

Z Type Hydraulic Fishing Jar



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# Z Type Hydraulic Fishing Jar

## OVERVIEW

The Logan Z Type Hydraulic Fishing Jar is used for light drilling, fishing, coring, reaming, testing, side tracking, and washover operations. This straight-pull jar combines proven principles of mechanics and hydraulics in a simple to assemble, easy to operate design.

The tool does not interfere with the operation of formation testers, safety joints, or other fishing tools. It can transmit full torque in either direction at all times during operation. Settings and adjustments are not necessary before going into the hole or after the fish has been engaged.

The Jar's closed hydraulic system contains hydraulic fluid within the Jar and prevents well fluids from entering the tool. The internal working parts are constantly lubricated by the hydraulic fluid within the tool, resulting in long-life wear of the parts.

The intensity of jarring impact — from very light to very heavy — can be easily controlled by the operator. A rapid series of jarring blows can be delivered when needed. The speed is limited only by the time it takes the operator to raise and lower the fishing string for each stroke.

Impact control is made possible by the metering action of the piston assembly. During the pull stroke, the piston assembly meters fluid from one cavity to another through a restricted passage. This retarded fluid flow delays the stroke thereby allowing the operator ample time to stretch the running string to strike a blow of desired intensity.

Metering action does not occur when the Jar is closed or reset. Only enough weight to overcome friction is required to close the tool and will not damage the Jar. When the mandrel/piston assembly is lowered, the piston rings travel upward in their grooves. When the Jar is reset for another stroke, large bypass relief ports in the piston open during the closing stroke to allow unobstructed fluid flow from the lower cavity to the upper cavity. The piston thus re-enters the cylinder with little resistance.

## USE

The Logan Z Type Hydraulic Fishing Jar is commonly used in fishing and coring operations, and formation testing. The Jar does not interfere with test equipment or other tools — an important design feature that preserves test data if jarring should become necessary. The packing can withstand higher pressures than those encountered during formation testing.

The tool does not interfere with the free operation of other fishing tools or safety joints. The operator can easily and simply control the intensity of the blow — from very light to heavy impact — without prior adjustment.

The Logan Z Type Hydraulic Jar is easy to use. Only straight pull is required to operate the jar. Each blow can be positively controlled by the operator from a very light blow to forceful impact. Successive blows can be struck as often as the operator can raise and slack off the running string. Full circulation through the tool can be maintained for effective flushing. Full torque may be used in either direction and at all times during operation.

## CONSTRUCTION

The Logan Z Type Hydraulic Fishing Jar basically consists of a mandrel/piston assembly that slides within a cylinder assembly. The cylinder assembly consists of a mandrel body (or top sub), middle body, washpipe body, fill plugs, and seal ring assemblies.

### Mandrel/Piston Assembly

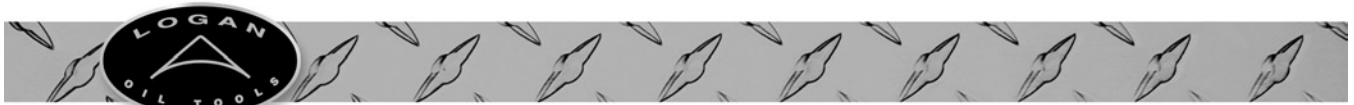
The mandrel/piston assembly is composed of a mandrel, piston assembly, knocker, and washpipe.

### Mandrel

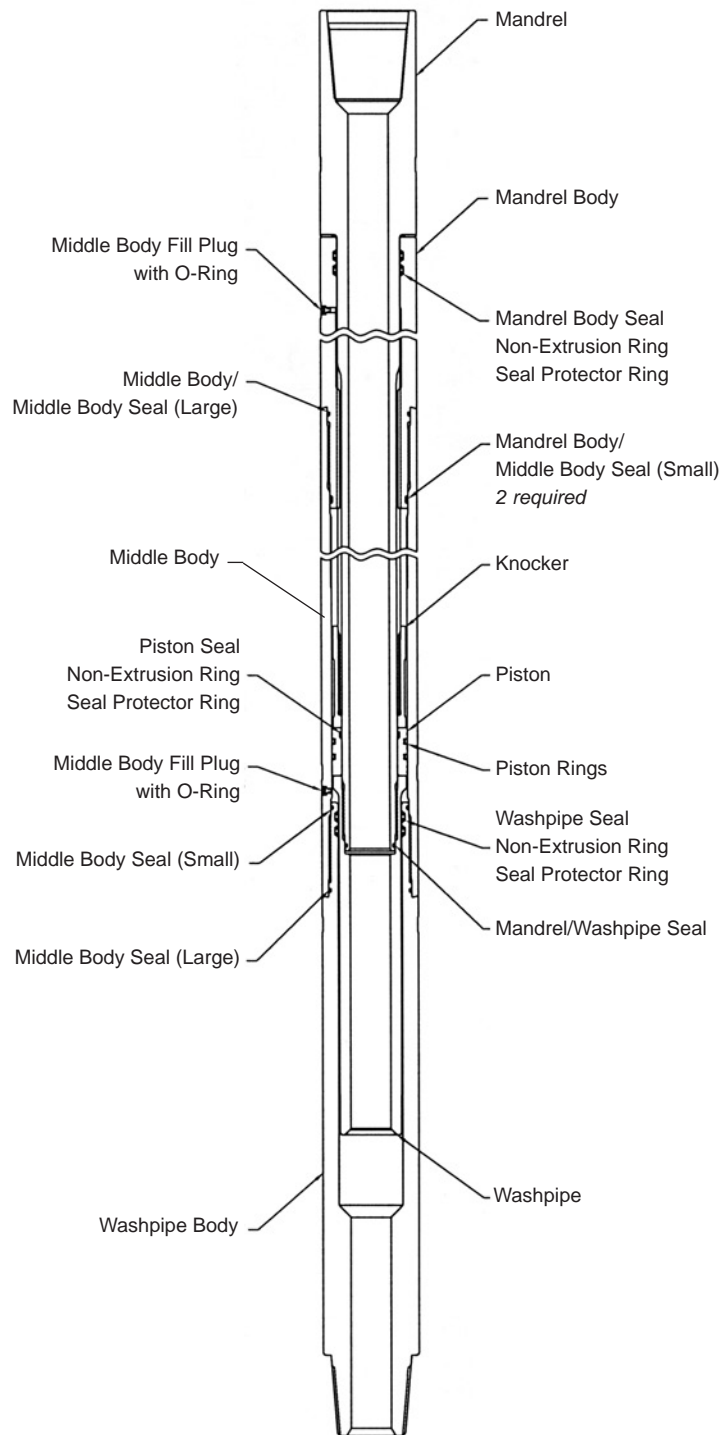
The shoulder-type, splined mandrel fits into the mating splines of the mandrel body. The splines are always engaged to provide a continuous source of torque transmission whether bumping or not. The mandrel freely moves up and down while transmitting torque to the mandrel body. There is a polished seal section between the splines and top end. A suitable knocker and washpipe are made up on the lower end of the mandrel.

### Mandrel Body

The mandrel body slides flat-end up over the mandrel. The inside of the mandrel body is designed with a series of straight splines near the lower end. These splines engage the corresponding splines of the mandrel to transmit torque conveyed by the running through the middle body, washpipe body, and attached tool. A fill plug located at the upper end of the mandrel body, similar to the fill plug on the lower end of the middle body, allows the Z Type Hydraulic Fishing Jar to be filled with oil. (See page 12 for a detailed description of the filling process.) Two seal assemblies (each consisting of a non-extrusion ring, seal protector ring, and an O-ring), seal the fluid in the upper end of the mandrel body.



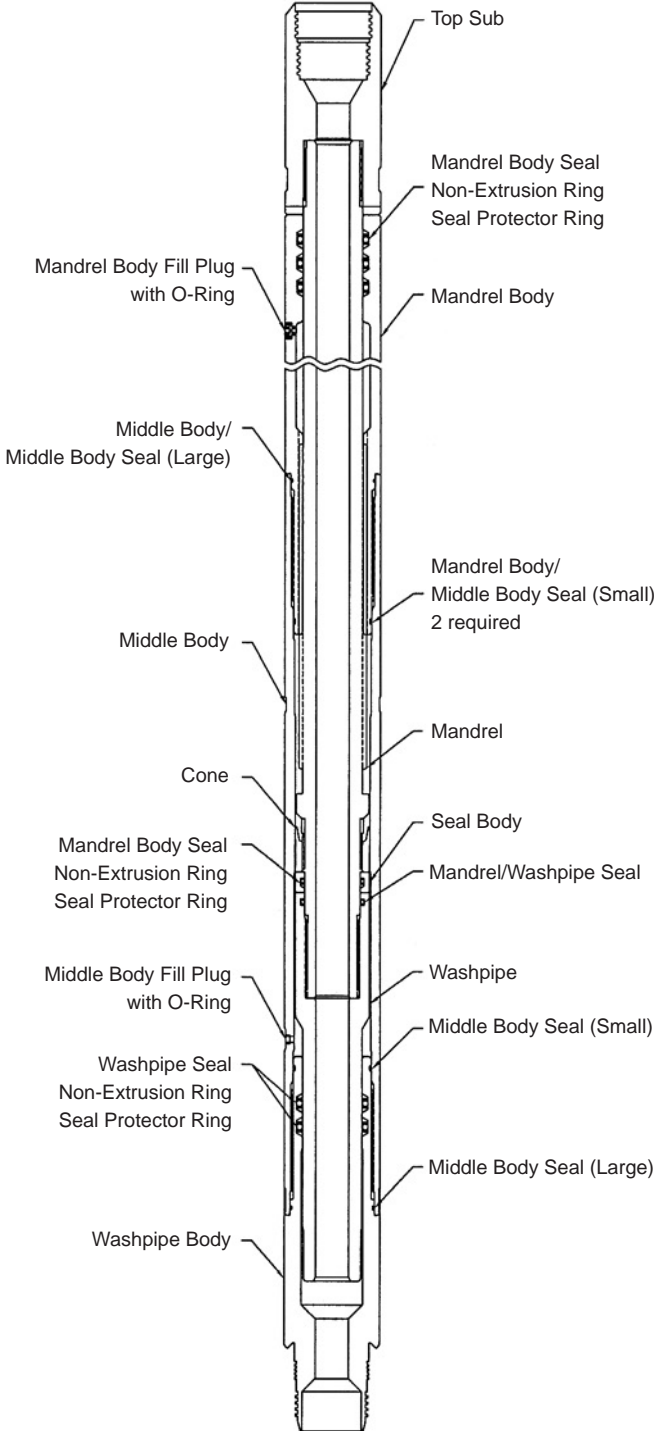
# Z Type Hydraulic Fishing Jar



**Logan Z Type Hydraulic Fishing Jar  
with Integral Mandrel**



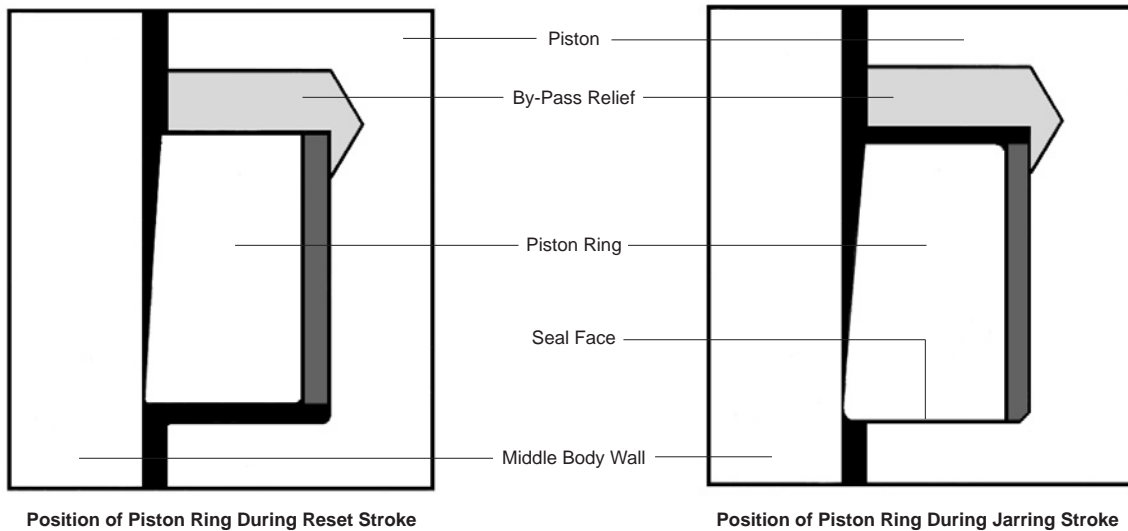
# Z Type Hydraulic Fishing Jar



Logan Z Type Hydraulic Fishing Jar  
with Sub Type Mandrel



## Z Type Hydraulic Fishing Jar



### Piston Assembly

The piston assembly consists of a piston, piston rings, and a piston seal assembly consisting of an O-ring seal, one non-extrusion ring, and one seal protector ring.

The piston rings are in constant contact with the bore of the middle body while the Jar is in operation. Short grooves in the piston allow the piston rings to freely move up and down the cylinder. During the pull stroke, the piston rings are forced down against the bottom of the grooves to form a positive metal-to-metal seal against the middle body cylinder. At the same time, the outside diameter of the piston rings form a seal around the bore of the middle body. Fluid under pressure tries to flow from above the piston to below. Gaps in the piston rings meter and restrict the flow of fluid between the cavities and allow sufficient strain of desired intensity to build to enable a blow.

### Middle Body

With the mandrel body at the upper end and the washpipe body at the lower end, the middle body forms an oil chamber for the lubricating oil for the working parts of the tool. The inside diameter of the middle body is closely fitted to the

outside diameter of the knocker and the upper end of the washpipe. This interior surface is highly polished to reduce frictional wear. The middle body fill plugs and seal assemblies are located at both ends of the middle body.

### Knocker

The knocker strikes a heavy impact blow to the lower end of the mandrel body. The knocker material is specially selected for use in impact loading. It is closely fitted to restrict high frequency lateral vibration, or chatter, that can shorten the life of the tool.

### Washpipe

The upper end of the washpipe is designed with stabilizing features similar to the knocker. The lower end is hard faced and ground to a high polish to reduce frictional wear in the sealed upper end of the washpipe body.

### Washpipe Body

The lowermost part of the tool is the washpipe body. Its primary purposes are to close the lower end of the middle body (oil chamber) and to transmit torque. Two seal assemblies (each consisting of a non-extrusion ring, seal protector ring, and an O-ring) are located in the washpipe body.

### Critical Seals

Seal assemblies, consisting of O-ring seals, seal protector rings, and non-extrusion rings, are placed in high differential pressure areas located at the upper end of the mandrel and the lower end of the washpipe. As hydraulic pressure is applied (in either direction), the seal ring assemblies reduce normal diametric clearance at the seal points to nearly zero. Non-extrusion rings prevent the O-rings from being pushed out or rolled out of position.

Seal assemblies are placed in tandem in places where a seal is subjected to high pressure in both directions

### OPERATION

Carefully examine the Logan Z Type Hydraulic Fishing Jar prior to use. Ensure that it is properly assembled and filled with hydraulic fluid. Test the Jar in a Logan Jar Tester if one is available.

