	288-231
2.562	1.750	15/16 - 10 UN	175-256	289-256	288-256
2.750	2.313	1-1/16 - 10 UN	175-275	289-275	288-275
2.813	2.313	1-1/16 - 10 UN	175-281	289-281	288-281
3.125	1.750	15/16 - 10 UN	175-312	289-312	288-312
3.313	2.313	1-1/16 - 10 UN	175-313	289-313	288-313
3.437	2.313	1-1/16 - 10 UN	175-343	289-343	288-343
3.688	3.125	1-1/16 - 10 UN	175-368	289-368	288-368

MODEL D-2 SHIFTING TOOL



Opening Position *Closing Position*

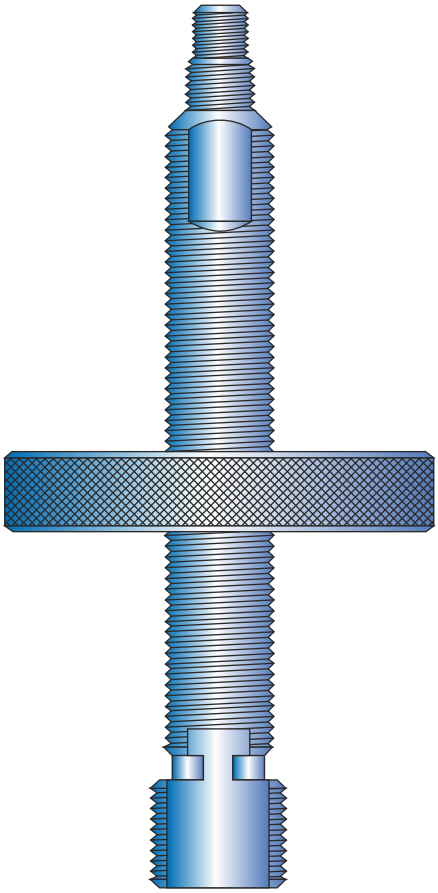
The ACT Model D-2 shifting tool is used to provide a safe, selective and controlled method of opening and closing Model 'L' sliding sleeve.

Advantages:

1. **Automatic locating collet**: Flags the operator when a sleeve is reached. It also indicates when the tool passes through a sleeve or a nipple.
2. **Proof of completed shift:** As soon as a shift, either open or close, is completed, an attempt to repeat the operation will give a positive indication that the shift was performed.
3. **Safety feature**: If the sleeve is opened in the presence of a differential pressure in favour of the annulus, the release mechanism is held inoperative by the flow until the pressure is balanced to allow safe removal.
4. **Open and close sleeves in one trip:** Shifting tools can be run in tandem if required to both open and close sleeves on the same run in a well. Run the tool with collect up to open sleeves or with collect down (Inverted position) to close sleeves.
5. **Deliberate release:** Even after the shifting tool is seated in the sleeve, it can be released without shifting the closing sleeve.

'D-2' SHIFTING TOOL			
'L' Sliding Sleeve Size I.D. (in)	Shifting Tool Collet Size O.D. (in)	Top Connection	F/N O.D. (in)
1.43	1.468	15/16 - 10 UN	1.188
1.50	1.531		
1.56	1.593		
1.62	1.656		
1.78	1.807	15/16 - 10 UN	1.375
1.81	1.843		
1.87	1.906		
2.25	2.281	15/16 - 10 UN	1.750
2.31	2.343		
2.75	2.781	1-1/16 - 10 UN	2.312
2.81	2.843		
3.68	3.743	1-1/16 - 10 UN	2.312
3.81	3.867		

PINNING TOOL



Pinning Tool

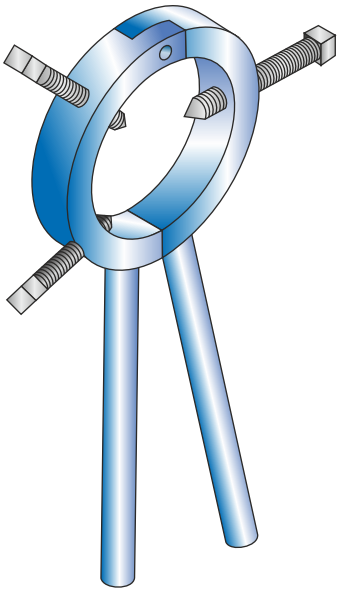
The ACT Pinning Tool is an essential part of a wireline toolboxes. It is used for the re-pinning of most standard running and pulling tools.

