EC Declaration of Conformity and user manual for Crosby® McKissick Snatch Blocks




McKissick Snatch Blocks

Industriepark Zone B N°26 2220 Heist o/d Berg BELGIUM

EC DECLARATION OF CONFORMITY IN ACCORDANCE WITH
EC MACHINERY DIRECTIVE 2006/42/EC.

The undersigned, **Jason Colwell**, Managing Director of **Crosby Europe**, Industriepark Zone B n° 26, 2220 Heist o/d Berg, Belgium, here to authorized by **The Crosby Group**, P.O. Box 3128 Tulsa, OKLAHOMA, 74101 USA, declares that the types **as listed below**, with detailed description in Crosby Group literature, and with **CE** marking, manufactured by **The Crosby Group**, comply with the applicable essential Health and Safety Requirements of the **EC Machinery Directive 2006/42/EC**. **Deputy composer** of the technical file is A. Smolderen, positioned at Leuvensebaan 51, 2580 Putte, Belgium.

EC Declaration of Conformity includes the following products:

L160	407	418	421
L170	408	419	430
402	409	420	431
404	416		
406	417		

Putte, 03/05/2019 **For The Crosby Group**

Jason Colwell
Man. Director

This certificate is only valid for CROSBY products marked as such.

All Crosby plants are ISO 9001 certified which gives a supplementary guarantee of quality and consistency of the processes.

Original instructions according to Directive 2006/42/EC on machinery, section 1.7.4 Instructions, and Annex II.1.A EC Declaration of Conformity of the Machinery.

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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 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 the load to become out of control, resulting in possible 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.

PROOF TEST – A test applied to a product solely to determine non-conforming material or manufacturing defects.

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.

SHEAVE BEARING ASSEMBLY - Purchased by O.E.M. or end user to be used in their block or lifting system design.

WARNING

- **Failure to read, understand and follow these instructions may cause death or serious injury.**
- **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.**

NOTE: For complete warnings and application information, see the Crosby Group General Catalog.

IMPORTANT!

For maximum safety and efficiency, tackle block and sheave systems must be properly designed, used, and maintained. You must understand the use of tackle block components and sheaves 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 DESIGN OR USE A TACKLE BLOCK OR SHEAVE SYSTEM!** For further assistance, call:
In U.S.A. - Crosby Engineered Products Group at 800-777-1555.
In CANADA - Crosby Canada, Ltd. (905) 451-9261.
IN EUROPE - N.V. Crosby Europe 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!

Block Identification

To thoroughly describe the block and sheaves for replacement, you will need the following (provide the block serial number if available):

BLOCKS

The following information should be specified:

1. Stock Number (if known)
2. Sheave Size
3. Block Number (Catalog number)
4. Number of Sheaves
5. Type of Bearings: (BB) Bronze Bushed, (RB) Roller, (TB) Tapered Roller
6. Type of Hook or Shackle
7. Wire Rope Diameter
8. Serial number if available

SHEAVES

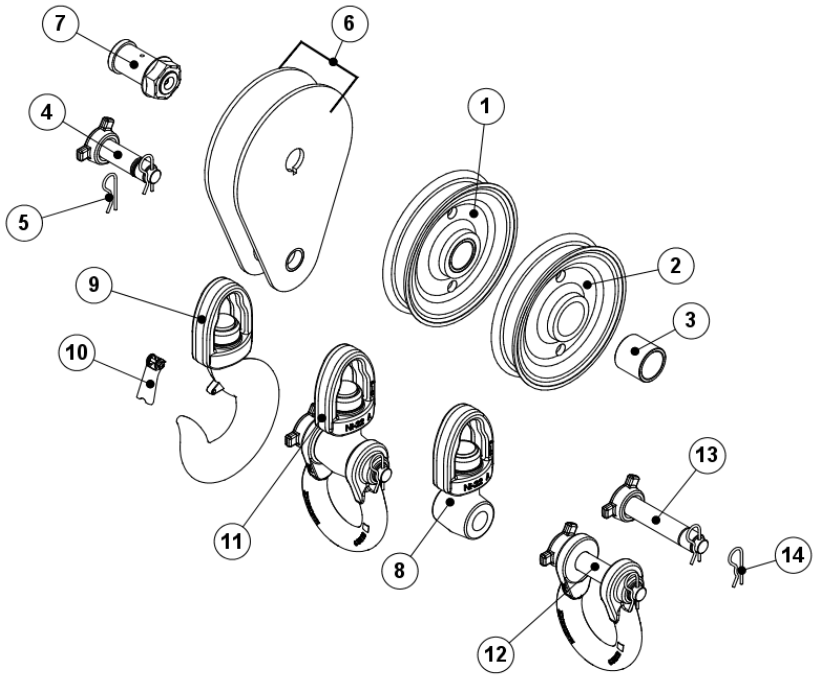
The following information should be specified:

1. Stock Number (if known)
2. Sheave O.D.
3. Bearing Type or Plain Bore
4. Shaft or Bore Size
5. Hub Width
6. Rim Width
7. Wire Rope Size
8. Special Machine Features
9. Special Finishes

When ordering parts for a block, refer to the specific “Parts Reference” drawing and “Reference Number Table” available for each block series or catalog number shown in this manual (see sample below). Provide the block serial number if available or the information noted above.

