



FISHING & INTERVENTION

FULL CIRCLE RELEASING SPEAR

Manual B210

**THE LEGACY
LIVES ON**

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OVERVIEW

Logan Full Circle Releasing Spears are used to internally engage and retrieve all sizes of tubing, drill pipe, and casing. They are designed to evenly distribute expansion strain over a long vertical section of a fish and ensure positive internal engagement. The design of the slip, and the effect of the body tapers upon the slip, permits tremendous pulling and jarring strains with no danger of distorting the fish. It may be used with internal cutters for cut and pull operations.

USE

The Logan Full Circle Releasing Spear can engage and retrieve tubing, casing, and drill pipe of all sizes. It may be used with other equipment such as internal cutters for cut and pull operations.

CONSTRUCTION

The Logan Full Circle Releasing Spear consists of a top sub with protector (on tubing and drill pipe spear assemblies only), body, sleeve (integral with the body), slip, unitizer, stop, safety ring, friction spring assembly or friction block with inner and outer block springs (depending on nominal size of spear), a two-piece retainer set, four retainer screws, and a bullnose nut (standard). Sub, mill, and sidehill type nuts are also available. The size and type of the upper box connection is furnished according to customer specification.

Some construction of the Full Circle Releasing Spear varies slightly according to size. Spears for tubing and drill pipe (sizes through 3-1/2" nominal, 4" O.D. tubing) utilize a friction spring assembly as the gripping mechanism. Tubing and drill pipe spears sized above 3-1/2" nominal, and all casing spears, use friction block assemblies.

Top Sub with Protector

Spears for tubing and drill pipe will utilize a top sub and a protector when a skirt or guide is not used.

The top sub serves as a stop. The lower end is suitably threaded to accept either a skirt or guide when these accessories are used. A protector prevents damage to the threads when they are not.

Body

A series of large tapers on the outside diameter of the body match similar tapers on the inside of the slips. During operation, the tapers cause the slips to expand and contact the fish. Lugs near the upper end of the body hold the upper ends of the slips in position.

Slips

The design of the full-circle slips allows easy entry into or withdrawal from the fish. The slips form an almost complete circumference when retracted, resulting in more slip engagement than most other spears. This design feature reduces the tendency to distort or rupture the fish.

Unitizer

The unitizer fits around the lower end of the body and holds the lower end of the slips in position. The unitizer is held in place by the stop, safety ring (or safety ring packoff), and nut on the lower end of the body.

Friction Retainer Set

The two-piece friction retainer set holds the friction blocks in place on all assemblies with 3-1/2" nominal tubing and above and all casing sizes. The friction retainer set is held in place with four friction retainer set screws.

Friction retainers for 3-1/2" tubing and smaller have integral friction springs.

Safety Ring

A properly sized safety ring prevents the spear from entering a fish with an inside diameter that is too small for the retracted slip to enter. This important safety feature ensures the ability to release from a fish a spear has penetrated.

The outside diameter of the safety ring should be slightly larger than the outside diameter of the slip in its retracted state. Therefore, the size of the safety ring should be carefully selected. *Refer to the Slip Range Charts on pages 21 – 25.*

Friction Block

Tubing and drill pipe spears with four-inch nominal tubing and above, and all casing spears, utilize friction block assemblies with inner and outer block springs as the friction grip mechanism.

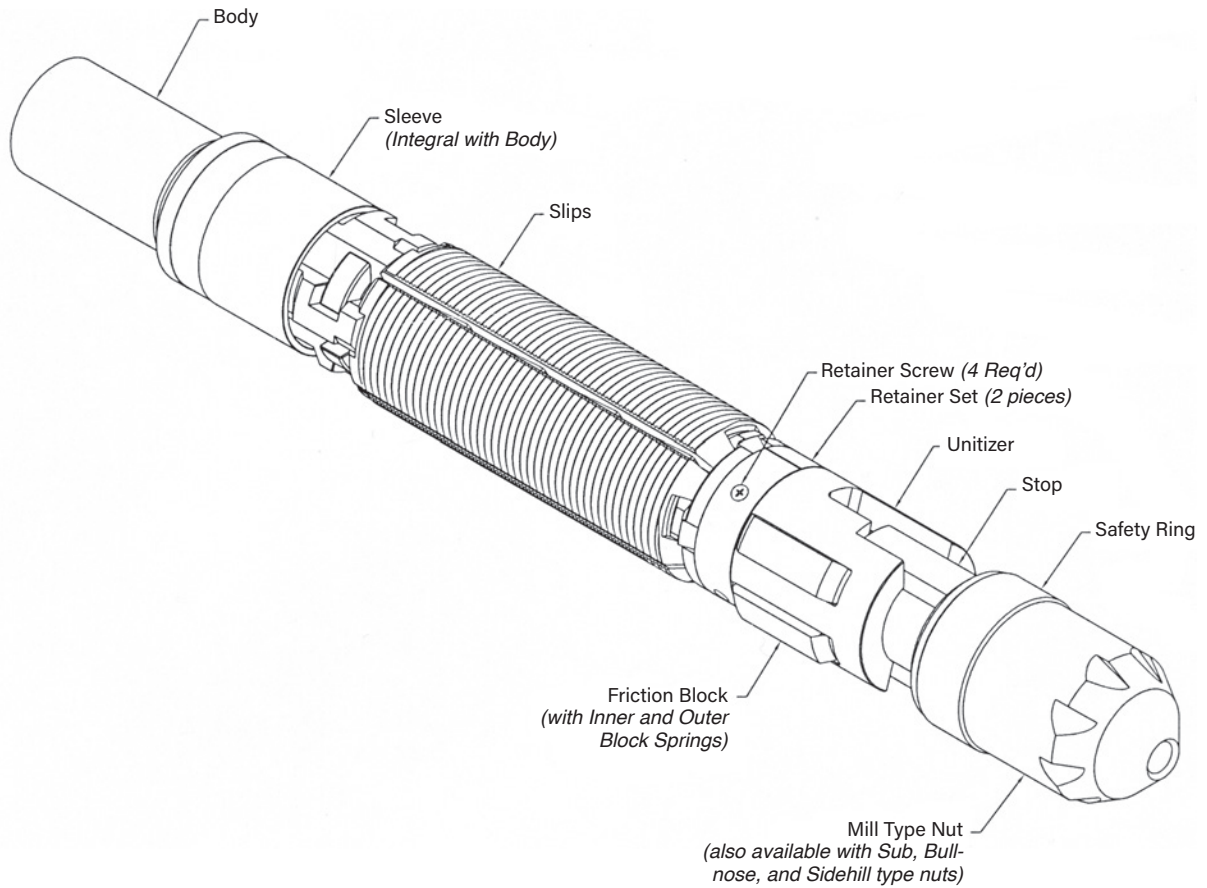
Friction blocks with springs contact the inner wall of the fish and hold the unitizer, friction retainer set, and slip in place until the shoulders of the tapers on the downwardly traveling body contact the end of the slip and the assembly is pushed into the fish to the desired depth.

Friction retainers on assemblies for 3-1/2" nominal tubing (including drill pipe and casing) and smaller utilize integral friction retainer springs.

Nut

The nut guides the spear into the fish. The standard bottom nut is a bullnose nut. Optional nut types — sub, mill, and sidehill — are available. *See Illustrations on page 4. Descriptions of these optional nuts and their usage can also be found on page 4.*

Full Circle Releasing Spear



OPTIONAL ACCESSORIES

Safety Ring Packoff

A safety ring packoff is substituted for the safety ring when it is necessary to circulate through a fish. A molded rubber packing ring is permanently bonded inside the steel body. Circulation pressure caused by fluid passing through the spear backs up against the rubber packing ring. The rubber lip expands against the inner walls of the fish to form a leak-proof seal. This pressure adds extra lifting power to the heavy upward pulling force exerted on the string. At the same time, circulation will help breakdown sediment or formation between the walls of the well bore and the fish, thereby freeing the fish.

The outside diameter of the safety ring should be slightly larger than the outside diameter of the slips in its retracted state. Therefore, the size of the safety ring should be carefully selected. Refer to Slip Range Charts on pages 21 – 25.

Extensions

In the event the upper end of the fish cannot be engaged, an extension installed between the top sub and body will permit the spear to penetrate the fish to the desired depth. As many extensions as needed to reach the desired depth may be installed. Three-foot-long extensions are available for drill pipe and tubing spears only. Extensions are bored for fluid circulation.

Mill Type Nut

A mill type nut is used to cut away a distorted end of a fish to ensure that the spear enters the fish. It can also effectively drill out sand from a plugged fish.

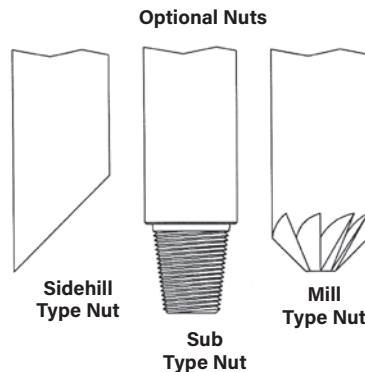
Sidehill Type Nut

When a fish is embedded in the side wall of a hole or is badly out of line, a sidehill type nut can be used to align the spear to the fish.

After the top of the fish has been reached, the fishing string is repeatedly elevated, partially rotated, and lowered until the leading edge of the sidehill type nut contacts the top of the fish that overlaps the well bore. The fish will then be directed into the spear.

Sub Type Nut

When the use of other tools is required below the spear, such as an internal cutter, a sub type nut replaces the standard bullnose nut to provide the necessary thread connection.

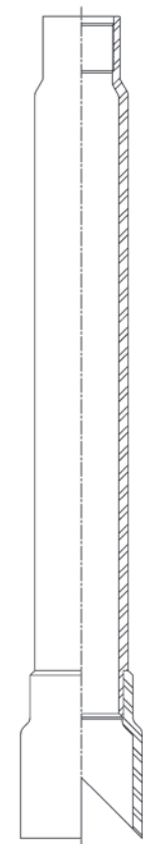


Skirts and Guides

When a hole size is larger than the diameter of the fish, the spear may pass alongside the fish without engaging it. To ensure alignment of the fish with the spear, a drill pipe or tubing Spear can be dressed with a Logan Full Circle Releasing Spear Skirt to easily guide the fish into the spear. The skirt is installed on the top sub in place of the protector (integral with the body).

For larger size holes, the Logan Full Circle Releasing Spear Guide can be installed on the bottom of the skirt. The guide will ensure alignment of the fish with the spear and properly guide the fish into the spear.

See page 19 for Full Circle Releasing Spear Skirts and page 20 for Full Circle Releasing Spear Guides ordering information.



Skirt and Guide

Stop Sub Assembly

The Logan Releasing Spear Stop Sub Assembly is an accessory designed to convert a releasing spear with a flush-type mandrel into a shouldered type spear. It is installed in the box connection at the top of the mandrel when the use of a positive stop is desired or required. A stop sub is particularly useful in spear operations to locate the top of a fish, to control penetration into a fish, and to bump against a fish. Stop subs can be installed anywhere above the spear and will not affect the operating mechanism.

A stop ring can be added to increase shoulder diameter. All stop rings are furnished with left-hand threads.

See page 27 for Full Circle Releasing Spear Stop Sub Assemblies and ordering information.

OPERATION

Check the specification tables on pages 8 – 17 and slip range charts on pages 21 – 25 to verify the Logan Full Circle Releasing Spear is the proper size for the fish to be caught.

