

**BVM CORPORATION**  
**TYPE “DB” TONG**  
**65,000 FT/LBS. MAXIMUM TORQUE**

**Part number:** \_\_\_\_\_ **Serial Number:** \_\_\_\_\_

**WARNING:** Manual tongs which have experienced excessive wear or are found to have cracks should be replaced or repaired by BVM Corp. or designated BVM service station. Failure to do so can result in serious bodily harm or property damage.

**WARNING:** To avoid injury do not place hands or any part of your body between pitch point areas like jaws and pipe, between jaws, between latch and latch jaw and between lever and jaws can cause severe injury.

**WARNING:** Only BVM parts should be used. Manual tongs are cast alloy heat treated steel and should not be welded in the field. Improper welding can cause cracks and brittleness in heat-affected areas which can result in drastic weakening of the part and possible failure. Repairs involving welding and/or machining should be performed only by an authorized BVM repair facility. Using a manual tong that has been improperly welded or repaired can cause failure which may result in serious bodily injury or property damage.

BVM Type “DB” Tong is ideal for light drilling and tubing work. Also used for seismographic, shot hole and exploration drilling. Like all other BVM Tongs a 3 Jaw design permits the jaws a uniform contact around the pipe. Jaw sizes range from 3 1/2” through 13” OD. All Steel specification are certified.

1. **PURPOSE**

This technical manual provides operation of and maintenance instructions to the BVM Type DB Manual Tongs, with assembly drawings and parts breakdown. It provides a guide for proper field use, disassembly and repairs.

2. **DESCRIPTION**

BVM Type DB Manual Tongs are designed in accordance with industry standards and can handle all kinds of pipe torque from light tubing to heavy wall pipe and drill collars.

All BVM Type DB manual tongs are precision machined from heat treated alloy steel, with hinge pins made from a special heat treated alloy steel. Interchangeable lug jaw design permits each tong to handle different sizes of pipe safely and conveniently.

3. **INSTALLATION**

BVM Type DB manual tongs are designed for quick installation and easy operation. To install the manual tong, the tong support line should be connected to the suspension ring. To prepare the tong for the job at hand, install the right lug jaw to cover the correct size range. Make sure the tong is capable of handling the torque required. For easy tong operation, freely suspend tong up to the tong support line as close to the center of the rotary table as is convenient. This reduces the arc of swing and the distance that the tong

must travel to the table. The pull up line must then be connected to the end of the lever. A back up line, sized to safely withstand the tong torque rating, should in all cases be connected to secure safe operation. A tong pull back can be installed to save rig time as it automatically repositions the tong for another take up.

#### 4. OPERATION

With the tong positioned and balanced properly, follow four simple steps outlined below:

- Grasp safety handle on lug jaw and safety handle on hanger to move the tong into position about the pipe.
- Press the short jaw firmly around and against the pipe.
- Pushing both safety handles simultaneously the manual tong will latch automatically.
- Pull both safety handles to break-over the tong and grip the pipe.

#### 5. MAINTENANCE:

##### 1.1 ROUTINE FUNCTIONAL TEST

The functional test should be done prior to use or on a regular basis when in use.

- Visually inspect the manual tong for loose, worn and missing parts.
- Check for worn hinge pins and hinge pin holes by trying to vertically move jaws from lever.
- Check if all pins are properly locked.
- Check for the proper latch engagement on steps of lug jaw. The latch must not contact any part of the tong when latched and under torque except the step on lug jaw.
- Brush dies clean and check for wear.

##### 1.2 ROUTINE LUBRICATION

The below lubrication should be done prior to use or on a regular basis when in use:

- Grease hinge pins through grease nipples.
- Lubricate regularly during usage and storage to prevent corrosion from attacking any part of the manual tong operating mechanism.

##### 1.3 LUBRICATION SPECIFICATION

Use extreme pressure lithium based, multi-purpose grease of no. 1 or 2 consistency and 10 W 30 or 10 W 40 multi-grade motor oil to lubricate BVM Manual Tongs.

##### 1.4 TORQUE TEST

BVM Type “DB” manual tongs are torque tested after manufacture or repair to 1/2 times their torque rating.

The Type “DB” tong is rated at 65,000 ft lbs torque with jaws up to 11 3/4” for new or very good condition tongs and jaws. The jaws for 11 3/4” and larger are rated at 40,000 ft lbs.

## **Inspection**

### **Daily Inspection (when tool is in use)**

#### **Category I.**

This category involves observing the equipment during operation for indications of inadequate performance. When in use, equipment shall be visually inspected on a daily basis for cracks, loose fits or connections, elongation of parts, and other signs of wear, corrosion or overloading. Any equipment found to show cracks, excessive wear, etc., shall be removed from service for further examination. The equipment shall be visually inspected by a person knowledgeable in that equipment and its function.

#### **Category II.**

This is Category I inspection plus further inspection for corrosion, deformation, loose or missing components, deterioration, proper lubrication, visible external cracks, and adjustment.