McKissick® Snatch Blocks

Descripti	Ref.
Sheave with Bushing or	LS1
Sheave, less Bearing	LS2
Bushing or Bearing	LS3
Hook Bolt Assembly	LS4
Hairpin for hook bolt	LS5
Plate Set (with name tag & warning sticker)	LS6
Center Pin Assembly (with nut, spring pin & zerk)	LS7
Tee and Yoke Assy.	LS8
Hook and Yoke Assembly	LS9
Latch Kit	LS10
Shackle (with Tee and Yoke	LS11
Shackle (with bolt, nut and cotter)	LS12
Bolt, nut & cotter (without shackle)	LS13
Cotter pin only (for shackle)	LS14
Kit, Warning, Block	LS15

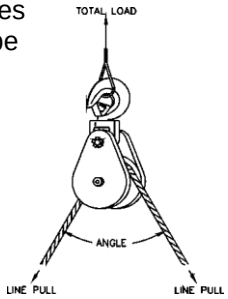


6” and larger Sheave Diameter

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.

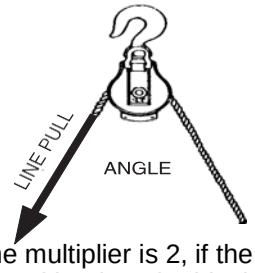
A single sheave block used to change load line direction can be subjected to total loads greatly different from the weight being lifted or pulled. The total load value varies with the angle between the incoming and departing lines to the block.

The following chart indicates the factor to be multiplied by the line pull to obtain the total load on the block.

The Total Load on the Block	=	Line Pull	x	Angle Factor

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°	1.93	130°	. 84
40°	1.87	135°	. 76
45°	1.84	140°	. 66
50°	1.81	150°	. 52
60°	1.73	160°	. 35
70°	1.64	170°	. 17
80°	1.53	180°	. 00
90°	1.41	—	—

Block Loading Examples



At 0 degrees the multiplier is 2, if the line pull is 1,000 lbs., the total load on the blocks is:

1000 X 2 = 2000 lbs.

At 90 degree the multiplier is 1.41, if the line pull is 1,000 lbs., the total load on the block is:

1000 X 1.41 = 1410 lbs.

How to Figure Line Parts

Sheaves in a system of blocks rotate at different rates of speed and have different loads. When raising and lowering, the line tension is not equal throughout the system.

The ratios in the table below are applicable for blocks as shown on Block Selection Guide CD (*Diagram Option* on Resource Menu), and also independent sheave systems that line is reeved through.

Ratio A Bronze Bushed Sheaves	Ratio B Anti -Friction Bearing Sheave s	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
5.16	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

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

After calculation 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.

$$\text{Ratio A} = \frac{72{,}180 \text{ lbs. (load to be lifted)}}{8{,}000 \text{ lbs. (single line pull)}} = 9{,}02 \quad \text{(Ratio A)}$$

Refer to ratio 9.02 or next highest number, 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.

$$\text{Single Line Pull} = \frac{68{,}000 \text{ lbs. (load to be lifted)}}{7.32 \text{ (ratio B of 8 part line)}} = 9.290 \text{ lbs.}$$

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

Blocks are designed to utilize all sheaves to attain the full Working Load Limit. If less than maximum sheaves are used, balance the sheave loading and reduce the Working Load Limit proportionally. This must be done regardless of wire rope capacity.

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" in the Crosby General Catalog), proper reeving (see "The Reeving of Tackle Blocks" in the 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. 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 .12 to .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.

Inspection Requirements

Inspection Categories

In accordance with ASME, OSHA and API standards, it is recommended that the owner or user of the equipment develops 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 load carrying components of the McKissick® 680 Series Construction Blocks, McKissick® Snatch Blocks, M-491 Tower /Derrick Blocks, and TU-480 Tilt Up Wall Blocks. If equipment is subjected to severe conditions such as dynamic 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.

