



AEROSPACE MAINTENANCE COMPETITION

PRESENTED BY *Snap-on*[®]

Event Manual

The Aerospace Maintenance Council, a non-profit organization, promotes and supports the aerospace maintenance community. The council's flagstone event, the Aerospace Maintenance Competition (AMC), recognizes and celebrates the aviation maintenance professional and raises awareness of the knowledge and skill required to maintain safe, airworthy aircraft worldwide. The event will take place April 25-28, 2022 in conjunction with [Aviation Week's MRO Americas](#) at the [Kay Bailey Hutchison Convention Center](#) in Dallas.

The purpose of this manual is to provide participants information about the competition and its competitive events. It will be revised periodically while events are added and modified, please check back often to ensure you're referencing the most current version.

Send comments and suggested revisions to team@aerospacecompetition.com.

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About

The AMC provides an opportunity for current and future maintenance professionals to showcase their abilities and see how they stack up against peers across the country and the world. Five-member teams compete in maintenance events intended to test skill and knowledge required of aviation maintenance professionals. Teams may enter one of the following categories:

- Commercial Aviation
- General Aviation
- Space
- Education
- Military
- MRO/OEM

The competition is managed by the Aerospace Maintenance Council's AMC committee. It is supported through the generous contributions of the aerospace community. A special thank you to all our sponsors that host events, provide prizes, and make monetary contributions in celebration of aviation maintenance professionals.

MRO Americas

The competition is held on the exhibit floor of [MRO Americas](#), an annual gathering of aviation maintenance professionals that incorporates informative conference sessions and a showcase of new and innovative products, technologies, offerings and services. More information about the location and logistics can be found on that event's website.

The AMC will take place at MRO Americas **Booth Number 100**. The exhibit hall layout is available at <https://exhibitor.mroamericas.aviationweek.com/am22/public/eventmap.aspx?shMode=E>.

Hotel Accommodation

Aviation Week has reserved room blocks at a discounted rate for all MRO Americas participants. Reserve accommodation at <https://mroamericas.aviationweek.com/en/plan-your-visit/hotel.html>.

Floor Access

To access the competition area, all AMC competitors, instructors/coaches, sponsors, visitors and volunteers must register for a floor pass at <https://na.eventscloud.com/ereg/index.php?eventid=650316&categoryid=4234257>.

Registration is free for AMC participants and visitors. Individuals must be 16 years and older to access the show floor.

Only AMC competitors, instructors/coaches, sponsors, and volunteers will have early access to the show floor. AMC visitors and guests will only have access when the show floor is open to the public.

Registration Hours

Badges may be picked up on site at the MRO Americas registration area. Participants are highly encouraged to pick up badges on Monday morning to avoid line delays the day of the competition.

- Monday, April 25 — 8:00 am to 5:00 pm
- Tuesday April 26 — 8:00 am to 5:30 pm
- Wednesday April 27 — 8:00 am to 5:30 pm
- Thursday, April 28 — 8:00 am to 1:00 pm

Exhibit Hall Hours

- Tuesday April 26 — 9:30 am to 5:30 pm
- Wednesday April 27 — 9:30 am to 5:30 pm
- Thursday, April 28 — 9:30 am to 1:00 pm

Schedule of Events

Monday, April 25

- 8:00 AM – 5:00 PM: Registration (badge collection) for MRO Americas
- 8:00 AM – 12:00 PM: Event Setup (sponsors and judges only)
- 9:00 AM – 3:00 PM: American Airlines Tour (students only, registration required)
- 2:00 PM – 3:00 PM: Judge Briefing (judges only)
- 3:00 PM – 4:30 PM: Competitor Orientation (competitors, coaches, and judges only)

Tuesday, April 26 (Expo floor open to the public at 9:30 AM, doors open for competitors at 8:00 AM)

- 8:00 AM – 8:30 AM: Event Setup (judges only)
- 8:30 AM – 9:30 AM: Competitor Walk-Through, Expo floor (competitors, coaches, and judges only)
- 9:30 AM – 5:30 PM: Competition, Expo floor

Wednesday, April 27 (Expo floor open to the public 9:30 AM, doors open for competitors at 8:00 AM)

- 8:30 AM – 5:30 PM: Competition, Expo floor

Thursday, April 28

- 9:00 AM – 12:00 PM: Award Ceremony

COVID-19 Safety Protocols

Currently the requirement to show vaccination status and the wearing of masks has been lifted; proof of vaccination and/or negative test is longer required.

Please note that government mandates, venue protocols and event requirements are subject to change, so be sure to check for the latest information at <https://mroamericas.aviationweek.com/en/plan-your-visit/entry-requirements.html>.

If you have any questions about event entry requirements, please contact events@aviationweek.com.

Competition Rules

- 1) Each team consists of five team members.
- 2) Competitors must be either certificated by a national aviation authority (e.g., hold an FAA mechanic certificate), enrolled in a certificated aviation maintenance technician school, employed by a certificated repair station or manufacturing facility, or a member of the armed forces.
- 3) School category teams may be comprised of a combination of—
 - a) Currently-enrolled students;
 - b) Individuals that graduated the institution in the six months previous to the competition that are not currently employed by an aviation-related company; and/or
 - c) Individuals that are currently employed by an aviation-related company but were enrolled at the school as of April 1, 2022.
- 4) Each team member must sign a [release of liability form](#) to participate. Hard copies will be provided for signature at orientation. Competitors under the age of 18 must bring a liability release signed by a parent or guardian.
- 5) Teams have 15 minutes to complete their assigned competitive event. All teams compete in all events.
- 6) Each event has a designated number of team member(s) required to complete the task. The team will assign member(s) of their choice to compete in each event.
- 7) There is a five-minute break between the end of one event and the beginning of the next event. Competitors present in the five minutes preceding the event start time may review task cards, materials, or prepare for the event, as permitted by the event judge. Time will not be credited for competitors arriving after the designated start time.
- 8) Event sponsors provide judges for each event. Judges may stop the clock for their particular event to remedy problems or answer a question at their discretion.
- 9) Scores provided verbally at the completion of an event are not official until properly recorded.
- 10) Score grievances may be brought to the sergeant at arms during the competition and up to one half hour after its conclusion. The AMC chairman reserves the right to modify final scores up until the awards ceremony.
- 11) The AMC chairman may remove any team member(s) from the competition for, but not limited to, unprofessional behavior, cheating, etc.
- 12) The AMC committee reserves the right to alter events and/or rules prior to or during the competition and will make best efforts to notify all team members of the change.
- 13) Participants are expected to observe personal protection equipment requirements throughout the competition. Failure to observe safety practices will result in penalties.
- 14) All required tooling and equipment are provided. Personal tools are not allowed.
- 15) The three teams with the lowest score in each category will be recognized at the awards ceremony. The team with the lowest score across all categories will be awarded the William F. “Bill” O’Brien Award for Excellence in Aircraft Maintenance.

Use of Alternates

Each team will consist of five team members. Each team is allowed, but not required, to designate alternate(s) in the event a member is not able to compete the day of the competition.

The five competing team members will receive identifying wristbands at orientation and are expected to wear them at all times during the competition. In the event a team member is not able to compete during the event, the alternate must obtain a wristband from the AMC chairman before taking the place of a competing member.

Goodie bags provided at orientation are for competing team members only. Only five bags per team will be distributed. Materials contained in goodie bags *may* be offered to alternates and instructors upon availability.

Scoring

Judges will utilize the standard AMC [score sheet](#) to calculate team scores for each event. Event scores are calculated by adding the total amount of time expended to complete the event, plus penalties assessed and bonus points awarded. Standard penalties are assessed for—

- Failure to follow safety-related warnings or cautions
- Improper use of safety equipment
- Unprofessionalism
- Failure to properly store tools and/or equipment
- Failure to follow procedures
- Incomplete or incorrect recordkeeping
- Improper use of tools
- Omitting a step in the process or procedure
- Other, and provided for by the specific event or at the judge's discretion

Any additional penalties and optional bonus opportunities specific to a particular event are detailed in that event's criteria.

Event Setup

Event setup will take place on Monday, April 25 from 8:00 AM to noon.

Event breakdown will take place when the exhibit floor closes on Thursday, April 28 from 1:00 to 9:00 PM.

All event spaces with electric needs will be pre-set with a 120V 5 Amp (500w) Single Outlet, two standard six-foot tables and two chairs. Sponsors are responsible for costs associated with any additional freight or facility needs (i.e., furniture, wireless internet, carpet, etc.). Contact team@aerospacecompetition.com to coordinate these additional requirements.

Information regarding shipments and exhibit hall access is in the MRO Americas Exhibitor Manual available at <https://mroamericas.aviationweek.com/en/exhibitor-resources1/exhibitor-resources22.html>.

Shipping Information

To ensure proper delivery, shipments should identify the AMC Booth #100, and the AMC-designated event or table number (for example, 100-01, 100-02, 100-A, etc.), as provided for in this manual.

Two options are available for shipping to the show in advance:

- a) **Warehouse Shipping Address** (for materials arriving between March 24 and April 18)
Aerospace Maintenance Competition / Booth #100-[Enter Event/Sponsor Table Number]
MRO AMERICAS APR 2022
C/O Freeman
5130 Cash Rd.
Dallas, TX 75247

Freeman will accept crated, boxed or skidded material beginning Thursday, March 24, 2022 at the above address. Material arriving after April 18, 2022 will be received at the warehouse with an additional after deadline charge. Please note that the Freeman Warehouse does not accept uncrated freight (loose, pad-wrapped material and/or unskidded machinery), COD shipments, hazardous materials, freight requiring refrigerated or frozen storage, a single piece of freight weighing more than 5,000 pounds or a single piece of freight beyond the dimensions of 108" H x 93" W. Warehouse materials are accepted at the warehouse Monday through Friday between the hours of 8:00 AM - 3:30 PM. Certified weight tickets must accompany all shipments. If required, provide your carrier with this phone number: (888) 508-5054.

- b) **Show Site Shipping Address** (for materials arriving after April 23)
Aerospace Maintenance Competition / Booth #100-[Enter Event/Sponsor Table Number]
MRO AMERICAS APR 2022
Kay Bailey Hutchison Convention Center
C/O Freeman
650 South Griffin
Dallas, TX 75202

Freeman will receive shipments at the exhibit facility beginning Saturday, April 23, 2022. Shipments arriving before this date may be refused by the facility. Any charges incurred for early freight accepted by the facility will be the responsibility of the exhibitor. Certified weight tickets must accompany all shipments. If required, provide your carrier with this phone number: (888) 508-5054.

Please note: Any materials received by Freeman are subject to material handling charges and are the responsibility of the Exhibitor. This also applies to items not ordered through the official show vendors.

All exhibitor materials must be removed from the facility by Friday, April 29, 2022 at 1:00 PM. To ensure all exhibitor materials are removed from the exhibit facility by the Exhibitor Move-Out deadline, please have all carriers check-in by Friday, April 29, 2022 at 9:00 AM.

Event Manual

Competition Layout

Numbered spaces indicate event assignments. Lettered spaces indicate recruitment row participant assignments.



AMC COMPETITION LAYOUT

P&W	2	3	C	D	E	F	G	H	I	B	AMC	16	J	K	L	M	N	O	P	Q	R	23	24	25	26
	4	5	6	7	12	13	14	15	17	18	PPG	United	FedEx												
	9	10	11	SNAP-ON A1	SNAP-ON A2	19-21	22	27																	
1	LOUNGE																						Photos		

EVENTS

<ul style="list-style-type: none"> 1 Pratt & Whitney Clearance Control Valve and Bleed Valve Solenoid Tests 2 BTree & Alaska Airlines Airframe Damage Inspection 3 Alaska Airlines External Power Receptacle 4 Barfield Air Data Testing 5 Barfield Antenna Testing 6 Barfield Handheld Bond Meter Test 7 Click Bond AR Relay Race 	<ul style="list-style-type: none"> 8 Moeller Aerospace Click-Loc® Challenge – We Won't Back Off 10 NBAA & StandardAero Engine Fan Blade Removal 11 Perfect Point E-Drill Fastener Removal 12 Michelin Tires Aircraft Tire Inspection 13 UPS Safety Wiring 14 American Airlines Pedestal 15 American Airlines APU Burner Can 	<ul style="list-style-type: none"> 16 drbillj.com and Northrop Rice Human Factors Exam 17 Daniels Manufacturing Corporation Electrical Troubleshooting 18 Daniels Manufacturing Corporation Safe-T-Cable® 19 PPG Aerospace Transparencies 20 PPG Aerospace Virtual Reality Paint Booth 21 PPG Aerospace Wing Sealant 	<ul style="list-style-type: none"> 22 United Airlines Fuel Tank Entry Precautions 23 United Airlines Cable Rigging 24 Nida Corporation Power Troubleshooting 25 U.S. Air Force Flex Fluid Lines 26 Eastern Florida State Simulated Spacecraft Vacuum Loading 27 FedEx Express PDU Removal and Installation
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RECRUITMENT ROW

<ul style="list-style-type: none"> A Snap-on Industrial B Aerospace Maintenance Council C Alaska Airlines D Aircraft Mechanics Fraternal Association E Pratt & Whitney 	<ul style="list-style-type: none"> F FEAM Maintenance/Engineering G SkyWest Airlines H Air Force Civilian Service, 412th Maintenance Group, Edwards AFB I TechForce Foundation 	<ul style="list-style-type: none"> J Northrop Grumman K JetBlue L International Association of Machinists and Aerospace Workers, Air Transport District 142 M American Airlines 	<ul style="list-style-type: none"> N PPG Aerospace O FedEx P AWING Q United Airlines R Teamsters
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Team and Sponsor Recognition

Sponsor and team logos will be displayed on event signage and in the event program. Signage will be created and displayed at the AMC committee’s discretion. Event sponsors and those in the exhibit areas may bring company-branded table skirts and any floor and/or table signage that will fit within their designated space. Banners or flags that require hanging or rigging are prohibited.

