

McKissick[®] Oilfield Servicing Equipment

70 & 80 Series Tubing Blocks



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



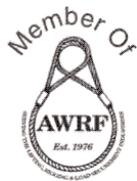
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General Cautions and Warnings

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

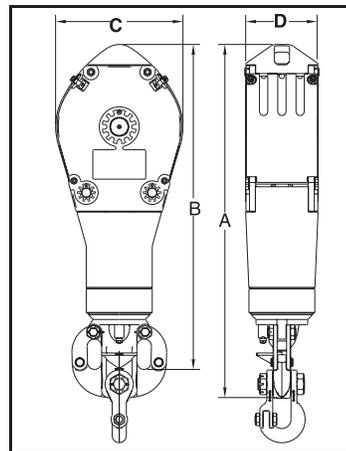
- Spring loaded duplex hook assuring ample travel for efficient tubing operations. No load carrying threads.
- Exclusive E-Z* opening guards, no bolts to pull out and lose. Feature gives fastest possible exposure of sheave cluster for quick reeving.
- Extremely short overall length, extra weight, and 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

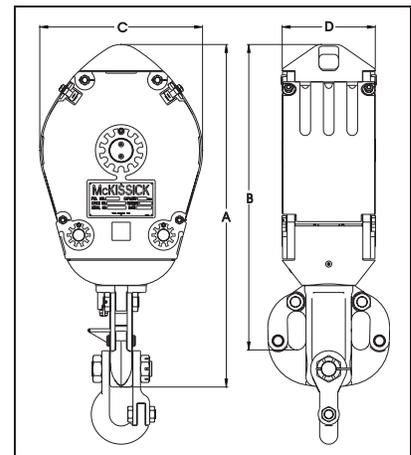
- Exclusive E-Z* opening guards, no bolts to pull out and lose. Feature gives fastest possible exposure of sheave cluster for quick reeving.
- Extremely short overall length, extra weight, and excellent balance for fast non-wobbling falls.
- Extra large sealed sheave bearing diameters for fully rated 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

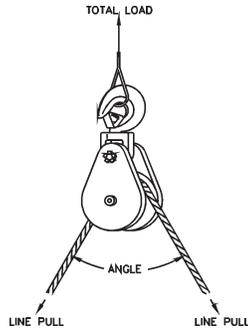
Fig. No.	Sheave Size (in.)	No. of Sheaves	Recommended Wire Rope Size (in.)	API Working Load (Tons)	Rod Hook Clevis Working Load Limit (lbs.)	Weight (lbs.)		Center Pin Diameter (in.)	Dimensions (in.)				
						Standard	Weighted		A	B	C	D Std.	D Wtd.
82	14	2	5/8 - 3/4	25	7,000	450	635	2-3/4	34-7/16	30-13/16	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 Bronze Bushed Sheaves	Ratio B Anti-Friction Bearing Sheaves	Number of 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.

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

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.

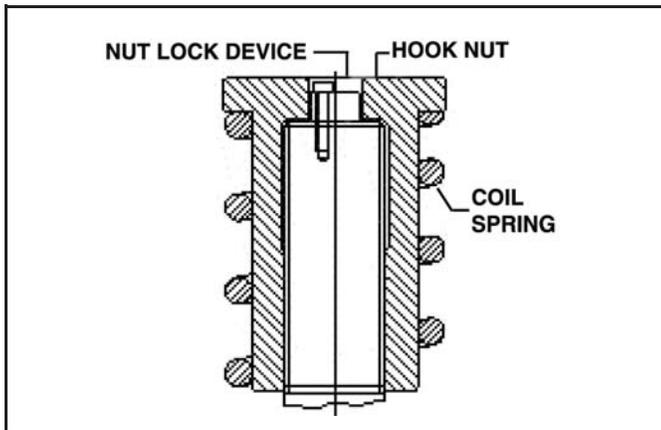


Figure 1

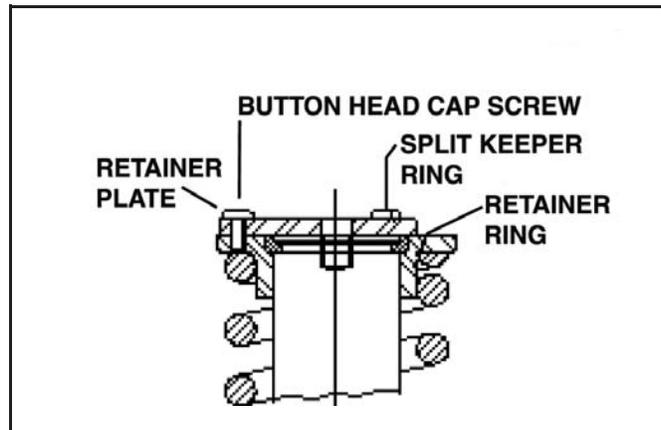


Figure 2

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.

