NOTICE OF REVISION (NOR)

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

1. DATE (YYMMDD)	Form Approved OMB No. 0704-0188
04/01/12	

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.

2. PROCURING ACTIVITY NO.	3. DODAAC
L3A2064	

4. ORIGINATOR	b. ADDRESS (Street, City, State, Zip Code)	5. CAGE CODE	6. NOR NO.
a. TYPED NAME (First, Middle Initial, Last) AMSTA-AR-FSA-T JOSEPH R. GOOCH	US-ARMY, ARDEC PICATINNY ARSENAL NJ 07806-5000	19200 7. CAGE CODE 19200	1 8.DOCUMENT NO. 12965300

9. TITLE OF DOCUMENT	10. REVISION LETTER		11. ECP NO.
	a. CURRENT	b. NEW	
HYDRAULIC POWER PACK ASSEMBLY	D		L3A2064

12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES	
HOWITZER, MEDIUM TOWED, 155MM, M198	SHEET 1 OF 3

13. DESCRIPTION OF REVISION

ZONE F-4/5 REMOVE: THE HYDRAULIC SCHEMATIC VIEW AND TITLE.
ZONE D-7/8 REMOVE: NOTE NUMBER 16
ZONE F-8 CHANGE NOTE NUMBER 1: FROM; A. MIL-STD-100E TO; A. MIL-STD-100D
ZONE F-8 CHANGE NOTE NUMBER 2: FROM; PUMP COMPATABLE... TO; PUMP COMPATIBLE....
ZONE F-8 CHANGE NOTE NUMBER 3: FROM; RATED PRESSURE: 2650 ±100 PSI.... TO; RATED PRESSURE: 2650 ±100 PSI MIN.....
ZONE E-8 CHANGE NOTE NUMBER 6: FROM; RATED CURRENT: 95 AMPS MAX. TO; RATED CURRENT: 95 AMPS MAX. AT; 24 VOLTS, 2650 ±100 PSI AND .95GPM FLOW RATE.
ZONE E-8 CHANGE NOTE NUMBER 7: FROM; PUMP SHOULD WITHSTAND 3975 PSIG... TO; PUMP SHALL WITHSTAND 3975 PSI....
ZONE E-8 CHANGE NOTE NUMBER 8: FROM; ...VOLTAGE RANGE: 18-30 VDC. TO; ... VOLTAGE RANGE: 18-30 VDC AND MOTOR SHALL BE SEALED.
ZONE E-8 CHANGE NOTE NUMBER 12:
FROM; DUTY CYCLE MAX.
36 CYCLES/DAY AT 50 SEC./CYCLE ON 20 MIN. MINIMUM OFF TIME BETWEEN CYCLES
TO; DUTY CYCLE MAX.
30 SECONDS ON, 30 SECONDS OFF FOR ONE HOUR THEN ONE HOUR OFF.
ZONE C-8 CHANGE NOTE NUMBER 17: FROM; QAP 12595300 APPLIES. TO; QAP 12965300 APPLIES.
ZONE C-8 ADD: A NOTE NUMBER 18;
18. FLUID CLEANLINESS REQUIREMENT MIL-STD-1246, LEVEL 200.
ZONE C-8 ADD: A NOTE NUMBER 19;
19. FINISH: FINISH 24.8 OF MIL-STD-171, COLOR WHITE 17925 OF FED-STD 595.
ZONE C-8 ADD: A NOTE NUMBER 20;
20. ITEM IDENTIFICATION: APPLY THE FOLLOWING MARKINGS TO CONTAINER IN ACCORDANCE WITH MIL-STD-130.
19200-12965300
MFR- (CAGE CODE)

14. THIS SECTION FOR GOVERNMENT USE ONLY

a. (X one)		
	X	(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)
AMSRD-AAR-AIC-F	

d. TITLE	e. SIGNATURE	f. DATE SIGNED (YYMMDD)
WALTER J. SONGAILA Chief, Configuration Management and Lifecycle Integration Support to Fielded Systems Group	Jan E. Kelsey for	23 February 2004

15.a. ACTIVITY ACCOMPLISHING REVISION	b. REVISION COMPLETED (Signature)	c. DATE SIGNED (YYMMDD)
AMSTA-AR-FSA-T		

NOTICE OF REVISION (NOR)

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04/01/12	

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2. PROCURING ACTIVITY NO.	3. DODAAC
L3A2064	

4. ORIGINATOR	b. ADDRESS (Street, City, State, Zip Code)	5. CAGE CODE	6. NOR NO.
a. TYPED NAME (First, Middle Initial, Last) AMSTA-AR-FSA-T JOSEPH R. GOOCH	US-ARMY, ARDEC PICATINNY ARSENAL NJ 07806-5000	19200 7. CAGE CODE 19200	1 8.DOCUMENT NO. 12965300

9. TITLE OF DOCUMENT	10. REVISION LETTER		11. ECP NO.
	a. CURRENT	b. NEW	
HYDRAULIC POWER PACK ASSEMBLY	D		L3A2064

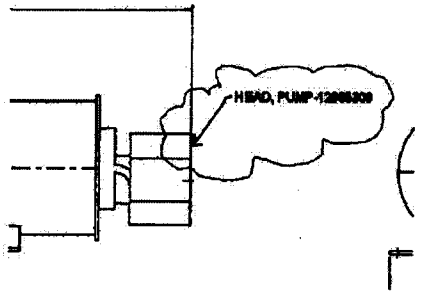
12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES	
HOWITZER, MEDIUM TOWED, 155MM, M198	SHEET 2 OF 3

13. DESCRIPTION OF REVISION

ZONE C-8 ADD: A NOTE NUMBER 21;

21. HYDRAULIC PORTS PER SAE J1926/1:
    INLET PORT; 3/4-16UNF-2B THREAD.
    DISCHARGE; 9/16-18UNF-2B THREAD.

ZONE B-1/2 ADD; A NEW VENDOR TO THE APPROVED SOURCE OF SUPPLY TABLE;
PART NO.; 12965300
VENDOR; REAL-TIME LABORATORIES, LLC
990 S. ROGERS CIRCLE, SUITE 5
BOCA RATON, FL 33487
CAGE CODE ; 62319
VENDOR PART NO. ; 142300076
ZONE D-3 ADD A PART CALL-OUT; "HEAD, PUMP-12965309" WITH LEADER LINE AS DEPICTED BELOW:



ADD A SHEET NUMBER TWO; SEE NOR 1 SHEET 3 OF 3 FOR PROPOSED NEW SHEET.
ZONE A-1 ADD IN THE SHEET BOX: 1 OF 2

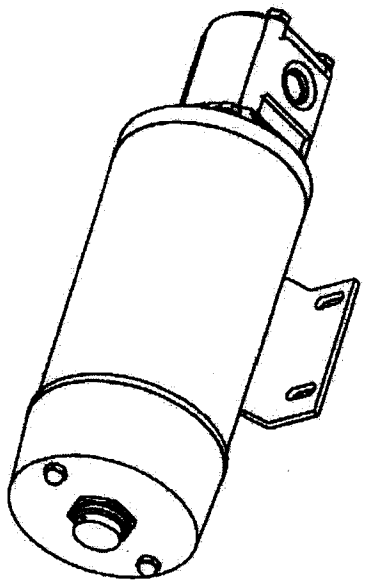
14. THIS SECTION FOR GOVERNMENT USE ONLY

a. (X one)		
	X	(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.

