



INNOVEX
LOGAN FISHING TOOLS

FISHING & INTERVENTION

FISHING
MAGNETS

Manual C325

**THE LEGACY
LIVES ON**

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Logan Heavy-Duty Ditch Magnets

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LEGAL NOTICE

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OVERVIEW

The Logan Fishing Magnet is designed to retrieve small metal, oddly-shaped objects such as milling shavings, bit cones, cutters, bearings, slips, tong pins, and hand tools from the bottom of the well bore. Typically, these objects are the result of bit failures, an accumulation of mill cuttings, or simply accidental droppings of objects that cannot be milled. In almost all of these cases, the fish can not be engaged in the normal manner. Fishing magnets successfully remove these objects from the hole.

Logan Fishing Magnets are available in sizes from 1-inch O.D. through 19- inches O.D. and are equipped with popular threaded pin connections for wireline or pipe operation. Depending on size, they are capable of exerting pulls from 5 to 5,000 pounds. Full circulation may be maintained through most of the magnets during service.

The Logan Fishing Magnet's generous circulation ports wash away cuttings and other debris that might interfere with or prevent contact with the magnet. A variety of guides are available to accommodate any retrieval situation.

The Logan Magnet Charger is available as an optional accessory. See page 4 for more information.

USES

Tool failures, milling jobs, and accidents can cause objects such as bit cones, bearings, slips, mill cuttings, tong pins and hammers to collect at the bottom of the hole. In many instances, these objects can only be retrieved by magnetic attraction. Logan Fishing Magnets are an indispensable accessory for retrieving the objects.

The Logan Fishing Magnet is also an indispensable aid during diamond coring operations. Particles such as chipped bit teeth and broken bearings can seriously damage or diminish the performance of diamond core bits. Logan Fishing Magnets can rid the hole of all such particles to ensure the bit's safety and performance, often in a single run.

CONSTRUCTION

The Logan Fishing Magnet Assembly consists of a body, integral housing, integral pole plate, magnet element, and standard flush guide.

The body is manufactured from high strength alloy steel. It has a tool joint pin top connection and generous circulation ports to keep the pole plate clean. The threaded lower end engages a flush, lipped, or mill guide.

The pole plate is highly magnetic. Magnetic flux is concentrated in a controlled field around the bottom pole plate. This magnetic field extends completely across the bottom end of the tool.

The magnet body, housing, and pole plate are threaded and welded together during assembly with the magnet element in place. The magnet assembly is magnetized after it is completely assembled. Magnetism does not emanate to any other part of the tool. Since the outside case is not magnetized, the tool can be run inside cased holes without losing its effectiveness. The magnet can be recharged if necessary.

The standard flush (having no extension below the pole plate) bottom guide is threaded and easily removed to allow the guide to be changed or repaired. Lipped guides and mill guides are also available. See Optional Accessories at right for more information.

Optional Accessories

Guides

A flush guide is standard on the Logan Fishing Magnet and is used to catch objects such as sledge hammers, cones, or flat objects that are too large to fit inside a lipped or mill guide.