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Competitor Orientation

Orientation takes place the day before the competition begins (see schedule, above) and is mandatory for all team members and judges. Guests are not permitted.

One hour before the competition begins, competitors will have the opportunity to walk around the competition floor to get a close-up look at each event and ask further questions. If practical and as time allows, that event's judge may offer tutorials to ensure all competitors understand the event criteria and requirements.

Teams

Seventy-four teams will compete in this year's event. Each team is assigned a team number that will be used as an identifier on the team schedule and to facilitate scoring.

Team Number	Team Name	Category
1	Cape Cod Community College	School
2	FedEx Express - INDY	MRO/OEM
3	Del Mar College	School
4	Eastern Florida State College	School
5	Embry-Riddle University- Team 1	School
6	Pittsburgh Institute of Aeronautics - Hagerstown	School
7	Mohawk Valley Community College	School
8	Spartan College of Aeronautics & Technology - Tulsa	School
9	MIAT College of Technology	School
10	Lewis University	School
11	Pittsburgh Institute of Aeronautics - Pittsburgh	School
12	Tulsa Tech - High School Aerospace Academy	School
13	Liberty University	School
14	Pittsburgh Institute of Aeronautics - Myrtle Beach	School
15	Salt Lake Community College	School
16	Embry-Riddle University- Team 2	School
17	Tarrant County College	School
18	George T. Baker Aviation Technical College	School
19	Utah State University	School
20	Portland Community College	School
21	Tulsa Tech - Adult Students	School
22	Indian Hills Community College	School
23	Middle Tennessee State University	School
24	Aviation Institute of Maintenance - Dallas Team 2	School
25	Pittsburgh Institute of Aeronautics - Youngstown	School
26	American Airlines - TUL	MRO/OEM
27	Pratt & Whitney - Team 2	MRO/OEM
28	United Airlines - MRO	MRO/OEM
29	Pratt & Whitney - Team 1	MRO/OEM
30	Leonardo DRS Advanced Program Support	MRO/OEM

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Team Number	Team Name	Category
31	ST Engineering	MRO/OEM
32	HAECO Americas	MRO/OEM
33	American Airlines - DWH	MRO/OEM
34	West Los Angeles College	School
35	Aviation Institute of Maintenance - Dallas Team 1	School
36	WSU Tech	School
37	Southwest Airlines	Commercial
38	Royal Canadian Air Force - 1 Air Maintenance Squadron	Military
39	Alaska Airlines - ANC	Commercial
40	United States Air Force - 354 AMXS Grizzlies	Military
41	United Airlines - Chix Fix	Commercial
42	United States Coast Guard - CG-41 Aeronautical Engineering Team	Military
43	UPS	Commercial
44	Delta Airlines DTW Line Maintenance	Commercial
45	United States Air Force - WR-ALC/AMXG/560 AMXS	Military
46	United States Air Force - 76 AMXG/EDMX	Military
47	United States Air Force - McChord	Military
48	United Airlines - Line	Commercial
49	Alaska Airlines - SEA	Commercial
50	United States Air Force - Creech AFB	Military
51	United States Air Force - 58 MXG Kirtland Air Force Base	Military
52	American Airlines - MOC	Commercial
53	American Airlines - WIT	Commercial
54	Elevate Aviation	Commercial
55	American Airlines - ORD	Commercial
56	American Airlines - LAX	Commercial
57	United States Air Force - 86 MXG	Military
58	Canadian Forces School of Aerospace Technology and Engineering	Military
59	FedEx Express - LAX	Commercial
60	Royal Canadian Air Force - 12 Air Maintenance Squadron	Military
61	United States Air Force - 402 EDMX	Military
62	United States Air Force - 412 MXG/Edwards AFB	Military
63	Horizon Air	Commercial
64	United States Air Force - 437th and 315th MXG Maintenance Team	Military
65	United States Air Force - 735th AMC, JB Pearl Harbor	Military
66	United States Air Force - 309 AMXG/EDMX	Military
67	JetBlue	Commercial
68	Spirit Airlines	Commercial
69	Azul Brazilian Airlines	Commercial
70	United States Air Force - 727 SOAMXS	Military
71	Royal Canadian Air Force - 442 and 418 Transport & Rescue Squadrons	Military
72	Royal Canadian Air Force - 435 Transport and Rescue Squadron	Military

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Team Number	Team Name	Category
73	Mesa Airlines, Inc.	Commercial
74	United States Army - 128th Aviation Brigade	Military

Events

Teams are responsible for assigning individual competitors to each event. The number of competitors required to complete each event is provided in the event criteria. Description, instructions, and judging criteria for each event are provided in subsequent pages of this manual. Competitors may contact judges directly with questions on a specific event.

Event Schedule

The competition consists of 15-minute stages where teams will compete in a group of events simultaneously. The event schedule provides the start and end time for each stage, and the team numbers assigned to each event for each stage.

EVENTS WILL BEGIN PROMPTLY AT THE DESIGNATED START TIME, AND END AT THE DESIGNATED END TIME. TEAMS ARRIVING LATE WILL NOT RECEIVE DISPENSATION.

Tuesday, April 26, 2022

NOTE: Numbers within the table indicate team numbers.

	Stage 1	Stage 2	Stage 3	Stage 4		Stage 5	Stage 6	Stage 7		Stage 8	Stage 9
Start Time	9:30 AM	9:50 AM	10:10 AM	10:30 AM	10:50 AM	11:10 AM	11:30 AM	11:50 AM	12:10 PM	1:00 PM	1:20 PM
End Time	9:45 AM	10:05 AM	10:25 AM	10:45 AM	11:05 AM	11:25 AM	11:45 AM	12:05 PM	12:55 PM	1:15 PM	1:35 PM
Group 1: Events 1, 2, 3	1 & 38	10 & 47	19 & 56	28 & 65	BREAK	37 & 74	9 & 46	18 & 55	LUNCH BREAK	27 & 64	36 & 73
Group 2: Events 4, 5, 9	2 & 39	11 & 48	20 & 57	29 & 66		1 & 38	10 & 47	19 & 56		28 & 65	37 & 74
Group 3: Events 6, 7, 11	3 & 40	12 & 49	21 & 58	30 & 67		2 & 39	11 & 48	20 & 57		29 & 66	1 & 38
Group 4: Events 10, 12	4 & 41	13 & 50	22 & 59	31 & 68		3 & 40	12 & 49	21 & 58		30 & 67	2 & 39
Group 5: Events 13, 15, 17	5 & 42	14 & 51	23 & 60	32 & 69		4 & 41	13 & 50	22 & 59		31 & 68	3 & 40
Group 6: Events 14, 22, 23	6 & 43	15 & 52	24 & 61	33 & 70		5 & 42	14 & 51	23 & 60		32 & 69	4 & 41
Group 7: Event 16, 24, 25	7 & 44	16 & 53	25 & 62	34 & 71		6 & 43	15 & 52	24 & 61		33 & 70	5 & 42
Group 8: Events 18, 26, 27	8 & 45	17 & 54	26 & 63	35 & 72		7 & 44	16 & 53	25 & 62		34 & 71	6 & 43
Group 9: Events 19, 20, 21	9 & 46	18 & 55	27 & 64	36 & 73		8 & 45	17 & 54	26 & 63		35 & 72	7 & 44

	Stage 10	Stage 11	Stage 12		Stage 13	Stage 14	Stage 15	Stage 16	Stage 17	Stage 18	Stage 19
Start Time	1:40 PM	2:00 PM	2:20 PM	2:40 PM	3:00 PM	3:20 PM	3:40 PM	4:00 PM	4:20 PM	4:40 PM	5:00 PM
End Time	1:55 PM	2:15 PM	2:35 PM	2:55 PM	3:15 PM	3:35 PM	3:55 PM	4:15 PM	4:35 PM	4:55 PM	5:15 PM
Group 1: Events 1, 2, 3	8 & 45	17 & 54	26 & 63	BREAK	35 & 72	7 & 44	16 & 53	25 & 62	34 & 71	6 & 43	15 & 52
Group 2: Events 4, 5, 9	9 & 46	18 & 55	27 & 64		36 & 73	8 & 45	17 & 54	26 & 63	35 & 72	7 & 44	16 & 53
Group 3: Events 6, 7, 11	10 & 47	19 & 56	28 & 65		37 & 74	9 & 46	18 & 55	27 & 64	36 & 73	8 & 45	17 & 54
Group 4: Events 10, 12	11 & 48	20 & 57	29 & 66		1 & 38	10 & 47	19 & 56	28 & 65	37 & 74	9 & 46	18 & 55
Group 5: Events 13, 15, 17	12 & 49	21 & 58	30 & 67		2 & 39	11 & 48	20 & 57	29 & 66	1 & 38	10 & 47	19 & 56
Group 6: Events 14, 22, 23	13 & 50	22 & 59	31 & 68		3 & 40	12 & 49	21 & 58	30 & 67	2 & 39	11 & 48	20 & 57
Group 7: Event 16, 24, 25	14 & 51	23 & 60	32 & 69		4 & 41	13 & 50	22 & 59	31 & 68	3 & 40	12 & 49	21 & 58
Group 8: Events 18, 26, 27	15 & 52	24 & 61	33 & 70		5 & 42	14 & 51	23 & 60	32 & 69	4 & 41	13 & 50	22 & 59
Group 9: Events 19, 20, 21	16 & 53	25 & 62	34 & 71		6 & 43	15 & 52	24 & 61	33 & 70	5 & 42	14 & 51	23 & 60

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Wednesday, April 27, 2022

NOTE: Numbers within the table indicate team numbers.

	Stage 20	Stage 21	Stage 22	Stage 23	Stage 24	Stage 25		Stage 26	Stage 27	Stage 28
Start Time	8:30 AM	8:50 AM	9:10 AM	9:30 AM	9:50 AM	10:10 AM	10:30 AM	10:50 AM	11:10 AM	11:30 AM
End Time	8:45 AM	9:05 AM	9:25 AM	9:45 AM	10:05 AM	10:25 AM	10:45 AM	11:05 AM	11:25 AM	11:45 AM
Group 1: Events 1, 2, 3	24 & 61	33 & 70	5 & 42	14 & 51	23 & 60	32 & 69	BREAK	4 & 41	13 & 50	22 & 59
Group 2: Events 4, 5, 9	25 & 62	34 & 71	6 & 43	15 & 52	24 & 61	33 & 70		5 & 42	14 & 51	23 & 60
Group 3: Events 6, 7, 11	26 & 63	35 & 72	7 & 44	16 & 53	25 & 62	34 & 71		6 & 43	15 & 52	24 & 61
Group 4: Events 10, 12	27 & 64	36 & 73	8 & 45	17 & 54	26 & 63	35 & 72		7 & 44	16 & 53	25 & 62
Group 5: Events 13, 15, 17	28 & 65	37 & 74	9 & 46	18 & 55	27 & 64	36 & 73		8 & 45	17 & 54	26 & 63
Group 6: Events 14, 22, 23	29 & 66	1 & 38	10 & 47	19 & 56	28 & 65	37 & 74		9 & 46	18 & 55	27 & 64
Group 7: Event 16, 24, 25	30 & 67	2 & 39	11 & 48	20 & 57	29 & 66	1 & 38		10 & 47	19 & 56	28 & 65
Group 8: Events 18, 26, 27	31 & 68	3 & 40	12 & 49	21 & 58	30 & 67	2 & 39		11 & 48	20 & 57	29 & 66
Group 9: Events 19, 20, 21	32 & 69	4 & 41	13 & 50	22 & 59	31 & 68	3 & 40		12 & 49	21 & 58	30 & 67

	Stage 29		Stage 30	Stage 31	Stage 32	Stage 33	Stage 34	Stage 35	Stage 36	Stage 37
Start Time	11:50 AM	12:10 PM	1:00 PM	1:20 PM	1:40 PM	2:00 PM	2:20 PM	2:40 PM	3:00 PM	3:20 PM
End Time	12:05 PM	12:55 PM	1:15 PM	1:35 PM	1:55 PM	2:15 PM	2:35 PM	2:55 PM	3:15 PM	3:35 PM
Group 1: Events 1, 2, 3	31 & 68	LUNCH BREAK	3 & 40	12 & 49	21 & 58	30 & 67	2 & 39	11 & 48	20 & 57	29 & 66
Group 2: Events 4, 5, 9	32 & 69		4 & 41	13 & 50	22 & 59	31 & 68	3 & 40	12 & 49	21 & 58	30 & 67
Group 3: Events 6, 7, 11	33 & 70		5 & 42	14 & 51	23 & 60	32 & 69	4 & 41	13 & 50	22 & 59	31 & 68
Group 4: Events 10, 12	34 & 71		6 & 43	15 & 52	24 & 61	33 & 70	5 & 42	14 & 51	23 & 60	32 & 69
Group 5: Events 13, 15, 17	35 & 72		7 & 44	16 & 53	25 & 62	34 & 71	6 & 43	15 & 52	24 & 61	33 & 70
Group 6: Events 14, 22, 23	36 & 73		8 & 45	17 & 54	26 & 63	35 & 72	7 & 44	16 & 53	25 & 62	34 & 71
Group 7: Event 16, 24, 25	37 & 74		9 & 46	18 & 55	27 & 64	36 & 73	8 & 45	17 & 54	26 & 63	35 & 72
Group 8: Events 18, 26, 27	1 & 38		10 & 47	19 & 56	28 & 65	37 & 74	9 & 46	18 & 55	27 & 64	36 & 73
Group 9: Events 19, 20, 21	2 & 39		11 & 48	20 & 57	29 & 66	1 & 38	10 & 47	19 & 56	28 & 65	37 & 74

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Event #1 (A) Pratt & Whitney Active Clearance Control Valve Test

Provided by



Team members required One

Contact(s)/Judge(s) Seth Hewitt seth.hewitt@prattwhitney.com
Chris Leoni chris.leoni@prattwhitney.com
Mansoor Memon mansoor.memon@prattwhitney.com

Description The task involves the removal, inspection, and replacement of an Active Clearance Control (ACC) valve installed on the PW1100G-JM engine.