The piston must be assembled with a piston seal with non-extrusion ring and seal protector ring at its upper end. The non-extrusion ring should be below the O-ring, towards the washpipe.



## Z Type Hydraulic Fishing Jar

Check the threaded connections between the mandrel body and middle body, and middle body and washpipe body. They should be made up as tightly as the other joints in the string.

**CAUTION: Tong at least four inches from the tool joint. Do not tong on the threads.**

Assemble the Jar in the string below the drill collars. (The number of drill collars used will depend on the type of operation.) For maximum effectiveness, a Logan Z Type Energizer is recommended — particularly in shallow, very deep, or crooked holes. The Energizer should be placed in the string three to five drill collars above the Jar.

**NOTE: Refer to the Strength Data on pages 30 – 31 for recommended drill collar weights.**

### Fishing Operations

The Logan Z Type Hydraulic Fishing Jar is installed in the string immediately below the drill collars. Refer to the Strength Data on pages 30 – 31 for recommended weight of drill collars above the Jar. For maximum effectiveness, a Logan Z Type Energizer should be installed in the fishing string approximately three to five drill collars above the Jar.

### Jarring Procedure

Raise the string to stretch it sufficiently to produce the desired impact. Set the brake and wait for the Jar to strike. The initial blow is affected by many variables and timing may range from a few seconds to several minutes. Variables include the depth of operation, down-hole temperature, condition of the hole, amount of stretch in the string, and if an Energizer is utilized.

Recommended pull load should not be exceeded at any time during operation, including the first pull. Additional load will not increase speed. Refer to the Strength Data, “Torque @ Yield” line, on pages 30 – 31 to determine the safe working load for the Jar. Velocity and relative impact load is controlled by the weight of the drill collars installed above the Jar and the amount of stretch in the running string. A crooked hole will prevent the string from stretching uniformly, so the same amount of pull can not be exerted as if the hole was straight.

After a stroke, the Jar is closed and the string is stretched for the next blow. The intensity of jarring impact — from very light to very heavy — can be easily controlled by the operator. A rapid series of jarring blows, at any desired intensity, can be delivered when needed. The speed is limited only by the time it takes the operator to raise and lower the fishing string for each stroke.

**WARNING: When closed, the Jar should not be left suspended from the elevator, especially with any appreciable weight suspended below it. When in this position, the Jar could fire and cause damage to the rig floor or bodily injury.**

### TROUBLESHOOTING

Corrective procedures for some of the most common operational difficulties are listed below.

#### Unable to strike first blow:

1. Make sure the Jar is fully closed or cocked.
2. Pull up the string to the desired stretch and set the brake. Hold the position until the Jar strikes.
3. Without exceeding the allowable working load on the Jar, increase the tension on the running string.

#### Unable to strike second blow:

1. The Jar may not be closing enough. Lower the running string farther.

#### Strike time seems excessive:

1. Do not allow the jar to close completely.

#### Blows are too hard or Jar does not pull open:

1. The piston ring gap may be plugged with contaminated oil.
  - a. Remove the Jar from the hole.
  - b. Disassemble and clean rings.
  - c. Clean the Jar and fill with clean oil.

#### Blows are not heavy enough:

1. Be sure the Jar is closing fully.
2. Pull up the running string faster.
3. Install more drill collars above the Jar.
4. Use a Logan Z Type Energizer.

#### Jar still does not strike hard enough:

1. The piston rings may be worn. Replace all worn parts.
2. The O-ring seals may be damaged.
  - a. Remove the Jar from the hole.
  - b. Disassemble and replace all seals.
  - c. Clean the Jar and fill with clean oil.

### ASSEMBLY

Thoroughly clean and inspect all parts prior to assembly. Install all seals in the mandrel body, washpipe body, and piston. Refer to the illustrations on pages 3 – 4 and installation photos on pages 8 – 10 for their proper location and direction. Care should be taken to ensure the proper assembly of non-extrusion devices. All seals should be lubricated with jar oil prior to assembly.

**NOTE: If the tool will be stored for a prolonged period, paint or lubricate the exterior surfaces to prevent corrosion. Do not paint or lubricate the seals. Paint, sunlight, solvents, and most lubricants are harmful to rubber products.**



## Z Type Hydraulic Fishing Jar

Proceed with assembly as follows:

### Seal Ring Assembly:

1. Referring to the photos on pages 8 – 10, install the non-extrusion seal assemblies in the mandrel body and washpipe body:

a. Carefully examine each non-extrusion ring and remove any burrs or rough edges with a hand file.

b. Holding the non-extrusion ring between thumbs and forefingers, overlap the ends until the diameter fits inside the body.

c. Place the edge opposite the split into the lower groove and spread the ring towards the ends. Be sure the beveled side of the ring matches the beveled groove.

d. Spread the ring from the center out towards the ends. Press the non-extrusion ring into the groove with the thumbs until the ends meet and the ring is firmly seated in the groove. Press into place as best as possible by hand.

e. Repeat the sequence for all non-extrusion rings.

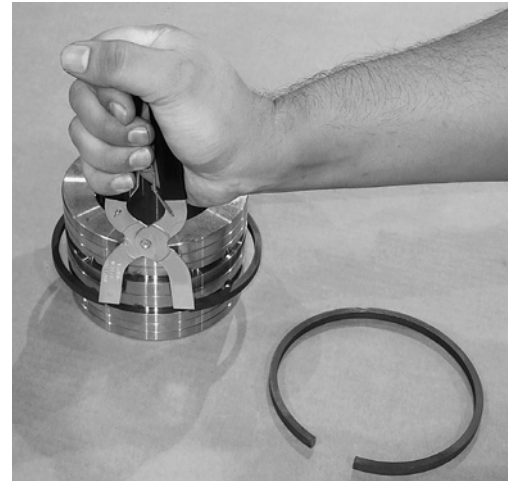
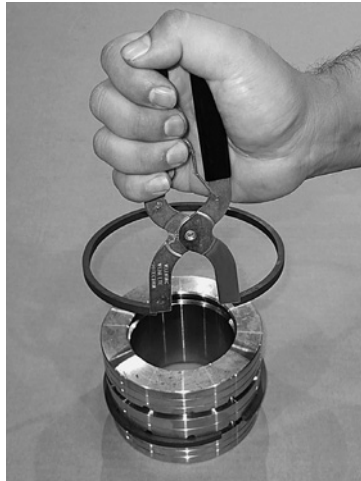
2. Install the seal protector rings:

a. Bend the seal protector ring until it is small enough to fit into the bore.

b. Insert one edge of the seal protector ring into the groove. Insert the opposite edge and press down until entire ring is in place.

c. Straighten and flatten the ring by pressing against it with the bent-tip installation tool (Logan Part No. J1073) from the Jar Service Kit.

e. Repeat the sequence for all seal protector rings.



**Piston Ring Installation and Removal:** Use the Piston Ring Pliers (Logan Part No. 26000-055), to carefully spread the piston ring at the gap (excessive spreading will distort the ring) until its inside diameter is larger than the piston's outside diameter. Place the piston ring in the groove, staggering the gap, and release the pliers to install it. Lift off the expanded piston ring to remove it. All piston rings are installed or removed in the same manner.

3. With both seal assemblies pressed into place as best as possible by hand with the aid of the installation tool, properly seat the seals with the setting tool. Tap around the edge of the setting tool to seat the rings if necessary.

4. Remove the setting tool and continue with O-rings installation. Make sure the seal protector rings are straight and flat. Press against them with the bent-tip installation tool (Logan Part No. J1073) from the Jar Service Kit if necessary. O-rings will be inserted in each groove between the seal protector rings.

a. Grasp the O-ring between the thumbs and forefingers. Bend the O-ring until it is small enough to fit into the bore.

b. Insert one edge of the O-ring into the groove between the seal protector rings. Insert the opposite edge and press down until the entire O-ring is in place.

c. Repeat the sequence for all O-rings.

### Piston Assembly:

5. Position the piston with the bypass relief holes face up. Position the gap of the piston ring in a piston ring pliers with the narrow side up. (*Top* is stenciled on the ring.) Piston rings have a slight bevel on the outside diameter that makes one side look wider than the other. The wide side should always be placed facing the O-ring seal. Spread the ring to widen the gap to make the inside diameter of the ring slightly larger than the outside diameter of the piston. (*Refer to photos above.*) Place all piston rings into the appropriate grooves. Set completed piston assembly aside.

6. After the seal ring assemblies have been installed on the mandrel body, secure the mandrel body horizontally in a vise. Clamp on the joint end.

**CAUTION:** Use only enough gripping action in the vise to secure the body. Avoid making heavy tool marks.

*Piston Assembly continues on page 11.*



# Z Type Hydraulic Fishing Jar

## SEAL ASSEMBLY INSTALLATION



Before installation, examine each non-extrusion ring and remove any burrs or rough edges with a small file. Hold the non-extrusion ring between the thumbs and forefingers.



Install the non-extrusion ring in the mandrel body. Overlap the ends of the ring until the diameter fits inside the body.



Place the edge of the ring opposite the split into the lower groove. Be sure the beveled side of the ring matches the beveled side of the groove.



Spread the ring from the center out towards the ends. Press the ring into the groove with the thumbs until the ends meet and the ring is firmly seated in the groove.



Press the non-extrusion ring into place as best as possible by hand.



Seal protector ring before it is bent. It will look like this after it is properly installed in the groove.



Bend the seal protector ring until it is small enough to fit into the bore.



Insert one edge of the seal protector ring into the groove. Insert the opposite edge and press down until entire ring is in place.



Straighten and flatten the seal protector ring by pressing against it with the bent-tip installation tool (Logan Part No. J1073) from the Jar Service Kit.



# Z Type Hydraulic Fishing Jar

## SEAL ASSEMBLY INSTALLATION (CONTINUED)



Repeat the installation sequence for the seal protector ring.



Bend the seal protector ring until it is small enough to fit into the bore.



Insert one edge of the seal protector ring into the groove. Insert the opposite edge and press down until entire ring is in place.



Straighten and flatten the seal protector ring by pressing against it with the bent-tip installation tool (Logan Part No. J1073) from the Jar Service Kit.



Grasp the non-extrusion ring between the thumbs and forefingers.

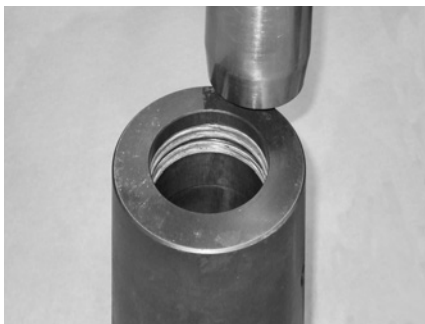


Overlap the ends of the ring until the diameter fits inside the body. Place the edge of the ring opposite the split into the lower groove. Be sure the beveled side of the ring matches the beveled side of the groove.



Spread the ring from the center out towards the ends. Press the ring into the groove with the thumbs until the ends meet and the ring is firmly seated in the groove.

Thoroughly coat the surfaces of the seals with a good grade of clean, lightweight oil. Do not apply lubricant to the seals if the tool is going to be stored.



Place the setting tool in a sling and position it over the top of the mandrel body/washpipe body.

Coat the polished surface of the setting tool with a good grade of clean, lightweight oil.

Lower the setting tool into position and remove the sling.



Insert a bar or rod through the top of the setting tool to make handles to hold the tool.



# Z Type Hydraulic Fishing Jar

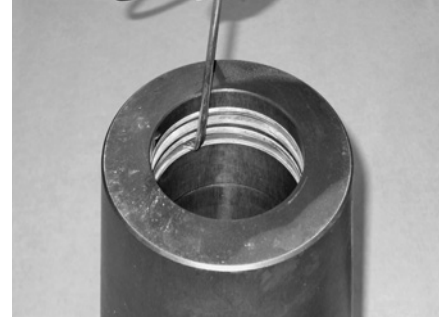
## SEAL ASSEMBLY INSTALLATION (CONTINUED)



Properly seat the seals with the aid of the setting tool, tapping around the entire top edge of the setting tool to seat the rings if necessary. (Setting tools are not included in the Jar Service Kit and must be ordered separately. Refer to Parts Lists on pages 16 – 28 for part numbers.)



Remove the setting tool and continue with seal assembly installation.



Make sure the seal protector rings are straight and flat. Press against them with the bent-tip installation tool (Logan Part No. J1073) from the Jar Service Kit if necessary. The O-rings will be inserted in the grooves between the seal protector rings.

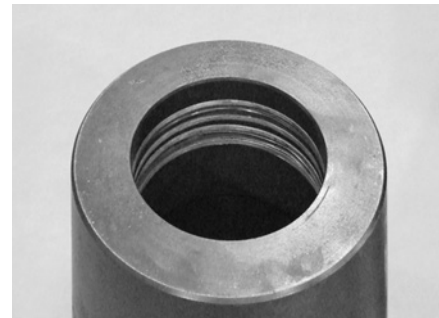


Grasp the O-ring between the thumbs and forefingers.

Bend the O-ring until it is small enough to fit into the bore.



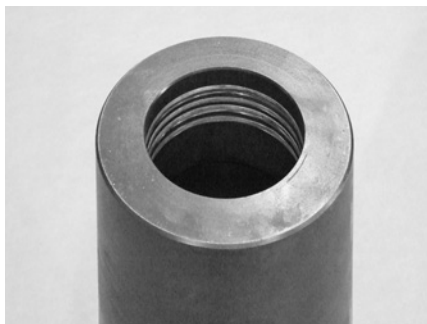
Insert one edge of the O-ring into the groove between the seal protector rings. Insert the opposite edge and press down until entire O-ring is in place.



O-rings are inserted in each groove between the seal protector rings.



Repeat the installation sequence for the second O-ring.



Completed seal assemblies.



## Z Type Hydraulic Fishing Jar

7. Thoroughly coat the polished mandrel surface with a good grade of clean, lightweight oil. Install the mandrel and washpipe seal in the groove on the lower end of the mandrel.

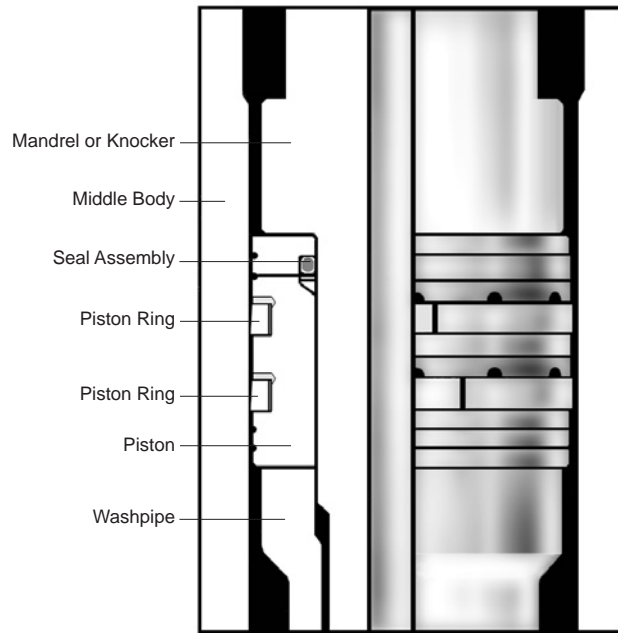
8. Carefully insert the splined end of the mandrel through the tool joint end of the mandrel body. Prevent damage to the seal assemblies as the threads and splines are inserted into the mandrel body. Align the splines and push it through the splines in the mandrel body. Continue to gently push it through until the mandrel bumps against the mandrel body, bringing the polished section of the mandrel past the seal ring assemblies. The mandrel should freely move back and forth. Do not force the mandrel as damage to the seal surface may result. If resistance is encountered, remove the mandrel. Reset the seal assemblies and remove any foreign matter.

