AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091 Addendum 2

SHEET NO. 5 OF 5

DATE: November 18, 1958

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

3.3.43	Nozzle Area Indication (left)	0304-25
3.3.44	Nozzle Area Indication (right)	0305-25
3.3.45	Fuel pressure in tank no. 5 (left)	
3.3.46	Fuel pressure in tank no. 5 (right)	
3.3.47	Engine Inlet fuel pressure (left)	0111-16
3.3.48	Engine Inlet fuel pressure (right)	0112-16
3.3.49	Cancelled	
3.3.50	Cancelled	
3.3.51	Fuel tank sequence monitoring lights - experimental flight test to provide facility only.	

3.4 Fuel System

Results of the following fuel system production tests are required and should be reported by Experimental Flight Test (Report 72/Systems 16/145):

Sub-section 3.8 System Leakage Tests

Section 4. Fuel Contents Gauging System.

" 5. Fuel System Functional Checking Procedure.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:

ARROW 2 - FLIGHT TEST

SUBJECT	RFT NO	DATE
Preflight testing - 25206	07-5091	6 Oct 58
	Add 1	28 Oct 58
	Add 2	18 Nov 58
	Add 4	23 Jan 59
	Add 5	29 Jan 59
Drop tank handling and jettison tests	07-5080	22 Sep 58
Drop tank full system flight test	07-5079	10 Sep 58
Engine handling flight tests	07-5073	11 Sep 58
Engine installation temp. flight tests	07-5063	30 Sep 58
Fuel system tests	07-5062	10 Sep 58
Preflight testing	07-5026	17 Mar 58
First flight R.F.T.	07-5024 Add 7	16 Apr 58
Corrected sheet of R.F.T. 07-5024 Add 4	07-5024 Add 4	3 Apr 58

	Add 1	28 Oct 58
	Add 2	18 Nov 58
	Add 4	23 Jan 59
	Add 5	29 Jan 59
Drop tank handling and jettison tests	07-5080	22 Sep 58
Drop tank full system flight test	07-5079	10 Sep 58
Engine handling flight tests	07-5073	11 Sep 58
Engine installation temp. flight tests	07-5063	30 Sep 58
Fuel system tests	07-5062	10 Sep 58
Preflight testing	07-5026	17 Mar 58
First flight R.F.T.	07-5024 Add 7	16 Apr 58
Corrected sheet of R.F.T. 07-5024 Add 4	07-5024 Add 4	3 Apr 58

Classification cancelled/changed to.....

by authority of.....(date).....

Signature.....Rank.....

AVRO AIRCRAFT

UNCLASSIFIED

S/L Armstrong

Interp Departmental Memorandum

Ref 4615/01/J
Date October 6, 1958
To Mr. S.E. Harper
From T. Roberts
Subject PREFLIGHT TESTING OF ARROW 2 AIRCRAFT 25206

Ref Status of Flt Test programmes for a/c 6, 7 and 8.

R.F.T. No. 07-5091, which lists the instrumentation requirements for pre-flight testing of aircraft 25206, is attached.

These measurements are to be recorded by the Experimental Flight Test Department, and will be sufficient to establish whether the aircraft systems are operating within safe limits during ground engine runs. Should any system malfunctions become evident, it may be necessary to record additional data from transducers listed in report 72/FAR/6, Issue 3 and supplementary I.D.M.'s.

T. Roberts

WE/b

T. Roberts
Technical Design Coordinator
FLIGHT TEST

A. Nicholson

c.c.
Messrs A. Buley
M. King
C. Barker
D. Scard
J. Lynch
D. Woolley (6)
G. Gibson
F. Brame
C. Marshall
D. Royston
J. Moors
A. Cornish
G. Shaw
A. Birding
A. Thomann
G. Duret
B. McCarter
S. Brown
A. Mathison
H. Malinowski

R. Young
J. Lucas
W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D. RCAF for transmittal to S/L K. Owen, C.E.P.E. Detachment

Central Files

FORM 1749 A

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091

SHEET NO. _____ OF _____

DATE: October 3, 1958

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

PRE-FLIGHT TESTING OF AIRCRAFT 25206

1. OBJECT

This R.F.T. is issued to define the test to be carried out by the Experimental Flight Test Department on aircraft 25206 prior to its first flight.

To assist in correlating this work with tests which Production will perform, the Production Test Procedures are listed in section 2.

2. PRODUCTION TEST PROCEDURES

(With the exception of items noted, these tests will be carried out by Production).

2.1 72/Systems 23/128 Fire Extinguishing System

2.2 72/Systems 13/121 Post Installation check of Antenna System

2.3 72/Systems 13/195 Post Installation check of AIC-10A.

2.4 72/Systems 21/182 Oxygen System.

2.5 72/Systems 18/185 Low Pressure Pneumatics.

2.6 72/Systems 13/194 AN/ARN-6

2.7 72/Systems 13/192 AN/APX-25A

2.8 71-2/Systems 25/203 Escape System.

2.9 72/Systems 22/221 Constant Speed Drive Separate Oil Systems.

2.10 72/Systems 29/222 Accessories Gearbox Cooling System.

2.11 72/Systems 22/223 Air Supply System for Constant Speed Drive and Main Accessories Gear box.

2.12 72/Systems 22/226 Air Conditioning.
NOTE:- Air distribution tests will be carried out by Experimental Flight Test.

2.13 72/System 11/247 Electrical System
NOTE:- Experimental will take some electrical system instrumentation readings during engine ground runs.

2.14 72/System 14/259 Engine Controls.

2.15 72/Systems 15/255 Flying Controls System.

R.F.T. PREPARED BY: Wm C. Etherington	APPROVED BY:	AUTHORIZED BY:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091 CONFIDENTIAL

SHEET NO. 2 OF

DATE: October 3, 1958

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

2.16 72/Systems 31/258 Parabrake System.

2.17 72/Systems 13/193 AN/ARC-52

2.18 72/Systems 19/220 Utility Hydraulic System

2.19 72/Systems 32/246 Flying Control Hydraulic System
2.20 71/Systems 15/16 Damping System Part 3
2.21 72/Systems 16/145 Fuel System.
2.22 72/Systems 25/157 Engine Installation Initial ground tests Issue 3

3. PRE-FLIGHT TESTING BY EXPERIMENTAL FLIGHT TEST

3.1 Air Conditioning - The air distribution test as detailed in report 72/Systems 22/226.

3.2 Damper System - Damper checking will be carried out by Minneapolis-Honeywell. Arrangements for doing this are currently being negotiated with M-H.

3.3 Ground Engine Runs - Ground engine runs will be carried out as detailed in Report 72/Systems 25/157, Issue 3. During these runs, it will be necessary for Experimental to record the following measurements:-

3.3.1	Supply frequency Left alternator	0090-11
3.3.2	Supply frequency Right alternator	0091-11
3.3.3	D.C. Ripple - Main Bus	0087-11
3.3.4	D.C. Ripple - Emergency Bus	
3.3.5	Const. Speed Drive Cut-in and Cutout vs. frequency	
3.3.6	Ignition cut-in and cut-out vs. R.P.M.	
3.3.7	H.P. Rotor R.P.M. (Left)	0133-25
3.3.8	H.P. Rotor R.P.M. (Right)	0134-25
3.3.9	Right Engine gill door angle	0148-25

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ettherington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

UNCLASSIFIED

R.F.T. NO. 07-5091 CONFIDENTIAL

SHEET NO. 3 OF

DATE: October 3, 1958

AIRCRAFT	ASSIGNMENT	WORK ORDER NO.
25206	X74-4018	

3.3.10	Right Heat exchanger gill door position	0308-25
3.3.11	Left engine intake static pressure P_{s2}	0135-25
3.3.12	Right engine intake static pressure P_{s2}	0136-25
3.3.13	Right engine rail-inner flange of former 737.44	0172-25
3.3.14	Right center rear engine Mount (sta. 731)	0178-25
3.3.15	Constant Speed drive inlet pressure Monitor Minimum Press: Warning 6 psia, shut down 4 psia.	0239-25
3.3.16	Constant speed drive inlet temp. Monitor: Warning 290°; shut down 305°	0240-25
3.3.17	Accessories gear box outlet pressure	0246-25
3.3.18	Accessories gear box outlet temp. Monitor: Warning 325°F; shut down 350°F	0247-25
3.3.19	Exhaust temperature of right T.R.U.	0094-11
3.3.20	Fuel temp. in tank No. 5 (right) Monitor: warning 145°F; shut down 160°F	0104-16
3.3.21	Fuel temp. at right engine inlet	0106-16
3.3.22	Utility Hydraulics System oil temperature downstream of junction of left and right pump output (RDF Stikons will be acceptable) Monitor: Warning 210°F; shut down 225°F	
3.3.23	Flying Control hydraulics 'A' system oil temp. downstream of junction of left and right pump outputs (RDF Stikons will be acceptable). Monitor: Warning 210°F; shut down 225°F	
3.3.24	Flying Control hydraulics 'B' system oil temp. downstream of junction of left and right pump outputs (RDF Stikons will be acceptable). Monitor: Warning 210°F; shut down 225°F	
3.3.25	* Air flow to radar nose (F - mph)	
3.3.26	* Heat exchanger inlet pressure (P_H - psi)	
3.3.27	* Cockpit inlet temp (T_C - °F)	

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091 CONFIDENTIAL UNCLASSIFIED

SHEET NO. 4 OF

DATE: October 3, 1958

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

3.3.28 * Equipment Supply temp. (T_E - °F)

3.3.29 * Turbine outlet temp. (T_T - °F)

3.3.30 * Ambient temperature (T_A - °F)

NOTE: Gauges are available in Production's Air Conditioning Test Unit, but these gauges are too small. To provide a more accurate presentation of data, larger gauges should be used instead of the gauges on this test unit.

