

QCY
Avro
CF105
RT-
08-387

AFHQ TECHNICAL LIBRARY
RT 08-387
FUNCTIONAL & OPERATIONAL
TESTS OF BREADBOARD ELECTRICAL
SYSTEM
ARROW I
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FILE IN VAULT
NRC - ICIST
J. H. PARKIN
BRANCH
MAY 29 1995
ANNEXE
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CNRC - ICIST

S. E. Harper 4 G. Hake 1 F. Brame 1 J. Clemenson 1 S. Brown 1 **ANALYZED**
 E.W.H. Thompson 1 A.V. R. CANADA LIMITED M. Pesr 1
 J. Scott 1
 J. Booth 1
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 Boughton 1

REQUISITION FOR

R.T. NO. 08-387
 SHEET NO. 1 OF 4 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE 11th January, 1955

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT C-105 Changed to Elec. System
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TITLE OF TEST

C105 ELECTRICAL SYSTEM FUNCTIONAL & OPERATIONAL TESTS

DATA

1. General

The purpose of these tests is to check the operation of the electrical system under all C105 operational conditions. To do this, it is proposed that a complete breadboard system be set up including the alternators and bus system and all of the electrical services. The system is to be driven and loaded in a manner simulating typical operation in the aircraft for all phases of typical missions. Where possible, environmental temperature conditions for the equipment are to be reproduced.

2. Test Program

2.1. Alternator & Bus System.

2.1.1. General:

Provision is to be made to power the alternators through their constant speed drives at speeds similar to those occurring in engine start up, taxi, take-off, climb, cruise, combat, descent, approach, and landing, and the tests are to be performed with the equipment subjected to representative environmental temperature, i.e. -65° F, to +250° F where applicable.

The purpose of these tests is to check normal operation of the power units and to check that the automatic transfer system functions on failure of an alternator or controls and/or a transformer rectifier unit. Relays and switches will have to be incorporated in the system for test purposes in order to simulate these failures.

2.1.1.1. Input power to each of the two constant speed drives should be based on power for a 20I VA 85% efficient alternator and an 85% efficient constant speed drive, giving an input power requirement of 37.2, say 40 H.P. (It is suggested that if new equipment is bought, powers for driving up to 40 KVA machines be considered.

/continued

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TARGET DATE: To be submitted.	15855974

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REQUISITION FOR TEST

R.T. NO. 08-387

SHEET NO. 2 OF 4 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE 11th January, 1955

REQUESTED BY DEPT. NO.

2909

ASSIGNMENT NO.

X7-0800

TEST DEPT. JOB NO.

FUNCTION
LOCATION
1100

PROJECT C-105

COMPONENT Elec. System

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL & OPERATIONAL TESTS

DATA

2. Test Program

2.1. Alternator & Bus System.

2.1.1.1. contd.

This would give such equipment a much longer useful life).

The alternator equipment, and therefore the test power equipment, must have an output = 150% normal for 5 mins. and 200% normal for 5 secs.

2.1.1.2. Input speed range of the engine = 2500 to 6175 rpm.

2.1.1.3. For reference the moment of inertia of the aircraft engine = 510 lbs. ft.².

2.1.1.4. Equipment will be required to record input speed, alternator speed, alternator temperature, alternator output, transformer rectifier output, transformer rectifier temperature, and battery outputs.
Switches and relays will be required to simulate failures of the system.

2.1.2. Test Program

During simulation of the operational conditions listed in Para. 2.1.1. all conceivable failure cases are to be checked. These will be described in detail as soon as the system schematic has been established.

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REQUISITION FOR TEST

R.T. NO. 08-387

SHEET NO. 3 OF 4 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE 11th January, 1955

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION 1100	PROJECT C-105
				COMPONENT Elec. System

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL & OPERATIONAL TESTS

DATA

2.2. Circuits System

2.2.1. General:

A breadboard of all the electrical circuits from the main bus system, including all system units, is to be made up.

~~During the test~~

Dummy loads are to be applied to actuators as required, dummy signals to switches are to be applied in their correct sequence, anti-icing and de-icing loads are to be simulated, as are conditions affecting fuel measurement, fuel low level indication, heat exchanger control system operation etc. Where practicable, environmental temperature conditions are to be reproduced.

The purpose of these tests is to check the operation of all circuits under simulated flight conditions to check functioning of units, sequence of operation, phase unbalance, effect of short circuits, and operation of emergency systems.

If the power system incorporating the system drives and alternators is not available for supplying the power for these tests, another source may be considered.

2.2.1.1. Power requirements:

2.2.1.1.1. Main d.c. bus - 27.5 ± 1 volts

2.2.1.1.2. Emergency d.c. bus - 14 to 29 volts

2.2.1.1.3. A.C. buses - phase to ground
110 to 120 volts
phase to phase
190 to 210 volts.

2.2.2. Test Program

As in 2.1.2.

/continued

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R.T. NO. 08-387

SHEET NO. 4 OF 4 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE 11th January, 1954

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION 1100	PROJECT C-105	COMPONENT Elec. System
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TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL & OPERATIONAL TESTS

DATA

2.3. Overall System

The complete system including alternator drive, alternator, bus systems, battery, all switches and relays, cockpit presentation, etc., is to be operated in a manner to simulate its use during all phases of typical missions. All types of failures are to be investigated, and where practicable ambient temperature conditions are to be reproduced.

2.4. The following is a breakdown of the system circuits as they exist at this date:

- (a) Power System - Supply, Control, Warning
- (b) Starting & Ignition System
- (c) Engine Services - Control, Indication, Warning
- (d) Undercarriage System - Actuation, Indication, Warning, Nose Steering.
- (e) A/C Fuel Valve, Control, Warning, External Tank, Refueling
- (f) Fuel Capacitance Indication
- (g) Fire Protection
- (h) Canopy Actuation
- (i) Ice Warning, Control, Heating Supply
- (j) Air Conditioning
- (k) Flight Service Instruments, Warning and Controls
- (l) Heat Exchanger - Hydraulics and Fuel Systems.
- (m) Interior Lights
- (n) Exterior Lights

2.5. The system schematic and descriptive brochure will be issued as soon as possible.

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R.T. NO. 08-387 Add 1

SHEET NO. 1 OF 1 SHEET

DATE August 18 - 55

TO DEPT. NO.

REQUESTED BY DEPT. NO.

ASSIGNMENT NO.

TEST DEPT. JOB NO.

FUNCTION
LOCATION

PROJECT

Electrical
COMPONENT Services

2909

X7 - 0800

1100

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Description of Test Specimen

A breadboard system of all electrical service circuits in accordance with scheme drawings 7-0111-0022 through 7-0111-0034 is to be set up. Correct prototype wire sizes and lengths are to be used. Where loads are not shown on the schemes they are to be simulated. Electrical loads may be simulated by using resistive or reactive dummy loads. Mechanical loads may be simulated by dash - pots, springs or similar motion restricting devices for the solenoids and prony brakes for the motors. If quantitative data is not available for mechanical loads, a realistic value can be established by loading the equipment to produce rated current at rated voltage. For signals, the actual transducers should be used where practicable. However, if input to the transducer cannot be feasibly effected, other devices may be used for signal transmitters (switches, relays, sequencing devices, etc.)

Method of Test

The test is to be performed at the ambient temperature and the atmospheric pressure existing at the time of the test. The test procedure is as follows:

- (a) Set the power supply characteristics to the minimum values specified in MIL-E-7894.
- (b) Simulate a typical fight mission by appropriate devices in a programmed sequence. During this operation, check that each unit functions properly.
- (c) Set the power supply characteristics to the maximum values specified in MIL-E-7894.
- (d) Repeat step (b).

Data Required

- (a) Report of functioning operations.
- (b) Ampere loads and terminal voltages of each electrical equipment for each of the two power supply conditions.

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J. Booth 1
E. Boughton 1
M. Pesando 1

S.H. Brown 1 F.Brame 1



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REQUISITION FOR TEST

R.T. NO. 08-387 Add'2

SHEET NO. 1 OF 16

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. ME. A.W. AMES DATE Dec. 14th 1955

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800		1100	C105	Electrics

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Introduction

This test supersedes the previous test outlined under this RT number.

Equipment delivery schedules and the resulting impracticability of utilising actual loads dictates that dummy loads must be used extensively. This limits the scope of the test such that it becomes a voltage drop test in lieu of the originally envisioned equipment test. Thus, it is not necessary to perform the tests at both minimum and maximum supply voltages since this feature was to check equipment operation within allowable voltage and frequency ranges. A 27.5 $\pm$ 1 volt reference transformer - rectifier output voltage is to be maintained by operation of the alternators at 420 cps throughout the test. This provides maximum ac voltage drop at supply voltages closely approximating those established for the load analysis (27.5 volts dc & 115 volts ac).

Upon completion of the wiring of each functional circuit, a check is to be made of that circuit only before starting the test. Items to check are:- (a) Proper indication of indicators and indicator lights. (b) Equipment instability such as excessive voltage modulation (MIL-E-7894), feedback, relay "chatter", etc. (c) Voltage drop of each circuit from bus to load, and (d) Suitability of circuit elements in view of ultimate conformance to installation per MIL-E-7080.

Test Specimen

Breadboard set-up of complete electrical system wiring to preliminary Prod. Drgs. utilizing load - analysis calibrated dummy loads where necessary.