PINNING TOOL	
Size (in)	**Part No.**
1-1/2, 1-5/8, 2-1/2	173-400-000
3, 4, R & S	

RELEASING TOOL

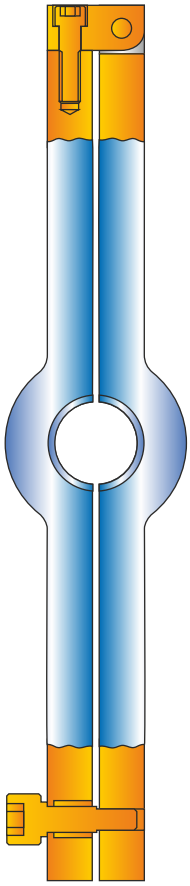
The ACT Releasing Tool is used to remove a latched device from 'S' and 'R' type pulling tools without removing the shear pin.

RELEASING TOOL	
Size (in)	**Part No.**
2, 2-1/2 & 3	172-300
4	172-400



Releasing Tool

FISHING BAR CLAMP

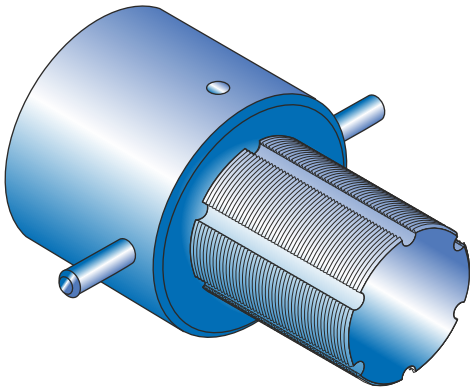


Fishing Bar Clamp

The ACT Toolstring Clamp is placed around standard toolstring fishing necks. The supporting arms rest on the box section of the wireline valve or riser to allow extended toolstring make-up.

FISHING BAR CLAMP		
Toolstring Dia. (in)	**F/N O.D. (in)**	**Part No.**
1.250	1.187	12231-1187
1.500	1.375	12231-1375
1.875 - 2.125	1.750	12231-1750
2.500	2.312	12231-2312

THREAD CHASER



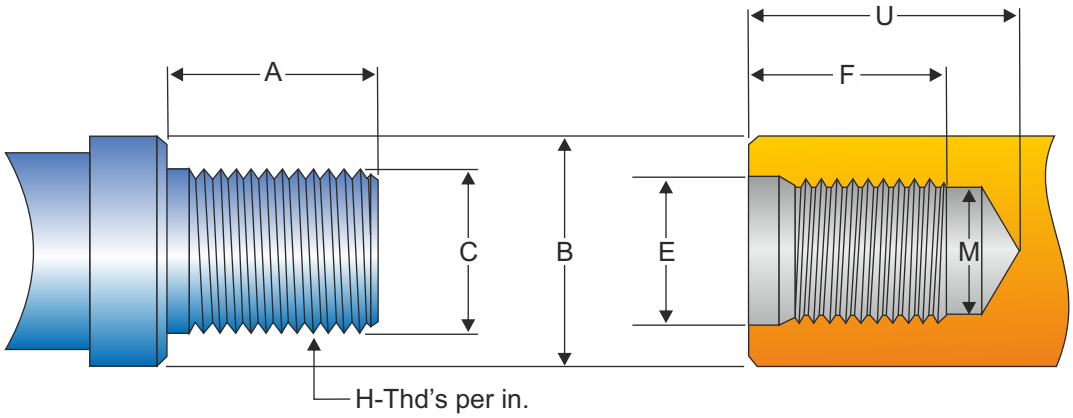
Thread Chaser

The ACT Thread Chaser is a must for all wireline toolboxes.

It is designed to redress sucker rod connections when minor damage has occurred.