9. Install both large and small mandrel/middle body seals on the outside diameter of the mandrel body's lower end.

10. Lubricate and install the knocker on the lower end of the mandrel. Tighten, using the wrench flats.

**CAUTION: Do not wrench on the hard faced bands between the wrench flats or gouge them with the sides of the wrench jaws. If they are inadvertently upset or otherwise damaged, remove the upset or burr with fine emery cloth or a hand file. Prevent loose burrs or steel slivers produced by wrenching from entering the Jar. Besides causing damage, they may plug the piston's by-pass relief holes and prevent it from operating. Clean and lubricate.**

11. Slide the assembled piston on the mandrel with the seal assembly facing towards the knocker. Use a rubber or brass hammer to tap piston into place.



Piston Assembly Installation

**NOTE: The piston assembly will not function if it is installed upside-down.**

12. Screw the washpipe onto the mandrel. Tighten, exercising the same care as described for the knocker installation. Do not wrench on the chromed or plated areas.

**CAUTION: If they are inadvertently upset or otherwise damaged, remove the upset or burr with fine emery cloth or a hand file. Prevent loose burrs or steel slivers produced by wrenching from entering the Jar. Besides causing damage, foreign matter may plug the piston's by-pass relief holes and prevent it from operating. Clean and lubricate.**

13. Thoroughly coat the piston and inside of the middle body with light oil. Stagger the gap openings on the piston rings. Slide the middle body onto the washpipe and over the lower end of the mandrel body. Be sure the larger inner diameter is at the top and the fill plug end down. Tighten connection to the lower end of the middle body.

**CAUTION: Excessive torque on the washpipe, especially on smaller size jars, can distort the piston.**

14. Install the two washpipe seal assemblies on the outside diameter of the washpipe body. Lubricate the washpipe and washpipe seal assemblies with light oil. Slide the washpipe body over the washpipe and screw it onto the middle body. Tighten, exercising the same care as described for the mandrel installation.

15. Check and tighten all joint connections before running the tool in the hole. They should be as tight as the tool joints in the string. Refer to the Maximum Recommended Tightening Torques table on page 32.

16. Paint or lubricate exterior surfaces to prevent corrosion.

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



## Z Type Hydraulic Fishing Jar

### Filling the Jar

Logan Jar Lube (Logan Part No. 49842) is recommended, but any ISO Grade 22 hydraulic oil that meets required specifications can be used.

The Logan Z Type Hydraulic Fishing Jar can be filled in either open or closed position. The open position is usually more convenient. The Jar may pump open if it is being filled in the closed position. This is normal and is not a cause for concern.

1. Tilt the mandrel body end upward at a 30° angle, positioning mandrel body fill plug on the upper side. *(Refer to illustration below for correct positioning.)*
2. Fill the volume pump (Logan Part No. J1069) from the Jar Service Kit *(see pages 33 – 34)* with oil. Connect the volume pump hose to the middle body fill plug hole. Attach the opposite end of the hose to the volume pump.
3. Attach the clear exhaust hose (Logan Part No. J1072) from the Jar Service Kit *(see pages 33 – 34)* to the lower mandrel body fill plug hole. Place the free end into the opening of the volume pump.
4. Pump oil into the tool at moderate speed to allow a smooth, uniform flow of oil. Hydraulic fluid entering the Jar will force the piston rings to travel enough to open the by-pass relief ports, allowing unimpeded flow of oil into the tool.

The Jar may pump open if it is being filled in the closed position. This is normal and not a cause for concern.

7. As the tool fills with oil, oil will begin to flow out of the exhaust hose. Air bubbles will be observed in the exhaust oil. Continue to pump oil into the tool until air bubbles cease in the out flowing exhaust oil.

8. Immediately detach the exhaust hose and insert the mandrel body fill plug. Tighten the mandrel body fill plug snugly but do not overtighten.
9. Bleed off any residual air by pumping moderate pressure into the tool and allowing it to bleed back into the volume pump. Move the Jar to a level position in the vise with the lower middle body fill plug on the top side. Detach the volume pump hose and immediately install the lower middle body fill plug. Tighten the fill plug snugly but do not overtighten.
10. Ensure that all seals are leakproof and the tool is functioning properly before putting it into service.

The tool is now ready for use.

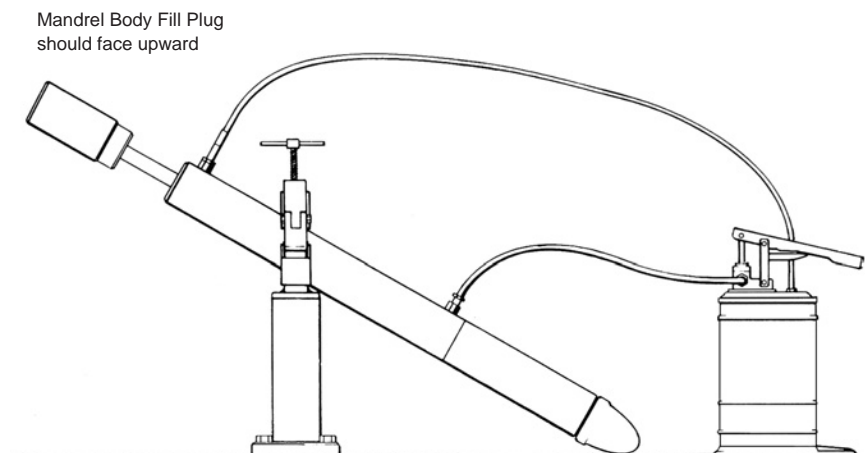
The Jar must be in the closed position before it is transported or run in the hole. If the Jar was filled in the open position, it may be closed by hand in most cases, by one or two men pushing the mandrel. Very large Jars may require several pounds of weight applied in a vertical position to close it. This can be done at the wellhead by applying the weight of the drill string.

Apply a good grade of thread dope to the tool joints and install thread protectors if the tool will be stored for future service. If the tool will be stored outside, the exterior of the tool should be cleaned and painted, or coated with a heavy application of grease. Thoroughly grease the bore if the climate is very humid or corrosive (salty).

### Testing the Jar

The Jar should be tested in a Logan Jar Tester *(see page 15)* after it has been completely assembled and filled with oil. Prior to testing, have all the necessary technical data, test loads, and times required to make a pull-through readily available. Use the Recommended Test Loads tables on page 29 as a guide.

Typically, a Jar is stroked one (1) time at low-load and five (5) times at high-load settings. Record the time for each pull-through. The first one or two pulls could be slow and may require several minutes to complete due to the Jar being cool. The Jar will gradually warm up as it is stroked. This will cause the oil to thin, thereby accelerating the pull-through times.



Filling the Jar: **Tilt the mandrel body end upward at a 30° angle, positioning the mandrel body fill plug on the upper side. Connect the volume pump hose to the middle body fill plug hole. Attach the opposite end of the hose to the volume pump. Attach the clear exhaust hose to the lower mandrel body fill plug hole. Place the free end into the opening of the volume pump.**



## Z Type Hydraulic Fishing Jar

1. Install the proper jar tester subs onto the Jar and lift it into the jar tester using an appropriate hoist.
2. Conduct the low-load test first, setting the jar tester at the proper load for the tool being tested.

3. Actuate the pull stroke and observe the movement of the Jar to ensure proper operation. Movement should be slow and steady without any jerking or stopping. It is okay to close the Jar and restart the pull stroke if the Jar does not operate properly.

Continue repeating the low-load test until uniform action is assured.

If the Jar does not pull through the stroke completely without stopping, set the pull load 2,000 lbs. higher than shown in the table and repeat the test. If the test is still not successful, redress the Jar to eliminate contaminated hydraulic fluid or correct anything that may be contributing to excessive friction.

Repeat the low-load test once more to ensure uniform action.

4. Conduct the high-load test by setting the jar tester at 20% higher than the maximum testing pull load listed in the table on page 29. Test pull the Jar eight (8) to ten (10) times. Record the pull-through times for each test and calculate the average.

Do not be concerned if the average load does not exactly match the listed loads. The loads should be considered nominal figures and be used only as a guide.

5. It is recommended that the low-load test be repeated after the high-load test to ensure that low-load pulls are the same after the Jar has reached maximum operating temperature.
6. Inspect the tool carefully, especially around the mandrel seals and the mandrel body fill plug, for leaks during the test pulls.

### RIG DOWN AND RIG FLOOR MAINTENANCE

The Logan Z Type Hydraulic Fishing Jar requires minimal maintenance. After moderate use on a short job and when the Jar will be kept at the rig site, minor maintenance can be done on the rig floor.

**CAUTION: *The Jar will usually come out of the hole in the open position. If the jar comes out of the hole in the closed (cocked) position, do not allow the Jar to hang from the elevators, especially with any amount of weight hanging off the tool. If the Jar falls the length of its free stroke, bodily harm or rig damage could occur.***

After removal from the fishing string, immediately flush all mud from the bore, especially around the washpipe and from the washpipe body. Clean the mandrel seal surface and grease to prevent corrosion. Also coat the box and pin threads with anti-gall grease. This will help prevent corrosion and aid make-up for next use. Push the Jar into closed position and cover the threads with protectors. Store the Jar with the mandrel end up or horizontally on a suitable rack.

### DRESSING AREA MAINTENANCE

Complete redressing is only necessary after prolonged field service or hard use. The Jar should be taken to an adequate dressing area to be completely disassembled, cleaned, inspected, repaired as required, and reassembled.

#### **Equipment Required**

The following is a list of equipment that will be needed to dress the Jar.

1. A suitable vise and tong or equivalent device of suitable size.
2. An overhead crane with 2,000 lb. minimum capacity.
3. Pipe wrenches of suitable sizes for outside diameters of body parts and for all internal parts.

4. Chain wrenches of suitable sizes for all threaded parts.
5. A suitable belt pulley that can be suspended from a hoist for rotating threaded parts during make up or break out.
6. Nylon lift straps suitable for lifting heavy parts during disassembly or assembly.
7. A suitable jar tester for tool diameter and length.
8. A Logan Jar Service Kit complete with mandrel and piston setting tools.
9. All required spare parts and packing sets for the tool size being dressed.

#### **Complete Disassembly**

The Jar should be in the open position for disassembly. Place a bucket or pan under the tool to catch oil that will drain out of the washpipe body, middle body, and mandrel body as each connection is broken. Referring to the illustrations on pages 3 – 4, proceed with disassembly as follows:

**CAUTION: *Use only enough gripping action in the vise to break the connections. Avoid making heavy tool marks.***

1. Secure the upper middle body end centered horizontally into a suitable vise.
2. Break the connections between the washpipe body and mandrel body.
3. Position a clean, open-mouthed receptacle under the washpipe body joint to catch draining oil.

**CAUTION: *Residual pressure may be trapped within the tool. Avoid possible injury or damage by firmly securing the washpipe body and removing the fill plugs after the tool is completely disassembled.***



## Z Type Hydraulic Fishing Jar

4. Firmly secure the washpipe body and unscrew the washpipe body until oil drains from the tool into the open receptacle. Remove the washpipe body and lay it aside.

**CAUTION: Do not scratch or dent the washpipe seal surface.**

5. Remove the middle body from the washpipe. Catch any fluid that drains from the middle body as it is removed.
6. Reposition the Jar in the vise and reclamp on the mandrel body. Do not clamp over the fill plug hole.
7. Remove the washpipe from the mandrel body and lay it aside. Wrench only on the wrench flats provided on the lower end of the washpipe.
8. Examine the middle body and washpipe body seals, seal protector rings, and non-extrusion rings for wear and/or damage. Remove seals and rings that show signs of wear and/or damage.
9. Carefully remove the piston assembly. Loosen the piston, if necessary, by driving a thin-blade screwdriver between the upper end of the piston and the knocker or mandrel shoulder. Take care not to mar the parts.
10. Remove the knocker from the mandrel.

**CAUTION: Do not wrench on the hard faced bands between the wrench flats or gouge them with the sides of the wrench jaws. If they are inadvertently upset or otherwise damaged, remove the upset or burr with fine emery cloth or a hand file. Clean and lubricate.**

11. Slide the mandrel out through the top of the mandrel body. Because of the tight grip of the seals, it may be necessary to strike the mandrel with forceful blows from a sledge hammer until it begins to slide out. Protect the end of the mandrel with a wood block before striking it.
12. After the mandrel is free, support the weight of the mandrel with a soft line or wire rope sling as it is removed. Handle carefully to prevent marring or denting the mandrel seal surface. Lay the mandrel aside.
13. Remove the seal from the small (washpipe) end of the mandrel.
14. Unclamp the mandrel body from the vise and lay it aside.
15. Examine the mandrel body and washpipe body seals, seal protector rings, and seal non-extrusion rings for wear and/or damage. Use the forefinger to feel for burrs or other damage. Remove seals and rings that show signs of wear and/or damage.
  - a. Carefully insert the tip of either the bent-tip installation tool (Logan Part No. J1073) or O-ring installation tool (Logan Part No. J1074) from the Jar Service Kit between the O-ring and the seal protector ring. Carefully lift out the O-ring, taking care not to damage the seal protector ring or non-extrusion ring.

**CAUTION: Do not run the installation tool around the groove under the rings. This will scratch and damage the grooves.**

16. Carefully examine the piston assembly. Using the piston ring pliers (Logan Part No. 26000-055), carefully spread each ring at the gap until the inside diameters are larger than the piston's inside diameter. Lift off the piston rings. Excessive spreading will distort the rings. Refer to the photos on page 7.
17. Remove the fill plugs from the mandrel body and middle body and install new O-ring seals on the fill plugs.
18. Examine all parts for defects, including the piston, middle body bore, tool joint threads, and especially any polished surfaces for pits or scratches. Minor abrasions, nicks, galls, or burrs may be removed with fine emery cloth or a small hand file.

Parts with polished surfaces (mandrel washpipe, and middle body bore) that have become deeply pitted or gouged must be replaced with new parts prior to reassembly. Any damage to the piston ring seating surface will render the piston unusable.

