



PILOT MILLING

Pilot Mills - Description and Usage

Parveen Pilot Mills dressed with Tungsten carbide are recommended for milling washpipe, safety joints, crossover swage and washover shoes. Liner hangers can be milled efficiently, eliminating inside cuts and running spears or jars. The nose, or pilot, can be dressed to mill out junk which may be encountered.

Use Pilot Mills to mill :

Adapters	Casing	Liners
Washpipe	Drill Pipe	Swaged Casing

General Guidelines for Using Pilot Mills

- In selecting a Pilot Mill, the blade O.D. should be about 1/4" larger than the O.D. of the tool joint or coupling of the fish to the milled. The pilot O.D. should be the same as the drift diameter of the fish.
- The best speed and weight to run a pilot Mill must be determined for each job. Also, conditions may change from one pilot-milling job to the next in the same well. This may require different speeds and weights at different times. In the absence of experience, start with a rotary speed between 80 and 100 RPM and tool weight of 2,000 to 6,000 lbs. Experiment to obtain the best results.
- When milling a liner or casing that has been gun perforated, damaged with a spear, or collapsed, use 60 RPM and 2,000 lbs. of weight or less.
- If, when milling swaged casing, you experience a sudden drop-of in milling rate, the trouble may be caused by a loose ring of steel formed at a joint or weld which is turning with the Pilot Mill. Try spudding the Pilot Mill gently. This should break up the ring and help position it for milling.
- If cutting stops altogether when milling washpipe, casing or liner, and there is no noticeable increase in torque, there is a good chance the fish is turning. If this is the case, pull the mill and attempt to retrieve the fish using a spear.

Considerations When Milling Liner, Hangers and Adapters

On most liner milling jobs, a Pilot Mill is used to first mill the liner hanger or adapter and then the liner. In some cases the liner hanger or adapter is milled using Junk Mill. Then the liner is milled with a Pilot Mill. This latter method is preferred if there is hard cement behind the liner or if the hanger has numerous bowsprings, slips, etc. Select a Pilot Mill with blades that will cut just over the pipe couplings. This will result in a minimum of cement being encountered.

A Pilot Mill is Ideal for Wash Pipe

The Pilot Mill is the most efficient tool for milling stuck washpipe. If drill pipe or drill collars are inside washpipe, however, they must first be milled with a Junk Mill or smaller Pilot Mill.

Milling Drill Pipe and Drill Collars

Drill pipe and drill collars are sometimes milled with Pilot Mills, if the I.D. is open. If the drill pipe is cemented inside the casing, particularly in deviated holes, the pipe is probably lying to one side with its center eccentric to the casing. Most often this makes the job extremely difficult for a Pilot Mill. Under these conditions, we recommend a full gauge Junk Mill. A Pilot Mill will do a reasonable job on drill collars, provided the cuttings can be removed as the milling progresses. If cuttings tend to fall into the I.D. and plug it, then a Junk Mill must be used.

Milling Casing

Casing can be milled with a Pilot Mill in the same manner that washpipe is milled.



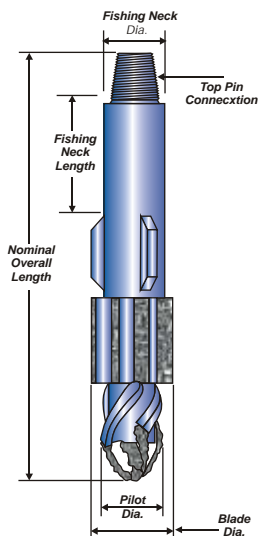
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Using the Pilot Mill in Swage Completion

The Pilot Mill is ideally suited to mill out the necked down portion of casing in swaged completion. In this method, necked-down lengths of casing—either J-55, K55 or N-80, corresponding in length to the thickness of the producing zones—are made up with swage to the regular casing collars in the string. The casing is cemented and water shut-off is obtained at all zone intervals. The necked-down portions are then milled on with a Pilot Mill and the resulting sections are opened with an underreamer. This last operation removes cement and wall cake, leaving a clean producing area.

How to Mill a Fish Using a Pilot Mill

1. Lower the mill about five feet above the fish. Set the brake and start rotating. Slowly increase rotation to 125 RPM. Raise and lower the mill three to six feet but do not touch the fish while rotating. This action will tell you the neutral weight of the string and it will permit you to note the normal torque in the string. By the torque in the string when the pilot of the mill enters the fish, you can determine if the pilot has entered properly.
2. Reduce rotation to about 30 RPM and enter the pilot into the fish. Apply 2,000 lbs. of weight. Stop rotating quickly while you note the torque action of the string. A gradual slow-down or spin indicates that the mill has entered the fish with proper alignment.
3. To mill J-55 or K-55 casing, use a weight between 4,000 and 6,000 lbs. and a speed of 125 RPM. N-80 and P-110 casing requires a weight of 8,000 to 10,000 lbs. If the casing is surrounded by hard cement, or if the open hole diameter is the same or less than the blade O.D. of the mill, more weight may be needed to drill cement or the formation, in addition to the fish. When working below the shoe of the casing, ream the hole up and down after every 15 to 20 feet of fish milled to clean out any accumulation of cuttings which may have collected at the shoe. Periodic reaming to ensure cutting removal is also a good practice in holes with drift angles of 45 degrees or higher.
4. Normally, milling should be continued at an even rate without interruption once it has been started. Do not re-weight the string at short intervals or pull the pilot out of the fish.



SPECIFICATIONS - PARVEEN PILOT MILLS						
BLADE DIA.	PIN CONN. API REG.	PILOT DIA.	OVERALL LENGTH	FISHING NECK LENGTH	FISHING NECK DIA.	WEIGHT lbs. (APPROX.)
3-1/4-3-7/8	2-3/8	1-3/4-2-3/4	27	12	3	40
4-4-3/8	2-3/8	1-3/4-2-3/4	27	12	3-1/8	45
4-5-3/8	2-7/8	2- 3-1/4	27	12	3-3/4	120
5-1/2-5-5/8	3-1/2	2-1/2-4-3/4	38	16	4-1/4	240
5-3/4-7-3/8	3-1/2	2-1/2-4-3/4	38	16	4-3/4	255
6-9-7/8	4-1/2	4-3/4-6-3/4	42	18	5-3/4	305
9-7/8-17-1/2	6-5/8	7-3/4-15	45	18	7-3/4	550

NOTE :

Standard API regular Pin. Other Size available on request.