Method of Test

- Set speed of alternators to produce a frequency of 420 cps.
- Perform test as detailed in accompanying chart.

/continued

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REQUISITION FOR TEST

R.T. NO. 08-387 Add.2

SHEET NO. 2 OF 16 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE Dec. 14th 1955

REQUESTED BY DEPT. NO.

2909

ASSIGNMENT NO.

X7-0800

TEST DEPT. JOB NO.

FUNCTION
LOCATION
1100

PROJECT

C105

COMPONENT

Electrics

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Data Required

- (a) Report of functioning operations
(b) Voltage drops from supply terminals to equipment terminals of all energized loads immediately after performance of steps asterisked, or during times noted after steps asterisked.

Simulated
FunctionTest
ProcedureFunctional
Check1. LOADING & ANCHOREnergize aircraft
buses from external
ground supplyEngage ground energizer
plugOperate master switch
E16/2 to "On"Air Conditioning
external control
relay E3/7 actuates

Normal refuelling

Operate right tank system
switch E24/11 & left tank
system switch E23/11 to "On"Check that refuelling
selector switch E21/3 is set
to "normal refuel"

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SHEET NO. 3 of 16 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J. H. AMES DATE Dec. 14th 1955

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION 1100	PROJECT C105	COMPONENT Electrics
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TITLE OF TEST ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Normal Refuelling	Operate refuelling master switch E21/2 to "on"	Relays E5/6, E5/12, E5/13, E5/14, & E5/24 actuate. Refuelling indicator lights indicate (assuming tank level sensing valves not wired in) Indicator light E15/3 indicates
	Operate refuelling master switch E21/2 to "Off"	Relays E5/6, E5/12, E5/13, E5/14 & E5/24 drop-out. Indicator lights go out.
	Operate right tank system switch E24/11 & left tank system switch E23/11 to "Off"	
Defuelling	Operate refuelling selector switch E21/3 to "defuel"	
	Operate refuelling master switch E21/2 to "On"	Relays E5/6, E5/12, E5/13, E5/14 & E5/24 actuate. Indicator light E15/3 indicates

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SHEET NO. 4 OF 16 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE Dec. 14th 1955

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION 1100	PROJECT C105
				COMPONENT Electrics

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Defuelling	Operate refuelling master switch E21/2 to "Off"	
	Operate refuelling master switch E21/2 to "On"	Relays E5/6, E5/12, E5/13, E5/14 & actuate Indicator light E15/3 indicates
	Operate refuelling master switch E21/2 to "Off"	E5/6, E5/12, E5/13, E5/14 & drop out E15/3 goes out.
Partial refuelling	Operate refuelling selector switch E21/3 to "partial refuel"	
	Operate refuelling master switch E21/2 to "On"	Relays E5/6, E5/13, E5/14, E5/15 & E5/24 actuate, Indicator light E15/3 indicates.

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REQUISITION FOR TEST

R.T. NO. 08-387 Add.2

SHEET NO. 5 OF 16 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE Dec. 14th 1955

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800		1100	C105	Electrics

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Partial refuelling	Operate left tank system switch E23/11 & right tank system switch E24/11 to "On" x	Refuelling indicator lights indicate
	Operate refuelling master switch E21/2 to "Off"	Relays E5/5, E5/6, E5/13, E5/14, E5/15, & E5/24 drop-out. Indicator lights go out.
Open front canopy	Operate ground service switch E3/10 to "open" and hold in this position	Relay E3/14 actuates
Open rear canopy	Operate ground service rear canopy switch E3/11 to "open" and hold in this position x	Relay E3/16 actuates
	Release canopy switches	Relays E3/14 & E3/16 drop-out

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REQUISITION FOR TEST

R.T. NO. 08-387 Add.2

SHEET NO. 7 OF 16 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE Dec. 14th 1955

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION 1100	PROJECT C105
				COMPONENT Electrics

TITLE OF TEST ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Start engines	Operate left & right engine starting switches El6/3 & El6/4 to "start" & hold in this position	Starting relays E5/19 & E5/20 actuate
	Operate starting switches El6/3 & El6/4 to "reset"	Manual reset relay actuates
	Operate starting switches El6/3 & El6/4 to "start" & hold in this position	Starting relays E5/19 & E5/20 actuates
	Close 700 rpm switches of both engines; then release switches El6/3 & El6/4 while holding 700 rpm switches	
	Open 3020 rpm switches of both engines while still holding 700 rpm switches closed	Relays E5/19 & E5/20 drop-out
	Release 700 rpm switches	

PREPARED BY: S.H. Brown

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TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. W. AMES

R.T. NO. 08-387 Add.2

SHEET NO. 8 OF 16 SHEETS

DATE Dec. 14th 1955

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION 1100	PROJECT C105	COMPONENT Electrics
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TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Check boost pump for normal operation	Operate press-to-test feature of indicator lights E21/9 & E21/10 & hold in this position	Lights indicate
	Release E21/9 & E21/10	Indicator lights E21/9 & E21/10 go out
Reset master warning lights	Operate switch E15/22 to "reset"	Master amber lights go out
Conclude operating condition	De-energize all loads not required for the next operating condition	
111 TAXI		
Continuous loads and emergency loads of less than 1.0 average amps.	Energize all loads of this operating condition for which no procedure is given below	

PREPARED BY: S.H. Brown

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REQUISITION FOR TEST

R.T. NO. 08-387 Add.2

SHEET NO. 10 OF 16 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. ME. O.W. AMES

DATE Dec. 14th 1955

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800		1100	C105	Electrics

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Release external lanyard-release plugs when A/C starts moving	Remove external power plugs	Air conditioning external control relay E3/7 drops-out
Nose wheel steering	Operate control column steering button and hold	
Conclude operating condition	De-energize all loads not required for the next operating condition	
1V TAKE-OFF AND CLIMB		
Continuous loads and emergency loads of less than 1.0 average amps.	Energize all loads of this operating condition for which no procedure is given below	
Landing gear scissors extension on take-off	Operate all switches which actuate when weight of complete landing gear becomes supported by A/C	Up-release solenoid energisers. Relay E6/11 energizer.

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R.T. NO. 08-387 Add.2

REQUISITION FOR TEST

SHEET NO. 12 OF 16 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J. M. AMES

DATE Dec. 14th 1955

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION 1100	PROJECT C105
				COMPONENT Electrics

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Engine cooling above Mach. 0.5	Energize zone 1 ejector relays E5/11 & E5/16	Relays E5/11 & E5/16 actuate
Actuate speed brakes to slow down	Operate pilot's speed brake switch to "out" & hold in this position X	
	Return pilot's speed brake switch to "hold"	
Engine cooling below Mach. 0.5	De-energize relays E5/11 & E5/16	Relays E5/11 & E5/16 actuate
Relight left hand engine	Operate left relight button to relight and hold X	
	Release relight button	
Discharge fire extinguisher bottle No. 1 into right hand engine compartment	Operate switch E14/5 momentarily. X Take recordings while fire bottle load is energized. Operation of switch E14/6 may be repeated several times to obtain readings	Left engine shut-off relay E3/6 locks on. Fire bottle load energizes $2\frac{1}{2} \pm \frac{1}{2}$ seconds after operating E14/6. $3 \pm \frac{1}{2}$ seconds later fire bottle load de-energizes

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R.T. NO. 08-387 Add.2

SHEET NO. 14 OF 16 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE Dec. 14th 1955

REQUESTED BY DEPT. NO. 2909	ASSIGNMENT NO. X7-0800	TEST DEPT. JOB NO.	FUNCTION LOCATION 1100	PROJECT C105
				COMPONENT Electrics

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Engine cooling above mach.0.5	Energize zone 1 ejector relays E5/11 & E5/16	Relays E5/11 & E5/16 actuate
Afterburner operation	Operate LH & RH afterburner switches E13/4 & E13/5 to "on"	Relays E5/9 & E5/10 actuate
	Release E13/4 & E13/5	Relays E5/9 & E5/10 drop-out
Actuate speed brakes to slow down	Operate pilot's speed brake switch to "out" and hold in this position	
	Return pilot's speed brake switch to "hold"	
Engine cooling below Mach. 0.5	De-energize zone 1 ejector relays E5/11 & E5/16	Relays E5/11 & E5/16 drops-out
Discharge fire extinguisher bottle No. 1 into hydraulic bay	Operate indicator-switch E14/7 & hold	Relay E6/9 locks on

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REQUISITION FOR TEST

SHEET NO. 16 OF SHEETS

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DATE Dec. 14th 1955

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				COMPONENT Electrics

TITLE OF TEST

ELECTRICAL SERVICES TEST

DATA

Simulated Function	Test Procedure	Functional Check
Extend landing gear	Operate nose, left & right door-up switches to "door-unlock" position	Relays E6/5, E6/7 & E6/8 drop-out. Nose, left and right U/C position indicators indicate "unlock"
	Operate nose, left & right U/C down switches to "down" position	Nose, left & right U/C position indicators indicate "down"
	Operate left & right telescopic stay switches to "down-lock" position	
Throttle - back to "idle"	Operate throttle switch to "idle" position	U/C position warning light goes out.
Touch-down	Operate all switches which actuate when A/C weight becomes supported by landing gear	Up-release solenoid de-energizes. Relay E6/11 drops-out
Open front canopy from cockpit	Operate switch E10/2 to "open" & hold in this position	Relay E6/12 actuates
Open rear canopy from cockpit	Operate switch E19/3 to "open" & hold in this position	Relay E6/14 actuates

PREPARED BY: S.H. Brown

FOR TEST DEPT. ONLY:

APPROVED BY: F.H. Brame

APPROVED FOR TEST:

AUTHORIZED BY:

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R.T. 08 - 387 ADD 4.