3.3.31	Left engine L.P. rotor RPM	0131-25
3.3.32	Right Engine L.P. rotor RPM	0132-25
3.3.33	Left engine intake total head press. (P_{t_2})	0137-25
3.3.34	Right engine intake total head press. (P_{t_2})	0138-25
3.3.35	Left engine turbine discharge press.(P_{t_7})	0139-25
3.3.36	Right engine turbine discharge press. (P_{t_7})	0140-25
3.3.37	Left engine turbine discharge temp. (T_{t_7})	0141-25
3.3.38	Right engine turbine discharge temp. (T_{t_7})	0142-25
3.3.39	Left engine main fuel flow	0149-25
3.3.40	Right engine main fuel flow	0150-25
3.3.41	Left engine fuel temp fwd. of fuel flow sensing head	0151-25
3.3.42	Right engine fuel temp fwd. of fuel flow sensing head	0152-25
3.3.43	Right engine restrictor flap angle (bottom)	0147-25
3.3.44	Right engine static pressure diff between Bypass & outside of a/c structure Stn. 610	0184-25
3.3.45	Right engine static pressure diff. between Bypass & outside of a/c structure just aft. of restrictor	0185-25

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

CONFIDENTIAL
UNCLASSIFIED

R.F.T. NO. 57-5021

SHEET NO. 5 OF

DATE: October 3, 1958

AIRCRAFT	ASSIGNMENT	WORK ORDER NO.
25206	X74-4018	

3.3.46	Right engine static press. diff between bypass and outside of shroud just ahead of A/B final nozzle	0186-25
3.3.47	Right engine pitot-static (4 probes) in bypass just fwd of restrictor	0188-25
3.3.48	Total press. just fwd of bypass gills (4 probes)	0189-25
3.3.49	Total press. in bypass just fwd. of plane of final nozzle (4 probes)	

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ettrington.		

AVRO AIRCRAFT

Inter-Departmental Memorandum

Ref: 5254/01/J
Date: October 28, 1958
To: Mr. S.E. Harper
From: T. Roberts
Subject: PREFLIGHT TESTING OF ARROW 2 AIRCRAFT 25206

R.F.T. No. 07-5091, Addendum 1 which alters the instrumentation requirements for pre-flight testing of aircraft 25206, is attached.

This supercedes and cancels R.F.T. No. 07-5091.

WE/mf

T. Roberts
Technical Design Coordinator
FLIGHT TEST

PROJECT APPROVAL

cc:
Messrs. A. Buley
M. King
C. Barker
D. Scard
J. Lynch
D. Woolley (6)
G. Gibson
F. Brame
C. Marshall
D. Royston
J. Moors
A. Cornish
G. Shaw
A. Binding
A. Thomann
G. Duret
B. McCarter
S. Brown
A. Mathison
H. Malinowski
A. Nicholson
R. Young
J. Lucas
W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D. RCAF for transmittal to S/L K. Owen. C.E.P.E. Detachment
T. Higgins
J. Hodge
Central Files

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AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

UNCLASSIFIED

R.F.T. NO. 07-5091 Addendum 1

SHEET NO. 1 OF 5

DATE: October 28, 1958

AIRCRAFT	25206	ASSIGNMENT	X74-4018	WORK ORDER NO.

PRE-FLIGHT TESTING OF AIRCRAFT 25206

1. OBJECT

This R.F.T. is issued to define the tests to be carried out by the Experimental Flight Test Department on aircraft 25206 prior to its first flight.

To assist in correlating this work with tests which Production will perform, the Production Test Procedures are listed in section 2.

2. PRODUCTION TEST PROCEDURES

(With the exception of items noted, these tests will be carried out by Production).

2.1	72/Systems 23/128	Fire Extinguishing System
2.2	72/Systems 13/121	Post Installation check of Antenna System
2.3	72/Systems 13/195	Post Installation check of AIC-10A.
2.4	72/Systems 21/182	Oxygen System
2.5	72/Systems 18/185	Low Pressure Pneumatics
2.6	72/Systems 13/194	AN/ARN-6
2.7	72/Systems 13/192	AN/APX-25A
2.8	71-2/Systems 25/203	Escape System
2.9	72/Systems 22/221	Constant Speed Drive Separate Oil Systems
2.10	72/Systems 29/222	Accessories Gearbox Cooling System
2.11	72/Systems 22/223	Air Supply System for Constant Speed Drive and Main Accessories Gear box.
2.12	72/Systems 22/226	Air Conditioning.

NOTE:- Air distribution tests will be carried out by Experimental Flight Test

2.13 72/System 11/247 Electrical System

NOTE:- Experimental will take some electrical system instrumentation readings during engine ground runs.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington.		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

UNCLASSIFIED

R.F.T. NO. 07-5091 Addendum 1

SHEET NO. 2 OF 5

DATE: October 28, 1958

AIRCRAFT	ASSIGNMENT	WORK ORDER NO.
25206	X74-4018	

2.14 72/System 14/259 Engine Controls

2.15 72/Systems 15/255 Flying Controls System

2.16 72/Systems 31/258 Parabrake System

2.17 72/Systems 13/193 AN/ARC-52

2.18 72/Systems 19/220 Utility Hydraulic System

2.19 72/Systems 32/246 Flying Control Hydraulic System

2.20 71/Systems 15/16 Damping System Part 3

2.21 72/Systems 16/145 Fuel System
NOTE:- Experimental will take readings during fuel system tests (see section 3.4 below).

2.22 72/Systems 25/157 Engine Installation Initial ground test Issue 3.
NOTE:- Test will be conducted jointly by Experimental and Production (see section 3.3 below)

3. PRE-FLIGHT TESTING BY EXPERIMENTAL FLIGHT TEST

3.1 Air Conditioning - The air distribution test as detailed in report 72/Systems 22/226.

3.2 Damper System - Damper checking will be carried out by Minneapolis-Honeywell. Arrangements for doing this are currently being negotiated with M-H.

3.3 Ground Engine Runs - Ground engine runs will be carried out as detailed in Report 72/Systems 25/157, Issue 3. During these runs, it will be necessary for Experimental to record the following measurements:-

3.3.1 Supply Frequency Left alternator 0090-11

3.3.2 Supply Frequency Right alternator 0091-11

3.3.3 D.C. Ripple - Main Bus 0087-11

3.3.4 D.C. Ripple - Emergency Bus

3.3.5 Const. Speed Drive Cut-in and Cutout vs. frequency

3.3.6 Ignition cut-in and cutout vs R.P.M.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ettrington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO: 07-5091 Addendum 1

SHEET NO. 3 OF 5

DATE: October 28, 1958

UNCLASSIFIED

AIRCRAFT	25206	ASSIGNMENT	X74-4018	WORK ORDER NO.	

3.3.7	H.P. Rotor R.P.M. (Left)	0133-25
3.3.8	H.P. Rotor R.P.M. (Right)	0134-25
3.3.9	Right Engine gill door angle	0148-25
3.3.10	Right Heat exchanger gill door position	0308-25
3.3.11	Left Engine intake static pressure P_{s2}	0135-25
3.3.12	Right Engine intake static pressure P_{s2}	0136-25
3.3.13	Right engine rail-inner flange of former 737.44 (temperature)	0172-25
3.3.14	Right centre rear engine Mount (sta. 731) (temperature)	0178-25
3.3.15	Constant Speed drive inlet pressure Monitor Minimum Press: Warning 6 psia, shut down 4 psia.	
3.3.16	Constant speed drive inlet temp. Monitor: Warning 290°; shut down 305°	0240-25
3.3.17	Accessories gear box outlet pressure	0246-25
3.3.18	Accessories gear box outlet temp. Monitor: Warning 325°F; shut down 350°F.	0247-25
3.3.19	Exhaust temperature of right T.R.U.	0094-11
3.3.20	Fuel temp. in tank No. 5 (right) Monitor: warning 145°F; shut down 160°F	0104-16
3.3.21	Fuel temp. at right engine inlet	0106-16
3.3.22	Utility Hydraulics System oil temperature downstream of junction of left and right pump output (RDF Stikons will be acceptable) Monitor: Warning 210°F; shut down 225°F	
3.3.23	Flying Control hydraulics 'A' system oil temp. downstream of junction of left and right pump outputs (RDF Stikons will be acceptable). Monitor: Warning 210°F; shut down 225°F	

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ethrington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 209 Addendum 1 UNCLASSIFIED

SHEET NO. 4 OF 9

DATE: October 28, 1958

AIRCRAFT	ASSIGNMENT	WORK ORDER NO.
25206	X74-4018	

3.3.24 Flying Control hydraulics 'B' system oil temp. downstream of junction of left and right pump outputs (RDF Stikons will be acceptable).
Monitor: Warning 210°F; shut down 225°F.

3.3.25 * Air flow to radar nose (F-mph)

3.3.26 * Heat exchanger inlet pressure (P_H- psi)

3.3.27 * Cockpit inlet temp (T_C - °F)

3.3.28 * Equipment Supply temp. (T_E - °F)

3.3.29 * Turbine outlet temp. (T_T - °F)

3.3.30 * Ambient temperature (T_A - °F)

*NOTE: Gauges are available in Production's Air Conditioning Test Unit, but these gauges are too small. To provide a more accurate presentation of data, larger gauges should be used instead of the gauges on this test unit.