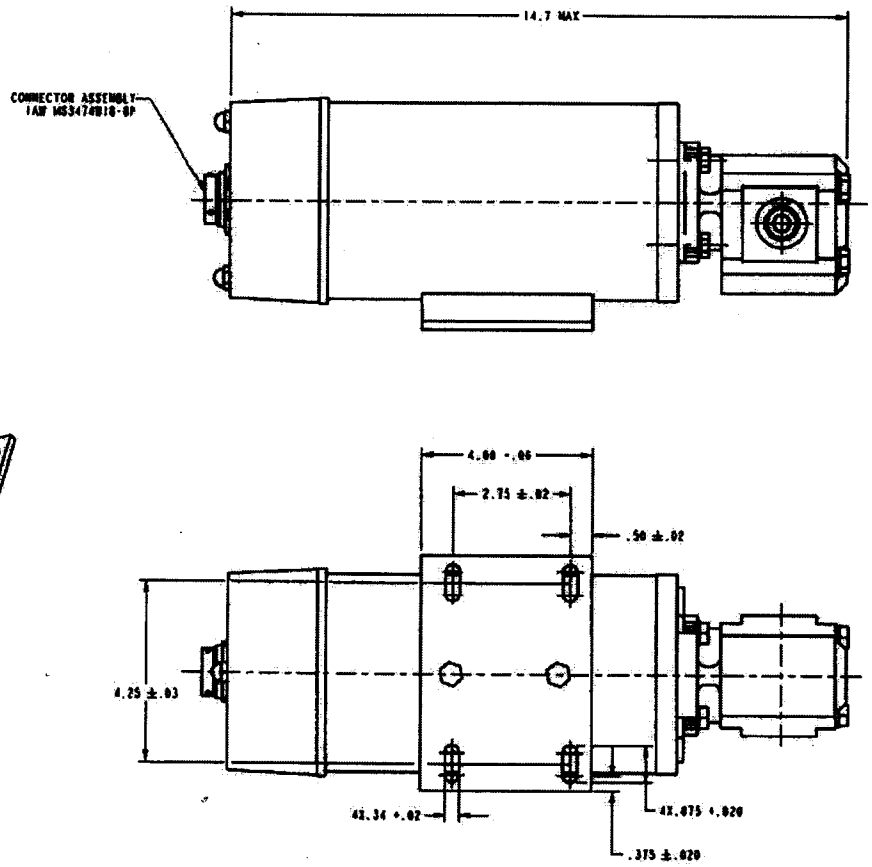
b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT	c. TYPED NAME (First, Middle Initial, Last)
AMSRD-AAR-AIC-F	

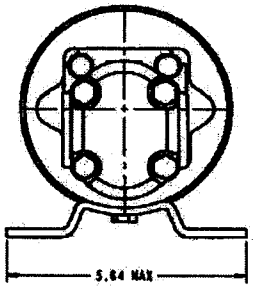
d. TITLE	e. SIGNATURE	f. DATE SIGNED (YYMMDD)
WALTER J. SONGAILA Chief, Configuration Management and Lifecycle Integration Support to Fielded Systems Group	Jan E. Kolwey for	23 February 2004

15.a. ACTIVITY ACCOMPLISHING REVISION	b. REVISION COMPLETED (Signature)	c. DATE SIGNED (YYMMDD)
AMSTA-AR-FSA-T		



ISOMETRIC VIEW





NOR # 1
SHEET 3 OF 3

ECP L3A2064

ALTERNATE CONFIGURATION
SOURCE CONTROL DRAWING

PART NO. 12965300

DISTRIBUTION STATEMENT A
APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION IS UNLIMITED

FSC	A
MECHANICAL PROPERTIES	
APPLICATION	
12965300	REV
NEXT ASSY	USED ON

DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON DECIMAL ± FRACTION ±
2 PL ±
3 PL ±
THIRD ANGLE PROJECTION

HYDRAULIC POWER PACK ASSEMBLY

SIZE	CAGE CODE	
D	19200	12965300
SCALE 3/4	SHT WT.	SHEET 2 OF 2

DRAWING SIZE D

DD FORM 68, 1 DEC 67(TEMP), REPLACES DSCAR FORM 68, 1 MAR 67(TEMP), WHICH MAY BE USED UNTIL EXHAUSTED

NOTICE OF REVISION (NOR)

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04-01-12	

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2. PROCURING ACTIVITY NO.	3. DODAAC
L3A2064	

4. ORIGINATOR	b. ADDRESS (Street, State, Zip Code)	5. CAGE CODE	6. NOR NO.
a. TYPED NAME (First, Middle Initial, Last) Amy J. Kreoll	U.S. ARMY, TACOM-ARDEC AMSTA-AR-WEP PICATINNY ARSENAL, NJ 07806-5000	19200	2
		7. CAGE CODE 19200	8. DOCUMENT NO. P12965300

9. TITLE OF DOCUMENT	10. REVISION LETTER		11. ECP NO.
	a. CURRENT	b. NEW	
Special Packaging Instruction for Hydraulic Power Pack Assembly	Orig		L3A2064

12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES	NOR SHT	ECP PAGE
M198, Howitzer, Towed, 155mm	1 of 2	

13. DESCRIPTION OF REVISION

SEE NOR CONTINUATION SHEET 2 OF 2 FOR NEW SPECIAL PACKAGING INSTRUCTION.

14. THIS SECTION FOR GOVERNMENT USE ONLY

a. (X one)		
	x	(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 APPROVED CHANGE FOR GOVERNMENT	c. TYPED NAME (First, Middle Initial, Last)
AMSRD-AAR-AIC-F	

d. TITLE	e. SIGNATURE	f. DATE SIGNED (YYMMDD)
WALTER J. SONGAILA Chief, Configuration Management and Lifecycle Integration Support to Fielded Systems Group	Jan E. Kolway for	23 February 2004

15.a. ACTIVITY ACCOMPLISHING REVISION	b. REVISION COMPLETED (Signature)	c. DATE SIGNED (YYMMDD)
AMSTA-AR-WEP, Packaging Division		

SPECIAL PACKAGING INSTRUCTION

Form Approved
OMB No. 0704-0188

1. PSP OR ORDERING NO. 12966300	HYDRAULIC POWER PACK ASSEMBLY		3. DODIC CODE 19200	4. NIIN (AMI) P12966300
5. NATIONAL STOCK NO. 4320-01-463-7253			6. EFFECTIVE DATE (YYMMDD)	7. SUPERSEDES / NIIN NO. -/-
8. UNIT OF ISSUE 1/EA	9. QTY -	10. UNIT PACK WT. (LB) 32.2	11. UNIT PACK CU. FT.(IN.CUBE) 0.327	12. UNIT PACK SIZE (INCHES(W) X L X H) 15.7 x 9.1 x 5.9