This addendum is being issued to cater
for further circuit alterations and
additional test procedures.

c.c. F. Brame
S. E. Harper
J. K. Scott
J. P. Booth
J. Lynch
S. Brown

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MILTON, ONTARIO

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38-387 ADD. 4

REQUISITION FOR TEST

SHEET NO. 1 OF 2 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
Starting & Ignition	(a) EN Emer D.C. Bus by Operating Master switch "ON"	Relay E6/19 EN	XI
	(b) Operate R/starting Switch E16/4 to "Start"	Relay E5/19 EN & Locks in R/external Air Valve EN R/engine starter EN R/Throttle light E16/7 ON	X2 D A 1c&2c
	(c) Simulate Engine at 700r.p.m.	Relay E5/32 EN R/engine igniters EN #2 Igniter DE-EN Relay E5/19 DE-EN	XI W&X X X2
	(d) Draw fuse E20/11	Light E16/7 Off.	1c&2c
	(e) Open C.B. E1/60 Press E1500/3	Relay E5/32 DE-EN #1 Igniter DE-EN	XI W
	(g) System as in "A"	Relay E5/32 EN	XI
	(h) Actuate Relight Switch E1500/3	R/Engine Igniters EN Light E16/7 ON	W&X
	(j) System as in "B"	Relay E5/22 EN	XI
	(k) Actuate switch E16/4 to "Reset"	Relay E/19 Drops out System Returns to normal	X2
	(l) System as in "A"	Relay E5/20 EN & Locks in L/external air valve EN L/engine Starter EN L/engine Starter EN	X2 C A B
	(m) Operate L/starting switch E16/3 to "Start"	Relay E5/18 EN Light E16/6 ON	XI
	(n) Simulate Engine at 700rpm		

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NO. 08-387 ADD 4

REQUISITION FOR TEST

SHEET NO. 2 OF 2 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA
SIMULATED
FUNCTION

TEST PROCEDURE

FUNCTIONAL CHECK

TERML

(o) Draw fuse E20/10	L/Engine Igniters EN	W&X
(p) Open C.B. E1/59	Igniter #2 DE-EN	X
& Press switch E1500/2	Relay E5/20 DE-EN	X2
	Light E16/6 Off	
	Ext Air Valve DE-EN	C
	Relay E5/18 DE-EN	XI
	Igniter #1 DE-EN	W
(q) System as in "M"		
(r) Operate Switch E16/3	Relay E5/20 Drops out	X2
to "Reset"		
(s) System as in "A"		
(t) Operate Relight Switch	Relay E5/18 EN	XI
E1500/2	L/Engine igniters EN	W&X
(u) System as in "B"		
(v) Simulate R/Engine at	Relay E5/19 Drops out	X2
3020 RPM		
(w) System as in "M"		
(x) Simulate L/engine at	Relay E5/20 Drops out	X2
3020 RPM		
(y) Open C.B. E1/23	Emer D.C. Bus DE-EN	
(z) Open C.B. E6/30	A/C Battery Isolated from Battery Bus.	
(a) Remove External D.C Supply	Relay E6/20 DE-EN	XI
	Emer D.C. Bus DE-EN	
(b) System as in "A"		
(c) Open C.B. E1/23	Emer D.C. Bus DE-EN	

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REQUISITION FOR TEST

R.T. NO. _____

SHEET NO. 1 OF 5 SHEETS

STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE December 6, 1956

TO DEPT. NO. _____

REQUESTED BY DEPT. NO. _____

ASSIGNMENT NO. _____

TEST DEPT. JOB NO. _____

FUNCTION
LOCATION _____

PROJECT _____

COMPONENT _____

TITLE OF TEST _____

DATA

Simulated Function	Test Procedure	Functional Check	Term'l.
Oil & Fuel Press.	A. EN Main D.C. Bus	Master Wrng. Box	1R & 2R
R/H Press. Switches	B. Simulate R/Low Oil Press.	" Amber Light On	
		Oil Press. Light E15/10 On	
	C. Press. Master Wrng. Reset	Master Amber Light off	
	D. Remove low press. signal	Light E15/10 off	
	E. Open C.B. E20/22 & simulate low oil press.	No function	
	F. System as in A & simulate low fuel pressure	Fuel Press. Light E15/12 On	1n & 2n
		Master Amber Light On	
	G. Press. Warning Reset	" " " Off	
	H. Remove low fuel Press. signal	Light E15/12 off	1n & 2M
	J. Open C.B. E/20/22 & simulate low fuel press.	No function	
L/H Press. Switches	K. System as in A & simulate L/Low Oil pressure	Master amber light on	
		L/oil press. light E15/11 on	1P & 2P
	L. Press. Warning Reset	Master amber light off	
	M. As in D	Light E15/11 off	1P & 2P
	N. System as in A. Open C.B. E20/21 and test as in K	No function	
	O. System as in A & simulate low fuel pressure	Master amber light on	
		L/Fuel Press. light E15/13 on	1M & 2M
	P. Press. Warning Reset	Master amber light off	
	Q. Remove low fuel press. signal	Light E/15/13 off	1M & 2M
	R. System as in A. Open C.B. E20/21 & test as in O.	No function	
Ejector Valves	A. EN Main D.C. Bus	Relay E5/16 EN	X1
R/H valve	B. Simulate engine start.	Ejector valve EN open	A
		Relay E5/16 De-EN	X1

PREPARED BY: L. Shearson

FOR TEST DEPT. ONLY:

APPROVED BY:

APPROVED FOR TEST:

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REQUISITION FOR TEST

R.T. NO. _____

SHEET NO. 2 OF _____ SHEETSTO DEPT. NO. STRUCTURAL TEST DEPT. MR. J.W. AMESDATE December 6, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
				COMPONENT

TITLE OF TEST

DATA

<u>Simulated Function</u>	<u>Test Procedure</u>	<u>Functional Check</u>	<u>Term'l.</u>
L/H Valve	C. Simulate Mach .5 & over	Ejector valve EN closed	B
	D. Open fuse E20/36	" " DE-EN	A-B
	E. Simulate engine start	Relay E5/11 EN	XL
		Ejector valve EN open	A
		Relay E5/11 DE-EN	
	F. Simulate .5 Mach & over	Ejector valve EN closed	B
	G. Open fuse E20/35	" " DE-EN	A & B
Pressure Ratio R/H	A. EN Primary A.C. Bus Phase A	Press. Ratio Trans'r. EN R/H	J
	B. Draw Fuse E20/34	" " " DE-EN R/H	J
	L/H C. System as in A	" " " EN L/H	J
	D. Draw Fuse E20/33	" " " DE-EN L/H	J
R/Engine Discharge Temperature	A. EN Primary A.C. Bus Phase A	R/indicator EN) not	E
	B. Open fuse E1/20	" " DE-EN) hooked	E
L/Engine Discharge Temperature	C. System as in A	L/indicator EN) into	E
	D. Open fuse E1/19	" " DE-EN) rig	E
R/Engine Heat Exchanger Oil Cooler Valve	A. EN Main D.C. Bus		
	B. Simulate normal flight	Relay E5/51 DE-EN	XL
		Valve EN closed	B
		A/B valve EN closed	T
	C. Simulate afterburner in	Relay E5/51 EN	XL
		Valve EN open	A
		A/B valve EN open	S
	D. Open C.B. E1/55	Relay E5/51 DE-EN	XL
		A/B Valve DE-EN	S & T
		Valve DE-EN	A & B

PREPARED BY: L. Shearson

FOR TEST DEPT. ONLY:

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NO. _____

REQUISITION FOR

SHEET NO. 3 OF _____ SHEETS

TO DEPT. NO. STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE December 6, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
				COMPONENT

TITLE OF TEST

DATA

<u>Simulated Function</u>	<u>Test Procedure</u>	<u>Functional Check</u>	<u>Term'l.</u>
L/Engine Cooler Valve	E. System as in A	Relay E5/50 DE-EN	XI
	F. Simulate Normal Flight	Valve EN closed	B
		A/B valve EN closed	T
	G. Simulate afterburner in	Relay E5/50 EN	XI
		Valve EN open	A
		A/B valve EN open	S
	H. Open C.B. E1/52	Relay E5/50 DE-EN	XI
		Valve DE-EN	A * B
		A/B Valve DE-EN	S * T
R/Rotor Overspeed	A. EN Main D.C. Bus		
	B. Simulate L/Rotor overspeed	Warning Light E15/20 on	1J * 2J
		Master amber light on	
	C. Press. Warning Reset	" " " off	
	D. Remove overspeed signal	Light E15/20 off	1J * 2J
	E. Draw Fuse E20/22/ Test as in B	No function	
L/Rotor overspeed	F. System as in A		
	G. Simulate L/Rotor Overspeed	Warning Light E15/19 on	1F * 2F
		Master amber light on	
	H. Press. Warning Reset	" " " off	
	J. Remove overspeed signal	Light E15/19 off	1F * 2F
	K. Draw Fuse E20/21 Test as in G	No Function	
Emergency Fuel Control L/H	A. EN Emergency D.C. Bus		
	B. Operate switch E14/8 to Emerg.	Emerg. Fuel Solenoid EN * Latches on	N
		Emergency Light E15/14 On	1C * 2C
	C. Open C.B. E1/53 * test as in B	No function	
	D. System as in B, Press. E14/8 to "Reset"	Emergency solenoid unlatched	
		Normal " EN	Q
		Light E15/14 off	

