

## ENGINEERING RELEASE RECORD

1. ERR NO. <b>BRI-U4382</b>	2. DATE	3. SHEET OF SHEET <b>1 OF 4</b>
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4. BASELINE ESTABLISHED OR CHANGED

FUNCTIONAL     
  ALLOCATED     
  PRODUCT

5. TYPE OF RELEASE <input type="checkbox"/> INITIAL <input checked="" type="checkbox"/> CHANGE	6. ECP NO. <u><b>BRI-U4382R1</b></u> DATE APPROVED <u><b>03/10/08</b></u>
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7. FUNCTIONAL ASSEMBLY <b>12260265</b> <b>12472352</b>	NOMENCLATURE <b>INSTALLATION SUSPENSION</b> <b>INSTALLATION SUSPENSION</b>
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8. SYSTEM / OR CONFIGURATION ITEM NOMENCLATURE

**HOWITZER, MEDIUM, SELF-PROPELLED, 155MM, M109A2-A5/A6/M992A2**

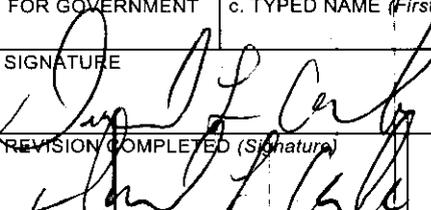
9. REMARKS / MISCELLANEOUS

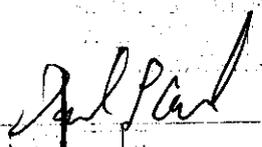
**THIS ERR CONTAINS ALL AFFECTED DOCUMENTS.**

**10. DATA RELEASED OR REVISED**

a Code ID	DOCUMENT				REVISION		h Release		i Change		j Other
	b Type	c Number	d Sh of Shts	e	f Ltr	g Date	IR	NAR	CH	CAN	
19207		K10936277	1	1	E	03-10-27			X		
19207	SQ	10936277	ALL	7	E	03-10-27			X		

11. SUBMITTED BY: <i>Rosie De Marcos</i> DATE: <i>03/12/11</i>	12. APPROVED: <i>[Signature]</i> <i>12/10/03</i>
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<b>NOTICE OF REVISION (NOR)</b>		1. DATE (YYMMDD) 030618		Form Approved OMB No. 0704-0188	
THIS REVISION DESCRIBED BELOW HAS BEEN AUTHORIZED FOR THE DOCUMENT LISTED.					
Public reporting burden for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Avenue, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				2. PROCURING ACTIVITY NO. BRI-U4382	
PLEASE DO NOT RETURN YOUR COMPLETED FORM TO EITHER OF THESE ADDRESSES. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICER FOR THE CONTRACT/PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THIS FORM.				3. DODAAC	
4. ORIGINATOR		b. ADDRESS (Street, City, State, Zip Code)		5. CAGE CODE	
a. TYPED NAME (First, Middle Initial, Last) BARNES & REINECKE, INC.		425 EAST ALGONQUIN ROAD ARLINGTON HEIGHTS, IL 60005-4683		85336	
				7. CAGE CODE 19207	
9. TITLE OF DOCUMENT		10. REVISION LETTER		11. ECP NO.	
HUB, SPROCKET, FINAL DRIVE		a. CURRENT D		b. NEW E	
				BRI-U4382 -BRI-U4382	
12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES				NOR SHEET	
HOWITZER, MEDIUM, SELF-PROPELLED, 155MM, M109A2-A5/A6/M992A2				1 OF 2	
13. DESCRIPTION OF REVISION					
<b>UNDER NOTES:</b>					
CHANGE FROM: "MATERIAL NOTE STEEL CASTING CLASS 150-125 SPEC QQ-S-681 EXCEPT SPLINE HARDNESS TO BE 302 MIN B.H.N. ALL OTHER AREAS TO BE 363 MAX B.H.N."			TO: "1. MATERIAL NOTE STEEL CASTING GRADE 150-135 ASTM A148 HARDNESS 302-363 BHN"		
CHANGE FROM: "FINISH PER DRAWING 12369003"			TO: "2. FINISH PER DRAWING 12369003"		
CHANGE FROM: "ALL HOLES AND MACHINED SURFACES MUST BE FREE FROM PRIME AND TOPCOAT"					
TO: "3. ALL HOLES AND MACHINED SURFACES MUST BE FREE FROM PRIMER AND TOPCOAT"					
CHANGE FROM: "ALL CAST DIAMETERS MUST BE CONCENTRIC TO SPLINE PD WITHIN .094 TIR"					
TO: "4. ALL CAST DIAMETERS MUST BE CONCENTRIC TO SPLINE PD WITHIN .094 TIR"					
CHANGE FROM: "SURFACES MARKED ✓ TO HAVE 125"					
TO: "5. SURFACES MARKED ✓ TO HAVE 125"					
14. THIS SECTION FOR GOVERNMENT USE ONLY					
a. (X one)		(1) Existing document supplemented by this NOR may be used in manufacture.			
		(2) Revised document must be received before manufacturer may incorporate this change.			
		(3) Custodian of master document shall make above revision and furnish revised document.			
b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT			c. TYPED NAME (First, Middle Initial, Last)		
d. TITLE		e. SIGNATURE		f. DATE SIGNED (YYMMDD)	
				12/10/03	
15.a. ACTIVITY ACCOMPLISHING REVISION		b. REVISION COMPLETED (Signature)		c. DATE SIGNED (YYMMDD)	
				12/10/03	