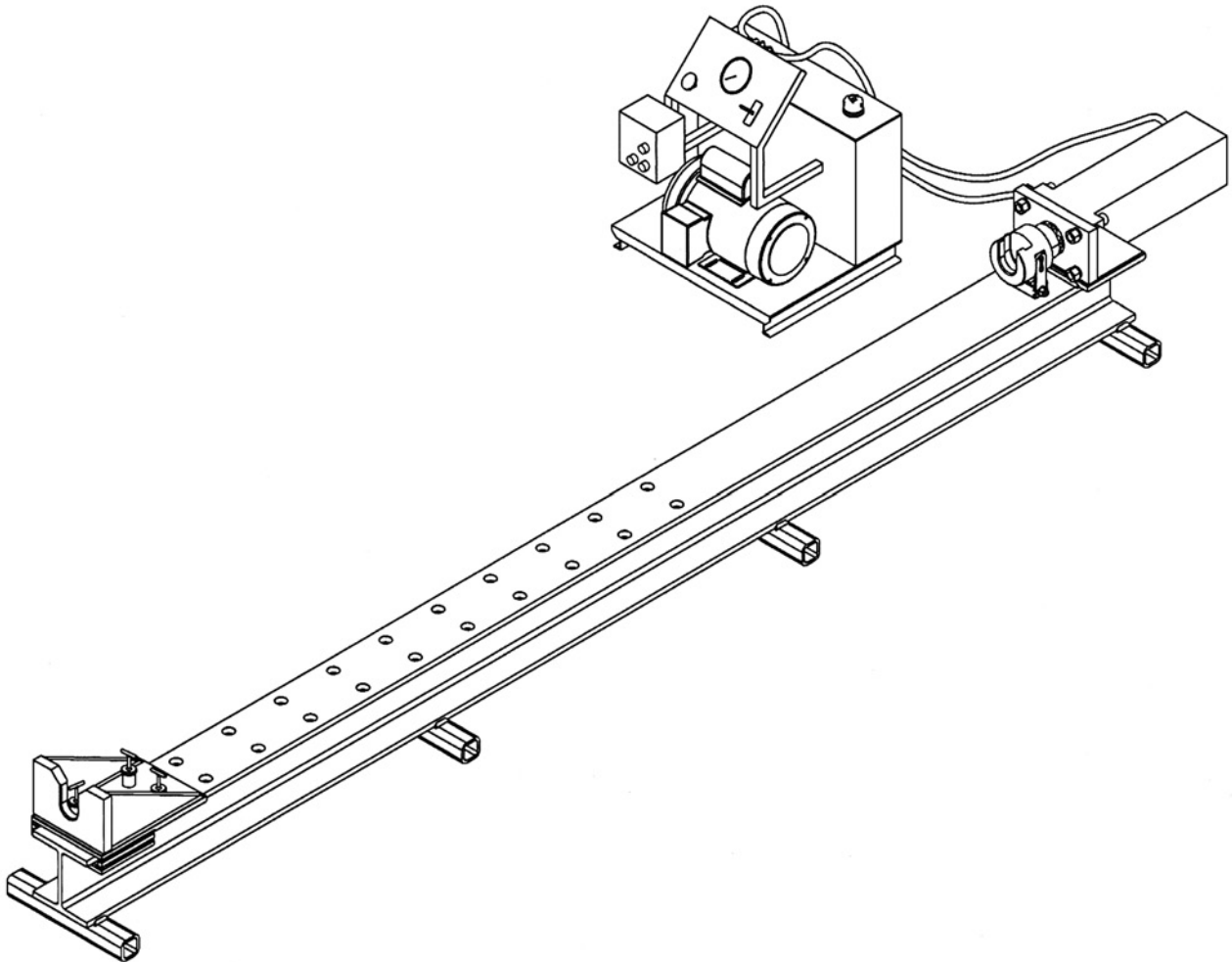
**CAUTION: Defects on the polished surfaces of the mandrel and/or mandrel will damage the O-ring seals, resulting in fluid loss during operation. Replace any defective parts prior to reassembly.**

19. Inspect the splines on the bottom of the mandrel for upset. Grind off upsets with a small hand file or grinder.
20. Thoroughly clean all disassembled parts in solvent and wipe dry with a clean, soft cloth. Lubricate all parts with a thin coating of a good grade of clean, lightweight oil.

Disassembly is now complete.



## Jar Tester



### OVERVIEW

The Logan Jar Tester is a versatile machine for setting, checking, or testing pull loads of a variety of tools with outer diameters up to 11 inches. The Jar Tester is capable of exerting tension or compression loads in a controlled manner. The Logan Jar Tester provides an effective and accurate means for shop testing hydraulic jars; setting and checking pull loads of mechanical rotary jars, safety joints, bumper subs, and other similar tools; and testing formation tools. It is especially useful when many such tools must be maintained on a recurring basis.

### CONSTRUCTION

The Logan Jar Tester is composed of two basic components: a frame and a prime mover. A pull plate and cross-head cradle the tool to be tested. The cross-head is attached to a hydraulic cylinder that supplies the tensile or compressive load. The prime mover (which is also referred to as the power-pak) is an electric, motor-driven hydraulic power supply. It is composed of a hydraulic pump, an electric motor, a hydraulic reservoir, a start/stop switch, a pressure gauge, a filter, and appropriate valve fittings to properly operate and maintain the system.

All components of the Logan Jar Tester are manufactured from high-grade materials. All main load bearing members are made from selected heat-treated alloy steel for maximum strength and durability.

All Logan Jar Testers are completely assembled and tested before shipment. The unit requires very little maintenance. However, usual wear parts must be occasionally replaced.

**When ordering, please specify:**  
Complete Assembly part number:  
**900-002**



## Z Type Hydraulic Fishing Jar

<b>TOOL JOINT CONNECTION</b>	7/8 Sucker Rod	1-13/16 Wilson FJ	1-1/4 API Reg	2-3/8 PH6 5.9# Hyd Bx	2-3/8 EUE	2-3/8 API Reg	2-7/8 API Reg	
<b>OUTSIDE DIAMETER (INCHES)</b>	1-5/8	1-13/16	2-1/4	2-29/32	3-1/16	3-1/8	3-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1/4	5/16	3/8	1	1-1/2	1	1-1/4	
<b>TOTAL STROKE (INCHES)</b>	7-1/16	7	6-15/16	11-7/16	11-9/16	11-13/16	11-13/16	
<b>TYPE JAR</b>	Sub	Special	Integral Mandrel	Sub	Sub	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-000</b> 70822	<b>605-001</b> 74723	<b>605-002</b> 54020	<b>605-003</b> 68010	<b>605-004</b> 55670	<b>605-005</b> 52504	<b>605-006</b> 52506
<b>TOP SUB</b>	<b>Logan Part No.</b> Bowen No.	<b>AG3000</b> 70823	<b>AG3001</b> 21156	... ...	<b>AG3003</b> 68015	<b>AG3004</b> 55889	... ...	... ...
<b>MANDREL</b>	<b>Logan Part No.</b> Bowen No.	<b>AG4000</b> 70825	<b>AG4001</b> 21155	<b>AG4002</b> 18780	<b>AG4003</b> 68014	<b>AG4004</b> 55888	<b>AG4005</b> 38056	<b>AG4006</b> 38041
<b>PISTON ASSEMBLY</b> <i>(Ring Type Standard)</i>	<b>Logan Part No.</b> Bowen No.	<b>26000-018</b> 70853	<b>26000-019</b> 74725	<b>26000-020</b> 59585	<b>26000-021</b> 68019	<b>26000-022</b> 56368	<b>26000-023</b> 61282	<b>26000-024</b> 68128
<b>MANDREL BODY</b>	<b>Logan Part No.</b> Bowen No.	<b>AG5000</b> 70824	<b>AG5001</b> 21153	<b>AG5002</b> 56571	<b>AG5003</b> 68013	<b>AG5004</b> 55887	<b>AG5005</b> 52764	<b>AG5006</b> 52770
<b>MIDDLE BODY</b>	<b>Logan Part No.</b> Bowen No.	<b>AG6000</b> 70826	<b>AG6001</b> 74724	<b>AG6002</b> 18777	<b>AG6003</b> 68012	<b>AG6004</b> 55886	<b>AG6005</b> 42737	<b>AG6006</b> 38044
<b>WASHPIPE BODY</b>	<b>Logan Part No.</b> Bowen No.	<b>AG7000</b> 70829	<b>AG7001</b> 21151	<b>AG7002</b> 18776	<b>AG7003</b> 68011	<b>AG7004</b> 55885	<b>AG7005</b> 38064	<b>AG7006</b> 38045
<b>KNOCKER</b>	<b>Logan Part No.</b> Bowen No.	... ...	... ...	<b>AG8002</b> 18781	... ...	... ...	<b>AG8005</b> 38060	<b>AG8006</b> 38049
<b>WASHPIPE</b>	<b>Logan Part No.</b> Bowen No.	<b>AG9000</b> 70828	<b>AG9001</b> 21154	<b>AG9002</b> 18779	<b>AG9003</b> 68016	<b>AG9004</b> 55890	<b>AG9005</b> 42738	<b>AG9006</b> 38046
<b>MANDREL BODY</b>	<b>Logan Part No.</b> Bowen No.	<b>AG10000</b> 617	<b>AG10000</b> 617	<b>AG10002</b> 329	<b>AG10000</b> 617	<b>AG10000</b> 617	<b>AG10002</b> 329	<b>AG10002</b> 329
<b>FILL PLUG</b>								
<b>MIDDLE BODY</b>	<b>Logan Part No.</b> Bowen No.	... ...	... ...	<b>AG10000</b> 617	<b>AG10004</b> 10641	<b>AG10004</b> 10641	<b>AG10000</b> 617	<b>AG10000</b> 617
<b>FILL PLUG</b>								
<b>PACKING SET</b>	<b>Logan Part No.</b> Bowen No.	<b>26000-036</b> 70961	<b>26000-037</b> 74802	<b>26000-038</b> 18793	<b>26000-039</b> 68017	<b>26000-040</b> 55924	<b>26000-041</b> 44622	<b>26000-042</b> 38048
<b>JAR LUBE</b>	<b>Logan Part No.</b> Bowen No.	<b>49842-A</b> 49842-A	<b>49842-B</b> 49842-B	<b>49842-C</b> 49842-C	<b>49842-D</b> 49842-D			
		1 Gallon	5 Gallons	20 Gallons	55 Gallons			

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

**Special Notes:**

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

<b>TOOL JOINT CONNECTION</b>	7/8 Sucker Rod	1-13/16 Wilson FJ	1-1/4 API Reg	2-3/8 PH6 5.9# Hyd Bx	2-3/8 EUE	2-3/8 API Reg	2-7/8 API Reg	
<b>OUTSIDE DIAMETER (INCHES)</b>	1-5/8	1-13/16	2-1/4	2-29/32	3-1/16	3-1/8	3-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1/4	5/16	3/8	1	1-1/2	1	1-1/4	
<b>TOTAL STROKE (INCHES)</b>	7-1/16	7	6-15/16	11-7/16	11-9/16	11-13/16	11-13/16	
<b>TYPE JAR</b>	Sub	Special	Integral Mandrel	Sub	Sub	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-000</b> 70822	<b>605-001</b> 74723	<b>605-002</b> 54020	<b>605-003</b> 68010	<b>605-004</b> 55670	<b>605-005</b> 52504	<b>605-006</b> 52506
<b>MANDREL</b>	<b>Logan Part No.</b>	<b>L365-16</b>	<b>L365-17</b>	<b>L365-24</b>	<b>L365-30.5</b>	<b>L364-32.5</b>	<b>L365-32</b>	<b>L365-35</b>
<b>NON-EXTRUSION RING</b>	Bowen No. No. Req'd	365-16 8	365-17 4	365-24 4	365-30.5 8	364-32.5 8	365-32 8	365-35 8
<b>MANDREL SEAL</b>	<b>Logan Part No.</b>	<b>L375-16</b>	<b>L375-17</b>	<b>L375-24</b>	<b>L375-30.5</b>	<b>L375-32.5</b>	<b>L375-32</b>	<b>L375-35</b>
<b>PROTECTOR RING</b>	Bowen No. No. Req'd	375-16 8	375-17 4	375-24 4	375-30.5 8	375-32.5 8	375-32 8	375-35 8
<b>MANDREL BODY</b>	<b>Logan Part No.</b>	...	...	<b>L56542</b>	...	...	...	...
<b>NON-EXTRUSION RING</b>	Bowen No.	...	...	56542	...	...	...	...
<b>MANDREL BODY</b>	<b>Logan Part No.</b>	<b>AG11000</b>	...	...	...	...	...	...
<b>INSERT</b>	Bowen No.	71254	...	...	...	...	...	...
<b>MANDREL BODY SEAL</b>	<b>Logan Part No.</b>	...	...	<b>L227-27.25</b>	...	...	...	...
<b>PROTECTOR RING</b>	Bowen No.	...	...	227-27.25	...	...	...	...

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*Special Notes:*

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

<b>TOOL JOINT CONNECTION</b>	7/8 Sucker Rod	1-13/16 Wilson FJ	1-1/4 API Reg	2-3/8 PH6 5.9# Hyd Bx	2-3/8 EUE	2-3/8 API Reg	2-7/8 API Reg	
<b>OUTSIDE DIAMETER (INCHES)</b>	1-5/8	1-13/16	2-1/4	2-29/32	3-1/16	3-1/8	3-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1/4	5/16	3/8	1	1-1/2	1	1-1/4	
<b>TOTAL STROKE (INCHES)</b>	7-1/16	7	6-15/16	11-7/16	11-9/16	11-13/16	11-13/16	
<b>TYPE JAR</b>	Sub	Special	Integral Mandrel	Sub	Sub	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-000</b> 70822	<b>605-001</b> 74723	<b>605-002</b> 54020	<b>605-003</b> 68010	<b>605-004</b> 55670	<b>605-005</b> 52504	<b>605-006</b> 52506
<b>RING TYPE</b>	<b>Logan Part No.</b>	<b>26000-018</b>	<b>26000-019</b>	<b>26000-020</b>	<b>26000-021</b>	<b>26000-022</b>	<b>26000-023</b>	<b>26000-024</b>
<b>PISTON ASSEMBLY</b>	Bowen No.	70853	74725	59585	68019	56368	61282	68128
<i>Consists of:</i>								
<b>PISTON</b>	<b>Logan Part No.</b> Bowen No.	<b>AG15000</b> 70827	...	<b>AG15002</b> 59586	...	...	<b>AG15005</b> 61283	<b>AG15006</b> 68127
<b>WAVE SPRING</b>	<b>Logan Part No.</b> Bowen No. No. Req'd	<b>L66164</b> 66164 2	...	...	...	...	...	...
<b>PISTON RING</b>	<b>Logan Part No.</b> Bowen No. No. Req'd	...	...	<b>L18783</b> 18783 2	...	...	<b>L61284</b> 61284 4	<b>L61287</b> 61287 2
<b>SEAL</b>	<b>Logan Part No.</b> Bowen No.	...	...	<b>568-214</b> 568214	...	...	<b>568-223</b> 568223	<b>568-226</b> 568226
<b>NON-EXTRUSION RING</b>	<b>Logan Part No.</b> Bowen No.	...	...	<b>L365-19</b> 365-19	<b>L370-1.5</b> 370-1.5	<b>L370-3.5</b> 370-3.5	<b>L370-1</b> 370-1	<b>L370-4</b> 370-4
<b>SEAL</b>	<b>Logan Part No.</b>	...	...	<b>L375-19</b>	<b>L376-1.5</b>	<b>L376-3.5</b>	<b>L376-1</b>	<b>L376-4</b>
<b>PROTECTOR RING</b>	Bowen No.	...	...	375-19	376-1.5	376-3.5	376-1	376-4
<b>CONE TYPE</b>	<b>Logan Part No.</b>	...	<b>26000-019</b>	...	...	...	...	...
<b>PISTON ASSEMBLY</b>	Bowen No.	...	74725	...	...	...	...	...
<i>Consists of:</i>								
<b>CONE</b>	<b>Logan Part No.</b> Bowen No.	...	<b>AG14001</b> 74726	...	<b>AG14003</b> 68020	<b>AG14004</b> 55891	...	...
<b>BY-PASS BODY</b>	<b>Logan Part No.</b> Bowen No.	...	<b>AG13001</b> 74727	...	...	...	...	...
<b>SEAL BODY</b>	<b>Logan Part No.</b> Bowen No.	...	<b>AG12001</b> 74728	...	<b>AG12003</b> 68021	<b>AG12004</b> 55892	...	...
<b>SEAL BODY SEAL</b>	<b>Logan Part No.</b> Bowen No.	...	<b>568-020</b> 568020	...	<b>568-224</b> 568224	<b>568-226</b> 568226	...	...

