

# McKissick<sup>®</sup> Oilfield Servicing Equipment

## 70 & 80 Series Tubing Blocks



- Maintenance Requirements
- Disassembly Instructions
- Inspection Requirements
- Maintenance Alerts



Licensed Under  
API Spec 8A-0023  
and 8C-0021

the **Crosby**<sup>®</sup> group,  
INC.

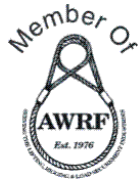
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# Table of Contents

General Cautions and Warnings ..... 1  
 Operation Information ..... 4  
 Preventive Maintenance ..... 5  
**McKissick® 70 Series Tubing Blocks**  
 Disassembly Instructions ..... 6 - 7  
 Assembly Instructions ..... 8  
 Inspection Requirements ..... 9 - 14  
 Parts List ..... 15 - 17

**McKissick® 80 Series Tubing Blocks**  
 Disassembly Instructions ..... 18  
 Assembly Instructions ..... 19  
 Inspection Requirements ..... 20 - 25  
 Parts List ..... 26 - 27  
 Hook Inspection ..... 28  
 Maintenance Alerts ..... 29 - 31  
 Crosby Testing Information ..... 32 - 33



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# General Cautions and Warnings

All products manufactured by The Crosby Group, Inc., are sold with the express understanding that the purchaser is thoroughly familiar with the safe and proper use and application of the product.

Responsibility for the use and application of the products rests with the user.

Failure of the product can occur due to misapplication, abuse, or improper maintenance. Product failure could allow property damage, personal injury or death.

There are numerous government and industry standards that cover products made by Crosby. This catalog makes no attempt to reference all of them. We do reference the standards that are most frequently asked about.

Ratings shown in Crosby Group literature are applicable only to new or "in as new" condition products.

Load limit ratings indicate the greatest force or load a product can carry under usual environmental conditions.

Shock loading and extraordinary conditions must be taken into account when selecting products for use in a system.

These general instructions deal with the normal installation, operation, inspection, and maintenance situations encountered with the equipment described herein. The instructions should not be interpreted to anticipate every possible contingency or to anticipate the final system, crane or configuration that uses this equipment.

## Definitions

**STATIC LOAD** – The load resulting from a constantly applied force or load.

**WORKING LOAD LIMIT** – The maximum mass or force which the product is authorized to support in general service when the pull is applied in-line, unless noted otherwise, with respect to the center line of the product.

This term is used interchangeably with the following terms:

1. WLL
2. Rated Load Value
3. SWL
4. Safe Working Load
5. Resultant Safe Working Load

**WORKING LOAD** – The maximum mass or force which the product is authorized to support in a particular service.

**PROOF LOAD** – The average force applied in the performance of a proof test; the average force to which a product may be subjected before deformation occurs.

**ULTIMATE LOAD** – The average load or force at which the product fails, or no longer supports the load.

**SHOCK LOAD** – A force that results from the rapid application of a force (such as impacting and/or jerking) or rapid movement of a static load. A shock load significantly adds to the static load.

**DESIGN (SAFETY) FACTOR** – An industry term denoting a product's theoretical reserve capability; usually computed by dividing the catalog Ultimate Load

by the Working Load Limit. Generally expressed for blocks as a ratio of 4 to 1.

**TACKLE BLOCK** – An assembly consisting of a sheave(s), side plates, and generally an end fitting (hook, shackle, etc.) that is used for lifting, lowering, or applying tension.



## **WARNING**

- Failure to read, understand and follow these instructions may cause death or serious injury. This equipment is not designed for and should not be used for lifting, supporting or transporting humans.
- Only trained and competent personnel should install, operate, inspect and repair this equipment.
- Modification to upgrade, repair or otherwise alter this equipment shall be authorized only by the original equipment manufacturer or qualified professional engineer.
- If this block is a component in a system, the system designer will be responsible for passing on to the end user the information contained in this manual.

## **IMPORTANT!**

For maximum safety and efficiency, tackle block systems must be properly designed, used, and maintained. You must understand the use of tackle block components in the system. These instructions provide this knowledge. Read them carefully and completely.

Some parts of these instructions must use technical words and detailed explanations. NOTE: If you do not understand all words, diagrams, and definitions —

**DO NOT TRY TO USE A TACKLE BLOCK SYSTEM!**

For further assistance, call:

**In U.S.A.** - Crosby Engineered Products Group at 1-800-777-1555.

**In CANADA** - Crosby Canada (905) 451-9261.

**In EUROPE** - N.V. Crosby Europe 011-32-15-757125.

As you read instructions, pay particular attention to safety information in bold print.

**KEEP INSTRUCTIONS FOR FUTURE USE – DO NOT THROW AWAY!**

# Oilfield Servicing Equipment

## McKissick® Oilfield Servicing Equipment Series 70 Streamlux Tubing Blocks with Spring Loaded Duplex Hook

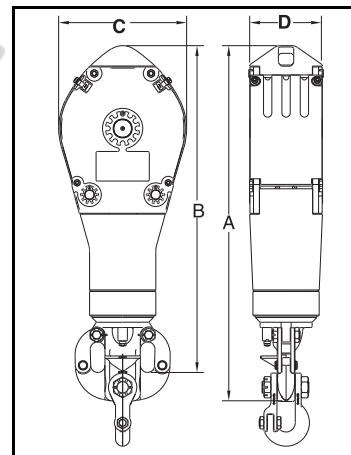
- Spring loaded duplex hook assuring ample travel for efficient tubing operations. No load carrying threads.
- Exclusive E-Z\* opening guards, no bolts to pull out and lose. Feature gives fastest possible exposure of sheave cluster for quick reeving.
- Extremely short overall length, extra weight, and excellent balance for fast non-wobbling falls.
- Extra large sealed sheave bearing diameters for fully rated capacities.
- Tapered roller thrust bearing in hook.
- Duplex hook for easy elevator operation, locks in six or eight positions.
- Convenient rod hook clevis available as shown on Figure 72A.
- Completely streamlined, no projections.
- Alloy steel flame hardened sheaves grooved for proper wire line size.
- Threaded hook parts precision machined and individually fitted for maximum safety.
- Hook assembly interchangeable with the Series 80 Streamlux Tubing Blocks.
- All blocks available with additional cheek weights.



Fig. 72A  
With Rod Hook Clevis



Fig. 73



\*patented

| Fig. No. | Sheave Size (in.) | No. of Sheaves | Recommended Wire Rope Size (in.) | API Working Load (Tons) | Rod Hook Clevis Working Load Limit (lbs.) | Weight (lbs.) |          | Center Pin Diameter (in.) | Dimensions (in.) |        |    |         |         |
|----------|-------------------|----------------|----------------------------------|-------------------------|---|---------------|----------|---------------------------|------------------|--------|----|---------|---------|
|          |                   |                |                                  |                         |   | Standard      | Weighted |                           | A                | B      | C  | D Std.  | D Wtd.  |
| 72       | 14                | 2              | 5/8 - 3/4                        | 25                      | 7,000                                     | 540           | 740      | 2-3/4                     | 46-1/2           | 43     | 16 | 8-1/4   | 12-1/4  |
| 73       | 14                | 3              | 5/8 - 3/4                        | 35                      | 7,000                                     | 720           | 920      | 2-3/4                     | 50-1/4           | 46-3/8 | 16 | 11-1/8  | 15-1/8  |
| 72       | 17                | 2              | 3/4 - 7/8                        | 40                      | 7,000                                     | 1120          | 1440     | 2-3/4                     | 57-7/8           | 54     | 19 | 10-7/16 | 14-7/16 |
| 73       | 17                | 3              | 3/4 - 7/8                        | 50                      | 15,000                                    | 1400          | 1720     | 2-3/4                     | 60-5/8           | 56-1/8 | 19 | 14      | 18      |
| 72       | 20                | 2              | 7/8 - 1                          | 50                      | 15,000                                    | 1460          | 1935     | 3-15/16                   | 64-3/8           | 59-3/8 | 23 | 11-7/8  | 15-7/8  |
| 73       | 20                | 3              | 7/8 - 1                          | 75                      | 25,000                                    | 1950          | 2425     | 3-15/16                   | 66-5/8           | 61-5/8 | 23 | 16-1/8  | 20-1/8  |
| 72       | 24                | 2              | 1 — 1-1/8                        | 75                      | 25,000                                    | 2160          | 2820     | 4-1/4                     | 71-1/4           | 66-1/4 | 27 | 11-1/4  | 15-1/4  |
| 73       | 24                | 3              | 1 — 1-1/8                        | 100                     | 35,000                                    | 2750          | 3410     | 4-1/4                     | 73-1/2           | 67-5/8 | 27 | 15-1/4  | 19-1/4  |
| 73       | 30                | 3              | 1-1/4                            | 150                     | 45,000                                    | 3950          | 5050     | 5-5/8                     | 86-3/4           | 78-1/4 | 33 | 16-1/16 | 20-1/8  |
| 74       | 30                | 4              | 1-1/4                            | 150                     | 45,000                                    | 4400          | 5500     | 5-5/8                     | 86-3/4           | 78-1/4 | 33 | 20-1/4  | 24-1/4  |

# Oilfield Servicing Equipment

## McKissick® Oilfield Servicing Equipment Series 80 Streamlux Tubing Blocks with Locking Duplex Swivel Hook

- Exclusive E-Z\* opening guards, no bolts to pull out and lose. Feature gives fastest possible exposure of sheave cluster for quick reeving.
- Extremely short overall length, extra weight, and excellent balance for fast non-wobbling falls.
- Extra large sealed sheave bearing diameters for fully rated capacities.
- Tapered roller thrust bearing in hook.
- Duplex hook for easy elevator operation, locks in six or eight positions.
- Convenient rod hook clevis available as shown on Figure 82A.
- Completely streamlined, no projections.
- Alloy flame hardened sheaves grooved for proper wire line size.
- Threaded hook parts precision machined and individually fitted for maximum safety.
- Hook assembly interchangeable with the Series 70 Streamlux Tubing Blocks.
- All blocks available with additional cheek weights.



Fig. 82A  
With Rod Hook Clevis

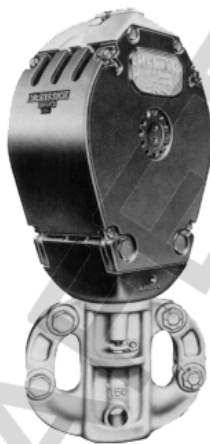
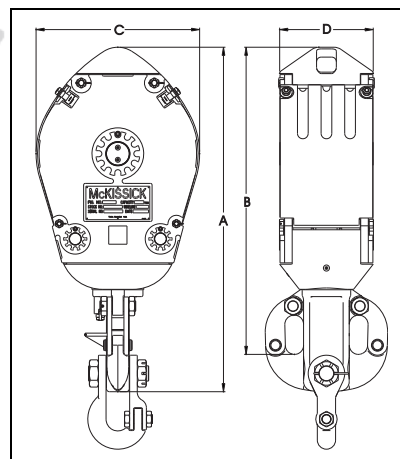


Fig. 83



\*patented

| Fig. No. | Sheave Size (in.) | No. of Sheaves | Recommended Wire Rope Size (in.) | API Working Load (Tons) | Rod Hook Clevis Working Load Limit (lbs.) | Weight (lbs.) |          | Center Pin Diameter (in.) | Dimensions (in.) |          |    |         |         |
|----------|-------------------|----------------|----------------------------------|-------------------------|---|---------------|----------|---------------------------|------------------|----------|----|---------|---------|
|          |                   |                |                                  |                         |   | Standard      | Weighted |                           | A                | B        | C  | D Std.  | D Wtd.  |
| 82       | 14                | 2              | 5/8 - 3/4                        | 25                      | 7,000                                     | 450           | 635      | 2-3/4                     | 34-7/16          | 30-13/16 | 16 | 8-1/4   | 12-1/4  |
| 83       | 14                | 3              | 5/8 - 3/4                        | 35                      | 7,000                                     | 600           | 800      | 2-3/4                     | 35-1/4           | 31-3/8   | 16 | 11-1/8  | 15-1/8  |
| 82       | 17                | 2              | 3/4 - 7/8                        | 40                      | 7,000                                     | 880           | 1200     | 2-3/4                     | 43-1/16          | 39-3/16  | 19 | 10-7/16 | 14-7/16 |
| 83       | 17                | 3              | 3/4 - 7/8                        | 50                      | 15,000                                    | 1110          | 1430     | 2-3/4                     | 44-15/16         | 40-7/16  | 19 | 14      | 18      |
| 82       | 20                | 2              | 7/8 - 1                          | 50                      | 15,000                                    | 1150          | 1625     | 3-15/16                   | 48-5/8           | 44-1/8   | 23 | 11-7/8  | 15-7/8  |
| 83       | 20                | 3              | 7/8 - 1                          | 75                      | 25,000                                    | 1600          | 2075     | 3-15/16                   | 50-3/8           | 45-3/8   | 23 | 16-1/8  | 20-1/8  |
| 82       | 24                | 2              | 1 — 1-1/8                        | 75                      | 25,000                                    | 1830          | 2490     | 4-1/4                     | 54-3/8           | 49-3/8   | 27 | 11-1/4  | 15-1/4  |
| 83       | 24                | 3              | 1 — 1-1/8                        | 100                     | 35,000                                    | 2250          | 2910     | 4-1/4                     | 58               | 52-1/8   | 27 | 15-1/4  | 19-1/4  |
| 83       | 30                | 3              | 1-1/4                            | 150                     | 45,000                                    | 2750          | 3850     | 5-5/8                     | 70-3/4           | 62-1/4   | 33 | 16-1/4  | 20-1/8  |
| 84       | 24                | 4              | 1 — 1-1/8                        | 100                     | 35,000                                    | 2750          | 3360     | 4-1/4                     | 63               | 56-1/2   | 27 | 19-1/4  | 23-1/4  |
| 84       | 30                | 4              | 1-1/4                            | 150                     | 45,000                                    | 3850          | 5050     | 4-1/4                     | 69-3/8           | 69-3/8   | 33 | 20-1/4  | 24-1/4  |

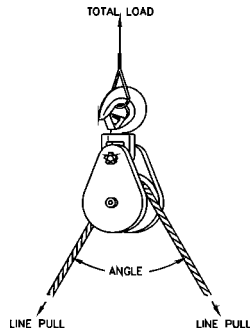


# Operation Information

## Loads on Blocks

The Working Load Limit (WLL) for Crosby Group blocks indicates the maximum load that should be exerted on the block and its connecting fitting. This total load value may be different from the weight being lifted or pulled by a hoisting or hauling system.

It is necessary to determine the total load being imposed on each block in the system to properly determine the rated capacity block to be used. A single sheave block used to change load line direction can be subjected to total loads greatly different from weight being lifted or pulled.



## How to Figure Line Parts

To help figure the number of parts of line to be used for a given load, or the line pull required for a given load, the following ratio table is provided with examples of how to use it.

| Ratio A<br>Bronze Bushed<br>Sheaves | Ratio B<br>Anti-Friction<br>Bearing Sheaves | Number<br>of<br>Line Parts |
|-------------------------------------|---|----------------------------|
| 0.96                                | 0.98  | 1                          |
| 1.87                                | 1.94  | 2                          |
| 2.75                                | 2.88  | 3                          |
| 3.59                                | 3.81  | 4                          |
| 4.39                                | 4.71  | 5                          |
| 5.19                                | 5.60  | 6                          |
| 5.90                                | 6.47  | 7                          |
| 6.60                                | 7.32  | 8                          |
| 7.27                                | 8.16  | 9                          |
| 7.91                                | 8.98  | 10                         |
| 8.52                                | 9.79  | 11                         |
| 9.11                                | 10.6  | 12                         |

| Angle Factor Multipliers |        |       |        |
|--------------------------|--------|-------|--------|
| Angle                    | Factor | Angle | Factor |
| 0°                       | 2.00   | 100°  | 1.29   |
| 10°                      | 1.99   | 110°  | 1.15   |
| 20°                      | 1.97   | 120°  | 1.00   |
| 30°                      | 1.03   | 130°  | .84    |
| 40°                      | 1.87   | 135°  | .76    |
| 45°                      | 1.84   | 140°  | .68    |
| 50°                      | 1.81   | 150°  | .52    |
| 60°                      | 1.73   | 160°  | .35    |
| 70°                      | 1.64   | 170°  | .17    |
| 80°                      | 1.53   | 180°  | .00    |
| 90°                      | 1.41   | —     | —      |

$$\text{Ratio A or B} = \frac{\text{Total Load to be Lifted}}{\text{Single Line Pull}}$$

After calculating Ratio A or B, consult table to determine number of parts of line.

