

**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

---

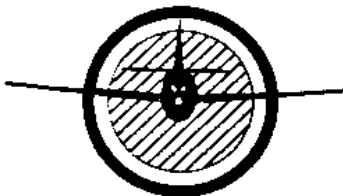
**AIRFRAME COURSE CURRICULUM**

---

**VOLUME 3**

**Revision #3 – June 07, 2019**

Exclusive Property  
Government of Puerto Rico  
Department of Education  
Occupational and Technical Education Program

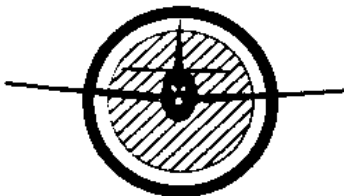


**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**RESTRICTED DATA**

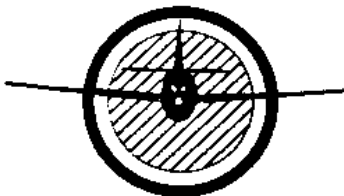
This data, furnished in connection with the request of the Federal Aviation Administration for the operation of Aviation Maintenance Technician Course in Puerto Rico Aviation Maintenance Institute, shall not be disclosed outside the Puerto Rico Department of Education, and shall not be duplicated, used on disclosed in whole or in part for any purpose other than to evaluate the course; provided that if is awarded to this office as result of or in connection with the submission of this data, the Government of Puerto Rico shall have the right to disclose the data the extent provided in contract between both agencies



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

<b>1</b>	<b>LIST OF EFFECTIVE PAGES</b>
<b>2</b>	<b>LOG OF REVISION</b>
<b>3</b>	<b>TABLE OF CONTENTS</b>
<b>4</b>	<b>AIRFRAME SCOPE</b>
<b>5</b>	<b>SCHEDULE OF REQUIRED TEST</b>
<b>6</b>	<b>GLOSSARY OF TERMS AND DEFINITIONS</b>
<b>7</b>	<b>TEXTBOOKS REQUIRED BY THE STUDENTS</b>
<b>8</b>	<b>CURRICULUM REQUIREMENTS</b>
<b>9</b>	<b>AIRFRAME CURRICULUM SUBJECTS</b>



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**LIST OF EFFECTIVE PAGES**

The following list shows all effective pages for the AIRFRAME COURSE CURRICULUM manuals. Added and revised pages are identified by the Revision No. and Date at the bottom corner. An asterisk (\*) to the left of the pages numbers indicate pages added, two asterisk (\*\*) deleted and three asterisk (\*\*\*) changed by the current revision.

Upon receipt of the first and subsequent revisions to this manual, the user should determine that all previous revisions have been received and incorporated. Action should be taken promptly if the manual is incomplete.

REVISION NO.	PAGE NO.	REVISION NO.	REVISION DATE
	I	REVISION 3	June 07, 2019
	II	REVISION 3	June 07, 2019
	LEP-1	REVISION 3	June 07, 2019
	LEP-2	REVISION 3	June 07, 2019
	LEP-3	REVISION 3	June 07, 2019
	LEP-4	REVISION 3	June 07, 2019
	LEP-5	REVISION 3	June 07, 2019
	LEP-6	REVISION 3	June 07, 2019
	LEP-7	REVISION 3	June 07, 2019
	LEP-8	REVISION 3	June 07, 2019
	LEP-9	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	LEP-10	REVISION 3	June 07, 2019
	LEP-11	REVISION 3	June 07, 2019
	LEP-12	REVISION 3	June 07, 2019
	LEP-13	REVISION 3	June 07, 2019
	LEP-14	REVISION 3	June 07, 2019
	LEP-15	REVISION 3	June 07, 2019
	LEP-16	REVISION 3	June 07, 2019
	LEP-17	REVISION 3	June 07, 2019
	LEP-18	REVISION 3	June 07, 2019
	LOR-1	REVISION 3	June 07, 2019
	TOC-1	REVISION 3	June 07, 2019
	TOC-2	REVISION 3	June 07, 2019
	TOC-3	REVISION 3	June 07, 2019
	TOC-4	REVISION 3	June 07, 2019
	TOC-5	REVISION 3	June 07, 2019
	TOC-6	REVISION 3	June 07, 2019
	TOC-7	REVISION 3	June 07, 2019
	TOC-8	REVISION 3	June 07, 2019
	TOC-9	REVISION 3	June 07, 2019
	TOC-10	REVISION 3	June 07, 2019
	TOC-11	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	TOC-12	REVISION 3	June 07, 2019
	TOC-13	REVISION 3	June 07, 2019
	TOC-14	REVISION 3	June 07, 2019
	TOC-15	REVISION 3	June 07, 2019
	TOC-16	REVISION 3	June 07, 2019
	TOC-17	REVISION 3	June 07, 2019
	TOC-18	REVISION 3	June 07, 2019
	1	REVISION 3	June 07, 2019
	2	REVISION 3	June 07, 2019
	3	REVISION 3	June 07, 2019
	4	REVISION 3	June 07, 2019
	5	REVISION 3	June 07, 2019
	6	REVISION 3	June 07, 2019
	7	REVISION 3	June 07, 2019
	8	REVISION 3	June 07, 2019
	9	REVISION 3	June 07, 2019
	10	REVISION 3	June 07, 2019
	11	REVISION 3	June 07, 2019
	12	REVISION 3	June 07, 2019
	13	REVISION 3	June 07, 2019
	14	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	15	REVISION 3	June 07, 2019
	16	REVISION 3	June 07, 2019
	17	REVISION 3	June 07, 2019
	18	REVISION 3	June 07, 2019
	19	REVISION 3	June 07, 2019
	20	REVISION 3	June 07, 2019
	21	REVISION 3	June 07, 2019
	22	REVISION 3	June 07, 2019
	23	REVISION 3	June 07, 2019
	24	REVISION 3	June 07, 2019
	25	REVISION 3	June 07, 2019
	26	REVISION 3	June 07, 2019
	27	REVISION 3	June 07, 2019
	28	REVISION 3	June 07, 2019
	29	REVISION 3	June 07, 2019
	30	REVISION 3	June 07, 2019
	31	REVISION 3	June 07, 2019
	32	REVISION 3	June 07, 2019
	33	REVISION 3	June 07, 2019
	34	REVISION 3	June 07, 2019
	35	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	36	REVISION 3	June 07, 2019
	37	REVISION 3	June 07, 2019
	38	REVISION 3	June 07, 2019
	39	REVISION 3	June 07, 2019
	40	REVISION 3	June 07, 2019
	41	REVISION 3	June 07, 2019
	42	REVISION 3	June 07, 2019
	43	REVISION 3	June 07, 2019
	44	REVISION 3	June 07, 2019
	45	REVISION 3	June 07, 2019
	46	REVISION 3	June 07, 2019
	47	REVISION 3	June 07, 2019
	48	REVISION 3	June 07, 2019
	49	REVISION 3	June 07, 2019
	50	REVISION 3	June 07, 2019
	51	REVISION 3	June 07, 2019
	52	REVISION 3	June 07, 2019
	53	REVISION 3	June 07, 2019
	54	REVISION 3	June 07, 2019
	55	REVISION 3	June 07, 2019
	56	REVISION 3	June 07, 2019



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	57	REVISION 3	June 07, 2019
	58	REVISION 3	June 07, 2019
	59	REVISION 3	June 07, 2019
	60	REVISION 3	June 07, 2019
	61	REVISION 3	June 07, 2019
	62	REVISION 3	June 07, 2019
	63	REVISION 3	June 07, 2019
	64	REVISION 3	June 07, 2019
	65	REVISION 3	June 07, 2019
	66	REVISION 3	June 07, 2019
	67	REVISION 3	June 07, 2019
	68	REVISION 3	June 07, 2019
	69	REVISION 3	June 07, 2019
	70	REVISION 3	June 07, 2019
	71	REVISION 3	June 07, 2019
	72	REVISION 3	June 07, 2019
	73	REVISION 3	June 07, 2019
	74	REVISION 3	June 07, 2019
	75	REVISION 3	June 07, 2019
	76	REVISION 3	June 07, 2019
	77	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	78	REVISION 3	June 07, 2019
	79	REVISION 3	June 07, 2019
	80	REVISION 3	June 07, 2019
	81	REVISION 3	June 07, 2019
	82	REVISION 3	June 07, 2019
	83	REVISION 3	June 07, 2019
	84	REVISION 3	June 07, 2019
	85	REVISION 3	June 07, 2019
	86	REVISION 3	June 07, 2019
	87	REVISION 3	June 07, 2019
	88	REVISION 3	June 07, 2019
	89	REVISION 3	June 07, 2019
	90	REVISION 3	June 07, 2019
	91	REVISION 3	June 07, 2019
	92	REVISION 3	June 07, 2019
	93	REVISION 3	June 07, 2019
	94	REVISION 3	June 07, 2019
	95	REVISION 3	June 07, 2019
	96	REVISION 3	June 07, 2019
	97	REVISION 3	June 07, 2019
	98	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	99	REVISION 3	June 07, 2019
	100	REVISION 3	June 07, 2019
	101	REVISION 3	June 07, 2019
	102	REVISION 3	June 07, 2019
	103	REVISION 3	June 07, 2019
	104	REVISION 3	June 07, 2019
	105	REVISION 3	June 07, 2019
	106	REVISION 3	June 07, 2019
	107	REVISION 3	June 07, 2019
	108	REVISION 3	June 07, 2019
	109	REVISION 3	June 07, 2019
	110	REVISION 3	June 07, 2019
	111	REVISION 3	June 07, 2019
	112	REVISION 3	June 07, 2019
	113	REVISION 3	June 07, 2019
	114	REVISION 3	June 07, 2019
	115	REVISION 3	June 07, 2019
	116	REVISION 3	June 07, 2019
	117	REVISION 3	June 07, 2019
	118	REVISION 3	June 07, 2019
	119	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	120	REVISION 3	June 07, 2019
	121	REVISION 3	June 07, 2019
	122	REVISION 3	June 07, 2019
	123	REVISION 3	June 07, 2019
	124	REVISION 3	June 07, 2019
	125	REVISION 3	June 07, 2019
	126	REVISION 3	June 07, 2019
	127	REVISION 3	June 07, 2019
	128	REVISION 3	June 07, 2019
	129	REVISION 3	June 07, 2019
	130	REVISION 3	June 07, 2019
	131	REVISION 3	June 07, 2019
	132	REVISION 3	June 07, 2019
	133	REVISION 3	June 07, 2019
	134	REVISION 3	June 07, 2019
	135	REVISION 3	June 07, 2019
	136	REVISION 3	June 07, 2019
	137	REVISION 3	June 07, 2019
	138	REVISION 3	June 07, 2019
	139	REVISION 3	June 07, 2019
	140	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	141	REVISION 3	June 07, 2019
	142	REVISION 3	June 07, 2019
	143	REVISION 3	June 07, 2019
	144	REVISION 3	June 07, 2019
	145	REVISION 3	June 07, 2019
	146	REVISION 3	June 07, 2019
	147	REVISION 3	June 07, 2019
	148	REVISION 3	June 07, 2019
	149	REVISION 3	June 07, 2019
	150	REVISION 3	June 07, 2019
	151	REVISION 3	June 07, 2019
	152	REVISION 3	June 07, 2019
	153	REVISION 3	June 07, 2019
	154	REVISION 3	June 07, 2019
	155	REVISION 3	June 07, 2019
	156	REVISION 3	June 07, 2019
	157	REVISION 3	June 07, 2019
	158	REVISION 3	June 07, 2019
	159	REVISION 3	June 07, 2019
	160	REVISION 3	June 07, 2019
	161	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	162	REVISION 3	June 07, 2019
	163	REVISION 3	June 07, 2019
	164	REVISION 3	June 07, 2019
	165	REVISION 3	June 07, 2019
	166	REVISION 3	June 07, 2019
	167	REVISION 3	June 07, 2019
	168	REVISION 3	June 07, 2019
	169	REVISION 3	June 07, 2019
	170	REVISION 3	June 07, 2019
	171	REVISION 3	June 07, 2019
	172	REVISION 3	June 07, 2019
	173	REVISION 3	June 07, 2019
	174	REVISION 3	June 07, 2019
	175	REVISION 3	June 07, 2019
	176	REVISION 3	June 07, 2019
	177	REVISION 3	June 07, 2019
	178	REVISION 3	June 07, 2019
	179	REVISION 3	June 07, 2019
	180	REVISION 3	June 07, 2019
	181	REVISION 3	June 07, 2019
	182	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	183	REVISION 3	June 07, 2019
	184	REVISION 3	June 07, 2019
	185	REVISION 3	June 07, 2019
	186	REVISION 3	June 07, 2019
	187	REVISION 3	June 07, 2019
	188	REVISION 3	June 07, 2019
	189	REVISION 3	June 07, 2019
	190	REVISION 3	June 07, 2019
	191	REVISION 3	June 07, 2019
	192	REVISION 3	June 07, 2019
	193	REVISION 3	June 07, 2019
	194	REVISION 3	June 07, 2019
	195	REVISION 3	June 07, 2019
	196	REVISION 3	June 07, 2019
	197	REVISION 3	June 07, 2019
	198	REVISION 3	June 07, 2019
	199	REVISION 3	June 07, 2019
	200	REVISION 3	June 07, 2019
	201	REVISION 3	June 07, 2019
	202	REVISION 3	June 07, 2019
	203	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	204	REVISION 3	June 07, 2019
	205	REVISION 3	June 07, 2019
	206	REVISION 3	June 07, 2019
	207	REVISION 3	June 07, 2019
	208	REVISION 3	June 07, 2019
	209	REVISION 3	June 07, 2019
	210	REVISION 3	June 07, 2019
	211	REVISION 3	June 07, 2019
	212	REVISION 3	June 07, 2019
	213	REVISION 3	June 07, 2019
	214	REVISION 3	June 07, 2019
	215	REVISION 3	June 07, 2019
	216	REVISION 3	June 07, 2019
	217	REVISION 3	June 07, 2019
	218	REVISION 3	June 07, 2019
	219	REVISION 3	June 07, 2019
	220	REVISION 3	June 07, 2019
	221	REVISION 3	June 07, 2019
	222	REVISION 3	June 07, 2019
	223	REVISION 3	June 07, 2019
	224	REVISION 3	June 07, 2019



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	225	REVISION 3	June 07, 2019
	226	REVISION 3	June 07, 2019
	227	REVISION 3	June 07, 2019
	228	REVISION 3	June 07, 2019
	229	REVISION 3	June 07, 2019
	230	REVISION 3	June 07, 2019
	231	REVISION 3	June 07, 2019
	232	REVISION 3	June 07, 2019
	233	REVISION 3	June 07, 2019
	234	REVISION 3	June 07, 2019
	235	REVISION 3	June 07, 2019
	236	REVISION 3	June 07, 2019
	237	REVISION 3	June 07, 2019
	238	REVISION 3	June 07, 2019
	239	REVISION 3	June 07, 2019
	240	REVISION 3	June 07, 2019
	241	REVISION 3	June 07, 2019
	242	REVISION 3	June 07, 2019
	243	REVISION 3	June 07, 2019
	244	REVISION 3	June 07, 2019
	245	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	246	REVISION 3	June 07, 2019
	247	REVISION 3	June 07, 2019
	248	REVISION 3	June 07, 2019
	249	REVISION 3	June 07, 2019
	250	REVISION 3	June 07, 2019
	251	REVISION 3	June 07, 2019
	252	REVISION 3	June 07, 2019
	253	REVISION 3	June 07, 2019
	254	REVISION 3	June 07, 2019
	255	REVISION 3	June 07, 2019
	256	REVISION 3	June 07, 2019
	257	REVISION 3	June 07, 2019
	258	REVISION 3	June 07, 2019
	259	REVISION 3	June 07, 2019
	260	REVISION 3	June 07, 2019
	261	REVISION 3	June 07, 2019
	261	REVISION 3	June 07, 2019
	262	REVISION 3	June 07, 2019
	263	REVISION 3	June 07, 2019
	264	REVISION 3	June 07, 2019
	265	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	266	REVISION 3	June 07, 2019
	267	REVISION 3	June 07, 2019
	268	REVISION 3	June 07, 2019
	269	REVISION 3	June 07, 2019
	270	REVISION 3	June 07, 2019
	271	REVISION 3	June 07, 2019
	272	REVISION 3	June 07, 2019
	273	REVISION 3	June 07, 2019
	274	REVISION 3	June 07, 2019
	275	REVISION 3	June 07, 2019
	276	REVISION 3	June 07, 2019
	277	REVISION 3	June 07, 2019
	278	REVISION 3	June 07, 2019
	279	REVISION 3	June 07, 2019
	280	REVISION 3	June 07, 2019
	281	REVISION 3	June 07, 2019
	282	REVISION 3	June 07, 2019
	283	REVISION 3	June 07, 2019
	284	REVISION 3	June 07, 2019
	285	REVISION 3	June 07, 2019
	286	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

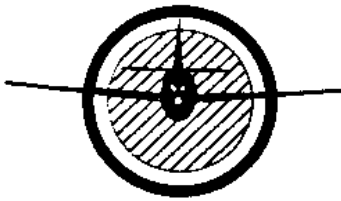
**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	287	REVISION 3	June 07, 2019
	288	REVISION 3	June 07, 2019
	289	REVISION 3	June 07, 2019
	290	REVISION 3	June 07, 2019
	291	REVISION 3	June 07, 2019
	292	REVISION 3	June 07, 2019
	293	REVISION 3	June 07, 2019
	294	REVISION 3	June 07, 2019
	295	REVISION 3	June 07, 2019
	296	REVISION 3	June 07, 2019
	A-1	REVISION 3	June 07, 2019
	A-2	REVISION 3	June 07, 2019
	A-3	REVISION 3	June 07, 2019
	A-4	REVISION 3	June 07, 2019
	A-5	REVISION 3	June 07, 2019
	A-6	REVISION 3	June 07, 2019
	A-7	REVISION 3	June 07, 2019
	A-8	REVISION 3	June 07, 2019
	A-9	REVISION 3	June 07, 2019
	A-10	REVISION 3	June 07, 2019
	A-11	REVISION 3	June 07, 2019

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**LIST OF EFFECTIVE PAGES, (Cont.)**

<b>REVISION NO.</b>	<b>PAGE NO.</b>	<b>REVISION NO.</b>	<b>REVISION DATE</b>
	A-12	REVISION 3	June 07, 2019
	A-13	REVISION 3	June 07, 2019
	A-14	REVISION 3	June 07, 2019
	A-15	REVISION 3	June 07, 2019



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

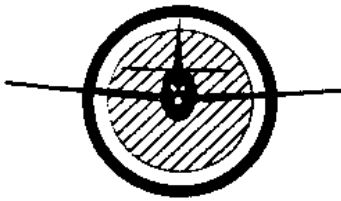
**LOG OF REVISIONS**

The Assistant Secretary of Occupational and Technical Education Program will submit revisions to the Airframe course curriculum manual to the Federal Aviation Administration for approval. The revision will be numbered consecutively. Upon receipt of revisions, the holder will revise the manual as indicated on the revision letter. When the required action is completed, the individual completing the action will write the revision number, sign and record the date the revision was entered, in the space provided below.

Changes to a page will be identified by using a bold italic font or a black bar alongside the paragraph either on the left or right side margins.

If any previous revisions missing, the holder of the Curriculum Manual will contact the General Course Coordinator prior to inserting any new revision or using the Curriculum Manual.

Rev. No	Entered by	Date	Rev. No	Entered by	Date
Revision 3	Jose H. Aponte/Mayda Igri Rosado / Prof. Ricardo Gomez / Prof. Raphael Torres / Prof. Angel Reyes	June 07, 2019			



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**TABLE OF CONTENTS**

---

	<u>Page</u>
<b>LIST OF EFFECTIVE PAGES</b>	LEP – 1 - 18
<b>LOG OF REVISION</b>	LOR – 1
<b>TABLE OF CONTENTS</b>	TOC – 1 - 18
<b>AIRFRAME SCOPE</b>	1 - 2
<b>SCHEDULE OF REQUIRED TEST</b>	3 - 4
<b>I. AIRFRAME STRUCTURES</b>	<b>5</b>
<b>A. WOOD STRUCTURE</b>	<b>5</b>
A. Inspection of Wood Structure	5
B. Service and Repair Wood Structures	5
C. Glues	5
D. Gluing	5 - 6
E. Spliced Joints	6
F. Plywood Skin Repairs	6
G. Spar and Rib Repairs	6
H. Bolt and Bushing Holes	6
I. Rib Repairs	6
J. Effect of Wood Shrinkage	6
K. Identify Protective Finishes	7

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
<b>PERFORMANCE GOALS – A. WOOD STRUCTURES</b>	<b>8</b>
1-A    Service and Repair Wood Structures	9
1-B    Service and Repair Wood Structures (Scarf)	9
2-A    Identify Wood Defects	9
3-A    Inspect Wood Structures	9
<b>PRACTICAL PROJECTS— A. WOOD STRUCTURES</b>	<b>10</b>
1-A    Service and Repair Wood Structures	11
1-B    Service and Repair Wood Structures	12
2-A    Identify Wood Defects	13
3-A    Inspect Wood Structures	14
<b>B.    AIRCRAFT COVERING</b>	<b>15</b>
A.    Aircraft Fabric Covering	15 - 16
B.    Covering Methods	16
C.    Recovering aircraft surface with Glass Cloth	16
D.    Repairs to Fabric and Fiberglass Covering	16
E.    Testing of Fabric Covering	17
F.    Inspection of Fabric	17
<b>PERFORMANCE GOALS – B. AIRCRAFT COVERING</b>	<b>18</b>
4-A    Select and Apply Fabric Covering Material	19
5-A    Inspect Test and Repair Fabric Covering	19
<b>PRACTICAL PROJECTS— B. AIRCRAFT COVERING</b>	<b>20</b>
4-A    Select and apply Fabric Covering Material	21
5-A    Inspect, Test and Repair fabric covering	22
<b>C. AIRCRAFT FINISHES</b>	<b>23</b>
A.    Finishing Materials	23
B.    Finishing Systems	24



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
C. Identification of Finishes	24
D. Paint Removal	24
E. Compatibility of Various Finishing Systems	24
F. Application Methods	25
G. Spray Primers, Dopes and Paints	25
H. Common Troubles in Dope Application	25
I. Common Troubles in Painting	25
J. Painting Trim and Registration Numbers	26
K. Decalcomanias	26
<b>PERFORMANCE GOALS – C. AIRCRAFT FINISHES</b>	<b>27</b>
6-A Apply Trim, Letters and Touch Up Paint	28
7-A Identify and Select Aircraft Finishing Materials	28
8-A Apply Finishing Materials	28
9-A Inspect Finishing and Identify Defects	28
<b>PRACTICAL PROJECT – C. AIRCRAFT FINISHES</b>	<b>29</b>
6-A Apply Trim, Letters and Touch-up Paint	30
7-A Identify and Select Aircraft Finishing Materials	31 - 32
8-A Apply Finishing Materials	33 - 34
9-A Inspect Finishes and Identify Defects	35 - 36
<b>D. SHEET METAL AND NON-METALLIC STRUCTURE</b>	<b>37</b>
A. Airframe Materials	37
B. Heat Treatment	37
C. Rivets	38
D. Shop Tools	38
E. Safety	38 - 39
F. Riveting	39

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>		<b>Page</b>
G.	Structure	39
H.	Sheet Metal Repair	39
I.	Bend Allowance and Setback	39 - 40
J.	Corrosion	40
K.	Special Rivets	40
L.	Forming Parts	40
M.	Transparent Enclosure	40
N.	Pressures Seals	40
O.	Seat and Safety Belt Mechanism	41
P.	Glass Cloth	41
Q.	Bonded Structure	41 - 43
R.	Transparent Plastic Materials	43 -44
<b>PERFORMANCE GOALS – D. SHEET METAL AND NON-METALLIC STRUCTURE</b>		<b>45</b>
10-A	Select, Install and Remove Special Fasteners for Metallic Bonded and Composite	46
11-A	Inspect, Bonded Structure	46
12-A	Inspect, Test and Repair Fiberglass, Plastics Composite and Laminated Primary and Secondary Structure	46 - 47
13-A	Inspect, Check, Service and Repair Windows, Door and Interior Furnishings	47
14-A	Inspect and Repair Sheet, Metal Structure	47 - 48
15-A	Install Conventional Rivets	48
16-A	Form, Lay out, and Bend Sheet Metal	48
<b>PRACTICAL PROJECT – C. AIRCRAFT FINISHES</b>		<b>49</b>
10-A	Select, Install and Remove, Special Fasteners for Metallic Bonded and Composite	50 - 51
11-A	Inspect, Bonded Structure	52

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b><u>Table of Contents (continued :)</u></b>	<b><u>Page</u></b>
12-A Inspect, Test and Repair Fiberglass, Plastics Composite and Laminated Primary and Secondary Structure	53 - 54
12-B Inspect, Test and Repair Fiberglass, Plastics, Composite and Laminated Primary and Secondary Structure	55 - 56
12-C Inspect, Test and Repair Fiberglass, Plastics, Composite and Laminated Primary and Secondary Structure	57 - 58
12-D Inspect, Test and Repair Fiberglass, Plastics, Composite and Laminated Primary and Secondary Structure	59 - 60
12-E Inspect, Test and Repair Fiberglass, Plastics, Composite and Laminated Primary and Secondary Structure	61 - 62
13-A Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings	63 - 64
13-B Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings	65 - 66
13-C Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings	67 - 68
13-D Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings	69 - 70
14-A Inspect and Repair Sheet, Metal Structure	71 - 72
14-B Inspect and Repair Sheet, Metal Structure	73 - 75
15-A Install Conventional Rivets	76 - 78
15-B Install Conventional Rivets	79 - 81
16-A Form, Lay out, and Bend Sheet Metal	82 - 83
<b>E. WELDING</b>	<b>84</b>
A. Types of Welding	84
B. Oxyacetylene Welding Equipment	84
C. Use of Gas Welding Equipment	84
D. Welding Position	85
E. Welded Joints	85

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
F. Correct Forming of a Weld	85
G. Oxyacetylene Welding of Ferrous Metals	85
H. Oxyacetylene Welding of Non-Ferrous Metals	85
I. Other Uses of the Oxyacetylene Flame	86
J. Soft Soldering	86
K. Electric Arc Welding	86
L. Techniques of Arc Welding	86
M. Welding Steel Aircraft Structure	87
<b>PERFORMANCE GOALS – E. WELDING</b>	<b>88</b>
17-A: Weld Magnesium and Titanium	89
18-A: Solder Stainless Steel	89
19-A: Fabricate Tubular Structure	89
20-A: Solder, Braze, Gas-Weld and Arc-Weld	89 - 90
21-A: Weld Aluminum and Stainless Steel	90
<b>PRACTICAL PROJECT – E. WELDING</b>	<b>91</b>
17-A Weld Magnesium and Titanium	92
18-A Solder Stainless Steel	93
19-A Fabricate Tubular Structure	94
20-A: Solder Braze, Gas-Weld and Arc-Weld Steel	95 - 96
20-B: Solder Braze, Gas-Weld and Arc-Weld Steel	97 - 98
20-C: Solder Braze, Gas-Weld and Arc- Weld Steel	99 - 100
20-D: Solder Braze, Gas-Weld and Arc-Weld Steel	101 - 102
20-E: Solder Braze, Gas-Weld and Arc-Weld Steel	103 - 104
21-A: Weld Aluminum and Stainless Steel	105
<b>F. ASSEMBLY AND RIGGING</b>	<b>106</b>
A. Use Correct Aircraft Nomenclature	106

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
B. Interpret Theory of Flight	106 - 107
C. Use Nomenclature Applicable to Rotary Wing Aircraft	107
D. Verify Alignment of Structures	107
E. Assembly Components	107
F. Identify Aircraft Control Cable	107 - 108
G. Install Swaged Cable Terminals	108
H. Verify Correct Control Response	108
I. Install and Tension a Control Cable, Inspect Cable Control System	108
J. Check Static Balance of a Control System	108 - 109
K. Inspect and Adjust Push-Pull Control Systems	109
L. Jacking Aircraft	109
<b>PERFORMANCE GOAL – F. ASSEMBLY AND RIGGING</b>	<b>110</b>
22-A: Rig rotary-Wing Aircraft	111
23-A: Rig Fixed-Wing Aircraft	111
24-A: Check Alignment of Structures	111
25-A: Assemble Aircraft Components, Including Flight Control Surface	111
26-A: Balance, Rig and Inspect Moveable Primary and Secondary Flight Control Surface	112
27-A: Jack Aircraft	112
<b>PRACTICAL PROJECTS – F. ASSEMBLY AND RIGGING</b>	<b>113</b>
22-A Rig rotary-Wing Aircraft	114
23-A: Rig Fixed- Wing Aircraft	115 - 116
23-B: Rig Fixed-Wing Aircraft	117 - 118
24-A: Check Alignment of Structure	119 - 120
25-A: Assembly Aircraft Component, Including Flight Control Surfaces	121

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
26-A: Balance, Ring and Inspect Movable Primary And Secondary Flight Control Surface	122 - 123
26-B: Balance, Ring and Inspect Movable Primary and Secondary Flight Control Surface	124 - 125
27-A: Jack Aircraft	126 - 127
<b>G. AIRFRAME INSPECTION</b>	<b>128</b>
A. Purpose	128
B. Types	128
C. 100 Hours and Annual Inspection	128 - 129
D. Rotorcraft Inspection	129
E. Inspection Procedure	129
<b>PERFORMANCE GOALS – G. AIRFRAME INSPECTION</b>	<b>130</b>
28-A: Perform Airframe Conformity and Airworthiness Inspections	131
<b>PRACTICAL PROJECT – G. AIRFRAME INSPECTION</b>	<b>132</b>
28-A: Perform Airframe Conformity and Airworthiness Inspections	133
28-B: Perform Airframe Conformity and Airworthiness Inspections	135 - 136
<b>II. AIRFRAME SYSTEM AND COMPONENTS</b>	
<b>A. AIRCRAFT LANDING GEAR SYSTEM</b>	<b>137</b>
A. Landing Gear Arrangement	137
B. Shock struts	137 - 139
C. Main Landing Gear Alignment, Support, Retraction and Safety Devices	139
D. Nose Wheel Steering System	140
E. Shimmy Dampers	140
F. Brake System	141
G. Brake Assemblies	141 - 142
H. Inspection and Maintenance of Brake System	142 - 144

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>		<b>Page</b>
I.	Aircraft Landing Wheels	144
J.	Aircraft Tires and Tubes	144 - 146
K.	Brake Anti-Skid Systems	146 -148
L.	Landing Gear Systems Main	146
<b>PERFORMANCE GOALS – A. AIRFRAME LANDING GEAR SYSTEM</b>		<b>149</b>
29:	Inspect, Check, Service and Repair Landing Gear, Retraction Systems, Shock Struts, Brakes Wheels, Tires and Steering System	150 - 151
<b>PRACTICAL PROJECT – A. AIRCRAFT LANDING GEAR SYSTEM</b>		<b>152</b>
29-A:	Inspect, Check, Service and Repair Landing Gear Retraction System, Shock Struts Brakes, Wheels, Tires And Steering System	153 - 154
29-B:	Inspect, Check, Services and Repair Landing Gear Retraction System, shock Struts, Brakes, Wheels, Tires and Steering System	155 - 156
29-C:	Inspect, Check, Service and Repair Landing Gear Retraction System, Shock Struts, Brakes, Wheels, Tires and Steering System	157 - 158
29-D:	Inspect, Check, Services and Repair Landing Gear Retraction System, Shock Struts, Brakes, Wheels, Tires and Steering System	159 - 160
29-E:	Inspect, Check, Services and Repair Landing Gear Retraction System, Shock Struts, Brakes, Wheels, Tires and Steering System	161 - 162
29-F:	Inspect, Check, Service and Repair Landing Gear Retraction System, Shock Struts, Brakes, Wheels, Tire and Steering System	163 - 164
29-G:	Inspect, Check, Service and Repair Landing Gear Retraction System, Shock Struts, Brakes, Wheels, Tires and Steering System	165 - 166
<b>B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS</b>		<b>167</b>
A.	Identify and Select Hydraulic Fluids	167 - 168
B.	Select and Install Seals	168 – 169