3.3.31	Left engine L.P. rotor RPM	0131-25
3.3.32	Right engine L.P. rotor RPM	0132-25
3.3.33	Left engine intake total head press. (P_{t2})	0137-25
3.3.34	Right engine intake total head press. (P_{t2})	0138-25
3.3.35	Left engine turbine discharge press. (P_{t7})	0139-25
3.3.36	Right engine turbine discharge press. (P_{t7})	0140-25
3.3.37	Left engine turbine discharge temp. (T_{t7})	0141-25
3.3.38	Right engine turbine discharge temp. (T_{t7})	0142-25
3.3.39	Left engine main fuel flow	0149-25
3.3.40	Right engine main fuel flow	0150-25
3.3.41	Left engine fuel temp fwd. of fuel flow sensing head	0151-25
3.3.42	Right engine fuel temp fwd. of fuel flow sensing head	0152-25

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ethrington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. [illegible] Add. 1

UNCLASSIFIED

SHEET NO. 5 OF 5

DATE: October 28, 1958

AIRCRAFT	ASSIGNMENT	WORK ORDER NO.
25206	X74-4018	

3.3.43 Nozzle Area Indication (left) 0304-25

3.3.44 Nozzle Area Indication (right) 0305-25

3.3.45 Fuel pressure in tank no. 5 (left)

3.3.46 Fuel pressure in tank no. 5 (right)

3.3.47 Engine Inlet fuel pressure (left) 0111-16

3.3.48 Engine inlet Fuel pressure (right) 0112-16

3.3.49 Main and Emergency generator Phase rotations

3.3.50 Current (Both main Generators)

3.4 Fuel System

Results of the following fuel system production tests are required and should be reported by Experimental Flight Test (Report 72/Systems 16/145):

Sub-section 3.8 System Leakage Tests

Section 4. Fuel Contents Gauging System.
" 5. Fuel System Functional Checking Procedure

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ethrington		

UNCLASSIFIED

AVRO AIRCRAFT

Inter-Departmental Memorandum

Ref 8037/22/J
Date November 18, 1958
To Mr. S.E. Harper
From T. Roberts
Subject PRE-FLIGHT TESTING OF ARROW 2 AIRCRAFT 25206

R.F.T. No. 07-5091, Addendum 2, which alters the instrumentation requirements for pre-flight testing of aircraft 25206, is attached.

This supercedes and cancels R.F.T. No. 07-5091, Addendum 1.

T. Roberts
Technical Design Coordinator
FLIGHT TEST

Project Approval

c.c.
Messrs J. Chamberlin
F. Brame
C. Lindow
A. Buley
T. Higgins
F. Mitchell
D. Scard
J. Lynch
D. Woolley (6)
J. Ames
J. Gale
J. Hodge
J. Lockyer
J. Lucas
C. Barker
M. King
R. Young
C. Meilton
A. Nicholson
A. Binding
C. Marshall
A. Thomann
A. Cornish

G. Shaw
S. Brown
W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D. RCAF for transmittal to S/L K. Owen, C.E.P.E. Detachment.

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FORM 1749 A

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091 Addendum 2

SHEET NO. 1 OF 5

DATE: November 18, 1958

UNCLASSIFIED

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

PRE-FLIGHT TESTING OF AIRCRAFT 25206

1. OBJECT

This R.F.T. is issued to define the tests to be carried out by the Experimental Flight Test Department on aircraft 25206 prior to its first flight.

To assist in correlating this work with tests which Production will perform, the Production Test Procedures are listed in section 2.

2. PRODUCTION TEST PROCEDURES

(With the exception of items noted, these tests will be carried out by Production).

2.1 72/Systems 23/128 Fire Extinguishing System

2.2 72/Systems 13/121 Post Installation check of Antenna System

2.3 72/Systems 13/195 Post Installation check of AIC-10A.

2.4 72/Systems 21/182 Oxygen System

2.5 72/Systems 18/185 Low Pressururе Pneumatics

2.6 72/Systems 13/194 AN/ARN-6

2.7 72/Systems 13/192 AN/APX-25A

2.8 71-2/Systems 25/203 Escape System.

2.9 72/Systems 22/221 Constant Speed Drive Separate Oil Systems

2.10 72/Systems 29/222 Accessories Gearbox Cooling System

2.11 72/Systems 22/223 Air Supply System for Constant Speed Drive and Main Accessories Gear box.

2.12 72/Systems 22/226 Air Conditioning.
NOTE:- Air distribution tests will be carried out by Experimental Flight Test

2.13 72/System 11/247 Electrical System
NOTE:- Experimental will take some electrical system instrumentation readings during engine ground runs.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091 Addendum 2

SHEET NO. 2 OF 5

DATE: November 18, 1958

UNCLASSIFIED

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

2.14 72/System 14/263 Engine Controls

2.15 72/Systems 15/255 Flying Controls System

2.16 72/Systems 31/258 Parabrake System

2.17 72/System 13/193 AN/ARC-52

2.18 72/Systems 19/220 Utility Hydraulic System

2.19 72/Systems 32/246 Flying Control Hydraulic System

2.20 71/Systems 15/16 Damping System Part 3

2.21 72/Systems 16/145 Fuel System
NOTE:- Experimental will take readings during fuel system tests (see section 3.4 below).

2.22 72/Systems 25/157 Engine Installation Initial ground test Issue 5.
NOTE:- Test will be conducted jointly by Experimental and Production (see section 3.3 below)

3. PRE-FLIGHT TESTING BY EXPERIMENTAL FLIGHT TEST

3.1 Air Conditioning - The air distribution test as detailed in report 72/Systems 22/226.

3.2 Damper System - Damper checking will be carried out by Minneapolis-Honeywell. Arrangements for doing this are currently being negotiated with M-H.

3.3 Ground Engine Runs - Ground engine runs will be carried out as detailed in Report 72/Systems 25/157, Issue 3. During these runs, it will be necessary for Experimental to record the following measurements:-

3.3.1	Supply Frequency Left alternator	0090-11
3.3.2	Supply Frequency Right alternator	0091-11
3.3.3	Cancelled	
3.3.4	D.C. Voltage - Emergency Bus	
3.3.5	Const. Speed Drive Cut-in and Cutout vs. frequency	
3.3.6	Ignition cut-in and cutout vs. R.P.M.	

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091 Addendum 2

SHEET NO. 3 OF 5

DATE: November 18, 1958

UNCLASSIFIED

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

3.3.7	H.P Rotor R.P.M. (Left)	0133-25
3.3.8	H.P. Rotor R.P.M. (Right)	0134-25
3.3.9	Right Engine gill door angle	0148-25
3.3.10	Right Heat exchanger gill door position	0308-25
3.3.11	Left Engine intake static pressure P_{s2}	0135-35
3.3.12	Right Engine instake static pressure P_{s2}	0136-25
3.3.13	Right Engine rail-inner flange of former 737.44(temp.)	0172-25
3.3.14	Right centre rear engine Mount (sta.731) (temp.)	0178-25
3.3.15	Constant Speed drive inlet pressure Monitor Minimum Press: Warning 6 psia, shut down 4 psia.	
3.3.16	Constant speed drive inlet temp. Monitor: Warning 290°; shut down 305°	0240-25
3.3.17	Accessories gear box outlet pressure	0246-25
3.3.18	Accessories gear box outlet temp. Monitor: Warning 325°F; shut down 350°F.	0247-25
3.3.19	Exhaust temperature of right T.R.U.	0094-11
3.3.20	Fuel temp. in tank No. 5 (right) Monitor: Warning 145°F; shut down 160°F	0104-16
3.3.21	Fuel temp. at right engine inlet	0106-16
3.3.22	Utility Hydraulics System oil temperature downstream of Junction of left and right pump outlet (RDF stikons will be acceptable) Monitor: Warning 210°F; shut down 225°F	
3.3.23	Flying Control hydraulics 'A' systems oil temp. downstream of junction of left and right pump outputs (RDF Stikons will be acceptable) Monitor: Warning 210°F; shut down 225°F	

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091 Addendum 2

SHEET NO. 4 OF 5

DATE: November 18, 1958

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

3.3.24 Flying Control hydraulics 'B' system oil temp. downstream of junction of left and right pump outputs (RDF Stikons will be acceptable). Monitor: Warning 210°F; shut down 225°F.

3.3.25 * Air flow radar nose (F-mph)

3.3.26 * Heat exchanger inlet pressure (P_H - psi)

3.3.27 * Cockpit inlet temp. (T_C - °F)

3.3.28 * Equipment Supply temp. (T_E - °F)

3.3.29 * Turbine outlet temp. (T_T - °F)

3.3.30 * Ambient temperature (T_A - °F)

* NOTE: Gauges are available in Production's Air Conditioning Test Unit, but these gauges are too small. To provide a more accurate presentation of data, larger gauges should be used instead of the gauges on this test unit.

3.3.31	Left Engine L.P. rotor R.P.M.	0131-25
3.3.32	Right Engine L.P. rotor R.P.M.	0132-25
3.3.33	Left Engine intake total head press. (P_{t2})	0137-25
3.3.34	Right Engine intake total head press. (P_{t2})	0138-25
3.3.35	Left Engine turbine discharge press. (P_{t7})	0139-25
3.3.36	Right Engine turbine discharge press. (P_{t7})	0140-25
3.3.37	Left Engine turbine discharge temp. (T_{t7})	0141-25
3.3.38	Right Engine turbine discharge temp. (T_{t7})	0142-25
3.3.39	Left Engine main fuel flow	0149-25
3.3.40	Right Engine main fuel flow	0150-25
3.3.41	Left Engine fuel temp. fwd. of fuel flow sensing head	0151-25
3.3.42	Right Engine fuel temp. fwd. of fuel flow sensing head	0152-25

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:

B/c Armstrong

UNCLASSIFIED

Inter-Departmental Memorandum

Ref 1021/22/J
Date January 23, 1959
To Mr. S. E. Harper
From T. Roberts
Subject PRE-FLIGHT TESTING OF AIRCRAFT 25206

R.F.T. 07-5091, Addendum 4 is attached, covering the addition of two pressure measurements in the return circuit of the Flying Control Hydraulic System, to be monitored during the early ground engine runs of aircraft 25206. 'Lash-up' instrumentation must be provided, as these measurements have not been requested previously, and transducers are not available in the aircraft.