### Examples:

- To find the number of parts of line needed when weight of load and single line pull are known, and using Bronze Bushed Sheaves.

$$\text{Ratio A} = \frac{72,180 \text{ lbs. (load to be lifted)}}{8,000 \text{ lbs. (single line pull)}} = \frac{9.02}{\text{(Ratio A)}}$$

Refer to ratio 9.02 in table or number nearest to it, then check column under heading "Number of Line Parts" = 12 parts of line to be used for this load.

- To find the single line pull needed when weight of load and number of parts of line are known, and using anti-friction bearing sheaves.

$$\text{Single Line Pull} = \frac{68,000 \text{ lbs. (load to be lifted)}}{7.32 \text{ (ratio B of 8 part line)}} = \frac{9,290}{\text{lbs.}}$$

9,290 lbs. single line pull required to lift this load on 8 parts of line.

# Preventive Maintenance

A regular preventive maintenance program should be established. Written maintenance procedures should be provided to the personnel responsible for the maintenance.

## Lubrication Requirements

**Lubrication:** The frequency of lubrication depends upon frequency and period of product use as well as environmental conditions, which are contingent upon the user's good judgment. Assuming normal product use, the following schedule is suggested when using lithium-based grease of a medium consistency.

### Sheave Bearings

**Tapered Roller Bearings** — Every 40 hours of continuous operation or every 30 days of intermittent operation.

**Roller Bearings** — Every 24 hours of continuous operation or every 14 days of intermittent operation.

**Bronze Bushings** — (Not Self-Lubricated) — Every 8 hours of continuous operation or every 14 days of intermittent operation.

### Hook Bearings

**Anti-Friction** — Every 14 days for frequent swiveling or every 45 days for infrequent swiveling.

**Bronze Thrust Bushing or No Bearing** — Every 16 hours for frequent swiveling or every 21 days for infrequent swiveling.

Tackle Block Maintenance also depends upon proper block selection (see "Loads on Blocks" on page 4), proper reeving (see "The Reeving of Tackle Blocks" (in Crosby General Catalog), consideration of shock loads, side loading, and other adverse conditions.

## Maintenance Requirements

Tackle Blocks must be regularly inspected, lubricated, and maintained for peak efficiency and extended usefulness. Their proper use and maintenance is equal in importance to other mechanical equipment. The frequency of inspection and lubrication is dependent upon frequency and periods of use, environmental conditions, and the user's good judgment.

**Inspection:** As a minimum, the following points should be considered:

1. Wear on pins or axles, rope grooves, side plates, bushing or bearings, and fittings (See Fitting Maintenance). Excessive wear may be a cause to replace parts or remove block from service.
2. Deformation in side plates, pins and axles, fitting attachment points, trunnions, etc. Deformation can be caused by abusive service and/or overload and may be a cause to remove block from service.
3. Misalignment or wobble in sheaves.
4. Security of nuts, bolts, and other locking methods, especially after reassembly following a tear down inspection. Original securing method should be used; e.g., staking set screw, cotter pin, cap screw.
5. Pins retained by snap rings should be checked for missing or loose rings.
6. Sheave pin nuts should be checked for proper positioning. Pins for tapered roller bearings should be tightened to remove all end play during sheave rotation. Pins for bronze bushings and straight roller bearings should have a running clearance of .031 inch per sheave of end play and should be adjusted accordingly.
7. Hook or shackle to swivel case clearance is set at .031 to .062 at the factory. Increased clearance can result from component wear. Clearance exceeding .18 should necessitate disassembly and further inspection.
8. Deformation or corrosion of hook and nut threads.
9. Surface condition and deformation of hook (See Fitting Maintenance and ANSI B30.10)
10. Welded side plates for weld corrosion or weld cracking.
11. Hook latch for deformation, proper fit and operation.

# Series 70 Disassembly Instructions

## Disassembly/Assembly Instructions for McKissick® 70 Series Tubing Blocks

On the following pages are general disassembly and assembly instructions for all sizes of McKissick® 70 Series Tubing Blocks. The instructions outline the necessary disassembly and assembly required for thorough inspection, or replacement of internal parts.

There are two versions of spring retention devices that were produced by McKissick® for the 70 Series Tubing block. The original design uses a threaded nut (Figure 1), and the current design uses split keeper rings that fit into grooves at the top of the hook shank (Figure 2).

The instructions consider both methods. Disassembly instructions consider the upper block assembly and the hook assembly separately, after the lower bolt assemblies are removed.

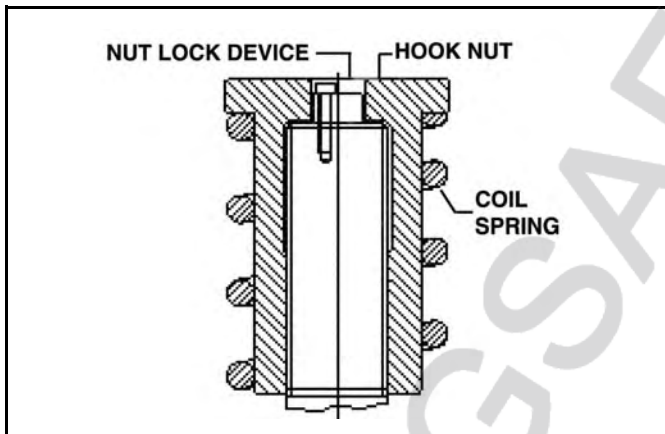


Figure 1

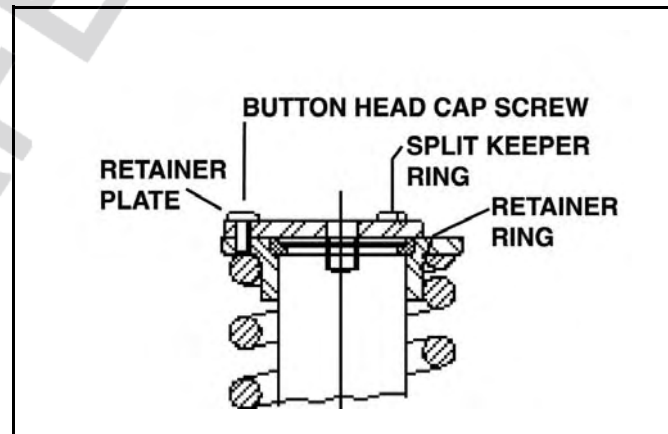


Figure 2



# Series 70 Disassembly Instructions

See Page 15 - 17 for block drawing and parts list

## Disassembly

Remove lower bolt assembly (11) to separate the hook assembly from the upper block assembly.

### Upper Block

1. Remove upper bolt assembly (12) and spreader.
2. Position upper block assembly on flat surface with sheave center pin assembly (05) vertical.
3. Remove all nuts, screws and bolt assemblies (12) attached to the block top plate (07).
4. Remove center pin star nut by removing locking cap screw, and unthreading.
5. Remove top side plate assembly (07).
6. Remove sheave assembly (01).
7. Continue alternately removing load plates and sheaves to completely disassemble block.

### Hook Assembly

1. Secure the hook/case assembly (15) in vertical position with the hook down.
2. Remove the cover plate to expose the interior of the swivel case.
3. Remove spring. Refer to Section A or B at end of Disassembly instructions, depending on which method is used to retain spring. Then return to Step 4.
4. Use a special follower removal tool (Figure 4) to remove one half of follower. This is accomplished by threading into the follower flange, and raising the follower as high as possible. Then lower approximately .25 inch and tilt out. It may require some movement side to side and up and down to completely remove both of the follower halves. If the split follower bushing is badly worn and rotated, the follower may have to be rotated to align with the splits of the bushings before removing.
5. Lift the swivel case from the hook.
6. Remove the thrust bearing from the case. Note the orientation of the races of the thrust bearing for proper re-assembly.
7. Remove the snap ring from the hook to allow removal of the bonnet.

### Section A

#### For hooks with a threaded spring retention device

Remove nut lock device from top of hook shank. Use a square driver in nut lock hole to unscrew the nut. The threads are right-handed. Completely remove nut and coil spring (27).

### Section B

#### For hooks with split keeper ring spring retention device

Remove the keeper retainer plate at top of hook shank.

Using the existing 1.00 UNC tapped hole in top of hook shank, install threaded rod (thread the full length) of at least 12" long to allow controlled release of spring (See Figure 3).

1. Remove the keeper retainer plate at top of hook shank.
2. Using the existing 1.00 UNC tapped hole in top of hook shank, install threaded rod (thread the full length) of at least 12" long to allow controlled release of spring (See Figure 3).



## WARNING

- Failure to read, understand and follow these instructions may cause death or serious injury.
- Read and understand these instructions before disassembly, assembly or repair of hook assembly.
- When releasing compression spring - KEEP BODY CLEAR!

3. Use the existing three button head cap screws, partially threaded into retainer ring, to provide at least 1 inch of space between retainer plate and retainer ring. Then tighten with a heavy hex nut against the retainer plate until the split keeper rings (qty. 2) can be removed through gap between retainer plate and retainer ring.
4. After removing the keeper rings, begin releasing the spring tension by turning the nut in counter-clockwise direction. (The spring is in compressed condition and can cause injury if released quickly. To reduce risk, make sure that the threaded rod installed in hook shank does not back out from the hook). When the spring tension is noticeably released, remove the retainer plate, and threaded rod, then remove spring.

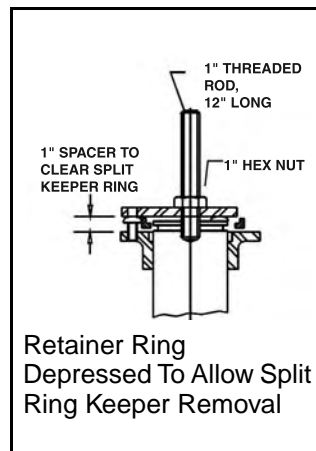


Figure 3

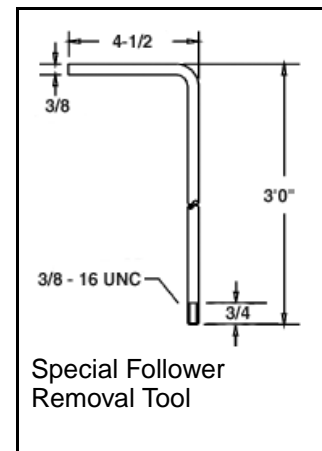


Figure 4

# Series 70 Assembly Instructions

## Assembly

### **Upper Block**

1. Install a star nut on one end of center pin (05).
2. Install outside plate (07) on center pin and place with center pin vertical and nut on flat horizontal surface.
3. Install one sheave assembly (01) including seals on center pin.
4. Install one center plate (06).
5. Continue alternately adding sheave and center plates until total block width is reached.
6. Install outside plate, and star nut on topside of plate. After centering and tightening the star nuts on the center pin, install nut lock screws. Note that the sheave bearings are non-adjustable type tapered roller bearings that require no specific adjustment. Therefore, to tighten the center pin, the star nuts are to be drawn tight and locked into place.
7. Rotate block to position with sheave center pin horizontal, and top of block up.
8. Install the spreader (upper casting) and upper bolt assembly (12).
9. Install both hinged guard assemblies and bolts.
10. Install all remaining nuts on bolt assemblies (except lower bolt assembly (11), and install lock screws, or stake in place securely.

### **Hook and Case Assembly (15)**

1. Secure the hook in vertical position with the body down, and shank portion up.
2. Install bonnet (31) onto hook (16) and install retaining ring (29).
3. Install swivel case onto hook shank.
4. Install hook thrust bearing (21). When being assembled, the thrust bearing must have the race with the large bore against the case or the hook will not swivel properly. The small bore race must be against the follower. The race bores should be measured with micrometers or calipers, as there is only .016 inch difference between upper race, and lower race. Large chamfer on outside diameter of lower race should be facing case. Large chamfer on inside diameter of upper race should be facing towards follower. Note: Before re-assembly of hook into the case, it is advisable to check the fit of the thrust bearing over the follower/bushing assembly. To accomplish this, the follower/bushing assembly can be clamped on the hook shank, and the thrust bearing fit over the follower. If the thrust bearing will not fit, then some light buffing of the inside surface of the follower bronze bushing may be required.
5. Install follower halves (20) onto the top of the hook thrust bearing using special follower removal tool (Figure 4 on page 7). The followers have a close fit around the hook and the case, so installation may

require some up and down, and side to side movement. Verify follower halves are free of burrs.

6. Place the coil spring on the follower.
7. Install spring retention device. Refer to Section A or B at end of Assembly instructions, depending on which method is used to retain spring. Then return to Step 8.
8. Install silicon sealant at interface between case and cover plate, then install cover plate and mounting screws.
9. Attach hook and case assembly (15) to assembled upper block by installing lower bolt assemblies (11), then secure nuts with lock screws, or stake in place devices.
10. Lubricate hook and sheave bearings.
11. Verify all fasteners / locking devices are properly installed.

### **Section A**

#### **For hooks with a threaded spring retention device**

Assemble the threaded nut completely on the hook shank to compress the coil spring.

Rotate the nut slightly to allow installation of the nut lock device at top of the hook.

### **Section B**

#### **For hooks with split keeper ring spring retention device**

1. Locate the retainer ring on the coil spring, and over the hook shank. Use the existing three button head cap screws, partially threaded into retainer ring, to provide at least 1 inch of space between retainer plate and retainer ring. Using the existing 1.00 UNC tapped hole in top of hook shank, install threaded rod (threads the full length) of at least 12" long to allow compression of the coil spring. Then tighten with a heavy hex nut against the retainer plate until the split keeper rings (qty. 2) can be installed through gap between retainer plate and retainer ring (See Figure 3 on page 7, note orientation of retainer ring).
2. After the two keeper rings are installed in proper orientation, rotate 1.00" heavy hex nut until spring tension is carried fully by keeper rings.
3. Remove threaded rod. Insert 1" UNC socket head set screw into thread hole. Apply sealant to threads, stake set screw threads.
4. Remove temporary spacers, and then secure retainer plate with three button head cap screws and lock washers.

# Series 70 Inspection Requirements

In accordance with API RP 8B, *Recommended Practice for Procedures for Inspections, Maintenance, Repair, and Remanufacture of hoisting Equip*, it is recommended that the owner or user of the equipment develop his own schedule of inspections based on experience, manufacturer's recommendations, and consideration of one or more of the following factors: environment; load cycles; regulatory requirements; operating time; testing;

repairs; remanufacture. Below please find the inspection category descriptions and recommended frequency for the critical load carrying components of the Series 70 Tubing Block. When equipment is subjected to severe conditions such as impact loading or low temperature service, a thorough inspection may be required at increased frequency.

## INSPECTION CATEGORIES

- Category I - Observation of equipment during operation for indications of inadequate performance.
- Category II - Category I inspection, plus further inspection for corrosion; deformation; loose or missing components; deterioration; proper lubrication; visible external cracks; and adjustment.
- Category III - Category II inspection, plus further inspection which may include NDE of exposed critical areas of load hook and some disassembly to access specific components and identify wear that exceeds allowable tolerances.
- Category IV - Category III inspection, plus further inspection where the equipment is disassembled to the extent necessary to conduct NDE of all primary load-carrying components.