#### **Observe and repair when needed (cat I + II)**

Observe the functioning of the tong as follows:

1) Check for proper latch engagement on lugs of lug jaw. The latch must not contact any part of the tong when latched and under torque except the lug on lug jaw.

· OK

2) Check for worn hinge pins and hinge pin bores by trying to vertically move jaws from lever

· OK

#### **Visually inspect and repair when needed (cat I + II)**

1. Check for worn and damaged parts · OK

2. Check for loose and missing parts · OK

3. Check all pins are properly locked · OK

4. Brush dies clean and check for wear · OK

5. Check the proper locking of:

• Bolts and nuts · OK

• Slotted nuts & cotter pins · OK

• Lock tabs & lock bars · OK

• Roll pins and dowel pins · OK

• Snap rings · OK

• Cotter pins · OK

### **6 Monthly Inspection (when tool is in use)**

#### **Category III**

This is Category II inspection plus further inspection, which should include NDT of critical areas and may involve some disassembly to access specific components and to identify wear that exceeds the manufacturer's allowable tolerances.

### **Annual (1 year) Inspection (when tool is in use)**

#### **Category IV**

This is Category III inspection plus further inspection for which the equipment is disassembled to the extent necessary to conduct NDT of all primary-load-carrying components as defined by manufacturer. Equipment shall be:

Disassembled in a suitably-equipped facility to the extent necessary to permit full inspection of all primary-load-carrying components and other components that are critical to the equipment & Inspected for excessive wear, cracks, flaws and deformations.

Corrections shall be made in accordance with the manufacturer's recommendations. Prior to Category III and Category IV inspections, all foreign material such as dirt, paint, grease, oil, scale, etc. shall be removed from the concerned parts by a suitable method (e.g. paint-stripping, steam-cleaning, grit-blasting).

### **Procedure on rig (cat III) ;**

Disassemble the following parts of the tong for dimensional check according to max. allowable wear (see this chapter):

- Hinge pins
- Latch pins
- Hinge pin holes
- Latch pin holes
- Jaws/Latches

### **Annual (1 year) Inspection (cat IV)**

MPI tong major load bearing components critical areas as per MPI-procedure, using the Critical Area Drawings.

Major load bearing components are:

- Latch lug jaw (CA-222)
- Latch jaw (CA-223)
- Short jaw (CA-224)
- Lever & Tubing tong lever (CA-225)
- Long jaw (CA-226)
- Manual tong hinge jaw (CA-227)
- Latch (CA-228)
- Hinge

## **Magnetic Particle Inspection**

The BMV critical area drawings will indicate which areas are considered as to be critical or noncritical.

In general; for load bearing components, in case no critical area drawing exists, the complete component is considered critical. Carry out MPI according to ASME BPVC sub section V, subsection A, article 7 and subsection B, article 25 or ASTM E709 or an equivalent standard.

Machined surfaces shall be examined by the wet fluorescent method, other surfaces shall be examined by wet or dry method. In case of inspecting a used product the only types of indications one need to consider are cracks with size bigger as 1.6 mm (1/16 inch). All other types of indications have been reviewed when the part was produced and found to be acceptable. In case the defect was not acceptable it must have developed a crack during use and shall be considered relevant.

### **Evaluations of indications**

#### **Qualifications and certification**

All personnel performing and interpreting MPI shall be qualified in accordance with the guidelines of ASNT SNT-TC-1A (latest edition) or an equivalent standard and shall be trained in the use of the reference photographs and the interpretation of the MPI with regard to the acceptance criteria and ASTM E125 reference photographs.

### **Examination**

BVM tongs should be MPI examined according to the maintenance procedures. The areas subject to inspection shall be inspected according to the procedures developed by the user or, alternatively, as per API RP 8B.

### Table 1: Acceptance criteria for API 7k equipment

Grey area NOT applicable for MPI for equipment in service.

NOTE: If any relevant indications are found, contact BVM to determine the next course of action. Preferably an inspection report (with photograph or sketch) detailing the serial number of the equipment and the type, length and location of the indication should be presented. BVM will be able to advise the proper and most efficient repair.

- Linear indication: An indication, revealed by NDE, having a length at least three times its width
- Rounded indication: An indication, revealed by NDE, with a circular or elliptical shape and having a length less than three times its width. (pay special attention to the weld joint area)

Grey area NOT applicable for MPI for equipment in service.

NOTE: If any relevant indications are found, contact BVM to determine the next course of action. Preferably an inspection report (with photograph or sketch) detailing the serial number of the equipment and the type, length and location of the indication should be presented. BVM will be able to advise the proper and most efficient repair.

- Linear indication: An indication, revealed by NDE, having a length at least three times its width
- Rounded indication: An indication, revealed by NDE, with a circular or elliptical shape and having a length less than three times its width.