PREPARED BY: L. Shearson

FOR TEST DEPT. ONLY:

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R.T. NO. _____

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SHEET NO. 4

OF _____ SHEETS

STRUCTURAL TEST DEPT. MR. J.W. AMES

TO DEPT. NO. _____

DATE December 6, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
				COMPONENT

TITLE OF TEST

DATA

Simulated Function	Test Procedure	Functional Check	Term'l.
Emergency Fuel Control R/H	E. System as in A		
	F. Operate switch E14/9 to "Emerg."	Energ. Fuel Solenoid EN + latches on	N
	G. Open C.B. E1/54 + test as in F	Energ. light E15/14 on	1c + 2C
	H. System as in F	No function	
	I. Operate switch E14/9 to "Reset"	Emergency solenoid unlatched Normal solenoid EN Light E15/14 off	Q
Engine Anti-icing	A. EN Main D.C. Bus		
	EN Emerg. D.C. Bus.		
	B. Simulate L/engine icing	L/ice det. relay EN	X1
		Warning light E15/39 on	1d + 2d
		Master amber warn. light on	
		R/ice det. relay EN + locked on	X1
		Timer controller EN	B
		Relay E5/21 EN + latched	X1
		Relay E5/34 EN + latched	X1
		L/H anti-icing valve EN	A
		R/H anti-icing valve EN	A
	C. L/H anti-icing valve fully open	Relay E5/21 unlatched	X3
		L/Anti-icing valve EN closed	
	D. R/anti-icing valve fully open	Relay E5/34 unlatched	
		R/anti icing valve EN closed	D
	E. Press. warning reset	Master amber light off	
	F. Remove L/engine icing signal	Light E15/39 is off	1d + 2d
	G. System as in A + draw fuse E20/16		
	H. Test as in B	No function	

PREPARED BY: L. Shearson	FOR TEST DEPT. ONLY:
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R.T. NO. _____

SHEET NO. 5 OF _____ SHEETS

TO DEPT. NO. STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE December 6, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
				COMPONENT

TITLE OF TEST

DATA

Simulated
FunctionTest ProcedureFunctional CheckTerm'l.

R/Engine icing

J. System as in A

Timer control EN
Warning Light E15/39 on
Master amber light on
Relay E5/34 EN + latched
Relay E5/21 EN + latched
R/anti icing valve EN
L/anti icing valve ENB
1d + 2d

X1

X1

A

A

K. Remove R/engine icing
signalL. Draw fuse E20/17 + test
as in

M. Draw fuse E20/3

Light E15/39 off

1d + 2d

No function

Timer Control DE-EN

E

PREPARED BY: L. Shearson

FOR TEST DEPT. ONLY:

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REQUISITION FOR TEST

R.T. NO. 08-387 ADD 4

SHEET NO. 1 OF 3 SHEET

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J. W. Ames DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA

SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
U/C Actuation Indication	(a) Energize Main D.C. Bus Energize emergency D.C. Bus Simulate A/C on Ground with Wheels down & Locked	All indicators shown down Down solenoid EN Relay E6/11 is EN Up release solenoid DE-EN Indicators DE-EN to Neutral Relay E6/11 is DE-EN Down Solenoid DE-EN	C C XI MAN A & C XI C
	(b) Open C.B. E1/65 Draw Fuse E20/18 Open C.B. E1/63 (c) System as in "A" Actuate ground test override switch E21/7 (d) System as in "A" But Simulate A/C Airborne Select Lever E12/3 to "UP"	Relay E6/11 is DE-EN U/C up valve is EN Indicators DE-EN to Neutral Relay E6/11 is DE-EN U/C Position Light goes "ON" U/C Position Light Goes "OFF" Position Light will go "ON"	XI B A & C XI L&VIS L&VIX XI XI
	(e) Open C.B. E1/63 (f) Close C.B. E1/63 U/C Continues to Retract & Locks "UP"	Relay E6/7 EN Relay E6/8 EN Indicators EN UP U/C Position Light goes "Off" Relay E6/7 is DE-EN Relay E6/8 is DE-EN U/C Position Light is "Off"	XI XI A L&VIS XI XI L&VIS
U/C "UP" & Locked all Buses EN	(g) Open C.B. E1/63 (h) Simulate Both engines Between idle & 1/3 throttle	Position warning Light: Flashes "ON" & "OFF"	

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REQUISITION FOR TEST

R.T. NO. 08-387 ADD 4

SHEET NO. 2 OF 3 SHEET

TO DEPT. NO.

DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
	(j) Select U/C "Down"	U/C Down valve is EN Position Light Stops Flashing, & goes "ON" Steadily. Indicators DE-EN to "Neutral"	C L & L A & C
	(k) U/C continues to "Extend" until down and locked	Check as at "A"	
	(l) Break R/telescopic Stay switch	R/indicator DE-EN to "Neutral"	C
	(m) Break L/telescopic Stay switch	L/indicator DE-EN to "Neutral"	C
	(n) System as in "K" Break Nose down switch	N/indicator DE-EN to "Neutral"	C
	(o) Break L/U/C down switch	L/indicator DE-EN to "Neutral"	C
	(p) Break R/U/C Down switch	R/indicator DE-EN to "Neutral"	C
	(q) System as in "A"		
	(r) Actuate L&R Scissors Switches	UP release solenoid EN	H
Automatic Braking	(s) System as in "D"	Relay E6/11 is DE-EN Anti-spin Solenoids EN Antipspin solenoids DE-EN	XI A&A A&A
Anti-skid Control	(u) System as in "F" Select U/C Down	Up relay E6/8 is DE-EN Anti-skid control unit EN	XI E
	(v) Operate emergency shut-off Switch E10/6 to "Off"	Anti-skid control unit DE-EN	E
PREPARED BY:		FOR TEST DEPT. ONLY:	
APPROVED BY:		APPROVED FOR TEST:	
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SHEET NO. 3 OF 3 SHEET

TO DEPT. NO.

DATE

REQUESTED BY DEPT. NO.

ASSIGNMENT NO.

TEST DEPT. JOB NO.

FUNCTION

LOCATION

PROJECT C-105

2909

X7-0800

2666

1100

COMPONENT ELECTRICS

TITLE OF TEST

DATA

SIMULATED
FUNCTION

TEST PROCEDURE

FUNCTIONAL CHECK

TERML

Nose Wheel
Steering(w) System as in "U"
Open C.B. E1/62Anti-skid control unit
DE-EN

E

(x) EN Main D.C. Bus
system as in "A"
(y) Operate control column
Steering button

Same as in "A"

(z) Actuate Nose Oleo
SwitchNose Wheel steering sol. EN
Steering solenoid DE-EN

A

A

(a) System as in "Y" &
open C.B. E1/61

Steering solenoid DE-EN

A

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R.T. NO. 08-387 ADD 4

SHEET NO. _____ OF _____ SHEET

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
-------------------------------	----------------	------------------	-------

Refuelling

(a) Energize Main D.C.

Bus

(b) Select switch E21/3 to "Full"

(c) Operate Master

Refuelling

Switch E21/2 to "ON"

Refuelling Ind Lights go. on & then Off.

Warning Lt E15/2 on

Master Amber Lt on

Relay E5/6 is actuated

Relay E5/40 is actuated

Right F/P by Pass EN "Open"

Left F/P by-pass EN "Open"

Normal & Partial refuelling

Relay E5/24 is actuated

Air pressure relief valves

are EN "Open"

Pressure regulator valves

are EN "Open"

External Tank Air Shut

Off valve DE-EN "Closed"

7 Left level sensing valves

EN

7 Right level sensing valves

"EN"

Relay E5/6 is DE-EN

Relay E5/40 is DE-EN

Relay E5/24 is DE-EN

L & R level sensing valves

DE-EN

Fuelling indicator lights

Off

Light E15/2 goes off

(g) Draw fuse E20/14

(h) System as in "C"

then simulate tanks full Refuelling ind lights on

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SHEET NO. _____ OF _____ SHEET

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
Partial refuelling	(j) Open switch E21/2	Refuelling lights off	1
	(a) EN main D.C. Bus selector switch to "Partial"	Refuelling ind lights on	I
	Switch E21/2 to "ON"	E15/2 warning light on	I
		Refuelling ind lights off	I
		Relay E5/6 EN	XI
		Relay E5/24 EN	
		Relay E5/40 EN	XI
		R/F/P by-pass EN closed	B
		L F/P by-pass EN closed	B
		Relay E5/15 EN	XI
Partial # 2	(b) switch E23/11 to "ON"	L/Tank level sensing valves EN	
	(c) Switch E 24/11 to "ON"	R/Tank level sensing valves EN	
	(d) Draw fuse E20/13	Relay E5/15 DE-EN	XI
	Same as Partial # 1		
De-Fuel	SW E21/2 to De-Fuel	Relays E5/24 & E5/15 DE-EN	XI
		Relays E5/6 & E5/40 DE-EN	XI
		R & L F/P valves EN Closed	B
		Relief override Sws DE-EN	
		Tank level sensing valves DE-EN	
		Shut off valves DE-EN	
		Refuelling indicator lts Off	

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REQUISITION FOR TEST

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SHEET NO. 1 OF 5 SHEETS

TO DEPT. NO.

