

NOTES:

1. APPLICABLE STANDARDS/SPECIFICATIONS:
 A. DOD-STD-00100D(AR)
 B. ANSI Y14.5M-1982

2. ENGINEERING REQUIREMENTS:
 CABLE ASSEMBLIES SHALL MEET THE REQUIREMENTS OF SAE J1292 AND J163. IDENTIFY CIRCUIT NUMBERS IAW US ARMY ORDNANCE DRAWING 7070301.

3. MANUFACTURING REQUIREMENTS:
 A. CONNECTOR ASSEMBLY:
 1. CRIMPING:
 a. CONNECTOR CONTACTS:
 THE CRIMP-TYPE CONNECTOR CONTACTS SHALL BE CRIMPED USING TOOLING AND PROCEDURES DEFINED BY THE CONNECTOR MANUFACTURER.
 b. TERMINAL LUGS:
 THE CRIMP-TYPE TERMINAL LUGS SHALL BE CRIMPED TO CONDUCTORS IN A MANNER THAT CONFORMS WITH THE REQUIREMENTS OF MIL-E-45782 AND TENSILE TEST DEFINED BY MFG.

2. CONTACT INSERTION IN CONNECTORS:
 DAMAGE TO CONNECTOR INSERTS, OR THE CONTACTS DUE TO INSERTION OR EXTRACTION, IS UNACCEPTABLE. THE INSERTION OR EXTRACTION TOOLS RECOMMENDED BY THE MANUFACTURER OF CONNECTOR AND CONTACTS SHALL BE USED IN ALL CASES. IF LUBRICANT IS RECOMMENDED BY THE CONNECTOR MANUFACTURER FOR ASSEMBLY THE CONNECTOR SHALL BE THOROUGHLY CLEANED AFTER ASSEMBLY WITH ISOPROPYL AND THERE SHALL BE NO EVIDENCE OF RESIDUE FROM LUBRICANT REMAINING ON THE CONNECTOR INSERT OR CONTACTS.

3. SOLDERING:
 THE SOLDERING OF ALL HARNESSES AND CABLE ASSEMBLIES SHALL BE IAW ANSI/J-STD-001.

4. TERMINAL LUGS AND SPLICES:
 TERMINAL LUGS AND SPLICES MUST MEET THE PERFORMANCE REQUIREMENTS OF MIL-T-7928, PARA. 3.5 OR EQUIVALENT MANUFACTURER RECOMMENDED INSTRUCTIONS.

B. INSULATION STRIPPING:
 THE REMOVAL OF INSULATION FROM ELECTRICAL WIRE CONDUCTORS SHALL BE PERFORMED SO THAT THERE IS NO EVIDENCE OF PHYSICAL DAMAGE TO THE INDIVIDUAL STRANDS. MINOR DAMAGE TO THE STRANDS OF LARGER CONDUCTORS IS PERMITTED BUT SHALL NOT EXCEED THE LIMITS SPECIFIED IN TABLE I.

NO. OF STRANDS IN WIRE	ALLOWABLE MAXIMUM NO. OF NICKED OR SEVERED STRANDS
1 TO 6	0
7 TO 15	1
16 TO 18	2
19 TO 25	3
26 TO 36	4
37 TO 40	5
OVER 40	15%

C. BINDING:
 1. CABLES AND HARNESSES SHALL BE BOUND TOGETHER WITH STRAP MS3367, IAW MIL-S-23190 AND USING SPACING AS INDICATED IN TABLE.

BUNDLE DIA. OVER	INCLUDING	AVERAGE SPACING
0mm	6mm	25mm
6mm	13mm	50mm
13mm	25mm	75mm
25mm	GREATER	100mm

2. OPTIONAL BINDING:
 HARNESSES SHALL BE FASHIONED INTO AN INTEGRAL BUNDLE WITH A SINGLE LAYER BRAID, OR FLEXTIX, OVER THE ENTIRE LENGTH OF THE HARNESS TO WITHIN 120±30mm FROM EACH CONNECTOR. THE METHOD OF SECURING THE BRANCH BREAKOUTS SHALL BE OPTIONAL. FOR CLARITY, THE BRAID IS NOT SHOWN IN PART VIEW.

3. OPTIONAL BINDING:
 BUNDLING WITH LACING TAPE, MIL-T-43435, SIZE 3, TYPE I, COLOR OPTIONAL AND EMPLOYING SPACING AS INDICATED IN TABLE.

4. CONVOLUTED CONDUIT:
 WHERE CONVOLUTED CONDUIT IS USED IT SHALL BE 150±25mm FROM BACK OF MAIN CONNECTOR.
 a. WHERE CONDUIT SIZE CHANGES IN BODY OF HARNESS IT SHALL OVERLAP 30±10mm.
 b. CONDUIT SHALL BE TERMINATED AT SEPARATION OF OR PER INSTRUCTIONS. WHEN BREAK OUTS ARE LESS THAN OR EQUAL TO 200MM, BARE WIRE IN ACCORDANCE WITH MIL-I-23053/4 CLASS 3, UNLESS OTHERWISE INDICATED.
 c. AT CONDUIT/SLEEVE INTERFACES, SLEEVE SHALL EXTEND APPROXIMATELY 10MM BEYOND POINT WHERE SHRINK SLEEVE SHALL COVER BARE WIRE IN ACCORDANCE WITH MIL-I-23053/4 CLASS 3, UNLESS OTHERWISE INDICATED.

D. WORKMANSHIP:
 WORKMANSHIP SHALL BE IAW MIL-STD-454 REQUIREMENT 9.

E. MARKER BAND:
 MARKER BANDS SHALL BE METAL TYPE IAW MIL-B-43436 AND IMPRESSION MARKED IAW MIL-STD-339. EXCEPT AS NOTED, MARKER BAND SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO CONNECTOR AS SPACE PERMITS AND HAVE APPROXIMATELY THREE WRAPS OF GLASS TAPE, PART NUMBER 12420956 AROUND WIRE BUNDLE UNDER BAND MARKER. GLASS TAPE SHALL BE APPLIED TO INDIVIDUAL WIRES OR GROUPS OF INDIVIDUAL WIRES. GLASS TAPE SHALL NOT BE APPLIED TO INSULATION SLEEVING, TRANSITIONS SLEEVES, OR BOOTS. WHEN INSTALLING, WRAP BAND MARKER AROUND WIRE SO THE ENTIRE NUMBER READS LEFT TO RIGHT WITH CONNECTOR IN A SIX (6) O'CLOCK POSITION AND WIRES IN A TWELVE (12) O'CLOCK POSITION. IF NOT SECURE, TIGHTEN WITH NON-ABRASIVE TOOL KEEPING NUMBER ON ONE SIDE. BAND MARKER MUST BE READABLE FROM A DISTANCE OF APPROXIMATELY SIX (6) INCHES.

F. MARKER SLEEVES:
 MARKER SLEEVES SHALL BE INSTALLED ON THE HARNESS AS CLOSE TO THE MAIN CONNECTOR AS SPACE PERMITS.

G. TOLERANCES:
 UNLESS OTHERWISE SPECIFIED, WIRE LENGTH TOLERANCES SHALL BE:

LENGTH OVER	INCLUSIVE	TOLERANCE
0mm	500mm	±12mm
500mm	1000mm	±25mm
1000mm	2500mm	±50mm
2500mm	GREATER	±100mm

BRANCHED-WIRE LENGTH TOLERANCE AT TIEWRAPPS SHALL BE MET DURING ASSEMBLY PROCESS. SUBSEQUENT TIEWRAP DISPLACEMENT SHALL NOT BE CAUSE FOR REJECTION.

H. SLEEVING:
 SLEEVING MAY BE MODIFIED ONE (1) SIZE UP OR DOWN IN DIAMETER TO FACILITATE MANUFACTURE AND WORKMANSHIP.

J. SPLICE LOCATIONS:
 SPLICE LOCATIONS AND MEASUREMENTS ARE FOR MANUFACTURING ONLY AND ARE NOT TO BE USED FOR INSPECTION.

K. DIMENSION:
 WIRE LENGTH DIMENSION SHOWN BETWEEN TWO TERMINAL LUGS REPRESENTS MEASUREMENT FROM EYELET TO AN EYELET.

L. BAND MARKER:
 BAND MARKER MAY BE MODIFIED ONE(1) SIZE UP OR ONE(1) SIZE DOWN TO FACILITATE MANUFACTURE AND WORKMANSHIP.

M. ELECTRICAL SPLICE:
 SPLICE MAY BE MODIFIED ONE SIZE UP OR DOWN TO FACILITATE MANUFACTURE AND WORKMANSHIP WITHOUT VIOLATION OF SUPPLIER SPECIFICATION.

4. ELECTRICAL TAPE:
 USE ELECTRICAL TAPE, PART NUMBER HH-1-595-B-66-0 TO SECURE WIRES IN SNUG BUNDLE INSIDE OF CONDUIT AND SECURING CONDUIT ENDS. WRAP APPROXIMATELY FOUR (4) TIMES AROUND WIRES APPROXIMATELY EVERY 8 INCHES AND WHERE TRANSITIONS TAKE OFF ALL SIDES. WHEN WRAPPING ELECTRICAL TAPE, OVERLAPS WILL NOT EXCEED 50% OF PREVIOUS WRAP WITH LAST WRAP BEING PERPENDICULAR TO WIRES.

5. WIRE MARKING:
 CABLE IDENTIFICATION SHALL BE IAW MIL-STD-339. WIRE CIRCUIT NUMBERS, IF APPLICABLE SHALL BE MARKED EVERY 150MM TO 300MM.

6. ELECTRICAL TESTING:
 A. ALL HARNESS OR CABLE SHALL BE CHECKED AND TESTED FOR CONTINUITY FROM THE CONNECTOR CONTACT AT THE END OF THE WIRE CONDUCTOR TO THE CORRESPONDING CONTACT AT THE OTHER END.
 B. THE DIELECTRIC WITHSTANDING VOLTAGE (DWV) TEST, (ALSO CALLED HIGH POTENTIAL, OVER-POTENTIAL, VOLTAGE BREAKDOWN, OR DIELECTRIC STRENGTH TEST) CONSISTS OF THE APPLICATION OF A HIGHER THAN RATED VOLTAGE POTENTIAL FOR A SPECIFIED TIME BETWEEN MUTUALLY INSULATED PORTIONS AND GROUND. THIS CONFIRMS THAT THE COMPONENT CAN OPERATE SAFELY AT THE RATED VOLTAGE AND CAN WITHSTAND MOMENTARY OVER-POTENTIALS DUE TO SWITCHING, SURGES, AND OTHER LIKE PHENOMENA.
 THE DWV TEST SHALL BE PERFORMED IAW MIL-STD-202, METHOD 301. THE VOLTAGE BEING APPLIED IS 500 VAC, RMS AT 60 Hz. OR 475±25 VOLTS dc FOR A MINIMUM OF TEN (10) MILLISECONDS WITH NO EVIDENCE OF ARCING OR BREAKDOWN AS DETECTED BY TEST EQUIPMENT. THE DWV TEST SHALL BE PERFORMED AT EITHER 100% RATED OR AT A LESSER RATE IAW AN APPROVED SAMPLING PLAN.

7. PERFORMANCE REQUIREMENTS:
 THE FOLLOWING TESTS SHALL BE PERFORMED FOR COMPONENT FIRST ARTICLE TESTS (CFAT) ONLY. CFAT'S WILL BE PERFORMED ON ONE (1) SAMPLE TAKEN FROM THE FIRST TEN UNITS PRODUCED.
 A. DIRECT CURRENT (DC) RESISTANCE:
 UNLESS OTHERWISE SPECIFIED ON THE HARNESS OR CABLE ASSEMBLY DRAWING, DC RESISTANCE SHALL BE MEASURED FROM THE CONNECTOR CONTACT AT ONE END OF THE WIRE CONDUCTOR TO THE CORRESPONDING CONTACT AT THE OTHER END (AS INDICATED BY THE HARNESS AND CABLE ASSEMBLY WIRING DIAGRAMS). SHALL NOT BE GREATER THAN THE FOLLOWING LISTED VALUES:
 20-16 AWG: 2.0 OHMS
 14-8 AWG: 1.0 OHM
 4-2/0 AWG: 0.5 OHM
 WHEN RFI SHIELDS ARE TERMINATED AT THE CONNECTOR SHELLS, THE DC RESISTANCE BETWEEN ANY TWO CONNECTOR SHELLS OF THE ASSEMBLY SHALL NOT EXCEED 0.5 OHM. TESTING SHALL BE PERFORMED IAW MIL-STD-202, METHOD 303.

B. INSULATION RESISTANCE:
 UNLESS OTHERWISE SPECIFIED ON THE HARNESS OR CABLE ASSEMBLY DRAWING, THE INSULATION RESISTANCE SHALL NOT BE LESS THAN 100 MEGOHMS WHEN MEASURED IAW MIL-STD-202, METHOD 302, TEST CONDITION B, FOR AT LEAST ONE (1) SECOND BETWEEN CONNECTOR PINS AND BETWEEN THE ASSEMBLY CONNECTOR HOUSING AND ISOLATED CIRCUITS.

C. TENSILE STRENGTH TEST:
 TENSILE STRENGTH TEST SHALL BE PERFORMED IAW MIL-STD-202, METHOD 211A, CONDITION A, ONLY AS RECOMMENDED BY MANUFACTURER. COMPONENT SHALL BE PULLED TO DESTRUCTION. THIS TEST SHALL BE PERFORMED ON SAMPLES USING THE SAME MATERIAL AND TOOLING USED IN PRODUCTION. TENSILE STRENGTH SHALL NOT BE LESS THAN MINIMUM RECOMMENDED BY MANUFACTURER.

D. DIELECTRIC WITHSTANDING TEST:
 THE DIELECTRIC WITHSTANDING VOLTAGE (DWV) TEST, (ALSO CALLED HIGH POTENTIAL, OVER-POTENTIAL, VOLTAGE BREAKDOWN, OR DIELECTRIC STRENGTH TEST) CONSISTS OF THE APPLICATION OF A HIGHER THAN RATED VOLTAGE POTENTIAL FOR A SPECIFIED TIME BETWEEN MUTUALLY INSULATED PORTIONS AND GROUND. THIS CONFIRMS THAT THE COMPONENT CAN OPERATE SAFELY AT THE RATED VOLTAGE AND CAN WITHSTAND MOMENTARY OVER-POTENTIALS DUE TO SWITCHING, SURGES, AND OTHER LIKE PHENOMENA.
 THE DWV TEST SHALL BE PERFORMED IAW MIL-STD-202, METHOD 301. THE VOLTAGE BEING APPLIED IS 500 VAC, RMS AT 60 Hz. OR 475±25 VOLTS dc FOR ONE (1) MINUTE WITH NO EVIDENCE OF ARCING OR BREAKDOWN.

E. ENVIRONMENTAL TESTS:
 1. LOW TEMPERATURE TEST:
 THE CABLE SHALL BE SUBJECTED TO LOW TEMPERATURE TESTS IAW MIL-STD-810E, METHOD 502.3, PROCEDURE I. THE TEMPERATURE OF -51°C SHALL BE MAINTAINED FOR A PERIOD OF 24 HOURS. AT THE END OF THIS TIME, WITH THE TEMPERATURE OF THE PIECE AT -29°C, THE HARNESS OR CABLE ASSEMBLY SHALL BE BENT AT LEAST 180 DEGREES AROUND A 152mm MANDREL. THERE SHALL BE NO EVIDENCE OF CRACKS, SPLITS, OR OTHER DAMAGE TO THE JACKETING OR CONDUIT. AFTER INSPECTION, AND WITH TEMPERATURE STABILIZED AT -29°C, PERFORM TESTS OF PARA. 7A & 7B. RETURN THE ASSEMBLY TO 24°C±8°C AND REPEAT TESTS OF PARA. 7A & 7B.
 2. HIGH TEMPERATURE TESTS:
 THE CABLE SHALL BE SUBJECTED TO HIGH TEMPERATURE TESTS IAW MIL-STD-810E, METHOD 501.3, PROCEDURE I. A TEMPERATURE OF 76°C SHALL BE MAINTAINED FOR A PERIOD OF 48 HOURS. AT THE END OF THIS TIME, WITH THE TEMPERATURE AT 60°C, TESTS OF PARA. 7A & 7B ARE PERFORMED. THE ASSEMBLY IS THEN RETURNED TO A TEMPERATURE OF 24°C±8°C, AND TESTS OF PARA. 7A & 7B ARE REPEATED.
 3. SUBMERGENCE TEST:
 PRIOR TO PERFORMING THE SUBMERGENCE TEST, PERFORM THE TESTS OF PARA. 7A & 7B. BEFORE SUBMERGING THE HARNESS, SEAL ALL CONNECTORS IN THE AREA FORWARD OF THE BACKSHELL/CONNECTOR INTERFACE. LEAKAGE FROM THIS SEALED AREA DURING THE TEST SHALL NOT CONSTITUTE A FAILURE. HOWEVER, A RETEST SHALL BE REQUIRED AFTER THE SEAL LEAKAGE IS CORRECTED. THE TEST SHALL BE CONDUCTED IN CLEAR, CLEAN WATER WITH THE UPPERMOST SURFACE OF THE ASSEMBLY A MINIMUM OF ONE (1) INCH BELOW THE WATER SURFACE. THE WATER SHALL BE 40°-90°C. THE TEST CONTAINER SHALL BE OF ADEQUATE SIZE AND MADE OF A SUITABLE MATERIAL SUCH AS TO PERMIT EFFECTIVE INSPECTION OF THE WIRING HARNESS ASSEMBLY DURING SUBMERGENCE. THE TEST CHAMBER SHALL BE EVACUATED SUCH THAT A 1-5 PSI DIFFERENTIAL PRESSURE IS PRODUCED (IN THAT INTERNAL HARNESS PRESSURE IS GREATER THAN EXTERNAL). THE DIFFERENTIAL PRESSURE SHALL BE MAINTAINED 5.0±0.5 MINUTES. INSPECTION FOR EVIDENCE OF LEAKAGE SHALL BEGIN AS SOON AS THE DIFFERENTIAL PRESSURE BEGINS AND SHALL CONTINUE THROUGH THE 5.0±0.5 MINUTE TIME PERIOD UNTIL THE PRESSURE IS RETURNED TO ZERO. LEAKAGE IS DEFINED AS A STEADY STREAM OF BUBBLES ESCAPING FROM THE INTERIOR OF THE ASSEMBLY AND FROM THE SAME GENERAL LOCATION OF THE HARNESS (I.E. THE SAME BOOT, TRANSITION BRANCH, ADAPTER TO CONNECTOR INTERFACE, ETC.). BUBBLES WHICH RESULT FROM ENTRAPPED AIR ON THE EXTERIOR SURFACES OF THE ASSEMBLY SHALL NOT BE CONSIDERED A LEAK. FOLLOWING THE TEST, THE HARNESS SHALL BE ALLOWED TO AIR DRY FOR A FIVE (5) MINUTE PERIOD, AFTER WHICH TIME TESTS OF PARA. 7A & 7B ARE REPEATED. CABLE ASSEMBLIES AND OR CONNECTORS THAT DO NOT NEED TO MEET THIS REQUIREMENT ARE AS FOLLOWS:
 ALL OF 12420877, 12420876, 12420887, 12420871, 12420872, 12420873, 12420874, 12420890, 12420892, 12420893, 12421781, 12421948, 12421946, AND PART OF 12420880 (P210), 12420982 (P210), 12420870 (P43, P43X), 12420866 (P27), 12420875 (P31, P31X), 12420884 (P51, P106), 12420885 (P108), 12420888 (P108), 12420889 (P108), 12421892 (P183), 12421931 (J191), 12422224 (J310), 12422225 (J312), 12422226 (J311), 12422248 (P43), 12422293 (J312), 12422269 (P51), 12422270 (P51), 12422271 (P51), 12422291 (P51).

DISTRIBUTION STATEMENT C:
 DISTRIBUTION AUTHORIZED TO U.S. GOVERNMENT AGENCIES AND THEIR CONTRACTORS.
 REASON: ADMINISTRATIVE OR OPERATIONAL USE.
 DATE OF DETERMINATION: 02-10-28
 OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO THE U.S. ARMY TANK AUTOMOTIVE AND ARMAMENTS COMMAND, ATTN: SFAE-CSS-MT, WARREN, MICHIGAN 48397-5000.

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REVISIONS			
ZONE/REV	DESCRIPTION	DATE	APPROVED
XA	REVISED IAW THE FOLLOWING NOR(S): 4869-12 & 4901-1	95-01-27	R.HENRY CAZ/WDC
XB	REVISED IAW THE FOLLOWING ECR: 5074	97-03-24	G.BECK BH/AWT
-	-PRODUCT BASELINE-		G.BECK BH/AWT
E4 A	1) NOTE 7E3, ADDED THE FOLLOWING: 12421781, 12421948, 12421946, 12421892 (P183), 12421931 (J191), 12422224 (J310), 12422225 (J312), 12422226 (J311), 12422248 (P43), 12422293 (J312), 12422269 (P51), 12422270 (P51), 12422271 (P51), 12422291 (P51)		
A2	2) ADDED "P.FIESTER" TO QA BLOCK ERR SSS-R6337	98-01-21	CHAUDHURI BH/AWT
B	THIS ECP INCORPS DEV 538		
C8	1) ADD NOTE c.		
C8	2) ADD NOTE d.		
F6	3) ADD NOTE L		
F6	4) NOTE 5 ADD "WIRE CIRCUIT NUMBERS, IF APPLICABLE, SHALL BE MARKED EVERY 130MM TO 300MM."		
H3	5) NOTE 7-E-1 LINE 2 METHOD 502.3 WAS METHOD 502.2		
G3	6) NOTE 7-E-2 LINE 2 METHOD 501.3 WAS METHOD 501.2		
	ERR SSS-R6580	00-03-14	A.TATE AWT/AWT
C	THIS ECP INCORPS DEV 1061		
F6	1) ADD NOTE M		
A4	2) DISTRIBUTION STATEMENT C WAS A		
	ERR SSS-US986	03-02-25	L.ROONEY ADJ/SEH

METRIC

MECHANICAL PROPERTIES		FMS NA		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS		CONTRACT NUMBER: DAE07-92-C-R001		PART NO. 12420908	
TEMP		1	2	TOLERANCES ON		DRAWN BY: C.ZUBIETA		U.S. ARMY, TANK AUTOMOTIVE COMMAND WARREN, MICHIGAN 48397-5000	
PL		±	±	DRAWING APPROVAL: E.HORNE		DATE (DD-MO-YY): 94-09-17		CABLE ASSEMBLY REQUIREMENTS	
SL		NEW ANGLE PROJECTION		CHECKED BY: D.HOUSTON		SCALE: NONE		REV: E	
WH		OR P.FIESTER		DATE: 02-10-28		CAGE CODE: 19207		QTY: 12420908	
WH		OR C.WATTS		REASON: ADMINISTRATIVE OR OPERATIONAL USE		DATE OF DETERMINATION: 02-10-28		OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO THE U.S. ARMY TANK AUTOMOTIVE AND ARMAMENTS COMMAND, ATTN: SFAE-CSS-MT, WARREN, MICHIGAN 48397-5000.	
WH		NEXT ASSY USED ON APPLICATION		REASON: ADMINISTRATIVE OR OPERATIONAL USE		DATE OF DETERMINATION: 02-10-28		OTHER REQUESTS FOR THIS DOCUMENT SHALL BE REFERRED TO THE U.S. ARMY TANK AUTOMOTIVE AND ARMAMENTS COMMAND, ATTN: SFAE-CSS-MT, WARREN, MICHIGAN 48397-5000.	