T. Roberts

/bb

T. Roberts
Technical Design Coordinator
FLIGHT TEST

Project Approval

c.c.
Messrs J. Chamberlin
F. Brame
C. Lindow
A. Buley
T. Higgins
F. Mitchell
D. Scard
J. Lynch
A. Stenning (6)
J. Ames
J. Gale
J. Hodge
J. Lockyer
M. King
R. Young
C. Meilton
A. Nicholson
C. Marshall
J. McKillop
S/L R.E. Young
S/L R.E. Young (2) AVRO T.S.D RCAF
for transmittal to
S/L K. Owen, C.E.P.E.
Detachment

FORM 1749 A-2

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091, Add. 4

SHEET NO. 1 OF 1

DATE: January 23, 1959

UNCLASSIFIED

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

PRE-FLIGHT TESTING OF AIRCRAFT 25206

The following Section should be added to R.F.T. 07-5091, addendum 2, Part 3 "Pre-Flight Testing by Experimental Flight Test ":-

3.6 Flying Control Hydraulic System

1. Due to the addition of viscous damping to control valves in the Flying Control System the need for surge damping in the return lines of the Flying Control Hydraulic System could not be established. However because of considerable trouble and lost time due to damaged equipment on Arrow 1 it is felt that pressures in the return circuit on Arrow 2 should be monitored during an early stage of engine running to establish either the adequacy of the damping or the need for continuation of the spherical accumulators which are at present not installed in the Aircraft.

2. Location of required pressure transducers:-

   (a) Flying Control Hydraulic "B" System air H.E. inlet.

   (b) Flying Control Hydraulic "B" System L. or R.H. Pump case drain line.

3. Pressure range 0 to 500 p.s.i.

4. Test

   The control surfaces are to be operated:-

   (a) Both singly and together

   (b) Both smoothly and vigourously.

   The engine conditions shall be:-

   (a) Both engines at max. R.P.M.

   (b) L.H. engine at max. R.P.M. R.H. engine at idling.

   (c) R.H. engine at max. R.P.M. L.H. engine idling.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington	J M Moore.	

AVRO AIRCRAFT

Inter-Departmental Memorandum

Ref 1208/22/J
Date January 29, 1959
To Mr. S. E. Harper
From T. Roberts
Subject PRE-FLIGHT TESTING OF AIRCRAFT 25206

R.F.T. 07-5091, Addendum 5 is attached, covering the addition of two Power Lever Position measurements to the trailer indication on pre-flight testing of aircraft 25206 by Experimental Flight Test.

T. Roberts

/bb

T. Roberts
Technical Design Coordinator
FLIGHT TEST

c.c.
Messrs J. Chamberlin
F. Brame
C. Lindow
A. Buley
T. Higgins
F. Mitchell
D. Scard
J. Lynch
A. Stenning (6)
J. Ames
J. Gale
J. Hodge
J. Lockyer
C. Marshall
H. Malinowski
A. Cornish
D. Rogers
C. Meilton
S/L R.E. Young
S/L R.E. Young (2) AVRO T.S.D. RCAF for transmittal to S/L K. Owen, C.E.P.E. Detachment.

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5091 Add. 5

SHEET NO. 1 OF 1

UNCLASSIFIED

AIRCRAFT 25206	ASSIGNMENT X74-4018	WORK ORDER NO.

PRE-FLIGHT TESTING OF AIRCRAFT 25206

The following trailer indications should be added to R.F.T. 07-5091 Add. 4, Section 3.3 "Pre-Flight Testing by Experimental Flight Test".

3.3.52 Power Lever Position (left) 0129-25

3.3.53 Power Lever Position (right) 0130-25

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
A. Birchling	G. Cornish	[illegible]

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Note - No structural testing included.

Inter-Departmental Memorandum

Ref 4049/01/J
Date September 22, 1958
To Mr. S.E. Harper
From T. Roberts
Subject DROP TANK HANDLING & JETTISON TESTS

R.F.T. No. 07-5080, covering drop tank handling and jettison tests on Arrow 2 aircraft 25208, is attached.

Four dummy tanks will be expended during the jettison tests.

T. Roberts

WE/b

T. Roberts
Technical Design Coordinator
Flight Test

c.c.
Messrs C.V. Lindow
J.A. Chamberlin
F.H. Brame
A.R. Buley
M. King
S. Kwiatkowski
G. Dimock
D. Ewart
J. Lucas
C. Marshall
A. Cornish
D. Scard
D. Woolley (6)
J. Lynch
D. Rogers
J. Scott
W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D. RCAF for transmittal to S/L K. Owen, C.E.P.E. Detachment.

FORM 1749 A

AVRO AIRCRAFT LIMITED

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REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5080

SHEET NO. 1 OF

DATE: September 22, 1958

AIRCRAFT 25208	ASSIGNMENT NO. X74-047	WORK ORDER NO.

DROP TANK HANDLING AND JETTISON TESTS

1. OBJECT

1.1 To assess the handling of the Arrow 2 aircraft up to the limitations of the drop tank installation.

1.2 To check the jettison characteristics of the drop tank for several flight cases.

2. INSTRUMENTATION

2.1 Handling - Stability and Control instrumentation, as listed in Part 1 of Report 72/FAR/6, Issue 3 will be required.

2.2 Jettison Tests -

2.2.1 Three cameras at locations (2, 3) 7, and 8, as outlined in Report 71/FAR/10.

2.2.2 Paint applied to the bottom of the fuselage of the aircraft.

2.2.3 Four jettisonable dummy tanks, one of which is ballasted to full weight and three to empty weight.

3. PROCEDURE

3.1 A preliminary qualitative assessment should be made, during which the effect of the drop tank on aircraft handling is checked up to the Mach .95 speed limitation. The handling at take-off, climb and cruise conditions should be assessed with Normal damper and Emergency damper.

R.F.T. PREPARED BY: Wm C. Ethrington	APPROVED BY: B.D.W. S.K.D.	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

SECRET
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R.F.T. NO. 07-5080

SHEET NO. 2 OF

DATE: September 22, 1958

AIRCRAFT 25208	ASSIGNMENT NO. X74-047	WORK ORDER NO.

3.2 The effect of the drop tank on directional stability should be determined with dampers off by producing steady sideslip (40% or less) with rudder and releasing the rudder at the following flight conditions:

3.2.1 Landing gear up and down

20,000 ft. M = .35
20,000 ft. M = .45
20,000 ft. M = .55

3.2.2 Landing gear up

40,000 ft. M = .90

3.3 Drop tanks should be jettisoned at the flight conditions listed in section 4.1, which have been selected to represent 'typical' operational cases. Wind tunnel test results (ref. report P/Wind Tunnel/138) were taken into consideration in selecting these cases.

Prior to the jettison flights the bottom of the aircraft fuselage should be painted so that evidence of 'strikes' can be obtained. A 'chase' plane, with a hand held camera in the rear cockpit should be utilized where practical to supplement the photographic coverage obtained by the three cameras on aircraft 25208.

After each jettison flight, the bottom of the aircraft should be carefully examined.

R.F.T. PREPARED BY: Wm C. Etherington	APPROVED BY: E.W.T. K.D.	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

SECRET
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R.F.T. NO. 07-5080

SHEET NO. 3 OF

DATE: September 22, 1958

REQUISITION FOR FLIGHT TEST

AIRCRAFT 25208	ASSIGNMENT NO. X74-047	WORK ORDER NO.

4. FLIGHT CONDITIONS FOR DROP TANK JETTISON TESTS

	FUEL STATE (DROP TANK)	ALTITUDE	AIRSPEED (T.A.S.)	APPROX. MACH NO.	SIDESLIP ANGLE	FLIGHT ATTITUDE
4.1	Full	Sea level	200 Kts.	.3	0°	Just after Take-off
4.2	Empty	36,000'	527 Kts.	.92	0°	Level
4.3	Empty	36,000'	527 Kts.	.92	4°	Level
4.4	Empty	Sea level	250 Kts.	.4	0°	Level

5. FLIGHT LIMITATIONS WITH DROP TANKS

.95 (true) Mach number
40,000 ft. altitude.
+4.50 - 1.5 'g' normal acceleration (at 68,000 lb. AUW).

6. DATA

6.1 Pilots comments on handling and jettison tests.

6.2 Recorded data from handling flights.

6.3 Photographic results.

6.4 Results of post-flight examinations

R.F.T. PREPARED BY: Norm C. Stherington	APPROVED BY: G.K.D.	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

AVRO AIRCRAFT

S/L Armstrong

Inter Departmental Memorandum

Ref 3630/05/J
Date September 10, 1958
To Mr. S. E. Harper
From T. Roberts
Subject DROP TANK FUEL SYSTEM FLIGHT TEST

R.F.T. No. 07-5079, covering flight testing of the drop tank fuel system on aircraft 25208, is attached.

T. Roberts

WE/b

T. Roberts
Technical Design Coordinator
FLIGHT TEST

A.C. Buley

c.c.
Messrs C. V. Lindow
J. A. Chamberlin
F. H. Brame
C. S. Marshall
A. Cornish
A. Buley
M. King
D. Scard
D. Woolley (6)
J. Lynch
J. Ames
F. Mitchell
J. Scott
J. Gale
D. Rogers
D. Ridler
W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D RCAF for transmittal to S/L K. Owen, C.E.P.E. Detachment.
Central Files

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AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5079

SHEET NO. 1 OF

DATE: September 10, 1958

UNCLASSIFIED

AIRCRAFT 25208	ASSIGNMENT	WORK ORDER NO.

DROP TANK FUEL SYSTEM FLIGHT TEST

1. OBJECT

To establish that the Arrow 2 drop tank fuel system functions satisfactorily.

2. EQUIPMENT

2.1 Air Pressure-Tank 5 - R.H. (Flight Test Ref. Item No. 208-0063-16) should be recorded.

3. PROCEDURE

3.1 Prior to flight, a ground engine run should be carried out with all tanks full (including the drop tank) to check that fuel is transferring properly from the drop tank to the collector tank.