Inspection Categories and Frequencies Chart for McKissick® 680 Series Construction Blocks, McKissick® Snatch Blocks, M-491 Tower/Derrick Blocks, and TU-480 Tilt Up Wall Blocks

Component	Table Reference No.	Daily Weekly When in Use	Semi-Annually		Annually	
			Normal Service	*Severe Service	Normal Service	*Severe Service
Hook or Swivel Tee	A (Snatch Blocks, M-491, TU-480)	I		II	II	III
Yoke Assembly	B (Snatch Blocks, M491, TU-480)	I		II	II	II
Load & Center Plates	C (680, Snatch Blocks, M-491, TU-480)	I			II	II
Pins and Bolts	D (680, Snatch Blocks, M-491, TU-480)	I		II	II	II
Sheave	E (680, Snatch Blocks, M-491, TU-480)	I		II	II	II
Bearings / Bushings	F (680, Snatch Blocks, M-491, TU-480)	I		II	II	II
Fasteners and Retaining devices	G (680, Snatch Blocks, M-491, TU-480)	I		II	II	II
Hangers, Shackles, deadends	H (680)	I			II	III

* Heavy and Severe Service involves frequent operation at 85% or more of rated load or unusual operating practices such as pulsating loads or exposure to severe corrosion.
Category IV inspection (including hook shank) may be required at intervals to be determined by the block user.

Inspection Requirements

Inspection and Acceptance Criteria

This Inspection and Acceptance Criteria for McKissick® 680 Series Contruction Blocks, McKissick® Snatch Blocks, M-491 Tower/Derrick Blocks, and TU-480 Tilt Up Wall Blocks is a partial list of inspection points. Refer to the Crosby Catalog and various ASME/OSHA publications for full information. All blocks must be included in the lifting equipment frequent and periodic inspection program.

Component and Table Reference	Inspection Characteristics	Inspection Method	Acceptance Criteria or Remedy
A **Hook or Swivel Tee** Snatch Blocks, M-491, TU-480	Wear, corrosion and deformation of hook body and shank or shackle bow and bolt	Visual	Remove any hook / shackle with wear exceeding 10%, significant deformation (more than 5%), or corrosion of threads
	Wear, nicks, gouges in load bearing surfaces	Visual	Remove any hook / shackle with wear exceeding 10% remove nicks, gouges by light grinding (less than wear allowance)
	Latch operation	Visual	Remove any hook latch that is distorted, bent or does not properly fit against tip of hook.
	Cracks	Visual or MPI	Remove from service until MPI evaluation can be complete

Component and Table Reference	Inspection Characteristics	Inspection Method	Acceptance Criteria or Remedy
B **Yoke Assembly** Snatch Blocks, M-491, TU-480	Wear, corrosion and damaged thrust washers	Visual	Remove from service any assembly with excessively worn or damaged thrust washers.
	Swivel case surface	Visual	Remove from service if wear exceeds 5% or visible deformation
	Hook / Swivel Case clearance	Visual by measurement	Check hook / case clearance (Set at .062" or less). If greater than .18", further disassembly required

Component and Table Reference	Inspection Characteristics	Inspection Method	Acceptance Criteria or Remedy
C **Load and Center Plates** 680, Snatch Block, M-491, TU-480	Wear at bolt and center pin bearing areas	Visual by measurement	Remove from service any plate with wear exceeding 5% of original dimension
	Cracks	Visual	Remove from service until MPI evaluation can be complete
	Deformation	Visual	Visible deformation is cause for removal from service

Inspection Requirements

Inspection and Acceptance Criteria

Component and Table Reference	Inspection Characteristics	Inspection Method	Acceptance Criteria or Remedy
D **Pins and Bolts** 680, Snatch Blocks, M-491 TU-480	Wear, corrosion and deformation	Visual	Remove from service any bolt or pin with wear exceeding 5% or significant bending in non-threaded areas. Remove from service any roller bearing pins worn below bearing manufacturers recommendations.
	Thread condition	Visual	Remove from service if significant corrosion, visible deformation or damaged threads.
	Cracks	Visual or MPI	Remove from service until MPI evaluation can be complete.

Component and Table Reference	Inspection Characteristics	Inspection Method	Acceptance Criteria or Remedy
E **Sheave** 680, Snatch Blocks, M-491, TU-480	Crack, deformation	Visual	Remove sheaves with cracks or other damage.
	Groove corrugation	Visual	Sheaves with shallow corrugations should be removed from service at next scheduled maintenance or before new wire rope is reeved into the system.
	Groove wear	Visual	Remove from service, any sheave with groove radius that is below allowable minimum dimension as defined by chart: **SHEAVE INSPECTION** **MINIMUM GROOVE RADI I FOR WORN SHEAVES** **Tolerance per Wire Rope User's Manual - (Third Edition)**

Nominal Wire Rope Size	Radii Inches	Nominal Wire Rope Size	Radii Inches
1/4 inch	.128	3/ 4 inch	.384
5/16 inch	.160	7/ 8 inch	.448
3/8 inch	.192	1 inch	.513
7/16 inch	.224	1-1/8 inch	.577
1/2 inch	.256	1-1/4 inch	.641
9/16 inch	.288	1-3/8 inch	.705
5/8 inch	.320	1-1/2 inch	.769

Component and Table Reference	Inspection Characteristics	Inspection Method	Acceptance Criteria or Remedy
F **Bearings & Bushings** 680, Snatch Blocks, M-491, TU-480	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 roller or race that cannot be removed with crocus cloth.
	Missing or damaged rollers	Visual	Remove from service any bearing with displaced, missing or damaged rollers.

