

SHORTENING of the undercarriage leg during retraction is achieved by means of this linkage evolved for the Arrow II.



# ARROW 2 MOCK-UP

# ENGINEERING EVALUATION

# CONFERENCE

Classification cance	led/changed to Francisco 1960 1971	THE STATE OF
by authority of	led/changed to (date)	7
Signature	Rank	

SEPTEMBER 1957

AVRO AIRCRAFT LIMITED

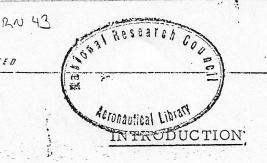
MALTON

ONTARIO

# TABLE OF CONTENTS

	PAGE
INTRODUCTION	1
ROYAL CANADIAN AIR FORCE PERSONNEL ATTENDING CONFERENCE	4
SUB-CONTRACTORS' PERSONNEL ATTENDING CONFERENCE	7
ORENDA ENGINES PERSONNEL ATTENDING CONFERENCE	8
AVRO AIRCRAFT PERSONNEL ATTENDING CONFERENCE	9
CONFERENCE PROGRAM	12
ARROW 2 - GENERAL DESCRIPTION	15
LIST OF ILLUSTRATIONS	
GENERAL LAYOUT OF PLANT SHOWING MOCK-UP AREA	3
3 VIEW GENERAL ARRANGEMENT OF AIRCRAFT	14
ARROW 2 COMPONENT BREAKDOWN	16
ARROW 2 ACCESS PANELS - TOP SURFACES	17
ARROW 2 ACCESS PANELS - BOTTOM SURFACES	18
ARROW 2 ACCESS PANELS - R/H & L/H VIEWS	19
ARROW 2 COCKPIT MOCK-UP - FRONT	20
ARROW 2 COCKPIT MOCK-UP - REAR	21
ARROW 2 LOCATION OF MAJOR EQUIPMENT	22
ARROW 2 STRUCTURE CUTAWAY	23

AVRO AIRCRAFT LIMITED



-AVRO ARROW

The ARROW 2 Mock-up Engineering Evaluation Conference has been arranged in accordance with the requirements of Royal Canadian Air Force Development Study Report DAEng - 32 dated 29th December, 1954.

Members are responsible for arranging their own accommodation.

The Secretary will assist with accommodation arrangements if requested in sufficient time.

Members requiring Company transportation from Toronto are requested to meet in the lobby of the Royal York Hotel at 8 a.m. daily.

Board Members and Technical Advisors are requested to enter and leave the Plant by the Main Lobby in the Administration Building. The location of this entrance, the parking area and relevant routes are illustrated on page 3.

Personnel attending the Conference will register in the Main Lobby, where badges will be issued.

Separate brochures detailing each of the ARROW 2 systems will be available for study in the mock-up area, as will the following specifications:

AIR 7-4, AIR 7-6, INST 92-5

ARDCM 80-1; CAP 479, Model Spec.

Other specifications can be made available on request to the Project Engineers or the Secretary.

Change Request Forms will be available from the Secretary and should be completed as follows:

- 1. The originator is to check with the AVRO specialist for accuracy and correct nomenclature and insert the name of this specialist in the top left hand corner when he completes the form.
- 2. The completed CR form is to be passed to the Secretary who will record it and have 4 copies typed.
- 3. After the 4 copies are signed by the originator, he will retain one and return 3 to the Secretary.

LUNCHEON CAFETERIA ROUTE ON MAIN FLOOR -MOCK-UP AREA ADMINISTRATION BUILDING EXPERIMENTAL DEPARTMENT RAW MATERIAL CAR PARK STORES REGISTRATION AREA WASH ROOM ROUTE TO PARKING AREA FROM MALTON FROM TORONTO GENERAL LAYOUT OF PLANT SHOWING MOCK-UP AREA

# ROYAL CANADIAN AIR FORCE PERSONNEL

# MOCK-UP BOARD MEMBERS

W/C	R.T. Hamilton	Chairman		AFHQ/DAEng
G/C	R.C. Hawtrey			AFHQ/DMEng
G/C	D.M. Holmann			AMCHQ/SACO
W/C	C.L.V. Gervais			AFHQ/DADR
W/C	J. Watts			AFHQ/DADO
W/C	R.E. Mooney			AFHQ/DATel
W/C	D.A. MacLulich			AFHQ/DIEEng
W/C	G.W. Erichsen			AFHQ/DArmE
W/C	E.P. Bridgland		•	OC, TSDs
W/C	B.D. McArthur			ADCHQ/SOMaint
S/L	B.C. Hartman			AFHQ/DAEEng
F/L	R.B. Hall	Secretary		AFHQ/DAEng

#### TECHNICAL ADVISORS

W/C W. Goss S/L H. Londeau S/L I.S. McLeish F/O G. Poulsen	AFHQ/DAEng "" "" ""
F/L J. Joslin F/L E.L. Aucoin W/C D.R. Walker	AFHQ/DATel AFHQ/DAPC/TSSG AFHQ/DATR
S/L D.L. Campbell S/L D. Whyte S/L A.J. Wright S/L V. Schroeder S/L R.S. Burks F/L K. Thomassen Capt. J.D.M. Morris	AFHQ/DIEEng "" "" "" "" "" ""
W/C P. de L. Markham W/C W.B. Coates S/L J. Irvine F/L J.B. Murray	AFHQ/DMEng " " "
G/C R.B. Brown W/C D.O. Coons	AFHQ/DGMS