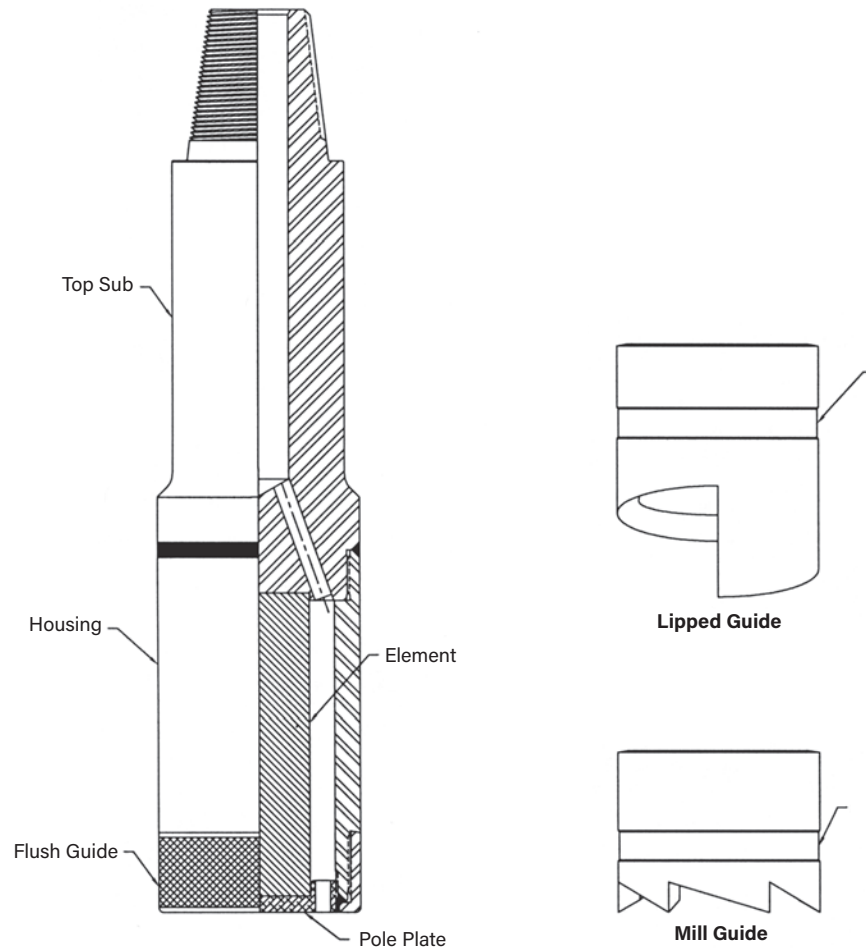
The lipped guide centralizes the fish to ensure contact with the magnet. A lipped guide is used when three or more cones are lost in the hole. The lipped guide can dig out one of the cones, roll it over one of the other cones, and cause it to ride up to the pole plate. After the first cone is recovered, the lipped guide is replaced with a mill guide for the second and subsequent runs.

The lipped guide should also be used to recover long objects that lie to one side and need to be straightened. For example, an 18-inch pipe wrench lost in the hole will usually lean to the side. The lipped guide would be used as a rake to straighten the wrench so it could enter the guide. It is important, in this case, to not apply too much weight. Excessive weight will tend to push the object into the formation and may damage the pole plate.

The mill guide enables milling of any soft formation or settling to free debris at the bottom of the hole. It is used when fishing for tong dies, only one or two cones, or during safety runs prior to diamond coring operations.

Keepers

Magnets generally do not lose their strength during normal use. However, storing the magnet in the vicinity of an electric motor, or bringing magnets too close to each other, can adversely affect their charge. Keepers are recommended when storing magnets to reduce the attraction of miscellaneous metal objects or particles. A keeper is required for shipment via air freight.



CAUTION: Never place the bottom of two tools against each other, especially if one is larger than the other, when transporting or storing. The smaller tool will lose some of its charge and be weakened.

Magnet Chargers

Logan Magnet Chargers ensure maximum charging efficiencies with ease of operation and long-life durability. The Logan Magnet Charger induces a strong magnetic charge into core-type magnets. Recharging is quick and easy with Logan's state-of-the-art control console. The Logan Magnet Charger can be used to magnetize magnets up to 19-inches O.D. There is no limit to the number of times a magnet can be recharged.



The Logan Magnet Charger is a pulsed-type unit that requires much lower electrical power than ordinary, continuous-type chargers. It is capable of performing large charging jobs with low electrical input.

The Logan Magnet Charger includes a power supply unit and magnetizing coil unit. The solid-state power supply unit converts alternating current (AC) input into short-pulse, high-peak, direct current (DC) output to the magnetizing coil.

The magnet is placed in the magnetizing coil and locked into place by means of two adjustable arms that are a part of the magnetic circuit. A pushbutton on the power supply unit starts the magnetizing cycle that automatically shuts off after it reaches peak magnetizing force.

Regardless of the type of charger (pulsed or continuous) used, a Logan Fishing Magnet is properly charged when it reads approximately 2,500 gauss or more on a commercial gauss meter.