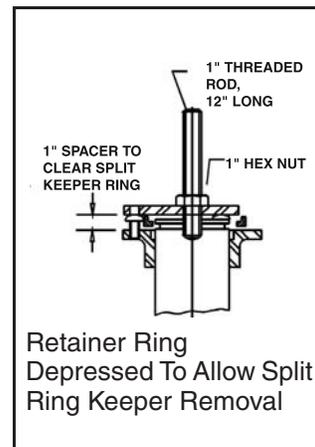


Figure 3

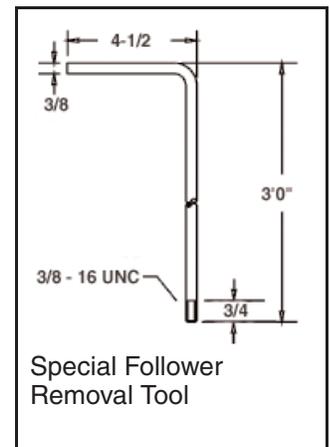


Figure 4

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
Hook Nut, Follower, Retainer Ring & Split Keeper Ring	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"> • No relevant indications. • No more than three indications in a line separated by less than 1/16" edge to edge. • No linear indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.
	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
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 14 for original dimensions.
	Cracks	MPI	Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> • No relevant indications. • No more than three indications in a line separated by less than 1/16" edge to edge. • No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.
	Deformation	Visual	Visible deformation is cause for removal from service.

70 - 6

Component	Inspection Characteristic	Inspection Method	Acceptance Criteria or Remedy
Sheave Bearing	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"> No relevant indications with a major dimension equal to or greater than 3/16". No more than ten indications in any continuous six square-inch area. No more than three indications in a line separated by less than 1/16" edge to edge. No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.
	Cracks in weld	MPI	Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> No relevant indications. No rounded indications greater than 1/8". For weld 5/8" or less, and 3/16" for welds greater than 5/8". Surface porosity and exposed slag is not permitted on or within 1/8" of sealing surfaces.

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"> No relevant indications with a major dimension equal to or greater than 3/16". No more than ten indications in any continuous six square-inch area. No more than three indications in line separated by less than 1/16" edge to edge. No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.
	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)