 12/10/03  
DATE

**NOTICE OF REVISION (NOR)  
CONTINUATION SHEET**

THIS REVISION DESCRIBED BELOW HAS BEEN AUTHORIZED FOR THE DOCUMENT LISTED.

<b>DATE:</b> 030618	<b>ECP NUMBER:</b> BRI-U4382	<b>NOR SHEET NUMBER:</b> 2	<b>NOR NUMBER:</b> 1
<b>CAGE CODE:</b> 19207	<b>DOCUMENT NUMBER:</b> 10936277	<b>DOCUMENT TITLE:</b> HUB, SPROCKET, FINAL DRIVE	

**DESCRIPTION OF REVISION**

**UNDER NOTES: (CONT'D)**

**CHANGE FROM:** "MUST BE FREE OF BURRS AND SHARP EDGES"

**TO:** <sup>3.</sup>~~2.~~ MUST BE FREE OF BURRS AND SHARP EDGES"

**CHANGE FROM:** "RADIOGRAPH IN ACCORDANCE WITH RADIOGRAPHIC POSITION CHART DRAWING K10921193"

**TO:** <sup>3.</sup> RADIOGRAPH IN ACCORDANCE WITH RADIOGRAPHIC POSITION CHART DRAWING K10921193"

**CHANGE FROM:** "QUALITY ASSURANCE PROVISIONS (QAPS) APPLY TO THIS DRAWING (QAP NO. SAME AS PART NO.)"

**TO:** <sup>10.</sup>~~8.~~ QUALITY ASSURANCE PROVISIONS (QAP) 10936277 APPLY TO THIS ITEM"

*ADD:* <sup>3.</sup> <sup>7.</sup> HARDNESS To Be Measured At These Points ON SURFACE X.  
HARDNESS To Be Measured Near Pitch DIAMETER

