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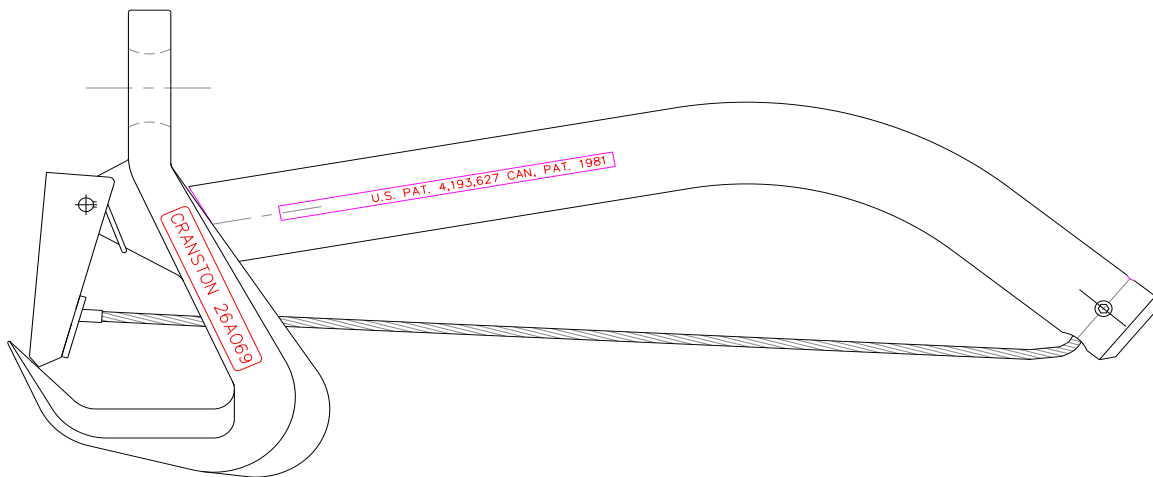
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SPECIFICATION NO. CS007, January 04, 2019

GUIDELINES FOR CARGO LIFTING WITH CRANSTON MACHINERY: UNILIFT MANUAL HOOKS

The use and maintenance of cargo handling gear is outside Cranston Machinery's control. Therefore, the user must conduct his own evaluation, under the conditions of his normal use and to the safety factor pertinent to his industry, to verify the safe application of Cranston Machinery hooks with his application.

Refer to individual hook model bulletins for limited warranty and limitation of liability.



1.0 The Purpose of this Specification

Is to define the methods and requirements for the use of Cranston Machinery Co. UNILIFT Manual Cargo Hooks. While the subject is an integral part of the broad field of Cargo Rigging, the user is referred to the publications of specialists in rigging for other equipment, methods, and cautions.

2.0 A Brief History and Background

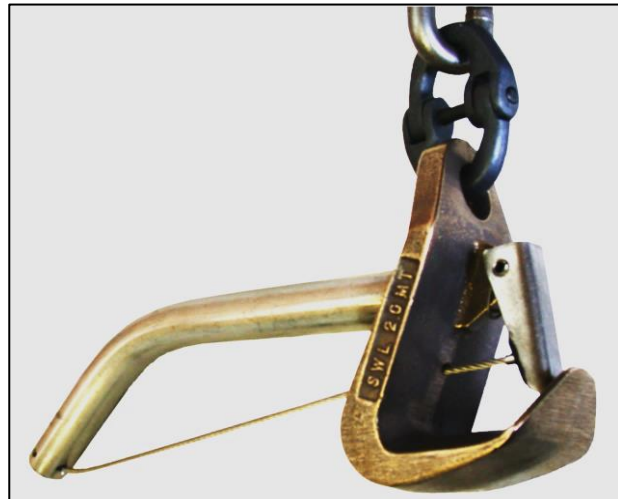
Cranston Machinery Co. UNILIFT Cargo hooks are generally designed for tandem (two-point) applications, with cargo specific spreaders or lift beams. Single hook applications are also possible, but all must be planned, tested, and documented in accordance with local regulations and accepted industry practice. Cranston Machinery UNILIFT Manual Hooks are used with webbing, flat steel strapping, and multiple strand wire.

In addition to UNIHOOKS, WEBLATCHES, and UNILIFT manual hooks in several configurations, Cranston Machinery designs and manufactures custom lift beams and spreader bars complete with controls and all hook components for a lifting system to customer specifications.

3.0 Cranston Machinery UNILIFT Manual Hooks

UNILIFT models and general applicability to certain lifting media are listed below. Model 26A073, 26A074 and 26A075 are in use, but no longer being produced. The UNILIFT **must be** supported by a swivel if the sling imparts a twist on the hook. Models used with flat steel strapping or webbing **must be** used within the manufacturer's specifications and instructions, including those related to damage, load limits, bridle angle, connections, and arrangement.

Model 26A069 2MT UNILIFT Manual hook, shown to right.



UNILIFT Model	SWL MT	Swivel Included	Handle Included	Latch Included	Applications		
					Multi-Wire/Pulp units	Steel Strapping	Webbing
26A069	2	No	Yes	Yes	*Two-point lift only	*Two-point lift only	Limited
26A073	2	No	No	Yes	*Two-point lift only	*Two-point lift only	Limited
26A074	2	Yes	No	No	*Two-point lift only	*Two-point lift only	Limited
26A075	2	Yes	No	Yes	*Two-point lift only	*Two-point lift only	Limited

* Shaded row indicates standard model

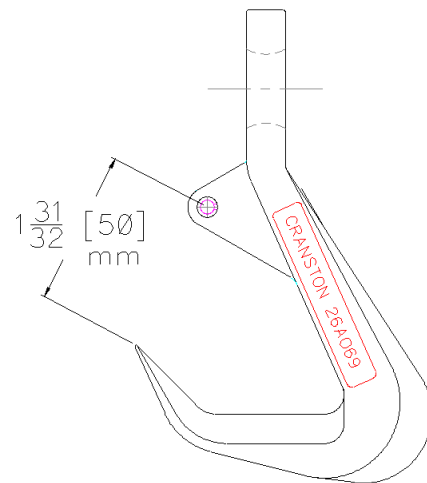
* see section 7.0 below

- 3.1 Cranston Machinery has tested the above UNILIFT Manual Hook bodies with **USLM Strapping**, with the following results:
- 3.1.1 The Manual Hook should not be used in a one-hook lift, due to the hook's edge radii. It tested to be suitable for use with USLM strapping with a spreader bar and two lift points on a single strap, **in accordance with Paragraph 3.1.2 below**. Two hook lifts on a strap must be arranged to produce a strap bridle angle of no more than 40 degrees with vertical.
- 3.1.2 Models used with **USLM strapping** must be used within all the manufacturer's instructional limits, including those related to use of damaged strapping, load limits, strap angles, strap sealing, and arrangement.
- 3.2 The **Maintenance of UNILIFT Manual Hooks** consists of inspection for wear or cracks at each use, and periodic lubrication of the latch mechanism, if applicable. The latch should contact the hook point squarely. See the parts detail supplied with the hook.

4.0 **UNILIFT Manual Hook Inspection and Repair**

- 4.1 UNILIFT Manual Hooks may be inspected and repaired by trained technicians or mechanics using the required tools, procedures, and lubrication. Parts are available upon request. Cranston Machinery offers hook inspection and repair with OEM parts.

The measurement shown at right is a nominal dimension, as manufactured, of the Cranston Machinery 2MT UNILIFT Manual Hooks. An increase in this dimension of 1/8" (3 mm) indicates that the hook has been overstressed by several times the SWL, and the hook should be destroyed.



5.0 **UNILIFT Manual Hook Set-up and Use**

- 5.1 Support chain and links of a size and SWL appropriate to the cargo hook SWL must be attached per the manufacturer's instructions. Under load, the hook must be able to swivel to the orientation of the gear securing the load, so the hook support chain when under load does not twist the lifting media against the latch. If the hook has no swivel attachment, the user must insure by inspection that the hook hangs freely to prevent this twist.

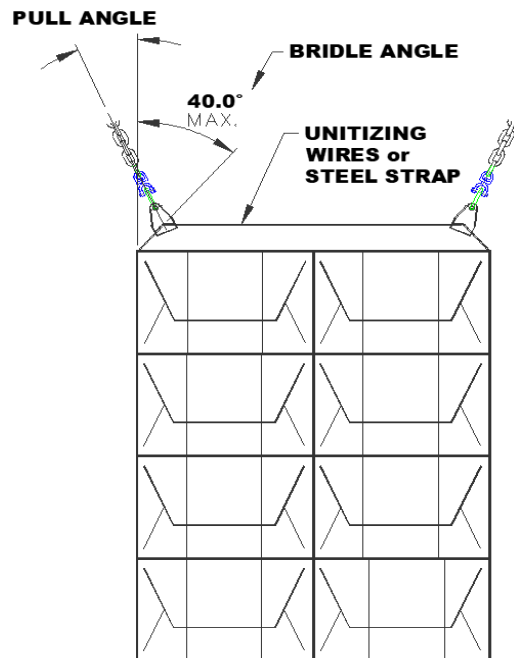
6.0 Safe Working Load / Factor of Safety

- 6.1 **Safe Working Load (SWL)** rating for Cranston Machinery Hooks is based on the straight pull applied to the hook. All load “below the hook” is additive to the product load being handled. Per OSHA regulations, each hook is clearly marked with the SWL.
- 6.2 The proper Factor of Safety for cargo handling equipment is specified by governing agencies of a given locality and may vary with many factors. Cranston Machinery Co. Cargo Hooks are designed with a Minimum Factor of Safety of 4:1. Thus the minimum Safe Working Load is one quarter of the minimum ultimate strength of the hook or mechanism, based on design stresses and actual destructive tests. **CHECK WITH LOCAL AUTHORITIES REGARDING THE REQUIRED FACTOR OF SAFETY FOR YOUR EQUIPMENT AND PROCEDURES.**

7.0 The Effect of Angular Pulls

This diagram illustrates how, in multiple hook lifts, the geometry effects the load applied to the hook and the unit binding media.