### Periodic Inspection Categories and Frequencies Chart for 70 Series Tubing Blocks

| Inspection Item  | Table Number Reference | Daily | Weekly | Monthly | Semi-Annually | Annually | Other Frequency |
|--|------------------------|-------|--------|---------|---------------|----------|-----------------|
| Hook   | 70 - 1                 | I     | II     |         | III           |          | IV (5 years)    |
| Swivel Case  | 70 - 2                 | I     | II     |         |               |          | IV (5 years)    |
| Rod Hook Clevis  | 70 - 3                 | I     | II     |         | III           |          | IV (5 years)    |
| Hook Nut, Follower, Retaining Ring & Split Keeper Ring | 70 - 4                 | I     | II     |         |               |          | IV (5 years)    |
| Rod Hook Bolt, Lower Bolt Assembly & Center Pin        | 70 - 5                 | I     | II     |         |               |          | IV (5 years)    |
| Sheave Bearing   | 70 - 6                 | I     | II     |         |               |          | IV (5 years)    |
| Sheave   | 70 - 7                 | I     | II     |         |               |          | IV (5 years)    |
| Load Plate & Center Plate                              | 70 - 8                 | I     | II     |         |               |          | IV (5 years)    |
| Hook Thrust Bearing                                    | 70 - 9                 | I     | II     |         |               |          | IV (5 years)    |
| Case Bushing   | 70 - 10                | I     |        |         |               |          | IV (5 years)    |
| Coil Spring  | 70 - 11                | I     |        |         |               |          | IV (5 years)    |

# Series 70 Inspection Requirements

## Series 70 Inspection and Acceptance Criteria

Unless otherwise noted, all areas are to be considered critical areas and require 100% inspection. For purposes of this inspection plan, indications detected by magnetic particle method with major dimensions greater than 1/16 inch and associated with a surface rupture are considered relevant.

A linear indication is an indication in which the length is equal to or greater than three times the width. A rounded indication is an indication that is circular or elliptical, with its length less than three times the width.

If you should have any questions regarding the inspection and acceptance criteria of the subject equipment, please contact our Technical Support staff at 1-800-777-1555.

### 70 - 1

| Component | Inspection Characteristic              | Inspection Method | Acceptance Criteria or Remedy  |
|-----------|--|-------------------|--|
| Hook      | Wear in body                           | Visual            | Remove from service, any hook with wear exceeding 5% of original dimensions. Refer to page 14 for original dimensions. |
|           | Defective locking mechanism            | Visual            | Replace with genuine Crosby McKissick® parts.  |
|           | Missing bolts or improper replacements | Visual            | Replace with genuine Crosby McKissick® parts.  |
|           | Damaged snap ring groove               | Visual            | Replace hook, or contact Crosby for remanufacture instructions.  |
|           | Wear at follower bushing location      | Visual            | Remove scratches and gouges by buffing or light grinding to produce smooth bushing surface.                            |
|           | Corrosion in threads                   | Visual            | Remove from service, any hook which has threads corroded more than 20% of the nut engaged length.                      |
|           | Deformation                            | Visual            | Visible deformation is cause for removal from service.   |
|           | Cracks                                 | MPI               | Magnetic Particle Inspection per ASTM E 709. See Table 1 (below) for acceptance criteria.                              |

### 70 - 2

| Component   | Inspection Characteristic  | Inspection Method | Acceptance Criteria or Remedy   |
|-------------|----------------------------|-------------------|---|
| Swivel Case | Wear at case bolt location | Visual            | Remove from service, any case with wear exceeding 5% of original dimension. Refer to page 14 for original dimensions. |
|             | Deformation                | Visual            | Visible deformation is cause for removal from service.  |
|             | Cracks                     | MPI               | See Table 1 (below) for acceptance criteria.  |

### 70 - 3

| Component       | Inspection Characteristic              | Inspection Method | Acceptance Criteria or Remedy   |
|-----------------|--|-------------------|---|
| Rod Hook Clevis | Wear in body                           | Visual            | Remove from service, any clevis with wear exceeding 5% of original dimension. Refer to page 14 for original dimensions. |
|                 | Missing bolts or improper replacements | Visual            | Replace with genuine Crosby McKissick® parts.   |
|                 | Deformation                            | Visual            | Visible deformation is cause for removal from service.  |
|                 | Cracks                                 | MPI               | Magnetic Particle inspection per ASTM E 709. See Table 1 (below) for acceptance criteria.                               |

### ASTM E 125 Casting Acceptance Criteria:

| Type | Discontinuity Description | Maximum Permitted Degree |                   |
|------|---------------------------|--------------------------|-------------------|
|      |                           | Critical Area            | Non-Critical Area |
| 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          |

# Series 70 Inspection Requirements

## Tubing Block Inspection and Acceptance Criteria (cont'd)

### 70 - 4

| Component  | Inspection Characteristic     | Inspection Method | Acceptance Criteria or Remedy   |
|--|-------------------------------|-------------------|---|
| <b>Hook Nut, Follower, Retainer Ring &amp; Split Keeper Ring</b> | Corrosion                     | Visual            | Remove from service, any hook nut which has threads corroded more than 20% of the engaged length.   |
|  | Cracks                        | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>• No relevant indications.</li> <li>• No more than three indications in a line separated by less than 1/16" edge to edge.</li> <li>• No linear indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.</li> </ul> |
|  | Follower bushing wear         | Dimensional       | Remove from service, follower bushing, with worn inside diameter exceeding the mating shank diameter by .03".   |
|  | Missing retainer plate screws | Visual            | Replace with genuine Crosby McKissick® parts.   |
|  | Missing nut lock device       | Visual            | Replace with genuine Crosby McKissick® parts  |

### 70 - 5

| Component  | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|--|---------------------------|-------------------|---|
| <b>Rod Hook Bolt, Lower Bolt Assembly &amp; Center Pin</b> | Wear                      | Visual            | Reduction of the center pin diameter due to wear, scoring, etc. is cause for removal from service. 5% of original dimension wear allowable for other bolts. Refer to page 14 for original dimensions.   |
|  | Cracks                    | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>• No relevant indications.</li> <li>• No more than three indications in a line separated by less than 1/16" edge to edge.</li> <li>• No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.</li> </ul> |
|  | Deformation               | Visual            | Visible deformation is cause for removal from service.  |

### 70 - 6

| Component             | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|-----------------------|---------------------------|-------------------|---|
| <b>Sheave Bearing</b> | Wear                      | Visual            | Remove from service, worn sheave bearings, detected by noticeable side play of sheave, or noticeable excessive wear of rollers or race when disassembled. |
|                       | Corrosion                 | Visual            | Remove from service, any bearing with corrosion on rollers or race that cannot be removed with crocus cloth.  |
|                       | Missing or damaged        | Visual            | Remove from service any bearing with displaced, missing, or damaged rollers.  |



# Series 70 Inspection Requirements

## Tubing Block Inspection and Acceptance Criteria (cont'd)

### 70 - 7

| Component | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|-----------|---------------------------|-------------------|---|
| Sheave    | Groove Wear               | Dimensional       | Remove from service, any sheave with groove radius measurement that is outside allowable minimum and maximum dimension as defined by API RP 9B. See Table 2 below.  |
|           | Cracks in web             | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>No relevant indications with a major dimension equal to or greater than 3/16".</li> <li>No more than ten indications in any continuous six square-inch area.</li> <li>No more than three indications in a line separated by less than 1/16" edge to edge.</li> <li>No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.</li> </ul> |
|           | Cracks in weld            | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>No relevant indications.</li> <li>No rounded indications greater than 1/8". For weld 5/8" or less, and 3/16" for welds greater than 5/8".</li> <li>Surface porosity and exposed slag is not permitted on or within 1/8" of sealing surfaces.</li> </ul>  |

### Groove Radius Dimensions per API RP 9 B Tenth Edition

| Table 2                           |      |      |      |      |        |        |
|-----------------------------------|------|------|------|------|--------|--------|
| Wire Rope Nominal Diameter (inch) | 5/8" | 3/4" | 7/8" | 1"   | 1-1/8" | 1-1/4" |
| Groove Radius Minimum Worn (inch) | .320 | .384 | .448 | .513 | .577   | .641   |
| Groove Radius Maximum (inch)      | .344 | .413 | .481 | .550 | .619   | .688   |

### 70 - 8

| Component                 | Inspection Characteristic                | Inspection Method | Acceptance Criteria or Remedy   |
|---------------------------|--|-------------------|---|
| Load Plate & Center Plate | Wear at bolt and center pin bearing area | Dimensional       | Remove from service, any plate with wear exceeding 5% of original dimension. Refer to page 14 for original dimensions.  |
|                           | Cracks                                   | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>No relevant indications with a major dimension equal to or greater than 3/16".</li> <li>No more than ten indications in any continuous six square-inch area.</li> <li>No more than three indications in line separated by less than 1/16" edge to edge.</li> <li>No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.</li> </ul> |
|                           | Deformation                              | Visual            | Visible deformation is cause for removal from service.  |

### 70 - 9

| Component           | Inspection Characteristic  | Inspection Method | Acceptance Criteria or Remedy  |
|---------------------|----------------------------|-------------------|--|
| Hook Thrust Bearing | Wear                       | Visual            | Remove from service, any bearing with visible wear of roller elements and races.                             |
|                     | Missing or damaged rollers | Visual            | Remove from service any bearing with displaced, missing, or damaged rollers.                                 |
|                     | Corrosion                  | Visual            | Remove from service, any bearing with corrosion on rollers or race that cannot be removed with crocus cloth. |

# Series 70 Inspection Requirements

## Tubing Block Inspection and Acceptance Criteria (cont'd)

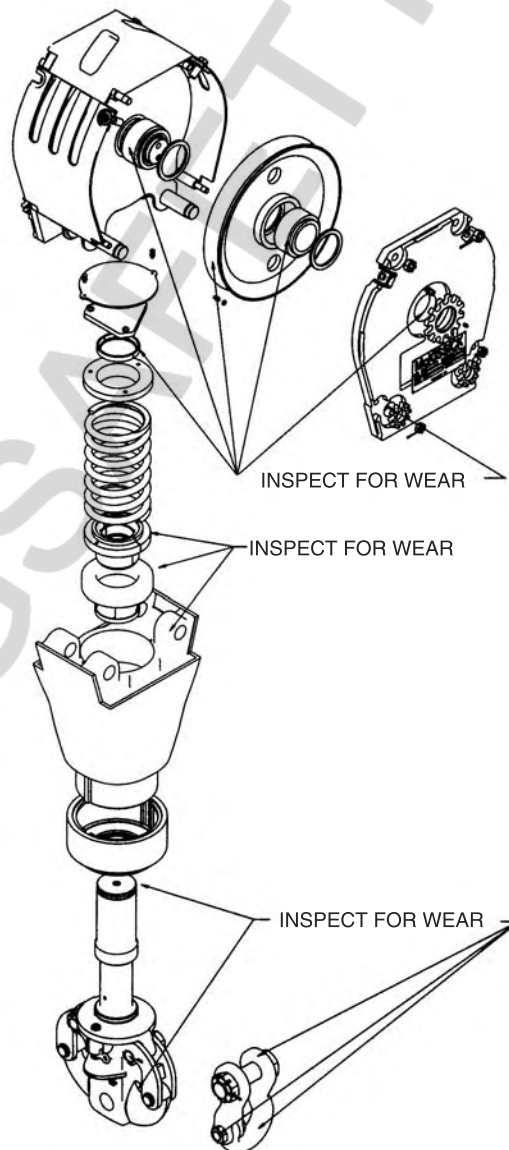
### 70-10

| Component    | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|--------------|---------------------------|-------------------|---|
| Case Bushing | Wear                      | Dimensional       | Remove from service, case bushings with worn inside diameter exceeding the mating shank diameter by .03". |

### 70-11

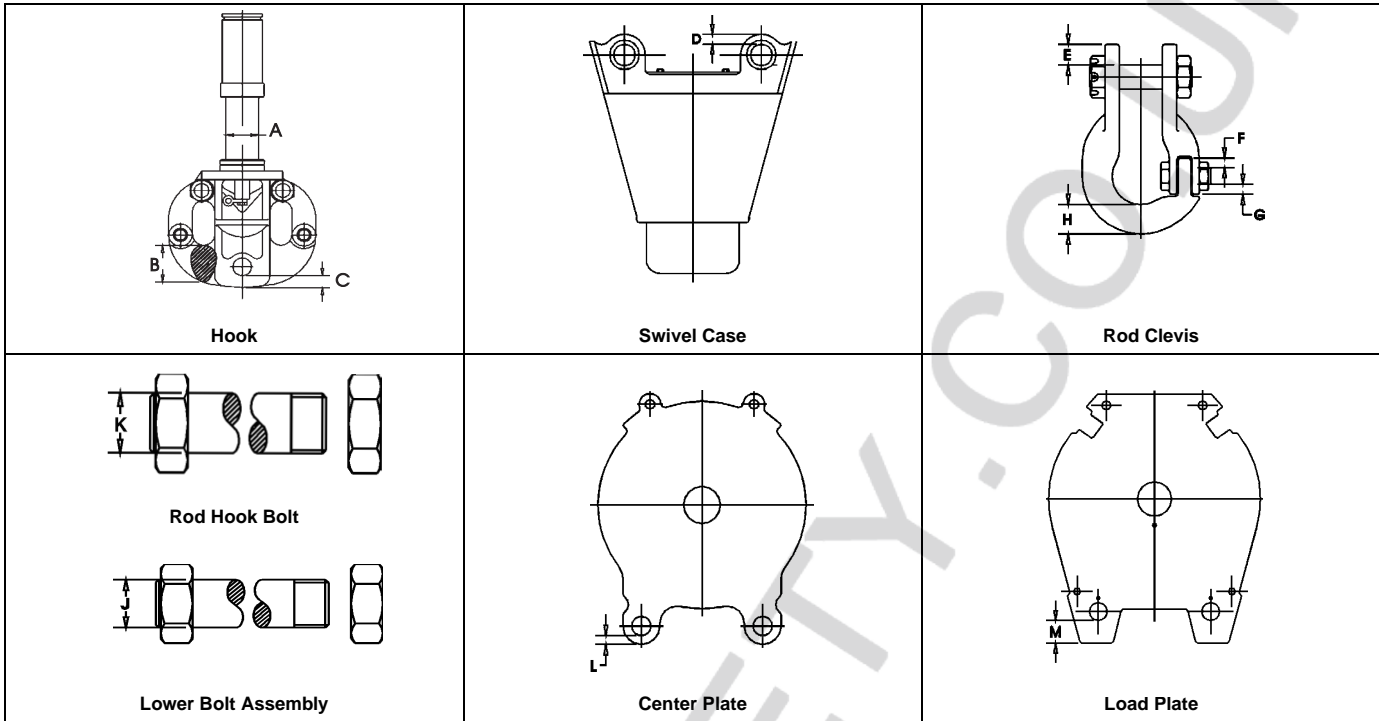
| Component   | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|-------------|---------------------------|-------------------|---|
| Coil Spring | Deformation               | Visual            | Visible deformation is cause for removal from service.  |
|             | Cracked or broken coils   | MPI               | Magnetic Particle Inspection per ASTM E 709.<br>Acceptance criteria:<br><ul style="list-style-type: none"> <li>• No relevant indications.</li> <li>• No more than three indications in a line separated by less than 1/16" edge to edge.</li> </ul> |