Note: This event is made up of two separate tasks. Teams 1-37 will complete Task #1(A), teams 38-74 will complete Task #1(B) (provided in subsequent pages of this manual).

References 43.13-1B – Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair

Tools and equipment list Electrical Connector Pliers
3/8" drive ratchet
3/8" drive 6" extension
3/8" drive, 3/8" 12 point deep well socket
11/16" open end wrench
1/2" open end wrench
7/8" open end wrench
Dead blow plastic hammer

Event #1 (A) Pratt & Whitney Active Clearance Control Valve Test

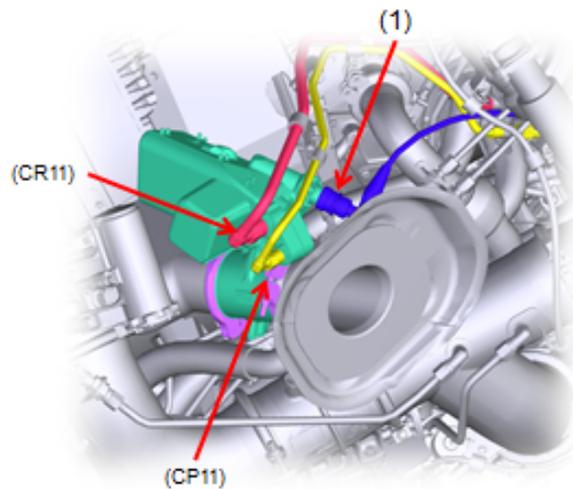
- 6" flathead screwdriver
- 3/8" drive torque wrench (click type – 200-1000 in/lb)
- 3/8" drive torque wrench (click type – 40-200 in/lb)
- 3/8" drive, 7/8" crows-foot
- 3/8" drive, 11/16" crows-foot
- Lint-Free cotton cloth

Instructions **"This document has been publicly released."**

Instructions

Removal

- 1) Using the connector pliers, disconnect the electrical connector (1) from the ACC valve connection point.
- 2) Place a lint-free cotton cloth under the servo fuel tubes (CR11) and (CP11) to absorb any fluid leakage.



Event

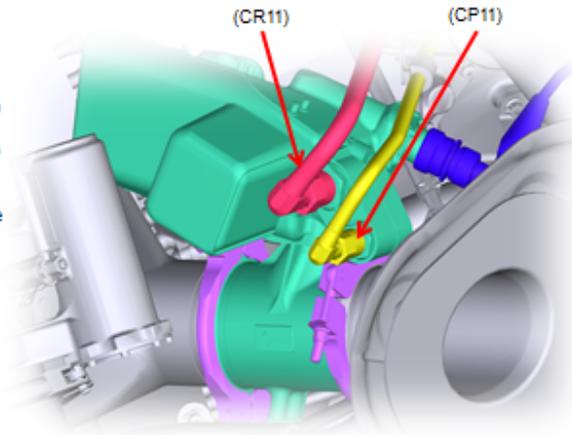
#1 (A) Pratt & Whitney Active Clearance Control Valve Test

3) Use a 7/8" wrench to loosen the servo return fuel tube B-nut (CR11) while using a 11/16" wrench as a back-up to apply counter-torque.

4) Disconnect the servo return fuel tube from the ACC valve.

5) Use a 11/16" wrench to loosen the servo pressure fuel tube B-nut (CP11) while using a 1/2" wrench as a back-up to apply counter-torque.

6) Disconnect the servo pressure tube from the ACC valve

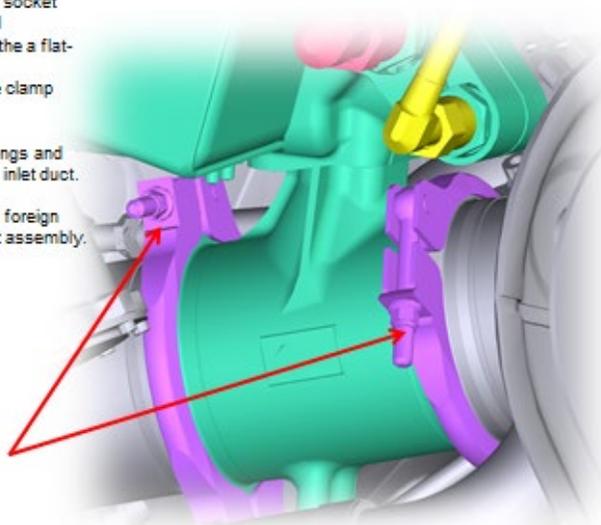


7) Use a 3/8" drive ratchet with a 6" extension and 3/8" deep-well socket installed to loosen the V-band couplings. If necessary, use the a flat-head screwdriver to assist in disengaging the bolt from the clamp assembly.

8) Remove the V-band couplings and the ACC valve from the ACC inlet duct.

9) Examine the assembly for foreign objects, damage, and correct assembly.

V Band Couplings x2



Event

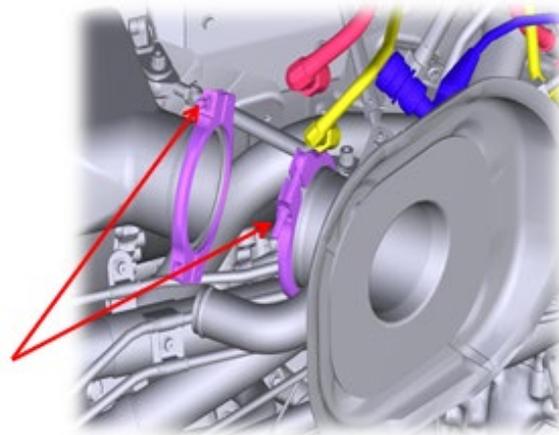
#1 (A) Pratt & Whitney Active Clearance Control Valve Test

Installation

Install the Active Clearance Control Valve as follows:

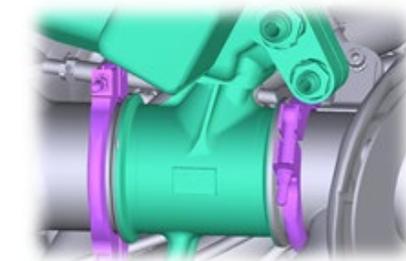
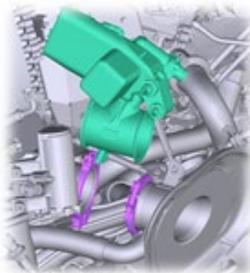
- 1) Place the V-band coupling on the inlet duct side of the valve.
- 2) Place the V-band coupling on the outlet duct side of the valve.

V Band Couplings



Hardware removed from graphic for clarity

- 3) Place the valve in position between the ducts.
- 4) Maneuver the V-band couplings to engage both the ducts and the ACC valve.



Ensure alignment tab on aft duct engages alignment slot on valve.

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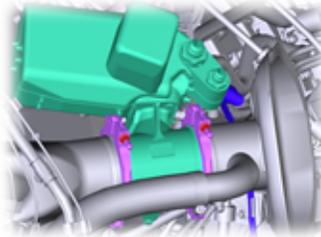
Event

#1 (A) Pratt & Whitney Active Clearance Control Valve Test

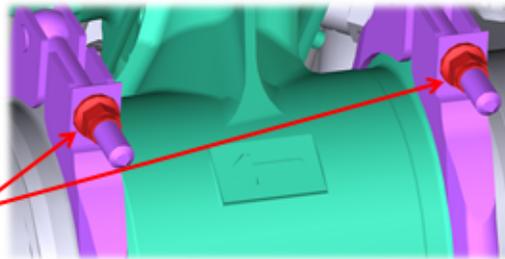
5) Using a 3/8" drive torque wrench with a 6" extension and a 3/8" deep-well socket installed, apply a torque of between 85 - 100 in. lb. to the two V-band coupling nuts.

6) Tap the V-band couplings at several places around their perimeter lightly with a soft face mallet to ensure proper seating.

7) Re-Torque the two V-band coupling nuts using the torque wrench combination from step #5 again until the torque indication holds.



V-Band Coupling nuts (2)



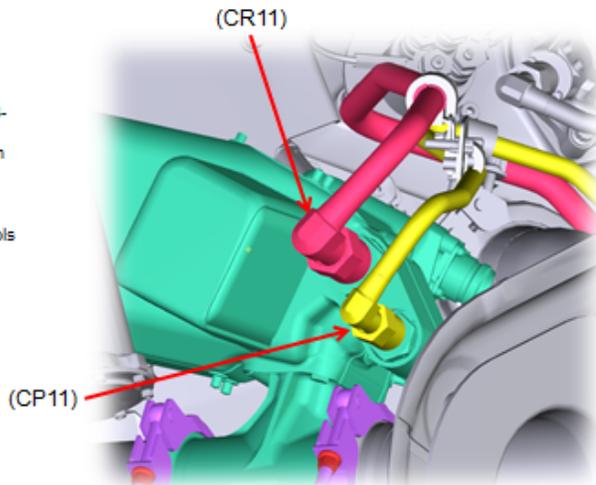
Hardware removed from graphic for clarity

8) Connect the servo fuel tubes (CR11) and (CP11) to the ACC valve by hand.

9) Using a 3/8" drive torque wrench with a 6" extension and a 7/8" crows-foot, apply an initial torque of between 200 - 225 in. lb. to the tube B-nut (CR11). Apply counter-torque using a 11/16" wrench while applying torque.

10) Fully loosen the tube B-nut using the appropriate tools while keeping the b-nut engaged on the threads.

11) Using the tools and practices from step #9, re-apply a final torque of between 200 - 225 lb.in. to the tube B-nut (CR11).



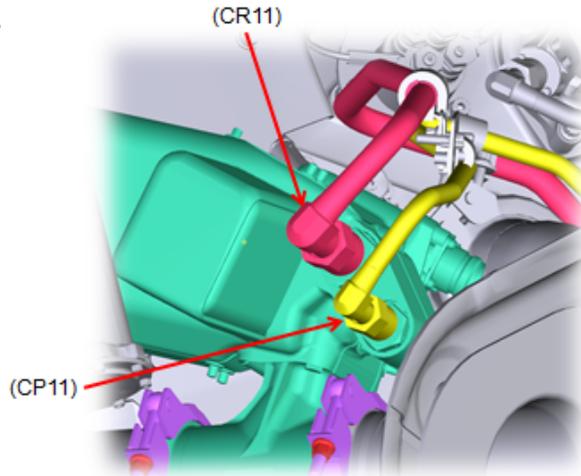
Event

#1 (A) Pratt & Whitney Active Clearance Control Valve Test

12) Using a 3/8" drive torque-wrench with a 6" extension and a 11/16" crows-foot installed, apply an initial torque of between 340 - 375 in. lb. to the tube B-nut (CP11).

13) Fully loosen the tube b-but using the appropriate tools while keeping the b-nut engaged on the threads.

14) Using the tools and practices from step #12, re-apply a final torque of between 340 - 375 in. lb. to the tube B-nut (CP11).

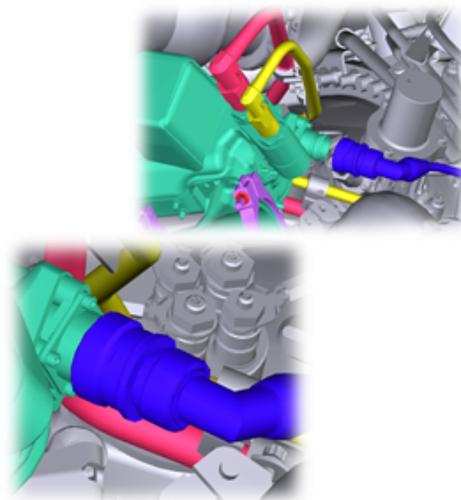


15) Align and engage the electrical connector of the wiring harness with the connection receptacle on the ACC valve.

16) Push lightly inward on the electrical connector while tightening the coupling ring by hand.

17) Using the connector pliers, tighten the electrical connector to the connection receptacle on the valve.

18) Tighten the connection until the connector pliers slip on the connector ring or until it no longer rotates.



Event	#1 (A) Pratt & Whitney Active Clearance Control Valve Test
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Scoring

Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for failure to place cloth under fuel lines, failure to validate torque wrench settings with the judge before use, failure to use back-up wrenches properly to apply counter-torque, or failure to visually examine the ACC valve and report findings to the judge.

Event #1 (B) Pratt & Whitney Bleed Valve Solenoid Test

Provided by



Team members required One

Contact(s)/Judge(s) Mansoor Memon mansoor.memon@prattwhitney.com
Chris Leoni chris.leoni@prattwhitney.com

Description This is a skill event that requires utilization of engine test equipment to determine proper function of engine components.
Note: This event is made up of two separate tasks. Teams 1-37 will complete Task #1(A), teams 38-74 will complete Task #1(B) (provided in subsequent pages of this manual).