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
C. Compare Constant, Pressure and Open Center Types of Hydraulic Systems	169
D. Interpret Information Pertaining to Servicing Hydraulic Reservoirs	169 - 171
E. Interpret Information Pertaining to Servicing Hydraulic Reservoirs	171
F. Identify and Describe the Operation of Constant And Variable Displacement Hydraulic Pumps	171 - 172
G. Check, Inspect, Remove and Install Hydraulic Power Pumps	172
H. Inspect Service and Check a Hydraulic Accumulator	172
I. Troubleshoot and Determine the Cause of Low, High or Fluctuating System Hydraulic Power Pumps	172 - 173
J. Inspect, Check and Service Hydraulically Operated System	173
K. Interpret Reference Information Pertaining to Operation Of Basic Pneumatic System Components	173 - 174
<b>PERFORMANCE GOALS – B. HYDRAULIC AND PNEUMATIC POWER SYSTEM</b>	<b>175</b>
30-A: Repair Hydraulic and Pneumatic Power Systems Components	176
31-A: Identify and Select Hydraulic Fluids	176
32-A: Inspect, Check, Service, Troubleshoot and Repair Hydraulic and Pneumatic Power System	176
<b>PRACTICAL PROJECTS – B. HYDRAULIC AND PNEUMATIC POWER</b>	<b>177</b>
30-A: Repair Hydraulic and Pneumatic Power System Component	178 - 179
31-A: Identify and Select Hydraulic Fluid	180 - 181
31-B: Identify and Select Hydraulic Fluid	182
32-A: Inspect, Check, Service, Troubleshoot and Repair Hydraulic and Pneumatic Power System	183 - 184
32-B: Inspect, Check, Service, Troubleshoot and Repair Hydraulic and Pneumatic Power System	185 - 186



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>		<b>Page</b>
<b>C.</b>	<b>CABIN ATMOSPHERE CONTROL SYSTEM</b>	<b>187</b>
A.	Oxygen and Atmosphere	187
B.	Air Conditioning and Pressurization Terminology	187 - 188
C.	Sources of Cabin Pressure	188
D.	Pressurization Controls	188
E.	Air Distribution	188
F.	Combustion Heaters	189
G.	Air Cycle Cooling Systems	189
H.	Air Cycle Cooling Components	189
I.	Electronic Temperature Controls	189
J.	Vapor Cycle Systems	190
K.	Vapor Cycle System Components	190
L.	Servicing Vapor Cycle System	190
M.	Oxygen System-General	190 - 191
N.	Oxygen Valves	191
O.	Oxygen Regulators	191
P.	Oxygen System Components	191
Q.	Servicing Gaseous Oxygen System	191 - 192
<b>PERFORMANCE GOALS – C. CABIN ATMOSPHERE CONTROL SYSTEM</b>		<b>193</b>
33-A:	Inspect, Check, Troubleshoot, Service and Repair Heating, Cooling, Air Conditioning Pressurization Systems and Air Cycle Machines	194
34-A:	Inspect, Check, Troubleshoot, Service and Repair Vapor Cycle Freon System	194
35-A:	Inspect, Check, Troubleshoot, Service and Repair Oxygen System	194

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b><u>Table of Contents (continued :)</u></b>		<b><u>Page</u></b>
<b>PRACTICAL PROJECTS – C. CABIN ATMOSPHERE CONTROL SYSTEM</b>		<b>195</b>
33-A	Inspect, Check, Troubleshoot, Service and Repair Heating, Cooling, Air Conditioning Pressurization Systems, and Air Cycle Machines	196
34-A	Inspect, Check, Troubleshoot, Service and Repair Vapor Cycle Freon System	197
35-A:	Inspect, Check, Troubleshoot, Service and Repair Heating, Cooling, Conditioning Pressurization System and Air Cycle Machines	198 - 199
<b>D.</b>	<b>AIRCRAFT INSTRUMENT SYSTEM</b>	<b>200</b>
A.	Aircraft Instrument Systems	200
B.	Handling and Storage Instruments	200 - 201
C.	Inspect aircraft Instrument Systems	201
D.	Check, Troubleshoot and Repair Aircraft Instrument System	201 - 202
<b>PERFORMANCE GOALS – D. AIRCRAFT INSTRUMENT SYSTEM</b>		<b>203</b>
36-A:	Inspect, Check, Serve, troubleshoot and Repair Electronic Flight Instrument Systems and Both Mechanical and Electrical Heading, Speed Altitude, Temperature, Pressure and Position Indicating Systems to Include the Use of Built-in-Test Equipment (B.I.T.E.)	204
37-A:	Install Instruments and Perform a Static Pressure System Leak Test	204
<b>PRACTICAL PROJECT – D. AIRCRAFT INSTRUMENT SYSTEM</b>		<b>205</b>
36-A	Inspect, Check, Serve, troubleshoot and Repair Electronic Flight Instrument Systems and Both Mechanical and Electrical Heading, Speed Altitude, Temperature, Pressure and Position Indicating Systems to Include the Use of Built-in-Test Equipment (B.I.T.E.)	206 - 207
37-A:	Install Instrument and Perform a Static Pressure System Leak Test	208 - 209

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>		<b>Page</b>
<b>E.</b>	<b>COMMUNICATION AND NAVIGATION SYSTEM</b>	<b>210</b>
A.	Basic Radio Principles	210
B.	Basic Equipment Components	210
C.	Communication System	210
D.	Navigation Equipment	210 - 211
E.	Emergency Locator Transmitters	211
F.	Equipment Installations	211
G.	Minimizing Radio Interference	211 - 212
H.	Aircraft Antenna Installation	212
I.	FCC Regulation Pertaining to Two-Way Radio Operation	212
	<b>PERFORMANCE GOALS – E. COMMUNICATION AND NAVIGATION SYSTEMS</b>	<b>213</b>
38-A:	Inspect, Check and Troubleshoot, Autopilot, Services and Approach Coupling Systems	214
39-A:	Inspect, Check and Service Aircraft Electronic Communications and Navigation Systems, Including VHF Passenger Address Interphones and Static: Discharge Devices, Aircraft VOR, ILS, LORAN, Computers and GPWS	214
40-A:	Inspect and Repair Antenna and Electronic Equipment Installations	214
	<b>PRACTICAL PROJECTS – E. COMMUNICATION AND NAVIGATION SYSTEM</b>	<b>215</b>
38-A	Inspect, Check and Troubleshoot, Autopilot, Services and Approach Coupling Systems	216
39-A	Inspect, Check and Service Aircraft Electronic Communications and Navigation Systems, Including VHF Passenger Address Interphones and Static: Discharge Devices, Aircraft VOR, ILS, LORAN, Computers and GPWS	217

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
40-A: Inspect and Repair Antenna and Electronic Equipment Installation	218
<b>F. AIRCRAFT FUEL SYSTEM</b>	<b>219</b>
A. Fuel Lines and Fittings	219
B. Fuel System Contamination	219 - 220
C. Aircraft Fuel System	220
D. Fuel System Components	220 -223
E. Multiengine Fuel System	223
F. Troubleshooting the Fuel System	223
G. Fuel Tank Repairs	223 - 224
H. Fire Safety Precautions	224
I. Fuel Dump System	225
<b>PERFORMANCE GOALS – F. AIRCRAFT FUEL SYSTEM</b>	<b>226</b>
41-A: Check and Service Fuel Dump system	227
42-A: Perform Fuel Management, Transfer, and De-Fueling	227
43-A: Inspect, Check and Repair Pressure Fueling	227
44-A: Repair Aircraft Fuel System Components	227
45-A: Inspect and Repair Fluid Quantity Indicating System and	228
46-A: Troubleshoot, Service and Repair Fluid Pressure Temperature Warning System	228
47-A: Inspect, Check, Service, Troubleshoot and Repair Aircraft Fuel System	228
<b>PRACTICAL PROJECTS – F. AIRCRAFT FUEL SYSTEM</b>	<b>229</b>
41-A Check and Service Fuel Dump system	230
42-A Perform Fuel Management, Transfer, and De-Fueling	231
43-A Inspect, Check and Repair Pressure Fueling	232
44-A: Repair Aircraft Fuel System Components	233

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
45-A: Inspect and Repair Fluid Quantity Indicating System	234
46-A: Troubleshoot, Service and Repair Fluid Pressure and Temperature Warning System	235
46-B: Troubleshoot, Service and Repair Fluid Pressure and Temperature Warning System	236
47-A: Inspect, Check, Service Troubleshoot and Repair Aircraft Fuel System	237
47-B: Inspect, Check, Service, Troubleshoot and Repair Aircraft Fuel System	238 -239
<b>G. AIRCRAFT ELECTRICAL SYSTEM</b>	<b>240</b>
A. Types and Characteristics of Aircraft Fuses, Circuits Breakers and Switches	240
B. Select and Install Aircraft Electrical Switches and Wiring to Components	240
C. Installation Requirements and Characteristics for Aircraft Electrical Wiring Systems and Junction Boxes	241
D. Install Electrical Terminals, Splices and Bonding Jumpers	241
E. Install Aircraft Electrical Wiring in a Conduct	241 - 242
F. Check and Connect Quick-Disconnect Plugs and Receptacles	242
G. Protect Electrical Emergency Switches Against Accidental Actuation	242
H. Check, Troubleshoot and Repair Aircraft DC Generator Electrical System	242
I. Methods of Providing AC in Aircraft Having only DC Electrical System	243
J. Troubleshoot and Repair a DC Electrical System Supplied by an Alternator	243
K. Characteristics and Advantages of AC Aircraft Electrical System	243
L. Identify Components and Operating Elements of 115/200 Volt AC Aircraft Electrical System	244

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>		<b>Page</b>
M.	Repair Aircraft Electrical System Components	244
N.	Inspect Installation and Check Circuit of Anti-collision and Position Lights	244
O.	Inspect, Check and Repair Landing and Taxi Light Installation	244 - 245
P.	Inspect, Check, Service and Repair Aircraft Interior Lighting Installation	245
Q.	Inspect, Check, Service and Repair Cockpit Lights and Lighting Circuits	245
R.	Inspect, Check, Service and Repair Passenger Lights and Lighting Circuits	245
S.	Inspect and Check Electrical Equipment Installations for Electrical Component Replacement	245
T.	Locate Replacement and Parts Numbers for Electrical Components Replacements	246
<b>PERFORMANCE GOALS – G. AIRCRAFT ELECTRICAL SYSTEM</b>		<b>247</b>
48-A:	Repair and Inspect Aircraft Electrical System Components Crimp and Splice Wiring to Manufacturer's Specifications; and repair Pins and Sockets of Aircraft Connections	248
49-A:	Install, Check and Service Airframe Electrical Wiring Controls, Switches, Indicators and Protective Devices	248
50-A:	Inspect, Check, Troubleshoot, Service and Repair Alternating Current and Direct Current Electrical System	248
50-B:	Inspect, Check and Troubleshoot Constant Speed and Integrated Speed Drive Generators	249
<b>PRACTICAL PROJECT – G. AIRCRAFT ELECTRICAL SYSTEM</b>		<b>250</b>
48-A:	Repair and Inspect Aircraft Electrical System	251 - 252
49-A:	Install, Check and Service Airframe	253 - 254
50-A:	Inspect, Check, Troubleshoot, Service and Repair Alternating Current and Direct Current Electrical Systems	255

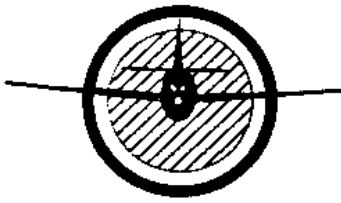
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b>Table of Contents (continued :)</b>	<b>Page</b>
50-B: Inspect, Check, troubleshoot, Service and Integrated Speed Drive Generators	256
<b>H. POSITIONS AND WARNING SYSTEM</b>	<b>257</b>
A. Warning System	257
B. Anti-Skid Control System	257
C. Position Indicating System	258
<b>PERFORMANCE GOALS – H. POSITION AND WARNING SYSTEM</b>	<b>259</b>
51-A: Inspect, Check and Service Speed and Configuration Warning Systems, Electrical Brake Controls and Anti-Skid System	260
52-A: Inspect, Check Troubleshoot and Service Landing Gear Position Indicating and Warning Systems	260
<b>PRACTICAL PROJECT – H. POSITION AND WARNING SYSTEM</b>	<b>261</b>
51-A: Inspect, Check and Service Speed and Configuration Warning Systems, Electrical Brake Controls and Anti-Skid System	262 - 263
52-A: Inspect, Check, Troubleshoot and Service Landing Gear Position Indicating and Warning System	264 - 265
<b>I. ICE AND RAIN CONTROL SYSTEM</b>	<b>266</b>
A. General Effects of Ice	266
B. Pneumatic Deicing System	266 - 269
C. Thermal Anti-Icing System	269 - 270
D. Windshield Icing Control System	270
E. Miscellaneous Anti-Ice, Deice System	270
F. Rain Eliminating System	270 - 271
<b>PERFORMANCE GOALS – I. ICE AND RAIN CONTROL SYSTEM</b>	<b>272</b>
53-A: Inspect, check, Troubleshoot, Service and Repair Airframe Ice and Rain Control System	273

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

<b><u>Table of Contents (continued :)</u></b>	<b><u>Page</u></b>
<b>PRACTICAL PROJECT – I. ICE AND RAIN CONTROL SYSTEM</b>	<b>274</b>
53-A:    Inspect, Check, Troubleshoot, Service and Repair Airframe Ice and Rain Control System	275 - 276
<b>J.    FIRE PROTECTION SYSTEM</b>	<b>277</b>
A.        General	277
B.        Fire Detection System	277
C.        Fire Extinguishing Agents	277 - 278
D.        Fire Extinguishing Systems	278
E.        Fire Protection System Inspection and Maintenance	278
F.        Cockpit and Cabin Interiors	278 - 279
<b>PERFORMANCE GOALS – J. FIRE PROTECTION SYSTEM</b>	<b>280</b>
54-A:    Inspect, Check, Service Smoke and Carbon Monoxide Detection System	281
55-A:    Inspect, Check, Service, Troubleshoot and Repair Aircraft Fire Detection and Extinguishing System	281
<b>PRACTICAL PROJECT – J. FIRE PROTECTION SYSTEM</b>	<b>282</b>
54-A:    Inspect, Check, Service Smoke and Carbon Monoxide Detection System	283
55-A:    Inspect, Check, Service, troubleshoot and Repair Aircraft Fire Detection and Extinguishing	284 - 285
55-B:    Inspect, Check, Service, troubleshoot and Repair Fire Detection and Extinguishing System	286
<b>GLOSSARY OF TERMS AND DEFINITIONS</b>	<b>287 - 289</b>
<b>TEXTBOOKS REQUIRED BY THE STUDENTS</b>	<b>290</b>
<b>CURRICULUM REQUIREMENTS</b>	<b>291</b>
<b>AIRFRAME CURRICULUM SUBJECTS</b>	<b>292 - 296</b>
<b>STUDENT WORKBOOK – PRACTICAL PROJECT RECORD.</b>	<b>A-1 – A-15</b>





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

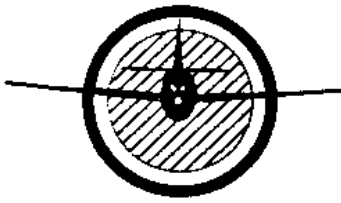
**AIRFRAME SCOPE**

SUBJECTS	THEORY	SHOP LAB	TOTAL HOURS
<b>I. AIRFRAME STRUCTURE</b>			
A. Wood Structures	6	6	12
B. Aircraft Covering	6	6	12
C. Aircraft Finishes	12	12	24
D. Sheet Metal and Non-Metallic Structures	66	96	162
E. Welding	18	24	42
F. Assembly and Rigging	24	48	72
G. Airframe Inspections	12	24	36
<b>II. AIRFRAME SYSTEMS AND COMPONENTS</b>			
A. Aircraft Landing Gear Systems	28	44	72
B. Hydraulic and Pneumatic Power Systems	18	30	48
C. Cabin Atmosphere Control Systems	18	12	30
D. Aircraft Instrument Systems	12	12	24

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**AIRFRAME SCOPE (continued :)**

<b>SUBJECTS</b>	<b>THEORY</b>	<b>SHOP LAB</b>	<b>TOTAL HOURS</b>
E. Communication and Navigation Systems	18	18	36
F. Aircraft Fuel System	12	24	36
G. Aircraft Electrical System	48	60	108
H. Position and Warning System	6	12	18
I. Ice and Rain Control System	9	9	18
J. Fire Protection	6	6	12
K. Final Curriculum Review	0		0
<b>TOTALS</b>	<b>319</b>	<b>443</b>	<b>762</b>

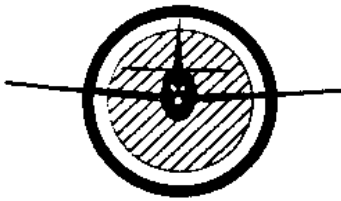


**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**SCHEDULE OF REQUIRED TEST**

<b>SUBJECTS</b>	<b>No. Written Test</b>	<b>Number of Hours</b>
<b>I. AIRFRAME STRUCTURES</b>		
A. Wood Structures	1	1
B. Aircraft Covering	1	1
C. Aircraft Finishes	1	1
D. Sheet Metal and Non-Metallic Structures	3	5
E. Welding	1	1
F. Assembly and Rigging	1	2
G. Airframe Inspection	1	1
<b>II. AIRFRAME SYSTEMS AND COMPONENTS</b>		
A. Airframe Landing Gear Systems	1	2
B. Hydraulic and Pneumatic Power Systems	1	1
C. Cabin Atmosphere Control Systems	1	1
D. Aircraft Instrument Systems	1	1
E. Communication and Navigation Systems	1	2

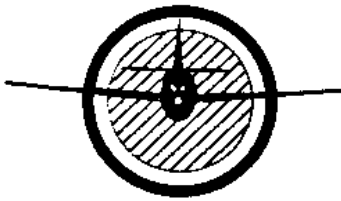


**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**SCHEDULE REQUIRED TEST (Cont.)**

<b>SUBJECTS</b>	<b>No. Written Test</b>	<b>Number of Hours</b>
F. Aircraft Fuel Systems	1	1
G. Aircraft Electrical Systems	2	4
H. Position and Warning Systems	1	1
I. Ice and Rain Control Systems	1	1
J. Fire Protection	1	1
<b>TOTAL</b>	<b>20</b>	<b>27</b>



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**I. AIRFRAME STRUCTURES**

**A. WOOD STRUCTURES**

**TOTAL HOURS: 12                      THEORY: 6                      SHOP/LAB: 6**

---

**A. INSPECTION OF WOOD STRUCTURES**

1. Glued Joint Inspection
2. Use of Magnifying Glass and Feeler Gauge
3. Wood Condition

**B. SERVICE AND REPAIR OF WOOD STRUCTURES**

1. Materials
2. Forms of Wood Used in Aircraft Structure
3. Species of Wood
4. Permissible Defects and Their Identification
5. Defects Not Permitted and Their Identification

**C. GLUES**

1. Casein Glues and Preservatives
2. Resin Glues

**D. GLUING**

1. Effect of Moisture Content on Joint Strength

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

2. Effect of Temperature on joint Strength
3. Explain “Open” and “Closed” Assembly Time
4. Use of Pressure Blocks and Clamps
5. Testing Glued Joints

**E. SPLICED JOINTS**

1. Making a Scarf Joint

**F. PLYWOOD SKIN REPAIRS**

1. Flush Patch
2. Plug Patch
3. Splayed Patch
4. Scarf Patch – Preferred Repair
5. Fabric Patch

**G. SPAR AND RIB REPAIR**

1. Use of Reinforcement Plates
2. Location of Splices

**H. BOLT AND BUSHING HOLES**

1. Methods of Repairing Elongated Bolt Holes in Spars
2. Use of Bushings to Minimize Elongation

**I. RIB REPAIRS**

1. Repairs to Cap Strips
2. Repairs to Trailing Edge

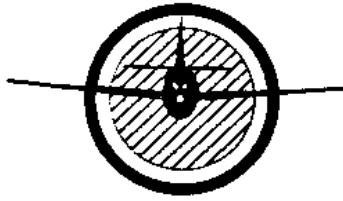
**J. EFFECTS OF WOOD SHRINKAGE**

1. Dimensional Changes in Various Directions
2. Repairs to Trailing Edges

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**K. IDENTIFY PROTECTIVE FINISHES**

1. Protective Finish for End Grain of Spars
2. Importance of Dope-proof Finishes

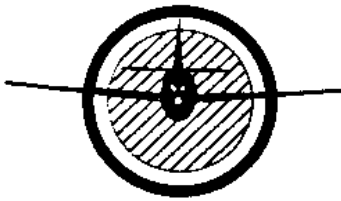


**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Performance Goals**





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**Performance Goals**

**I. AIRFRAME STRUCTURES**

**A. WOOD STRUCTURES**

**LEVEL**

**1: SERVICE AND REPAIR WOOD STRUCTURES (1)**

1-A. Using AC 43.13-1B (as revised) and list of five types of wood, select two substitute woods that exceed the strength properties of aircraft spruce.

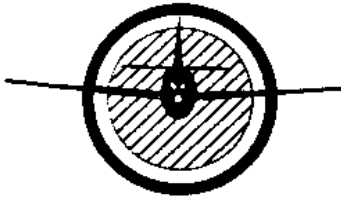
1-B. Using AC 43.13-1B (as revised) and information sheet containing sketches without dimensions of typical scarf joints, insert the dimensions to the sketches and determine the ratio dimensions.

**2: IDENTIFY WOOD DEFECTS (1)**

2-A. Using a sample of aircraft wood; identify the wood and describe the strength characteristics.

**3: INSPECT WOOD STRUCTURES (1)**

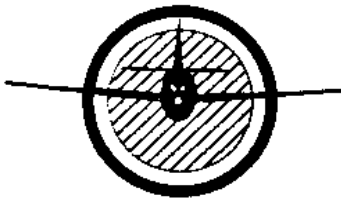
3-A. Using AC 43.13 1B (as revised) and given information, identify different species forms of aircraft wood



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Wood Practical Projects**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**A. WOOD STRUCTURES**

**1-A: SERVICE AND REPAIR WOOD STRUCTURES**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 1.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify the types of woods used in aviation.

**REFERENCES:**

1. AC 43:13-1B/2B (as revised) Acceptable methods, techniques and practices.

**EQUIPMENT AND TOOLS REQUIRED:**

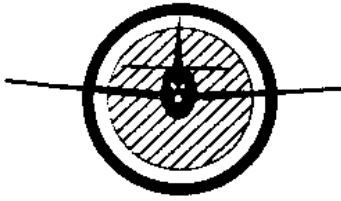
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

N/A

**PROCEDURES:**

Using AC 43.13-1B/2B (as revised) and list of five types of wood, select two substitute woods that exceed the strength properties of aircraft spruce.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**A. WOOD STRUCTURES**

**1-B: SERVICE AND REPAIR WOOD STRUCTURES**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 1.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to measure and determine ratio dimension of scarf joints.

**REFERENCES:**

1. AC 43:13-1B (as revised) Acceptable methods, techniques and practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

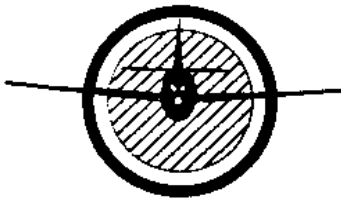
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Sample of Wood Splice

**PROCEDURES:**

Using AC 43.13-1B (as revised) and information sheet containing sketches without dimensions of typical scarf joints insert the dimensions to the sketches and determine the ratio dimensions.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**A. WOOD STRUCTURES**

**2-A: IDENTIFY WOOD DEFECTS**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify and select aircraft wood.

**REFERENCES:**

1. AC 43.13-1B (as revised) Acceptable methods, techniques and practices
2. FAA-H-8083-31A Airframe Handbook.

**EQUIPMENT AND TOOLS REQUIRED:**

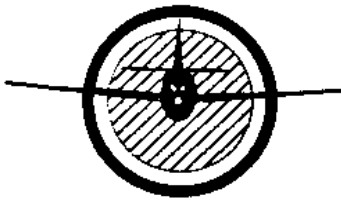
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Samples of woods.

**PROCEDURES:**

Using a sample of aircraft wood; identify the wood and describe the strength characteristics.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**A. WOOD STRUCTURES**

**3-A: INSPECT WOOD STRUCTURES**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify and select aircraft wood

**REFERENCES:**

1. AC 43.13-1B (as revised) Acceptable methods, techniques and practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

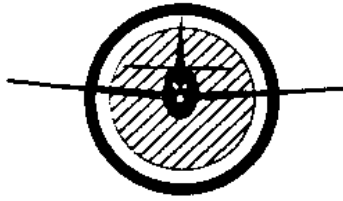
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Samples of wood

**PROCEDURES:**

Using AC 43.13 1B (as revised) and given information, identify different species forms of aircraft wood



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**I. AIRFRAME STRUCTURES**

**B. AIRCRAFT COVERING:**

<b>TOTAL HOURS:</b>	<b>12</b>	<b>THEORY:</b>	<b>6</b>	<b>SHOP/LAB:</b>	<b>6</b>
---------------------	-----------	----------------	----------	------------------	----------

---

**A. AIRCRAFT FABRIC COVERING**

1. Textile Fabric Used in Aircraft Covering
  - a. Cotton Fabrics
  - b. Linen Fabrics
  - c. Synthetic Fabrics
  - d. Glass Cloth
2. Miscellaneous Textile Materials
  - a. Reinforcing Tape
  - b. Surface Tape
  - c. Lacing Cord
  - d. Sewing Thread
  - e. Special Fasteners
3. Preparation of the Structure for Covering
  - a. Dope-proofing
  - b. Chafe Points

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- c. Inter-rib Lacing
- d. Preparations of Plywood Surface for Covering
  - 1) Cleaning
  - 2) Applications of Sealer and Dope

**B. COVERING METHODS**

- 1. The envelope Method
- 2. The Blanket Method
- 3. Reinforcing Tape
  - a. Use of Anti-tear strips
- 4. Lacing
  - a. Double Loop Lacing
  - b. Fuselage Lacing
- 5. Surface Tape

**C. RECOVERING AIRCRAFT SURFACE WITH GLASS CLOTH**

- 1. Advantage of Glass Cloth
- 2. Classes of Glass Cloth Covering
- 3. Recommended Practices and Applications Methods

**D. REPAIRS TO FABRIC AND FIBERGLASS COVERING**

- 1. Repairs to Tears in Fabric
- 2. Sewed Patch Repair
- 3. Doped-on Repair
- 4. Repair by a Doped-in Panel
- 5. Repair of Fiberglass Covering



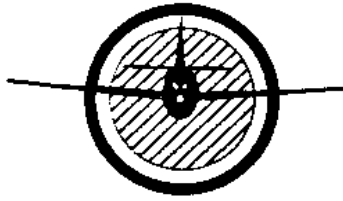
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**E. TESTING OF FABRIC COVERING**

1. Strength Criteria for Aircraft Fabric
2. Tensile Testing of Undoped Fabric
3. Punch Testing of Aircraft Fabric

**F. INSPECTION OF FABRIC**

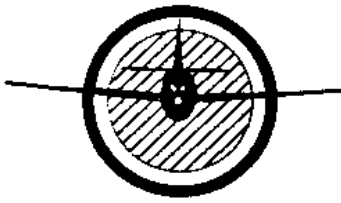
1. Causes of Fabric Deterioration
  - a. Mildew
  - b. Acid Dopes Film
  - c. Insufficient Dope Film
  - d. Storage Condition
2. Checking Conditions of Dope Fabric
  - a. Areas Selected for Test



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Performance Goals**



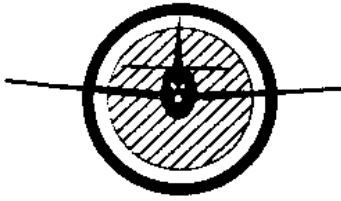
**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**I. AIRFRAME STRUCTURES**

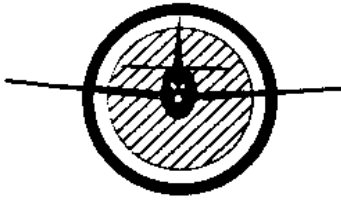
<b>B. AIRCRAFT COVERING</b>	<b><u>LEVEL</u></b>
<b>4: SELECT AND APPLY FABRIC AND FIBERGLASS COVERING MATERIALS</b>	<b>(1)</b>
A. Using AC 43.13-1B/2B (as revised), samples of cotton, linen and synthetic textile materials and samples of dopes and sewn seams, identify the samples sawed and the correct fabric to be used when the airspeed and wing loading is specified by the instructor.	
<b>5: INSPECT, TEST, AND REPAIR FABRIC AND FIBERGLASS</b>	<b>(1)</b>
A. Using AC 43.13-1B/2B (as revised), a fabric tester, and a fabric covered aircraft or structure and the materials and tools necessary to make a repair, perform a fabric strength test and make a doped or sewn repair.	



**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Practical Projects**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**B. AIRCRAFT COVERING**

**4-A: SELECT AND APPLY FABRIC AND FIBERGLASS COVERING MATERIALS**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify and select aircraft fabric.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable methods, techniques and practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

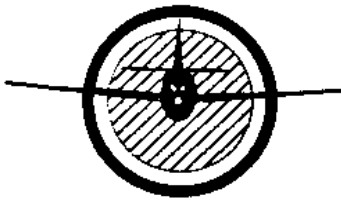
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Samples of Fabric (Cotton, linen, and synthetic textile material)
2. Samples of Dope

**PROCEDURES:**

Using AC 43.13-1B (as revised), samples of cotton, linen and synthetic textile materials and samples of dopes and sewed seams, identify the samples sawed and the correct fabric to be used when the airspeed and wing loading is specified by the instructor



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**B. AIRCRAFT COVERING**

**5-A: INSPECT, TEST, AND REPAIR FABRIC AND FIBERGLASS**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify and select aircraft fabric.