Inspection Requirements

Inspection and Acceptance Criteria

Component and Table Reference	Inspection Characteristics	Inspection Method	Acceptance Criteria or Remedy
G **Fasteners and Retaining Devices** 680, Snatch Blocks, M-491, TU-480	Loose devices	Visual	Tighten
	Damaged devices	Visual	Replace with genuine Crosby McKissick® parts
	Missing devices	Visual	Replace with genuine Crosby McKissick® parts
It is important to make sure that all locking screws, mechanisms or other locking devices are in place and are properly secured at all times. Special attention should be given after disassembly and reassembly for inspection or maintenance.			

Component and Table Reference	Inspection Characteristics	Inspection Method	Acceptance Criteria or Remedy
H **Hangers, Shackles and Dead ends** 680, Snatch Blocks M-491, TU-480	Deformation / Wear	Visual	Visible deformation is cause for removal from service.
	Bolt holes wear	Visual	Remove from service if holes worn open or elongated in excess of 10%.

McKissick® Snatch Blocks

- Forged alloy heat treated hooks.
- Forged steel swivel tees, yokes and shackles.
- Can be furnished with SS-4055 hook latch.
- Pressure lube fittings.
- Fatigue rated.
- 3” - 10” feature dual size wireline sheaves.

- Standard McKissick® snatch blocks are offered in bronze bushed and straight roller bearings.
  - Plain bronze: Slow line speeds, infrequent and intermittent use.
  - Straight roller bearings: Slow to medium line speeds, intermittent and more frequent use.

