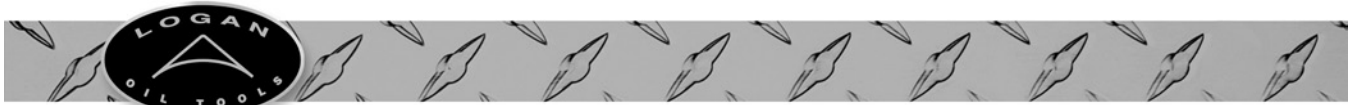




Standard External Cutters



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Standard External Cutters

OVERVIEW

The Logan Standard External Cutter features automatic spring-fed knives that prevent excessive strain from being applied from the rig floor that could cause the knives to burn or break before the cut is completed.

Interchangeable assemblies — Spring Dog, Ratchet Pawl, and Slip — adapt the Logan Standard External Cutter to any type of drill pipe or tubing.

USES

The Logan Standard External Cutter is used to cut and remove long sections of tubing, casing, and drill pipe. It may also be run on sucker rods. When used in conjunction with a washover string, it may be used to cut and remove stuck pipe.

CONSTRUCTION

The Logan Standard External Cutter consists of a top sub, body, guide, knives, spring dog (standard) assembly, thrust washer, thrust bearing, preload sleeve, feed ring, main spring, and shear pins.

The top sub threads into the body and holds the inner parts in position. It has a suitable connection at its upper end for attaching to the running string.

The body has threaded connections top and bottom to accept the top sub and guide. A shouldered inside diameter acts as a stop for the thrust washer and the parts above it to stop against during operation. Knife slots in the lower end of the body incorporate crossholes for the knife pins. Two holes in the body, placed diametrically opposite each other, hold the shear pins.

The guide, which is usually cut-lipped, threads into the bottom of the body. It guides the fish into the Cutter. Alternate guides, such as an extra long wallhook, or a mill-toothed guide, may be substituted if necessary.

The knives are made from high quality tempered steel for strength and durability. The cutting end of the knives is curved for the most efficient cutting action. The radius of the shank end matches the integral concave bearing face that it rests against in the body. A hole on the shank end of each knife accepts the knife pins. Set screws hold the knife pins in the body.

The Spring Dog Assembly is standard equipment on all Logan Standard External Cutters. The Spring Dog Assembly catches square shouldered collars or couplings, and retains the cut-off section after the cut is made. A variety of pipe sizes can be caught by each assembly for each different size of cutter.

Spring Dog Assembly

The Spring Dog Assembly consists of a cylinder, six rectangular vertically mounted springs, and twelve rivets. The springs are positioned to rest at their lower end on a shoulder so the force applied to the springs will be transmitted to the Spring Dog Body rather than the rivets. The springs are closed at the top to form a small opening. This arrangement allows the Spring Dog Assembly to outwardly deflect and pass over collars or couplings but stay close around the pipe or tubing so that they will always be in position to butt up against the bottom of the collar or coupling when raised. The springs are sufficiently closed to catch any size pipe or tubing that the Logan Standard External Cutter is designed to cut.

The thrust washer and thrust bearing allow the entire tool, except the catcher assembly (Spring Dog, Ratchet Pawl, or Slip Assembly), to rotate during operation while the catcher assembly remains stationary. The thrust washer and thrust bearing are placed between the main spring and the catcher assembly.

The preload sleeve is a steel cylinder located between the thrust washer and the top of the main spring. The preload sleeve maintains sufficient load on

the feed ring without the necessity of applying a pull load from the surface. The preload sleeve may be removed to relieve all preload tension on the main spring. If removed, knives must be manually fed from the surface.

The preload sleeve is used with all three catcher assemblies: Spring Dog, Ratchet Pawl, and Slip Assembly. The preload sleeve is not used when the knives are fed manually.

The cylindrically-shaped feed ring has a bevelled lower face that allows it to nest below the cutting ends of the knives. The two (2) spear pin holes in the feed ring, placed diametrically opposite each other, align with the holes in the body.

During operation, the feed ring forces the knives inward against the fish. The shear pins maintain the feed ring in running-in position until the string is pulled. The force exerted by the pull shears the pins and releases the feed ring.

The main spring is located between the thrust washer and the feed ring. It is wound from steel and is tempered to provide trouble-free service. During operation, the main spring is pre-loaded by a predetermined calculated amount that will exert the best cutting load on each knife. The load is then transmitted through the feed ring. Once the shear pins have been sheared, the cutter may be moved to any point between the two collars or joints where shearing occurred for the actual cut. No additional load needs to be applied from the rig floor to make a cut.

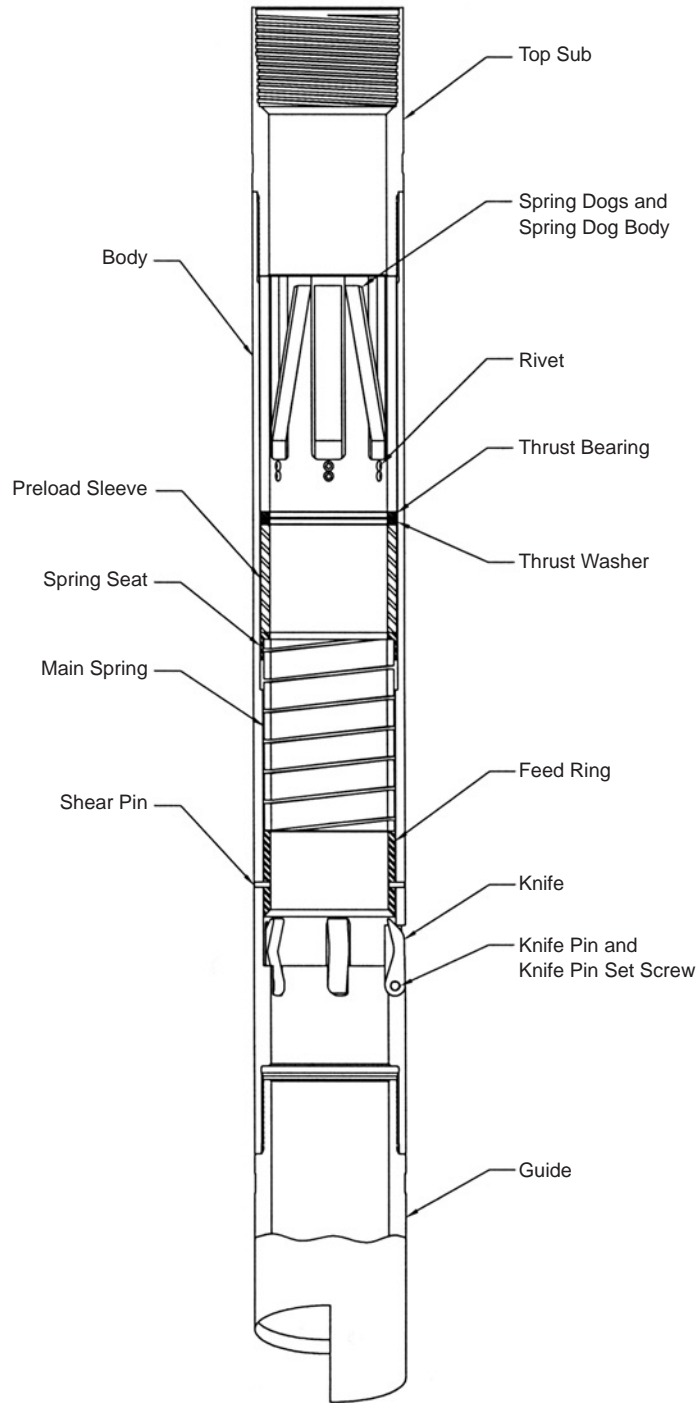
Shear pin sizes vary with the cutter size. They are manufactured from clean shearing brass rod. The shear strength of each shear pin is listed in the table on page 7.

