BVM Corporation

Rotary Slips “SDS”, SDML” & “SDXL”

For 2-3/8” through 7”

Part number: _____ **Serial Number: _____**

Safety

CAUTION: Practice safety in the operation and maintenance and use only approved safety methods, materials and tools. Keep hands away from any pinch point or undesignated areas; use only the provided handles for operating the slip.

WARNING: Slip sets which have experienced wear beyond established wear criteria set by OEM, or are found to have cracks must be replaced.

WARNING: Only original BVM parts may be used. Slip sets are produced from cast alloy heat treated steel and must not be welded in the field. Improper welding can cause cracks and brittleness in heat-affected areas which can result in dramatic weakening of the part and possible failure. Repairs involving welding and/or machining should be performed only by a BVM authorized repair facility. Using a Slip set that has been improperly welded or repaired is dangerous.

NOTE: The owner and user together with the manufacturer should jointly develop and update inspection, maintenance, repair and remanufacture procedures consistent with equipment application, loading, work environment, usage and other operational conditions. These factors may change from time to time as a result of new technology, equipment history, product improvements, new maintenance techniques and changes in service conditions.

Confidentiality Statement

Note: Original Instructions are published in English; in the event the end-user may wish to obtain a translation of these in the official language of the country in which the machinery is to be used please contact your local BVM representative or BVM directly. Please note that this service may not be free of charge. Original Instruction can be downloaded from www.bvmcorp.com

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Description

This series of Slips are for use in API standard insert bowls (4.00 in / axial foot). These slips feature improved contact on drill pipe through a superior wrap around configuration and unique insert design that helps to prevent bottlenecking and gouging damage. The buttress design of the body segments provides great strength while minimizing weight for ease of handling.

BVM rotary slips are designed to provide long and trouble-free service under the most severe conditions. Inserts are held securely in dovetail slots and are easily changed by removing the nuts, bolts, and retainer at the top of the slots.

SDS Slips are designed for shallow hole drilling SDML Slips are the perfect choice for all medium depth drilling. With the proper drill string design they can handle depths beyond 20,000 feet. BVM SDXL Slips are designed for deep drilling. See below for static load ratings:

- SDS = 75 tons
- SDML = 125 tons
- SDXL = 250 tons

The well drilling industry has had many accidents caused by slips being set on moving pipe. The drill pipe must be stopped completely before the slips are set on the pipe. The driller should look at the weight indicator to see that he is holding the full load. If the bit should hit a ledge which supports part of the weight of the string, when the elevator is removed the pipe could be jarred free and the full shock load dumped on the slips. When the shock load hits the slips, the drill string acts like a rubber band. A 15,000 foot (4572 m) string of 4-1/2 inch drill pipe can stretch approximately 38 feet (11 m). The string will start to bounce and could cause the slips to be thrown out of the rotary table; then the pipe will be dropped in the hole. If the pipe does not go in the hole and the slips do hold, another problem could occur; the drill pipe is could be permanently deformed and cracked just below the slips, resulting in wash-outs.

Do not set slips on larger size pipe than they were designed to hold. When 5 inch slips for example, are used on 5 inch pipe, the inserts have the proper contour. If the slip is used on larger pipe or on tool joints, the stress is placed on the outside corners of each segment. This causes the slip bodies to spread and crack. After the slip has been used on larger pipe and then placed on the pipe size for which it was

designed, the slip bodies will conform to their original contour. This could cause the slips to break and allow pieces to fall into the hole.

Taper Marking
Rotary slips are marked with the taper, delineated as inches of diametrical change per foot. For example a taper of 4 in./ft will be marked as “4.00”.

CE Marking (if applicable):

CE

Cleaning and Lubrication

See below for BVM recommendations for grease / lubricants:

- Extreme pressure, lithium based, multi-purpose grease classification according to ISO 6743-9:2003 Lubricants, industrial oil and related products (class L) – Classification – Part 9: Family X (greases) or equivalent

Clean the inside taper of the drilling bowls to remove any abrasive material. Lubricate the inside taper of the drilling bowls frequently with grease to prevent slips from sticking in the bowls. Warning: Never use pipe dope to grease the back of the slips.

A word of caution: There are times when setting the slips that the driller does not pick up enough to get the rotary slips around the pipe. In this case the top of the rotary slips is on the tool joint. When the drill pipe is lowered, the slip’s body is bridged between the master bushing and the pipe. This causes the back of the slips to bend. The normal reaction is to raise the string and let the slip segment settle around the pipe. The slip segments have been bent and when placed in the master bushing around the pipe, they will bend back to their original form, however, cracks may have developed in the slip bodies. As a result of this, the toe of the slip could break and fall into the hole. If the driller runs into a slip, inspect it or use a new set until the damaged slip can be inspected properly.