		•	
W/C	J.A. Duncan		AFHQ/DTA
	V. Clouthier		ii .
	· · · · · · · · · · · · · · · · · · ·		
W/C	J.D. Lindsay		AFHQ/DADO
	J.R.D. Braham		AFHQ/DADR
F/L	R.A. Jackson		H = 1
CIT	C Manyand		A PHO/D A PEno
9\T	G. Maynard		AFHQ/DAEEng
S/T	G.T. Reiser		AFHQ/DArmE
6/11	a. I. Reibei		111 112, 2111 1112
S/L	R.A. Stubbs		IAM Toronto
	W.G. Leach		
	F.E.M. Beldam		11
W/C	A.H. Hill		ADCHQ
S/L	D.C. Manion		11
S/L	A.W. Armstrong		CEPE
F/L	J. Woodman		u .
F/L	K.D.J. Owen		H Salah Sala
	F.L. Bernstein		RCAF Plant Rep/RCA
S/L	G.S. Coburn		
	R.E. Young		TSD's Avro
	R.S. Crosby		<b>H</b>
	N.E. McCuaig		II.
S/L	L.J. Sullivan		
F/O	J.D. Young		H.
	J.O.H. Neff		MAT/Avro
WOI	E.H. Rossell		
	K.R. Grimley	· · · · · · · · · · · · · · · · · · ·	AMCHQ
	D.D. Cunningham		10
	K. W. Walton		
	G.H. Cooper		11
	W.J. St. Louis		
	E.A. Brain		
	G.A. Jones		H .
F/L	H.C. Brisco		11
F/L	G.S. Crosby		tt i i i i i i i i i i i i i i i i i i
	W.R. Manley	real control and the second of	
	B.D. Darling		If
F/L	D. W. Cooke		II

UNGLASSITI

O RINGERRET LIMITED

F/O F/O	W.G. Angus	AMCHQ " " " " "
A/C	D.A.R. Bradshaw	ADCHQ
G/C	A.C. Hull	
S/L	R.D. Schultz	.11
F/L	R.W. Baxter	
Mr.	A. Kielland	DDP
Mr.	A.A. Macintyre	11
Mr.	T.P. Walsh	11
Mr.	C. V. Rayment	DRB
Dr.	S.Z. Mark	11
Dr.	I. Paghis	li .
Dr.	H.J. Meek	11
Mr.	R.S. Thain	. 11
Mr.	F.E. Smith	11
Mr.	J.W. Cox	11
Mr.	J.L. Orr	11
Mr.	H.C. Oatway	H
Dr.	M.G. Whillans	111
Dr.	R. Bromiley	11

# RESIDENT DEPARTMENT OF DEFENCE PRODUCTION REPRESENTATIVE

Mr. C.A. Hore

D.D.P. Representative

WWW. HISTED

#### ARROW 2 MOCK-UP ENGINEERING EVALUATION CONFERENCE

## SUB-CONTRACTORS' PERSONNEL

Mr. H. Henderson

Minneapolis-Honeywell, Minneapolis, U.S.A.

11

Mr. C.S. Herrala

Mr. J. Smalley

Mr. C. Sharp

Mr. J. Daelhousen

Mr. E. Blanchard

Mr. R. Bushnell

Mr. E. Morris

Mr. R. Good

Mr. D. Sherwin

Mr. R. Parker

Mr. P.J. Nuss

Mr. R. H. Hogue

Mr. S. W. Kingsbury

Mr. H.E. MacFarland

Mr. D. H. Spellum

Mr. W. Anderson

Mr. G. Bell

Mr. W. Edwall

Mr. J. Letwin

Mr. E. Minett

Mr. S. Rosenberg

Mr. R. Shaffer

Mr. L. Swartz

Mr. E. Williams

RCA Flight Lab., New Castle, Del.

RCA, Waltham, Mass.

RCA, Moorestown, N. J.

RCA, Montreal

11

Minneapolis-Honeywell Liaison Office,

11

Avro

RCA Liaison Office, Avro

11

RCA, Camden, N.J.

11

. .

11

11

14

11

11



#### ORENDA ENGINES PERSONNEL

#### ENGINEERING

S. Britton Chief Projects Engineer

B.A. Avery Chief Design Engineer

A. Smallwood Projects Engineer

SERVICE

R.A. Stanyar Assistant Service Manager, Publications

J. Burgess Chief Service Engineer

R.J. Palmer Area Service Supervisor



## AVRO AIRCRAFT PERSONNEL

#### ENGINEERING

J.C. Floyd Vice-President Engineering

R.N. Lindley Chief Engineer

G. Hake Project Designer

A. Buley Assistant Project Designer

J. Chamberlin Chief of Technical Design

S.E. Harper Chief Experimental Engineer

J. W. Kenny Experimental Manager

R. Adey Chief Administrative Engineer

F. Brame Assistant Chief of Technical Design

I. R. Liss Chief of Project Management Services

J.W. Ames Chief of Product Design

F. P. Mitchell Special Assistant to Chief Engineer

J.P. Booth Chief of Equipment Design

I.R. Craig Project Engineer (Armament, Fire

Control, Radar Communications)

N. Ring Chief of Airframe Design

E. Boughton ARROW 2 Mock-up Co-ordinator

J. Moore ASTRA I Co-ordinator

W. Farrance Section Chief Design

G. Emmerson Section Chief Maintenance and

Reliability

A.R. Littleboy Section Chief Ground Equipment

S. Whiteley Chief of Airborne Equipment

C.S.R. Marshall Chief of Systems Engineering

H. K. Malinowski Senior Systems Engineer Flying Controls

S.H. Brown
Senior Systems Engineer
Electrical System

A. H. Cornish Senior Systems Engineer Fuel System

J. Housego Senior Systems Engineer
Armament System

W. Taylor Section Chief Electronics System

K. Keeping Group Leader Electronics System

B. Delbridge Systems Engineer

G. Shaw Senior Engineer Air Conditioning System

A. Shaw

Design Engineer (ARROW 2 Mock-up
Build & Equipment Installation)