3.2 A flight check should be performed, starting with all tanks full. During the climb, the pilot should check the fuel quantity gauges to ensure that the fuel is not transferring from the internal tanks. The time at which the 'drop tank empty' light comes on should be noted.

4. DATA

4.1 Pilot's report.

4.2 Records of tank 5 air pressure during ground run and flight.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington	G. Comish	A R Bradley

UNCLASSIFIED

AVRO AIRCRAFT

S/L Owen

F/L Armstrong

Inter-Departmental Memorandum

Ref 3847/22/J
Date September 11, 1958
To Mr. S.E. Harper
From T. Roberts
Subject ARROW 2 ENGINE HANDLING FLIGHT TESTS

R.F.T. No. 07-5073, covering flight tests of Engine Handling and Installation on aircraft 25206 or 25208, is attached.

One measurement "Right Engine Restrictor Flap Angle (Top" has been added to the instrumentation requirements listed in Report 72/FAR/6, Issue 3

T Roberts

WE/b

T. Roberts
Technical Design Coordinator
FLIGHT TEST

AR Bailey
Project Approval

c.c.
Messrs C.V. Lindow
J.A. Chamberlin
F.H. Brame
A. Buley
M. King
D. Scard
D. Woolley (6)
J. Lynch
C. Barker
C. Marshall
A. Binding
B. McCarter
A. Thomann
J. Ames
F. Mitchell
J. Scott
J. Gale
D. Rogerts
D. Ridler

W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D. RCAF for transmittal to S/L K. Owen, C.E.P.E. Detachment

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MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

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R.F.T. NO. 07-5073

SHEET NO. 1 OF

DATE: August 26, 1958

AIRCRAFT 25206 or 25208	ASSIGNMENT NO. X74-4007	WORK ORDER NO.

ARROW 2 - ENGINE HANDLING AND INSTALLATION TESTS

1. OBJECT

To assess the engine handling characteristics of the Orenda Engines in the Arrow 2, and to establish that the engine installation is satisfactory.

2. INSTRUMENTATION

Data is required from the following instruments listed in Report 72/FAR/6 Issue 3:

2.1 Part 1 - Stability and Control

			FLT TEST ITEM NO.
1	2.1.1	Aircraft static pressure (3 ranges)	206-0057-18 to 206-0063-18
2	2.1.2	Aircraft differential Pressure (3 ranges)	
3	2.1.3	Free air total temperature	
4	2.1.4	Angle of attack	206-0033-15
5	2.1.5	Angle of sideslip	206-0034-15

2.2 Part 3 - Engine Installation

			FLT TEST ITEM NO.
6	2.2.1	Left engine power lever position	206-0129-25 to 206-0148-25
7	2.2.2	Right engine power lever position	
8	2.2.3	Left engine L.P. rotor R.P.M.	
9	2.2.4	Right engine L.P. rotor R.P.M.	
10	2.2.5	Left engine H.P. rotor R.P.M.	

R.F.T. PREPARED BY: [signature]	APPROVED BY: A.B. [signature] [signature]	AUTHORIZED BY: [signature]
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

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MALTON, ONTARIO

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REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5073

SHEET NO. 2 OF

DATE: August 26, 1958

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25206 or 25208	X74-4007	

2.2 Part 3 - Engine Installation Cont'd

11	2.2.6	Right engine H.P. rotor R.P.M.	206-0129-25 to 206-0148-25
12	2.2.7	Left engine intake static pressure(P_{s_2})	
13	2.2.8	Right engine intake static pressure (P_{s_2})	
14	2.2.9	Left engine intake total head pressure (P_{t_2})	
15	2.2.10	Right engine intake total head pressure (P_{t_2})	
16	2.2.11	Left engine turbine discharge pressure (P_{t_7})	
17	2.2.12	Right engine turbine discharge pressure (P_{t_7})	
18	2.2.13	Left engine turbine discharge temp. (T_{t_7})	
19	2.2.14	Right engine turbine discharge temp. (T_{t_7})	
20	2.2.15	Right engine blow-in door indication	
21	2.2.16	Right engine restrictor flap angles (bottom)	
22	2.2.17	Right engine gill door angles (at top)	
23	2.2.18	Right air/oil heat exchanger gill door position	206-0308-25
24	2.2.19	Right engine static press. diff. between by-pass and outside of structure at Sta. 610 (ref IDM 1369/04/J)	206-0184-25
25	2.2.20	Right engine static press. diff. between by-pass and outside of structure just aft of restrictor	206-0185-25

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ethrington	ATB	A.R.B.
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5073 UNCLASSIFIED SECRET

SHEET NO. 3 OF

DATE: September 11, 1958

AIRCRAFT 25206 or 25208	ASSIGNMENT X74-4007	WORK ORDER NO.

26	2.2.21	Right engine static press. diff. between bypass and outside of structur just ahead of A/B final nozzle	206-0186-25
27	2.2.22	Right engine pitot static (4 probes) in bypass just forward of restrictor	206-0188-25
28	2.2.23	Right engine total pressure just forward of bypass fills (4 probes, one at botton of duct)	206-0189-25
29	2.2.24	Right engine total press. in bypass just forward of plane of final nozzle (4 probes) (ref. I.D.M. 8162/02A/J)	206-0295-25
30	2.2.25	Right engine constant speed drive inlet press.	206-0239-25
31	2.2.26	Right engine constant speed drive inlet temp.	206-0240-25
32	2.2.27	Right engine constant speed drive outlet press.	206-0241-25
33	2.2.28	Right engine constant speed drive outlet temp.	206-0242-25
34	2.2.29	Right engine constant speed drive air inlet temp.	206-0243-25
35	2.2.30	Right engine access. gear box outlet press.	206-0246-25
36	2.2.31	Right engine access. gear box outlet temp.	206-0247-25
37	2.2.32	Right engine access. gear box inlet temp.	206-0248-25
38	2.2.33	Static pressure in inner surface of ejector (8 points)	206-0282-25 to 206-0289-25
39	2.2.34	Right engine air temp in bypass Sta. 836B	206-0177-25
40	2.2.35	Left nozzle area indication	206-0304-25
41	2.2.36	Right nozzle area indication	206-0305-25
42	2.2.37	Left engine fuel pressure at inlet to engine	206-0300-25
43	2.2.38	Right engine fuel pressure at inlet to engine	206-0301-25

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
W. C. Etherington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5073 UNCLASSIFIED SECRET

SHEET NO. 4 OF

DATE: September 11, 1958

AIRCRAFT 25206-25208	ASSIGNMENT X74-4007	WORK ORDER NO.

44 2.2.39 * Right engine restrictor flap angle (top)

* Note This is a new requirement. Orenda is now responsible for design of the top restrictor flaps.

45	2.2.40	Left engine main fuel flow	206-0149-25 to 206-0156-25
46	2.2.41	Right engine main fuel flow	
47	2.2.42	Left engine fuel temps fwd of fuel flow sensing head.	
48	2.2.43	Right engine fuel temps fwd of fuel flow sensing head	
49	2.2.44	Left engine A/B fuel flow	
50	2.2.45	Right engine A/B fuel flow	
51	2.2.46	Left engine fuel temp fwd of A/B fuel flow sensing head.	
52	2.2.47	Right engine fuel temp fwd of A/B fuel flow sensing head	
53	2.2.48	Fuel temp. engine inlet R.H.	206-0106-16

2.3 Cockpit Indications (each engine)

[to be noted during engine handling tests at Pilot's discretion]

2.3.1 Jet Pipe Temperature

2.3.2 R.P.M. H.P. rotor.

2.3.3 R.P.M. L.P. rotor.

2.3.4 Fuel Pressure at Engine Inlet.

2.3.5 Engine Oil Low Pressure Warning Light.

2.3.6 Nozzle Area Indication.

2.3.7 Afterburner Operation Light.

2.3.8 Hydraulic Oil Low Level Warning light

2.3.9 Hydraulic Oil Low Press. Warning light.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ethrington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

UNCLASSIFIED SECRET

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-7073

SHEET NO. 5 OF

DATE: August 26, 1958

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25206 or 25208	X74-4007	

3. PROCEDURE

3.1 Carry out take-offs and climbs to maximum obtainable altitudes, using:-

3.1.1 Maximum thrust without afterburner.

3.1.2 Maximum thrust with afterburner.

3.1.3 Military thrust without afterburner.

3.1.4 Military thrust with afterburner.

3.2(a) Establish single engine windmilling rotor speeds at various altitudes and aircraft forward speeds.

(b) Carry out altitude restarts at intervals of 10,000 ft. Stop each engine in turn to determine the time for it to run down to windmilling R.P.M., then relight, and determine the time for the engine to accelerate to normal flight idling R.P.M.

(c) A relight flight envelope should be established for the aircraft, with oxygen.

3.3 Determine afterburner light up characteristics at altitudes between 30,000 ft. and maximum.

3.4 Carry out acceleration and deceleration tests at altitude intervals of 10,000 ft., covering:-

3.4.1 Idle to maximum (non-afterburning) thrust.

3.4.2 70% to maximum (non-afterburning) thrust.

3.4.3 Idle to maximum thrust with afterburner.

3.4.4 Maximum thrust (non-after burning) to idle.

3.4.5 Maximum thrust with afterburner to idle.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ethwright	ATB	ARB
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

UNCLASSIFIED

R.F.T. NO. 07-5073

SHEET NO. 6 OF

DATE: August 26, 1958

REQUISITION FOR FLIGHT TEST

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25206 or 25208	X74-4007	

3.5 Steady state engine data should be obtained at intervals over the altitude range of the aircraft to test for J.P.T. or R.P.M. creep.

3.6 Test the actuation of the emergency fuel control system at a safe altitude, and repeat the tests of 3.2b and 3.5 on "Emergency" fuel.