NOTE: A gauss meter reads the strength of a charge. Strength does not vary with of the size of the magnet. Lifting capacity is a function of size, contact area, and charge.

OPERATION

Logan Fishing Magnets are usually run on tubing or drill pipe, but when circumstances demand it, they also can be run on wireline.

NOTE: Procedures will vary with hole conditions and with the type and quantity of junk being fished.

Ample circulation and proper weight applications are the keys to success while running a Logan Fishing Magnet. In most cases, too much circulation is almost impossible. Maximum weight that should be applied to any size magnet during rotation is 5,000 lbs. Some jobs require no rotary. In most cases, maximum weight applied to any size magnet without rotation should be limited to 10,000 lbs. Excessive weight or rotation may cause severe damage to the pole plate and magnetic element.

The Logan Fishing Magnet is made up to the bottom of the fishing string and lowered into the hole to within six to twelve inches of the fish. Circulate to wash the fish. Reduce circulation and lower the fishing magnet to the fish. Slowly rotate to ensure positive contact. Discontinue circulation and lift the fishing magnet from the hole.

Wireline Procedure

Operation on wireline is achieved by utilizing 5/8" or 3/4" sucker rod adapters and wireline rope sockets, which also are available from Logan. (Refer to Optional Components in the parts lists on pages 6 – 9.) The fishing magnet is dressed with a flush guide and is lowered to the bottom of the hole and returned to the surface at a fairly slow speed. Although operation on wireline is economical, it does not allow fluid circulation through the tool.

Assemble the fishing magnet on the running string and lower it within six (6) to twelve (12) inches of the fish. Circulate the fluid to wash out and remove heavy cuttings. Reduce circulation and lower the fishing magnet until it contacts the fish. Rotate the fishing magnet to ensure good contact and discontinue circulation. Pull the fishing magnet to the surface and remove the fish.

Repeat this procedure for any additional objects still in the hole. Before making additional runs, be certain all circulation ports are clear. Remove any debris plugging these holes with a screwdriver or small rod probe.

Fishing for One Cone

Assemble the Logan Fishing Magnet with a mill type guide and run it in the hole.

Upon running the last stand or joint of the running string, make up the kelly. Immediately begin circulation and start the rotary at the same time. Rotate and lower the tool down to within six (6) to twelve (12) inches of the fish. Allow the tool to run in this position for three (3) or four (4) minutes to clean the bottom of the hole. Closely observe the weight indicator for any sign of weight loss. Weight loss is a positive indication that additional washing is required to reach true bottom.

CAUTION: Do not rotate yet.

Lift the tool approximately five (5) to ten (10) feet off of the bottom. Repeat the lowering and probing procedure, checking for the same depth and weight. Make sure there is not a subsequent weight loss. When no more weight can be circulated off, engage the rotary. Using 3,000 lbs of weight, let the rotary make three (3) to six (6) turns and observe whether there is torque resistance. Six (6) turns of the rotary should not give more than one (1) or two (2) turns of torque. If five (5) or six (6) turns of torque are returned with five (5) to six (6) turns of the rotary, take off about half the weight shown on the weight indicator and rotate again. A jump of the rotary and a subsequent smoothing out will indicate the formation is hard or firm.

Disengage the pump. Lift the tool five (5) to ten (10) feet off of the bottom. Allow the tool to idle for a few minutes, then slowly lower it back to the bottom.

CAUTION: Do not use the pump and do not rotate.

Check the depth and weight on the fish. If the values are correct, turn the rotary three (3) or four (4) times. A similar jump of the rotary and subsequent smoothing out may occur. It is good practice to repeat this last procedure, but it should be done without circulation.

MAINTENANCE

Since Logan Fishing Magnets are never completely disassembled, maintenance is minimal. However, good maintenance will ensure the best performance and maximum life of the Logan Fishing Magnet. After each use, the fishing magnet should be thoroughly rinsed out with fresh water. Circulate fresh water through the tool from the pin until all drilling mud, salt, and other solutions have been completely removed.

Inspect the circulation ports in the pole

plate and remove any metal particles. This may be done by inserting the tip of a screwdriver into the holes and lifting out the metal particles.