Ratchet Pawl Assembly

The Ratchet Pawl Assembly is a thick walled cylinder that contains five (5) to eight (8) pawls, depending on size. The pawls are arranged to form a circle around the pipe. They are spring loaded



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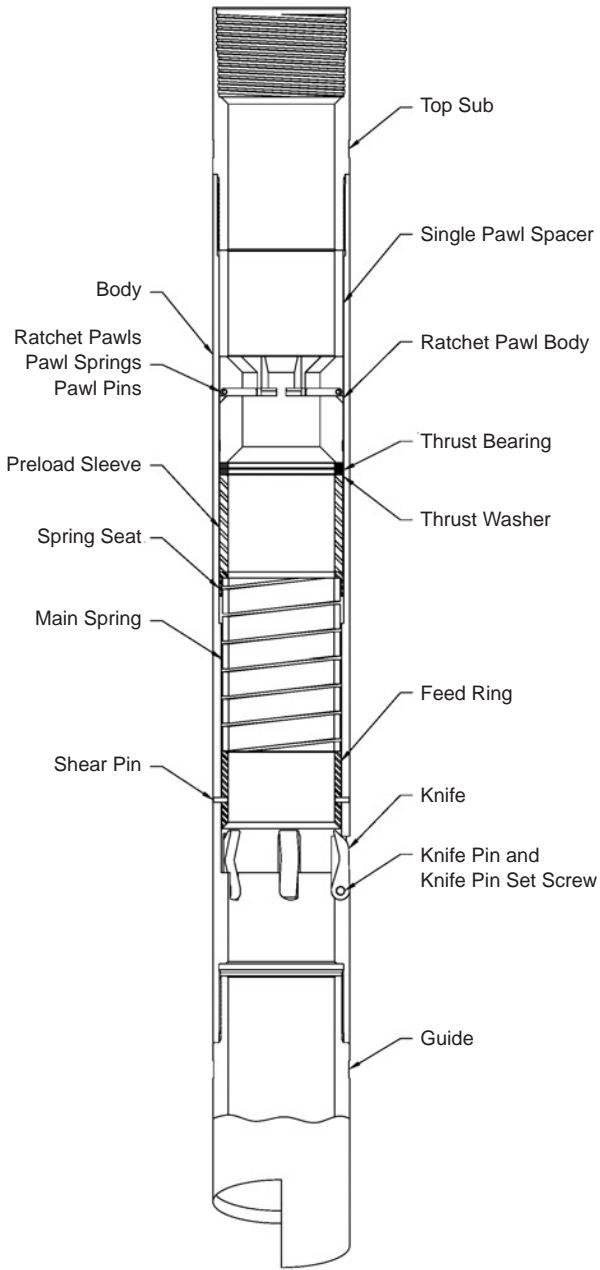


**Logan Standard External Cutter
with Spring Dog Assembly**

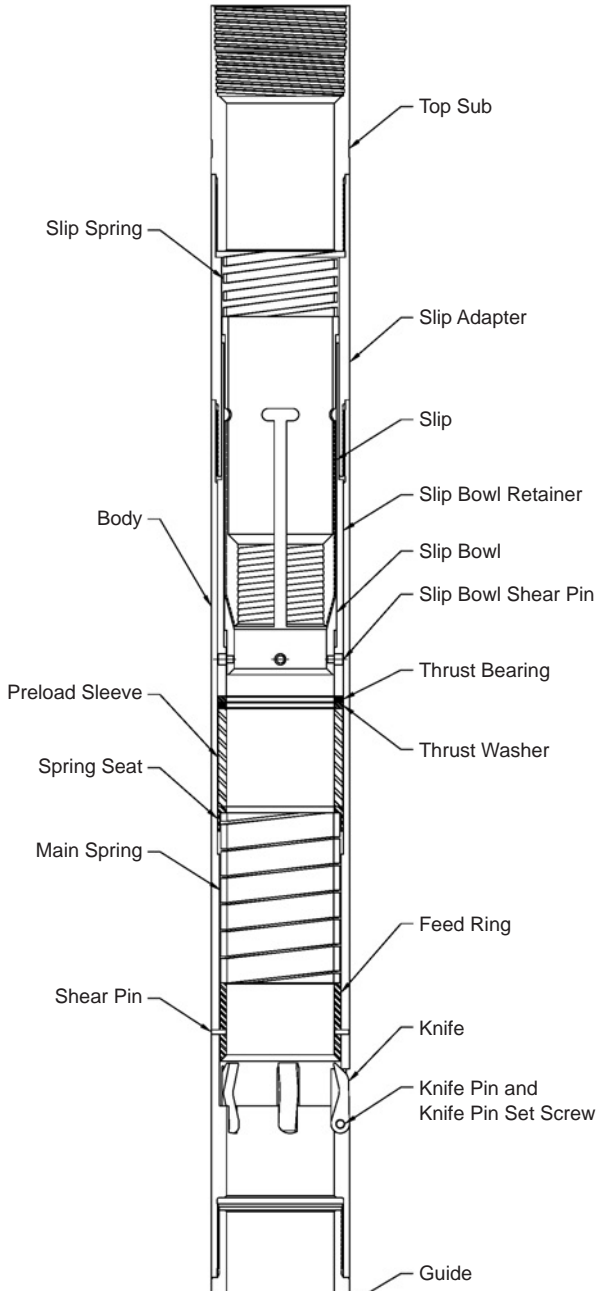
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Standard External Cutters



Logan Standard External Cutter with Ratchet Pawl Assembly



Logan Standard External Cutter with Slip Assembly

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to allow them to be deflected by passing a coupling or collar, then return to horizontal position after passing over the coupling. During operation, they catch the underside of the taper and transmit the load from the pawls through the pawl body and to the main spring.

The Ratchet Pawl Assembly is designed to catch tapered upset integral tool joints. They are also capable of catching square shouldered collars or couplings.

As a general rule, Ratchet Pawl Assemblies fit only one particular size of pipe or tubing joint and will be provided upon request. A separate Ratchet Pawl Assembly must be used for each size. An assembly may be redressed with proper length pawls in the size for which it is to be used.

Special Note: A Single Pawl Spacer is required when using the Ratchet Pawl Assembly.

A Single Pawl Spacer is used with the Ratchet Pawl Assembly. The length of a Ratchet Pawl Assembly is half the length of the Spring Dog Assembly. The spacer adds extra length to the Ratchet Pawl Assembly to make their combined length the same as a standard Spring Dog Assembly. If two Ratchet Pawl Assemblies are run in tandem, a Single Pawl Spacer is not necessary.

In the event the operator desires to abort the cut once the cutting position is reached, the Cutter may be released by repeatedly jarring the Ratchet Pawl Assembly against the collar or taper to shear the pawl pins. This will allow the cutter to be backed out of the hole without making a cut.

Slip Assembly

This optional assembly is designed to cut and retain pipe with external tool joints. The slips can grip the pipe at any point and retain the cut-off section after making the cut. Slip assemblies are provided upon request.

