

CHAPTER

29

HYDRAULIC POWER



**737-600/700/800/900
AIRCRAFT MAINTENANCE MANUAL**

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HYDRAULIC POWER**

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20	BLANK		R 615	Jun 15/2009		O 654	Jun 15/2009	
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902	Feb 10/2006		A 216	Jun 15/2009		R 202	Jun 15/2009	
903	Jun 10/2006		A 217	Jun 15/2009		203	Oct 10/2003	
904	Feb 10/2006		A 218	BLANK		204	Oct 10/2003	
905	Jun 10/2006		29-09-02			205	Feb 15/2009	
906	Feb 10/2006		201	Feb 15/2009		206	Feb 15/2008	
907	Feb 10/2006		202	Feb 15/2009		207	Oct 10/2003	
908	Feb 10/2006		203	Feb 15/2009		208	Jun 10/2007	
909	Feb 10/2006		204	Feb 15/2009		209	Oct 15/2008	
910	Feb 10/2006		205	Feb 15/2009		210	Oct 15/2008	
911	Jun 10/2006		206	Feb 15/2009		211	Oct 15/2008	
912	Jun 10/2006		207	Feb 15/2009		212	Oct 15/2008	
913	Jun 10/2006		208	BLANK		213	Oct 15/2008	
914	BLANK		29-09-03			214	BLANK	
29-09-00			401	Feb 15/2009		29-11-00		
201	Feb 15/2009		402	Feb 15/2009		501	Oct 10/2003	
202	Feb 15/2009		403	Feb 15/2009		502	Oct 10/2005	
203	Feb 15/2009		404	Feb 15/2009		503	Oct 15/2008	
204	Feb 15/2009		405	Feb 15/2009		504	Oct 15/2008	
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502	Feb 15/2009		203	Feb 15/2009		29-11-00		
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603	Feb 15/2008		603	Jun 10/2007		402	Oct 10/2003	
604	Feb 15/2008		604	Jun 10/2007		403	Oct 10/2003	
29-11-01			29-11-04			404	Oct 10/2003	
201	Jun 10/2007		401	Feb 15/2009		405	Oct 10/2003	
202	Jun 10/2007		402	Feb 15/2009		406	Oct 10/2003	
203	Jun 10/2007		403	Oct 10/2003		407	Oct 10/2003	
204	Jun 10/2007		404	Oct 10/2003		408	Oct 10/2003	
205	Jun 10/2007		405	Feb 15/2009		409	Feb 15/2009	
206	Oct 10/2007		406	Feb 15/2009		410	Feb 10/2007	
207	Jun 10/2007		407	Feb 15/2009		411	Feb 10/2007	
208	BLANK		408	Feb 15/2009		412	Feb 10/2007	
29-11-01			409	Feb 15/2009		29-11-21		
501	Jun 10/2007		410	Feb 15/2009		501	Feb 15/2009	
502	Jun 10/2007		29-11-04			502	Feb 15/2009	
503	Jun 10/2007		601	Feb 15/2009		503	Feb 15/2009	
504	Jun 10/2007		602	Feb 15/2009		504	Feb 15/2009	
505	Jun 10/2007		603	Feb 10/2007		505	Feb 15/2009	
506	Jun 10/2007		604	BLANK		506	Oct 10/2003	
507	Jun 10/2007		29-11-08			507	Oct 10/2003	
508	BLANK		401	Oct 10/2003		508	BLANK	
29-11-02			402	Oct 10/2003		29-11-27		
401	Feb 15/2009		403	Oct 10/2003		401	Oct 15/2008	
402	Feb 15/2009		404	Oct 10/2003		402	Jun 15/2008	
403	Jun 10/2007		405	Oct 10/2003		403	Jun 15/2008	
404	Jun 10/2007		406	Oct 15/2008		404	Oct 10/2003	
405	Jun 10/2007		407	Oct 10/2007		405	Oct 10/2003	
406	Feb 15/2009		408	BLANK		406	Jun 15/2008	
407	Feb 15/2009		29-11-11 Config 1			407	Feb 10/2004	
408	Feb 15/2009		401	Feb 15/2008		408	BLANK	
409	Feb 15/2009		402	Feb 15/2008		29-11-31		
410	Feb 15/2009		403	Feb 15/2008		401	Oct 10/2003	
411	Feb 15/2009		404	Oct 10/2003		402	Oct 10/2003	
412	BLANK		405	Oct 10/2003		403	Oct 10/2003	
29-11-02			406	Oct 15/2008		404	Oct 10/2003	
601	Jun 10/2007		407	Feb 15/2009		405	Oct 10/2003	
602	Jun 10/2007		408	Feb 15/2008		406	Oct 15/2008	
29-11-03			409	Oct 10/2007		407	Oct 10/2007	
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410	Oct 10/2007		408	Jun 15/2008		A 410	BLANK	
411	Feb 10/2006		409	Oct 10/2007		29-11-91		
412	BLANK		410	Oct 10/2007		401	Oct 10/2005	
29-11-41			29-11-61			402	Oct 10/2005	
401	Feb 15/2009		601	Feb 15/2009		403	Oct 10/2005	
402	Feb 15/2009		602	BLANK		404	Oct 10/2005	
403	Feb 15/2009		29-11-71			29-18-01		
404	Feb 10/2006		401	Feb 15/2009		401	Oct 10/2003	
405	Feb 10/2006		402	Oct 10/2003		402	Feb 10/2005	
406	Feb 10/2006		403	Jun 10/2005		403	Oct 10/2003	
407	Feb 15/2009		404	Oct 10/2003		404	Oct 15/2008	
408	Feb 15/2009		405	Oct 10/2003		405	Oct 10/2003	
409	Jun 15/2008		406	Oct 10/2003		406	BLANK	
410	Jun 15/2008		407	Oct 10/2003		29-18-11		
411	Jun 15/2008		408	Oct 10/2005		401	Feb 15/2009	
412	Jun 15/2008		409	Oct 10/2003		402	Oct 10/2003	
413	Jun 15/2008		410	Oct 15/2008		403	Oct 10/2003	
414	Jun 15/2008		411	Jun 15/2008		404	Jun 15/2008	
29-11-51			412	Jun 15/2008		405	Feb 15/2009	
401	Feb 15/2009		413	Jun 15/2008		406	Feb 15/2009	
402	Feb 15/2009		414	Feb 15/2009		29-18-21		
403	Feb 15/2009		415	Feb 15/2009		401	Oct 10/2003	
404	Feb 15/2009		416	Feb 15/2009		402	Oct 10/2003	
405	Feb 15/2009		417	Feb 15/2009		403	Oct 10/2003	
406	Feb 15/2009		418	Jun 15/2008		404	Jun 15/2008	
407	Feb 15/2009		419	Oct 15/2008		405	Oct 10/2007	
408	Feb 15/2009		420	Jun 15/2008		406	BLANK	
409	Feb 15/2009		421	Oct 15/2008		29-21-00		
410	Feb 15/2009		422	Jun 15/2008		201	Jun 10/2005	
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412	BLANK		401	Feb 15/2009		203	Jun 10/2007	
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506	Feb 15/2009		406	Feb 15/2009		406	Oct 15/2008	
507	Oct 15/2008		407	Feb 15/2009		407	Feb 15/2009	
R 508	Jun 15/2009		408	Jun 15/2008		408	Oct 10/2007	
509	Oct 15/2008		409	Jun 15/2008		29-22-21		
510	Feb 15/2009		410	Feb 15/2009		401	Feb 15/2009	
511	Feb 15/2009		411	Jun 15/2008		402	Feb 15/2009	
512	Feb 15/2009		412	BLANK		403	Oct 10/2003	
513	Feb 15/2009		29-21-51			404	Feb 15/2008	
514	Jun 15/2008		401	Feb 15/2009		405	Jun 15/2008	
515	Feb 15/2009		402	Jun 10/2005		406	Feb 15/2009	
516	Feb 15/2009		403	Oct 10/2003		407	Feb 15/2009	
517	Feb 15/2009		404	Oct 10/2003		408	Feb 15/2009	
518	Jun 15/2008		405	Oct 10/2003		409	Feb 15/2009	
29-21-21			406	Feb 15/2009		410	Feb 15/2009	
401	Feb 15/2009		407	Feb 15/2009		411	Feb 15/2009	
402	Feb 15/2009		408	Feb 15/2009		412	Feb 15/2009	
403	Jun 10/2007		409	Feb 15/2009		29-22-31		
404	Oct 10/2003		410	Feb 15/2009		401	Oct 10/2003	
405	Feb 15/2009		411	Feb 15/2009		402	Oct 10/2003	
406	Oct 10/2007		412	Jun 10/2005		403	Oct 10/2003	
407	Feb 15/2009		413	Oct 15/2008		404	Oct 10/2003	
408	BLANK		414	Feb 15/2009		405	Jun 15/2008	
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401	Feb 10/2007		501	Feb 15/2009		407	Feb 10/2006	
402	Feb 10/2007		502	Feb 15/2009		408	Feb 10/2005	
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405	Feb 10/2007		505	Feb 15/2009		402	Oct 10/2003	
406	Feb 10/2007		506	Feb 15/2009		403	Oct 10/2003	
407	Oct 15/2008		507	Feb 15/2009		404	Oct 10/2003	
408	Feb 10/2007		508	Feb 15/2009		405	Jun 15/2008	
409	Feb 15/2009		509	Feb 15/2009		406	Oct 10/2007	
410	Feb 10/2007		510	Feb 15/2009		407	Oct 10/2007	
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406	Oct 10/2003		410	Jun 10/2006				
407	Oct 10/2003		29-34-00					
408	BLANK		501	Feb 15/2009				
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501	Feb 15/2009		R 503	Jun 15/2009				
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504	Feb 15/2009		401	Oct 10/2003				
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401	Oct 10/2003		407	Jun 15/2008				
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Standby Reservoir Low Quantity Switch Installation TASK 29-33-21-400-801			407	HAP ALL
<u>PUMP LOW PRESSURE WARNING SYSTEM - ADJUSTMENT/TEST</u>	29-34-00		501	HAP ALL
Pump Low Pressure Warning System Test TASK 29-34-00-700-801			501	HAP ALL
<u>HYDRAULIC SYSTEMS A AND B EDP LOW PRESSURE SWITCH - REMOVAL/ INSTALLATION</u>	29-34-11		401	HAP ALL
Engine Driven Pump (EDP) Low Pressure Switch Removal TASK 29-34-11-000-801			401	HAP ALL

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CHAPTER 29
HYDRAULIC POWER

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Engine Driven Pump (EDP) Low Pressure Switch Installation TASK 29-34-11-400-801			407	HAP ALL
<u>HYDRAULIC SYSTEMS A AND B EMDP LOW PRESSURE SWITCH - REMOVAL/ INSTALLATION</u>	29-34-21		401	HAP ALL
Hydraulic System A or B EMDP Low Pressure Switch Removal TASK 29-34-21-000-801			401	HAP ALL
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<u>STANDBY HYDRAULIC SYSTEM ELECTRIC MOTOR DRIVEN PUMP (EMDP) LOW PRESSURE SWITCH - REMOVAL/ INSTALLATION</u>	29-34-31		401	HAP ALL
Standby System EMDP Low Pressure Switch Removal TASK 29-34-31-000-801			401	HAP ALL
Standby System EMDP Low Pressure Switch Installation TASK 29-34-31-400-801			404	HAP ALL

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HYDRAULIC POWER - MAINTENANCE PRACTICES

1. General

A. This procedure has two tasks:

- (1) Airworthiness Limitation Precautions
- (2) Hydraulic Fluid Replacement

B. Flush hydraulic components only with hydraulic fluid to prevent contamination of the hydraulic system.

TASK 29-00-00-910-801

2. Airworthiness Limitation Precautions

A. General

(1) Critical Design Configuration Control Limitations (CDCCLs)

(a) All occurrences of CDCCLs found in this chapter of the AMM are identified by this note after each applicable CDCCL design feature:

1) NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions (AMM 29-00-00/201), for important information on Critical Design Configuration Control Limitations (CDCCLs).