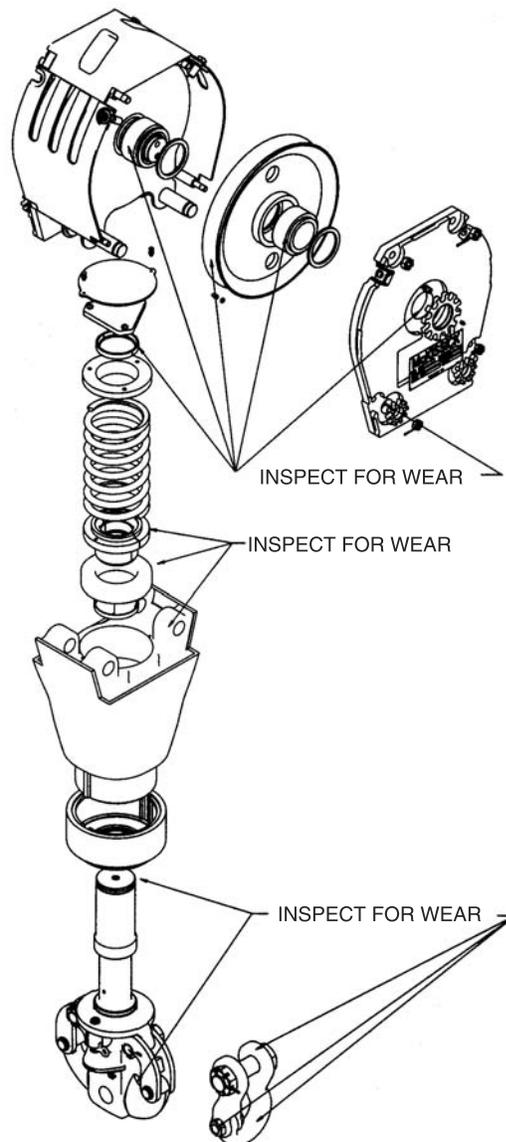
70-10

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

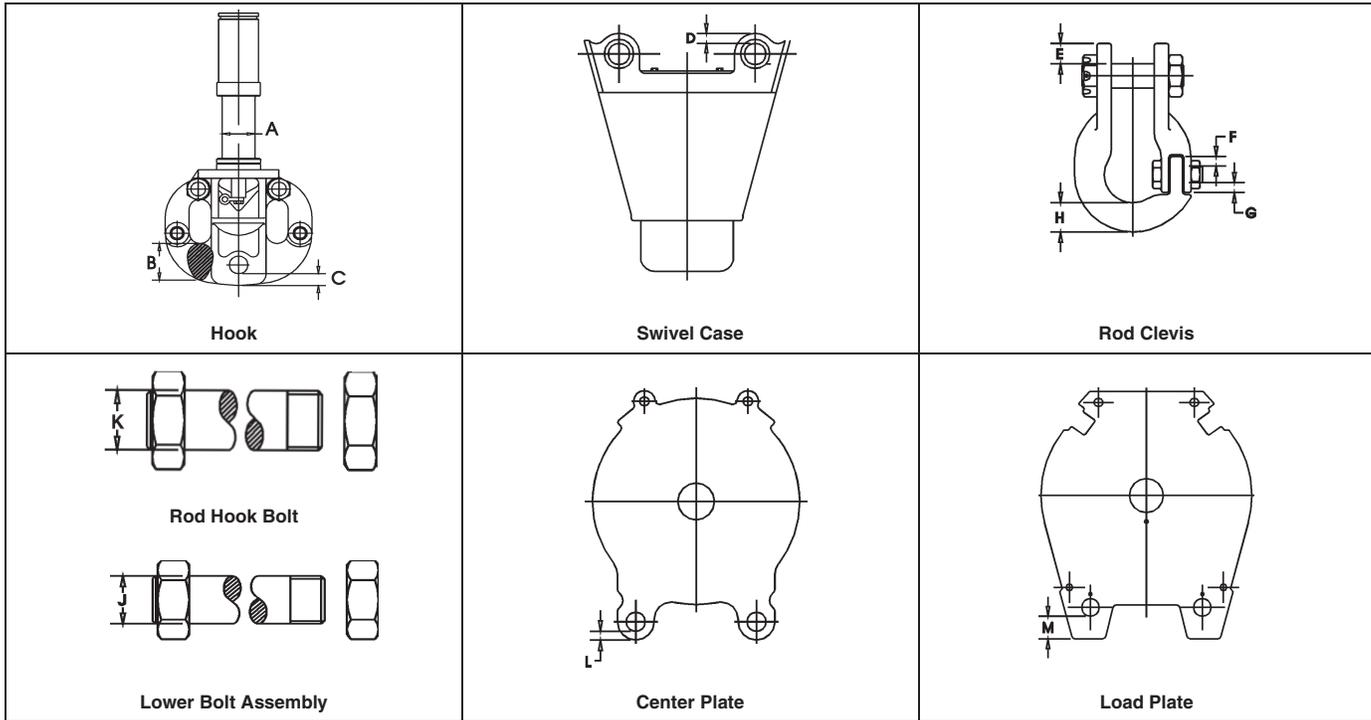
Component	Inspection Characteristic	Inspection Method	Acceptance Criteria or Remedy
Coil Spring	Deformation	Visual	Visible deformation is cause for removal from service.
	Cracked or broken coils	MPI	Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> •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

McKissick® 70 Series Tubing Block Inspection Points



Series 70 Inspection Requirements

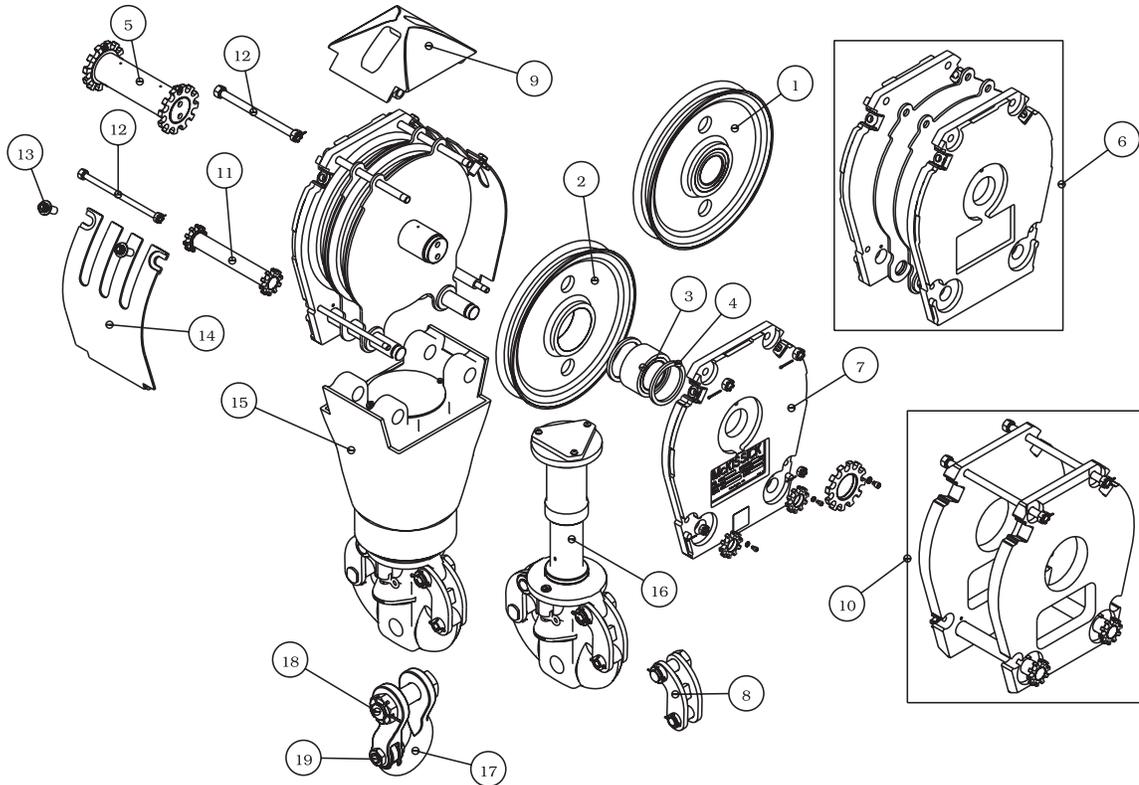
McKissick® 70 Series Tubing Block Original Reference Dimensions