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**Special Notes:**

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

<b>TOOL JOINT CONNECTION</b>	7/8 Sucker Rod	1-13/16 Wilson FJ	1-1/4 API Reg	2-3/8 PH6 5.9# Hyd Bx	2-3/8 EUE	2-3/8 API Reg	2-7/8 API Reg	
<b>OUTSIDE DIAMETER (INCHES)</b>	1-5/8	1-13/16	2-1/4	2-29/32	3-1/16	3-1/8	3-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1/4	5/16	3/8	1	1-1/2	1	1-1/4	
<b>TOTAL STROKE (INCHES)</b>	7-1/16	7	6-15/16	11-7/16	11-9/16	11-13/16	11-13/16	
<b>TYPE JAR</b>	Sub	Special	Integral Mandrel	Sub	Sub	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-000</b> 70822	<b>605-001</b> 74723	<b>605-002</b> 54020	<b>605-003</b> 68010	<b>605-004</b> 55670	<b>605-005</b> 52504	<b>605-006</b> 52506

### OPTIONAL

<b>MANDREL BODY</b>	<b>Logan Part No.</b>	<b>AG1000-16</b>	<b>AG1000-17</b>	<b>AG1000-24</b>	<b>AG1000-29.5</b>	<b>AG1000-32.5</b>	<b>AG1000-32</b>	<b>AG1000-35</b>
<b>SETTING TOOL</b>	Bowen No.	22709-16	22709-17	22709-24	22709-29.5	22709-32.5	22709-32	22709-3
<b>PISTON SETTING TOOL</b>	<b>Logan Part No.</b>	...	...	<b>AG1000-19</b>	<b>AG1000-30.5</b>	<b>AG1000-31</b>	<b>AG1000-29</b>	<b>AG1000-32</b>
	Bowen No.	...	...	22709-19	22709-30.5	22709-31	22709-29	22709-32
<b>PISTON RING PLIERS</b>	<b>Logan Part No.</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>
	Bowen No.	...	...	...	...	...	...	...
<b>JAR SERVICE KIT</b>	<b>Logan Part No.</b>	<b>26000-054</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>
	Bowen No.	21279	55403	55403	55403	55403	55403	55403
<b>HI-TEMPERATURE PACKING SET</b>	<b>Logan Part No.</b>	...	<b>26000-73</b>	<b>26000-074</b>	...	<b>26000-076</b>	<b>26000-077</b>	<b>26000-078</b>
	Bowen No.	...	149945	149884	...	148247	73659	80004
<b>PACKING SET</b>	<b>Logan Part No.</b>	<b>26000-036</b>	<b>26000-037</b>	<b>26000-038</b>	<b>26000-039</b>	<b>26000-040</b>	<b>26000-041</b>	<b>26000-042</b>
<i>Consists of:</i>	Bowen No.	70961	74802	18793	68017	55924	44622	38048
<b>MANDREL/ WASHPipe SEAL</b>	<b>Logan Part No.</b>	<b>568-211</b>	<b>568-212</b>	<b>568-219</b>	<b>568-328</b>	<b>568-330</b>	<b>568-329</b>	<b>568-332</b>
	Bowen No.	568211	568212	568219	568328	568330	568329	568332
	No. Req'd	4	4	4	4	4	4	4
<b>LARGE MIDDLE BODY SEAL</b>	<b>Logan Part No.</b>	<b>568-216</b>	<b>568-019</b>	<b>568-224</b>	<b>568-036</b>	<b>568-038</b>	<b>568-231</b>	...
	Bowen No.	568216	568019	568224	568036	568038	568231	568235
	No. Req'd	2	2	2	2	2	2	2
<b>SMALL MIDDLE BODY SEAL</b>	<b>Logan Part No.</b>	<b>568-214</b>	<b>568-027</b>	<b>568-228</b>	<b>568-035</b>	<b>568-036</b>	<b>568-228</b>	<b>568-233</b>
	Bowen No.	568214	568027	568228	568035	568036	568228	568233
	No. Req'd	3	3	3	3	3	3	3
<b>WASHPipe SEAL</b>	<b>Logan Part No.</b>	...	<b>568-115</b>	<b>568-210</b>	<b>568-224</b>	<b>568-226</b>	<b>568-220</b>	<b>568-222</b>
	Bowen No.	...	568115	568210	568224	568226	568220	568222

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#### Special Notes:

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

#### When ordering, please specify:

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

#### Recommended Spares:

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



# Z Type Hydraulic Fishing Jar

<b>TOOL JOINT CONNECTION</b>	7/8 Sucker Rod	1-13/16 Wilson FJ	1-1/4 API Reg	2-3/8 PH6 5.9# Hyd Bx	2-3/8 EUE	2-3/8 API Reg	2-7/8 API REG	
<b>OUTSIDE DIAMETER (INCHES)</b>	1-5/8	1-13/16	2-1/4	2-29/32	3-1/16	3-1/8	3-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1/4	5/16	3/8	1	1-1/2	1	1-1/4	
<b>TOTAL STROKE (INCHES)</b>	7-1/16	7	6-15/16	11-7/16	11-9/16	11-13/16	11-13/16	
<b>TYPE JAR</b>	Sub	Special	Integral Mandrel	Sub	Sub	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-000</b> 70822	<b>605-001</b> 74723	<b>605-002</b> 54020	<b>605-003</b> 68010	<b>605-004</b> 55670	<b>605-005</b> 52504	<b>605-006</b> 52506
<b>MANDREL BODY</b>	<b>Logan Part No.</b>	<b>568-005</b>	<b>568-005</b>	<b>568-006</b>	<b>568-005</b>	<b>568-006</b>	<b>568-006</b>	<b>568-006</b>
<b>FILL PLUG SEAL</b>	Bowen No.	568005	568005	568006	568005	568006	568006	568006
<b>MIDDLE BODY</b>	<b>Logan Part No.</b>	...	...	<b>568-005</b>	...	...	<b>568-005</b>	<b>568-005</b>
<b>FILL PLUG SEAL</b>	Bowen No.	...	...	568005	...	...	568005	568005
<b>PISTON SEAL</b>	<b>Logan Part No.</b>	...	...	<b>568-214</b>	...	...	<b>568-223</b>	<b>568-226</b>
	Bowen No.	...	...	568214	...	...	568223	568226
<b>MIDDLE BODY / MANDREL BODY SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
<b>WASHPIPE / MIDDLE BODY SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
<b>BACK-UP RINGS</b>	<b>Logan Part No.</b>	<b>8-024</b>	...	...	...	...	...	...
	Bowen No.	8-024	...	...	...	...	...	...
<b>MANDREL SEAL</b>	<b>Logan Part No.</b>	<b>568-015</b>	...	...	...	...	...	...
	Bowen No.	568015	...	...	...	...	...	...
<b>MANDREL BODY SEAL</b>	<b>Logan Part No.</b>	<b>568-024</b>	...	...	...	...	...	...
	Bowen No.	568024	...	...	...	...	...	...

<b>JAR LUBE</b>	<b>Logan Part No.</b>	<b>49842-A</b>	<b>49842-B</b>	<b>49842-C</b>	<b>49842-D</b>			
	Bowen No.	49842-A	49842-B	49842-C	49842-D			
		1 Gallon	5 Gallons	20 Gallons	55 Gallons			

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**Special Notes:**

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

TOOL JOINT CONNECTION	2-3/8 API IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 API FH	3-1/2 API IF	3-1/2 API IF	
<b>OUTSIDE DIAMETER (INCHES)</b>	3-3/4	3-3/4	4-1/4	4-1/2	4-3/4	4-3/4	4-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1-1/2	1-7/8	1-15/16	2-3/8	1-1/2	2	2-1/4	
<b>TOTAL STROKE (INCHES)</b>	12-1/8	10-1/8	11-13/16	12-1/4	11-13/16	13-5/16	...	
<b>TYPE JAR</b>	Sub	Sub	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-007</b> 52528	<b>605-008</b> 52497	<b>605-009</b> 52502	<b>605-010</b> 52653	<b>605-011</b> 52530	<b>605-012</b> 52500	<b>605-018</b> ...
<b>TOP SUB</b>	<b>Logan Part No.</b> Bowen No.	<b>AG3007</b> 37412	<b>AG3008</b> 20156	... ...	... ...	... ...	... ...	... ...
<b>MANDREL</b>	<b>Logan Part No.</b> Bowen No.	<b>AG4007</b> 37411	<b>AG4008</b> 20155	<b>AG4009</b> 44484	<b>AG4010</b> 35850	<b>AG4011</b> 25965	<b>AG4012</b> 38115	<b>AG40125</b> 38115
<b>PISTON ASSEMBLY</b> <i>(Ring Type Standard)</i>	<b>Logan Part No.</b> Bowen No.	<b>26000-025</b> 61288	<b>26000-026</b> 61285	<b>26000-027</b> 68420	<b>26000-028</b> 68421	<b>26000-029</b> 55285	<b>26000-030</b> 55193	<b>26000-030</b> 55193
<b>MANDREL BODY</b>	<b>Logan Part No.</b> Bowen No.	<b>AG5007</b> 52771	<b>AG5008</b> 52772	<b>AG5009</b> 52780	<b>AG5010</b> 52815	<b>AG5011</b> 52749	<b>AG5012</b> 52833	<b>AG5012</b> 52833
<b>MIDDLE BODY</b>	<b>Logan Part No.</b> Bowen No.	<b>AG6007</b> 20152	<b>AG6007</b> 20152	<b>AG6009</b> 41840	<b>AG6010</b> 35853	<b>AG6011</b> 25962	<b>AG6012</b> 38112	<b>AG6012</b> 38112
<b>WASHPIPE BODY</b>	<b>Logan Part No.</b> Bowen No.	<b>AG7007</b> 37407	<b>AG7008</b> 20151	<b>AG7009</b> 44487	<b>AG7010</b> 35854	<b>AG7011</b> 25961	<b>AG7012</b> 38111	<b>AG70125</b> 38111
<b>KNOCKER</b>	<b>Logan Part No.</b> Bowen No.	... ...	... ...	<b>AG8009</b> 44490	<b>AG8010</b> 35857	<b>AG8011</b> 25966	<b>AG8012</b> 38116	<b>AG8012</b> 38116
<b>WASHPIPE</b>	<b>Logan Part No.</b> Bowen No.	<b>AG9007</b> 37410	<b>AG9008</b> 20154	<b>AG9009</b> 44488	<b>AG9010</b> 35855	<b>AG9011</b> 25964	<b>AG9012</b> 38114	<b>AG90125</b> 38114
<b>MANDREL BODY</b>	<b>Logan Part No.</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>
<b>FILL PLUG</b>	Bowen No.	329	329	329	329	329	329	329
<b>MIDDLE BODY</b>	<b>Logan Part No.</b>	<b>AG10000</b>	<b>AG10000</b>	<b>AG10000</b>	<b>AG10000</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>
<b>FILL PLUG</b>	Bowen No.	617	617	617	617	329	329	329
<b>PACKING SET</b>	<b>Logan Part No.</b> Bowen No.	<b>26000-043</b> 37415	<b>26000-044</b> 20163	<b>26000-045</b> 44491	<b>26000-046</b> 35858	<b>26000-047</b> 25892	<b>26000-048</b> 38120	<b>26000-048</b> 38120

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*Special Notes:*

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.*
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.*

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

TOOL JOINT CONNECTION		2-3/8 API IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 API FH	3-1/2 API IF	3-1/2 API IF
<b>OUTSIDE DIAMETER (INCHES)</b>		3-3/4	3-3/4	4-1/4	4-1/2	4-3/4	4-3/4	4-3/4
<b>INSIDE DIAMETER (INCHES)</b>		1-1/2	1-7/8	1-15/16	2-3/8	1-1/2	2	2-1/4
<b>TOTAL STROKE (INCHES)</b>		12-1/8	10-1/8	11-13/16	12-1/4	11-13/16	13-5/16	...
<b>TYPE JAR</b>		Sub	Sub	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b>	<b>605-007</b>	<b>605-008</b>	<b>605-009</b>	<b>605-010</b>	<b>605-011</b>	<b>605-012</b>	<b>605-018</b>
	Bowen No.	52528	52497	52502	52653	52530	52500	...
<b>MANDREL NON-EXTRUSION RING</b>	<b>Logan Part No.</b>	<b>L365-36</b>	<b>L365-36</b>	<b>L365-40</b>	<b>L365-42</b>	<b>L365-40</b>	<b>L365-41</b>	<b>L365-41</b>
	Bowen No.	365-36	365-36	365-40	365-42	365-40	365-41	365-41
	No. Req'd	8	8	8	8	8	8	8
<b>MANDREL SEAL PROTECTOR RING</b>	<b>Logan Part No.</b>	<b>L375-36</b>	<b>L375-36</b>	<b>L375-40</b>	<b>L375-42</b>	<b>L375-40</b>	<b>L375-41</b>	<b>L375-41</b>
	Bowen No.	375-36	375-36	375-40	375-42	375-40	375-41	375-41
	No. Req'd	8	8	8	8	8	8	8
<b>MANDREL BODY NON-EXTRUSION RING</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
<b>MANDREL BODY INSERT</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
<b>MANDREL BODY SEAL PROTECTOR RING</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
<b>RING TYPE PISTON ASSEMBLY</b>	<b>Logan Part No.</b>	<b>26000-025</b>	<b>26000-026</b>	<b>26000-027</b>	<b>26000-028</b>	<b>26000-029</b>	<b>26000-030</b>	<b>26000-030</b>
	Bowen No.	61288	61285	68420	68421	55285	55193	55193
<i>Consists of:</i>								
<b>PISTON</b>	<b>Logan Part No.</b>	<b>AG15007</b>	<b>AG15008</b>	<b>AG15009</b>	<b>AG15010</b>	<b>AG15011</b>	<b>AG15012</b>	<b>AG15012</b>
	Bowen No.	61289	61286	68413	68415	55286	55194	55194
<b>WAVE SPRING</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
	No. Req'd	...	...	...	...	...	...	...
<b>PISTON RING</b>	<b>Logan Part No.</b>	<b>L61287</b>	<b>L61287</b>	<b>L68414</b>	<b>L68416</b>	<b>L25968</b>	<b>L25293</b>	<b>L25293</b>
	Bowen No.	61287	61287	68414	68416	25968	25293	25293
	No. Req'd	4	4	3	3	2	2	2
<b>SEAL</b>	<b>Logan Part No.</b>	<b>568-228</b>	<b>568-229</b>	<b>568-231</b>	<b>568-233</b>	<b>568-231</b>	<b>568-232</b>	<b>568-232</b>
	Bowen No.	568228	568229	568231	568233	568231	568232	568232
<b>NON-EXTRUSION RING</b>	<b>Logan Part No.</b>	<b>L370-6</b>	<b>L52495</b>	<b>L370-9</b>	<b>L370-11</b>	<b>L370-8.5</b>	<b>L370-10</b>	<b>L370-10</b>
	Bowen No.	370-6	52495	370-9	370-11	370-8.5	370-10	370-10
<b>SEAL PROTECTOR RING</b>	<b>Logan Part No.</b>	<b>L376-6</b>	<b>L52496</b>	<b>L376-9</b>	<b>L376-11</b>	<b>L376-8.5</b>	<b>L376-10</b>	<b>L376-10</b>
	Bowen No.	376-6	52496	376-9	376-11	376-8.5	376-10	376-10