Type	Discontinuity description	Max. permitted degree critical areas	Max. permitted degree non-critical areas
	Linear discontinuities (hot tears, cracks)	None, see note	Degree I
II	Shrinkage	Degree II	Degree II
III	Inclusions	Degree II	Degree II
IV	Internal chills and chaplets	Degree I	Degree I
V	Porosity	Degree I	Degree II

### Table 2: Acceptance criteria for welds

- No relevant linear indications ( 1.6 mm (1/16”)
- No rounded indications with a major dimension 3.2 mm ( 1/8 inch) for welds whose depth is 16 mm ( 5/8 inch) or less
- No rounded indications with major dimension greater than 5 mm ( 3/16”) for welds whose depth is greater than 16 mm ( 5/8 inch)
- No more than 3 relevant indications in a line separated by less than 1.6mm (1/16 inch)

### Table 3: Acceptance Criteria for wrought material

- No relevant indications with a major dimension equal or greater than 3/16”
- No more than ten relevant indications in any continuous 6 in<sup>2</sup>
- No more than 3 relevant indications in a line separated by less than 1/16” edge to edge
- No relevant indications in pressure sealing areas, in the root area of rotary threads or in stress-relief features of threaded joints.

## Tests

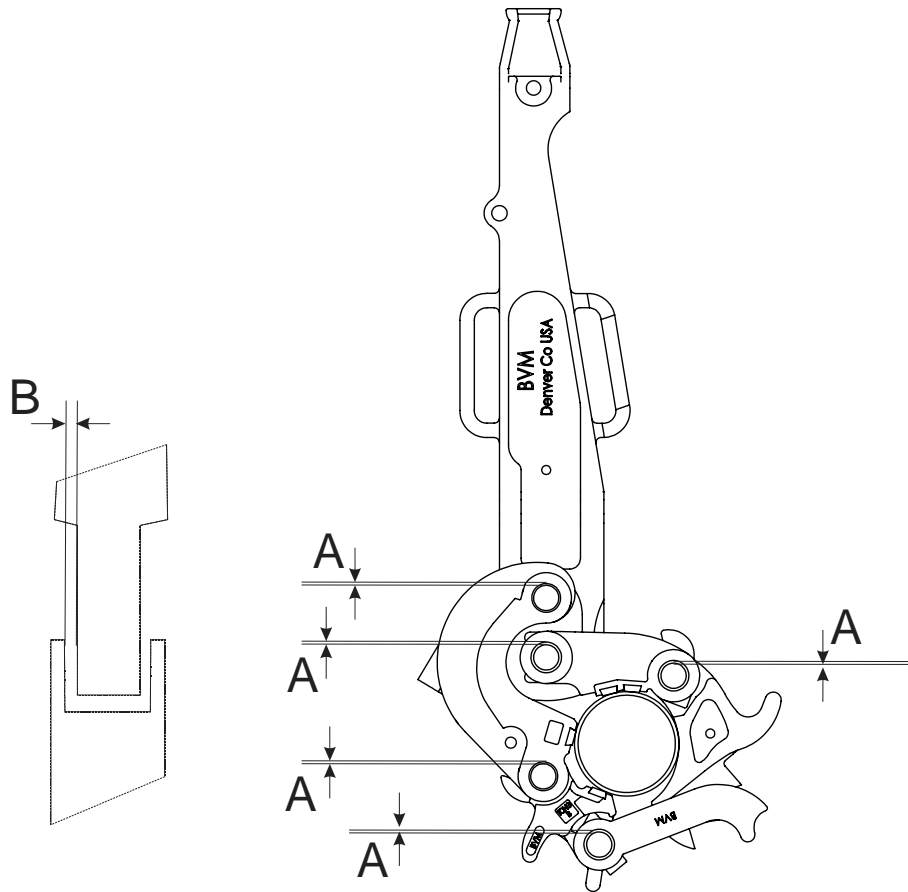
BVM Manual tongs are torque tested after manufacture or repair to 1.5 times their torque rating.

NOTE: Only a BVM authorized repair facility is allowed to remanufacture BVM Manual tongs which have indications outside the acceptance criteria.

**WARNING: BVM Manual tongs which have experienced wear or are found to have cracks must be replaced or repaired by a BVM authorized repair facility.**

**WARNING: Only original BVM-OEM parts must be used. BVM Manual tongs 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 an BVM authorized repair facility. Using a HT tong that has been improperly welded or repaired is dangerous.**

## Maximum allowable wear to maintain 100% torque rating



Tong Type	Dimension A Maximum clearance (inch)	Dimension B Maximum clearance (inch)
SDD	0.035	0.035
DB	0.035	0.035
B	0.025	0.035
C	0.030	0.035
LF	0.030	0.035
MS	0.025	0.035

## Shop repairs

### Changing dies/inserts

1. Remove the cotter pin and take out the retaining pin
2. After replacing the inserts, the retaining pins with the cotter pins shall be reinstalled.

**CAUTION:** Wear eye protection when removing or replacing inserts to protect against chip fragments