**ABOVE NOTES:**

**CHANGE FROM:** ".53 + .1 / 64 DIA

**TO:** ".812 ± .005 DIA

8 HOLES TO BE SQUARE WITH SURFACE Y WITHIN .002 TIR AND CENTERED WITH SPLINE PD WITHIN .005"

8 HOLES TO BE SQUARE WITH SURFACE Y WITHIN .002 TIR AND CENTERED WITH SPLINE PD WITHIN .005"

**IN APPLICATION BLOCK**

**CHANGE FROM:** "K10913485 HSP-M109"

**TO:** "PMIC A  
12333115 M992A2  
12260265 M109A2/A5  
12472352 M109A6"

**TO THE LEFT OF APPLICATION BLOCK**

**ADD:** "DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED."

**IN TITLE BLOCK**

**CHANGE FROM:** "SEE NOTE"

**TO:** "SEE NOTE 1"

**CHANGE FROM:** "SEE NOTE"

**TO:** "SEE NOTE <sup>3.</sup>

**ABOVE TITLE BLOCK:**

**CHANGE FROM:** "CODE IDENT. NO. 00000"

**TO:** "CODE IDENT NO. ~~00000~~ 19207"

 SIGNATURE	17/06/93 DATE
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<b>NOTICE OF REVISION (NOR)</b> THIS REVISION DESCRIBED BELOW HAS BEEN AUTHORIZED FOR THE DOCUMENT LISTED.		<b>1. DATE (YYMMDD)</b> 030618	Form Approved OMB No. 0704-0188
Public reporting burden for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington DC 20503. <b>PLEASE DO NOT RETURN YOUR COMPLETED FORM TO EITHER OF THESE ADDRESSES. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICER FOR THE CONTRACT/PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THIS FORM.</b>		<b>2. PROCURING ACTIVITY NO.</b> BRI-U4382	
		<b>3. DODAAC</b>	
<b>4. ORIGINATOR</b>	<b>b. ADDRESS (Street, City, State, Zip Code)</b>	<b>5. CAGE CODE</b>	<b>6. NOR NO.</b>
a. TYPED NAME (First, Middle Initial, Last) <b>BARNES &amp; REINECKE, INC.</b>	<b>425 EAST ALGONQUIN ROAD ARLINGTON HEIGHTS, IL 60005-4683</b>	85336	2
		<b>7. CAGE CODE</b> 19207	<b>8. DOCUMENT NO.</b> SQ10936277
<b>9. TITLE OF DOCUMENT</b>		<b>10. REVISION LETTER</b>	
HUB, SPROCKET, FINAL DRIVE		a. CURRENT D	b. NEW E
<b>12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES</b>			<b>11. ECP NO.</b> BRE U4382R1 BRI-U4357
HOWITZER, MEDIUM, SELF-PROPELLED, 155MM, M109A2-A5/A6/M992A2			<b>NOR SHEET</b> 1 OF 10
<b>13. DESCRIPTION OF REVISION</b>			
<p><b>SEE NOR CONTINUATION SHEETS 2 AND 3 OF 10 FOR CURRENT QAP</b></p> <p><b>AND</b></p> <p><b>NOR CONTINUATION SHEETS 4, 5, 6, 7, 8, 9 AND 10 OF 10 FOR PROPOSED REVISION TO QAP</b></p>			
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <p style="text-align: center;">BRI-U4382R1</p> </div>			
<b>14. THIS SECTION FOR GOVERNMENT USE ONLY</b>			
a. (X one)	<input type="checkbox"/> (1) Existing document supplemented by this NOR may be used in manufacture. <input type="checkbox"/> (2) Revised document must be received before manufacturer may incorporate this change. <input type="checkbox"/> (3) Custodian of master document shall make above revision and furnish revised document.		
<b>b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT</b>		<b>c. TYPED NAME (First, Middle Initial, Last)</b>	
<b>d. TITLE</b>	<b>e. SIGNATURE</b>		<b>f. DATE SIGNED (YYMMDD)</b>
			10/6/03
<b>15.a. ACTIVITY ACCOMPLISHING REVISION</b>	<b>b. REVISION COMPLETED (Signature)</b>		<b>c. DATE SIGNED (YYMMDD)</b>
			12/18/03

