

BVM Corporation Maintenance Manual

“SR” SUCKER ROD ELEVATOR

20 Tons

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 elevator.

WARNING: Elevators which have experienced wear beyond established wear criteria set by OEM, or are found to have cracks must be replaced or repaired by a BVM authorized repair facility.

WARNING: Only original BVM parts may be used. Elevators 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 an Elevator 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. Alternatively, BMV recommends using the Periodic inspection and maintenance Categories and Frequencies as mentioned in API RP8B Table 1.

Load test

WARNING: BMV elevators are load tested after manufacture or repair. Load testing is mandatory on elevators which have not been load tested before. Load testing is required on elevators which have been overloaded, for example jarring operations or operations that have induced elevators to high accelerations or high impact loads. In addition, after the load test, an annual inspection should be performed.

Confidentiality Statement

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Contents

Safety	1
Purpose	2
Description.....	2
Operation	3
Maintenance.....	4
Inspection.....	4
Wear data	6
Critical Area Drawings	7
Troubleshooting.....	7
Assembly drawing and List of Parts	7

Purpose

This manual contains operation and service instructions for Sucker Rod Type Elevators. This manual provides a guide for assembly, disassembly, inspection, and repair.

Description

The BVM “SR” Sucker Rod Elevator is used to install and remove sucker rod and may also be used on or around the rig floor for handling sucker rod. The BVM elevator comes in sizes ranging from 5/8” through 1-1/8”, with a capacity of 20 tons. Elevators are made from alloy steel; load tested and are magnetic particle inspected.

Operation

To attach the elevator to the sucker rod, the elevator operator stands on one side of the sucker rod with the elevator on the opposite side. The operator reaches around the sucker rod with one hand on either side of the sucker rod. The elevator is gripped by the bail, and the operator pulls the elevator to the sucker rod, so that the sucker rod is automatically latched in the center of the elevator.

Warning:

- The 20 ton load rating of the elevator should never be exceeded. Both the static and dynamic loads must be calculated to ensure safe working loads.
- It is important for the elevator operator to visually verify that the sucker rod is completely inside the elevator and that the latch retainers are in place, or premature release of the sucker rod could occur resulting in bodily injury and/or dropping the sucker rod down the well, requiring fishing of the dropped sucker rod string.
- Elevators are made from cast alloy steel and should not be welded in the field. Improper welding can cause cracks and brittleness in repaired area and can result in drastic weakening of the Elevator and Parts and possible Failure.
- Repairs which involve welding and or machining by others that is not authorized by BVM will void the warranty.
- Using an Elevator which has been improperly welded can result in serious bodily harm and property damage.
- Never use the elevator other than what it is intended for: size and tonnage, which is clearly marked on elevator.
- To minimize probability and severity of dropped objects, ensure the following:
 - Wear proper PPE.
 - Use extra caution while people are working overhead.
 - Avoid carrying tools while climbing the derrick ladder. Raise tools with a line to any worker above the derrick floor.
 - Ensure that all tools and equipment being used are secured with the proper safety lines.
- Only use the elevator within the specified temperature rating, which is -4°F to 150°F unless otherwise specified.

Note: If an elevator is used despite the above warnings BVM voids all warranties.

Maintenance

Safety should be practiced at all times when servicing the equipment always use BVM Corporation, approved safety methods, material and tools. Always wear protective gear for eyes, head and hands. Should any parts need replacing, please contact your BVM Corporation Authorized Supplier for replacement parts. Use Titan 5620 or equivalent grease.

1. Grease front latches, back latches, and springs.
2. Grease connection between body and bail.
3. Grease all exposed material to prevent corrosion.

Caution:

- Use only parts manufactured and sold by BVM Corporation
- Re-machining of parts should be performed only at BVM Corporation. Improper machining could result in increased stress (Decreased Load carrying capability) or improper alignment of component parts. Either condition could be hazardous to personnel and equipment.
- Always wear proper PPE when handling and greasing parts.

Inspection (PER API-RP8B)

Daily Inspection (Cat. II – elevator in use)

1. Check for any worn and damaged parts.
2. Check for loose and missing parts.
3. Check condition of the front and back latch.
4. Check condition of the springs.
5. Check to make sure the elevator is greased properly.
6. Check for any visible cracks.
7. Check for any corrosion.
8. Manually operate the front latches 5 times slowly and 5 times quickly. Check that the elevator works flawlessly without interference.

Annual Inspection (Category IV)

1. MPI inspect the following parts (See critical areas drawings):
 - Bail
 - Body

Magnetic Particle Inspection (MPI)

Carry out MPI according to ASTM E709 or ASME BPVC sub section A, article 7 and subsection B, article 25; determine the type of defects and the degree by comparing defects to ASTM E125 reference photographs to the acceptance criteria.

Only cracks may develop and as such need to be reviewed. All other indication types have been addressed by the manufacturer during production. As such, the elevator has left the factory with indication (if at all) which were deemed acceptable. All cracks which have developed in service are relevant and need to be examined.