3.7 Investigate the effects of pitch and yaw on engine stability, at the Pilot's discretion.

3.8 Investigate the engine stability during rapid descent with both throttles at idle.

3.9 The following data should be measured in the flight regions specified, or as close to these as the flight program allows:-

	ITEM	ALTITUDE	M	RPM	ATMOS
3.9.1	2.2.7	S.L.	Static	Full	Cold
3.9.2	2.2.8	S.L.	Static	Full	Cold
3.9.3	2.2.19	30,000 ft	2.0	Full A/B on	Std
3.9.4	2.2.20	30,000 ft	2.0	Full A/B on	Std
3.9.5	2.2.21	S.L.	1.09	Full A/B off	Std
		S.L.	Static	Full A/B on	Std

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ethington	ATB	ORB
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

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REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5073

SHEET NO. 7 OF

DATE: August 26, 1958

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25206 or 25208	X74-4007	

3.10 All of the measurements listed in section 2 "Instrumentation" should be recorded at the following flight conditions, or as close to these conditions as the flight program allows:-

	FLIGHT ATTITUDE	ALTITUDE	MACH NO	RPM
3.10.1	On the ground	S.L.	Static	Full A/B off
3.10.2	On the ground	S.L.	Static	Full A/B on
3.10.3	Subsonic acceleration	S.L.	0.2 to .92	Full A/B off
3.10.4	Subsonic acceleration	S.L.	0.2 to .92	Full A/B on
3.10.5	Subsonic climb	-	.92	Full A/B off
3.10.6	Subsonic climb	-	.92	Full A/B on
3.10.7	Subsonic cruise	40000 ft	.92	As req'd A/B off
3.10.8	Supersonic cruise	50000 ft	1.5	Full Partial A/B
3.10.9	Supersonic speeds	50000 ft	1.5 to 2.0	Full Full A/B

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

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MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

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R.F.T. NO. 07-5073

SHEET NO. 8 OF

DATE: August 26, 1958

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25206 or 25208	X74-4007	

4. DATA

4.1 Pilot's comments on all tests.

4.2 Recordings from instruments listed in Section 2.

(a) A. Binding is primarily interested in the results of tests 3.1 to 3.8.

(b) W. B. McCarter is primarily interested in the results of tests 3.9 and 3.10.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
W. C. Ethwright	ATB	ARB
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

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S/L Finnerty

AVRO AIRCRAFT

Inter-Departmental Memorandum

Ref 4360/04/J
Date September 30, 1958
To Mr. S. E. Harper
From T. Roberts
Subject ENGINE INSTALLATION TEMPERATURE FLIGHT TESTS

R.F.T. No. 07-5063, covering flight tests to measure the structural and system temperatures related to the engine installation in Arrow 2 aircraft 25206 or 25208, is attached.

T. Roberts

WE/b

T. Roberts
Technical Design Coordinator
FLIGHT TEST

c.c.
Messrs J. Chamberlin
F. Brame
C. Lindow
A. Buley
M. King
D. Scard
D. Woolley (6)
D. Rogers
J. Soott
J. Ames
F. Mitchell
S. Whiteley
E. Duret
A. Thomann
C. Marshall
A. Binding
J. Lynch
J. Gale
J. Lucas
W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D. RCAF
for transmittal to
S/L K. Owen, C.E.P.E.
Detachment
Central Files

T. Higgins

FORM 1749 A

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

UNCLASSIFIED

R.F.T. NO. 07-5063

SHEET NO. 1 OF

DATE: September 30, 1958

AIRCRAFT 25206 or 25208	ASSIGNMENT X74-4007	WORK ORDER NO.

ARROW 2 - ENGINE COOLING TESTS

1. OBJECT

To measure the structural and system temperatures related to the engine installation in the Arrow 2 (aircraft 25206 or 25208).

2. INSTRUMENTATION

Data is required by the Thermoelastics group from the instruments listed below (Ref. 72/FAR/6, Issue 3). For convenience, Flight Test Instrumentation List reference number for aircraft 25206 are also quoted. Sampling frequencies and accuracies are given in 72/FAR/6.

Part 1 - Stability and Control

Aircraft Static Pressure	208-0057-18
Aircraft Differential Pressure	208-0060-18
Free Air Total Temperature	208-0063-18

Part 2 - Flying Control Hydraulics

Left Engine Pump Inlet Temperature "B" System	206-0009-32
No. 1 Heat Exchanger Inlet Temperature "B" System	206-0010-32
No. 1 Heat Exchanger Outlet Temperature "B" System	206-0011-32
No. 2 Heat Exchanger Outlet Temperature "B" System	206-0012-32

Part 3 - Engine Instrumentation

Left Engine L.P. Rotor RPM	206-0131-25
Right Engine L.P. Rotor RPM	206-0132-25
Left Engine H.P. Rotor RPM	206-0133-25
Right Engine H.P. Rotor RPM	206-0134-25
Left Engine Intake Static Pressure (P_{s_2})	206-0135-25
Right Engine Intake Static Pressure (P_{s_2})	206-0136-25
Left Engine Intake Total Head Pressure (P_{t_2})	206-0137-25
Right Engine Intake Total Head Pressure (P_{t_2})	206-0138-25
Left Turbine Discharge Temperature (T_{t_7})	206-0141-25
Right Turbine Discharge Temperature (T_{t_7})	206-0142-25
Right Engine Gill Door Angles (at top)	206-0148-25

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington	E L Daniel, ATB	

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5063 SECRET

SHEET NO. 2 OF UNCLASSIFIED

DATE: September 30, 1958

AIRCRAFT 25206 or 25208	ASSIGNMENT X74-4007	WORK ORDER NO.

Cooling (Right Engine Only)

Shroud	Sta. 740D	206-0157-25
	818A	206-0159-25
	740B	206-0158-25
	818B	206-0160-25
	838B	206-0161-25
Former-inner flange	Sta. 659B	206-0162-25
	674B	206-0163-25
	737B	206-0164-25
	778B	206-0165-25
	803B	206-0166-25
	811B	206-0167-25
	821B	206-0168-25
	836B	206-0169-25
Latch-mid web of former 808		206-0170-25
Frame 591 Lower Flange		206-0171-25
Engine Rail 737.44 Inner Flange		206-0172-25
Air in By-Pass	Sta. 615A	206-0173-25
	665C	206-0174-25
	765C	206-0175-25
	820B	206-0176-25
	836B	206-0177-25
Center Rear Mount	Sta. 731	206-0178-25
Engine	Sta. 731C	206-0179-25
	740C	206-0180-25
	818B	206-0181-25
Lower Wing Skin	Sta. 740C	206-0182-25
Dorsal on ℄ Aircraft	Sta. 317	206-0191-25
Dorsal on ℄ on Aircraft	Sta. 590	206-0190-25
Blow in Doors	Sta. 673	206-0193-25
Lower Wing Skin above Engine ℄		206-0192-25
Total Press. just fwd. of By-pass Gills		206-0189-25
Temp. Inlet to Constant Speed Drive		206-0240-25
Temp. Outlet to Constant Speed Drive		206-0242-25
Temp. Air Supply to Constant Speed Drive		206-0243-25
Temp. Outlet of Access. Gear Box		206-0247-25
Temp. Inlet of Access. Gear Box		206-0248-25
Fuel Temp. - Left Engine Just Fwd. of Fuel Sensing Head		206-0151-25
Fuel Temp - Right Engine Just Fwd. of Fuel Sensing Head		206-0152-25
Right Air/Oil Heat Exchanger Gill Door position		

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Ethrington	Ed Dunn	DH

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5063 UNCLASSIFIED

SHEET NO. 3. OF

DATE: September 30, 1958

AIRCRAFT 25206 or 25208	ASSIGNMENT	WORK ORDER NO.

Part 4 - Fuel System

Fuel Temp. #3 Tank (R.H.)	206-0103-16
Fuel Temp. #5 tank (R.H.)	206-0104-16
Fuel Temp. H.E. Inlet (R.H.)	206-0105-16
Fuel Temp. Engine Inlet (R.H.)	206-0106-16
Temp. - Press. Air to right tanks	206-0107-16

Part 6 - Utility Hydraulics

L.H. Pump Inlet Temperature	206-0019-19

3. PROCEDURE

3.1 All the quantities listed in paragraph 2 should be recorded throughout flights covering the established flight envelope, and during subsequent flights that extend the flight envelope.

Inspection of the test results may allow deletion of some of the quantities to be measured for subsequent flights which cover similar ranges of flight conditions.

3.2 The aircraft should be flown under the conditions laid down in Section 4; the level flight cases for 10 minutes each or the maximum permissible time, whichever is the shorter. Flight at some of the conditions given may be curtailed due to adverse results appearing during the continuous monitoring of some of the more critical quantities.

3.3 Following inspection of the results obtained longer duration of runs in the level flight cases may be requested.

* Test results from the initial flight test program with reduced instrumentation (Ref IDM 4404/02A/J) will be reviewed during that program, and recording requirements for systems and engine installation testing will be reduced accordingly.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5063 UNCLASSIFIED SECRET

SHEET NO. 4 OF

DATE: September 30, 1958

AIRCRAFT 25206 or 25208	ASSIGNMENT	WORK ORDER NO.

4. TEST CONDITIONS

4.1 Stabilized Cases

4.1.1 (a) Straight and level flight at M = .92, 40,000' alt, cruise r.p.m. A/B off.

(b) Straight and level flight at M = .92, 30,000' alt, cruise r.p.m. A/B off.

4.1.2 Straight and level flight at M = .4, 5,000' alt, cruise r.p.m. A/B off.

4.1.3 (a) Straight and level flight at M = 1.5, 40,000', cruise power.

(b) Straight and level flight at M = 1.5, 50,000', cruise power.

* 4.1.4 Straight and level flight at M = 1.09, 5,000', (or max. power).

4.1.5 (a) Straight and level flight M = 2.0 (or max) 30,000'.

(b) Straight and level flight M = 2.0 (or max) 40,000'.

(c) Straight and level flight M = 2.0 (or max) 60,000'.