- 7.1 The **Bridle Angle** effects the stress in the unit binding media (ie. Unitizing wires, slings, straps, wire ropes) and must be planned by the producer of the unit and considered by all subsequent handlers of the unit. Cranston Standard CS001 provides guidance in this planning for multiple strand unitizing wire.
- 7.2 The Pull Angle directly effects the load applied to the UNILIFT. When using two hooks on a common unit binding media each hook bears half the unit weight if there is no pull angle. With a pull angle of 40 degrees, the load on each hook is half the unit weight divided by .776, or 30.5% more. The table below provides a factor, the cosine of the angle, for angles between 5 and 40 degrees.

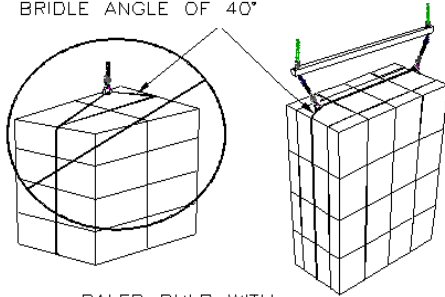


PULL ANGLE	5	10	15	20	25	30	35	40
FACTOR (Cosine of Angle)	0.996	0.985	0.966	0.940	0.906	0.866	0.819	0.766
RESULTANT HOOK LOAD	100.4%	101.5%	103.5%	106.4%	110.4%	115.5%	122.1%	130.5%

8.0 Cargo Hook arrangements

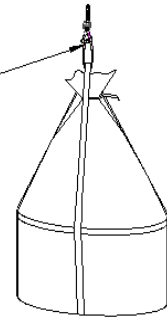
The following diagrams show some acceptable and unacceptable cargo hook and unit arrangements. These apply to Cranston Machinery UNILIFT Manual Hook

CRANSTON CS001 DEFINES MAX. BRIDLE ANGLE OF 40°



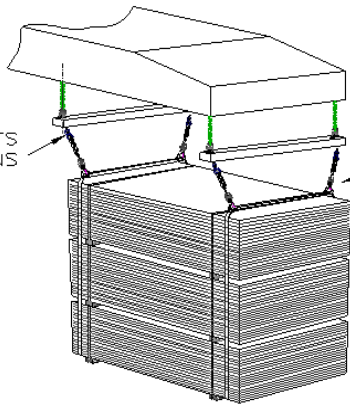
BALED PULP WITH MULTI-STRAND WIRE

WEBBING MUST FIT IN FLAT OF HOOK AND BE TESTED PER ALL REGULATORY REQUIREMENTS



BAGS

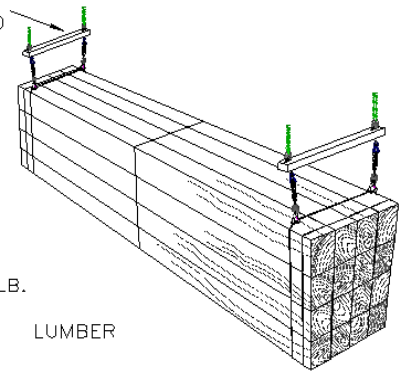
SWIVEL PREVENTS TWIST ON CHAINS AND HOOK EYE



PANEL PRODUCTS

SPREADER BEAM MAINTAINS PULL ANGLE FOR DESIGNED STRAP LIFT ARRANGEMENT

IF THIS UNIT WEIGHS 6000 LB. AND PULL ANGLE OF THIS HOOK IS 30°, LOAD ON THIS HOOK IS 1/4 OF 6000/.866, OR 1732 LB.



LUMBER

9.0 Suggested Instructions for Stevedores and Longshoremen

- 9.1 When using Cranston Machinery Cargo Hooks, observers are forbidden to stand under or near a hanging unit, or within the fall area of a moving load.
- 9.2 When using Cranston Machinery Cargo Hooks, all hook riggers must be clear of the load before lifting of the unit commences, and clear of the fall area of the load. Likewise, all individuals must stand clear until the load is relieved from the hooks and is completely at rest. (Crane or load may swing or shift without warning).
- 9.3 When loading or unloading, only one crew is to work in a cargo space unless work areas are properly guarded to confine multiple crews to their own work area.
- 9.4 When using Cranston Machinery Cargo Hooks, any unit with missing or damaged lifting wires or straps must be lifted with extreme caution to the point where it can be lifted out with a wire rope sling.
- 9.5 When lifting or lowering with Cranston Machinery Cargo Hooks, sudden acceleration and braking of the crane must absolutely be avoided. Cranes which permit "free-running" lowering of the load are not permitted to be used. The operator must gently take the slack out of all lift components, to allow visual confirmation that proper hook connections or disconnects have been made.
- 9.6 Cranston Machinery has no responsibility for the tools or crews used or activities of individuals involved in attaching or releasing units to or from Cranston Machinery Cargo Hooks. Local regulations and safety precautions must be followed.
- 9.7 All individuals involved in the use, inspection and maintenance of cargo handling equipment must be properly trained and authorized per local regulations and company policy.

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