



# TASK CARD AMC-Fleet

Task Card: Aircraft Electrical Wire Maintenance			Date: Feb 2020	Aircraft: N/A
E/C: N/A	P/N: N/A	S/N: N/A	A/C Pos: N/A	NLA Pos: N/A
<p><b>Description:</b> This is a 4-person team task worth a maximum of 100 points. The time period to complete the task is 30 minutes. The team will work together to install two circular connector crimp-type contacts, two crimp-type ring terminals, two environmental splices, perform electrical resistance checks on a typical aircraft 34-wire harness, and identify faulty wire connections.</p>				

Area:	Labor Hours:	W/O Phase:
Skills:		

ITEM:	INSTRUCTIONS	MECH:	QC
	<p><b>OBJECTIVE:</b> Given the tools, equipment, and consumable materials listed below, perform the following with zero assistance from non-team members:</p> <ol style="list-style-type: none"> <li>(1) Demonstrate proper calibration and use of precision aircraft wire crimping tools</li> <li>(2) Demonstrate proper stripping and crimping techniques of aircraft electrical wire terminals, contacts, and splices</li> <li>(3) Demonstrate proper removal and installation of aircraft electrical wire terminals, contacts, and splices</li> <li>(4) Identify faults in an aircraft electrical harness using a digital multi-meter</li> </ol> <p><b>TOOLS, EQUIPMENT, AND CONSUMABLE MATERIALS:</b></p> <ul style="list-style-type: none"> <li>Aircraft Wire Harness Training Device</li> <li>Wire Harness Pin-Out List</li> <li>Wire Stripper (2)</li> <li>Wire Cutter, Diagonal and Flush Type (1ea)</li> <li>Contact Crimper M22520/1-01 and Turret M22520/1-02 (1)</li> <li>Contact Crimper Go/No-Go gage (1)</li> <li>Splice Crimper GMT232 (1)</li> <li>Splice Crimper Go/No-Go gage (1)</li> <li>Ring Terminal Crimper M22520/5-01 (1)</li> <li>Contact Extraction Tool MS1969/19-07 (1)</li> <li>Contact Insertion Tool MS81969/17-03 (1)</li> <li>Digital Multi-Meter with test lead adapter (2)</li> <li>Heat Gun (1) with Extension Cord</li> <li>5/32" Socket with Ratchet Drive and Torque Wrench</li> <li>Contacts (Sockets) M39029/32-259 (100)</li> <li>Environmental Splices Raychem D-436-37-10 (50)</li> <li>Ring Terminals (50)</li> <li>Lacing String (1 roll)</li> <li>18 AWG Electrical Wire (1 roll)</li> </ul>		



ITEM:	INSTRUCTIONS	MECH:	QC
	<p><b><u>EVALUATION CRITERIA:</u></b> Each team will be evaluated on the following skills, abilities, and outcomes:</p> <ol style="list-style-type: none"> <li>(1) Proper procedure and tool use to verify crimp tool calibration and adjustment prior to use</li> <li>(2) Proper technique used to strip insulation from electrical wire</li> <li>(3) Proper technique used to crimp electrical contacts and/or ring terminals to wire</li> <li>(4) Proper technique and tool use to remove and install contacts in a circular electrical connector</li> <li>(5) Proper technique and tool use to removed and install terminals on a terminal board</li> <li>(6) Proper technique and tool use to install environmental splices in a wire harness</li> <li>(7) Proper and safe use of digital multi-meter to test electrical wire harness and identify wire connection faults</li> <li>(8) Effective team work and collaboration</li> <li>(9) Clear communication between team members</li> <li>(10) Proper use of safety gear and practices applicable to electrical wire harness maintenance</li> </ol> <p><b><u>PROCEDURES:</u></b></p> <ol style="list-style-type: none"> <li>1. Split team into two 2-person groups. One 2-person group shall repair circular connector P/J101, while the other 2-person group shall repair terminal board TB99</li> <li>2. Repair circular connector P/J101 as follows: <ol style="list-style-type: none"> <li>a. Remove old contacts from P101 that are attached to two broken wires</li> <li>b. Strip insulation from wires that require re-termination</li> <li>c. Prepare proper crimping tool for use</li> <li>d. Re-terminate wires with new contacts using crimping tool <b>NOTE: Allow judge to verify crimp quality before step 2.e.</b></li> <li>e. Install new contacts in circular connector in correct position</li> </ol> </li> <li>3. Repair terminal board TB99 as follows: <ol style="list-style-type: none"> <li>a. Remove old ring terminals and two broken wires from terminal board TB99</li> <li>b. Cut two replacement wires to proper length</li> <li>c. Terminate one end of replacement wire with new ring terminals <b>NOTE: Allow judge to verify crimp quality before step 3.g</b></li> <li>d. Prepare splice crimping tool for use</li> <li>e. Attach replacement wires to matching harness wires using two environmental splices <b>NOTE: Allow judge to verify crimp quality before step 3.f.</b></li> <li>f. Shrink splice insulation sleeve in place using heat gun</li> <li>g. Install new ring terminals on terminal board TB99 in correct position</li> </ol> </li> <li>4. Test <u>all</u> wires in electrical wire harness as follows: <b>NOTE: Switches, lights and gauge on training device are not connected to electrical wires</b> <ol style="list-style-type: none"> <li>a. Set up digital multi-meter to measure Ohms</li> <li>b. Test end-to-end connection of each wire according to Pin-Out Worksheet</li> <li>c. Annotate test results of each wire on Pin-Out Worksheet</li> <li>d. Submit Pin-Out Worksheet to judge for scoring</li> </ol> </li> <li>5. Return all tools, equipment, and consumable materials and cleanup work area</li> </ol> <p style="text-align: center;">--END--</p>		