DATE

REQUESTED BY DEPT. NO.

ASSIGNMENT NO.

TEST DEPT. JOB NO.

FUNCTION
LOCATION

PROJECT

COMPONENT

TITLE OF TEST

DATA
SIMULATED
FUNCTION

TEST PROCEDURE

FUNCTIONAL CHECK

TERMS

Fire Protection (a) EN Emergency D.C. Bus
& Battery Bus.

Simulate Fire in L/engine Red fire warning light
A/C master switch is "ON" will do "ON"

Master Red warning Light
"ON"

(b) Operate extinguishing Relay E3/5 Actuates &
Button E14/5 locks in

Left L/P valve EN closed

L/time delay relay EN &

After 2 1/2 secs - 1/2 sec it

supplies power to "A" of

Connector #1, bottle #1

Power will be removed
from connector #1, bottle
#1.

(c) At this point, open
C.B. E1/45

(d) Close C.B. E1/45
system as in "B"

When power is applied
to "A" of connector #1
bottle #1 it will remain
there for an elapsed time
of 3 secs. 1 1/2 sec at which
time the time delay relay will
remove the power from the
bottle

(e) Remove L/engine fire
signal Press master
warning "reset".

Open A/C master switch.

E16/2 close E16/2

Close E16/2

(f) Simulate fire signal
from R/engine

Red warning light "Off"
master red warning light
"off"

Relay E3/5 DE-EN & system
returns to normal

Fire warning light E14/6
"ON"

Master red warning light
"ON"

XI

B

- - 13

A conn 1.

A conn 1.

A conn 1.

28

XI

2n

PREPARED BY:

FOR TEST DEPT. ONLY:

APPROVED BY:

APPROVED FOR TEST:

AUTHORIZED BY:

ASSIGNED TO:

PRIORITY:

DATE R.T. RECEIVED:

TARGET DATE:

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AVRO AIRCRAFT LIMITED

REQUISITION FOR TEST

R.T. NO. 08-367 Add.4

SHEET NO. 2 OF 5 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE

REQUESTED BY DEPT. NO.

2909

ASSIGNMENT NO.

X7-0800

TEST DEPT. JOB NO.

FUNCTION
LOCATION
1100

PROJECT

0-105

COMPONENT

Electrics

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL & OPERATIONAL TESTS

DATA

SIMULATED
FUNCTION

TEST PROCEDURE

FUNCTIONAL CHECK

TERML

SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
Fire Protection	(g) Operate extinguishing button El4/6	Relay E3/6 actuates & locks in Right L/P lock is enclosed R/time delay EN & after 2 1/2 secs ± 1/2 sec. it applies Power to "A" connector No. 1 Bottle No. 2	X1 B 4-19 "A" Conn.1
	(h) At this point open C.B. El/46 El/26	Power will be removed from "A" of Connector No. 1 Bottle No. 2	"A" Conn.1
	(j) Close C.B. El/46 & El/26 System as in "G"	When power is applied to "A" Conn. No. 1 Bottle No. 2 it will remain there for an elapsed time of 3 Secs. ± 1/2 SES at which time the time delay will remove the power from the bottle Red warning light is off Master " " is off Relay E3/6 is de-en & system returns to normal	"A" Conn.1 2n X1
	(k) Remove R/engine fire signal. Press Master warning "reset" Open A/C master switch El6/2	Fire warning light El4/7 "on" Master red warning light "on"	2u
	(l) Close El6/2 Simulate hydraulic bay Fire Signal	Relay E6/9 EN & Locks in. Power is applied to "A" of connector No. 3 Bottle No. 1	X1 4-17 "A" Conn.3
	(m) Operate Extinguishing button El4/7		

PREPARED BY: L. Shearson

FDR TEST DEPT. ONLY:

APPROVED BY:

APPROVED FOR TEST:

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R.T. NO. 08-387 Add.4

REQUISITION FOR TEST

SHEET NO. 3 OF 5 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800		1100	G-105	Electrics

TITLE OF TEST C-105 ELECTRICAL SYSTEM FUNCTIONAL & OPERATIONAL TESTS

DATA

SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
Fire Protection	(n) Open C.B. E1/47	Power is removed from "A" Connector No. 2 Bottle No. 1	"A" Conn.3
	(o) Remove Hyd. Bay fire signal. Press master warning reset	Red Warning light "off"	2u
	(p) Open master switch E16/2	Master warning light "Off"	
	(q) System as at termination of "B"	Relay E6/9 drops out & system returns to normal	
	Operate 2nd shot switch E14/10	Relay E3/5 locked in	X1
		Relay E6/21 EN	X1
		Power applied to "A" of Connector No. 2 Bottle No. 2	"A" Conn.2
	(r) Open C.B. E1/49	Power is removed from "A" Of Conn No. 2 Bottle No.2	" "
	(s) Remove L/engine fire signal Press master warning "Reset"	Red warning light "off"	2B
	Open A/C master switch E16/2	Red Master Warning off	
	(t) With system as at termination of "G", operate 2nd shot Switch E14/10	Relay E3/5 is de-en.	X1
		Relay E3/6 En & locked in	X1
		Relay E6/21 EN	X1
		Power is applied to "A" of Conn No. 2 Bottle No.1	"A"Conn.2
	(u) Open C.B. E1/50	Power is removed from "A" Conn. No. 2 Bottle No. 1	"A" Conn.2
		Relay E6/21 De-en.	X1

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FDR TEST DEPT. ONLY:

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REQUISITION FOR TEST

R.T. NO. 08-387 Add.4

SHEET NO. 4 OF 5 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

REQUESTED BY DEPT. NO.

ASSIGNMENT NO.

TEST NO.

FUNCTION

2909

X7-0800

1100

PROJECT C-105

COMPONENT Electrics

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL & OPERATIONAL TESTS

DATA

SIMULATED
FUNCTION

TEST PROCEDURE

FUNCTIONAL CHECK

TERML

Fire Protection (v) Remove R/Engine fire signal. Press master warning "Reset" Open A/C master switch E16/2 (w) With system as at termination of "M" operate 2nd shot switch E14/10 (x) Open C.B. E1/49 (y) Remove hydraulic bay fire signal Press master warning "reset" Open master A/C switch E16/2 (z) While operating 2nd shot switch E14/10, open C.B. E1/50 (a) EN battery bus A/C master switch "Off" (b) Simulate operation of inertia switch	Red warning light "off" Master warning light "off" Relay E3/6 is De-en. Relay E6/9 EN & locked in Relay E6/21 EN Relay E6/9 EN & locked in Relay E6/21 EN Power is applied to "A" of Conn. No. 3 Bottle No. 2 Power is removed from "A" Conn. No. 3 Bottle No. 2 Red warning light "Off" Master red warning light "Off" Relay E6/9 is de-en. & system returns to normal Relay E6/21 is de-en. & power removed from bottle valves Relay E5/39 EN Right L/P lock EN closed Left L/P lock EN closed Relay E3/6 EN Relay E3/5 EN Power is applied to "A" of Conn No. 3 Bottle No. 1 Power is applied to "A" of Conn.#2 Bottle #2	X1 X1 X1 X1 X1 "A" Conn.3 " " X1 All X1 B B X1 X1 "A" Conn.3 " " 2
---	---	---

PREPARED BY:

FOR TEST DEPT. ONLY:

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REQUISITION FOR TEST

R.T. NO. 08-387 Add.4

SHEET NO. 5 OF 5 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800		1100	C-105	Electrics

TITLE OF TEST C-105 ELECTRICAL SYSTEM FUNCTIONAL & OPERATIONAL TESTS

DATA

SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML.
Fire Protection	(c) Open C.B. El/47 & Open SW El6/2	Power is applied to "A" of Conn. #1 Bottle # 2	"A" Conn. 1
	(d) Open C.B. El/45	Power removed from "A" Conn. # 3 Bottle # 1	"A" Conn. 3
	(e) Open C.B. El/46	Power is removed from "A" of Conn. # 2 Bottle # 2	"A" Conn. 2
	(f) Open inertia switch	Power is removed from "A" of Conn. # 1 Bottle No. 2	"A" Conn. 1
	Open C.B. El/45 & Press switch El4/5	System returns to normal	
	Open C.B. El/46 & Press switch El/46	No function	
	Open C.B. El/47 & press switch El/47	No function	
	Draw fuses E20/37 & E20/38 & C.B. El/51. Operate ground test switch E21/8	No function	
L/Engine & Hydraulic Bay Fire	Press El4/5 & hold & then Press El4/7 (No timer available for this check)	No warning lights	
		Relay E3/5 EN & locks in	X1
		Relay E6/9 " " " "	X1
		Connector # 3 Bottle # 2 EN	A
		" # 2 " # 2 EN	A

* Check desirability

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REQUISITION FOR TEST

R.T. NO. 08-387 ADD 4

SHEET NO. 1 OF 2 SHEET

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J. T. AGES DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA

SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
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Canopy Actuation Battery Bus & emergency
sht 9 D.C. Buses EN

Canopies in open position

Pilots switch E10/2 to Relay E6/12 Actuates XI

"Close" Front Canopy Actuator EN B

Open C.B. E1/76 Front Canopy Actuator DE-EN B

Open C.B. E1/71 Relay E6/12 is DE-EN XI

Rear C/P switch E19/13 Relay E6/14 is EN XI

to "Close" Rear Canopy actuator EN B

Open C.B. E1/75 Rear Canopy Actuator DE-EN B

Open C.B. E1/77 Relay 6/14 is DE-EN XI

Simulate closing off

front & Rear canopy Sealing valve is EN A

latches

Open C.B. E1/74 Sealing valve is DE-EN A

Close C.B. E1/74 &

operate Front & rear Sealing valve EN A

canopy switches.