## McKissick® 70 Series Tubing Block Inspection Points



# Series 70 Inspection Requirements

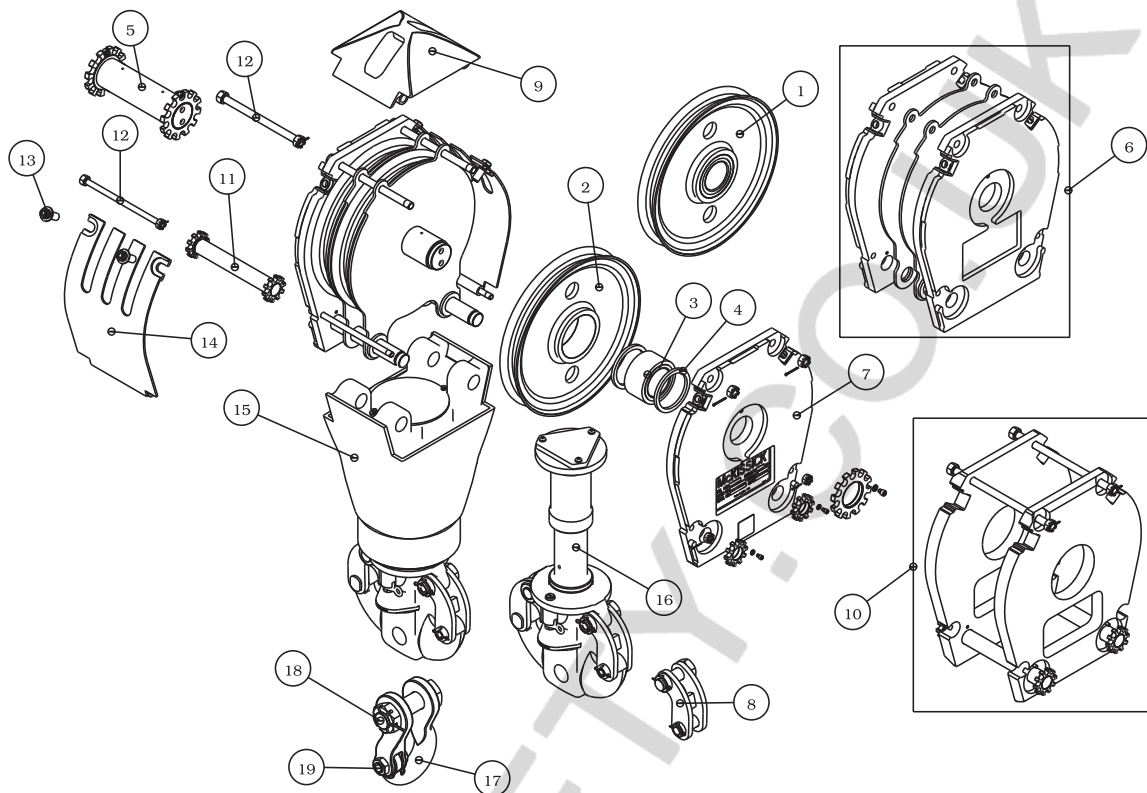
## McKissick® 70 Series Tubing Block Original Reference Dimensions



| Size   | A    | B     | C     | D    | E     | F    | G    | H     | J     | K    | L    | M    |
|--------|------|-------|-------|------|-------|------|------|-------|-------|------|------|------|
| 14" 72 | 2.00 | 3.15  | 1.25  | .65  | .72   | —    | —    | 1.25  | 1.00  | 1.00 | .48  | 1.16 |
| 14" 73 | 2.50 | 3.00  | .97   | .59  | .97   | .59  | .59  | 1.81  | 1.25  | 1.00 | .48  | 1.16 |
| 17" 72 | 2.50 | 3.00  | .97   | .59  | .97   | .59  | .59  | 1.81  | 1.25  | 1.25 | .97  | 1.84 |
| 17" 73 | 3.00 | 3.81  | 1.47  | .59  | 1.19  | .59  | .59  | 1.81  | 1.50  | 1.25 | .97  | 1.84 |
| 20" 72 | 3.00 | 3.81  | 1.47  | .73  | 1.19  | .59  | .59  | 1.81  | 1.50  | 1.25 | 1.09 | 1.84 |
| 20" 73 | 4.00 | 5.34* | 1.69* | .73  | 1.69* | .97* | .97* | 3.00* | 2.50* | 1.25 | 1.09 | 1.84 |
| 24" 72 | 4.00 | 5.34* | 1.69* | 1.03 | 1.69* | .97* | .97* | 3.00* | 2.50* | 2.12 | 1.03 | 2.84 |
| 24" 73 | 4.50 | 5.34  | 1.69  | 1.03 | 1.69  | .97  | .97  | 3.00  | 2.50  | 2.12 | 1.03 | 2.84 |
| 30" 72 | 5.50 | 7.12  | 2.94  | 1.61 | 1.94  | 1.09 | 1.09 | 3.00  | 3.50  | 2.25 | 1.59 | 2.34 |
| 30" 73 | 5.50 | 7.12  | 2.94  | 1.61 | 1.94  | 1.09 | 1.09 | 3.00  | 3.50  | 2.25 | 1.59 | 2.34 |

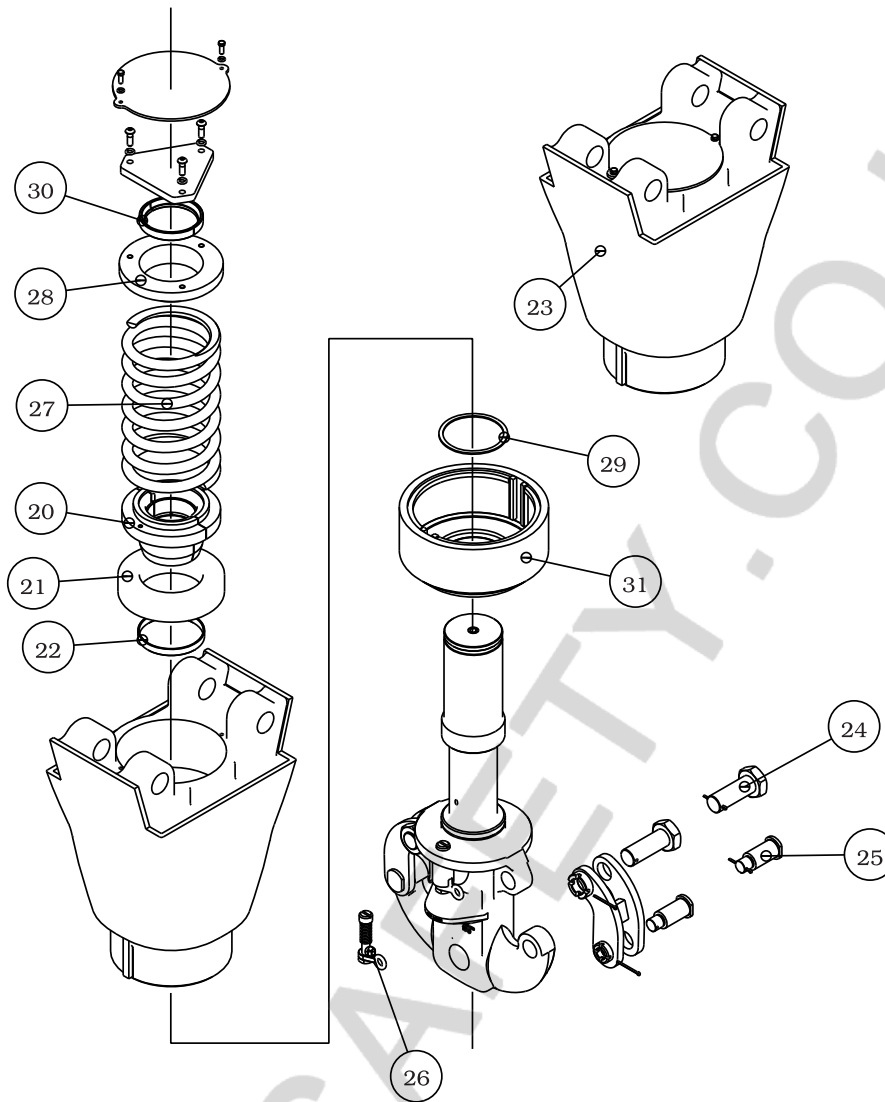
\*75 ton blocks produced before 1985 utilize a smaller hook assembly distinguishable by a 2.00" diameter rod hook bolt (Ref. 18). The following dimensions apply. B = 4.25, C = 1.94, E = 1.56, F = .72, G = .72, H = 2.38, J = 2.00.

# Series 70 Parts List



| Ref. No. | Description                      | Ref. No. | Description            |
|----------|----------------------------------|----------|------------------------|
| 01       | Sheave with Timken Bearing       | 16       | Hook with Nut Assy.    |
| 02       | Sheave Only                      | 17       | Rod Hook Clevis        |
| 03       | Bearing Assy. Sheave (TB)        | 18       | Rod Hook Clevis Bolt   |
| 04       | Seal Kit                         | 19       | Rod Hook Latch Bolt    |
| 05       | Pin Assy. Center (TB)            | 20       | Follower               |
| 06       | Plate Assy. Complete             | 21       | Thrust Bearing, Hook   |
| 07       | Plate Assy. Kit                  | 22       | Case Bushing           |
| 08       | Bail Arm Assy. Set               | 23       | Case Assy.             |
| 09       | Spreader                         | 24       | Upper Arm Bolt         |
| 10       | Weight Kit                       | 25       | Lower Arm Bolt         |
| 11       | Bolt Assy. Lower                 | 26       | Hook Locking Assembly  |
| 11       | Bolt Assy. Lower - Weighted      | 27       | Spring                 |
| 12       | Bolt Set Guard & Upper           | 28       | Spring Retaining Ring  |
| 12       | Bolt Set Guard & Upper, Weighted | 29       | Retaining Ring, Bonnet |
| 13       | Guard Lock Bolt Kit              | 30       | Retaining Ring, Hook   |
| 14       | Guard Plate Set                  | 31       | Bonnet                 |
| 15       | Hook Assy.                       | 32       | Hook Warning Kit       |

# Series 70 Parts List



| Ref. No. | Description            |
|----------|------------------------|
| 20       | Follower               |
| 21       | Thrust Bearing, Hook   |
| 22       | Case Bushing           |
| 23       | Case Assy.             |
| 24       | Upper Arm Bolt         |
| 25       | Lower Arm Bolt         |
| 26       | Hook Locking Assembly  |
| 27       | Spring                 |
| 28       | Spring Retaining Ring  |
| 29       | Retaining Ring, Bonnet |
| 30       | Retaining Ring, Hook   |
| 31       | Bonnet                 |
| 32       | Hook Warning Kit       |



# Series 70 Parts List

| DESCRIPTION                  | Ref. No. | 14" 72, 72A   | 14" 73, 73A   | 17" 73, 73A   | 17" 72, 72A   | 20" 72, 72A   | 20" 73, 73A   | 24" 72, 72A     | 24" 73, 73A     | 30" 73, 73A     | 30" 74, 74A     |
|------------------------------|----------|---------------|---------------|---------------|---------------|---------------|---------------|-----------------|-----------------|-----------------|-----------------|
| SHEAVE W/TAPERED BEARING     | 1        | 2026181 (5/8) | 2026181 (5/8) | 2026196 (3/4) | 2026196 (3/4) | 2025955 (7/8) | 2025955 (7/8) | 2025933 (1)     | 2025933 (1)     | 2026002 (1-1/8) | 2026002 (1-1/8) |
| SHEAVE W/TAPERED BEARING     | 1        | 2026113 (3/4) | 2026113 (3/4) | 2026023 (7/8) | 2026023 (7/8) | 2026103 (1)   | 2026103 (1)   | 2026109 (1-1/8) | 2026109 (1-1/8) | 2026285 (1-1/4) | 2026285 (1-1/4) |
| SHEAVE ONLY                  | 2        | 2026182 (5/8) | 2026182 (5/8) | 2026197 (3/4) | 2026197 (3/4) | 2025956 (7/8) | 2025956 (7/8) | 2025931 (1)     | 2025931 (1)     | 2026003 (1-1/8) | 2026003 (1-1/8) |
| SHEAVE ONLY                  | 2        | 2026143 (3/4) | 2026143 (3/4) | 2026024 (7/8) | 2026024 (7/8) | 2026104 (1)   | 2026104 (1)   | 2026110 (1-1/8) | 2026110 (1-1/8) | 2026285 (1-1/4) | 2026285 (1-1/4) |
| BEARING ASSY, SHEAVE (TB)    | 3        | 2017498       | 2017498       | 2017498       | 2017498       | 2017500       | 2017500       | 2017501         | 2017501         | 2017502         | 2017502         |
| SEAL KIT                     | 4        | 2026025       | 2026025       | 2026025       | 2026025       | 2025957       | 2025957       | 2025932         | 2025932         | 2026119         | 2026119         |
| PIN ASSY, CENTER (TB)        | 5        | 2026146       | 2026262       | 2026185       | 1401593       | 2025958       | 2025958       | 2025934         | 2025986         | 2026004         | 2026120         |
| PLATE ASSEMBLY, COMPLETE     | 6        | 2026147       | 2026263       | 2026186       | 2026027       | 2025959       | 2025978       | 2025935         | 2026114         | 2026005         | 2026121         |
| PLATE ASSEMBLY KIT           | 7        | 2026148       | 2026148       | 2026028       | 2026028       | 2025960       | 2025960       | 2025936         | 2025936         | 2026006         | 2026006         |
| BAIL ARM ASSEMBLY SET        | 8        | 2026149       | 2026187       | 2026187       | 2025961       | 2025961       | 2025989       | 2025989         | 2025989         | 2026007         | 2026007         |
| SPREADER                     | 9        | 2026150       | 2026264       | 2026188       | 2026029       | 2025962       | 2025979       | 2025938         | 2025990         | 2026008         | 2026040         |
| WEIGHT KIT                   | 10       | 2026203       | 2026287       | 2026206       | 2026030       | 2025963       | 2025980       | 115093          | 2025991         | 2026009         | 2026122         |
| BOLT ASSEMBLY, LOWER (WTD)   | 11       | 2026204       | 2026288       | 2026207       | 2026031       | 2025964       | 2025981       | 2025940         | 2025992         | 2026010         | 2026123         |
| BOLT ASSEMBLY, LOWER (STD)   | 11       | 2026151       | 2026265       | 2026189       | 2026216       | 2022156       | 2026218       | 2026105         | 2026220         | 2026231         | 2026351         |
| BOLT SET-GUARD & UPPER (WTD) | 12       | 2026205       | 2026289       | 2026208       | 2026032       | 2025965       | 2025982       | 2025941         | 2025993         | 2026011         | 2026124         |
| BOLT SET-GUARD & UPPER (STD) | 12       | 2026152       | 2026267       | 2026190       | 2026217       | 2026102       | 2026219       | 2026106         | 2026221         | 2026232         | 2026352         |
| GUARD LOCK BOLT KIT          | 13       | 2022142       | 2022143       | 2025942       | 2025942       | 2025942       | 2025942       | 2025942         | 2025942         | 2026012         | 2026012         |
| GUARD PLATE SET              | 14       | 2026153       | 2026268       | 2026191       | 2026053       | 2026127       | 2025983       | 2025943         | 2026052         | 2026013         | 2026125         |
| HOOK ASSEMBLY                | 15       | 2026318       | 2026347       | 2026324       | 2026349       | 2026330       | 2026111       | 2026315         | 2026115         | 2026117         | 2026126         |
| HOOK WITH NUT ASSEMBLY       | 16       | 127446        | 127482        | 127482        | 127543        | 127543        | 127570        | 127570          | 1402985         | 127767          | 127767          |
| ROD HOOK CLEVIS              | 17       | 105585        | 2026211       | 2026211       | 2025968       | 2025968       | 2025996       | 2025996         | 2025996         | 2026016         | 2026016         |
| ROD HOOK CLEVIS BOLT         | 18       | 2002727       | 2026212       | 2026212       | 2025969       | 2025969       | 2025997       | 2025997         | 2025997         | 2026017         | 2026017         |
| ROD HOOK LATCH BOLT          | 19       | —             | 2026213       | 2026213       | 2025970       | 2025970       | 2025998       | 2025998         | 2025998         | 2026018         | 2026018         |
| FOLLOWER                     | 20       | 2026320       | 2026326       | 2026326       | 2026331       | 2026320       | 2026158       | 2026158         | 2026165         | 2026173         | 2026173         |
| THRUST BEARING, HOOK         | 21       | 18055         | 18064         | 18064         | 18082         | 18055         | 18108         | 18108           | 18135           | 18135           | 18153           |
| CASE BUSHING                 | 22       | 17350         | 17403         | 17403         | 17458         | 17350         | 55585         | 55585           | 70185           | 73609           | 73609           |
| CASE ASSEMBLY                | 23       | 2026321       | 2026348       | 2026327       | 2026350       | 2026321       | 2026159       | 2026317         | 2026167         | 2026175         | 2026175         |
| UPPER ARM BOLT               | 24       | 2019376       | 2019378       | 2019378       | 2025973       | 2025973       | 2026055       | 2026055         | 2026055         | 2026057         | 2026057         |
| LOWER ARM BOLT               | 25       | 2019377       | 2019379       | 2019379       | 2025924       | 2025974       | 2026056       | 2026056         | 2026056         | 2026058         | 2026058         |
| HOOK LOCKING ASSEMBLY        | 26       | 100991        | 100982        | 100982        | 100982        | 100982        | 2021060       | 2021060         | 2021060         | 2021060         | 2021060         |
| SPRING                       | 27       | 2026322       | 2026328       | 2026328       | 2026160       | 2026160       | 2026160       | 2026160         | 2026168         | 2026176         | 2026176         |
| SPRING RETAINING RING        | 28       | —             | —             | —             | —             | 2030299       | 2026161       | 2026161         | 2026169         | 2026177         | 2026177         |
| RETAINING RING, BONNET       | 29       | 19401         | 19410         | 19410         | 2031171       | 2031171       | 2031170       | 2031170         | 2031172         | 2031173         | 2031173         |
| RETAINING RING, HOOK         | 30       | —             | —             | —             | —             | 2030300       | 2026163       | 2026163         | 2026171         | 2026179         | 2026174         |
| BONNET                       | 31       | 2026323       | 2026329       | 2026333       | 2026333       | 2026333       | 2026164       | 2026164         | 2026172         | 2026180         | 2026180         |
| HOOK WARNING KIT             | 32       | 2021680       | 2021680       | 2021680       | 2021680       | 2021681       | 2021681       | 2021681         | 2021681         | 2021681         | 2021681         |

\* Some items may be unavailable due to obsolescence.