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

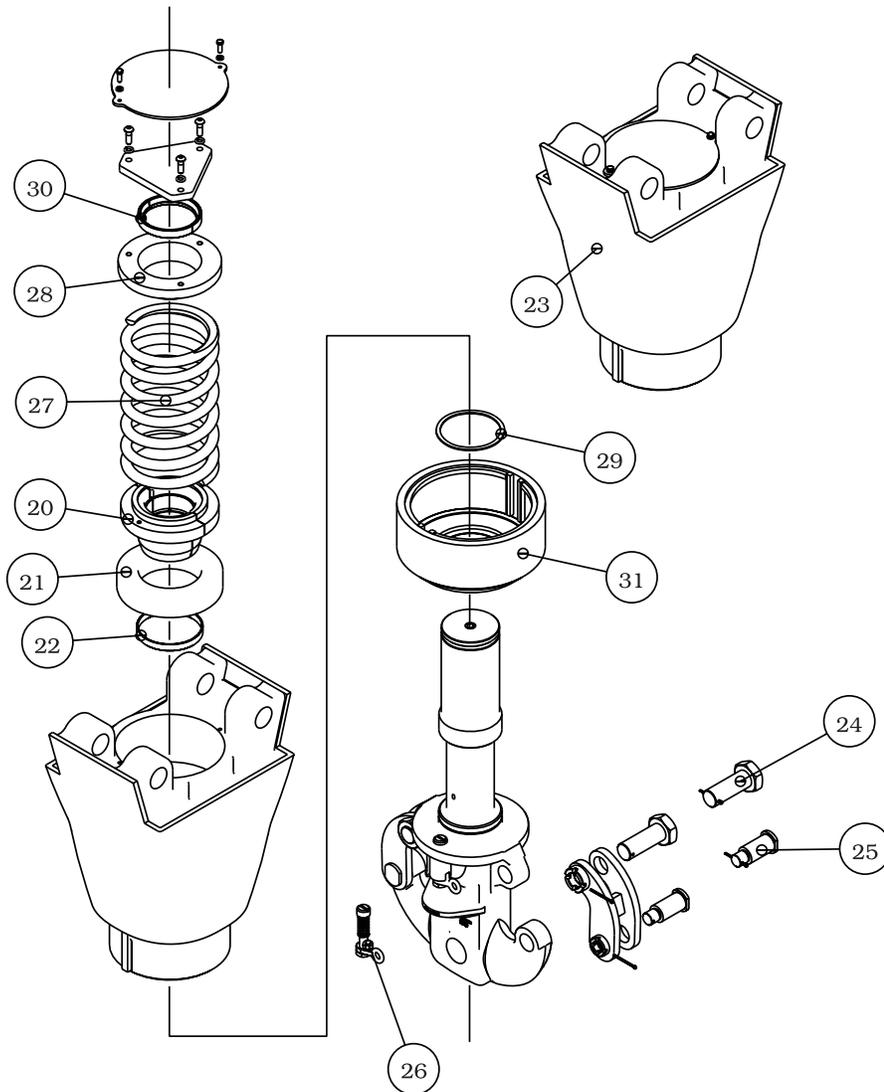
*75 ton blocks produced before 1985 utilize a smaller hook assembly distinguishable by a 2.00" diameter rod hook bolt (Ref. 18). The following dimensions apply. B = 4.25, C = 1.94, E = 1.56, F = .72, G = .72, H = 2.38, J = 2.00.

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"	14"	17"	17"	20"	20"	24"	24"	30"	30"
		72, 72A (5/8)	73, 73A (5/8)	73, 73A (3/4)	72, 72A (3/4)	72, 72A (7/8)	73, 73A (7/8)	72, 72A (1)	73, 73A (1)	73, 73A (1-1/8)	74, 74A (1-1/8)
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	75609	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	19438	19438	19456	19456	19474	46783	46783
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	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"> No relevant indications. No more than three indications in a line separated by less than 1/16" edge to edge. No linear indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.
	Missing nut lock device	Visual	Replace with genuine Crosby McKissick® parts.

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"> No relevant indications. No more than three indications in a line separated by less than 1/16" edge to edge. No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.
	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"> No relevant indications with a major dimension equal to or greater than 3/16". No more than ten indications in any continuous six square-inch area. No more than three indications in a line separated by less than 1/16" edge to edge. No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.
	Cracks in weld	MPI	Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> No relevant indications. No rounded indications greater than 1/8". For weld 5/8" or less, and 3/16" for welds greater than 5/8". Surface porosity and exposed slag is not permitted on or within 1/8" of sealing surfaces.