F. H. Bradshaw Power Plant Liaison Engineer

## INSPECTION

J. Fairbairn Quality Control and Inspection Manager

H. Williams Foreman Inspector

G. Hughes Foreman Inspector

## SALES AND SERVICE

J. A. Morley Vice President Sales & Service

M. D. Willer Sales & Service Manager

W. Stephens Sales Manager

F.C. Plumb

H. Horne

P.E. Adams

T.G. Dunkin

E. Burn

A.G. Roberts

D.H. Rogers

J. Zurakowski

W.J. Potocki

Service Manager

Assistant Parts Manager

Contracts Officer, Development

Chief of Technical Analysis

Service Co-ordinator

Service Engineer

## TEST PILOTS

Chief of Flight Operations

Chief Experimental Test Pilot

Experimental Test Pilot



# PROGRAM

DATE	TIME	FUNCTION
Wesnesday		
Sept. 18	9.00 A.M.	Welcome and Introduction of personnel by Mr. G. Hake, Project Designer, ARROW Aircraft
	9.15 - 10.45	Lecture period: General description of complete aircraft and systems - Mr. A.R. Buley
	10.45 - 11.00	FREE PERIOD
	11.00 - 12.00	Question period: complete aircraft and systems
	12.15 - 1.15	LUNCH
	1.30 - 3.00	Lecture period: ASTRA I & Armament - Mr. I.R. Craig
	3. 00 onward	Question period: ASTRA I & Armament
Thursday		
Sept. 19	9.00 - 1.15	ASTRA I & Armament Evaluation
	1.15 - 2.15	LUNCH
	2.15 onward	ASTRA I & Electrics Evaluation
Friday		
Sept. 20	9.00 - 1.15	Engine Installation & Fuel System Evaluation
	1.15 - 2.15	LUNCH .
	2.15 onward	Air Conditioning & L.P. Pneumatics, De-icing and Oyxgen Evaluation



		PROGRAM
DATE	TIME	FUNCTION
DATE	TIME	I ONO HON
Wednesday Sep. 18	9.00 A.M.	Welcome and Introduction of personnel by Mr. G. Hake, Project Designer, ARROW Aircraft
	9.15 - 10.45	Lecture period: General description of complete aircraft and systems - Mr. A.R. Buley
	10.45 - 11.00	FREE PERIOD
	11.00 - 12.00	Question period: complete aircraft and systems
	12.15 - 1.15	LUNCH
	1.30 - 3.00	Lecture period: ASTRA I & Armament - Mr. I.R. Craig
	3.00 onward	Question period: ASTRA I & Armament.
Thursday		
Sept. 19	9.00 - 1.15	ASTRA I & Armament Evaluation
	1.15 - 2.15	LUNCH
	2.15 onward	ASTRA I, Cockpits & Electrics Evaluation
Friday Sept. 20	9.00 - 1.15	Engine Installation & Fuel System Evaluation
	1.15 - 2.15	LUNCH
	2.15 onward	Air Conditioning & L.P. Pneumatics, De-icing and Oxygen Evaluation



DATE	TIME	FUNCTION
Monday		
Sept. 23	9.00 - 1.15	Hydraulics - Utility & Flying Controls
		Evaluation; Flying Controls, Damping & Mechanical Evaluation
	1.15 - 2.15	IINCL
	1.15 - 2.15	LUNCA
	2.15 onward	Meeting of Chairman, Members and Advisors to discuss the change request forms
Tuesday		
Sept. 24	9.00 - 12.15	Meeting of Chairman, Members and Advisors to discuss the change request forms
	12.15 - 1.15	LUNCH
	1.15 onward	Meeting (Continued)

ATRO AIRCHAFT LIMITED

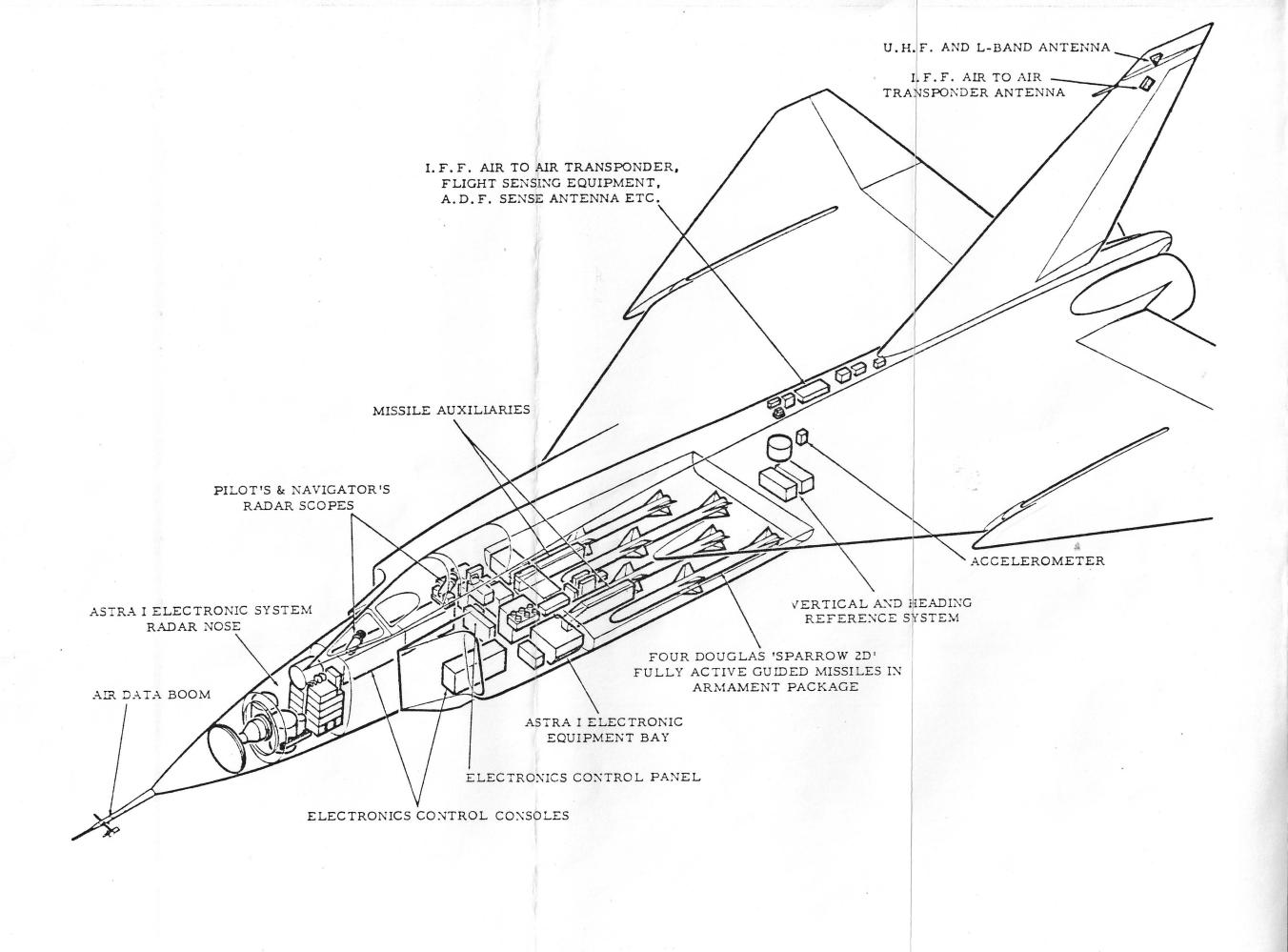
## ARROW 2 - GENERAL DESCRIPTION

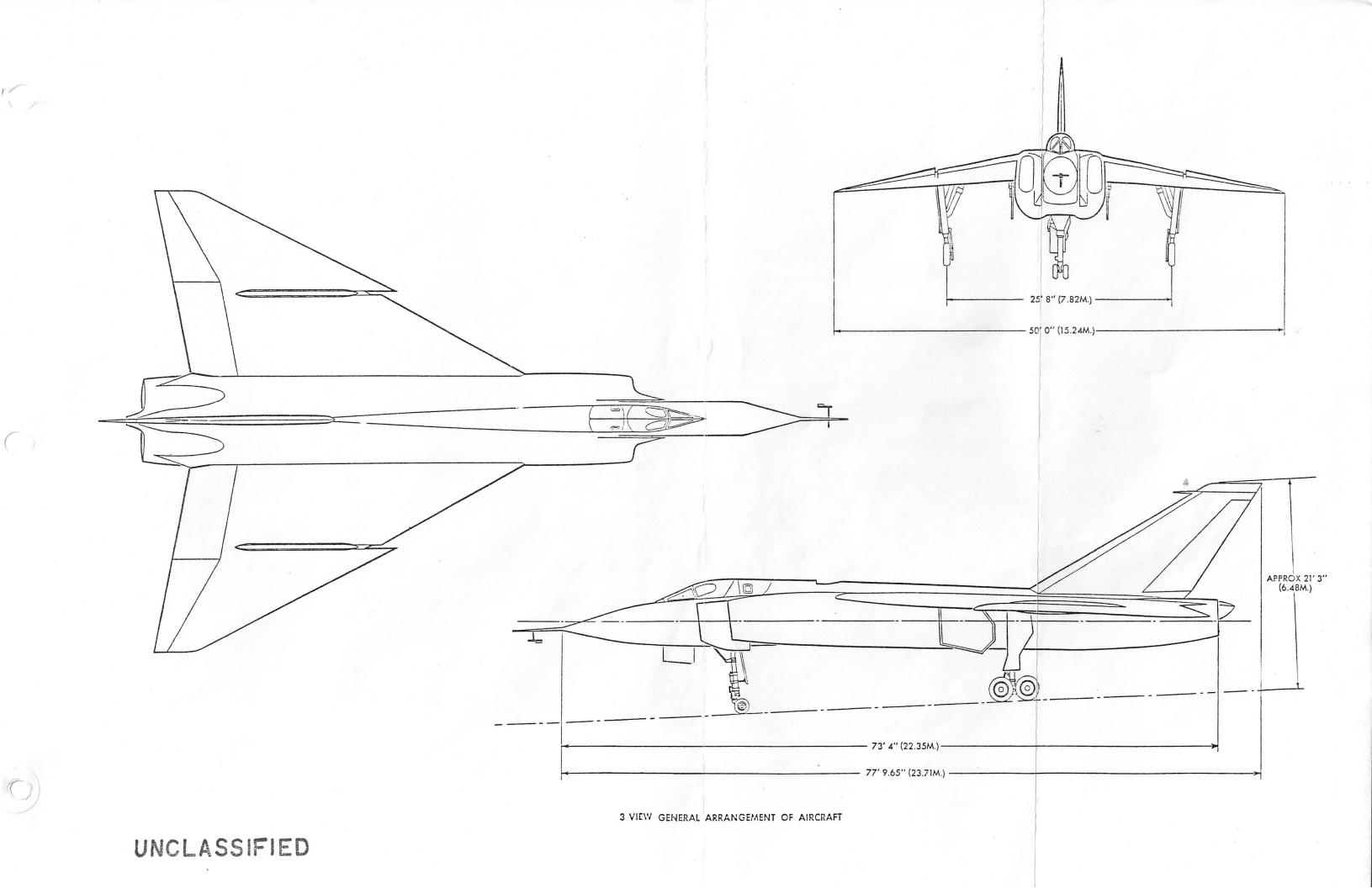
The ARROW 2 aircraft is an all weather night and day interceptor which carries a crew consisting of a pilot and a radar operator. Its primary mission is the destruction of enemy bomber aircraft at high altitudes.

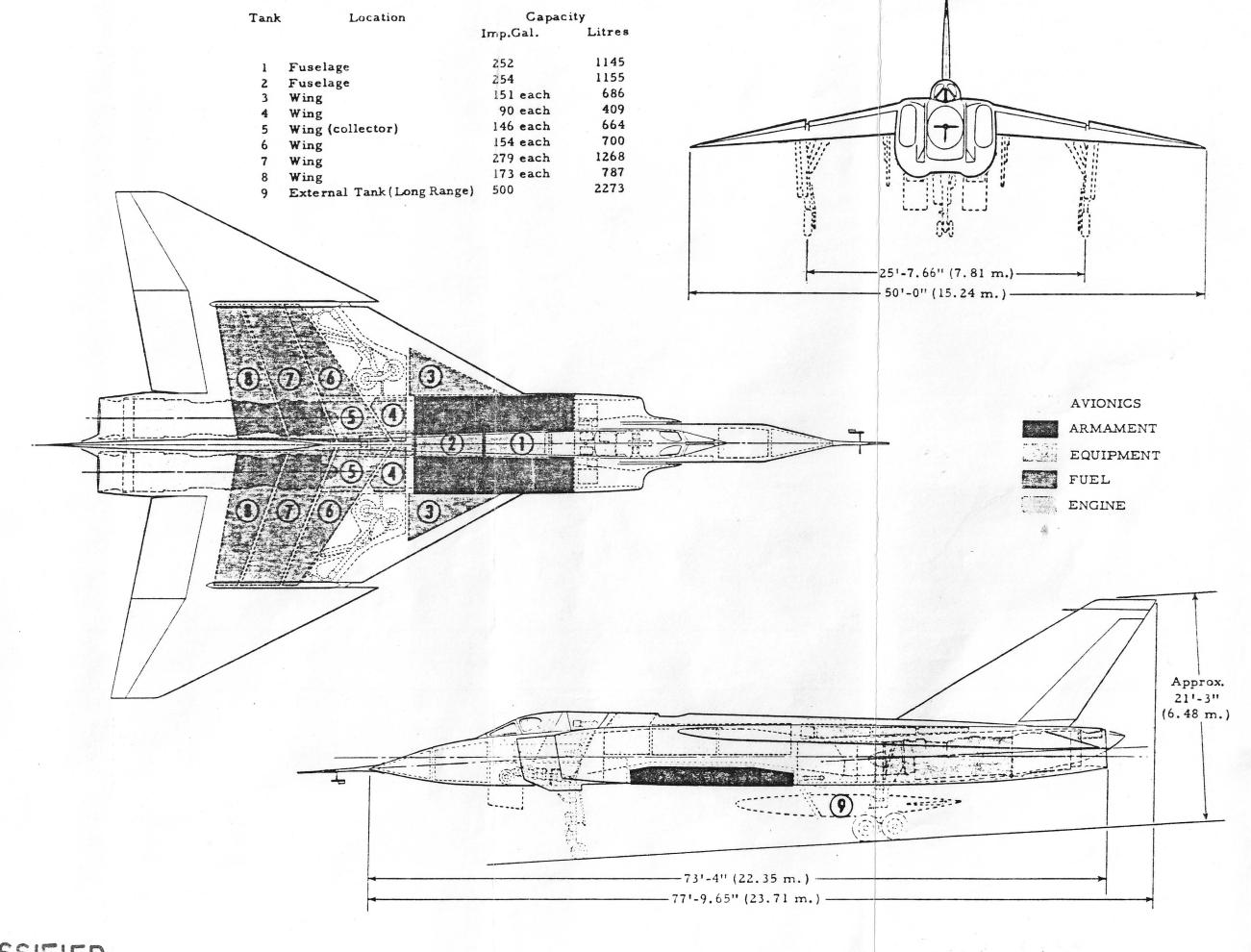
The differences between the ARROW 1 and the ARROW 2 are primarily a result of the installation of the ASTRA I integrated electronic system, Sparrow 2D missiles, and two Iroquois engines, the latter replacing the Pratt and Whitney J-75 engines.

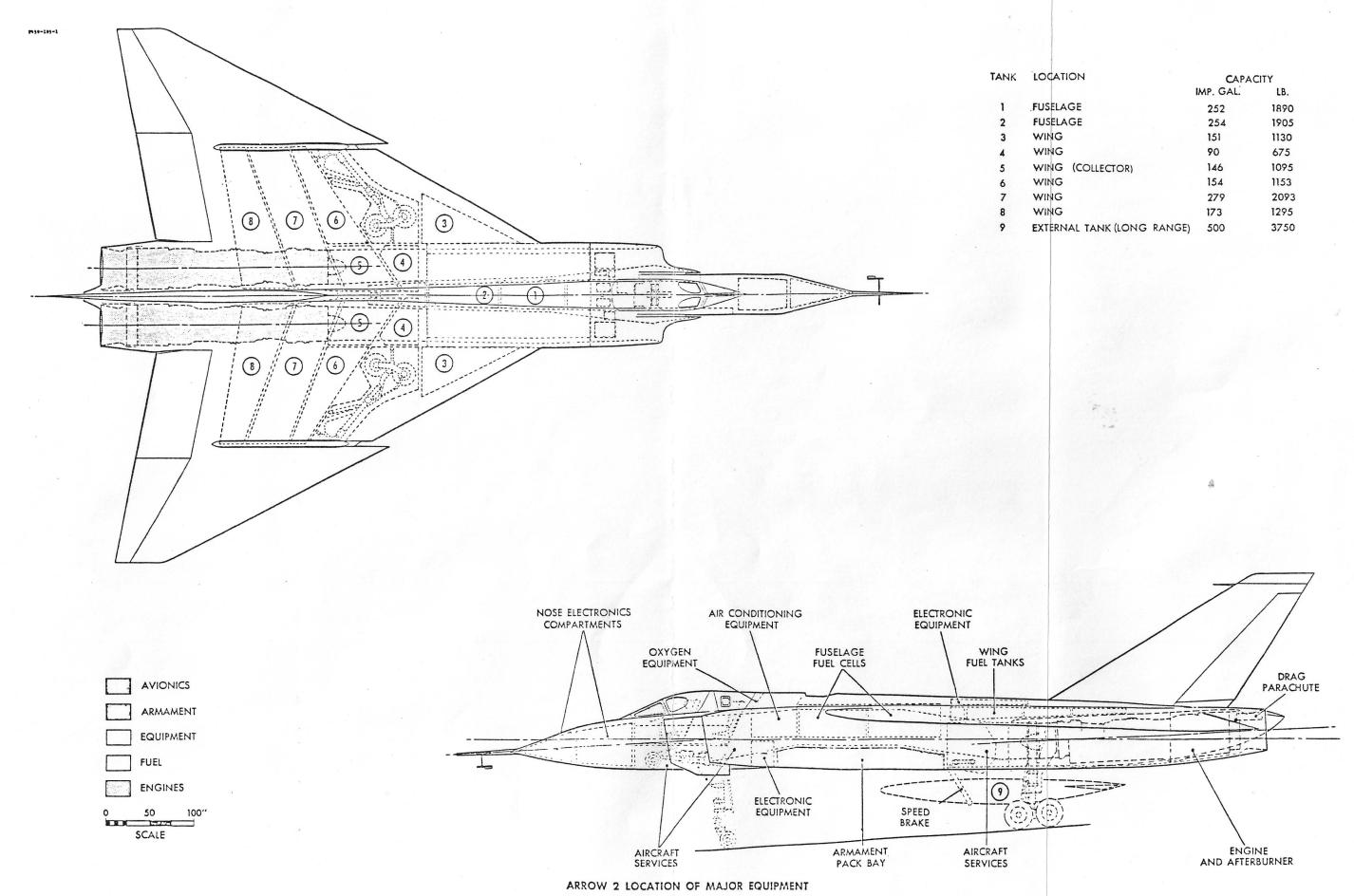
The radar nose is completely redesigned and the electrical system is considerably modified. The engine change resulted in changes to the intake geometry, inner wing structure, duct and engine bay structure, rear fuselage structure; engine controls, air conditioning and pressurization systems, and the addition of an attachment for the external fuel tank.

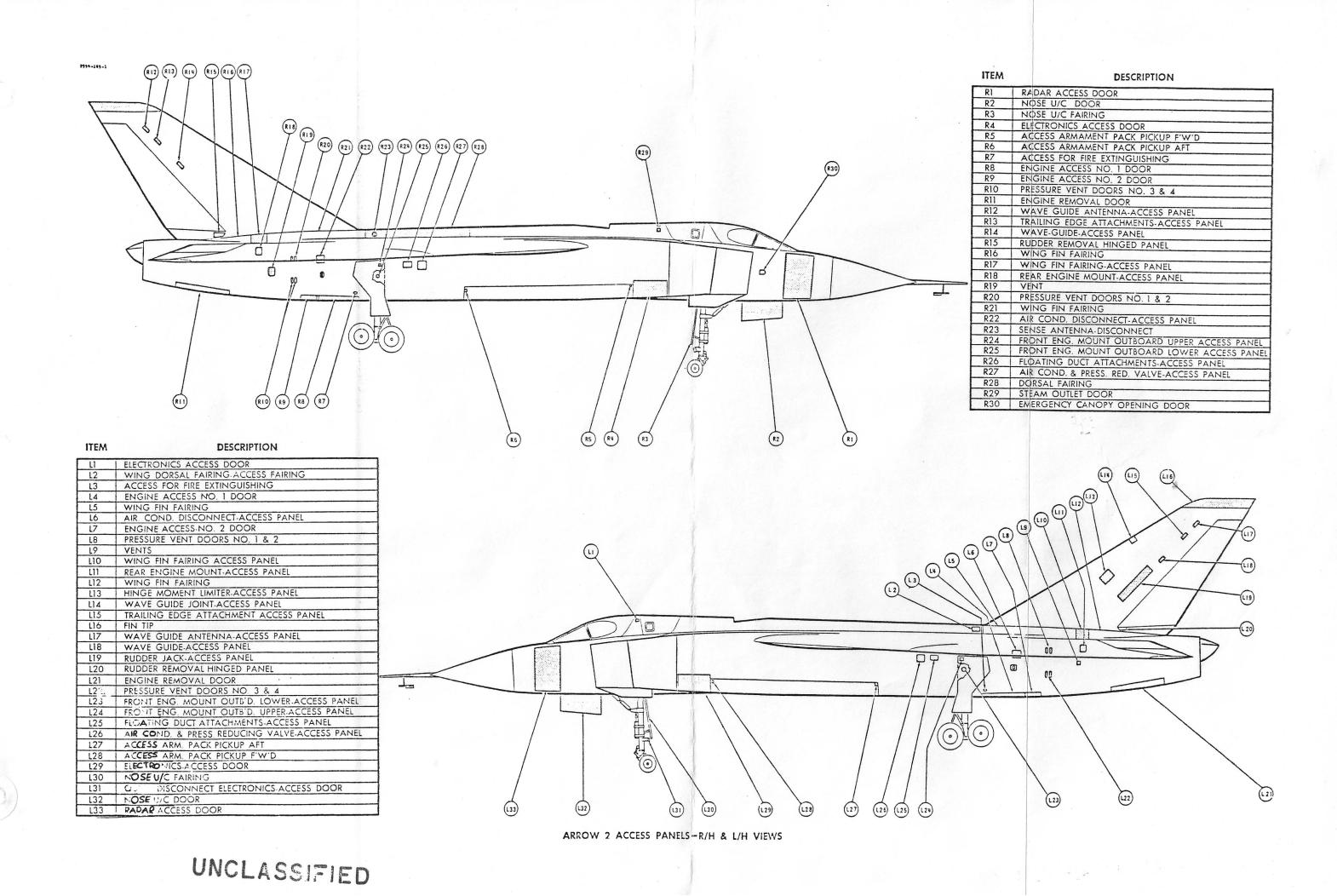
The ARROW 2 incorporates other changes as suggested by the R.C.A.F. or found to be desirable from research and tests carried out during the ARROW 1 program. The present windshield rain repellant system has been deleted and the windows in the navigator's cockpit enlarged. The proportioner-type fuel system on the ARROW 1 has been replaced by an absolute pressure fuel transfer system.