The Slip Assembly requires a slip adapter. The slip adapter is positioned between the top sub and body to provide an extra length housing for the Slip Assembly. The upper end of the slip adapter screws onto the top sub. The lower end screws into the body. The slip spring pushes against the slip adapter's internal shoulder that is located just below the threads at the upper end. The lower pin end of the slip adapter forms a shoulder that holds the slip retainer bowl in position after assembly.

OPERATION

Washover Procedure

Before the Logan Standard External Cutter can be run, stuck pipe must be freed from the formation with a washover operation to provide adequate clearance so the tool can be lowered over the stuck pipe. It is recommended that the stuck pipe be washed over at least one full joint below where the cut is to be made so that the stuck pipe will be centered in the hole at the point where the cut will be made.

The washpipe is equipped with a suitable Logan Rotary Shoe. The shoe should have a slightly larger outside diameter and slightly smaller inside diameter than the Logan Standard External Cutter being used.

After the stuck pipe has been washed over the required depth, the washover string is withdrawn from the well. The rotary shoe is removed from the bottom of the string and the Logan Standard External Cutter is installed in its place.

Operating Procedure

Before use, be sure the Logan Standard External Cutter is properly assembled. Threaded connections should be tightly made up. Avoid placing tongs directly over the knife slots. To prevent the knives from falling towards the inside of the cutter and being damaged while moving down hole, it is recommended that the knives be wedged into the knife slots. Bind the knives in the slots

by passing a strand of string or cord around each knife and pulling it towards the outside of the body. The tool should be dressed for the size of pipe to be cut. Refer to the specifications on pages 12 – 16 for the correct assembly number for the size of pipe to be cut.

The Logan Standard External Cutter is made up on the bottom of the cutting string. The cutting string is lowered into the well until the guide on the Logan Standard External Cutter contacts and passes over the top of the fish. Run the cutter to the desired depth. Apply enough pull load on the work string to pull the spring dog assembly (or other catcher assembly if used) up against a coupling or upset of a tool joint. This will apply load to the thrust bearings, preload ring, and main spring that will shear the pins on the feed ring. This allows the main spring to apply sufficient load on the knives so the cut can be made. The length of pipe passed over should not exceed the weight shown in the table on page 9.

Operating Precautions

Careful measurements taken during running in will ensure cuts are made at the correct depths. Use the knives as a reference point when taking all measurements.

1. Select the proper place to make the cut. The cut should be made one joint above the lowest position where the rotary washover shoe was run. One joint of free pipe below the cutter will be left that will align itself in the cutter.
2. Circulation is advisable when reaching the top of the fish to condition the mud and to flush all caked mud or debris from the tool.
3. Make up the kelly in the string and establish a normal rate of circulation. Rotate the cutting string to determine the amount of torque required to run the cutter when the knives are not in contact with the



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fish. Wash the hole sufficiently and allow the cutter to rotate freely. Stop the circulation and rotation. Raise the cutting string until the spring dogs contact the next highest coupling or tool joint tool.

When using a cutter with a Slip Assembly, the slips will stay in contact with the pipe at all times. Raising the cutter will shear the shear pins between the feed ring and the body will be sheared and the knives will be forced against the fish when the cutter is raised.

- Exercise care when going over the top of the fish. When going over a fish, the Logan Standard External Cutter should be rotated to the right whenever possible. After the fish has entered the cutter, the cutter must not be raised more than absolutely necessary. The cutting string should be lifted only high enough to free the table slips on the rig. If one table slip segment is free and the others are tight, turn the table to free the tight ones. If the cutting string is pulled higher than needed to release the table slips, the upward movement will shear the shear pins and force the knives into the fish. If this should happen, the cutter will not pass over the next lower tool joint or coupling without breaking the knives. It will be necessary to cut the fish at this point.
- Exercise care when running circulation pumps so pulsations are not transmitted to the cutting string. The pulsations will cause the knives to move up and down and result in an uneven cutting action.
- Apply only a small amount of torque when starting rotation. The cutter should be lowered slightly until the string can be turned with a minimum of torque. After the cutter has rotated freely for a few

minutes, stop the rotation. Raise the cutting string about 1/4" and rotate again. Raising and rotating should be repeated until increased torque is evident. This will indicate to the operator that the knives are cutting the pipe. The operator should take every precaution to guard against excessive torque until the cut is complete.

- Spring dogs sometimes may rotate off the coupling or tool joint shoulder before the cut has been completed. This occurs when the coupling or tool joint, under which the spring dogs are engaged, are quite thin. If the spring dogs rotate off the shoulder, the pipe must be backed down until the spring dogs are engaged under the coupling or tool joint, and cutting operations resumed.

CAUTION: If there is an indication that the spring dogs have rotated off the coupling or tool joint shoulder, immediately stop rotation to prevent damage to the knives.

Carefully raise the pipe. The knives may catch under the collar or tool joint and break. Do not exceed the maximum load ratings to prevent damage to the knives.

Cutting Procedure

When the desired depth is reached, the cutting string is raised until the Spring Dog Assembly (Ratchet Pawl Assembly or Slip assembly) engages the tool joint. Strain on the string compresses the main spring and shears the feed ring shear pins. A sudden movement on the weight indicator will register the shearing of the pins.

After the pins have been sheared, the cut may be made at any point on the pipe or tubing. The main spring will provide the force to feed the knives into the pipe at a predetermined rate. Rotate the cutting string to the right at a uniform rate of speed. There will be a noticeable

movement of the weight indicator when the pipe is severed.

Unless the preload sleeve has been removed, it is not necessary to maintain an upward strain against the collar or upset. However, maintaining an upward strain will help provide an indication when the cut is complete.

Withdraw the cut-off section from the well. Repeat the cutting procedure until all of the stuck pipe is removed.

For maximum efficiency and control when making cuts, a Logan Power Swivel is recommended.

Proving the Cut

There will be noticeable movement on the weight indicator when the Logan Standard External Cutter severs a pipe.

To prove a cut, raise the drill string to avoid pinching the knives between the cut fish and the portion of fish remaining in the hole. Raise the drill string 1" to 2" or until there is two to three points additional load (a load sufficient to lift the cut portion of the fish) shows on the indicator. Rotate the string after it is raised. A freely rotating string is almost conclusive proof that the cut has been successful.

Carefully raise the string. If no additional obstacles are encountered, the entire string may be hoisted and the fish removed from the hole.

As the operator gains experience, changes in the action of the cutter that may indicate cut has been completed will become more noticeable and familiar. When cutting a short fish, rotation speed may increase and the cutter will run freely immediately after the cut is completed.

Just before the cut is completed on a long fish, the portion of the fish above the cutter may slightly pinch the knives against the lower portion of the fish and make forward rotation impossible. The cutter may continue to rotate smoothly but additional rotational torque will be



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required. While rotating, the weight indicator may suddenly rise. The weight increase will indicate the cut has been completed and the cutter is carrying the weight of the severed piece.

None of these indications should be taken as positive proof of a completed cut. In any case, the string should not be withdrawn from the hole until the proof test described at left has been made.

Withdrawing from the Hole

The operator may slowly raise the string when he is convinced the cut has been completed. Slowly raise the string for one or two joints to be sure the cut has actually been made and to prevent striking a collar with excessive force.

If the cut has not been made, spring dogs, ratchet pawls, or knife pins must be sheared to bring the cutter to the

surface. It will need to be completely redressed.