13. MILITARY PRESERVATION	14. ITEMS	15. QTY	16. DESCRIPTION
MIL-STD-2073-1, METHOD 41			
13. CLEANING *	1	AR	COMMERCIAL GRADE CAPS/PLUGS, NOTE (A)
	2	AR	WRAP, MIL-PRF-121, TY-II, SEE NOTE (B)
14. DRYING *	3	AR	TAPE, A-A-883
	4	AR	BAG, MIL-DTL-117, TY-I, CL-E,
15. PACKING [redacted]	5	1	CONTAINER, ASTM D6118, ST-RSC, GR-W5C
a. LEVEL A MIL-STD-2073-1	6	AR	FILLER, A-A-1888, GR-II, CL-B, SEE NOTE (C)
b. LEVEL B MIL-STD-2073-1	7		CLOSURE, ASTM D1974, SEALING METHOD B
16. MARKING MIL-STD-129			
17. NONSTANDARDS			

* UNLESS OTHERWISE SPECIFIED, CLEANING AND DRYING SHALL BE IN ACCORDANCE WITH PARAGRAPH 5.2.1 OF MIL-STD-2073-1. WEIGHTS AND SIZES ARE ESTIMATED AND MAY VARY SLIGHTLY.
INTERMEDIATE PACKAGING AND PACKING WILL BE IN ACCORDANCE WITH SPECIFICATION MIL-STD-2073-1 OR AS OTHERWISE SPECIFIED HEREON.

(A) ALL OPENINGS SHALL BE SEALED WITH COMMERCIAL GRADE CAPS OR PLUGS OF APPROPRIATE SIZE/SHAPE.
(B) WRAP ITEM IN A DOUBLE THICKNESS OF SPECIFIED MATERIAL AND SECURE WITH TAPE.
(C) UTILIZE SUFFICIENT AMOUNT OF MATERIAL TO IMMOBILIZE THE ITEM IN THE UNIT CONTAINER.

NOR SHEET 2 OF 2, DATED 04-01-12, HCP
L3A2064, Proposed New Special Packaging Instruction.

Amy J. Ercoli, Packaging Specialist

WBC: ITEM SIZE: 15.23 X 5.84 X 5.43 ITEM WEIGHT: 28.00 APPROVED: *Vienna N. Khanna*

DISTRIBUTION STATEMENT A, UNLIMITED

NOTICE OF REVISION (NOR)

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1. DATE (YYMMDD)	Form Approved OMB No. 0704-0188
4 01 12	

2. PROCURING ACTIVITY NO.	3. DODAAC
L3A2064	

4. ORIGINATOR	b. ADDRESS (Street, City, State, Zip Code)	5. CAGE CODE	6. NOR NO.
a. TYPED NAME (First, Middle Initial, Last) Robert E. Ehrenbeck	U.S. Army TACOM-ARDEC AMSTA-AR-QAA-R Picatinny Arsenal, NJ 07806-5000	19200 7. CAGE CODE 19200	3 8. DOCUMENT NO. SQ12965300

9. TITLE OF DOCUMENT	10. REVISION LETTER		11. ECP NO.
	a. CURRENT	b. NEW	
Quality Provisions for Hydraulic Power Pack Assembly	A	B	L3A2064

12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES
Howitzer, Medium, Towed, 155 mm, M198

NOR Sheet 1 of 17

13. DESCRIPTION OF REVISION

See NOR continuation sheets 2 through 10 for current QAP.

See NOR continuation sheets 11 through 17 for revised QAP.

14. THIS SECTION FOR GOVERNMENT USE ONLY

a. (X one)		
	X	(1) Existing document supplemented by this NOR may be used in manufacture.
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AMSRD-AAR-AIC-F	

d. TITLE	e. SIGNATURE	f. DATE SIGNED (YYMMDD)
WALTER J. SONGAILA Chief, Configuration Management and Lifecycle Integration Support to Fielded Systems Group	Jan E. Kolway for	23 February 2004

15.a. ACTIVITY ACCOMPLISHING REVISION	b. REVISION COMPLETED (Signature)	c. DATE SIGNED (YYMMDD)
AMSRD-AAR-QEW-B		

QUALITY ASSURANCE PROVISIONS (QAP)

(DARCOM-R-702-10)

1. COGNIZANT AGENCY:
U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER
PICATINNY ARSENAL, NJ 07806-5000

2. THESE QAP'S FORM PART OF DRAWING/SPECIFICATION 12965300 AS SPECIFIED IN THE CONTRACT.
INSPECTION SHALL BE CONDUCTED AS SPECIFIED HEREIN AND IN ACCORDANCE WITH REFERENCED DOCUMENTS.

3.

PART I. LIST OF APPLICABLE DOCUMENTS

DRAWINGS

12965300	Pump
12265304	Performance Requirements Hydraulic Power Pack Assembly
12274873	General Requirements of Vehicle Electrical Systems
12282832	Hydraulic Power Pack Assembly
12344343	Interior CARC Paint Specification

STANDARDS

FED-STD-595	Colors Used in Government Procurement
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
MIL-STD-461	Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment
MIL-STD-810	Environmental Engineering Considerations and Laboratory Tests
MIL-STD-1246	Product Cleanliness Levels and Contamination Control Program
MIL-STD-1916	DoD Preferred Methods for Acceptance of Product

SPECIFICATIONS

A-A-59293	Sealing Compound, Adhesive: Curing (Polysulfide Base)
MIL-PRF-6083	Hydraulic Fluid, Petroleum Base, for Preservation and Operation
MIL-PRF-22750	Coating, Epoxy, High-Solids

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

4. RELEASE NUMBER	Chg Ltr 2113											
5. DATE	020219											
4. RELEASE NUMBER												
5. DATE												
REVISION STATUS OF SHEETS	6. REVISION	A	A	A	A	A	A	A	A	A		
	7. SHEET	1	2	3	4	5	6	7	8	9		
	8. REVISION											
	7. SHEET											

8. QAP FOR: Pump, HyPAK: 155 mm Towed Howitzer, M198 — CAGE CODE 19200

9. SUBMITTED BY: AMSTA-AR-QAA-R — 10. QAP NO.: 12965300

11. DATE: 951130 — 12. APPROVED: — 13. NO. OF PAGES: 9

NOR CONTINUATION SHEET 2 OF 17
ECP NO. L3A2064
DATE: 040112
CURRENT QAP 12965300

PART II. CONFORMANCE PROVISIONS

1. General provisions.

1.1 Classification of characteristics. There are three classes of characteristics covered in this QAP. These are: Critical Characteristics, Major Characteristics, and Minor Characteristics, as defined in MIL-STD-1916.

1.2 Workmanship. All parts shall be fabricated and finished in a thorough, workmanlike manner and all manufacturing, processing and assembly shall be correctly performed. The parts shall be clean and free of burrs, sharp edges, unblended radii, surface defects, cracks, chips, dirt, grease, oil (except where specifically required), rust, foreign matter or any evidence of poor workmanship that could render the system unsuitable for its intended purpose.