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*Special Notes:*

- (1) *Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.*
- (2) *Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.*

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

<b>TOOL JOINT CONNECTION</b>		2-3/8 API IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 API FH	3-1/2 API IF	3-1/2 API IF
<b>OUTSIDE DIAMETER (INCHES)</b>		3-3/4	3-3/4	4-1/4	4-1/2	4-3/4	4-3/4	4-3/4
<b>INSIDE DIAMETER (INCHES)</b>		1-1/2	1-7/8	1-15/16	2-3/8	1-1/2	2	2-1/4
<b>TOTAL STROKE (INCHES)</b>		12-1/8	10-1/8	11-13/16	12-1/4	11-13/16	13-5/16	...
<b>TYPE JAR</b>		Sub	Sub Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b>	<b>605-007</b>	<b>605-008</b>	<b>605-009</b>	<b>605-010</b>	<b>605-011</b>	<b>605-012</b>	<b>605-018</b>
	Bowen No.	52528	52497	52502	52653	52530	52500	...
<b>CONE TYPE</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
<b>PISTON ASSEMBLY</b>	Bowen No.	...	...	...	...	...	...	...
<i>Consists of:</i>		...	...	...	...	...	...	...
<b>CONE</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
<b>BY-PASS BODY</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
<b>SEAL BODY</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
<b>SEAL BODY SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...

### OPTIONAL

<b>MANDREL BODY</b>	<b>Logan Part No.</b>	<b>AG1000-36</b>	<b>AG1000-36</b>	<b>AG1000-40</b>	<b>AG1000-42</b>	<b>AG1000-40</b>	<b>AG1000-41</b>	<b>AG1000-41</b>
<b>SETTING TOOL</b>	Bowen No.	22709-36	22709-36	22709-40	22709-42	22709-40	22709-41	22709-41
<b>PISTON SETTING TOOL</b>	<b>Logan Part No.</b>	<b>AG1000-34</b>	<b>AG2000</b>	<b>AG1000-37</b>	<b>AG1000-39</b>	<b>AG1000-36.5</b>	<b>AG1000-38</b>	<b>AG1000-38</b>
	Bowen No.	22709-34	54922	22709-37	22709-39	22709-36.5	22709-38	22709-38
<b>PISTON RING PLIERS</b>	<b>Logan Part No.</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>
	Bowen No.	...	...	...	...	...	...	...
<b>JAR SERVICE KIT</b>	<b>Logan Part No.</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>
	Bowen No.	55403	55403	55403	55403	55403	55403	55403
<b>HI-TEMPERATURE PACKING SET</b>	<b>Logan Part No.</b>	...	...	<b>26000-081</b>	...	<b>26000-083</b>	<b>26000-084</b>	<b>26000-084</b>
	Bowen No.	...	...	78330	...	80115	80005	80005

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- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

#### When ordering, please specify:

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

#### Recommended Spares:

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

TOOL JOINT CONNECTION		2-3/8 API IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 API FH	3-1/2 API IF	3-1/2 API IF
OUTSIDE DIAMETER (INCHES)		3-3/4	3-3/4	4-1/4	4-1/2	4-3/4	4-3/4	4-3/4
INSIDE DIAMETER (INCHES)		1-1/2	1-7/8	1-15/16	2-3/8	1-1/2	2	2-1/4
TOTAL STROKE (INCHES)		12-1/8	10-1/8	11-13/16	12-1/4	11-13/16	13-5/16	...
TYPE JAR		Sub	Sub Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral
COMPLETE ASSEMBLY	<b>Logan Part No.</b> Bowen No.	<b>605-007</b> 52528	<b>605-008</b> 52497	<b>605-009</b> 52502	<b>605-010</b> 52653	<b>605-011</b> 52530	<b>605-012</b> 52500	<b>605-018</b> ...
<b>PACKING SET</b>	<b>Logan Part No.</b> <i>Consists of:</i> Bowen No.	<b>26000-043</b> 37415	<b>26000-044</b> 20163	<b>26000-045</b> 44491	<b>26000-046</b> 35858	<b>26000-047</b> 25892	<b>26000-048</b> 38120	<b>26000-048</b> 38120
<b>MANDREL / WASHPIPE SEAL</b>	<b>Logan Part No.</b> Bowen No. No. Req'd	<b>568-333</b> 568333 4	<b>568-333</b> 568333 4	<b>568-337</b> 568337 4	<b>568-339</b> 568339 4	<b>568-337</b> 568337 4	<b>568-338</b> 568338 4	<b>568-338</b> 568338 4
<b>LARGE MIDDLE BODY SEAL</b>	<b>Logan Part No.</b> Bowen No. No. Req'd	<b>568-235</b> 568235 2	<b>568-235</b> 568235 2	<b>568-239</b> 568239 2	<b>568-241</b> 568241 2	<b>568-241</b> 568241 2	<b>568-241</b> 568241 2	<b>568-241</b> 568241 2
<b>SMALL MIDDLE BODY SEAL</b>	<b>Logan Part No.</b> Bowen No. No. Req'd	<b>568-233</b> 568233 3	<b>568-233</b> 568233 3	<b>568-237</b> 568237 3	<b>568-239</b> 568239 3	<b>568-239</b> 568239 3	<b>568-239</b> 568239 3	<b>568-239</b> 568239 3
<b>WASHPIPE SEAL</b>	<b>Logan Part No.</b> Bowen No.	<b>568-224</b> 568224	<b>568-227</b> 568227	<b>568-227</b> 568227	<b>568-233</b> 568233	<b>568-228</b> 568228	<b>568-228</b> 568228	<b>568-228</b> 568228
<b>MANDREL BODY FILL PLUG SEAL</b>	<b>Logan Part No.</b> Bowen No.	<b>568-006</b> 568006	<b>568-006</b> 568006	<b>568-006</b> 568006	<b>568-006</b> 568006	<b>568-006</b> 568006	<b>568-006</b> 568006	<b>568-006</b> 568006
<b>MIDDLE BODY FILL PLUG SEAL</b>	<b>Logan Part No.</b> Bowen No.	<b>568-005</b> 568005	<b>568-005</b> 568005	<b>568-005</b> 568005	<b>568-005</b> 568005	<b>568-006</b> 568006	<b>568-006</b> 568006	<b>568-006</b> 568006
<b>PISTON SEAL</b>	<b>Logan Part No.</b> Bowen No.	<b>568-228</b> 568228	<b>568-229</b> 568229	<b>568-231</b> 568231	<b>568-233</b> 568233	<b>568-231</b> 568231	<b>568-232</b> 568232	<b>568-232</b> 568232
<b>MIDDLE BODY / MANDREL BODY SEAL</b>	<b>Logan Part No.</b> Bowen No.	... ...	... ...	... ...	... ...	... ...	... ...	... ...
<b>WASHPIPE / MIDDLE BODY SEAL</b>	<b>Logan Part No.</b> Bowen No.	... ...	... ...	... ...	... ...	... ...	... ...	... ...
<b>BACK-UP RINGS</b>	<b>Logan Part No.</b> Bowen No.	... ...	... ...	... ...	... ...	... ...	... ...	... ...
<b>MANDREL SEAL</b>	<b>Logan Part No.</b> Bowen No.	... ...	... ...	... ...	... ...	... ...	... ...	... ...
<b>MANDREL BODY SEAL</b>	<b>Logan Part No.</b> Bowen No.	... ...	... ...	... ...	... ...	... ...	... ...	... ...
<b>JAR LUBE</b>	<b>Logan Part No.</b> Bowen No.	<b>49842-A</b> 49842-A 1 Gallon	<b>49842-B</b> 49842-B 5 Gallons	<b>49842-C</b> 49842-C 20 Gallons	<b>49842-D</b> 49842-D 55 Gallons			

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

**Special Notes:**

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

<b>TOOL JOINT CONNECTION</b>		4-1/2 API FH	4-1/2 API IF	5-1/2 API Reg	6-5/8 API Reg	7-5/8 API Reg		
<b>OUTSIDE DIAMETER (INCHES)</b>		6	6-1/4 & 6-1/2	6-3/4	7-3/4 & 8	9		
<b>INSIDE DIAMETER (INCHES)</b>		2	2-1/4	2-3/8	3-1/16	3-3/4		
<b>TOTAL STROKE (INCHES)</b>		11-7/16	14-3/8	14-11/16	14-3/8	13-13/16		
<b>TYPE JAR</b>		Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel		
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b>	<b>605-013</b>	<b>605-014</b>	<b>605-015</b>	<b>605-016</b>	<b>605-017</b>		
	Bowen No.	52498	52544	52680	52711	66346		
<b>TOP SUB</b>	<b>Logan Part No.</b>	...	...	...	...	...		
	Bowen No.	...	...	...	...	...		
<b>MANDREL</b>	<b>Logan Part No.</b>	<b>AG4013</b>	<b>AG4014</b>	<b>AG4015</b>	<b>AG4016</b>	<b>AG4017</b>		
	Bowen No.	14715	12375	11131	15156	66352		
<b>PISTON ASSEMBLY</b>	<b>Logan Part No.</b>	<b>26000-031</b>	<b>26000-032</b>	<b>26000-033</b>	<b>26000-034</b>	<b>26000-035</b>		
<i>(Ring Type Standard)</i>	Bowen No.	55246	55212	55335	68924	66355		
<b>MANDREL BODY</b>	<b>Logan Part No.</b>	<b>AG5013</b>	<b>AG5014</b>	<b>AG5015</b>	<b>AG5016</b>	<b>AG5017</b>		
	Bowen No.	52834	52835	52836	53088	66354		
<b>MIDDLE BODY</b>	<b>Logan Part No.</b>	<b>AG6013</b>	<b>AG6014</b>	<b>AG6015</b>	<b>AG6016</b>	<b>AG6017</b>		
	Bowen No.	14712	12372	11133	15158	66347		
<b>WASHPIPE BODY</b>	<b>Logan Part No.</b>	<b>AG7013</b>	<b>AG7014</b>	<b>AG7015</b>	<b>AG7016</b>	<b>AG7017</b>		
	Bowen No.	14711	12371	701	15164	66350		
<b>KNOCKER</b>	<b>Logan Part No.</b>	<b>AG8013</b>	<b>AG8014</b>	<b>AG8015</b>	<b>AG8016</b>	<b>AG8017</b>		
	Bowen No.	14717	12377	11134	15159	66348		
<b>WASHPIPE</b>	<b>Logan Part No.</b>	<b>AG9013</b>	<b>AG9014</b>	<b>AG9015</b>	<b>AG9016</b>	<b>AG9017</b>		
	Bowen No.	14714	12374	704	15163	66349		
<b>MANDREL BODY</b>	<b>Logan Part No.</b>	<b>AG10003</b>	<b>AG10003</b>	<b>AG10003</b>	<b>AG10003</b>	<b>AG10003</b>		
<b>FILL PLUG</b>	Bowen No.	508	508	508	508	508		
<b>MIDDLE BODY</b>	<b>Logan Part No.</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>	<b>AG10002</b>		
<b>FILL PLUG</b>	Bowen No.	329	329	329	329	329		
<b>PACKING SET</b>	<b>Logan Part No.</b>	<b>26000-049</b>	<b>26000-050</b>	<b>26000-051</b>	<b>26000-052</b>	<b>26000-053</b>		
	Bowen No.	14720	12383	9738	20980	66359		
<b>MANDREL</b>	<b>Logan Part No.</b>	<b>L453</b>	<b>L365-48</b>	<b>L365-50.75</b>	<b>L365-59</b>	<b>L365-65</b>		
<b>NON-EXTRUSION RING</b>	Bowen No.	453	365-48	708	365-59	365-65		
	No. Req'd	8	8	8	8	8		
<b>MANDREL SEAL</b>	<b>Logan Part No.</b>	<b>L449</b>	<b>L375-48</b>	<b>L375-50.75</b>	<b>L375-59</b>	<b>L375-65</b>		
<b>PROTECTOR RING</b>	Bowen No.	449	375-48	709	375-59	375-65		
	No. Req'd	8	8	8	8	8		
<b>MANDREL BODY</b>	<b>Logan Part No.</b>	...	...	...	...	...		
<b>NON-EXTRUSION RING</b>	Bowen No.	...	...	...	...	...		