E10/2 & E19/13 to "Open" No canopy actuation
or "Close"

Open front & Rear Canopy Sealing valve DE-EN A

Latches.

Pilots switch E10/2 to Relay E6/12 is EN XI

"Open" Front canopy actuator is EN A

Open C.B. E1/76 Front Canopy actuator is A

DE-EN

Open C.B. E1/77 Relay E6/12 is DE-EN XI

Rear C/P canopy switch Relay E6/14 is EN XI

E19/13 to "Open" Rear canopy actuator EN A

Open C.B. E1/75 Rear Canopy actuator DE-EN A

Open C.B. E1/77 Relay E6/14 is DE-EN XI

Circuit Back to Normal

& Both Canopies open

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SHEET NO. 2 OF 2 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
Canopy Actuation Continued	Front Ground Service Switch to "Close"	Relay E3/14 is EN Front Canopy Actuator EN	XI B
	Open C.B. E1/76	Front Canopy Actuator DE-EN	B
	Open C.B. E1/77	Relay E3/14 DE-EN	XI
	Close C.B.s & operate Front		
	Ground Service switch to "Open"	Relay E3/14 is EN Front Canopy Actuator EN	XI A
	Rear Canopy Open Operate Rear		
	Ground Service Switch to "Close"	Relay E3/16 is EN Rear Canopy Actuator EN	XI B
	Open C.B. E1/75	Rear Canopy Actuator DE-EN	B
	Open C.B. E1/77	Relay E3/16 is DE-EN	XI
	Close C.B.s & Operate Rear		
	Ground Service Switch to "Open"	Relay E3/16 is EN Rear Canopy Actuator EN	XI A
	With Canopies Closed & Latches closed operate both ground Service Switches To "Open" of "Close"	Sealing valve EN No Canopy Function	A

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A.V. ROE CANADA LIMITED
MALTON, ONT.

R.T. NO. 08-387 ADD 4

REQUISITION FOR

SHEET NO. 1 OF 5 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames

DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT C-105
				COMPONENT ELECTRICS

TITLE OF TEST

DATA
SIMULATED
FUNCTION

TEST PROCEDURE

FUNCTIONAL CHECK

TERML

Air conditioning (a) EN Main D.C Bus
A/C Airborne U/C EN emergency D.C. Bus
UP EN Primary A.C. Buses

All breakers & Fuses Made Relay E3/4 EN
(b) Switch E18/3 at Relay E6/22 DE-EN
"Normal"

XI
XI

L/Ram Air Inlet EN closed B
R/Ram Air inlet EN closed B
Radar Nose Inlet EN Open A
Relay E6/8 EN XI
Relay E3/13 DE-EN XI
C/P S/O valve EN Open A
Flow augmentor DE-EN open A
Main Control Valve EN open A

(c) Simulate Modulator Control

Main Control Valve EN B
Closed
Main Control Valve DE-EN A&B
Modulator DE-EN D

(d) Open C.B. E1/57

(e) Open C.B. E1/12

(g) System as in "A"

Switch E18/3 to "Emergency" Relay E6/22 EN

XI
XI

Relay E3/4 DE-EN
L/Ram Air Inlet EN Open A
R/Ram Air Inlet EN Open A
Radar Nose Inlet EN closed B
Main Control Valve DE-EN

(h) Open C.B. E1/33

Modulator DE-EN E.B.F.
L/Ram Air Inlet DE-EN A&B
R/Ram Air Inlet DE-EN A&B
Radar Nose Inlet Valve A&B
DE-EN
Main Control Valve DE-EN A&B
C/P S/O Valve DE-EN A&B
Relay E6/22 DE-EN XI
Flow Augmentor Valve DE-EN A
EN

PREPARED BY:

FOR TEST DEPT. ONLY:

APPROVED BY:

APPROVED FOR TEST:

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A.V. ROE CANADA LIMITED
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R.T. NO. 08-387 ADD 4

REQUISITION FOR TEST

SHEET NO. 2 OF 5 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. NO.	LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

UNCLASSIFIED

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
	(j) System as in "A" Switch E18/3 to "OFF"	Relay E6/22 DE-EN Relay E3/4 DE-EN L/Ram Air Inlet EN Closed R/Ram Air Inlet EN Closed Radar Nose Inlet EN Closed Main Control Valve DE-EN Relay E6/8 EN Relay E3/13 DE-EN C/P Valve EN Open Flow Augmentor DE-EN Open Modulator DE-EN	XI XI B B A A XI XI A A E.B.F.
Air Conditioning A/C on Ground	(k) Adapter switch closed switch E18/3 to "Normal"	Relay E3/4 DE-EN Relay E3/7 EN L/Ram Air inlet EN Closed R/Ram Air inlet EN Closed Radar Nose inlet EN Open Main Control Valve DE-EN Relay E6/8 DE-EN Relay E3/13 EN C/P shut off Valve EN Closed Flow augmentor EN Closed Relay E3/13 DE-EN	XI XI B B A A&B XI XI B A XI
	(l) Operate Test Switch E3/10	Relay E3/13 DE-EN	XI
	(m) System as in "K" Open C.B. E1/33	Relay E3/13 DE-EN C/P S/O Valve DE-EN Flow augmentor DE-EN Visor Heaters EN Visor heaters DE-EN	XI A&B A A
Visor Heaters	EN Main D.C. Bus Open C.B. E1/78		
Cabin Pressure	Close C.B. E1/78 Short B&C of Aneroid SW	Warning light E15/38 ON	1

PREPARED BY:	FOR TEST DEPT. ONLY:
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A.V. ROE CANADA LIMITED

MALTON, ONT.

R.T. NO. 08-387 ADD 4

REQUISITION FOR TEST

SHEET NO. 3 OF 5 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J. W. AMES DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
Air Cond Warning	Remove Short	Master amber light on	1
	Open C.B. E1/78	E15/38 goes OFF.	
	Short B&C of Aneroid SW	No Function	
	EN Emergency D.C. Bus		
Cabin Press Dump	Short Air Cond Thermostat	Warning Light E5/37 ON	1
	Remove short	Master amber light on	
	Open C.B. E1/80 & Short	E5/37 Goes off	
	Air cond thermostat	No function	
Oxygen Indication	EN emergency D.C. Bus	Dump Solenoid EN	A A M H
	Operate Dump SW to "ON"	Dump Solenoid DE-EN	
	Open C.B. E1/80	Indicator EN D.C.	
	EN Main D.C. Bus	Indicator EN A.C.	
Electronics Temp- erature Control	EN A.C. Primary Bus Phase B		AtoB AtoB AtoB AtoB
	Mer. will supply equip- ment to test this.		
	EN Primary A.C. Bus Phase A	Temp. Controller EN	
	Open C.B. E1/12	Temp. Controller DE-EN	
Cockpit Temp- erature Control	EN Primary A.C. Bus Phase A	Temp Controller EN	AtoB AtoB AtoB AtoB
	Open C.B. E1/12	Temp Controller DE-EN	
Air Cond s/o Valves	(a) Main D.C. Bus		A E
	(b) Short Any R/duct thermostats or pressure switch	Relay E5/55 EN & Locks in XI	
		R/Engine s/o Valve EN	
	(c) Remove Shorts as in B & Press Annunciator	Annunciator Indicates	

PREPARED BY:

FOR TEST DEPT. ONLY:

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HALTOW, ONTARIO

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NO. 08-387 ADD 4

REQUISITION FOR TEST

SHEET NO. 4 OF 5 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames

DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL TEST	TERML
	Reset Switch	Relay E5/55 Unlatched Annunciator Clears	X3 E
	(d) System as in "A" (e) Draw fuse E20/21 & apply test as in "B" (f) System as in A&B & short any L/duct thermostats or pressure switch (g) system as in "A" & short any L/Duct ther- mostat or pressure SW	No function No function Relay E5/12 EN & Locks in L/engine s/o valve EN Annunciator indicates	 XT A D
	(h) Remove shorts as in "G" & Press Annunciator reset switch	Relay E5/12 Unlatched Annunciator Clears	X3 D
	(j) System as in "A" Draw Fuse E20/22 & apply test as in "G" (k) System as in "G" & apply test as in "B"	No Function Relay E5/55 EN & Locks in R/Engine s/o Valve DE-EN Annunciator indicates	 XI A E
Electronics Over Temp.	(a) EN main D.C. Bus (b) Simulate over Temp by shorting out Therm- ostats (c) System as in "A" Open C.B. E1/32 & apply Test as in "B" (d) System as in "B", Press annunciator reset Switch	Annunciator indicates No Function Annunciator clears	F F