1.3 Certification provisions.

1.3.1 Certificate of conformance (COC). A certificate of conformance is required for Military Standard and commercial items, supported by inspection and test data, material analysis, or certification from the raw material producer or processor, and shall be made available to the Government for specifications covering raw material, processed material, and processes. The contractor shall make the COC available to the Government prior to or with the request to perform acceptance inspection approval by the Government. This is in addition to, and not in lieu of, any rights of the Government under this contract or law. A COC may be used as an element incident to, but shall not be used as the sole basis for, Government acceptance of contract item(s) unless so indicated in the technical documentation or contract. As a minimum, the COC shall contain the following:

a. Name of company and date.

b. Contract number or purchase order number, national stock number and drawing number.

c. Complete nomenclature of supplies together with lot number or other identification. The quantity in each lot or shipment shall be given.

d. A statement, as follows, certifying that material meets all requirements of the contract:

"The undersigned, individually, and as the authorized representative of the contractor, warrants and represents that: All the information supplied above is true and accurate; the material covered by this certificate conforms to all contract requirements (including but not limited to the drawings and specifications); the analyses appearing herein are true and accurate analyses; and this certificate is made for the purpose of inducing payment and with knowledge that the information and certification may be used as a basis for such payment."

e. Signature and title of certifying official.

1.3.2 Certified test reports (CTR). When specified in the contract or in documents referenced herein, the contractor shall make available to the Government a CTR for each lot of parts, assemblies, subsystems and systems by lot number prior to acceptance. This test report is in addition to, and not in lieu of, any rights of the Government under this contract or law. A CTR may be used as an element incident to, but shall not be used as the sole basis for, Government acceptance of contract item(s) unless so indicated in the technical documentation or contract. As a minimum, the report shall contain the following:

PART II. CONFORMANCE PROVISIONS (CONT'D)

a. Name of company and date.

b. Contract number or purchase order number, national stock number and drawing number.

c. Complete nomenclature of supplies together with lot number or other identification. The quantity in each lot or shipment shall be given

d. All inspections and tests required by contract (i.e., material, processes, performance, functional, etc.) shall be recorded in test reports. These reports shall identify each lot submitted for acceptance by lot number, the specification or drawing, revision and date, grade or type as applicable, number of specimens tested, specified characteristics and requirements, and actual results obtained.

e. Reports of the raw material producer's chemical, mechanical, and physical analysis.

f. A statement, as follows, certifying that material meets all requirements of the contract:

"The undersigned, individually, and as the authorized representative of the contractor, warrants and represents that: All the information supplied above is true and accurate; the material covered by this certificate conforms to all contract requirements (including but not limited to the drawings and specifications); the analyses appearing herein are true and accurate analyses; and this certificate is made for the purpose of inducing payment and with knowledge that the information and certification may be used as a basis for such payment."

g. Signature and title of certifying official.

2. First article inspection.

2.1 Submission. Unless otherwise specified, a first article sample consisting of three (3) pumps shall be submitted for inspection and approval in accordance with the terms of this contract. The samples shall be inspected for all of the characteristics listed below.

CLASS	CHARACTERISTIC	REF. DWG.	INSPECTION METHOD
CRITICAL: None			
MAJOR:			
101	Completeness of assembly	12965300	Visual
102	Electrical transients	12965304	Dwg. 12274873
103	Performance	12965304	Para. 502
104	Submergence	12965304	Para. 503
105	Electrical isolation	12964304	Para. 504
106	Electromagnetic interference	12965304	Para. 505
107	Humidity	12965304	Para. 506
108	Basic shock	12965304	Para. 507
109	Vibration	12965304	Para. 508
110	Temperature, high and low	12965304	Para. 509

NOR CONTINUATION SHEET 4 OF 17
ECP NO. L3A2064
DATE: 040112
CURRENT QAP 12965300

QUALITY ASSURANCE PROVISION (QAP)
(DARCOM-R-702-16)

PART II. CONFORMANCE PROVISIONS (CONT'D)

CLASS	CHARACTERISTIC	REF. DWG.	INSPECTION METHOD
MAJOR (CONT'D):			
111	Storage temperature	12965304	Para. 510
112	Fungus	12965304	Para. 513
113	Endurance	12965304	Para. 511
114	Chemical resistance	12965304	Para. 512
115	Proof pressure	12965304	Para. 501
116	Voltage operating range	12965304	Para. 514
117	Gun-firing shock	12965304	Para. 515
118	Ballistic shock	12965304	Para. 516
119	Connector crimps	12965304	Certificate of Conformance
120	Final protective finish paint per top coat requirements per Dwg. 12344343, color white, and color 17038 black, of FED-STD-595	12965304	Certificate of Conformance
121	Sealant (A-A-59293)	12965304	Certificate of Conformance
122	Effluent from the assembly shall meet the cleanliness requirement of MIL-STD-1246	12965304	Certified Test Report
123	Final protective finish, color 11136, red, MIL-PRF-22750 of FED-STD-595	12965304	Certificate of Conformance
MINOR:			
201	Sealing compound applied to indicated areas (A-A-59293)	12965304	Visual
202	Identification marking requirements on Dwg. 12344343, color 17038 black on FED-STD-595	12965304	Visual
203	Indicated areas free of paint	12965304	Visual
204	Final protective finish color white per Dwg. 12344343	12965304	Visual
205	Positive terminal indicated with red paint, MIL-PRF-22750 color 11136 of FED-STD-595	12965304	Visual

2.2 Rejection. If any sample item fails to comply with any of the applicable requirements, the First Article sample shall be rejected. The Government reserves the right to terminate inspection upon any failure to comply with any of the requirements.

3. Verification. Verification inspection shall consist of inspection of all conformance characteristics contained in Part II, Conformance Provisions; Part III, Inspection Requirements; and Part IV, Certification Provisions, of this QAP. Failure to comply with the conformance criteria specified shall be cause for rejection of the lot or quantity represented.

3.1 Lot formation. Inspection lots shall comply with the lotting requirements of MIL-STD-1916, paragraph 4.2.

18 REVISION NUMBER AND DATE	A020219					CAGE CODE 19200
						10 QAP NO 12965300
						1 PAGE NO 4

NOR CONTINUATION SHEET 5 OF 17
ECP NO. L3A2064
DATE: 040112
CURRENT QAP 12965300

QUALITY ASSURANCE PROVISION (QAP)
(DARCOM-R-702-10)

3

PART II. CONFORMANCE PROVISIONS (CONT'D)

3.2 Attributes sampling inspection. The provisions/procedures of MIL-STD-1916 are applicable to this QAP. Unless otherwise specified, attributes sampling for the conformance characteristics listed in Part III herein shall be in accordance with MIL-STD-1916, Table II, using the verification level cited in the conformance criteria columns of Part III. The procedure in MIL-STD-1916 for normal inspection shall be used at the start of production for current or previous suppliers of the item. For all new suppliers of the item, tightened inspection shall be used at the start of production and be continued until the criteria for normal inspection are met.