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

*Special Notes:*

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



# Z Type Hydraulic Fishing Jar

TOOL JOINT CONNECTION		4-1/2 API FH	4-1/2 API IF	5-1/2 API Reg	6-5/8 API Reg	7-5/8 API Reg
<b>OUTSIDE DIAMETER (INCHES)</b>		6	6-1/4 & 6-1/2	6-3/4	7-3/4 & 8	9
<b>INSIDE DIAMETER (INCHES)</b>		2	2-1/4	2-3/8	3-1/16	3-3/4
<b>TOTAL STROKE (INCHES)</b>		11-7/16	14-3/8	14-11/16	14-3/8	13-13/16
<b>TYPE JAR</b>		Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b>	<b>605-013</b>	<b>605-014</b>	<b>605-015</b>	<b>605-016</b>	<b>605-017</b>
	Bowen No.	52498	52544	52680	52711	66346
<b>MANDREL BODY</b>	<b>Logan Part No.</b>	...	...	...	...	...
<b>INSERT</b>	Bowen No.	...	...	...	...	...
<b>MANDREL BODY SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	...
<b>PROTECTOR RING</b>	Bowen No.	...	...	...	...	...
<b>RING TYPE</b>	<b>Logan Part No.</b>	<b>26000-031</b>	<b>26000-032</b>	<b>26000-033</b>	<b>26000-034</b>	<b>26000-035</b>
<b>PISTON ASSEMBLY</b>	Bowen No.	55246	55212	55335	68924	66355
<i>Consists of:</i>						
<b>PISTON</b>	<b>Logan Part No.</b>	<b>AG15013</b>	<b>AG15014</b>	<b>AG15015</b>	<b>AG15016</b>	<b>AG15017</b>
	Bowen No.	55247	55213	55339	68925	66357
<b>WAVE SPRING</b>	<b>Logan Part No.</b>	...	...	...	...	...
	No. Req'd	...	...	...	...	...
<b>PISTON RING</b>	<b>Logan Part No.</b>	<b>L1999</b>	<b>L12379</b>	<b>L719</b>	<b>L15162</b>	<b>L66356</b>
	Bowen No.	1999	12379	719	15162	66356
	No. Req'd	1	2	2	4	5
<b>SEAL</b>	<b>Logan Part No.</b>	<b>568-236</b>	<b>568-237</b>	<b>568-239</b>	<b>568-426</b>	<b>568-430</b>
	Bowen No.	568236	568237	568239	568426	568430
<b>NON-EXTRUSION RING</b>	<b>Logan Part No.</b>	<b>L370-13.75</b>	<b>L370-15</b>	<b>L370-17</b>	<b>L365-53</b>	<b>L365-57</b>
	Bowen No.	370-13.75	370-15	370-17	365-53	365-57
<b>SEAL PROTECTOR RING</b>	<b>Logan Part No.</b>	<b>L376-13.75</b>	<b>L376-15</b>	<b>L376-17</b>	<b>L375-53</b>	<b>L375-57</b>
	Bowen No.	376-13.75	376-15	376-17	375-53	375-57
<b>CONE TYPE</b>	<b>Logan Part No.</b>	...	...	...	...	...
<b>PISTON ASSEMBLY</b>	Bowen No.	...	...	...	...	...
<i>Consists of:</i>						
<b>CONE</b>	<b>Logan Part No.</b>	...	...	...	...	...
	Bowen No.	...	...	...	...	...
<b>BY-PASS BODY</b>	<b>Logan Part No.</b>	...	...	...	...	...
	Bowen No.	...	...	...	...	...
<b>SEAL BODY</b>	<b>Logan Part No.</b>	...	...	...	...	...
	Bowen No.	...	...	...	...	...
<b>SEAL BODY SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	...
	Bowen No.	...	...	...	...	...

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**Special Notes:**

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

<b>TOOL JOINT CONNECTION</b>		4-1/2 API FH	4-1/2 API IF	5-1/2 API Reg	6-5/8 API Reg	7-5/8 API Reg	
<b>OUTSIDE DIAMETER (INCHES)</b>		6	6-1/4 & 6-1/2	6-3/4	7-3/4 & 8	9	
<b>INSIDE DIAMETER (INCHES)</b>		2	2-1/4	2-3/8	3-1/16	3-3/4	
<b>TOTAL STROKE (INCHES)</b>		11-7/16	14-3/8	14-11/16	14-3/8	13-13/16	
<b>TYPE JAR</b>		Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b>	<b>605-013</b>	<b>605-014</b>	<b>605-015</b>	<b>605-016</b>	<b>605-017</b>	
	Bowen No.	52498	52544	52680	52711	66346	

### OPTIONAL

<b>MANDREL BODY</b>	<b>Logan Part No.</b>	<b>AG1001</b>	<b>AG1000-48</b>	<b>AG1000-51</b>	<b>AG1000-59</b>	<b>AG1000-65</b>	
<b>SETTING TOOL</b>	Bowen No.	448	22709-48	22709-51	22709-59	22709-65	
<b>PISTON SETTING TOOL</b>	<b>Logan Part No.</b>	<b>AG1000-41.75</b>	<b>AG2001</b>	<b>AG1000-45</b>	<b>AG1000-53</b>	<b>AG1000-57</b>	
	Bowen No.	22709-41.75	54309	22709-45	22709-53	22709-57	
<b>PISTON RING PLIERS</b>	<b>Logan Part No.</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	
	Bowen No.	...	...	...	...	...	
<b>JAR SERVICE KIT</b>	<b>Logan Part No.</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	<b>26000-055</b>	
	Bowen No.	55403	55403	55403	55403	55403	
<b>HI-TEMPERATURE PACKING SET</b>	<b>Logan Part No.</b>	<b>26000-085</b>	<b>26000-086</b>	<b>26000-087</b>	<b>26000-088</b>	...	
	Bowen No.	148246	79015 & 147932	9738/006	20980/006 & 007	...	
<b>PACKING SET</b>	<b>Logan Part No.</b>	<b>26000-049</b>	<b>26000-050</b>	<b>26000-051</b>	<b>26000-052</b>	<b>26000-053</b>	
<i>Consists of:</i>	Bowen No.	14720	12383	9738	20980	66359	
<b>MANDREL / WASHPIPE SEAL</b>	<b>Logan Part No.</b>	<b>568-344</b>	<b>568-345</b>	<b>568-348</b>	<b>568-432</b>	<b>568-438</b>	
	Bowen No.	568344	568345	568348	568432	568438	
	No. Req'd	4	4	4	4	4	
<b>LARGE MIDDLE BODY SEAL</b>	<b>Logan Part No.</b>	<b>568-248</b>	<b>568-252</b>	<b>568-256</b>	<b>568-261</b>	<b>568-265</b>	
	Bowen No.	568248	568252	568256	568261	568265	
	No. Req'd	2	2	2	2	2	
<b>SMALL MIDDLE BODY SEAL</b>	<b>Logan Part No.</b>	<b>568-246</b>	<b>568-250</b>	<b>568-254</b>	<b>568-259</b>	...	
	Bowen No.	568246	568250	568254	568259	...	
	No. Req'd	3	3	3	3	3	
<b>WASHPIPE SEAL</b>	<b>Logan Part No.</b>	<b>568-234</b>	<b>568-235</b>	<b>568-235</b>	<b>568-242</b>	<b>568-246</b>	
	Bowen No.	568234	568235	568235	568242	568246	
<b>MANDREL BODY FILL PLUG SEAL</b>	<b>Logan Part No.</b>	<b>568-011</b>	<b>568-011</b>	<b>568-011</b>	<b>568-011</b>	<b>568-011</b>	
	Bowen No.	568011	568011	568011	568011	568011	
<b>MIDDLE BODY FILL PLUG SEAL</b>	<b>Logan Part No.</b>	<b>568-006</b>	<b>568-006</b>	<b>568-006</b>	<b>568-006</b>	<b>568-011</b>	
	Bowen No.	568006	568006	568006	568006	568011	
<b>PISTON SEAL</b>	<b>Logan Part No.</b>	<b>568-236</b>	<b>568-237</b>	<b>568-239</b>	<b>568-426</b>	<b>568-430</b>	
	Bowen No.	568236	568237	568239	568426	568430	

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#### Special Notes:

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

#### When ordering, please specify:

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

#### Recommended Spares:

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Z Type Hydraulic Fishing Jar

TOOL JOINT CONNECTION		4-1/2 API FH	4-1/2 API IF	5-1/2 API Reg	6-5/8 API Reg	7-5/8 API Reg
<b>OUTSIDE DIAMETER (INCHES)</b>		6	6-1/4 & 6-1/2	6-3/4	7-3/4 & 8	9
<b>INSIDE DIAMETER (INCHES)</b>		2	2-1/4	2-3/8	3-1/16	3-3/4
<b>TOTAL STROKE (INCHES)</b>		11-7/16	14-3/8	14-11/16	14-3/8	13-13/16
<b>TYPE JAR</b>		Integral	Integral	Integral	Integral	Integral
		Mandrel	Mandrel	Mandrel	Mandrel	Mandrel
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b>	<b>605-013</b>	<b>605-014</b>	<b>605-015</b>	<b>605-016</b>	<b>605-017</b>
	Bowen No.	52498	52544	52680	52711	66346
<b>MIDDLE BODY / MANDREL BODY SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	<b>568-441</b>
	Bowen No.	...	...	...	...	568441
<b>WASHPIPE / MIDDLE BODY SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	<b>568-263</b>
	Bowen No.	...	...	...	...	568263
<b>BACK-UP RINGS</b>	<b>Logan Part No.</b>	...	...	...	...	...
	Bowen No.	...	...	...	...	...
<b>MANDREL SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	...
	Bowen No.	...	...	...	...	...
<b>MANDREL BODY SEAL</b>	<b>Logan Part No.</b>	...	...	...	...	...
	Bowen No.	...	...	...	...	...

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

**Special Notes:**

- (1) Packing Sets include all seals necessary to dress the tool. Non-Extrusion Rings and Seal Protector Rings are not included, and must be ordered separately.
- (2) Jar Service Kit does not include Seal Setting Tools or Piston Ring Pliers, which must be ordered separately.

**When ordering, please specify:**

- (1) Name and number of assembly or part
- (2) Connections, if other than standard
- (3) Outside diameter, if other than standard

**Recommended Spares:**

- (1) 1 Jar Service Kit
- (2) 1 Washpipe
- (3) 2 Piston Assemblies
- (4) 16 Non-Extrusion Rings
- (5) 16 Seal Protector Rings
- (6) 4 Mandrel Body Fill Plugs
- (7) 4 Middle Body Fill Plugs
- (8) 8 Packing Sets
- (9) 1 Mandrel Body Setting Tool
- (10) 1 Piston Setting Tool
- (11) 1 Piston Ring Pliers



## Recommended Test Loads

<b>TOOL JOINT CONNECTION</b>	7/8 Sucker Rod	1-13/16 Wilson FJ	1-1/4 API Reg	2-3/8 PH6 5.9# Hyd Bx	2-3/8 EUE	2-3/8 API Reg	2-7/8 API Reg	
<b>OUTSIDE DIAMETER (INCHES)</b>	1-5/8	1-13/16	2-1/4	2-29/32	3-1/16	3-1/8	3-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1/4	5/16	3/8	1	1-1/2	1	1-1/4	
<b>STROKE LENGTH (INCHES)</b>	7-1/16	7	6-15/16	11-7/16	11-9/16	11-13/16	11-13/16	
<b>JAR TYPE</b>	Sub	Special	Integral Mandrel	Sub	Sub	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-000</b> 70822	<b>605-001</b> 74723	<b>605-002</b> 54020	<b>605-003</b> 68010	<b>605-004</b> 55670	<b>605-005</b> 52504	<b>605-006</b> 52506
<b>LOW PULL LOAD (LBS)</b>	4,000	4,000	4,000	6,000	6,000	7,000	8,000	
<b>MAX. ALLOWABLE LOAD (LBS)</b>	15,400	18,000	21,000	35,400	27,800	32,400	56,500	
<b>TESTING PULL LOAD (LBS) *</b>	5,000 – 8,500	6,000 – 10,000	7,200 – 12,000	12,600 – 19,000	12,000 – 16,000	15,000 – 23,000	18,000 – 26,000	

<b>TOOL JOINT CONNECTION</b>	2-3/8 API IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 API FH	3-1/2 API IF	3-1/2 API IF	
<b>OUTSIDE DIAMETER (INCHES)</b>	3-3/4	3-3/4	4-1/4	4-1/2	4-3/4	4-3/4	4-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1-1/2	1-7/8	1-15/16	2-3/8	1-1/2	2	2-1/4	
<b>STROKE LENGTH (INCHES)</b>	12-1/8	10-1/8	11-13/16	12-1/4	11-13/16	13-5/16	...	
<b>TYPE JAR</b>	Sub	Sub	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-007</b> 52528	<b>605-008</b> 52497	<b>605-009</b> 52502	<b>605-010</b> 52653	<b>605-011</b> 52530	<b>605-012</b> 52500	<b>605-018</b> ...
<b>LOW PULL LOAD (LBS)</b>	8,000	8,000	8,000	8,000	10,000	10,000	...	
<b>MAX. ALLOWABLE LOAD (LBS)</b>	46,000	46,500	46,700	49,000	85,000	74,500	...	
<b>TESTING PULL LOAD (LBS) *</b>	15,000 – 26,000	15,000 – 26,000	18,000 – 28,000	18,000 – 28,000	28,000 – 45,000	28,000 – 45,000	...	

<b>TOOL JOINT CONNECTION</b>	4-1/2 API FH	4-1/2 API IF	5-1/2 API Reg	6-5/8 API Reg	7-5/8 API Reg		
<b>OUTSIDE DIAMETER (INCHES)</b>	6	6-1/4 & 6-1/2	6-3/4	7-3/4 & 8	9		
<b>INSIDE DIAMETER (INCHES)</b>	2	2-1/4	2-3/8	3-1/16	3-3/4		
<b>STROKE LENGTH(INCHES)</b>	11-7/16	14-3/8	14-11/16	14-3/8	13-13/16		
<b>TYPE JAR</b>	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel		
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-013</b> 52498	<b>605-014</b> 52544	<b>605-015</b> 52680	<b>605-016</b> 52711	<b>605-017</b> 66346	
<b>LOW PULL LOAD (LBS)</b>	10,000	12,000	12,000	12,000	14,000		
<b>MAX. ALLOWABLE LOAD (LBS)</b>	136,400	159,000	172,800	149,000	214,000		
<b>TESTING PULL LOAD (LBS) *</b>	41,000 – 62,000	55,000 – 80,000	62,000 – 110,000	63,000 – 100,000	80,000 – 120,000		

\* Figures are based on a Jar Tester speed of 2-1/2 feet per minute.

Full speed, approximately 6-1/2 feet per minute, is needed to reach maximum allowable load.

**WARNING:** All jarring and pulling loads listed in this manual assume that force is acting alone along the major axis of the Jar. Torque and tension, or bending and tension, combine stresses that may lead to failure at less than the rated loads. Combining rotation and bending can lead to fatigue.

**CAUTION:** Operators should also be aware that milling operations may cause complex stresses in the Jar other than the simple torsional and tensile values listed on page 30. The weight necessary for milling can cause bending forces. When combined with torsional forces, very high stresses may be generated in some areas of the Jar. Rotating the Jar in a deviated hole or at a neutral point may have a similar effect. Milling operations are necessary at times and are not discouraged. However, operators should exercise caution and be aware of the possible dangers when rotating under adverse conditions.