4.2 Transient Cases

4.2.1 Deceleration at 40,000' (const) from M = 2.0 (or max) to M = .92 cruise.

4.2.2 Descent from max. alt. to sea level M = .92.

(a) Normal descent.

(b) Low rate of descent (as used to extend range).

4.2.3 Dive from 60,000' to 30,000'.

4.2.4 Decelerate at 5,000 ft. from max speed to minimum by reducing power on both engines to idle until more power is required to maintain safe flying speed.

* Subject to Orenda Engines Limited engine restriction.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington	E L Darel	

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

UNCLASSIFIED SECRET

R.F.T. NO. 07-5063

SHEET NO. _____ OF _____

DATE: September 30, 1958

AIRCRAFT 25206 or 25208	ASSIGNMENT	WORK ORDER NO.

5. DATA

5.1 Scaled continuous trace recordings of all parameters for the duration of the flight.

5.2 Tabulated readings may be requested after studying the time histories of 5.1. The following will be specified at each request.

(a) The parameters to be digitized.

(b) The time period over which they are to be digitized.

(c) The frequency at which the samples are to be taken.

It is understood that the tabulated data is expressed as a percentage of full scale only. Full scale values are to be provided, and scaling will be performed manually by Technical Design.

5.3 Pilot's comments.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington	E. L. Duret	

AVRO AIRCRAFT

~~K.O.~~

S/L Armstrong

Inter-Departmental Memorandum

S/L Owen

Ref 3622/05/J
Date September 10, 1958
To Mr. S. E. Harper
From T. Roberts
Subject ARROW 2 - FUEL SYSTEM TESTS

R.F.T. No. 07-5062, covering engineering tests of the fuel system in Arrow 2 aircraft 25206 or 25208, is attached.

T. Roberts

WE/b

T. Roberts
Technical Design Coordinator
FLIGHT TEST

c.c.
Messrs J. Chamberlin
F. Brame
C. Lindow
C. Marshall
A. Buley
M. King
D. Scard
D. Woolley (6)
D. Rogers
J. Scott
J. Ames
S. Whiteley
A. Cornish
A. Binding
J. Lynch
J. Gale
W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D. RCAF for transmittal to S/L K. Owen, C.E.P.E. Detachment.

F.P. Mitchell
A. Thomann

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REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5062

SHEET NO. 1 OF 3

DATE: July 21, 1958

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25206 or 25208	X74-4007	

ARROW 2
FUEL SYSTEM ENGINEERING TESTS

1. OBJECT

To prove the Arrow 2 fuel system on a complete aircraft.

2. INSTRUMENTATION REQUIRED

The instrumentation required is as in Part 4 of 72/FAR/6, Issue 3, plus THE2, Heat Exchanger Bleed Air Outlet Temp. (Item "206-0224-22) in Part 6 of the above report.

3. PROCEDURE

It is required to record all fuel system parameters referred to above during the following manoeuvres:-

* 3.1 Take off and acceleration to climb speed.

3.1.1 at military rating

3.1.2 with afterburner.

* 3.2 Climb from sea level, without the afterburner at M .92 to 35,000 ft. and then at best climb speed to operational ceiling (without afterburner).

* 3.3 With the afterburner, climb at M .92 to 35,000 ft. and then at M 1.5 to operational ceiling (with afterburner).

* 3.4 Climb to operational ceiling, with the afterburner on and at the maximum rate of climb.

3.5 Level flight at the aircraft operational ceiling.

3.6 Dive from 50,000 ft to 15,000 ft with the following conditions

3.6.1 Starting at M 1.5 with the engines idling.
3.6.2 Starting at minimum drag speed with the engines idling.

R.F.T. PREPARED BY: W. C. Etherington	APPROVED BY:	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

UNCLASSIFIED SECRET

R.F.T. NO. 07-5062

SHEET NO. 2 OF 3

DATE: September 10, 1958

AIRCRAFT 25206 or 25208	ASSIGNMENT X74-4007	WORK ORDER NO.

3.7 Establish inverted flight endurance (not exceeding 60 seconds inverted flight, as specified for the Iroquois in Orenda Engines Specification EMS-8) for the following conditions.

3.7.1 At 35,000 ft. with the throttle set for cruise at Mach .92.

3.7.2 At 35,000 ft. with the throttle set for cruise at Mach 1.5.

3.7.2 At 50,000 ft. with the throttle set for cruise at Mach 1.5.

* 3.8 Establish zero 'G' endurance (not exceeding 10 seconds, as specified for the Iroquois in Orenda Engines Specification EMS-8).

3.9 Beginning with a full fuel load climb and accelerate to M 1.50 at 50,000 ft. Open throttles to full afterburning and accelerate to M = 2.0 or maximum level speed, whichever is less. Maintain this speed for the maximum permissible length of time. (This test is to be done in conjuction with R.F.T. 07-5063)

NOTE:- 1. The manoeuvres marked (*) are to be performed starting with the following fuel quantities aboard:

(a) All tanks as nearly full as is practical.

(b) 8000# on each side.

(c) 5000# on each side.

2. Since the manoeuvres of paragraph 3.7 may result in an engine flame-out, it is suggested that prior to conducting these tests the engine relight and recover from negative 'G' characteristics should be checked. It may be possible to avoid a double engine flame out by retarding the throttle of one engine during the manoeuvre to extend its endurance.

4. DATA

4.1 Recordings from all the instrumentation of Part 4 of 72/FAR/6 Issue 3, are required throughout the specified manoeuvres.

4.2 The following aerodynamic parameters are also to be recorded.

1. Aircraft static pressure.
2. Aircraft differential pressure.
3. Free air total temperature.
4. Angle of attack.

R.F.T. PREPARED BY: Miss C. Ethrington	APPROVED BY:	AUTHORIZED BY:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5062

SHEET NO. 3 OF 3

DATE: July 21, 1958

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25206 or 25208	X74-4007	

5. Longitudinal acceleration.
6. Normal acceleration
7. Left engine HP rotor RPM
8. Right engine HP rotor RPM

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
Wm C. Etherington		
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

S/L Owen
CEPE Arrow Det

For ... UNCLASSIFIED

AVRO AIRCRAFT LIMITED

Inter-Departmental Memorandum

Ref 7319/22/J
Date March 17, 1958
To S. E. Harper
From J. D. Hodge
Subject PRE-FLIGHT TESTING OF ARROW 1

Herewith R.F.T. No. 07-5026, Pre-Flight Testing of Arrow 1. Aircraft 25202 and 25203, which outlines the procedure required for pre-flight testing and details the instrumentation requirements.

AA*bb

J. D. Hodge
Technical Flight
Test Coordinator

c.c.
Messrs J. Chamberlin
F. Brame
C. Lindow
F. Mitchell
P. Martin
C. Marshall
D. Scard (6)
J. Lynch
J. Gale
H. Malinowski
D. Royston
S. Brown
W. Taylor
G. Shaw
S. Kwiatkowski
A. Cornish
A. Binding
F. Bradshaw
J. Ames
J. Booth
R. Young (2)

W/C G. Waterman (2) AVRO T.S.D.
RCAF for transmittal
to S/L K. Owen, C.E.P.E.
Attachment.

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO.

REQUISITION FOR FLIGHT TEST

R.F.T. No. 07-5026

Sheet No. 1 of

Date. March 11, 1958

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25202 25203	X73-379	

PRE-FLIGHT TESTING OF ARROW 1

1. PURPOSE

To carry out tests required to prepare aircraft 25202 and 25203 for flight.

2. INSTRUMENTATION

As attached sheets. (Assign. No. X73-278 covers Instrumentation Requirements.)

3. PROCEDURE

To define the pre-flight testing required on aircraft 25202 and 25203 it has been divided into its separate systems.

3.1 Hydraulics

The testing required on the Hydraulics sub-systems consists only of the standard functional checks, as on Production Aircraft. The details of these checks are in the following reports.

3.1.1 Low Pressure Pneumatics refer to 71/Systems/18-9

3.1.2 Flying Control Hydraulics refer to 71/Systems/32-56

3.1.3 Utility Hydraulics refer to 71/Systems/19-11

3.1.4 Oxygen System refer to P/Systems/59

3.1.5 Fire Protection system refer to P/Systems/60

3.2 Electrics

The testing required on this system is as on the first aircraft and for details refer to P/Systems/34.

3.3 Electronics

Standa rd testing on the operation of the Interphone is all that is required on this system.

R.F.T. Prepared By: Approved By: Authorized By:

Date for Completion	Priority	Estimated Completion Date:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO.

REQUISITION FOR FLIGHT TEST

R.F.T. No. 07-5026

Sheet No. 2 of 2

Date. March 11, 1958

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25202 25203	X73-379	

3.4 Fuel System

This system should undergo the standard production testing. Refer to 71/Systems/16-5 Production testing of Fuel System.

3.5 Air-Conditioning

This system should be checked as in the first aircraft. Refer to R.T. 08-692 Flow Distribution Checks, together with the Engine Run Checks.

3.6 Damper System

Go-Nogo testing is all that should be required on this system as laid out in CRED 10/11 Damper Test Set and CRED 10/12 Damper Auxiliary Test Set. However, both these aircraft will have flight simulation instrumentation installed which will be available if required during the flight test program.

3.7 Engine Installation

The preparation and testing of the J75 - P3 - P5 Engine Installation is covered in R.E. No. 08-742, Add. 9. This R.T. is issued on aircraft 25202 but the testing specified therein will cover pre-flight testing aircraft 25203 as well.

R.F.T. Prepared By:	Approved By:	Authorized By:
Date for Completion	Priority	Estimated Completion Date:

PRE-FLIGHT INSTRUMENTATION REQUIREMENTS

ARROW MK. 1 - AIRCRAFT 25202 AND 25203.

