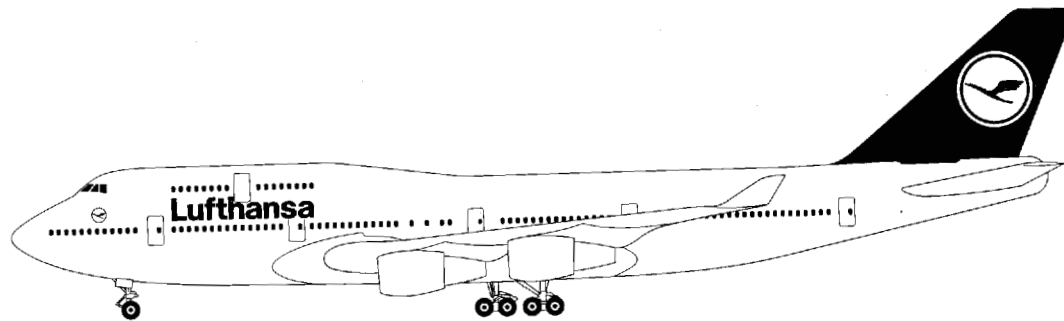


# Training Manual

**B747-430**

## **ATA 49** Practical Training Handbook



**WF-12-E/M**

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Bestellnr: DLH B747-4 49 PTH



**Lufthansa**  
TECHNISCHE SCHULUNG



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## **Lufthansa Technical Training GmbH**

### **Lufthansa Base Frankfurt**

D-60546 Frankfurt/Main

Tel. +49 69 / 696 41 78

Fax +49 69 / 696 63 84

### **Lufthansa Base Hamburg**

Weg beim Jäger 193

D-22335 Hamburg

Tel. +49 40 / 5070 24 13

Fax +49 40 / 5070 47 46

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# ATA 49 AIRBORNE AUXILIARY POWER

## STUDENT PACED PRACTICAL TRAINING ITEMS

### B - 1 - M QUALIFICATION

### B - 12 - M QUALIFICATION

#### SP - PRAXIS LOCATION :

- APU im Lager (Tor 23) oder
- APU in der Triebwerkwerkstatt oder
- APU im Flugzeug

#### APU AIR INLET SYSTEM :

- APU AIR INLET DOOR
- APU AIR INLET DOOR ACTUATOR / HOUSING
- APU AIR INLET DOOR POSITION SWITCH

#### BOROSKOP ACCESS

#### EXHAUST SYSTEM

#### APU OIL SYSTEM :

- APU OIL PUMP
- APU OIL FILTER
- APU OIL PRESSURE REGULATING VALVE
- FUEL COOLED OIL COOLER (FCOC)
- AIR COOLED OIL COOLER (ACOC)
- MAIN OIL TEMPERATURE SENSOR
- LOW OIL PRESSURE SWITCH
- OIL FILTER DIFF. PRESSURE INDICATOR
- OIL LEVEL SENSOR

#### LGB- / AGB CHIP DETECTOR

#### APU FUEL SYSTEM

- APU FUEL PUMP
- APU FUEL METERING UNIT (FMU)
- FLOW DIVIDER AND DUMP VALVE
- FUEL MANIFOLD AND NOZZLES

#### APU COOLING AIR SYSTEM :

- P-3 FILTER
- DIVERTER VALVE CONTROL
- RATE SENSOR
- DIVERTER VALVE
- IGV ACTUATOR

#### APU DRAIN SYSTEM COMPONENTS

#### IGNITION AND STARTING SYSTEM :

- STARTER MOTOR
- IGNITION EXCITER

- IGNITION PLUGS

#### APU CONTROLS :

- APU CONTROLLER
- N1 - SPEED SENSOR
- N2 - SPEED SENSOR
- T6 - TRIM UNIT
- S/N IDENTIFICATION UNIT
- P1 - INLET PRESSURE SENSOR
- 71 - INLET TEMPERATURE SENSOR
- T1.2 - LOAD COMPRESSOR INLET TEMPERATURE SENSOR
- T1.3 - LOAD COMPRESSOR OUTLET TEMPERATURE SENSOR
- T6 - EXHAUST GAS THERMOCOUPLES
- APU CURRENT TRANSFORMER



## STUDENT PACES PRACTICAL TRAINING ITEMS

### B - 1 - E QUALIFICATION

### B - 12 - E QUALIFICATION

#### SP - PRAXIS LOCATION :

- APU im Lager (Tor 23) oder
- APU in der Triebwerkwerkstatt oder
- APU im Flugzeug

#### APU AIR INLET SYSTEM :

- APU AIR INLET DOOR
- APU AIR INLET DOOR ACTUATOR / HOUSING
- APU AIR INLET DOOR POSITION SWITCH

#### APU OIL SYSTEM :

- MAIN OIL TEMPERATURE SENSOR
- LOW OIL PRESSURE SWITCH
- OIL FILTER DIFF. PRESSURE INDICATOR
- OIL LEVEL SENSOR

#### APU FUEL SYSTEM

- APU FUEL PUMP
- APU FUEL METERING UNIT (FMU)
- FLOW DIVIDER AND DUMP VALVE
- FUEL MANIFOLD AND NOZZLES

#### APU COOLING AIR SYSTEM :

- P-3 FILTER
- DIVERTER VALVE CONTROL
- RATE SENSOR
- DIVERTER VALVE
- IGV ACTUATOR

#### IGNITION AND STARTING SYSTEM :

- STARTER MOTOR
- IGNITION EXCITER
- IGNITION PLUGS

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- APU CONTROLLER
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- T1.3 - LOAD COMPRESSOR OUTLET TEMPERATURE SENSOR
- T6 - EXHAUST GAS THERMOCOUPLES
- APU CURRENT TRANSFORMER



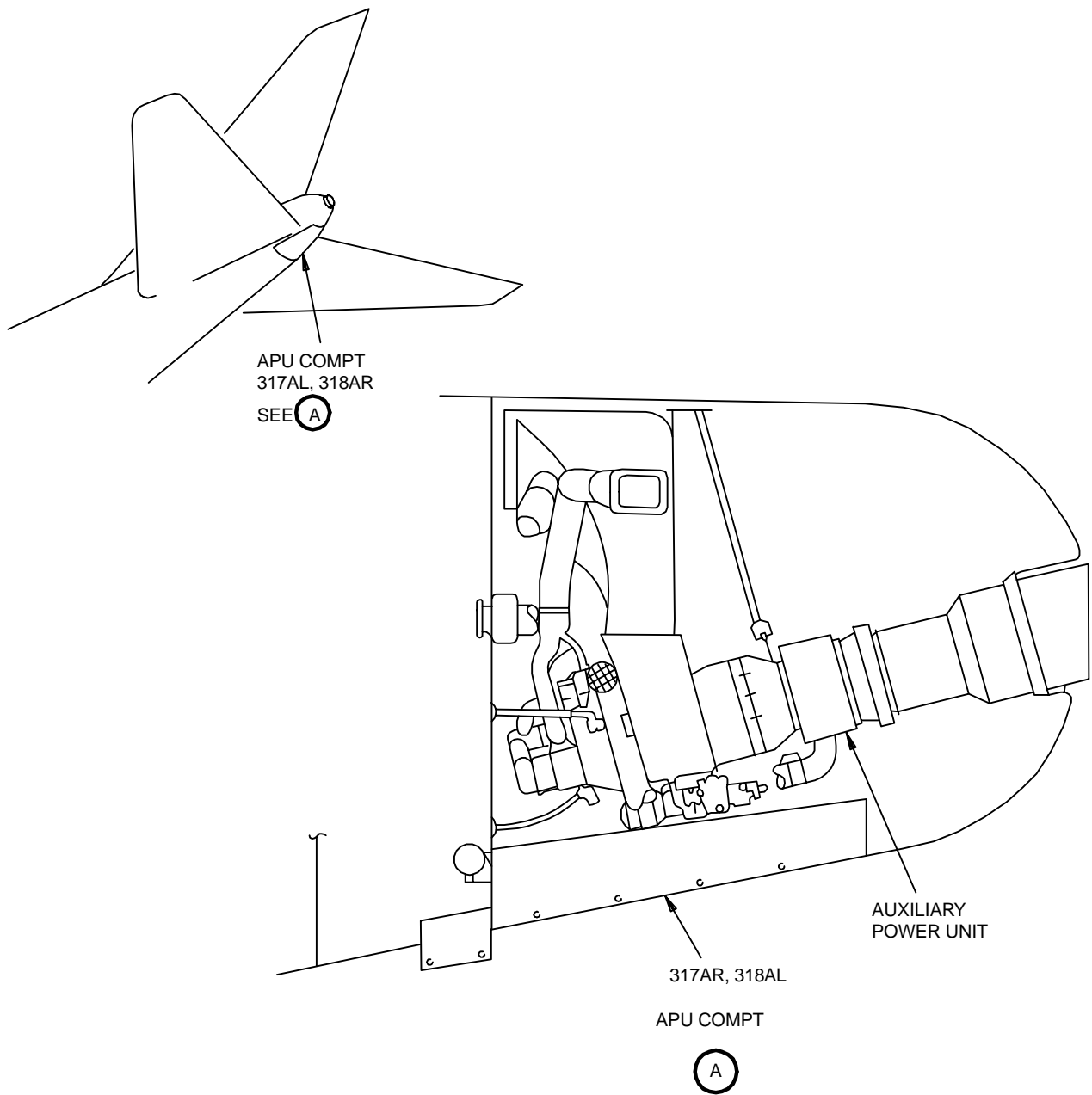
**ATA 49     AIRBORNE AUXILIARY POWER**

**49-1 1     AUXILIARY POWER UNIT**

AUXILIARY POWER UNIT

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
AUXILIARY POWER UNIT	--	1	317AL,318AR, APU COMPT	49-11-01

Auxiliary Power Unit - Component Index  
Figure 101



Auxiliary Power Unit - Component Locator  
Figure 102

Figure 1 AUXILIARY POWER UNIT - COMPONENT LOCATOR



## 49-13      APU AIR INLET SYSTEM

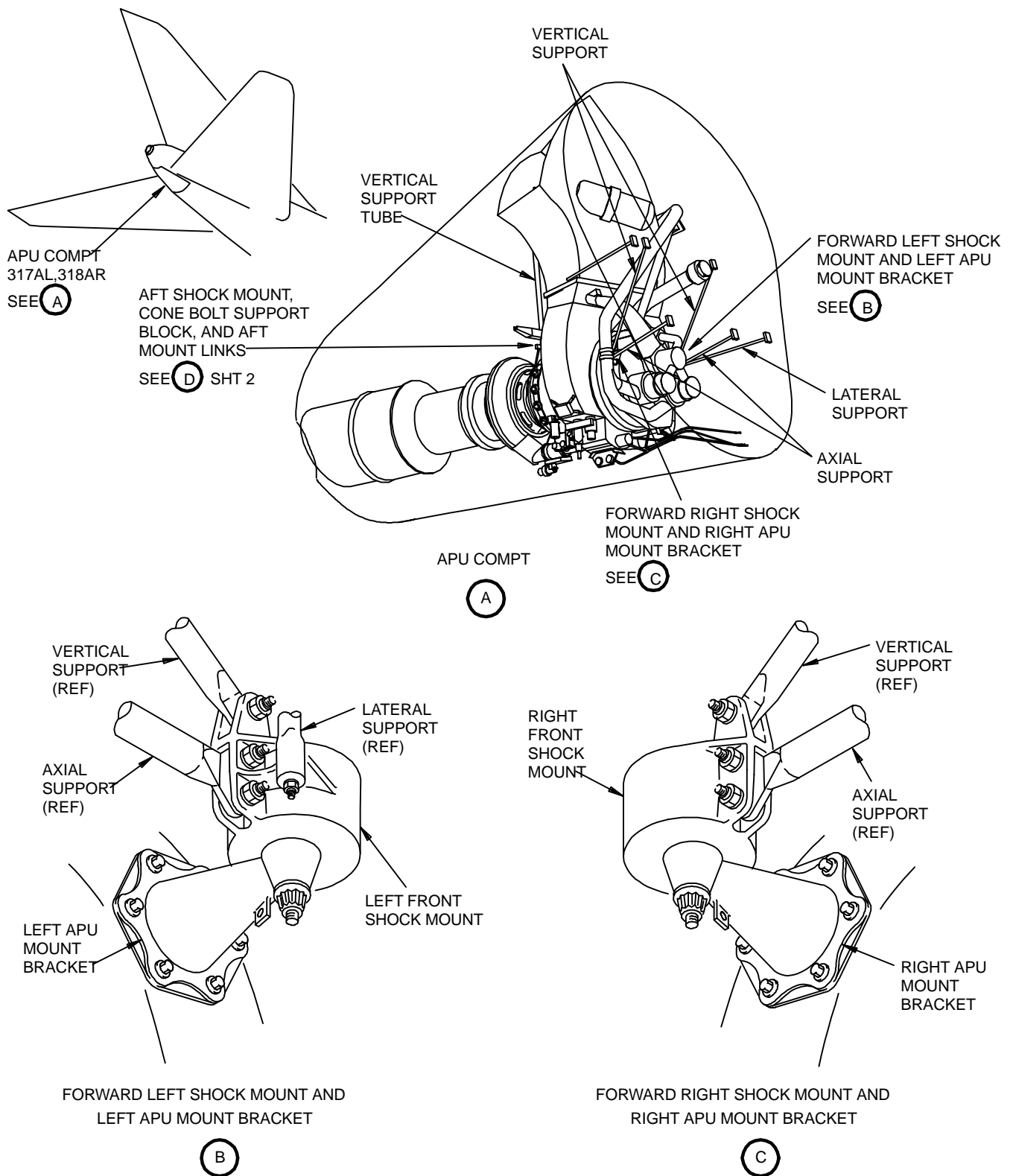


APU MOUNTS

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
BLOCK - CONE BOLT SUPPORT	2	1	317AL,318AR, APU COMPT	49-13-06
BRACKET - APU MOUNT	1	2	317AL,318AR, APU COMPT	49-13-03
LINK - AFT MOUNT	2	2	317AL,318AR, APU COMPT	49-13-07
SHOCKMOUNT - LEFT FRONT	1	1	317AL,318AR, APU COMPT	49-13-01
SHOCKMOUNT - RIGHT FRONT	1	1	317AL,318AR, APU COMPT	49-13-01
SHOCKMOUNT - AFT	2	1	317AL,318AR, APU COMPT	49-13-05
SUPPORT - AXIAL	1	2	317AL,318AR, APU COMPT	49-13-00
SUPPORT - LATERAL	1	1	317AL,318AR, APU COMPT	49-13-00
SUPPORT - VERTICAL	1	2	317AL,318AR, APU COMPT	49-13-00
TUBE - VERTICAL SUPPORT	1	1	317AL,318AR, APU COMPT	49-13-04