After the tool has thoroughly dried, clean the outside surfaces, and paint or grease the body and housing. Do not apply paint to the pole plate. Apply high-grade thread dope or grease to the tool joint pin and guide threads.

CAUTION: Never place the bottom of two tools against each other, especially if one is larger than the other, when transporting or storing. The smaller tool will lose some of its charge and be weakened.

The magnetic charge in a Logan Fishing Magnet is essentially permanent. However, it may weaken over a long period of time or by mishandling. When this occurs, the fishing magnet should be recharged.

Unless the operator has a Logan Magnet Charger (available as an optional accessory), the tool must be returned to Logan Oil Tools for proper recharging.

DISASSEMBLY

If a Logan Fishing Magnet requires extensive repairs due to wear or damage, it should be returned to Logan Oil Tools where the tool will be completely demagnetized, disassembled, repaired, and reassembled under controlled shop conditions.

ASSEMBLY

The Logan Fishing Magnet is shipped pre-assembled and ready for use.

Logan Fishing Magnets

HOLE SIZE		1-1/4 to 2	1-5/8 to 2-1/2	2 to 2-3/4	2-3/8 to 3-1/4	2-3/4 to 3-5/8	3 to 3-3/4	3-1/4 to 4-1/8
O.D. OF BODY		1	1-1/4	1-1/2	1-3/4	2-1/4	2-1/2	3
TOP CONNECTION		5/8-11 UNC	5/8 SR	5/8 SR	3/4 SR	3/4 SR	3/4 SR	2-3/8 Tbg
ESTIMATED PULLING CAPACITY IN LBS.		4	6	9	12	20	65	70
COMPLETE ASSEMBLY	Logan Part No.	306-100	306-125	306-150	306-175	306-225	306-250	306-300
	Bowen No.	32060	32080	32100	32120	32150	32170	32180
BODY	Logan Part No.	...	V1000	V1001	V1002	V1003	V1004	V1005
	Bowen No.	...	32081	32101	32121	32151	32171	32181
HOUSING	Logan Part No.	V20005	V2000	V2001	V2002	V2003	V2004	V2005
	Bowen No.	32062	32082	32102	32122	32152	32172	32182
POLE PLATE	Logan Part No.	V30005	V3000	V3001	V3002	V3003	V3004	V3005
	Bowen No.	32063	32083	32103	32123	32153	32173	32183
MAGNETIC ELEMENT	Logan Part No.	V4000	V4000	V4001	V4002	V4003	V4004	V4005
	Bowen No.	32064	32084	32104	32124	32154	32174	32184
FLUSH GUIDE	Logan Part No.	...	V6000	V6001	V6002	V6003	V6004	V6005
	Bowen No.	...	32085	32105	32125	32155	32175	32185
LIFTING CAP	Logan Part No.	...	...	...	...	...	...	...
	Connection	...	...	...	...	...	...	...

OPTIONAL COMPONENTS

CUT-LIPPED GUIDE	Logan Part No.	...	V6000	V6001	V6002	V6003	V6004	V6005
	Bowen No.	...	32085	32105	32125	32155	32175	32185
MILL GUIDE	Logan Part No.	...	V6000	V6001	V6002	V6003	V6004	V6005
	Bowen No.	...	32085	32105	32125	32155	32175	32185
ADAPTER - 5/8" SUCKER ROD	Logan Part No.	...	...	...	...	...	...	...
	Bowen No.	...	...	...	...	...	...	...
ADAPTER - 3/4" SUCKER ROD	Logan Part No.	...	...	...	...	...	...	V7005
	Bowen No.	...	...	...	...	...	...	70513
KEEPER	Logan Part No.	V90005	V9000	V9001	V9002	V9003	V9004	V9005
	Bowen No.	...	66005	66008	74731	74732	66014	71716

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

Special Notes:

- (1) Guides left oversized are extra charge. Magnets shipped via air freight must include a Keeper.
- (2) Pulling capacity assumes a flat fish, larger than the diameter of the magnet, that is in full contact with a fully charged magnet, pulled with a consistent steady force. Estimated pulling capacity will be considerably reduced when engaging smaller surface areas, i.e., smaller than the diameter of the magnet.