THREAD CHASER	
Pin X Box	**Part Number**
15/16" - 10 UN	322-11
1-1/16" - 10 UN	322-22
1-9/16" - 10 UN	322-33

SUCKER ROD CONNECTION



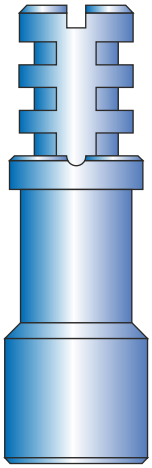
SUCKER ROD CONNECTION								
Size (in)	A (in)	B (in)	C (in)	E (in)	F (in)	H	M (in)	U (in)
5/8	1.250	1.250	.9362	.995	1.41	10	.830	1-3/4
3/4	1.437	1.500	1.0611	1.080	1.60	10	.955	1-15/16
7/8	1.625	1.625	1.1861	1.205	1.79	10	1.080	2-1/8
1	1.875	2.000	1.3735	1.393	2.07	10	1.267	2-1/2
1-1/8	2.125	2.250	1.5609	1.580	2.31	10	1.455	2-3/4

WRENCH FLATS ON SUCKER ROD

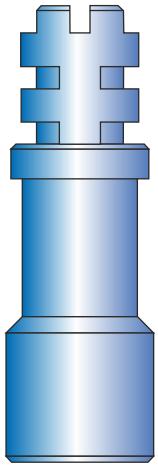
WRENCH FLATS ON SUCKER ROD		
Rod Size (in)	Distance Across Flats (in)	Length Of Flats (in)
5/8	1-1/4	7/8
3/4	1-1/4	1
7/8	1-1/4	1
1	1-1/2	1-5/16
1-1/8	1-5/8	1-1/2

QUICK LOCK CONNECTION

The Quick Lock Connection provides a method of attaching and releasing tools by hand. The male half is mated with the female half, then rotated through 90 degrees. A spring loaded spade in the female section engages a slot in the male section and locks the assembly in place. It is released by pushing upon the spring and rotating again through 90 degrees. It eliminates the chance of items backing off and does away with the need for pipe wrenches.



Quick Lock Male-Sub



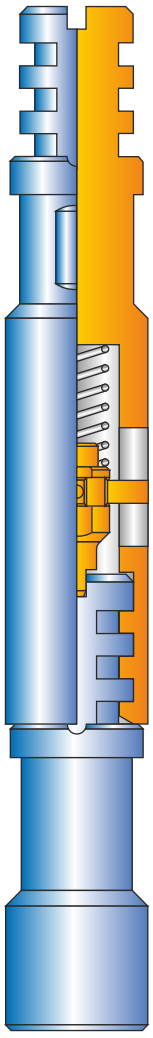
Double Shoulder Quick Lock Male-Sub

ADVANTAGES :

- The joint strength of wireline tools with quick lock connections is much higher than the joint strength of API sucker rod connection.
- There is no need to use wrenches to make or break connections.
- It is a safer & faster method of connection.
- There is no possibility of unscrewing downhole.

The Quick Lock Connections are available in following sizes:

1) 1-1/2
2) 1-7/8
3) 2-1/8



Quick Lock Assy.

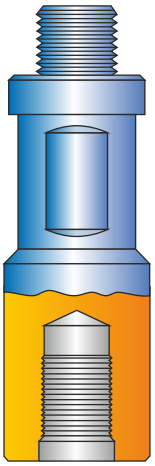
Design Parameters of Sucker Rod Threads & Quick Lock Connection

Thread / QLS	Design Tensile * Strength	Design Shear * Strength	Ultimate Tensile
15/16 - 10 SRT	47,584 lbs.	68,475 lbs.	72,966 lbs.
1-1/16 - 10 SRT	63,910 lbs.	79,888 lbs.	96,600 lbs.
1-9/16 - 10 SRT	148,819 lbs.	195,382 lbs.	228,200 lbs.
1-1/2 QLS	51,128 lbs.	60,258 lbs.	77,700 lbs.
1-7/8 QLS & 2-1/8 QLS	77,605 lbs.	74,409 lbs.	119,000 lbs.

* Values shown are for guidance only.

WIRELINE CROSS OVERS

The ACT Wireline Cross Overs are used to connect to tool strings having different threads. These are available with quick lock connections also.