\*\* 75 ton blocks produced before 1985 utilize a smaller hook assembly distinguishable by a 2.00" diameter rod hook bolt (Ref. 97) and requires the following replacement parts.

| Desc.                 | Stock No. |
|-----------------------|-----------|
| Upper Arm Bolt Assy.  | 2025952   |
| Lower Arm Bolt Assy.  | 2025953   |
| Rod Hook Latch Bolt   | 2025951   |
| Rod Hook Clevis Assy. | 226302    |
| Rod Hook Bolt Assy.   | 2025950   |

# Series 80 Disassembly Instructions

## Disassembly / Assembly Instructions for McKissick® 80 Series Tubing Blocks

On these pages are general disassembly and assembly instructions for all sizes of McKissick® 80 Series Tubing Blocks. The instructions outline the necessary disassembly and assembly required for thorough inspection, or replacement of internal parts.



### WARNING

- Failure to read, understand and follow these instructions may cause death or serious injury.
- Read and understand assembly or repair instructions before disassembly of hook assembly.

### Disassembly

See pages 27 & 28 for block drawing and parts list

Remove lower bolt assemblies (11) to separate the hook and case assembly from the upper block assembly.

#### Upper Block

1. Remove upper bolt assembly (12) and spreader.
2. Position upper block assembly on flat surface with sheave center pin assembly (05) vertical.
3. Remove all nuts, screws and bolt assemblies (12) attached to the block top plate (07).
4. Remove center pin star nut by removing locking cap screw, and unthreading.
5. Remove top side plate assembly (07).
6. Remove sheave assembly (01).
7. Continue alternately removing load plates and sheaves to completely disassemble block.

#### Hook and Case Assembly - Threaded Nut

- Secure hook assembly (15) so that shank is vertical with case on top.
- Remove hook nut key that is installed to retain hook to hook nut.
- Thoroughly clean debris out of drilled hole location of hook nut key with compressed air or solvent.
- Firmly tap with brass hammer around the outside surface of hook nut to loosen any threads damaged by the hook nut key.
- Remove the hook nut using a strap wrench if necessary (the threads are right handed). If the hook nut becomes difficult to remove (tightens up on the threads), it should be rotated back and forth, and firmly tapped on with a brass hammer until it loosens.
- Remove the hook thrust bearing (21) from the swivel case (23). Note the orientation of the races of the thrust bearing for proper re-assembly.

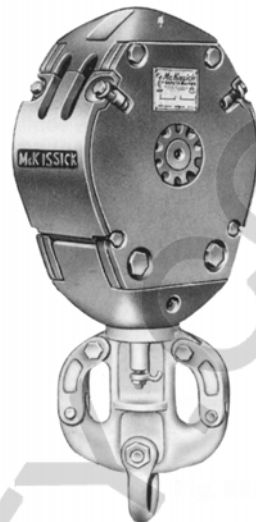


Figure 82 A

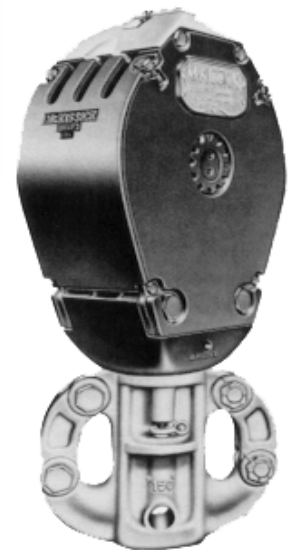


Figure 83

#### Hook and Case Assembly - Split Nut

- Secure hook assembly (15) so that shank is vertical with case on top.
- Remove tie wires and qty four hex cap screws from top of split nut cover.
- Remove set screw from top center of split nut cover.
- Thread one of the hex cap screws into center hole of split nut cover.
- Continue to tighten the screw to move the split nut cover.
- Remove split nut cover and split nut halves.
- Remove the hook thrust bearing (21) from the swivel case (23). Note the orientation of the races of the thrust bearing for proper re-assembly.

# Series 80 Assembly Instructions

## Assembly

### Upper Block

1. Install a star nut on one end of center pin (05).
2. Install side plate assembly (07) on center pin and place with center pin vertical and nut on flat horizontal surface.
3. Install one sheave assembly (01) including seals on center pin.
4. Install one center plate (06).
5. Continue alternately adding sheave and center plates until total block width is reached.
6. Install side plate assembly, and star nut on topside of plate. After centering and tightening the star nuts on the center pin, install nut lock screws. Note that the sheave bearings are non-adjustable type tapered roller bearings that require no specific adjustment. Therefore, to tighten the center pin, the star nuts are to be drawn tight and locked into place.
7. Rotate block to position with sheave center pin horizontal, and top of block up.
8. Install the spreader (upper casting) and upper bolt assembly (12).
9. Install both hinged guard assemblies and bolts.
10. Install all remaining nuts on bolt assemblies (except lower bolt assembly (12), and install lock screws, or stake in place securely.

### Hook and Case Assembly - Threaded Nut

- Secure hook (16) with lock mechanism installed, in vertical orientation with shank up.
- Install swivel case (23) over hook shank.
- Install case bushing (22) in swivel case (23).
- Install thrust bearing (21). When being assembled, the thrust bearing must have the race with the large bore against the case or the hook will not swivel properly. The small bore race must be against the hook nut. The race bores should be measured with micrometers or calipers, as there is only .016 inch difference between upper race, and lower race.
- Apply thread anti-seize and lubrication compound to threads of hook and hook nut before assembly.
- Install the hook nut with chamfered corner positioned towards end of hook shank.
- Adjust the nut to proper location on the hook shank to provide .031 to .062 inch clearance between bottom of case and hook shoulder.
- Install hook nut key in existing hole location of hook nut and shank, or cross-drill for new location at a distance no further than  $\frac{1}{4}$  of nut thickness from top of nut.
- Install hook grease seal (20) over the top of the nut, and into case bore. Lip of seal is to be facing out.
- Degrease top of nut and shank, and then apply silicon sealant to cover exposed thread interface and hook nut key holes.

- Attach hook and case assembly (15) to assembled upper block by installing lower bolt assemblies (11), then secure nuts with lock screws, or stake in place.
- Lubricate hook and sheave bearings.

### Hook and Case Assembly - Split Nut

- Measure hook case thickness. If dimension "A" is less than value shown in table, on page 26, case should be removed from service and replaced.
- Install case bushing (22) in swivel case (23).
- Secure hook (16) with lock mechanism installed, in vertical orientation with shank up.
- Install swivel case (23) over shank.
- Install thrust bearing (21). When being assembled, the thrust bearing must have the race with the large bore against the case or the hook will not swivel properly. The small bore race must be against the hook nut. The race bores should be measured with micrometers or calipers, as there is only .016 inch difference between upper race and lower race.
- Completely coat grooves of hook and hook split nut grease or heavy rust preventative.
- Install the split nut with drilled and tapped holes positioned up towards end of shank.
- Install split nut on shank, making sure that nuts fully engage shank.
- Add thin film of grease, or heavy rust preventative on the outside of the split nuts and inside of cap.
- Align four holes of cap with matching holes in hook and split nuts, then slide cap over split nuts. Install and seal quantity 4 long bolts & lock washers. Tighten bolts to the following values:
  - 50 Ton (11-15 Ft.-Lbs.)
  - 75 Ton (19-27 Ft.-Lbs.)
  - 100 Tons (47-65 Ft.-Lbs.)
  - 150 Ton (94-130 Ft.-Lbs.)Safety wire the bolts.
- Apply sealant, and install the set screw plug into center hole of cap.
- Install hook grease seal (20) over the top of the nut, and into case bore. Lip of seal is to be facing out.
- Attach hook and case assembly (15) to assembled upper block by installing lower bolt assemblies (11), then secure nuts with lock screws, or stake in place.
- Lubricate hook and sheave bearings.

# Series 80 Inspection Requirements

In accordance with API RP 8B, *Recommended Practice for Procedures for Inspections, Maintenance, Repair, and Remanufacture of Hoisting Equip*, it is recommended that the owner or user of the equipment develop his own schedule of inspections based on experience, manufacturer's recommendations, and consideration of one or more of the following factors: environment; load cycles; regulatory requirements; operating time; testing; repairs; and remanufacture.

Below please find the inspection category descriptions and recommended frequency for the critical load carrying components of the McKissick® 80 series tubing blocks. When equipment is subjected to severe conditions such as impact loading or low temperature service, a thorough inspection may be required at increased frequency.

## INSPECTION CATEGORIES

- Category I - Observation of equipment during operation for indications of inadequate performance.
- Category II - Category I inspection, plus further inspection for corrosion; deformation; loose or missing components; deterioration; proper lubrication; visible external cracks; and adjustment.
- Category III - Category II inspection, plus further inspection, which should include NDE of exposed critical areas and may involve some disassembly to access specific components and identify wear that exceeds allowable tolerances.
- Category IV - Category III inspection, plus further inspection, where the equipment is disassembled to the extent necessary to conduct NDE of all primary load-carrying components.

### Periodic Inspection and Frequencies Chart for 80 Series Tubing Block

| Inspection Item                                 | Table Number Reference | Daily | Weekly | Monthly | Semi-Annually | Annually | Other Frequency |
|---|------------------------|-------|--------|---------|---------------|----------|-----------------|
| Hook  | 80 - 1                 | I     | II     |         | III           |          | IV (5 years)    |
| Swivel Case                                     | 80 - 2                 | I     | II     |         |               |          | IV(5 years)     |
| Rod Hook Clevis                                 | 80 - 3                 | I     | II     |         | III           |          | IV (5 years)    |
| Hook Nut  | 80 - 4                 | I     | II     |         |               |          | IV(5 years)     |
| Rod Hook Bolt, Lower Bolt Assembly & Center Pin | 80 - 5                 | I     | II     |         |               |          | IV(5 years)     |
| Sheave Bearing                                  | 80 - 6                 | I     | II     |         |               |          | IV(5 years)     |
| Sheave  | 80 - 7                 | I     | II     |         |               |          | IV(5 years)     |
| Load Plate & Center Plate                       | 80 - 8                 | I     | II     |         |               |          | IV(5 years)     |
| Hook Thrust Bearing                             | 80 - 9                 | I     | II     |         |               |          | IV(5 years)     |
| Case Bushing                                    | 80 - 10                | I     |        |         |               |          | IV(5 years)     |



# Series 80 Inspection Requirements

## Series 80 Inspection and Acceptance Criteria

Refer to Figure 6 (Page 24) for location of wear areas requiring inspection as defined below. Unless otherwise noted, all areas are to be considered critical areas and require 100% inspection. For purposes of this inspection plan, indications detected by magnetic particle method with major dimensions greater than 1/16 inch and associated with a surface rupture are considered relevant. A linear indication is an indication in which the length is equal to or greater than three

times the width. A rounded indication is an indication that is circular or elliptical, with its length less than three times the width.

If you should have any questions regarding the inspection and acceptance criteria of the subject equipment, please contact our Technical Support staff at 1-800-777-1555.

### 80 - 1

| Component | Inspection Characteristic              | Inspection Method | Acceptance Criteria or Remedy  |
|-----------|--|-------------------|--|
| Hook      | Wear in body                           | Visual            | Remove from service, any hook with wear exceeding 5% of original dimensions. Refer to page 25 for original dimensions. |
|           | Defective locking mechanism            | Visual            | Replace with genuine Crosby McKissick® parts.  |
|           | Missing bolts or improper replacements | Visual            | Replace with genuine Crosby McKissick® parts.  |
|           | Corrosion in threads                   | Visual            | Remove from service, any hook which has threads corroded more than 20% of the nut engaged length.                      |
|           | Deformation                            | Visual            | Visible deformation is cause for removal from service.   |
|           | Cracks                                 | MPI               | Magnetic Particle Inspection per ASTM E 709. See Table 1 (Page 10) for acceptance criteria.                            |
|           | Wear at Shank (see page 28)            | Visual            | Remove scratches and gouges by buffing or light grinding to produce smooth bushing surface.                            |
|           | Corrosion in Grooves (split nut)       | Visual            | Remove from service, any hook which has grooves corroded more then 5% of each groove thickness.                        |

### 80 - 2

| Component   | Inspection Characteristic  | Inspection Method | Acceptance Criteria or Remedy   |
|-------------|----------------------------|-------------------|---|
| Swivel Case | Wear at case bolt location | Visual            | Remove from service, any case with wear exceeding 5% of original dimension. Refer to page 25 for original dimensions. |
|             | Deformation                | Visual            | Visible deformation is cause for removal from service.  |
|             | Cracks                     | MPI               | See Table 3 (below) for acceptance criteria.  |

### 80 - 3

| Component       | Inspection Characteristic              | Inspection Method | Acceptance Criteria or Remedy   |
|-----------------|--|-------------------|---|
| Rod Hook Clevis | Wear in body                           | Visual            | Remove from service, any clevis with wear exceeding 5% of original dimension. Refer to page 25 for original dimensions. |
|                 | Missing bolts or improper replacements | Visual            | Replace with genuine Crosby McKissick® parts.   |
|                 | Deformation                            | Visual            | Visible deformation is cause for removal from service.  |
|                 | Cracks                                 | MPI               | Magnetic Particle inspection per ASTM E 709. See Table 3 (below) for acceptance criteria.                               |

### ASTM E 125 Casting Acceptance Criteria:

| Type | Discontinuity Description | Maximum Permitted Degree |                   |
|------|---------------------------|--------------------------|-------------------|
|      |                           | Critical Area            | Non-Critical Area |
| 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          |



# Series 80 Inspection Requirements

## Tubing Block Inspection and Acceptance Criteria (cont'd)

### 80 - 4

| Component | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|-----------|---------------------------|-------------------|---|
| Hook Nut  | Corrosion                 | Visual            | Remove from service, any hook nut which has threads corroded more than 20% of the engaged length.   |
|           | Cracks                    | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>No relevant indications.</li> <li>No more than three indications in a line separated by less than 1/16" edge to edge.</li> <li>No linear indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.</li> </ul> |
|           | Missing nut lock device   | Visual            | Replace with genuine Crosby McKissick® parts.   |
|           | Wear                      | Visual            | See page 28   |

### 80 - 5

| Component                                       | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|---|---------------------------|-------------------|---|
| Rod Hook Bolt, Lower Bolt Assembly & Center Pin | Wear                      | Visual            | Reduction of the center pin diameter due to wear, scoring, etc. is cause for removal from service. 5% of original dimension wear allowable for other bolts. Refer to page 25 for original dimensions.   |
|   | Cracks                    | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>No relevant indications.</li> <li>No more than three indications in a line separated by less than 1/16" edge to edge.</li> <li>No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.</li> </ul> |
|   | Deformation               | Visual            | Visible deformation is cause for removal from service.  |