Evaluation of indications:

Relevant indications: Only those indications with major dimensions greater than 1/16 Inch (1.6mm) and associated with a surface rupture shall be considered relevant. Relevant indications are indications that results from, discontinuities within the test part. Non relevant indications are indications that results from excessive magnetizing current, structural design or permeability variances within the test parts. Any indication believed to be non-relevant shall be regarded as relevant and shall be re-examined to determine whether an actual defect exists. Linear indications shall be considered as those having a length of more than three times the width. Rounded indications shall be considered as those having a length less than three times the width. A lined indication shall be considered as a group of three more indications which touch an imaginary straight line connecting any two of the group.

For equipment certified in accordance with API 8A & 8C PSL 1:

Maximum Allowable Degree			
Type	Discontinuity Descriptions	Critical Areas	Non-critical Areas
I	Hot tears, cracks	None	Degree 1
II	Shrinkage	Degree 2	Degree 2
III	Inclusions	Degree 2	Degree 2
IV	Internal chills, chaplets	Degree 1	Degree 1
V	Porosity	Degree 1	Degree 2

For equipment certified in accordance with API 8A & 8C PSL 2:

Maximum Allowable Degree			
Type	Discontinuity Descriptions	Critical Areas	Non-critical Areas
I	Hot tears, cracks	None	None
II	Shrinkage	None	Degree 1
III	Inclusions	Degree 1	Degree 2
IV	Internal chills, chaplets	None	Degree 1
V	Porosity	Degree 1	Degree 2

Note: Only BVM authorized repair facilities are allowed to repair elevators with indications outside the acceptance criteria.

Wear data

The inspection data and maximum wear tolerances are only valid if the equipment is in otherwise good condition and has not been mis-used, does not exhibit excessive wear, cracks or other defects. Additionally any weld repairs – not done at a BVM authorized repair facility – shall require examination and re-certification by a BVM authorized repair facility before being used further. These data and tolerances only apply to certain critical components and cannot on their own determine the overall condition of the equipment or its suitability for continued use. These data and tolerances are what is required to retain 100% ratings.

Table 1: Wear table

Variable	Value (in)
R (Min Worn)	0.10
ØA (Min Worn)	1.20
B (Min Worn)	0.43

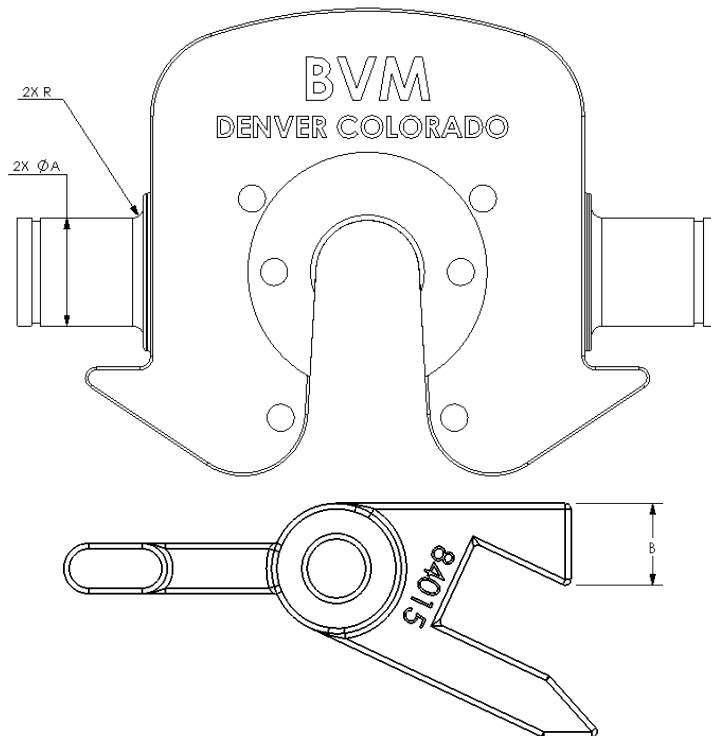


Figure 1: Wear variables

Critical Area Drawings

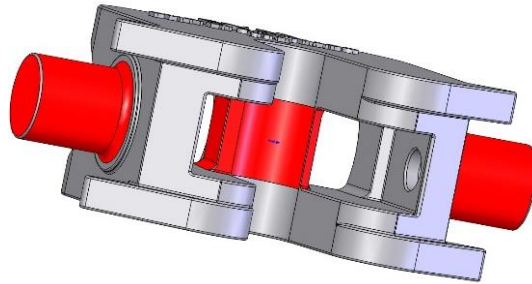


Figure 2: Body critical area



Figure 3: Bail critical area

Troubleshooting

When problems cannot be solved, contact an authorized BVM repair facility.

Overview possible problems:

Problem	Possible cause	Possible solution
Bail does not swing freely	Parts bent or damaged	Check elevator
Elevator does not securely hold sucker rod	Parts worn	Check elevator
Elevator does not close or is difficult to close	Pipe too big	Use different size elevator or plate
Elevator does not open	Yielding due to overload	Replace Elevator
	Elevator corroded	Open elevator by force, clean and lubricate. Check elevator for excessive wear.

Assembly drawing and List of Parts

See data sheet found at www.bvmcorp.com.