## ELECTRICAL WIRE HARNESS MAINTENANCE SCORE SHEET

School/Team Name: \_\_\_\_\_

Judge Name: \_\_\_\_\_

Each item below has a value of 20 points each, and each sub-item is scored on a scale of 0 to 5, with 5 being the maximum value. Score each sub-item using the following guide:

5 = Perfect: desired result achieved with no room for improvement

2 = Average: achieved desired result but with moderate difficulty or needed improvement

0 = Unacceptable: desired result not achieved or step not performed

The total team score (100 points maximum possible) is the sum total of the five items (each 20 points maximum possible).

ITEM	EVALUATION CRITERIA	SCORE
<b>1</b>	<b>Circular Connector J/P101</b> <span style="float: right;"><b>20 POINTS TOTAL</b></span>	
	a. Verify crimp tool calibration (0 - 5 points)	
	b. Correct crimp tool tension & use (0 - 5 points)	
	c. Contact crimp quality (0 - 5 points)	
	d. Contact removal & installation (0 - 5 points)	
<b>2</b>	<b>Environmental Splices</b> <span style="float: right;"><b>20 POINTS TOTAL</b></span>	
	a. Verify crimp tool calibration (0 - 5 points)	
	b. Correct crimp tool use (0 - 5 points)	
	c. Splice installation quality (0 - 5 points)	
	d. Splices staggered correctly (0 - 5 points)	
<b>3</b>	<b>Ring Terminals TB99</b> <span style="float: right;"><b>20 POINTS TOTAL</b></span>	
	a. Correct crimp tool use (0 - 5 points)	
	b. Ring terminal crimp quality (0 - 5 points)	
	c. Correct wire length (0 - 5 points)	
	d. Proper hardware and torque (0 - 5 points)	
<b>4</b>	<b>Wire Harness Testing</b> <span style="float: right;"><b>20 POINTS TOTAL</b></span>	
	a. Proper ohmmeter use (0 - 5 points)	
	b. Identified all Type-A faults (0 - 5 points)	
	c. 1Kohm P101-G/P102A & P104-J/TB99-2 (0 - 5 points)	
	d. Completed all worksheet checks (0 - 5 points)	
<b>5</b>	<b>Team Work &amp; Communication</b> <span style="float: right;"><b>20 POINTS TOTAL</b></span>	
	a. Equal team member participation (0 - 5 points)	
	b. Proper safety gear employed (0 - 5 points)	
	c. Clear communication between members (0 - 5 points)	
	d. No added faults introduced in trainer (0 - 5 points)	

**TOTAL TEAM SCORE:**

## CONNECTOR PIN-OUT WORKSHEET

SCHOOL/TEAM NAME: \_\_\_\_\_

CONNECTOR	WIRE LABEL	CONNECTOR	GO	NO-GO	FAILURE DESCRIPTION
P101-A	TN1A20	J102-H			
P101-B	RN2A20	J103-G			
P101-C	P9A20	TB99-4			
P101-D	TN2A20	J102-D			
P101-E	RN3A20	J103-C			
P101-F	P10A20	TB99-6			
P101-G	TN3A20	J102-A			
P101-H	RN4A20	J103-E			
P101-J	TN4A20	J102-F			
P101-K	RN5A20	J103-A			
CONNECTOR	WIRE LABEL	CONNECTOR			
TB99-1	TN5A18	J102-B			
TB99-2	P11A18	P104-J			
TB99-3	RN1A18	J103-B			
TB99-4	P9A20	P101-C			
TB99-5	P12A18	P104-E			
TB99-6	P10A20	P101-F			
TB99-7	P13A18	P104-A			
TB99-8	P14A18	P104-B			
CONNECTOR	WIRE LABEL	CONNECTOR			
J102-A	TN3A20	P101-G			
J102-B	TN5A18	TB99-1			
J102-C	TN6A18	P104-G			
J102-D	TN2A20	P101-D			
J102-E	TN7A18	P104-N			
J102-F	TN4A20	P101-J			
J102-G	TN8A18	P104-C			
J102-H	TN1A20	P101-A			
CONNECTOR	WIRE LABEL	CONNECTOR			
J103-A	RN5A20	P101-K			
J103-B	RN1A18	TB99-3			
J103-C	RN3A20	P101-E			
J103-D	RN6A18	P104-L			
J103-E	RN4A20	P101-H			
J103-F	RN7A18	P104-Q			
J103-G	RN2A20	P101-B			
J103-H	RN8A18	P104-U			
CONNECTOR	WIRE LABEL	CONNECTOR			
P104-A	P13A18	TB99-7			
P104-B	P14A18	TB99-8			
P104-C	TN8A18	J102-G			
P104-E	P12A18	TB99-5			
P104-G	TN6A18	J102-C			
P104-J	P11A18	TB99-2			
P104-L	RN6A18	J103-D			
P104-N	TN7A18	J102-E			
P104-Q	RN7A18	J103-F			
P104-U	RN8A18	J103-H			