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
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 25 for original dimensions.
	Cracks	MPI	Magnetic Particle Inspection per ASTM E 709. Acceptance criteria: <ul style="list-style-type: none"> No relevant indications with a major dimension equal to or greater than 3/16". No more than ten indications in any continuous six square-inch area. No more than three indications in line separated by less than 1/16" edge to edge. No relevant indications in pressure sealing areas, the root area of rotary threads, and stress relief features of thread joints.
	Deformation	Visual	Visible deformation is cause for removal from service.

80 - 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.

80 - 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".

Series 80 Inspection Requirements

McKissick® 80 Series Tubing Block Inspection Points

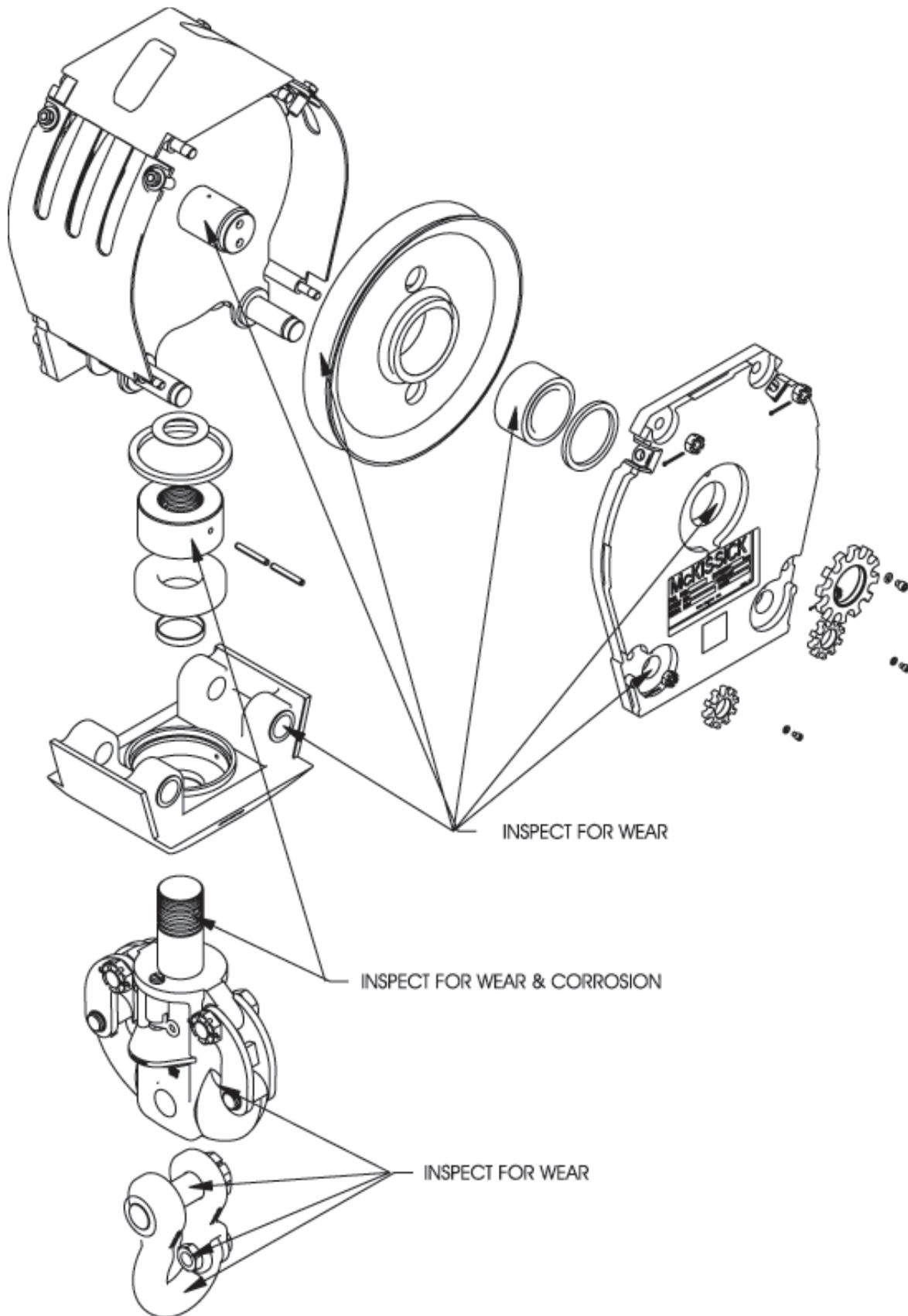
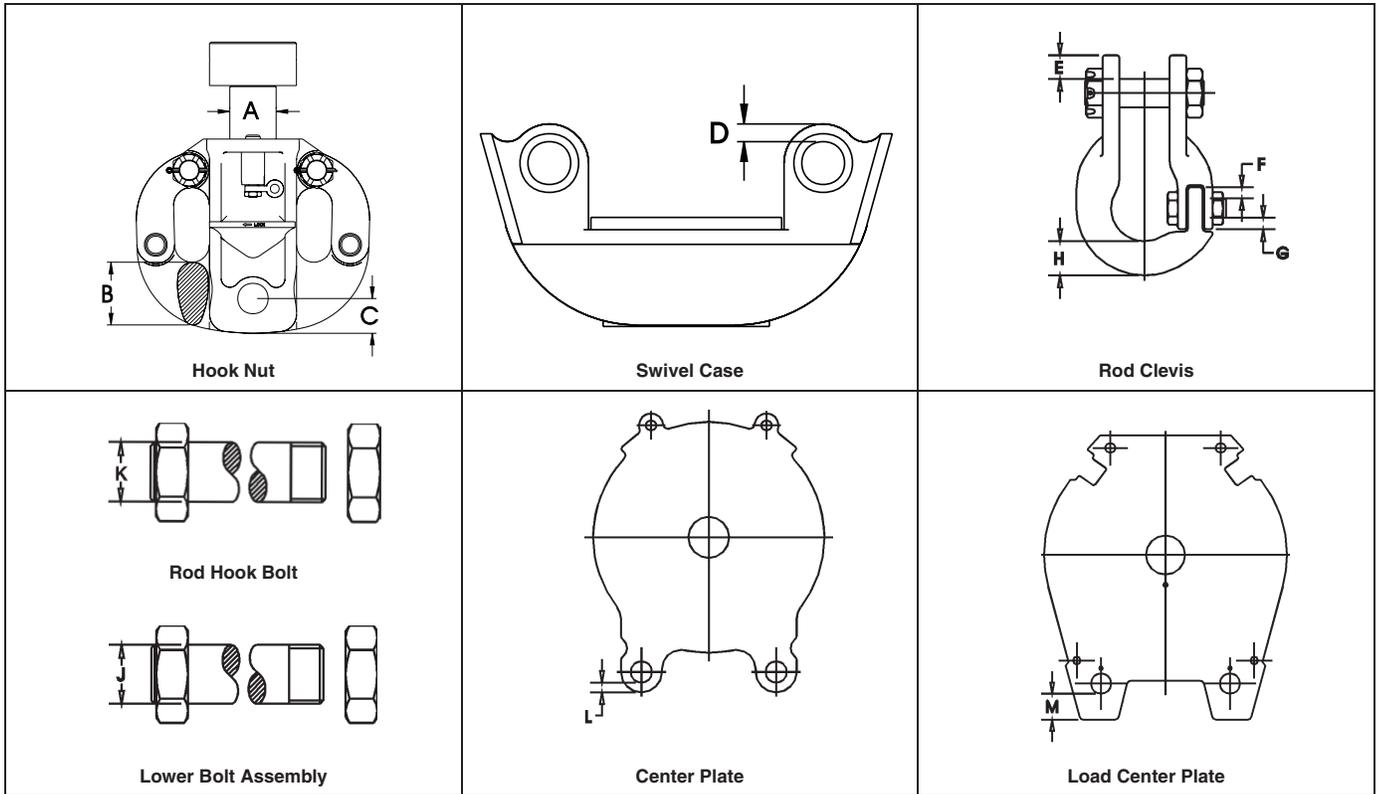