(b) Design features that are CDCCLs are defined and controlled by Special Federal Aviation Regulation (SFAR) 88, and can be found in Section 9 of the Maintenance Planning Data (MPD) document. CDCCLs are a means of identifying certain design configuration features intended to preclude a fuel tank ignition source for the operational life of the airplane. CDCCLs are mandatory and cannot be changed or deleted without the approval of the FAA office that is responsible for the airplane model Type Certificate, or applicable regulatory agency. A critical fuel tank ignition source prevention feature may exist in the fuel system and its related installation or in systems that, if a failure condition were to develop, could interact with the fuel system in such a way that an unsafe condition would develop without this limitation. Strict adherence to configuration, methods, techniques, and practices as prescribed is required to ensure the CDCCL is complied with. Any use of parts, methods, techniques or practices not contained in the applicable CDCCL must be approved by the FAA office that is responsible for the airplane model Type Certificate, or applicable regulatory agency.

(2) Airworthiness Limitation Instructions (ALIs)

(a) All occurrences of fuel tank system ALIs found in this chapter of the AMM are identified by this step after the General section in the applicable ALI inspection task:

1) ALI - Refer to the task: Airworthiness Limitation Precautions (AMM 29-00-00/201), for important information on airworthiness limitation instructions (ALIs).

(b) Inspection tasks that are ALIs are defined and controlled by Special Federal Aviation Regulation (SFAR) 88, and can be found in Section 9 of the Maintenance Planning Data (MPD) document. These ALIs identify inspection tasks related to fuel tank ignition source prevention which must be done to maintain the design level of safety for the operational life of the airplane. These ALIs are mandatory and cannot be changed or deleted without the approval of the FAA office that is responsible for the airplane model Type Certificate, or applicable regulatory agency. Strict adherence to methods, techniques and practices as prescribed is required to ensure the ALI is complied with. Any use of methods, techniques or practices not contained in these ALIs must be approved by the FAA office that is responsible for the airplane model Type Certificate, or applicable regulatory agency.

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B. Location Zones

Zone	Area
100	Lower Half of Fuselage
200	Upper Half of Fuselage
500	Left Wing
600	Right Wing

C. Critical Design Configuration Control Limitations (CDCCLs)

SUBTASK 29-00-00-910-001

WARNING: OBEY THE MANUFACTURER'S PROCEDURES WHEN YOU DO MAINTENANCE THAT HAS AN EFFECT ON A CDCCL. IF YOU DO NOT OBEY THE PROCEDURES, IT CAN INCREASE THE RISK OF A SOURCE OF FUEL TANK IGNITION. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR IF THERE IS A FIRE OR EXPLOSION.

- (1) Make sure you follow the procedures for items identified as CDCCLs.

D. Airworthiness Limitation Instructions (ALIs)

SUBTASK 29-00-00-910-002

WARNING: OBEY THE MANUFACTURER'S PROCEDURES WHEN YOU DO ANY MAINTENANCE THAT MAY AFFECT AN ALI. IF YOU DO NOT FOLLOW THE PROCEDURES, IT CAN INCREASE THE RISK OF A FUEL TANK IGNITION SOURCE.

- (1) Make sure you follow the procedures for items identified as ALIs.

END OF TASK

TASK 29-00-00-900-801

3. Hydraulic Fluid Replacement

A. References

Reference	Title
07-11-01-580-815	Lift the Airplane with the Jacks (P/B 201)
07-11-01-580-816	Lower the Airplane Off the Jacks (P/B 201)
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
24-22-00-860-813	Supply External Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-802	Hydraulic System A or B Pressurization with a Portable Hydraulic Cart (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-41-000-801	EMDP Case Drain Filter Element Removal (P/B 401)
29-11-41-400-801	EMDP Case Drain Filter Element Installation (P/B 401)
29-11-51-000-801	EDP Case Drain Filter Element Removal (P/B 401)
29-11-51-400-801	EDP Case Drain Filter Element Installation (P/B 401)

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Reference	Title
29-11-61-000-801	Return Filter Element Removal (P/B 401)
29-11-61-400-801	Return Filter Element Installation (P/B 401)
29-11-71-000-802	Hydraulic Systems A and B Pressure Filter Module Element Removal (P/B 401)
29-11-71-400-802	Hydraulic Systems A and B Pressure Module Filter Element Installation (P/B 401)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
29-21-41-000-801	Standby EMDP Case Drain Filter Element Removal (P/B 401)
29-21-41-400-801	Standby EMDP Case Drain Filter Element Installation (P/B 401)
29-21-51-000-802	Standby Hydraulic System Pressure Module Filter Removal (P/B 401)
29-21-51-400-802	Standby Hydraulic System Pressure Module Filter Installation (P/B 401)
29-22-21-020-801	PTU Pressure Filter Element Removal (P/B 401)
29-22-21-400-802	PTU Pressure Filter Element Installation (P/B 401)
32-32-00-710-801	Main Landing Gear Operational Test (P/B 501)
32-33-00-710-801	Operational Test for the Nose Landing Gear (P/B 501)
32-41-00-870-802	Normal (System B) Hydraulic Brake System - Bleeding (P/B 201)
32-51-00-700-801	Nose Wheel Steering System Test (P/B 501)
78-31-00-980-801-F00	Thrust Reverser Operation - Extend (Selection) (P/B 201)
78-31-00-980-802-F00	Thrust Reverser Operation - Retract (Selection) (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1795	Lockset - Reservoir Vent Valve (Part #: B29002-5, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700QC, -800, -900, -BBJ)
SPL-6107	Drain Hose - Hydraulic Reservoir (Part #: C29004-1, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.
STD-1154	Container - 5 Gallon (19 Liters)
STD-3901	Container - Hydraulic Fluid Resistant, 50 Gallon (190 l)

C. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

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D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
194HL	Aft Wing To Body Fairing Panel

F. Prepare to Replace the Hydraulic Fluid

SUBTASK 29-00-00-100-001

- (1) During this replacement, if hydraulic fluid gets on the airplane, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

SUBTASK 29-00-00-860-001

- (2) Make sure that hydraulic power is removed from the A and B hydraulic systems. To remove power from A and B systems, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 29-00-00-860-284

- (3) Make sure that hydraulic power is removed from the standby hydraulic system. To remove power from the standby system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 29-00-00-860-002

- (4) Release the pressure from the hydraulic reservoirs. To release them, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-00-00-480-001

- (5) Install the lockset, SPL-1795 on the systems A and B depressurization (vent) valves when the valves are fully open.

SUBTASK 29-00-00-680-001

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

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(WARNING PRECEDES)

CAUTION: YOU MUST MONITOR THE INSTRUMENTS AND INDICATOR LIGHTS FOR THE HYDRAULIC SYSTEMS WHEN THE HYDRAULIC SYSTEMS ARE PRESSURIZED. THIS IS TO MAKE SURE THE HYDRAULIC SYSTEMS OPERATE CORRECTLY. IF THE OVERHEAT LIGHT OF A HYDRAULIC SYSTEM COMES ON, YOU MUST STOP THE OPERATION OF THAT HYDRAULIC SYSTEM IMMEDIATELY. DAMAGE TO THE EQUIPMENT CAN OCCUR IF YOU DO NOT DO THIS.

- (6) Drain the hydraulic fluid from the system A and B hydraulic reservoirs into a 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

NOTE: Do this with the drain valve that is on the bottom of each reservoir.

SUBTASK 29-00-00-420-001

- (7) Close the drain valves.

SUBTASK 29-00-00-616-002

- (8) Drain the hydraulic fluid from the standby hydraulic system as follows:

- (a) Do the steps of either Method 1 or Method 2 to drain the hydraulic fluid from the standby system reservoir:

- 1) Do these steps to accomplish Method 1:

CAUTION: PULL DOWN ON THE KNURLED RING OF THE SELF-SEAL DISCONNECT BEFORE YOU TURN IT. IF YOU DO NOT DO THIS, TOO MUCH TORQUE WILL BE NECESSARY TO TURN THE RING. THIS WILL CAUSE DAMAGE TO THE SELF-SEAL DISCONNECT.

- a) Disconnect the supply line for the standby hydraulic pump at the quick-disconnect on the bottom of the standby hydraulic reservoir.
- b) Connect a drain hose, SPL-6107 to the quick-disconnect on the bottom of the standby reservoir.
- c) Put the end of the drain hose, SPL-6107 into a 5 gallon (19 liter) container, STD-1154.
- d) Drain the hydraulic fluid into the 5 gallon (19 liter) container, STD-1154.
- e) Disconnect the drain hose, SPL-6107 from the quick-disconnect on the bottom of the standby reservoir.

CAUTION: MAKE SURE THAT THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY, DISCONNECT THE SELF-SEAL DISCONNECT, AND MAKE SURE THAT THE POPPET IS STRAIGHT. AFTER YOU INSTALL IT, MAKE SURE THAT THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 IN. (1.52 MM). IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL DECREASE OR STOP. THIS CAN CAUSE DAMAGE TO THE RESERVOIR, AND THE PUMP.

- f) Reconnect the supply line for the standby hydraulic pump at the quick-disconnect on the bottom of the standby hydraulic reservoir.

- 2) Do these steps to accomplish Method 2:

- a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
194HL	Aft Wing To Body Fairing Panel

- b) Put a 5 gallon (19 liter) container, STD-1154 below the standby EMDP.

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- c) Disconnect the supply line at the standby EMDP.
d) Put the disconnected end of the supply line into the 5 gallon (19 liter) container, STD-1154.
e) Allow the hydraulic fluid from the standby reservoir to drain into the 5 gallon (19 liter) container, STD-1154.
f) Reconnect the supply line to the standby EMDP.
g) Close this access panel:

Table with 2 columns: Number, Name/Location. Row 1: 194HL, Aft Wing To Body Fairing Panel

- (b) Drain the hydraulic fluid collected from the standby hydraulic reservoir into a 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

SUBTASK 29-00-00-080-001

- (9) Remove the lockset, SPL-1795 from the depressurization valves.

SUBTASK 29-00-00-420-002

- (10) Close the depressurization valves.

SUBTASK 29-00-00-020-001

- (11) Disconnect the pressure, case drain, and supply lines from the engine-driven pumps (EDP) for the A and B hydraulic systems.

NOTE: The hose connections are self-sealing. The pressure line has a quick-release fitting.

SUBTASK 29-00-00-480-002

- (12) Connect the pressure line of the portable hydraulic cart, STD-163 to the case drain line of the system B EDP.

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

SUBTASK 29-00-00-480-003

- (13) Install a drain hose to drain the hydraulic fluid from the supply lines, of the system A and B EDP, into 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

SUBTASK 29-00-00-480-004

- (14) Connect the return line of the portable hydraulic cart, STD-163 to a supply of new fluid, D00153.

SUBTASK 29-00-00-860-003

- (15) Do this task: Supply External Power, TASK 24-22-00-860-813.