When the washpipe reaches the surface, it should be evident where the top of the fish will be in relation to the top of the washpipe. To allow the fish to extend above the top of the washpipe, the operator may lay down the required number of joints of washpipe. This will permit him to hoist the fish from the washpipe with the aid of two elevators while it is held in the table with the slips.

It is recommended that a safety clamp be placed around the fish and a drill pipe elevator used under the clamp to raise the top section of the fish when there is no coupling on the top of the fish.

After the fish has been laid down, the washpipe can be pulled from the hole

and the cutter unscrewed from the bottom joint. The operator should supervise the breaking loose of the cutter. Place the tongs in the same manner as when making up. Loosen the threaded connection between the top sub and the body to hand-tight for ease of servicing.

MAINTENANCE

Good maintenance will ensure the best performance and maximum life of the Logan Standard External Cutter. The tool should be thoroughly washed and cleaned to remove all drilling mud and other debris. Worn or damaged parts, especially the knives, should be examined for wear or damage and replaced during disassembly/assembly. It is recommended that the tool be completely disassembled, cleaned, lubricated (or painted), and reassembled after each use and before storing.

TUBING/CASING SIZE TO CUT	1.050 to 1.315 Tbg	1.315 to 2-3/8 Tbg	1.660 to 2-3/8 Tbg	1.900 to 2-7/8 Tbg	2-1/16 to 3-1/2 Tbg	2-3/8 to 3-1/2 Tbg	2-3/8 to 4 Tbg
MAXIMUM SIZE WILL PASS OVER	1.552	3-1/16	3-1/8	3-3/4	4-1/4	4-1/2	4-3/4
INSIDE DIAMETER (CUTTER)	1-5/8	3-1/8	3-1/4	3-7/8	4-3/8	4-5/8	4-7/8
OUTSIDE DIAMETER (CUTTER)	2-5/16	3-7/8	4-1/2	4-11/16	5-5/8	5-7/8	6-1/16
MINIMUM SIZE HOLE TO RUN IN	2-7/16	4-1/8	4-3/4	4-15/16	5-7/8	6-1/8	6-1/4
COMPLETE ASSEMBLY w/SPRING DOG	410-231 32848	410-388 47127	410-450 47167	410-468 47210	410-563 47309	410-588 47264	410-606 47360
LOAD REQUIRED TO SHEAR EACH SHEAR PIN (LBS)	377	377	805	377	805	805	805
DOUBLE SHEAR STRENGTH (LBS)	754	754	1,610	754	1,610	1,610	1,610
LOAD REQUIRED TO SHEAR EACH SLIP BOWL SHEAR PIN (LBS)	...	4,125	4,125	4,125	8,285	8,285	8,285
QUADRUPLE SHEAR STRENGTH (LBS)	...	16,500	16,500	16,500	33,150	33,150	33,150

TUBING/CASING SIZE TO CUT	3-1/2, 4, 4-1/2 & 5 DP	4 to 5-3/4 Csg					
MAXIMUM SIZE WILL PASS OVER	6-1/4	6-1/2					
INSIDE DIAMETER (CUTTER)	6-3/8	6-5/8					
OUTSIDE DIAMETER (CUTTER)	7-5/8	8-1/8					
MINIMUM SIZE HOLE TO RUN IN	8-1/4	8-5/8					
COMPLETE ASSEMBLY w/SPRING DOG	410-763 47422	410-813 47541					
LOAD REQUIRED TO SHEAR EACH SHEAR PIN (LBS)	805	805					
DOUBLE SHEAR STRENGTH (LBS)	1,610	1,610					
LOAD REQUIRED TO SHEAR EACH SLIP BOWL SHEAR PIN (LBS)	8,285	8,285					
QUADRUPLE SHEAR STRENGTH (LBS)	33,150	33,150					



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DISASSEMBLY

After the Logan Standard External Cutter is removed from the well, it should be thoroughly washed down with clean water to remove all excess drilling mud and other debris. At the rig, it is advisable to break the top sub from the body with the rig tongs. Loosen the connection to a point where it may be uncoupled by hand. Move the entire assembly to a clean and convenient location for disassembly. Disassembly and repairs should be conducted in a clean, well-equipped shop.

NOTE: These instructions are for a Logan Standard External Cutter with a Spring Dog Assembly. See instructions on pages 8 – 9 for Ratchet Pawl and Slip Assemblies.

1. Place the cutter in a suitable vise. Clamp near the center.
2. Remove the loosened top sub from the body.

CAUTION: The main spring exerts considerable tension load. Exercise care during its removal to avoid damage to the top sub or injury to the operator.

3. Lift out the spring dog assembly.
4. Remove the thrust bearing and thrust washer.
5. Remove the preload sleeve.
6. Remove the spring seat and main spring.
7. Slide out and remove the feed ring.
8. Drive the sheared halves of the two (2) shear pins from the body with a suitable punch.
9. Using a socket head wrench, remove the set screws that lock the knife pins in place.
10. Push out the knife pins with a suitable punch.

CAUTION: The shouldered knife pins must be removed from the side of the hole that has the set screw holes. They can not be removed from the other side. The knives will fall free when the knife pins are removed.

11. Loosen and remove the guide from the lower end of the body.
12. With a suitable punch, remove the sheared pins from the feed ring.

CAUTION: Carefully remove the sheared pins from the body and feed ring. Do not distort or damage the shear pin holes.

13. Thoroughly clean and examine each part for any sign of damage or advanced wear. The body interior should be free of mars or scratches, and bits of shear pin and other loose debris.
14. Examine the feed ring. It should be free of mars and scratches. Smooth any distortion on the edges with a hand file.
15. Examine the knives. They must be in perfect condition for re-use. Replace them if they are chipped or worn. Minor wear or damage may sometimes be repaired with skillful regrinding. However, it is important that the contour and overall length of each knife be preserved.
16. Check the Spring Dog Assembly to ensure that all dog springs are in place with tight rivets.

Disassembly of the Logan Standard External Cutter with a Spring Dog Assembly is now complete.

Ratchet Pawl Assembly

The following disassembly instructions are for a Logan Standard External Cutter with a Ratchet Pawl Assembly:

1. Place the cutter in a suitable vise. Clamp near the center.

2. Remove the loosened top sub from the body.

CAUTION: The main spring exerts considerable tension load. Exercise care during its removal to avoid damage to the top sub or injury to the operator.

3. Lift out the spring dog assembly.
4. Remove the thrust bearing and thrust washer.
5. Remove the preload sleeve.
6. Remove the spring seat and main spring.
7. Slide out and remove the feed ring.
8. Drive the sheared halves of the two (2) shear pins from the body with a suitable punch.
9. Using a socket head wrench, remove the set screws that lock the knife pins in place.
10. Push out the knife pins with a suitable punch.

CAUTION: The shouldered knife pins must be removed from the side of the hole that has the set screw holes. They can not be removed from the other side. The knives will fall free when the knife pins are removed.

11. Loosen and remove the guide from the lower end of the body.
12. With a suitable punch, remove the sheared pins from the feed ring.

CAUTION: Carefully remove the sheared pins from the body and feed ring. Do not distort or damage the shear pin holes.

13. Thoroughly clean and examine each part for any sign of damage or advanced wear. The body interior should be free of mars or scratches, and bits of shear pin and other loose debris.