Figure 6

Series 80 Inspection Requirements

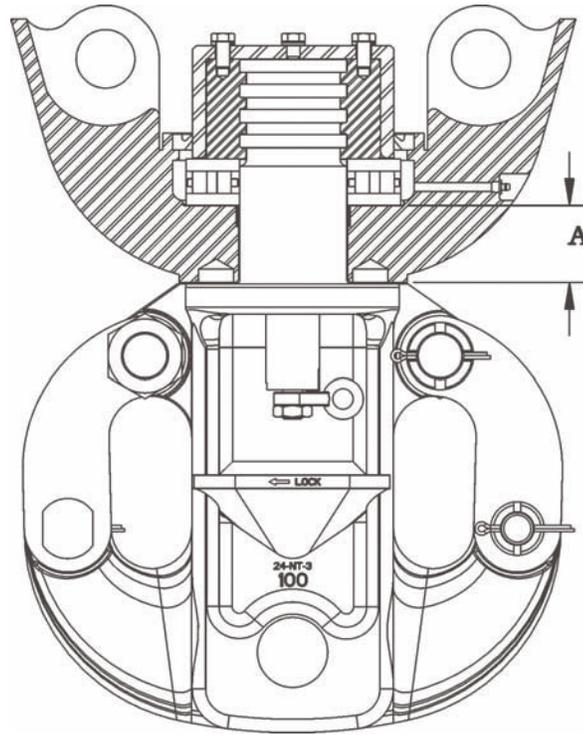
McKissick® 80 Series Tubing Block Original Reference Dimensions