SUBTASK 29-00-00-860-004

WARNING: DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (16) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Rows: A 15 C01081 HYDRAULIC SYSTEM PTU VALVE CONT 1; A 16 C01085 HYDRAULIC SYSTEM PTU VALVE CONT 2

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-860-005

- (17) Make sure these switches on the forward overhead panel, P5, are in the OFF position:
- (a) HYD PUMPS A and B (4 places)
 - (b) FLT CONTROL A and B
 - (c) ALTERNATE FLAPS
 - (d) SPOILER A and B
 - (e) YAW DAMPER

G. Case Drain Lines Flushing

SUBTASK 29-00-00-170-001

CAUTION: DO NOT OPERATE THE PORTABLE HYDRAULIC CART, STD-163 AT MORE THAN 100 PSI (689 KPA). IF YOU OPERATE THE PORTABLE HYDRAULIC CART, STD-163 MORE THAN 100 PSI (689 KPA), THE RETURN SYSTEM CAN BE DAMAGED.

- (1) Operate the portable hydraulic cart, STD-163 at approximately 75 psi (517 kPa). Do this until approximately 2 gallons (8 liters) of hydraulic fluid comes out of the supply line into the 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

SUBTASK 29-00-00-860-006

- (2) Remove the pressure from the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-080-002

- (3) Disconnect the pressure line of the portable hydraulic cart, STD-163 from the case drain line of the system B EDP.

SUBTASK 29-00-00-480-005

- (4) Connect the pressure line of the portable hydraulic cart, STD-163 to the case drain line of the system A EDP.

SUBTASK 29-00-00-170-002

CAUTION: DO NOT OPERATE THE PORTABLE HYDRAULIC CART, STD-163 AT MORE THAN 100 PSI (689 KPA). IF YOU OPERATE THE PORTABLE HYDRAULIC CART, STD-163 AT MORE THAN 100 PSI (689 KPA), THE RETURN SYSTEM CAN BE DAMAGED.

- (5) Operate the portable hydraulic cart, STD-163 at approximately 75 psi (517 kPa). Do this until approximately 2 gallons (8 liters) of hydraulic fluid comes out of the supply line into the 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

SUBTASK 29-00-00-860-007

- (6) Release the pressure from the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-080-003

- (7) Disconnect the pressure line of the portable hydraulic cart, STD-163 from the case drain line of the system A EDP.

H. System A Hydraulic Fluid Replacement

SUBTASK 29-00-00-580-001

- (1) Do this task: Lift the Airplane with the Jacks, TASK 07-11-01-580-815.

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SUBTASK 29-00-00-480-006

- (2) Connect the pressure line of the portable hydraulic cart, STD-163 to the pressure line of the system A EDP.

SUBTASK 29-00-00-860-008

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (3) Operate the portable hydraulic cart, STD-163 to pressurize system A to 3000 psi (20684 kPa).

SUBTASK 29-00-00-860-009

- (4) Retract and extend the main and nose landing gear through one full cycle TASK 32-32-00-710-801) (TASK 32-33-00-710-801 . Do these at the same time.

SUBTASK 29-00-00-580-003

- (5) Do this task: Lower the Airplane Off the Jacks, TASK 07-11-01-580-816.

SUBTASK 29-00-00-860-010

- (6) Set the FLT CONTROL A and SPOILER A switches on the forward overhead panel, P5, to the ON position.

SUBTASK 29-00-00-860-011

- (7) Operate the elevators through seven full cycles, from down to up to down.

SUBTASK 29-00-00-860-012

- (8) Operate the nose wheel steering through two full cycles TASK 32-51-00-700-801.

SUBTASK 29-00-00-860-013

- (9) Operate the rudders through two full cycles.

SUBTASK 29-00-00-860-014

- (10) Set the rudder to the neutral position.

SUBTASK 29-00-00-860-015

- (11) Turn the control wheel through five full cycles.

NOTE: This operates the flight spoilers and the ailerons.

SUBTASK 29-00-00-860-016

- (12) Set the control wheel to the neutral position.

SUBTASK 29-00-00-860-017

- (13) Set the FLT CONTROL A and SPOILER A switches, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-860-018

- (14) Operate the thrust reverser of the No. 1 engine through three full cycles (TASK 78-31-00-980-802-F00) (TASK 78-31-00-980-801-F00) .

SUBTASK 29-00-00-860-019

- (15) Operate the control lever for the speed brakes through two full cycles.

SUBTASK 29-00-00-870-001

- (16) Open the bleed valves on each brake (TASK 32-41-00-870-802) and let a minimum of 2 quarts of fluid bleed from each brake.

SUBTASK 29-00-00-860-020

- (17) Remove the pressure from the portable hydraulic cart, STD-163.

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SUBTASK 29-00-00-080-004

- (18) Disconnect the pressure line of the portable hydraulic cart, STD-163 from the pressure line of the system A EDP.

SUBTASK 29-00-00-080-005

- (19) Disconnect the drain hose from the supply line for the system A EDP.

SUBTASK 29-00-00-611-001

- (20) Service the system A hydraulic reservoir. Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

I. System B Hydraulic Fluid Replacement

SUBTASK 29-00-00-582-001

- (1) Do this task: Lift the Airplane with the Jacks, TASK 07-11-01-580-815.

SUBTASK 29-00-00-480-007

- (2) Connect the pressure line of the portable hydraulic cart, STD-163 to the pressure line of the system B EDP.

SUBTASK 29-00-00-860-021

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

- (3) Operate the portable hydraulic cart, STD-163 to pressurize system B to 3000 psi (20684 kPa).

SUBTASK 29-00-00-860-023

- (4) Retract the main and nose landing gear. Do these at the same time.

SUBTASK 29-00-00-863-002

- (5) Pressurize hydraulic system A to with the electric motor-driven pump (EMDP). To pressurize it, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-00-00-867-001

- (6) Extend the main and nose landing gear. Do these at the same time.

SUBTASK 29-00-00-864-001

- (7) Remove the power from hydraulic system A (Hydraulic System A or B Power Removal, TASK 29-11-00-860-805).

SUBTASK 29-00-00-580-002

- (8) Do this task: Lower the Airplane Off the Jacks, TASK 07-11-01-580-816.

SUBTASK 29-00-00-860-025

- (9) Operate the nose wheel steering through two full cycles (TASK 32-51-00-700-801).

SUBTASK 29-00-00-860-026

- (10) Remove the pressure from the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-860-027

- (11) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C00799	HYD SYS LDG GR SYS XFR VALVE SEC

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<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	16	C00781	HYD SYS LDG GR SYS XFR VALVE PRI

SUBTASK 29-00-00-860-028

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

(12) Operate the portable hydraulic cart, STD-163 to pressurize system B to 3000 psi (20684 kPa).

SUBTASK 29-00-00-860-029

(13) Set the FLT CONTROL B and SPOILER B switches, on the P5 panel, to the ON position.

SUBTASK 29-00-00-860-030

(14) Operate the elevators through seven full cycles.

SUBTASK 29-00-00-860-031

(15) Put the control column in its usual position.

SUBTASK 29-00-00-860-032

(16) Operate the rudders through two full cycles.

SUBTASK 29-00-00-860-033

(17) Put the rudder pedals in the usual position.

SUBTASK 29-00-00-860-034

(18) Operate the trailing edge flaps two times from 0 to 10 to 0 degrees.

NOTE: This will also operate the leading edge devices.

SUBTASK 29-00-00-860-035

(19) Set the flap control lever to 1 degree.

SUBTASK 29-00-00-860-036

(20) Turn the control wheel through five full cycles.

NOTE: This operates the flight spoilers and the ailerons.

SUBTASK 29-00-00-860-037

(21) Put the control wheel in its usual position.

SUBTASK 29-00-00-860-038

(22) Set the SPOILER B and the FLT CONTROL B switches, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-860-039

(23) Operate the thrust reverser of the No. 2 engine through three full cycles (TASK 78-31-00-980-802-F00) (TASK 78-31-00-980-801-F00) .

SUBTASK 29-00-00-860-040

(24) Release the pressure from the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-860-041

(25) Push and release the brake pedals until the pressure is released from the brake accumulator.

SUBTASK 29-00-00-860-042

(26) Operate the portable hydraulic cart, STD-163 to pressurize the brake accumulator.

SUBTASK 29-00-00-860-043

(27) Release the pressure from the portable hydraulic cart, STD-163.

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SUBTASK 29-00-00-860-044

(28) Push and release the brake pedals until the pressure is released from the brake accumulator.

SUBTASK 29-00-00-860-045

(29) Pressurize the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-870-002

(30) Open the bleed valves on each brake (TASK 32-41-00-870-802) and let a minimum of 2 quarts (1.9 liters) of fluid bleed from each brake.

SUBTASK 29-00-00-420-003

(31) Tighten the nuts for the bleed valves (TASK 32-41-00-870-802).

SUBTASK 29-00-00-860-046

(32) Release the pressure from the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-080-006

(33) Disconnect the pressure line of the portable hydraulic cart, STD-163 from the pressure line of the system B EDP.

SUBTASK 29-00-00-480-008

(34) Install a drain hose from the return line of the ground service disconnect for system B, into a 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901, to drain the hydraulic fluid.

SUBTASK 29-00-00-480-009

(35) Connect the pressure line of the portable hydraulic cart, STD-163 to the supply line of the ground service disconnect for system B.

SUBTASK 29-00-00-860-047

(36) Do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-00-00-860-048

(37) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

SUBTASK 29-00-00-860-049

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THEAILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE THE EMDP FOR MORE THAN TWO MINUTES IF THE NO. 1 FUEL TANK CONTAINS LESS THAN 250 GALLONS (1675 POUNDS/760 KILOGRAMS) OF FUEL. YOU MUST LET THE RESERVOIR TEMPERATURE DECREASE TO AMBIENT TEMPERATURE BEFORE YOU OPERATE THE PUMP AGAIN. DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT DO THIS.

(38) Pressurize hydraulic system A to 3000 psi with the electric motor-driven pump (EMDP). To pressurize it, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

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SUBTASK 29-00-00-860-050

- (39) Pressurize hydraulic system B to 1500-2000 psi (10342-13790 kPa) with the portable hydraulic cart. To pressurize it, do this task: Hydraulic System A or B Pressurization with a Portable Hydraulic Cart, TASK 29-11-00-860-802.

SUBTASK 29-00-00-860-051

- (40) Set the flap lever to the Flaps 2 position and let the flaps stop.

SUBTASK 29-00-00-860-052

- (41) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	16	C01356	LANDING GEAR AIR/GND SYS 1

NOTE: The PTU will operate.

SUBTASK 29-00-00-860-053

- (42) Do these steps to operate the leading edge slats:
 - (a) Slowly turn the left Stall Warning (AOA) Vane counterclockwise to the top stop.
 - (b) Let the leading edge slats extend fully.
 - (c) Slowly turn the left Stall Warning (AOA) Vane clockwise to the bottom stop.
 - (d) Let the leading edge slats retract to the middle position.

SUBTASK 29-00-00-860-054

- (43) Do the steps above a second time to operate the leading edge slats again.

SUBTASK 29-00-00-860-055

- (44) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	16	C01356	LANDING GEAR AIR/GND SYS 1

NOTE: The PTU will stop.

SUBTASK 29-00-00-860-056

- (45) Set the flap lever to the Flap 0 position and let the flaps retract fully.

SUBTASK 29-00-00-860-057

- (46) Remove the pressure from hydraulic systems A and B. To release them, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

SUBTASK 29-00-00-860-058

- (47) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2
B	14	C01070	FLIGHT CONTROL AUTOSLAT DC 2
C	14	C01068	FLIGHT CONTROL AUTOSLAT DC 1
D	13	C00841	FLIGHT CONTROL ALTN T.E. FLAP DRIVE

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SUBTASK 29-00-00-080-008

- (48) Disconnect the drain hose from the return line of the ground service disconnect for system B.

SUBTASK 29-00-00-080-009

- (49) Disconnect the pressure line of the portable hydraulic cart, STD-163 from the ground service disconnect for system B.