Ligh t Champion Double Snatch Blocks

408

409

New Improved Light Champion Snatch Blocks

418

419

404

Champion Snatch Blocks

420

421

406

Super Champion Snatch Blocks

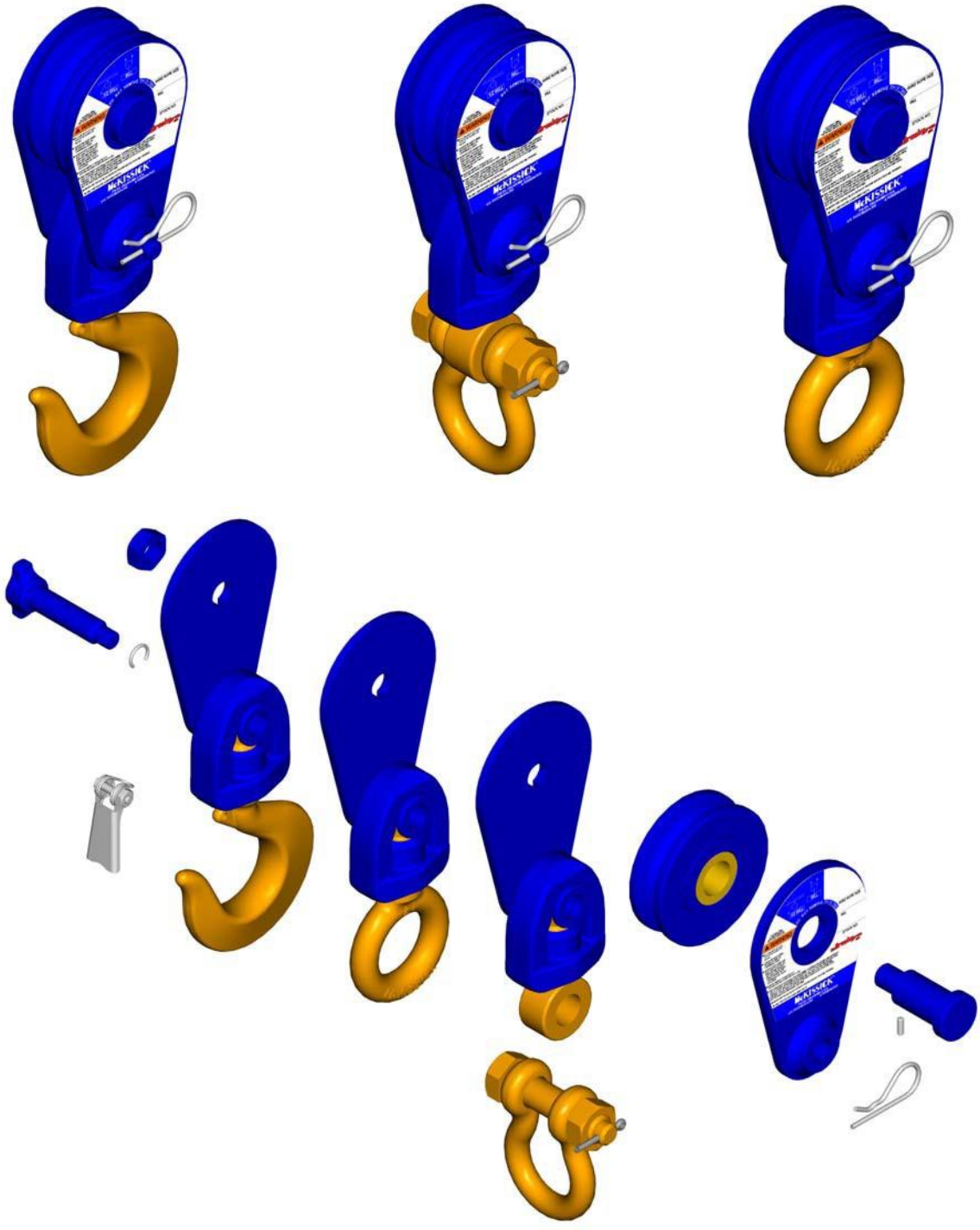
430

431

407

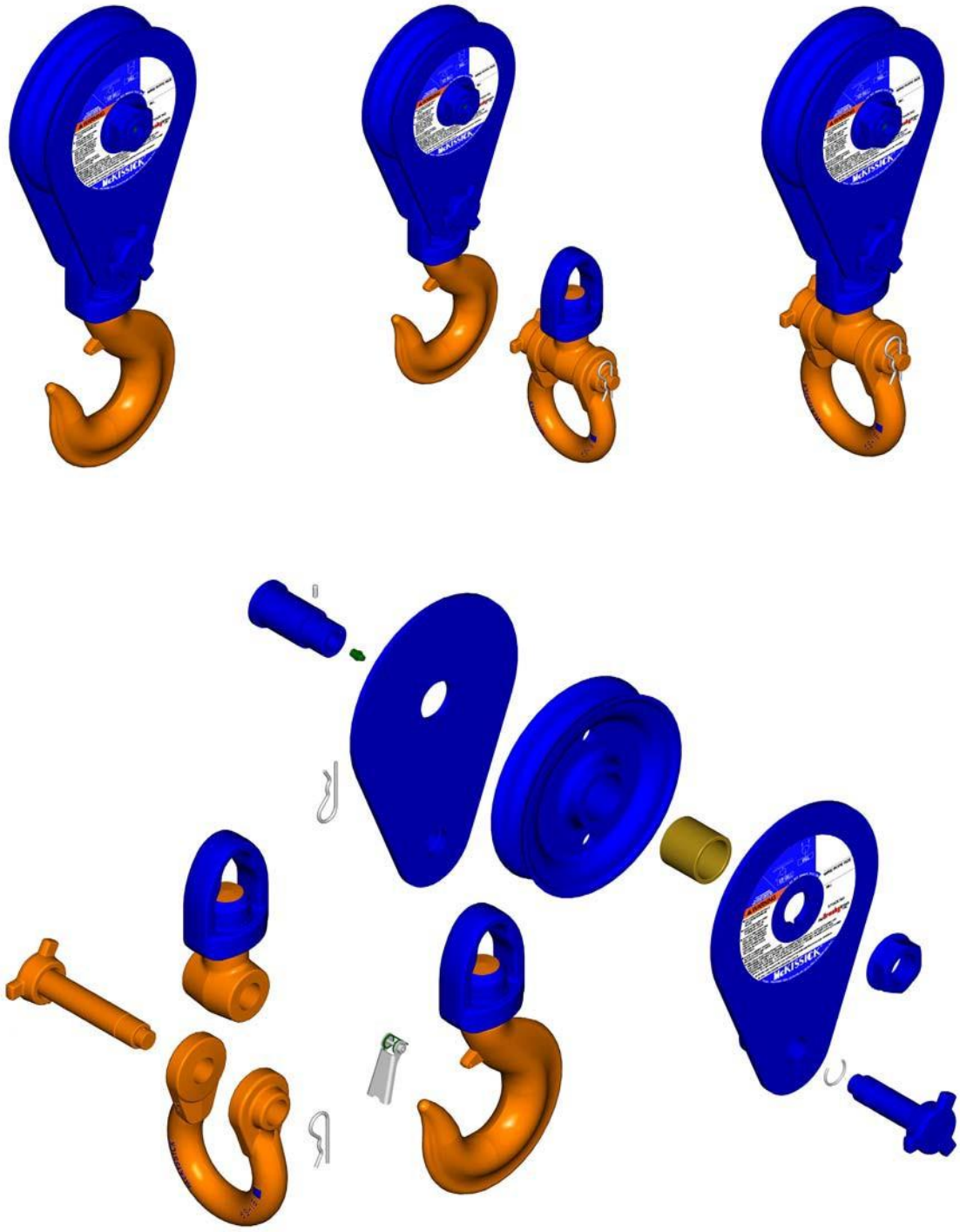
Disassembly View

McKissick® Snatch Blocks
3” and 4.5” Sheave Diameter



Disassembly View

McKissick® Snatch Blocks 6” and Larger Sheave Diameter



General Disassembly Instructions

McKissick® Snatch Blocks for Category I and II Inspection

The following instructions are general disassembly guidelines for typical 418/419 series Snatch blocks. Refer to "Inspection and Acceptance Criteria" table found on pages 5 through 8 for inspection details. Varations in configuration and capacities result in variations in center pin retention, load bolts and trunnion retention. If additional assistance is required, contact Crosby Engineering.