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

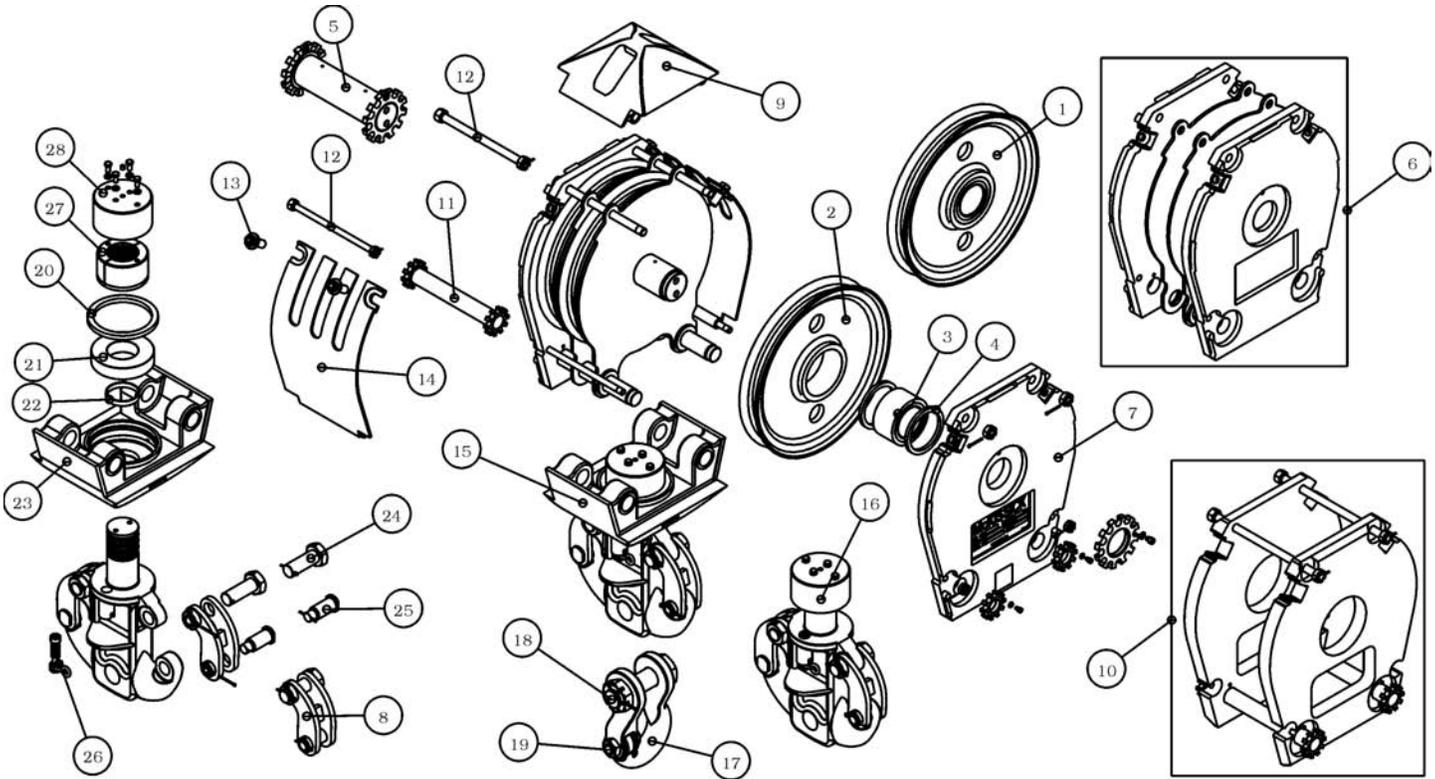
Series 80 Tubing Block

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

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

Series 80 Parts List

DESCRIPTION	No.	14 " 82, 82A	14 " 83, 83A	17 " 82, 82A	17 " 83, 83A	20 " 82, 82A	20 " 83, 83A	24 " 82, 82A	24 " 83, 83A	24 " 84, 84A	30 " 83, 83A	30 " 84, 84A
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)	2025933 (1)	2026002 (1-1/8)	2026035 (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)	2026109 (1-1/8)	2026285 (1-1/4)	2026303 (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)	2025931 (1)	2026003 (1-1/8)	2026036 (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)	2026110 (1-1/8)	2026286 (1-1/4)	2026304 (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
PN ASSY ,CENTER (TB)	5	2026146	2026262	2026185	1401593	574346	574346	2025934	2025986	2026037	2026004	2026037
PLATE ASSEM BLY , COMPLETE	6	2026147	2026263	2026186	2026027	2025978	2025978	2025935	2026987	2026047	2026005	2026038
PLATE ASSEM BLY KIT	7	2026148	2026148	2026028	2026028	2025960	2025960	2025936	2026588	2026048	2026006	2026039
BALARM ASSEM BLY 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
W EIGHT KIT	10	2026203	2026287	2026206	2026030	2025980	2025980	115093	115100	2026049	2026009	2026041
BOLT ASSEM BLY ,LOW ER (W EIGHTED)	11	2026204	2026288	2026207	2026031	2025981	2025981	2025940	2025992	2026042	2026010	2026042
BOLT ASSEM BLY ,LOW ER (STANDARD)	11	2026151	2026265	2026189	2026216	2022156	2026218	2026105	2026220	2026296	2026231	2026296
BOLT SET-GUARD & UPPER (W EIGHTED)	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 ASSEM BLY	15	2026154	2026270	2026192	2026033	2025984	2025984	2025948	2025994	2026050	2026014	2026045
HOOK W TH NUT ASSEM BLY	16	131173	131182	131182	131191	131333	131333	131333	131351	131351	131388	131388
ROD HOOK CLEVE	17	105585	2026211	2026211	2025968	226302	226302	226302	2025996	2025996	2026016	2026016
ROD HOOK CLEVE 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 BUSHNG	22	17305	17350	17350	17403	17458	17458	17458	17458	17458	55585	55585
CASE ASSEM BLY	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
LOW ER ARM BOLT	25	2019377	2019379	2019379	2025974	2025953	2025953	2025953	2026056	2026056	2026058	2026058
HOOK LOCKNG ASSEM BLY	26	100991	100982	100982	100982	2021060	2021060	2021060	2021060	2021060	100982	2021060
SPLIT NUT ASSEM BLY	27	-	-	-	2021560	2021557	2021557	2021557	2021551	2021551	2021554	2021554
SPLIT NUT COVER	28	-	-	-	2025976	2025954	2025954	2025954	2026001	2026001	2026022	2026022
HOOK W ARNING KIT	29	2021680	2021680	2021680	2021680	2021681	2021681	2021681	2021681	2021681	2021681	2021681