SUBTASK 29-00-00-611-002

- (50) Service the system B hydraulic reservoir. Fill the reservoir to approximately 66%. (Hydraulic Reservoir Servicing, TASK 12-12-00-610-801)

SUBTASK 29-00-00-080-010

- (51) Disconnect the supply line of the standby system EMDP from the standby system reservoir. Do this at the self-seal disconnect below the reservoir.

SUBTASK 29-00-00-480-010

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

- (52) Connect a drain hose to the self-seal disconnect that is below the standby system reservoir. Put the end of the hose in a 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

SUBTASK 29-00-00-020-002

- (53) Disconnect the pressure line of the standby system EMDP at the self-seal disconnect.

SUBTASK 29-00-00-480-011

- (54) Connect the pressure line of the portable hydraulic cart, STD-163 to the self-seal disconnect which goes to the standby pressure module.

SUBTASK 29-00-00-860-059

- (55) Pressurize the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-860-060

- (56) Set the FLT CONTROL A or FLT CONTROL B switch, on the P5 panel, to the STDBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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SUBTASK 29-00-00-860-061

- (57) Operate the rudder through two full cycles.

SUBTASK 29-00-00-860-062

- (58) Set the rudder to the middle position.

SUBTASK 29-00-00-860-063

- (59) Set the FLT CONTROL A and FLT CONTROL B switches, on the P5 panel, to the OFF position.

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HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

SUBTASK 29-00-00-860-064

- (60) Set the master arming switch for the ALTERNATE FLAPS, on the P5 panel, to the ARM position.

SUBTASK 29-00-00-860-065

WARNING: KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE LEADING EDGE SLATS. THE LEADING EDGE SLATS CAN MOVE AUTOMATICALLY. INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT DO THIS.

- (61) Set the ALTERNATE FLAPS switch, on the P5 panel, to the DOWN position.

SUBTASK 29-00-00-860-066

- (62) Release the ALTERNATE FLAPS switch.

SUBTASK 29-00-00-210-001

- (63) Make sure the leading edge slats extend fully.

SUBTASK 29-00-00-860-067

- (64) Set the master arming switch for the ALTERNATE FLAPS, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-866-001

- (65) Set the flap handle to the indicated flaps position.

SUBTASK 29-00-00-860-068

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE THE EMDP FOR MORE THAN TWO MINUTES IF THE NO. 2 FUEL TANK CONTAINS LESS THAN 250 GALLONS (1675 POUNDS/760 KILOGRAMS) OF FUEL. YOU MUST LET THE RESERVOIR TEMPERATURE DECREASE TO AMBIENT TEMPERATURE BEFORE YOU OPERATE THE PUMP AGAIN. DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT DO THIS.

- (66) Pressurize hydraulic system B with the EMDP. To pressurize it, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-00-00-860-069

- (67) Put the flap handle to the FLAP UP position.

SUBTASK 29-00-00-860-070

- (68) Remove power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 29-00-00-860-071

WARNING: KEEP ALL PERSONS AND EQUIPMENT AWAY FROM THE LEADING EDGE SLATS. THE LEADING EDGE SLATS CAN MOVE AUTOMATICALLY. INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT DO THIS.

- (69) Set the ALTERNATE FLAPS switch, on the P5 panel, to the ARM position.

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SUBTASK 29-00-00-860-072

(70) Push the ALTERNATE FLAPS switch, on the P5 panel, down and then release it.

SUBTASK 29-00-00-210-002

(71) Make sure the leading edge slats extend fully.

SUBTASK 29-00-00-860-073

(72) Set the ALTERNATE FLAPS switch, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-860-074

(73) Remove the pressure from the portable hydraulic cart, STD-163, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-866-002

(74) Set the flap handle to the indicated flaps position.

SUBTASK 29-00-00-860-075

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE THE EMDP FOR MORE THAN TWO MINUTES IF THE NO. 2 FUEL TANK CONTAINS LESS THAN 250 GALLONS (1675 POUNDS/760 KILOGRAMS) OF FUEL. YOU MUST LET THE RESERVOIR TEMPERATURE DECREASE TO AMBIENT TEMPERATURE BEFORE YOU OPERATE THE PUMP AGAIN. DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT DO THIS.

(75) Pressurize hydraulic system B with the EMDP. To pressurize it, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-00-00-860-076

(76) Set the flap handle to the 10 degree position and the speed brake lever to the UP position.

SUBTASK 29-00-00-860-077

(77) Remove power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-080-011

(78) Disconnect the pressure line of the portable hydraulic cart, STD-163 from the standby pressure module at the self-seal disconnect.

SUBTASK 29-00-00-080-012

(79) Disconnect the drain hose from the standby reservoir.

SUBTASK 29-00-00-420-004

(80) Connect the pressure line of the standby EMDP at the self-seal disconnect.

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SUBTASK 29-00-00-420-005

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED.

(81) Connect the supply line of the standby EMDP to the self-seal disconnect below the reservoir.

SUBTASK 29-00-00-611-003

(82) Service the system B hydraulic reservoir (Hydraulic Reservoir Servicing, TASK 12-12-00-610-801).

SUBTASK 29-00-00-900-001

(83) Replace these filter elements:

(a) The return filter elements for the A and B hydraulic systems.

These are the tasks: Return Filter Element Removal, TASK 29-11-61-000-801, Return Filter Element Installation, TASK 29-11-61-400-801.

(b) The EDP case drain filter elements for the A and B hydraulic systems.

These are the tasks: EDP Case Drain Filter Element Removal, TASK 29-11-51-000-801, EDP Case Drain Filter Element Installation, TASK 29-11-51-400-801.

(c) The EMDP case drain filter elements for the A and B hydraulic systems.

These are the tasks: EMDP Case Drain Filter Element Removal, TASK 29-11-41-000-801, EMDP Case Drain Filter Element Installation, TASK 29-11-41-400-801.

(d) The pressure module filters for the EDPs and the EMDPs for the A and B hydraulic systems.

These are the tasks: Hydraulic Systems A and B Pressure Filter Module Element Removal, TASK 29-11-71-000-802, Hydraulic Systems A and B Pressure Module Filter Element Installation, TASK 29-11-71-400-802

(e) The EMDP case drain filter for the standby hydraulic system.

These are the tasks: Standby EMDP Case Drain Filter Element Removal, TASK 29-21-41-000-801, Standby EMDP Case Drain Filter Element Installation, TASK 29-21-41-400-801

(f) The standby pressure module filter.

These are the tasks: Standby Hydraulic System Pressure Module Filter Removal, TASK 29-21-51-000-802, Standby Hydraulic System Pressure Module Filter Installation, TASK 29-21-51-400-802

(g) The PTU pressure filter element.

These are the tasks: PTU Pressure Filter Element Removal, TASK 29-22-21-020-801, PTU Pressure Filter Element Installation, TASK 29-22-21-400-802

SUBTASK 29-00-00-860-078

WARNING: DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

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(84) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-860-079

(85) Set the FLT CONTROL A or B switch, on the P5 panel, to the STDBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253

(a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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SUBTASK 29-00-00-790-001

(86) Examine the connections of the standby hydraulic system for leaks.

SUBTASK 29-00-00-860-080

(87) Set the FLT CONTROL switch, on the P5 panel, to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253

(a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

SUBTASK 29-00-00-420-006

(88) Connect the pressure lines, supply lines, and case drain lines to the EDP's for A and B hydraulic systems.

J. Hydraulic Systems Leakage Check

SUBTASK 29-00-00-610-001

(1) Make sure the reservoirs for the A and B hydraulic systems are full. To fill them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-00-00-860-081

(2) Pressurize the reservoirs for the A and B hydraulic systems. To pressurize them, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-00-00-860-082

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

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CAUTION: DO NOT OPERATE THE EMDP FOR MORE THAN TWO MINUTES IF THE NO. 1 FUEL TANK CONTAINS LESS THAN 250 GALLONS (1675 POUNDS/760 KILOGRAMS) OF FUEL. YOU MUST LET THE RESERVOIR TEMPERATURE DECREASE TO AMBIENT TEMPERATURE BEFORE YOU OPERATE THE PUMP AGAIN. DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT DO THIS.

- (3) Pressurize hydraulic system A with the EMDP and EDP (motor engine). To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-00-00-790-002

- (4) Examine all of the connections in hydraulic system A for leaks.

SUBTASK 29-00-00-860-083

- (5) Remove the power from hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-860-084

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THEAILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE THE EMDP FOR MORE THAN TWO MINUTES IF THE NO. 2 FUEL TANK CONTAINS LESS THAN 250 GALLONS (1675 POUNDS/760 KILOGRAMS) OF FUEL. YOU MUST LET THE RESERVOIR TEMPERATURE DECREASE TO AMBIENT TEMPERATURE BEFORE YOU OPERATE THE PUMP AGAIN. DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT DO THIS.

- (6) Pressurize hydraulic system B with the EMDP and EDP (motor engine). To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-00-00-790-003

- (7) Examine all of the connections in hydraulic system B for leaks.

SUBTASK 29-00-00-860-085

- (8) Set the flap handle to the FLAP UP position and the speed brake lever to the DOWN position.

SUBTASK 29-00-00-860-086

- (9) Remove the power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

K. Put the Airplane Back to Its Usual Condition

SUBTASK 29-00-00-860-257

- (1) Make sure these switches on the P5 panel are in the ON position:

- (a) FLT CONTROL A and B
- (b) SPOILER A and B

SUBTASK 29-00-00-860-087

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1

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Row	Col	Number	Name
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2
B	14	C01070	FLIGHT CONTROL AUTOSLAT DC 2
C	14	C01068	FLIGHT CONTROL AUTOSLAT DC 1
C	15	C00799	HYD SYS LDG GR SYS XFR VALVE SEC
C	16	C00781	HYD SYS LDG GR SYS XFR VALVE PRI
D	13	C00841	FLIGHT CONTROL ALTN T.E. FLAP DRIVE

END OF TASK

TASK 29-00-00-870-801

4. Bleed the Hydraulic Systems

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
27-51-00-860-803	Extend the Trailing Edge Flaps (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
29-00-00-790-801	Hydraulic System External Leakage Check (P/B 601)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-804	Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
78-31-00-980-805-F00	Thrust Reverser Operation - Extend (Power Procedure) (P/B 201)
78-31-00-980-806-F00	Thrust Reverser Operation - Retract (Power Procedure) (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Procedure

SUBTASK 29-00-00-611-004

(1) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-00-00-490-002

WARNING: OBEY THE PROCEDURE FOR THE INSTALLATION OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

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SUBTASK 29-00-00-863-003

- (3) Do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-00-00-863-004

WARNING: KEEP PERSONNEL AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (4) Do this task: Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804 and this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-00-00-866-003

- (5) Cycle the flight controls.
- (a) Turn the captain's control wheel through full travel (fully counterclockwise and fully clockwise) 3 times.
 - (b) Move the control column through full travel (fully forward and fully aft) 3 times.
 - (c) Operate the rudder pedals to move the rudder through full travel 3 times.
 - (d) Turn the stabilizer trim control wheel to full APL NOSE DOWN and FULL APL NOSE UP 3 times.
 - (e) Cycle the flaps 3 times:
 - 1) Do this task: Extend the Trailing Edge Flaps, TASK 27-51-00-860-803.
 - 2) Do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.
 - 3) Repeat these steps 2 more times.

SUBTASK 29-00-00-869-001

- (6) Cycle the thrust reversers.
- (a) Do this task: Thrust Reverser Operation - Extend (Power Procedure), TASK 78-31-00-980-805-F00.
 - (b) Do this task: Thrust Reverser Operation - Retract (Power Procedure), TASK 78-31-00-980-806-F00.