APU Mounts - Component Index  
Figure 101

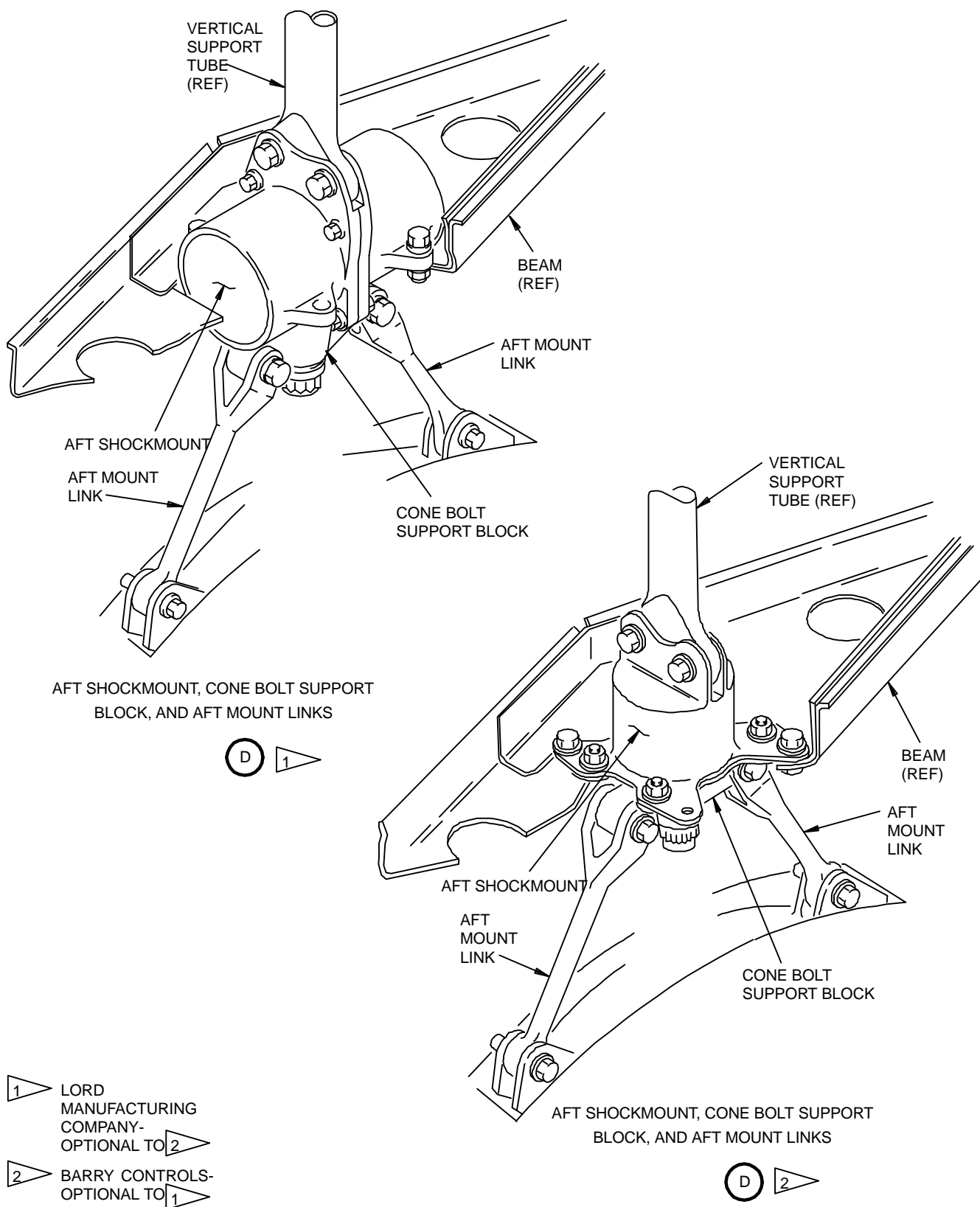
Figure 2    APU MOUNTS - COMPONENT INDEX



APU Mounts - Component Location  
Figure 102 (Sheet 1)

**Figure 3 APU MOUNTS - COMPONENT LOCATION**





APU Mounts - Component Location (Details From Sht 1)  
Figure 102 (Sheet 2)

**Figure 4 APU MOUNTS - COMPONENT LOCATION**



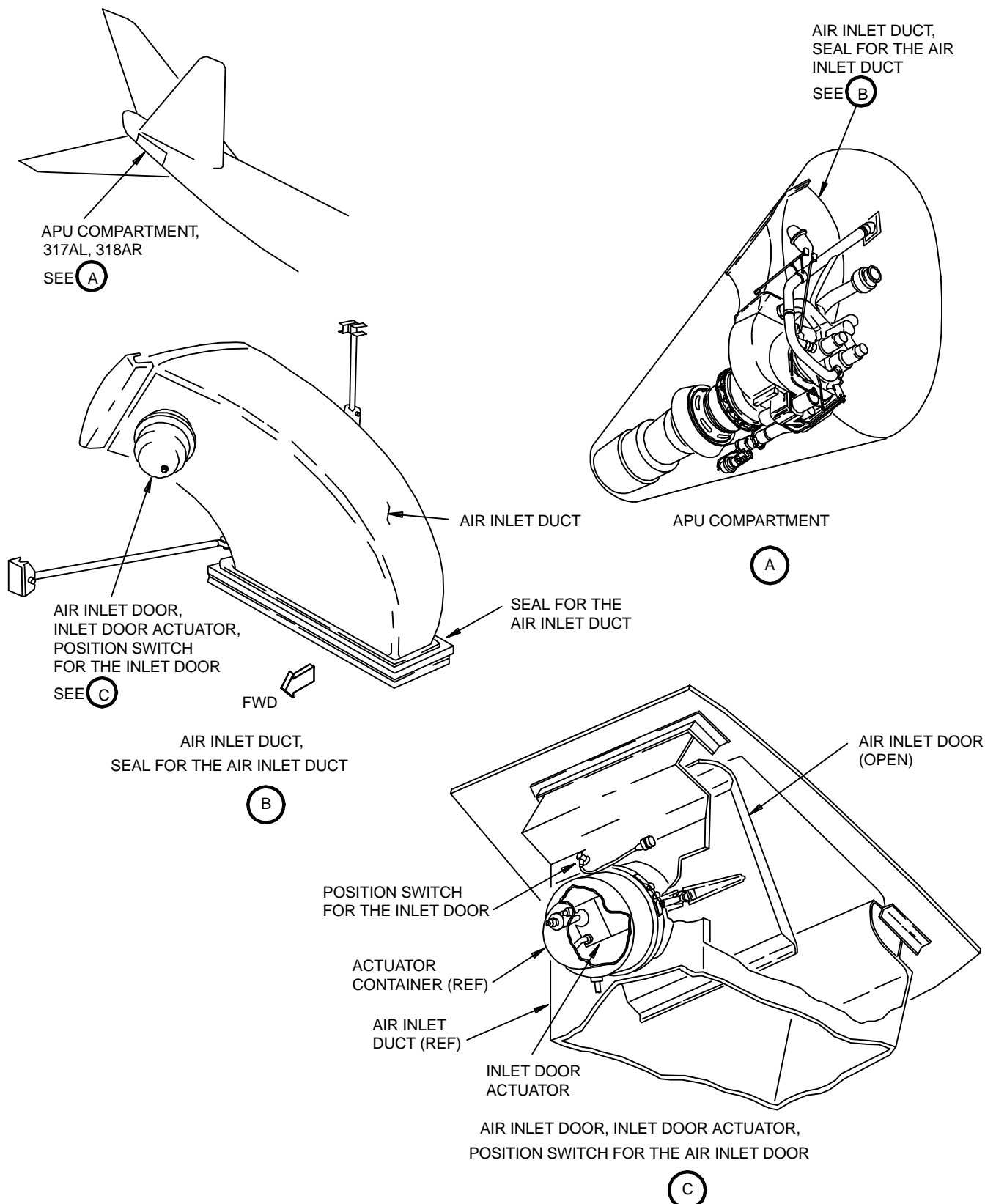
## **49-15      APU AIR INLET SYSTEM**

APU AIR INLET

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
ACTUATOR - AIR INLET DOOR, M83	1	1	317AL,318AR, APU COMPT	49-15-04
CIRCUIT BREAKERS -	2	1	835L, AFT EQUIP CTR E8, P83	*
APU INLET DOOR, C389		1		*
APU START, C8816		1		
CONTROLLER - (REF 49-61-00, FIG. 101)				
APU, M7847				
DOOR - AIR INLET	1	1	317AL,318AR, APU COMPT	49-15-03
DUCT - AIR INLET	1	1	317AL,318AR, APU COMPT	49-15-00
RELAYS - (REF 31-01-15, FIG. 101)				
AIR/GND, R359				
APU INLET CLOSED, R460				
APU INLET OPEN, R461				
APU INLET DRIVE, R7176				
RELAY - (REF 31-01-36, FIG. 101)				
EXT SHT DN, R7204				
RELAY - (REF 31-01-39, FIG. 101)				
SYSTEM PRIMARY AIR/GND, R263				
SEAL - AIR INLET DUCT	1	1	317AL,318AR, APU COMPT	49-15-02
SWITCH - APU DOOR POSITION, S1598	1	1	317AL,318AR, APU COMPT	49-15-05
UNIT - (REF 31-61-00, FIG. 101)				
C EICAS INTERFACE, M7352				
L EICAS INTERFACE, M7353				
R EICAS INTERFACE, M7351				

\* SEE WDM EQUIPMENT LIST

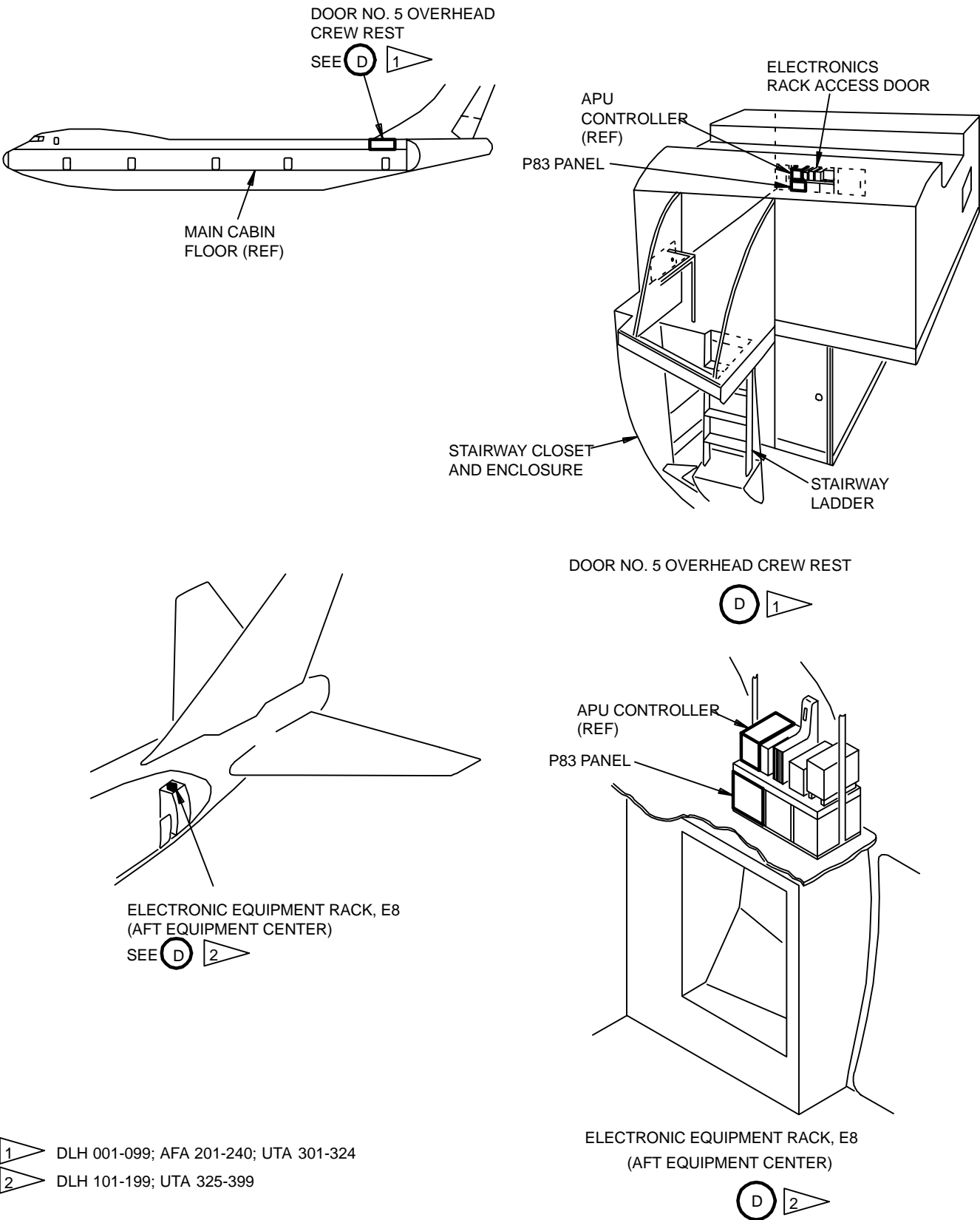
APU Air Inlet - Component Index  
Figure 101**Figure 5 APU AIT INLET - COMPONENT INDEX**



APU Air Inlet - Component Location  
Figure 102 (Sheet 1)

**Figure 6 APU AIR INLET - COMPONENT LOCATION**





APU Air Inlet - Component Location  
Figure 102 (Sheet 2)