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14. Examine the feed ring. It should be free of mars and scratches. Smooth any distortion on the edges with a hand file.
15. Examine the knives. They must be in perfect condition for re-use. Replace them if they are chipped or worn. Minor wear or damage may sometimes be repaired with skillful regrinding. However, it is important that the contour and overall length of each knife be preserved.
16. Check the Ratchet Pawl Assembly to ensure that the pawls, pawl pins, and pawl springs are in usable condition. Replace any collapsed springs or those that have a weak recoil. Be sure the pawls freely swing on the pawl pins.
17. Thoroughly clean and inspect all parts. Replace any blades that are chipped or severely worn. Tong and wrench marks should be filed smooth.

Disassembly of the Logan Standard External Cutter with a Ratchet Pawl Assembly is now complete.

Slip Assembly

The following disassembly instructions are for a Logan Standard External Cutter with a Slip Assembly:

1. Place the cutter in a suitable vise. Clamp near the center.
2. Remove the loosened top sub from the body.

CAUTION: The main spring exerts considerable tension load. Exercise care during its removal to avoid damage to the top sub or injury to the operator.

3. Lift out the spring dog assembly.
4. Remove the thrust bearing and thrust washer.
5. Remove the preload sleeve.

6. Remove the spring seat and main spring.
7. Slide out and remove the feed ring.
8. Drive the sheared halves of the two (2) shear pins from the body with a suitable punch.
9. Using a socket head wrench, remove the set screws that lock the knife pins in place.
10. Push out the knife pins with a suitable punch.

CAUTION: The shouldered knife pins must be removed from the side of the hole that has the set screw holes. They can not be removed from the other side. The knives will fall free when the knife pins are removed.

11. Loosen and remove the guide from the lower end of the body.
12. With a suitable punch, remove the sheared pins from the feed ring.

CAUTION: Carefully remove the sheared pins from the body and feed ring. Do not distort or damage the shear pin holes.

13. Thoroughly clean and examine each part for any sign of damage or advanced wear. The body interior should be free of mars or scratches, and bits of shear pin and other loose debris.
14. Examine the feed ring. It should be free of mars and scratches. Smooth any distortion on the edges with a hand file.
15. Examine the knives. They must be in perfect condition for re-use. Replace them if they are chipped or worn. Minor wear or damage may sometimes be repaired with skillful regrinding. However, it is important that the contour and overall length of each knife be preserved.

16. Check the Slip Assembly to ensure that the slip spring and slip bowl shear pin are in usable condition. Replace any collapsed springs or those that have a weak recoil.
17. Thoroughly clean and inspect all parts. Replace any parts that are damaged or severely worn. Tong and wrench marks should be filed smooth.

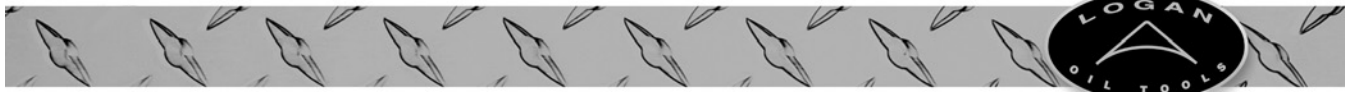
Disassembly of the Logan Standard External Cutter with a Slip Assembly is now complete.

ASSEMBLY

The Logan Standard External Cutter is easily assembled using standard shop tools. No special tools are required. Make sure all parts have been thoroughly cleaned, inspected, and lubricated prior to assembly. Replace any collapsed springs or those that have a weak recoil. Replace any blades that are chipped or severely worn. Use high quality thread compound on the top sub and guide connections.

The following assembly instructions are for a Logan Standard External Cutter with a Spring Dog Assembly:

1. Secure the Standard External Cutter in a suitable vise. Clamp near the center of the tool.
2. Set the knives in the body with the cutting edges facing the inside. Slip a knife pin through the hole in the body and through the pin hole in the knife. Insert a set screw and tighten. Wedge the knives in place with a piece of soft rope or string to help maintain their position while the remaining knives are assembled.
3. After all of the knives have been assembled, insert the feed ring, with the bevelled face toward the knives, through the top of the body. Position the feed ring so the two (2) shear pin holes in the feed ring



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align with the two (2) shear pin holes in the body.

4. Insert the two (2) shear pins into the holes in the body and feed ring.

NOTE: If the ends of the shear pins are slightly upset, tap them with a small hammer until they snugly fit the shear pin holes.

5. Insert the main spring in the body. Slide it down until it seats against the feed ring.
6. Slide the preload sleeve into the body until it seats against the main spring.
7. Insert the thrust washer, followed by the thrust bearing, into the body.
8. Insert the Spring Dog Assembly into the body.

CAUTION: Be sure that the dog springs in the Spring Dog Assembly face the upper end of the body to deflect and pass collars going into the hole.

9. Thread the top sub into the body. Tighten the connection.

NOTE: The main spring is partially compressed when it enters the top sub. Considerable resistance will be felt as the top sub is made up.

10. Thread the guide onto the lower end of the body. Tighten the connection.

The Logan Standard External Cutter with a Spring Dog Assembly is now ready for use.

Ratchet Pawl Assembly

The following assembly instructions are for a Logan Standard External Cutter with a Ratchet Pawl Assembly:

1. Secure the Standard External Cutter in a suitable vise. Clamp near the center of the tool.

2. Set the knives in the body with the cutting edges facing the inside. Slip a knife pin through the hole in the body and through the pin hole in the knife. Insert a set screw and tighten. Wedge the knives in place with a piece of soft rope or string to help maintain their position while the remaining knives are assembled.

3. After all of the knives have been assembled, insert the feed ring, with the bevelled face toward the knives, through the top of the body. Position the feed ring so the two (2) shear pin holes in the feed ring align with the two (2) shear pin holes in the body.

4. Insert the two (2) shear pins into the holes in the body and feed ring.

NOTE: If the ends of the shear pins are slightly upset, tap them with a small hammer until they snugly fit the shear pin holes.

5. Insert the main spring in the body. Slide it down until it seats against the feed ring.

6. Slide the preload sleeve into the body until it seats against the main spring.

7. Insert the thrust washer, followed by the thrust bearing, into the body.

8. Insert the Ratchet Pawl Assembly into the body.

9. Thread the top sub into the body. Tighten the connection.

10. Thread the guide onto the lower end of the body. Tighten the connection.

The Logan Standard External Cutter with a Ratchet Pawl Assembly is now ready for use.

Slip Assembly

The following assembly instructions are for a Logan Standard External Cutter with a Slip Assembly:

1. Secure the Standard External Cutter in a suitable vise. Clamp near the center of the tool.

2. Set the knives in the body with the cutting edges facing the inside. Slip a knife pin through the hole in the body and through the pin hole in the knife. Insert a set screw and tighten. Wedge the knives in place with a piece of soft rope or string to help maintain their position while the remaining knives are assembled.

3. After all of the knives have been assembled, insert the feed ring, with the bevelled face toward the knives, through the top of the body. Position the feed ring so the two (2) shear pin holes in the feed ring align with the two (2) shear pin holes in the body.

4. Insert the two (2) shear pins into the holes in the body and feed ring.

NOTE: If the ends of the shear pins are slightly upset, tap them with a small hammer until they snugly fit the shear pin holes.

5. Insert the main spring in the body. Slide it down until it seats against the feed ring.

6. Slide the preload sleeve into the body until it seats against the main spring.

7. Insert the thrust washer, followed by the thrust bearing, into the body.

8. Insert the Slip Assembly into the body.

9. Thread the top sub into the body. Tighten the connection.

10. Thread the guide onto the lower end of the body. Tighten the connection.

The Logan Standard External Cutter with a Slip Assembly is now ready for use.



Standard External Cutters

MAXIMUM LENGTH AND LOAD OF TUBING OR DRILL PIPE TO BE PICKED UP

EXTERNAL CUTTER KNIVES							RATCHET PAWLS	
Size (ins)	ID	OD	Logan No.	Bowen No.	Length (ft)	Load (lbs) *	Length (ft)	Load (lbs) *
1.050 Tbg	1-5/8	2-5/16	410-231	32848	1,650	1,985	1,700	2,000
1.315 Tbg	1-5/8	2-5/16	410-231	32848	1,500	2,800	2,000	3,600
1.315 Tbg	3-1/8	3-7/8	410-388	47127	666	1,200	888	1,600
1.660 Tbg	3-1/8	3-7/8	410-388	47127	583	1,400	875	2,100
1.900 Tbg	3-1/8	3-7/8	410-388	47127	552	1,600	965	2,800
2-1/16 Tbg	3-1/8	3-7/8	410-388	47127	500	1,700	1,029	3,500
2-3/8 Tbg	3-1/8	3-7/8	410-388	47127	468	2,200	1,400	6,600
1.660 Tbg	3-1/4	4-1/2	410-450	47167	2,420	5,800	3,630	8,740
1.900 Tbg	3-1/4	4-1/2	410-450	47167	2,275	6,600	3,430	9,940
2-1/16 Tbg	3-1/4	4-1/2	410-450	47167	2,088	7,100	3,150	10,725
2-3/8 Tbg	3-1/4	4-1/2	410-450	47167	1,830	8,600	2,804	12,900
1.900 Tbg	3-7/8	4-11/16	410-468	47210	379	1,100	420	1,225
2-1/16 Tbg	3-7/8	4-11/16	410-468	47210	347	1,180	375	1,275
2-3/8 Tbg	3-7/8	4-11/16	410-468	47210	276	1,300	275	1,290
2-7/8 Tbg	3-7/8	4-11/16	410-468	47210	260	1,700	300	1,930
2-1/16 Tbg	4-3/8	5-5/8	410-563	47309	1,290	4,400	2,350	8,000
2-3/8 Tbg	4-3/8	5-5/8	410-563	47309	1,210	5,700	2,020	9,500
2-7/8 Tbg	4-3/8	5-5/8	410-563	47309	1,307	8,500	1,965	12,750
3-1/2 Tbg	4-3/8	5-5/8	410-563	47309	1,258	11,700	1,905	17,700
2-3/8 Tbg	4-5/8	5-7/8	410-588	47264	1,212	5,700	1,850	8,735
2-7/8 Tbg	4-5/8	5-7/8	410-588	47264	1,061	6,900	1,610	10,500
3-1/2 Tbg	4-5/8	5-7/8	410-588	47264	1,000	9,300	1,515	14,100
2-3/8 Tbg	4-7/8	6-1/16	410-606	47360	500	2,350	750	3,525
2-7/8 Tbg	4-7/8	6-1/16	410-606	47360	415	2,700	625	4,070
3-1/2 Tbg	4-7/8	6-1/16	410-606	47360	387	3,600	570	4,555
4 Tbg	4-7/8	6-1/16	410-606	47360	436	4,800	655	7,200
3-1/2 DP	6-3/8	7-5/8	410-763	47422	315	4,790	470	7,180
4 DP	6-3/8	7-5/8	410-763	47422	325	5,100	500	7,750
4-1/2 DP	6-3/8	7-5/8	410-763	47422	295	5,900	450	8,925
5 DP	6-3/8	7-5/8	410-763	47422	395	7,700	600	11,625
4 Csg	6-5/8	8-1/8	410-613	47541	380	5,950	570	8,925
4-1/2 Csg	6-5/8	8-1/8	410-613	47541	335	6,700	500	10,125
5 Csg	6-5/8	8-1/8	410-613	47541	446	8,700	745	13,090
5-1/2 Csg	6-5/8	8-1/8	410-613	47541	412	10,400	640	15,640
5-3/4 Csg	6-5/8	8-1/8	410-613	47541	550	12,400	830	18,640

* These are maximum static loads. Reduce values by 50% if shock loaded.



Standard External Cutters

TUBING/CASING SIZE TO CUT	1.050 to 1.315 Tbg	1.315 to 2-3/8 Tbg	1.660 to 2-3/8 Tbg	1.900 to 2-7/8 Tbg	2-1/16 to 3-1/2 Tbg	2-3/8 to 3-1/2 Tbg	2 3/8 to 4 Tbg	
MAX SIZE WILL PASS OVER	1.552	3-1/16	3-1/8	3-3/4	4-1/4	4-1/2	4-3/4	
INSIDE DIAMETER (CUTTER)	1-5/8	3-1/8	3-1/4	3-7/8	4-3/8	4-5/8	4-7/8	
OUTSIDE DIAMETER (CUTTER)	2-5/16	3-7/8	4-1/2	4-11/16	5-5/8	5-7/8	6-1/16	
MINIMUM SIZE HOLE TO RUN IN	2-7/16	4-1/8	4-3/4	4-15/16	5-7/8	6-1/8	6-1/4	
COMPLETE ASSEMBLY w/SPRING DOG	Logan Part No. Bowen No.	410-231 32848	410-388 47127	410-450 47167	410-468 47210	410-563 47309	410-588 47264	410-606 47360
TOP SUB	Logan Part No. Bowen No.	P1000 13626	P1001 47128	P1002 47168	P1003 47211	P1004 33574	P1005 47265	P1006 33648
BODY	Logan Part No. Bowen No.	P2000 13627	P2001 47129	P2002 47169	P2003 47212	P2004 47310	P2005 47266	P2006 47361
THRUST WASHER	Logan Part No. Bowen No.	P3000 13633	P3001 32904	P3002 47171	P3003 33083	P3004 36484	P3005 47268	P3006 33650
THRUST BEARING	Logan Part No. Bowen No.	P4000 32852	P4001 32905	P4002 47172	P4003 33084	P4004 33595	P4005 47269	P4006 33651
PRELOAD SLEEVE	Logan Part No. Bowen No.	P5000 32891	P5001 45844	P5002 47173	P5003 47214	P5004 33582	P5005 47270	P5006 47362
SPRING SEAT	Logan Part No. Bowen No.	P6000 80149	P6001 14209	P6002 47174	P6003 47215	P6004 33583	P6005 49254	P6006 47363
MAIN SPRING	Logan Part No. Bowen No.	P7000 13634	P7001 14217	P7002 33020	P7003 33085	P7004 9994	P7005 39164	P7006 33652
FEED RING	Logan Part No. Bowen No.	P8000 13635	P8001 32907	P8002 47175	P8003 33086	P8004 33579	P8005 47577	P8006 33653
SHEAR PIN	Logan Part No. Bowen No. No. Req'd	P9000 14205 2	P9000 14205 2	P9002 47578 2	P9000 14205 2	P9004 33580 2	P9004 33580 2	P9006 33654 2
KNIFE	Logan Part No. Bowen No. No. Req'd	P10000 13637 5	P10001 32909 5	P10002 33023 5	P10003 33088 5	P10004 34553 5	P10004 34553 5	P10006 33655 5
KNIFE PIN	Logan Part No. Bowen No. No. Req'd	P11000 37015 5	P11001 32910 5	P11002 33024 5	P11003 33089 5	P11004 34554 5	P11004 34554 5	P11006 33656 5
KNIFE PIN SET SCREW	Logan Part No. Bowen No. No. Req'd	P12001 32911 5	P12002 23687 5	P12003 23664 5	P12004 23703 5	P12004 23703 5	P12006 23685 5
GUIDE	Logan Part No. Bowen No.	P13000 13628	P13001 14203	P13002 47176	P13003 33093	P13004 33584	P13005 39169	P13006 33660

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Special Notes:

- (1) Assembly includes one Spring Dog assembly, which differs from Ratchet Pawl or Slip assemblies; see chart above.
- (2) Connections other than API available upon request.
- (3) Single Pawl Spacer is required when using Ratchet Pawl Assembly.

When ordering, please specify:

- (1) Name and number of assembly or part
- (2) Size and type of top connection
- (3) Any desired options by name and number
- (4) Any desired spares by name and number

Recommended Spare Parts:

- (1) 2 sets Knife Pins
- (2) 1 Feed Ring
- (3) 24 Shear Pins
- (4) 6 sets of Knives
- (5) 2 Spring Dog, Ratchet Pawl, or Slip Assemblies
- (6) 1 set Knife Pin Screws



Standard External Cutters

TUBING/CASING SIZE TO CUT	1.050 to 1.315 Tbg	1.315 to 2-3/8 Tbg	1.660 to 2-3/8 Tbg	1.900 to 2-7/8 Tbg	2-1/16 to 3-1/2 Tbg	2-3/8 to 3-1/2 Tbg	2 3/8 to 4 Tbg	
MAXIMUM SIZE WILL PASS OVER	1.552	3-1/16	3-1/8	3-3/4	4-1/4	4-1/2	4-3/4	
INSIDE DIAMETER (CUTTER)	1-5/8	3-1/8	3-1/4	3-7/8	4-3/8	4-5/8	4-7/8	
OUTSIDE DIAMETER (CUTTER)	2-5/16	3-7/8	4-1/2	4-11/16	5-5/8	5-7/8	6-1/16	
MINIMUM SIZE HOLE TO RUN IN	2-7/16	4-1/8	4-3/4	4-15/16	5-7/8	6-1/8	6-1/4	
COMPLETE ASSEMBLY	Logan Part No.	410-231	410-388	410-450	410-468	410-563	410-588	410-606
w/SPRING DOG	Bowen No.	32848	47127	47167	47210	47309	47264	47360

SPRING DOG ASSEMBLY

COMPLETE ASSEMBLY	Logan Part No.	11000-000	11000-001	11000-002	11000-003	11000-004	11000-005	11000-006
<i>Consists of:</i>	Bowen No.	13629	47131	47177	47216	47313	47271	47365
SPRING DOG BODY	Logan Part No.	P14000	P14001	P14002	P14003	P14004	P14005	P14006
	Bowen No.	13630	47132	47178	47217	47314	47272	47366
SPRING DOG	Logan Part No.	P15000	P15001	P15002	P15003	P15004	P15004	P15006
	Bowen No.	13631	32917	47179	33103	33644	33644	33663
	No. Req'd	6	6	6	6	6	6	6
RIVET	Logan Part No.	P16000	P16001	P16002	P16003	P16004	P16002	P16004
	Bowen No.	13632	45626	47180	45842	44803	47180	44803
	No. Req'd	12	12	12	12	12	12	12

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

Special Notes:

- (1) Assembly includes one Spring Dog assembly, which differs from Ratchet Pawl or Slip assemblies; see chart above.
- (2) Connections other than API available upon request.
- (3) Single Pawl Spacer is required when using Ratchet Pawl Assembly.

When ordering, please specify:

- (1) Name and number of assembly or part
- (2) Size and type of top connection
- (3) Any desired options by name and number
- (4) Any desired spares by name and number

Recommended Spare Parts:

- (1) 2 sets Knife Pins
- (2) 1 Feed Ring
- (3) 24 Shear Pins
- (4) 6 sets of Knives
- (5) 2 Spring Dog, Ratchet Pawl, or Slip Assemblies
- (6) 1 set Knife Pin Screws



Standard External Cutters

TUBING/CASING SIZE TO CUT	1.050 to 1.315 Tbg	1.315 to 2-3/8 Tbg	1.660 to 2-3/8 Tbg	1.900 to 2-7/8 Tbg	2-1/16 to 3-1/2 Tbg	2-3/8 to 3-1/2 Tbg	2 3/8 to 4 Tbg	
MAXIMUM SIZE WILL PASS OVER	1.552	3-1/16	3-1/8	3-3/4	4-1/4	4-1/2	4-3/4	
INSIDE DIAMETER (CUTTER)	1-5/8	3-1/8	3-1/4	3-7/8	4-3/8	4-5/8	4-7/8	
OUTSIDE DIAMETER (CUTTER)	2-5/16	3-7/8	4-1/2	4-11/16	5-5/8	5-7/8	6-1/16	
MINIMUM SIZE HOLE TO RUN IN	2-7/16	4-1/8	4-3/4	4-15/16	5-7/8	6-1/8	6-1/4	
COMPLETE ASSEMBLY	Logan Part No.	410-231	410-388	410-450	410-468	410-563	410-588	410-606
w/SPRING DOG	Bowen No.	32848	47127	47167	47210	47309	47264	47360

OPTIONAL RATCHET PAWL ASSEMBLY

COMPLETE ASSEMBLY	Logan Part No.	11000-009	11000-010	11000-011	11000-012	11000-013	11000-014	11000-015
<i>Consists of:</i>	Bowen No.	13666	47138	47181	47218	47315	47275	47367
PAWL BODY	Logan Part No.	P17000	P17001	P17002	P17003	P17004	P17005	P17006
	Bowen No.	13667	47139	47182	47219	47316	47276	47368
RATCHET PAWL	Logan Part No.	P18000	P18001	P18002	P18003	P18004	P18005	P18006
	Bowen No.	13668	32946	47183	47220	47317	47277	47369
	No. Req'd	6	6	6	6	6	6	6
PAWL SPRING	Logan Part No.	P19000	P19001	P19002	P19003	P19002	P19002	P19002
	Bowen No.	14213	15656	14829	18729	14829	14829	14829
	No. Req'd	6	6	6	6	6	6	6
PAWL PIN	Logan Part No.	P20000	P20001	P20002	P20001	P20004	P20005	P20002
	Bowen No.	37011	33128	37019	33128	37031	47253	37019
	No. Req'd	6	6	6	6	6	6	6
SINGLE PAWL SPACER <i>(See Note 3)</i>	Logan Part No.	P27000	P27001	P27002	P27003	P27004	P27005	P27006
	Bowen No.	32890	47141	47190	47227	47326	47286	47378

OPTIONAL SLIP ASSEMBLY

COMPLETE ASSEMBLY	Logan Part No.	...	11000-019	11000-020	11000-021	11000-022	11000-023	11000-024
<i>Consists of:</i>	Bowen No.	...	47133	47185	47221	47319	47279	47371
SLIP	Logan Part No.	...	P21001	P21002	P21003	P21004	P21005	P21006
	Bowen No.	...	47134	47186	47222	47320	47280	47372
SLIP BOWL	Logan Part No.	...	P22001	P22002	P22003	P22004	P22005	P22006
	Bowen No.	...	47135	47187	47223	47321	47281	47373
SLIP BOWL RETAINER	Logan Part No.	...	P23001	P23002	P23003	P23004	P23005	P23006
	Bowen No.	...	47136	47188	47224	47322	47282	47374
SLIP SPRING	Logan Part No.	...	P24001	P24002	P24003	P24004	P24005	P24006
	Bowen No.	...	47137	47189	47225	47323	47283	47375
SLIP BOWL SHEAR PIN	Logan Part No.	...	P25001	P25001	P25001	P25004	P25004	P25004
	Bowen No.	...	47208	47208	47208	47324	47324	47324
	No. Req'd	...	4	4	4	4	4	4
SLIP ADAPTER	Logan Part No.	...	P26001	P26002	P26003	P26004	P26005	P26006
	Bowen No.	...	47130	47170	47213	47311	47267	47364