SUBTASK 29-00-00-867-002

- (7) Cycle the landing gear control lever.
- (a) Move the landing gear control lever to the UP position and back to the DN position 3 times.
 - (b) Make sure the landing gear lever is in the DN position.

SUBTASK 29-00-00-864-002

- (8) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-210-058

- (9) Inspect the airplane for hydraulic fluid leaks.
- (a) If any leaks are found, do this task: Hydraulic System External Leakage Check, TASK 29-00-00-790-801.

SUBTASK 29-00-00-902-001

- (10) Put the airplane back to its usual condition.
- (a) If not needed for further maintenance, do these tasks:

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- 1) Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802
 - 2) Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801
- (b) If necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801

————— **END OF TASK** —————

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HYDRAULIC POWER - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these leakage check tasks:
 - NOTE: Independent leakage checks can be accomplished without doing all of the leakage checks in this section.
 - (1) Hydraulic System External Leakage Check - Use this check to find if the parts have too much external leakage.
 - (2) Gross Internal Leak Check - Use this check to find if hydraulic system A and B has too much internal leakage.
 - (3) Sub-System Internal Leakage Check - Use this check to find if one or more of the systems that use hydraulic power has too much internal leakage.
 - (4) Part Internal Leakage Check - Use this check to find if one part or a small group of parts has too much internal leakage.
 - (5) Standby Hydraulic System Internal Leakage Check - Use this check to find if the standby hydraulic system has too much internal leakage.
- C. To do a check of the hydraulic fluid, do this procedure for the applicable hydraulic system: Hydraulic Fluid Check, TASK 29-11-00-200-801.
- D. This procedure gives you the instructions to find if the hydraulic system is in good condition. It will help you to find which parts are worn.
- E. You can use this procedure to find the general internal condition of the hydraulic system. You can also use it for trouble-shooting the system.
 - (1) When you are trouble-shooting the hydraulic system, it is only necessary for you to do these procedures for the system (A or B) with the problem. You can feel for hot tubes or actuators, or listen for fluid leaks to find which parts have the problem. When you can, use standard tools to measure heat, vibration, or sound. Before you get near parts that move, operate them to make sure they can not hit you.

TASK 29-00-00-790-801

2. Hydraulic System External Leakage Check

(Table 601)

A. General

- (1) The table of permitted external leakage gives the maximum external leakage rates for different parts for normal operation and for dispatch of the airplane to avoid a delay. You must make a decision on the total leakage you will permit from all of the parts.
- (2) It is possible that a crack in a static seal housing can cause a leakage. This leakage can increase with increased pressure.
- (3) Some NAS1611 seals can leak at cold temperatures that occur in flight. If there is evidence of leakage near one of these seals that can not be duplicated on the ground, the seal should be replaced with an improved seal (SL 20-048). Areas where these seals are used include MLG shimmy dampers, and the main and standby rudder PCUs.
- (4) These conditions are important when you do a leakage check for the various components:
 - (a) The seal at the B-nut tube connections is made by metal-to-metal surfaces. If a leak will not stop when you tighten the B-nut to the correct torque, the joint is defective and must be repaired.

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- (b) Supply hydraulic pressure to the component while you measure the leakage.
- (c) If it is possible, operate the actuators to see if the leakage changes during the travel.
- (d) Make sure the leak is not a type which will increase to a much higher rate with time. Use the type of leak and the length of time the component is pressurized to make this decision.
- (e) Make sure all the reservoirs are full before each flight.
- (f) After each flight, do a check of the components which have a leak.
- (g) If hydraulic fluid collects in the area of the leak, it must not cause damage to the airplane equipment.

B. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-801	Standby Hydraulic System Pressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-41-41-700-802	Main Landing Gear Brake Fast Check (Wheel Installed on the Airplane) (P/B 601)
78-31-00-700-801-F00	Thrust Reverser Normal Operation Test (P/B 501)

C. Location Zones

Zone	Area
100	Lower Half of Fuselage
200	Upper Half of Fuselage
300	Empennage
400	Powerplant and Nacelle Struts
500	Left Wing
600	Right Wing

D. Procedure

SUBTASK 29-00-00-490-001

WARNING: MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR AND THE TAIL SKID. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT, AND THE TAIL SKID CAN EXTEND. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

- (1) Make sure the ground locks are installed at the nose and main landing gear. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-00-00-010-001

- (2) Get access to the part that has a leak.

SUBTASK 29-00-00-160-001

- (3) Clean hydraulic fluid from the part.

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SUBTASK 29-00-00-860-103

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Pressurize the applicable hydraulic system. To pressurize the hydraulic system A or B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-00-00-863-001

- (5) To pressurize the standby hydraulic system, do this task: Standby Hydraulic System Pressurization, TASK 29-21-00-000-801.

SUBTASK 29-00-00-790-004

- (6) Do these steps to find the leakage rate:
 - (a) If it is possible, move the part through approximately three full cycles.
 - (b) Measure the leakage rate of the part.
 - 1) For dynamic seals, measure the leakage rate when the part stops and moves, if it is possible.
 - (c) Compare the leakage rate of the part with the external leakage limits (Table 601).

NOTE: For the Thrust Reverser actuator leakage limit rate, see (Thrust Reverser Normal Operation Test, TASK 78-31-00-700-801-F00).

- (d) Remove pressure from the applicable hydraulic system. To remove the pressure from the hydraulic system A or B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

To remove the pressure from the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

- (e) If the leakage rate is more than the external leakage limits (Table 601), repair the cause of the leak.
- (f) To remove the hydraulic fluid from the area of the leakage, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

Table 601/29-00-00-993-804 Hydraulic Fluid Leakage Limits

COMPONENTS	NORMAL OPERATION LIMITS ^{*[1]}	DISPATCH LIMITS TO AVOID DELAY ^{*[1]}
1. Tube Connections ^{*[2]}	No leakage	No leakage
2. Static Seals ^{*[3]}	1 drop in 10 min.	Operator decides
A. MLG Shimmy Dampers ^{*[4]}	1 drop in 1 min.	1 drop in 1 min.
3. Dynamic seals ^{*[5]}		
A. Engine-Driven Pump	30 drops in 1 min.	60 drops in 1 min.
B. Electric Motor- Driven Pump		
(1) ABEX	10 drops in 1 min.	20 drops in 1 min.
(2) Vickers	20 drops in 1 min.	30 drops in 1 min.
(3) Vickers Standby Pump	10 drops in 1 min.	20 drops in 1 min. (Correct at the first time possible)

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COMPONENTS	NORMAL OPERATION LIMITS ^{*[1]}	DISPATCH LIMITS TO AVOID DELAY ^{*[1]}
C. Power Transfer Unit	10 drops in 1 min.	20 drops in 1 min.
D. Other dynamic seals when they stop, at any pressure ^{*[6]}	1 drop in 10 min. (No repair is necessary)	30 drops in 1 min. (Correct at the first time possible)
E. Other dynamic seals when they move ^{*[6]}	1 drop each cycle	1 drop each cycle
4. Landing gear brake assemblies	No leakage	See Main Landing Gear Brake Fast Check (Wheel Installed on the Airplane), TASK 32-41-41-700-802

*[1] There are approximately 20 drops in a cubic centimeter or 75600 drops in a gallon.

*[2] Make sure the connection is tightened to the correct torque.

*[3] A static seal is a seal between two parts that do not move relative to each other (Example: manifold cover, pump housing cover).

*[4] Leakage may be checked while the airplane is parked by cycling the landing gear lever with the "A" hydraulic system pressurized. Make sure the landing gear lock pins are installed before cycling the lever.

*[5] A dynamic seal is a seal between two parts that move relative to each other (Example: piston rod seal, pump shaft seal, swivel seal).

*[6] The center vent on the rudder PCU is actually the drain for the two dynamic seals. Thus, when evaluating leakage from the center vent at the rudder PCU, all dynamic seal limits can be doubled.

END OF TASK

TASK 29-00-00-790-802

3. Gross Internal Leakage Check

(Figure 601, Figure 602)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) Use this check to find the gross internal leakage of the A and B hydraulic systems.
- (3) You must find the changes in the flow of hydraulic fluid (during different conditions of operation) to find the internal leakage rate for each system. There are three methods to measure the flow: the ammeter, the flowmeter, and the amp-clamp/multimeter.
 - (a) To use the ammeter method, you must connect an ammeter in series with one phase of the motor on the electric motor-driven pump (EMDP). To find the flow you measure the current, subtract the other current reading as directed, and use the (Figure 602) to change it to a flow.
 - (b) To use the flowmeter method, you install a flowmeter on a hydraulic service cart and read the flow from it.

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- (c) To use the amp-clamp/multimeter method, you put the amp-clamp adapter around one of the wires connected to a relay for the EMDP. You can use either a dedicated amp-clamp meter or a clamp-on current probe connected to a generic multimeter. You then read the current directly on the amp-clamp meter or on the multimeter that is connected to the clamp-on current probe. To find the flow you measure the current, subtract the other current readings as directed, and use the (Figure 602) to get the flow.
(4) When you read the current, make a record of the value to the nearest 0.1 ampere.
(5) When you read the flowmeter, make a record of the value to the nearest 100 cc/minute.

B. References

Table with 2 columns: Reference, Title. Rows include: 12-12-00-610-801 Hydraulic Reservoir Servicing (P/B 301), 24-22-00-860-811 Supply Electrical Power (P/B 201), 29-09-00-860-801 Hydraulic Reservoirs Pressurization (P/B 201), 29-11-00-860-801 Hydraulic System A or B Pressurization (P/B 201), 29-11-00-860-805 Hydraulic System A or B Power Removal (P/B 201), 29-11-01-860-801 Hydraulic Reservoirs Pressurization (P/B 201), 32-00-01-480-801 Landing Gear Downlock Pins Installation (P/B 201), 34-21-00-820-801 Air Data Inertial Reference System - Alignment from the FMC CDU (P/B 201), 34-21-00-820-802 Air Data Inertial Reference System - Alignment from the ISDU (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Table with 2 columns: Reference, Description. Rows include: COM-1786 Flowmeter - Leakage Check, Hydraulic System Internal (Part #: 410DME-10AR, Supplier: 05172, A/P Effectivity: 737-ALL), COM-1787 Ammeter - Leakage Check, A.C. Internal Hydraulic System (Part #: 433-2919001, Supplier: 32590, A/P Effectivity: 737-ALL), COM-1793 Multimeter - Digital, 3 1/2 Digits (Part #: 187, Supplier: 89536, A/P Effectivity: 737-ALL), COM-2531 Meter - Current, RMS (Part #: 321, Supplier: 89536, A/P Effectivity: 737-ALL), COM-9509 Ammeter - Clamp-on (Measures ac/dc current into the low milliamp range up to 40A) (Part #: I30, Supplier: 89536, A/P Effectivity: 737-ALL)

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Reference	Description
SPL-1788	Cable - Hydraulic Leakage Check (Part #: F80135-13, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: F80135-1, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare for the Gross Internal Leakage Check

SUBTASK 29-00-00-840-001

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES DURING THE LEAK CHECK. THEAILERONS, RUDDER, ELEVATOR FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED ON ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Make sure the ground locks are installed at the nose and main landing gear. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-00-00-840-002

- (2) Make sure the main landing gear has blocks installed.

SUBTASK 29-00-00-840-003

- (3) Remove the blocks and the tow bar from the nose landing gear.

SUBTASK 29-00-00-860-212

- (4) Open this access panel to get access to the main electronics equipment compartment.

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 29-00-00-840-004

- (5) Make sure that all cowls on the engine are closed.