# QUALITY ASSURANCE PROVISIONS (QAP)

(PRODUCT ASSURANCE PAM 702-155)

1. COMMAND AGENCY: **U. S. ARMY TANK AUTOMOTIVE RESEARCH, DEVELOPMENT & ENGINEERING CENTER, WARREN, MI 48397-5000**

2. THESE QAPS FORM PART OF DRAWING / SPECIFICATION **10936277** AS SPECIFIED IN THE CONTRACT. INSPECTION SHALL BE CONDUCTED AS SPECIFIED HEREIN AND IN ACCORDANCE WITH REFERENCED DOCUMENTS. THIS INCLUDES GENERAL QUALITY ASSURANCE PROVISIONS ( STA FORM 458 ), WHICH FORMS A PART OF THIS QAP.

3. **PART I - LIST OF APPLICABLE DOCUMENTS**

**DRAWINGS**

- 8321932 FLUSH PIN GAGE
- 8321935 CONCENTRICITY GAGE (FUNCTIONAL)
- 10880102 FIXTURE GAGE
- 10880103 ALIGNMENT FIXTURE
- 10880104 GAGE ALIGNMENT OF HOLES
- 10880105 INVOLUTE GO COMPOSITE PLUG GAGE
- 10880106 INVOLUTE NO GO PADDLE PLUG GAGE
- 10921193 RADIOGRAPHIC POSITION CHART
- 12369003 PAINT SYSTEMS FOR STEELS, EXTERIOR SURFACES, GREEN 383

**STANDARDS**

ASTM A148 STEEL CASTINGS, HIGH STRENGTH, FOR STRUCTURAL PURPOSES

**SPECIFICATIONS** NONE

**DISTRIBUTION STATEMENT A. APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.**

**REVISIONS**

4. RELEASE NUMBER	BRI - U4382																			
5. DATE	10-27-03																			
4. RELEASE NUMBER																				
5. DATE																				
REVISION STATUS OF SHEETS	6. REVISION	E	E	E	E	E	E	E												
	7. SHEET	1	2	3	4	5	6	7												
	6. REVISION																			
	7. SHEET																			

8. QAP FOR: <b>HUB, SPROCKET, FINAL DRIVE</b>										9. CODE: <b>19207</b>														
10. SUBMITTED BY: <b>BARNES &amp; REINECKE, INC.</b>										11. QAP NO. <b>10936277</b>														
12. DATE: <b>3-25-63</b>					13. APPROVED: <i>[Signature]</i>					14. RELEASE NO. <b>-----</b>					15. PAGE NO. <b>1</b>					16. NO. OF PAGES <b>7</b>				

**QUALITY ASSURANCE PROVISIONS (QAP) ( CONTINUATION SHEET)**

(PRODUCT ASSURANCE PAM 702-155)