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Standard External Cutters

TUBING/CASING SIZE TO CUT	3-1/2, 4, 4-1/2 & 5 DP	4 to 5-3/4 Csg
MAXIMUM SIZE WILL PASS OVER	6-1/4	6-1/2
INSIDE DIAMETER (CUTTER)	6-3/8	6-5/8
OUTSIDE DIAMETER (CUTTER)	7-5/8	8-1/8
MINIMUM SIZE HOLE TO RUN IN	8-1/4	8-5/8
COMPLETE ASSEMBLY w/SPRING DOG	Logan Part No. 410-763 Bowen No. 47422	410-813 47541
<i>Consists of:</i>		
TOP SUB	Logan Part No. P1007 Bowen No. 33885	P1008 33959
BODY	Logan Part No. P2007 Bowen No. 47423	P2008 47542
THRUST WASHER	Logan Part No. P3007 Bowen No. 33887	P3008 33961
THRUST BEARING	Logan Part No. P4007 Bowen No. 33888	P4008 33962
PRELOAD SLEEVE	Logan Part No. P5007 Bowen No. 47424	P5008 47543
SPRING SEAT	Logan Part No. P6007 Bowen No. 49255	P6008 49258
MAIN SPRING	Logan Part No. P7007 Bowen No. 33889	P7008 33963
FEED RING	Logan Part No. P8007 Bowen No. 33890	P8008 33964
SHEAR PIN	Logan Part No. P9007 Bowen No. 33891 No. Req'd 2	P9008 33965 2
KNIFE	Logan Part No. P10004 Bowen No. 34553 No. Req'd 5	P10008 44802 5
KNIFE PIN	Logan Part No. P11004 Bowen No. 34554 No. Req'd 5	P11008 33966 5
KNIFE PIN SET SCREW	Logan Part No. P12004 Bowen No. 23703 No. Req'd 5	P12008 23705 5
GUIDE	Logan Part No. P13007 Bowen No. 33897	P13008 33969

TUBING/CASING SIZE TO CUT	3-1/2, 4, 4-1/2 & 5 DP	4 to 5-3/4 Csg
MAXIMUM SIZE WILL PASS OVER	6-1/4	6-1/2
INSIDE DIAMETER (CUTTER)	6-3/8	6-5/8
OUTSIDE DIAMETER (CUTTER)	7-5/8	8-1/8
MINIMUM SIZE HOLE TO RUN IN	8-1/4	8-5/8

SPRING DOG ASSEMBLY

COMPLETE ASSEMBLY	Logan Part No. 11000-007 <i>Consists of:</i> Bowen No. 33949	11000-008 47545
SPRING DOG BODY	Logan Part No. P14007 Bowen No. 33950	P14008 47546
SPRING DOG	Logan Part No. P15007 Bowen No. 50192 No. Req'd 6	P15007 50192 6
RIVET	Logan Part No. P16004 Bowen No. 44803 No. Req'd 12	P16008 50191 12

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Special Notes:

- (1) Assembly includes one Spring Dog Assembly which differs from Ratchet Pawl or Slip Assemblies. See table on next page.
- (2) Connections other than API available upon request.
- (3) Single Pawl Spacer is required when using Ratchet Pawl Assembly. It is not included in the Complete Assembly.

When ordering, please specify:

- (1) Name and number of assembly or part
- (2) Size and type of top connection
- (3) Any desired options by name and number
- (4) Any desired spares by name and number

Recommended Spare Parts:

- (1) 2 sets Knife Pins
- (2) 1 Feed Ring
- (3) 24 Shear Pins
- (4) 6 sets of Knives
- (5) 2 Spring Dog, Ratchet Pawl, or Slip Assemblies
- (6) 1 set Knife Pin Screws



Standard External Cutters

TUBING/CASING SIZE TO CUT	3-1/2, 4, 4-1/2 & 5 DP	4 to 5-3/4 Csg
MAXIMUM SIZE WILL PASS OVER	6-1/4	6-1/2
INSIDE DIAMETER (CUTTER)	6-3/8	6-5/8
OUTSIDE DIAMETER (CUTTER)	7-5/8	8-1/8
MINIMUM SIZE HOLE TO RUN IN	8-1/4	8-5/8

TUBING/CASING SIZE TO CUT	3-1/2, 4, 4-1/2 & 5 DP	4 to 5-3/4 Csg
MAXIMUM SIZE WILL PASS OVER	6-1/4	6-1/2
INSIDE DIAMETER (CUTTER)	6-3/8	6-5/8
OUTSIDE DIAMETER (CUTTER)	7-5/8	8-1/8
MINIMUM SIZE HOLE TO RUN IN	8-1/4	8-5/8

OPTIONAL RATCHET PAWL ASSEMBLY

COMPLETE ASSEMBLY	Logan Part No. 11000-016	11000-017
<i>Consists of:</i>	Bowen No. 47426	47547
PAWL BODY	Logan Part No. P17007	P17008
	Bowen No. 47427	47548
RATCHET PAWL	Logan Part No. P18007	P18008
	Bowen No. 47428	47549
	No. Req'd 6	6
PAWL SPRING	Logan Part No. P19002	P19008
	Bowen No. 14829	47443
	No. Req'd 6	6
PAWL PIN	Logan Part No. P20004	P20008
	Bowen No. 37031	47550
	No. Req'd 6	6
SINGLE PAWL SPACER	Logan Part No. P27007	P27008
<i>(See Note 3)</i>	Bowen No. 47437	47557

OPTIONAL SLIP ASSEMBLY

COMPLETE ASSEMBLY	Logan Part No. 11000-025	11000-026
<i>Consists of:</i>	Bowen No. 47430	47551
SLIP	Logan Part No. P21007	P21008
	Bowen No. 47431	47552
SLIP BOWL	Logan Part No. P22007	P22008
	Bowen No. 47432	47553
SLIP BOWL RETAINER	Logan Part No. P23007	P23008
	Bowen No. 47433	47554
SLIP SPRING	Logan Part No. P24007	P24008
	Bowen No. 47434	47556
SLIP BOWL SHEAR PIN	Logan Part No. P25007	P25008
	Bowen No. 47435	47555
	No. Req'd 4	4
SLIP ADAPTER	Logan Part No. P26007	P26008
	Bowen No. 47425	47544

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When ordering, please specify:

- (1) Name and number of assembly or part
- (2) Size and type of top connection
- (3) Any desired options by name and number
- (4) Any desired spares by name and number

Recommended Spare Parts:

- (1) 2 sets Knife Pins
- (2) 1 Feed Ring
- (3) 24 Shear Pins
- (4) 6 sets of Knives
- (5) 2 Spring Dog, Ratchet Pawl, or Slip Assemblies
- (6) 1 set Knife Pin Screws

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