Dressing Slips and Insert Bowls

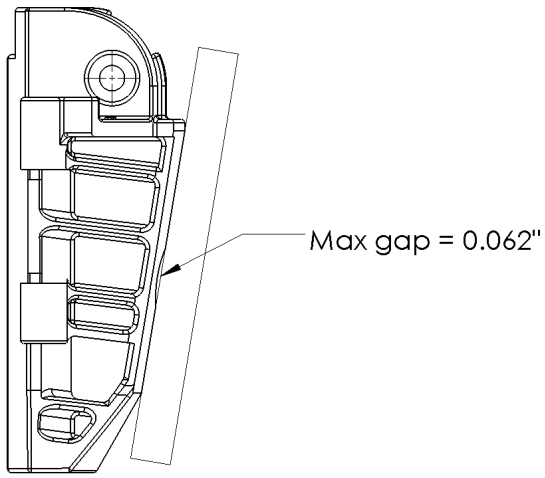
The slips and bowl ID should be dressed as well as cleaned to prevent sticking of the slips. Abrasive materials in the drilling mud can cause horizontal lines of wear in the mating surfaces of the slips and bowls. Dressing these surfaces, using an up

and down motion with emery cloth will result in the grain of the two parts running with each other to significantly reduce friction.

Inspection

Periodic inspections should be performed on drill pipe and drill collar slips as a preventive measure. Areas of particular concern are slip segment hinges and the hinge pins.

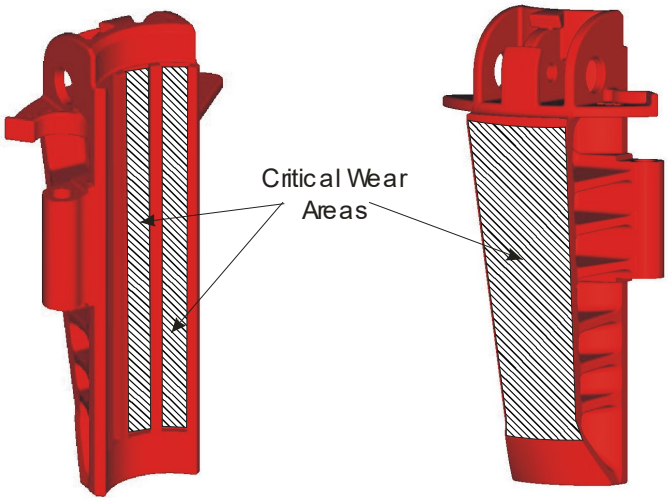
Placing a straight edge against the backs and inside face of the slips will indicate if they are bent or worn. A good slip back is straight, smooth, and well-greased. Slips should be replaced when there is more than 0.062" between the slip back and the straight edge, see below.



Slip segment hinges should be inspected regularly to see that the hinge pin is locked into position with the cotter pin and not worn or cracked. Slips that sag or flop over when standing alone on the rig floor, are extremely worn in the hinge area. Pull the hinge pins and check for straightness. A bent hinge pin will indicate oversize hinge pin holes. Oversize hinge pin holes are cause for replacement of the slips. If not replaced, wear will increase at an accelerated rate until the slips do not set correctly in the master bushing. This could damage drill pipe. The slips should be replaced when the hinge hole is greater than Ø.968.

Check inserts and insert slots for damage or wear. When the insert slots are badly worn, danger of losing an insert down the hole exists. Replace the slips before a costly failure occurs. Slips should be replaced when there is over 3/16 inch (3.2 to 4.8 mm) clearance between the back of the inserts and the insert slot.

Also check that there is not excessive wear/deformation at the bottom of the slip groove.



Spare Parts:

SDS kit: 3900-SP

- Handles (left, right, and center)
- 3x Handle Pin with cotter pin
- 3x Hinge Pin with cotter pin

SDML & SDXL kit: 15500-SP

- Handles (left, right, and center)
- 3x Handle Pin with cotter pin
- 3x Hinge Pin with cotter pin

Risk Assessment According to EN-ISO 12100:2010

The conclusion of the risk assessment is that in general, the crew must:

- Wear person safety protection like safety glasses, hard hats, etc.
- Follow instructions as stated in the manual.
- Have knowledge of rig procedures.
- Must have been instructed for safe use of the tool.
- Always use secondary retention as established and implemented by BVM.

Applicable standards:

- EN-ISO 12100:2010 Safety of machinery – Basic concepts, general principles for design – Risk assessment and risk reduction
- Machinery Directive: 2006/42/EC
- API 7K

Assembly Drawing and List of Parts

See data sheet at www.bvmcorp.com.