References V2500 HPC STAGE 7 SOLENOID VALVE 4020KS2, REMOVAL – FUNCTIONAL – TEST INSTRUCTIONS
BASIC SOLENOID TEST PROCEDURES LISTED ON TEST SET FACE PLATE

Tools and equipment list IAE 2R19437 TEST SET
11/16 COMBINATION WRENCH
3/4 COMBINATION WRENCH
13/16 COMBINATION WRENCH
7/8 COMBINATION WRENCH
3/4 INCH DRIVE RATCHET

Event	#1 (B) Pratt & Whitney Bleed Valve Solenoid Test ¼ – 12 POINT SOCKET ¼ INCH DRIVE EXTENSION 6 INCH PLIERS SOFT-JAW 11/16 CROWS FOOT ¼ DRIVE (OPEN END) 13/16 CROWS FOOT ¼ DRIVE (OPEN END) TORQUE WRENCH 0-250 INCH POUNDS STRAP WRENCH FOR ELECTRICAL CONNECTOR PROTECTIVE CAPS/COVERS
Instructions	“This document has been publicly released.” REMOVAL STAGE 7 SOLENOID VALVE 4020KSE 1. DISCONNECT THE HP3 AIR TUBES: A) HP3 SUPPLY INPUT. B) HP3 SERVO OUTPUT. 2. DISCONNECT THE ELECTRICAL CONNECTOR. 3. REMOVE HPC STAGE 7 SOLENOID VALVE: A) REMOVE THE BOLTS & WASHERS WHICH ATTACH SOLENOID VALVE TO ENGINE BRACKET. B) REMOVE SOLENOID VALVE. 4. INSTALL PROTECTIVE COVERS. FUNCTIONAL TEST OF SOLENOID VALVE 4020KSE WITH TEST SET IAE2RI9437 1. INSTALLATION OF TEST SET: A) CONNECT RED LINE TO SOLENOID VALVE SUPPLY INPUT CONNECTOR. TORQUE TO 210 IN LBS.

Event

#1 (B) Pratt & Whitney Bleed Valve Solenoid Test

B) CONNECT GREEN LINE TO SOLENOID VALVE SERVO OUTPUT CONNECTOR.

TORQUE TO 165 IN LBS.

2. CONNECT SOLENOID VALVE ELECTRICAL CONNECTOR WITH CABLE PROVIDED TO TEST SET.

3. PREFORM BASIC SOLENOID TEST PROCEDURES LISTED ON TEST SET FACE PLATE.

(NOTE: SOLENOID VALVE IS ALREADY CONNECTED TO TEST SET)

4. REMOVAL OF SOLENOID VALVE FROM TEST SET:

A) TURN TEST SET ELECTRICAL POWER OFF AND REMOVE ELECTRICAL CABLE.

B) REMOVE RED LINE FROM SOLENOID VALVE SUPPLY INPUT CONNECTOR.

C) REMOVE GREEN LINE FROM SOLENOID VALVE SERVO OUTPUT CONNECTOR.

INSTALLATION OF STAGE 7 SOLENOID VALVE 4020KSE

1. REMOVE PROTECTIVE COVERS FROM LINES AND ELECTRICAL CONNECTOR.

2. ATTACH THE SOLENOID VALVE TO ENGINE BRACKET WITH WASHERS AND BOLTS.

TORQUE TO 40 IN LBS.

4. INSTALL THE ELECTRICAL CONNECTOR TO THE SOLENOID VALVE

TIGHTEN CONNECTOR FULLY UNTIL RED LINE IS NO LONGER VISABLE

1. CONNECT THE HP3 AIR TUBES:

5. CONNECT THE HP3 SUPPLY LINE TO SOLENOID VALVE.

TORQUE TO 210 IN LBS.

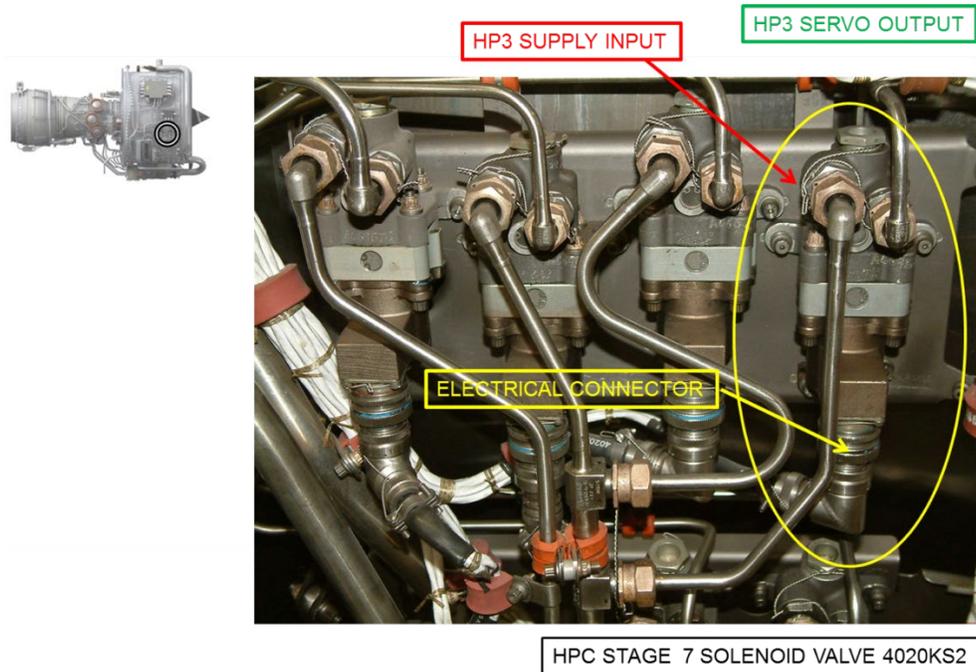
B) CONNECT THE HP3 SERVO LINE TO SOLENOID VALVE.

TORQUE TO 165 IN LBS.

Event

#1 (B) Pratt & Whitney Bleed Valve Solenoid Test

5. CLEAN UP AND REPLACE TOOLS.
6. INFORM JUDGE THAT EVENT IS COMPLETED.

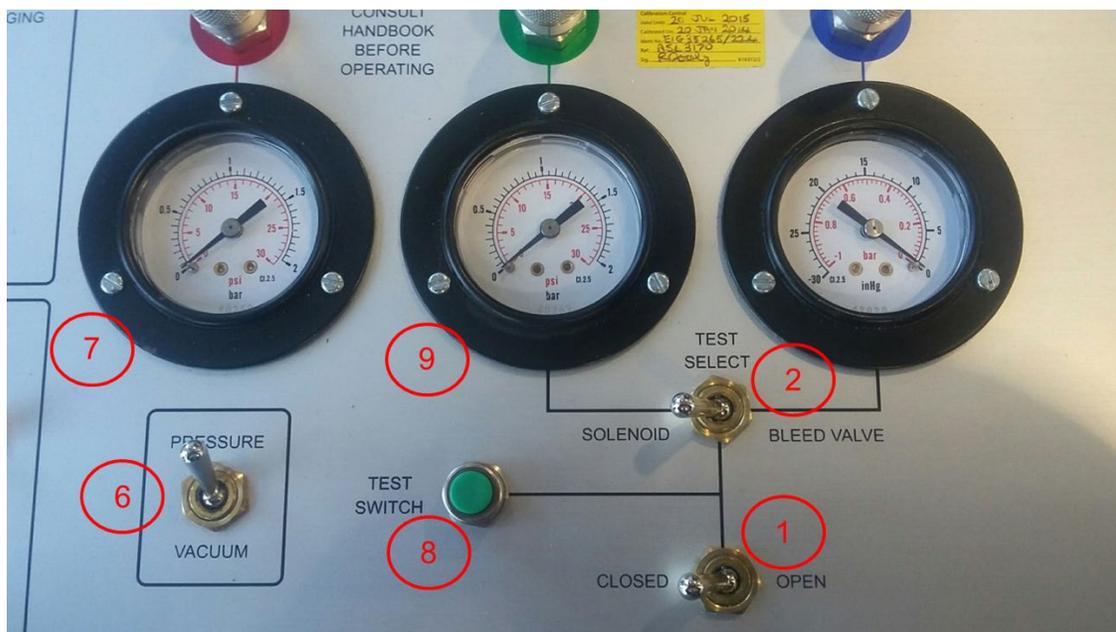
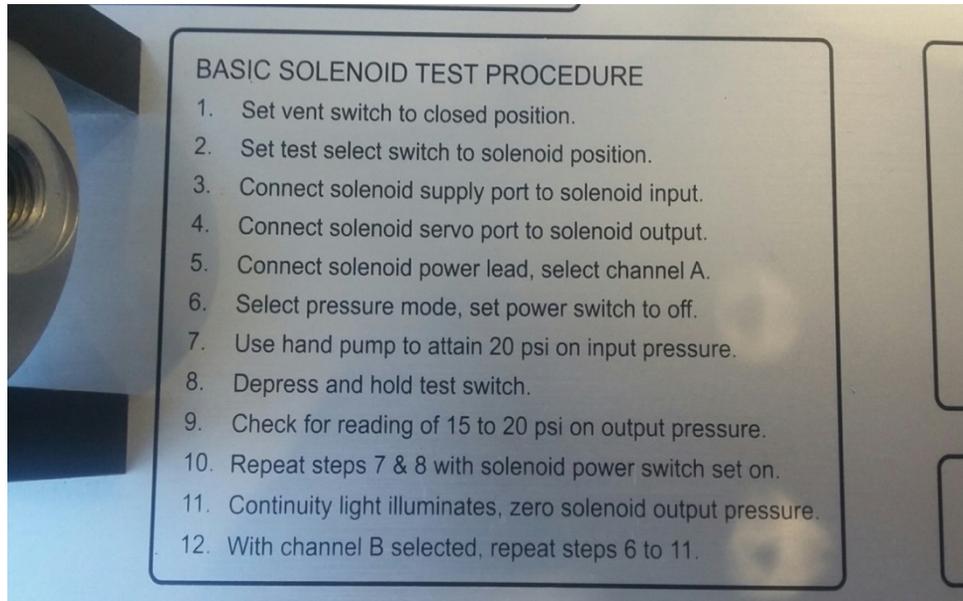


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Event

#1 (B) Pratt & Whitney Bleed Valve Solenoid Test

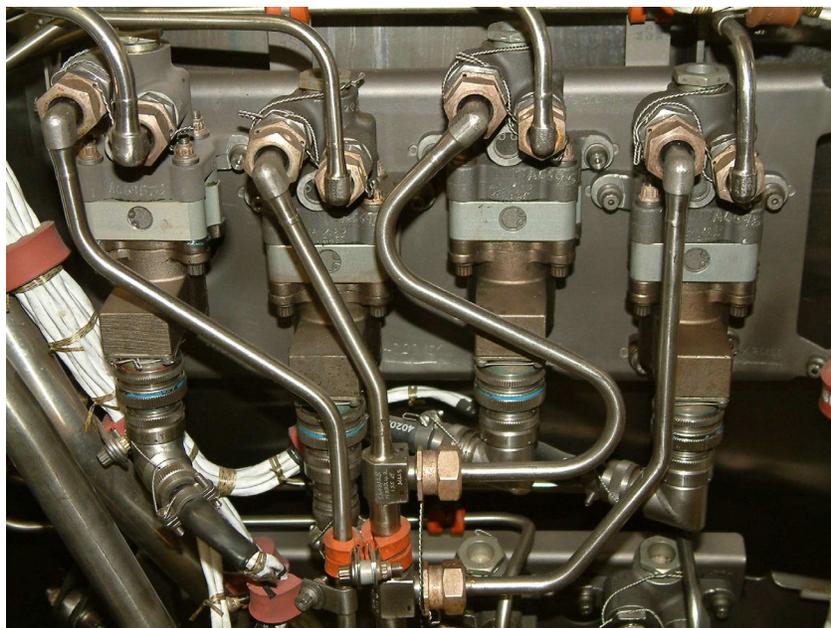
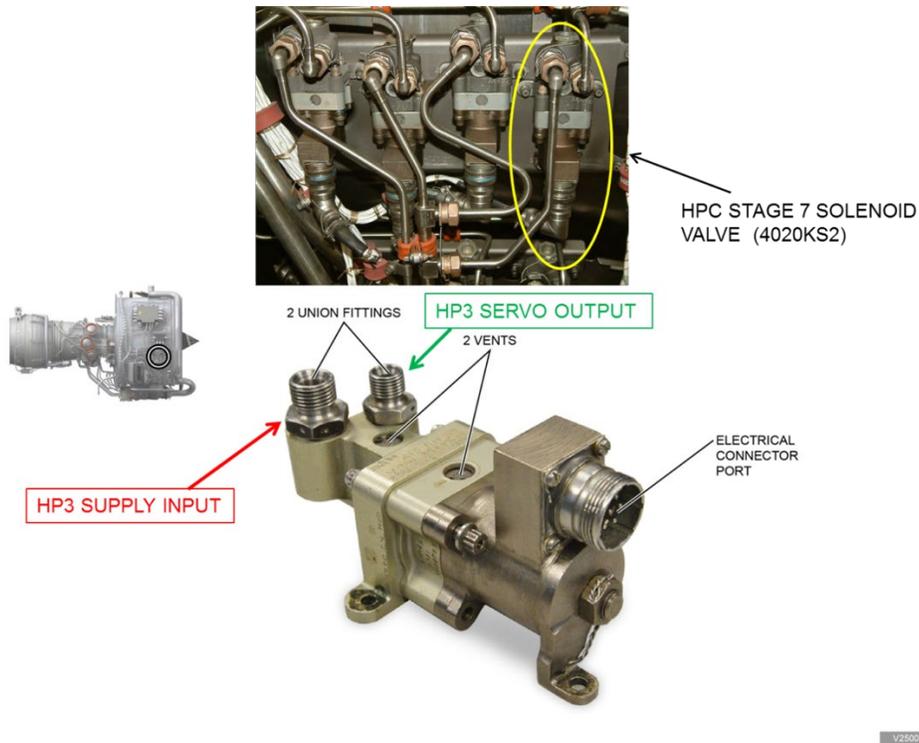