**PART II - INSPECTION REQUIREMENTS**

**TABLE I - CLASSIFICATION OF QUALITY CONFORMANCE CHARACTERISTICS**

<b><u>CLASS</u></b>	<b><u>CHARACTERISTIC</u></b>	<b><u>INSPECTION METHOD</u></b>
<b><u>CRITICAL</u></b>	NONE	
<b><u>MAJOR</u></b>	<b><u>AQL 1.0% DEFECTIVE</u></b>	
101	INTERNAL INVOLUTE SPLINE, FLAT ROOT, SIDE FIT, 45 TEETH, 30° PRESSURE ANGLE, 6/12 DIAMETRICAL PITCH	GAGES 10880105 AND 10880106 AND IMC PAGE 7
102	SPLINE MINOR DIAMETER 7.3333 - .0050	GO PLUG GAGE NO GO PLUG GAGE
103	4.500 + .001 DIAMETER BORE	DIAL BORE GAGE
104	13.500 - .010 DIAMETER (2 PLACES)	GO SNAP GAGE NO GO SNAP GAGE
105	CONCENTRICITY OF 4.500 DIA., AND 7.500 PITCH DIA. WITHIN .002 TIR AND SQUARE WITH SURFACE "Y" WITHIN .002 TIR	GAGE 10880102 OR CMM
106	INDICATED SURFACES PARALLEL TO SURFACE "Y" AND TO EACH OTHER WITHIN .010	DIAL INDICATOR WITH STAND, SURFACE PLATE OR CMM
107	SURFACE "Y" PERPENDICULAR TO SPLINE PITCH DIAMETER ( * ) WITHIN .002	GAGE 10880102 OR CMM
108	.812 DIA. (8 HOLES) SQUARE WITH SURFACE "Y" WITHIN .002 AND CENTERED WITH SPLINE PITCH DIA. WITHIN .005	DIAL INDICATOR WITH STAND, V-BLOCK SURFACE PLATE OR CMM
109	.515 DIA. (20 HOLES) IN LINE WITH OPPOSITE HOLES WITHIN .005	GAGE 10880104 OR CMM
110	DIAMETER BOLT CIRCLE OF .515 DIA. (20 HOLES) CONCENTRIC WITH OUTSIDE DIA. WITHIN .010 TIR (BOTH SIDES)	GAGE 8321935 OR CMM
111	CENTERLINE OF INDICATED HOLE IN LINE WITH THE CENTERLINE OF THE INDICATED TOOTH SPACE AND 4.500 DIA. BORE WITHIN .010	GAGE 10880103 OR CMM

17 QAP REVISION SYMBOL & DATE	E 10-27-03					11 QAP NUMBER
						<b>10936277</b>
						15 PAGE NUMBER
						<b>2</b>

**QUALITY ASSURANCE PROVISIONS (QAP) ( CONTINUATION SHEET)**

(PRODUCT ASSURANCE PAM 702-155)

**PART II - INSPECTION REQUIREMENTS**

**TABLE I - CLASSIFICATION OF QUALITY CONFORMANCE CHARACTERISTICS (CONTINUED)**

<b><u>CLASS</u></b>	<b><u>CHARACTERISTIC</u></b>	<b><u>INSPECTION METHOD</u></b>
<b><u>MAJOR</u></b>		
112	13.500 DIA. CONCENTRIC WITH 7.500 SPLINE PITCH DIA. WITHIN .010 (2 PLACES)	DIAL INDICATOR WITH STAND, V-BLOCK SURFACE PLATE OR CMM
113	.515 + .005 DIA. (20 HOLES)	GO PLUG GAGE NO GO PLUG GAGE
114	LOCATION OF HOLES	DIAL INDICATOR WITH STAND, V-BLOCK SURFACE PLATE OR CMM OR CERTIFIED DRILL FIXTURE
115	PAINT APPLICATION - COVERAGE - COLOR - ADHESION - THICKNESS - WORKMANSHIP	VISUAL AND THICKNESS GAGE
116	HUB RADIOGRAPHIC INSPECTION	VISUAL (REF. PART IV, PARA. 1)
<b><u>MINOR</u></b>		
<b><u>AQL 2.5% DEFECTIVE</u></b>		
201	8.074 - .010 DIMENSION	GAGE 8321932 OR LENGTH GAGE
202	13.500 - .010 OUTSIDE DIA. (2 PLACES)	GO SNAP GAGE NO GO SNAP GAGE
203	3/4-16UNF-2B THREAD (2) HOLES	GO THREAD PLUG GAGE NO GO THREAD PLUG GAGE
204	12.510 - .020 DIMENSION	LENGTH GAGE
205	5/16 DIA. HOLE THRU	GO PLUG GAGE NO GO PLUG GAGE
206	1.750 - .010 DIMENSION	LENGTH GAGE
207	PART NUMBER APPLICATION	VISUAL
208	"THIS SIDE OUT" CAST LETTERS AS INDICATED	VISUAL