1. To begin disassembly, remove shackle bolt, nut and cotter (not required for hook type). The shackle and bolt (or hook) should be inspected.
2. Remove hitch pin and unscrew the upper bolt allowing the side plate to rotate on the center pin and swing out of the way to permit inspection (or snatching of the wire rope). Open the block and do a visual inspection:
   A. Verify that the upper (hook) bolt cannot be removed, insure that the snap ring clip is in place on the end of the bolt.
   B. Verify that the sheave is easy to rotate offering no resistance or wobble.
   C. Inspect upper (hook) bolt.
3. A snap ring on the end of the upper bolt prevents it from pulling all the way through the side plate.
4. Ensure that the round retention nut is secure and properly staked with 3 stakes.
5. For long term applications use a snatch block with bolt, nut and cotter. Always make sure that the "hitch pin" (hairpin) is always in place to prevent loosening of the hook bolt and the retention spool nut.

NOTE: Bronze bushings are used for applications using slow line speeds and moderate use. Examine condition of all bronze bushings for indication of excessive wear that would indicate improper application. Standard roller bearings are designed for medium speeds but are not sealed and are not recommended for higher speeds.

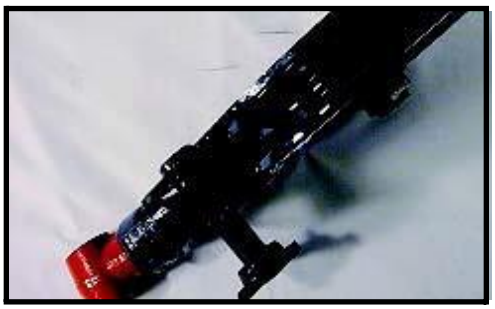
NOTE: A Category IV inspection will require further disassembly of the center pin and sheave assembly. Take care when removing prevailing torque lock nut to avoid shearing roll pin on the center pin.

Refer to the Crosby Block CD-ROM and contact the Crosby Group Engineering Dept. for further instructions.

1.

2.

3.



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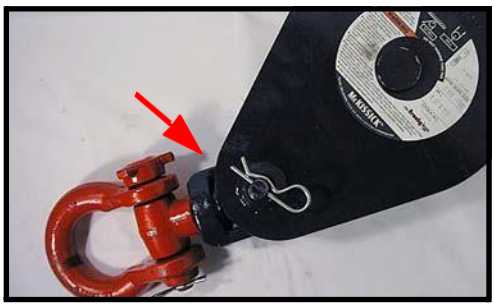


Inspection Requirements

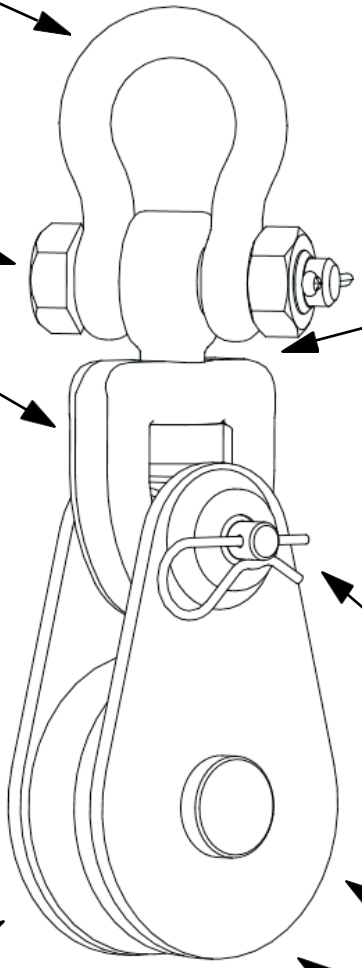
McKissick® Snatch Blocks

Refer to inspection reference on pages 5 through 8 for additional details on inspection criteria.

Inspection reference "A", "H"
Check hook or shackle for deformation or excessive wear, check load bearing surface of the hook or shackle for excessive wear or stress damage including: cracks, sharp nicks, deep gouges.

Inspection reference "D"
Check for condition of bolts.

Inspection reference "G"
Check overall tightness and security of hook/shackle. Make sure the hairpin or hitch pin is always in place and undamaged.



