DISTRIBUTION SHEET

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Project Title/Work Order		EDT No. 609848
Acceptance Test Report for the Link Belt LS-518 Crane Hook Position/Rate Indication System		ECN No. NA

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6/4

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2. To: (Receiving Organization) See Distribution List	3. From: (Originating Organization) Engineering Services	4. Related EDT No.: 608811
5. Proj./Prog./Dept./Div.: 241-SY-101	6. Cog. Engr.: M. J. Ostrom	7. Purchase Order No.: NA
8. Originator Remarks: See attached Acceptance Test Report for the Link Belt LS-518 Crane Hook Position/Rate Indication System.		9. Equip./Component No.: NA
		10. System/Bldg./Facility: 241-SY-101
11. Receiver Remarks:		12. Major Assm. Dwg. No.: NA
		13. Permit/Permit Application No.: NA
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(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Impact Level	Reason for Trans- mittal	Origi- nator Dispo- sition	Receiv- er Dispo- sition
1.	WHC-SD-WM-ATR-110		0	Acceptance Test Report for the Link Belt LS-518 Crane Hook Position/Rate Indication System.	SQ	1		

16. KEY		
Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)										(G)	(H)
Reason	Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	Reason	Disp.
1	1	Cog.Eng. MJ Ostrom	<i>[Signature]</i>	12/21/94	H5-68						
1	1	Cog.Mgr. CE Hanson	<i>[Signature]</i>	12/21/94	H5-09						
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1		Safety LS Krogsrud	<i>[Signature]</i>	12/21/94	R3-08						
		Env.									
		Proj/Prog.									
1		Other TE-Meekey	<i>[Signature]</i>	12/21/94	S2-03						
		GA Ritter	<i>[Signature]</i>	12/21/94	H0-38						

18. Signature of EDT Originator <i>[Signature]</i> Date: 12/21/94	19. Authorized Representative for Receiving Organization CE Hanson <i>[Signature]</i> Date: 12/21/94	20. Cognizant/Project Engineer's Manager CE Hanson <i>[Signature]</i> Date: 12/21/94	21. DOE APPROVAL (if required) Ltr. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
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RELEASE AUTHORIZATION

Document Number: WHC-SD-WM-ATR-110, REV. 0

Document Title: Acceptance Test Report for the Link Belt LS-518
Crane Hook Position/Rate Indication System

Release Date: 01/03/95

**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Niki Solis

01/03/95

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SUPPORTING DOCUMENT		1. Total Pages 25
2. Title Acceptance Test Report for the Link Belt LS-518 Crane Hook Position/Rate Indication System.	3. Number WHC-SD-WM-ATR-110	4. Rev No. 0
5. Key Words line counter Coast Crane mitigation ATR acceptance test report 101-SY	6. Author Name: B. L. Aftanas Signature Organization/Charge Code OHJ48/N226A	
7. Abstract This Acceptance Test Report (ATR) is for the Link Belt LS-518 Crane Hook Position/Rate Indication System.		
8. RELEASE STAMP

ACCEPTANCE TEST REPORT

Link Belt LS-518 Crane, Serial # 4EW509

Hook Position/ Rate Indication System

Prepared for
Westinghouse/ Hanford

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

Prepared by:
Ron Fox,
Engineer

Coast Crane Co. of WA

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Intro.

This document (Acceptance Test Report), provided by Coast Crane Co of WA to show compliance of the hook position instrumentation with Westinghouse specification WHC-S-0318 rev 0. All testing as required by the specification was completed satisfactorily and witnessed by the buyer's representative. This report covers operational parameters only.

Procedure

1. Test performed in accordance with WHC-SD-WM-ATP-110 rev.0 Acceptance Test Procedure (ATP).
2. Applied load was approximately 23,600 lb and consisted of a freely suspended test weight and the cranes hook block. Crane was rigged with four parts of line.
3. Reference point on ground was a large wooden block.
4. Measuring device for the test was a steel surveyor's tape. The tape is ruled in hundredths of a foot. Accuracy of this method of testing should not be impied beyond +/- .02 feet. Most errors in reading tape are due to physical alignment and instability of the load (bouncing).

Results

Lift #	Initial Height	Final Height	Height Difference	Indicated Height	Height Deviation	Percentage Difference
1	4.78	84.65	79.87	80.09	0.22	0.28%
2	84.65	6.11	78.54	78.67	0.13	0.17%
3	6.11	83.75	77.64	77.83	0.19	0.24%
4	83.75	5.55	78.20	78.33	0.13	0.17%
5	5.55	82.75	77.20	77.35	0.15	0.19%
6	82.75	5.55	77.20	77.36	0.16	0.21%
7	5.55	83.05	77.50	77.67	0.17	0.22%
8	83.05	4.98	78.07	78.19	0.12	0.15%
Averages			78.03	78.19	0.16	0.20%
Std Dev					0.03	0.04%

Analysis

Specification called for accuracy of +/- .104 foot per 100 feet of cable(.104%). On average over the test lifts the accuracy was:

Deviation	Height	Parts of Line	Accuracy
0.16	78.03	4	0.051%

Worst case accuracy was at lift number 1. Accuracy on this lift was:

Deviation	Height	Parts of Line	Accuracy
0.22	79.87	4	0.069%

Conclusion

System meets the specified accuracy by better than one and one half times. System errors are all grouped so as to give an average indication that is over the actual measured value by .16 foot over 312 feet of cable. This fixed offset could readily be reduced by further calibration and refinement of the calibration factor stored in the display unit. A reduction of the factor would result in a lower indicated value per revolution of the encoder. Signed copies of the ATP accompany this report.

Notes

- The 4-20mA output stage was not tested for accuracy. This stage should be tested. The output of the 4-20 mA section is based on the displayed value and should be at least as accurate as the display.
- Systems mechanical details must be monitored for the first several months. Cables and encoder must be monitored for interference from the crane. Potential areas to watch include but are not limited to:
 - Base of boom – watch for pinching or pulling of the cable assemblies.
 - Length of boom – watch for chafing or pinching.
 - Boom Tip – look for chafing, pinching, misalignment of the roller assembly.
 - Interface cable to remote monitor – watch that it does not become pinched in the swing assembly.

ATTACHMENT 1

SPECIFICATION DATA SHEETS

NEMA 4 ENCLOSURE ASSEMBLY

MOUNTING BRACKET INSTALLATION

INSTALLATION

THE RLC ASTRO LINE PRODUCTS (GENI, LIBRA, APOLLO) HAVE SIDE OPENINGS IN THE CASE FOR PANEL MOUNTING LATCHES. SPECIAL LATCHES ARE SUPPLIED WITH EACH ENCLOSURE TO ENGAGE THE LATCH OPENINGS AND SECURELY RETAIN THE INSTRUMENT. THE INSTALLATION PROCEDURE IS AS FOLLOWS:

- APPLY THE SELF-STICK PANEL GASKET SUPPLIED WITH THE INSTRUMENT TO THE ENCLOSURE OPENING. THE GASKET SHOULD BE APPLIED WITH THE ADHESIVE SIDE OF THE GASKET AGAINST THE ENCLOSURE FRONT PANEL.
- INSERT THE MOUNTING LATCHES, WITH THE ENGAGING HOOK FACING INWARD, INTO THE ENCLOSURE. PLACE THE LATCHES AGAINST THE SIDEWALLS AND INSTALL A FLAT-HEAD SCREW THROUGH THE CHAMFERED HOLES IN THE REAR OF THE ENCLOSURE. ENGAGE THE SCREWS 2 OR 3 THREADS INTO THE THREADED FASTENERS IN THE LATCHES.
- WITH THE LATCHES AGAINST THE SIDEWALLS, INSERT THE UNIT INTO THE ENCLOSURE THROUGH THE FRONT SO THAT THE BEZEL FLANGE BOTTOMS OUT ON THE GASKET.
- THE LATCH HOOK WILL ALIGN WITH THE LATCH OPENINGS IN THE SIDE WALLS OF THE UNIT. TO ENGAGE THE LATCHES, GRIP THE LATCH THROUGH THE REAR OPENING AND PULL IT BACK AND AGAINST THE UNIT UNTIL THE HOOK ENGAGES THE LATCH OPENING. TIGHTEN THE SCREW TO FULLY RETAIN THE LATCH, AND REPEAT FOR THE OTHER LATCH. THE SCREWS SHOULD BE TIGHTENED SO THAT THE FRONT PANEL GASKET IS COMPRESSED TO AT LEAST 50% OF ITS ORIGINAL THICKNESS.

- INSTALL THE REAR PANEL GASKET WITH THE ADHESIVE SIDE AGAINST THE ENCLOSURE AND THE SCREW CLEARANCE HOLES ALIGNED WITH THE THREADED HOLES IN THE ENCLOSURE.
- INSTALL ANY CONNECTORS OR CONDUIT FITTINGS TO THE REAR ACCESS PANEL. MAKE THE DESIRED WIRING CONNECTIONS TO THE ENCLOSED UNIT WITH THE REMOVABLE WIRING BLOCK.

- AFTER ALL ELECTRICAL CONNECTIONS HAVE BEEN MADE, ATTACH THE REAR ACCESS PANEL TO THE REAR OF THE ENCLOSURE WITH THE FOUR SCREWS AND WASHERS PROVIDED.

MOUNTING OPTIONS

SPECIFICATION DATA
SHEET NO. ENC5/6SP-A

REVISED 4/87

**RED LION
RLC CONTROLS**

INTERNATIONAL HEADQUARTERS
20 Willow Springs Circle, York, Pa. 17402
(717) 767-6511 FAX: (717) 764-0639

EUROPEAN HEADQUARTERS
892 Plymouth Road, Slough, Berkshire SL1 4LP
ENGLAND 753-696888 FAX: 753-696339

MHC-SD-MM-ATR-110 Rev. 0

Series 625/525 Opal™ Encoders

- Heavy-duty size 25 (2.5" diameter) construction
- Up to 5000 PPR with optional markers
- High performance

The Series 625/525 encoders are high resolution, optical incremental transducers suitable for industrial shop-floor environments. They feature mechanical standard size 25 flange, servo and face mounting options for easy mounting.

The electrical outputs are designed to be compatible with most instruments, electronic counters, PLC's, CNC's, motion controllers and motor drives. Optional differential line driver outputs allow for longer cable runs (hundreds of feet) and higher electrical noise immunity for the signals.

The 625 is designed with heavy-duty bearings, sealing at the shaft, cast metal enclosure with environmental seals, and sealed MS pin connectors or pre-wired cables. The Series 525 features the same construction but with shielded bearings and lower starting torque. Industry-standard flange, servo, and face mounting options can be connected easily via flexible couplings to leadscrews/ballscrews, rack and pinions, etc. Axial and radial connectors are available.

Applications

- CNC's, machine tool, cutting, forming, welding, robotics
- Oil well, logging
- Counters, instruments, web processing, roll handling
- PLC's, material handling, food processing, assembly machines
- Rotary tables

Mechanical and Environmental Features

- 3/8" or 1/4" dia. stainless steel shaft
- Flange, servo, or face mounting
- Environmentally sealed enclosure
- Up to 5000 RPM
- ABEC 5 bearings
- 0 to 70°C operating range
- Heavy-duty sealed MS pin connector

Electrical Features

- Up to 5000 pulses per revolution
- 100 kHz electronic operating speed
- Current sink or line driver outputs
- Bidirectional and marker pulse
- Single LED illumination of all detectors for better long-term performance

SPECIFICATIONS

Electrical

Resolution: Available counts (cycle per shaft revolution): 1, 5, 10, 12, 50, 60, 100, 120, 150, 180, 200, 240, 250, 256, 300, 344, 360, 400, 500, 512, 600, 625, 635, 720, 800, 900, 1000, 1024, 1200, 1250, 1270, 1500, 1600, 1800, 1968, 2000, 2048, 2500, 2540, 3600, 4096, 5000. (Other counts available; contact factory.)

Code: Incremental

Maximum Current Requirements (not including load current):

Units with Current Sink Outputs = 120 mA

Units with Differential Line Drivers = 70 mA

Output Format: Two channel quadrature with optional zero reference and complementary outputs.

Quadrature Phasing: $90^\circ \pm 18^\circ$ at a 10 kHz rate

Symmetry: $180^\circ \pm 9^\circ$ at a 10 kHz rate

Phase Sense: A leads B for CCW rotation as viewed from the shaft end of the encoder

Zero Reference: .5 cycles wide

Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pF

Frequency Response: Count channel 100 kHz. Zero reference 75 kHz relative to count channel

Illumination: Single gallium-aluminum-arsenide LED

Connector: 7 pin, style MS3102E-16S-1P

10 pin, style MS3102E-18-1P

Mating Connector:

7 pin, style MS3106A-16S-1S

(Dynapar No. MCN-N5);

10 pin, style MS3106A-18-1S

(Dynapar No. MCN-N6)

Mechanical

Bearings: ABEC precision bearings

Shaft Tolerance: $-0.0004" - 0.0007"$

Shaft Loading: 40 lbs. axial and 35 lbs. radial (5 lbs. axial and radial for Series 525 w/1/4" shafts only)

Starting Torque: Series 625: 5 oz-in max.