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SUBTASK 29-00-00-860-213

- (6) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

NOTE: If you use a ground cart for electrical power, it must supply a voltage of 114 to 116 volts ac at 400 -5 Hz. Do not operate other electrical equipment during this test.

SUBTASK 29-00-00-840-094

- (7) Make sure the main tank 1 (for the system A heat exchanger) and the main tank 2 (for the system B heat exchanger) have a minimum of 250 gallons (1675 pounds/760 kilograms) of fuel in them.

NOTE: This is necessary to prevent the hydraulic pumps from overheating.

SUBTASK 29-00-00-840-095

- (8) Put the parking brakes on.

SUBTASK 29-00-00-840-096

- (9) Put the FLT CONTROL A and B, on the P5 panel, in the ON position.

SUBTASK 29-00-00-840-097

- (10) Put the SPOILER A and B switches, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-214

- (11) Make sure that the hydraulic reservoir for hydraulic system A and system B is pressurized to 20 psi minimum. To pressurize them, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-00-00-860-215

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (12) Pressurize the hydraulic systems A and B with the electric motor-driven pump or with a portable hydraulic cart. To pressurize them, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

SUBTASK 29-00-00-840-098

- (13) Operate the flaps 2 times to warm the hydraulic fluid.

SUBTASK 29-00-00-840-099

- (14) Operate all of the control surfaces through a minimum of 10 cycles after the hydraulic fluid is warm.

SUBTASK 29-00-00-840-100

- (15) Do these steps to put the airplane in its initial condition:

- (a) Put the reverse thrust levers in the STOWED position.
- (b) Put the stabilizer trim in the green band.

NOTE: The stabilizer indicator is on the control stand.

- (c) Set the aileron trim to zero.

NOTE: The aileron trim indicator is on the control wheel.

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(d) Set the rudder trim to zero.

NOTE: The rudder trim indicator is on the P8 panel.

(e) Do these steps to turn off the antiskid system:

1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01345	LANDING GEAR AUTOBRAKE BITE CONT 2
A	18	C00583	LANDING GEAR AUTOBRAKE BITE CONT 1
E	16	C00196	LANDING GEAR ANTISKID INBD
E	18	C00195	LANDING GEAR ANTISKID OUTBD

(f) Make sure the ADIRS is aligned. To align the ADIRS, do this task: Air Data Inertial Reference System - Alignment from the ISDU, TASK 34-21-00-820-802 or Air Data Inertial Reference System - Alignment from the FMC CDU, TASK 34-21-00-820-801.

NOTE: The ADIRS must be aligned to enable operation of the yaw damper system.

(g) Put the YAW DAMPER switch, on the P5 panel, in the OFF position.

(h) Put the A/P ENGAGE switches, on the mode control panel (MCP), in the OFF position.

(i) Put the LANDING GEAR handle, on the P2 panel, in the OFF position.

(j) Put the SPEED BRAKE lever, on the control stand, in the DOWN position.

(k) Put the FLT CONTROL A and B switches, on the P5 panel, in the OFF position.

(l) Put the SPOILER A and B switches, on the P5 panel, in the OFF position.

(m) Set the FLAP position lever to 25 and let the flaps move.

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGE AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(n) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

(o) Put the ALTERNATE FLAPS switch, on the P5 panel, in the ARM position.

(p) Set the FLAP position lever to 40.

NOTE: The flaps will not move.

SUBTASK 29-00-00-210-043

(16) Make sure that the A and B hydraulic systems have a minimum pressure of 2850 psi (19650 kPa).

SUBTASK 29-00-00-860-216

(17) Remove power from the hydraulic systems A and B. To remove them, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

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- (a) Twenty seconds after you remove hydraulic power, make sure hydraulic systems A and B have a minimum of 200 psi (1379 KPa) remaining in them.

NOTE: On airplanes equipped with digital pressure gages, read the 200 psi (1379 KPa) directly. On airplanes with analog pressure gages, estimate the 200 psi (1379 KPa) reading.

- 1) If the pressure in system B is less than 200 psi (1379 KPa), use the trouble-shooting procedure to find the bad parts. Some parts to examine are the relief valve and cartridge check valve in the hydraulic system B pressure module.
- 2) If the pressure in system A is less than 200 psi (1379 KPa), use the trouble-shooting procedure to find the bad parts. Some parts to examine are the relief valve and cartridge check valve in the hydraulic system A pressure module and the ground spoilers (spoiler 1, 6, 7, and 12).

SUBTASK 29-00-00-840-005

- (18) If you use the ammeter, COM-1787, then do these steps:

NOTE: When you read the ammeter, make a record of the value to the nearest 0.1 ampere. Use (Figure 602) to change current to flow.

- (a) Make sure the person in the flight compartment and the person on the ground can speak to each other (interphone, radio).

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGE AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

- (b) To do a test of hydraulic system B:
 - 1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

- (c) To do a test of hydraulic system A:
 - 1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

- (d) Disconnect the electrical connector from the electric motor-driven pump (EMDP) for the A or B hydraulic system.
- (e) Connect the cable, SPL-1788 to the EMDP module as follows:

NOTE: Make sure you examine (WDM 29-11-12) for the applicable EMDP module and for system wiring.

- 1) For hydraulic system A connect one end of the cable, SPL-1788 to the EMDP module M1103.
- 2) For hydraulic system B connect one end of the cable, SPL-1788 to the EMDP module M1104.

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(f) Connect the cable, SPL-1788 as follows:

NOTE: Make sure you examine (WDM 29-11-12) for the applicable connector and for system wiring.

- 1) For hydraulic system A connect the other end of the cable, SPL-1788 to the electrical connector D2664.
- 2) For hydraulic system B connect the other end of the cable, SPL-1788 to the electrical connector D2666.

CAUTION: PUT THE AMMETER IN THE SHORT CIRCUIT POSITION. THE CURRENT TO START THE EMDP IS APPROXIMATELY 180 AMPS. THIS WILL CAUSE DAMAGE TO THE AMMETER IF IT IS IN THE CIRCUIT.

(g) Put the switch on the ammeter, COM-1787 in the short-circuit position.

(h) To do a test of hydraulic system B:

- 1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

(i) To do a test of hydraulic system A:

- 1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-00-00-840-006

(19) If you use the hydraulic system internal leakage check flowmeter, COM-1786 and portable hydraulic cart, STD-163, then do these steps:

NOTE: When you read the flowmeter, make a record of the value to the nearest 100 cc/minute.

(a) Connect the portable hydraulic cart, STD-163 to the ground service module for hydraulic system A or B.

- 1) If applicable, put the remote readout for the hydraulic system internal leakage check flowmeter, COM-1786 in the control cabin.
- 2) Operate the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-840-077

(20) If you use the current meter, COM-2531, or a combination of the clamp-on ammeter, COM-9509 and the digital multimeter, COM-1793, then do these steps:

NOTE: The current meter, COM-2531 or clamp-on ammeter, COM-9509 is installed on one of the three wires that provide phased electrical power to the EMDP. These tools can either be installed at the EMDP in the wheel well or at the relay in the P91 and P92 panel.

NOTE: When you use the current meter, COM-2531 or digital multimeter, COM-1793, read the current on the meter and use (Figure 602) to get the flow.

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- (a) To install the current meter, COM-2531 or clamp-on ammeter, COM-9509 in the P91 or P92 panel, do these steps:

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGE AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

- 1) To do a test of hydraulic system B:
 - a) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

- 2) To do a test of hydraulic system A:
 - a) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

WARNING: BE CAREFUL WHEN YOU INSTALL THE DIGITAL MULTIMETER, COM-1793 INTO THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES THAT MAY CAUSE INJURIES TO PERSONS.

- 3) To test hydraulic system B, get access to the R318 relay for the system B EMDP in the P91 panel.
- 4) To test hydraulic system A, get access to the R317 relay for the system A EMDP in the P92 panel.
- 5) Put the current meter, COM-2531 or clamp-on ammeter, COM-9509 around one of the three wires that go aft from the relay. If used, connect the digital multimeter, COM-1793 to the clamp-on ammeter, COM-9509.

- 6) To do a test of hydraulic system B:
 - a) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

- 7) To do a test of hydraulic system A:
 - a) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

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G. Hydraulic System B Gross Internal Leakage Check

SUBTASK 29-00-00-860-108

(1) If you use the current meter, COM-2531, set the ammeter to its highest range.

SUBTASK 29-00-00-860-217

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-00-00-210-044

(3) Make sure the pressure in system B is a minimum of 2850 psi (19650 kPa).

SUBTASK 29-00-00-210-045

(4) Make sure hydraulic power to system A has been removed.

SUBTASK 29-00-00-790-005

(5) If you use the ammeter, amp-clamp, or multimeter method do this step:

NOTE: The amperage measured is the system B basic current, and must be subtracted from all other system B amperage readings before you use the result of the subtraction to find the equivalent flow from Figure 602.

(a) Read the amperage and write it here:

Table 602/29-00-00-993-812

Amperage: _____ (Value 1)
Note: This is the system B basic current.

SUBTASK 29-00-00-970-001

(6) If you use the flow meter method, read the flow value and write it here:

Table 603/29-00-00-993-813

Flow: _____ (Value 1)
Note: This is the system B basic flow.

SUBTASK 29-00-00-860-109

(7) Do these steps to supply hydraulic power from system B to the flight controls.

(a) Put the SPOILER B switch, on the P5 panel, in the ON position.

(b) Put the SPEED BRAKE lever, on the control stand, half the distance between the ARMED and the FLIGHT DETENT positions.

NOTE: The spoilers will move.

(c) Put the ALTERNATE FLAPS switch, on the P5 panel, in the OFF position.

NOTE: Do not continue until the flaps move to 40 units.

(d) Set the FLAP position lever to 25, and let the flaps move.

NOTE: The flaps will move to 25 units.

(e) Put the FLT CONTROL B switch, on the P5 panel, in the ON position.

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- (f) Do these steps with the DFCS BITE on the control display unit (CDU) to engage the autopilot one channel at a time.

NOTE: Engage the autopilot in BITE to make sure all the inputs are at zero.

NOTE: Follow the instructions in this procedure for the DFCS BITE.

- 1) Push the line select key (LSK) adjacent to INIT/REF.
2) Push the LSK adjacent to INDEX.
3) Push the LSK adjacent to MAINT.
4) Push the LSK adjacent to DFCS.

NOTE: Stop until the BITE test is complete.

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- 5) Put the FMC transfer switch, on the P5 panel, to the BOTH ON L position.

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- 6) Push the LSK adjacent to EXTENDED MAINTENANCE.
7) Push the LSK adjacent to RIGGING.
8) Push the LSK adjacent to ELEVATOR.
9) Push the LSK adjacent to CONTINUE.

NOTE: Ignore the message on the screen.

- 10) Push the LSK adjacent to CONTINUE.
11) Push the LSK adjacent to ELEV AUTH SINGLE.

NOTE: Ignore instructions to pressurize pitot inputs.

- 12) Push the LSK adjacent to CONTINUE on screen 51.16.

NOTE: Stop until BITE test is complete. Ignore the instructions to set the stabilizer to test condition in the maintenance manual.

- 13) Push the LSK adjacent to CONTINUE on screen 51.17.

NOTE: Stop until BITE test is complete. A new 51.17 screen will appear with instructions to engage the A/P.

- 14) Engage the system B autopilot.

SUBTASK 29-00-00-790-006

- (8) Do these steps to find the internal leakage for System B Flight Controls and Spoilers 3, 5, 8 and 10:

- (a) If you use the ammeter, amp-clamp, or multimeter method do these steps:

- 1) Read the amperage and write it here:

Table 604/29-00-00-993-814

Amperage: _____ (Value 2)

- 2) Subtract the Value 1 from the Value 2 and write it here:

Table 605/29-00-00-993-815

Amperage: _____ (Calculated) amperage)

Note: In all cases, subtract the AMPERAGES from each other BEFORE referring to the applicable pump amperage/flow value table (Fig. 602).