### 80-6

| Component      | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy  |
|----------------|---------------------------|-------------------|--|
| Sheave Bearing | Wear                      | Visual            | Removal from service, worn sheave bearings, detected by noticeable side play of sheave, or noticeable excessive wear of rollers or race when disassembled. |
|                | Corrosion                 | Visual            | Remove from service, any bearing with corrosion on rollers or race that cannot be removed with crocus cloth.   |
|                | Missing or damaged        | Visual            | Remove from service any bearing with displaced, missing, or damaged rollers.   |

### 80-7

| Component | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|-----------|---------------------------|-------------------|---|
| Sheave    | Groove Wear               | Dimensional       | Remove from service, any sheave with groove radius measurement that is outside allowable minimum and maximum dimension as defined by API RP 9B. See Table 4 on page 23.   |
|           | Cracks in web             | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>No relevant indications with a major dimension equal to or greater than 3/16".</li> <li>No more than ten indications in any continuous six square-inch area.</li> <li>No more than three indications in a line separated by less than 1/16" edge to edge.</li> <li>No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.</li> </ul> |
|           | Cracks in weld            | MPI               | Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> <li>No relevant indications.</li> <li>No rounded indications greater than 1/8". For weld 5/8" or less, and 3/16" for welds greater than 5/8".</li> <li>Surface porosity and exposed slag is not permitted on or within 1/8" of sealing surfaces.</li> </ul>  |

## Tubing Block Inspection and Acceptance Criteria (cont'd)

# Series 80 Inspection Requirements

## Groove Radius Dimensions per API RP 9B Tenth Edition

| Table 4                           |      |      |      |      |        |        |
|-----------------------------------|------|------|------|------|--------|--------|
| Wire Rope Nominal Diameter (inch) | 5/8" | 3/4" | 7/8" | 1"   | 1-1/8" | 1-1/4" |
| Groove Radius Minimum Worn (inch) | .320 | .384 | .448 | .513 | .577   | .641   |
| Groove Radius Maximum (inch)      | .344 | .413 | .481 | .550 | .619   | .688   |

### 80 - 8

| Component                            | Inspection Characteristic                | Inspection Method | Acceptance Criteria or Remedy  |
|--------------------------------------|--|-------------------|--|
| <b>Load Plate &amp; Center Plate</b> | Wear at bolt and center pin bearing area | Dimensional       | Remove from service, any plate with wear exceeding 5% of original dimension. Refer to page 25 for original dimensions.   |
|                                      | Cracks                                   | MPI               | Magnetic Particle Inspection per ASTM E 709.<br>Acceptance criteria: <ul style="list-style-type: none"> <li>No relevant indications with a major dimension equal to or greater than 3/16".</li> <li>No more than ten indications in any continuous six square-inch area.</li> <li>No more than three indications in line separated by less than 1/16" edge to edge.</li> <li>No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.</li> </ul> |
|                                      | Deformation                              | Visual            | Visible deformation is cause for removal from service.   |

### 80 - 9

| Component                  | Inspection Characteristic  | Inspection Method | Acceptance Criteria or Remedy  |
|----------------------------|----------------------------|-------------------|--|
| <b>Hook Thrust Bearing</b> | Wear                       | Visual            | Remove from service, any bearing with visible wear of roller elements and races.                             |
|                            | Missing or damaged rollers | Visual            | Remove from service, any bearing with displaced, missing, or damaged rollers.                                |
|                            | Corrosion                  | Visual            | Remove from service, any bearing with corrosion on rollers or race that cannot be removed with crocus cloth. |

### 80 - 10

| Component           | Inspection Characteristic | Inspection Method | Acceptance Criteria or Remedy   |
|---------------------|---------------------------|-------------------|---|
| <b>Case Bushing</b> | Wear                      | Dimensional       | Remove from service, case bushings with worn inside diameter exceeding the mating shank diameter by .03". |

# Series 80 Inspection Requirements

## McKissick® 80 Series Tubing Block Inspection Points

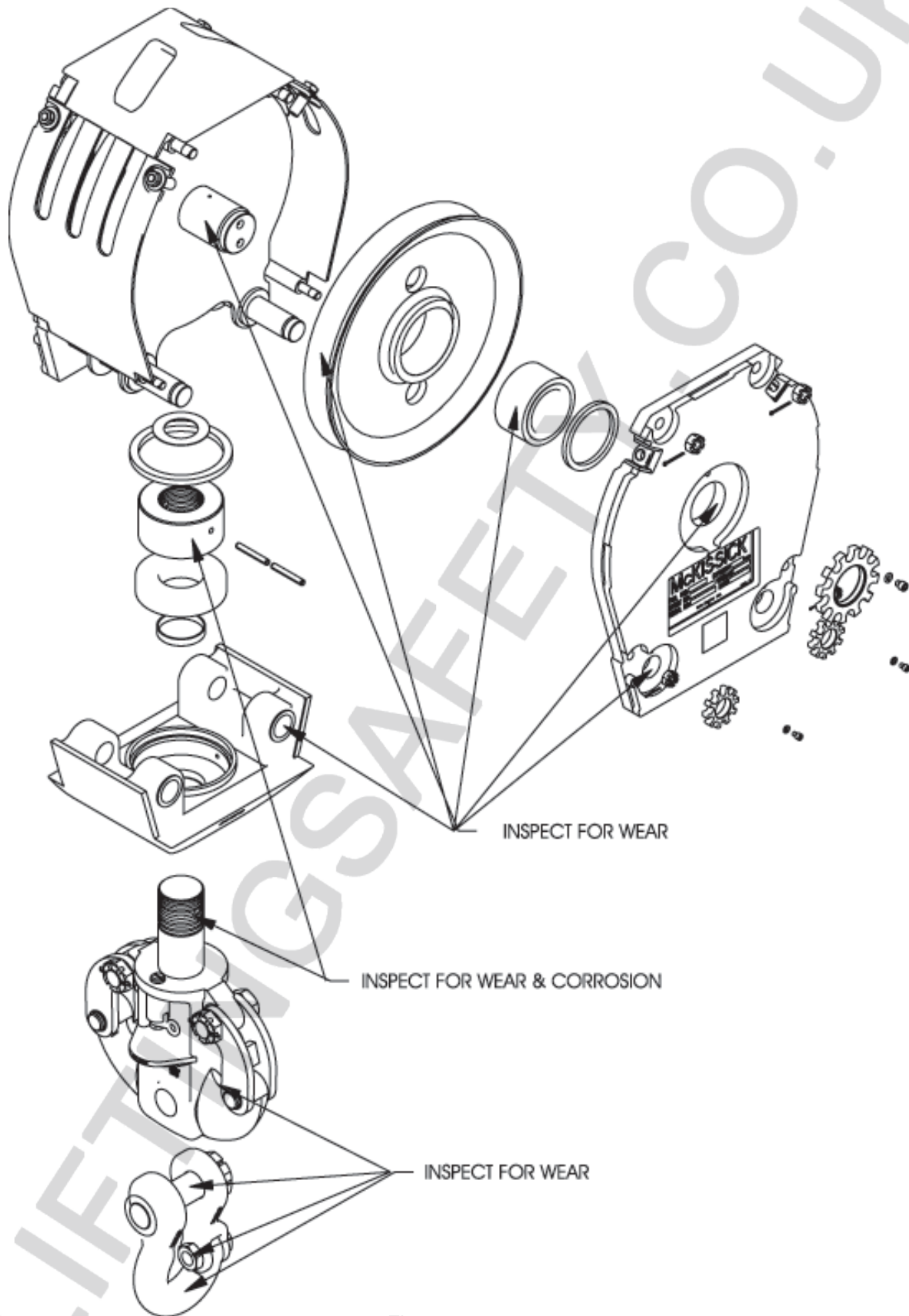
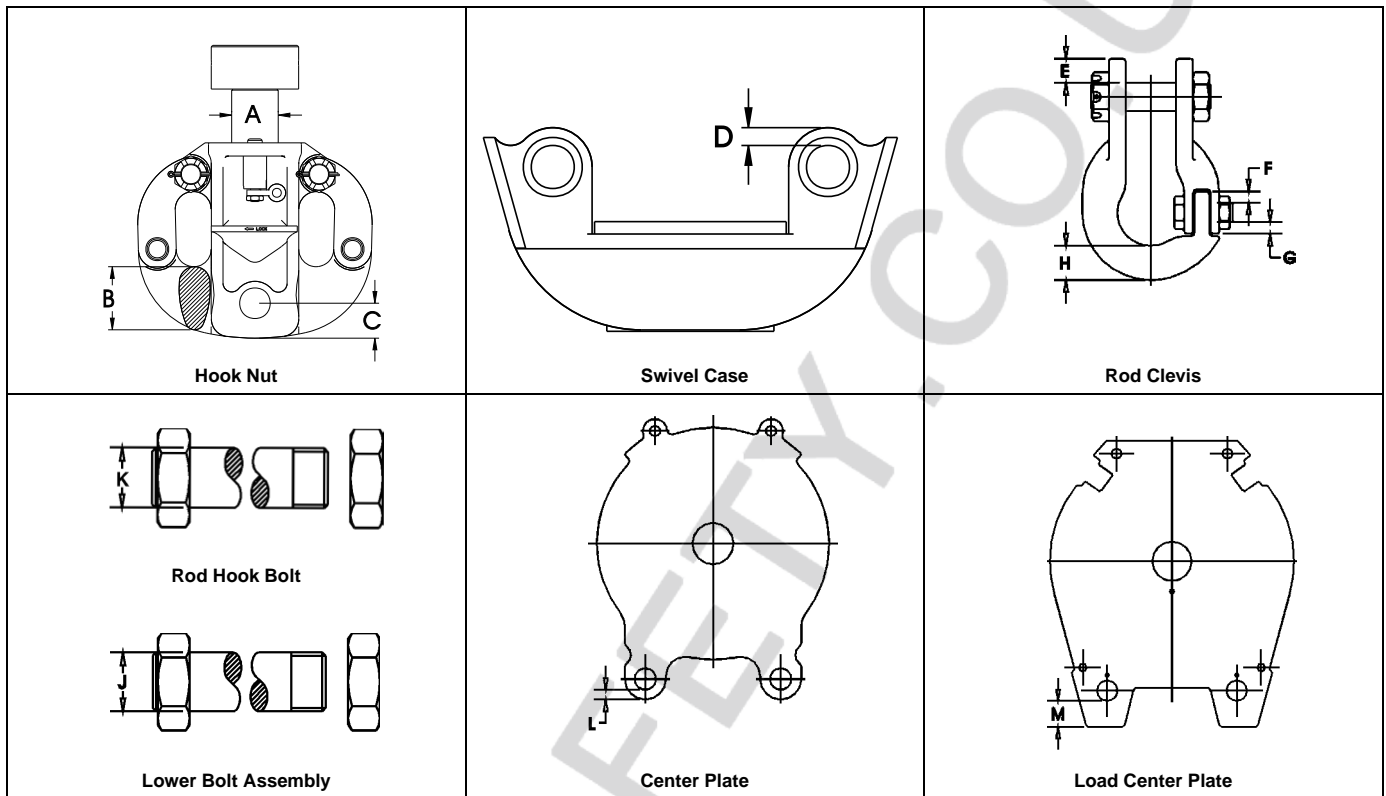


Figure 6

# Series 80 Inspection Requirements

## McKissick® 80 Series Tubing Block Original Reference Dimensions



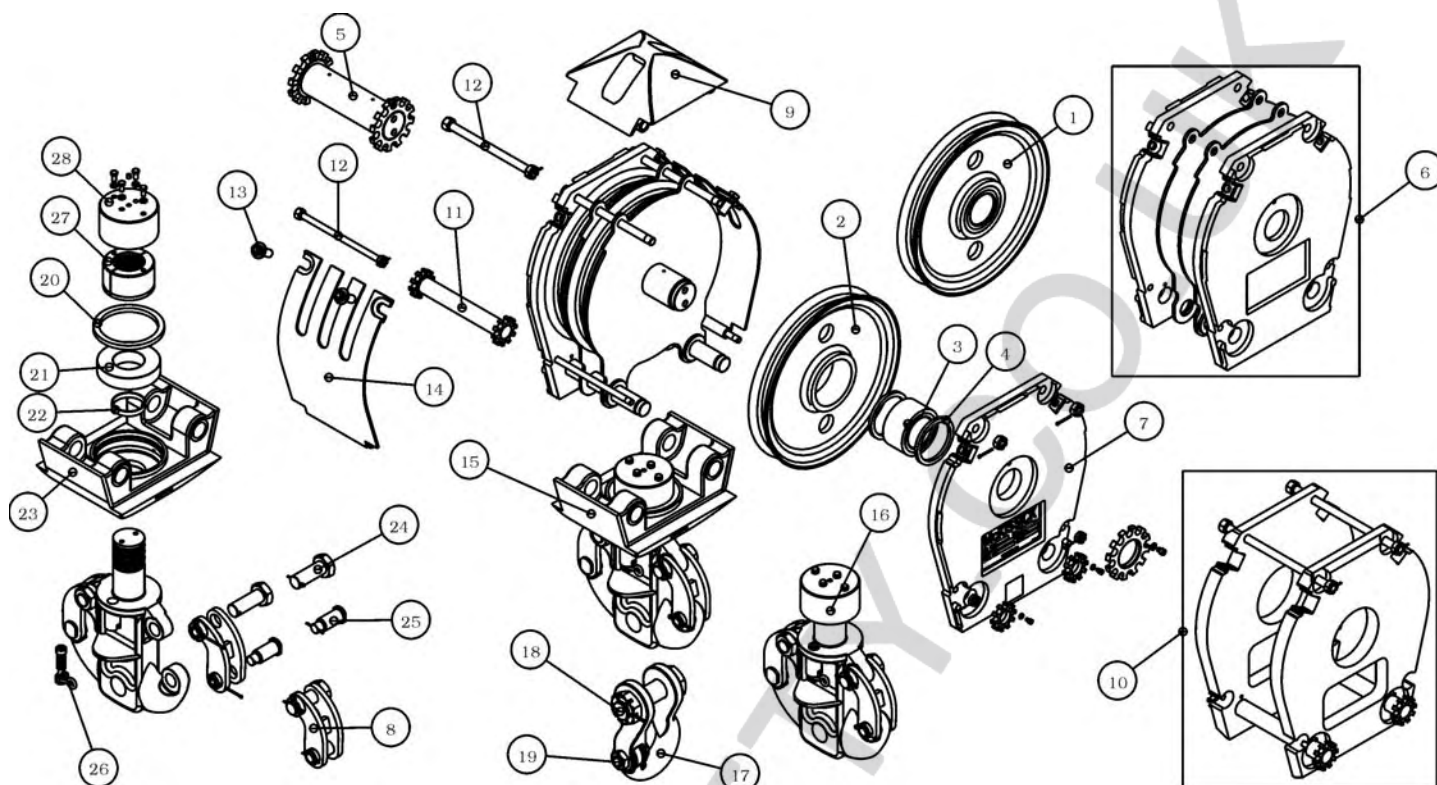
| Size   | A    | B    | C    | D    | E    | F    | G    | H    | J    | K    | L    | M    |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|
| 14" 82 | 2.00 | 3.15 | 1.25 | .66  | .72  | —    | —    | 1.25 | 1.00 | 1.00 | .48  | 1.16 |
| 14" 83 | 2.50 | 3.31 | .97  | .47  | .97  | .59  | .59  | 1.81 | 1.25 | 1.00 | .48  | 1.16 |
| 17" 82 | 2.50 | 3.31 | .97  | .59  | .97  | .59  | .59  | 1.81 | 1.25 | 1.25 | .97  | 1.84 |
| 17" 83 | 3.00 | 3.81 | 1.47 | .59  | 1.19 | .59  | .59  | 1.81 | 1.50 | 1.25 | .97  | 1.84 |
| 20" 82 | 3.00 | 3.81 | 1.47 | .72  | 1.19 | .59  | .59  | 1.81 | 1.50 | 1.25 | 1.09 | 1.84 |
| 20" 83 | 4.00 | 4.12 | 1.94 | .53  | 1.56 | .72  | .72  | 2.38 | 2.00 | 1.25 | 1.09 | 1.84 |
| 24" 82 | 4.00 | 4.12 | 1.94 | .91  | 1.56 | .72  | .72  | 2.38 | 2.00 | 2.12 | 1.03 | 2.84 |
| 24" 83 | 4.00 | 4.75 | 1.75 | .91  | 1.69 | .97  | .97  | 3.00 | 2.50 | 2.12 | 1.03 | 2.84 |
| 30" 82 | 4.00 | 4.75 | 1.75 | .91  | 1.69 | .97  | .97  | 3.00 | 2.50 | 2.12 | 1.41 | 2.78 |
| 30" 83 | 5.00 | 6.88 | 2.94 | 1.59 | 1.94 | 1.09 | 1.09 | 3.00 | 3.50 | 2.25 | 1.59 | 2.34 |
| 30" 84 | 5.00 | 6.88 | 2.94 | .91  | 1.94 | 1.09 | 1.09 | 3.00 | 3.50 | 2.12 | 1.28 | 2.97 |