**REFERENCES:**

1. AC 43:13-1B/2B(as revised) Acceptable methods, techniques and practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

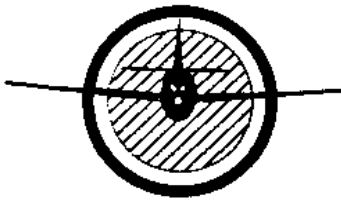
1. Fabric Tester

**SUPPLIES AND MATERIALS REQUIRED:**

1. Fabric covered control surface

**PROCEDURES:**

Using AC 43.13-1B (as revised), a fabric tester, and a fabric covered aircraft or structure and the materials and tools necessary to make a repair, perform a fabric strength test and make a doped or sew repair.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**I. AIRFRAME STRUCTURES**

**C. AIRCRAFT FINISHES**

<b>TOTAL HOURS:</b>	<b>24</b>	<b>THEORY:</b>	<b>12</b>	<b>SHOP/LAB:</b>	<b>12</b>
---------------------	-----------	----------------	-----------	------------------	-----------

---

**A. FINISHING MATERIALS**

1. Acetone
2. Alcohol
3. Benzene
4. Thinners
5. Mineral Spirits
6. Toluene
7. Turpentine
8. Linseed Oil
9. Zinc Chromate Primer – Original and Modified
10. Paint Remover
11. Epoxy Remover
12. Masking Materials

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**B. FINISHING SYSTEMS**

1. Dope
  - a. Kinds of Dope
  - b. Aluminum Pigmented Dope
  - c. Rejuvenator
  - d. Thinners and Reducers
  - e. Dope Proof Paints
2. Nitrocellulose Lacquers
3. Acrylic Nitrocellulose Lacquers
4. Enamels
5. Epoxy Finishes
6. Fluorescent Finishes

**C. IDENTIFICATION OF FINISHES**

1. Use of Engine Oil: Results and Conclusion
2. Use of Methyl-Ethyl-Ketone (MEK); Results and Conclusion

**D. PAINT REMOVAL**

1. Use of Strippers
2. Physical Precautions for Personnel Involved

**E. COMPATIBILITY OF VARIOUS FINISHING SYSTEMS**

1. Use of Zinc-Chromate Primers
2. Use of Wash Primers
3. Adhesion of Lacquers, Enamels, and Epoxy



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**F. APPLICATION METHODS**

1. Surface Preparation
2. Preparation of Paint for Brushing or Spraying

**G. SPRAY PRIMERS, DOPES AND PAINTS**

1. Introduction to Spray Equipment
2. Use of Spray Gun
3. Application Technique

**H. COMMON TROUBLES IN DOPE APPLICATION**

1. Effects of Temperature in Doping, Including Roping
2. Effects of Humidity in Doping, Including Blushing
3. Bubbles and Blisters
4. Slack Panels
5. Pinholes
6. Peeling
7. Runs and Sags
8. Installation of Surface Tape, Drain Grommets, Inspection Ring and Reinforcing Patches
9. Number of Coats Required

**I. COMMON TROUBLES IN PAINTING**

1. Poor Adhesion
2. Spray Dust
3. Runs and Sags
4. Spray Mottle
5. Blushing

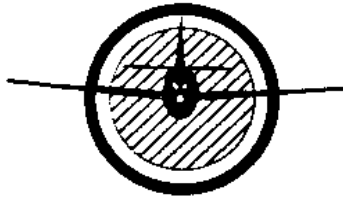
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME CURRICULUM MANUAL, VOLUME III**

**J. PAINTING TRIM AND REGISTRATION NUMBERS**

1. Application Technique
2. Size and Spacing of Markings
3. Permanence, Embellishment, Color, and Legibility

**K. DECALCOMANIAS**

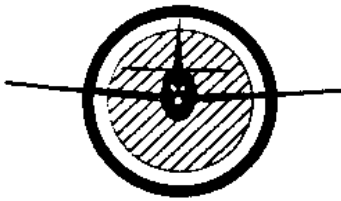
1. Types
2. Application Method
3. Removal



**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Performance Goals**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**I. AIRFRAME STRUCTURE**

**C. AIRCRAFT FINISHES LEVEL**

**6: APPLY TRIM, LETTERS AND TOUCH UP PAINT (1)**

- A. Using 14 CFR part 45 to locate the information as to the location, size and display of aircraft registration marking. On grid or graph paper draw the letters and numbers (as specified by the instructor). Describe the application of trim and methods of touching up paint.

**7: IDENTIFY AND SELECT AIRCRAFT FINISHING MATERIALS (2)**

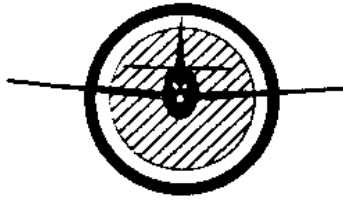
- A. Using labeled samples of Nitrate and butyrate dope, lacquer, zinc-chromate primer, enamel, and appropriate thinners, select the thinner which would be used with each of the sample materials.

**8: APPLY FINISHING MATERIALS (2)**

- A. Using AC 43:13-1B (as revised), a structure; apply finishing material.

**9: INSPECT FINISHES AND IDENTIFY DEFECTS (2)**

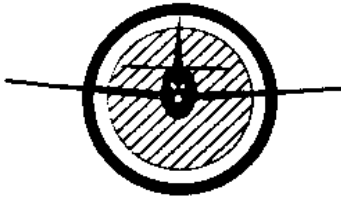
- A. Using AC 43.13-1B (as revised), random samples of aircraft parts with defects in the finish, recognize the kind of material that was originally applied as finish. Also describe which finishing material may be applied over it.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Practical Projects**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**C. AIRCRAFT FINISHES**

**6-A: APPLY TRIM, LETTERS AND TOUCH UP PAINT**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify and select aircraft finishing materials

**REFERENCES:**

1. Federal Aviation Regulations

**EQUIPMENT AND TOOLS REQUIRED:**

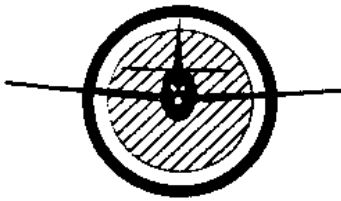
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Graph paper
2. Pencil

**PROCEDURE:**

Using 14 CFR part 45 to locate the information as to the location, size and display of aircraft registration marking. On grid or graph paper draw the letters and numbers (as specified by the instructor). Describe the application of trim and methods of touching up paint



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**C. AIRCRAFT FINISHES**

**7-A:** Identify and Select Aircraft Finishing Materials

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify and select aircraft finishing materials

**REFERENCES:**

1. AC 43:13-1B/2B (as revised) Acceptable methods, techniques and practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Labeled samples of paint finishing
2. Zinc-Chromate
3. Thinners
4. Reducers

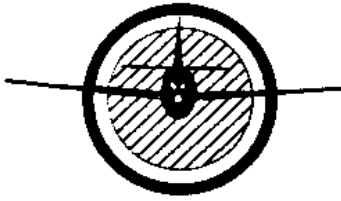
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

5. Solvents
6. Butyrate dope
7. Information sheet

**PROCEDURES:**

Using references and written information the student will write a complete list of materials paint finishing and select the thinner which would be used with each of the sample materials.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**C. AIRCRAFT FINISHES**

**8-A: Apply Finishing Materials**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME; 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to apply aircraft finishing material.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable methods, techniques and practices.
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Compressor
2. Air-hoses
3. Air Regulator
4. Spray paint gun
5. Spray touch up paint gun
6. Small container

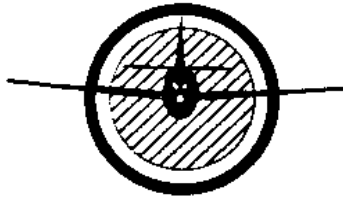
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**SUPPLIES AND MATERIALS REQUIRED:**

1. Information sheet
2. Available colors finish
3. Dope
4. Thinners
5. Reducers
6. Paint Filter

**PROCEDURES:**

The student will prepare the surface for painting and apply primers, dopes and paint finish by spraying.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**C. AIRCRAFT FINISHES**

**9-A: Inspect Finishes and Identify Defects**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to inspect finishes and identify defects.

**REFERENCES:**

1. AC 43.13-1B (as revised) Acceptable methods, techniques and practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

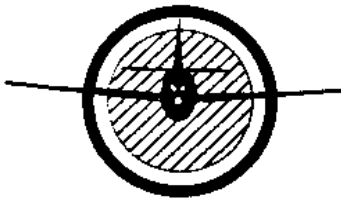
**SUPPLIES AND MATERIALS REQUIRED:**

1. Samples different paint finishing
2. Samples different structures painted
3. Information sheet

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**PROCEDURES:**

Using reference and written information the student will recognize the kind of material that was originally applied as a finish. He will describe which finishing materials may be applied over the original finish. He will recognize defects in the finishes of the sample paint.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**I. AIRFRAME STRUCTURE**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

<b>TOTAL HOURS:</b>	<b>162</b>	<b>THEORY:</b>	<b>66</b>	<b>SHOP/LAB:</b>	<b>96</b>
---------------------	------------	----------------	-----------	------------------	-----------

---

**A. AIRFRAME MATERIALS**

1. Properties of Metals
2. Magnesium Alloys
3. Titanium
4. Ferrous Metals
5. Aluminum Alloys
  - a. Casting Alloys
  - b. Wrought Alloys
6. Selection and Substitution

**B. HEAT TREATMENT**

1. Heat Treating Mediums
2. Ferrous Metals
3. Non-Ferrous Metals

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**C. RIVETS**

1. Head Styles
2. Rivet Sets
3. Composition
4. Replacement
  - a. Larger Rivets
  - b. Other Materials
5. Ice Box Rivets
6. Rivet Code
7. Shear and Bearing Strength
8. Drill Size

**D. SHOP TOOLS**

1. Large tools
  - a. Shears
  - b. Formers
  - c. Saws
  - d. Finishing Tools
2. Hand Tools
  - a. Cutting Tools
  - b. Layout Tools
3. Drills, Reamers, and Sharpening
4. Miscellaneous

**E. SAFETY**

1. Drilling

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

2. Grinding
3. Cleanliness

**F. RIVETING**

1. Tools
2. Preparation
3. Inspection and Rivet Failures
4. Removal and Replacement

**G. STRUCTURE**

1. Stress
2. Types of Structures
3. Primary, Secondary, and Non-structural

**H. SHEET METAL REPAIR**

1. Basic Requirements
2. Inspection of Damage
3. General Procedures
4. Structural Skin Repair
5. Stringer Repair
6. Frame Repair
7. Spar and Rib Repair
8. Miscellaneous
9. Logbook Entries and Form 337

**I. BEND ALLOWANCE AND SETBACK**

1. Straight Line Bends
2. 90 Degree Angles

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

3. Other
4. Layout and Duplication
5. Relief Holes
6. Joggles

**J. CORROSION**

1. Types
2. Factors
3. Inspection
4. Removal
5. Prevention and Protection

**K. SPECIAL RIVETS**

1. Blind Fasteners
2. Hi-shear Rivets and Bolts
3. Rivnut and Drill Nuts

**L. FORMING PARTS**

1. Bumping
2. Form Blocks

**M. TRANSPERENT ENCLOSURES**

1. Glass
2. Plastic
3. Protection and Cleaning
4. Replacement and Repair

**N. PRESSURE SEALS**

1. Doors
2. Windows



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**O. SEAT AND SAFETY BELT MECHANISMS**

1. Requirements
2. Reclining Seats
3. Safety Belt Installation

**P. GLASS CLOTH**

1. Covering Method
  - a. Three Covering Methods
2. Strength
3. Difficulty
4. Attachment

**Q. BONDED STRUCTURE**

1. Construction
  - a. Natural Resins
  - b. Cellulose Resins
  - c. Protein Resins
  - d. Synthetic Resins
2. Laminated Structural Materials
  - a. Fiberglass Structure
    - 1) Fiberglass
    - 2) Polyester Resin
    - 3) Epoxy Resin
    - 4) Thixotropic Agents
3. Laminated Construction
  - a. Fiberglass Lay-up
  - b. Honeycomb
  - c. Wood Core Sandwich

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

4. Repair of Laminated Structure
  - a. Assessment of Damage
  - b. Criteria of a Good Repair
  - c. Equipment Needed
5. Specific Repairs to Laminated Structure
  - a. Damage to Fiberglass Laminated Structure
    - 1) Surface Scratches
    - 2) Delamination
      - a) Scarf Method
      - b) Step Joint Method
  - b. Damage to Honeycomb Structure
    - 1) Dents
    - 2) Surface Scratches
    - 3) Surface Delamination
    - 4) Skin Penetrated
      - a) Core Not Damaged
      - b) Core Damaged
      - c) Radome Repair
6. General Consideration of Repair to Bonded Structure
  - a. Cutting Information
  - b. Surface Treatment
  - c. Types of Adhesives
  - d. Application of Heat and Pressure for Curing
7. Summary of Bonded Structure Repair
  - a. Manufacturer Recommendations
  - b. Corrosion

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

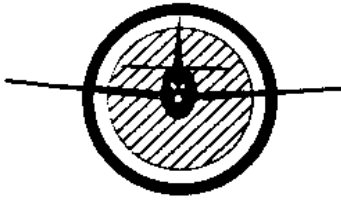
- c. Strength and Rigidity
- d. Cure Time

**R. TRANSPARENT PLASTIC MATERIALS**

- 1. Types of Transparent Plastics
  - a. Cellulose Acetate
  - b. Acrylic
- 2. Storage and Handling
- 3. Forming Procedures and Techniques
  - a. Heating
  - b. Forms
  - c. Forming Methods
    - 1) Simple curve forming
    - 2) Compound curve forming
      - a) Stretch Forming
      - b) Male and Female Die Forming
      - c) Vacuum Forming (Without Forms)
      - d) Vacuum Forming (With Female Forms)
  - d. Sawing and Drilling
    - 1) Sawing
    - 2) Drilling
  - e. Cementing
    - 1) Application of Cement
    - 2) Application of Pressure
    - 3) Curing
- 4. Repairs
  - a. Temporary Repairs

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

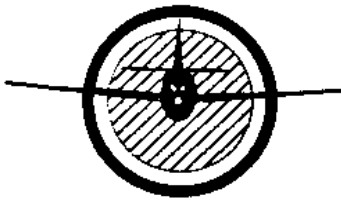
- b. Permanent Repairs
  - c. Polishing and Finishing
  - d. Cleaning
- 5. Protection
- 6. Windshield Installation



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Performance Goals**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**I. AIRFRAME STRUCTURE**

**D. SHEET METAL AND NON-METALLIC STRUCTURE**

	<b><u>LEVEL</u></b>
<b>10: SELECT, INSTALL AND REMOVE SPECIAL FASTENERS FOR METALLIC, BONDED AND COMPOSITE STRUCTURE</b>	<b>(2)</b>
A. Using the sheet metal project guidebook, AC 43.13-1B/2B (as revised), proper tools, and equipment, install special rivets and fasteners. Remove and reinstall special rivets and fasteners.	
<b>11: INSPECT BONDED STRUCTURES</b>	<b>(2)</b>
A. Using the composites project guidebook, inspect for delamination and separation.	
<b>12: INSPECT, TEST AND REPAIR FIBERGLASS, PLASTICS, HONEYCOMB, COMPOSITE AND LAMINATED PRIMARY AND SECONDARY STRUCTURES</b>	<b>(2)</b>
A. Using the composite project guidebook and the AC 43.13-1B/2B (as revised) inspect and repair a sample section of honeycomb structure.	

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- B. Using the composite project guidebook, inspect and repair a sample section of laminated structure.
- C. Using the composites guidebook and the AC 43.13-1B as revised) answer questions concerning laminate structure repair.
- D. Using the composites project guidebook, and the AC 43.13-1B/2B (as revised), inspect and make a repair to plastics.
- E. Given a section of fiberglass structure and written information, inspect for damage, test for delamination, and repair the damaged area.

**13: INSPECT, CHECK, SERVICE, AND REPAIR  
WINDOWS, DOORS AND INTERIOR FURNISHINGS**

**(2)**

- A. Using the sheet metal project guidebook, And AC 43.13-1B/2B (as revised), inspect and check an Aircraft door and seal, list all repairs; as needed.
- \*B. Using the sheet metal project guidebook, And AC 43.13-1B/2B (as revised); inspect and aircraft window and list all repairs, as needed.
- C. Using the sheet metal project guidebook, And AC 43.13-1B/2B (as revised); inspect and check the Seat tracks and locking mechanism, and list all repairs as needed.
- D. Using the sheet metal project guidebook, and AC 43.13-1B/2B (as revised); inspect and check the seat belt and seat belt installation. List repairs as needed.

**14: INSPECT AND REPAIR SHEET METAL STRUCTURES**

**(3)**

- A. Using the sheet metal project book, inspect structures, Identify scratches reparable by burnishing. Burnish one or more scratches.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- B. Using the sheet metal project book, the AC 43.13-1B/2B (as revised) , and three 6"x6" pieces of .032 aluminum make a flush patch as laid out in the project guide.

**15: INSTALL CONVENTIONAAL RIVETS**

**(3)**

- A. Using the sheet metal project guidebook and the AC 43.13-1B/2B (as revised), cut aluminum alloys, lay out rivet patterns, drill rivet holes, and install the proper type and length rivets.
- B. Using the sheet metal project guidebook the AC 43.13-1B/2B (as revised) and reference drawing fabricate the airfoil tab assembly.

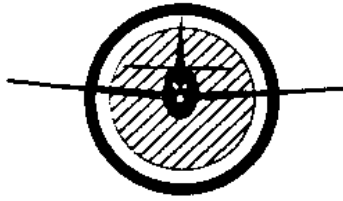
**16: FORM, LAY OUT, AND BEND SHEET METAL**

**(3)**

- A. Using the sheet metal project guide book, and the AC 43.13-1B/2B (as revised) , calculate and layout dimensions and bend lines for a large radius bend at a specified angle of bend. Select a different type of material which requires a small radius bend. Calculate and layout bend lines for 130 degree bend.

\* OPTIONAL PROJECT

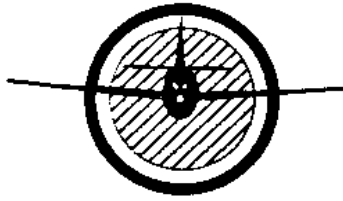




**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Practical Projects**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE**

FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**10-A:** Select, Install and Remove, Special Fasteners for metallic, Bonded and Composite Structure

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to install special rivets and fasteners.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable methods, techniques and practices.
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

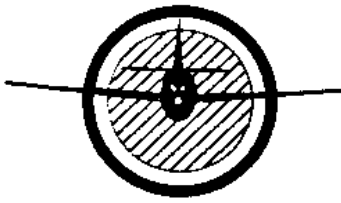
1. Samples special fasteners
2. Information Sheet
3. Special rivets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**10-A:** Select, Install and Remove, Special Fasteners for metallic, Bonded and Composite Structure

**PROCEDURES:**

Using reference and written information the student will answer five questions concerning precautions necessary for proper fit when installing special hi-shear and pull type rivets. He will identify and list by type eight different special rivets and fasteners used in aircraft.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**11-A: Inspect Bonded Structures**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify aircraft bonded structures defects.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices.
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

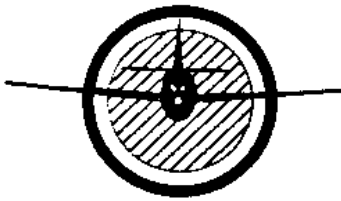
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Composite kit, 2-samples of bonded structures, 3-information sheet

**PROCEDURES:**

The student will inspect bonded structures samples and identify the possible defects. Also identify on composite kit the different materials for repair bonded structures.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**12: INSPECT, TEST AND REPAIR FIBERGLASS, PLASTICS, HONEYCOMB,  
COMPOSITE AND LAMINATED PRIMARY AND SECONDARY STRUCTURES**

A:

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge understanding to evaluate repairs on bonded honeycomb structures.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

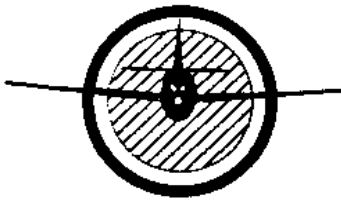
1. Composite kit
2. Sample bonded honeycomb structure
3. Information sheet

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**12-A:** Inspect, Test and Repair Fiberglass, Plastic, Honeycomb, Composite and Laminate  
Primary and Secondary Structures

**PROCEDURES:**

The student will identify and write the possible defect on bonded honeycomb structure, will write the correct procedures for repairs on bonded honeycomb structure.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**12-B:** Inspect, Test and repair Fiberglass, Plastic, Honeycomb, Composite and Laminate Primary and Secondary Structures.

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify defects and repair composite aircraft structures.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Composite kit
2. Laminate structures sample
3. Information sheets

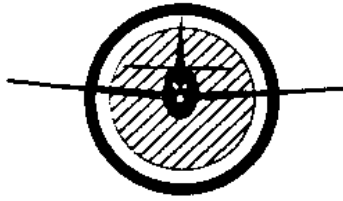
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**12-B:** Inspect, Test and repair Fiberglass, Plastic, Honeycomb, Composite and Laminate Primary and Secondary Structures.

**PROCEDURES:**

The student will inspect and identify damage on laminate structures samples. Using AC 43.13-1B Chapter 2(as revised): Typical Laminate repairs; use the correct procedures to repair laminate structures.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**12-C:** Inspect, Test and Repair Fiberglass, Plastic Honeycomb, Composite and Laminate Primary and Secondary Structures.

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 12.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to identify and check aircraft laminate structure.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

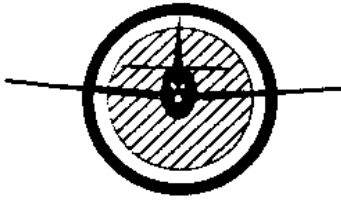
1. Information Sheet
2. Laminate Structures Samples

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**12-C:** Inspect, Test and Repair Fiberglass, Plastic Honeycomb, Composite and Laminate Primary and Secondary Structures.

**PROCEDURES:**

Using the given information and references the student will read; understand and answer questions concerning to aircraft laminate structures.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**12-D:** Inspect, Test and Repair, Fiberglass, Plastic Honeycomb, Composite and Laminated Primary and Secondary Structures

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in performing repair on plastics.

**REFERENCES:**

1. AC 4.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

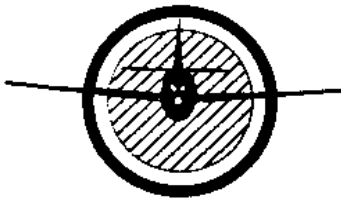
1. Sand paper 320,4000,600, 2 polish compound, 3-plastic sample, 4-wax polish compound, 5- polish cloth, 6- information sheets.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**12-D:** Inspect, Test and Repair Fiberglass, Plastic Honeycomb, Composite and Laminate  
Primary and Secondary Structures

**PROCEDURES:**

After observing a demonstration by the instructor and using the project guide reference, the student will demonstrate to the instructor the procedure to repair damage on a plastic sample. He will repair a simple scratch on plastic.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**12-E:** Inspect, Test and Repair Fiberglass, Plastic Honeycomb, Composite and Laminate Primary and Secondary Structures.

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding to perform inspection and repair on bonded structures.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Method, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Coins or test equipment

**SUPPLIES AND MATERIALS REQUIRED:**

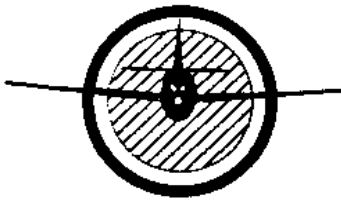
1. Bonded structures sample
2. Information sheets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**12-E:** Inspect, Test and Repair Fiberglass, Plastic Honeycomb, Composite and Laminate  
Primary and Secondary Structures

**PROCEDURES:**

Using the project guide references, the student will demonstrate to the instructor the correct procedure to test a bonded structure for delamination and will explain the proper procedure to a repair damage area.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**13-A:** Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 3.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in performing an inspection of aircraft doors, door's seals and the lock mechanism operation.

**REFERENCES:**

1. AC 443.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices.
2. Aircraft Maintenance Manual PA 23-250 and PA 32-300.

**EQUIPMENT AND TOOLS REQUIRED:**

1. Basic hands tools
2. Aircraft PA 32-300 or PA 23-250

**SUPPLIES AND MATERIALS REQUIRED:**

1. Information sheet
2. Aircraft door sample

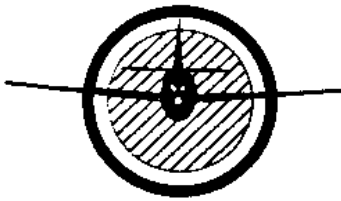
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**13-A:** Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings

**PROCEDURES:**

The instructor will demonstrate to the student the correct procedure to inspect an aircraft doors, door's lock mechanism (including Emergency Exits), windows and interior furnishings. After this demonstration, the student will make a complete inspection on a given aircraft door and he will write a list of repairable damage on the door, window or interior furnishings.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME SYSTEM AND COMPONENTS**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**13-B:** Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 3.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of the standard practices of tire servicing.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook
3. PA 23-250 Aztec or PA 32-300 Cherokee Maintenance Manuals

**EQUIPMENT AND TOOLS REQUIRED:**

1. Basic Hand Tools
2. Special Tools for PA 23-250 or PA 32-300

**SUPPLIES AND MATERIALS REQUIRED:**

1. Information Sheets
2. Aircraft door sample

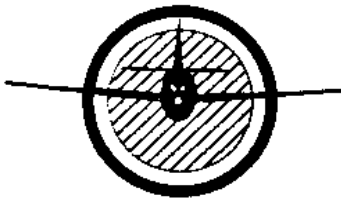
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**13-B:** Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings

3. Windows and seals

**PROCEDURES:**

Using the given reference and an aircraft, the students will check and inspect the aircraft windows and he will write a list of discrepancies and the proper corrective action to be taken.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECTS**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**13-C:** Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in performing, checks and inspections of aircraft interior furnishings.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. PA 23-250 and PA 32-300 Maintenance Manuals

**EQUIPMENT AND TOOLS NEEDED:**

1. Basic hands tools
2. Available Aircraft PA 23-250 or PA 32-300

**SUPPLIES AND MATERIALS:**

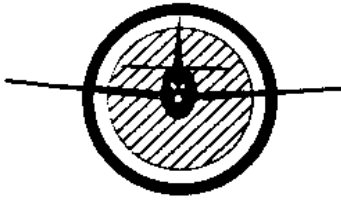
1. Information sheets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**13-C:** Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings

**PROCEDURES:**

Using the given references and written information, the student will check and inspect the seat tracks and locking mechanism in accordance with the aircraft manufacturer maintenance service manual. The student will make a list of discrepancies noticed at this time. At this time, the instructor will explain and demonstrate possible corrective actions to be taken for the reported discrepancies.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME SYSTEM AND COMPONENTS**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**13-D:** Inspect, Check, Service and Repair Windows, Doors, and Interior Furnishing

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in performing aircraft safety belt inspections and repairs.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. PA 23-250 Aztec or PA 32-300 Cherokee Maintenance Manuals

**EQUIPMENT AND TOOLS REQUIRED:**

1. Basic Hand tools
2. Specials Tools for PA 23-250 or PA 32-300

**SUPPLIES AND MATERIALS:**

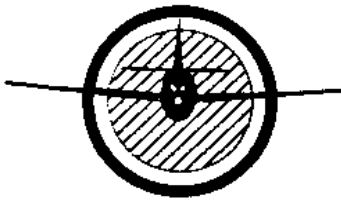
1. Information Sheets
2. Aircraft Safety belt samples

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**13-D:** Inspect, Check, Service and Repair Windows, Doors and Interior Furnishings

**PROCEDURES:**

On a given aircraft, the student will check and inspect the seat belts, seat belts locking mechanism, installation, and general condition. The student will make a list of discrepancies noticed at this time. At this time, the instructor will explain and demonstrate the proper corrective actions to be taken based on the manufacturer's recommendations.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**14-A:** Inspect, and Repair Sheet-Metal Structures.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with required knowledge, understanding and skill to perform sheet-metal skin repairs by burnishing.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Polish Equipment

**SUPPLIES AND MATERIALS REQUIRED:**

1. Metal polish compound
2. Polish cloth
3. Piece metal skin sample
4. Information sheets

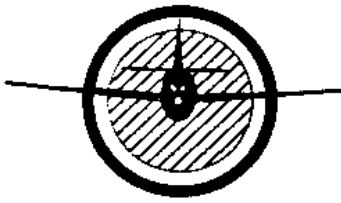
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**14-A: Inspect, and Repair Sheet-Metal Structures**

**PROCEDURES:**

On a given piece of aluminum sheet-metal skin, the students will apply the method and technique to repair surface scratches by burnishing. The student will use metal polish compound to burnish the scratches. The instructor will inspect and grade the work performed and will discuss with the student the required maintenance entries for the work performed, if this work had been performed on an airworthy aircraft.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**14-B: Inspect, and Repair Sheet-Metal Structures**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 12.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill to perform stressed-skin metal repairs.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Cutting shears
2. Files (round, flat, half round)
3. Air drill
4. Drill bits #30
5. Rivet Gun
6. Rivet Gun Regulator

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**14-B: Inspect, and Repair Sheet-Metal Structures**

7. Rivet set AN4704
8. Bucking bar
9. Vice
10. Worktable
11. Cleco pliers
12. Cleco (#30)
13. Hole saw cutter 2" diameter
14. Drill Press
15. Safety goggles
16. Grease pencil
17. Ruler (metallic type)
18. Protractor
19. Paper for drawing
20. Compass
21. Dimpling tool

**SUPPLIES AND MATERIALS REQUIRED:**

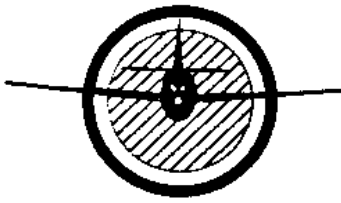
1. Information sheet
2. Aluminum alloy sheet 6" x 6" 2024T3 .032
3. Aluminum alloy sheet 6" x 6" 2024T3 .040
4. Aluminum alloy sheet 2 ½" x 2 ½" 2024 T .032
5. Approx. 30 each aluminum alloy rivets AN470AD4-4

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**14-B: Inspect, and Repair Sheet-Metal Structures**

**PROCEDURES:**

Using the references and write information provided, the student will perform a repair on a damaged sheet-metal skin, simulating a stress-skin area on a wing structure. He will determine and present to the instructor the correct rivet layout and spacing to be used in accordance with specifications in the reference publications and instruction sheets. After the work has been inspected and graded, the instructor will discuss with the student the maintenance entries and/or forms (for example FAA 337 Form) required, if this work had been performed on an airworthy aircraft.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**15-A: Install Conventional Rivets**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and skill to perform in performing conventional aircraft rivet installation

**REFERENCES:**

1. AC 43.13-1B (as revised) Acceptable Methods, Techniques and Practices.
2. FAA-H-8083-31A Airframe Handbook.

**EQUIPMENT AND TOOLS REQUIRED:**

1. Cutting shears
2. Flat file
3. Air drill
4. Drill bits; #40, #30, #21
5. Rivet gun, with regulator

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**15-A: Install Conventional Rivets**

6. Rivet sets
  - a. 470-3
  - b. 470-4
  - c. 470-5
  - d. Flush set
7. Bucking bar
8. Vice
9. Work table
10. Cleco pliers
11. Clecos #40 or # 30
12. Safety goggles
13. Grease pencil
14. Metal ruler
15. Rivet cutter
16. Micro Countersink
17. Countersink bits #3/32, 1/8, 5/32
18. Dimpling tool

**SUPPLIES AND MATERIALS REQUIRED:**

1. Information sheet
2. Two pieces aluminum alloy sheet 6" x 5" 2024T3-.032
3. Rivets
  - a. 20 each AN470AD3

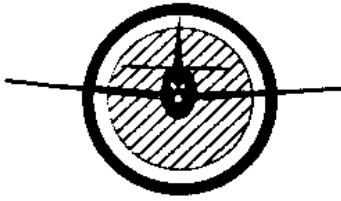
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**15-A: Install Conventional Rivets**

- b. 20 each AN470AD4
- c. 20 each AN470AD5
- d. 10 each An442AD4
- e. 10 each AN430AD4
- f. 10 each AN426AD3
- g. 10 each AN426AD4
- h. 10 each AN426AD5

**PROCEDURES:**

Using the suggested references and written information provided, the student will cut two pieces of aluminum alloy 6" x 5", 2024T3-.032; in which he will layout hole location, drill holes and install the proper type and length rivets. He will prepare rows of holes to install different sizes of rivets and will use air-powered riveting gun to install conventional rivets. He must select rivet sets and bucking bars suitable for each type of rivet used.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**15-B: Install Conventional Rivets**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 20.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of how to fabricate designed aircraft sections or components in accordance with provided specifications.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Method, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Cutting shears
2. Files (Round file, flat file and half round)
3. Air drill
4. Drill bits (#40, 1/4")
5. Rivet Gun
6. Rivet Gun regulator

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**15-B: Install Conventional Rivets**

7. Rivet set AN470-3
8. Bucking bar (any appropriate for the work)
9. Vice
10. Worktable
11. Cleco Pliers
12. Clecos (#40) (quantity as needed)
13. Hole saw cutter (3/4 diameter)
14. Drill press
15. Safety goggles
16. Grease pencil
17. Ruler (metal type)
18. Protractor
19. Paper (for drawing)
20. Light hammer or mallet
21. Brake Bender
22. Deburring Tool
23. Air Compressor
24. Air Hoses

**SUPPLIES AND MATERIALS REQUIRED:**

1. Information sheet
2. Two sheets aluminum alloy 2024T3 .025 x 10 ¼"x 5"
3. Three sheets aluminum alloy 2024T3 .025 x 4"x2 ½"



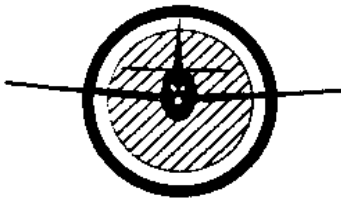
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**15-B: Install Conventional Rivets**

4. One sheet aluminum alloy 2024T3 .025 x 2 1/4" x 10 1/4"
5. Seventy (70) each AN470AD3-3 rivets (approx.).
6. Aileron tab drawing
7. Plywood or Hardwood 6" x 6" 3/4" thick

**PROCEDURES:**

Using the references and written information provided, the student will fabricate an airfoil tab assembly. The quality of work fabricating this tab must be such that it could be acceptable to install on an airworthy aircraft. After fabricating the airfoil tab assembly, the student will discuss with the instructor the required maintenance record entry required, if it was to be installed on an airworthy aircraft.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURE**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

**16-A: Form, Lay out, and Bend Sheet Metal**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and practice to form layouts and bends in sheet metal.