17 QAP REVISION SYMBOL & DATE	E 10-27-03					11 QAP NUMBER
						<b>10936277</b>
						15 PAGE NUMBER
						<b>3</b>

**QUALITY ASSURANCE PROVISIONS (QAP) (CONTINUATION SHEET)**

(PRODUCT ASSURANCE PAM 702-155)

**PART II - INSPECTION REQUIREMENTS (CONTINUED)**

**TABLE I - CLASSIFICATION OF QUALITY CONFORMANCE CHARACTERISTICS (CONTINUED)**

<u>CLASS</u>	<u>CHARACTERISTIC</u>	<u>INSPECTION METHOD</u>
<b><u>MINOR</u></b>		
209	SURFACE TEXTURE "63"	COMPARATOR BLOCKS
210	SURFACE TEXTURE "125" (7 PLACES)	COMPARATOR BLOCKS
211	NO PRIMER OR PAINT ON HOLES AND MACHINED SURFACES	VISUAL
212	WORKMANSHIP	VISUAL AND TACTILE

**TABLE II - SPECIAL SAMPLING INSPECTION**

1. **INITIAL PRODUCTION INSPECTION.** ONE (1) OF THE FIRST ITEMS PRODUCED SHALL BE SELECTED AT RANDOM AND SUBJECTED TO EXAMINATIONS AND TESTS BY THE CONTRACTOR. THE ITEM SHALL BE PRODUCED UNDER MANUFACTURING METHODS TO BE USED IN PRODUCTION. INITIAL PRODUCTION INSPECTION SHALL BE ACCOMPLISHED TO DETERMINE CONFORMANCE TO ALL REQUIREMENTS OF DRAWING 10936277.

1.1 **MANUFACTURING PROCESS CHANGE.** WHENEVER A CHANGE IS MADE IN THE MANUFACTURING PROCEDURE USED IN PRODUCTION, WHICH MAY AFFECT FIT, FUNCTION, OR SERVICE LIFE OF THE ITEM, THE GOVERNMENT REPRESENTATIVE WILL BE NOTIFIED PRIOR TO THE CHANGE AND TWO (2) OF THE FIRST ITEMS PRODUCED UNDER THE NEW PROCESS SHALL BE GIVEN A COMPLETE INSPECTION AS SPECIFIED IN PARAGRAPH 1 ABOVE.

1.2 **FAILURE.** FAILURE OF AN INITIAL PRODUCTION SAMPLE TO MEET THE SPECIFIED REQUIREMENTS SHALL BE CAUSE FOR REJECTION. THE CONTRACTOR SHALL PROVIDE OBJECTIVE EVIDENCE TO THE GOVERNMENT WITHIN 20 DAYS AFTER FAILURE OF EFFECTIVE CORRECTIVE ACTION TAKEN IN PREVENTING RECURRENCE OF FAILURES, AND PARAGRAPH 1 SHALL APPLY UNTIL ACCEPTABLE ITEMS ARE PRODUCED.

2. **PRODUCTION QUALITY CONTROL (SURFACE HARDENING ONLY).** THE CONTRACTOR SHALL RANDOMLY SELECT HUB SPROCKETS AT THE RATE OF ONE (1) FOR EACH TWENTY (20) OR LESS PRODUCED. THE SELECTED SAMPLE(S) SHALL BE IDENTIFIED AS TO PRODUCTION PERIOD AND SUBJECTED TO INSPECTION BY SECTIONING AS DESCRIBED IN PART IV, PARA. 2.

**NOTE:** THESE ITEMS SHALL NOT BE MADE PART OF THE CONTRACT QUANTITY.

17 QAP REVISION SYMBOL & DATE	E 10-27-03					11 QAP NUMBER
						<b>10936277</b>
						15 PAGE NUMBER
						<b>4</b>

**QUALITY ASSURANCE PROVISIONS (QAP) ( CONTINUATION SHEET)**

(PRODUCT ASSURANCE PAM 702-155)

**PART II - INSPECTION REQUIREMENTS (CONTINUED)**

**TABLE II - SPECIAL SAMPLING INSPECTION (CONTINUED)**

<b><u>NUMBER</u></b>	<b><u>CHARACTERISTIC</u></b>	<b><u>INSPECTION METHOD</u></b>
301	HARDNESS BHN 302-363	HARDNESS TESTER (REF. PART IV, PARA. 2)

2.1 **FAILURE**. FAILURE OF ANY ONE (1) TEST SAMPLE SHALL BE CAUSE FOR REJECTION OF THE ENTIRE REPRESENTATIVE PRODUCTION LOT. ITEMS PRODUCED SUBSEQUENT TO FAILURE OF A TEST SAMPLE SHALL NOT BE SUBMITTED FOR ACCEPTANCE UNTIL OBJECTIVE EVIDENCE HAS BEEN SUBMITTED TO THE GOVERNMENT THAT CORRECTIVE ACTION HAS ELIMINATED THE CAUSE OF THE FAILURE. ACCEPTANCE OF PRODUCTION LOTS SUBSEQUENT TO TEST FAILURE SHALL NOT RESUME UNTIL THREE (3) CONSECUTIVELY PRODUCED SAMPLES SUCCESSFULLY MEET TEST REQUIREMENTS SPECIFIED IN PARAGRAPH 2.

**PART III - CERTIFICATION REQUIREMENTS**

<b><u>NUMBER</u></b>	<b><u>CHARACTERISTIC</u></b>	<b><u>CERTIFICATION METHOD</u></b>
401	MATERIAL (ASTM A148) - CHEMICAL ANALYSIS - SOUNDNESS REQUIREMENTS	CERTIFIED MATERIAL REPORT
402	HEAT TREATMENT	CERTIFIED PROCESS REPORT
403	CLEANING AND PRETREATMENT (DWG. 12369003)	CERTIFIED PROCESS REPORT
404	PRIMER AND PAINT (DWG. 12369003)	CERTIFIED MATERIAL REPORT FROM APPROVED SUPPLIER
405	PRIMING AND PAINTING (DWG. 12369003)	CERTIFIED PROCESS REPORT
406	RADIOGRAPHIC INSPECTOR(S)	CERTIFIED RADIOGRAPHIC INSPECTOR

17 QAP REVISION SYMBOL & DATE	E 10-27-03					11 QAP NUMBER
						<b>10936277</b>
						15 PAGE NUMBER
						<b>5</b>

**QUALITY ASSURANCE PROVISIONS (QAP) ( CONTINUATION SHEET)**

(PRODUCT ASSURANCE PAM 702-155)

**PART IV - TEST METHODS AND PROCEDURES**

1. **RADIOGRAPHIC INSPECTION.** RADIOGRAPHIC INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH THE DRAWING 10921193. THE INSPECTION SHALL DETERMINE CONFORMITY OF THE CASTING TO THE SOUNDNESS REQUIREMENTS OF THE DRAWING 10936277 AND SPECIFICATION ASTM A148.

2. **HARDNESS INSPECTION.** SAMPLE HUB SPROCKETS SELECTED FOR INSPECTION AND TESTS SHALL BE SECTIONED IN ACCORDANCE WITH DRAWING 10936277, SECTION A-A AND NOTES 8 AND 9. A MINIMUM OF FOUR READINGS SHALL BE TAKEN IN EACH OF THE AREAS SHOWN IN THE DRAWING. THE TEST SHALL BE PERFORMED TO DETERMINE CONFORMITY TO THE DRAWING HARDNESS REQUIREMENTS OF BHN 302-363.