3.3 Alternative verification provisions. Unless otherwise specified, alternative verification provisions, such as statistical process control (preferred), variables or continuous sampling plans, may be used by the contractor in lieu of the inspection provisions contained herein when such alternative(s) provide an equivalent or better level of quality, and provided they have been described in a written proposal which has been approved by the Government.

3.4 Inspection equipment. Unless otherwise specified herein or the contract, all inspection equipment required to perform the examinations and tests in this QAP shall be designed, documented and maintained by the contractor, including any fixtures necessary to accommodate the test procedures. Inspection equipment shall incorporate the appropriate measurement capability, precision and accuracy to assure rejection of all nonconforming product.

PART III. INSPECTION REQUIREMENTS

1. Classification of conformance characteristics.

CLASS	CHARACTERISTIC	REF. DWG.	CONFORMANCE CRITERIA	INSPECTION METHOD
CRITICAL: None				
MAJOR:				
101	Completeness of assembly	12965304	II	Visual
102	Performance	12965304	100 %	Para. 502
103	Submergence	12965304	100 %	Para. 503
104	Electrical isolation	12965304	100 %	Para. 504
MINOR:				
201	Sealing compound applied to indicated areas (A-A-59293)	12965304	I	Visual
202	Identification marking MIL-STD-130, per top coat requirements on Dwg. 12344343, color 17038 black on FED-STD-595	12965304	I	Visual
203	Indicated areas free of paint	12965304	I	Visual
204	Final protective finish color white per Dwg. 12344343	12965304	I	Visual
205	Positive terminal indicated with red paint, MIL-PRF-22750 color 11136 of FED-STD-595	12965304	I	Visual

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CAGE CODE	MIL-QAP NO.	IDENT NO.
19200	2965300	5

QUALITY ASSURANCE PROVISION (QAP)

(DARCOM-R-702-10)

PART III. INSPECTION REQUIREMENTS (CONT'D)

2. Special sampling instruction. The contractor shall select sample assemblies at random at the rate of one (1) from each 600 assemblies except that not more than one (1) test performance in a six (6) month period nor less than one (1) test in a twelve (12) month period. The assembly may be selected from the first ten (10) assemblies produced for the interval defined or the last ten (10) assemblies from the preceding interval.

CLASS	CHARACTERISTIC	REF. DWG.	INSPECTION METHOD
301	Endurance	12965304	Para. 511
302	Voltage operating range	12965304	Para. 514

2.1 Failure. Failure of a pump to meet the specified instructions shall be considered cause to reject subsequent assemblies until deficiencies that caused the failure are corrected and proven by testing through consecutively produced assemblies. Control inspection verification for assemblies shall be limited to the parameters directly related to the failure cause and the parameters affected by the corrective action taken.

PART IV. CERTIFICATION PROVISIONS

1. The certification provisions of paragraph 1.3 shall apply. Certifications are required for the following:

NUMBER	CHARACTERISTIC	CERTIFICATION METHOD	TEST DATA TO COMPLY WITH
401	Connector crimps	Certificate of Conformance	Dwg. 12965300
402	Final protective finish paint per top coat requirements per Dwg. 12344343, color white and color 17038 black of FED-STD-595	Certificate of Conformance	Dwg. 12965300
403	Sealant (A-A-59293)	Certificate of Conformance	Dwg. 12965300
404	Effluent fluid from the assembly shall meet the cleanliness requirement of MIL-STD-1246, Level 200, when influent fluid is clean to MIL-STD-1246, Level 200	Certified Test Report	Dwg. 12965300
405	Final protective finish, color 11136 red, MIL-PRF-22750 of FED-STD-595	Certificate of Conformance	Dwg. 12965300

PART V. TEST METHODS AND PROCEDURES

501 Proof pressure test. The assembly shall be connected to a hydraulic test stand using fluid per MIL-PRF-6083 and subjected to a 3975-psig minimum pressure for five (5) minutes minimum without external leakage, degradation of performance or permanent deformation.

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PART V. TEST METHODS AND PROCEDURES (CONT'D)

502 Performance. Install the assembly in a suitable hydraulic test stand and verify that the hydraulic fluid temperature to valve inlet is 90 +/- 5 degrees (deg.) Fahrenheit (F).

502.1 Check Valve. Verify that the leak rate from outlet to inlet side of the check valve does not exceed 10 cubic centimeters per minute with 2650 +/- 100 psig applied to the outlet port.

502.2 Operation. Perform two (2) test cycles of 30 seconds on, 30 seconds off and then continuous for one minute. During the one-minute and first off, second on cycles, verify and record that at 2650 +/- 100 psig operating at 24.0 +/- 5 volts DC and the fluid at 90 +/- 5 deg. F, the minimum flow rate and the maximum amperage do not exceed the requirements cited on Dwg. 12965300.

503 Submergence. The assembly shall be submerged in a container with the uppermost surface a minimum of one inch below the surface of the liquid subjected to a 6 +/- 0.6 psi differential pressure (so that the internal pressure is positive with respect to the external pressure) for a period of five (5) minutes. The assembly shall be observed to verify the absence of proof seals, as evidenced by a steady stream of bubbles escaping from the interior of the assembly. Bubbles resulting from entrapped air on the exterior surface of the assembly shall not be considered a leak. After exposure, the assembly shall meet the performance tests of Para. 502.

504 Electric isolation. Using the method of MIL-STD-202, Method 302, Condition A, verify that the insulation resistance between the isolated circuits of the assembly exceeds 7 megohms.

505 Electromagnetic interference. Using the methods of MIL-STD-461, verify that the assembly meets the conducted emissions (CE04, CE05) and radiated emissions (RE02) requirements of MIL-STD-461, Notice 4.

506 Humidity. Place the assembly in a humidity chamber and subject it to the humidity test of MIL-STD-810, Method 507.1, Procedure II to verify conformance to Dwg. 12965304. Subject the assembly to the performance tests of Para. 502 both during and after exposure to the test conditions.

507 Basic shock. The assembly shall be mounted using the installed interface configuration for its intended application (hard mounted to vehicle floor or equivalent) and subjected to the test of MIL-STD-810, Method 516.2, Procedure I, to verify conformance to Dwg. 12965304. A total of three half sine wave shock pulses shall be applied in both directions along each of three mutually perpendicular axes. Peak amplitude shall be 30 +/- 3 G, 11 +/- 1.1 milliseconds (ms). During exposure the assembly shall be filled with hydraulic fluid and all ports capped. At the conclusion of this test, examine the assembly for damage and subject the assembly to the performance test of Para. 502.

508 Vibration. The assembly shall be mounted using the installed interface configuration for its intended application (hard mounted to vehicle floor or equivalent) and subjected to the test of MIL-STD-810, Method 514.2, Procedure VIII, to verify conformance to Table I below. The vibration schedule shall be in accordance with Table I for a total of 180 minutes in each of three mutually perpendicular axes at an ambient temperature of 140 deg. F. During exposure the assembly shall be filled with hydraulic fluid and all ports capped. At the conclusion of this test, the assembly shall be returned to room ambient temperature, examined for damage, and subjected to the performance test of Para. 502.