Inspection reference "A"
Check swivel tee for deformation, wear and conditions of drilled hole.

Inspection reference "E"
Inspect sheaves for cracks or damage

Inspection reference "F"
Check sheaves for wobble and ease of rotation.

Inspection reference "E"
Inspect sheave grooves for wear or corrugation.

Inspection reference "D", "G"
Check for condition of center pin and hanger bolt.

Inspection reference "D", "G"
Check security of center pin.

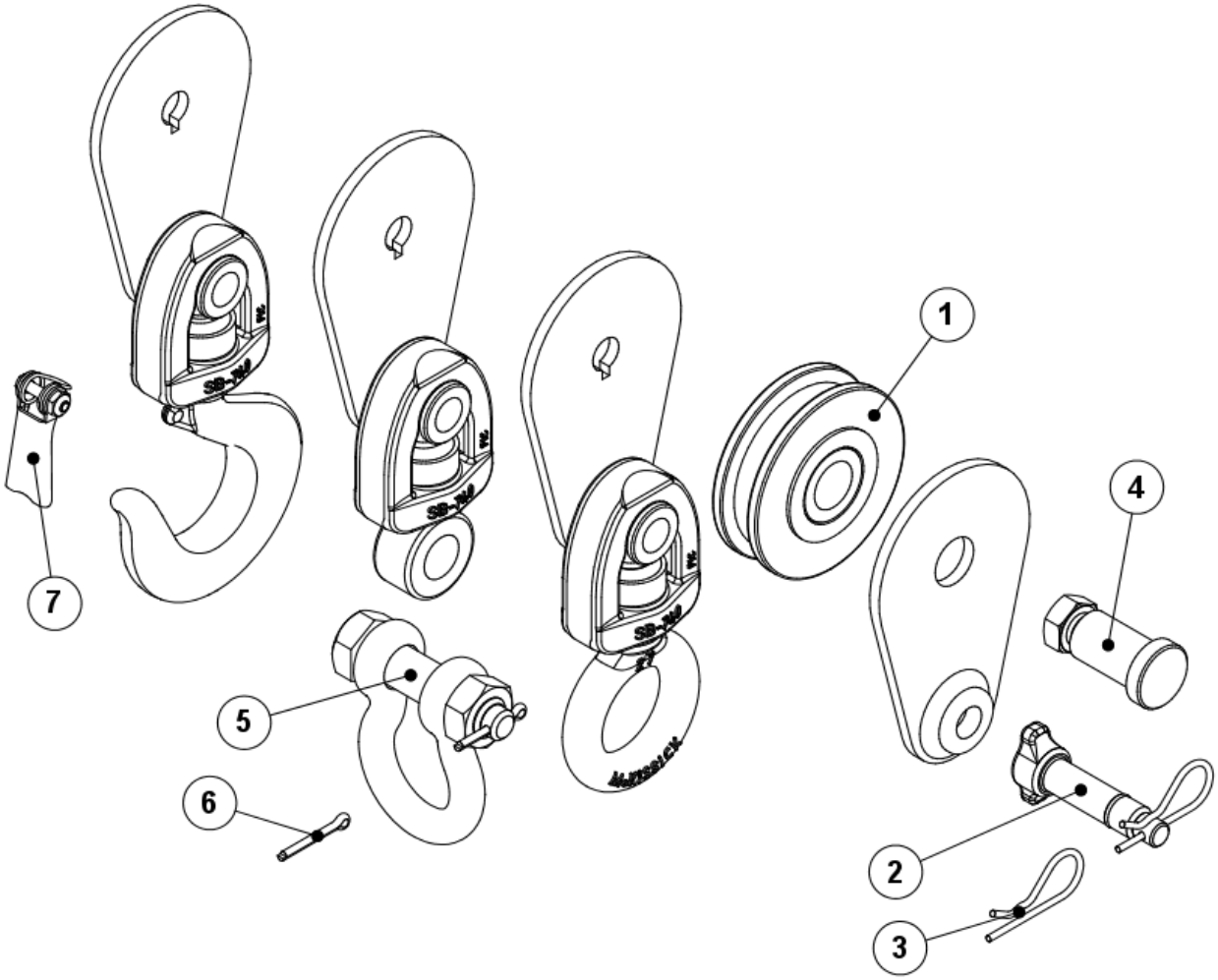
Inspection reference "C"
Check side plates for deformation or excessive wear.

Check the name tag and warning tag for legibility and consistency with existing maintenance records.