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- 3) Use (Figure 602) for the applicable pump to change the calculated amperage to a flow value and write it here:

Table 606/29-00-00-993-816

Flow: _____ cc/min (Value 3)
Note: This is the net internal leakage for System B flight controls and spoilers 3, 5, 8, and 10.

- (b) If you use the flowmeter method do these steps:

- 1) Read the flow value and write it here:

Table 607/29-00-00-993-817

Measured Flow: _____ cc/min (Value 2)

- 2) Subtract the Value 1 from the Value 2 and write it here:

Table 608/29-00-00-993-818

Calculated Flow: _____ cc/min (Value 3)
Note: This is the net internal leakage for System B flight controls and spoilers 3, 5, 8, and 10.

- (c) If the Value 3 is more than 13,100 cc/min, do the steps to check Hydraulic System B sub-systems to find one or more sub-systems that has too much internal leakage. To do it, do this task: System A or System B Sub-System Internal Leakage Check, TASK 29-00-00-790-803.

SUBTASK 29-00-00-860-110

- (9) Remove power from the hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

H. Hydraulic System A Gross Internal Leakage Check

SUBTASK 29-00-00-480-012

- (1) Connect the equipment that is necessary to measure the flow or current to hydraulic system A.

SUBTASK 29-00-00-860-111

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Pressurize the hydraulic system A. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-00-00-210-027

- (3) Make sure the pressure in system A is a minimum of 2850 psi (19650 kPa).

SUBTASK 29-00-00-790-007

- (4) Do these steps to find the System A basic current or flow:

- (a) If you use the ammeter, amp-clamp, or multimeter method do this step:

NOTE: This amperage measured is the system A basic current, and must be subtracted from all other system A amperage readings before you use the result of the subtraction to find the equivalent flow from Figure 602.

- 1) Read the amperage and write it here:

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Table 609/29-00-00-993-819

Amperage: _____ (Value 4)
Note: This is the system A basic current.

(b) If you use the flow meter method, read the flow value and write it here:

Table 610/29-00-00-993-820

Flow: _____ (Value 4)
Note: This is the system A basic flow.

SUBTASK 29-00-00-860-112

(5) Do these steps to supply hydraulic power from system A to the flight controls and landing gear.

(a) Put the SPOILER A switch in the ON position.

NOTE: Keep the SPEED BRAKE lever half the distance between the ARMED and the FLIGHT DETENT positions.

(b) Put the FLT CONTROLS A switch in the ON position.

(c) Put the LANDING GEAR lever in the DN position.

(d) Do these steps with the DFCS BITE on the CDU:

- 1) Push the LSK adjacent to PREVIOUS MENU.
- 2) Push the LSK adjacent to ELEV AUTH SINGLE.

NOTE: Ignore instructions to pressurize pitot inputs.

3) Push the LSK adjacent to CONTINUE on screen 51.16.

NOTE: Stop until BITE test is complete. Ignore the instructions to set the stabilizer to test condition in the maintenance manual.

4) Push the LSK adjacent to CONTINUE on screen 51.17.

NOTE: Stop until BITE test is complete. A new 51.17 screen will appear with instructions to engage the A/P.

5) Engage the system A autopilot.

SUBTASK 29-00-00-790-074

(6) Do these steps to find the internal leakage for System A Flight Controls and Spoilers 2, 4, 9 and 11:

(a) If you use the ammeter, amp-clamp, or multimeter method do these steps:

1) Read the amperage and write it here:

Table 611/29-00-00-993-821

Amperage: _____ (Value 5)

2) Subtract the Value 4 from the Value 5 and write it here:

Table 612/29-00-00-993-822

Amperage: _____ (Calculated amperage)
Note: In all cases, subtract the AMPERAGES from each other BEFORE referring to the applicable pump amperage/flow value table (Fig. 602).

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- 3) Use (Figure 602) for the applicable pump to change the calculated amperage to a flow value and write it here:

Table 613/29-00-00-993-823

Flow: _____ cc/min (Value 6)
Note: This is the internal leakage for System A flight controls and spoilers 2, 4, 9, and 11.

- (b) If you use the flowmeter method do these steps:

- 1) Read the flow value and write it here:

Table 614/29-00-00-993-824

Measured Flow: _____ cc/min (Value 5)

- 2) Subtract the Value 4 from the Value 5 and write it here:

Table 615/29-00-00-993-825

Calculated Flow: _____ cc/min (Value 6)
Note: This is the internal leakage for the System A flight controls and spoilers 2, 4, 9, and 11.

- (c) If the Value 6 is more than 12,000 cc/min, do the steps to check Hydraulic System A sub-systems to find the one or more sub-systems that has too much internal leakage. To do it, do this task: System A or System B Sub-System Internal Leakage Check, TASK 29-00-00-790-803.

SUBTASK 29-00-00-860-218

- (7) Push the INIT/REF key on the CDU to get out of the DFCS BITE.

NOTE: Horn will sound.

SUBTASK 29-00-00-860-219

- (8) Push the A/P ENGAGE A switch on the control wheel .

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SUBTASK 29-00-00-860-113

- (9) Put the FMC transfer switch, on the P5 panel, to NORMAL.

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- I. Put the Airplane Back to its Usual Condition

SUBTASK 29-00-00-860-220

- (1) Make sure that the ALTERNATE FLAPS switch, on the P5 panel, in the OFF position.

SUBTASK 29-00-00-860-114

- (2) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-860-221

- (3) Make sure that the FLT CONTROL A and B, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-116

- (4) Make sure that the SPOILER A and B switches, on the P5 panel, in the ON position.

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SUBTASK 29-00-00-860-222

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-00-00-860-223

- (6) Put the SPEED BRAKE lever to the DOWN position.

SUBTASK 29-00-00-860-117

- (7) Remove power from the hydraulic systems A and B. To remove them, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-080-013

- (8) Remove the portable hydraulic cart or the ammeter equipment from the airplane.

SUBTASK 29-00-00-993-826

- (9) Do these steps to turn on the antiskid system:
(a) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01345	LANDING GEAR AUTOBRAKE BITE CONT 2
A	18	C00583	LANDING GEAR AUTOBRAKE BITE CONT 1
E	16	C00196	LANDING GEAR ANTISKID INBD
E	18	C00195	LANDING GEAR ANTISKID OUTBD

SUBTASK 29-00-00-840-101

- (10) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 29-00-00-610-005

- (11) If necessary, service the system A and B hydraulic reservoirs. To service them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

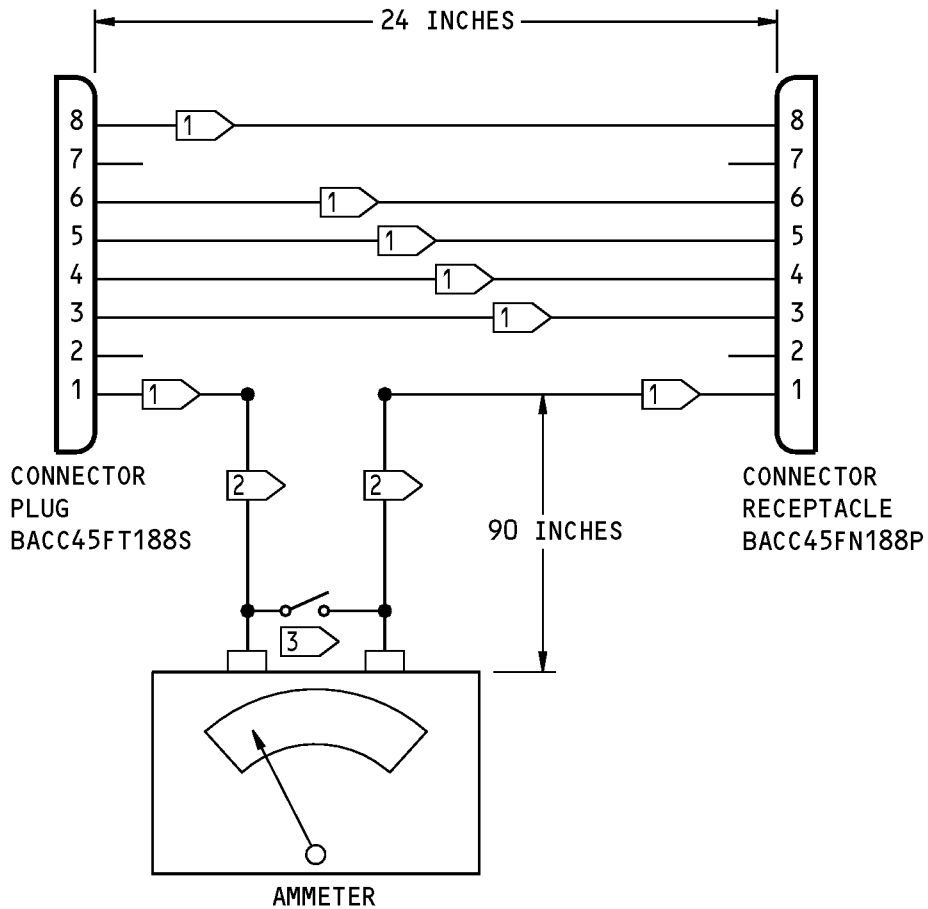
————— **END OF TASK** —————

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- 1 NO. 12 WIRE
- 2 NO. 10 WIRE
- 3 SHORT CIRCUIT SWITCH

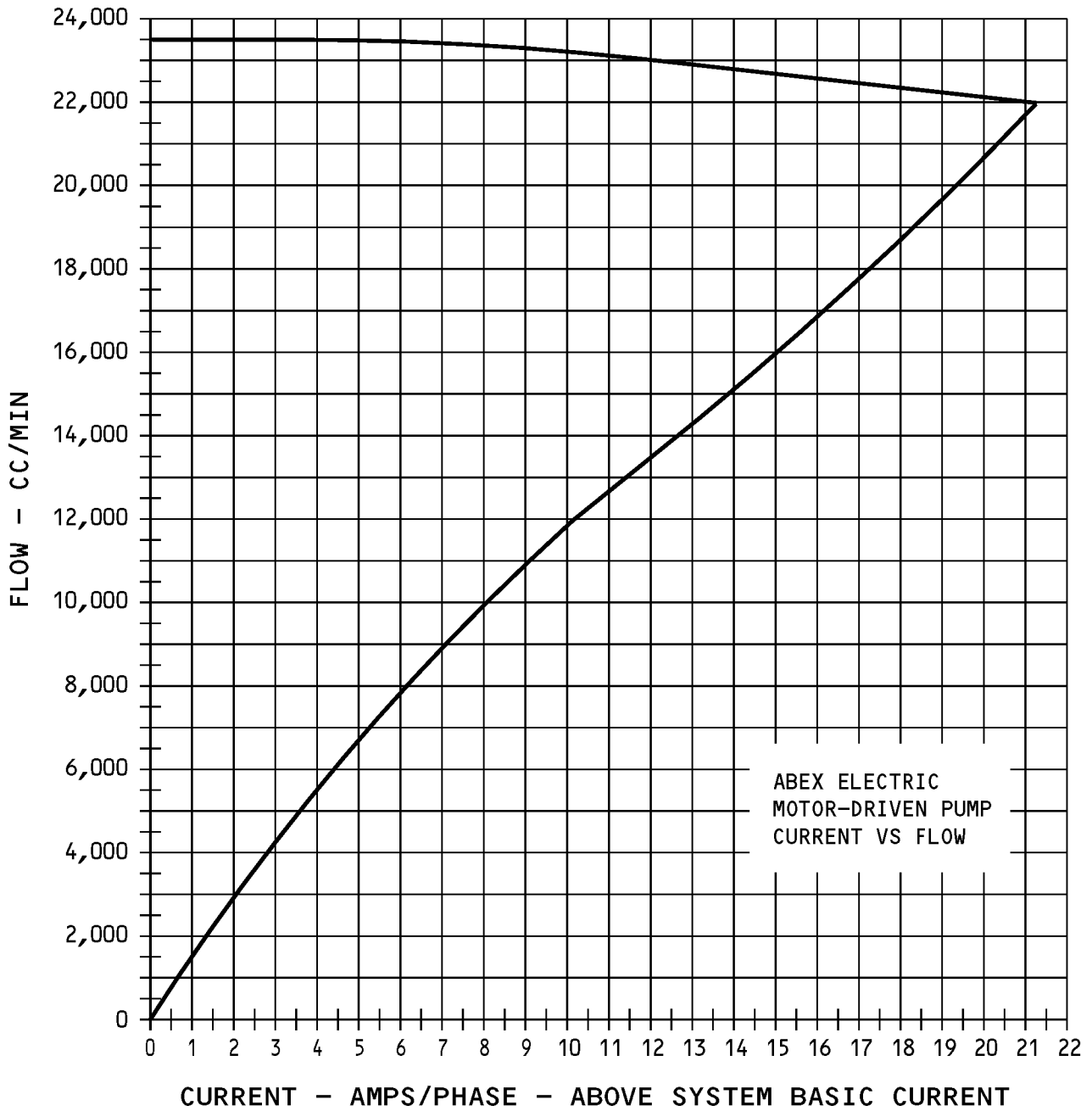
**Ammeter Wiring Harness for the A and B EMDP Hydraulic Systems
Figure 601/29-00-00-990-804**