PART V. TEST METHODS AND PROCEDURES (CONT'D)

TABLE I. VIBRATION LEVELS

FREQUENCY, Hz	VERTICAL	AMPLITUDE LATITUDINAL	AMPLITUDE LONGITUDINAL
5 – 25	+/- 1 G	+/- 1 G	+/- 1 G
25 - *	.030 DA	.030 DA	.030 DA
* - 500	+/- 5 G	+/- 3 G	+/- 3 G
	* = 57 Hz	* = 44 Hz	* = 44 Hz

509 Temperature, high and low.

509.1 High temperature. Subject the assembly to the high temperature test specified in MIL-STD-810, Method 501.1, Procedure I to verify conformance with Dwg. 12965304. Maintain the temperature at 160 deg. F for a period of 48 hours. At the conclusion of this time, stabilize the assembly and hydraulic fluid temperature at 140 deg. F, and perform two (2) test cycles of 30 seconds on, 30 seconds off and then continuous for one minute. During the one-minute and first 30-seconds-on cycles, verify and record that the current does not exceed 95 amps and the flows meet the 0.95 gpm minimum. During and after completion of test, fluid temperature is allowed to reach 160 deg. F. Verify the leak rate from the check valve meets the requirements of Para. 502.1. After testing, return the assembly to 73 +/- 18 deg. F and perform the test of Para. 502.

509.2 Low temperature. Subject the assembly to the low temperature test specified in MIL-STD-810, Method 502.1, Procedure I to verify conformance with Dwg. 12965304. Maintain the temperature at –60 deg. F for a period of 24 hours. At the conclusion of this time, stabilize the assembly and hydraulic fluid temperature at –25 deg. F and perform two (2) test cycles of 30 seconds on, 30 seconds off, and then continuous for one minute. During the first 30-second-on cycle, verify there is fluid flow at a pressure of 2650 +/- 100 psig. During the second 30-second-on cycle and the one-minute-on cycle, verify and record that the current and flows do not exceed the requirements cited on Dwg. 12965304. During and after completion of the test, the fluid temperature shall be maintained at –25 +/- 5 deg. F. Verify the leak rate from the check valve meets the requirements of Para. 502.1. After testing, return the assembly to 73 +/- 18 deg. F and perform the tests of Para. 502.

510 Storage temperature. Subject the assembly to the tests of Para. 509 to verify conformance to storage temperature of –60 deg. F and 160 deg. F.

511 Endurance. The assembly shall be subjected to 1000 hours of duty cycle operation as specified in Dwg. 12965304. During endurance testing, the applied voltage shall be 24 +/- .5 VDC for 500 duty cycles (1000 hours of 30 seconds on and 30 seconds off for one hour then followed by one hour off) at 1/3 and 2/3 of the test time. Verify that the assembly meets the performance test of Para. 502. For all tests the hydraulic fluid temperature shall be a minimum of 150 deg. F but shall not exceed 190 deg. F and the assembly shall be at ambient room temperature (78 +/- 18 deg. F).

511.1 Endurance (control test). Perform the test of Para. 511, except the total test duration will be 100 hours.

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PART V. TEST METHODS AND PROCEDURES (CONT'D)

512.1 Chemical resistance. Subject the assembly to exposure of the vapors and direct contact with the chemicals specified on Dwg. 12965304 for a minimum of 48 hours. After exposure, the assembly shall show no sign of damage and shall perform as specified without failure.

513 Fungus. The assembly shall be tested in accordance with MIL-STD-810, Method 508.2, Procedure I except the conditions of Dwg. 12965304 shall apply, to verify conformance to Dwg. 12282832. In lieu of the MIL-STD-810 test, a certification of conformance with supporting data shall be provided attesting that the assembly is constructed of materials that will not support fungus growth.

514 Voltage operating range. Operate the assembly with fluid at a temperature of 90 +/- 5 deg. F and a discharge pressure of 2650 +/- 100 psig. With fluid with an input voltage of 18 +0.5 –0.0 VDC, verify the assembly operates and pumps fluid. With an input voltage of 30 +0.0 –0.5 VDC, the flow shall exceed .95 gpm

515 Gun firing shock. The assembly shall be mounted using the installed interface configuration for its intended application (i.e. hard mounted to vehicle skin, bracket mounted, etc.) or equivalent and subjected to the test of MIL-STD-810, Method 516.2, Procedure IV, to verify conformance to Table II below. A total of three half sine wave shock pulses shall be applied in both directions along each of three mutually perpendicular axes. Peak amplitude shall be in accordance with Table II. At the conclusion of this test, examine the assembly for damage and subject the assembly to the performance test of Para. 502.

TABLE II. GUN FIRING SHOCK LEVELS (HALF SINE WAVE)

AXIS	PULSE AMPLITUDE (PK), G's	DURATION, ms
Vertical	100	1.5
Latitudinal	100	1.5
Longitudinal	100	1.5

516 Ballistic shock. The assembly shall be mounted using the installed interface configuration for its intended application (i.e. hard mounted to vehicle skin, bracket mounted, etc.) or equivalent and subjected to the test of MIL-STD-810, Method 516.2, Procedure IV to verify conformance to Table III below. A total of three half sine wave shock pulses shall be applied in both directions along each of three mutually perpendicular axes. Peak amplitude shall be in accordance with Table III below. At the conclusion of this test, examine the assembly for damage and subject the assembly to the performance test of Para. 502.

TABLE III. BALLISTIC SHOCK LEVELS (HALF SINE WAVE)

AXIS	PULSE AMPLITUDE, G's	DURATION, ms
Vertical	200	0.5
Latitudinal	200	0.5
Longitudinal	200	0.5

QUALITY ASSURANCE PROVISIONS (QAP)

(DARCOM-R-702-10)

1. COMMAND AGENCY:

U.S. ARMY ARMAMENT RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER
PICATINNY ARSENAL, NJ 07806-5000

2. THESE QAP'S FORM PART OF DRAWING/SPECIFICATION 12965300 AS SPECIFIED IN THE CONTRACT. INSPECTION SHALL BE CONDUCTED AS SPECIFIED HEREIN AND IN ACCORDANCE WITH REFERENCED DOCUMENTS.

3.

PART I. LIST OF APPLICABLE DOCUMENTS

DRAWINGS

12965300 Pump

STANDARDS

MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests
MIL-STD-1916 DoD Preferred Methods for Acceptance of Product

SPECIFICATIONS

MIL-PRF-6083 Hydraulic Fluid, Petroleum Base, for Preservation and Operation

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DRAFT REVISION OF QAP 12965300

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4. RELEASE NUMBER	L3A2064												
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REVISION STATUS OF SHEETS	6. REVISION	B	B	B	B	B	B	B					
	7. SHEET	1	2	3	4	5	6	7					
	8. REVISION												
	7. SHEET												

8. QAP FOR: Pump, HyPAK: 155 mm Towed Howitzer, M198		CAGE CODE 19200	
9. SUBMITTED BY: AMSRD-AAR-QEW-B		10. QAP NO.: 12965300	
11. DATE: 951130	12. APPROVED:	13. RELEASE NO.: G5A2030	14. PAGE NO.: 1 / 15. NO. OF PAGES: 7

PART II. CONFORMANCE PROVISIONS

1. General provisions.

1.1 Classification of characteristics. There are three classes of characteristics covered in this QAP. These are: Critical Characteristics, Major Characteristics, and Minor Characteristics, as defined in MIL-STD-1916.

1.2 Workmanship. All parts shall be fabricated and finished in a thorough, workmanlike manner and all manufacturing, processing and assembly shall be correctly performed. The parts shall be clean and free of burrs, sharp edges, unblended radii, surface defects, cracks, chips, dirt, grease, oil (except where specifically required), rust, foreign matter or any evidence of poor workmanship that could render the system unsuitable for its intended purpose.

1.3 Certification provisions.

1.3.1 Certificate of conformance (COC). A certificate of conformance is required for Military Standard and commercial items, supported by inspection and test data, material analysis, or certification from the raw material producer or processor, and shall be made available to the Government for specifications covering raw material, processed material, and processes. The contractor shall make the COC available to the Government prior to or with the request to perform acceptance inspection approval by the Government. This is in addition to, and not in lieu of, any rights of the Government under this contract or law. A COC may be used as an element incident to, but shall not be used as the sole basis for, Government acceptance of contract item(s) unless so indicated in the technical documentation or contract. As a minimum, the COC shall contain the following:

a. Name of company and date.

b. Contract number or purchase order number, national stock number and drawing number.

c. Complete nomenclature of supplies together with lot number or other identification. The quantity in each lot or shipment shall be given.

d. A statement, as follows, certifying that material meets all requirements of the contract:

"The undersigned, individually, and as the authorized representative of the contractor, warrants and represents that: All the information supplied above is true and accurate; the material covered by this certificate conforms to all contract requirements (including but not limited to the drawings and specifications); the analyses appearing herein are true and accurate analyses; and this certificate is made for the purpose of inducing payment and with knowledge that the information and certification may be used as a basis for such payment."

e. Signature and title of certifying official.

1.3.2 Certified test reports (CTR). When specified in the contract or in documents referenced herein, the contractor shall make available to the Government a CTR for each lot of parts, assemblies, subsystems and systems by lot number prior to acceptance. This test report is in addition to, and not in lieu of, any rights of the Government under this contract or law. A CTR may be used as an element incident to, but shall not be used as the sole basis for, Government acceptance of contract item(s) unless so indicated in the technical documentation or contract. As a minimum, the report shall contain the following:

3.

PART II. CONFORMANCE PROVISIONS (CONT'D)

a. Name of company and date.

b. Contract number or purchase order number, national stock number and drawing number.

c. Complete nomenclature of supplies together with lot number or other identification. The quantity in each lot or shipment shall be given

d. All inspections and tests required by contract (i.e., material, processes, performance, functional, etc.) shall be recorded in test reports. These reports shall identify each lot submitted for acceptance by lot number, the specification or drawing, revision and date, grade or type as applicable, number of specimens tested, specified characteristics and requirements, and actual results obtained.

e. Reports of the raw material producer's chemical, mechanical, and physical analysis.

f. A statement, as follows, certifying that material meets all requirements of the contract:

"The undersigned, individually, and as the authorized representative of the contractor, warrants and represents that: All the information supplied above is true and accurate; the material covered by this certificate conforms to all contract requirements (including but not limited to the drawings and specifications); the analyses appearing herein are true and accurate analyses; and this certificate is made for the purpose of inducing payment and with knowledge that the information and certification may be used as a basis for such payment."

g. Signature and title of certifying official.

2. First article inspection.

2.1 Submission. Unless otherwise specified, a first article sample consisting of three (3) pumps shall be submitted for inspection and approval in accordance with the terms of this contract. The sample items will be subjected to any or all of the conformance inspections listed in Part III of this QAP and may be inspected for compliance with any or all of the requirements of the applicable drawing(s) and specification(s). Unless otherwise specified, the first article samples shall also be subjected to all of the tests listed below. The certification requirements of Part IV apply.

CLASS	CHARACTERISTIC	INSPECTION METHOD
MAJOR:		
A	Operation	Para. 502
B	Endurance	Para. 506
C	Immersion	Para. 503
D	Basic shock	Para. 504
E	Vibration	Para. 505
F	Temperature, high and low	Para. 508
G	Voltage operating range	Para. 507
H	Proof pressure	Para. 501

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PART II. CONFORMANCE PROVISIONS (CONT'D)

2.2 Rejection. If any sample item fails to comply with any of the applicable requirements, the First Article sample shall be rejected. The Government reserves the right to terminate inspection upon any failure to comply with any of the requirements.

3. Verification. Verification inspection shall consist of inspection of all conformance characteristics contained in Part II, Conformance Provisions; Part III, Inspection Requirements; and Part IV, Certification Provisions, of this QAP. Failure to comply with the conformance criteria specified shall be cause for rejection of the lot or quantity represented.

3.1 Lot formation. Inspection lots shall comply with the lotting requirements of MIL-STD-1916, paragraph 4.2.

3.2 Attributes sampling inspection. The provisions/procedures of MIL- STD-1916 are applicable to this QAP. Unless otherwise specified, attributes sampling for the conformance characteristics listed in Part III herein shall be in accordance with MIL-STD-1916, Table II, using the verification level cited in the conformance criteria columns of Part III. The procedure in MIL-STD-1916 for normal inspection shall be used at the start of production for current or previous suppliers of the item. For all new suppliers of the item, tightened inspection shall be used at the start of production and be continued until the criteria for normal inspection are met.

3.3 Alternative verification provisions. Unless otherwise specified, alternative verification provisions, such as statistical process control (preferred), variables or continuous sampling plans, may be used by the contractor in lieu of the inspection provisions contained herein when such alternative(s) provide an equivalent or better level of quality, and provided they have been described in a written proposal which has been approved by the Government.

3.4 Inspection equipment. Unless otherwise specified herein or the contract, all inspection equipment required to perform the examinations and tests in this QAP shall be designed, documented and maintained by the contractor, including any fixtures necessary to accommodate the test procedures. Inspection equipment shall incorporate the appropriate measurement capability, precision and accuracy to assure rejection of all nonconforming product.