## Strength Data

<b>TOOL JOINT CONNECTION</b>	7/8 Sucker Rod	1-13/16 Wilson FJ	1-1/4 API Reg	2-3/8 PH6 5.9# Hyd Bx	2-3/8 EUE	2-3/8 API Reg	2-7/8 API Reg	
<b>OUTSIDE DIAMETER (INCHES)</b>	1-5/8	1-13/16	2-1/4	2-29/32	3-1/16	3-1/8	3-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1/4	5/16	3/8	1	1-1/2	1	1-1/4	
<b>STROKE LENGTH (INCHES)</b>	7-1/16	7	6-15/16	11-7/16	11-9/16	11-13/16	11-13/16	
<b>JAR TYPE</b>	Sub	Special	Integral Mandrel	Sub	Sub	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-000</b> 70822	<b>605-001</b> 74723	<b>605-002</b> 54020	<b>605-003</b> 68010	<b>605-004</b> 55670	<b>605-005</b> 52504	<b>605-006</b> 52506
<b>MAXIMUM JARRING LOAD (LBS)</b>	15,400	18,000	21,000	35,400	27,800	32,400	56,500	
<b>LIFT LOAD AFTER JARRING</b>	46,300	59,400	118,500	194,800	160,200	229,200	345,000	
<b>TENSILE @ YIELD (LBS)</b>	260	340	1,800	2,260	2,200	4,060	7,640	
<b>TORQUE @ YIELD (FT-LBS)</b>	1,100 – 1,450	1,360 – 1,800	1,560 – 2,100	2,200 – 3,000	2,300 – 3,100	2,400 – 3,300	4,200 – 5,700	

<b>TOOL JOINT CONNECTION</b>	2-3/8 API IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 API FH	3-1/2 API IF	3-1/2 API IF	
<b>OUTSIDE DIAMETER (INCHES)</b>	3-3/4	3-3/4	4-1/4	4-1/2	4-3/4	4-3/4	4-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1-1/2	1-7/8	1-15/16	2-3/8	1-1/2	2	2-1/4	
<b>STROKE LENGTH (INCHES)</b>	12-1/8	10-1/8	11-13/16	12-1/4	11-13/16	13-5/16	...	
<b>TYPE JAR</b>	Sub	Sub	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b> Bowen No.	<b>605-007</b> 52528	<b>605-008</b> 52497	<b>605-009</b> 52502	<b>605-010</b> 52653	<b>605-011</b> 52530	<b>605-012</b> 52500	<b>605-018</b> ...
<b>MAXIMUM JARRING LOAD (LBS)</b>	46,000	46,500	46,700	49,000	85,000	74,500	...	
<b>LIFT LOAD AFTER JARRING</b>	299,700	179,500	430,300	375,000	591,900	468,800	...	
<b>TENSILE @ YIELD (LBS)</b>	5,340	2,980	9,920	11,160	18,420	17,200	...	
<b>TORQUE @ YIELD (FT-LBS)</b>	3,400 – 4,600	3,500 – 4,700	3,500 – 4,700	3,600 – 4,900	6,300 – 8,500	5,600 – 7,500	...	

Tensile strengths listed above are calculated theoretical yield strengths and are considered accurate to ±20%.

Operating torques are set at 50% of the calculated theoretical yield torque and are the maximum recommended operating torques.

These figures do not constitute a guarantee, actual or implied. They are meant to serve as a guide only, and an appropriate safety allowance must be made in use.

**WARNING: All jarring and pulling loads listed in above assume that force is acting alone along the major axis of the Jar. Torque and tension, or bending and tension, combine stresses that may lead to failure at less than the rated loads. Combining rotation and bending can lead to fatigue.**

**CAUTION: Operators should also be aware that milling operations may cause complex stresses in the Jar other than the simple torsional and tensile values listed above. The weight necessary for milling can cause bending forces. When combined with torsional forces, very high stresses may be generated in some areas of the Jar. Rotating the Jar in a deviated hole or at a neutral point may have a similar effect. Milling operations are necessary at times and are not discouraged. However, operators should exercise caution and be aware of the possible dangers when rotating under adverse conditions.**



## Strength Data

<b>TOOL JOINT CONNECTION</b>	4-1/2 API FH	4-1/2 API IF	5-1/2 API Reg	6-5/8 API Reg	7-5/8 API Reg		
<b>OUTSIDE DIAMETER (INCHES)</b>	6	6-1/4 & 6-1/2	6-3/4	7-3/4 & 8	9		
<b>INSIDE DIAMETER (INCHES)</b>	2	2-1/4	2-3/8	3-1/16	3-3/4		
<b>STROKE LENGTH (INCHES)</b>	11-7/16	14-3/8	14-11/16	14-3/8	13-13/16		
<b>TYPE JAR</b>	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel	Integral Mandrel		
<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b>	<b>605-013</b>	<b>605-014</b>	<b>605-015</b>	<b>605-016</b>	<b>605-017</b>	
	<b>Bowen No.</b>	52498	52544	52680	52711	66346	
<b>MAXIMUM JARRING LOAD (LBS)</b>	136,400	159,000	172,800	149,000	214,000		
<b>LIFT LOAD AFTER JARRING</b>	937,000	917,400	1,013,800	1,587,900	1,621,000		
<b>TENSILE @ YIELD (LBS)</b>							
<b>TORQUE @ YIELD (FT-LBS)</b>	34,320	40,680	48,660	64,020	92,260		
<b>COLLAR WEIGHT ABOVE JAR (LBS)</b>	10,200 – 13,800	11,800 – 16,000	13,000 – 17,500	11,000 – 15,000	14,300 – 19,600		

*Tensile strengths listed above are calculated theoretical yield strengths and are considered accurate to ±20%.*

*Operating torques are set at 50% of the calculated theoretical yield torque and are the maximum recommended operating torques.*

*These figures do not constitute a guarantee, actual or implied. They are meant to serve as a guide only, and an appropriate safety allowance must be made in use.*

**WARNING: All jarring and pulling loads listed in above assume that force is acting alone along the major axis of the Jar. Torque and tension, or bending and tension, combine stresses that may lead to failure at less than the rated loads. Combining rotation and bending can lead to fatigue.**

**CAUTION: Operators should also be aware that milling operations may cause complex stresses in the Jar other than the simple torsional and tensile values listed above. The weight necessary for milling can cause bending forces. When combined with torsional forces, very high stresses may be generated in some areas of the Jar. Rotating the Jar in a deviated hole or at a neutral point may have a similar effect. Milling operations are necessary *t* times and are not discouraged. However, operators should exercise caution and be aware of the possible dangers when rotating under adverse conditions.**



## Recommended Tightening Torques

### MAXIMUM RECOMMENDED TIGHTENING TORQUES (FT-LBS)

<b>TOOL JOINT CONNECTION</b>	7/8 Sucker Rod	1-13/16 Wilson FJ	1-1/4 API Reg	2-3/8 PH6 5.9# Hyd Bx	2-3/8 EUE	2-3/8 API Reg	2-7/8 API Reg	
<b>OUTSIDE DIAMETER (INCHES)</b>	1-5/8	1-13/16	2-1/4	2-29/32	3-1/16	3-1/8	3-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1/4	5/16	3/8	1	1-1/2	1	1-1/4	
<b>COMPLETE ASSEMBLY</b>	<b>Logan No.</b> Bowen No.	<b>605-000</b> 70822	<b>605-001</b> 74723	<b>605-002</b> 54020	<b>605-003</b> 68010	<b>605-004</b> 55670	<b>605-005</b> 52504	<b>605-006</b> 52506
<b>MANDREL BODY INSERT TO MANDREL BODY</b>	320	...	...	...	...	...	...	
<b>TOP SUB TO MANDREL</b>	130	170	...	1,130	1,100	...	...	
<b>MANDREL BODY TO MIDDLE BODY</b>	150	350	900	1,950	2,100	2,030	3,820	
<b>KNOCKER TO MANDREL</b>	...	...	30	...	...	200	300	
<b>MANDREL TO WASHPIPE</b>	80	100	150	800	690	690	1,140	
<b>MIDDLE BODY TO WASHPIPE BODY</b>	270	520	1,050	2,070	2,100	2,030	3,820	

### MAXIMUM RECOMMENDED TIGHTENING TORQUES (FT-LBS)

<b>TOOL JOINT CONNECTION</b>	2-3/8 API IF	2-3/8 EUE	2-7/8 API IF	2-7/8 EUE	3-1/2 API FH	3-1/2 API IF	3-1/2 API IF	
<b>OUTSIDE DIAMETER (INCHES)</b>	3-3/4	3-3/4	4-1/4	4-1/2	4-3/4	4-3/4	4-3/4	
<b>INSIDE DIAMETER (INCHES)</b>	1-1/2	1-7/8	1-15/16	2-3/8	1-1/2	2	2-1/4	
<b>COMPLETE ASSEMBLY</b>	<b>Logan No.</b> Bowen No.	<b>605-007</b> 52528	<b>605-008</b> 52497	<b>605-009</b> 52502	<b>605-010</b> 52653	<b>605-011</b> 52530	<b>605-012</b> 52500	<b>605-018</b> ...
<b>MANDREL BODY INSERT TO MANDREL BODY</b>	...	...	...	...	...	...	...	
<b>TOP SUB TO MANDREL</b>	2,670	1,490	...	...	...	...	...	
<b>MANDREL BODY TO MIDDLE BODY</b>	3,570	3,570	4,960	5,580	9,770	9,750	...	
<b>KNOCKER TO MANDREL</b>	...	...	500	500	700	500	...	
<b>MANDREL TO WASHPIPE</b>	890	410	1,880	1,930	2,130	2,010	...	
<b>MIDDLE BODY TO WASHPIPE BODY</b>	3,570	3,570	4,960	5,580	9,210	8,600	...	

### MAXIMUM RECOMMENDED TIGHTENING TORQUES (FT-LBS)

<b>TOOL JOINT CONNECTION</b>	4-1/2 API FH	4-1/2 API IF	5-1/2 API Reg	6-5/8 API Reg	7-5/8 API Reg		
<b>OUTSIDE DIAMETER (INCHES)</b>	6	6-1/4 & 6-1/2	6-3/4	7-3/4 & 8	9		
<b>INSIDE DIAMETER (INCHES)</b>	2	2-1/4	2-3/8	3-1/16	3-3/4		
<b>COMPLETE ASSEMBLY</b>	<b>Logan No.</b> Bowen No.	<b>605-013</b> 52498	<b>605-014</b> 52544	<b>605-015</b> 52680	<b>605-016</b> 52711	<b>605-017</b> 66346	
<b>MANDREL BODY INSERT TO MANDREL BODY</b>	...	...	...	...	...		
<b>TOP SUB TO MANDREL</b>	...	...	...	...	...		
<b>MANDREL BODY TO MIDDLE BODY</b>	17,530	20,340	24,330	32,020	57,760		
<b>KNOCKER TO MANDREL</b>	2,200	2,000	1,900	3,200	6,200		
<b>MANDREL TO WASHPIPE</b>	4,990	5,460	7,260	11,680	21,540		
<b>MIDDLE BODY TO WASHPIPE BODY</b>	17,160	20,340	24,330	32,010	46,130		

The make-up torques listed above are the maximum recommended make-up torques for each connection. Values are set at 50% of the calculated theoretical yield torque. Torques this high are not required for all fishing jobs. Lower values will result in less thread wear.

The tightening torque values were calculated assuming Itcolube or similar zinc-based grease was applied to all threads and shoulders.



Note: Photos of parts are not actual size.

# Jar Service Kit



J1045-001  
3/8" Fill Plug  
Adapter



J1046-001  
7/16" Fill Plug  
Adapter



J1224-001  
5/8" Fill Plug  
Adapter



J1086  
1/4" Female Couplers



J1374  
Hex Bushing



J1373  
Box Coupler



J1376  
Hose Fitting



J1085  
1/4" Male Couplers



J1078  
1/4" x 1" Pipe Nipple



J1080  
Line Filter

568010-100  
O-Ring



568005-100  
O-Rings



J1073  
Installation Tool



J1074  
O-Ring Installation Tool

J1077  
Fill Plug Wrench



J1075  
Torx Head  
Fill Plug Wrench



26000-055  
Piston Ring Pliers

**Piston Ring Pliers are not included in the Service Kit and must be ordered separately at additional cost.**



AG1000-xx \*  
Mandrel Setting Tool

**Setting Tools are not included in the Service Kit and must be ordered separately for each tool size at additional cost.**

\* Refer to Parts Lists on pages 16 – 28 for complete part numbers.



# Jar Service Kit



Pump Hose



J1072  
6 Ft. Exhaust Hose



J1069  
Volume Pump



J1070  
Metal Box

<b>COMPLETE ASSEMBLY</b>	<b>Logan Part No.</b>	<b>26000-055</b>
<i>Consists of:</i>	<i>Bowen No.</i>	<i>145213</i>
<b>SEAL PROTECTOR RING</b>	<b>Logan Part No.</b>	<b>J1073</b>
<b>INSTALLATION TOOL</b>	<i>Bowen No.</i>	<i>625</i>
<b>O-RING</b>	<b>Logan Part No.</b>	<b>J1074</b>
<b>INSTALLATION TOOL</b>	<i>Bowen No.</i>	<i>626</i>
<b>FILL PLUG WRENCH — T30 TORX HEAD</b>	<b>Logan Part No.</b>	<b>J1075</b>
	<i>Bowen No.</i>	<i>359T</i>
<b>FILL PLUG WRENCH — ALLEN HEAD</b>	<b>Logan Part No.</b>	<b>J1077</b>
	<i>Bowen No.</i>	<i>620A</i>
<b>1/4" x 1" PIPE NIPPLE</b>	<b>Logan Part No.</b>	<b>J1078</b>
	<i>Bowen No.</i>	<i>36953</i>
<b>LINE FILTER</b>	<b>Logan Part No.</b>	<b>J1080</b>
	<i>Bowen No.</i>	<i>56565</i>
<b>1/4" MALE COUPLER</b>	<b>Logan Part No.</b>	<b>J1085</b>
	<i>Bowen No.</i>	<i>656</i>
<b>1/4" FEMALE COUPLER</b>	<b>Logan Part No.</b>	<b>J1086</b>
	<i>Bowen No.</i>	<i>655</i>
<b>3/8" BOX x 1/4" GALVANIZED BOX COUPLER</b>	<b>Logan Part No.</b>	<b>J1373</b>
	<i>Bowen No.</i>	<i>...</i>
<b>1/8" BOX x 1/4" PIN HEX BUSHING</b>	<b>Logan Part No.</b>	<b>J1374</b>
	<i>Bowen No.</i>	<i>...</i>

<b>1/4" 19 NPT PIN HOSE FITTING</b>	<b>Logan Part No.</b>	<b>J1376</b>
	<i>Bowen No.</i>	<i>...</i>
<b>6 FT. EXHAUST HOSE</b>	<b>Logan Part No.</b>	<b>J1072</b>
	<i>Bowen No.</i>	<i>33435</i>
<b>PUMP HOSE</b>	<b>Logan Part No.</b>	<b>...</b>
	<i>Bowen No.</i>	<i>2581</i>
<b>VOLUME PUMP</b>	<b>Logan Part No.</b>	<b>J1069</b>
	<i>Bowen No.</i>	<i>2580</i>
<b>METAL BOX</b>	<b>Logan Part No.</b>	<b>J1070</b>
	<i>Bowen No.</i>	<i>1995</i>
<b>5/8" FILL PLUG ADAPTER</b>	<b>Logan Part No.</b>	<b>J1224-001</b>
	<i>Bowen No.</i>	<i>...</i>
<b>7/16" 20 NF FILL PLUG ADAPTER</b>	<b>Logan Part No.</b>	<b>J1046-001</b>
	<i>Bowen No.</i>	<i>...</i>
<b>3/8" 24 NF FILL PLUG ADAPTER</b>	<b>Logan Part No.</b>	<b>J1045-001</b>
	<i>Bowen No.</i>	<i>...</i>
<b>O-RING</b>	<b>Logan Part No.</b>	<b>568010-100</b>
	<i>Bowen No.</i>	<i>568010</i>
<b>O-RING — 70 DURO NITRILE</b>	<b>Logan Part No.</b>	<b>568005-100</b>
	<i>Bowen No.</i>	<i>568005</i>

Mandrel Setting Tools are not included in the Service Kit and must be ordered separately for each tool size at additional cost. See pages 16 – 28 for part numbers. Piston Ring Pliers (Logan Part No. 26000-055) are not included in the Service Kit and must be ordered separately at additional cost.

**When ordering, please specify:** Name and number of assembly or part



Notes



Notes

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