**REFERENCE:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. Use FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Pencils
2. Calculator
3. Ruler

**SUPPLIES AND MATERIALS REQUIRED:**

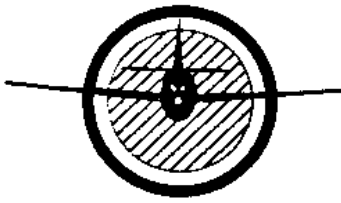
1. Information Sheets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**16-A: Form, Lay out, and Bend Sheet Metal**

**PROCEDURES:**

The student will solve mathematic problems, calculate and layout dimensions and bend lines for a specified bend angle. He will make bends using recommended bending techniques. The student will select different types of materials, some which will require smaller bend radiuses. He must calculate and layout lines for a 130 degrees bend. He will bend the materials to the specified bend, using the minimum bend radius permissible in the reference table for the type and thickness of the material used



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

<b>TOTAL HOURS: 42</b>	<b>THEORY: 18</b>	<b>SHOP/LAB: 24</b>
------------------------	-------------------	---------------------

---

**A. TYPES OF WELDING**

1. Gas Welding
2. Electric Arc Welding
3. Electric Resistance Welding

**B. OXYACETYLENE WELDING EQUIPMENT**

1. Acetylene Gas
2. Acetylene Cylinders
3. Oxygen Gas
4. Oxygen Cylinders
5. Welding Torch
6. Welding Torch Tips
7. Goggles
8. Filler Rod

**C. USE OF GAS WELDING EQUIPMENT**

1. Setting Up Equipment
2. Oxyacetylene Flame Adjustment
3. Oxyacetylene Welding Processes

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

4. Extinguishing the Torch
5. Fundamental Gas Welding Techniques

**D. WELDING POSITIONS**

1. Flat Welds
2. Overhead Welding
3. Horizontal Welding
4. Vertical Welds

**E. WELDED joints**

1. Butt Joints
2. Tee Joints
3. Lap Joints
4. Corner Joints
5. Edge Joints

**F. CORRECT FORMING OF A WELD**

1. Expansion and Contraction of Metals During Welding
2. Characteristics of a Good Weld

**G. OXYACETYLENE WELDING OF FERROUS METALS**

1. Mild Steel
2. Chrome-Molybdenum Steel
3. Stainless Steel

**H. OXYACETYLENE WELDING OF NON-FERROUS METALS**

1. Aluminum
2. Magnesium
3. Titanium

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**I. OTHER USES OF THE OXYACETYLENE FLAME**

1. Cutting Torch
2. Brazing
3. Silver Soldering

**J. SOFT SOLDERING**

1. Applications
2. Strength
3. Soldering Copper and Soldering Irons

**K. ELECTRICAL ARC WELDING**

1. Metallic Arc Welding
2. Gas Shielded Arc Welding
  - a. Tungsten Inert Gas (TIG)
  - b. Metal Inert Gas (MIG)
  - c. Plasma Arc Welding

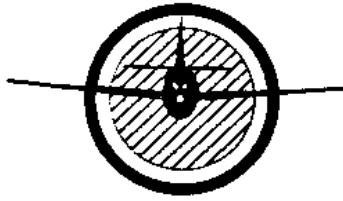
**L. TECHNIQUES OF ARC WELDING**

1. Starting the Arc
2. Multiple Pass Welding
3. Position Welding
  - a. Flat Position
  - b. Overhead
  - c. Vertical
4. Types of Welds
  - a. Bead Welds
  - b. Groove Welds
  - c. Fillet Welds

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**M. WELDING STEEL AIRCRAFT STRUCTURE**

1. Steel Parts Not to Be Welded
2. Repair of Tubular Members
  - a. Welded Sleeve
  - b. Welded Patch Repair
  - c. Inner Sleeve Method
  - d. Engine Mounts
  - e. Repairs at Fuselage Fittings
  - f. Repairs to Tubular Landing Gear
  - g. Built Up Tubular Spars
  - h. Steel Struts

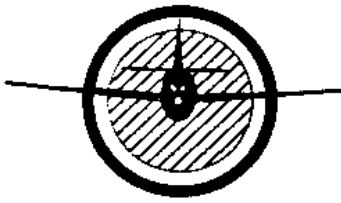


**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Performance Goals**





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**I. AIRFRAME STRUCTURES**

<b>E. WELDING</b>	<b>LEVEL</b>
<b>17: WELD MAGNESIUM AND TITANIUM</b>	<b>(1)</b>
A. Select answers to questions covering the welding soldering of magnesium and titanium.	
<b>18: SOLDER STAINLESS STEEL</b>	<b>(1)</b>
A. Select answer to questions covering the soldering of stainless steel.	
<b>19: FABRICATE TUBULAR STRUCTURES</b>	<b>(1)</b>
A. Using the AC43.13-1B (as revised) and samples of tubular structure inspect and list whether there are signs of: smooth seam and uniform in thickness, tapered smoothly into the base metal, there are No signs of blowholes, porosity or projecting globules.	
<b>20: SOLDER, BRAZE, GAS-WELD AND ARC-WELD STEEL</b>	<b>(2)</b>
A. Using the welding project guidebook, splice a wire by soldering.	
B. Using the welding project guidebook, set up the gas welding equipment.	

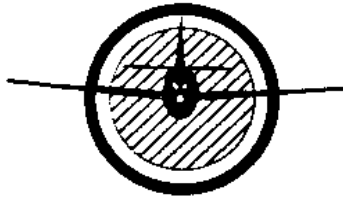
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- C. Using the welding project guidebook, And the AC 43.13-1B (as revised) braze two steel plates together.
- D. Using the welding project guidebook, And the AC 43.13-1B (as revised) and the arc-welding equipment, run beads until one has been used.

**21: WELD ALUMINUM AND STAINLESS STEEL**

**(1)**

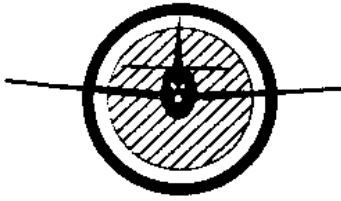
- A. Select answer to questions covering the welding of aluminum and stainless steel.



**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Practical Projects**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**17-A: WELD MAGNESIUM AND TITANIUM**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with required knowledge and understanding in the process of welding magnesium and titanium.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

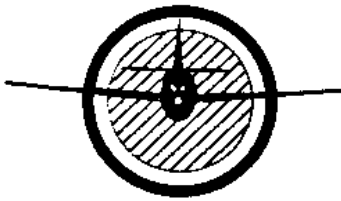
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. List of questions.

**PROCEDURE:**

Select the correct answer to the questions regarding the process of welding magnesium and titanium parts.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**18-A: SOLDER STAINLESS STEEL.**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of repairing stainless steel by soldering.

**REFERENCES:**

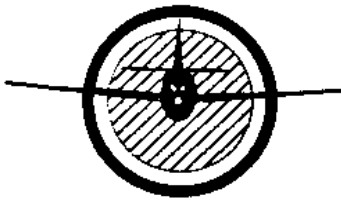
1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

1. List of questions.

**SUPPLIES AND MATERIALS REQUIRED:**

Select the correct answer to the questions regarding the process of stainless steel parts by soldering.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**19-A: FABRICATE TUBULAR STRUCTURES.**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE**

To acquaint the student with required knowledge and understanding in the process of welding aluminum and stainless steel.

**REFERENCES:**

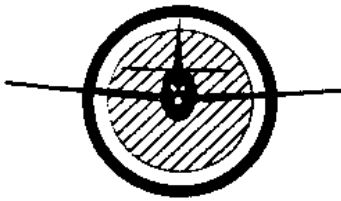
1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Samples of tubular structures

**SUPPLIES AND MATERIALS REQUIRED:**

Using the AC43.13-1B (as revised) and samples of tubular structure, inspect and list whether there are signs of: smooth seam and uniform in thickness, tapered smoothly into the base metal, there are No signs of blowholes, porosity or projecting globules.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**20-A:** Solder, braze, gas-weld and arc-weld steel.

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of electric wire repair by soldering.

**REFERENCES:**

1. AC 43.13-1B Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Soldering kit

**SUPPLIES AND MATERIALS REQUIRED:**

1. Two pieces electric cables
2. Solder material
3. Information sheet

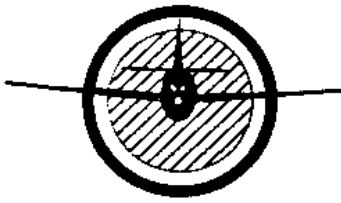
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**20-A:** Solder, braze, gas-weld and arc-weld steel

**PROCEDURES:**

Using the given references and soldering equipment, the student will splice an electric wire by soldering.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**20-B:** Solder, braze, gas-weld and arc-weld steel

**TEACHING LEVEL 2**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in setting up gas welding equipment.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Gas weld Torch
2. Oxygen bottle
3. Acetylene bottle
4. Oxygen house
5. Acetylene hose
7. Oxygen Acetylene Regulators
8. Special tool wrench

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

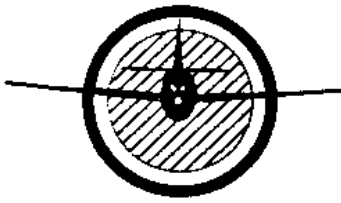
**20-B:** Solder, braze, gas-weld and arc-weld steel.

**SUPPLIES AND MATERIALS REQUIRED:**

1. Information sheet

**PROCEDURES:**

Using the references and instructions provided, the student will set up the gas welding equipment to perform oxy-acetylene welding practice.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**20-C:** Solder, braze, gas-weld and arc-weld steel

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the brazing method of welding.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Gas welding equipment
2. Welding goggles
3. Lighter
4. Welding gloves

**SUPPLIES AND MATERIALS REQUIRED:**

1. Two steel plates
2. Welding all purpose rods

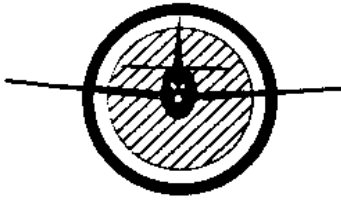
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**20-C:** Solder, braze, gas-weld and arc-weld steel.

3. Information sheets

**PROCEDURES:**

Using the above references and information sheets provided, student will weld together two steel using the brazing method.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**20-D:** Solder, braze, gas-weld and arc-weld steel

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in gas-welding steel parts.

**REFERENCES:**

1. AC 43.131-1B/2B Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Gas welding equipment
2. Welding goggles
3. Welding gloves
4. Flint-lighter

**SUPPLIES AND MATERIALS REQUIRED:**

1. Two steel plates
2. Welding rod

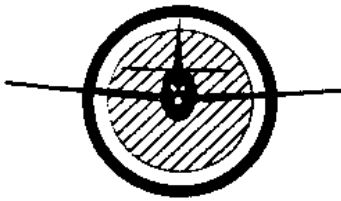
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**20-D:** Solder, braze, gas-weld and arc-weld steel.

3. Oxygen and acetylene
4. Information sheets

**PROCEDURES:**

The student will identify and select parts which he considers repairable by welding. He will set up a portable gas welding set, clean and prepare steel parts for welding, and use the portable welding set to repair the steel parts. He will preheat the parts, select the correct size tip and adjust the oxy-acetylene torch for the correct type of flame. He will select and use the proper filler rod and demonstrate to the instructor his ability in welding steel parts and normalize them.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**20-E:** Solder, braze, gas-weld and arc-weld steel

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with required knowledge and understanding in the process of arc-welding.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Arc welding equipment
2. Arc weld mask
3. Welding gloves

**SUPPLIES AND MATERIALS REQUIRED:**

1. Steel plate
2. Arc weld rod
3. Information sheets

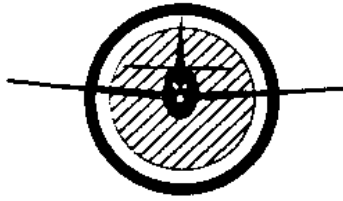
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**20-E:** Solder, braze, gas-weld and arc-weld steel.

**PROCEDURES:**

Using the above references, the information sheets provided and the arc welding equipment, the student will run beads on a steel plate. After practice, the student will discuss with the instructor the difference of good, acceptable and non-acceptable arc-welding beads.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**E. WELDING**

**21-A: WELD ALUMINUM AND STAINLESS STEEL**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with required knowledge and understanding in the process of welding aluminum and stainless steel.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

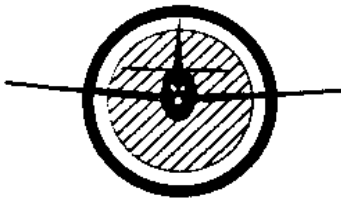
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Question sheet

**PROCEDURES:**

Using the above references, the information sheets provided, the student shall answer questions covering the welding of aluminum and stainless steel



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**TOTAL HOURS: 72                      THEORY: 24                      SHOP/LAB: 48**

---

**A. USE CORRECT AIRCRAFT NOMENCLATURE**

1. Classification by Powerplants
2. Classification by Wing Configuration
3. Classification by Tail Surface Configuration
4. Classification by Landing Gear Configuration
5. Nomenclature of Aircraft Components
  - a. Fuselage
  - b. Wings
  - c. Empennage and Control Surfaces
  - d. Landing Gears

**B. INTERPRET THEORY OF FLIGHT**

1. The Atmosphere
2. Lift and Drag
3. Airfoil and Streamlined Shapes
4. Drag Components
5. Characteristics of Airfoils
6. Lift and Drag Devices

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

7. Thrust
8. Stability and Control about the Axis of Fixed Wing Aircraft
  - a. Longitudinal Stability
  - b. Directional Stability
  - c. Lateral Stability
  - d. Control of the Airplane
9. Maneuvers
  - a. Straight and Level Flight
  - b. Performance Limitations

**C. USE NOENCLATURE APPLICABLE TO ROTARY WING AIRCRAFT**

1. Rotary Wing Characteristics
2. Axis of Rotorcraft
3. Primary Flight Controls
4. Maintenance Concepts

**D. VERIFY ALIGNMENT OF STRUCTURES**

1. Fuselage Station Numbering Systems
2. Wing Station numbering Systems

**E. ASSEMBLY COMPONENTS**

1. Bolted Installations
2. Aircraft Nuts
3. Safety Devices
4. Screws

**F. IDENTIFY AIRCRAFT CONTROL CABLE**

1. Types of Control Cable
  - a. Non-flexible

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- b. Flexible
  - c. Extra Flexible
  - d. Fiber Cores
- 2. Size of Cable
  - 3. Materials

**G. INSTALL SWAGED CABLE TERMINALS**

- 1. Nico press Terminals
- 2. Swaged Terminals
- 3. Cutting Control Cables

**H. VERIFY CORRECT CONTROL RESPONSE**

- 1. Control Movement and Resultant Control Surface Displacement
- 2. Control Surface Displacement and Resultant Action of the Airplane
- 3. Effect of Tabs on Primary Control Surfaces
- 4. Controllable Flaps, Slots and High Lift, High Drag Devices
- 5. Control Locks

**I. INSTALL AND TENSION A CONTROL CABLE, INSPECT A CABLE CONTROL SYSTEM**

- 1. Removal and Installation of Cable
- 2. Tension of Cables
- 3. Standard Cable (Clevises, Shackles, Clevis Pins, Bolts, Nuts, Pulleys, Turnbuckles, Etc.)
- 4. Control Surface Travel

**J. CHECK STATIC BALANCE OF A CONTROL SYSTEM**

- 1. Balanced Control Surfaces
  - a. Static Balance

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

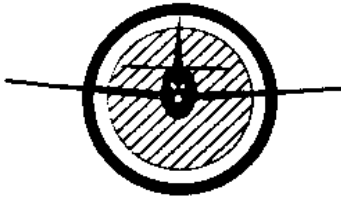
- b. Aerodynamic Balance
- 2. Check Balance of Control Surface
- 3. Recommend Corrective Action to Balance the Surface

**K. INSPECT AND ADJUST PUSH-PULL CONTROL SYSTEMS**

- 1. Push-pull and torque Tube Type Actuating Systems
- 2. Inspection and Adjustment of Push-pull Systems

**L. JACKING AIRCRAFT**

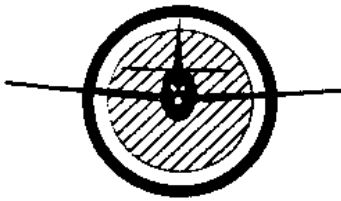
- 1. Preparation of Aircraft for Jacking
- 2. Selection of Jacking Equipment
- 3. Safety Precautions
- 4. Jacking a Complete Aircraft
- 5. Jacking One Wheel of an Aircraft



**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Performance Goals**



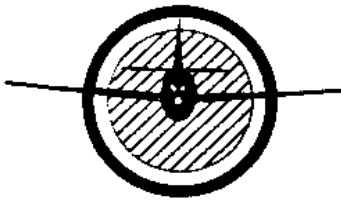
**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**I. AIRFRAME STRUCTURES**

<b>F.</b>	<b>ASSEMBLY AND RIGGING</b>	<b>LEVEL</b>
<b>22:</b>	<b>RIG ROTARY-WING AIRCRAFT</b>	<b>(1)</b>
A.	Using the assembly and rigging project guide book and the AC 43.13-1B/2B (as revised), answer questions on rotary-wing aircraft.	
<b>23:</b>	<b>RIG FIXED-WING AIRCRAFT</b>	<b>(2)</b>
A.	Using the assembly and rigging project guide book and the AC 43.13-1B/2B (as revised); install a control cable and check for proper tension, routing movement and safety.	
B.	Using the 43.13-1B/2B (as revised); make a thimble-eye splice.	
<b>24:</b>	<b>CHECK ALIGNMENT OF STRUCTURES</b>	<b>(2)</b>
A.	Using the assembly and rigging project guidebook check for proper alignment of the structure by doing symmetry check.	
<b>25:</b>	<b>ASSEMBLY AIRCRAFT COMPONENTS, INCLUDING FLIGHT CONTROL SURFACES</b>	<b>(3)</b>
A.	Using the assembly and rigging project guidebook remove and install hardware as directed by the instructor.	



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**26: BALANCE, RIG AND INSPECT MOVABLE PRIMARY  
AND SECONDARY FLIGHT CONTROL SURFACES (3)**

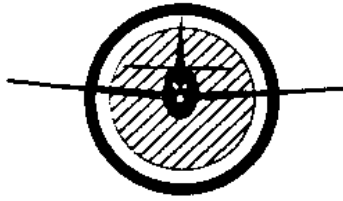
- A. Using the assembly and rigging project guide book, static balance a control surface.
- B. Using the assembly and rigging project guidebook and a propeller protractor measure the travel of a control surface as stated in the appropriate manual or written instructions. Re-rig the surface as needed.

**27: JACK AIRCRAFT (3)**

- A. Using the appropriate service manual or written instructions follow the instructions to raise an aircraft and subsequently lower the aircraft. All safety precautions will be observed.

**\* OPTIONAL PROJECT**

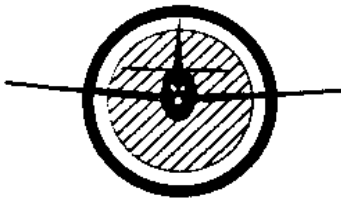




**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **Practical Projects**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**22-A: RIG ROTARY-WING AIRCRAFT**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in performing installation and rigging of aircraft control cable.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

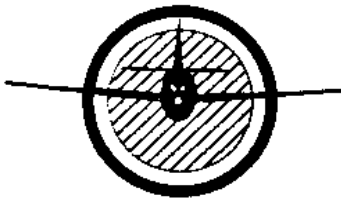
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. List of Questions

**PROCEDURES:**

Using the assembly and rigging project guide book and the AC 43.13-1B (as revised), answer questions on rotary-wing aircraft.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**23-A: Rig Fixed-Wing Aircraft**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in performing installation and rigging of aircraft control cable.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook
3. Available Aircraft Maintenance Manuals

**EQUIPMENT AND TOOLS REQUIRED:**

1. Cable Tension Meter
2. Available Aircraft (PA 23-250, PA 32-300)

**SUPPLIES AND MATERIALS REQUIRED:**

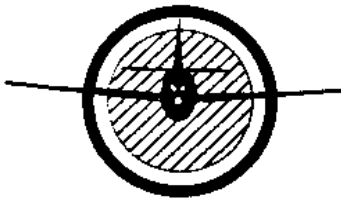
1. Safety wire .032, .40
2. Information Sheets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**23-A: Rig Fixed-Wing Aircraft**

**PROCEDURES:**

Using manufacturer aircraft maintenance manuals, the above references and the instruction sheets provided, the student will perform a control cable installation, adjust cable tension, confirm correct cable routing, and will safety all turnbuckles and/or attaching devices in accordance with the approved and acceptable methods.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**23-B:** Rig Fixed-Wing Aircraft

**TEACHING LEVEL:** (2)

**AVERAGE COMPLETION TIME:** 6.0 Hrs.

**PURPOSE:**

To acquaint student with the required knowledge and understanding in performing aircraft control cable splices.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Nico-press tool
2. Basic hand tool

**SUPPLIES AND MATERIALS REQUIRED:**

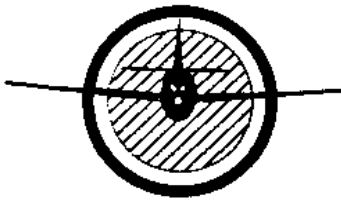
1. Sample control cable piece
2. Thimble nico-press (size available)
3. Information Sheets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**23-B:** Rig Fixed-Wing Aircraft

**PROCEDURES:**

Using the above references and instruction sheets provided, student will perform a control cable thimble eye splice.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**24-A: Check Alignment of Structures**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint student with the required knowledge and understanding to check alignment of aircraft structures in accordance with the manufacturer specifications.

**REFERENCES:**

1. Available Aircraft Maintenance (PA-23.50, PA32.300) or equivalent reference

**EQUIPMENT AND TOOLS REQUIRED:**

1. Basic hand tools
2. Level
3. Measuring tape
4. Plumb bob
5. Available aircraft

**SUPPLIES AND MATERIALS REQUIRED:**

1. Information Sheets
2. Chalk

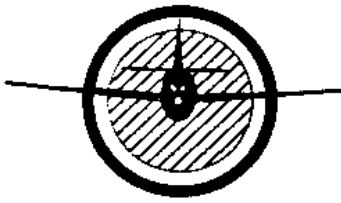
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**24-A: Check Alignment of Structures**

**PROCEDURES:**

The student will level an aircraft fuselage and verify the alignment of the structure. Using the data available in the manufacturer's manuals, he will interpret the information and record the measurements necessary to verify the alignment of the aircraft landing gear, wings and fixed tail surfaces.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**25-A Assemble Aircraft Components, Including Flight Control Surfaces**

**TECHNICAL LEVEL 3**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint student with the required knowledge and skill in the selection and installation of aircraft hardware.

**REFERENCES:**

1. Available Aircraft Maintenance Manuals (PA-23.20 and PA 32.300)
2. AC 43.13-1B/2B (as revised) Acceptable Methods, Techniques and Practices

**EQUIPMENT AND TOOLS REQUIRED:**

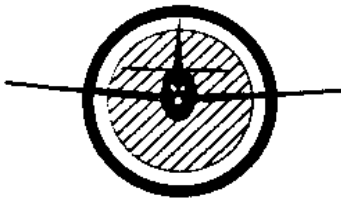
1. Basic hand/s tools

**SUPPLIES AND MATERIALS REQUIRED:**

1. Hardware Necessary
2. Information Sheet

**PROCEDURES:**

The student will identify and select the required hardware (bolts, nuts, screws, etc.) from the stock room supply. He will install, torque and safety these fasteners on an aircraft. After the work is completed, the student will present to the instructor and discuss with him the required maintenance record entries, simulating a return to service situation.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**26-A** Balance, Rig and Inspect Movable Primary and Secondary Flight Control Surfaces

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint student with the required knowledge, understanding and skill in performing flight control surface balance.

**REFERENCES:**

1. Available Aircraft Maintenance Manuals (PA-23.250, PA 32.300)

**EQUIPMENT AND TOOLS REQUIRED:**

1. Basic hands tools
2. Weight Scale
3. Balance jig equipment
4. Available aircraft flight control

**SUPPLIES AND MATERIALS REQUIRED:**

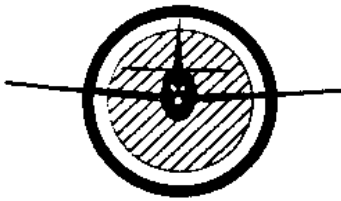
1. Hardware Necessary
2. Information Sheets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**26-A Balance, Rig and Inspect Movable Primary and Secondary Flight Control Surfaces**

**PROCEDURES:**

Using the above references and information sheets, the student will interpret the manufacturer's instructions and will follow the procedures using the proper equipment to check for an unbalance condition of the flight control surface. The student will present to the instructor a sample of the required maintenance records entries, simulating a return to service condition.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**26-B** Balance, Rig and Inspect Movable Primary and Secondary Flight Control Surfaces

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint student with the required knowledge, understanding and skill in inspecting and rigging aircraft control surfaces.

**REFERENCES:**

1. Available Aircraft Maintenance Manuals (PA-23.25, PA 32.300)
2. Aircraft specifications

**EQUIPMENT AND TOOLS REQUIRED:**

1. Basic hands tools
2. Protractor (universal propeller protractor)
3. Ruler
4. Templates
5. Rigging fixtures

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

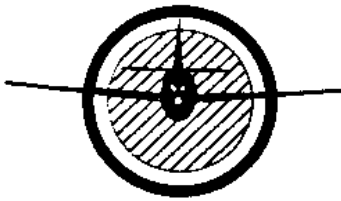
**26-B** Balance, Rig and Inspect Movable Primary and Secondary Flight Control Surfaces

**SUPPLIES AND MATERIALS REQUIRED:**

1. Hardware Necessary
2. Information sheets

**PROCEDURES:**

Using the manufacturer maintenance manuals, and aircraft specification, the student will measure and record the travel of a flight control surface from a given aircraft. The student will rig the control surface, as needed. He will prepare and discuss with the instructor the required maintenance records entries, simulating a return to service situation.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**F. ASSEMBLY AND RIGGING**

**27-A Jack Aircraft**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint student with the required knowledge, understanding and skill to jack an aircraft.

**REFERENCES:**

1. Available Aircraft Maintenance Manuals (PA-23.250, PA 32.300)

**EQUIPMENT AND TOOLS REQUIRED:**

1. Aircraft jacks
2. Basic hand tools
3. Tails stand
4. Ballast

**SUPPLIES AND MATERIALS REQUIRED:**

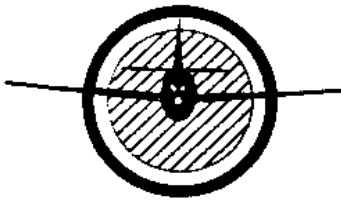
1. Information Sheets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**27-A Jack Aircraft**

**PROCEDURES:**

Using the above references and written information sheets, the student will jack and aircraft using the appropriate equipment and ballast. He will follow all safety procedures to raise and subsequently lower the aircraft. The student will discuss with the instructor the required maintenance record entry, simulating a return to service situation.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**I. AIRFRAME STRUCTURES**

**G. AIRFRAME INSPECTION**

<b>TOTAL HOURS: 36</b>	<b>THEORY: 12</b>	<b>SHOP/LAB: 24</b>
------------------------	-------------------	---------------------

---

**A. PURPOSE**

1. To determine Serviceability and Airworthiness of the Aircraft.
2. The procedure to be used of frequency of the inspection will be determined by the utilization of the Aircraft.

**B. TYPES OF INSPECTION**

1. Air Carrier Maintenance (14 CFR Part 121)
2. Air Taxi Maintenance (14 CFR Part 135)
3. Progressive Inspection (14 CFR Part 91.409)
4. Maintenance Programs under 14 CFR Part 91. Sub Part "E

" 14 CFR 91.217 through 91.219.

**C. 100 HOUR AND ANNUAL INSPECTION**

1. What Establishes the Frequency and Type of Inspection Required 91.409.
2. Persons Authorized to Conduct a 100 Hour Inspection.
3. Persons Authorized to Conduct an Annual Inspection.
4. Maximum Time Authorized Between Annual Inspections.
5. Use of Manufactures Service Information, Inspection Aids, Airworthiness Directives and Type Certificate Data Sheets.



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

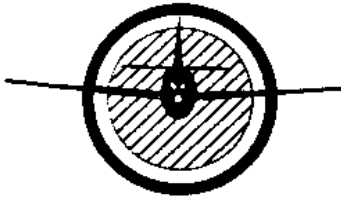
6. Inspection of Aircraft Maintenance Records.
7. Inspection Entries and Records.
8. Scope and Detail of Inspections
  - a. CFR 14 part 43, Appendix D
  - b. Manufacturers Inspection Schedule
9. Use of Checklist and Other Additional Performance Rules

**D. ROTORCRAFT INSPECTIONS**

1. Rotorcraft for Which a Rotorcraft Maintenance Manual Containing and “Airworthiness Limitations” requirement, 14 CFR Part 91.409 (e).
2. Additional Performance Rules for Rotorcraft 14 CFR Part 43.15(b).
3. Inspection of Rotorcraft with “Airworthiness Limitations” Section, maintenance must be done in accordance with that maintenance manual, 14 CFR Part 43.16.

**E. INSPECTION PROCEDURE**

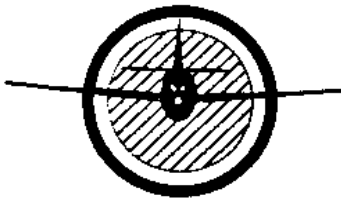
1. Inspection for Airworthiness May Take the Place of Annual of 100 Hour.
2. Annual or 100 Hour May Not Apply to Certain Aircraft
  - a. Special Flight Permit
  - b. Experimental Flight Permit
  - c. Other Certificates Which May Be Exempted
3. Some Inspections May Be Mandatory at Time Interval Specified By Manufacturer
4. Other Special Inspections
  - a. Overweight Landing
  - b. Hard Landing
  - c. Severe Turbulence



**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**I. AIRFRAME STRUCTURES**

**G. AIRFRAME INSPECTION**

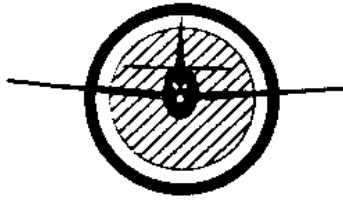
**LEVEL**

**28 PERFORM AIRFRAME CONFORMITY AND  
AIRWORTHINESS INSPECTIONS**

**(3)**

- A. Using manufacturer's manual, written procedures, forms, and an aircraft conduct and annual inspection. Research the airworthiness directives for applicable airworthiness directives. Verify through the type certificate data sheets that the aircraft conforms to certification standards. Make a proper return to service entry or an entry indicating reasons for not returning the aircraft to service in a sample log book (provided by the instructor) and a list of discrepancies to the instructor.
- B. The student will accomplish a 100 hours inspection on an airframe and record the conditions disclosed as a result of the inspection.

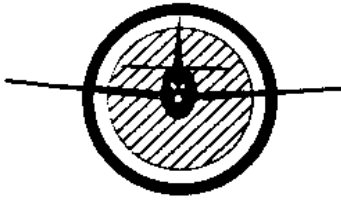
**(3)**



**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**G. AIRFRAME INSPECTION**

**28-A** Perform Airframe Conformity and Airworthiness Inspections

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 12.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required understanding and skill in performing airframe conformity inspections.