PREPARED BY:

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R.T. NO. 08-387 ADD 4

SHEET NO. 5 OF 5 SHEETS

REQUISITION FOR TEST

UNCLASSIFIED

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames

DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST
C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
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Rain Repellant	(a) EN main D.C. Bus (b) Pilots switch E18/5 to "OFF" (c) Pilots switch E18/5 to "ON" Simulate over Temperature Open C.B. E1/32	Air Valve EN Closed Air Valve EN Open Air Valve EN Closed Air Valve DE-EN Closed	B A B A&B
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REQUISITION FOR TEST

R.T. NO. 08-387 ADD 4

SHEET NO. 1 OF 4 SHEETS

TO DEPT. NO. STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE December 7, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
				COMPONENT

TITLE OF TEST

DATA FLIGHT SERVICES

<u>Simulated Function</u>	<u>Test Procedure</u>	<u>Functional Check</u>	<u>Term'l.</u>
Fin pitot heaters	Main D.C. bus EN Switch E21/16 normal pos. Switch E21/16 to "momentary" Open C.B. E1/79 Switch E21/16 to normal position & C.B. E1/79 open. Switch E21/16 in normal position, press indicator lights to test.	Pitot heaters go "ON" Lights E21/17 & E21/18 go ON Ind. Lights will go "OUT" Pitot heaters will not go "ON" Lights will go "ON"	1 1 1 1 2
Artificial horizon	Primary A.C. bus energized Battery bus energized Connect A.C.V.M. in secondary of star to delta trans. Open C.B.s E1/9, E1/10, E1/8 Close C.B.s and simulate R and L power failure Connect A.C.V.M. from phases to ground at indicator Open C.B.s E1/71 and E1/72 Open C.B.s E1/69 and E1/70	V.M. should read 115V A.C. phase to phase or phase to gnd. V.M. will not register Relay E3/15 EN Transformer will be fed from emergency A.C. supply V.M. will register V.M. will not register No power to T4 compass	
Rear C-P Bail out Warning	Emergency D.C. Bus EN Simulate navigator still in R/Cockpit Close Bail out switch E14/13	Navigators buzzer will operate and red warning lights will go "ON", and pilot's two green pre-bail out signal lights will go "ON"	

PREPARED BY: L. Shearson	FOR TEST DEPT. ONLY:
APPROVED BY:	APPROVED FOR TEST:
AUTHORIZED BY:	ASSIGNED TO:
PRIORITY:	DATE R.T. RECEIVED:
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REQUISITION

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R.T. NO. 08-387 ADD 4

SHEET NO. 2 OF 4 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J. W. JAMES DATE December 7, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
				COMPONENT

TITLE OF TEST

DATA

Simulated
Function

Test Procedure

Functional Check

Term'l.

Brake Parachute	Simulate "Navigator Bailed Out" by opening Navigator's seat limit switch EN main D.C. bus actuate lever limit switch Open C.B. El/67	All above will go "OFF" Door release solenoid EN " " " DE-EN	A A
Speed Brake	EN Emergency D.C. Bus Speed brake switch El3/7 to "hold". Operate El3/7 to "IN" " " " "OUT" Open C.B. El/67	Speed Brake Solenoids DE/EN " " " EN " " " EN Speed Brake Solenoids DE-EN when El3/7 actuated	A * C A C A * C
Turn and slip	EN Emergency D.C. bus Open C.B. El/73	T and S Indicator EN T and S Indicator DE-EN	A A
Skin Temperature	EN Primary A.C. Bus phase A	S/T indicator EN	E
Hydraulic Pressure	EN Main D.C. Bus	Hydraulic Press, Switch "A" EN " " " "B" EN " Utility " EN Emergency Brake EN	A A A A
	Simulate Press. failure at switch "A" only " " " " "	Warning light El5/9 on Master amber light El1/9 ON " " " " OFF	1 1 1
	Press. Reset Switch El5/22	Light El5/9 stays ON Warn'g. light El5/8 ON Master Amber Light ON	1 1 1
	Press. Failure at "B" only	" " " " OFF	1
	Press. Reset Switch	El5/8 light goes ON El5/9 " " " "	1 1
	Press. Failure at "A" + "B"	Master Red Light El1/7 ON Master Amber Light ON	1 1

PREPARED BY: L. Shearson

FOR TEST DEPT. ONLY:

APPROVED BY:

APPROVED FOR TEST:

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REQUISITION FOR TEST

R.T. NO. 08-387 ADD 4

SHEET NO. 3 OF 4 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. AMES

DATE December 7, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
				COMPONENT

TITLE OF TEST

DATA

Simulated
Function

Test Procedure

Functional Check

Term'l

Press. Reset Switch

Master Red Light off

1

Master amber light off

1

Open C.B. EL/66

All other warn'g. lights off

1

Draw Fuse E20/23

Press. switch "A" DE-EN

A

" " "B" DE-EN

A

Draw Fuse E20/24

Utility Press. switch DE-EN

A

Emergency Brake Press. Switch
DE-EN

A

Trim Indicator

EN Main D.C. Bus

Common of Pots EN

A

Draw Fuse E20/12

Indicator EN

3

Potentiometers DE-EN

A

Indicator DE-EN

3

Master Dimming

EN Main D.C. Bus

EN Emergency D.C. Bus

Actuate Master Test Switch

EL5/23

All master warning panel
lights plus bail out and U/C
position warning light, will
go on at full brillianceOperate master dimming
switch to "night"All warning lights will dim
except fire warning lights

Draw fuse EL/68

All dimmed lights go out.

PREPARED BY: L. Shearson

FOR TEST DEPT. ONLY:

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REQUISITION FOR TEST

R.T. NO. 08-387 ADD 4

SHEET NO. 4 OF 4 SHEETS

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J. JAMES

DATE December 7, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
				COMPONENT

TITLE OF TEST

DATA

<u>Simulated Function</u>	<u>Test Procedure</u>	<u>Functional Check</u>	<u>Term</u>
Ground Check Signal Box	A. Main D.C. Bus is EN B. Simulate overheating in R/air duct C. Draw Fuse E20/22 D. Draw Fuse E20/21 E. Return system to normal as in "A" and apply test as in "B" F. Press. reset button G. Simulate overheating in L/air duct H. Draw Fuse E20/22 J. Draw Fuse E20/21 K. Return System to normal as in "A" and apply test as in "G" L. Press. Reset button M. Simulate electronics System overtemperature by pulsing D.C. to "F" of signal box N. Press. reset button O. Simulate operation of Radar nose de-icing by pulsing D.C. to term. "C" of signal box. P. Press. re-set button	Indicator at "E", will show. Relay E5/55 will be "EN" R/Engine S/O valve will close R/Engine S/O valve will open Relays E5/55 will be DE-EN Indicator disappears at "E" Relay E5/55 is unlatched system returns to normal Indicator at "D" will show. Relay E5/12 will be EN L/Engine S/O Valve will close L/Engine S/O valve will open Relay E5/12 will be DE-EN Indicator at "D" disappears Relay E5/12 is unlatched System returns to normal Indicator at "F" will show Indicator at "F" will disappear Indicator at "C" will show " " " " disappear	E X2 A A X2 E X3 D X2 A A X2 D X3 F F C C

PREPARED BY: L. Shearson

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REQUISITION FOR TEST

SHEET NO. 1 OF 2 SHEET

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. AMES DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST
C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
Interior Lights	(a) Energize Main D.C. Bus EN emergency D.C. Bus EN Primary A.C. Bus Phase "A" (b) Front C/P control El7/3 to "Bright" (c) Operate Control to "Dim" (d) Draw Fuse El7/6 (e) Replace Fuse El7/6 (f) Open C.B. El/15 (g) System as in "A" Operate Control El7/4 to "Bright" (h) Operate El7/4 to "Dim" (j) Draw Fuse El7/7 (k) Replace fuse El7/7 (l) Open C.B. El/15 (m) System as in "A" Operate Control El7/5 to "Bright" (n) Operate El7/5 to "Dim" (o) Draw Fuse El7/8 (p) Replace fuse El7/8 (q) Open C.B. El/16 (r) System as in "A" Close switch El7/9 (s) Close Switch El9/9	Edge & Instrument Lights On M.I.P. go "Full On" Above Lights go "Dim" Above Lights go "Off" Above Lights go "ON" Above Lights go "Off" to M.I.P. Consol Edge Lights Go "Full On" Above Lights go "Dim" Above Lights go "Off" Above Lights go "ON" Above Lights go "Off" Front C/P console flood Lights go "Full On" Above Lights go "Dim" Above Lights go "Off" Above Lights go "ON" Above Lights go "Off" Front C/P High Altitude Console Flood Lights go "ON" Rear C/P High altitude Console Flood Lights go "ON"	
PREPARED BY:	FOR TEST DEPT. ONLY:		
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R.T. NO. 08-387-ADD 4

SHEET NO. 2 OF 2 SHEET

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOO NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	TEST PROCEDURE	FUNCTIONAL CHECK	TERML
Interior Lights Continued	(t) Open C.B. E1/37 (u) System as in "A" & Operate Control E26/5 to "Bright" (v) Operate E26/5 to "Dim" Draw fuse E26/8 Replace Fuse E26/8 Open C.B. E1/18 (w) System as in "A" & Operate Control E26/4 to "Bright" Operate E26/4 to "Dim" Draw Fuse E26/7 Replace Fuse E26/7 Open C.B. E1/17 (x) System as in "A" Operate Front & Rear C/P Emergency Flood Lights to "ON" Open C.B. E1/36	All above Lights to "Off" Rear C/P Console Flood Lights will go "Full On" Above Lights go "Dim" Above Lights go "Off" Above Lights go "ON" Above Lights go "Off" Rear C/P Electronics Edge & Instrument Light "Full ON" Above Lights go "Dim" Above Lights go "Off" Above Lights go "ON" Above Lights go "Off" Emergency Flood Lights go "ON" Above Lights go "Off"	
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REQUISITION FOR TEST

R.T. NO. _____

SHEET NO. 1 OF 1 SHEETSTO DEPT. NO. STRUCTURAL TEST DEPT. MR. J.W. AMESDATE December 7, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT
			COMPONENT	

TITLE OF TEST

DATA

Simulated

Function

External Lights

Test Procedure

Functional Check

Term'l.