Figure 7 APU AIR INLET - COMPONENT LOCATION



**49-16      APU DRAINS AND VENTS**

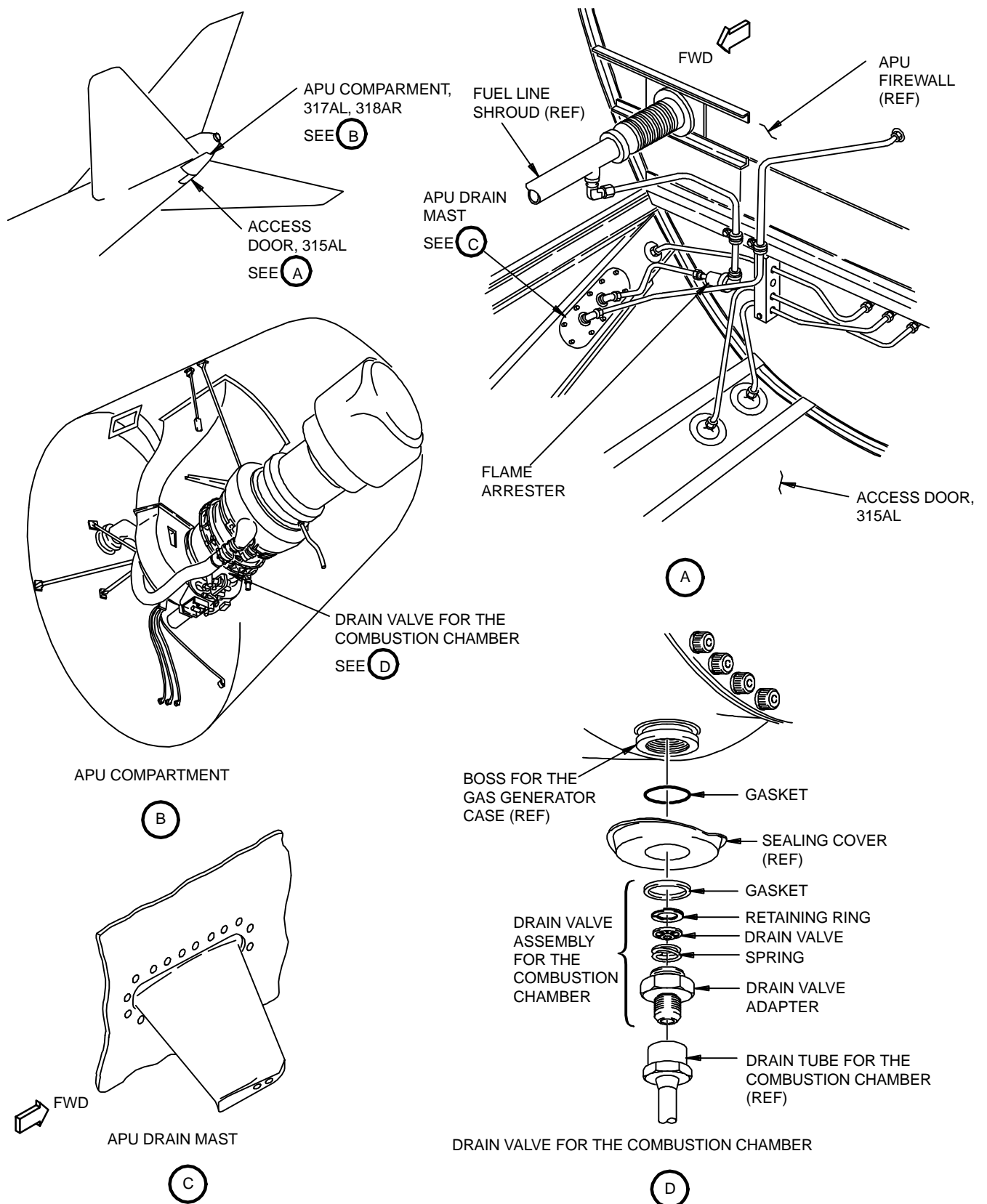


APU DRAINS AND VENTS

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
ARRESTER - APU FUEL DRAIN FLAME	--	1	315AL, ACCESS DOOR	49-16-00
DRAIN - AFT APU FUEL LINE SHROUD	--	1	315AL, ACCESS DOOR	49-16-00
MAST - APU DRAIN	--	1	315AL, ACCESS DOOR	49-16-03
VALVE - COMBUSTION CHAMBER DRAIN	--	1	317AL,318AR, APU COMPT	49-16-01

APU Drains and Vents - Component Index  
Figure 101

Figure 8    APU DRAINS AND VENTS - COMPONENT INDEX



APU Drains and Vents Location  
Figure 102

**Figure 9 APU DRAINS AND VENTS LOCATION**



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**49-27      APU ENGINE LUBRICATION SYSTEM**

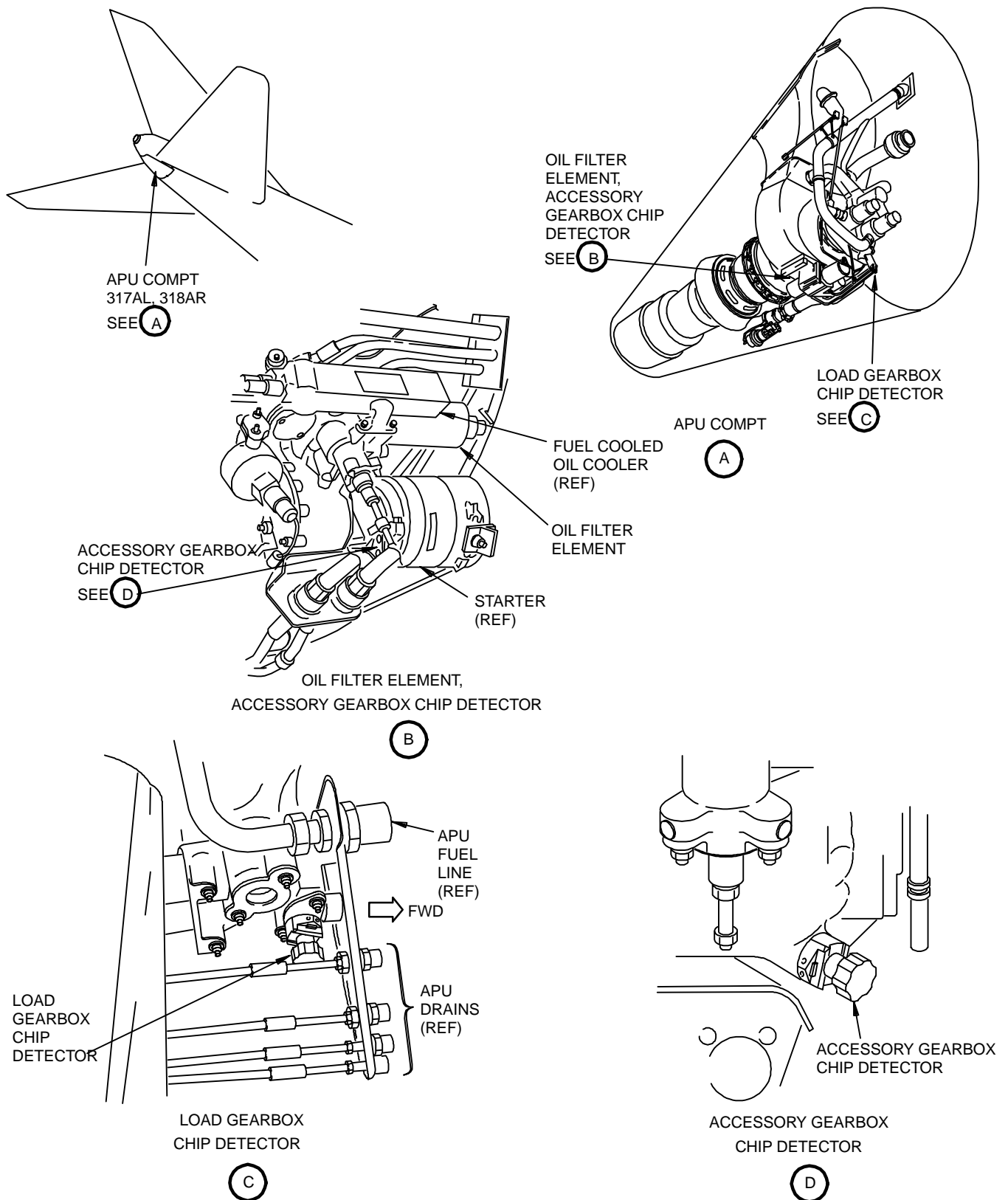


APU ENGINE LUBRICATION SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
DETECTOR - APU ACCESSORY GEARBOX CHIP	--	1	317AL,318AR, APU COMPT	49-27-04
DETECTOR - APU LOAD GEARBOX CHIP	--	1	317AL,318AR, APU COMPT	49-27-04
ELEMENT - OIL FILTER	--	1	317AL,318AR, APU COMPT	49-27-03

APU Engine Lubrication System - Component Index  
Figure 101

Figure 10    APU ENGINE LUBRICATION SYSTEM - COMPONENT INDEX



APU Engine Lubrication System - Component Location  
Figure 102

**Figure 11 APU ENGINE LUBRICATION SYSTEM - COMPONENT LOCATION**



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## **49-31      APU ENGINE FUEL SYSTEM**

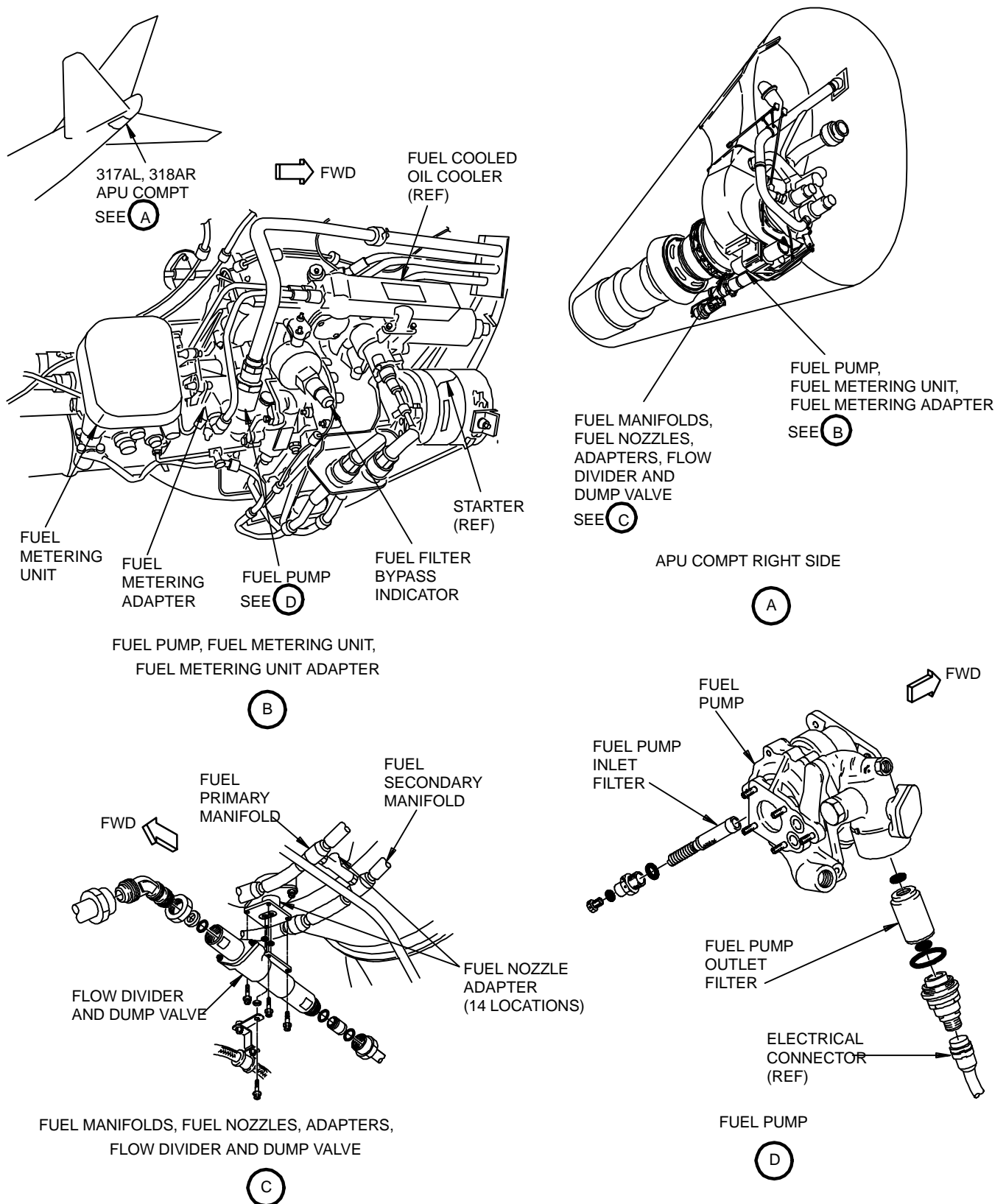


APU FUEL SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
ADAPTER - FUEL METERING	--	1	317AL,318AR, APU COMPT	49-31-02
ADAPTERS - FUEL NOZZLE	--	14	317AL,318AR, APU COMPT	49-31-04
COOLER - (REF 49-91-00, FIG. 101) FUEL COOLED OIL				
FILTER - FUEL PUMP INLET	--	1	317AL,318AR, APU COMPT	49-31-00
FILTER - FUEL PUMP OUTLET	--	1	317AL,318AR, APU COMPT	49-31-00
INDICATOR - FUEL FILTER BYPASS	--	1	317AL,318AR, APU COMPT	49-31-05
MANIFOLD - FUEL PRIMARY	--	1	317AL,318AR, APU COMPT	49-31-04
MANIFOLD - FUEL SECONDARY	--	1	317AL,318AR, APU COMPT	49-31-04
PUMP- FUEL	--	1	317AL,318AR, APU COMPT	49-31-03
UNIT - FUEL METERING	--	1	317AL,318AR, APU COMPT	49-31-01
VALVE - FLOW DIVIDER AND DUMP	--	1	317AL,318AR, APU COMPT	49-31-00

APU Fuel System - Component Index  
Figure 101

Figure 12 APU FUEL SYSTEM - COMPONENT INDEX



APU Fuel System - Component Location  
Figure 102

**Figure 13 APU FUEL SYSTEM - COMPONENT LOCATION**



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**49-41      APU STARTING AND IGNITION SYSTEM**



