120 Inch Telescope Crane Hook Modification

Introduction: The 5 and 15 ton hook for the 120” dome crane had been modified many years ago to fit the spreader-bar used for doing focus changes on the telescope. This modification rendered the safety latch on the hook inoperative thus the concern that we were in violation of the OSHA rules. The investigation and request for an OSHA waver are documented in the following pages. A waver was denied but also not needed as long as the hook was not modified beyond the limits and using the procedures specified by the manufacturer. We are in compliance with the manufacturer and must follow the rules listed in the final letter on page 8 issued by ‘WPH a division of P&H Material Handling’

The Modified Hook

120 Inch Telescope Crane Hook Modification

WPH Crane Services
3077 Teagarden Street
San Leandro, CA 94577
(800) 480-0049
(510) 352-4720
Fax: (510) 483-0336

July 19,1996

University of California Observatories
Lick Observatory
PO BOX 85
Mt. Hamilton, CA. 95140

ATTN: Mr. Jack Schultz

SUBJECT: Reply of Request for Waiver from CAL-OSHA

Dear Sir;

Enclosed is the Request for Waiver reply from CAL-OSHA regarding the modified load hook on your 15 ton Telescope Crane.

Per paragraph 8, a waiver or variance will not be issued for this modification. You may, however, elect to submit a variance to the CAL/OSHA Standards Board, for review of the cited article for possible revision.

As noted in Paragraphs 5 and 6, there are alternatives that would be acceptable by CAL-OSHA. WPH Crane Services would be happy to work with you in acquiring either a custom made load hook assembly to meet your needs, and/or having an engineering analysis performed on the existing load hook.

A copy of your Request for Waiver, as well as the reply letter from CAL-OSHA, will be retained in our Cal-Osha customer files for future reference. A copy is also to be maintained in your records.

Once the load hook in question has been certified by an engineer as being acceptable, as stated in paragraph 6, all future CAL-OSHA certificates will reflect this, and each certificate will have the signed engineers' letter attesting to this, to prevent any future questions arising from these modifications.

A copy of all of the information I have regarding this modification will be forwarded to Dan Colburn, Accounts Manager, who will be working with you to find the best possible way to resolve this matter and get your crane system back in full compliance with CAL-OSHA.

If you have any other questions regarding Cal-Osha and/or safety related concerns, please contact me. Either Dan or myself can be reached at (510) 352-4720.

With Best Regards,

Jack Powell
Cal-Osha Liaison
Safety Director

120 Inch Telescope Crane Hook Modification

STATE OF CALIFORNIA — Pete Wilson, *Governor*

DEPARTMENT OF INDUSTRIAL RELATIONS
DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

45 Fremont Street, Room 1200
San Francisco, CA 94105

ADDRESS REPLY TO:
P.O. BOX 420603
San Francisco, CA 94142

RECEIVED
JUL 18 1996
CRANE SERVICES

July 10, 1996

Mr. Jack Powell
Safety Director
WPH Crane Services
3077 Teagarden Street
San Leandro, California 94577

Re: CA-57, **WPH Crane Services**
Title 8 California Code of Regulations (T8CCR) Section 5031(d)(1) and
ASME/ANSI B30.10-1987 - Crane Hooks

Dear Mr. Powell:

The DOSH Crane Unit in Anaheim received your letter regarding a Request for Waiver from Lick Observatory.

The Crane Unit has researched their files and can find no information on this alleged request for waiver. If an employer can not meet a T8CCR requirement because equipment can not feasibly be engineered to meet a Cal/OSHA standard, the employer may submit application for a permanent variance through the Cal/OSHA Standards Board. If they have accomplished this and a permanent variance has been granted the employer is obligated to maintain a copy of that variance at their place of employment. If a variance has been issued on a crane, the variance should be made a part of the crane's detailed preventive maintenance records and shall be maintained in accordance with T8CCR Section 5033.

The fact that the employer changes a load block and hook assembly to a lower rated capacity for a special task creates no problem, as long as the operators are properly trained on the fact that the rated capacity of the crane has been reduced to the rated capacity of that load block and hook assembly. Upon completion of a special task, the regular load block and hook assembly shall be replaced to prevent the load block and hook assembly from being operated beyond its rated capacity in accordance with T8CCR Section 4999(a). All load block and hook assemblies shall have rated capacities legibly marked on the load block or hook assembly in accordance with T8CCR Section 4973.

Section 5002 requires safety closures on crane hooks or an equivalent means of preventing loads from becoming disengaged only when loads must be passed directly over workers, occupied workspaces or occupied passageways.

To prevent the use of an unauthorized modified crane hook you should recommend that your client check with crane and rigging suppliers in his area to determine if a crane hook of proper shape, size and rated capacity is available in the marketplace for this crane.

If a suitable crane load block and hook is not available, your client must contact the certified agent (the manufacturer of the hook) to determine if they will allow modification of their equipment. If the manufacturer will not allow modification of their load block and hook a civil, structural or mechanical engineer currently registered in the state of California who is knowledgeable in the structure and use of the load block and hook assembly may design modification of this hook assembly. This qualified, registered engineer would establish engineered procedures to modify the hook to include proper heat treatment procedures to insure proper ductility of metal upon completion of the modification.

For crane and hoist hooks, two good references recommended for you and your client are ASME/ANSI B.30.10-1987 and ASME/ANSI B.30.10a-1990.

The DOSH Crane Unit will not issue a waiver or variance for modification of a crane hook. If your client wishes to submit a variance to the Cal/OSHA Standards Board they may do so, but under normal circumstances a variance would probably not be considered or approved. Please advise your client to either replace the crane hook with one suitable for the work to be accomplished or have the hook properly re-engineered.

If you have any questions concerning this correspondence please contact me at (415) 972-8500 or Associate Safety Engineer Doyle Riney at (714) 939-8478.

Sincerely,

Frank R. Ciofalo, Ph.D.
Deputy Chief

dvr/FRC/mm

cc: Sr. Safety Staff

DRL003/0796

120 Inch Telescope Crane Hook Modification

An ISO 9001 Certified Company

the Crosby group, inc.

GENERAL OFFICES
2801 DAWSON ROAD (74110-5040)
P.O. BOX 3128
TULSA, OKLAHOMA 74101-3128

TELEPHONE 918-834-4611 TELEX 262569 CRSBY UR
CROSBY FAX NO. 918-832-0940

September 11, 1996

Mr. Mike Owens
P. O. Box 111
Mount Hamilton, CA 95140

Dear Mr. Owens:

This letter is in reference to our phone conversation of this date concerning the tip removal of Crosby Hoist Hooks. Figure 1 of the attached catalog page identifies several zones of the hooks for defect removal. Zone A shows that no repair is required. This is because Zone A is on an unstressed area of the hook. Therefore, the tip of the hook may be removed without affecting the hook's performance, provided:

A) Tip removal does not exceed the limits shown in Figure 1;
B) The tip is not removed by flame cutting, as the excessive heat may affect the hooks performance; and
C) The bowl of the hook will adequately support the load.

When the tip of the hook is removed, the hook will no longer function with a latch.

If we may be of any further assistance, please let us know.

Sincereiy,

THE CROSBY GROUP, INC.

Don Conner
Group Q.A. Manager

dc/kdr

Attachment

120 Inch Telescope Crane Hook Modification

Crosby® Hoist Hooks

SHANK HOOKS

QUIC-CHECK™ Q/®

Patented trademark indicates QUIC-CHECK™ product.

S-319

Hoist hooks incorporate markings forged into the product which address two (2) QUIC-CHECK™ features:

Deformation Indicators — Two strategically placed marks, one just below the shank or eye and the other on the hook tip, which allows for a QUIC-CHECK™ measurement to determine if the throat opening has changed, thus indicating abuse or overload.

To check, use a measuring device (i.e., tape measure) to measure the distance between the marks. The marks should align to either an inch or half-inch increment on the measuring device. If the measurement does not meet this criteria, the hook should be inspected further for possible damage.

Angle Indicators — Indicates the maximun included angle which is allowed between two (2) sling legs in the hook. These indicators also provide the opportunity to approximate other included angles between two sling legs.

SEE APPLICATION AND WARNING INFORMATION
On Pages 70 - 71

Working Load Limit* (tons)			Hook Identification Code			Shank Hooks Stock No.				
Carbon	Alloy	Bronze	319-C 320-C 322-C	319-A 320-A 322-A	319-B	Carbon S-319-C S.C.	Alloy S-319-A S.C.	Bronze S-319-B S.C.	Shank ** Length Type	Weight Each (lbs.)
3/4	1	.5	DC	DA	DB	1024180	1024607	1025107	Std.	.50
1	1½	.6	FC	FA	FB	1024206	1024625	1025125	Std.	.75
1½	2	1	GC	GA	GB	1024224	1024643	1025143	Std.	1.00
2	3	1.4	HC	HA	HB	1024242	1024661	1025161	Std.	1.82
3	4½	2	IC	IA	IB	1024260	1024689	1025189	Std.	3.69
5	7	3½	JC	JA	JB	1024288	1024705	1025205	Std.	7.25
7½	11	5	KC	KA	KB	1024304	1024723	1025223	Std.	13.49
10	15	6½	LC	LA	LB	1024322	1024741	1025241	Std.	18.00
15	22	10	NC	NA	NB	1024340	1024769	1025269	Std.	35.33
20	30	—	OC	OA	OB	1024386	1024803	—	Std.	72.00
20	30	—	OC	OA	OB	1024402	1024821	—	Long	85.50
25	37	—	PC	PA	—	1024420	1024849	—	Std.	134.00
25	37	—	PC	PA	—	1024448	1024867	—	Long	172.00
30	45	—	SC	SA	—	1024466	1024885	—	Std.	182.00
30	45	—	SC	SA	—	1024484	1024901	—	Long	214.00
40	60	—	TC	TA	—	1024509	1024929	—	Std.	268.00
40	60	—	TC	TA	—	1024545	1024965	—	Long	312.00
50	75	—	UC	UA	—	1024563	1024983	—	Std.	390.00
50	75	—	UC	UA	—	1024581	1025009	—	Long	426.00
—	100	—	—	WA	—	—	1025027	—	Std.	610.00
—	100	—	—	WA	—	—	1025045	—	Long	675.00
—	150	—	—	XA	—	—	1025063	—	Std.	735.00
—	200	—	—	YA	—	—	1025081	—	Std.	1020.00
—	300	—	—	ZA	—	—	1025090	—	Std.	1390.00

** See column "Y " on page 73 for actual length.
Hook I. D. Codes: A - Alloy Steel, B - Bronze High Strength, C - Carbon Steel.

* NOTE: Proof load is 2 times Working Load Limit. All carbon hooks - average straightening load (ultimate load) is 5 times Working Load Limit. Alloy eye hooks 1 ton through 22 ton - average straightening load (ultimate load) is 5 times Working Load Limit. Alloy eye hooks 30 tons through 60 tons - average straightening load (ultimate load) is 4.5 times Working Load Limit. All Alloy shank hooks - average straightening load (ultimate load) is 4.5 times the Working Load Limit. All Bronze hooks - average straightening load (ultimate load) is 4 times Working Load Limit.

(For Custom Machining, see page 211.)

120 Inch Telescope Crane Hook Modification

Crosby® Hoist Hooks

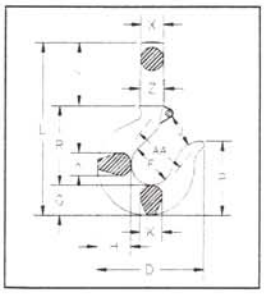
SHANK HOOKS

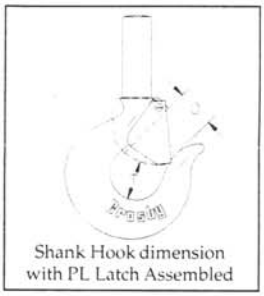
S-319

QUIC-CHECK™

SEE APPLICATION AND WARNING INFORMATION
On Pages 70 - 71

- The most complete line of shank hoist hooks. Available ¾ to 300 tons.
- Available in carbon steel, alloy steel, and bronze.
- Quenched and Tempered.
- Proper design, careful forging, and precision controlled quench and tempering give maximum strength without excessive weight and bulk.
- Every Crosby Shank Hook has a pre-drilled cam which can be equipped with a latch. Simply purchase the latch assemblies listed and shown on pages 83 or 85. Even years after purchase of the original hook, latch assemblies can be added.
- Load Rating code stamped on each hook.





Shank Hook dimension with PL Latch Assembled

Hook I.D. Code	Dimensions (in.) D	F	G	H	J	K	L	O	P	R	T	X††	Y	Z	Deformation Indicator AA
D	2.88	1.25	.75	.81	.97	.56	5.03	.88†	2.00	2.28	.81†	.59	2.00	.69	1.50
F	3.19	1.38	.84	.94	1.06	.62	5.62	.97†	2.25	2.53	.81†	.66	2.25	.78	1.50
G	3.62	1.50	1.00	1.16	1.12	.75	6.19	1.00†	2.53	2.69	.84†	.72	2.50	.88	2.00
H	4.09	1.63	1.12	1.31	1.25	.84	6.94	1.12†	2.84	3.06	1.19†	.88	2.75	1.00	2.00
I	4.94	2.00	1.44	1.62	1.50	1.12	8.47	1.06	3.56	3.78	1.38	1.16	3.25	1.25	2.50
	6.50	2.50	1.81	2.06	1.88	1.38	10.31	1.50	4.44	4.75	1.78	1.41	3.75	1.56	3.00
K	7.56	3.00	2.25	2.62	2.25	1.62	12.38	1.75	5.50	5.88	2.12	1.81	4.25	1.94	4.00
L	8.69	3.25	2.59	2.94	2.50	1.94	13.53	1.91	6.19	6.41	2.56	2.00	4.50	2.19	4.00
N	11.00	4.25	2.97	3.50	3.38	2.38	16.44	2.75	7.31	7.94	2.88	2.56	5.50	2.62	5.00
O	13.62	5.00	3.62	4.62	4.00	3.00	23.09	3.25	8.78	9.44	3.44	3.12	10.00	3.12	6.50
O	13.62	5.00	3.62	4.62	4.00	3.00	31.09	3.25	8.78	9.44	3.44	3.12	18.00	3.12	6.50
P	14.06	5.38	4.56	5.00	4.25	3.62	32.12	3.00	11.38	12.56	3.88	4.00	15.00	4.00	7.00
P	14.06	5.38	4.56	5.00	4.25	3.62	41.12	3.00	11.38	12.56	3.88	4.00	24.00	4.00	7.00
S	15.44	6.00	5.06	5.50	4.75	3.72	34.12	3.38	12.63	14.00	4.75	4.00	15.00	4.00	8.00
S	15.44	6.00	5.06	5.50	4.75	3.72	43.12	3.38	12.63	14.00	4.75	4.00	24.00	4.00	8.00
T	18.50	7.00	6.00	6.50	5.75	4.44	36.06	4.12	14.81	15.50	5.69	4.50	14.50	4.50	10.00
T	18.50	7.00	6.00	6.50	5.75	4.44	47.56	4.12	14.81	15.50	5.69	4.50	26.00	4.50	10.00
U	20.62	7.75	6.69	7.25	6.50	4.81	41.16	5.38	16.53	19.38	6.00	5.00	15.00	5.00	11.50
U	20.62	7.75	6.69	7.25	6.50	4.81	49.16	5.38	16.53	19.38	6.00	5.00	23.00	5.00	11.50
W	23.00	6.81	8.59	9.88	5.88	5.50	42.12	4.50	17.38	18.41	7.00	7.00	15.00	7.00	12.00
W	23.00	6.81	8.59	9.88	5.88	5.50	48.12	4.50	17.38	18.41	7.00	7.00	21.00	7.00	12.00
X	24.38	6.75	9.12	10.94	6.00	6.00	45.75	4.50	18.00	18.38	7.00	7.25	18.00	7.25	13.00
Y	26.69	7.50	9.75	11.81	6.60	7.00	50.50	5.00	19.25	20.50	8.00	8.00	20.00	8.00	13.00
Z	30.12	9.50	10.62	12.94	8.00	7.25	54.69	6.25	22.69	20.50	8.25	9.50	20.00	9.50	15.00

ailable hot dip galvanized.
Dimensions shown are for 4055 Latch kits. Dimensions for sizes 3 ton carbon and larger are for PL Latch Kits.
†† Dimension before machining (as forged). See page 71 - for maximum clean up dimensions after machining.
***NOTE: Proof load is 2 times Working Load Limit. All carbon hooks - average straightening load (ultimate load) is 5 times Working Load Limit. Alloy eye hooks 1 ton through 22 ton - average straightening load (ultimate load) is 5 times Working Load Limit. Alloy eye hooks 30 tons through 60 tons - average straightening load (ultimate load) is 4.5 times Working Load Limit. All Alloy shank hooks - average straightening load (ultimate load) is 4.5 times the Working Load Limit. All Bronze hooks - average straightening load (ultimate load) is 4 times Working Load Limit.**

120 Inch Telescope Crane Hook Modification

WPH Crane Services
3077 Teagarden Street
San Leandro, CA 94577
(800) 480-0049
(510) 352-4720
Fax: (510) 483-0336

9/26/96

LICK OBSERVATORY
P. O. Box 111
Mt. Hamilton, ca. 95140

ATTN: Mr. Mike Owens

Dear Mr. Owens;

Please find enclosed CAL-OSHA certificates for your crane systems. Per CAL-OSHA regulation TITLE 8, Article 99.5021.a.2, you are required to maintain this certification record on file, which attests to current compliance with testing and examination standards acceptable to CAL-OSHA.

Due to the use of a specially altered load hook that is of lower capacity rating than that of the crane system, it is imperative that ALL employees who work with, or around the crane while it is in use, fully understand that:

1) The maximum capacity of the crane system shall be the capacity rating of the lowest rated member...in this case, the 5 ton load hook. (When this hook has been installed for the temporary lifts.)

2) As the load hook safety latch has been removed or otherwise disabled on this altered load hook, NO LIFTS ARE TO BE MADE DIRECTLY OVER WORKERS, OCCUPIED WORK SPACES, OR OCCUPIED PASSAGEWAYS.

To prevent any future problems with certifications of this crane system, it is highly recommended that this letter and all accompanying paperwork with this certification be presented, or otherwise brought to the attention of, any and all personnel who will inspect and/or certify this crane system.

I would also strongly urge that the load hook not currently on the crane system at the time of inspection be made available to the inspector for inspection.

Additionally, CAL-OSHA requires that ALL crane and hoisting equipment of any capacity be inspected every 3 months or 750 operating hours, whichever occurs first. (TITLE 8, Article 100.5031.c) Records attesting to this inspection are also to be kept on file.

I would be most happy to discuss establishing a preventative maintenance and inspection program designed to fit your company needs, or to assist you with any CAL-OSHA related concerns. Please contact me at (800) 480-0049.

Thank you for giving WPH Crane Services the opportunity to serve you.

Very best regards,

Jack Powell
Cal-Osha Liaison
WPH Crane Services

120 Inch Telescope Crane Hook Modification

Mike Owens Notes on the Hook