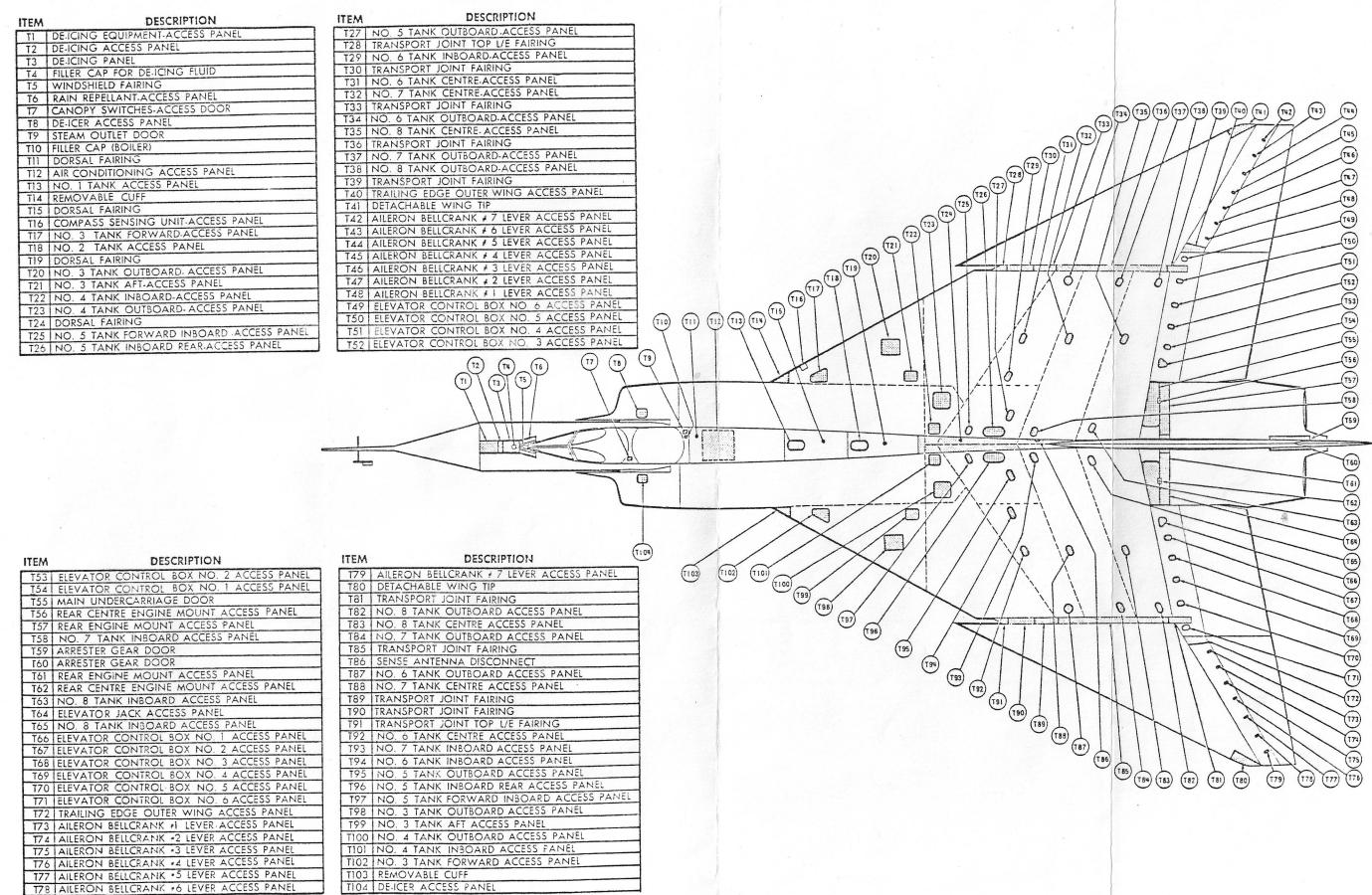








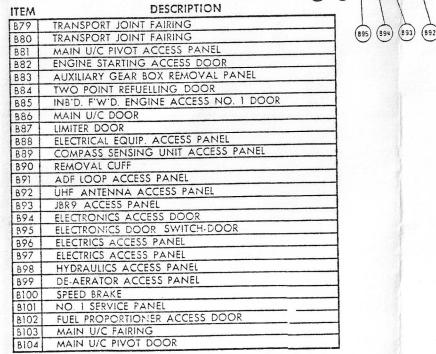


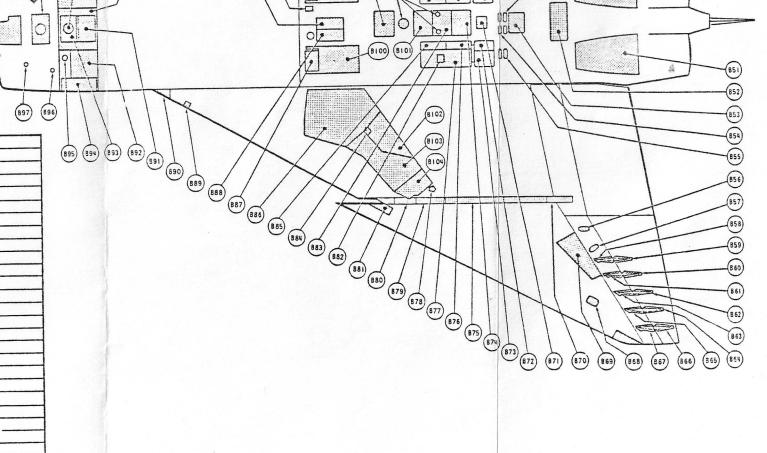


B1	UHF ANTENNA.ACCESS PANEL
82	ICE DETECTOR-ACCESS PANEL
33	NOSE U/C DOOR
14	NOSE U/C FAIRING
5	FLECTRICS-ACCESS PANEL
36	ATTACHMENT RING. AIR CONDITIONING
37	AIR COND. EQUIPMENT. ACCESS PANEL
8	ELECTRICS ACCESS PANEL
39	ELECTRONIC CIRCUIT BREAKER. ACCESS DOOR
310	ELECTRONICS-ACCESS DOOR
311	ELECTRONICS ACCESS PANEL
312	ELECTRONICS EQUIP. BAY CENTRE DOOR
813	REMOVABLE CUFF
314	ELECTRICS-ACCESS PANEL
B15	GROUND POWER-ACCESS DOOR
B16	MASTER REFUELLING DOOR
B17	MAIN U/C DOOR
B18	TWO POINT REFUELLING DOOR
B19	FUEL PROPORTIONER ACCESS DOOR
B20	MAIN U/C FAIRING
B21	MAIN U/C PIVOT ACCESS PANEL
B22	TRANSPORT JOINT FAIRING
B23	MAIN U/C PIVOT DOOR
B24	MAIN U/C JACK ACCESS PANEL
B25	TRANSPORT JOINT FAIRING
B26	GEAR BOX DRAIN ACCESS PANEL

ITEM	DESCRIPTION	
B27	ENGINE ACCESS NO. 1 DOOR	
828	INB'D. F'W'D. ENGINE ACCESS NO. 1 DOOR	
B29	ENGINE STARTING ACCESS DOOR	4
B30	INB'D, AFT ENGINE ACCESS NO. 1 DOOR	
B31	ENGINE ACCESS NO. 2 DOOR	_
B32	TRANSPORT JOINT FAIRING	
B33	TRANSPORT JOINT FAIRING	(879) (830) (831) (832) (833) (834) (835)
B34	AILERON JACK ACCESS PANEL	- (828) $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$
B35	NO. 7 AILERON LINK FAIRING F'W'D.	827
B36	NO. 7 AILERON LINK FAIRING AFT	
837	NO. 6 AILERON LINK FAIRING F'W'D.	(825)
B38	NO. 6 AILERON LINK FAIRING AFT	824)