Maintenance Alert

McKissick® 14” through 24” Oilfield Tubing Blocks

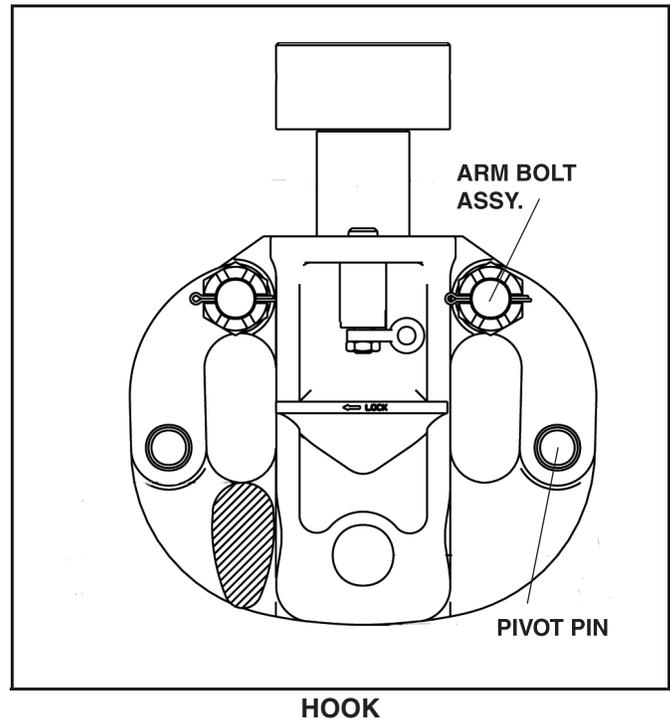
The Crosby Group, Inc. is aware of improper use and maintenance of McKissick® 14” through 24” Tubing Blocks. Some crew members are removing the hook latch **pivot pin**, to load the links. Repeated removal and installation of the pivot pin retaining rings may damage the rings and prevent proper seating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



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®.)

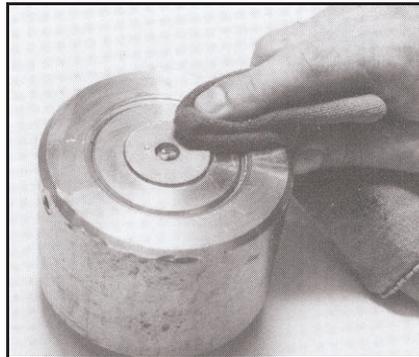


Figure 1



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.

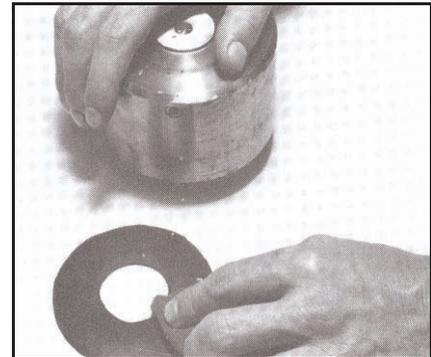


Figure 3

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.

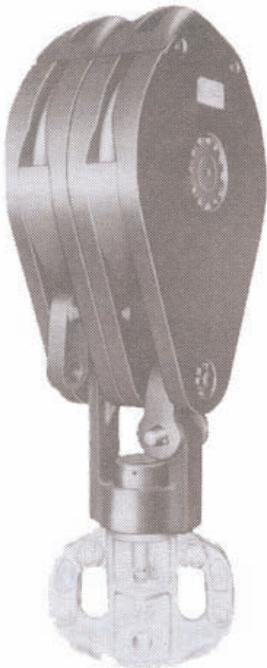
The Crosby Group, Inc. does not recommend the use of equipment that has been modified or repaired beyond the given allowables, and recommends the use of only genuine Crosby® McKissick® replacement parts. Age, severity of service and obsolescence of design may preclude repair, and should result in block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

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