17 QAP REVISION SYMBOL & DATE	E 10-27-03					11 QAP NUMBER
						<b>10936277</b>
						15 PAGE NUMBER
						<b>6</b>

# QUALITY ASSURANCE PROVISIONS (QAP) -- INSPECTION METHOD CONTROL

(PRODUCT ASSURANCE PAM 702-165)

INSTRUCTIONS: USE SYMBOLS IN ACCORDANCE WITH ANSI Y14.5

USE EXPANDING

LEGEND: MANDATORY REQUIREMENTS



= LOCATI



= MEASURING POINT



= DEVICES

## SPLINE INSPECTION METHODS

TOOTH FORM:	(X) INVOLUTE	(-) STRAIGHT	(-) PARALLEL
TYPE OF FIT:	(X) SIDE	(-) MAJOR DIA	(-) MINOR DIA
ROOT TYPE:	(X) FLAT ROOT	(-) FULL FILLET ROOT	

## INSPECTION WITH GAGES

(-) CIRCULAR TOOTH THICKNESS (EXTERNAL):

(-) MAXIMUM EFFECTIVE \_\_\_\_\_  
 (-) MINIMUM EFFECTIVE (-) REF \_\_\_\_\_  
 (-) MAXIMUM ACTUAL (-) REF \_\_\_\_\_  
 (-) MINIMUM ACTUAL \_\_\_\_\_

(X) CIRCULAR SPACE WIDTH (INTERNAL):

(X) MINIMUM EFFECTIVE \_\_\_\_\_ .2618  
 (X) MAXIMUM EFFECTIVE (X) REF \_\_\_\_\_ .2636  
 (X) MINIMUM ACTUAL (X) REF \_\_\_\_\_ .2642  
 (X) MAXIMUM ACTUAL \_\_\_\_\_ .2660

(-) MAJOR DIAMETER FIT:

(-) THE MAJOR DIAMETER AND EFFECTIVE SPLINE MUST BE CONCENTRIC AT MAXIMUM MATERIAL CONDITIONS

(-) MINOR DIAMETER FIT:

(-) THE MINOR DIAMETER AND EFFECTIVE SPLINE MUST BE CONCENTRIC AT MAXIMUM MATERIAL CONDITIONS

## ANALYTICAL INSPECTION NOTES

1. THE MAJOR AND MINOR DIAMETER INSPECTION METHODS ARE SPECIFIED ON PAGE/S 2 CHARACTERISTIC NUMBERS 102
2. FOR ROUTINE INSPECTION WITH GAGES, THE FOLLOWING SPLINE DATA MARKED (\*) SHALL SERVE AS REFERENCE. THIS DATA HOWEVER MAY BE USED TO EVALUATE PARTS REJECTED BY GAGES OR MAY BE USED AS ACCEPTANCE CRITERIA FOR PROTOTYPE PARTS OR FOR SHORT RUNS WHERE SPLINE GAGES ARE NOT USED.
3. WHEN MARKED (X), ANALYTICAL INSPECTION IS REQUIRED AS A SUPPLEMENT TO INSPECTION WITH GAGES WHERE EACH INDIVIDUAL VARIATION MUST BE CONTROLLED.

(\*) PROFILE TOLERANCE

(X) ZERO AT 7.500 PITCH DIAMETER \_\_\_\_\_ + .0005/- .0007

(X) FORM DIAMETER (-) MAX (X) MIN (-) 7.6443

(\*) TOTAL INDEX TOLERANCE \_\_\_\_\_ .0024

(\*) LEAD TOLERANCE ACROSS 1 3/8 LENGTH OF ENGAGEMENT \_\_\_\_\_ .0004

(X) MEASUREMENT (-) OVER (X) BETWEEN TWO .2830 DIAMETER PINS \_\_\_\_\_ 7.0860+ .0033

LEGEND: (X) APPLICABLE (-) NOT APPLICABLE (\*) SEE NOTES 2 AND 3

17					18 CHARACTERISTICS	11 QAP NUMBER
QAP	E 10-27-03				101	10936277
REVISION						15 PAGE NUMBER
SYMBOL					102	7
& DATE						