B39	NO. 5 AILERON LINK FAIRING F'W'D.	(823)
840	NO. 5 AILERON LINK FAIRING AFT	
841	NO. 4 AILERON LINK FAIRING F'W'D.	(820)
B42	NO. 4 AILERON LINK FAIRING AFT	
B43	NO. 3 AILERON LINK FAIRING AFT	(818)
B44	NO. 3 AILERON LINK FAIRING F'W'D.	(817)
B45	NO. 2 AILERON LINK FAIRING F'W'D.	816)
B46	NO. 1 AILERON LINK FAIRING F'W'D	
B47	ENGINE ACCESS DOOR	
B48	PRESSURE VENT DOORS NO. 5 & 6	
B49	PRESSURE VENT DOORS NO. 7 & 8	$\frac{1}{2}$
B50	ENGINE REMOVAL DOOR	83 69 (810 (811))
B51	ENGINE REMOVAL DOOR	
B52	NO. 4 SERVICE PANEL	
	B1 B2 B3 B4 B5 B6	

ITEM	DESCRIPTION
B53	NO. 3 SERVICE PANEL
B54	PRESSURE VENT DOORS NO. 7 & 8
B55	PRESSURE VENT DOORS NO. 5 & 6
B56	NO. 1 AILERON LINK ACCESS PANEL
B57	NO. 2 AILERON LINK FAIRING
B58	NO. 3 AILERON LINK FAIRING F'W'D.
B59	NO. 3 AILERON LINK FAIRING AFT
B60	NO. 4 AILERON LINK FAIRING AFT
B61	NO. 4 AILERON LINK FAIRING F'W'D.
B62	NO. 5 AILERON LINK FAIRING AFT
B63	NO. 5 AILERON LINK FAIRING F'W'D.
B64	NO. 6 AILERON LINK FAIRING AFT
865	NO. 6 AILERON LINK FAIRING F'W'D.
B66	NO. 7 AILERON LINK FAIRING AFT
B67	NO. 7 AILERON LINK FAIRING F'W'D.
B68	ROLL INDICATOR ACCESS PANEL
B69	AILERON JACK ACCESS PANEL
B70	TRANSPORT JOINT FAIRING
B71	FLYING CONTROL COMPENSATOR REMOVAL PANEL
B72	ENGINE ACCESS DOOR
B73	ENGINE ACCESS NO. 2 DOOR
B74	NO. 2 SERVICE PANEL
B75	TRANSPORT JOINT FAIRING
B76	INB'D AFT NO. 1 ENGINE ACCESS DOOR
B77	ENGINE ACCESS NO. 1 DOOR
878	MAIN U/C JACK ACCESS PANEL





(898) (899)