# Series 80 Parts List

| DESCRIPTION                       | No. | 14"              | 14"              | 17"              | 17"              | 20"              | 20"              | 24"                | 24"                | 24"                | 30"                | 30"                |
|-----------------------------------|-----|------------------|------------------|------------------|------------------|------------------|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                                   |     | 82, 82A          | 83, 83A          | 82, 82A          | 83, 83A          | 82, 82A          | 83, 83A          | 82, 82A            | 83, 83A            | 84, 84A            | 83, 83A            | 84, 84A            |
| SHEAVE W/TAPERED BEARING          | 1   | 2026181<br>(5/8) | 2026181<br>(5/8) | 2026196<br>(3/4) | 2026196<br>(3/4) | 2025955<br>(7/8) | 2025955<br>(7/8) | 2025933<br>(1)     | 2025933<br>(1)     | 2025933<br>(1)     | 2026002<br>(1-1/8) | 2026035<br>(1-1/8) |
| SHEAVE W/TAPERED BEARING          | 1   | 2026113<br>(3/4) | 2026113<br>(3/4) | 2026023<br>(7/8) | 2026023<br>(7/8) | 2026103<br>(1)   | 2026103<br>(1)   | 2026109<br>(1-1/8) | 2026109<br>(1-1/8) | 2026109<br>(1-1/8) | 2026285<br>(1-1/4) | 2026303<br>(1-1/4) |
| SHEAVE ONLY                       | 2   | 2026182<br>(5/8) | 2026182<br>(5/8) | 2026197<br>(3/4) | 2026197<br>(3/4) | 2025956<br>(7/8) | 2025956<br>(7/8) | 2025931<br>(1)     | 2025931<br>(1)     | 2025931<br>(1)     | 2026003<br>(1-1/8) | 2026036<br>(1-1/8) |
| SHEAVE ONLY                       | 2   | 2026143<br>(3/4) | 2026143<br>(3/4) | 2026024<br>(7/8) | 2026024<br>(7/8) | 2026104<br>(1)   | 2026104<br>(1)   | 2026110<br>(1-1/8) | 2026110<br>(1-1/8) | 2026110<br>(1-1/8) | 2026286<br>(1-1/4) | 2026304<br>(1-1/4) |
| BEARING ASSY, SHEAVE (TB)         | 3   | 2017498          | 2017498          | 2017498          | 2017498          | 2017500          | 2017500          | 2017501            | 2017501            | 2017501            | 2017502            | 2017501            |
| SEAL KIT                          | 4   | 2026025          | 2026025          | 2026025          | 2026025          | 2025957          | 2025957          | 2025932            | 2025932            | 2025932            | 2026119            | 2025932            |
| PIN ASSY, CENTER (TB)             | 5   | 2026146          | 2026262          | 2026185          | 1401593          | 574346           | 574346           | 2025934            | 2025986            | 2026037            | 2026004            | 2026037            |
| PLATE ASSEMBLY, COMPLETE          | 6   | 2026147          | 2026263          | 2026186          | 2026027          | 2025978          | 2025978          | 2025935            | 2026987            | 2026047            | 2026005            | 2026038            |
| PLATE ASSEMBLY KIT                | 7   | 2026148          | 2026148          | 2026028          | 2026028          | 2025960          | 2025960          | 2025936            | 2026588            | 2026048            | 2026006            | 2026039            |
| BAIL ARM ASSEMBLY SET             | 8   | 2026149          | 2026182          | 2026187          | 2025961          | 2025937          | 2025937          | 2025937            | 2025989            | 2025989            | 2026007            | 2026007            |
| SPREADER                          | 9   | 2026150          | 2026264          | 2026188          | 2026029          | 2025979          | 2025979          | 2025938            | 2025990            | 2026040            | 2026008            | 2026040            |
| WEIGHT KIT                        | 10  | 2026203          | 2026287          | 2026206          | 2026030          | 2025980          | 2025980          | 115093             | 115100             | 2026049            | 2026009            | 2026041            |
| BOLT ASSEMBLY, LOWER (WEIGHTED)   | 11  | 2026204          | 2026288          | 2026207          | 2026031          | 2025981          | 2025981          | 2025940            | 2025992            | 2026042            | 2026010            | 2026042            |
| BOLT ASSEMBLY, LOWER (STANDARD)   | 11  | 2026151          | 2026265          | 2026189          | 2026216          | 2022156          | 2026218          | 2026105            | 2026220            | 2026296            | 2026231            | 2026296            |
| BOLT SET-GUARD & UPPER (WEIGHTED) | 12  | 2026205          | 2026289          | 2026208          | 2026032          | 2025982          | 2025982          | 2025941            | 2025993            | 2026043            | 2026011            | 2026043            |
| BOLT SET-GUARD & UPPER (STANDARD) | 12  | 2026152          | 2026267          | 2026190          | 2026217          | 2026102          | 2026219          | 2026106            | 2026221            | 2026297            | 2026232            | 2026297            |
| GUARD LOCK BOLT KIT               | 13  | 2022142          | 2022143          | 2025942          | 2025942          | 2025942          | 2025942          | 2025942            | 2025942            | 2025942            | 2026012            | 2026012            |
| GUARD PLATE SET                   | 14  | 2026153          | 2026268          | 2026191          | 2026053          | 2025983          | 2025983          | 2025943            | 2026052            | 2026054            | 2026013            | 2026044            |
| HOOK ASSEMBLY                     | 15  | 2026154          | 2026270          | 2026192          | 2026033          | 2025984          | 2025984          | 2025948            | 2025994            | 2026050            | 2026014            | 2026045            |
| HOOK WITH NUT ASSEMBLY            | 16  | 131173           | 131182           | 131182           | 131191           | 131333           | 131333           | 131333             | 131351             | 131351             | 131388             | 131388             |
| ROD HOOK CLEVIS                   | 17  | 105585           | 2026211          | 2026211          | 2025968          | 226302           | 226302           | 226302             | 2025996            | 2025996            | 2026016            | 2026016            |
| ROD HOOK CLEVIS BOLT              | 18  | 2002727          | 2026212          | 2026212          | 2025969          | 2025950          | 2025950          | 2025950            | 2025997            | 2025997            | 2026017            | 2026017            |
| ROD HOOK LATCH BOLT               | 19  | —                | 2026213          | 2026213          | 2025970          | 2025951          | 2025951          | 2025951            | 2025998            | 2025998            | 2026018            | 2026018            |
| SEAL (HOOK)                       | 20  | 19955            | 19704            | 19704            | 19722            | 19722            | 19919            | 19919              | 19875              | 19875              | 19624              | 19624              |
| THRUST BEARING, HOOK              | 21  | 18046            | 18055            | 18055            | 18064            | 18082            | 18082            | 18082              | 18091              | 18091              | 18117              | 18117              |
| CASE BUSHING                      | 22  | 17305            | 17350            | 17350            | 17403            | 17458            | 17458            | 17458              | 17458              | 17458              | 55585              | 55585              |
| CASE ASSEMBLY                     | 23  | 2026157          | 2026273          | 2026195          | 2026034          | 2025985          | 2025985          | 2025946            | 2025999            | 2026051            | 2026020            | 2026046            |
| UPPER ARM BOLT                    | 24  | 2019376          | 2019378          | 2019378          | 2025973          | 2025952          | 2025952          | 2025952            | 2026055            | 2026055            | 2026057            | 2026057            |
| LOWER ARM BOLT                    | 25  | 2019377          | 2019379          | 2019379          | 2025974          | 2025953          | 2025953          | 2025953            | 2026056            | 2026056            | 2026058            | 2026058            |
| HOOK LOCKING ASSEMBLY             | 26  | 100991           | 100982           | 100982           | 100982           | 2021060          | 2021060          | 2021060            | 2021060            | 2021060            | 100982             | 2021060            |
| SPLIT NUT ASSEMBLY                | 27  | —                | —                | —                | 2021560          | 2021557          | 2021557          | 2021557            | 2021551            | 2021551            | 2021554            | 2021554            |
| SPLIT NUT COVER                   | 28  | —                | —                | —                | 2025976          | 2025954          | 2025954          | 2025954            | 2026001            | 2026001            | 2026022            | 2026022            |
| HOOK WARNING KIT                  | 29  | 2021680          | 2021680          | 2021680          | 2021680          | 2021681          | 2021681          | 2021681            | 2021681            | 2021681            | 2021681            | 2021681            |

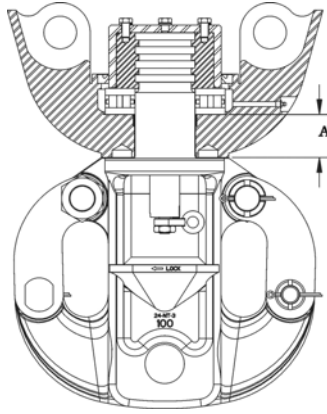


# Series 80 Part List



| Ref. No. | Description                     | Ref. No. | Description            |
|----------|---------------------------------|----------|------------------------|
| 01       | Sheave with Timken Bearing      | 16       | Hook with Nut Assy.    |
| 02       | Sheave Only                     | 17       | Rod Hook Clevis        |
| 03       | Bearing Assy. Sheave (TB)       | 18       | Rod Hook Clevis Bolt   |
| 04       | Seal Kit                        | 19       | Rod Hook Latch Bolt    |
| 05       | Pin Assy. Center (TB)           | 20       | Follower               |
| 06       | Plate Assy. Complete            | 21       | Thrust Bearing, Hook   |
| 07       | Plate Assy. Kit                 | 22       | Case Bushing           |
| 08       | Bail Arm Assy. Set              | 23       | Case Assy.             |
| 09       | Spreader                        | 24       | Upper Arm Bolt         |
| 10       | Weight Kit                      | 25       | Lower Arm Bolt         |
| 11       | Bolt Assy, Lower                | 26       | Hook Locking Assembly  |
| 11       | Bolt Assy, Lower - Weighted     | 27       | Spring                 |
| 12       | Bolt Set Guard & Upper          | 28       | Spring Retaining Ring  |
| 12       | Bolt Set Guard & Upper Weighted | 29       | Retaining Ring, Bonnet |
| 13       | Guard Lock Bolt Kit             | 30       | Retaining Ring, Hook   |
| 14       | Guard plate Set                 | 31       | Bonnet                 |
| 15       | Hook Assy.                      | 32       | Hook Warning Kit       |

## Minimum Case Thickness



| Block Series (in.) | API Working Load Limit (Tons) | Minimum "A" Dimension |
|--------------------|-------------------------------|-----------------------|
| 17" 83 / 20" 82    | 50                            | 1.82                  |
| 20" 83 / 24" 82    | 75                            | 1.94                  |
| 24" 83 / 24"       | 100                           | 2.82                  |
| 30" 83/ 30"        | 150                           | 2.44                  |

## Hook Shank and Split Nut Inspection

### Removal of split nut assembly (Reference Figure A):

- Remove vinyl cover.
- Remove spring retaining ring.
- Slide steel keeper ring off split nuts **CAUTION:** Removal of keeper ring will allow split nut halves to fall from hook shank).
- Remove split nut halves.

### Inspection of split nut assembly and hook shank interface area (Reference Figure B):

- Inspect hook shank and split nut for signs of deformation on and adjacent to the load bearing surfaces.
- Inspect outside corner of hook shank load bearing surface to verify the corner is sharp.
- Verify retaining ring groove will allow proper seating of the retaining ring.
- Inspect retaining ring for corrosion or deformation. Remove from service any retaining ring that has excessive corrosion or is deformed.
- Use fine grit emery or crocus cloth to remove any corrosion from machined hook shank and split nut assembly.
- Follow inspection recommendations listed in this document under IMPORTANT SAFETY INFORMATION.
- If corrosion is present on the nut / shank interface area and deterioration or degradation of the metal components is evident, further inspection is required.
  - The use of a feeler gauge is required to properly measure the maximum allowable gap width between the split nut inside diameters and shank outside diameters.
  - With one split nut half seated against the hook shank, push the nut to one side and measure the maximum gaps as shown in Figure B. The hook should be measured in four places, 90-degrees apart.
  - Repeat above inspection procedure with other half of split nut.

Remove from service any hook and split nut assembly that exhibits a gap greater than 0.030".

### Installation of split nut assembly (Reference Figure A):

- Coat hook shank and inside of split nut with an anti-seize compound or heavy grease.
- Install split nut halves onto shank. The flanged bottom of the split nut should be closest to the hook shoulder.
- Slide steel keeper ring over split nut halves. Verify the split nut halves properly seat against the load bearing surface of the hook shank and the steel keeper ring seats against the flange of the split nut.

- Install retaining ring onto split nut halves. Verify the retaining ring seats properly in the retaining ring groove on the outside diameter of the split nut assembly.
- Install vinyl cover over split nut and hook shank assembly.
- Verify all fasteners are correctly installed.
- Always use Genuine Crosby replacement parts.

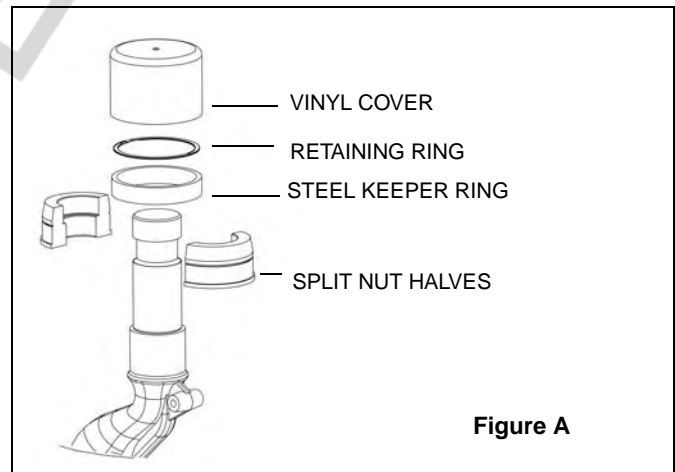


Figure A

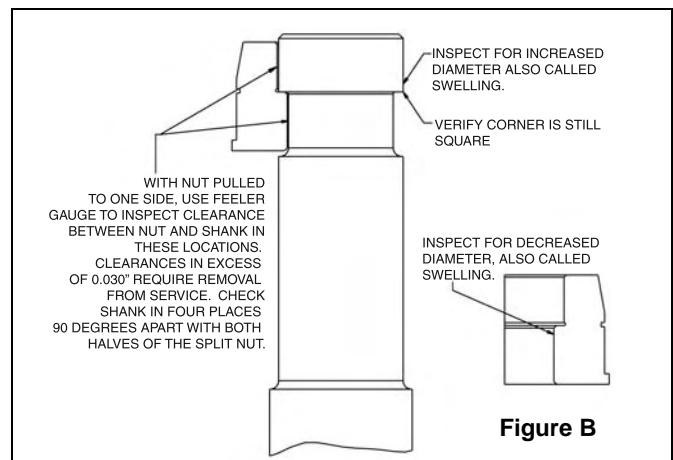


Figure B

## Maintenance Alert

### McKissick® 14” through 24” Oilfield Tubing Blocks

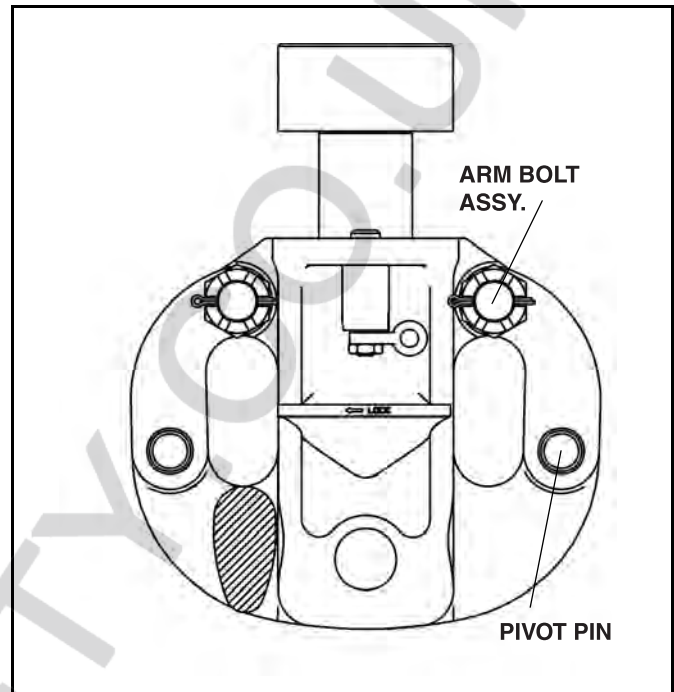
The Crosby Group, Inc. is aware of improper use and maintenance of McKissick® 14” through 24” Tubing Blocks. Some crew members are removing the hook latch **pivot pin**, to load the links. Repeated removal and installation of the pivot pin retaining rings may damage the rings and prevent proper seating in pin grooves.