**REFERENCES:**

1. Airworthiness directives
2. Manufacturer Manuals
3. Type Certificate Data Sheets or Aircraft specifications
4. 14 CFR (EA-14 CFR -M2)

**EQUIPMENT AND TOOLS REQUIRED:**

1. PA 23-250 OR PA 32-300 Aircraft

**SUPPLIES AND MATERIALS REQUIRED:**

1. LogBook Sample
2. Information sheets

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**28-A** Perform Airframe Conformity and Airworthiness Inspections

**PROCEDURES:**

The student will accomplish an airframe conformity inspection and record discrepancies found.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**PRACTICAL PROJECT**

**I. AIRFRAME STRUCTURES**

**G. AIRFRAME INSPECTION**

**28-B** Perform Airframe Conformity and Airworthiness Inspections

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 12.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required understanding and skill in performing airframe inspections.

**REFERENCES:**

1. Airworthiness Directives
2. Manufacturer Manuals
3. 100 hours inspection forms
4. Type Certificate Data Sheets
5. Aircraft Specifications
6. 14 CFR Part 91,121,125,135)

**EQUIPMENT AND TOOLS REQUIRED:**

1. PA 23-250 OR PA 32-300 Aircraft

**SUPPLIES AND MATERIALS REQUIRED:**

1. Log Book Sample
2. Information sheets
3. 100 hours inspection forms

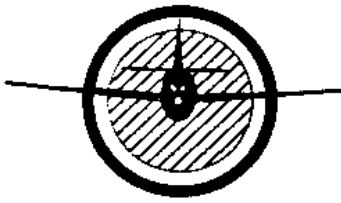
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**28-B** Perform Airframe Conformity and Airworthiness Inspections

**PROCEDURES:**

The student will accomplish a 100 hours inspection on an airframe and record the conditions disclosed as a result of the inspection.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**A. AIRCRAFT LANDING GEAR SYSETMS**

**TOTAL HOURS: 72      THEORY: 28      SHOP/LAB: 44**

---

**A. LANDING GEAR ARRANGEMENT**

1. Conventional Gear
2. Tricycle Gear
3. Tandem/Bicycle Gear
4. Boogie Wheel Arrangement
5. Fixed Gear
6. Retractable Gears
  - a. Electrically Operated
  - b. Hydraulically Operated
  - c. Emergency Extension
    - 1) Manually
    - 2) Hand Pump
    - 3) Accumulator Pressure
    - 4) Pneumatic

**B. SHOCK STRUTS**

1. Spring Oil Struts
2. Air Oil Struts (Oleo Struts)

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- a. Cylinder
- b. Piston
- c. Orifice
- d. Metering Pin
- e. Metering Tube
- f. Recoil Valve
- g. Spacers and Bearings
- h. Seals
- i. Schrader Valve
  - 1) High Pressure Valve Core Type
    - a) Identification of High Pressure core
  - 2) Poppet Type
  - 3) Combination Type
- j. Torque Links/Scissors
  - 1) Purpose
  - 2) Disconnect on Nose Gear Before Towing Aircraft
  - 3) Operation of Shock Strut
    - a) Shock Absorption of Landing
    - b) Shock Absorption During Static or Taxing
  - 4) Deflating Shock Struts on Aircraft
    - a) Clear All Equipment From Under the Aircraft
    - b) Release Air Pressure Slowly
    - c) Fluid Loss May Be Noted
  - 5) Servicing a Shock Strut With Hydraulic Fluid
    - a) Sources of Information for Correct Fluid
    - b) Remove Schrader Valve

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- c) Correct Fill Level
- 6) Servicing Shock Struts With Air or Nitrogen
  - a) Reinstall Schrader Valve and New Gasket
  - b) Inflate Strut With Compressed Air or Nitrogen to Manufacturers Specifications
    - 1. Inches of Piston Extension
    - 2. Inflate to Specified Pressure (PSI)
- 7) Bleeding a Shock Strut
  - a) Jack Aircraft to Fully Extended Strut
  - b) Service with correct fluid
  - c) Connect Bleeder Hose to Filler Point, Submerge Other End in a Container of Fluid
  - d) Compress and Telescope Strut Unit Air Bubbles Cease
  - e) Remove Bleeder Hose, Install Schrader Valve, and Inflate Strut
- 8) Inspection of Shock Struts
  - a) Fluid Leaks
  - b) Proper Extension
  - c) Damage to Exposed Piston

**C. MAIN LANDING GEAR ALIGNMENT, SUPPORT, RETRACTION, AND SAFETY DEVICES**

- 1. Torque Links
- 2. Trunnion
- 3. Drag Struts
- 4. Electric and Hydraulic Gear Retraction Devices
  - a. Gear-Up Locks

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- b. Gear Down Locks
  - 1) Gear Ground Locks
- c. Sequence Valves
- d. Landing Gear Safety Switches
- 5. Gear Position Indicators
  - a. Lights
  - b. Printed Tabs
  - c. Wheel Silhouette
  - d. In Transit Indication
  - e. Gear Unsafe Warning Horn

**D. NOSE WHEEL STEERING SYSTEM**

- 1. Light Aircraft
  - a. Mechanical Linkage to Rudder
- 2. Large Aircraft
  - a. Cockpit Control
  - b. Metering Valve
  - c. Power Source
  - d. One or More Steering Cylinders
  - e. Pressurizing Anti-shimmy Assembly
  - f. Follow Up Mechanism
  - g. Safety Devices

**E. SHIMMY DAMPERS**

- 1. Types
  - a. Piston Type
  - b. Vane Type

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- c. Steer Damper

**F. BRAKE SYSTEMS**

- 1. Independent Systems
  - a. Master Cylinder
    - 1) Cups Seal
    - 2) Piston
    - 3) Return Spring
    - 4) Compensating Port
- 2. Power Brake control System (PBCV)
  - a. Power Source
    - 1) Main Hydraulic System
    - 2) Accumulator
  - b. Pressure Ball – Check Brake Control Valve
  - c. Power Brake Sliding Spool Control Valve
  - d. Brake Debooster Valve
  - e. Brake fuse – Lockout Cylinder
  - f. Emergency Air Brake system
- 3. Power Boost Brake Systems
  - a. Reservoir
  - b. Power Boost Master Cylinders
  - c. Shuttle Valves

**G. BRAKE ASSEMBLES**

- 1. Single Disc Brake
- 2. Dual Disc Brake
- 3. Multiple Disc Brake

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

4. Segmented Rotor Brake
5. Expander Tube Brake
6. Advantages and Disadvantages of Each Type Brake Assembly

**H. INSPECTION AND MAINTENANCE OF BRAKE SYSTEMS**

1. Remove, Inspect and Replace a Brake Assembly
  - a. Locating Reference Information to Determine Procedures
  - b. Heat Crack of Drums and Discs
  - c. Brake Linings
  - d. Pistons and Seals
  - e. Fluid Level - Independent System
    - 1) Common Reservoir
    - 2) Master Cylinder Integral Reservoir
  - f. Lines and Fittings
  - g. Flexible Hoses
    - 1) Ballooning Flexible Hoses
2. Adjust Brake Clearances
  - a. Automatic Adjusters
  - b. Manual Adjustment
3. Bleeding Air from Brake Systems
  - a. Power Brake Control Valve Systems
    - 1) Using Accumulator Pressure
    - 2) Using System Pressure
  - a. Independent Brake Systems
    - 1) Gravity Feed Bleeding
    - 2) Pressure Feed Bleeding

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 4. Troubleshooting a Brake System
  - a. Loss of Brake Fluid
    - 1) Internal Leaks
    - 2) External Leaks
  - b. Creeping Brake Pedal
  - c. Grabbing Brake
    - 1) Grease or Oil Saturated Linings
    - 2) Corroded Brake Drum or Disc
  - d. Spongy Brake Pedal Movement
    - 1) Air in System
    - 2) Ballooning Flexible Hoses
  - e. Fading Brakes
    - 1) Glazed Brake Linings
    - 2) Wet Brake Linings
  - f. Dragging Brakes
    - 1) Broken or Weak Return Springs
      - a) Master Cylinder Return Spring
      - b) Brake Release Spring
    - 2) PBCV Open
    - 3) Contaminated Fluid
    - 4) Excessively Corroded Brake Drums or Discs
  - g. Excessive Brake Pedal Travel
    - 1) Worn Linings
    - 2) Linkage Adjustments

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- h. Overheated Brakes
  - 1) Safety Precautions
  - 2) Proper Extinguishing Methods
  - 3) Dangers of Sudden Cooling

**I. AIRCRAFT LANDING WHEELS**

- 1. Material Used
  - a. Aluminum Alloy
  - b. Magnesium Alloy
    - 1) Fire Hazard of Magnesium Wheels
- 2. Types of Wheels
  - a. Split Wheel
  - b. Removal Flange
  - c. O-ring seal between wheel sections
  - d. Torqueing of Assembly Hardware
- 3. Inspection of Wheels
  - a. Corrosion
  - b. Cracks
  - c. Dents and Warpage

**J. AIRCRAFT TIRES AND TUBES**

- 1. Cleaning and Storage of Tires
  - a. Proper Cleaning Procedures
  - b. Tire Storage
    - 1) Climatic Conditions
    - 2) Proper Racks for Storage



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

2. Construction Features of Tires and Tubes
  - a. Balance Dot on Tires
  - b. Balance Stripe on Tubes
  - c. Alignment of Balance References During Tire and Tube Mounting
3. Manufacturers Tire Data
  - a. Size
  - b. Ply Rating
  - c. Tubeless or Tube Type
  - d. Speed Rating
  - e. Manufacturers Name
  - f. Serial Number
  - g. Tire Type
4. Recapped Tires
  - a. Number of Recaps Permitted
  - b. Data Applied By Recapped
5. Demount, Inspect, Repair, and Reinstall Tires and Tubes on Wheel
  - a. Demounting Procedure and Safety Precautions
  - b. Inspection of Tires and Tubes
  - c. Tire and Tube Repairs
  - d. Mounting of Tires and Tubes
  - e. Inflation of Tires and Tubes
6. Balancing Tire and Wheel Assembly
7. Remove, Inspect, Service, and Reinstall Tire and Wheel Assembly
  - a. Sources of Service Information
  - b. Jacking Procedures and Safety Precautions

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- c. Axle Thread Protection
- d. Wheel Bearings
- e. Inspection of Wheels
  - 1) Fuse Plugs
  - 2) Any Defects
- f. Installation of Wheel Assembly
  - 1) Pre-Seat Wheel Bearings
  - 2) Final Torque of Wheel Nut

**K. BRAKE ANTI-SKID SYSTEM**

- 1. Components and Their Function
  - a. Transducer
  - b. Anti-skid Velocity Comparator
  - c. Anti-skid Valve
  - d. Anti-skid Cockpit Indicator Light
    - 1) Normal Operation
    - 2) System Malfunction

**L. LANDING GEAR SYSTEM MAINTENANCE**

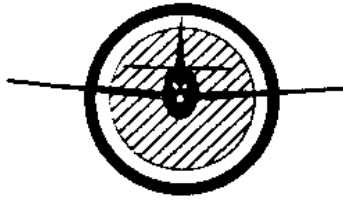
- 1. Periodic Inspection
  - a. Thoroughly Clean All Surfaces
  - b. Shock Struts
    - 1) Leaks
    - 2) Proper Servicing Fluid and Air
    - 3) Damage to Piston Surface
    - 4) Installed Ground Locks
    - 5) Condition of Attaching Brackets and Hardware

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 6) General condition for Bent or Cracked Structural Units
    - 7) All Areas of Corrosion
  - c. Shimmy Dampers and Steering Units
    - 1) Cables
    - 2) Leakage
    - 3) Security of Attachment
  - d. Wheels
    - 1) Corrosion
    - 2) Bent, Warped, or Damaging Defects
    - 3) Wheel Bolt for Looseness
    - 4) Fuse Plugs for Security
  - e. Tires
    - 1) Wear
    - 2) Cuts
    - 3) Deterioration
    - 4) Presence of Grease or Oil
    - 5) Alignment of Slippage Marks
    - 6) Proper Inflation
- 2. Landing Gear Rigging and Adjustment
  - a. Use Manufacturers Service Manual for Proper Adjustment
    - 1) Up Lock Clearances
    - 2) Down Lock Clearances
    - 3) Landing Gear Position Limit Switches
    - 4) Door Linkage

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

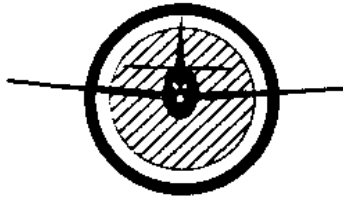
- 5) Landing Gear Door Clearances
- 6) Landing Gear Alignment
- 3. Landing Gear Retraction Check
  - a. When Required
    - 1) During an Annual Inspection of the Landing Gear
    - 2) After Performing Maintenance That Might Affect the Landing Gear Operation or Clearances within the Wheel Well Area
    - 3) After a hard or Overweight Landing
    - 4) Checking the Landing Gear Position and Warning System
    - 5) Operation of Cross-flow Valve
    - 6) Any Time a Malfunction in the Retraction system is known or suspected



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEM AND COMPONENTS**

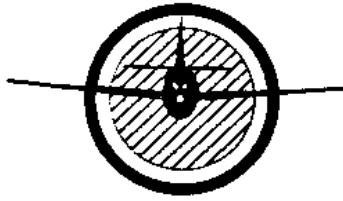
**A. AIRCRAFT LANDING GEAR SYSTEMS LEVEL**

**29: INSPECT, CHECK, SERVICE AND REPAIR LANDING GEAR, RETRACTION SYSTEMS, SHOCK STRUTS, TIRES, BRAKES, WHEELS, AND STEERING SYSTEMS (3)**

- A. Using written procedures and the AC 43.13-1B (as revised) de-mount a tire. Inspect the tire, the tube, (if tube type tire) and the wheel assembly. Determine and list repairs as needed. Reinstall the tire and inflate to the proper pressure. All safety precautions will be observed.
- B. Using appropriate written service information, wheel assembly mounted on an airplane or mock-up, remove the wheel from the axle. Inspect the wheel assembly and the bearings. Prepare a list of discrepancies found. Lubricate the bearings, re-install the wheel assembly on the axle, and adjust the bearing play. All safety precautions will be observed.
- C. Using a completely assembled shock strut installed on an airplane or mock-up, deflate the shock strut, drain the fluid, remove the piston, install seals, re-assemble the shock strut, re-install the air valve, service with fluid, inflate the shock strut and check for leaks. All safety precautions will be observed.
- D. Using an airplane or mock-up incorporating an operational nose wheel or tail wheel steering mechanism and dampener, inspect and adjust the steering mechanism and dampener.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- E. Using a wheel assembly containing a brake assembly on an airplane or mock-up, remove the brake-actuating cylinder, inspect the cylinder and re-install the actuating cylinder, check for leaks and bleed the air out of the system.
  
- F. Using an operational, retractable landing gear, written information or manufacturer's service manual, operate the retractable landing gear, inspect, adjust, and lubricate the landing gear as needed

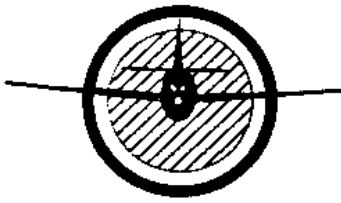


**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**A. AIRCRAFT LANDING GEAR SYSTEMS**

**29-A** Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of the standard practices of tire servicing.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook
3. Manufacturer's Service Manual

**EQUIPMENT AND TOOLS REQUIRED:**

1. Nitrogen bottle and Air Compressor
2. Air Hoses
3. Air gooseneck
4. Air pressure gage.
5. Core removal tool.
6. Basic hand-tools
7. Torque wrench

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

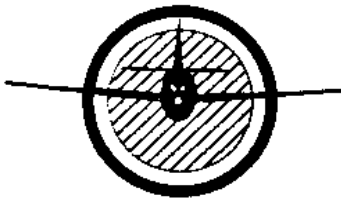
**29-A** Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Talc
3. Wheel Assembly
4. Tire Assembly.

**PROCEDURES:**

The student will demount a tire; remove tube, and wheel assembly. He will determine and list the necessary repairs. After presenting his findings to the instructor and making the necessary repairs, if any, he will reinstall the tube and tire and inflate to the correct tire pressure. He will observe all safety precautions related to tire servicing.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**B. AIRCRAFT LANDING GEAR SYSTEMS**

**29-B** Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and skill in the inspection, service and repair of aircraft wheels.

**REFERENCES:**

2. AC 43.13-1B/2B (as revised)
3. FAA-H-8083-31A Airframe Handbook
4. Manufacturer's Service Manual

**EQUIPMENT AND TOOLS REQUIRED:**

1. Aircraft or landing gear mock-up (with wheel and tire assembly)
2. Hand tools
3. Torque wrench
4. Aircraft jacks

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

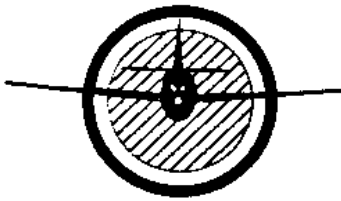
**29-B** Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Bearing grease

**PROCEDURES:**

The student will raise the aircraft and remove the wheel assembly from the axle. He will inspect the wheel assembly and bearing and prepare a written list of discrepancies found. He will describe the reason for rejecting any wheel component and describe the repairs that may be necessary. He will inspect, lubricate, and reinstall the wheel bearings and the wheel assembly on the aircraft wheel axle. The student will check for proper bearing play, torque and safety attaching nut and lower the airplane.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**A. AIRCRAFT LANDING GEAR SYSTEMS**

**29-C** Inspect, check, service, and repair landing gear, retraction, systems, shock struts, brakes, wheels, tires and steering systems.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE**

To acquaint the student with the required knowledge and skills in the inspection and service of landing gear shock struts.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook
3. Manufacturer's Service Manual

**EQUIPMENT AND TOOLS REQUIRED:**

1. Aircraft or Landing gear mock-up
2. Air Compressor or nitrogen bottle
3. Basic Hand tools

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

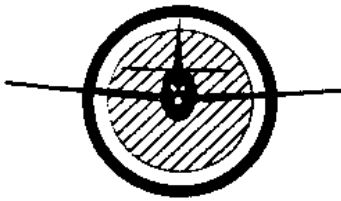
**29-C** Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**SUPPLIED AND MATERIAL REQUIRED:**

1. Written information
2. Replacement seals
3. Hydraulic fluid

**PROCEDURES:**

The students will deflate a shock strut, drain the fluid, remove the piston from the cylinder, install seals, reassemble the strut, service with fluid, reinstall the air valve and inflate the strut. He will locate and interpret information from the service instruction and explain the probable causes of malfunctions normally encountered in the operation of shock struts assemblies.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**A. AIRCRAFT LANDING GEAR SYSTEMS**

**29-D** Inspect, check, service, and repair landing gear, retraction, systems, shock struts, brakes, wheels, tires and steering systems.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE**

To acquaint the student with the required knowledge, understanding and skills in the inspection and service of steering system and mechanism.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook
3. Manufacturer's Service Manual

**EQUIPMENT AND TOOLS REQUIRED:**

1. Aircraft or mock-up
2. Basic hand tools

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Hydraulic fluid

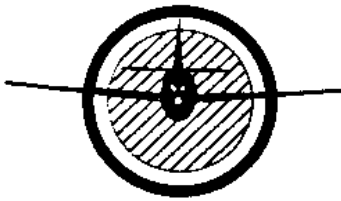
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**29-D**    Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**PROCEDURES:**

The student will inspect, adjust, and service a nose wheel steering and dampener mechanism. He will list all discrepancies found and discuss them with the instructor the proper repairs for his findings, based on the aircraft manufacturer recommendations.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**A. AIRCRAFT LANDING GEAR SYSTEMS**

- 29-E** Inspect, check, service, and repair landing gear, retraction, systems, shock struts, brakes, wheels, tires and steering systems.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE**

To acquaint the student with the required knowledge and skills in the inspection service and repair of aircraft brakes.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook
3. Manufacturer's Service Manual

**EQUIPMENT AND TOOLS REQUIRED:**

1. Aircraft or mock-up (with hydraulic brake system)
2. Jacks
3. Basic hand-tools

**SUPPLIES AND MATERIALS REQUIRED:**

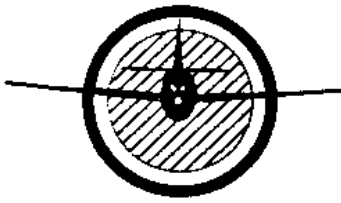
1. Written information

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**29-E** Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**PROCEDURES:**

The student will remove the wheel from the axle, inspect the brake assembly, adjust the clearance as necessary and reinstall the wheel. He will list all discrepancies found and discuss with the instructor the possible repairs, based on the manufacturer service manuals.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**A. AIRCRAFT LANDING GEAR SYSTEMS**

**29-F** Inspect, check, service, and repair landing gear, retraction systems, shock struts, brakes, wheels, tires and steering systems.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE**

To acquaint the student with the required knowledge and skills in the operation, test, and service of brake actuating systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook
3. Manufacturer's Service Manual

**EQUIPMENT AND TOOLS REQUIRED:**

1. An operational hydraulic brake system installed in an airplane or mock-up.
2. Jacks
3. Basic hand tools
4. Bleeder tank

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

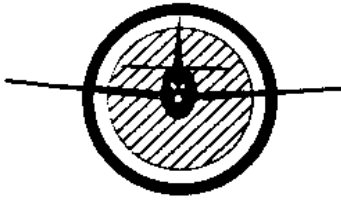
**29-F** Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Hydraulic fluid

**PROCEDURES:**

The student will remove a brake actuating cylinder and perform a functional test of the system. He will inspect and reinstall the brake actuating cylinder, following the instructions on the manufacturer service manuals. The student must discuss with the instructor his findings and the work that was performed on this unit.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**A. AIRCRAFT LANDING GEAR SYSTEMS**

**29-G** Inspect, check, service, and repair landing gear, retraction, systems, shock struts, brakes, wheels, tires and steering systems.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and skills in the inspection service and repair of retractable landing gear.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook
3. Manufacturer's Service Manual

**EQUIPMENT AND TOOLS REQUIRED:**

1. An operational retractable landing gear
2. Lubrication equipment
3. Mirror
4. Measuring devices

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

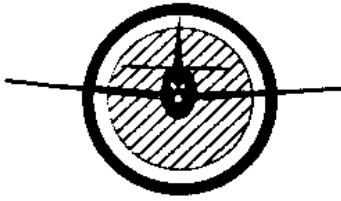
**29-G** Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Grease

**PROCEDURES:**

The student will operate the retractable, landing gear, inspect and adjust the landing gear to meet return to service standards. He will also lubricate the landing gear as needed.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS**

**TOTAL HOURS: 48**

**THEORY: 18**

**SHOP/LAB: 30**

---

**A. IDENTIFY AND SELECT HYDRAULIC FLUIDS**

1. Vegetable Base Fluids
  - a. Odor
  - b. Viscosity
  - c. Color
  - d. Military Specifications
  - e. Type of Seals
2. Mineral Base Fluids
  - a. Odor
  - b. Viscosity
  - c. Color
  - d. Military Specifications
  - e. Type of Seals
3. Chemical Base Fluids
  - a. Trade Names
  - b. Odor

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- c. Color
  - d. Viscosity
  - e. Precautions during Servicing
  - f. Types of Seals
4. Hydraulic Fluid Contamination
- a. Contamination Control
  - b. Contamination Check

**B. SELECT AND INSTALL SEALS**

1. Types of Seals
- a. Packing
  - b. Gaskets
2. Materials
- a. Natural Rubber
  - b. Synthetic
    - 1) Neoprene
    - 2) Butyl Rubber
    - 3) Teflon
3. Design
- a. O-ring
  - b. Chevron
  - c. Cup
  - d. Square
  - e. Special
  - f. Miscellaneous



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

4. Installation of Seals
5. Removal of Seals
6. Cure Date of Seals

**C. COMPARE CONSTANT PRESSURE AND OPEN CENTER TYPES OF HYDRAULIC SYSTEMS**

1. Constant Pressure Systems
  - a. Selector Valve Arrangement
2. Open Center Systems
  - a. Selector Valve Arrangement
3. Live Line System
  - a. Variable Displacement Pump

**D. INTERPRET REFERENCE INFORMATION PERTAINING TO OPERATION OF BASIC HYDRAULIC SYSTEM COMPONENTS**

1. Hand Pumps
  - a. Single Action
  - b. Double Action
2. Actuating Cylinders
  - a. Single Action
  - b. Double Action
    - 1) Balanced
    - 2) Unbalanced
3. Reservoir
  - a. Vented
  - b. Pressurized
4. Check Valves

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- a. Plain Check Valve
- b. Orifice Type Check Valve
- 5. Selector Valves
  - a. Design Types
    - 1) Rotor
    - 2) Poppet
    - 3) Spool
- 6. Relief Valves
  - a. Ball Type
  - b. Poppet Type
  - c. Sleeve Type
  - d. Main System Relief Valve
  - e. Thermal Relief Valve
- 7. Pressure Regulators
  - a. Balanced Type
  - b. Spool Type
- 8. Accumulator
  - a. Bladder Type
  - b. Diaphragm Type
  - c. Piston Type
- 9. Flap Overload Valve
- 10. Sequence/Timing Valve
- 11. Cross-flow Valve
- 12. Shuttle Valve

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 13. Hydraulic Fuse
- 14. Pressure Gauges and Snubbers
- 15. Hydraulic Filters
  - a. Micronic
  - b. Screen

**E. INTERPRET INFORMATION PERTAINING TO SERVICING HYDRAULIC RESERVOIRS**

- 1. Hydraulic Reservoir Construction Features
  - a. Filler Openings
  - b. Expansion Space
  - c. Fluid Quantity
  - d. Filters
  - e. Pressurized Reservoirs
  - f. Stand Pipe
  - g. Internal Baffles

**F. IDENTIFY AND DESCRIBE THE OPERATION OF CONSTANT AND VARIABLE DISPLACEMENT HYDRAULIC PUMPS**

- 1. Constant Displacement Pumps
  - a. Gear Type
  - b. Piston Type
  - c. Gerotor Type
  - d. Vane Type
- 2. Variable Displacement Pumps
  - a. Stroke Reduction Type
  - b. Intake Starvation Type

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- c. Demand Type
- 3. Pump Shear Shaft Provisions

**G. CHECK, INSPECT, REMOVE, AND INSTALL HYDRAULIC POWER PUMPS**

- 1. Methods of Driving Pumps
  - a. Engine Driven
  - b. Electrically Driven
  - c. Air Driven
- 2. Inspection of Pumps
- 3. Removal and Installation of Hydraulic Pumps

**H. INSPECT, SERVICE AND CHECK A HYDRAULIC ACCUMULATOR**

- 1. Operation of Accumulators
- 2. Servicing Accumulators
- 3. Inspection, Removal, and Installation of Accumulators
  - a. Design Types of Accumulators
    - 1) Bladder
    - 2) Diaphragm
    - 3) Piston

**I. TROUBLESHOOT AND DETERMINE THE CAUSE OF LOW, HIGH, OR FLUCTUATING SYSTEM HYDRAULIC PRESSURE**

- 1. Normal System Operation
- 2. Low System Pressures
- 3. High System Pressures
- 4. Fluctuating Pressures
- 5. Adjustment of Pressures

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**J. INSPECT, CHECK, AND SERVICE A HYDRAULICALLY OPERATED SYSTEM**

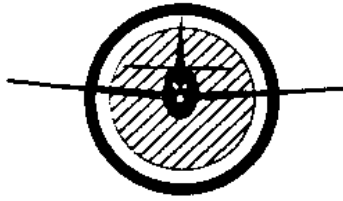
1. System Operation
2. Inspection of System
3. Servicing Hydraulic Systems

**K. INTERPRET REFERENCE INFORMATION PERTAINING TO OPERATION OF BASIC PNEUMATIC SYSTEM COMPONENTS**

1. Use of Pneumatics
  - a. Brakes
  - b. Opening and Closing Doors
  - c. Driving Hydraulic Pumps, Alternators, Starters, Water Injection Pumps
  - d. Operating Emergency Devices
2. Similarities of Pneumatic and Hydraulic Systems
3. Sources of Pneumatic Power
  - a. Storage Bottles
  - b. Installed Air Compressors
  - c. Bleed Air
4. Pneumatic System Components
  - a. Relief Valves
  - b. Control Valves
  - c. Check Valves
  - d. Restrictions
    - 1) Fixed
    - 2) Variables
  - e. Filters

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

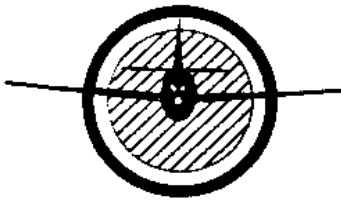
- 1) Micronic
    - 2) Screen
  - f. Air Compressors
    - 1) Electrically Operated
    - 2) Hydraulically Operated
  - g. Moisture Separation
  - h. Chemical
  - i. Pressure Transmitter
  - j. Pressure Switch
  - k. Condensation Dump Valve
- 5. Pneumatic Power System Maintenance
  - a. Lubricating Oil Level for Compressor
  - b. Pumping of the Pneumatic System
    - 1) Excessive Oil or Foreign Matter
    - 2) Draining of System Air Bottles
  - c. Servicing Storage Bottles
    - 1) Nitrogen
    - 2) Clean Dry Air
  - d. Operational and Leak Check Installation



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**B. HYDRAULIC AND PNEUMATIC SYSTEMS**

**LEVEL**

**30 REPAIR HYDRAULIC AND PNEUMATIC POWER SYSTEM COMPONENTS (2)**

- A. Using hydraulic components, not requiring complex disassembly or reassembly. Seal. Fluids and written reference information; disassemble. Inspect, install seals, reassemble and test component

**31 IDENTIFY AND SELECT HYDRAULIC FLUIDS. (3)**

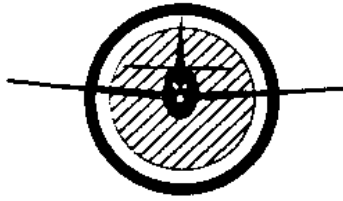
- A. Given samples of hydraulic fluids; distinguish the fluids by color, odor, and specification number. When shown a sample placard or data plate, select the fluid used to service the system.
- \* B. Given samples of hydraulic fluid, describe the characteristics of each type of hydraulic fluid.

**32 INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND REPAIR HYDRAULIC AND PNEUMATIC POWER SYSTEMS. (3)**

- A. Given a hydraulic system on an aircraft or mock-up, written inspection and service instructions; trouble shot, inspect check and repair the hydraulic system
- B. Given a pneumatic power system, written procedures for inspecting, checking servicing, repairing and troubleshoots the system and list all repairs as needed.