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Event

#1 (B) Pratt & Whitney Bleed Valve Solenoid Test

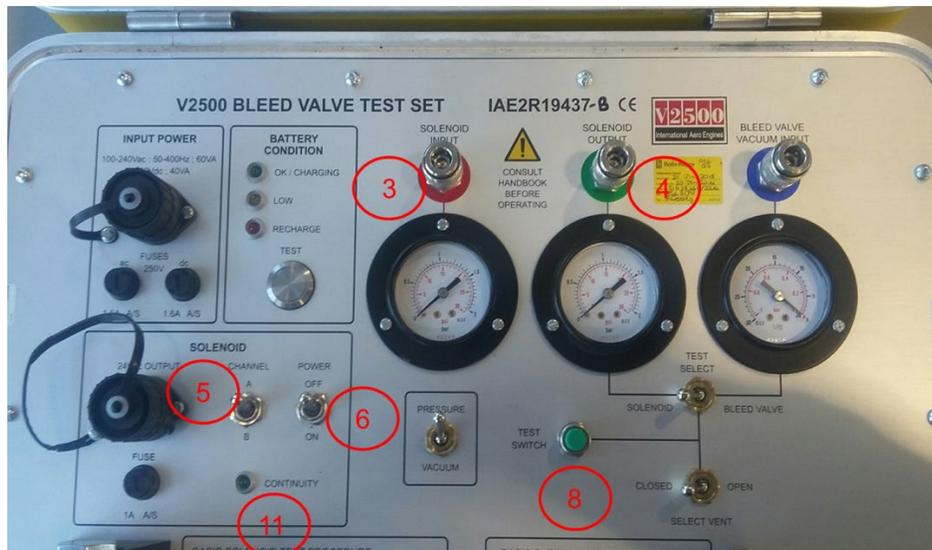


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Event

#1 (B) Pratt & Whitney Bleed Valve Solenoid Test



Scoring

Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for each step not completed, or incorrect test results.

Event #2 8Tree and Alaska Airlines Airframe Damage Inspection

Provided by



Team members required Two

Contact(s)/Judge(s) Howard Chung, howard@8-tree.com
Keith Li, keith@8-tree.com

Description Competitors will measure dent damages on an airframe panel using traditional methods and with the dentCHECK inspection tool. Competitors will be evaluated on the ability to follow the prescribed steps outlined in the manual.

References [Task Instructions](#)

Tools and equipment list Depth gauge, six-inch ruler, marker, flashlight, calculator, calibration block, camera, dentCHECK inspection tool

Instructions Within the allocated 15 minutes, complete tasks in order:

1. Evaluate dent as per Task #1 Manual (Dent Evaluation using Traditional Method)
2. Repeat dent evaluation as per Task #2 Manual (Dent Evaluation using dentCHECK)

Scoring Scores will be calculated according to the AMC score sheet.

Event #3 Alaska Airlines External Power Receptacle

Provided by



Team members required Two

Contact(s)/Judge(s) Justin Evans, justin.evans@alaskaair.com
Orville Hunt, orville.hunt@alaskaair.com

Description Competitors will evaluate a discrepancy provided on a logbook sheet and determine steps for corrective action. Competitors will utilize tools to complete the task the complete appropriate paperwork.

References [Task Summary](#)
[Simulator Aircraft Maintenance Manual \(Rev. i\)](#)

Tools and equipment list Inspection flashlight, screwdriver, wrench – hex 1/8 inch and 3/16 inch, wear gage, safety tags

Instructions

- A) Identify the aircraft and aircraft type you are tasked to work on
- B) Understand the discrepancy provided on the logbook sheet and determine planned action for corrective action
- C) Identify the appropriate sections of the Simulated Aircraft Structure (SAS) Maintenance Manual to accomplish corrective maintenance action and associated Task Cards
- D) Identify components, determine effectivities, utilize tools, hardware, technical data and standard aircraft maintenance practices to complete tasks

Event	#3 Alaska Airlines External Power Receptacle
	<ul style="list-style-type: none">E) Complete logbook entry filling in required areas with appropriate informationF) Consider completed task on SAS Simulator same as completed task on live aircraftG) Tool collection and accountabilityH) Foreign object debris (FOD) survey within work locationI) Document completion and task card completion
Scoring	Scores will be calculated according to the AMC score sheet.

Event #4 Barfield Air Data Test

Provided by



Team members required Two

Contact(s)/Judge(s) Victor Bontorno, Director Distribution & GSTE, 305-894-5408,
Victor.bontorno@barfieldinc.com

Description This competition is designed to test the skills of each participating team in their understanding of and ability to troubleshoot an aircraft Pitot-Static system. Barfield recommends participants fully understand a basic aircraft Pitot-Static system and potential issues that could be found. The faults found during this procedure will test this knowledge.

References [DPS500NG – RVSM Digital Pitot Static Test Set Brochure](#)

Tools and equipment list See instructions

Instructions [Air Data Procedure](#)

Scoring Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for damaging indicators, not following cautions outlined in the procedure, replacing hose with incorrect parts, unnecessarily replacing a good hose, incorrectly identifying a broken indicator, or loitering in the pitot-static event area prior to competing.

Event #5 Barfield Antenna Test

Provided by



Team members required Two

Contact(s)/Judge(s) Victor Bontorno, Director Distribution & GSTE, 305-894-5408,
Victor.bontorno@barfieldinc.com

Description Coaxial Cable & Antenna System Inspection with a Frequency Domain Reflectometer

References [FlightHawk Aviation RF Cable & Antenna Analyzer Product Information](#)

Tools and equipment list FlightHawk 7003A001-4 RF Aviation & Cable Analyzer – Aviation Test Kit

Instructions [Procedure](#)

Scoring Scores will be calculated according to the AMC score sheet.

Event #6 Barfield Handheld Bond Meter Test

Provided by



Team members required Two

Contact(s)/Judge(s) Victor Bontorno, Director Distribution & GSTE, 305-894-5408,
Victor.bontorno@barfieldinc.com

Description Bond testing with a Barfield BT-700

References [Handheld Bond Meter Product Information](#)

Tools and equipment list BT-700 Handheld Milliohmmeter/Bond Meter

Instructions [Procedure](#)

Scoring Scores will be calculated according to the AMC score sheet.

Event #7 Click Bond XR Process Optimization

Provided by



Team members required Two

Contact(s)/Judge(s) Ellie Keene, Brand Experience Designer, 775-885-8000 x1197, ellie.keene@clickbond.com
Rick Angell, Senior Project Support Manager
Chris Galassini, Field Applications Engineer
Gino Galassini, Field Applications Engineer

Description The challenge of validation and tracking within aerospace maintenance has created an opportunity for XR to become a solution for process optimization in the future.

In this event, competitors will need to utilize their communication, teamwork, and forward-thinking skills to complete an avionic modification to an aircraft panel using an iPad and Click Bond assembly fasteners. Competitors will be guided through a series of steps within the AR on the iPad to collect, locate, and position the fasteners.

References Check our website page on March 25 for videos, tutorials, and further information: www.clickbond.com/amc22

Tools and equipment list Rules and instruction sheet (provided at competition)
(1) iPads
(1) F18 Panel -OR- (1) Wing Panel

Event #7 Click Bond XR Process Optimization

- (1) Grease Pencils
- (1) 6-inch machinist scale
- (1) Click Bond Fastener Kit

Instructions

Team members will complete a XR installation sequence:

- A) Read all instructions provided at the competition and on our website, www.clickbond.com/amc22
- B) Use provided iPad
- C) Follow guided instructions in the correct order
- D) Accurately position the fasteners



Scoring

Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for collecting the wrong fastener or incorrect positioning on the panel.

Event

#8 Abaris Training Composite Repair - CANCELLED

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Event #9 Moeller Aerospace Click-Loc® Challenge – We Won't Back Off

Provided by



Team members required One

Contact(s)/Judge(s) Edward Probst, Director of Click-Loc® Technology, probste@click-loc.com
Bryan Rowe, Click-Loc® Sr. Technical Product Support Specialist, roweb@click-loc.com

Description This is a skills event that compares the installation of Safety Wire to Click-Loc® Self-Locking Technology.

References A) Click-Loc® Self-Locking Technology Reference Information
B) [Safety Wire Specification – AC 43.13-1B Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair](#)

Tools and Equipment List Station #1:
A) 3/4" Crowfoot Wrench with 3/8" Drive
B) 1-150 lb/in Torque Wrench with 3/8" Drive
Station #2:
A) 3/4" Crowfoot Wrench with 3/8" Drive
B) 1-150 lb/in Torque Wrench with 3/8" Drive
C) Safety Wire Pliers
D) Safety Wire .032 CS
E) Wire Cutters
Station #3:
A) 3/8" Drive Ratchet
B) 2" - 3/8" Drive Extension
C) 1-150 lb/in Torque Wrench with 3/8" Drive

Event

#9 Moeller Aerospace Click-Loc® Challenge – We Won't Back Off

Station #4:

- A) 3/8" Drive Ratchet
- B) 2"-3/8" Drive Extension
- C) 1-150 lb/in Torque Wrench with 3/8" Drive
- D) Safety Wire Pliers
- E) Safety Wire .032 CS
- F) Wire Cutters

Station #5:

- A) 11/16" Combination Box End Wrench
- B) 11/16" Crowfoot Wrench 3/8" Drive
- C) 1-150 lb/in Torque Wrench with 3/8" Drive

Station #6:

- A) 11/16" Crowfoot Wrench 3/8" Drive
- B) 11/16" Combination Box End Wrench
- C) 1-150 lb/in Torque Wrench with 3/8" Drive
- D) Safety Wire Pliers
- E) Safety Wire .032 CS
- F) Wire Cutters

Event

#9 Moeller Aerospace Click-Loc® Challenge – We Won't Back Off

Instructions

A) Station 1 – Upper left corner of panel (Click-Loc® Turnbuckle)

- 1) Start timer.
- 2) Rotate and adjust the Heim joint to fit the orange-handled pin and push into receptacle.
- 3) Torque the jam nut to 115 lb/in.
- 4) Press lap count or clock switch to engage count on other side.

Note: Complete when fingers engage over detents and torque is achieved.

B) Station 2 – Upper right corner of panel (Safety Wire Turnbuckle)

- 1) Rotate and adjust the Heim joint to fit the orange-handled pin and push into receptacle.
- 2) Torque the jam nut to 100 lb/in.
- 3) Safety-wire the jam nut to the turnbuckle body per AC 43.13-1B.
- 4) Press lap count or clock switch to engage count on other side.

C) Station 3 – Middle left side of panel (Click-Loc® Borescope Plug)

- 1) Install Click-Loc® borescope plug into the fixture and hand tighten.
- 2) Seat borescope plug with ratchet and torque to 115 lb/in.
- 3) Press lap count or clock switch to engage count on other side.

D) Station 4 – Middle right side of panel (Safety Wire Borescope Plug)

- 1) Install generic borescope plug into the fixture and hand tighten.
- 2) Seat borescope plug with ratchet and torque to 100 lb/in.
- 3) Safety-wire the borescope plug to the fixture per AC 43.13-1B.
- 4) Press lap count or clock switch to engage count on other side.

E) Station 5 – Lower Left side of panel (Click-Loc® -06 Fluid Fitting)

- 1) Slide the B-Nut down the fluid tube and connect to the nipple of the bulkhead fitting and hand thread together.
- 2) Seat fluid fitting with wrench.
- 3) Torque B-nut to 115 lb/in.
- 4) Press lap count or clock switch to engage count on other side.

F) Station 6 – Lower right side of panel (Safety Wire -06 Fluid Fitting)

- 1) Slide the B-nut down the fluid tube and connect to the nipple of the bulkhead fitting and hand thread together.
- 2) Seat fluid fitting with wrench.
- 3) Torque B-nut to 100 lb/in.
- 4) Safety-Wire the B-nut to the bulkhead fitting per AC 43.13-1B.
- 5) Press stop or pause button to stop timer.

All safety wire remnants need to go into FOD bag

Event #9 Moeller Aerospace Click-Loc® Challenge – We Won't Back Off

Scoring Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for failure to validate torque wrench settings with judge before use, noncompliance with AC 43.13, and incorrect handling of FOD.

Event	#10NBAA & StandardAero Engine Fan Blade Removal
Provided by	 The logo for NBAA StandardAero features a stylized globe icon on the left, followed by the text 'NBAA' in a bold, sans-serif font, and 'StandardAero' in a larger, bold, sans-serif font to its right. Below 'NBAA' is the text 'NATIONAL BUSINESS AVIATION ASSOCIATION' in a smaller font.
Team members required	Three
Contact(s)/Judge(s)	Darrell Capra, Program Director Joe Capra, Program Director Send questions to Jim Huntoon James.Huntoon@viasat.com
Description	<p>The pilot reported a bird strike on landing rollout with power lever at idle. You and your team have already borescoped the high-pressure compressor (HPC) verifying no damage to the core of the engine.</p> <p>This event will require technicians to remove the fan blades in a uniform manner to prevent shingling of the mid span dampeners. (Technicians will not be reassembling the engine.)</p>
References	None
Tools and equipment list	Eye, foot, and hand protection required. Hand tools and silver pencil will be provided.
Instructions	<p>Removal of Fan Blades (Fan Assembly Installed on Engine) (Subtask 72-70-03-020-006-A01)</p> <p>CAUTION: DURING THE FOLLOWING BLADE REMOVAL PROCEDURE DO NOT USE ANY FORCE OTHER THAN HAND PRESSURE FOR REMOVING THE FAN BLADES. USE OF FORCE OTHER THAN HAND PRESSURE CAN RESULT IN DAMAGE TO FAN BLADE MIDSPAN DAMPERS, FAN DISC, AND SUBSEQUENT MIDSPAN DAMPER FAILURE</p> <p>A) Pre SB TFE731-72-36431 Remove fan blades (fan assembly installed on engine).</p> <p>NCLIE: If blades become locked up during the blade removal process, work the blades back into the disc, using hand pressure only, until the</p>

Event

#10NBAA & StandardAero Engine Fan Blade Removal

blades we no longer locked up before continuing the blade removal process.