A. EN main D.C. bus

B. EN D.C. shedding bus

C. U/C extended or extending

D. Operate switch E10/3 to
"landing"

E. Open C.B. E1/39

F. Open C.B. E1/40

G. System as in D but simu-
late U/C locked upH. Operate navigation lights
switch E22/5 to "steady"

J. Open C.B. E1/38

K. System as in A and
operate switch E22/5 to
"Flash".

L. Open C.B. E1/38

Relay E6/7 DE-EN

Relay E6/13 EN

Relay E6/10 EN

Taxi Light on

Landing light on

Relay E6/13 DE-EN

Landing light off

Relay E6/10 DE-EN

Taxi light off

Landing & taxi lights off

Relay E6/13 DE-EN

Relay E6/10 DE-EN

L & R wing tip lights on

Lower fin tip light on

Top fin tip light on

All navigation lights off

Flasher EN

Wing tip lights & lower fin

Tip light goes on for .75 secs.

then go off for .75 secs. while

the top fin tip light goes on

for .75 secs., this sequence

continues as long as the switch

selection is at "Flash"

Flasher unit is DE-EN

All navigation lights off

PREPARED BY: <u>L. Shearson</u>	FOR TEST DEPT. ONLY:
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SHEET NO. 1 OF 2 SHEET

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. Mr. J.W. Ames

DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2909	X7-0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA

SIMULATED
FUNCTION

TEST PROCEDURE

FUNCTIONAL CHECK

TERML

Duct de-icing (a) EN Main D.C. Bus
EN Main A.C. Buses

Simulate L/Duct (b) Short A & B of L/ice
Icing detector

(c) Predetermined No. of icing
Pulses

(d) Draw fuse E20/15 & Test
as in B, C & D

(e) Draw fuses E33/2, E33/4
E33/6

(f) Draw fuses E34/2, E34/4
E34/6

(g) Draw Fuses E33/1, E33/3
E33/5

L&R Distributors EN A.C. A.E.C.

L&R Distributors EN D.C. B

L/ice det relay EN & Locks XI
inR/ice det relay EN & Locks XI
inIce warning Light E15/39 on 1d&2d
Master amber light on

Timer is EN E

Timer is EN F

Timer is EN J

Timer is EN B

Parting strips EN

Signal through O/H thermo-
state

To coils of P/S Relays XI

L&R distributors cycle
onceproviding O/H thermostats
closed-

Predetermined overhang time

L&R distributors cycle once
more

& Then system shuts down

Distributors will not fun- B
ction

P/S relays DE-EN XI XI

L/load distributor DE-EN A.E.C

R/load distributor DE-EN A.E.C

L/parting strip relay DE- L1, L2, L3
EN

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R.T. NO. 08-387 ADD 4

SHEET NO. 2 OF 2 SHEET

TO DEPT. NO. 3110 STRUCTURAL TEST DEPT. MR. J.W. Ames

DATE

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. NO.	FUNCTION-LOCATION	PROJECT	COMPONENT
2909	X7 0800	2666	1100	C-105	ELECTRICS

TITLE OF TEST

C-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA SIMULATED FUNCTION	Test Procedure	FUNCTIONAL CHECK	TERML
Simulate R/duct Icing	(h) Draw Fuses E34/1 E34/3, E34/5	R/Parting strip relay DE-EN	L1, L2, L3
	(j) Short A&B of R/ice detector	Warning light E15/39 on	2D
		Timer is EN	E
		Timer is EN	F
		Timer is EN	J
Actuation of boots & sensors	(k) Test as in C	Timer is EN	B
	(l) Initiate icing cycle & immediately initiate another	Timer is EN	
		L&R distributors EN A.C.	A.E.C
		L&R distributors EN D.C.	B
		P/strips EN as in B	
		Check as in C	
		Distributor will cycle twice	
		Predetermined hang on time	
		Distributor cycles once	
		More & system shuts down	
	These are simulated on the electrical test rig by Lights & switches	Appropriate lights will go on as distributor cycles & the switches when open will de-energize D of distributors removing the A.C. from the boots	

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SHEET NO. 1 OF 2 SHE

TO DEPT. NO. STRUCTURAL TEST DEPT. MR. J. W. AMES

DATE December 7, 1956

REQUESTED BY DEPT. NO.

ASSIGNMENT NO.

TEST DEPT. JOB NO.

FUNCTION
LOCATION

PROJECT

COMPONENT

TITLE OF TEST

UNCLASSIFIED

DATA

Simulated

FunctionTest ProcedureFunctional checkTerm'l.Radar Nose and Canopy
De-icingA. Primary A.C. buses & main
D.C. bus is energizedD.C. on four control units B
Contactors E40/7, E40/8, E40/9
& E40/10 are EN XIA.C. Voltage is impressed on
"A" of four control units.
A.C. voltage through transformer
E40/6, to buses on L & R canopy
& L & R WindscreenB. Open C.B. E1/22
Open C.B. E1/42
Open C.B.s E1/2, E1/3,
E1/4R/WS & L/C contactors DE-EN XI
L/WS & R/C contactors DE-EN XIC. System as in A
Open C.B.s E40/11, /12, /13,
/14No A.C. voltage at contactors 2
No A.C. voltage on controllers AOpen C.B.s E1/2, E1/5,
E1/4No A.C. on relays E40/7, /8, /9,
/10 XI
A.C. Voltage still on Trans Sec. 4
" " " " 5
" " " " 6No voltage at trans. Primary 1
2
3

No A.C. voltages at Control Units A

System as in A & simulate
overheat at each canopy
& windscreen

The appropriate relay DE-EN XI

De-icing (Radar Nose) A. A-C in flight U/C up
Main D.C. bus is energized
Simulate icing by shorting Signal to annunciator box C
(CONT)

PREPARED BY: L. Shearson

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REQUISITION FOR **CONFIDENTIAL**TO DEPT. NO. STRUCTURAL TEST DEPT. MR. J.W. AMESR.T. NO. 08-387 ADD 4SHEET NO. 2 OF 2 SHEETSDATE December 7, 1956

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT

TITLE OF TEST

DATA

Simulated
FunctionTest ProcedureFunctional checkTerm'l.A. Continued"A" and "B" of fwd. ice
detector

D.C. fed to time delay relay
and feeds out of ter. 4 to
EN de-icing solenoid A
De-icing solenoid is EN for
1 second and then DE-EN A
D.C. is then fed from term. 5
of time delay relay to EN air
valve relay. XI
Air valve as EN, open for approx.
23 seconds. A
Time delay relay then returns
to normal. 3
Air valve DE-EN A
No power at timer 1
No function as above
Relay E6/11 is EN XI
No power to time delay motor

B. Open C.B. E1/21

C. Open C.B. E1/41 * simulate
icing again

D. Simulate A/C on ground

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A.V. ROE CANADA
MALTON, ONTARIO

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R.T. NO. 08-387 ADD 4

REQUISITION FOR TEST

SHEET NO. _____ OF _____ SHEETS

TO DEPT. NO. _____

DATE _____

REQUESTED BY DEPT. NO.	ASSIGNMENT NO.	TEST DEPT. JOB NO.	FUNCTION LOCATION	PROJECT	COMPONENT
2921	X7-0800		1100	CF-105	Electrics

TITLE OF TEST

CF-105 ELECTRICAL SYSTEM FUNCTIONAL AND OPERATIONAL TESTS

DATA

Transfer of Power from Normal to Emergency A.C.

One Power Failure Detector to be installed normally on the "Rig", but the line from terminal "F" of the P.F.D. will be tied into both "G" and "H" terminals at the Master Failure Warning Box.

Failure of the alternator will be simulated by opening the appropriate C.S.D. centrifugal switch.

Instrumentation will be set up to record:-

- (a) The time lapse between the failure of the normal A.C. power (D.C. interruption at pin "E" of power failure detector) and pick up of signal at transfer relay coil and valve solenoid.
- (b) The time lapse between normal A.C. failure (D.C. interruption at pin "E" of power failure detector) and pick up of emergency A.C. at emergency bus.

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