SEE APPLICATION AND WARNING INFORMATION
See the Crosby General Catalog

Parts Reference

McKissick® Snatch Blocks
3” and 4.5” Sheave Diameter

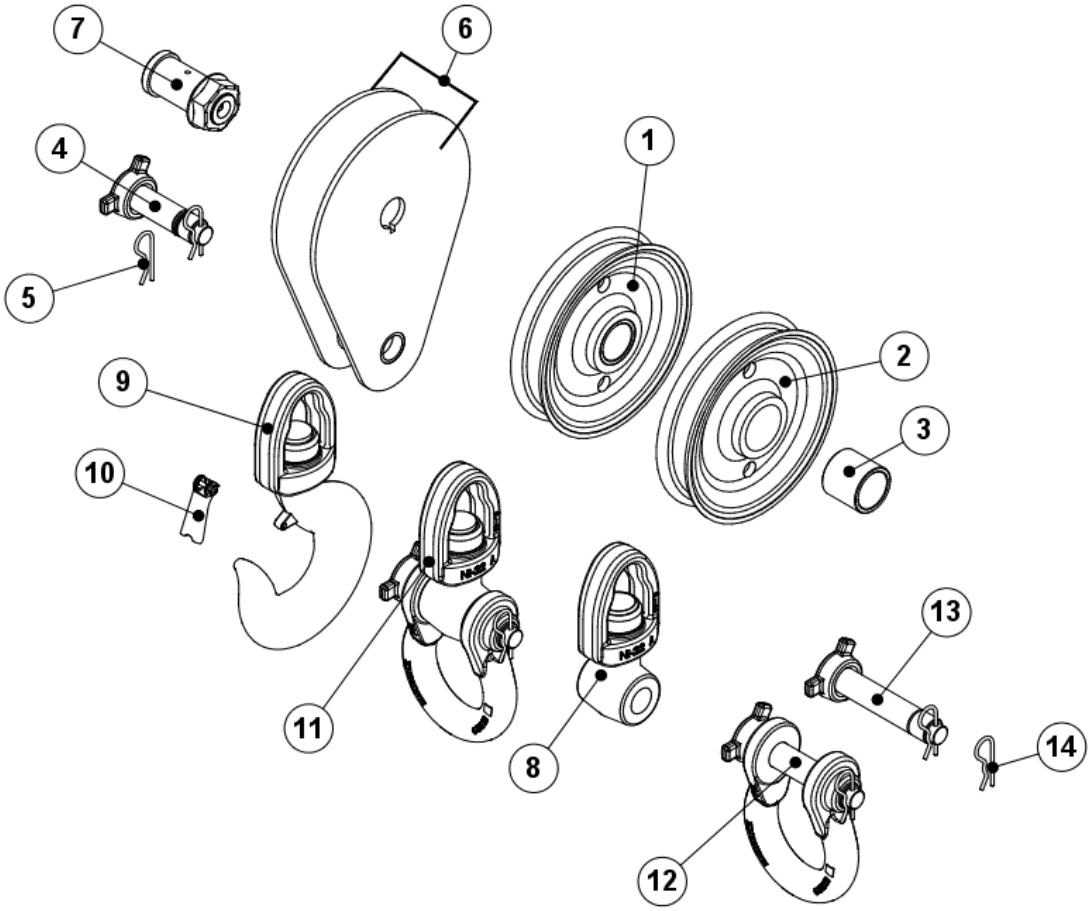


Description	Ref. No.
Sheave with bushing or bearing	SS1
Hook Bolt Assembly (bolt, clip, hairpin)	SS2
Hairpin for hook bolt	SS3
Center Pin Assembly	SS4

Description	Ref. No.
Shackle Assembly	SS5
Cotter pin only (for shackle)	SS6
Latch Kit	SS7
Kit, Warning, Block information	SS8

Parts Reference

McKissick® Snatch Blocks 6” and larger Sheave Diameter



Description	Ref. No
Sheave with Bushing or Bearing	LS1
Sheave, less Bearing	LS2
Bushing or Bearing	LS3
Hook Bolt Assembly	LS4
Hairpin for hook bolt	LS5
Plate Set (with name tag & warning sticker)	LS6
Center Pin Assembly (with nut, spring pin & zerk)	LS7
Tee and Yoke Assy.	LS8

Description	Ref. No.
Hook and Yoke Assembly	LS9
Latch Kit	LS 10
Shackle (with Tee and Yoke Assembly)	LS 11
Shackle (with bolt, nut and cotter)	LS 12
Bolt, nut & cotter (without shackle)	LS 13
Cotter pin only (for shackle)	LS 14
Kit, Warning, Block Information	LS 15

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, statutor y 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 Sur vey 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 (Offshore Containers), DNV witnesses proof test and issues theirProof 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 gover nments to verify products confor m to statutory requirements and provides inspection and advisor y 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

Lloyd's Register of Shipping continued

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 Par ticle, 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 Definitons 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, Lloyds, 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 avail able and must be requested at time of order.

McKISSICK®

Your Total Block Company.

P.O. Box 3128
Tulsa, OK 74101
Ph: (918) 834-4611
Fax: (918) 832-0940
www.thecrosbygroup.com

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