PART III. INSPECTION REQUIREMENTS

1. Classification of conformance characteristics.

CLASS	CHARACTERISTIC	CONFORMANCE CRITERIA	INSPECTION METHOD
CRITICAL: None			
MAJOR:			
101	Completeness of assembly	II	Visual
102	Operation	100 %	Para. 502
103	Immersion	100 %	Para. 503
104	Proof pressure	301	Para. 501
105	Temperature, high and low	302	Para. 508
106	Voltage operating range	303	Para. 507

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PART III. INSPECTION REQUIREMENTS (CONT'D)

CLASS	CHARACTERISTIC	CONFORMANCE CRITERIA	INSPECTION METHOD
MAJOR (CONT'D):			
107	Thread, inlet port, 3/4-16 UNF-2B		
	Minor dia.	II	SMTE
	Pitch dia.	II	SMTE
108	Thread, discharge port, 9/16-18 UNF-2B		
	Minor dia.	II	SMTE
	Pitch dia.	II	SMTE
MINOR:			
201	Item identification missing, incorrect or illegible (Note 20)	I	Visual
202	Protective finish missing or defective (Note 19)	I	Visual
203	Workmanship	I	Para. 1.2

2. Special sampling instruction. The contractor shall select sample assemblies at random at the rate of one (1) from each 600 assemblies except that not more than one (1) test performance in a six (6) month period or less than one (1) test in a twelve (12) month period. The assembly may be selected from the first ten (10) assemblies produced for the interval defined or the last ten (10) assemblies from the preceding interval.

NUMBER	CHARACTERISTIC	INSPECTION METHOD
301	Proof pressure test	Para. 501
302	Temperature, high and low	Para. 508
303	Voltage operating range	Para. 507

2.1 Failure. Failure of a pump to meet the specified instructions shall be considered cause to reject subsequent assemblies until deficiencies that caused the failure are corrected and proven by testing through consecutively produced assemblies. Control inspection verification for assemblies shall be limited to the parameters directly related to the failure cause and the parameters affected by the corrective action taken.

PART IV. CERTIFICATION PROVISIONS

1. The certification provisions of paragraph 1.3 shall apply. Certifications are required for the following:

NUMBER	CHARACTERISTIC	CERTIFICATION METHOD	TEST DATA TO COMPLY WITH
401	Protective finish	Certificate of Conformance	Dwg. 12965300, Note 19
402	Cleanliness level	Certified Test Report	Dwg. 12965300, Note 18

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PART V. TEST METHODS AND PROCEDURES

501 Proof pressure test. The assembly shall be connected to a hydraulic test stand using fluid per MIL-PRF-6083 and subjected to a 3975-psig minimum pressure for five (5) minutes minimum without external leakage, degradation of performance, or permanent deformation.

502 Operational test. Perform two (2) test cycles of 30 seconds on and 30 seconds off. Then, operate continuously for one minute. During the one-minute operation, verify and record that at 2650 +/- 100 psig operating at 24.0 +/- 5 volts DC and the fluid at ambient temperature, the minimum flow rate and maximum amperage meet or exceed the requirements cited on Dwg. 12965300.

503 Immersion. The assembly shall be immersed in a container with the uppermost surface a minimum of one inch below the surface of the liquid subjected to a 6 +/- 0.5 psi differential pressure (so that the internal pressure is positive with respect to the external pressure) for a period of five (5) minutes. The assembly shall be observed to verify the absence of proof seals, as evidenced by a steady stream of bubbles escaping from the interior of the assembly. Bubbles resulting from entrapped air on the exterior surface of the assembly shall not be considered a leak. After exposure, the assembly shall meet the operational tests of Para. 502.

504 Basic shock. The assembly shall be mounted using the installed interface configuration for its intended application (hard-mounted to howitzer or equivalent) and subjected to the test of MIL-STD-810, Method 516.5, Procedure I. A total of three half sine-wave shock pulses shall be applied in both directions along each of three mutually perpendicular axes. Peak amplitude shall be 30 +/- 3 G, 11 +/- 1.1 milliseconds (ms). During exposure, the assembly shall be filled with hydraulic fluid with all ports capped. At the conclusion of this test, examine the assembly for damage and subject the assembly to the operational test of Para. 502.

505 Vibration. The assembly shall be mounted using the installed interface configuration for its intended application (hard-mounted to howitzer or equivalent) and subjected to the test of MIL-STD-810, Method 514.5, Procedure I, Category 20, to verify conformance to Table I below. The vibration schedule shall be in accordance with Table I for a total of 180 minutes in each of three mutually perpendicular axes at ambient temperature. During exposure, the assembly shall be filled with hydraulic fluid with all ports capped. At the conclusion of this test, the assembly shall be returned to room ambient temperature, examined for damage, and subjected to the operational test of Para. 502.

TABLE I. VIBRATION LEVELS

	AMPLITUDE		
FREQUENCY, Hz	VERTICAL	LATITUDINAL	LONGITUDINAL
5 – 25	+/- 1 G	+/- 1 G	+/- 1 G
25 - *	.030 DA	.030 DA	.030 DA
* - 500	+/- 5 G	+/- 3 G	+/- 3 G
	* = 57 Hz	* = 44 Hz	* = 44 Hz

506 Endurance. The assembly shall be subjected to 400 hours of duty cycle operation as specified in Dwg. 12965300. During endurance testing, the applied voltage shall be 24 +/- .5 VDC for 800 test cycles (1600 hours of 30 seconds on and 30 seconds off for one hour, followed by one-hour off). At 1/3 and 2/3 of the test time, verify that the assembly meets the operational test of Para. 502. For all tests, the hydraulic fluid temperature shall be a minimum of 70 deg. F but shall not exceed 190 deg. F and the assembly shall be at ambient room temperature.

PART V. TEST METHODS AND PROCEDURES (CONT'D)

507 Voltage operating range. Operate the assembly with fluid at ambient temperature and a discharge pressure of 2650 +/–100 psig. With an input voltage of 18 +0.5 –0.0 VDC, verify the assembly operates and meets the fluid flow requirement of 0.95 gpm. With an input voltage of 30 +0.0 –0.5 VDC, the flow shall meet or exceed 0.95 gpm.

508 Temperature, high and low.

508.1 High temperature. Subject the assembly to the high-temperature test specified in MIL-STD-810, Method 501.4, Procedure I to verify conformance with Dwg. 12965300. Maintain the temperature at 160 deg. F for a period of 48 hours. At the conclusion of this time, stabilize the assembly and hydraulic fluid temperature at 140 deg. F, and perform twenty (20) test cycles of 30 seconds on and 30 seconds off. Then, operate continuously for one minute. During the one-minute operation, verify and record that the current does not exceed 95 amps and the flow meet the 0.95 gpm minimum. During and after completion of this test, the fluid temperature is allowed to reach 160 deg. F. After testing, return the assembly to 73 +/- 18 deg. F and perform the operational test of Para. 502.

508.2 Low temperature. Subject the assembly to the low-temperature test specified in MIL-STD-810, Method 502.4, Procedure I to verify conformance with Dwg. 12965300. Maintain the temperature at –50 deg. F for a period of 24 hours. At the conclusion of this time, stabilize the assembly and hydraulic fluid temperature at –25 deg. F and perform twenty (20) test cycles of 30 seconds on and 30 seconds off. Then, operate continuously for one minute. During the one-minute operation, verify and record that the current and flow meet or exceed the requirements cited on Dwg. 12965300. During and after completion of the test, the fluid temperature shall be maintained at –25 +/- 5 deg. F. After testing, return the assembly to 73 +/- 18 deg. F and perform the operational test of Para. 502.