- 1) Remove fan spinner and spinner support Refer to REMOVAL (PGBLK 72-70-01-3000).
 - 2) Mark blades and disc. using Verithin Na 753, silver pond, Violet, No.127 1/2. industrial marking ink, or Yellow No. 170T, China marker, to allow reinstallation at same relative position on disc.
 - 3) Using hand pressure only and working in a clockwise direction, pull on each blade, one at a time, to shift the blades out of the disc. Initially, each blade will move only a small amount. After several rotations' blades will gradually move slightly more each tine hand pressure is applied. Continue working one blade at a time until one blade can be removed.
 - 4) Remove the blade adapter.
 - 5) Working in a clockwise direction, remove the remaining blades and blade adapters one at a time until all blades and blade adapters have been removed.
- B) (Post SB TFE731-72-3643) Remove fan blades (fan assembly installed on engine).
- 1) Remove fan spinner and spinner support Refer to REMOVAL (PGBLK 72-70-01-3000).
 - 2) Mark blades and disc, using Verithin Na 753, silver pond, Violet, No.127 1/2. industrial marking Ink, or Yellow No. 170T, China marker, to allow reinstallation at same relative position on disc.
 - 3) Using PN 5837184-1. retaining ring compression tool. compress fan blade retaining ring and tighten screw to lock tool in compressed position.
 - 4) Using hand pressure only and working in a clockwise direction. pull on each blade, one at a time, to shift the blades out of the disc. Initially, each blade will move only a small amount. After several rotations' blades will gradually move slightly more each time hand pressure is applied. Continue working one blade at a time until one blade can be removed.
 - 5) Working in a clockwise direction, remove the remaining blades one at a time until all blades have been removed.
 - 6) Remove PN 5837184-1, retaining ring compression tool.
 - 7) Remove retainer ring from fan disc.

Event	#10 NBAA & StandardAero Engine Fan Blade Removal
Scoring	Scores will be calculated according to the AMC score sheet.

Event #11 Perfect Point E-Drill Fastener Removal

Provided by



Team Members Required One

Contact(s)/Judge(s) Jim Becker, President, jim@ppedm.com
Sam Derenne, Director of Sales & Customer Support, sam@ppedm.com
Nils Besvold, Marketing Manager, nils@ppedm.com
Jenn Robb, Sales & Marketing Associate, jrobb@ppedm.com

Description This event will test the technician's ability and speed when removing titanium fasteners from an aircraft structure. This will require technicians to remove 5 fasteners using an E-drill from a wing flap. The Fasteners will be of a blind-bolt configuration and exact part numbers will be presented at the competition.

References [Event Detailed Instructions](#)
[Test article photos](#)
[E-drill Training Videos](#)
[Full E-drill User Guide](#)

Tools and equipment list Eye protection required. The E-drill hand tool, locating devices, punches, hammers, and consumables will be provided.

Event	#11 Perfect Point E-Drill Fastener Removal
Instructions	<p>A) Using supplied reference data, remove the Qty. (5) fasteners identified on the flap. The fasteners to be removed will be marked. See references for detailed instructions and videos on using the E-drill with blind-bolt.</p> <p>B) Using the Air Punch, sever the stem of the fastener from the head.</p> <p>C) Locate and remove all FOD and check the structure for damage to the structure.</p>
Scoring	Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for mis-aligning the E-drill over the fastener which results in damage to the structure, mis-handling the tool or locators, and excessive water leakage or sparking.

Event	#12 Michelin Aircraft Tires Inspection
Provided by	
Team members required	Two
Contact(s)/Judge(s)	Brian Remsberg, brian.remsberg@micelin.com Randy Hedrick, randy.hedrick@micelin.com
Description	Competitors will answer inspection requirement questions and perform an airworthiness inspection of an aircraft tire including visual inspection, tire pressure reading, inspection record, and required maintenance actions.
References	CYGNUS X1 Aircraft Maintenance Manual, Task 32-0000001 CYGNUS X1 Aircraft Maintenance Manual, Task 32-0000002 Michelin Aircraft Tire Care & Service Manual Tire Inspection Form
Tools and equipment list	Proper Tire Pressure Gauge Tread Depth Gauge Tire Inspection Form Appropriate PSE Flashlight
Instructions	Competitors will be presented with a mounted and inflated aircraft tire with visible worn conditions and damages. Tire is assumed to be on-wing and stationary for 4 hours. A) Answer the following questions: 1) How often should on-wing aircraft tires be inspected? 2) How often should on-wing aircraft tire pressures be verified? 3) How much is the pressure of an aircraft wheel/tire assembly allowed to decrease in 24 hours? 4) What is the cause of Chevron Cutting? 5) What is the purpose of the Sidewall Vents?

Event	#12 Michelin Aircraft Tires Inspection
	<p>B) Perform visual inspection of wheel/tire assembly per job card including tread depth.</p> <p>C) Record the following:</p> <ol style="list-style-type: none"> 1) Tire Part Number and Size including Ply, Load and Speed Rating 2) Tire Serial Number 3) Retread Level 4) Remaining Tire Skid Depth <p>D) Record any noted conditions and damages on inspection form. Determine tire disposition and required actions.</p> <p>E) Perform Tire Pressure Check and record readings. Determine tire disposition and required actions.</p> <p>Determine what corrective actions may be required and make appropriate maintenance log entries.</p>
Scoring	Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for incorrect answers/log entries.

Event #13 UPS Safety Wiring

Provided by



Team members required One

Contact(s)/Judge(s) Lornna Ruble, 502-396-4062 or 305-869-8218, lornnaruble@ups.com
Candice McHargue, 502-494-2657, cmchargue@ups.com
Juliet Oyula, 510-316-3448, joyula@ups.com
Thomas Dungan, 757-897-8855, tdunganjr@ups.com

Description This event will test each participant's skill and speed while accomplishing a series of safety wire patterns and safeties.

References [AC 43.13-1B - Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair](#)

Tools and equipment list Safety wire pliers
wire cutters
needle nose
32/1000 safety wire
FOD Can

Instructions Competitors will have eleven minutes to complete safety wiring in two sections (see illustration, below). (Note, this is different than in years past when competitors had 15 minutes to complete as many patterns as possible.)



Scoring

Scores will be calculated according to the AMC score sheet. A thirty second penalty will be assessed for each incorrect safety wire pattern (which may include but is not limited to inadequate tautness of the safety wire, loose pigtail to the securing hardware, and negative safety).

There are two aircraft parts on the board that provide bonus opportunities. The competitor must tell the judge in advance whether they will attempt completion of the bonus section.

- After completing Section 1, competitors have the option of safety wiring one of two aircraft parts in the bonus area for a one-minute deduction off the final time. (Must tell the judge in advance if completing the bonus)
- After completing Section 2, competitors will have the option of safety wiring the second aircraft part in the bonus area for a two-minute deduction off the final time. (Must tell the judge in advance if completing the bonus)

Bonus points will not be provided for incorrect or inadequate safety wiring in the bonus area. Penalties will not be assessed for incorrect or inadequate safety wiring in the bonus area.

Event #14 American Airlines Pedestal

Provided by



Team members required One

Contact(s)/Judge(s) Aaron Klippel mtnbikeaj@yahoo.com
Ed Kempa ekempa1@yahoo.com

Description Execute removal/replacement of MD-80 pedestal floor light.

References [Removal and Replacement Instructions](#)

Tools and equipment list See removal and replacement instructions, linked above.

Instructions See removal and replacement instructions, linked above.

Scoring Scores will be calculated according to the AMC score sheet.

Event #15 American Airlines APU Burner Can

Provided by



Team members required Two

Contact(s)/Judge(s) Lyle Becnel, Technical Crew Chief, American Airlines
lyle.becnel@aa.com
Jason Yoder Technical Crew Chief, American Airlines
Jason.yoder@aa.com

Description Remove and replace MD80 APU combustion chamber O-ring packing per instructions. Competitors will show inspector torques and return to zero after usage. Know how to safety 3 B-nuts not in a line. Know how to attach and safety a V-style coupling clamp.

References [MD80 AMM 49-20-01-201 Rev 78.0](#)
[V Clamp Rev 4-12](#)

Tools and equipment list
1 - diagonal cutter plier
1 - 8" wire twist plier
1 - 10" wire twist plier
1 - spool of .032" safety wire
1 - 3/8" dr 7/16" deep 12pt socket
1 - 3/8" dr 9/16" crows foot
1 - 5/8 x 9/16 open end wrench
1 - 3/4 x 7/8 open end wrench
1 - 3/8" dr ratchet

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Revision Number: 04
Original Issue Date: 02/07/2022
Revision Date: 04/13/2022

Event	#15 American Airlines APU Burner Can
	1 - 3/8" dr torque wrench 40-200in lbs 1 - 48oz dead blow hammer 1 - 6" blade flat tip screwdriver
Instructions	Remove and Replace MD80 APU Combustion Chamber Instructions
Scoring	Scores will be calculated according to the AMC score sheet.

Event #16 drbillj.com and Northrop Rice Human Factors Exam

Provided by



Team members required One

Contact(s)/Judge(s) Dr. Bill Johnson, drbillj@gmail.com
Cathy Landry, clandry@northroprice.com

Description This event will consist of multiple-choice questions relating to human factors.
NOTE: Special thanks to former FAA Chief Scientist Dr. Bill Johnson and the Northrop Rice Aviation Training Solution's Cathy Landry for creating the text questions for this year's revised exam.

References [FAA Aviation Maintenance Technician General Handbook](#) Chapter 14

Tools and equipment list Tablet

Instructions Each designated team member will sit for a timed exam, proctored on a tablet.

Scoring Scores will be calculated based on the number of incorrect answers and unanswered questions, and the time it takes to complete the test.

Event #17 Daniels Manufacturing Corporation Electrical Troubleshooting

Provided by



Team members required Two

Contact(s)/Judge(s) Judge 1: Michael Timney
Judge 2: Arthur Siwecki
Please send all communication to Irene Montanaro at irenem@dmctools.com

Description Competitors will be required to find the multiple faults in a MIL-DTL-26482 and MIL-DTL-38999 Series 3 connector consisting of 21 size 16 contacts using a Snap-on multi-meter. Competitors will remove the faulty wires, properly terminate contacts to a new wire, insert the new wire into both sides of the connector, check contact retention using a retention tester and continuity using a multi-meter.

References [DMC Instructional Video Electrical Troubleshooting](#)
[DMC wiring diagram](#)

Tools and equipment list AF8 Crimp Tool
TH1A: Turret Head
TH163: Turret Head
DAK16B: Insertion Tool
DRK16B: Removal Tool
DAK95-16B or M81969/14-03: Insertion Tool
DRK95-16B or M81969/14-03: Removal Tool
HT250-2: Retention Tester

Event	#17 Daniels Manufacturing Corporation Electrical Troubleshooting
	67-016-01: Retention Tester Tip (socket) 68-016-01: Retention Tester Tip (pin) Digital Multimeter: Snap-on, part number EEDM504D 22" pre-stripped wire Contacts: M39029/32-248 (SOCKET), M39029/58-364 (PIN) 26482 (Front Release) Connector: PT07SE22-21S-ND (Amphenol PN) D38999 (Rear Release) Connector: D38999/24FH21PN Multiple wires improperly terminated to simulate a faulty wire
Instructions	A) Competitors will be presented with mounted 26500 and D38999 receptacles on a mock panel B) The connector will have 21 contact cavities with size 16 contacts C) Competitors must check continuity of ALL contact cavities and find the faulty wires using a multi-meter D) Remove the faulty wires using the proper tooling E) Competitors must assemble the crimp tools provided with the corresponding accessory (turret head or positioner). Different turret heads may be required for different connectors/contacts F) The competitors must set the crimp tools to the proper crimp settings based upon the contact part number and wire gauge. This may be different for different contacts G) Once properly set, the competitors will crimp a pin and socket on the opposite ends of a 22" piece of pre-stripped wire (provided) H) Completed wire must then be inserted into the proper cavities of the connector I) Once the new wire is inserted, the competitors must test contact retention using a 5lb or less retention test tool J) Competitors MUST test the continuity of the new wires using a multi-meter K) The final step of the contest will require contestants to properly store tooling in foam cut locations.
Scoring	Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for incorrect repair of faulty wire.