SUBJECT	VARIABLE	Required For		
		GROUND TEST	FLIGHT SIMULATION	ENGINE RUNS
ENGINE	L.P. Compressor RPM Port Engine (N_1)			X
	L.P. Compressor RPM Stbd Engine (N_1)			X
	H.P. Compressor RPM Port Engine (N_2)			X
	H.P. Compressor RPM Stbd Engine (N_2)			X
	Turbine Discharge Pressure Port Engine (P_{T7})			X
	Turbine Discharge Pressure Stbd Engine (P_{T7})			X
	Turbine Discharge Temp. Port Engine (T_{T7})			X
	Turbine Discharge Temp. Stbd Engine (T_{T7})			X
	P_{T7} Y Connection in line to Cockpit P_{T7}/P_{T_2} Gauge Port Engine			X
	P_{T7} Y Connection in line to Cockpit P_{T7}/P_{T_2} Gauge Stbd Engine			X
ENGINE OIL SYSTEMS	Gear Box System Line Pressure Port Engine			X
	Gear Box System Line Pressure Stbd Engine			X
	Oil Temp. at Engine H.E. Tapping Port Engine			X
	Oil Temp. at Engine H.E. Tapping Stbd Engine			X
	Accessory Gear Box Inlet Temp. Port Engine			X
ENGINE FUEL	Volume Flow of Fuel-Main Port Engine			X
	Volume Flow of Fuel Main Stbd Engine			X
	Burner Pressure Port Engine			X

SUBJECT	VARIABLE	Required For		
		GROUND TEST	FLIGHT SIMULATION	ENGINE RUNS
ENGINE INTAKE DUCT	Intake Duct Static Pressure (P_{S_2}) Port Engine			X
	Intake Duct Static Pressure (P_{S_2}) Stbd Engine			X
ENGINE STRUCTURAL COOLING	Centre Rear Engine Mount Temp Port Engine			X
	Temp of Top Shroud Inner Flange Stn. 803. Port Engine			X
	Temp of Top Flange of Former Directly below Firewall Port Engine			X
	Temp of Lower Longeron Engine Bay Port Engine			X
	Ejector Shroud Differential Pressure Port Engine			X
	Top Flange of I Beam on Centre Line through Heat Exchanger			X
FUEL SYSTEM	Fuel Temp. Stbd Engine Pump Inlet			X
	Fuel Pressure Pump Inlet Port Engine			X
	Fuel Pressure Pump Inlet Stbd Engine			X
	Fuel Contents Collector Tank Port	X		X
	Fuel Contents Collector Tank Stbd	X		X
	Fuel Contents #1 Fus. Tank	X		X
	Fuel Contents #2 Fus. Tank	X		X
	Fuel Contents #3 Wing Tank Port	X		X
	Fuel Contents #3 Wing Tank Stbd	X		X

Cont'd...../3

SUBJECT	VARIABLE	Required For		
		GROUND TEST	FLIGHT SIMULATION	ENGINE RUNS
	Fuel Contents #4 Wing Tank Port	X		X
	Fuel Contents #4 Wing Tank Stbd	X		X
	Fuel Contents #6 Wing Tank Port	X		X
	Fuel Contents #6 Wing Tank Stbd	X		X
	Fuel Contents #7 Wing Tank Port	X		X
	Fuel Contents #7 Wing Tank Stbd	X		X
	Fuel Contents #8 Wing Tank Port	X		X
	Fuel Contents #8 Wing Tank Stbd	X		X
	Fuel Contents Total Port	X		X
	Fuel Contents Total Stbd	X		X
FUEL SYSTEM	Vol. Flow of Fuel A/B Port Engine			X
	Vol. Flow of Fuel A/B Stbd Engine			X
CONT'D	Collector Tank Pressure Port			X
	Collector Tank Pressure Stbd			X
	Fuselage Tank Pressure Port			X
	Fuselage Tank Pressure Stbd			X
	Downstream Press. of 10 PSI Diff'l Regulator			X
	Downstream Press. of ABS Press. Regulator Port			X
	Downstream Press. of ABS Press. Regulator Stbd			X
	Downstream Press. of Vent Valve Regulator			X
	Downstream Press. of Fuel Press Regulator Port			X
	Downstream Press. of Fuel Press Regulator Stbd.			X

Assign. No. X73-378

SUBJECT	VARIABLE	Required For		
		GROUND TEST	FLIGHT SIMULATION	ENGINE RUNS
AIR CONDIT-IONING	Air Conditioning Turbine RPM			X
UTILITY HYD.	Temp. Pump Inlet Port			X
	Press. Reg. Return Port	X		
	Press. Reg. "Systems" Port	X		
FLYING CONTROL HYD.	Valve Inlet Pressure, Port Aileron 'A' System	X	X	
	Valve Inlet Pressure, Port Aileron 'B' System	X	X	
	Valve Inlet Pressure, Port Elevator 'A' System	X	X	
	Valve Inlet Pressure, Port Elevator 'B' System	X	X	
	Valve Inlet Pressure, Rudder 'A' System	X	X	
	Valve Inlet Pressure, Rudder 'B' System	X	X	
	Pump Inlet Temp. Port 'A' System			X
	Pump Inlet Temp. Port 'B' System			X
	Elevator Valve Position Port	X	X	
	Aileron Valve Position Port	X	X	
	Rudder Valve Position	X	X	

SUBJECT	VARIABLE	Required For		
		GROUND TEST	FLIGHT SIMULATION	ENGINE RUNS
STABILITY & CONTROL	Port Elev. Angle Full Range	X	X	
	Port Aileron Angle Full Range	X	X	
	Rudder Angle Full Range	X	X	
	Port Airbrake Angle		X	
	Stick Position Elevator	X	X	
	Stick Position Aileron	X	X	
	Rudder Pedal Position	X	X	
	Port Elevator Damper Servo Position	X	X	
	Port Aileron Damper Servo Position	X	X	
	Rudder Damper Servo Position	X	X	
DAMPING SYSTEM	Differential Servo Balance Normal Yaw Axis		X	
	Differential Servo Balance Emergency Yaw Axis		X	
	Left Differential Servo Balance Pitch Axis		X	
	Left Differential Servo Balance Roll Axis		X	
	Control Stick Force Roll Axis		X	
	Control Stick Force Pitch Axis		X	

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Inter-Departmental Memorandum

Ref 8165/22/J
Date April 16, 1958
To S. E. Harper
From T. Roberts
Subject ARROW 1 - FIRST FLIGHT R.F.T.

Herewith Addendum 7, of R.F.T. 07-5024, giving the flight plan and fuel used for the fifth flight of the initial series of flights.

T. Roberts

TR*bb

T. Roberts
Technical Flight
Test Co-ordinator

c.c.
Messrs J.C.Floyd
J.A.Chamberlin
R.N.Lindley
F.H.Brame
C.S.Marshall
C.V.Lindow
F.P.Mitchell
P. Martin
D.N.Scard (6)
J. Booth
J. Ames
J. Scott
J. Lynch
J. Gale
G. Hake
D. Rogers
J. Zurakowski

W/C G. Waterman
W/C G. Waterman (2) AVRO T.S.D. RCAF
For transmittal to
S/L K.Owen C.E.P.E.
Detachment

Central Files

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AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 07-5024 Add. 7

SHEET NO. 1 OF 1

DATE: April 16, 1958

AIRCRAFT 25201	ASSIGNMENT NO.	WORK ORDER NO.

This addendum covers the flight plan and fuel used for the fifth flight of the initial series of flights.

1. INSTRUMENTATION

As given in Addendum 6.

2. FLIGHT PLAN

As given in Addendum 6 but delete item 2.3.1., start damper checks at 300 kts. EAS.

NOTE It is recommended on the basis of simulator tests that asymmetric power checks at or above M = 1.1, items 2.5.2 to 2.5.4. be done with normal damper gear up mode engaged.

3. FUEL USED AND TIME

As given in Addendum 6.

R.F.T. PREPARED BY: T. Roberts	APPROVED BY:	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

S/L Armstrong
CCRE Uplands

UNCLASSIFIED

Date April 3, 1958
To S. E. Harper
From J. D. Hodge
Subject CORRECTED SHEET OF R.F.T. 07-5024 ADDENDUM 4

Herewith corrected copy of the second page of R.F.T. 07-5024, Addendum 4. Memo Reference Number 7757/22/J.

Please destroy the original copy.

J. D. Hodge

c.c.
Messrs J. C. Floyd
J. A. Chamberlin
R. Lindley
F. H. Drame
C. S. Marshall
C. V. Lindow
F. P. Mitchell
P. Martin
D. N. Scard (6)
J. Booth
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D. Rogers
J. Zurakowski

W/C G. Waterman
W/C G. Waterman (2) Avro T.S.D. RCAF for transmittal to S/L K. Owen C.E.P.E. Detachment.

Central Files

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

UNCLASSIFIED

R.F.T. NO. 07-5024 Add. 4

SHEET NO. 2 OF 2

DATE: April 1, 1958

AIRCRAFT 25201	ASSIGNMENT NO.	WORK ORDER NO.

2.3 Test Period

Level off at 40,000 ft, disengage the damper and assess aircraft handling at M = 0.90.

Accelerate to M = 1.10 and again assess handling. It is recommended that a continuous acceleration be made between these speeds.

Decelerate to M = 0.90 engage normal damper gear up mode, light afterburner and accelerate to M = 1.10.

Continue to accelerate to M = 1.3 in steps of 0.05 M proceding in conjunction with ground operations controller. Aileron taps will be required at each speed. If time permits, accelerate to M = 1.4 and assess handling.

2.4 Descent

Reduce speed to M = 0.90 and descend to approximately 25,000 ft., continuing to descend to circuit height at 350 kts.

Land.

3. FUEL USED AND TIME

3.1 Attached appendix 2e shows an estimate of fuel used and time for the above flight plan.

3.2 During taxi the aircraft is estimated to use 1400 lb/hour/engine.

3.3 2500 lb. of fuel shall remain unuseable in addition to any fuel used to ballast the aircraft.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE: