Jay M

Daryl, Note Ed's Note, PIP # 94-0802 Return Day

INTER-OFFICE CORRESPONDENCE

[redacted]

Midwest Operations

[redacted]

TO: Daryl [redacted] DATE: 8-10-94

FROM: Gene [redacted] COPIES: Mike [redacted]
Ed [redacted]

SUBJECT: Counterbalance valve squeal

Bruce [redacted] phoned to report a squeal on two TA35 [redacted] devices during the lowering of the articulating arm. In the process of testing they ran the return oil in a more direct route to tank reducing back pressure and that got rid of the squeal. The original counterbalance holding valve was a 352-00037 with a 3:1 pilot ratio. They replaced with the same with no change in the symptom. They installed a 352-00026 with a 10:1 pilot ratio and the squeal disappeared. These are demo. stock units. I noticed in the SUN catalog that the 352-00037 (CBCA-LHN) and 352-00026 (CBCH-LCN) are listed as affected by back pressure. The CWCA-LHN is listed as unaffected by back pressure.

Need to check for boom oscillation if this is to be permanent fix.

GW

INTER-OFFICE CORRESPONDENCE

[redacted]

MIDWEST DIVISION

TO: Mike [redacted]

FROM: Howard [redacted]

DATE: August 31, 19[redacted]

SUBJECT: **AT235 AND TA35 ARTICULATING ARM CYLINDER NOISE**

COPIES: Dan [redacted], Daryl [redacted] LeRoy [redacted]

It has been reported that an isolated number of the AT235 and TA35 units have been experiencing a squealing sound from the articulating arm cylinder. The noise has been traced to the counterbalance valve in the articulating arm cylinder. To correct the condition, a restrictive type counterbalance valve was tested with very good results.

Based on these test results, it is being recommended that on customers units experiencing this noise condition the articulating arm cylinder counterbalance valve be replaced with part number 352-70061. It is not being recommended that all units be changed, since this condition is not a safety related issue according to Sun Hydraulics. The following is an outline of the steps necessary to complete the valve change.

I. Secure booms in boom rest, or other rigid support means.
   A. Place articulating arm assembly in full down position.
   B. Fully retract booms and place in the boom rest or other substantial support means, such as an overhead hoist of 1500 pounds minimum capacity.

II. Prior to removal of the counterbalance valve from the articulating arm cylinder, read the following CAUTION notes.
   A. CAUTION ! Failure to remove load from articulating arm cylinder and/or placing boom in the boom rest may cause uncontrolled motion when counterbalance valve is removed.
   B. CAUTION ! Failure to remove pressure from the articulating arm cylinder when removing the counter balance valve may cause oil to spray out under pressure as valve is loosened. Hydraulic oil escaping under pressure can have enough force to inject oil into the flesh.

C. CAUTION ! In case of injury by escaping oil, seek medical attention at once. Serious Infection or reaction can result if medical treatment is not given immediately.

D. CAUTION ! Keep the unit and work area clean. Spilled hydraulic oil creates slick surfaces and may cause personnel to slip and/or fall.

III. Remove the counterbalance valve, part number 352-70037, from the articulating arm cylinder, part number 350-10045.

IV. Install counterbalance valve, part number 352-70061, in the articulating arm cylinder and torque valve cartridge from 30 to 35 foot pounds.

A. CAUTION ! After installing the counterbalance valve do not operate the aerial device from the upper controls or with personnel in the platform until all air is purged from the articulating arm cylinder. Operate the articulating arm assembly from the lower controls three or four times and all signs of trapped are gone.

Concerning production units, Dan [redacted] is processing the change so when the articulating arm cylinders become available from Rosenboom, the counterbalance valves, part number 352-70061 will be incorporated.

October 18, 19[redacted]

[redacted]
St. Joseph, [redacted]

ATTENTION: Jay [redacted]

Dear Jay,

[redacted] AM units are beginning to reach the 5 year overhaul stage. Contrary to our recommendations, they are not replacing the leveling cables automatically. They are pulling the cables, inspecting them and replacing only if considered defective.

Enclosed are [redacted] inspection people rejected this cable and a new one was ordered. We sourced the cable from our inventory from Kit 750-40013 shipped to us on P-ticket 24694, 02/25/94. The forged end is shaped differently.

Mr. Bob [redacted] has posed two questions to me

1. What is our opinion of the cracks that are showing? Is this a manufacturers defect, a field stress problem, forge mark ??

2. At what point (date) did we change the design and or manufacturer of the forged end? If design change only, why was it changed?

Yours truly,

[redacted]

PDF:rj1
encl.
c.c. Dave [redacted]

[redacted]

Phone conversation w/ Paul 10/20/[redacted]

234 - 12005 - Eyelet

12029

12030 - Eyelet

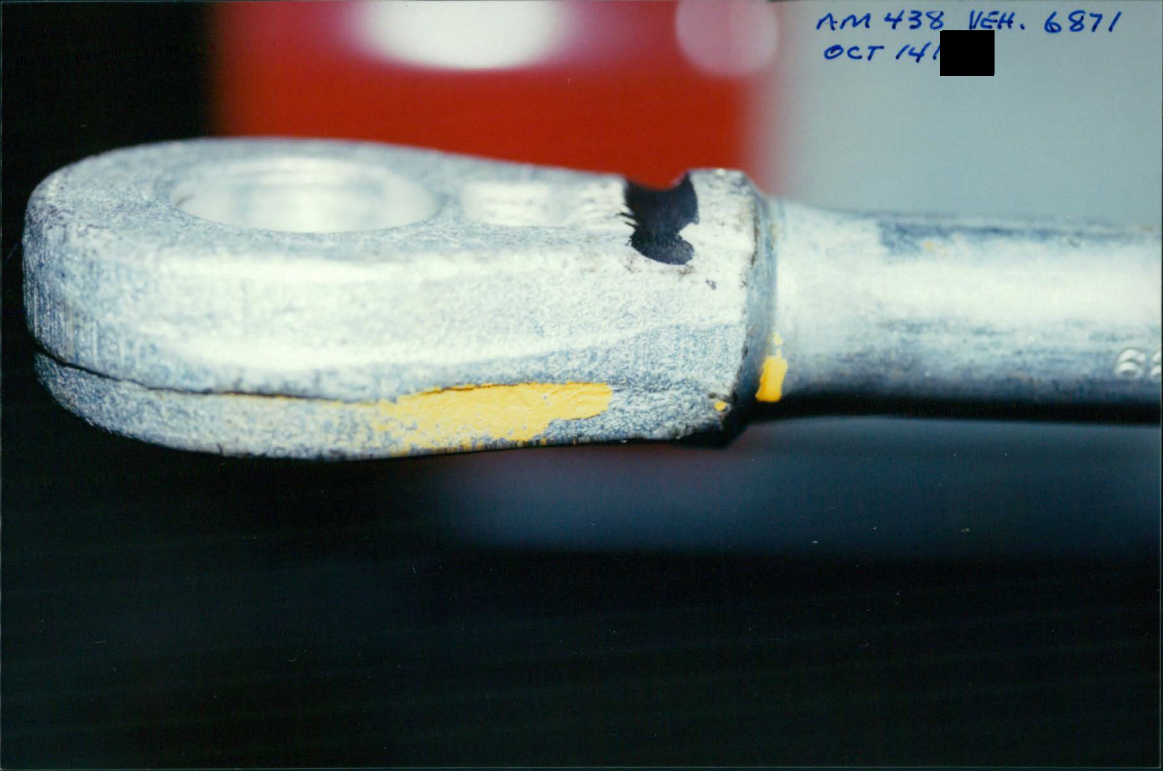
234 - 12030 the design and supplier (wireco) have been unchanged since the date it was released

234-12005 - The design has not ever changed. Except for 100 pieces purchased in 1983, the supplier (wireco) has remain the same since the released date.

Judging from the pictures, the grooved line in the eyelet is a forge mark. ~~I would need to see~~ Upon request, we can have a lab evaluated the eyelet. ~~if required.~~

Paul to compare the two cables and for me the visual differences. Paul will send the cable in question to me so we can get it evaluated by Arrow Labs.


AM 438 VEHICLE 6871
OCT 14 [redacted]


AM 438 VEH. 6871
OCT 14 [redacted]


AM 438 VEHICLE 6871
OCT 141


ALTEC AM 438 VEHICLE 6871
OCT 14 [redacted]

THE [redacted] LABORATORY - [redacted]

Laboratory Log No. L-94-160

To: [redacted]

Date: 11/30/[redacted]

Subject: An evaluation of a returned No.S-502, 1/2 inch swage socket with magnetic particle indications below the eye section.

Background: The returned swage socket had been swaged onto a short wire rope pendant containing a threaded swage stud on the opposite end. The assembly was reported to have been used for stabilizing a personnel basket, and had been in service for 5 years. A magnetic particle inspection of the swage socket revealed the presence of indications below the eye section. The area containing the indications had been ground during the inspection. The whole swage assembly was returned to the Crosby Group Laboratory for an evaluation.

PROCEDURE AND RESULTS

The evaluation of the returned swage socket consisted of the following:

(1) Visual/Macroscopic Examination

(2) Hardness Tests

(3) Chemical Analysis

(4) Metallographic Examination

Visual/Macroscopic Examination: The returned swage socket had been galvanized and contained a ground area below the product identification code being transverse to the loading axis (Enclosure A, Figure 1). The magnetic indications in the ground area could not be seen without the aid of a microscope. Macroscopic examination of the ground area did reveal the presence of some small discontinuous fissures in the steel (Enclosure A, Figure 2). The balance of the swage socket did not appear to be worn or damaged. The following markings were observed on the socket: CG and M5B. The product identification code indicated that the socket had been forged in 1988.

Hardness Tests: Brinell hardness tests were performed on the steel adjacent the eye section of the returned swage socket. The hardness measured BHN 156.

Chemical Analysis: A chemical analysis was performed on a section from the returned swage socket. The analysis revealed that the socket had been forged from a type 1035 carbon steel. The steel had been silicon killed and was vanadium refined. The results of the analysis and the requirements for a type 1035 carbon steel are presented.

Results, Chemical Analysis

Element	Result %, Swage Socket	Required %, Type 1035 Carbon Steel
C	0.38	0.32 - 0.38
Mn	0.89	0.60 - 0.90
P	0.006	0.040 Max.
S	0.018	0.050 Max.
Si	0.26	0.15 - 0.35
V	0.05	0.020 Min.

Metallographic Examination: A metallographic examination was performed on a section taken from the ground area where the magnetic particle indications were observed. The observed microstructure of the steel from the socket consisted of ferrite and spheroidal carbide. The steel had been properly heat treated. Observation of the steel in the zone where the indications were located revealed the presence of some fissures at the surface (Enclosure B). The steel adjacent the fissures did contain a decarburized zone. The observed decarburization and fissures in the steel appeared to be the result of a fold or lapping condition created in the forging operation. The deepest observed fissure in the socket measured approximately 0.040 inch in depth. The surface grinding performed on the area had removed some of the depth. The steel did not contain any observed cracks extending into the base metal initiating from the fissures.

Discussion: The returned socket did conform to the specification requirements for chemical composition, heat treatment, and hardness. The swage socket had been properly processed. The magnetic particle indications observed in the steel appeared to be the result of a fold of material forged into the surface of the socket. The folded material was evidenced by the presence of decarburization in a dish shaped pattern in the surface steel. There were no cracks observed in the base material resulting from the presence of the fissures in the surface material. The location of the fissures, and the notch toughness properties of the steel resulting from the "Cold Tuff" heat treatment, are the major

reasons why no cracks had initiated from the fissured material. The swage socket, as a standard catalog item, would meet the requirements for commercial surface quality. The fissures in the steel could not be detected by the unaided eye and were only detectable by magnetic particle inspection. The special order, magnetic particle inspection quality, products contain a more refined surface quality.

Prepared by:

[redacted]

copy to:

Don [redacted]

December 29, 1994

[redacted]
SURREY, B.C.

Attention: [redacted]

Dear [redacted]

Subject: [redacted]

[redacted]

[redacted] Please advise if you still have concerns.

Yours truly,

[redacted]

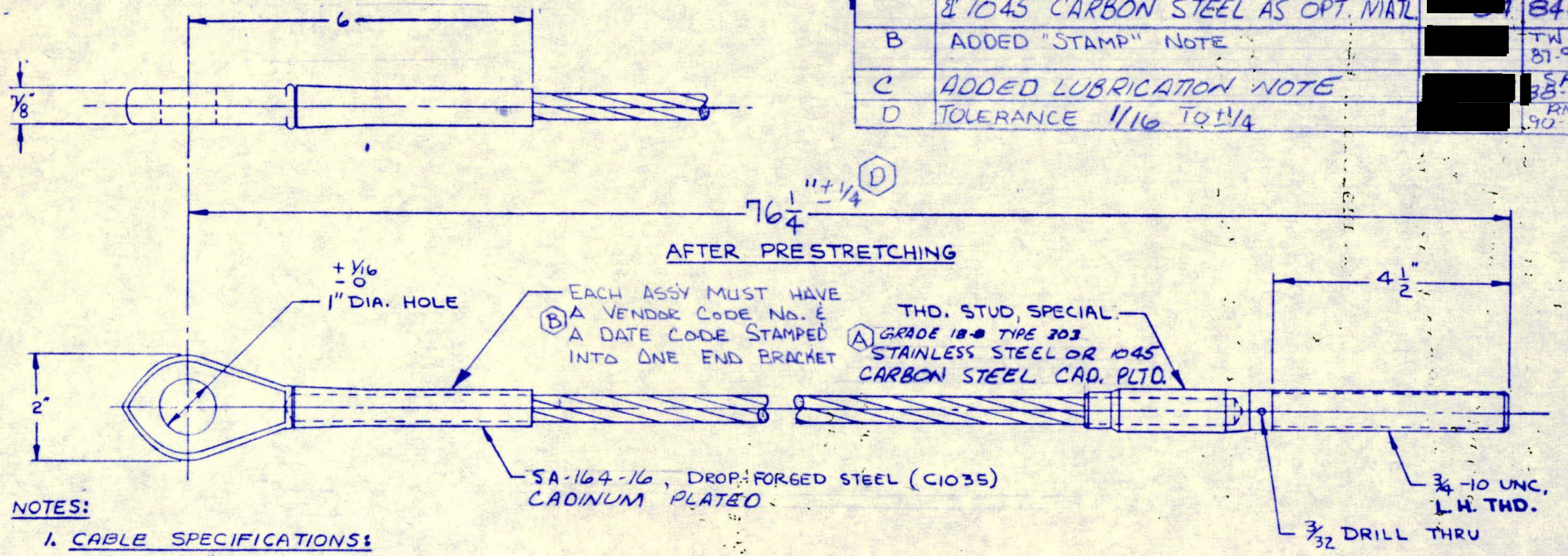
[redacted]
encl.

[redacted]

APPROVED VENDOR	VENDOR PART NUMBER
MACWHYTE	
WIRECO	

(A)

REVISIONS			
SYM.	DESCRIPTION	DATE	DRAWN CHK'D.
A	ADDED WIRECO AS VENDOR, & 1045 CARBON STEEL AS OPT. MATL.	[redacted]	SP 84-961
B	ADDED "STAMP" NOTE	[redacted]	TW 87-949
C	ADDED LUBRICATION NOTE	[redacted]	SP 88-737
D	TOLERANCE 1/16 TO ±1/4	[redacted]	RM 90-553



NOTES:

1. CABLE SPECIFICATIONS:
   - DIA. = 1/2"
   - 6 X 36 IWRC GALVANIZED (WARRINGTON SEALE CONSTRUCTION)
   - NOMINAL STRENGTH: 20,600 LBS.
   - (C) LUBRICATE W/HOOSON 9RZ DURING STRANDING PROCESS
2. TERMINAL SPECIFICATIONS:
   - MATERIAL: AS NOTED ABOVE.
3. STRENGTH OF TERMINAL TO CABLE ATTACHMENT MUST MEET OR EXCEED THE BREAKING STRENGTH OF THE CABLE.
4. CABLE TO BE PRESTRETCHED TO 40% OF NOMINAL STRENGTH PER FEDERAL SPECIFICATIONS RR-W-410C-3.3.4
5. CABLE ASSEMBLY TO BE PROOF LOADED TO 40% OF NOMINAL STRENGTH.

ITEM	QTY.	PART NUMBER
ITEM	NEXT DRWG.	
WHERE USED LIST		

DRAWN LR | CHECKED

DATE [redacted] | APPROVED

TOLERANCE UNLESS NOTED:
FRACTIONS ± 1/16
DECIMALS ± .015
ANGLES ± 1°
MACHINE SURFACES 125

DO NOT SCALE THIS PRINT
REMOVE ALL BURRS AND SHARP EDGES

[redacted]

TITLE: CABLE ASS'Y., 1/2 DIA. X 76 1/4"

SCALE	WEIGHT	SIZE	NUMBER	REV.
			[redacted]	D

[redacted] [redacted] 2

HWP - For your info - May want to call Gene & find out more, Dave

INTER-OFFICE CORRESPONDENCE

[redacted]

Midwest Operations

[redacted]

[redacted]

TO: Don [redacted] DATE: 5-31-95

FROM: Gene [redacted] COPIES: [redacted]

SUBJECT: D2OOO [redacted]

Per your phone call I contacted [redacted] and discussed the D2000 problem. [redacted]. He is to phone when they try that to report the results.