The hook latch assembly consists of a lower **pivot pin** and an upper **arm bolt assembly**. The lower pivot pin assembly consists of a pin with grooves at each end and two retaining rings. The upper arm bolt assembly consists of a bolt, castellated nut, and cotter pin. This design allows the latch to pivot open after the arm bolt is removed. Repeated removal and re-installation of the pivot pin retaining ring is not recommended.

- Crosby recommends at your next frequent inspection to visually inspect the pivot pin retaining rings for damage and verify they are securely seated in pin grooves.
- Proper installation of an undamaged genuine Crosby retaining ring is the responsibility of the end user.
- Damaged retaining rings or rings not properly seated and secured, may allow the pivot pin to disengage and fall to the rig floor during operation.
- Use only genuine Crosby replacement parts.
- A falling pin may cause serious injury or death.

To accommodate end users who prefer removing the lower bolt the latch on the upper arm bolt assembly, Crosby offers a lower bolt assembly with a castellated nut and cotter pin to replace the lower pivot pin.

If you should have any questions regarding this Maintenance Alert, please contact our Technical Support staff at 1-800-777-1555.



HOOK



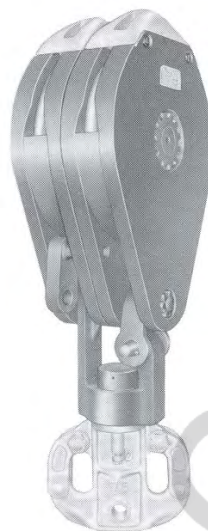
# Maintenance Alert



**Series 80 Standard Tubing Blocks**



**Series 90 Standard Tubing Blocks**



**Series 21 and 31 Double & Triple Dividing Standard Tubing Blocks**

The Crosby Group, Inc. is aware of instances where blocks have been improperly maintained. The above listed blocks, if improperly maintained may result in severe corrosion of the threads that connect the hook shank to the round nut.

If, by inspection, it is found that the threads are badly deformed and/or corroded, and the sum of the effected thread length exceeds 20% of the total length, the block should be removed from service. If you should have any questions regarding this inspection procedure, call 1-800-777-1555.

Reassembly of inspected parts, or replacement parts, should incorporate the use of a thread sealing compound applied to the threads of the hook shank and the round nut.

**Recommended Thread Sealants:**

- TFE - Thread Sealer #C-648F (Mfg. Fel-Pro, Inc.; Skokie, IL)
- Never-Seez (Mfg. never-Seez Corp.)

To complete the assembly, a rubber gasket ring cap (Buna-N material 1/16" thick) that covers the threaded joint should be applied to the top surface of the nut/hook shank.

(The rubber gasket ring cap may be purchased from Crosby / McKissick®.)



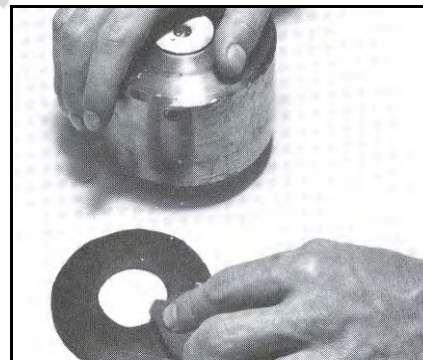
**Figure 1**



**Figure 2**

In preparation for applying the rubber cap, clean the top surface of the nut/hook shank and one side of the rubber cap with a degreasing solvent (See figures 1 and 2).

Apply a silicone rubber sealant (Mfg. - General Electric or Dow Corning) to the cleaned side of the rubber cap.



**Figure 3**

Cover entire surface with about 1/16" thickness of sealant.

Apply rubber cap to the top surface of the nut/hook shank. Press rubber cap downward causing sealant to flow inward and outward from rubber cap edge. Wipe away excess creating a fillet around each edge (See Figure 3).

Then, with degreasing solvent, clean either end of spring pin that has been inserted through the round nut and shank. Apply silicone sealant to the ends of the spring pin.

Subsequent annual inspections should be made in accordance with intervals established by OSHA or API.

# Maintenance Alert

The Crosby Group, Inc. has recently been made aware of conditions of inadequate maintenance, inspection, and unauthorized modification of McKissick® oilfield tubing blocks.

The Crosby Group, Inc. does not recommend the use of equipment that has been modified or repaired beyond the given allowables, and recommends the use of only genuine Crosby® McKissick® replacement parts. Age, severity of service and obsolescence of design may preclude repair, and should result in block assembly being removed from service.

As defined in API RP8B and AESC (formerly AOSC) Recommended Safe Procedures and Guidelines for Oil and Gas Well Servicing, maintenance and inspection must be performed on sheave blocks to ensure they are in proper working condition. Visual and magnetic particle inspection must be performed on all primary load carrying components to detect service related defects such as wear and fatigue cracks. Fatigue cracks left undetected will progress to ultimate component failure at load less than the predicted ultimate load of the block due to reduced cross section of the material at crack location. The Crosby Group warnings has general guidelines for inspection and removal from service criteria for tackle blocks and can be found in the Crosby general catalog.

For McKissick® tubing maintenance, refer to sections of Tackle Block Maintenance and/or Fitting Maintenance sections of Tackle Block Warning, Use and Maintenance Information located in the latest edition of Crosby's general catalog. Other guidelines for inspection and maintenance can be found in API RP8B and RP9B, in addition to AESC (formerly AOSC) Recommended Safe Procedures and Guidelines for Oil and Gas Well Servicing.

Inspection of primary load carrying components, as shown in this document, must be performed in addition to the above requirements. Frequency of the inspection should be based on the environment, load cycles, and operation time. Annual inspection is recommended. However, the maximum inspection interval should not exceed five (5) years. Shown below are representative blocks covered by this inspection plan.

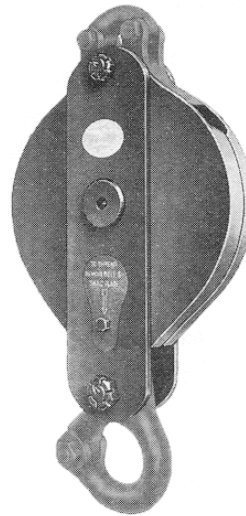
If you should have any question regarding this Maintenance Alert or the inspection and acceptance criteria of the subject equipment, please contact our Technical Support staff at 1-800-777-1555.



20 Series Double Dividing  
30 Series Triple Dividing



70 Series Spring Loaded  
80 Series Duplex Hooks  
90 Series Auto Latching



100 Series



120 Series



## Glossary of Terms for Testing and Third Party Certification

### **American Bureau of Shipping - (ABS)**

American Bureau of Shipping is a third party certification agency. ABS publishes several guidelines for various lifting applications. Some of the most common "lifting" guidelines include the following.

- *Guide for Certification of Cranes*
- *Requirements for Certification of Construction and Survey of Cargo Gear on Merchant Vessels*
- *Guide for the Certification of Drilling Systems*

(This is not intended to be a complete list of guidelines published by ABS.)

A common request is for ABS third party witness of proof test and magnetic particle inspection after proof test.

Depending on the type of certification, requirements may include design review, materials testing, nondestructive testing, proof load and special packaging.

**When specifying ABS certification, it is necessary to know to which guideline the product is to be certified (i.e., Guide for Certification of Cranes, etc.).**

### **Det Norske Veritas - (DNV)**

Det Norske Veritas is an independent foundation established in 1864 for safeguarding life, property and the environment. Along with inspection and advisory services, DNV provides the following three types of certification services.

Classification - Certification based on DNV Rules or Certification Notes.

Statutory Certification - Certification under authority granted by National Authorities (i.e., NPDP, UK-HSE, Canada, Australia, etc.) according to acts, regulations, statutory instruments given by Statutory Authorities.

Conformity Certification - Certification to client specifications, National Standards or recognized codes. Some of the most common DNV certification rules for lifting are:

- *Rules for Certification of Lifting Appliances*
- *Certification Notes No. 2.7-1 Offshore Containers*
- *Rules for Classification of Mobile Offshore Units Part 6, Chapter 5.*

(This is not intended to be a complete list of DNV Rules.)

Lifting products may require design review, materials testing, nondestructive testing, DNV issued Proof Test Certificate (CG3) and DNV issued Certificate of Conformity (C of C).

Type approved products with a Manufacturer's Survey Agreement (MSA), require all the above except: Design Review, DNV issued Proof Test Certificate (CG3) and DNV issued Certificate of Conformity (C of C). For products certified to 2.7-1 Specification (Off-shore Containers), DNV witnesses proof test and issues their Proof Test Certificate (CG3) and Certificate of Conformity (C of C) to the distributor responsible for building the container set. It is the distributor's responsibility and cost to contact DNV.

**When specifying DNV certification, always specify one of the three types of services, and if it is a DNV Rule, which Rule is applicable (i.e., Rules for Certification of Lifting Appliances, etc.).**

### **American Petroleum Institute - (API)**

Established in 1919, API writes specifications that are published as aids for the procurement of standardized equipment and materials, as well as instructions to manufacturers of equipment or materials covered by an API specification. Some of the common specifications written by API for "Lifting" are:

- *Specification for Drilling and Production Hoisting Equipment (API Spec 8A)*
- *Specification for Drilling and Production Hoisting Equipment (API Spec 8C)*
- *Specification for Offshore Cranes (API Spec 2C)*
- *Specification for Wire Rope (API 9 Spec A)*
- *Specification for Quality Programs (API Spec Q1)*

A standard to which a manufacturer's quality system must comply in order to state that products are manufactured to API requirements, resulting in permission to apply the API monogram.

**When specifying API, it is necessary to know to which API Specifications the product is to be certified (i.e., Specification for Drilling and Production Hoisting Equipment (API Spec 8A), etc.).**

### **Lloyd's Register of Shipping**

A society established in 1760 and recognized under UK laws and to provide third party assurance of compliance to plans, specifications, rules, codes and fitness of use by approving designs, surveys and reports. Lloyd's Register acts on behalf of clients and governments to verify products conform to statutory requirements and provides inspection and advisory services to clients.

Some of the most commonly used Lloyd's Register certification types include the following.

- *Code for Lifting Appliances in a Marine Environment*
- *Rules and Regulations for the Classification of Ships*
- *Rules and Regulations for the Classification of Mobile Offshore Units*
- *Container Certification Scheme*

# Glossary of Terms for Testing and Third Party Certification

Cont'd

A common request is for Lloyd's Register Witness Proof Test and Magnetic Particle Inspection with Certification. However, certification may require design review, material tests or product verification to statutory or customer requirements.

**When specifying Lloyd's Register of Shipping certification, know the code, standard, statute or customer requirement (i.e., Code for Lifting Appliances in a Marine Environment, etc.).**

## Federal Specifications & Military Standards

The Federal Specifications & Military Standards' documents specify dimensional, performance and test requirements for products. Some specifications define particular testing that is not normally performed on standard items. Crosby products, when identified in the latest Crosby General Catalog, will meet the requirements when tested by the party awarded the government contract. Certification is usually covered by a Crosby Standard Certificate of Conformance.

## ISO 9001

A standard defining a manufacturer's or service organization's Quality Management System requiring third party certification. ISO 9001, the most comprehensive ISO certification level, involves the design, development, production and shipping of products. ISO 9001 requires that all procedures, work instructions, processes and additional activities be documented.

Attainment of ISO 9001 forms the basis for meeting other world standards and provides customers with documented proof of Crosby's ability to consistently provide product quality and performance.

## National Association of Chain Manufacturers (NACM)

A U.S. Standard specifying dimensional and performance criteria for graded chain.

## American Society for Testing and Materials (ASTM)

American Society for Testing and Materials, established in 1898, is the largest voluntary standards development system in the world. ASTM Standards cover:

**Inspection Methods** (Certificates Required) — i.e., Magnetic Particle, Ultrasonic, Dye Penetrant, X-Ray, Hardness, etc.

**Processes** (Standard Certificate of Conformance) — i.e., Hot Dip Galvanizing, Electroplate, Mechanical Galvanizing, etc.

**Material Properties** (Tensile Test Report Required) — i.e., Specification for Steel Forging, Carbon and Alloy for General Industrial Use (A668), Specification for Steel, Closed-Impression Die Forgings for General Industrial Use (A521), etc.

**Material Test Methods** — Covers Tensile and Charpy impact test specimens and test methods. i.e., Test Methods of Tension Testing of Metallic Materials (E8), A370 Test Methods and Definitions for Mechanical Testing of Steel Products (A370), etc.

## American National Standards Institute (ANSI)

American National Standards Institute established in 1916 develops product specific performance standards for items such as cranes, hooks, slings, screw threads, etc., usually covered with a standard Certificate of Conformance.

### **Crosby Standard Testing Upon Request**

\***Crosby Proof Test with Third Party Witness** — Receive load test certification signed, documented and serial number traceable to these agencies: ABS, DNV, Lloyd's, B.V., RINA, Germanischer Lloyd, etc.

\***Crosby Proof Test with I.L.O. Certificates** — Standard load test performed and documented on International Labor Organization Form 4 (I.L.O. Form 4). Certified and traceable by serial number. The certificates are maintained at Crosby.

**Crosby Standard Certificate of Conformance** — Part number, description, date and statement of conformity to Crosby literature available at time of manufacture.

\***Crosby Magnetic Particle Inspection with Certification** — ASTM E-709 wet or dry method standard at Crosby. Customer can require other types. Certified and traceable to serial number.

\***Crosby Ultrasonic Inspection with Certification** — ASTM A-609 for castings, ASTM A-388 for forging standard at Crosby. Customer can require other types. Certified and traceable to serial number.

\***Crosby X-Ray with Certification** — Customer provides x-ray technique and level of acceptance.

\***Crosby Dye Penetrant Inspection with Certification** — A liquid penetrant examination to ASTM E-165. Other types of Dye Penetrant certification is available at time of order. Certified and traceable to serial number.

\***Crosby Material Tensile Test with Certification** — Tensile test performed per ASTM A370. Test report documents Tensile strength, Yield Strength, Elongation, and Reduction of Area.

**Crosby Material Chemical with Certification** — Chemical certification provided by steel mill or foundry Traceable to heat number, heat letters and PIC code.

\***Crosby Charpy Impact Test with Certification** — Impact Test per ASTM A370 or ASTM E8 at temperature, location, and energy absorbed requirement as defined by customer or applicable specification.

\*A charge will be applied. Crosby certification is available when requested at time of order.

The items listed above are for standard certification. Additional certification is available and must be requested at time of order.



*Your Total Block Company.*

**the Crosby** group,  
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