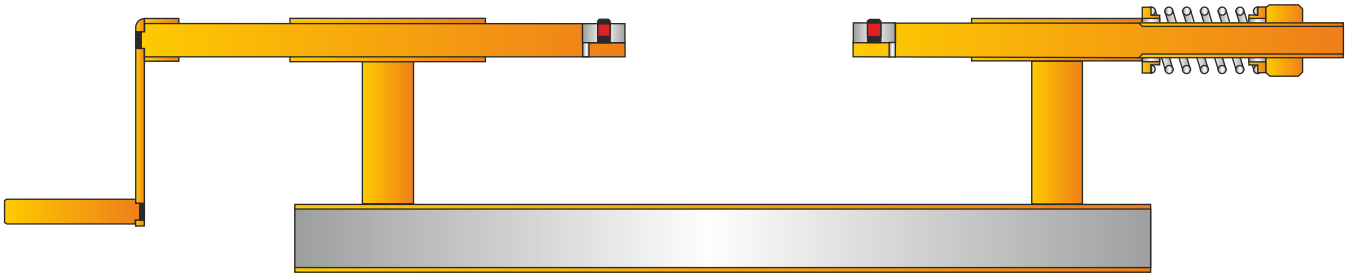
Wireline Crossover

WIRELINE CROSSOVERS				
Max. O.D. (in)	F/N. O.D. (in)	Connection		Part No.
		Pin	Box	
1.500	1.375	15/16 - 10 UN	15/16 - 10 UN	4115211
1.375	1.375	15/16 - 10 UN	1-1/16 - 10 UN	4113212
2.250	1.375	15/16 - 10 UN	1-9/16 - 10 UN	4122216
2.312	1.375	15/16 - 10 UN	1-9/16 - 10 UN	4123216
1.375	1.375	1-1/16 - 10 UN	15/16 - 10 UN	4113221
1.750	1.750	1-1/16 - 10 UN	15/16 - 10 UN	4117321
2.312	1.750	1-1/16 - 10 UN	15/16 - 10 UN	4123321
2.312	2.312	1-1/16 - 10 UN	1-3/16 - 10 UN	4123425
2.312	2.312	1-1/16 - 10 UN	1-9/16 - 10 UN	4123426
1.750	1.750	1-3/16 - 10 UN	15/16 - 10 UN	4117351
2.312	2.312	1-3/16 - 10 UN	1-9/16 - 10 UN	4123456
2.250	1.750	1-3/8 - 10 UN	1-9/16 - 10 UN	4122076
2.312	2.312	1-9/16 - 10 UN	15/16 - 10 UN	4123461
2.500	2.312	1-9/16 - 10 UN	15/16 - 10 UN	4125461
2.312	2.312	1-9/16 - 10 UN	1-1/16 - 10 UN	4123462
2.312	2.312	1-9/16 - 10 UN	1-3/16 - 10 UN	4123465
2.312	2.312	1-9/16 -10 UN	1-3/8 - 10 UN	4123467

- Box By Box And Pin By Pin Crossover Available On Request.

WIRELINE TORSION TESTER

ACT Wireline Torsion Tester is a portable bench apparatus to facilitate the test and evaluate the quality of the carbon steel wireline to API 9A Specification. Regular testing of wire in service is strongly recommended in order to monitor the inevitable deterioration in wire properties and to prevent wireline failure downhole. The Torsion Wire Tester is designed to access the ductility of wire ranging from 0.092" up to including 0.125" diameter. The test consists of twisting a sample of wireline along its own axis until failure occurs, noting the number of turns to failure (compare to API 9A for compliance). Strongly recommend all wirelines to be tested prior to commencement of a downhole operation.



Wireline Torsion Tester

Part No. 373-125-00

TERMS & CONDITIONS OF SALE

Note: These Terms & Conditions of Sales control the rights and responsibilities of the parties in connection with goods and/or services sold to any customer or purchaser of goods or service hereunder (hereinafter, "Buyer") by ACT. and its affiliates (individually and/or collectively "Seller"). Please read this document carefully because of its significant legal consequences.

1. ACCEPTANCE: Acceptance by Seller of Buyer's order or proposal is expressly made conditional on assent to these Terms & Conditions of Sales, either by written acknowledgment or by conduct by Buyer that recognizes the existence and controlling nature of these Terms & Conditions of Sales.

2. FORM OF CONTRACT AND NO WAIVER: Seller will not be deemed to have accepted any proposal or sales order through course of dealing, performance, implied consent, or waiver specifically, but without limitation, Seller's (I) supplying products or performing services in response to Buyer's purchase order or proposal, and/or (ii) failing to complain of Buyer's noncompliance with these Terms & Conditions of Sales or the presence of any conflicting terms and condition in any other purchase order or similar document and/or (iii) accepting payment for products or services, shall not be construed as acceptance of any terms and conditions proposed by Buyer. No attempted modification by Buyers of these Terms & Conditions of Sales will be effective against Seller unless expressly in a writing signed by Seller's competent authority with the express authority of Seller to make such agreements.