Series 525: 1.0 oz-in max.

Moment of Inertia: 3.7×10^{-4} oz-in-sec² max.

Weight: 13 oz. max.

Slew Speed: 5000 RPM max.

Environmental

Operating Temperature Range: 0° to +70°C

Storage Temperature Range: -40° to +90°C

Shock: 50 G's for 11 milliseconds duration

Vibration: 5 to 2000 Hz @ 2 G's

Humidity: to 98% without condensation

Enclosure Rating: Series 625: NEMA 4, 13 and IP56

Electrical Connections

With Current Sink Output			
Pin	Function (If Used)	Wire Color Code	Dyn. #14004310010* Cable Accessory Color Code
A	Signal A	BRN	RED
B	Signal B	ORN	BLUE
C	Signal Z	YEL	YEL
D	Power Source	RED	WHT
E	No Connection	—	GRN
F	Common	BLK	BLK
G	Case	GRN	SHIELD

With Line Driver Output			
Pin	Function (If Used)	Wire Color Code	Dyn. #14006350010* Cable Accessory Color Code
A	Signal A	BRN	BRN
B	Signal B	ORN	ORN
C	Signal Z	YEL	YEL
D	Power Source	RED	RED
E	No Connection	—	—
F	Common	BLK	BLK
G	Case	GRN	GRN
H	Signal A	BRN/WH	BRN/WH
I	Signal B	ORN/WH	ORN/WH
J	Signal Z	YEL/WH	YEL/WH

*This is a mating connector/cable assembly described in the Encoder Accessories section of this catalog. Color-coding information is provided here for reference.

Note: Wire color codes are referenced here for models that are specified with pre-wired cable.

PIVOT MOUNTING BASE

Provides adjustable, vertical, spring loading for 60A, 60C, 42 Series Rotopulsers™ and 2.5" Encoders equipped with either one or two measuring wheels.

Order Model No. MBP-14D574

FEATURES

- **Complete mounting system**
- **Complete Encoder mounting hardware included**
- **Single or Dual Wheel uses same mount**
- **Supports 60A, 60C and 42 Series Rotopulsers™**
- **Mounts any 2.5" Dia. Flange Mount Encoder**
- **Simple machine attachment**
- **Pre-assembled ready to "bolt up"**
- **Automatic spring tension built in**

MECHANICAL

Note: Dynapar Series 60C Rotopulser™ and Measuring Wheels not included

ATTACHMENT 2

WIRING DIAGRAM

CRANE CAB
GEM41100

REMOTE MONITORING LOCATION
IMA04137

PROPRIETARY INFORMATION, USAGE IS
LIMITED TO REPAIR OR MODIFICATION
OF EXISTING COAST CRANE SYSTEM

Coast Crane Company of Washington			
Date	10/04/94	Drawn by	
Scale	NONE	RRF	
WIRING DIAGRAM HOOK POSITION / RATE INDICATION SYSTEM			
Dwg Size: A	REV. 0	DWG NO LS518WIR	SPEC B

ATTACHMENT 3

INTERCONNECT DIAGRAM

C-2

IN CAB DISPLAY
GEM41100 FUSED DC POWER
AND GROUND
(5A MAX)
(10-30VDC)

CRANE CAB

4 COND CABLE, 250' SHEILDDED

C1204

ENCODER AT
BOOM TIP

REMOTE MONITOR LOCATION

REMOTE DISPLAY
IMA04137

6 COND CABLE, 250' SHEILDDED

C1206

2 COND CABLE, 250' SHEILDDED
TO DATA AQ. EQUIPMENT

C1202

4-20 mA ANALOG OUTPUT

BUYERS
DATA
AQ.
SYS.

CONNECTOR DESCRIPTIONS

ITEM #	PART #
1	MS3108E16S-1S
2	MS3108E14S-6P
3	MS3102E14S-6P
4	MS3102E12S-3S
5	MS3102E12S-3P
6	MS3106E12S-3S
7	MS3106E14S-6P

PROPRIETARY INFORMATION, USAGE IS
LIMITED TO REPAIR OR MODIFICATION
OF EXISTING COAST CRANE SYSTEMCoast Crane Company
of Washington

Date	10/04/94	Drawn by	RRF
Scale	NONE		

INTERCONNECT DIAGRAM
HOOK POSITION / RATE INDICATION
SYSTEM

Dwg Size: A	REV. 0	DWG NO LS510WIR	SPEC A
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WMC-SD-WM-ATR-110 Rev. 0

ATTACHMENT 4

LINKBELT LS-518 INDEPENDENT INSPECTOR CERTIFICATION FORM

DELCON CRANE CERTIFICATORS, INC.
19889 7th Avenue N.E., Suite 215, Poulsbo, WA 98370
Phone or Fax (206) 598-6000

WHC-SD-WM-ATR-110 Rev. 0

**CRANES, DERRICKS OR MATERIAL HANDLING DEVICES WORKSHEET
AND CERTIFICATION FORM**

NAME OF OWNER <i>Westinghouse</i>		PREVIOUS WA. STATE CERT. #	EXPIRATION DATE <i>11, 2, 95</i>	WT. TEST EXP. DATE <i>11, 2, 98</i>
ADDRESS <i>S-315 PO Box 1970</i>		CITY <i>Richland Washington</i>	STATE	ZIP <i>99352</i>
DESCRIPTION: DERRICK ☐ CRANE ☒ OTHER ☐ (describe)		REMAINS AT WORK SITE ☒ YES ☐ NO IF NO, explain		
MANUFACTURER <i>FMC-Link Belt</i>		MODEL NUMBER <i>LS518</i>	SERIAL NUMBER <i>4EW509</i>	
EXACT LOCATION <i>Hon Ford Site</i>		IF CRANE OR DERRICK, STATE TYPE; RAIL, STEAM, ETC. <i>CRAWLER</i>		
POWERED BY: SUPPLIED ELECTRICITY ☐ STEAM ☐ DIESEL ☒ DIESEL ELECTRIC ☐ OTHER ☐		SERVICE STATUS AT TIME OF TEST describe MAGNET ☐ ☐ CLAMHELL LIFTING ☒ ☐ CONTAINER SPREADER ☐ OTHER		
BOOM LENGTH AT TIME OF TEST		TYPE AT BOOM CONSTRUCTION		
MAIN HOIST: <i>140'</i> WHIP: JIB:		<i>Tube Grabs & Tube Lattice</i>		

WIRE ROPE	NO PARTS	DIAMETER	NO. STRANDS	WIRES PER STRAND	TYPE CORE	BREAK STRENGTH	ATTACHED MANUFACTURER'S CERTIFICATE OF WIRE ROPE: YES ☐ NO ☒
MAIN HOIST	4	1 1/8	6x	37	SWRC	56.5 TONS	
WHIP	—						
BOOM	18	3/4	6x	19	SWRC	25.6 TONS	
BOOM PENDANTS	2	1 1/4	6x	37	SWRC	109.9 TONS	

THE FOLLOWING ITEMS MUST BE INSPECTED WHERE APPLICABLE; IF NOT APPLICABLE, SO INDICATE:

	ACCEP	REJEC	N/A
(a) Durable rating chart visible to operator	☒		
(b) Boom angle indicator	☒		
(c) Radius indicator			☒
(d) Operator controls marked or explanation of controls in operator's view	☒		
(e) Main hoist wire limit control	☒		
(f) Whip hoist wire limit control			☒
(g) Travel alarm			☒
(h) Outrigger locks			☒
(i) All pins and shafts	☒		
(j) Counterweight	☒		
(k) Hydraulic system	☒		
Fire extinguisher	☒		
(l) Air system	☒		
(m) Electrical system	☒		
(n) Blocks and sheaves	☒		
(o) All deadending of cables	☒		
(p) All hook safety latches & straps	☒		
(q) All brakes	☒		
(r) Boom light fixture safety lines			☒
(s) Intercom system dock to cab			☒
(t) Cable clamps, proper size, type spacing	☒		
(u) All clutches, dogs, gauges	☒		
(v) Weight indicator in proper working order			☒
(w) Anti-Collision Device			☒
(x) Boom stops	☒		
(y) Boom hoist cut out	☒		

4. TEST REQUIRED: Proof load test for cranes shall be based on manufacturer's load ratings to be applied at 10% excess at maximum and minimum radius and at any intermediate radii deemed necessary at time of certification. A derrick shall be proof load tested in excess of safe working load: to 20 T — proof load 25% excess; to 50 T — proof load 5 T excess; over 50 T — 10% excess. Bridge type cranes — 25% in excess of manufacturer's ratings.

RADIUS In feet	TEST LOAD		MANUF. RATING	RATED CAPACITY		IDENTIFY MAIN OR WHIP LINE
	Tons	Lbs.		Tons	Lbs.	
<i>95.91</i>	<i>23,000</i>		<i>21,000</i>			<i>MAIN & PERV 360° A & B Counter Weights</i>

MEANS OF APPLICATION OF PROOF LOAD

Known Weights

BASIS FOR ASSIGNED LOAD RATING—DESIGNATE OWNER OR MANUFACTURER

Manufacturer

REMARKS

- 1 Repair Broken Windows*
- 2 Repair Right Boom Hoist Drum Line won't spool correctly.*
- 3 Travel won't cut properly.*

I HEREBY CERTIFY THE ABOVE TEST AND/OR EXAMINATIONS HAVE BEEN CONDUCTED IN ACCORDANCE WITH WASHINGTON STATE STANDARDS WAC 296-CHAPTER 56 AND/OR OSHA STANDARDS 29 CFR 1918.13 (b) CFR 1919, 1910N 1926H 1918G AND ARE BASED UPON ANSE/ASME B-30.5 AS APPLICABLE.

DATE <i>11, 2, 94</i>	SIGNATURE OF CERTIFIED INSPECTOR <i>[Signature]</i>	ADDRESS	CITY	ZIP
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Test Worksheet

D-2

PROFESSIONAL MEMBER CRANE CERTIFICATION ASSN OF AMERICA

ATTACHMENT 5

RESOLUTIONS TO REPAIRS FROM LINKBELT
LS-518 INDEPENDENT INSPECTOR CERTIFICATION FORM

[39] From: William J (Bill) Mangan at -WHC206 11/16/94 5:39PM (1037 bytes: 20 ln
)
To: Kristi D Parham at -WHC207
Subject: Please print the following messages, THX
----- Message Contents -----

Text item 1:

BILL,

AFTER CHANGING THE BOOM HOIST LINE ON THE 518 LINK BELT CRANE WE HAD SOME SPOOLING PROBLEMS ON THE RIGHT BOOM HOIST DRUM. WE FEEL WITH A LITTLE BREAK IN TIME THE PROBLEM WILL GO AWAY. IN THE MEAN TIME WE WILL KEEP A CLOSE WATCH ON THE REEVING PROCESS WHILE THE CRANE IS BEING WORKED. IT SEEMS TO BE GETTING BETTER THE MORE WE USE THE CRANE.

KEITH BEST
373-5692

Text item 2:

The heavy equipment mechanics have replaced the cracked glass in the crane cab and are scheduled to complete the steering repairs by November 24, 1994.

Hannon Hager
373-0586

cas

ATTACHMENT 6

BILL OF MATERIALS/ MANUFACTURERS INFORMATION

Bill of Materials

Link Belt LS-518

Hook Position/Rate Indication System

Item	Part #	Description	Manufacturer	Estimated availability
1.	GEM41100	Crane Display	Red Lion Controls	1 week
2.	IMA04137	Remote Display	Red Lion Controls	3-4 weeks
3.	ENC60000	Enclosure (cab display)	Red Lion Controls	1 week
	• (3) SHC1023CR .375-.5	CORD GRIPS		
4.	ENC50000	Enclosure (remote display)	Red Lion Controls	1 week
	• (1) SHC1022CR .25-.375	CORD GRIPS		
	• (1) SHC1023CR .375-.5	CORD GRIP		
5.	62510000000	Encoder 1000 pulse	Dynapar Corp.	1 week
6.	16002070177	Measuring wheel	Dynapar Corp.	1 week
7.	14005740000	Encoder mount	Dynapar Corp.	1 week
8.	250' 4 wire cable	Encoder signal	Coast Crane Co	1 week
	• C1204 20/4 Neoprene sheild (250 feet)		Carol	
9.	250' 6 wire cable	Remote display interface	Coast Crane Co	1 week
	• C1206 18/6 Neoprene sheild (250 feet)		Carol	
10.	2 wire cable	4-20mA analog output	Coast Crane Co	1 week
	• C1202 18/2 Neoprene sheild (250 feet)		Carol	

see wiring interconnect diagram for connector details and part #.

Manufacturers Information

Red Lion Controls

International Headquarters
20 Willow Springs Circle
York, PA 17402

(717) 767-6511 Fax(717) 764-0839

Dynapar Corp.

1675 Delany Road
Gurney, IL 60031

(708) 662-2666 Fax(708) 662-4150

Coast Crane Co. of WA

1531 Utah Ave South
Seattle, WA 98134

ATTACHMENT 7

CVI FILE #22646

CONTENTS OF CVI FILE #22646

1. Bill of Materials
2. Acceptance Test Report
3. Nema 4 Enclosure Assembly Details
4. Optical Encoder Data Sheet
5. Encoder Mount Data Sheet
6. System Wiring Diagram
7. System Interconnect Diagram
8. Model IMA Instruction Manual
9. Gemini 4100 Instruction Manual

ATTACHMENT 8

DOCUMENTED ACCEPTANCE TEST PROCEDURE RESULTS

Acceptance Test Procedure
Link Belt Hook Position Monitor System

1. Prepare test weight to give approximately half of crane capacity at desired radius for test. Select a weight that will provide for full cable loading if possible.
2. Prepare reference measurement point on ground near test weight lift area. Reference point to be a sharp line or edge on a large object such as a cement block.
3. Prepare measuring tape. Tape is to be freely suspended from load and must be able to be weighted without causing the load to tip or sway.
4. Lift load. Observing normal safety precautions lift weight off from ground to a height of approximately five feet. Measure and record. Place a small weight on the tape to eliminate wind effects and sway. Use this same weight throughout all subsequent measurements.
5. Lift load to full height or 100' as practical. Measure and record. Perform calculations to determine height difference and relation of indicated height to measured height. Record.
6. Repeat previous steps while lowering load and record.
7. Repeat until eight (8) recordings have been made.
8. Calibration of rate meter. Hoist up at a steady indicated speed while timing the ascent with a stopwatch. Calculate and average hoist rate and record. Calculate relation between indicated rate and measured rate.
9. Repeat and record rate calculation four (4) times.

Test Engineers

Barb Altman

Rick Barnett

Ron Fox

B.L. Altman 11/3/94

R.B. Barnett 11/3/94

Ron Fox 11/3/94

WHC-SD-WM-ATR-110 Rev. 0
Acceptance Test Procedure
Link Belt Hook Position Monitor System

Lift #	Load (lbs)	Initial Height	Final Height	Height Diff	Indicated Height	Ind. Ht/ Ht. Diff	Recorded By	Witnessed By
1	23,600	4.78	84.65	79.87	80.09	1.00275	BPA 11/3/94	RAB 11/3/94
2		84.65	6.11	78.54	78.67	1.00166	BPA 11/3/94	RAB 11/3/94
3		6.11	83.75	77.64	77.83	1.00245	BPA 11/3/94	RAB 11/3/94
4		83.75	5.55	78.20	78.33	1.00166	BPA 11/3/94	RAB 11/3/94
5		5.55	82.75	77.20	77.35	1.00194	BPA 11/3/94	RAB 11/3/94
6		82.75	5.55	77.20	77.36	1.00207	BPA 11/3/94	RAB 11/3/94
7		5.55	83.05	77.50	77.67	1.00219	BPA 11/3/94	RAB 11/3/94
8		83.05	4.98	78.07	78.19	1.00154	BPA 11/3/94	RAB 11/3/94

Lift #	Start Time	End Time	Elapsed Time	Indicated Time Rate	Ind/Elaps Time Rate	Initial Height	Final Height	Recorded By	Witnessed By
1			56.84/60 (.94min)	33	34.8	5.05	35.78	BPA 11/3/94	RAB 11/3/94
2			64.22/60 (1.07min)	25	25.2	35.78	10.12	BPA 11/3/94	RAB 11/3/94
3			83.22/60 (1.38min)	36	36.1	5.9	55.85	BPA 11/3/94	RAB 11/3/94
4			104.22/60 (1.73min)	28	28.4	55.85	6.57	BPA 11/3/94	RAB 11/3/94