Pay particular attention to the slip size and the safety ring (or safety ring pack-off) size. The outside diameter of the safety ring or safety ring pack-off should be slightly larger than the outside diameter of the slips in the retracted state. Therefore, the size should be carefully selected.

Properly assemble the tool and determine that it is in good working condition. Connect the spear to the bottom of the fishing string. The spear should be in the retracted position with the upper and lower end of the slips engaged with the lugs on the body and the unitizer. In this position, the retracted slips are pressed inward and will not engage the pipe as the spear is run in the hole.

PRECAUTION: Always maintain a moderate upward strain on the fishing string when rotating in either direction during operation.

Engaging and Pulling the Fish

The Logan Full Circle Releasing Spear is made up to the bottom of the fishing string. As the fishing string is slowly lowered, the nut will direct the spear into the fish. Continue lowering the string until the spear enters the fish.

The friction blocks will contact the inner wall of the fish and hold the unitizer, friction retainer, and slips stationary until the shoulders tapers on the downward traveling body make contact with the shoulders tapers of the slips and push the spear into the fish at the desired depth.

With the slips now in their uppermost position relative to the body, rotate the fishing string at least one-sixth (1/6) of a turn to the left (counter-clockwise) for a right-hand spears to move the spear into engaging position.

NOTE: For left-hand spears, follow the instructions, except rotate to the right (clockwise) to engage the fish and to the left (counter-clockwise) to release the fish.

NOTE: In deep or crooked holes, it may be necessary to rotate the string more than one-sixth (1/6) of a turn. Additional rotation will not harm the operation of the spear.

When the fishing string is rotated to the left, the slips are held stationary by the friction block. The body travels downward until the lugs at the upper end of the body become disengaged from the slots in the upper fingers of the slips. The keys on the stop will simultaneously disengage from the recesses in the unitizer.

When the fishing string is raised, the friction block will hold the slips stationary. The tapers on the upwardly traveling body will expand the fingers of the slips, allowing them to fully encircle and tightly engage the fish.

Releasing a Fish

PRECAUTION: Always bump down the full weight of the fishing string before beginning the releasing operation.

Bump down the full weight of the fishing string to break the hold. Rotate the string at least one-sixth (1/6) of a turn to the right (clockwise) for right-hand spears. (See note regarding left-hand spears.)

NOTE: In deep or crooked holes, it may be necessary to rotate the string more than one-sixth (1/6) of a turn. Additional rotation will not harm the operation of the spear.

When the fishing string is rotated to the right (see note regarding left-hand spears) and bumped down, the slips are held stationary by the friction block. The body travels downward until the lugs on the upper end of the body are opposite the slots in the upper fingers of the slips. The keys of the stop will position themselves into the recesses of the unitizer. In this position, the tapers of the body cannot expand the fingers of the slips into the fish. The spear can now be pulled up or down within the fish.

A straight upward pull will release the spear from the fish. Elevate the fishing string until it clears the fish.

If the spear will not release from the fish, bump down and simultaneously rotate the string to the right (clockwise) for right-hand spears. (See note regarding left-hand spears.) Slowly raise the string until the spear clears the fish. It is important to combine rotation with elevation to unscrew the spear from the fish. Continue with slow, rotation until the spear is clear of the fish.

NOTE: For left-hand spears, follow the instructions, except rotate to the right (clockwise) to engage the fish and to the left (counter-clockwise) to release the fish.

Left-hand wickers are cut on the slips, the lugs on the body, and the keys on the stop as a secondary releasing mechanism to force the slips to rotate with the spear. After bumping down the string to release the hold, the combination of right-hand rotation (see note regarding left-hand spears) with slow elevation will unscrew the spear from the fish.

ASSEMBLY

The Logan Full Circle Releasing Spear can be assembled at the rig site where it will be used.

Check all parts to ensure that they are in good working condition before beginning assembly. Make sure the Releasing Spear is the proper size for the operation. Refer to the Full Circle Releasing Spear Slip Range Charts on pages 21 – 25.

Thoroughly clean and lubricate parts. If the tool will be stored for a long period, paint or lubricate the exterior surfaces to prevent corrosion.

NOTE: Do not paint or lubricate the safety ring pack-off. Paint, sunlight, solvents, and most lubricants are harmful to rubber products.

Referring to the illustrations on pages 3 and 7, proceed with assembly as follows:

1. Clamp the Full Circle Releasing Spear horizontally into a suitable vise, securing the upper body end.

CAUTION: Use only enough grip-ping action in the vise to break the connections. Avoid making heavy tool marks.

2. For spears 2-3/8" thru 5-1/2" nominal size, install the top sub (includes protector) onto the body.

NOTE: The sleeve is integral with the body.

3. Place the slips on the body.

NOTE: Use a tie strap or harness to hold the slips in place while the upper slip fingers are inserted into the sleeve.

4. Slide the unitizer, friction spring with integral friction retainer (for 2-3/8" thru 3-1/2" tubing)*, stop, and safety ring (or safety ring pack-off) onto the body. Make sure the slip fingers are engaged in the unitizer.

*** For spears sized for 4" drill pipe thru 13-3/8" casing, skip to step 6.**

5. Install the two-piece retainer set and tighten the four retainer set screws.
6. For spears sized for 4" drill pipe thru 13-3/8" casing, slide the friction block (with inner and outer block springs) onto the unitizer.
7. Install the nut onto the body and tighten the set screw in the nut.
8. Tighten all connections to the recommended torque before running the tool in the hole.
9. Paint or lubricate exterior surfaces to prevent corrosion.

NOTE: Do not paint or lubricate the safety ring pack-off. Paint, sunlight, solvents, and most lubricants are harmful to rubber products.

Assembly is now complete and the tool is ready for service.

MAINTENANCE

Maintenance of the Logan Full Circle Releasing Spear is simple but important. After each use, the tool should be completely disassembled, thoroughly inspected, cleaned, and repaired as required. Routine maintenance will guard against misruns and prolong the life of the tool.

Before reassembling, inspect all parts for damage and wear. Replace worn or damaged parts to ensure safe operation. Clean and lubricate parts as they are reassembled. Grease or paint the exterior surfaces to prevent corrosion.

NOTE: Do not paint or lubricate the safety ring pack-off. Paint, sunlight, solvents, and most lubricants are harmful to rubber products.

Disassembly

Referring to the illustrations on page 3 and 7, proceed with disassembly as follows:

CAUTION: Use only enough grip-ping action in the vise to break the connections. Avoid making heavy tool marks.

1. Clamp the Full Circle Releasing Spear horizontally into a suitable vise, securing the upper body end.

NOTE: The sleeve is integral with the body. A damaged sleeve must be machined off the body and a new one welded on.

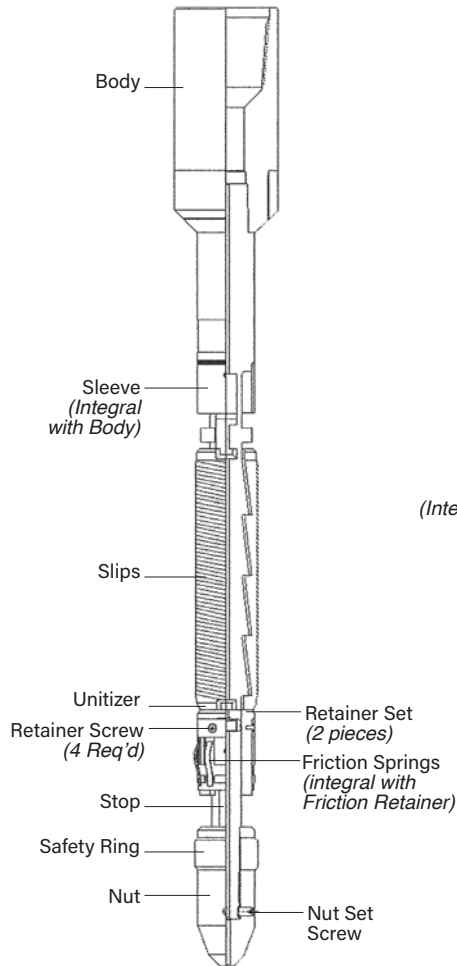
2. Loosen the nut set screw in the nut and remove the nut from the body.
3. Slide the safety ring (or safety ring pack-off), stop, and unitizer from the body.
4. Slide the friction block (with inner and outer block springs) down the unitizer and remove.

CAUTION: Inner and outer friction block springs are highly compressed when installed. Exercise care when removing springs from the friction block.

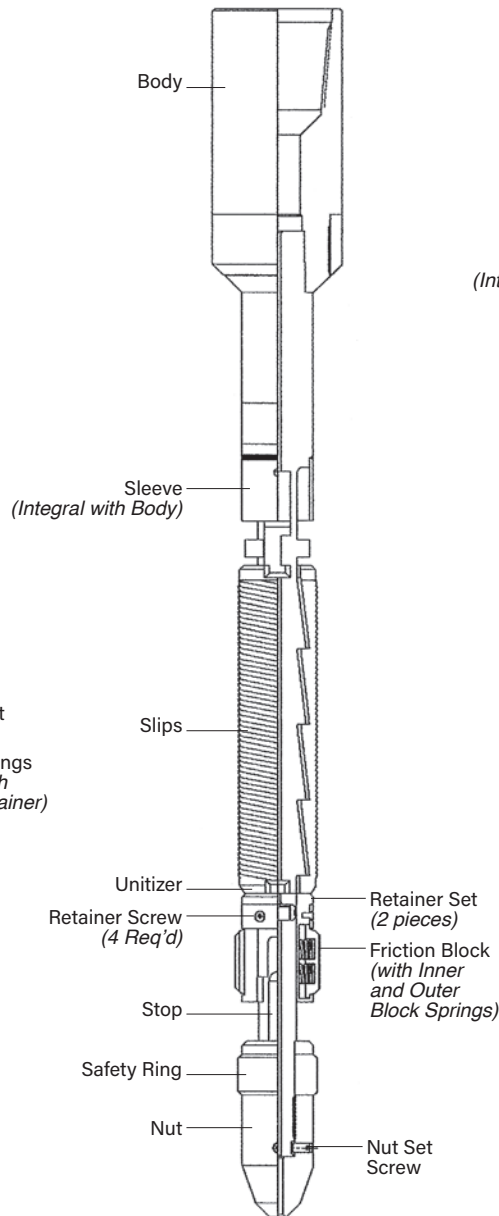
5. Unscrew the four retainer screws and remove the two-piece retainer set.
6. Lift the slips off the body.

Disassembly is now complete.

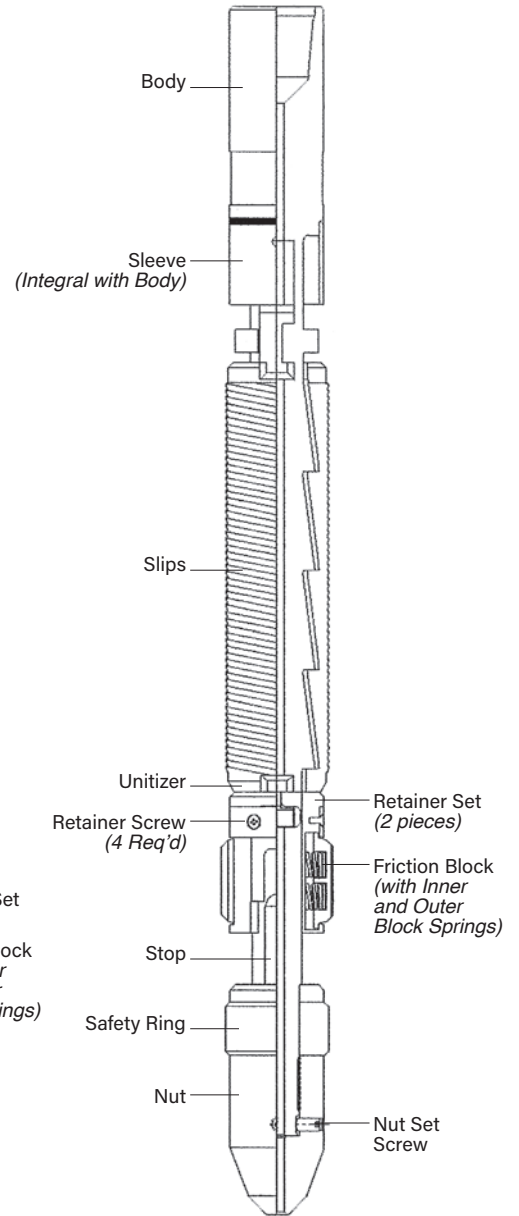
Full Circle Releasing Spear



**Logan Full Circle Releasing Spear
with Friction Retainer Springs
for 2-3/8" thru 3-1/2" Tubing**



**Logan Full Circle Releasing Spear
with Friction Blocks
for 4" thru 5-1/2" Drill Pipe**



**Logan Full Circle Releasing Spear
with Friction Blocks
for 4-1/2" thru 13-3/8" Casing**

Full Circle Releasing Spear

NOMINAL SIZE		2-3/8 DP	2-3/8 Tbg	2-7/8 DP	2-7/8 Tbg	3-1/2 DP	3-1/2 Tbg	4 DP
RECOMMENDED CATCHING RANGE †		2-3/8 DP	2-3/8 Tbg	2-7/8 DP	2-7/8 Tbg	3-1/2 DP	3-1/2 Tbg	4 DP
OD SMALLEST SLIPS RETRACTED		1-11/16	1-29/32	2	2-5/16	2-7/16	2-13/16	3-3/32
EXPANSION SLIPS OVER SAFETY RING		11/32	11/32	3/8	3/8	13/32	13/32	15/32
SLIP ENGAGEMENT AREA (SQ IN)		55	59	74	87	95	115	126
COMPLETE ASSEMBLY	Logan Part No.	204-000	204-001	204-002	204-003	204-004	204-005	204-006
	Bowen No.	6175	6693	6246	6684	7640	6701	7648
TOP SUB *	Logan Part No.	AV1000	AV1001	AV1002	AV1003	AV1004	AV1005	AV1006
<i>(Includes Protector)</i>	Bowen No.	6176	5858	6247	5774	6363	6702	6676
PROTECTOR	Logan Part No.	AV2000	AV2001	AV2002	AV2003	AV2004	AV2005	AV2006
	Bowen No.	6176-1	5858-1	6247-1	5774-1	6363-1	6702-1	6676-1
BODY **	Logan Part No.	AV3000	AV3001	AV3002	AV3003	AV3004	AV3005	AV3006
	Bowen No.	6177	6694	6248	6685	7641	6703	7649
SLIP	Logan Part No.	AV4000	AV4001	AV4002	AV4003	AV4004	AV4005	AV4006
<i>(Includes Fingers)</i>	Bowen No.	6178	6695	6249	6686	C7642	6704	7650
	No. Req'd.	3	3	3	3	3	3	3
UNITIZER	Logan Part No.	AV5000	AV5001	AV5002	AV5003	AV5004	AV5005	...
	Bowen No.	6179	6696	6250	6687	A7643	A6705	...
FRICTION RETAINER	Logan Part No.	AV6000	AV6001	AV6002	AV6003	AV6004	AV6005	...
<i>(Includes Springs)</i>	Bowen No.	6546F	6697F	A6542F	6688F	7644F	A6706F	...
FRICTION RETAINER	Logan Part No.	AV7000	AV7000	AV7000	AV7000	AV7000	AV7001	...
SCREWS	Bowen No.	6423	6423	6423	6423	6423	23508	...
	No. Req'd.	4	4	4	4	4	4	...
FRICTION RETAINER	Logan Part No.	AV8000	AV8000	AV8001	AV8001	AV8002	AV8002	...
SPRINGS	Bowen No.	8951	8951	8945	8945	A8952	A8952	...
	No. Req'd.	8	8	10	10	12	12	...
FRICTION BLOCK ASSY.	Logan Part No.	...	...	...	...	...	...	AV90000
<i>Consists of:</i>	Bowen No.	...	...	...	...	...	...	14931
UNITIZER	Logan Part No.	...	...	...	...	...	...	AV10000
	Bowen No.	...	...	...	...	...	...	14932
RETAINER SET	Logan Part No.	...	...	...	...	...	...	AV11000
<i>(2 pieces)</i>	Bowen No.	...	...	...	...	...	...	14933
FRICTION BLOCK	Logan Part No.	...	...	...	...	...	...	AV12000
	Bowen No.	...	...	...	...	...	...	14934
	No. Req'd.	...	...	...	...	...	...	2
RETAINER SCREW	Logan Part No.	...	...	...	...	...	...	AV13000
	Bowen No.	...	...	...	...	...	...	15964
	No. Req'd.	...	...	...	...	...	...	4
OUTER BLOCK SPRING	Logan Part No.	...	...	...	...	...	...	AV14000
	Bowen No.	...	...	...	...	...	...	14935
	No. Req'd.	...	...	...	...	...	...	4
INNER BLOCK SPRING	Logan Part No.	...	...	...	...	...	...	AV15000
	Bowen No.	...	...	...	...	...	...	14936
	No. Req'd.	...	...	...	...	...	...	4
STOP	Logan Part No.	AV16000	AV16001	AV16002	AV16003	AV16004	AV16005	AV16006
	Bowen No.	7638	6961	7639	A7452	A7645	7647	7653
SAFETY RING	Logan Part No.	AV17000	AV17001	AV17002	AV17003	AV17004	AV17005	AV17006
	Bowen No.	6547	6545	6543	6424	6541	6707	6681
NUT	Logan Part No.	AV18000	AV18001	AV18002	AV18003	AV18004	AV18005	AV18006
	Bowen No.	6180	5864	6251	6345	6267	6708	6682
NUT SET SCREW	Logan Part No.	AV19000	AV19000	AV19001	AV19001	AV19001	AV19002	AV19003
	Bowen No.	23330	23330	17762	17762	17762	23358	23345
	No. Req'd.	2	2	2	2	2	2	2

† Size and weight of pipe to be caught.

* Top Sub can be left oversized for larger OD drill pipe and tubing connections.

** Body OD is maximum for casing ID.

Full Circle Releasing Spear

NOMINAL SIZE		2-3/8 DP	2-3/8 Tbg	2-7/8 DP	2-7/8 Tbg	3-1/2 DP	3-1/2 Tbg	4 DP
RECOMMENDED CATCHING RANGE †		2-3/8 DP	2-3/8 Tbg	2-7/8 DP	2-7/8 Tbg	3-1/2 DP	3-1/2 Tbg	4 DP
OD SMALLEST SLIPS RETRACTED		1-11/16	1-29/32	2	2-5/16	2-7/16	2-13/16	3-3/32
EXPANSION SLIPS OVER SAFETY RING		11/32	11/32	3/8	3/8	13/32	13/32	15/32
SLIP ENGAGEMENT AREA (SQ IN)		55	59	74	87	95	115	126
COMPLETE ASSEMBLY	Logan Part No.	204-000	204-001	204-002	204-003	204-004	204-005	204-006
	Bowen No.	6175	6693	6246	6684	7640	6701	7648

OPTIONAL ACCESSORIES

UNITIZER	Logan Part No.	...	...	...	...	...	...	AV20000
	Bowen No.	...	...	...	...	...	...	7651
FRICTION RETAINER <i>(Includes Springs)</i>	Logan Part No.	...	...	...	...	...	...	AV21000
	Bowen No.	...	...	...	...	...	...	7652F
FRICTION RETAINER SCREWS	Logan Part No.	...	...	...	...	...	...	AV22000
	Bowen No.	...	...	...	...	...	...	23508
	No. Req'd.	...	...	...	...	...	...	4
FRICTION RETAINER SPRINGS	Logan Part No.	...	...	...	...	...	...	AV23000
	Bowen No.	...	...	...	...	...	...	A8953
	No. Req'd.	...	...	...	...	...	...	12
FRICTION BLOCK	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...

OPTIONAL ACCESSORIES

SAFETY RING PACKOFF	Logan Part No.	AV25000	AV25001	AV25002	AV25003	AV25004	AV25005	AV25006
	Bowen No.	6181	6174	6252	5779	6268	6709	6683
EXTENSION <i>(3 feet long)</i>	Logan Part No.	AV26000	AV26001	AV26002	AV26003	AV26004	AV26005	AV26006
	Bowen No.	6176-6177	5858-6694	6247-6248	5771-6685	6263-7641	6702-6703	6676-7649
MILL TYPE NUT	Logan Part No.	AV18000-A	AV18001-A	AV18002-A	AV18003-A	AV18004-A	AV18005-A	AV18006-A
	Bowen No.	6180A	5864A	6251A	6345A	6267A	6708A	6682A
SUB TYPE NUT	Logan Part No.	AV18000-B	AV18001-B	AV18002-B	AV18003-B	AV18004-B	AV18005-B	AV18006-B
	Bowen No.	6180B	5864B	6251B	6345B	6267B	6708B	6682B
SIDEHILL TYPE NUT	Logan Part No.	AV18000-C	AV18001-C	AV18002-C	AV18003-C	AV18004-C	AV18005-C	AV18006-C
	Bowen No.	6180C	5864C	6251C	6345C	6267C	6708C	6682C

† Size and weight of pipe to be caught.

* Top Sub can be left oversized for larger OD drill pipe and tubing connections.

** Body OD is maximum for casing ID.

See Tool Joint OD Chart on page 18.

Logan Oil Tools reserves the right to change or discontinue designs without notice.

When ordering, please specify:

- (1) Complete assembly or part number
- (2) Size and type of top connection
- (3) Size and type of fish to be caught

Recommended Spare Parts:

- (1) 2 sets of Slips for each size
- (2) 1 Safety Ring for each size
- (3) 1 Unitizer and 2 Friction Retainers on 2-3/8" to 3-1/2" Tubing Spears
or 2 Friction Block Assemblies on 4" Tubing Spears and larger
- (4) 1 Stop

Full Circle Releasing Spear

NOMINAL SIZE		4 Tbg	4-1/2 DP	5-1/2 DP	4-1/2 Csg	5 Csg	5-1/2 Csg	6 Csg
RECOMMENDED CATCHING RANGE †		4 Tbg	4-1/2 DP & 5-9/16 DP	5-1/2 & 5 Csg	4-1/2, 4-3/4	5 Csg	5-1/2 Csg	6 Csg
OD SMALLEST SLIPS RETRACTED		3-5/16	3-15/32	4-1/2	3-25/32	4	4-1/2	5-1/2
EXPANSION SLIPS OVER SAFETY RING		15/32	1/2	9/16	1/2	1/2	9/16	9/16
SLIP ENGAGEMENT AREA (SQ IN)		136	178	265	210	217	265	315
COMPLETE ASSEMBLY	Logan Part No.	204-007	204-008	204-009	204-010	204-011	204-012	204-013
	Bowen No.	6710	6715	6723	10536	9337	9342	9347
TOP SUB *	Logan Part No.	AV1007	AV1008	AV1009	...	...	...	...
<i>(Includes Protector)</i>	Bowen No.	5839	6270	6277	...	...	...	...
PROTECTOR	Logan Part No.	AV2007	AV2008	AV2009	...	...	...	...
	Bowen No.	5839-1	6270-1	6277-1	...	...	...	...
BODY **	Logan Part No.	AV3007	AV3008	AV3009	AV3010	AV3011	AV3012	AV3013
	Bowen No.	6711	6716	6724	10537	C9338	9343	9348
SLIP	Logan Part No.	AV4007	AV4008	AV4009	AV4010	AV4011	AV4012	AV4013
<i>(Includes Fingers)</i>	Bowen No.	6712	6717	6725	10538	9339	9344	9349
	No. Req'd.	3	3	4	3	3	4	4
UNITIZER	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
FRICTION RETAINER	Logan Part No.	...	...	...	...	...	...	...
<i>(Includes Springs)</i>	Bowen No.	...	...	...	...	...	...	...
	Price	...	...	...	...	...	...	...
FRICTION RETAINER	Logan Part No.	...	...	...	...	...	...	...
SCREWS	Bowen No.	...	...	...	...	...	...	...
	No. Req'd.	...	...	...	...	...	...	...
FRICTION RETAINER	Logan Part No.	...	...	...	...	...	...	...
SPRINGS	Bowen No.	...	...	...	...	...	...	...

† Size and weight of pipe to be caught.

* Top Sub can be left oversized for larger OD drill pipe and tubing connections.

** Body OD is maximum for casing ID.

See Tool Joint OD Chart on page 18.

Logan Oil Tools reserves the right to change or discontinue designs without notice.

When ordering, please specify:

- (1) Complete assembly or part number
- (2) Size and type of top connection
- (3) Size and type of fish to be caught

Recommended Spare Parts:

- (1) 2 sets of Slips for each size
- (2) 1 Safety Ring for each size
- (3) 1 Unitizer and 2 Friction Retainers on 2-3/8" to 3-1/2" Tubing Spears
or 2 Friction Block Assemblies on 4" Tubing Spears and larger
- (4) 1 Stop

Full Circle Releasing Spear

NOMINAL SIZE		4 Tbg	4-1/2 DP	5-1/2 DP	4-1/2 Csg	5 Csg	5-1/2 Csg	6 Csg
RECOMMENDED CATCHING RANGE †		4 Tbg	4-1/2 DP & 5-9/16 DP	5-1/2 & 5 Csg	4-1/2, 4-3/4	5 Csg	5-1/2 Csg	6 Csg
OD SMALLEST SLIPS RETRACTED		3-5/16	3-15/32	4-1/2	3-25/32	4	4-1/2	5-1/2
EXPANSION SLIPS OVER SAFETY RING		15/32	1/2	9/16	1/2	1/2	9/16	9/16
SLIP ENGAGEMENT AREA (SQ IN)		136	178	265	210	217	265	315
COMPLETE ASSEMBLY	Logan Part No.	204-007	204-008	204-009	204-010	204-011	204-012	204-013
	Bowen No.	6710	6715	6723	10536	9337	9342	9347
FRICTION BLOCK ASSEMBLY	Logan Part No.	AV90001	AV90002	AV90003	AV90004	AV90005	AV90006	AV90007
	Bowen No.	14901	14937	14838	14923	14943	14949	14950
	<i>Consists of:</i>							
UNITIZER	Logan Part No.	AV10001	AV10002	AV10003	AV10004	AV10005	AV10006	AV10007
	Bowen No.	14902	14938	14839	14924	14944	14962	14951
RETAINER SET (2 pieces)	Logan Part No.	AV11001	AV11002	AV11003	AV11004	AV11005	AV11006	AV11007
	Bowen No.	14903	14939	14841	14925	14945	14841	14952
FRICTION BLOCK	Logan Part No.	AV12001	AV12002	AV12003	AV12004	AV12005	AV12006	AV12007
	Bowen No.	14904	14940	14840	14927	14946	14840	14953
	No. Req'd.	2	2	4	2	2	4	4
RETAINER SCREW	Logan Part No.	AV13001	AV13000	AV13002	AV13000	AV13002	AV13002	AV13003
	Bowen No.	23108	15964	25214	15964	25214	25214	23126
	No. Req'd.	4	4	4	4	4	4	4
OUTER BLOCK SPRING	Logan Part No.	AV14001	AV14002	AV14003	AV14004	AV14005	AV14006	AV14007
	Bowen No.	14919	14941	14842	14926	14947	14842	14954
	No. Req'd.	4	4	8	2		4	4
INNER BLOCK SPRING	Logan Part No.	AV15001	AV15002	AV15003	AV15004	AV15005	AV15006	AV15007
	Bowen No.	14920	14942	14837	16589	14948	14837	14955
	No. Req'd.	4	4	8	2	2	4	4
STOP	Logan Part No.	AV16007	AV16008	AV16009	AV16010	AV16011	AV16009	AV16012
	Bowen No.	7654	7655	7454	A7603	A7580	7454	7597
SAFETY RING	Logan Part No.	AV17007	AV17008	AV17012	AV17010	AV17011	AV17012	AV17013
	Bowen No.	6539	6720	6485	6733	7581	6485	6520
NUT	Logan Part No.	AV18007	AV18008	AV18012	AV18010	AV18011	AV18012	AV18013
	Bowen No.	5729	6721	6483	6376	7582	6483	6040
NUT SET SCREW	Logan Part No.	AV19004	AV19005	AV19006	AV19005	AV19005	AV19006	AV19006
	Bowen No.	23366	23368	23379	23368	23368	23379	23379
	No. Req'd.	2	2	2	2	2	2	2

† Size and weight of pipe to be caught.

Logan Oil Tools reserves the right to change or discontinue designs without notice.

When ordering, please specify:

- (1) Complete assembly or part number
- (2) Size and type of top connection
- (3) Size and type of fish to be caught

Recommended Spare Parts:

- (1) 2 sets of Slips for each size
- (2) 1 Safety Ring for each size
- (3) 1 Unitizer and 2 Friction Retainers on 2-3/8" to 3-1/2" Tubing Spears
or 2 Friction Block Assemblies on 4" Tubing Spears and larger
- (4) 1 Stop

Full Circle Releasing Spear

NOMINAL SIZE		4 Tbg	4-1/2 DP	5-1/2 DP	4-1/2 Csg	5 Csg	5-1/2 Csg	6 Csg
RECOMMENDED CATCHING RANGE †		4 Tbg	4-1/2 DP & 5-9/16 DP	5-1/2 & 5 Csg	4-1/2, 4-3/4	5 Csg	5-1/2 Csg	6 Csg
OD SMALLEST SLIPS RETRACTED		3-5/16	3-15/32	4-1/2	3-25/32	4	4-1/2	5-1/2
EXPANSION SLIPS OVER SAFETY RING		15/32	1/2	9/16	1/2	1/2	9/16	9/16
SLIP ENGAGEMENT AREA (SQ IN)		136	178	265	210	217	265	315
COMPLETE ASSEMBLY	Logan Part No.	204-007	204-008	204-009	204-010	204-011	204-012	204-013
	Bowen No.	6710	6715	6723	10536	9337	9342	9347

OPTIONAL COMPONENTS

UNITIZER	Logan Part No.	AV20001	AV20002	AV20003	AV20004	AV20005	AV20006	AV20007
	Bowen No.	B6713	6718	6726	10539	B9340	9345	9350
FRICITION RETAINER <i>(Includes Springs)</i>	Logan Part No.	AV21001	AV21002	AV21003	AV21004	AV21005	AV21006	AV21007
	Bowen No.	6714F	6719F	6727F	10540	9341	9346	9351
FRICITION RETAINER SCREWS	Logan Part No.	AV22000	AV22000	AV22001	AV22001	AV22001	AV22001	AV22002
	Bowen No.	23508	23508	25214	25214	25214	25214	23518
	No. Req'd.	4	4	4	4	4	4	4
FRICITION RETAINER SPRINGS	Logan Part No.	AV23000	AV23000	AV23001	AV23002	AV23002	AV23002	AV23003
	Bowen No.	A8953	A8953	8918	10541	10541	10541	9606
	No. Req'd.	12	14	16	14	14	16	18
FRICITION BLOCK	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...

OPTIONAL ACCESSORIES

SAFETY RING	Logan Part No.	AV25007	AV25008	AV25009	AV25010	AV25011	AV25009	AV25012
PACK-OFF	Bowen No.	5730	6722	6484	6734	A7583	6484	6041
EXTENSION <i>(3 feet long)</i>	Logan Part No.	AV26007	AV26008	AV26009	...	...	...	...
	Bowen No.	5839-6711	6270-6716	6277-6724	...	...	...	...
MILL TYPE NUT	Logan Part No.	AV18007-A	AV18008-A	AV18009-A	AV18010-A	AV18011-A	AV18012-A	AV18013-A
	Bowen No.	5729A	6721A	6483A	6376A	7582A	6483A	6040A
SUB TYPE NUT	Logan Part No.	AV18007-B	AV18008-B	AV18009-B	AV18010-B	AV18011-B	AV18012-B	AV18013-B
	Bowen No.	5729B	6721B	6483B	6376B	7582B	6483B	6040B
SIDEHILL TYPE NUT	Logan Part No.	AV18007-C	AV18008-C	AV18009-C	AV18010-C	AV18011-C	AV18012-C	AV18013-C
	Bowen No.	5729C	6721C	6483C	6376C	7582C	6483C	6040C

† Size and weight of pipe to be caught.

Logan Oil Tools reserves the right to change or discontinue designs without notice.

Full Circle Releasing Spear

NOMINAL SIZE		6-5/8 Csg	7 Csg	7-5/8 Csg	8-5/8 Csg	9-5/8 Csg	10-3/4 Csg	11-3/4 Csg
RECOMMENDED CATCHING RANGE		6-5/8 Csg	7 Csg	7-5/8 Csg & 9 Csg	8-5/8 & 10 Csg	9-5/8	10-3/4 Csg 12 Csg	11-3/4 to
OD SMALLEST SLIPS RETRACTED †		5-1/2	5-3/4	6-7/16	7-1/4	8-3/16	9-1/2	10-9/16
EXPANSION SLIPS OVER SAFETY RING		5/8	5/8	5/8	11/16	3/4	13/16	13/16
SLIP ENGAGEMENT AREA (SQ IN)		350	365	430	485	580	690	785
COMPLETE ASSEMBLY	Logan Part No.	204-014	204-015	204-016	204-017	204-018	204-019	204-020
	Bowen No.	9796	9352	10608	6318	10473	6067	6073
TOP SUB *	Logan Part No.	...	...	...	...	...	...	...
<i>(Includes Protector)</i>	Bowen No.	...	...	...	...	...	...	...
PROTECTOR	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
BODY **	Logan Part No.	AV3014	AV3015	AV3016	AV3017	AV3018	AV3019	AV3020
	Bowen No.	9797	9353	10609	6319	10474	6068	6074
SLIP	Logan Part No.	AV4014	AV4015	AV4016	AV4017	AV4018	AV4019	AV4020
<i>(Includes Fingers)</i>	Bowen No.	9798	9354	10610	6320	10475	6069	6075
	No. Req'd.	4	4	4	4	4	6	6
UNITIZER	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
FRICTION RETAINER	Logan Part No.	...	...	...	...	...	...	...
<i>(Includes Springs)</i>	Bowen No.	...	...	...	...	...	...	...
FRICTION RETAINER	Logan Part No.	...	...	...	...	...	...	...
SCREWS	Bowen No.	...	...	...	...	...	...	...
	No. Req'd.	...	...	...	...	...	...	...
FRICTION RETAINER	Logan Part No.	...	...	...	...	...	...	...
SPRINGS	Bowen No.	...	...	...	...	...	...	...
FRICTION BLOCK	Logan Part No.	AV90008	AV90009	AV90010	AV90011	AV90012	AV90013	AV90014
ASSEMBLY	Bowen No.	14956	14958	14964	14970	14976	14981	14986
<i>Consists of:</i>								
UNITIZER	Logan Part No.	AV10008	AV10009	AV10010	AV10011	AV10012	AV10013	AV10014
	Bowen No.	14957	14959	14965	14971	14977	14982	14987
RETAINER SET	Logan Part No.	AV11008	AV11009	AV11010	AV11011	AV11012	AV11013	AV11014
<i>(2 pieces)</i>	Bowen No.	14834	14960	14966	14972	14978	14983	14988
FRICTION BLOCK	Logan Part No.	AV12008	AV12009	AV12010	AV12011	AV12012	AV12013	AV12014
	Bowen No.	14835	14961	14967	14973	14979	14984	14989
	No. Req'd.	4	4	4	4	4	4	6
RETAINER SCREW	Logan Part No.	AV13001	AV13001	AV13004	AV13004	AV13004	AV13004	AV13004
	Bowen No.	23108	23108	25221	25221	25221	25221	25221
	No. Req'd.	4	4	4	4	4	4	4
OUTER BLOCK SPRING	Logan Part No.	AV14008	AV14008	AV14009	AV14010	AV14011	AV14011	AV14014
	Bowen No.	14836	14836	14968	14974	17694	17694	14990
	No. Req'd.	8	8	8	8	12	12	18
INNER BLOCK SPRING	Logan Part No.	AV15006	AV15006	AV15008	AV15009	AV15010	AV15010	...
	Bowen No.	14837	14837	14969	14975	11816	11816	...
	No. Req'd.	8	8	8	8	12	12	...
STOP	Logan Part No.	AV16013	AV16014	AV16015	AV16016	AV16018	AV16017	AV16019
	Bowen No.	B6965	7609	7626	7494	7531	7627	7628
SAFETY RING	Logan Part No.	AV17014	AV17015	AV17016	AV17017	AV17018	AV17019	AV17020
	Bowen No.	6488	6522	6524	6528	6531	6533	6535
NUT	Logan Part No.	AV18014	AV18015	AV18016	AV18017	AV18018	AV18019	AV18020
	Bowen No.	6108	6046	6054	6321	6062	6071	6079
NUT SET SCREW	Logan Part No.	AV19006	AV19006	AV19007	AV19007	AV19007	AV19008	AV19008
	Bowen No.	23379	23379	23386	23386	23386	41056	41056
	No. Req'd.	2	2	2	2	2	2	2

† Size and weight of pipe to be caught.

* Top Sub can be left oversized for larger OD drill pipe and tubing connections.

** Body OD is maximum for casing ID.

Full Circle Releasing Spear

NOMINAL SIZE		6-5/8 Csg	7 Csg	7-5/8 Csg	8-5/8 Csg	9-5/8 Csg	10-3/4 Csg	11-3/4 Csg
RECOMMENDED CATCHING RANGE †		6-5/8 Csg	7 Csg	7-5/8 Csg & 9 Csg	8-5/8 & 10 Csg	9-5/8	10-3/4 Csg 12 Csg	11-3/4 to
OD SMALLEST SLIPS RETRACTED		5-1/2	5-3/4	6-7/16	7-1/4	8-3/16	9-1/2	10-9/16
EXPANSION SLIPS OVER SAFETY RING		5/8	5/8	5/8	11/16	3/4	13/16	13/16
SLIP ENGAGEMENT AREA (SQ IN)		350	365	430	485	580	690	785
COMPLETE ASSEMBLY	Logan Part No.	204-014	204-015	204-016	204-017	204-018	204-019	204-020
	Bowen No.	9796	9352	10608	6318	10473	6067	6073

OPTIONAL COMPONENTS

UNITIZER	Logan Part No.	AV20008	AV20009	AV20010	AV20011	AV20012	AV20013	AV20014
	Bowen No.	9799	9355	10611	7493	10476	6070	6078
FRICTION RETAINER <i>(Includes Springs)</i>	Logan Part No.	AV21008	AV21009	AV21010	AV21011	AV21012	AV21013	AV21014
	Bowen No.	9800	9356	10612	7495F	B10477	6532F	6534
FRICTION RETAINER SCREWS (4 req'd)	Logan Part No.	AV22003	AV22003	AV22004	AV22004	AV22004	AV22004	AV22004
	Bowen No.	6964	6964	25175	25175	25175	25175	25175
FRICTION RETAINER SPRINGS	Logan Part No.	AV23003	AV23003	AV23004	AV23005	AV23005	AV23011	AV23012
	Bowen No.	9606	9606	10613	8948	8948	A9631	9631
	No. Req'd.	18	20	16	14	16	16	18
FRICTION BLOCK	Logan Part No.	...	...	...	AV24000	...	...	AV24001
	Bowen No.	...	...	...	15001	...	...	15000

OPTIONAL COMPONENTS

SAFETY RING PACK-OFF	Logan Part No.	AV25013	AV25015	AV25014	AV25016	AV25017	AV25018	AV25019
	Bowen No.	6487	6047	6055	6529	6063	6072	6080
EXTENSION <i>(3 feet long)</i>	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
MILL TYPE NUT	Logan Part No.	AV18014-A	AV18015-A	AV18016-A	AV18017-A	AV18018-A	AV18019-A	AV18020-A
	Bowen No.	6108A	6046A	6054A	6321A	6062A	6071A	6079A
SUB TYPE NUT	Logan Part No.	AV18014-B	AV18015-B	AV18016-B	AV18017-B	AV18018-B	AV18019-B	AV18020-B
	Bowen No.	6108B	6046B	6054B	6321B	6062B	6071B	6079B
SIDEHILL TYPE NUT	Logan Part No.	AV18014-C	AV18015-C	AV18016-C	AV18017-C	AV18018-C	AV18019-C	AV18020-C
	Bowen No.	6108C	6046C	6054C	6321C	6062C	6071C	6079C

† Size and weight of pipe to be caught.

Logan Oil Tools reserves the right to change or discontinue designs without notice.

When ordering, please specify:

- (1) Complete assembly or part number
- (2) Size and type of top connection
- (3) Size and type of fish to be caught

Recommended Spare Parts:

- (1) 2 sets of Slips for each size
- (2) 1 Safety Ring for each size
- (3) 1 Unitizer and 2 Friction Retainers on 2-3/8" to 3-1/2" Tubing Spears
or 2 Friction Block Assemblies on 4" Tubing Spears and larger
- (4) 1 Stop

Full Circle Releasing Spear

NOMINAL SIZE		13-3/8 Csg					
RECOMMENDED CATCHING RANGE †		13 to 13-3/8 Csg					
OD SMALLEST SLIPS RETRACTED		12					
EXPANSION SLIPS OVER SAFETY RING		13/16					
SLIP ENGAGEMENT AREA (SQ IN)		890					
COMPLETE ASSEMBLY	Logan Part No.	204-021					
	Bowen No.	6081					
TOP SUB *	Logan Part No.	...					
<i>(Includes Protector)</i>	Bowen No.	...					
PROTECTOR	Logan Part No.	...					
	Bowen No.	...					
BODY **	Logan Part No.	AV3021					
	Bowen No.	6082					
SLIP	Logan Part No.	AV4021					
<i>(Includes Fingers)</i>	Bowen No.	6083					
	No. Req'd.	6					
UNITIZER	Logan Part No.	...					
	Bowen No.	...					
FRICTION RETAINER	Logan Part No.	...					
<i>(Includes Springs)</i>	Bowen No.	...					
FRICTION RETAINER	Logan Part No.	...					
SCREWS	Bowen No.	...					
	No. Req'd.	...					
FRICTION RETAINER	Logan Part No.	...					
SPRINGS	Bowen No.	...					

† Size and weight of pipe to be caught.

* Top Sub can be left oversized for larger OD drill pipe and tubing connections.

** Body OD is maximum for casing ID.

See Tool Joint OD Chart on page 18.

Logan Oil Tools reserves the right to change or discontinue designs without notice.

When ordering, please specify:

- (1) Complete assembly or part number
- (2) Size and type of top connection
- (3) Size and type of fish to be caught

Recommended Spare Parts:

- (1) 2 sets of Slips for each size
- (2) 1 Safety Ring for each size
- (3) 1 Unitizer and 2 Friction Retainers on 2-3/8" to 3-1/2" Tubing Spears
or 2 Friction Block Assemblies on 4" Tubing Spears and larger
- (4) 1 Stop

Full Circle Releasing Spear

NOMINAL SIZE		13-3/8 Csg				
RECOMMENDED CATCHING RANGE †		13 to 13-3/8 Csg				
OD SMALLEST SLIPS RETRACTED		12				
EXPANSION SLIPS OVER SAFETY RING		13/16				
SLIP ENGAGEMENT AREA (SQ IN)		890				
COMPLETE ASSEMBLY	Logan Part No.	204-021				
	Bowen No.	6081				
FRICION BLOCK ASSEMBLY	Logan Part No.	AV90015				
	Bowen No.	14991				
<i>Consists of:</i>						
UNITIZER	Logan Part No.	AV10015				
	Bowen No.	14992				
RETAINER SET	Logan Part No.	AV11015				
<i>(2 pieces)</i>	Bowen No.	14993				
FRICION BLOCK	Logan Part No.	AV12015				
	Bowen No.	14994				
	No. Req'd.	6				
RETAINER SCREW	Logan Part No.	AV13004				
	Bowen No.	25221				
	No. Req'd.	4				
OUTER BLOCK SPRING	Logan Part No.	AV14015				
	Bowen No.	14996				
	No. Req'd.	18				
INNER BLOCK SPRING	Logan Part No.	...				
	Bowen No.	...				
	No. Req'd.	...				
STOP	Logan Part No.	AV16020				
	Bowen No.	7629				
SAFETY RING	Logan Part No.	AV17021				
	Bowen No.	6537				
NUT	Logan Part No.	AV18021				
	Bowen No.	6087				
NUT SET SCREW	Logan Part No.	AV19008				
	Bowen No.	41056				
	No. Req'd.	2				

† Size and weight of pipe to be caught

Logan Oil Tools reserves the right to change or discontinue designs without notice.

When ordering, please specify:

- (1) Complete assembly or part number
- (2) Size and type of top connection
- (3) Size and type of fish to be caught

Recommended Spare Parts:

- (1) 2 sets of Slips for each size
- (2) 1 Safety Ring for each size
- (3) 1 unitizer and 2 friction retainers on 2-3/8" to 3-1/2" Tubing Spears
or 2 friction block assemblies on 4" Tubing Spears and larger
- (4) 1 Stop

Full Circle Releasing Spear

NOMINAL SIZE		13-3/8 Csg				
RECOMMENDED CATCHING RANGE †		13 to 13-3/8 Csg				
OD SMALLEST SLIPS RETRACTED		12				
EXPANSION SLIPS OVER SAFETY RING		13/16				
SLIP ENGAGEMENT AREA (SQ IN)		890				
COMPLETE ASSEMBLY	Logan Part No.	204-021				
	Bowen No.	6081				

OPTIONAL COMPONENTS

UNITIZER	Logan Part No.	AV20015				
	Bowen No.	6086				
FRICTION RETAINER <i>(Includes Springs)</i>	Part No.	AV21015				
	Bowen No.	6536F				
FRICTION RETAINER SCREWS	Logan Part No.	AV22004				
	No. Req'd.	4				
	Bowen No.	25175				
FRICTION RETAINER SPRINGS	Logan Part No.	AV23013				
	Bowen No.	8950				
	No. Req'd.	16				
FRICTION BLOCK	Logan Part No.	AV24002				
	Bowen No.	14995				

OPTIONAL ACCESSORIES

SAFETY RING PACK-OFF	Logan Part No.	AV25020				
	Bowen No.	6088				
EXTENSION <i>(3 feet long)</i>	Logan Part No.	...				
	Bowen No.	...				
MILL TYPE NUT	Logan Part No.	AV18021-A				
	Bowen No.	6087A				
SUB TYPE NUT	Logan Part No.	AV18021-B				
	Bowen No.	6087B				
SIDEHILL TYPE NUT	Logan Part No.	AV18021-C				
	Bowen No.	6087C				

† Size and weight of pipe to be caught

Logan Oil Tools reserves the right to change or discontinue designs without notice.

When ordering, please specify:

- (1) Complete assembly or part number
- (2) Size and type of top connection
- (3) Size and type of fish to be caught

Recommended Spare Parts:

- (1) 2 sets of Slips for each size
- (2) 1 Safety Ring for each size
- (3) 1 unitizer and 2 friction retainers on 2-3/8" to 3-1/2" Tubing Spears
or 2 friction block assemblies on 4" Tubing Spears and larger
- (4) 1 Stop

Tool Joint OD Chart

NOMINAL SIZE		2-3/8 DP	2-3/8 Tbg	2-7/8 DP	2-7/8 Tbg	3-1/2 DP	3-1/2 Tbg	4 DP
TOOL JOINT OD (INCHES)		3-1/8	3-1/8	3-5/8	3-3/4	4-1/4	4-1/4	5-1/2
COMPLETE ASSEMBLY	Logan Part No.	204-000	204-001	204-002	204-003	204-004	204-005	204-006
	Bowen No.	6175	6693	6246	6684	7640	6701	7648
TOP SUB	Logan Part No.	AV1000	AV1001	AV1002	AV1003	AV1004	AV1005	AV1006
	Bowen No.	6176	5858	6247	5774	6363	6702	6676
BODY	Logan Part No.	AV3000	AV3001	AV3002	AV3003	AV3004	AV3005	AV3006
	Bowen No.	6177	6694	6248	6685	7641	6703	7649

NOMINAL SIZE		4 Tbg	4-1/2 DP	5-1/2 DP	4-1/2 Csg	5 Csg	5-1/2 Csg	6 Csg
TOOL JOINT OD (INCHES)		4-1/4	5-1/2	6-3/4	3-3/4	4	4-1/2	5-1/16
COMPLETE ASSEMBLY	Logan Part No.	204-007	204-008	204-009	204-010	204-011	204-012	204-013
	Bowen No.	6710	6715	6723	10536	9337	9342	9347
TOP SUB	Logan Part No.	AV1007	AV1008	AV1009	...	...	...	...
	Bowen No.	5839	6270	6277	...	...	...	...
BODY	Logan Part No.	AV3007	AV3008	AV3009	AV3010	AV3011	AV3012	AV3013
	Bowen No.	6711	6716	6724	10537	C9338	9343	9348

NOMINAL SIZE		6-5/8 Csg	7 Csg	7-5/8 Csg	8-5/8 Csg	9-5/8 Csg	10-3/4 Csg	11-3/4 Csg
TOOL JOINT OD (INCHES)		5-1/2	5-3/4	6-7/16	7-1/4	8-3/16	9-1/2	10-9/16
COMPLETE ASSEMBLY	Logan Part No.	204-014	204-015	204-016	204-017	204-018	204-019	204-020
	Bowen No.	9796	9352	10608	6318	10473	6067	6073
TOP SUB	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
BODY	Logan Part No.	AV3014	AV3015	AV3016	AV3017	AV3018	AV3019	AV3020
	Bowen No.	9797	9353	10609	6319	10474	6068	6074

NOMINAL SIZE		13-3/8 Csg						
TOOL JOINT OD (INCHES)		12						
COMPLETE ASSEMBLY	Logan Part No.	204-021						
	Bowen No.	6081						
TOP SUB	Logan Part No.	...						
	Bowen No.	...						
BODY	Logan Part No.	AV3021						
	Bowen No.	6082						

Full Circle Releasing Spear Skirts

NOM SIZE OF DP/TBG SPEAR ASSEMBLY		2-3/8	2-7/8	3-1/2	4	4-1/2	5-1/2	6-5/8
SKIRT SIZE (INCHES)								
4 OD	Logan Part No.	AV27000-128	AV27001-128	...	...	...	...	...
	Bowen No.	4644	4646	...	...	...	...	...
4-1/2 OD	Logan Part No.	AV27000-144	AV27001-144	AV27002-144	AV27003-144	...	...	...
	Bowen No.	4645	4647	4649	19446	...	...	...
5 OD	Logan Part No.	...	AV27001-160	AV27002-160	AV27003-160	...	...	...
	Bowen No.	...	4648	4650	19447	...	...	...
5-1/2 OD	Logan Part No.	...	AV27001-176	AV27002-176	AV27003-176	AV27004-176	...	...
	Bowen No.	...	4778	4651	19448	4652	...	...
6 OD	Logan Part No.	...	...	AV27002-192	AV27003-192	AV27004-192	...	...
	Bowen No.	...	...	19441	19449	19454	...	...
6-5/8 OD	Logan Part No.	...	...	AV27002-212	AV27003-212	AV27004-212	AV27005-212	...
	Bowen No.	...	...	5495	19450	4653	4655	...
7 OD	Logan Part No.	...	...	AV27002-224	AV27003-224	AV27004-224	AV27005-224	...
	Bowen No.	...	...	5494	19451	4654	5497	...
7-5/8 OD	Logan Part No.	...	...	AV27002-244	AV27003-244	AV27004-244	AV27005-244	AV27006-244
	Bowen No.	...	...	4772	19452	4864	4656	4658
8-5/8 OD	Logan Part No.	...	...	AV27002-276	AV27003-276	AV27004-276	AV27005-276	AV27006-276
	Bowen No.	...	...	4773	19453	5496	4657	4659
9-5/8 OD	Logan Part No.	...	...	AV27002-308	...	AV27004-308	...	AV27006-308
	Bowen No.	...	...	56829	...	39190	...	4661
10-3/4 OD	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...

NOM SIZE OF DP/TBG SPEAR ASSEMBLY		7-5/8						
SKIRT SIZE (INCHES)								
4 OD	Logan Part No.	...						
	Bowen No.	...						
4-1/2 OD	Logan Part No.	...						
	Bowen No.	...						
5 OD	Logan Part No.	...						
	Bowen No.	...						
5-1/2 OD	Logan Part No.	...						
	Bowen No.	...						
6 OD	Logan Part No.	...						
	Bowen No.	...						
6-5/8 OD	Logan Part No.	...						
	Bowen No.	...						
7 OD	Logan Part No.	...						
	Bowen No.	...						
7-5/8 OD	Logan Part No.	...						
	Bowen No.	...						
8-5/8 OD	Logan Part No.	...						
	Bowen No.	...						
9-5/8 OD	Logan Part No.	...						
	Bowen No.	...						
10-3/4 OD	Logan Part No.	AV27007-344						
	Bowen No.	79749						

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Full Circle Releasing Spear Guides

NOMINAL SIZE		4	4-1/2	5	5-1/2	6	6-5/8	7
GUIDE SIZE (INCHES) *								
OVER 5 to 6	Logan Part No.	AV28000	AV28001	AV28002	...	...	...	...
	Bowen No.	4662	4663	4664	...	...	...	...
OVER 6 to 7	Logan Part No.	AV28000	AV28001	AV28002	AV28003	...	...	...
	Bowen No.	4662	4663	4664	4665	...	...	...
OVER 7 to 8	Logan Part No.	...	AV28001	AV28002	AV28003	AV28004	...	...
	Bowen No.	...	4663	4664	4665	4685	...	...
OVER 8 to 9	Logan Part No.	...	AV28001	AV28002	AV28003	AV28004	AV28005	AV28006
	Bowen No.	...	4663	4664	4665	4685	4299	3824
OVER 9 to 10	Logan Part No.	...	...	...	AV28003	AV28004	AV28005	AV28006
	Bowen No.	...	...	...	4665	4685	4299	3824
OVER 10 to 11	Logan Part No.	...	...	...	AV28003	AV28004	AV28005	AV28006
	Bowen No.	...	...	...	4665	4685	4299	3824
OVER 11 to 12	Logan Part No.	...	...	...	...	...	AV28005	AV28006
	Bowen No.	...	...	...	...	...	4299	3824
OVER 12 to 13	Logan Part No.	...	...	...	...	...	...	AV28006
	Bowen No.	...	...	...	...	...	...	3824
OVER 13 to 14	Logan Part No.	...	...	...	...	...	...	AV28006
	Bowen No.	...	...	...	...	...	...	3824

NOMINAL SIZE		7-5/8	8-5/8	9	9-5/8	10-3/4	11-3/4	
GUIDE SIZE (INCHES) *								
OVER 5 to 6	Logan Part No.	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...
OVER 6 to 7	Logan Part No.	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...
OVER 7 to 8	Logan Part No.	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...
OVER 8 to 9	Logan Part No.	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...
OVER 9 to 10	Logan Part No.	AV28007	...	...	...	...	...
	Bowen No.	4666	...	...	...	...	...
OVER 10 to 11	Logan Part No.	AV28007	AV28008	...	...	...	...
	Bowen No.	4666	4295	...	...	...	...
OVER 11 to 12	Logan Part No.	AV28007	AV28008	AV28009	AV28010	AV28011	AV28012	
	Bowen No.	4666	4295	4667	4668	79750	65526	
OVER 12 to 13	Logan Part No.	AV28007	AV28008	AV28009	AV28010	...	...
	Bowen No.	4666	4295	4667	4668	...	...
OVER 13 to 14	Logan Part No.	AV28007	AV28008	AV28009	AV28010	
	Bowen No.	4666	4295	4667	4668	

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* Guide OD depends upon hole size.

Full Circle Releasing Spear Slip Range For Drill Pipe and Tubing

FISH SIZE		2-3/8 DP	2-3/8 DP	2-3/8 Tbg	2-7/8 DP	2-7/8 DP	2-7/8 DP	2-7/8 Tbg
WEIGHT (LBS/FT)		6.65	4.8, 4.6	4.7, 4.6, 4.0	10.4	8.35	6.45	6.5, 6.4
SPEAR ASSEMBLY	Logan Part No.	204-000	204-000	204-001	204-002¹	204-002¹	204-002¹	204-003²
	Bowen No.	6175	6175	6693	6246	6246	6246	6684
SLIP SIZE STAMPED		1-13/16	2	2-1/32	2-5/32	2-11/32	2-1/2	2-7/16
	Logan Part No.	AV4000	AV4000	AV4001	AV4002	AV4002	AV4002	AV4003
	Bowen No.	6178	6178	6695	6249	6249	6249	6686
SAFETY RING SIZE STAMPED		1-11/32	1-7/8	1-29/32	2	2-3/16	2-11/32	2-5/16
	Logan Part No.	AV17000	AV17000	AV17001	AV17002	AV17002	AV17002	AV17003
	Bowen No.	6547	6547	6545	6543	6543	6543	6424
SAFETY RING PACK-OFF SIZE STAMPED		1-11/32	1-7/8	1-29/32	2	2-3/16	2-11/32	2-5/16
	Logan Part No.	AV25000	AV25000	AV25001	AV25002	AV25002	AV25002	AV25003
	Bowen No.	6181	6181	6174	6252	6252	6252	5779

FISH SIZE		3-1/2 DP	3-1/2 DP	3-1/2 DP	3-1/2 DP	3-1/2 Tbg	3-1/2 Tbg	4 DP
WEIGHT (LBS/FT)		15.5	13.3	11.2	8.5	10.2, 9.3, 9.2	7.7	15.7
SPEAR ASSEMBLY	Logan Part No.	204-004	204-004	204-004	204-004	204-005	204-005	204-006
	Bowen No.	7640	7640	7640	7640	6701	6701	7648
SLIP SIZE STAMPED		2-5/8	2-25/32	2-15/16	3-3/32	2-31/32	3-1/8	3-9/32
	Logan Part No.	AV4004	AV4004	AV4004	AV4004	AV4005	AV4005	AV4006
	Bowen No.	C7642	C7642	C7642	C7642	6704	6704	7650
FRICTION BLOCK SIZE STAMPED		...	...	...	...	...	...	...
	Logan Part No.	...	...	...	...	...	...	AV12000
	Bowen No.	...	...	...	...	...	...	14934
SAFETY RING SIZE STAMPED		2-7/16	2-19/32	2-3/4	2-29/32	2-13/16	2-15/16	3-3/32
	Logan Part No.	AV17004	AV17004	AV17004	AV17004	AV17005	AV17005	AV17006
	Bowen No.	6541	6541	6541	6541	6707	6707	6681
SAFETY RING PACK-OFF SIZE STAMPED		2-7/16	2-19/32	2-3/4	2-29/32	2-13/16	2-15/16	3-3/32
	Logan Part No.	AV25004	AV25004	AV25004	AV25004	AV25005	AV25005	AV25006
	Bowen No.	6268	6268	6268	6268	6709	6709	6683

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Spears for drill pipe will pass through API, Reed, Spang, Hughes, and Hydril IF tool joints and the internal upset section of Spang double-seal, external upset drill pipe.

CAUTION:

¹ Logan Spear Assembly 204-002 (Bowen No. 6246) dressed for 2-7/8" - 8.7 lb will not go in completely. The 3-5/8" OD top sub is too large.

² Logan Spear Assembly 204-003 (Bowen No. 6684) dressed for 2-7/8" - 8.7 lb will not go in completely. The 2-5/16" OD top sub is too large for tubing.

Full Circle Releasing Spear Slip Range For Drill Pipe and Tubing

FISH SIZE		4 DP	4 Tbg	4 Tbg	4-1/2 DP	4-1/2 DP	4-1/2 DP	5-1/2 DP
WEIGHT (LBS/FT)		14	11	9.5	20	18.1, 16.6	13.75, 12.75	24.7, 21.9
SPEAR ASSEMBLY	Logan Part No.	204-006	204-007	204-007	204-008	204-008	204-008	204-009
	Bowen No.	7648	6710	6710	6715	6715	6715	6723
SLIP SIZE STAMPED		3-11/32	3-1/2	3-19/32	3-11/16	3-7/8	4-1/32	4-3/4
	Logan Part No.	AV4006	AV4007	AV4007	AV4008	AV4008	AV4008	AV4009
	Bowen No.	7650	6712	6712	6717	6717	6717	6725
FRICTION BLOCK SIZE STAMPED		...	3-1/4	3-1/4	3-5/8	3-5/8	3-5/8	4-3/4
	Logan Part No.	AV12000	AV12001	AV12001	AV12002	AV12002	AV12002	AV12003
	Bowen No.	14934	14904	14904	14940	14940	14940	14840
SAFETY RING SIZE STAMPED		3-5/32	3-5/16	3-13/32	3-15/32	3-21/32	3-13/16	4-1/2
	Logan Part No.	AV17006	AV17007	AV17007	AV17008	AV17008	AV17008	AV17009
	Bowen No.	6681	6539	6539	6720	6720	6720	6485
SAFETY RING PACK-OFF SIZE STAMPED		3-5/32	3-5/16	3-13/32	3-15/32	3-21/32	3-13/16	4-1/2
	Logan Part No.	AV25006	AV25007	AV25007	AV25008	AV25008	AV25008	AV25009
	Bowen No.	6683	5730	5730	6722	6722	6722	6484

FISH SIZE		5-1/2 DP	5-1/2 DP	5-1/2 DP				
WEIGHT (LBS/FT)		25.25	22.2	19				
SPEAR ASSEMBLY	Logan Part No.	204-009	204-009	204-009				
	Bowen No.	6723	6723	6723				
SLIP SIZE STAMPED		4-3/4	4-7/8	5-1/16				
	Logan Part No.	AV4009	AV4009	AV4009				
	Bowen No.	6725	6725	6725				
FRICTION BLOCK SIZE STAMPED		4-3/4	4-3/4	4-3/4				
	Logan Part No.	AV12003	AV12003	AV12003				
	Bowen No.	14840	14840	14840				
SAFETY RING SIZE STAMPED		4-1/2	4-5/8	4-13/16				
	Logan Part No.	AV17009	AV17009	AV17009				
	Bowen No.	6485	6485	6485				
SAFETY RING PACK-OFF SIZE STAMPED		4-1/2	4-5/8	4-13/16				
	Logan Part No.	AV25009	AV25009	AV25009				
	Bowen No.	6484	6484	6484				

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Spears for drill pipe will pass through API, Reed, Spang, Hughes, and Hydril IF tool joints and the internal upset section of Spang double-seal, external upset drill pipe.

Full Circle Releasing Spear Slip Range For Casing

FISH SIZE		4-1/2 Csg	4-1/2 Csg	4-3/4 Csg	5 Csg	5 Csg	5 Csg *	5 Csg
WEIGHT (LBS/FT)		13.5, 11.6	9.5	16	21	18.0, 17.7	15	13.0, 11.5
SPEAR ASSEMBLY	Logan Part No.	204-010	204-010	204-010	204-011	204-011	204-011	204-011
	Bowen No.	10536	10536	10536	9337	9337	9337	9337
SLIP SIZE STAMPED		4	4-5/32	4-5/32	4-7/32	4-11/32	4-15/32	4-19/32
	Logan Part No.	AV4010	AV4010	AV4010	AV4011	AV4011	AV4011	AV4011
	Bowen No.	10538	10538	10538	9339	9339	9339	9339
FRICITION BLOCK SIZE STAMPED		4-1/2	...	4-1/2	4-5/8	...	...	...
	Logan Part No.	AV12004	...	AV12004	AV12005	...	...	...
	Bowen No.	14927	...	14927	14946	...	...	...
SAFETY RING SIZE STAMPED		3-25/32	3-15/16	3-15/16	4	4-1/8	4-1/4	4-3/8
	Logan Part No.	AV17010	AV17010	AV17010	AV17011	AV17011	AV17011	AV17011
	Bowen No.	6733	6733	6733	7581	7581	7581	7581
SAFETY RING PACK-OFF SIZE STAMPED		3-25/32	3-15/16	3-15/16	4	4-1/8	4-1/4	4-3/8
	Logan Part No.	AV25010	AV25010	AV25010	AV25011	AV25011	AV25011	AV25011
	Bowen No.	6734	6734	6734	A7583	A7583	A7583	A7583

FISH SIZE		5-1/2 Csg	5-1/2 Csg	5-1/2 Csg	5-3/4 Csg †	5-3/4 Csg †	6 Csg	6 Csg
WEIGHT (LBS/FT)		23	20, 17	15.5, 14, 13	22.5, 19.5	17, 14	23	20, 18
SPEAR ASSEMBLY	Logan Part No.	204-012	204-012	204-012	204-012	204-012	204-012	204-012
	Bowen No.	9342	9342	9342	9342	9342	9347	9347
SLIP SIZE STAMPED		4-3/4	4-7/8	5-1/16	5-1/16	5-5/16	5-5/16	5-7/16
	Logan Part No.	AV4012	AV4012	AV4012	AV4012	AV4012	AV4013	AV4013
	Bowen No.	9344	9344	9344	9344	9344	9349	9349
FRICITION BLOCK SIZE STAMPED		4-3/4	...	...	5-1/16	...	4-3/4	...
	Logan Part No.	AV12006	...	...	AV12006	...	AV12007	...
	Bowen No.	14840	...	...	14840	...	14953	...
SAFETY RING SIZE STAMPED		4-1/2	4-5/8	4-13/16	4-13/16	5-1/16	5-1/16	5-3/16
	Logan Part No.	AV17012	AV17012	AV17012	AV17012	AV17012	AV17013	AV17013
	Bowen No.	6485	6485	6485	6485	6485	6520	6520
SAFETY RING PACK-OFF SIZE STAMPED		4-1/2	4-5/8	4-13/16	4-13/16	5-1/16	5-1/16	5-3/16
	Logan Part No.	AV25009	AV25009	AV25009	AV25009	AV25009	AV25012	AV25012
	Bowen No.	6484	6484	6484	6484	6484	6041	6041

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* If the spear must pass through joints of 5"-15 lb or 8-5/8" - 32 lb Spang Extreme Line Casing, use the next smaller size slip and safety ring, or safety pack-off ring.

† Requires Oversize Friction Retainer, Logan Part No. to be advised (Bowen No. 9346-FO).

Full Circle Releasing Spear Slip Range For Casing

FISH SIZE		6 Csg	6-5/8 Csg	6-5/8 Csg	6-5/8 Csg	7 Csg	7 Csg	7 Csg
WEIGHT (LBS/FT)		16, 15	32, 29, 28 24, 22	26.8, 26,	20, 17	40	38, 35 28	32, 30, 29,
SPEAR ASSEMBLY	Logan Part No.	204-013	204-014	204-014	204-014	204-014	204-015	204-015
	Bowen No.	9347	9796	9796	9796	9796	9352	9352
SLIP SIZE STAMPED		5-19/32	5-3/4	5-15/16	6-1/8	5-15/16	6	6-3/16
	Logan Part No.	AV4013	AV4014	AV4014	AV4014	AV4014	AV4015	AV4015
	Bowen No.	9349	9798	9798	9798	9798	9354	9354
FRICTION BLOCK SIZE STAMPED		...	5-3/4	...	6-1/8	6-1/8	5-3/4	...
	Logan Part No.	...	AV12008	...	AV12008	AV12008	AV12009	...
	Bowen No.	...	14835	...	14835	14835	14961	...
SAFETY RING SIZE STAMPED		5-11/32	5 -1/2	5-11/16	5-7/8	5-11/16	5-3/4	5-15/16
	Logan Part No.	AV17013	AV17014	AV17014	AV17014	AV17014	AV17015	AV17015
	Bowen No.	6520	6488	6488	6488	6488	6522	6522
SAFETY RING PACK-OFF SIZE STAMPED		5-11/32	5-1/2	5-11/16	5-7/8	5-11/16	5-3/4	5-15/16
	Logan Part No.	AV25012	AV25013	AV25013	AV25013	AV25013	AV25015	AV25015
	Bowen No.	6041	6487	6487	6487	6487	6047	6047

FISH SIZE		7 Csg	7 Csg	7-5/8 Csg	7-5/8 Csg	7-5/8 Csg	8 Csg	8-1/8 Csg
WEIGHT (LBS/FT)		26, 24, 23, 22	20, 17	39, 33.7	29.7, 26.4	24, 20	26	39.5, 35.5
SPEAR ASSEMBLY	Logan Part No.	204-015	204-015	204-016	204-016	204-016	204-016	204-016
	Bowen No.	9352	9352	10608	10608	10608	10608	10608
SLIP SIZE STAMPED		6-3/8	6-17/32	6-11/16	6-15/16	7-3/32	7-7/16	7-1/4
	Logan Part No.	AV4015	AV4015	AV4016	AV4016	AV4016	AV4016	AV4016
	Bowen No.	9354	9354	10610	10610	10610	10610	10610
FRICTION BLOCK SIZE STAMPED		...	...	6-5/8	...	...	6-7/8	6-7/8
	Logan Part No.	...	...	AV12010	...	...	AV12010	AV12010
	Bowen No.	...	...	14967	...	...	14967	14967
SAFETY RING SIZE STAMPED		6-1/8	6-9/32	6-7/16	6-11/16	6-27/32	7-3/16	7
	Logan Part No.	AV17015	AV17015	AV17016	AV17016	AV17016	AV17016	AV17016
	Bowen No.	6522	6522	6524	6524	6524	6524	6524
SAFETY RING PACK-OFF SIZE STAMPED		6-1/8	6-9/32	6-7/16	6-11/16	6-27/32	7-3/16	7
	Logan Part No.	AV25015	AV25015	AV25014	AV25014	AV25014	AV25014	AV25014
	Bowen No.	6047	6047	6055	6055	6055	6055	6055

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Full Circle Releasing Spear Slip Range For Casing

FISH SIZE		8-1/8 Csg	8-5/8 Csg	8-5/8 Csg	8-5/8 Csg *	9 Csg	9 Csg	9 Csg
WEIGHT (LBS/FT)		32, 28	49, 44 38, 36	43, 40,	32, 28, 24	55	45	40, 38, 34
SPEAR ASSEMBLY	Logan Part No.	204-016	204-017	204-017	204-017	204-017	204-017	204-017
	Bowen No.	10608	6318	6318	6318	6318	6318	6318
SLIP SIZE STAMPED		7-7/16	7-9/16	7-13/16	8-1/16	7-13/16	8-1/16	8-5/16
	Logan Part No.	AV4016	AV4017	AV4017	AV4017	AV4017	AV4017	AV4017
	Bowen No.	10610	6320	6320	6320	6320	6320	6320
FRICTION BLOCK SIZE STAMPED		...	7-3/4	...	...	7-3/4	...	...
	Logan Part No.	...	AV12011	...	...	AV12011	...	...
	Bowen No.	...	14973	...	...	14973	...	...
SAFETY RING SIZE STAMPED		7-3/16	7-1/4	7-1/2	7-3/4	7-1/2	7-3/4	8
	Logan Part No.	AV17016	AV17017	AV17017	AV17017	AV17017	AV17017	AV17017
	Bowen No.	6524	6528	6528	6528	6528	6528	6528
SAFETY RING PACK-OFF SIZE STAMPED		7-3/16	7-1/4	7-1/2	7-3/4	7-1/2	7-3/4	8
	Logan Part No.	AV25014	AV25016	AV25016	AV25016	AV25016	AV25016	AV25016
	Bowen No.	6055	6529	6529	6529	6529	6529	6529

* If the spear must pass through joint of 8-5/8"-32 lb Spang Extreme Line Casing, use the next smaller size slip and safety ring, or safety pack-off ring.

FISH SIZE		9-5/8 Csg	9-5/8 Csg	9-5/8 Csg	10 Csg	10-3/4 Csg	10-3/4 Csg	11-3/4 Csg
WEIGHT (LBS/FT)		58, 47, 53.5	40, 36, 43.5	32.3, 29.3	33 48	55.5, 54, 51, 40.5, 32.75	45.5, 45, 40,	60, 54
SPEAR ASSEMBLY	Logan Part No.	204-018	204-018	204-018	204-018	204-019	204-019	204-020
	Bowen No.	10473	10473	10473	10473	6067	6067	6073
SLIP SIZE STAMPED		8-1/2	8-13/16	9	9-3/8	9-13/16	10-1/16	10-7/8
	Logan Part No.	AV4018	AV4018	AV4018	AV4018	AV4019	AV4019	AV4020
	Bowen No.	10475	10475	10475	10475	6069	6069	6075
FRICTION BLOCK SIZE STAMPED		8-7/8	...	...	8 7/8	10	...	...
	Logan Part No.	AV12012	...	...	AV12012	AV12013	...	...
	Bowen No.	14979	...	...	14979	14984	...	...
SAFETY RING SIZE STAMPED		8-3/16	8-1/2	8-11/16	9-1/16	9-1/2	9-3/4	10-9/16
	Logan Part No.	AV17018	AV17018	AV17018	AV17018	AV17019	AV17019	AV17020
	Bowen No.	6531	6531	6531	6531	6533	6533	6535
SAFETY RING PACK-OFF SIZE STAMPED		8-3/16	8-1/2	8-11/16	9-1/16	9-1/2	9-3/4	10-9/16
	Logan Part No.	AV25017	AV25017	AV25017	AV25017	AV25018	AV25018	AV25019
	Bowen No.	6063	6063	6063	6063	6072	6072	6080

FISH SIZE		11-3/4 Csg	12 Csg	13 Csg	13-3/8 Csg	13-3/8 Csg	16 Csg	
WEIGHT (LBS/FT)		47, 42, 38	40	54, 50, 45, 40	83, 72, 68, 61	54, 48	84, 75, 65, 55	
SPEAR ASSEMBLY	Logan Part No.	204-020	204-020	204-021	204-021	204-021	204-021	
	Bowen No.	6073	6073	6081	6081	6081	6081	
SLIP SIZE STAMPED		11-1/8	11-3/8	12-3/8	12-3/8	12-5/8	15-3/16	
	Logan Part No.	AV4020	AV4020	AV4021	AV4021	AV4021	AV4021	
	Bowen No.	6075	6075	6083	6083	6083	6083	
FRICTION BLOCK SIZE STAMPED		...	...	12-1/4	12-1/4	...	15	
	Logan Part No.	...	...	AV12015	AV12015	...	AV12015	
	Bowen No.	...	...	14994	14994	...	14994	
SAFETY RING SIZE STAMPED		10-13/16	11-1/16	12	12	12-1/4	14-13/16	
	Logan Part No.	AV17020	AV17020	AV17021	AV17021	AV17021	AV17021	
	Bowen No.	6535	6535	6537	6537	6537	6537	
SAFETY RING PACK-OFF SIZE STAMPED		10-13/16	11-1/16	12	12	12-1/4	14-13/16	
	Logan Part No.	AV25019	AV25019	AV25020	AV25020	AV25020	AV25020	
	Bowen No.	6080	6080	6088	6088	6088	6088	

Calculated Strengths

COMPLETE ASSEMBLY NO.	LOGAN SLIP NO.	BOWEN SLIP NO.	YIELD STRENGTH OF BODY (LBS)
204-000	AV4000	6178	56,400
204-001	AV4001	6695	71,500
204-002	AV4002	6249	110,400
204-003	AV4003	6686	134,000
204-004	AV4004	C7642	172,000
204-005	AV4005	6704	224,000
204-006	AV4006	7650	296,000
204-007	AV4007	6712	275,000
204-008	AV4008	6717	318,000
204-009	AV4009	6725	628,000
204-010	AV4010	10538	376,000
204-011	AV4011	9339	454,000
204-012	AV4012	9344	628,000
204-013	AV4013	9349	945,000
204-014	AV4014	9798	1,060,000
204-015	AV4015	9354	1,228,000
204-016	AV4016	10610	1,414,000
204-017	AV4017	6320	1,761,000
204-018	AV4018	10475	2,324,000
204-019	AV4019	6069	3,300,000
204-020	AV4020	6075	4,300,000
204-021	AV4021	6083	5,961,000

Notes:

1. Listed strengths are theoretical calculations based on the yield strength of the material and are accurate within 20%.
2. Calculations refer to the tensile strength of the body and do not relate to the strength of the fish being engaged.
3. Thin walled, or old, corroded pipe may allow the grapple to overly expand and jump the mandrel spirals.
4. Jarring may amplify the pull load by a factor of 3:10.

Releasing Spear Stop Sub Assembly

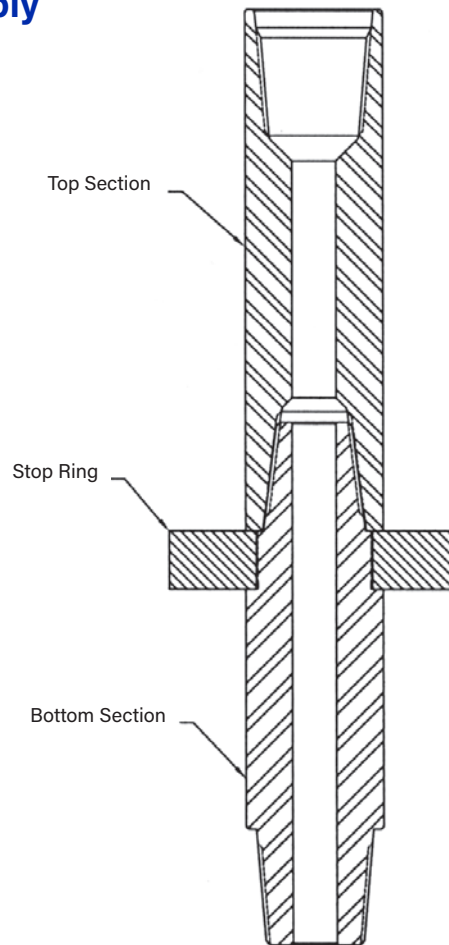
OVERVIEW

The Logan Releasing Spear Stop Sub Assembly is an accessory designed to convert a releasing spear with a flush-type mandrel into a shouldered type spear. It is installed in the box connection at the top of the mandrel when the use of a positive stop is desired or required.

A stop ring can be added to increase shoulder diameter. All stop rings are furnished with left-hand threads.

When ordering, please specify:

- (1) O.D. of stop sub
- (2) Length from stop to threaded connection
- (3) Top and bottom connection desired
- (4) Assembly number of spear on which the stop sub will be run
- (5) O.D. of stop ring



STANDARD STOP SUB & FLUSH MANDREL OD	3-1/8	3-1/4	3-5/8	4-1/32	5
STOP SUB ASSEMBLY	400-064	400-063	400-050	400-051	400-052
STOP SUB (2 PCS. REQ'D)					
UPPER SECTION 18" LENGTH	F11002-A	F11005-A	F11000-A	F11001-A	F11002-A
LOWER SECTION 12" LENGTH	F11002-B	F11005-B	F11000-B	F11001-B	F11002-B
STOP RING	F120002	F120005	F120000	F120001	F120002
Minimum O.D.	4-1/8	4-1/8	4-1/2	5	6

STANDARD STOP SUB & FLUSH MANDREL O.D.	5-3/4	7-1/4	7-3/4	8-1/4	11-3/4
STOP SUB ASSEMBLY	400-053	400-054	400-062	400-065	400-056
STOP SUB (2 PCS. REQ'D)					
UPPER SECTION 18" LENGTH	F11003-A	F11004-A	F11005-A	F11015-A	F11006-A
LOWER SECTION 12" LENGTH	F11003-B	F11004-B	F11005-B	F11015-B	F11006-B
STOP RING	F12003	F12004	F12005	F12015	F12006
Minimum O.D.	7	8-5/8	9-5/8	9-5/8	13-3/8

Logan Oil Tools reserves the right to change or discontinue designs without notice.

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