3. CONFLICTING PROVISION VOID: Seller hereby objects to and rejects any terms & conditions included in Buyer's purchase order or other writing or modification that conflict with these Terms & Conditions of Sales. Any inconsistent terms and conditions contained in Buyer's purchase order, terms & conditions, or any other writing that represents Buyer's offer are not a pan of the agreement between Seller and Buyer and shall have no effect.

4. PAYMENT STANDARD: Payment terms are 30% advance and balance before delivery at ex-works days from the date of Seller's invoice. Seller at its sole discretion reserve the right to require progress payments or payment in advance. If payment is not made when due the unpaid balance will be subject to a finance charge of 1½% of the unpaid balance per month or at the highest interest rate allowed by law, whichever is less. The amount of finance charges will be added to the balance owed to Seller. If Buyer fails to pay any invoice when due, or if the financial condition or credit of Buyer becomes unsatisfactory to Seller. Seller, at its sole discretion and without affecting any other lawful remedy, may change the terms of payment or suspend work and further deliveries, or both, until Buyer provides security or other assurance of performance as demanded by Seller. In the event Seller institutes legal or collection action against Buyer for non-payment, Buyer shall be liable to Seller for all reasonable costs and attorney's fees incurred by Seller in connection therewith. In the event of a dispute between Seller and Buyer regarding any separate sale(s), purchase(s), project(s), or service(s), Buyer shall not be entitled to withhold payments due Seller as a setoff for claims based on separate sale(s), purchase(s), project(s), or service(s).

5. LIMITED WARRANTY: Subject to limitations contained below, Seller warrants that services performed by Seller will be free from defects in workmanship under normal care and use until the expiration of the applicable warranty periods hereafter set forth said services are warranted for a period of ninety (90) days from the date of services. If Buyer discovers any warranty defects and notifies Seller thereof in writing and during the applicable warranty period, Seller shall at its sole discretion, promptly correct any errors that are found by the Seller in the services or refund the purchase price of the defective services. All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable environmental conditions, accident, misuse, or by improper installation, modification, repair, storage, or handling or any other cause not the fault of Seller, are not covered by this limited warranty, and shall be at Buyer's expense. Seller shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing and in advance by an authorized representative of Seller. All cost of transportation and time and expenses of Seller's personnel for site travel and diagnosis under this warranty clause will be borne by Buyer. Warranty services rendered during the warranty period shall be warranted for the remainder of the original warranty period. This limited warranty is the sole warranty made by Seller and can be amended only in writing signed by an authorized representative of Seller.
OTHER THAN AS EXPRESSED ABOVE, THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, AT LAW, BY CONTRACT, OR OTHERWISE, AS TO THE MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO ANY OF THE GOODS OR SERVICE.

6. LIMITATION OF REMEDY AND LIABILITY: In no event, regardless of the form of the claim or cause of action (including but not limited to claims based in contract, patent or trademark infringement, negligence, strict liability, other tort, or otherwise), shall Seller's liability to Buyer and/or its affiliates exceed the contract price. The parties agree that in no event shall either party's liability to the other and/or their affiliates extend to include incidental, consequential, punitive or exemplary damages. The term "consequential damages" shall include, but not be limited to, lost or deferred production, loss of anticipated profits, loss of use, loss of revenue, and cost of capital.

7. DELIVERY: Seller's obligation is to deliver the goods F.O.B. Seller's warehouse, place of manufacture, or other place from which the goods are actually shipped within INDIA, at which point risk of loss shall pass to Buyer. Freight will be prepaid and added to invoice unless otherwise agreed to by Seller in writing. Delivery dates give to Buyer in any manner are approximate. Seller will not be liable for failure to make delivery or delay in making delivery that directly or indirectly results from or is contributed to by any cause beyond Seller's reasonable control, including but not limited to fire, flood or other acts of God, strikes or other labor disagreements, accidents, acts or requirements of government or civil authorities, riot, war, embargo, shortages of labor, material or energy, delay in transportation, failure or delay by subcontractors or suppliers, or necessary changes in production or shipment schedules. In the event of such delay, Seller, at its sole discretion, will have the right to apportion supplies among its customers, including Buyer, in any manner that Seller determines, and any delivery date will be postponed for a period of time equal to the delay. If shipments are held at Seller's premises at request of Buyer, invoices will be rendered for all completed goods as though actually shipped, and Buyer will also pay Seller for all extra expenses incurred.

8. CANCELLATION BY BUYER: Buyer may cancel its order, or any part of it, by sending written notice of cancellation to Seller and by paying Seller a reasonable cancellation fee. The reasonable cancellation fee will be determined by Seller and will reflect, among other factors: the expenses already incurred, other commitments made by Seller, sales and administrative overheads, and profits. Goods may not be returned without Seller's prior written consent. Restocking charges may be assessed at the sole discretion of Seller.

9. PRICES: Unless otherwise specified by Seller, Seller's prices for the goods or services shall remain in effect for thirty (30) days from the date of Seller's quotation or acceptance of the order for the goods, whichever occurs first, provided an unconditional, complete authorization for the immediate procurement and shipment of the goods pursuant to Seller's standard invoicing procedures is received and accepted by the Seller from the Buyer within such time period. After such thirty (30) days period, Seller shall have the right to revise the price of the goods or services up to Seller's price in effect for the goods at the time the order is released by Buyer and Seller prior to shipment. The price for any Resale Goods or Services shall be Sellers's price in effect at the time of shipment to Buyer.

10. INSTALLATION: All goods shall be installed by and at the expense of the Buyer.

11. TAXES: Buyer is responsible for any taxes, charges or other fees presently or subsequently imposed by any law, order, regulation or ordinance of the Federal, State or municipal governments for production sale, use, transportation, delivery or servicing of the products sold hereby. The foregoing shall not apply to taxes based upon Seller's net income.

12. ASSIGNMENT: Buyer shall not (by operation of law or otherwise) assign its rights or delegate its performance hereunder without the prior written consent of Seller, and any attempted assignment or delegation without such consent shall be void.

13. GOVERNING LAW: All sales shall be governed by and construed for all purpose, including without limitation, Seller's obligations or liabilities respecting its products, according to the laws of the Government Of India at New Delhi.

14. ENTIRE AGREEMENT: These Terms & Conditions of Sale (and any of Seller's purchase or work orders in connection therewith) constitute a complete and exclusive statement of the agreement between Seller and Buyer. There are no understandings, agreements or representations, express or implied, not specified in the Agreement. These Terms & Conditions of Sale control over any conflicting provision in any purchase or work order issued by Buyer. There are no other promises, conditions, understandings, representations or warranties. All provisions are severable, and if any of these Terms & Conditions of Sales are found by a court of competent jurisdiction to be unenforceable, then the Terms & Conditions of Sale shall be deemed modified only to the extent necessary to make them enforceable.

15. CREDIT BALANCES: Buyer agrees that any credit balances issued will be applied within one (1) year of its issuance. IF NOT APPLIED OR REQUESTED WITHIN ONE (1) YEAR, ANY BALANCE REMAINING WILL BE SUBJECT TO CANCELLATION, AND SELLER SHALL HAVE NO FURTHER LIABILITY.

16. GENERAL PROVISION: (a) No action, regardless of form, arising out of transactions under the Agreement, may be brought by either party more than one (1) year after the cause of action has accrued. (b) UNLESS OTHERWISE SPECIFICALLY PROVIDED IN SELLER'S QUOTATION, GOODS AND SERVICES HEREUNDER ARE NOT INTENDED FOR USE IN ANY NUCLEAR OR NUCLEAR RELATED APPLICATIONS. Buyer (i) accepts Goods and Services in accordance with the restriction set forth in the immediately preceding sentence, (ii) agrees to communicate such restriction in writing to any and all subsequent purchasers or users and (iii) agrees to defend, indemnify and hold harmless Seller from any and all claims, losses, liabilities, suits, judgments and damages, including incidental and consequential damages, araising from use of Goods and Services in any nuclear or nuclear related applications, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability. (c) The 1980 United Nation Convention on Contracts for the International Sale of Goods does not apply to this Agreement. (d) Seller specifically objects to the application of any Federal Acquisition Regulation ("FAR") provision or clause to the Agreement.

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