APU STARTING AND IGNITION

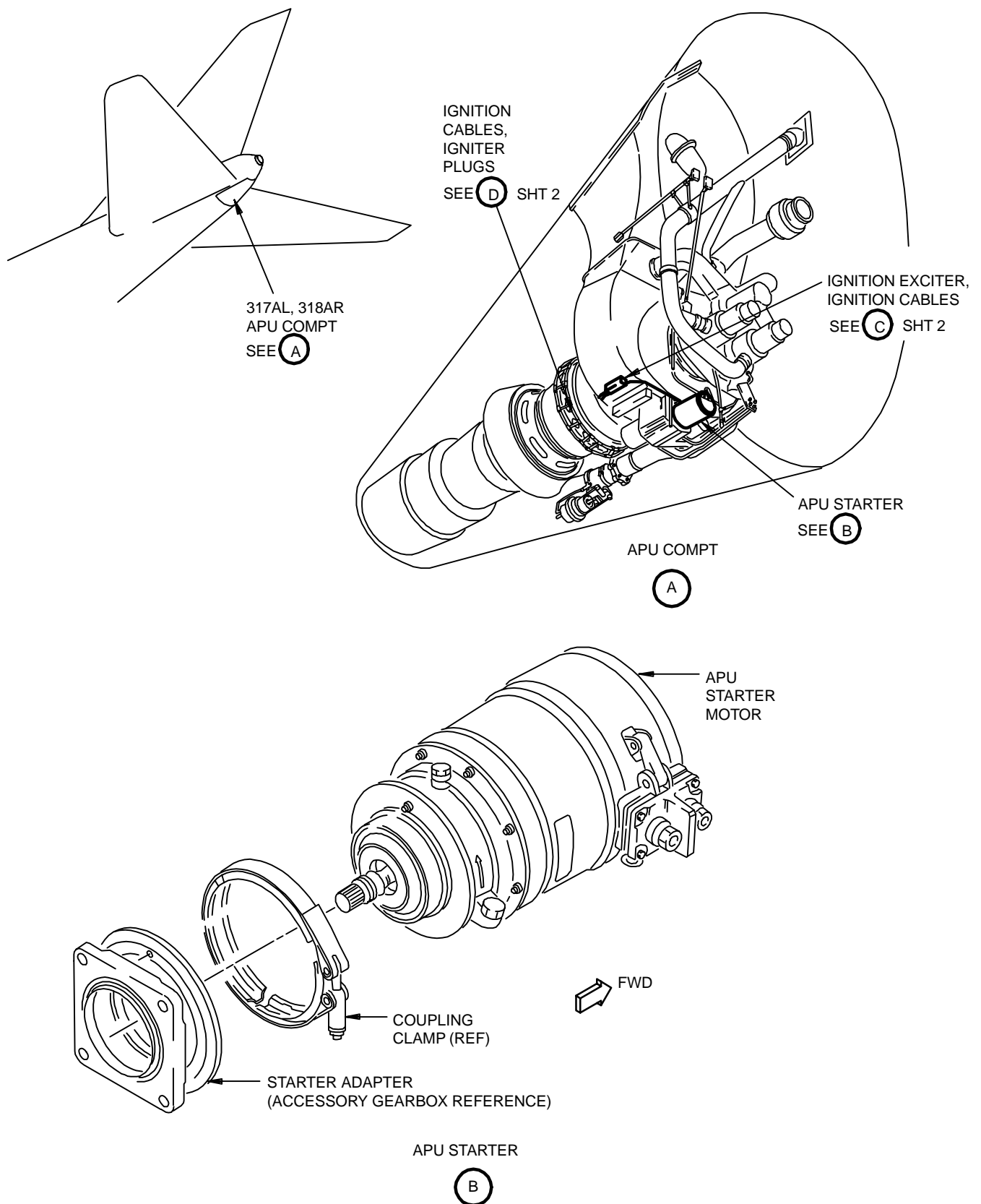
COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CABLES - IGNITION	2	2	317AL,318AR, APU COMPT	49-41-01
CIRCUIT BREAKERS - APU START, C8816	2	1	835L, AFT EQUIP CTR, P83	*
CONTACTOR - APU CRANK, R7184	2	1	835L, AFT EQUIP CTR, P183	*
CONTROLLER - (REF 49-61-00, FIG. 101) APU, M7847				
DIODE - (REF 31-01-06, FIG. 101) M3555				
DIODE - (REF 31-01-39, FIG. 101) M4575 M4590				
EXCITER - IGNITION MODULE - (REF 24-20-00, FIG. 101) ELEC SYSTEM CONT, M7307	2	1	317AL,318AR, APU COMPT	49-41-03
MOTOR - STARTER, M3194	1	1	317AL,318AR, APU COMPT	49-41-01
PLUG - IGNITER	2	2	317AL,318AR, APU COMPT	49-41-04
RELAY - (REF 31-01-06, FIG. 101) APU START LATCH, R7730				
RELAY - (REF 31-01-15, FIG. 101) APU INLET DOOR, R7176 APU START, R7188				
RELAY - (REF 31-01-39, FIG. 101) APU FAULT, R7198 APU FUEL CONTROL, R7200				

\* SEE WDM EQUIPMENT LIST

APU Starting and Ignition - Component Index  
Figure 101

**Figure 14    APU STARTING AND IGNITION - COMPONENT INDEX**

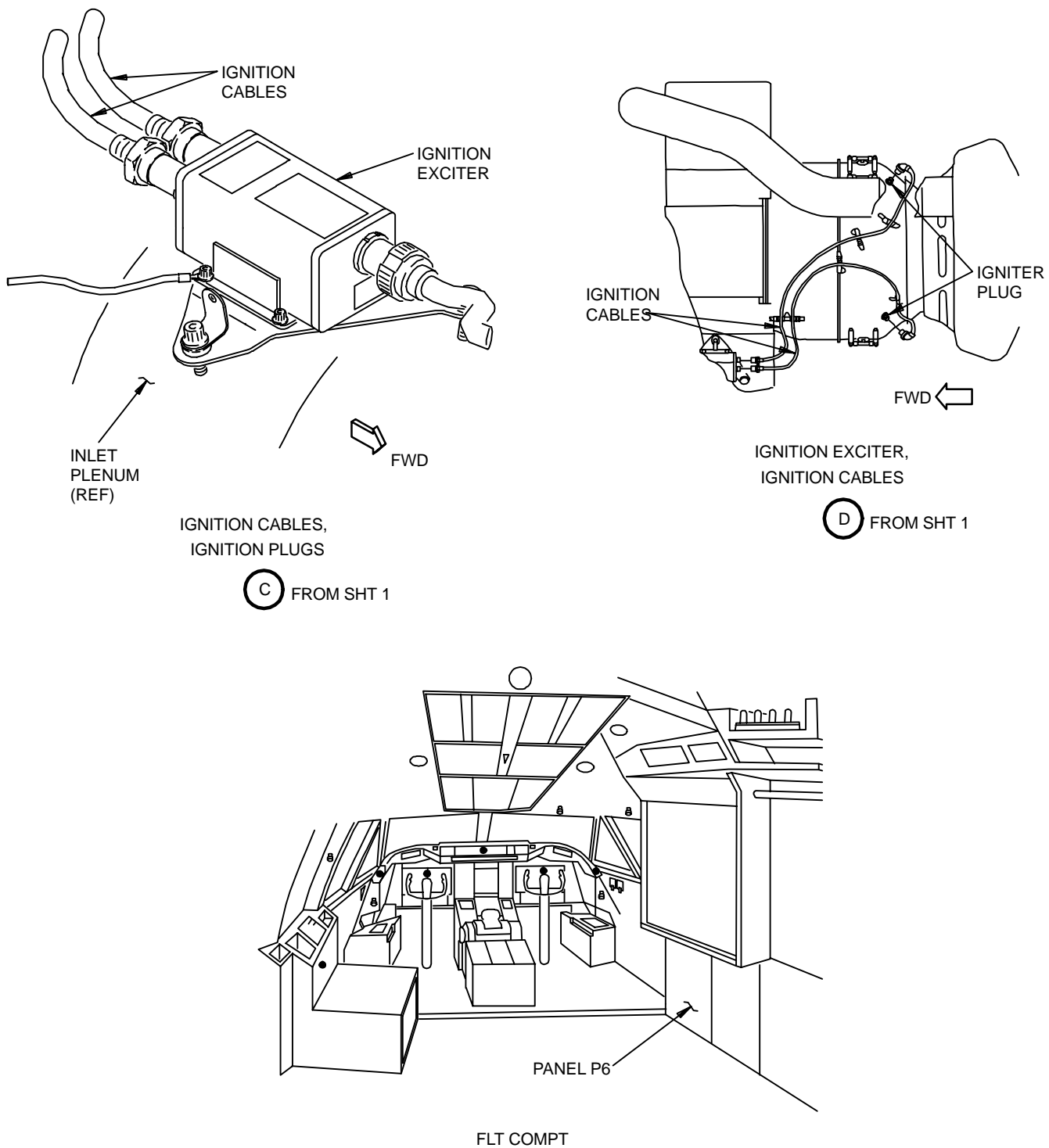




APU Starting and Ignition - Component Location  
Figure 102 (Sheet 1)

**Figure 15 APU STARTING AND IGNITION - COMPONENT LOCATION**

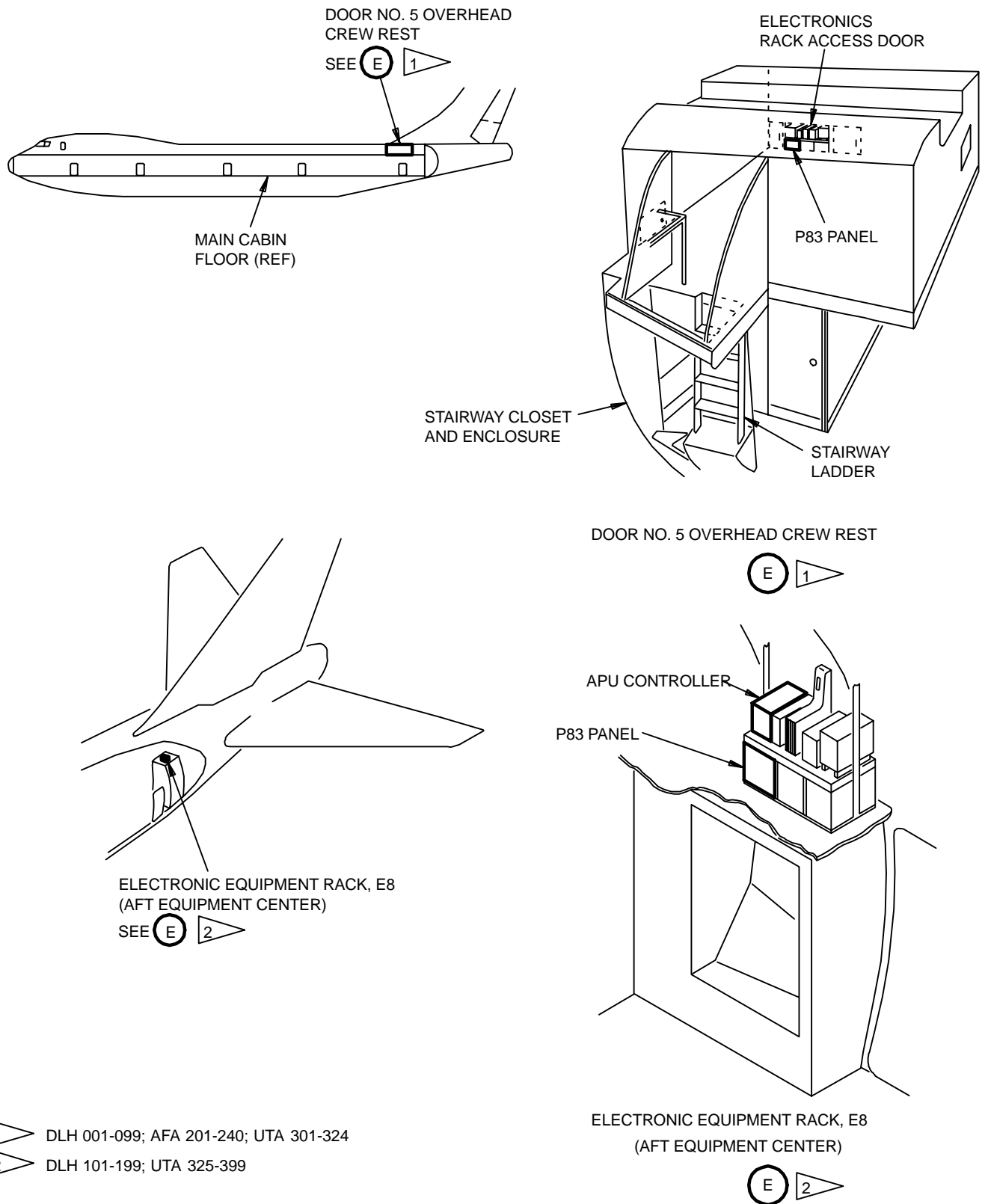




APU Starting and Ignition - Component Location  
Figure 102 (Sheet 2)

**Figure 16 APU STARTING AND IGNITION - COMPONENT LOCATION**

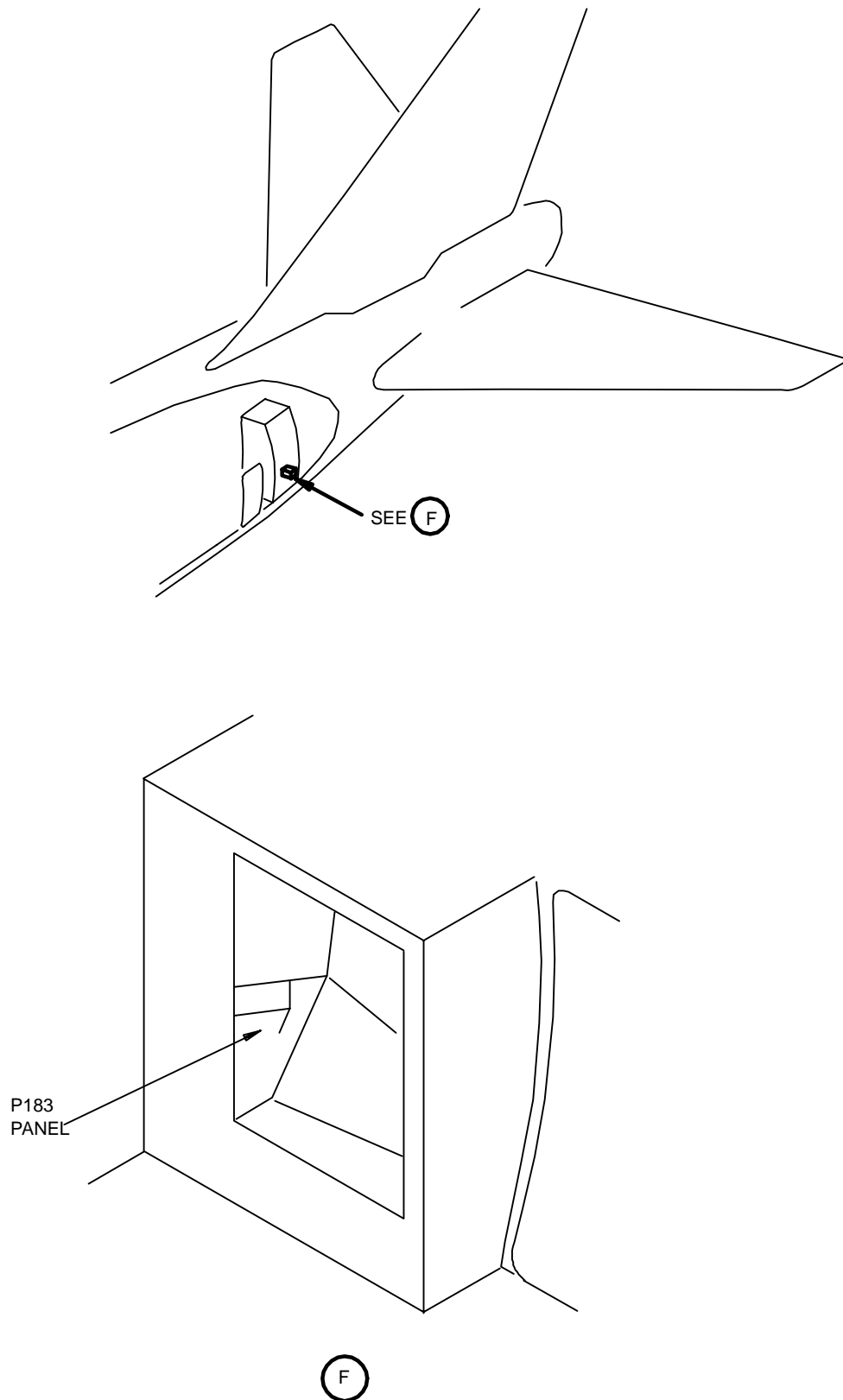




APU Starting and Ignition - Component Location  
Figure 102 (Sheet 3)

**Figure 17 APU STARTING AND IGNITION - COMPONENT LOCATION**






APU Starting and Ignition - Component Location  
Figure 102 (Sheet 4)

**Figure 18 APU STARTING AND IGNITION - COMPONENT LOCATION**

## 49-51      APU COOLING AIR SYSTEM



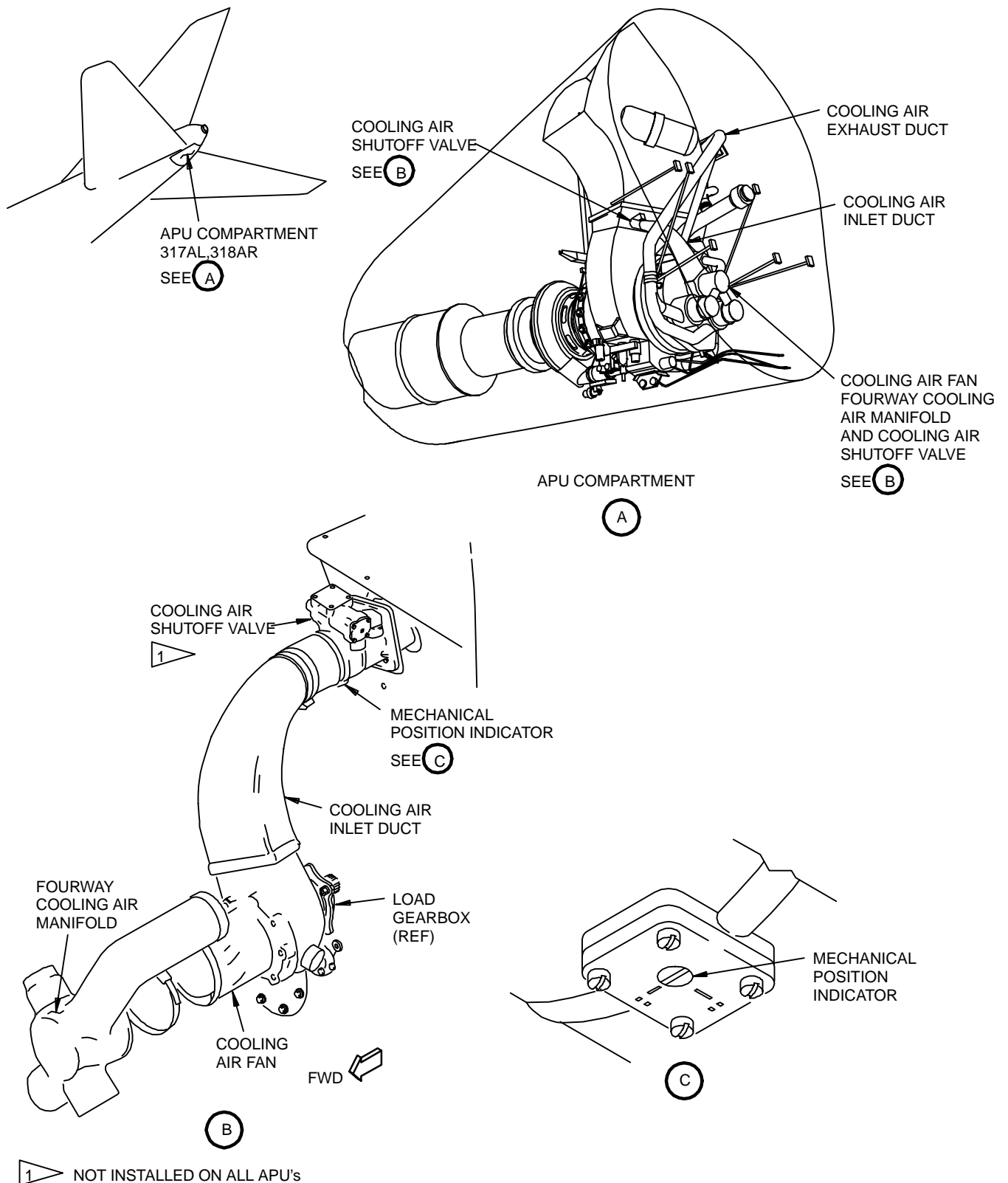
APU COOLING AIR SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
DUCT - COOLING AIR EXHAUST	--	1	317AL,318AR, APU COMPT	49-51-00
DUCT - COOLING AIR INLET	--	1	317AL,318AR, APU COMPT	49-51-00
FAN - COOLING AIR	--	1	317AL,318AR, APU COMPT	49-51-02
MANIFOLD - FOURWAY COOLING AIR	--	1	317AL,318AR, APU COMPT	49-51-00
VALVE - COOLING AIR SHUTOFF 	--	1	317AL,318AR, APU COMPT	49-51-01

 NOT INSTALLED ON ALL APU'S

APU Cooling Air System - Component Index  
Figure 101

Figure 19    APU COOLING AIR SYSTEM - COMPONENT INDEX



APU Cooling Air System - Component Location  
Figure 102

**Figure 20 APU COOLING AIR SYSTEM - COMPONENT LOCATION**







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



**49-52      APU DIVERTER AND IGV CONTROL SYSTEM**



## APU DIVERTER AND INLET GUIDE VANE CONTROL SYSTEMS

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
ACTUATOR - INLET GUIDE VANE	2	1	317AL,318AR, APU COMPT	49-52-03
CIRCUIT BREAKERS -	2		835L, AFT EQUIP CTR, P83	
APU DUCT OVERHEAT, C385		1		*
APU START, C8816 		1		
CONTROLLER - (REF 49-61-00, FIG. 101)				
APU, M7847				
DIODES -	2		835L, AFT EQUIP CTR	
M3886,M3887,M3888		1		*
M3889 		1		*
M3890,M3891		1		*
M4648,M4649 		1		*
FILTER - P3 AIR	1	1	317AL,318AR, APU COMPT	49-52-08
LIGHT - (REF 31-01-15, FIG. 101)				
APU DUCT OVERHEAT, L6				
RELAY - (REF 31-01-15, FIG. 101)				
BLEED VALVE CLOSED, R8079				
DUCT OVERHEAT, R686				
PACK 1 CLOSED, R8077				
PACK 3 CLOSED, R8078				
SENSOR - RATE	1	1	317AL,318AR, APU COMPT	49-52-07
SWITCH - (REF 31-01-15, FIG. 101)				
APU DUCT OVERHEAT RESET, S220				
SWITCHES - THRM (REF 26-19-00, FIG. 1)				
S969 THRU S986				
S1173,S1924				
S2207 THRU S2213 				
UNIT - DIVERTER VALVE CONTROL	1	1	317AL,318AR, APU COMPT	49-52-06
UNIT - (REF 31-61-00, FIG. 101)				
C EICAS INTERFACE, M7352				
L EICAS INTERFACE, M7353				
R EICAS INTERFACE, M7351				
VALVE - DIVERTER	2	1	317AL,318AR, APU COMPT	49-52-04

\* SEE THE WDM EQUIPMENT LIST

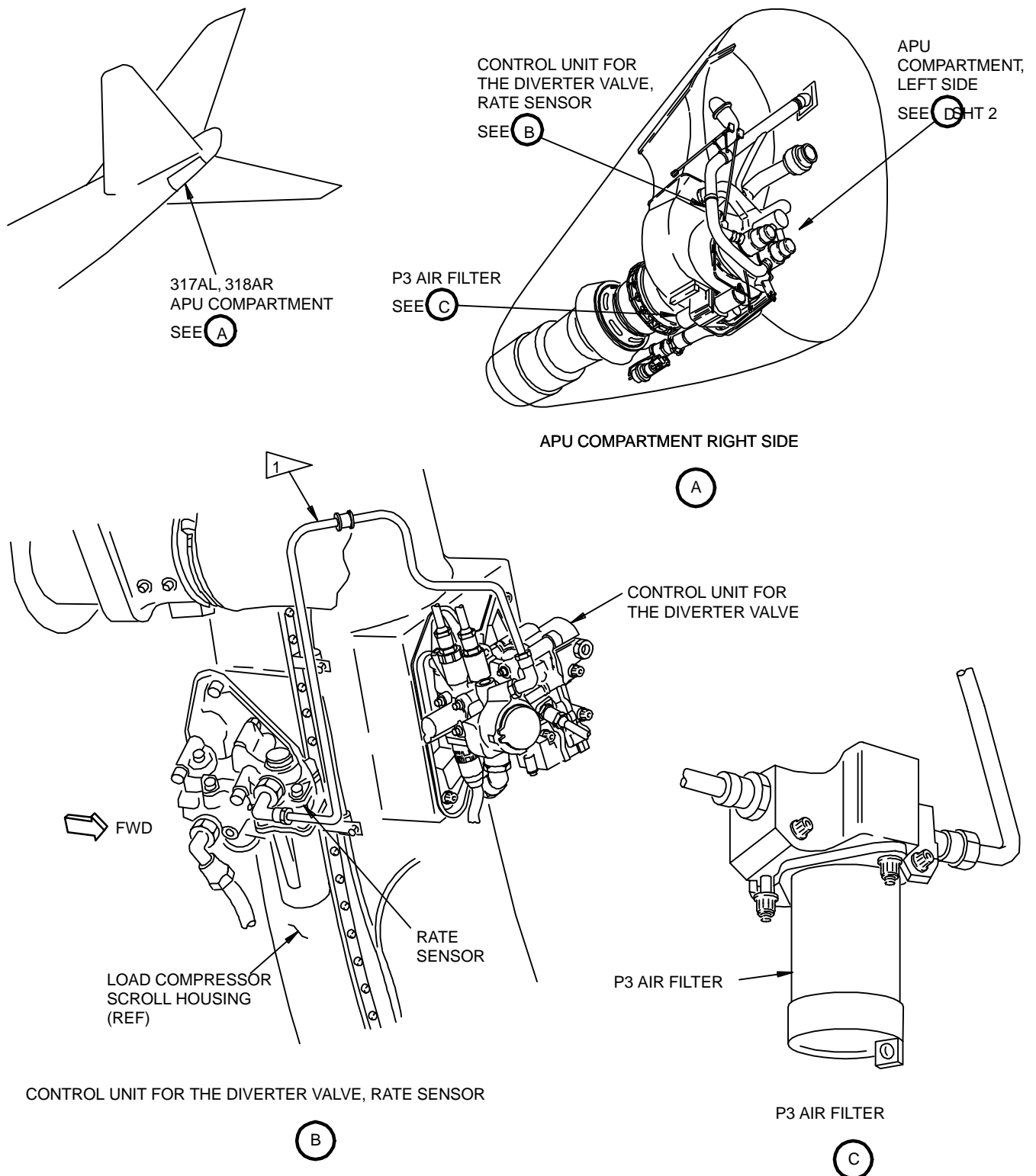
-  1 DLH 002
-  2 ALL EXCEPT DLH 002
-  3 DLH 001-006,101-104
-  4 ALL EXCEPT DLH 001-006,101-104

APU Diverter and Inlet Guide Vane Control Systems - Component Index  
Figure 101

**Figure 21 APU DIVERTER AND IGV CONTROL - COMPONENT INDEX**





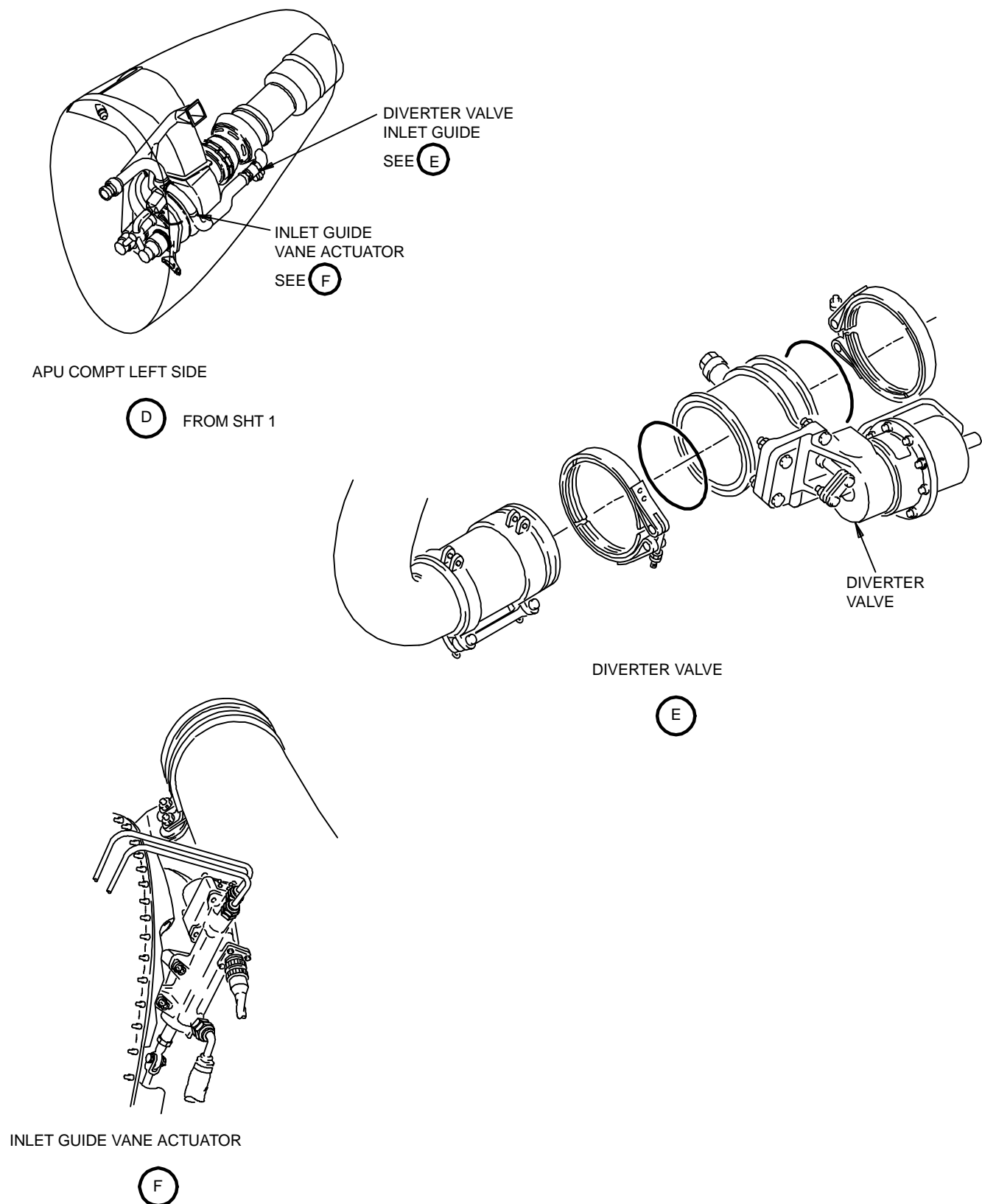


1 ON APUs WITH THE SENSE LINE BETWEEN THE DIVERTER VALVE CONTROL AND THE RATE SENSOR

APU Diverter Control and Inlet Guide Vane Control System - Component Location  
Figure 102 (Sheet 1)

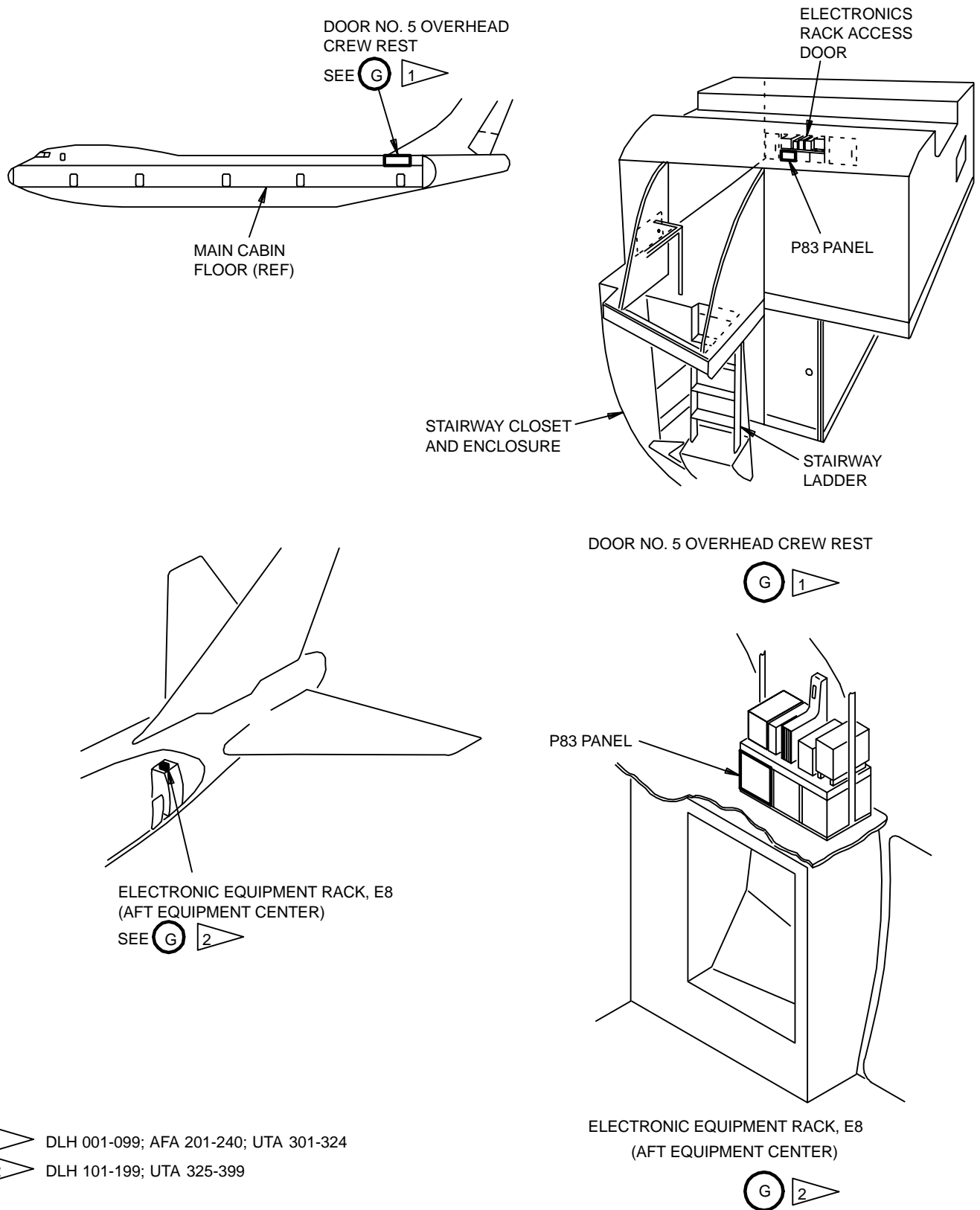
**Figure 22 APU DIVERTER AND IGV CONTROL - COMPONENT LOCATION**





APU Diverter Control and Inlet Guide Vane Control System - Component Location  
Figure 102 (Sheet 2)

**Figure 23 APU DIVERTER AND IGV CONTROL - COMPONENT LOCATION**



APU Diverter Control and Inlet Guide Vane Control System - Component Location  
Figure 102 (Sheet 3)

**Figure 24 APU DIVERTER AND IGV CONTROL - COMPONENT LOCATION**



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**49-61      APU CONTROLS**



## APU CONTROLS

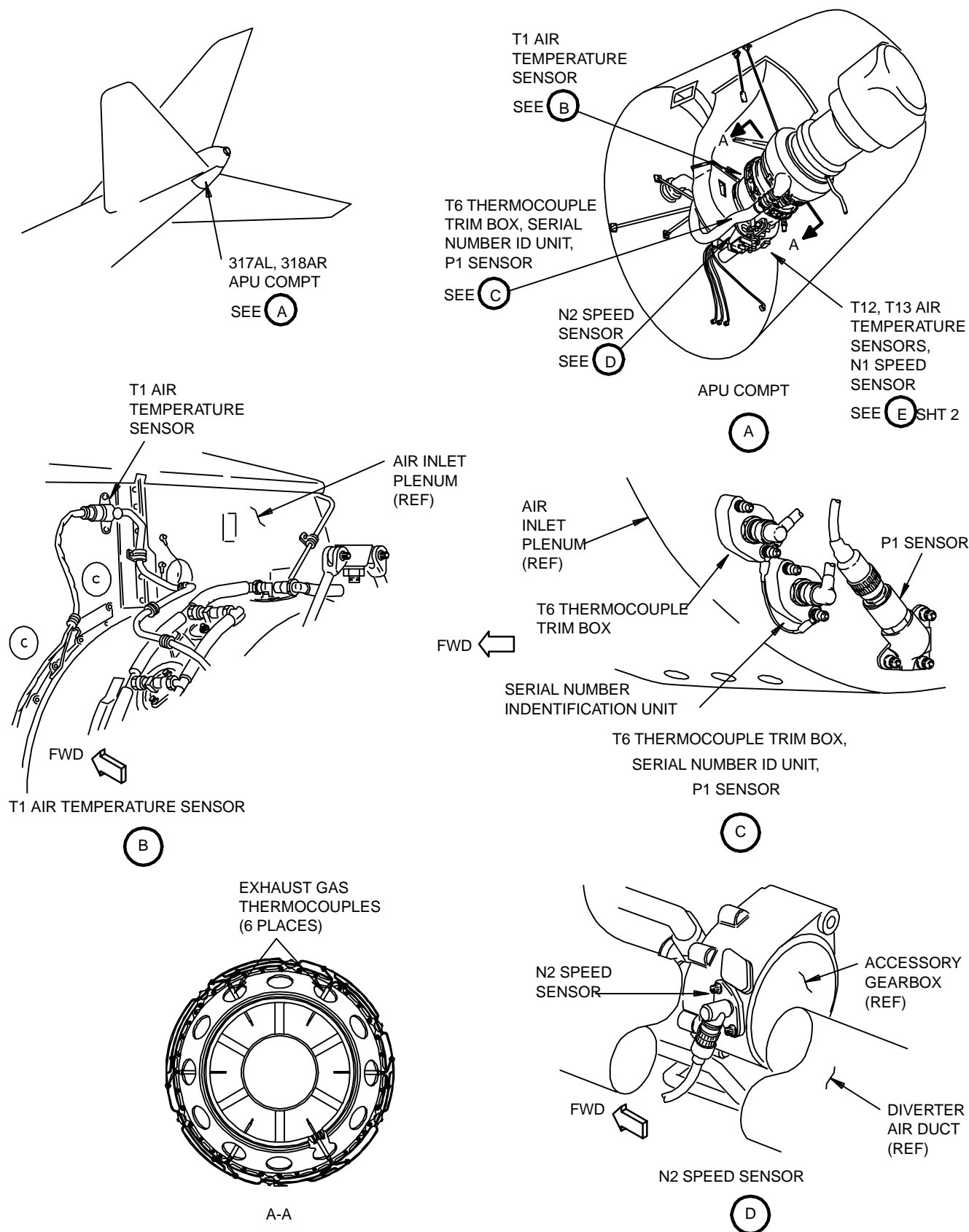
COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
BOX - T6 THERMOCOUPLE TRIM	1	1	317AL,318AR, APU COMPT	49-61-04
CIRCUIT BREAKER	2		FLT COMPT, P6	
APU ALTN CTRL, C8814		1	6K18	*
CIRCUIT BREAKERS -	3		835L, AFT EQUIP CTR, E8, P83	
APU DRIVE CONT, C8815		1		*
APU START, C8816		1		*
CONTROLLER - APU, M7847	4	1	835L, AFT EQUIP CTR, E8	49-61-07
DIODE - (REF 31-01-15, FIG. 101)				
M3200				
M3202				
RELAY - (REF 31-01-15, FIG. 101)				
AIR/GND, R359				
APU 95% GEN AVAIL, R8310				
APU 95% SPEED, R7715				
ECS ON, R7802				
RELAY - (REF 31-01-36, FIG. 101)				
ENABLE 7, R8059				
RELAY - (REF 31-01-39, FIG. 101)				
APU FAULT, R7198				
SENSORS -				
AIR TEMPERATURE, T1, T1515	1	1	317AL,318AR, APU COMPT	49-61-05
AIR TEMPERATURE, T12, T1513	2	1	317AL,318AR, APU COMPT	49-61-05
AIR TEMPERATURE, T13, T1514	2	1	317AL,318AR, APU COMPT	49-61-05
SENSOR - INLET PRESSURE (P1), T1502	1	1	317AL,318AR, APU COMPT	49-61-06
SENSOR - SPEED (N1), T1505	2	1	317AL,318AR, APU COMPT	49-61-02
SENSOR - SPEED (N2), T1506	1	1	317AL,318AR, APU COMPT	49-61-02
SWITCH - APU MASTER CONT, M7307	2	1	FLT COMPT, P5	*
THERMOCOUPLES - EXHAUST GAS, T1508	1	6	317AL,318AR, APU COMPT	49-61-03
TRANSFORMER - CURRENT, T1503	4	1	146AZ, ACCESS STA 2160 BULKHEAD DOOR	49-61-1 1
TRANSFORMER - CURRENT, T1504	4	1	146AZ, ACCESS STA 2160 BULKHEAD DOOR	49-61-1 1
UNITS - (REF 31-61-00, FIG. 101)				
C EICAS INTERFACE, M7352				
L EICAS INTERFACE, M7353				
R EICAS INTERFACE, M7351				
UNIT - SERIAL NUMBER IDENTIFICATION, M3373	1	1	317AL,318AR, APU COMPT	49-61-10

\* SEE WDM EQUIPMENT LIST

APU Controls - Component Index  
Figure 101

Figure 25 APU CONTROLS - COMPONENT INDEX

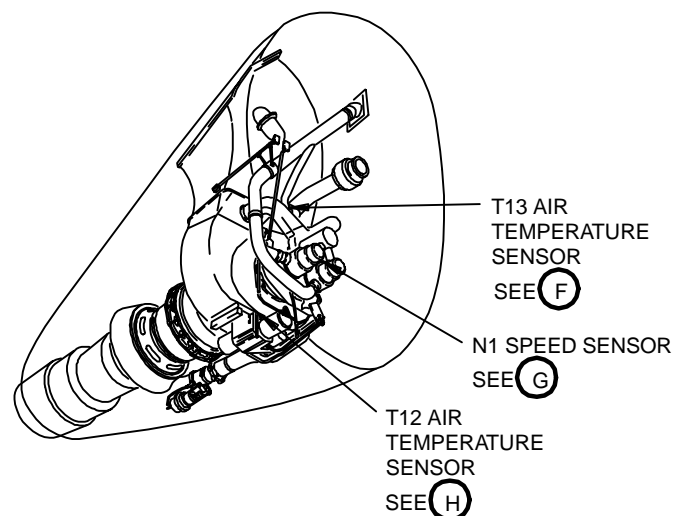




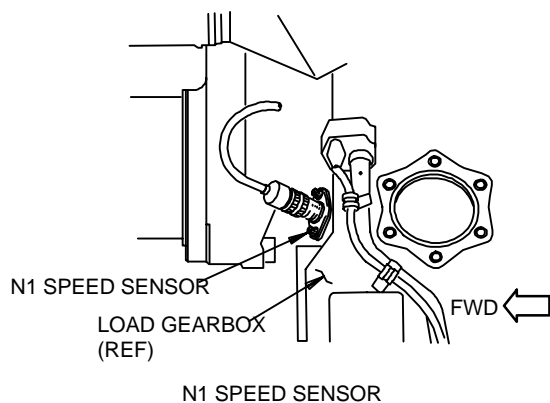
APU Controls - Component Location  
Figure 102 (Sheet 1)

**Figure 26 APU CONTROLS - COMPONENTS LOCATION**



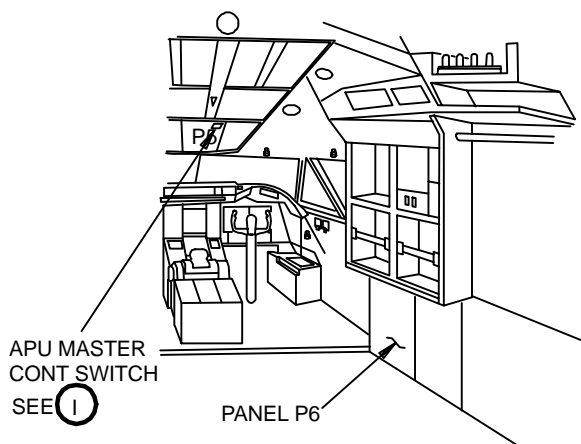
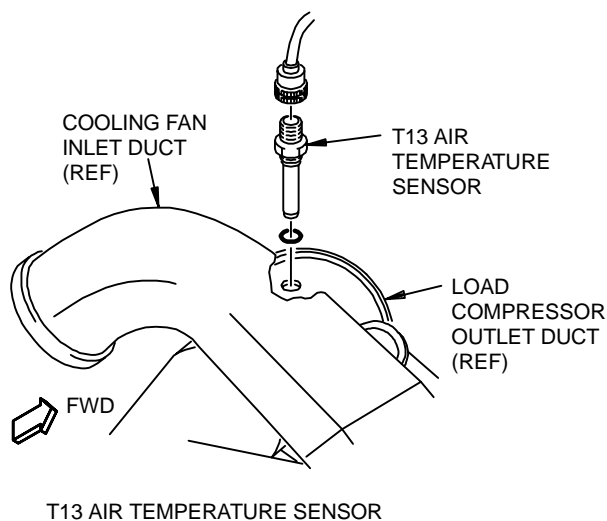
T12, T13 AIR TEMPERATURE SENSORS  
N1 SPEED SENSOR

(E) FROM SHT 1



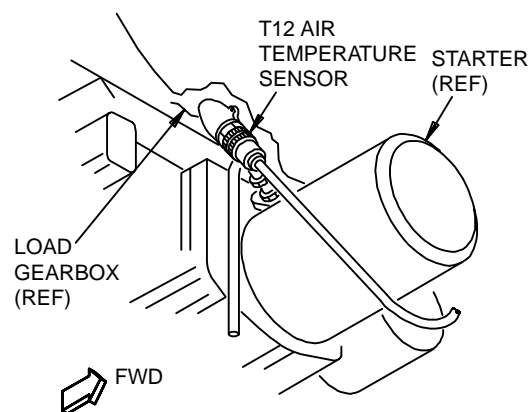
N1 SPEED SENSOR

(G)

APU Control - Component Location  
Figure 102 (Sheet 2)

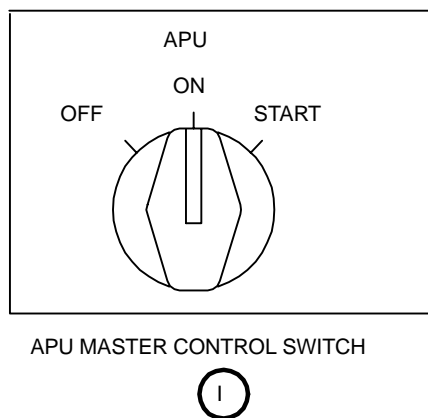
T13 AIR TEMPERATURE SENSOR

(F)



T12 AIR TEMPERATURE SENSOR

(H)

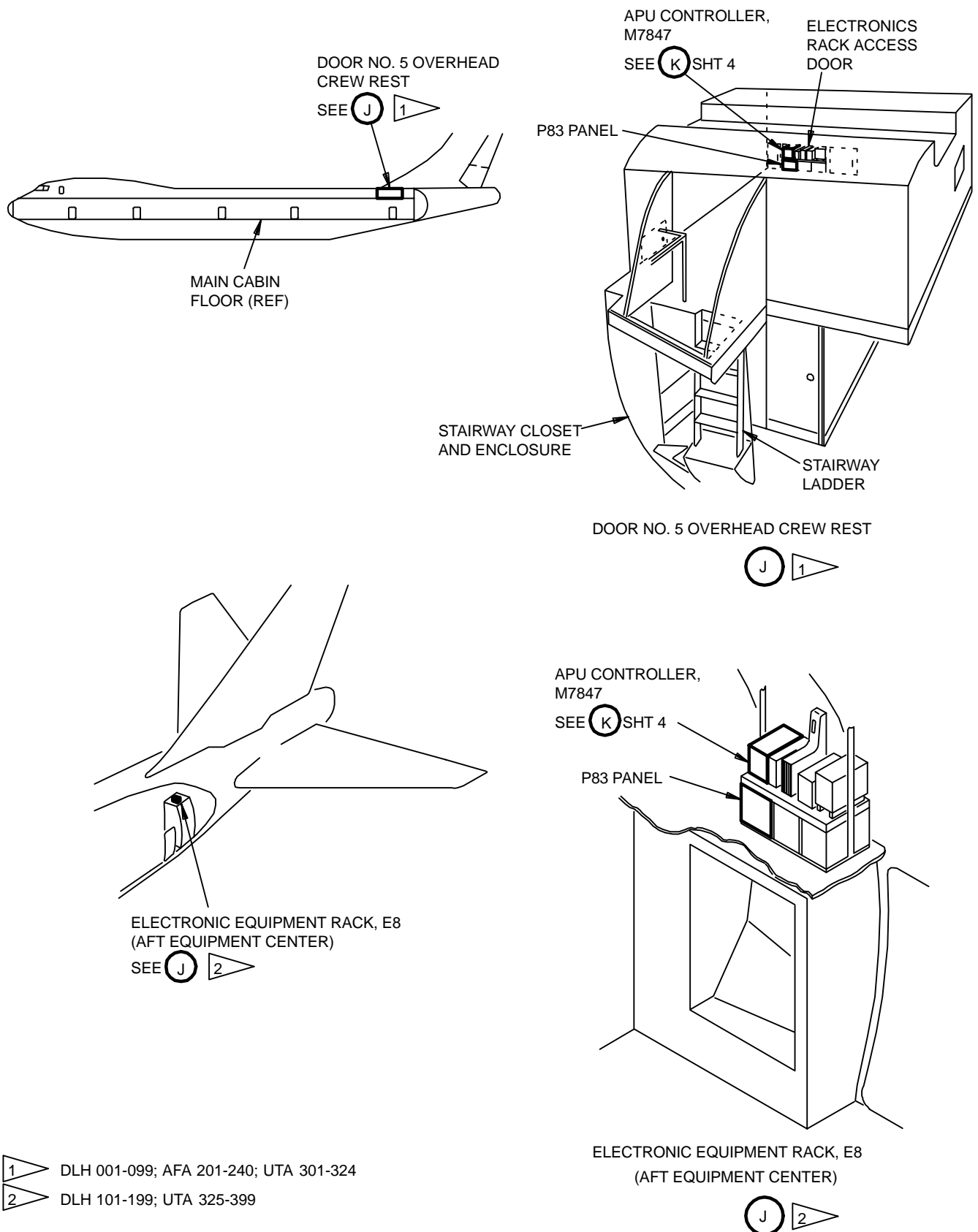


APU MASTER CONTROL SWITCH

(I)

**Figure 27 APU CONTROLS - COMPONENT LOCATION**

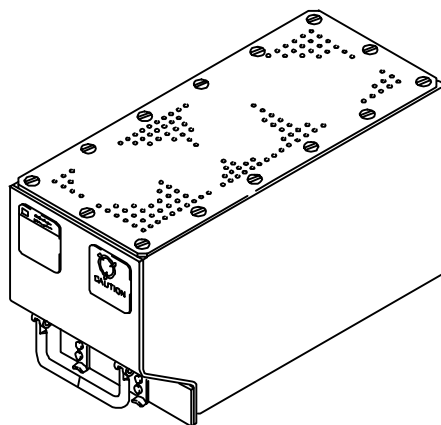




APU Controls - Component Location  
Figure 102 (Sheet 3)

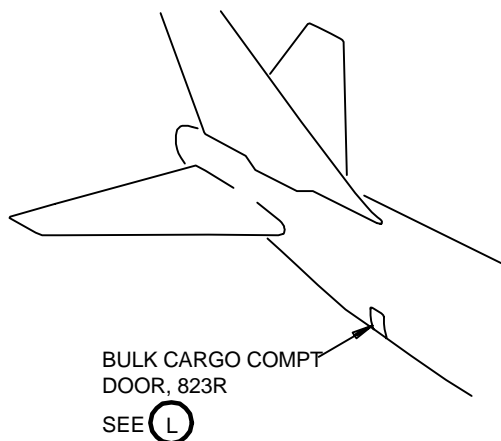
**Figure 28 APU CONTROLS - COMPONENT LOCATION**





APU CONTROLLER, M7847

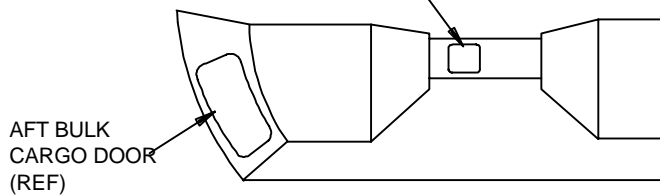
(K)

BULK CARGO COMPT  
DOOR, 823R

SEE (L)

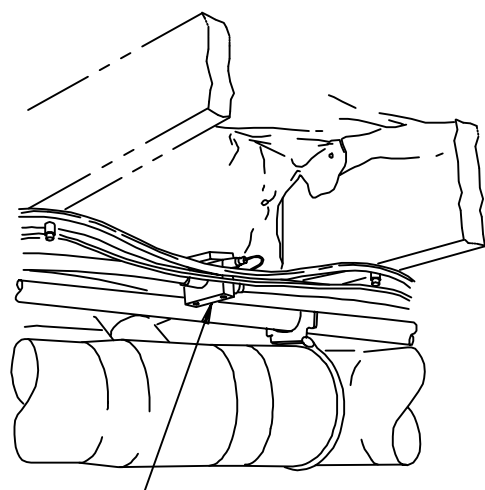
ACCESS STA 2160  
BULKHEAD DOOR, 146AZ

SEE (M) (N)

AFT BULK  
CARGO DOOR  
(REF)

BULK CARGO COMPT

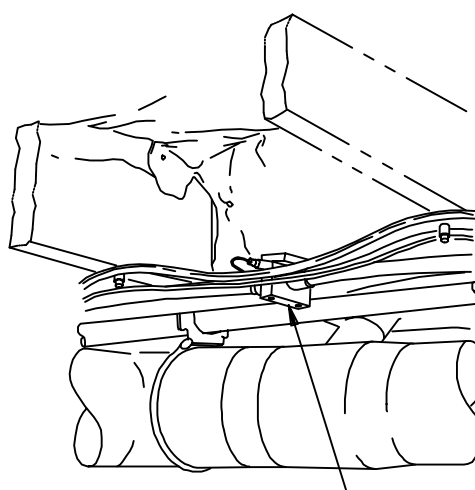
(L)



CURRENT TRANSFORMER

RIGHT STA 2160 BULKHEAD

(M)



CURRENT TRANSFORMER

LEFT STA 2160 BULKHEAD

(N)

APU Controls - Component Location  
Figure 102 (Sheet 4)**Figure 29 APU CONTROL - COMPONENT LOCATION**

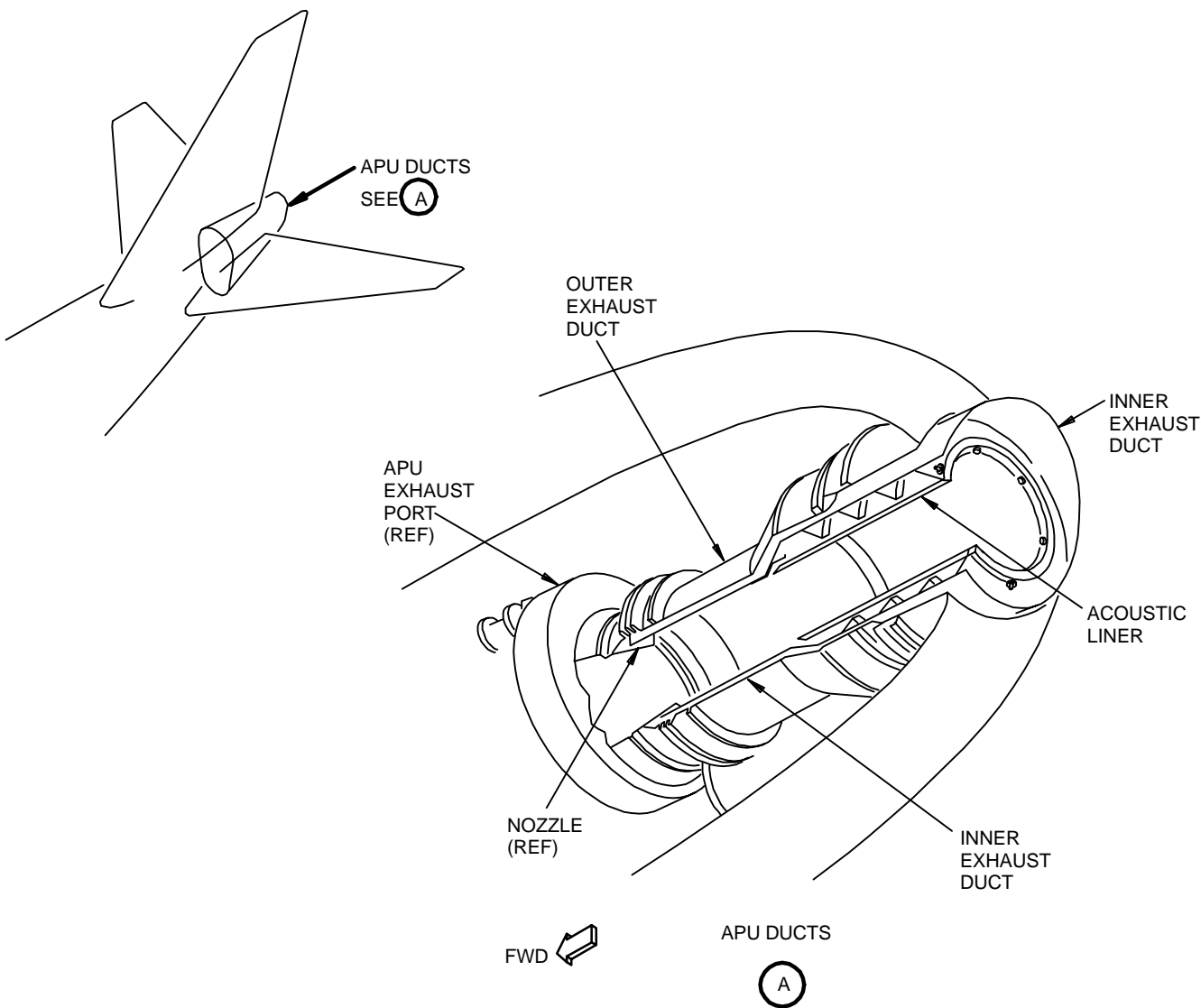
**49-81      APU EXHAUST**



APU EXHAUST SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
DUCT - INNER EXHAUST	--	1	317AL,318AR, APU COMPT	49-81-02
DUCT - OUTER EXHAUST	--	1	317AL,318AR, APU COMPT	49-81-01
LINER - ACOUSTIC	--	1	317AL,318AR	49-81-03

APU Exhaust System - Component Index  
Figure 101



APU Exhaust System - Component Location  
Figure 102

Figure 30 APU EXHAUST SYSTEM - COMPONENT LOCATION

## **49-91      APU OIL EXTERNAL DISTRIBUTION SYSTEM**

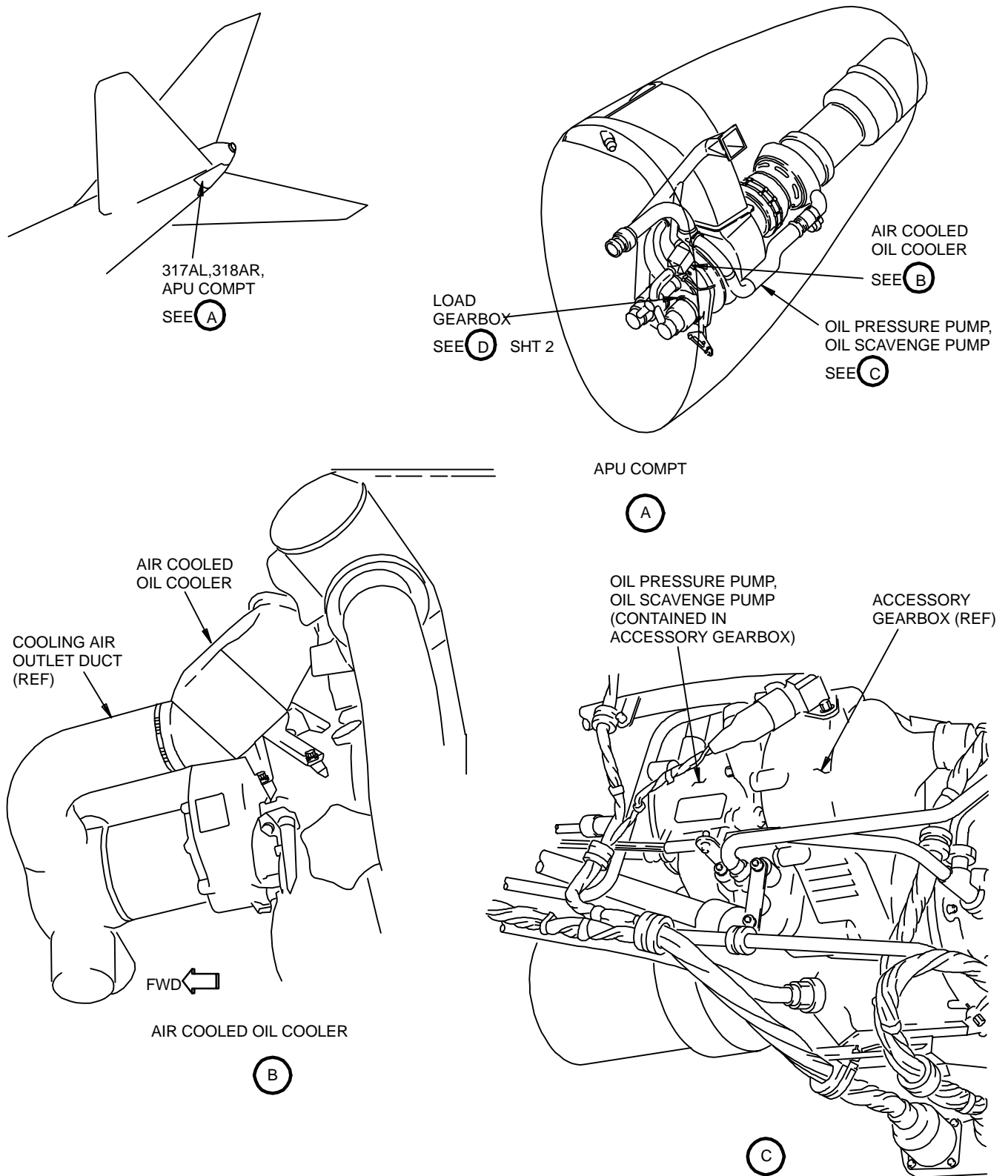


APU OIL EXTERNAL DISTRIBUTION SYSTEM

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
COOLER - AIR COOLED OIL	1	1	317AL,318AR, APU COMPT	49-91-00
COOLER - FUEL COOLED OIL	2	1	317AL,318AR, APU COMPT	49-91-00
GEARBOX - LOAD (OIL TANK)	2	1	317AL,318AR, APU COMPT	49-91-00
PUMP - OIL PRESSURE	1	1	317AL,318AR, APU COMPT	49-91-00
PUMP - OIL SCAVENGE	1	1	317AL,318AR, APU COMPT	49-91-00
VALVE - PRESSURE REGULATING	2	1	317AL,318AR, APU COMPT	49-91-00

APU Oil External Distribution - Component Index  
Figure 101

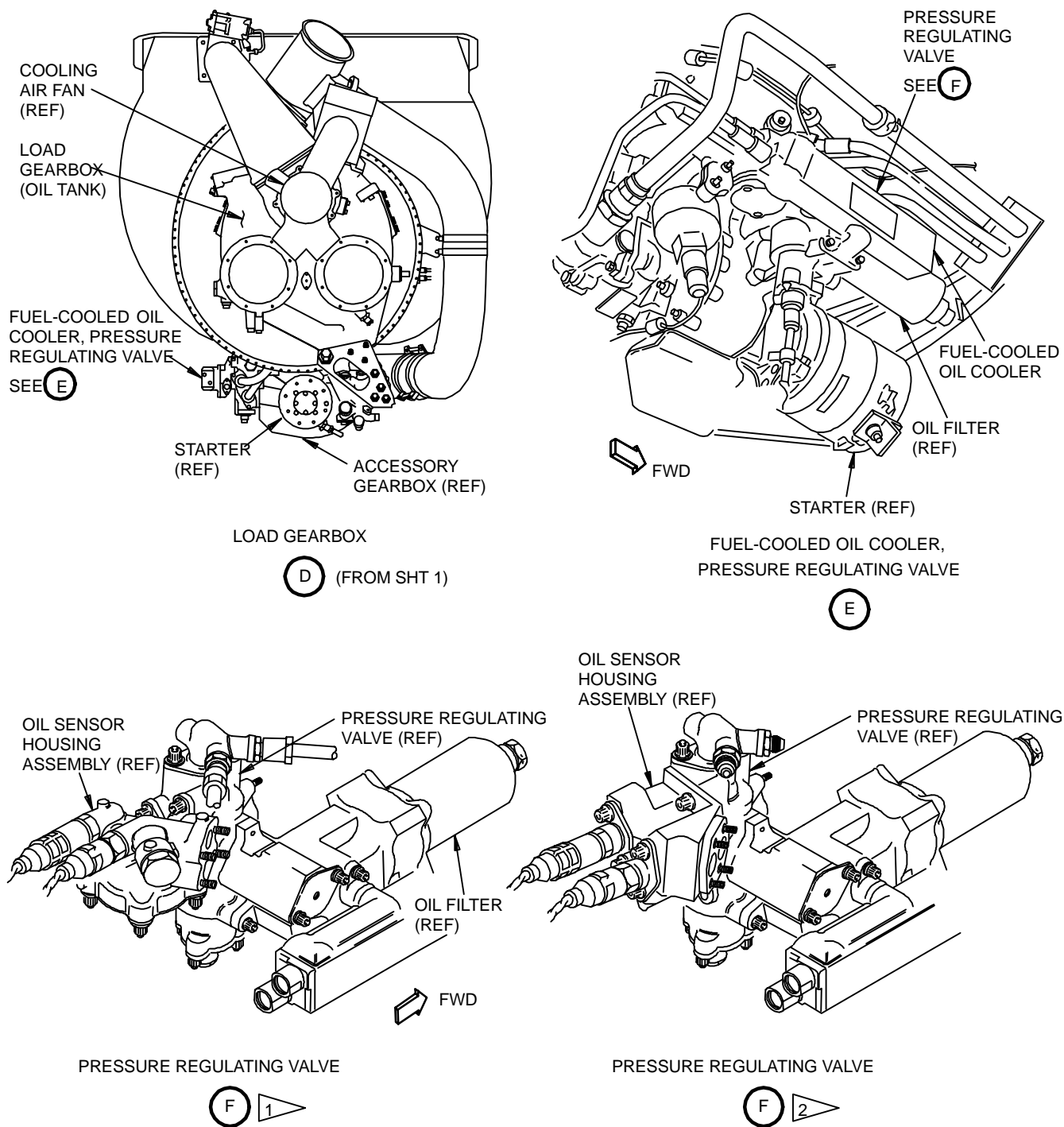
Figure 31    APU OIL EXT DISTRIBUTION - COMPONENT INDEX



APU Oil External Distribution System - Component Location  
Figure 102 (Sheet 1)

**Figure 32 APU OIL EXT DISTRIBUTION - COMPONENT LOCATION**





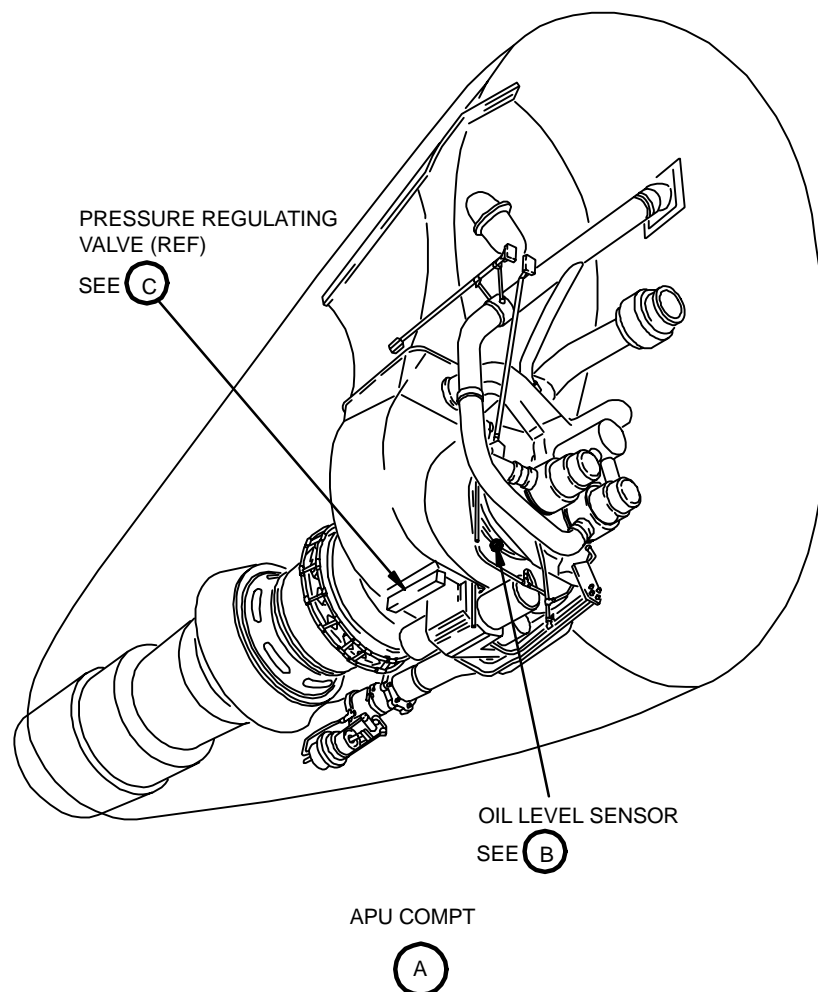
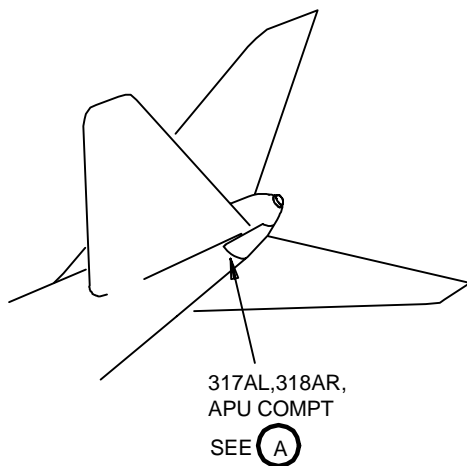
APU Oil External Distribution System - Component Location  
Figure 102 (Sheet 2)

**Figure 33 APU OIL EXT DISTRIBUTION SYSTEM - COMPONENT LOCATION**

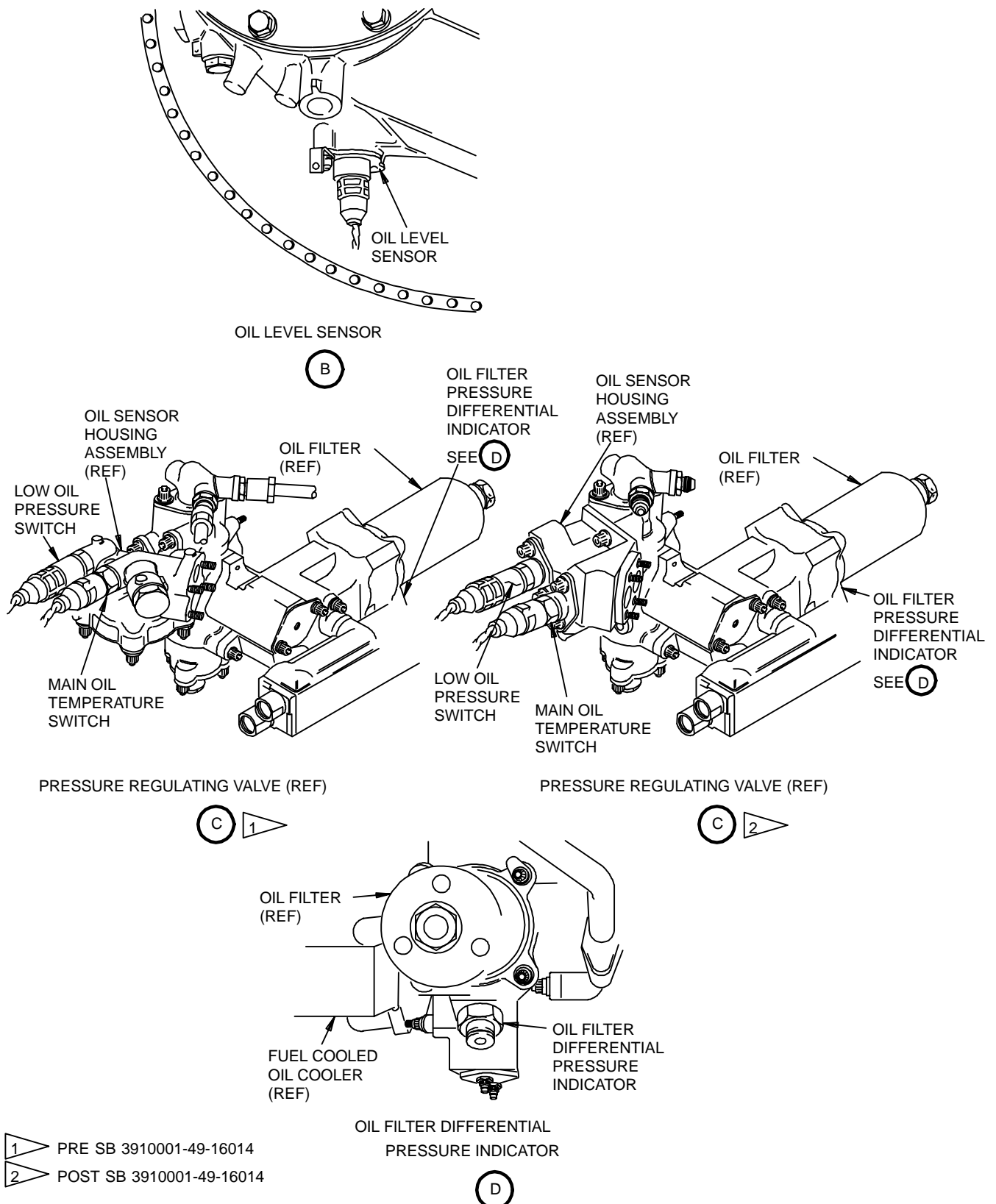


## 49-94      APU OIL INDICATING SYSTEM





APU Oil Indicating System - Component Location  
Figure 102 (Sheet 1)  
**Figure 34 APU OIL INDICATING SYSTEM**



APU Oil Indicating System - Component Location  
Figure 102 (Sheet 2)

**Figure 35 APU OIL INDICATING SYSTEM**



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