**\* OPTIONAL; PROJECTS**

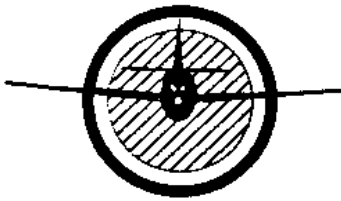




**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS**

**30-A Repair Hydraulic and Pneumatic Power System Components**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge in hydraulic and pneumatic power system components repair.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2
3. Manufacturer service information

**EQUIPMENT AND TOOLS REQUIRED**

1. Basic Hand Tools

**SUPPLIES AND MATERIALS REQUIRED:**

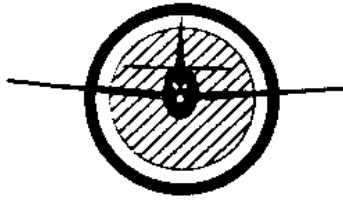
1. Hydraulic component
2. Seals and fluids
3. Written information

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**30-A** Repair Hydraulic and Pneumatic Power System Components

**PROCEDURES:**

The student will install seals in one unit in accordance with the procedures specified and test the unit.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS**

**31-A Identify and Select Hydraulic Fluid**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge in hydraulic fluid characteristics and specifications.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

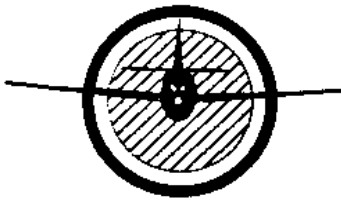
1. Written information
2. Fluid samples
3. Sample placards of the type used or attached to hydraulic reservoir.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**31-A Identify and Select Hydraulic Fluid**

**PROCEDURES:**

The student will distinguish between the sample fluids by colors, odor and specification number when shown the sample placard or reservoir data plate, he will select the fluid that would be used to service the system. He will describe the characteristics of each type of hydraulic fluid.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS**

**31-B Identify and Select Hydraulic Fluid**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge in hydraulic fluid in hydraulic characteristics.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

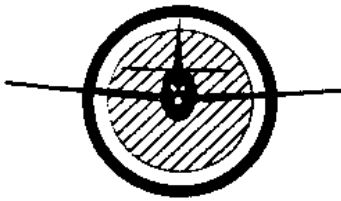
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Fluid samples

**PROCEDURES:**

The student will identify samples of vegetable, petroleum and synthetic base hydraulic fluid and describe the characteristics of each type of fluid.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECTS**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS**

- 32-A** Inspect, check, service, troubleshoot and repair hydraulic and pneumatic power system

**TEACHING LEVEL (3)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the operation of hydraulic and pneumatic power system.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Hydraulic system on an aircraft or mock-up
2. Basic hand-tools

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Manufacturer's publications applicable to the specific system

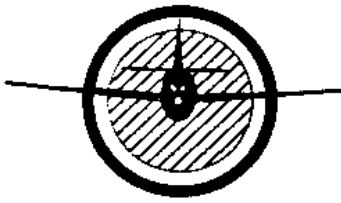
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**32-A** Inspect, check, service, troubleshoot and repair hydraulic and pneumatic power system

**PROCEDURES:**

The student will operate, troubleshoot, check, describe and repair the faults in the system. He will make the necessary repairs to restore the system to operating tolerances.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS**

**32-B** Inspect, check, service, troubleshoot and repair hydraulic and pneumatic power system

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, and understanding in the operation and repair of hydraulic and pneumatic power system.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook

**EQUIPMENT AND TOOLS REQUIRED:**

1. Pneumatic system on an aircraft or mock-up
2. Basic hand-tools

**SUPPLIES AND MATERIALS REQUIRED:**

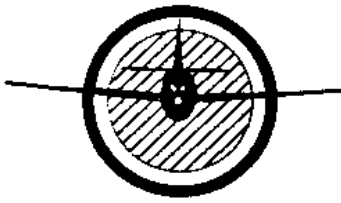
1. Written information
2. Manufacturer's publications applicable to the specific system

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**32-A** Inspect, check, service, troubleshoot and repair hydraulic and pneumatic power system

**PROCEDURES:**

The student will interpret information and explain the operation of the specific system and list all repairs as needed to operate system correctly.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**C. CABIN ATMOSPHERE CONTROL SYSTEMS**

**TOTAL HOURS: 30                      THEORY: 18                      SHOP/LAB: 12**

---

**A. OXYGEN AND THE ATMOSPHERE**

1. Need for Oxygen
2. Atmospheric Pressure Changes with Altitude
3. Temperature Changes With Altitude

**B. AIR CONDITIONING AND PRESSURIZATION TERMINOLOGY**

1. Absolute Pressure
2. Absolute Temperature
3. Adiabatic Cooling
4. Ambient Temperature
5. Ambient Pressure
6. Barometric Pressure
7. Cabin Altitude
8. Differential Pressure
9. Gauge Pressure

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

10. Ram Air Temperature Rise

11. Temperature Scales

a. Centigrade

b. Fahrenheit

c. Kelvin

**C. SOURCES OF CABIN PRESSURE**

1. Reciprocating Engine Internal Superchargers

2. Turbine Engine Compressor Bleed Air

3. Positive Displacement Compressors (Superchargers)

4. Centrifugal Cabin Compressors

5. Supercharger Controls

6. Supercharger Instrumentation

**D. PRESSURIZATION CONTROLS**

1. Controller

2. Cabin Pressure Regulator

a. Isobaric Mode

b. Differential Mode

c. Cabin Pressure Safety Valve

**E. AIR DISTRIBUTION**

1. Controls

2. Ducting

3. Filters

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**F. COMBUSTION HEATERS**

1. Fuel System
2. Ignition System
3. Air System
4. Inspection and Maintenance

**G. AIR CYCLE COOLING SYSTEMS**

1. Principle of Operation

**H. AIR CYCLE SYSTEM COMPONENTS**

1. Primary Heat Exchanger
2. Primary Heat Exchanger Bypass Valve
3. Shutoff Valve
4. Refrigeration Bypass Valve
5. Secondary Heat Exchanger
6. Refrigeration Unit
7. Water Separators
8. Ram Air Valve

**I. ELECTRONIC TEMPERATURE CONTROLS**

1. Cabin Temperature Pickup Unit
2. Cabin Temperature Selector
3. Cabin Temperature Regulator
4. System Operation

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**J. VAPOR CYCLE SYSTEMS**

1. Refrigeration Cycle
2. Basic Laws of Thermodynamics
3. System's Principles of Operation

**K. VAPOR CYCLE SYSTEM COMPONENTS**

1. Compressor
2. Condenser
3. Receiver – Drier
4. Sight Glass
5. Expansion Valve
6. Evaporator

**L. SERVICING VAPOR CYCLE SYSTEMS**

1. Physical Precautions Required
2. Refrigerant – 12 (R-12)
3. Manifold Set
4. Purging the System
5. Evacuating the System
6. Recharging
7. Checking Oil Level

**M. OXYGEN SYSTEMS - GENERAL**

1. Continuous Flow Systems
2. Pressure Demand Systems

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

3. Portable Oxygen Systems
4. Cylinders for Gaseous Oxygen
5. Solid State Oxygen Systems
6. Oxygen Systems Plumbing

**N. OXYGEN VALVES**

1. Filler Valves
2. Check Valves
3. Shutoff Valves
4. Pressure Reducing Valves
5. Pressure Relief Valves

**O. OXYGEN REGULATORS**

1. Diluter Demand Style
2. Continuous Flow type

**P. OXYGEN SYSTEM COMPONENTS**

1. Flow Indicator
2. Pressure Gauge
3. Masks

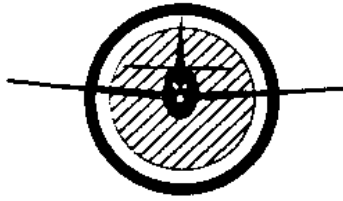
**Q. SERVICING GASEOUS OXYGEN SYSTEMS**

1. Safety Precautions
2. Leak Testing
3. Draining an Oxygen System
4. Cleaning the Oxygen System – Approved Cleaning Agents

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- a. Anhydrous Ethyl Alcohol
  - b. Isopropyl Alcohol
  - c. Trichlorethylene
  - d. Commercial Compounds
- 5. Purging the Oxygen System
  - 6. Charging Oxygen Cylinders
  - 7. Hydrostatic Checks
  - 8. Temperature – Pressure Conversion Charts

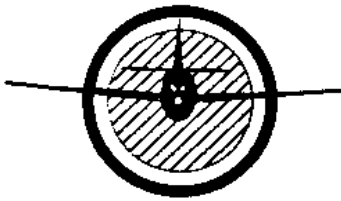




**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**C. CABIN ATMOSPHERE CONTROL SYSTEMS LEVEL**

**33 INSPECT, CHECK, TROUBLESHOOT, SERVICE, AND REPAIR HEATING, COOLING, AIR CONDITIONING, PRESSURIZATION SYSTEMS AND AIR CYCLE MACHINES (1)**

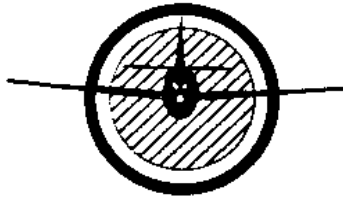
- A. Using written information, and a diagram answer questions concerning the inspection, check troubleshoot, service and repair heating, cooling, air conditioning, pressurization systems, and air cycle machines.

**34 INSPECT, CHECK, TROUBLESHOOT, SERVICE, AND REPAIR HEATING, COOLING, AIR-CONDITIONING, AND PRESSURIZATION SYSTEMS (1)**

- A. Using written information and a diagram answer questions concerning the inspection, check, troubleshoot, service and repair of a vapor cycle Freon system.

**35 INSPECT, CHECK, TROUBLESHOOT, SERVICE, AND REPAIR OXYGEN SYSTEMS (2)**

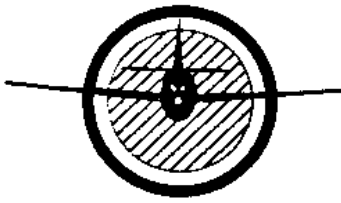
- A. Using manufacturer's service manual or equivalent written information, check the oxygen system for leakage, and system pressure. Inspect oxygen masks for contamination and proper operation.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**C. CABIN ATMOSPHERE CONTROL SYSTEMS**

**33-A INSPECT, CHECK, TROUBLESHOOT, SERVICE, AND REPAIR HEATING, COOLING, AIR CONDITIONING, PRESSURIZATION SYSTEMS AND AIR CYCLE MACHINES**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 3.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the inspection, service and repair of heating, cooling, air conditioning, pressurization systems and air cycle machines.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2
3. Aircraft heating, cooling, air conditioning, pressurization systems and air cycle machines system mock-up instructions

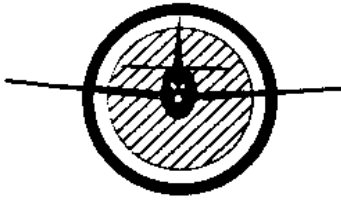
**EQUIPMENT AND TOOLS REQUIRED:**

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Soap and water solution

**PROCEDURES:**

Using written information, and a diagram answer questions concerning the inspection, check troubleshoot, service and repair heating, cooling, air conditioning, pressurization systems, and air cycle machines.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**C. CABIN ATMOSPHERE CONTROL SYSTEMS**

**34-A INSPECT, CHECK, TROUBLESHOOT, SERVICE, AND REPAIR HEATING, COOLING, AIR-CONDITIONING, AND PRESSURIZATION SYSTEMS**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 3.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the inspection, service and repair of oxygen systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

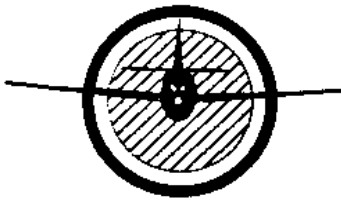
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURES:**

Using written information and a diagram; answer questions concerning the inspection, check, troubleshoot, service and repair of a vapor cycle Freon system.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**C. CABIN ATMOSPHERE CONTROL SYSTEMS**

**35-A** Inspect, Check, Troubleshoot, Service and Repair Oxygen Systems

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the inspection, service and repair of oxygen systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2
3. Aircraft oxygen system mock-up instructions

**EQUIPMENT AND TOOLS REQUIRED:**

1. Oxygen system mock-up

**SUPPLIES AND MATERIALS REQUIRED:**

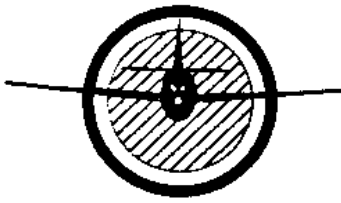
1. Written information
2. Soap and water solution

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**35-A** Inspect, Check, Troubleshoot, Service and Repair Oxygen Systems

**PROCEDURES:**

The student will check the oxygen system for leakage, check bottle pressure, check oxygen system pressure, and inspect oxygen masks for contamination and check and oxygen mask and regulator for proper operation.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**D. AIRCRAFT INSTRUMENT SYSTEMS**

**TOTAL HOURS: 24                      THEORY: 12                      SHOP/LAB: 12**

---

**A. AIRCRAFT INSTRUMENT SYSTEMS**

1. Instrument Requirements in Modern Aircraft
2. Flight Instruments – Minimum Required
3. Engine Instruments – Minimum Required
4. Navigational Instruments
5. Instrument Cases – Airtight – Vented
6. Instrument Dials
7. Instrument Range Markings
8. Instrument Panels – Shock Mounts
9. Bonding of Instrument Panels
10. Repair of Instruments

**B. HANDLING AND STORAGE OF INSTRUMENTS**

1. Preservations of Instruments
  - a. Pickling, Wrapping, Sealing in Plastic
  - b. Dust Protection – Humidity Protection
  - c. Packing Cartons – Metal, Cardboard, Fiberglass



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- d. Packing Material – Foam, Plastic coated Hair, Etc.
- 2. Storage of Serviceable Instruments
  - a. Extended Storage of Instruments – Inspect Periodically
  - b. Shipping of Instruments – Proper Cartons
  - c. Use of Drying Agents
  - d. Large Units – Use of Shock Mounts

**C. INSPECT AIRCRAFT INSTRUMENT SYSTEM**

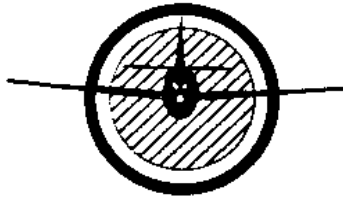
- 1. External Pilot Static System
- 2. Instrument Inspection
  - a. Pointers, Flags, Etc., for Proper Position Power-Off
  - b. Pointers, Flags, and Gyro Noise, Etc., for Proper Position Power-On
- 3. Range Markings Proper and Legible – Slippage Mark
- 4. Instrument Panel
  - a. Proper Bonding
  - b. Shock Mounts
  - c. Binding or Rubbing Between Panels of the Airframe
- 5. Check Conditions of All Wiring and Plumbing

**D. CHECK, TROUBLESHOOT, AND REPAIR AIRCRAFT INSTRUMENT SYSTEMS**

- 1. Pitot Static Systems - Airspeed - Altimeter Check
- 2. Gyro Altitude Indicator System - Vacuum - Electric
- 3. Temperature Indicating Systems - Vapor Pressure, Thermocouple
- 4. Pressure Indicating Systems - Bourdon Tube Autosyn

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

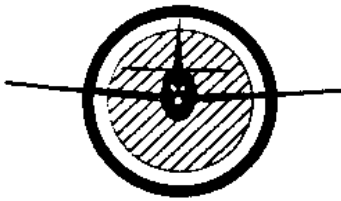
- 5. Positions Indicating Systems
  - a. Swinging a Compass
- 6. Speed Indicating Systems - MACH - IAS - TAS



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

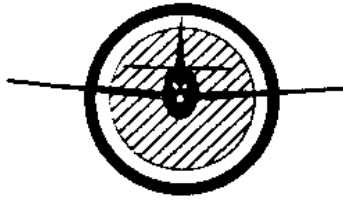
**C. AIRCRAFT INSTRUMENT SYSTEMS LEVEL**

**36: INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND REPAIR ELECTRONIC FLIGHT INSTRUMENT SYSTEMS AND BOTH MECHANICAL AND ELECTRICAL, HEADING, SPEED, ALTITUDE, TEMPERATURE, PRESSURE, AND POSITION INDICATING SYSTEMS TO INCLUDE THE USE OF BUILT-IN TEST EQUIPMENT (BITE) (1)**

A. Using the AC 43.13-1B/2B (as revised), the EA-ITP-AB, EA-14 CFR -1M and the projects sheets; answer questions concerning instruments.

**37: INSTALL INSTRUMENTS AND PERFORM A STATIC PRESSURE SYSTEM LEAK TEST (2)**

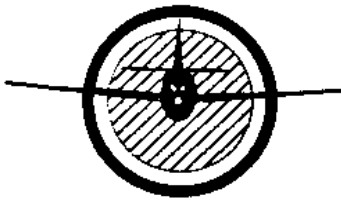
A. Using AC 43.13-B/2B (as revised), remove and install two instruments, checking the lines and/or wires for proper routing, security, and condition. Answer questions on operating principle and the use of the static pressure system leak test.



**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**D. AIRCRAFT INSTRUMENT SYSTEMS**

**36-A** INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND REPAIR ELECTRONIC FLIGHT INSTRUMENT SYSTEMS AND BOTH MECHANICAL AND ELECTRICAL, HEADING, SPEED, ALTITUDE, TEMPERATURE, PRESSURE, AND POSITION INDICATING SYSTEMS TO INCLUDE THE USE OF BUILT-IN TEST EQUIPMENT (BITE)

**TEACHING LEVEL:** (1)

**AVERAGE COMPLETION TIME:** 4.0 Hrs.

**PURPOSE:**

To acquaint the student with the required knowledge of aircraft instruments

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

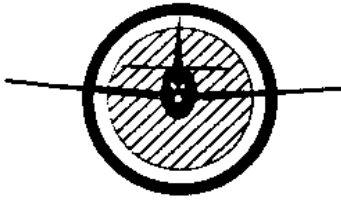
1. Written information
2. Questions concerning static pressure system leak test

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**36-A** INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND REPAIR ELECTRONIC FLIGHT INSTRUMENT SYSTEMS AND BOTH MECHANICAL AND ELECTRICAL, HEADING, SPEED, ALTITUDE, TEMPERATURE, PRESSURE, AND POSITION INDICATING SYSTEMS TO INCLUDE THE USE OF BUILT-IN TEST EQUIPMENT (BITE)

**PROCEDURES:**

Using the AC 43.13-1B/2B (as revised), FAA-H-8083-31A Airframe Handbook Vol. 2;  
answer questions concerning instruments.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**D. AIRCRAFT INSTRUMENT SYSTEMS**

**37-A Install Instruments and Perform a Static Pressure system Leak Test**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge in instrument installation and static pressure system leak check.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

1. Aircraft or instrument mock-up
2. Pitot static Leak Tester
3. Basic hand-tools

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Questions concerning static pressures system leak test

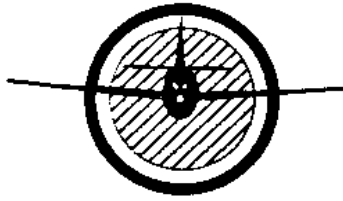


**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**37-A** Install Instruments and Perform a Static Pressure system Leak Test

**PROCEDURES:**

The student will remove and install two instruments, checking the lines, and/or wires for proper routing, security and condition, Answer questions on operating principle and use of the static pressure system leak test.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**E. COMMUNICATION AND NAVIGATION SYSTEMS**

**TOTAL HOURS: 36                      THEORY: 18                      SHOP/LAB: 18**

**A. BASIC RADIO PRINCIPLES**

1. Simple A. C. Circuits
2. Frequency Bands

**B. BASIC EQUIPMENT COMPONENTS**

1. Transmitters
2. Receivers
3. Antennas
4. Microphones
5. Power Supplies

**C. COMMUNICATION SYSTEMS**

1. VHF (Very High Frequency) Communications
2. HF (High Frequency) Radio Systems

**D. NAVIGATION EQUIPMENT**

1. VOR (Very High Frequency Omnidirectional Range)
  - a. Course Deviation Indicator
  - b. Tests and Test Facilities

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

2. ILS (Instrument Landing System)
  - a. Localizer
  - b. Glideslope
  - c. Marker Beacons
3. DME (Distance Measuring Equipment)
4. ADF (Automatic Direction Finding)
5. Transponder
6. Doppler Systems
7. INS (Inertial Navigation Systems)
8. Airborne Weather Radar
9. Radio Altimeters

**E. EMERGENCY LOCATOR TRANSMITTERS**

1. Use in Civil Aircraft
2. Transmitter
3. Batteries
4. Acceptable Test Procedures

**F. EQUIPMENT INSTALLATION**

1. Instrument Panel Mounting
2. Cooling
3. Moisture
4. Vibration Isolation

**G. MINIMIZING RADIO INTERFERENCE**

1. Isolation

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

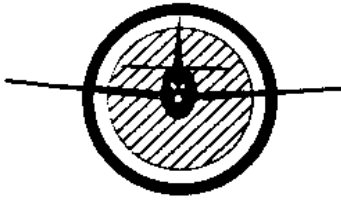
2. Bonding
3. Shielding
4. Static Discharge Wicks
  - a. Carbon Braid
  - b. Metallic Braid
  - c. Null field

**H. AIRCRAFT ANTENNA INSTALLATION**

1. Fixed and Trailing Wire Antennas
2. Whip and Blade Antennas
3. Flush Mounted Antennas
4. Coaxial Cable and Fittings
5. Radomes
6. Radome Inspection
7. Radome Maintenance and Repair
8. Calibration of Loop Antennas

**I. FCC REGULATIONS PERTAINING TO TWO-WAY RADIO OPERATION**

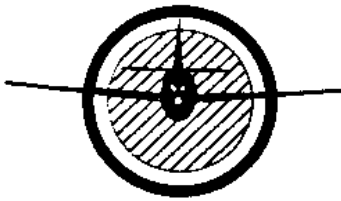
1. FCC License Requirements
2. FCC Regulations Covering Transmission Techniques



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

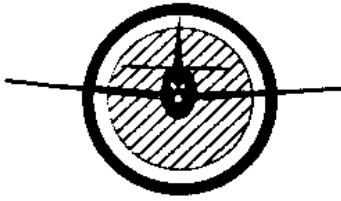
**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**E. COMMUNICATION AND NAVIGATION SYSTEMS**

**LEVEL**

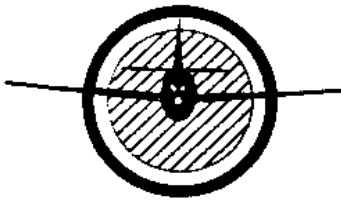
- |           |  |            |
|-----------|--|------------|
| <b>38</b> | <b>INSPECT, CHECK AND TROUBLESHOOT, AUTOPILOT, SERVOS AND APPROACH COUPLING SYSTEMS.</b>   | <b>(1)</b> |
|           | <p>A. Answer statements (essay type), concerning the purposes and operation of an auto-pilot, using the AC 43.13-B (as revised) and the FAA-H-8083-31A Airframe Handbook Vol.</p>  |            |
| <b>39</b> | <b>INSPECT, CHECK AND SERVICE AIRCRAFT ELECTRONIC COMMUNICATION AND NAVIGATION SYSTEMS, INCLUDING VHF PASSENGER ADDRESS INTERPHONES AND STATIC DISCHARGE DEVICES, AIRCRAFT VOR, ILS, LORAN. RADAR BEACON TRANSPONDERS, FLIGHT MANAGEMENT COMPUTERS, AND GPWS.</b>    | <b>(1)</b> |
|           | <p>A. Answer questions dealing with types of equipment used in various aircraft, where and how the equipment is mounted, cooled, and the reduction of electrical interference.</p>   |            |
| <b>40</b> | <b>INSPECT AND REPAIR ANTENNA AND ELECTRONIC EQUIPMENT INSTALLATIONS</b>   | <b>(2)</b> |
|           | <p>A. Using aircraft manufacturer's manual and/or AC 43.13-1B (as revised), locate and inspect a fixed wire antenna or a blade antenna as specified by the instructor), also inspect the antenna wiring. Using the antenna defect sheet list all repairs needed.</p> |            |



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**E. COMMUNICATION AND NAVIGATION SYSTEMS**

**38-A INSPECT, CHECK AND TROUBLESHOOT, AUTOPILOT,  
SERVOS AND APPROACH COUPLING SYSTEMS.**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the inspection, checking and troubleshooting auto-pilot, servos and approach coupling systems.

**REFERENCES:**

AC 43.13-1B/2B  
FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

1. Aircraft with electronic installation and antennas.

**SUPPLIES AND MATERIALS REQUIRED:**

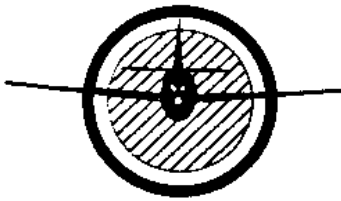
1. Written information

**PROCEDURES:**

Answer statements (essay type), concerning the purposes and operation of an auto-pilot, using the AC 43.13-1B/2B (as revised) and the FAA-H-8083-31A Airframe Handbook

Vol. 2





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**E. COMMUNICATION AND NAVIGATION SYSTEMS**

- 39-A** INSPECT, CHECK AND SERVICE AIRCRAFT ELECTRONIC COMMUNICATION AND NAVIGATION SYSTEMS, INCLUDING VHF PASSENGER ADDRESS INTERPHONES AND STATIC DISCHARGE DEVICES, AIRCRAFT VOR, ILS, LORAN. RADAR BEACON TRANSPONDERS, FLIGHT MANAGEMENT COMPUTERS, AND GPWS.

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the inspection, and servicing of aircraft communication and navigation systems.

**REFERENCES:**

AC 43.13-1B/2B (as revised)

FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

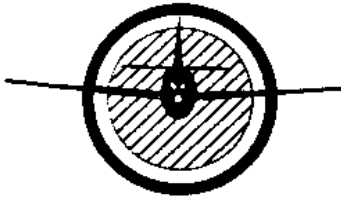
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURES:**

Answer questions dealing with types of equipment used in various aircraft, where and how the equipment is mounted, cooled, and the reduction of electrical interference.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**E. COMMUNICATION AND NAVIGATION SYSTEMS**

**40-A** Inspect, and Repair Antenna and Electronic Equipment  
Installation

**TEACHING LEVEL 2**

**AVERAGE COMPLETION TIME: 10.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the inspection and repair of antennas.

**REFERENCES:**

AC 43.13-1B/2B (as revised)

FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

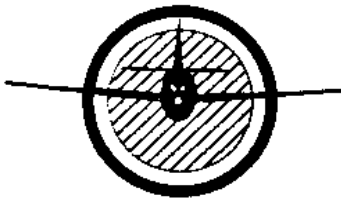
1. Aircraft with electronic installation and antennas.

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURES:**

The student will locate repair and replacement information for a fixed wire antenna, a blade or whip antenna and a flush type antenna. He will list all repairs needed.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**F. AIRCRAFT FUEL SYSTEMS**

**TOTAL HOURS: 36                      THEORY: 12                      SHOP/LAB: 24**

---

**A. FUEL LINES AND FITTINGS**

1. Compatibility of Fitting.
2. Routing in Vicinity of
  - a. Control Cables
  - b. Electric Wiring or Conduit
  - c. Heat Sources
3. Alignment
4. Bonding
5. Support Clamps
6. Color Code for Fuel Lines

**B. FUEL SYSTEMS CONTAMINATION**

1. Water
2. Foreign Particles
3. Contamination with Other Grades of Fuel
4. Microbial Growth
5. Sediment
  - a. Fine Sediment

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- b. Coarse Sediment
  - c. Settling Time for Sediment Check
- 6. Contamination Detection
  - a. Food Color
  - b. Hypodermic Needle
  - c. Chemical Powder
  - d. Visual Check of Drained Fuel Sample
- 7. Contamination Control
  - a. During Storage
  - b. During Aircraft Servicing
  - c. After Servicing Aircraft Fuel Tanks

**C. AIRCRAFT FUEL SYSTEM**

- 1. Purpose
  - a. Stores Fuel
  - b. Cleans Fuel
  - c. Delivers Fuel to System
    - 1) Quantity
    - 2) Pressure
- 2. Types of Fuel Systems
  - a. Gravity Feed System
  - b. Pressure Feed System

**D. FUEL SYSTEM COMPONENTS**

- 1. Fuel Tanks
  - a. Fuel Tank Sump and Drain
  - b. Vents

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 1) Size for Small Tanks
- 2) Size for Large Tanks
- c. Internal Baffles
- d. Expansion Space
- e. Filler Neck and Scupper Drain
- f. Fuel Cap Restraining Device
- g. Required Markings Near Filler Cap
- h. Strength Requirements for Fuel Cell.
2. Fuel Cells
  - a. Bladder Type Fuel Cells
  - b. Integral Fuel Cells
3. Fuel Filters
  - a. FAA Requirements
  - b. Light Aircraft Fuel Filters
  - c. Filters for Large Multi-engine Aircraft
4. Fuel Pumps
  - a. Hand Pumps
  - b. Engine Driven Pumps
  - c. Electrically Operated Pumps
  - d. Boost Pumps
    - 1) Centrifugal Type-Non-positive Displacement
    - 2) Sliding Vane Type-Positive Displacement
5. Fuel Valves
  - a. Selector Valves
    - 1) Poppet Type

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 2) Cone Type
- 3) Rotor Type
- 4) Cross-feed Valve
- 5) Fuel Transfer Valve
- b. Fuel Shutoff Valve
  - 1) Manually Operated
  - 2) Electrically Operated
- 6. Fuel System Indicators
  - a. Fuel Quantity Indicator
    - 1) Sight Glass
    - 2) Mechanical
    - 3) Electrical
    - 4) Electronic
  - b. Fuel Flowmeter
    - 1) Transmitter
    - 2) Indicator
  - c. Fuel Pressure Gauge
    - 1) Single Indicator
    - 2) Engine Gauge Unit
    - 3) Differential Pressure Indicator
      - a) Air Connection
      - b) Fuel Connection
    - 4) Bourdon Tube Type Indicator
    - 5) Remote Indicator Electrically Operated
  - d. Fuel Pressure Warning Signal

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 1) Pressure Switch
- 2) Warning Light
- e. Valve-in-transit Lights
- f. Fuel Temperature Indicator

**E. MULTI-ENGINE FUEL SYSTEMS**

- 1. Tank Arrangement
  - a. Interconnecting Check Valves
- 2. Cross-feed System
- 3. Manifold System
  - a. Single Point Refueling
- 4. Fuel Shutoff Requirement

**F. TROUBLESHOOTING THE FUEL SYSTEM**

- 1. Use of Aircraft and Engine Maintenance Manuals
- 2. Location of Leaks and Defects
  - a. Internal
  - b. External
- 3. Replacement of Seals
  - a. Removal of Old Seals and Compound
  - b. Check New Seals for Cleanliness and Serviceability
  - c. Proper Torque during Installation

**G. FUEL TANK REPAIRS**

- 1. Welding Fuel Tanks
  - a. Purging Tank Prior to Welding
    - 1) CO<sub>2</sub>
    - 2) Nitrogen

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 3) Steam
- b. Detecting Leak Location
  - 1) Air Pressure Not Over 5 P.S.I.
  - 2) Use Soap or Bubble Solution
- c. Removing Flux after Welding
  - 1) Flushing
  - 2) Soaking Tank
  - 3) Rinsing Tank
  - 4) Checking for Complete Flux Removal
- 2. Fuel Cell Repairs
  - a. Detecting fuel Leak
  - b. Removal from Aircraft
  - c. Repair According to Manufacturers Recommendations
- 3. Integral Fuel Tanks
  - a. Fuel Leak Classifications
    - 1) Slow Seep
    - 2) Seep
    - 3) Heavy Seep
    - 4) Running Leak
  - b. Leak Repairs to Integral Tanks
    - 1) In Accordance with Manufacturers Specifications

**H. FIRE SAFETY PRECAUTIONS**

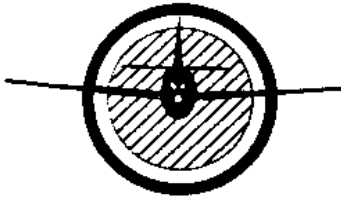
- 1. Turbine Fuels
- 2. Aviation Gasoline
- 3. Removing Fuel; Spills



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**I. FUEL DUMP SYSTEMS**

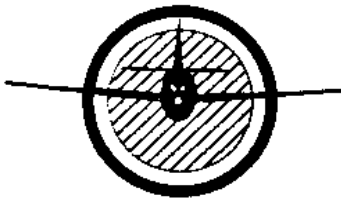
1. FAA Requirements
  - a. Transport Aircraft
  - b. General Aviation Aircraft
  - c. Take-off Weight
  - d. Landing Weight
2. Design Requirements
  - a. Minimum Fuel Shut-off Provisions
    - 1) Reciprocating Engine Aircraft
    - 2) Turbine Powered Aircraft
  - b. Two Independent Systems
    - 1) Left Wing System
    - 2) Right Wing System
  - c. Safety Provisions
    - 1) Dump Fuel Clear of Aircraft Cabin
    - 2) Dump Fuel Clear of Engine Intakes
3. Fuel Dump System Components
  - a. Plumbing Lines
  - b. Control Valves
  - c. Dump Chutes
    - 1) Fixed
    - 2) Extendable
  - d. Chute Operating Mechanism



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEM AND COMPONENTS**

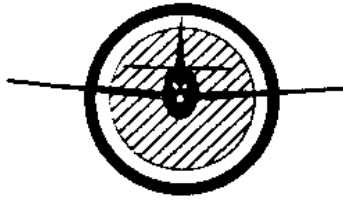
**F. AIRCRAFT FUEL SYSTEMS**

**LEVEL**

- |           |  |            |
|-----------|--|------------|
| <b>41</b> | <b>CHECK AND SERVICE FUEL DUMP SYSTEMS</b>   | <b>(1)</b> |
|           | A. Using written information, AC 43.13-1B (as revised) and FAA-H-8083-31A Airframe Handbook Vol. 2. describes the checking and servicing requirements of a fuel dump system.   |            |
| <b>42</b> | <b>PERFORM FUEL MANAGEMENT, TRANSFER, AND DEFUELING</b>  | <b>(1)</b> |
|           | A. Using diagrams or mock-up, AC 43.13-1B (as revised) and FAA-H-8083-31A Airframe Handbook Vol. 2 describe the procedures necessary to transfer or cross-feed fuel and de-fuel the system.  |            |
| <b>43</b> | <b>INSPECT, CHECK, AND REPAIR PRESSURE FUEL SYSTEM</b>   | <b>(1)</b> |
|           | A. Using visual aids, AC 43.13-1B (as revised) and FAA-H-8083-31A Airframe Handbook Vol. 2 describe the procedures to be followed when inspecting, checking and repairing a pressure type fuel system.                               |            |
| <b>44</b> | <b>REPAIR AIRCRAFT FUEL SYSTEM COMPONENTS</b>  | <b>(2)</b> |
|           | A. Using AC 43.13-1B (as revised), FAA-H-8083-31A Airframe Handbook Vol. 2 appropriate reference information, typical fuel tanks, fuel strainers, selector valves, and fuel lines; inspect, list and describe the repairs as needed. |            |

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME CURRICULUM MANUAL, VOLUME III**

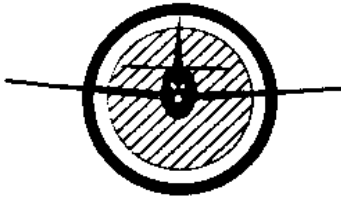
- 45      INSPECT AND REPAIR FLUID QUANTITY INDICATING SYSTEMS      (2)**
- A.    Using ac 43.13-1B (as revised), EA-14 CFR -1M, appropriate reference information; describe the inspection and repair procedures.
- 46      TROUBLESHOOT, SERVICE, AND REPAIR FLUID PRESSURE AND TEMPERATURE WARNING SYSTEMS      (2)**
- A.    Using an operating fuel system installed in an airplane or mock-up, a schematic or diagram of the system, and appropriate information; check and adjust fuel pressure as needed.
- B.    Using appropriate written information; write a brief explanation of how the temperature warning system in a typical jet transport airplane works.
- 47      INSPECT, CHECK, SERVICE, TROUBLESHOOT AND REPAIR AIRCRAFT FUEL SYSTEM      (3)**
- A.    Using an operation fuel system, selector valve, fuel boost pumps and written information or service information; inspect, check, service, troubleshoot and list repairs as needed.
- B.    Using appropriate service or written information, EA-14 CFR-1M and fuel tanks; inspect tanks, describe the construction characteristics, installation and servicing precautions.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**41-A CHECK AND SERVICE FUEL DUMP SYSTEMS**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 1.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the repair of aircraft fuel system components.

**REFERENCES:**

1. 14 CFR Part 23
2. AC 43.13.1B/2B (as revised)
3. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

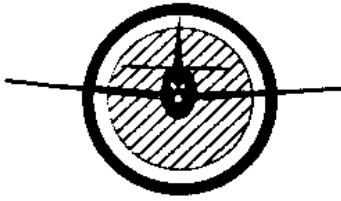
N/A

**Supplies and materials required:**

1. Written information

**PROCEDURE:**

Using written information, AC 43.13-1B (as revised) and 14 CFR -1M, describe the checking and servicing requirements of a fuel dump system



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**42-A PERFORM FUEL MANAGEMENT, TRANSFER, AND DEFUELING**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 1.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the operation of the transfer, cross-feed and defueling of the aircraft fuel system.

**REFERENCES:**

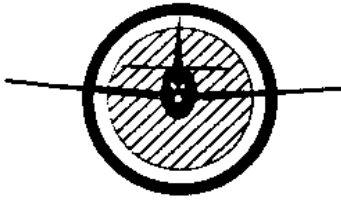
1. AC 43.13.1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

1. Fuel system Mock—up
2. Fuel system diagrams

**PROCEDURE:**

Using diagrams or mock-up, AC 43.13-1B/2B (as revised) and FAA-H-8083-31A Airframe Handbook Vol. 2 describe the procedures necessary to transfer or cross-feed fuel and defuel the system.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**43-A INSPECT, CHECK, AND REPAIR PRESSURE FUEL SYSTEM**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 1.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the checking and repair of the pressure type fuel system.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

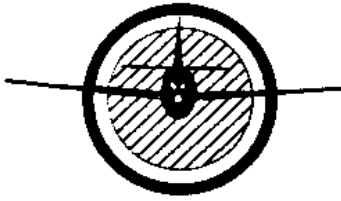
**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**PROCEDURE:**

Using visual aids, AC 43.13-1B/2B (as revised) and EA-14 CFR -1M, describe the procedures to be followed when inspecting, checking and repairing a pressure type fuel system.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**44-A REPAIR AIRCRAFT FUEL SYSTEM COMPONENTS**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the repair of aircraft fuel system components.

**REFERENCES:**

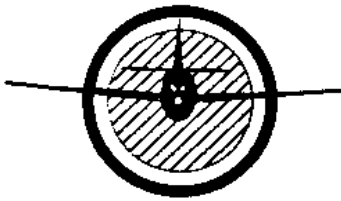
1. 14 CFR Part 23
2. AC 43.13-1B/2B (as revised)
3. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

Typical aircraft fuel tanks, fuel strainer, selector valves, fluid lines, flexible hoses, and fuel drains.

**PROCEDURE:**

The student will locate and interpret information from the manuals and describe the repair procedures for fuel system components as specified.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**45-A INSPECT AND REPAIR FLUID QUANTITY INDICATING SYSTEMS**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge to inspect and repair fluid quantity indicating system.

**REFERENCES:**

1. 14 CFR Part 23
2. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2
3. Fuel system Mock-up instructions
4. Aircraft manufacturer's service manual

**EQUIPMENT AND TOOLS REQUIRED:**

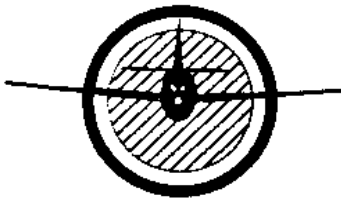
1. Fuel System Mock-up or aircraft with fuel quantity indicating system.

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURE:**

The student will inspect the operating system, correctly interpret information from the manuals and describe the repair that would be undertaken to correct the malfunction indicated by the instructor.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**46-A TROUBLESHOOT, SERVICE, AND REPAIR FLUID  
PRESSURE AND TEMPERATURE WARNING SYSTEMS**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding the operation, service and repair of fuel pressure and temperature warning system.

**REFERENCES:**

1. 14 CFR Part 23
2. AC 43.13-1B/2B (as revised)
3. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

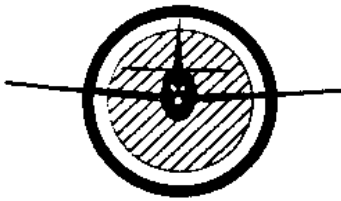
1. Operating fuel system installed in an airplane or mock-up
2. Basic hand tools

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURE:**

The student will operate the system and adjust the pressure. He will interpret information from the service information and identify the cause of the faults. He will repair the system as directed in the service manual.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**46-B TROUBLESHOOT, SERVICE, AND REPAIR FLUID  
PRESSURE AND TEMPERATURE WARNING SYSTEMS**

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 3.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of the operation, of the fuel temperature warning system.

**REFERENCES:**

1. 14 CFR Part 23
2. AC 43.13-1B/2B (as revised)
3. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

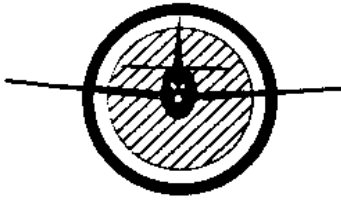
N/A

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURE:**

Using appropriate written information; write a brief explanation of how the temperature warning system in a typical jet transport airplane works



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**47-A INSPECT, CHECK, SERVICE, TROUBLESHOOT AND REPAIR AIRCRAFT FUEL SYSTEM**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of the construction, installation and servicing of fuel tanks.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol.2

**EQUIPMENT AND TOOLS REQUIRED:**

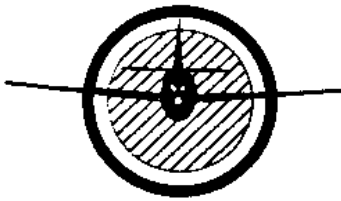
Operational fuel system Mock-up

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURE:**

Using an operational fuel system, the student will inspect, check, service troubleshoot and list repairs as needed



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**H. AIRCRAFT FUEL SYSTEM**

**47-B INSPECT, CHECK, SERVICE, TROUBLESHOOT AND REPAIR AIRCRAFT FUEL SYSTEM**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of the construction, installation and service of fuel tanks.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

1. Fuel system Mock-up or aircraft

**SUPPLIES AND MATERIALS REQUIRED:**

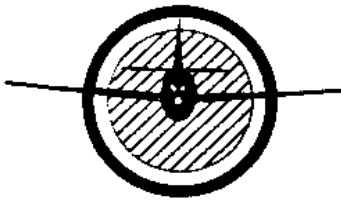
1. Fuel tank of separate type, flexible bladder and integral type

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**47B: INSPECT, CHECK, SERVICE, TROUBLESHOOT AND REPAIR AIRCRAFT FUEL SYSTEM (continued)**

**PROCEDURE:**

The student will inspect three different types of tanks. Using reference information, he will describe the construction characteristics, the installation and servicing precautions for each type of tank.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**G. AIRCRAFT ELECTRICAL SYSTEMS**

**TOTAL HOURS: 108                      THEORY: 48                      SHOP/LAB: 60**

---

**A. TYPES AND CHARACTERISTICS OF AIRCRAFT FUSES, CIRCUIT BREAKERS, AND SWITCHES**

1.     Circuit Protection in Aircraft
2.     Circuit Breakers
3.     Circuit Breakers Switches
4.     Characteristics and Uses of Fuses
5.     Replacement of Blown Fuses
6.     Switches
7.     Switch Designations

**B. SELECT AND INSTALL AIRCRAFT ELECTRICAL SWITCHES AND WIRING TO COMPONENTS**

1.     Determine Current Requirements
2.     Determine Wire Requirements
3.     Wiring Procedures
4.     Electrical Cable Chart in AC 43.13-1B (as revised)
5.     Select Aircraft Switches
6.     Installation of Open Wiring and Closed Wiring



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**C. INSTALLATION REQUIREMENTS AND CHARACTERISTICS FOR AIRCRAFT ELECTRICAL WIRING SYSTEMS AND JUNCTION BOXES**

1. Single Wire Systems
2. Ground Return Path
3. Allowable Voltage Drop
4. Aluminum vs. Copper Wire
5. Junction Boxes
6. Terminal Strips
7. Shielding Wiring and Equipment

**D. INSTALL ELECTRICAL TERMINALS, SPLICES AND BONDING JUMPERS**

1. Selection of Cable Terminals
2. Wire Preparation
3. Methods of Attaching Wire or Cable
4. Special Precautions
5. Splicing Wire or Cable
6. Bonding Jumpers
7. Allowable Resistance
8. Bonding Connection
9. Current Carrying Capacity

**E. INSTALL AIRCRAFT ELECTRICAL WIRING IN A CONDUIT**

1. Removal of Damaged Wiring From Conduit
2. Cleaning of Conduit
3. Preparing Wiring for Pulling Through Conduit

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

4. Check for Correct Circuit Continuity

**F. CHECK AND CONNECT QUICK-DISCONNECT PLUGS AND RECEPTACLES**

1. Quick-disconnect Connector Terminology
2. Classes of Connectors as Given in AC 43.13-1B (as revised)
3. Wire Connection to Connectors
4. Pin and Socket Locator Identification Letters or Numbers
5. Causes of Malfunctions
6. Wire Protection
7. Methods of Securing Connectors

**G. PROTECT ELECTRICAL EMERGENCY SWITCHES AGAINST ACCIDENTAL ACTUATION**

1. Guarded Switches
2. Non-guarded Safeties Switches

**H. CHECK, TROUBLESHOOT, AND REPAIR AIRCRAFT DC GENERATOR ELECTRICAL SYSTEM**

1. Compound DC Generator Electrical System Components
2. Voltage Regulators
3. Equalizing Circuit and Adjustment
4. Effect of Residual or Stray Magnetism in a Generator Field
5. Flashing the Field
6. Reverse Current Cutout Relays
7. Voltage and Current Indication
8. Effects of Open and short Circuits in Generators
9. Current Limiters

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**I. METHODS OF PROVIDING AC IN AIRCRAFT HAVING ONLY DC ELECTRICAL SYSTEMS**

1. Common Needs for AC in Aircraft Having Only a DC Electrical System
2. Methods of Converting DC to AC in Aircraft
3. Operating Principles of Rotary Inverts
4. Heat Dissipation for Inverters
5. Operating Principles of Solid State Inverters
6. Frequency Control for Inverters
7. Special Uses of AC in Aircraft
8. Use of Alternators on One or More Engines to Furnish AC

**J. TROUBLESHOOT AND REPAIR A DC ELECTRICAL SYSTEM SUPPLIED BY AN ALTERNATOR**

1. Use of Alternators for DC Aircraft electrical Systems
2. Field Excitation Control for Voltage Regulation
3. Rectification of the AC to Obtain DC Output
4. Over-voltage and Overload Protection

**K. CHARACTERISTICS AND ADVANTAGES OF AC AIRCRAFT ELECTRICAL SYSTEMS**

1. Advantages of AC Electrical Systems in Aircraft
2. Determining Frequency of AC Generator Output
3. Use of 400 Cycle AC for Aircraft
4. Transformer Principles
5. Transformer – Rectifier Units

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**L. IDENTIFY COMPONENTS AND OPERATING ELEMENTS OF 115/200 VOLT AC AIRCRAFT ELECTRICAL SYSTEM**

1. AC Generator Design and Arrangement
2. Principle of Operation of the C.S.D. Unit
3. Annunciator Panel in Flight Compartment
4. Busses and bus Tie Relays
5. External Power

**M. REPAIR AIRCRAFT ELECTRICAL SYSTEM COMPONENTS**

1. Solenoid Chatter Causes
2. Operational Symptoms of Solenoid Chatter
3. Effects of Solenoid Chatter
4. Preventative or Corrective Action

**N. INSPECT INSTALLATION AND CHECK CIRCUITS OF ANTI-COLLISION AND POSITION LIGHTS**

1. Anti-collision Lights
2. Crew Vision Requirements
3. Placards
4. Location of Lights
5. Position Lights for Navigation
6. Viewing Angles
7. Colors and Intensity
8. Electrical Circuit Requirements

**O. INSPECT, CHECK AND REPAIR LANDING AND TAXI LIGHT INSTALLATIONS**

1. Purposes and Uses of Landing Lights

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

2. Repair Procedures for Retractable Landing Lights
3. Repair Procedures of Fixed Landing Lights
4. Taxi Lights

**P. INSPECT, CHECK, SERVICE, AND REPAIR AIRCRAFT INTERIOR LIGHTING INSTALLATIONS**

1. DC Cabin Lighting Systems
2. Seat Reading Lights
3. Entry Lights and Compartment Lights

**Q. INSPECT, CHECK, SERVICE, AND REPAIR PASSENGER CABIN LIGHTS AND LIGHTING CIRCUITS**

1. DC Cabin Lighting Systems
2. Seat Reading Lights
3. Entry Lights and Compartment Lights

**R. INSPECT, CHECK, SERVICE, AND REPAIR COCKPIT LIGHTS AND LIGHTING CIRCUITS**

1. Types of Overhead and Panel Lighting Installations for Cockpit Lighting
2. Instrument Lighting
3. Servicing Procedures for Cockpit Lighting

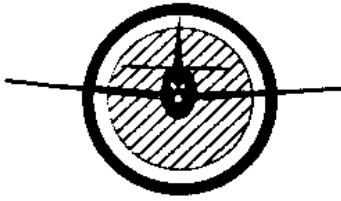
**S. INSPECT AND CHECK ELECTRICAL EQUIPMENT INSTALLATIONS FOR ELECTRICAL COMPONENT REPLACEMENT**

1. Electrical Equipment Installations in Bays or Compartments
2. Shock Mounting
3. Plug-in Quick Disconnect Connectors
4. Ventilation and Cooling for Shelf or Rack Mounted units
5. Servicing Procedures and Precautions

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**T. LOCATE REPLACEMENT PROCEDURES AND PARTS NUMBERS  
FOR ELECTRICAL COMPONENTS REPLACEMENT**

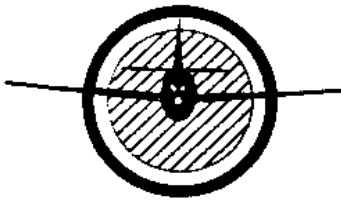
1. Locating Replacement Procedures for Electrical Components
2. Locating Part Numbers



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**G. AIRCRAFT ELECTRICAL SYSTEMS**

**LEVEL**

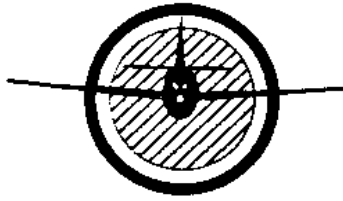
- |           |   |            |
|-----------|---|------------|
| <b>48</b> | <b>REPAIR AND INSPECT AIRCRAFT ELECTRICAL SYSTEM COMPONENTS: CRIMP AND SPLICE WIRING TO MANUFACTURER'S SPECIFICATIONS; AND REPAIR PINS AND SOCKETS OR AIRCRAFT CONNECTORS.</b>  | <b>(2)</b> |
|           | A. Using AC 43.13-1B (as revised); select wire, materials and splice a wire by soldering.   |            |
| <b>49</b> | <b>INSTALL, CHECK, AND SERVICE AIRFRAME ELECTRICAL WIRING, CONTROLS, SWITCHES, INDICATORS, AND PROTECTIVE DEVICES</b>   | <b>(3)</b> |
|           | A. Using written information, AC 43.13-1B (as revised), a mock-up, switches, electrical components, assorted electrical wire, assorted connectors, protective devices, and buss bars, connect components into a circuit using a volt-ohmmeter to measure voltages as specified points in the circuits (as specified by instructor). |            |
| <b>50</b> | <b>INSPECT, CHECK, TROUBLESHOOT, SERVICE AND REPAIR ALTERNATING CURRENT AND DIRECT CURRENT ELECTRICAL SYSTEMS</b>   | <b>(3)</b> |
|           | A. Using manufacturer's manual and volt ohmmeter, inspect, check, troubleshoot and service aircraft electrical circuits, as specified by the instructor, and list all discrepancies and describe repairs as needed.   |            |



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**50      INSPECT, CHECK AND TROUBLESHOOT CONSTANT      (1)**  
**SPEED AND INTEGRATED SPEED DRIVE GENERATORS**

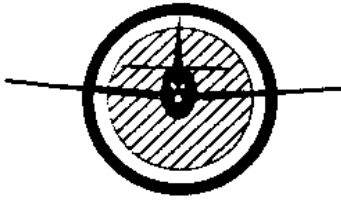
- B.    Using written information, answer questions dealing with  
operation of generators.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENT**

**G. AIRCRAFT ELECTRICAL SYSTEM**

**48-A** Repair and Inspect aircraft electrical system component, crimp and splice wiring to manufacturer's specifications and repair pins and sockets of aircraft connectors.

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 6.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the inspections and repair of aircraft electrical wires.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

1. Soldering iron or soldering gun
2. Electric extension (AC)
3. Wire stripper
4. Plastic sleeve

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

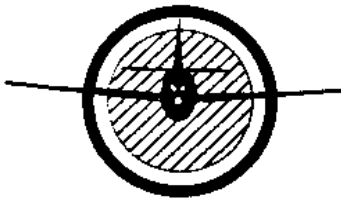
**48-A** Repair and Inspect aircraft electrical system component, crimp and splice wiring to manufacturer's specifications and repair pins and sockets of aircraft connectors.

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information
2. Electric wires solder (Rosin-core)

**PROCEDURES:**

The student will solder splice the selected wire using proper techniques and procedures.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**G. AIRCRAFT ELECTRICAL SYSTEM**

**49-A** Install check and service airframe electrical wiring, control, Switches, indicators and protective devices.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 24.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the installation, check and service of airframe electrical systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2
3. Manufacturer's Service Manual

**EQUIPMENT AND TOOLS REQUIRED:**

1. An aircraft or electrical mock-up
2. Crimping tool
3. Hand tools

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

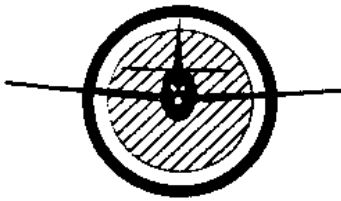
**49-A** Install, check and service airframe electrical wiring, control, Switches, indicators and protective devices.

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written Information
2. Electric component
3. Electrical wires
4. Electric cable terminals

**PROCEDURES:**

The student will connect an electrical component to the Aircraft or Mock-up electrical system, such as a landing light, position light, rotating beacon or other. He will determine wire requirements and protection for the installation and also check the circuit for proper operation.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**H. AIRCRAFT ELECTRICAL SYSTEM**

- 50-A.** Inspect, check, service and repair alternating and direct current electrical systems.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 26.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the servicing and repair of alternating and direct current systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2
3. Electrical system mock-up instructions

**EQUIPMENT AND TOOLS REQUIRED:**

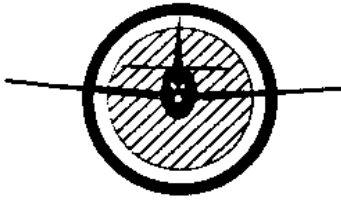
1. An aircraft or electrical mock-up
2. Voltmeter

**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURES:**

The student will read and record voltage and output, locate and correct malfunctions introduced by instructor, and list all discrepancies and describe repairs as needed.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**H. AIRCRAFT ELECTRICAL SYSTEM**

**50-B. INSPECT, CHECK AND TROUBLESHOOT CONSTANT  
SPEED AND INTEGRATED SPEED DRIVE GENERATORS.**

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the servicing and troubleshooting of constant speed and integrated speed drive generators systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

**N/A**

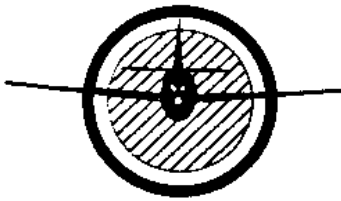
**SUPPLIES AND MATERIALS REQUIRED:**

1. Written information

**PROCEDURES:**

Using written information provided, the student will answer questions dealing with operation of generators.





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**H. POSITION AND WARNING SYSTEMS:**

**TOTAL HOURS: 18                      THEORY: 6                      SHOP/LAB: 12**

**A. WARNING SYSTEM**

1. Principles of Operation of Speed, Stall, and Take-Off Warning Systems
  - a. Speed or Mach Warning System
  - b. Stall Warning System
  - c. Take-Off Warning System
2. Inspection Checking and Servicing of Speed, Stall and Take-Off Warning Systems

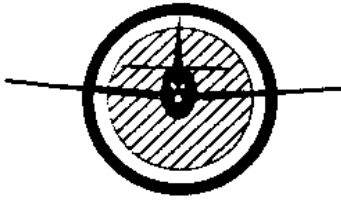
**B. ANTI-SKID CONTROL SYSTEMS**

1. Principles of Operation
2. Skid Detectors
3. Anti-skid Computer
4. Electrical/Hydraulic Control Units for Braking
5. Cockpit Controls and Ground/Flight Interface
6. Inspection and Check of Anti-skid Systems

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**C. POSITION INDICATING SYSTEM**

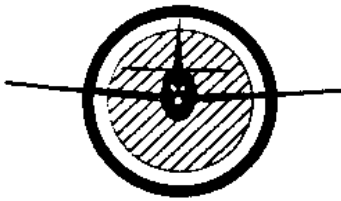
1. Landing Gear Position Indicating Systems
2. Flap Position Indicating Systems
3. Annunciator Light Systems



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**H. POSITION AND WARNING SYSTEMS**

**LEVEL**

**51 INSPECT, CHECK AND SERVICE SPEED AND CONFIGURATION WARNING SYSTEMS, ELECTRICAL BRAKE CONTROLS AND ANTI-SKID SYSTEMS.**

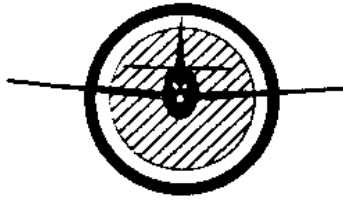
**(2)**

- A. Using written information and diagrams, complete essay statements on the principles of operation of speed or Mach warning, stall warning, take-of warning and anti-skid brake control systems.

**52 INSPECT, CHECK TROUBLESHOOT, AND SERVICE LANDING GEAR POSITION INDICATING AND WARNING SYSTEMS.**

**(3)**

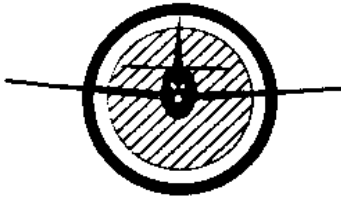
- A. Using manufacturer's manual or equivalent written information, and aircraft or mockup having retractable landing gear with a position indicating and warning system, inspect and check operation of each component of the position indicating and unsafe warning system. Troubleshoot and list all malfunctions and describe the repairs needed.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**F. POSITION AND WARNING SYSTEMS**

**51-A** Inspect, Check and Service Speed and Configuration Warning Systems, Electrical Brake Controls and Anti-skid systems.

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 4.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding of the operation, installation, service and configuration warning systems, electrical brake controls and anti-skid systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2

**EQUIPMENT AND TOOLS REQUIRED:**

N/A

**SUPPLIES AND MATERIALS REQUIRED:**

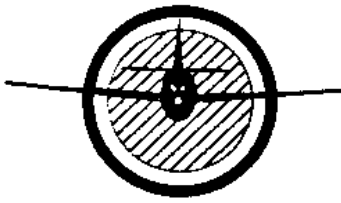
1. Written information
2. Visual training aid or diagrams

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**51-A** Inspect, Check and Service Speed and Configuration Warning Systems, Electrical Brake Controls and Anti-skid systems.

**PROCEDURES:**

The student will complete 15 statements on the principle of operation and basic method of installation of speed or Mach warning, stall warning, take-off warning and electrical/hydraulic antiskid brake control system.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**H. POSITION AND WARNING SYSTEMS**

**52-A** Inspect, Check, Troubleshoot, and Service Landing Gear Position Indicating and Warning System.

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 8.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the operation, service and repair of landing gear position indicating and warning systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2
3. Aircraft Manufacturer's Service Manual or landing gear mock-up manufacturer's instruction.

**EQUIPMENT AND TOOLS REQUIRED**

1. Aircraft or mock-up having retractable landing gear with position indicating and warning system installed and operating.
2. Aircraft Jacks
3. Basic Hands tools



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

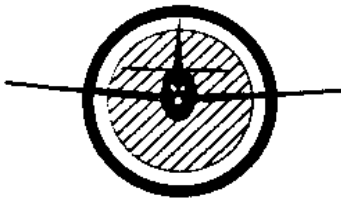
**52-A** Inspect, Check, Troubleshoot, and Service Landing Gear Position Indicating and Warning System.

**SUPPLIES AND MATERIALS REQUIRED**

1. Written information

**PROCEDURES:**

The student will check the operation of the position indicating and warning lights by operating the landing gear inspect the components of the position indicating and warning system, troubleshoot and list all malfunctioning and describe the repairs needed.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**I. ICE AND RAIN CONTROL**

**TOTAL HOURS: 18                      THEORY: 9                      SHOP/LAB: 9**

---

**A. GENERAL EFFECTS OF ICE**

1. Types of Ice Encountered in Flight
  - a. Rime Ice
  - b. Glaze Ice
2. Aircraft Performance during Icing
  - a. Decreased Lift
  - b. Increased Weight
  - c. Increased Drag
  - d. Decreased Thrust
3. Methods of Preventing or Controlling Ice
  - a. Heating Surfaces Using Hot Air
  - b. Heating by Means of Electrical Elements
  - c. Breaking Up Ice Formations
  - d. Chemical Spray

**B. PNEUMATIC DEICING SYSTEMS**

1. Deicer Boot Construction

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- a. Multiple Cells
  - b. Conductive Neoprene Coating
  - c. Methods of Attaching Boots to Leading Edges
2. Pneumatic System Operation
- a. Small Aircraft
  - b. Larger Aircraft Using Multiple Sections for Each Wing
  - c. Pressuring Corresponding Wing Sections
  - d. Regulating Pressure
  - e. Regulating Vacuum
3. Pneumatic Deicing System Components
- a. Engine Driven Air Pump
    - 1) Vane Type
    - 2) Methods of Lubricating the Pumps
    - 3) Maintenance of Engine Driven Pump
  - b. Safety Valves
    - 1) Purpose and Location
  - c. Oil Separation
    - 1) Used With Wet Type Air Pump
    - 2) Maintenance of Oil Separator
  - d. Combination Regulator, Unloading Valve and Oil Separator
    - 1) Functions
    - 2) Maintenance
  - e. Suction Regulating Valve
    - 1) Purpose
    - 2) Maintenance

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- f. Solenoid Distributor Valve
  - 1) Function
  - 2) Operational Check
- g. Electronic Timer
  - 1) Operational Sequence
  - 2) Time Intervals
- 4. Pneumatic Deicing system Maintenance
  - a. Operational Checks
    - 1) Engine Driven Air Pump
    - 2) External Air Source
    - 3) Proper Air Pressure
    - 4) Correct Suction
    - 5) Proper Operating Sequence
  - b. Adjustments
    - 1) Control Linkage
    - 2) Pressure Relief Valve
    - 3) Suction Relief Valve
  - c. Troubleshooting
    - 1) Adjustment Trouble
    - 2) Component Malfunction Trouble
    - 3) Final Operational Check
  - d. Inspection
    - 1) Pre-flight
    - 2) Periodic

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- e. Deicer Boot Maintenance
  - 1) Cleaning
  - 2) Resurfacing
  - 3) Repairing
  - 4) Cold Patch
  - 5) Storage of Removed deicer Boots

**C. THERMAL ANTI-ICING SYSTEMS**

- 1. Anti-icing Using Combustion Heaters
  - a. Five Protection Controls
  - b. Duct Pressure Safety Switch
- 2. Anti-icing Using Exhaust Heaters
  - a. Exhaust Heat Muffs
  - b. Heat Controls
  - c. Manual Operation
- 3. Anti-icing Using Engine Bleed Air
  - a. Source of Air
  - b. Shut Off Valve
  - c. Temperature Indicator
  - d. Overheat Warning Light
- 4. Pneumatic System Ducting
  - a. Materials Used
  - b. Expansion Bellows
  - c. Pressure Checking
  - d. Leak Checking

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 5. Ground Deicing of Aircraft
  - a. Frost Removal
    - 1) Use of Deicing Fluid
    - 2) Time of Application Before Flight
  - b. Removing Ice and Snow Deposits
    - 1) Precautions to be Used to Prevent Damage
    - 2) Light Dry Snow Removal
    - 3) Use of Chemicals on Heavy Snow
    - 4) Inspection of Aircraft After Snow Removal
    - 5) Snow and Ice on Turbine Engine Compressor

**D. WINDSHIELD ICING CONTROL SYSTEMS**

- 1. Electrical
- 2. Heated Air
- 3. Chemical

**E. MISCELLANEOUS ANTI-ICE, DEICE SYSTEMS**

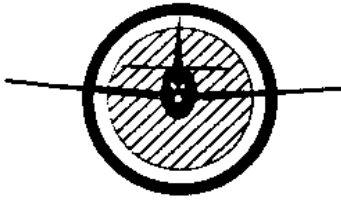
- 1. Pilot Tube Anti-icing
- 2. Window Defrost System
- 3. Windshield and Carburetor Chemical Deicing System
- 4. Water Drain Heaters

**F. RAIN ELIMINATING SYSTEMS**

- 1. Electrical Windshield Wiper System
- 2. Hydraulic Windshield Wiper System
- 3. Pneumatic Rain Removal System

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- 4. Chemical Rain Repellant
- 5. Maintenance of Rain Removal System
  - a. Windshield Wiper Systems
  - b. Pneumatic Rain Removal Systems

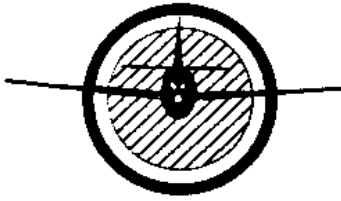


**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

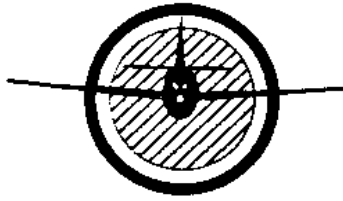
**I. ICE AND RAIN CONTROL SYSTEMS:**

**LEVEL**

**53 INSPECT, CHECK, TROUBLESHOOT, SERVICE,  
AND REPAIR AIRFRAME ICE AND RAIN CONTROL  
SYSTEMS**

**(2)**

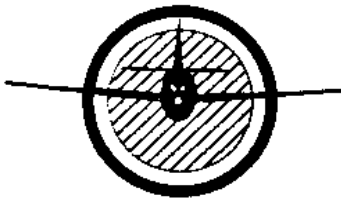
- A: Using written information, AC 43.13-1B/2B (as revised), schematic diagrams, remove, inspect, and reinstall and check the operation of an electrically heated pitot tube. Complete a work sheet showing work accomplished.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**I. ICE AND RAIN CONTROL SYSTEMS:**

**53-A** Inspect, Check, Troubleshoot, Service and Repair Airframe Ice and Rain Control Systems.

**TEACHING LEVEL: (2)**

**AVERAGE COMPLETION TIME: 9.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding the operation, inspection, service and repair of ice and rain control systems.

**REFERENCES:**

1. AC 43.13-1B/2B (as revised)
2. FAA-H-8083-31A Airframe Handbook Vol. 2
3. Ice and rain control system mock-up manufacturer's instructions.

**EQUIPMENT AND TOOLS REQUIRED:**

1. Ice and Rain control system mock-up

**SUPPLIES AND MATERIALS REQUIRED:**

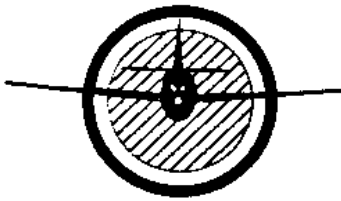
1. Written information

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

**53-A** Inspect, Check, Troubleshoot, Service and Repair Airframe Ice and Rain Control Systems.

**PROCEDURES:**

The students will locate appropriate work procedures, to remove, inspect, reinstall and check the operation of an electrically heated pitot tube. He will complete a work sheet showing work accomplished.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**II. AIRFRAME SYSTEM AND COMPONENTS**

**J. FIRE PROTECTION SYSTEM**

**TOTAL HOURS: 12**

**THEORY: 6**

**SHOP/LAB: 6**

---

**A. GENERAL**

1. Detection Methods
2. Detection System Requirements
3. Types of fires
4. Fire Zones

**B. FIRE DETECTION SYSTEMS**

1. Thermal Switch Systems
2. Thermocouple Systems
3. Continuous Loop Systems
4. Lindberg Detection Systems

**C. FIRE EXTINGUISHING AGENTS**

1. Hydrocarbon Agents
  - a. Halon 1301
  - b. Halon 1211
  - c. Halon 1011
  - d. Halon 1001

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- e. Halon 104
- f. Halon 1202
- 2. Inert Cold Gas Agents
  - a. Carbon Dioxide (CO-2)
  - b. Nitrogen (N-2)

**D. FIRE EXTINGUISHING SYSTEMS**

- 1. High Rate of Discharge Systems
- 2. Conventional Systems
- 3. Reciprocating Engine Systems
- 4. Turbojet Fire Protection systems
- 5. Turbine Engine Extinguishing Systems
- 6. Turbine Engine Ground fire Protection

**E. FIRE PROTECTION SYSTEM INSPECTION AND MAINTENANCE**

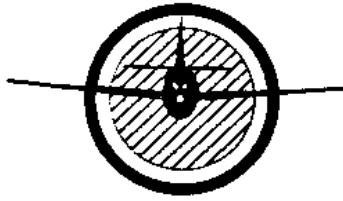
- 1. Fire Detection Maintenance and Inspection
- 2. Detection System Troubleshooting
- 3. Extinguisher System Maintenance
  - a. Container Pressure Check
  - b. Freon Discharge Cartridges
  - c. Freon Containers
  - d. Carbon Dioxide Cylinders

**F. COCKPIT AND CABIN INTERIORS**

- 1. Extinguisher Types
- 2. Unsuitable Extinguisher
- 3. Smoke Detection Systems
  - a. Carbon Monoxide Detectors

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AIRFRAME CURRICULUM MANUAL, VOLUME III**

- b. Photoelectric Smoke Detectors
- c. Visual Smoke Detectors

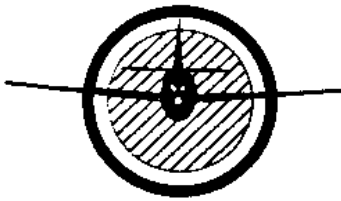


**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PERFORMANCE GOALS**





**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PERFORMANCE GOALS**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**J. FIRE PROTECTION**

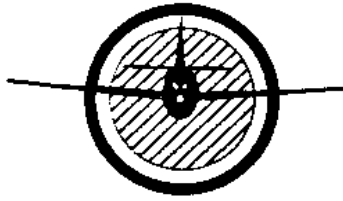
**LEVEL**

**54 INSPECT, CHECK, AND SERVICE SMOKE AND CARBON MONOXIDE DETECTION SYSTEMS (1)**

- A. Using written information, complete essay, completion type statements concerning photoelectric and visual smoke detectors and chemical type carbon monoxide detectors.

**55 INSPECT, CHECK, SERVICE, TROUBLESHOOT, AND REPAIR AIRCRAFT FIRE DETECTION AND EXTINGUISHING SYSTEMS (3)**

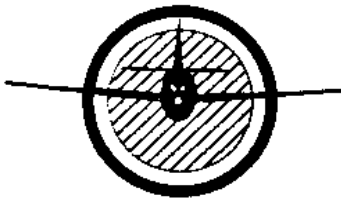
- A. Using manufacturer's or equivalent written information, an aircraft or mockup fire detection and extinguishing system, inspect, check, troubleshoot and repair the systems.
- B. Using written information and drawings of fire detectors, write a brief description of the operation of a thermal switch, thermocouple, and continuous loop fire detectors.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

# **PRACTICAL PROJECTS**



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**J. FIRE PROTECTION**

**54-A INSPECT, CHECK, AND SERVICE SMOKE AND CARBON MONOXIDE  
DETECTION SYSTEMS**

**TEACHING LEVEL: (1)**

**AVERAGE COMPLETION TIME: 1.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the operation inspection and repair of fire detection and extinguishing systems.

**REFERENCE:**

1. FAA-H-8083-31A Airframe Handbook Vol. 2
2. Mock-up manufacturer's information

**EQUIPMENT AND TOOLS REQUIRED:**

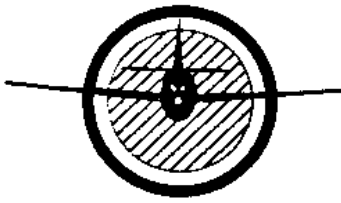
1. Fire detector Mock-up
2. Voltmeter

**SUPPLIES AND MATERIAL REQUIRED:**

1. Written information

**PROCEDURE:**

Using written information, complete essay, completion type statements concerning photo-electric and visual smoke detectors and chemical type carbon monoxide detectors.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**J. FIRE PROTECTION**

**55-A** Inspect, Check, Service, Troubleshoot and Repair Aircraft Fire Detection and Extinguishing System

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 2.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge, understanding and skill in the operation inspection and repair of fire detection and extinguishing systems.

**REFERENCE:**

1. FAA-H-8083-31A Airframe Handbook Vol. 2
2. Mock-up manufacturer's information

**EQUIPMENT AND TOOLS REQUIRED:**

1. Fire detector Mock-up
2. Voltmeter

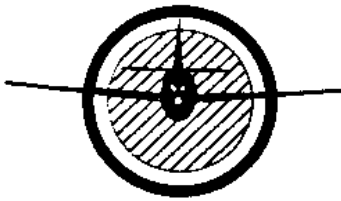
**SUPPLIES AND MATERIAL REQUIRED:**

1. Written information

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**55-A** Inspect, Check, Service, Troubleshoot and Repair Aircraft Fire Detection and Extinguishing System PROCEDURES:

**Procedure:** On a mock-up, the student will trace the circuit of a fire detection system and activate the system alarm. He will use a voltmeter to locate a malfunction introduced into the mock-up circuit and correct it.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT**

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**J. FIRE PROTECTION**

**55-B** Inspect, Check, Service, Troubleshoot and Repair Aircraft  
Fire Detection and Extinguishing System

**TEACHING LEVEL: (3)**

**AVERAGE COMPLETION TIME: 3.0 Hrs.**

**PURPOSE:**

To acquaint the student with the required knowledge and understanding in the operation of aircraft detection system.

**REFERENCE:**

1. FAA-H-8083-31A Airframe Handbook Vol. 2
2. Fire detection manufacturer instruction

**EQUIPMENT AND TOOLS REQUIRED:**

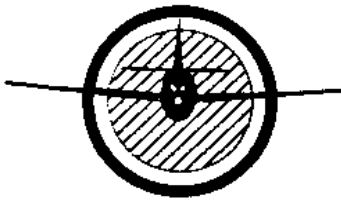
1. Fire detector Mock-up

**SUPPLIES AND MATERIALS REQUIRED:**

2. Written information

**PROCEDURES:**

The student will write a brief description of the method of operation for each of the following types of fire detectors: thermal-switch, thermocouple and continuous loop.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**GLOSSARY OF TERMS AND DEFINITIONS**

<b>AC 43.13-1B/2B</b>	:	An advisory Circular in book form issued by the Federal Aviation Administration which covers acceptable methods, techniques, and practices for aircraft inspection and repair.
<b>AC Out Put</b>	:	Alternating current produced or generated.
<b>ADF</b>	:	Automatic Direction Finder: A method of radio navigation that keeps the pilot informed of his heading relative to the station.
<b>Airframe</b>	:	The structure of an aircraft without the power plant.
<b>Aircraft spruce</b>	:	Wood species origin from USA and Canada that meets FAA requirements set forth on AC 43.13-1B.
<b>Anti-icing</b>	:	The prevention of ice formation.
<b>Anti-tear Strip</b>	:	Strips of fabric of the same materials as the airplane is covered with, laid over the wing rib under the reinforcing tape.
<b>Airworthiness (airworthy):</b>		Meets all of the requirements established on the Federal Aviation Regulations (US-FAR)
<b>Arc-Welding</b>	:	A form of welding in which the heat required to melt the metal is produced by an electric arc.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**GLOSSARY OF TERMS AND DEFINITIONS**

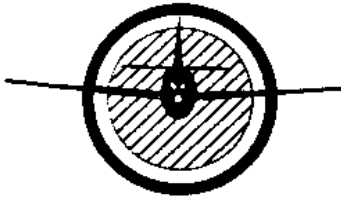
<b>CSD Unit- Constant Speed Drive</b>	:	A unit used to maintain a constant rotation speed of aircraft AC alternators even though the engine speed varies.
<b>CO Detector-Carbon Monoxide Detector</b>	:	A device used to detect the presence and concentration of carbon monoxide gas.
<b>Chafe Points</b>	:	Metal seam of protruding rivets or screws, which requires protective covering before fabric application.
<b>Check</b>	:	Means to verify proper operation.
<b>DC Out Put</b>	:	Direct current produced or generated.
<b>DME-Distance Direction Equipment</b>	:	Electronic Navigation equipment which measures the time required for a signal to travel from the airplane to a ground station and return to the airplane. This time is translated into nautical miles to the station.
<b>Dope-proof Paint</b>	:	A finish applied over a varnished surface to prevent the solvents in the dope coming in contact with the varnish and lifting it.
<b>8083-31A</b>	:	Airframe handbook developed and first printed in 1972. Provide basic information on principles fundamentals and technical procedures in the subject areas relating to the airframe rating.
<b>FAA FORM 337</b>	:	Major Repair and Alteration Form required to be fill-out upon the completion of any major repair or alteration as set forth on FAR 43.
<b>FCC-Federal Communications Commission</b>	:	That part of the federal government that regulates the transmission of energy or intelligence by radio.
<b>Gas-Weld</b>	:	The method of fusing metals together by a flame using gas as its fuel. The most common types of gas welding are oxy-acetylene and oxy-hydrogen.



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**GLOSSARY OF TERMS AND DEFINITIONS**

<b>HF-High Frequency</b>	:	Frequency range between 3 to 30 Mhz.
<b>Honeycomb</b>	:	A hexagonal cellular material made of thin metal, paper or plastic, used as a core material for sandwich structure. Named after the bee's honeycomb because of its appearance.
<b>Inspect</b>	:	Means to examine by sign and touch.
<b>ILS-Instrument Landing System</b>	:	A precision instrument approach system which normally consists of the following electronic components and visual aids: localizer, glide slope, outer marker, and approach lights.
<b>Loran-Long Range Aid To Navigation</b>	:	Low frequency navigation system; replaced by modern Loran-C navigational systems.
<b>MEK-Methyl Ethyl Ketone</b>	:	An important low-cost solvent similar to acetone. Used as a cleaning agent to prepare a surface for painting, and as a stripper for certain finished.
<b>Overhaul</b>	:	Means to disassemble, inspect, repair as necessary, and check.
<b>PBCV- Power Brake Control Valve</b>	:	A special form of pressure regulator between the aircraft hydraulic systems and the brake cylinders. The amount of pressure applied to the brakes is directly proportional to the force the pilots puts on the brake pedals.
<b>Repair</b>	:	Means to correct a defective condition. Repair of an airframe or power plant system includes components replacement and adjustment, but not component repair.
<b>Service</b>	:	Means to perform functions that assure continued operation.
<b>Troubleshoot</b>	:	Means to analyze and identify malfunctions.

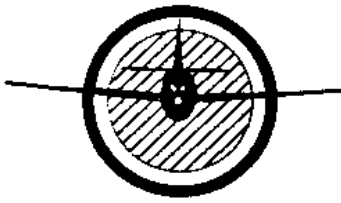


**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**TEXTBOOKS REQUIRED BY THE STUDENTS**

1. Airframe and Powerplant Mechanics Handbook FAA-H-8083-31A (as revised)
2. Airframe Section Textbook Jeppesen ISBN 9780884891828.



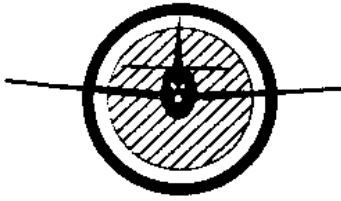
**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**  
**CURRICULUM REQUIREMENTS**

This is the description of the levels of proficiency at which items under each subject in the curriculum shall be taught.

**TEACHING LEVELS:**

- (1) Level 1 requires:
  - (i) Knowledge of general principles but not practical application.
  - (ii) Development of sufficient manipulative skills to perform basic operations.
  - (iii) Instruction by lecture, demonstration, discussion and limited practical application.
- (2) Level 2 requires:
  - (i) Knowledge of general principles, and limited practical application.
  - (ii) Development of sufficient manipulative skills to perform basic operations.
  - (iii) Instruction by lecture, demonstration, discussion and limited practical application.
- (3) Level 3 requires:
  - (i) Knowledge general principles, and performance of high degree of practical application.



**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME COURSE CURRICULUM MANUAL**

**AIRFRAME CURRICULUM SUBJECTS**

This list is the subjects required in 792 hours in the Airframe Curriculum, in addition to 492 hours in General Curriculum subjects.

The number in parentheses before each item listed under each subject heading indicated the level of proficiency at which that item shall be taught.

**I. AIRFRAME STRUCTURES**

**A. WOOD STRUCTURE**

- (1) 1. Service and repair wood structures.
- (1) 2. Identify wood defects.
- (1) 3. Inspect wood structures.

**B. AIRCRAFT COVERING**

- (1) 4. Select and apply fabric and fiberglass covering materials.
- (1) 5. Inspect, test, and repair fabric and fiberglass.

**C. AIRCRAFT FINISHES**

- (1) 6. Apply trim, letters, and touch-up paint.
- (2) 7. Identify and select aircraft finishing materials.
- (2) 8. Apply finishing materials.
- (2) 9. Inspect finishes and identify defects.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**AIRFRAME CURRICULUM SUBJECTS**

**D. SHEET METAL AND NON-METALLIC STRUCTURES**

- (2) 10. Select, install, and remove special fasteners for metallic, bonded, and composite structures.
- (2) 11. Inspect bonded structures.
- (2) 12. Inspect, test, and repair fiberglass, plastic honeycomb, composite, and laminated primary and secondary structure.
- (2) 13. Inspect, check, service, and repair windows, doors, and interior furnishing.
- (2) 14. Inspect and repair sheet metal structures.
- (3) 15. Install conventional rivets.
- (3) 16. Form, lay-out and bend sheet metal.

**E. WELDING**

- (1) 17. Weld magnesium and titanium.
- (1) 18. Solder stainless steel.
- (1) 19. Fabricate tubular structures.
- (2) 20. Solder, braze, gas-weld, and arc-weld steel.
- (1) 21. Weld aluminum and stainless steel.

**F. ASSEMBLY AND RIGGING**

- (1) 22. Rig rotary-wing aircraft.
- (2) 23. Rig fixed-wing aircraft.
- (2) 24. Check alignment of structures.
- (3) 25. Assemble aircraft components, including flight control surfaces.
- (3) 26. Balance, rig, and inspect movable primary and secondary flight control surfaces.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**AIRFRAME CURRICULUM SUBJECTS**

- (3) 27. Jack aircraft.

**G. AIRFRAME INSPECTION**

- (3) 28. Perform airframe conformity and air-worthiness inspections.

**II. AIRFRAME SYSTEMS AND COMPONENTS**

**A. AIRCRAFT LANDING GEAR SYSTEMS**

- (3) 29. Inspect, check, service and repair landing gear, retraction systems, shock struts, brakes, wheels, tires, and steering systems.

**B. HYDRAULIC AND PNEUMATIC POWER SYSTEM**

- (2) 30. Repair hydraulic and pneumatic power systems components.
- (3) 31. Identify and selected hydraulic fluids.
- (3) 32. Inspect, check, service, troubleshoot, and repair hydraulic and pneumatic power system.

**C. CABIN ATMOSPHERE CONTROL SYSTEMS**

- (1) 33. Inspect, check, troubleshoot, service, and repair heating, cooling, air conditioning, pressurization systems.
- (1) 34. Inspect, check, troubleshoot, service, and repair heating, cooling, air conditioning, and pressurization systems.
- (2) 35. Inspect, check, troubleshoot, service and repair oxygen system.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**AIRFRAME CURRICULUM SUBJECTS**

**D. AIRCRFAT INSTRUMENTS**

- (1) 36. Inspect, check, service, troubleshoot and repair electronic flight instrument systems and both mechanical and electrical heading, speed, altitude, temperature, pressure, and position indicating systems to include the use of built-in test equipment.
- (2) 37. Install instruments and perform a static pressure system leak test.

**E. COMMUNICATION AND NAVIGATION SYSTEMS**

- (1) 38. Inspect, check, and troubleshoot autopilot, servos and approach coupling systems.
- (1) 39. Inspect, check, and service aircraft electronic communication and navigation systems, including VHF passenger address interphones and static discharge devices, aircraft VOR, ILS, LORAN, Radar beacon transponders, flight management computer, and GPWS.
- (2) 40. Inspect and repair antenna and electronic equipment installations.

**F. AIRCRAFT FUEL SYSTEMS**

- (1) 41. Check and service fuel dump systems.
- (1) 42. Perform fuel management, transfer, and defueling.
- (1) 43. Inspect, check, and repair pressure fueling systems.
- (2) 44. Repair aircraft fuel system components.
- (2) 45. Inspect and repair fluid quantity indicating systems.
- (2) 46. Troubleshoot, service, and repair fluid pressure and temperature warning systems.

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**AIRFRAME CURRICULUM SUBJECTS**

- (3) 47. Inspect, check, service, troubleshoot, and repair aircraft fuel systems.

**G. AIRCRAFT ELECTRICAL SYSTEMS**

- (2) 48. Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturers' specifications; and repair pins and sockets of aircraft connectors.
- (3) 49. Install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices.
- (3) 50.a. Inspect, check, troubleshoot, service, and repair alternating and direct current electrical systems.
- (1) 50.b. Inspect, check, and troubleshoot constant speed and integrated speed drive generators.

**H. POSITION AND WARNING SYSTEMS**

- (2) 51. Inspect, check, and service speed and configuration warning systems, electrical brake controls, and anti-skid systems.
- (3) 52. Inspect, check, troubleshoot, and service landing gear position indicating and warning systems.

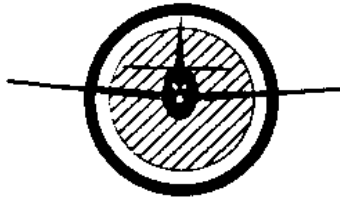
**I. ICE AND RAIN CONTROL SYSTEMS**

- (2) 53. Inspect, check, troubleshoot, service, and repair airframe ice and rain control systems.

**J. FIRE PROTECTION SYSTEMS**

- (1) 54. Inspect, check, and service smoke and carbon monoxide detection systems.
- (3) 55. Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing system

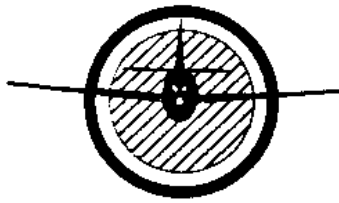




**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

# **STUDENT WORKBOOK**

## **AIRFRAME CURRICULUM**



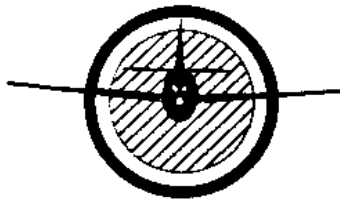
**DEPARTMENT OF EDUCATION  
PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AVIATION MAINTENANCE TECHNICIAN COURSE  
FAA Approved # DN9T092R**

**AIRFRAME CURRICULUM  
PRACTICAL PROJECT RECORD**

Student Name: \_\_\_\_\_ Student Num. \_\_\_\_\_

Instructor: \_\_\_\_\_ Group: \_\_\_\_\_

<b>I. AIRFRAME STRUCTURES</b>				
<b>A. WOOD STRUCTURES – <u>Practical Projects: 3</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
1-A	Service and repair wood structures	1		
1-B	Service and repair wood structures *Optional	1		
2-A	Identify wood defects	1		
3-A	Inspect wood structures	1		
	<b>TOTALS</b>			
<b>B. AIRCRAFT COVERING – <u>Practical Projects: 2</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
4-A	Select and apply fabric and fiberglass covering materials	1		



**DEPARTMENT OF EDUCATION**  
**PUERTO RICO AVIATION MAINTENANCE INSTITUTE**  
**AVIATION MAINTENANCE TECHNICIAN COURSE**  
FAA Approved # DN9T092R

5-A	Inspect, test, and repair fabric and fiberglass	1		
	<b>TOTALS</b>			

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

<b>C. AIRCRAFT FINISHES– <u>Practical Projects: 4</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
6-A	Apply trim, letters, and touch-up paint	1		
7-A	Identify and select aircraft finishing materials	2		
8-A	Apply finishing materials	2		
9-A	Inspect finishes and identify defects	2		
	<b>TOTALS</b>			

<b>D. SHEET METAL AND NON-METALLIC STRUCTURES- <u>Practical Projects: 16</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
10-A	Select, install, and remove special fasteners for metallic, bonded and composite structures.	2		
11-A	Inspect bonded structures	2		
12-A	Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	2		
12-B	Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	2		

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

12-C	Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	2		
12-D	Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	2		
12-E	Inspect, test, and repair fiberglass, plastics, honeycomb, composite, and laminated primary and secondary structures.	2		
13-A	Inspect, check, service, and repair windows, doors and interior furnishings	2		
13-B	Inspect, check, service, and repair windows, doors and interior furnishings	2		
13-C	Inspect, check, service, and repair windows, doors and interior furnishings	2		
13-D	Inspect, check, service, and repair windows, doors and interior furnishings	2		
14-A	Inspect and repair sheet metal structures	3		
14-B	Inspect and repair sheet metal structures	3		
15-A	Install conventional rivets	3		
15-B	Install conventional rivets	3		

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

16-A	Form, lay-out, and bend sheet metal.	3		
	<b>TOTALS</b>			

<b>E. WELDING – <u>Practical Projects: 9</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
17-A	Weld magnesium and titanium	1		
18-A	Solder Stainless steel	1		
19-A	Fabricate tubular structures	1		
20-A	Solder, braze, gas-weld, and arc-weld steel	2		
20-B	Solder, braze, gas-weld, and arc-weld steel	2		
20-C	Solder, braze, gas-weld, and arc-weld steel	2		
20-D	Solder, braze, gas-weld, and arc-weld steel	2		
20-E	Solder, braze, gas-weld, and arc-weld steel	2		
21-A	Weld aluminum and stainless steel	1		
	<b>TOTALS</b>			

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

<b>F. ASSEMBLY AND RIGGING – <u>Practical Projects: 8</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
22-A	Rig rotary-wing aircraft	1		
23-A	Rig rotary-wing aircraft	2		
23-B	Rig rotary-wing aircraft	2		
24-A	Check alignment of structures	2		
25-A	Assemble aircraft component, including flight control surfaces.	3		
26-A	Balance, rig, and inspect movable primary and secondary flight control	3		
26-B	Balance, rig, and inspect movable primary and secondary flight control	3		
27-A	Jack aircraft	3		
	<b>TOTAL</b>			

<b>G. AIRFRAME INSPECTION – <u>Practical Projects: 2</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

28-A	Perform airframe conformity and airworthiness inspections	3		
28-B	Perform airframe conformity and airworthiness inspections	3		
	<b>TOTAL</b>			

<b>AIRFRAME SYSTEMS AND COMPONENTS</b>				
<b>A. AIRCRAFT LANDING GEAR SYSTEMS – <u>Practical Projects: 7</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
29-A	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		
29-B	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		
29-C	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		



**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

29-D	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		
29-E	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		A-8
29-F	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		
29-G	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		
	<b>TOTALS</b>			

<b>B. HYDRAULIC AND PNEUMATIC POWER SYSTEMS</b> <u>Practical Projects: 5</u>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
30-A	Repair Hydraulic and pneumatic power systems components.	2		
31-A	Identify and select hydraulic fluids	3		

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

31-B	Identify and select hydraulic fluids	3		
32-A	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		
32-B	Inspect, check, service, and repair landing gear retraction systems, shock struts, brakes wheels, tires and steering systems.	3		A-9
	<b>TOTALS</b>			

<b>C. CABIN ATMOSPHERE CONTROL SYSTEMS – <u>Practical Projects: 3</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
33-A	Inspect, check, troubleshoot, service, and repair heating, cooling, air conditioning, pressurization systems, and air cycle machines.	1		
34-A	Inspect, check, troubleshoot, service, and repair heating, cooling, air conditioning, and pressurization systems.	1		
35-A	Inspect, check, troubleshoot, service and repair oxygen systems.	2		

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

	<b>TOTALS</b>			
--	---------------	--	--	--

<b>D. AIRCRAFT INSTRUMENT SYSTEMS – <u>Practical Projects: 2</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
36-A	Inspect, check, service, troubleshoot and repair electronic flight instrument systems and both mechanical and electrical heading speed, altitude, temperature, pressure, and position indicating systems to include the use of built-in test equipment (BITE).	1		
37-A	Install instruments and perform a static pressure system leak test.	2		
	<b>TOTALS</b>			

<b>E. COMMUNICATION AND NAVIGATION SYSTEMS – <u>Practical Projects 3</u></b>
--

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
38-A	Inspect, check, and troubleshoot autopilot, servos and approach coupling systems.	1		
39-A	Inspect, check and service aircraft electronic communication and navigation systems, including VHF passenger address interphones and static discharge devices, aircraft VOR, ILS, LORAN, Radar beacon transponders, flight management computers, and GPWS.	1		A-11
40-A	Inspect and repair antenna and electronic equipment installations	2		
	<b>TOTALS</b>			

<b>F. AIRCRAFT FUEL SYSTEMS – <u>Practical Projects: 9</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
41-A	Check and service fuel dump systems	1		
42-A	Perform fuel management, transfer, and defueling	1		
43-A	Inspect, check and repair pressure fueling systems	1		

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

44-A	Repair aircraft fuel system components	2		
45-A	Inspect and Repair Fluid Quantity Indicating Systems.	2		
46-A	Troubleshoot service and repair fluid pressure and temperature warning system.	2		
46-B	Troubleshoot service and repair fluid pressure and temperature warning system.	2		
47-A	Inspect, check, service, troubleshoot, and repair aircraft fuel systems.	3		
47-B	Inspect, check, service, troubleshoot, and repair aircraft fuel systems.	3		
	<b>TOTALS</b>			

<b>G. AIRCRAFT ELECTRICAL SYSTEMS – <u>Practical Projects 4</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
48-A	Repair and inspect aircraft electrical system components; crimp and splice wiring to manufacturer's specifications; and repair pins and sockets of aircraft connectors.	2		

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

49-A	Install, check, and service airframe electrical wiring, controls, switches, indicators, and protective devices.	3		
50-A	Inspect, check, troubleshoot, service and repair alternating and direct current electrical systems.	3		A-13
50-B	Inspect, check, and troubleshoot constant speed and integrated speed drive generators.	1		
	<b>TOTALS</b>			

<b>H. POSITION AND WARNING SYSTEMS – <u>Practical Projects: 2</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
51-A	Inspect, check, and service speed and configuration warning systems, electrical brake controls, and antiskid systems.	2		
52-A	Inspect, check troubleshoot, and service landing gear position indicating and warning systems.	3		
	<b>TOTALS</b>			

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

<b>I. ICE AND RAIN CONTROL SYSTEMS – <u>Practical Projects 1</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
53-A	Inspect, check, troubleshoot, and service landing gear position indicating and warning systems.	2		
	<b>TOTALS</b>			

<b>J. FIRE PROTECTION – <u>Practical Projects 3</u></b>				
<b>Number</b>	<b>Practical Project Title</b>	<b>Level</b>	<b>Hour</b>	<b>Evaluation Grade</b>
54-A	Inspect, check, and service smoke and carbon monoxide detection systems.	1		
55-A	Inspect, check, service, troubleshoot, and repair aircraft fire detection and extinguishing systems	3		
55-B	Inspect, check, service, troubleshoot, and repair aircraft fire detection and Extinguishing systems.	3		
	<b>TOTALS</b>			

**PUERTO RICO AVIATION MAINTENANCE INSTITUTE  
AIRFRAME COURSE CURRICULUM MANUAL**

**PRACTICAL PROJECT RECORD**

<b>TOTAL PRACTICAL PROJECT:</b>	<b>83</b>	
<b>TOTAL HOURS:</b>		
<b>EVALUATION GRADE:</b>		

A-15