When ordering, please specify:

- (1) Name and number of assembly
- (2) Size - O.D.
- (3) Top connection, if other than standard

Recommended Accessories:

- (1) 1 Lipped Guide
- (2) 1 Mill Guide

Logan Fishing Magnets

HOLE SIZE		4 to 4-1/4	4-1/4 to 4-1/2	4-1/2 to 5	5-1/8 to 5-1/2	5-5/8 to 6	6-1/8 to 6-1/2	6-1/8 to 6-1/2
O.D. OF BODY		3-1/4	3-1/2	4	4-1/2	5	5-1/2	5-3/4
TOP CONNECTION		2-3/8 Tbg	2-3/8 API Reg	2-3/8 API Reg	2-7/8 API Reg	2-7/8 API Reg	3-1/2 API Reg	3-1/2 API Reg
ESTIMATED PULLING CAPACITY IN LBS.		85	90	115	160	200	250	250
COMPLETE ASSEMBLY	Logan Part No.	306-325	306-350	306-400	306-450	306-500	306-550	306-575
	Bowen No.	32190	32210	32230	32240	32260	32270	32280
BODY	Logan Part No.	V1006	V1007	V1008	V1009	V1010	V1011	V1012
	Bowen No.	32191	32211	32231	32241	32261	32271	32281
HOUSING	Logan Part No.	V2006	V2007	V2008	V2009	V2010	V2011	V2012
	Bowen No.	32192	32212	32232	32242	32262	32272	32282
POLE PLATE	Logan Part No.	V3006	V3007	V3008	V3009	V3010	V3011	V3012
	Bowen No.	32193	32213	32233	32243	32263	32273	32283
MAGNETIC ELEMENT	Logan Part No.	V4006	V4007	V4008	V4009	V4010	V4011	V4011
	Bowen No.	32194	32214	32234	32244	32264	32274	32274
FLUSH GUIDE	Logan Part No.	V6006	V6007	V6008	V6009	V6010	V6011	V6012
	Bowen No.	32195	32215	32235	32245	32265	32275	32285
LIFTING CAP	Logan Part No.	...	V8000	V8000	V8001	V8001	V8002	V8002
	Connection	...	2-3/8 API Reg	2-3/8 API Reg	2-7/8 API Reg	2-7/8 API Reg	3-1/2 API Reg	3-1/2 API Reg

OPTIONAL COMPONENTS

CUT-LIPPED GUIDE	Logan Part No.	V6006	V6007	V6008	V6009	V6010	V6011	V6012
	Bowen No.	32195	32215	32235	32245	32265	32275	32285
MILL GUIDE	Logan Part No.	V6006	V6007	V6008	V6009	V6010	V6011	V6012
	Bowen No.	32195	32215	32235	32245	32265	32275	32285
ADAPTER — 5/8" SUCKER ROD	Logan Part No.	...	...	V5008	V5009	V5009	V5011	V5011
	Bowen No.	...	...	62250	62252	62252	62254	62254
ADAPTER — 3/4" SUCKER ROD	Logan Part No.	V7005	...	V7008	V7009	V7009	V7011	V7011
	Bowen No.	70513	...	62251	62253	62253	62255	62255
KEEPER	Logan Part No.	V9006	V9007	V9008	V9009	V9010	V9011	V9012
	Bowen No.	66016	66021	66026	66027	66030	66031	74962

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When ordering, please specify:

- (1) Name and number of assembly
- (2) Size - O.D.
- (3) Top connection, if other than standard

Recommended Accessories:

- (1) 1 Lipped Guide
- (2) 1 Mill Guide

Logan Fishing Magnets

HOLE SIZE		6-5/8 to 7-1/2	7-5/8 to 8-1/2	8-5/8 to 9-3/4	9-7/8 to 11-5/8	10-1/2 to 11-7/8	11-3/4 to 13	12-1/4 to 14
O.D. OF BODY		6	7	8	9	10	10-1/2	11-1/2
TOP CONNECTION		3-1/2 API Reg	4-1/2 API Reg	4-1/2 API Reg	4-1/2 API Reg	6-5/8 API Reg	6-5/8 API Reg	6-5/8 API Reg
ESTIMATED PULLING CAPACITY IN LBS.		255	330	560	680	750	800	800
COMPLETE ASSEMBLY	Logan Part No.	306-600	306-700	306-800	306-900	306-1000	306-1050	306-1150
	Bowen No.	32290	32300	32310	32330	32340	32350	32370
BODY	Logan Part No.	V1013	V1014	V1015	V1016	V1017	V1018	V1019
	Bowen No.	32291	32301	32311	32331	32341	32351	32371
HOUSING	Logan Part No.	V2013	V2014	V2015	V2016	V2017	V2018	V2019
	Bowen No.	32292	32302	32312	32332	32342	32352	32372
POLE PLATE	Logan Part No.	V3013	V3014	V3015	V3016	V3017	V3017	V3019
	Bowen No.	32293	32303	32313	32333	32343	32343	32373
MAGNETIC ELEMENT	Logan Part No.	V4013	V4014	V4015	V4016	V4017	V4017	V4019
	Bowen No.	32294	32304	32314	32334	32344	32344	32374
FLUSH GUIDE	Logan Part No.	V6013	V6014	V6015	V6016	V6017	V6018	V6019
	Bowen No.	32295	32305	32315	32335	32345	32355	32375
LIFTING CAP	Logan Part No.	V8002	V8003	V8003	V8003	V8004	V8004	V8004
	Connection	3-1/2 API Reg	4-1/2 API Reg	4-1/2 API Reg	4-1/2 API Reg	6-5/8 API Reg	6-5/8 API Reg	6-5/8 API Reg

OPTIONAL COMPONENTS

CUT-LIPPED GUIDE	Logan Part No.	V6013	V6014	V6015	V6016	V6017	V6018	V6019
	Bowen No.	32295	32305	32315	32335	32345	32355	32375
MILL GUIDE	Logan Part No.	V6013	V6014	V6015	V6016	V6017	V6018	V6019
	Bowen No.	32295	32305	32315	32335	32345	32355	32375
ADAPTER – 5/8" SUCKER ROD	Logan Part No.	V5011	V5014	V5014	V5014	V5017	V5017	V5017
	Bowen No.	62254	62256	62256	62256	62258	62258	62258
ADAPTER – 3/4" SUCKER ROD	Logan Part No.	V7011	V7014	V7014	V7014	V7017	V7017	V7017
	Bowen No.	62255	62257	62257	62257	62259	62259	62259
KEEPER	Logan Part No.	V9013	V9014	V9015	V9016	V9017	V9017	V9019
	Bowen No.	66039	56181	66041	66044	66045	66045	66218

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Special Notes:

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- (2) Pulling capacity assumes a flat fish, larger than the diameter of the magnet, that is in full contact with a fully charged magnet, pulled with a consistent steady force. Estimated pulling capacity will be considerably reduced when engaging smaller surface areas, i.e., smaller than the diameter of the magnet.

When ordering, please specify:

- (1) Name and number of assembly
- (2) Size – O.D.
- (3) Top connection, if other than standard

Recommended Accessories:

- (1) 1 Lipped Guide
- (2) 1 Mill Guide

Logan Fishing Magnets

HOLE SIZE		15	17	20				
O.D. OF BODY		14	16	19				
TOP CONNECTION		6-5/8 API Reg	6-5/8 API Reg	7-5/8 API Reg				
ESTIMATED PULLING CAPACITY IN LBS.		1,190	1,120	1,470				
COMPLETE ASSEMBLY	Logan Part No.	306-1400	306-1600	306-1900				
	Bowen No.	32380	79183	79189				
BODY	Logan Part No.	V1020	V1021	V1022				
	Bowen No.	32381	145730	79190				
HOUSING	Logan Part No.	V2020	V2021	V2022				
	Bowen No.	32382	145731	79191				
POLE PLATE	Logan Part No.	V3020	V3021	V3022				
	Bowen No.	32383	145732	79192				
MAGNETIC ELEMENT	Logan Part No.	V4020	V4020	V4022				
	Bowen No.	32384	32384	79193				
FLUSH GUIDE	Logan Part No.	V6020	V6021	V6022				
	Bowen No.	32385	79188	79194				
LIFTING CAP	Logan Part No.	V8004	V8004	V8005				
	Connection	6-5/8 API Reg	6-5/8 API Reg	7-5/8 API Reg				