Event	#18 Daniels Manufacturing Corporation® Safe-T-Cable®
Provided by	 The logo for Daniels Manufacturing Corporation features the letters 'DMC' in a large, bold, red font with horizontal lines through the 'M'. To the right, the words 'DANIELS MANUFACTURING CORPORATION' are written in a bold, black, sans-serif font, with a registered trademark symbol (®) at the end.
Contact(s)/Judge(s)	Bill Randall, Strategic Accounts Manager, billr@dmctools.com Art Siwecki, National Account Executive, arthurs@dmctools.com Please direct all emails to Irene Montanaro at Irenem@dmctools.com
Description	This event will test each participant's skill and speed while accomplishing a series of patterns using Safe-T-Cable®. The application of the Safe-T-Cable® must maintain positive tension on the fasteners and meet the criteria for flex limits.
References	Installation Instructions Verification Equipment Elongated Ferrules Self-Looping Jumper Assembly Cable
Tools and equipment list	SCTR325 Safe-T-Cable® Tool (5 inch nose for .032 cable) C10-218 Cable (.032 x 18" safety cables) F10-04 Elongated Ferrules (use where low profile bolts or connectors are present) C10-218JA Self-Looping Jumper Assemblies SCT-TB1 Torque Verification Block SCTD013 Force Tester 3/8" Drive Torque Wrench
Team members required	One

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Event	#18 Daniels Manufacturing Corporation® Safe-T-Cable®
Instructions	<p>Competitors must first verify proper function and tension settings of the tool by using the SCT-TB1 and a 3/8 inch drive torque wrench. Safe-T-Cable® should remain in place on SCT-TB1 test block after applying measured force. The SCTD013 force tester is then used to verify cable tension after torque verification. Once verification is complete the torque wrench should be returned to zero torque and stored.</p> <p>Competitors will then complete as many 2 or 3 bolt patterns as they can in the allotted time. Competitors must properly thread Safe-T-Cable® through the fasteners in a manner that maintains positive tension. Competitors will properly tension the Safe-T-Cable® and crimp a ferrule on the end of the cable using the SCTR325 rotary tool. Any excess cable/FOD must be properly disposed of after application is complete.</p> <p>Bonus: The contestant may choose to use a self-looping jumper assembly to secure a threaded fastener to an adjacent structure.</p>
Scoring	Scores will be calculated according to the AMC score sheet. Additional penalties will be assessed related to tautness of the cable.

Event	#19 PPG Transparencies
Provided by	
Team members required	Two
Contact(s)/Judge(s)	Connie Little, Product Support Engineer, connie.little@ppg.com
Description	The transparencies section will require a framing assembly repair and a Surface Seal application. One competitor will conduct a framing assembly repair, and the other must prepare glass and apply Surface Seal coating solution.
References	None
Tools and equipment list	See procedures, linked below
Instructions	Glass Plug Replacement Procedure Surface Seal® Procedure
Scoring	Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for any process errors and/or quality concerns.

Event	#20 PPG Virtual Reality Paint Booth
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Provided by



Team members required One

Contact(s)/Judge(s) Connie Little, Product Support Engineer, connie.little@ppg.com

Description The competitor will use a Virtual Reality (VR) paint booth to simulate painting.

References None

Tools and equipment list None

Instructions

- A) When it's your turn, disinfect your hands using the provided alcohol gel dispenser.
- B) Approach the flat screen display and accept the VR paint gun from the PPG operator.
- C) Spray the panel on the VR display using good painting techniques to achieve a consistent target film thickness of 3 – 6 wet mils while minimizing overspray.
- D) Each participant will be allowed five total minutes to spray one panel for practice, receive the evaluation of that panel, and then spray a second panel to earn a score.
- E) Tell the operator when you are finished.

Scoring Performance results are calculated using a weighted average of 90% target film coverage and 10% transfer efficiency.

Event #21 PPG Wing Sealant

Provided by



Team members required

Two

Contact(s)/Judge(s)

Connie Little, Product Support Engineer, connie.little@ppg.com

Description

Competitors will perform a fillet seal and fastener dome seal in an inaccessible area. Selection of correct tooling and equipment to perform the job, safety/PPE, quality and cleanliness of job performed will be considered.

References

Technical data sheet for Surface Seal, Semco® 285 Battery Powered Mixer, Semco® 1250 Battery Gun (available on <http://www.ppgaerospace.com>)

Tools and equipment list

Provided on site

Instructions

Sealants Procedure (provided on site)

Scoring

Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for any process errors and /or quality concerns.

Event #22 United Fuel Tank Entry Precautions

Provided by

UNITED



Team members required

Two

Contact(s)/Judge(s)

Fred Glau, fred.glau@united.com

Description

Competitors will defuel and refuel a 747-400 fuel tank.

References

[Fuel Tank Diagram](#)

[Fuel Tank SIM Photos](#)

[Grounding lug photo](#)

Tools and equipment list

Speed Handle with no 3 apex bit

Screw Driver with no 3 apex bit

0-200 in/lb torque wrench

Grease pencil

Instructions

[Fuel tank procedures](#)

Scoring

Scores will be calculated according to the AMC score sheet.

Event	#23 United Cable Rigging
Provided by	UNITED 
Team members required	Two
Contact(s)/Judge(s)	Fred Glau, fred.glau@united.com
Description	After first flight the aileron cable rig was found to be out of tolerance. Team members will re-rig cables AA & AB.
References	Cable Rigging Tension and Turnbuckle Diagram
Tools and equipment list	Cable Tension Meter ACX-250-1 Cable diameter gauge
Instructions	Instructions
Scoring	Scores will be calculated according to the AMC score sheet.

Event #24 Nida Corporation Power Troubleshooting

Provided by



Team members required Two

Contact(s)/Judge(s) Robin Asplund, robina@nida.com

Description This event challenges the aircraft maintenance technician's ability to troubleshoot basic aircraft power distribution systems. Contestants will be provided schematics, system descriptions and operational procedures to troubleshoot generic single engine and multi-engine power distribution systems. Scores will be based on the speed and accuracy of finding the system faults.

References None

Tools and equipment list Multi-meters

Instructions [See 2022 AMC Pre-Event Contest Details](#) (Rev 08mar22)

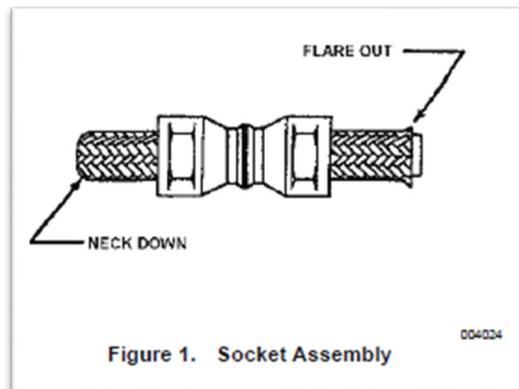
Scoring Scores will be calculated according to the AMC score sheet. A fifteen-minute penalty will be assessed for the first incorrectly identified fault and a five-minute penalty for the second and third misidentified fault. The team will receive a 30 second bonus for correctly identifying all faults.

Event	#25 U.S. Air Force Flex Fluid Lines
Provided by	
Team members required	Two
Contact(s)/Judge(s)	Robert Bowman, Robert.bowman.3@us.af.mil TSgt Randel Kephart, randel.kephart@us.af.mil SrA Ian Cernetich, ian.cernetich@us.af.mil
Description	Hose assembly length is 11.5 inches ("A"). Assembly length is measured from middle of b-nut flat to middle of b-nut flat. Cutoff factor for each hose end fitting is .75 inches ("C") (See figure 6)
References	None
Tools and equipment list	Qty 2, 11/16 combination wrench Qty 1, 13/16 combination wrench Qty 1, tape measure Qty 1, feeler gauge (0.23 - .046) Qty 1, 3/8" dr torque wrench able to torque 190-215 in lbs. Qty 1, 3/8" dr 11/16" crow foot Qty 1, hacksaw blade (32 TPI) Qty, 1 diagonal cutters Qty 1, brass pick Qty 2, leather gloves
Instructions	A) Medium pressure PTFE hose buildup 1) Measure hose to required length

Event

#25 U.S. Air Force Flex Fluid Lines

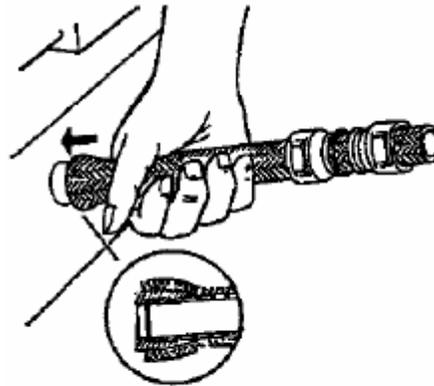
- 2) Wrap circumference of hose with masking tape at cutoff to prevent flare out of braid
****CAUTION**** Do not overwrap tape
- 3) Cut off hose square using hack saw
- 4) Clamp sockets in vise.
****CAUTION**** Do not overtighten vice on thin walled fittings
- 5) Insert neck-down end of hose into sockets using a twisting, pushing motion until hose is through the sockets, ensuring the ends are skirt to skirt. (Figure 1). Remove tape from hose and assembly from vise



- 6) Separate wire braid from tube. Seal pick is provided to aide in separation.
- 7) Insert sleeve between braid and outer diameter of the inner tube ****CAUTION**** Do not allow wire braid to be caught between sleeve and inner tube. Do not pinch inner tube with sleeve
- 8) Complete positioning of sleeve by pushing sleeve against a flat surface until tube bottoms against inside sleeve diameter (Figure 3).

Event

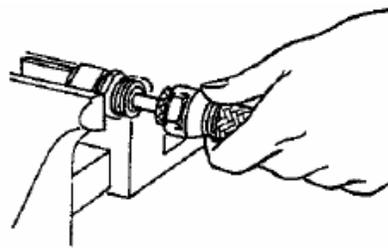
#25 U.S. Air Force Flex Fluid Lines



004026

Figure 3. Positioning Sleeve

- 9) Check tube end to make sure it is bottomed against sleeve and wires are not trapped under sleeve. Trim excess wires as needed.
- 10) Clamp Nipple in vise (Note: Do not lubricate hose or nipple before insertion. Fitting components are dryfilm lubricated at time of manufacture.)
- 11) Size tube to sleeve by pushing hose over nipple until sleeve bottoms against nipple chamfer.
- 12) Check end to make sure sleeve is positioned properly.
- 13) Slide socket forward and thread onto nipple by hand



004027

Figure 4. Positioning Socket and Nipple

- 14) Reposition assembly by placing socket flats in vise.

Event #25 U.S. Air Force Flex Fluid Lines

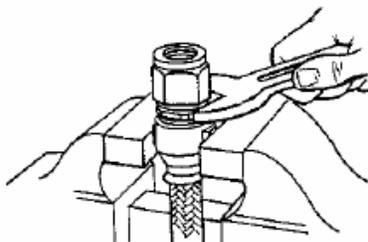


Figure 5. High-Pressure Hose Tightening Assembly 004028

- 15) Tighten assembly by using a wrench on the nipple hex until gap between socket hex and nipple hex is 1/32 inch. Gap may vary from .023 to .046 inch.
- 16) Repeat steps 6 through 15 for fitting on the other end.
- 17) Inspect hose.
- B) Medium pressure PTFE hose install
 - 1) Place hose into fixture assembly, threading coupling nuts on by hand.
 - 2) Torque coupling nuts 190-215 in lbs. utilizing a backup wrench.

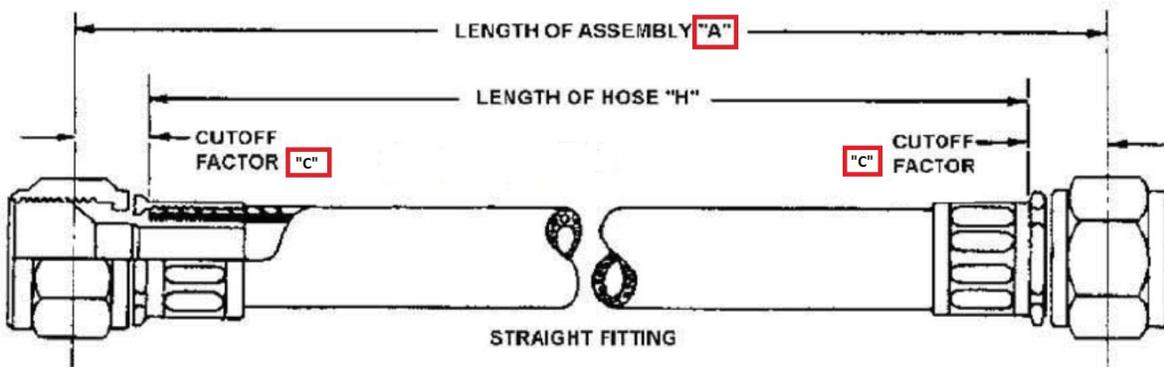


Figure 6.

Scoring

Scores will be calculated according to the AMC score sheet.

Event #26 Eastern Florida State Simulated Spacecraft Vacuum Loading

Provided by



Team members required Two

Contact(s)/Judge(s) E.J. Mango, mangoe@easternflorida.edu

Description This event simulates the loading of a small quantity of a hazardous commodity from a holding tank into a space vehicle flight tank. The individual performing the procedure will be required to don the proper PPE, assemble a mobile fluid transfer station per a detailed procedure and a schematic and transfer 150 grams of a commodity (colored water) from a holding tank to a flight tank using a vacuum loading operation. A command/response protocol (see definition below) must be followed when completing the operation. Upon completion of the fluid transfer all system lines will be evacuated using compressed air (60 seconds) and disassembled from the station.

(Note: The Flight Tank does not drain during line evacuation).

The QDs we are using are a push/pull type connector (explain inserting and pushing until it bottoms out and then how they have to push on the collar to get it to release the tubing). One will be available at the event table prior to the event for the technician to look at and operate to familiarize themselves on how it works.

All steps must be completed. There are no provisions for NOT PERFORMING a step or series of steps.

Definition of Command/Response Protocol- a method of communication in such a manner that the command or work instruction is read by one individual (command) and then it is repeated (response) by the person performing that work step as they complete the instruction.

Event #26 Eastern Florida State Simulated Spacecraft Vacuum Loading

References None

- Tools and equipment list
- PE provided for the individual performing the procedure
 - Tyvek suit (simulates SCAPE Suit)
 - Disposable Polypropylene Coveralls with Hood and Booties
 - Neoprene gloves
 - Face Shields
 - Disposable Respirator
 - Painters Tape
 - Equipment provided
 - Control Box – 3 (plus 3 AC to DC adapters)
 - Vacuum Pump w/gauge
 - Air compressor plus one 3 way adapter and 2 hoses
 - Compressed air-pressure regulator
 - Supply tank
 - Flight tanks
 - Vacuum & Fluid Lines (6 Tygon tubes cut to 4 foot lengths each)
 - Digital Scale
 - Poly-Temp PTFE Thread Tape
 - Tool Bag and Tools
 - Tube Bender
 - Tube Cutter
 - 37 Degree Flaring Tool
 - Fitting Box
 - Spare Tubing
 - Box Cutter
 - Needle Nose Pliers
 - Tape Measure
 - Phillips and Flathead Screwdrivers
 - 2 Adjustable Wrenches
 - Wire Cutters
 - Slip Joint Pliers
 - Scissors

Event

#26 Eastern Florida State Simulated Spacecraft Vacuum Loading

Instructions

- A) Preparation and protocol
 - 1) The operator (team member 1) will dress out in appropriate PPE to simulate the protective equipment used during such an operation.
 - 2) Team member 2 will read out the procedure while team member 1 performs the operation. The “call and response” protocol referenced above must be used. That is, team member 2 will read out the step, and team member 1 gives an appropriate response to verify the step is complete. For example, if team member 2 reads off “close valve 1”, team member 1 would respond with “valve 1 closed” after completing the step
- B) Setup (Reference Figure 1)
 - 1) Turn on power to Control Box
 - 2) Cycle electrical valves to ensure operation (red light indicator)
 - 3) Verify all valves (manual and electrical) are closed
 - 4) Turn off power to the Control Box
 - 5) Connect Vacuum and Fluid lines as shown in schematic (Figure 1) Note: all fittings are push lock type. Ensure lines are pushed in all the way. The compressed air line to pressure valve will already be connected.
 - 6) Verify all Vacuum and Fluid lines are connected as shown in schematic (Figure 1)
 - 7) Verify Flight Tank is on digital scale.
- C) Evacuate Tank
 - 1) Turn on power to Control Box
 - 2) Open MV 4
 - 3) Start Vacuum Pump
 - 4) Open Vacuum Valve
 - 5) Open Flight Valve
 - 6) Open MV2
 - 7) Evacuate system until vacuum gage reads at least 22 Hg +/- 5
 - 8) Close Vacuum Valve
 - 9) Close Flight Valve
 - 10) Close MV 4
 - 11) Turn off Vacuum pump
- D) Flight Tank Load-Vacuum
 - 1) Turn on digital scale and tare
 - 2) Open Atmospheric Vent Valve

Event

#26 Eastern Florida State Simulated Spacecraft Vacuum Loading

- 3) Open Supply Valve
- 4) Open Flight Valve and cycle valve as necessary to meter 150 grams of fluid into Flight Tank – NOTIFY JUDGE WHEN COMPLETE
- 5) Close all valves (manual and electric)

Note: If Vacuum load was unsuccessful, Step E-System Drain must be completed before restarting step C- Evacuate tank

E) System Drain

- 1) Verify all valves closed (manual and electric)
- 2) Verify compressed air regulator set at 20 +/-5 psi
- 3) Open MV3
- 4) Open MV1
- 5) Open Atmospheric Vent Valve
- 6) Open Flight Valve
- 7) Open Supply Valve
- 8) Open Pressure Valve
- 9) Purge all water from system for 60 seconds (use timer provided) Note: FLIGHT TANK DOES NOT DRAIN
- 10) Close Pressure Valve
- 11) Close Supply Valve
- 12) Close Flight Valve
- 13) Close Atmospheric Vent Valve
- 14) Close MV1
- 15) Reduce compressed air regulator to zero
- 16) Close MV3
- 17) Open MV2 to vent Flight Tank
- 18) Open MV1 to vent Supply Tank
- 19) Close all valves (manual and electric)
- 20) Turn off power to Control Box

F) System Clean up

- 1) Verify power to Vacuum pump and control box is turned off
- 2) Verify all valves closed
- 3) Disconnect all hoses between control panel and tanks (both ends of all 5 hoses must be disconnected)

END OF EVENT

Participants should remove PPE and return it to the PPE staging table

Event #26 Eastern Florida State Simulated Spacecraft Vacuum Loading

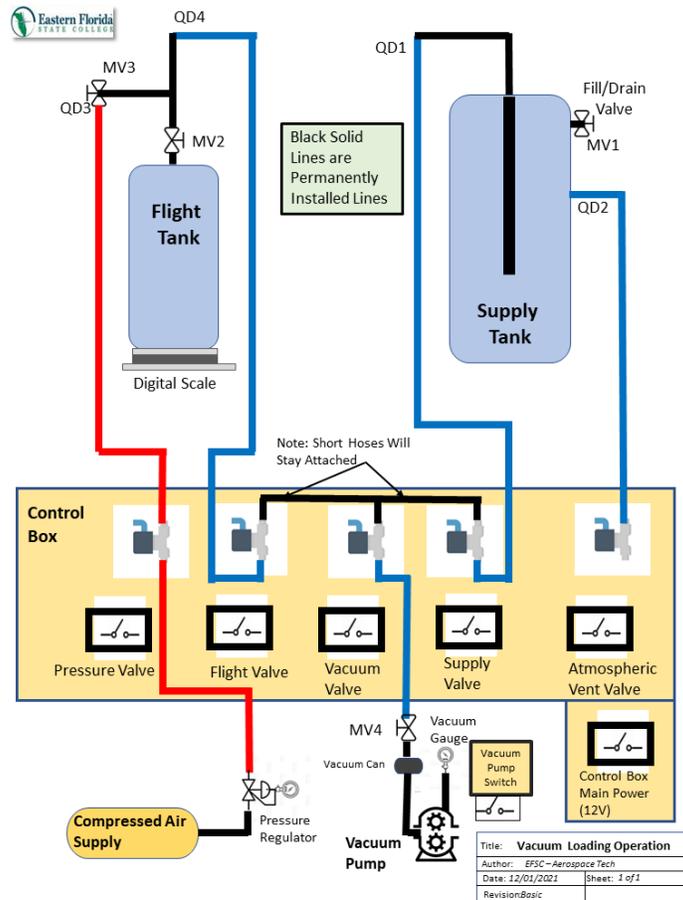


Figure 1 : Space Vehicle – Vacuum Loading Operation

Scoring

- Scores will be calculated according to the AMC score sheet.
- Bonus of 30 seconds for proper use of command & response.
- Bonus of 60 seconds for exact loading to 150 grams.
- Penalty of 60 seconds for each step not completed.
- Penalty of 15 seconds for each gram over or under required load of 150 grams.

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Event #27 FedEx Express Turbine PDU Removal and Installation

Provided by



Team members required Two

Contact(s)/Judge(s) Christopher Hart, christopher.hart@fedex.com
Meschelle Barnes, meschelle.barnes@fedex.com

Description This event will test the technician's ability to remove and install the Thrust Reverser, Pneumatic Drive Unit (PDU) on a Pratt and Whitney JT9D-7R4 turbofan engine.

References None

Tools and equipment list
1/4" Drive 40-200 in lb torque wrench (PN QD1R200)
1/4" Drive 12-Point 1/4" semi-deep socket (PN TMDS8)
1/4" Drive 12-Point 5/16" semi-deep socket (PN TMDS10)
1/4" Drive 12-Point 7/16" semi-deep socket (PN TMDS14)
1/4" Drive 12-Point 9/16" semi-deep socket (PN TMDS18)
1/4" Drive 6" extension (PN TMXK60)
1/4" Drive 14" extension (PN TMXK140)
1/4" Drive ratchet (PN T72)
1/4" Drive 9/16" crowfoot (PN TMCO18)
3/8" Drive 200 - 1000 in lb torque wrench (PN QD2R1000A)
3/8" Drive 12-Point 1/4" shallow socket (PN F081)
3/8" Drive 12-Point 5/16" shallow socket (PN F101)

Event	#27 FedEx Express Turbine PDU Removal and Installation
	<p>3/8" Drive 12-Point 7/16" shallow socket (PN F141) 3/8" Drive 12-Point 9/16" shallow socket (PN F181) 3/8" Drive 6" extension (PN FXK6) 3/8" Drive 11" extension (PN FXK11) 3/8" Drive ratchet (PN F80) 3/8" Drive 5/8" crowfoot (PN FC020A) 3/8" Drive 11/16" crowfoot (PN FC022A) 1/4 combination wrench (PN OEX8B) 7/16 combination wrench (PN OEX14B) 9/16 combination wrench (PN OEX18B) 5/8 combination wrench (PN OEX20B) 11/16 combination wrench (PN OEX22B) 8-3/4" Snap-On ratcheting screwdriver (PN SSDMR4B) Jaw cannon plug pliers (PN PWC52A)</p>
Instructions	JT9D Pneumatic Drive Unit – Removal/Installation Instructions
Scoring	Scores will be calculated according to the AMC score sheet. Additional penalties may be assessed for failure to place PDU on table and simulate packing change, failure to show judge torque on wrench before proceeding, failure to install or secure mount bolts, failure to install, secure or torque Lines and B Nuts.

Record of Revisions

REVISION NUMBER	REVISION DATE	PAGE(S) AFFECTED	REVISION DESCRIPTION
00	02/07/2022	ALL	Initial Release
01	03/08/2022	9	Replace floor layout with new drawing
01	03/08/2022	10-11	Removed and replaced list of registered teams
01	03/08/2022	15 & 22	Added note that all school teams will compete in the Pratt & Whitney Task, Event #1(A) .
01	03/08/2022	31	Added link to reference and procedure for Barfield Air Data Test (Event #4)
01	03/08/2022	32	Added link to procedure for Barfield Antenna Test (Event #5)
01	03/08/2022	33	Added link to procedure for Barfield Handheld Bond Meter (Event #6)
01	03/08/2022	34-35	Updated event name and instructions for Click Bond, Event #7
01	03/08/2022	55	Added additional step “K” to instructions for Event #17 (Daniels Manufacturing Corporation Electrical Troubleshooting)
01	03/08/2022	56	Replaced Event #18 , Daniels Manufacturing Corporation LaceLok, with Daniels Manufacturing Corporation® Safe-T-Cable®
01	03/08/2022	62	Added meter description (Cable Tension Meter ACX-250-1) to the United Cable Rigging, Event #23 .
01	03/08/2022	63	Revised penalty amount assessments for Nida Troubleshooting Event #24 , revised linked procedures (see change to item #6 in the “Rules of Engagement.”
01	03/08/2022	64	Added additional judge contact to Air Force Flex Fluid Lines Event #25
01	03/08/2022	58	Revised description, instructions, and scoring criteria for PPG Transparencies event (Event #19)
01	03/08/2022	60	Revised description, references, and instructions for PPG Wing Sealant event (Event #21)
02	03/10/2022	56	Corrected Safe-T-Cable (Event #18) competitors required, from two competitors to one competitor
03	04/12/2022	5	Revised entry requirements. Aviation Week is no longer requiring attendees to show vaccination status to gain entry to the show floor.
03	04/12/2022	5	Revised registration hours and show times to align with revised schedule as published on the MRO Americas website.

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REVISION NUMBER	REVISION DATE	PAGE(S) AFFECTED	REVISION DESCRIPTION
03	04/12/2022	6	Added link to release of liability form . Added requirement that competitors under the age of 18 must bring a release of liability signed by a parent or guardian.
03	04/12/2022	9	Replaced competition layout with final version.
03	04/12/2022	10-11	Replaced team list with the final roster and added team numbers.
03	04/12/2022	13-14	Replaced schedule with final competition times and stages.
03	04/12/2022	15	Revised judge contacts for Pratt & Whitney Valve Test (Event #1A and #1B)
03	04/12/2022	37	Removed event criteria for Abaris Training Composite Repair (Event #8), event has been cancelled for the 2022 competition.
03	04/12/2022	40-41	Removed and replaced Moeller Aerospace Click-Loc Challenge (Event #9) instructions with revised version, added additional penalty for not adhering to AC 43.13 or incorrect handling of FOD.
03	04/12/2022	42	Changed team members required for Engine Fan Blade Removal (Event #10) from 2 to 3 competitors.
03	04/12/2022	47	Changed team members required for Michelin Aircraft Tires Inspection (Event #12) from 1 to 2 competitors.
03	04/12/2022	54	Corrected hyperlink and reference to FAA general handbook (Event #16)
03	04/12/2022	56	Revised judge contacts for DMC Electrical Troubleshooting event (Event #17)
03	04/12/2022	55	Removed and replaced DMC wiring diagram with revised version to correct the contact part number's BIN code (correct number is 248, not 247) (Event #17)
03	04/12/2022	65	Revised judge contacts for U.S. Air force Flex Fluid Line Event (Event #25)
03	04/12/2022	73	Revised bonus and penalty assessments on Eastern Florida State Space Vacuum Loading (Event #26) to align with standard score sheet
04	04/13/2022	15 & 22	Revised note for Pratt and Whitney events. Teams 1-37 will complete Task #1(A), teams 38-74 will complete Task #1(B).

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