OPTIONAL COMPONENTS

CUT-LIPPED GUIDE	Logan Part No.	V6020	V6021	V6022				
	Bowen No.	32385	79188	79194				
MILL GUIDE	Logan Part No.	V6020	V6021	V6022				
	Bowen No.	32385	79188	79194				
ADAPTER – 5/8" SUCKER ROD	Logan Part No.	V5017	...	...		
	Bowen No.	62258	...	...		
ADAPTER – 3/4" SUCKER ROD	Logan Part No.	V7017	...	...		
	Bowen No.	62259				
KEEPER	Logan Part No.	V9020	V9021	V9022				
	Bowen No.	66219	145867	...				

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- (2) Pulling capacity assumes a flat fish, larger than the diameter of the magnet, that is in full contact with a fully charged magnet, pulled with a consistent steady force. Estimated pulling capacity will be considerably reduced when engaging smaller surface areas, i.e., smaller than the diameter of the magnet.

When ordering, please specify:

- (1) Name and number of assembly
- (2) Size – O.D.
- (3) Top connection, if other than standard

Recommended Accessories:

- (1) 1 Lipped Guide
- (2) 1 Mill Guide

Heavy-Duty Ditch Magnets

OVERVIEW

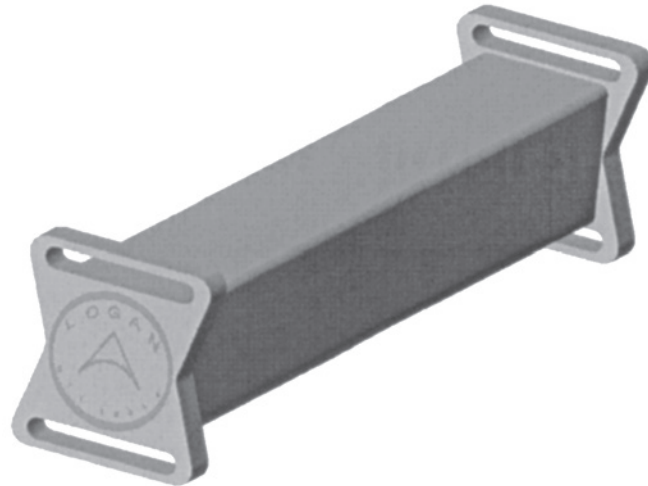
The Logan Heavy-Duty Ditch Magnet will capture all magnetized metals and effectively trap and remove metal particles from drilling mud missed by the shale shaker.

USES

The Logan Heavy-Duty Ditch Magnet is particularly valuable for the removal of mill cuttings and debris that cause wear on mud pumps and other equipment during milling operations. It eliminates the problems caused by harmful debris returned downhole and is equally effective in both washover and fishing jobs.

CONSTRUCTION

The clean, simple design eliminates the use of trays, gates, and other extra equipment. The magnet is encased in stainless steel and has integral handles at each end for lifting.



OPERATION

No special instructions are required to operate the Logan Heavy-Duty Ditch Magnet. The ditch magnet is most effective when it is suspended by soft line in the mud ditch before the shale shaker, or in the shaker discharge. Depending on milling rate, the unit should be cleaned several times per day with fresh or salt water. The unit may be cleaned less often when cuttings come at a slow rate.

LENGTH (INCHES)		18	24	36				
COMPLETE ASSEMBLY	Logan Part No.	305-018	305-024	305-036				
	Bowen No.	...	152761	79162				
KEEPER	Logan Part No.	DMK-018	DMK-024	DMK-036				

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

Special Notes:

(1) Magnets shipped via air freight must include a Keeper set.

When ordering, please specify:

(1) Name and number of magnet



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