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Hydraulic System A and B EMDP Characteristics
Figure 602 (Sheet 1 of 2)/29-00-00-990-805

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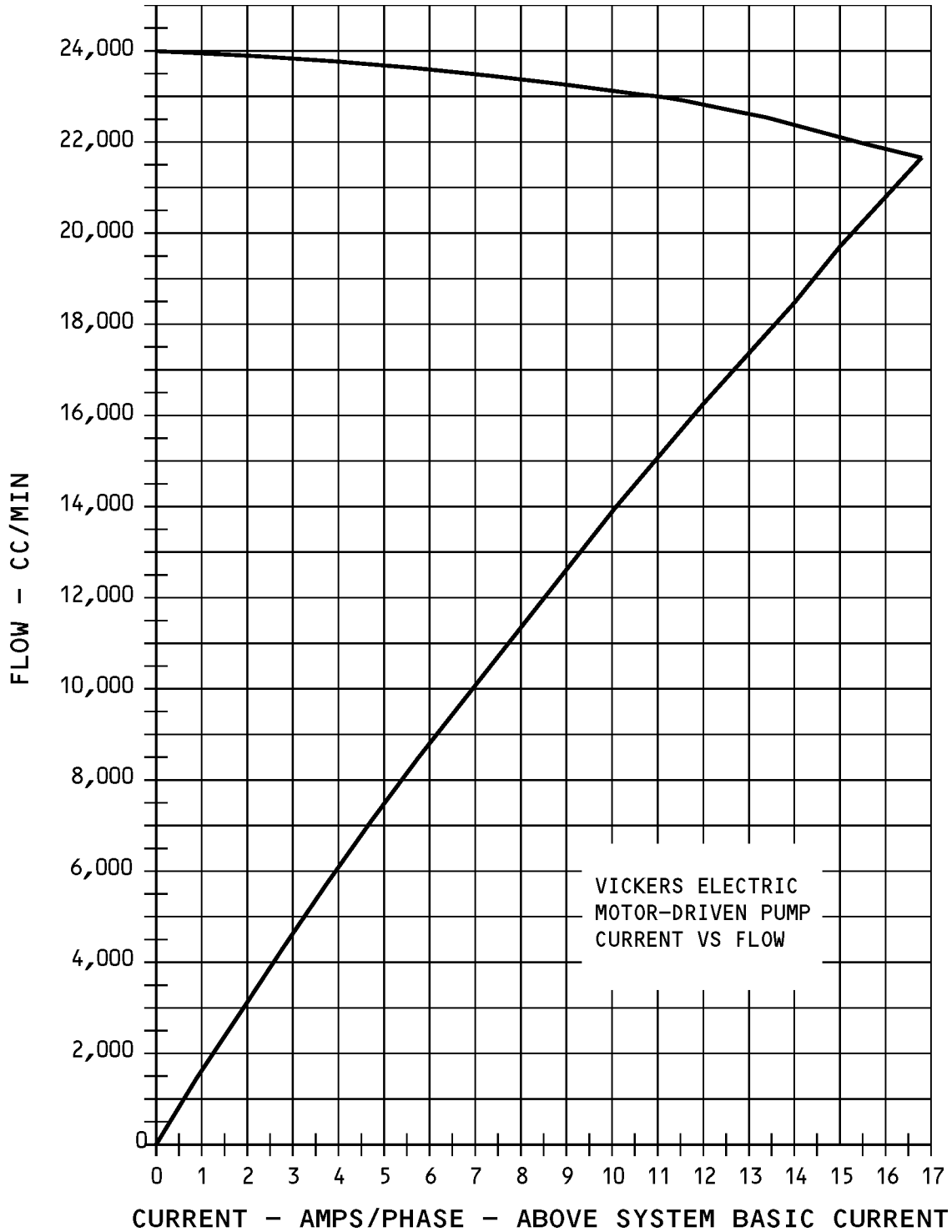
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Hydraulic System A and B EMDP Characteristics
Figure 602 (Sheet 2 of 2)/29-00-00-990-805

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TASK 29-00-00-790-803

4. System A or System B Sub-System Internal Leakage Check

(Figure 601, Figure 602)

A. General

- (1) Use this check to find the internal leakage of the systems that use hydraulic power.
(2) You must find the changes in the flow of hydraulic fluid (during different conditions of operation) to find the internal leakage rate for each part of the system. There are three methods to measure the flow: the ammeter, the flowmeter, and the amp-clamp multimeter.
(a) To use the ammeter method, you connect an ammeter in series with one phase of the motor on the electric motor-driven pump (EMDP) (Figure 601). To find the flow you measure the current, subtract the other current readings as directed, and use (Figure 602) to change it to a flow.
(b) To use the flowmeter method, you install a flowmeter on a hydraulic service cart and read the flow from it.
(c) To use the amp-clamp multimeter method, you put the amp-clamp adapter around one of the wires connected to a relay for the EMDP. You then read the current on the multimeter (that is connected to the amp-clamp adapter), subtract other current reading as directed, and use (Figure 602) to change it to a flow.
(3) When you read the ammeter, make a record of the value to the nearest 0.1 ampere.
(4) When you read the flowmeter, make a record of the value to the nearest 100 cc/minute.

B. References

Table with 2 columns: Reference, Title. Contains 8 rows of reference numbers and titles such as 'Hydraulic Reservoir Servicing (P/B 301)', 'Supply Electrical Power (P/B 201)', etc.

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Table with 2 columns: Reference, Description. Contains 3 rows of tool references and descriptions such as 'Flowmeter - Leakage Check, Hydraulic System Internal', 'Ammeter - Leakage Check, A.C. Internal Hydraulic System', etc.

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(Continued)

Reference	Description
COM-2531	Meter - Current, RMS (Part #: 321, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 322, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: LH41A, Supplier: 15566, A/P Effectivity: 737-ALL) (Part #: MODEL 33, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: MODEL 36, Supplier: 89536, A/P Effectivity: 737-ALL)
SPL-1788	Cable - Hydraulic Leakage Check (Part #: F80135-13, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: F80135-1, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
312	Area Aft of Pressure Bulkhead - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare for the System Internal Leakage Check

SUBTASK 29-00-00-840-102

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES DURING THE LEAK CHECK. THE AILERONS, RUDDER, ELEVATOR FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED ON ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Make sure the ground locks are installed at the nose and main landing gear. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-00-00-840-103

- (2) Install locking pin in the nose gear steering by-pass valve.

SUBTASK 29-00-00-840-104

- (3) Make sure the main landing gear has blocks installed.

SUBTASK 29-00-00-840-105

- (4) Remove the blocks and the tow bar from the nose landing gear.

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SUBTASK 29-00-00-840-106

(5) Make sure that all cowls on the engine are closed.

SUBTASK 29-00-00-860-224

(6) Open this access panel to get access to the main electronics equipment compartment.

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 29-00-00-840-107

(7) If you use the ammeter, COM-1787, then do these steps:

NOTE: When you read the ammeter, make a record of the value to the nearest 0.1 ampere. Use the (Figure 602) to change current to flow.

(a) Make sure the person in the flight compartment and the person on the ground can speak to each other (Interphone, radio).

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGE AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(b) To do a test of hydraulic system B:

1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

(c) To do a test of hydraulic system A:

1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

(d) Disconnect the electrical connector from the electric motor-driven pump (EMDP) for the A or B hydraulic system (Figure 601).

(e) Connect one end of the cable, SPL-1788 to the EMDP.

(f) Connect the other end of the cable, SPL-1788 to the electrical connector.

CAUTION: PUT THE AMMETER IN THE SHORT CIRCUIT POSITION. THE CURRENT TO START THE EMDP IS APPROXIMATELY 180 AMPS. THIS WILL CAUSE DAMAGE TO THE AMMETER IF IT IS IN THE CIRCUIT.

(g) Put the switch on the ammeter, COM-1787 in the short-circuit position.

(h) To do a test of hydraulic system B:

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- 1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

- (i) To do a test of hydraulic system A:

- 1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-00-00-840-108

- (8) If you use the hydraulic system internal leakage check flowmeter, COM-1786 and portable hydraulic cart, STD-163, then do these steps:

NOTE: When you read the flowmeter, make a record of the value to the nearest 100 cc/minute.

- (a) Connect the portable hydraulic cart, STD-163 to the ground service module for hydraulic system A or B.

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

- 1) If applicable, put the remote readout for the hydraulic system internal leakage check flowmeter, COM-1786 in the control cabin.
- 2) Operate the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-840-109

- (9) If you use the current meter, COM-2531 or digital multimeter, COM-1793, then do these steps:

NOTE: The current meter, COM-2531 or digital multimeter, COM-1793 is installed on one of the three wires that provide phased electrical power to the EMDP. These tools can either be installed at the EMDP in the wheel well or at the relay in the P91 and P92 panel.

NOTE: When you use the current meter, COM-2531 or digital multimeter, COM-1793, read the current on the meter and use (Figure 602) to get the flow.

- (a) To install the current meter, COM-2531 or digital multimeter, COM-1793 in the P91 or P92 panel, do these steps:

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGE AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

- 1) To do a test of hydraulic system B:

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a) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

2) To do a test of hydraulic system A:

a) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

WARNING: BE CAREFUL WHEN YOU INSTALL THE DIGITAL MULTIMETER, COM-1793 INTO THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES THAT MAY CAUSE INJURIES TO PERSONS.

3) To test hydraulic system B, get access to the R318 relay for the system B EMDP in the P91 panel.

4) To test hydraulic system A, get access to the R317 relay for the system A EMDP in the P92 panel.

5) Put the digital multimeter, COM-1793 around one of the three wires that go aft from the relay.

6) To do a test of hydraulic system B:

a) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

7) To do a test of hydraulic system A:

a) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-00-00-860-225

(10) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

NOTE: If you use a ground cart for electrical power, it must supply a voltage of 114 to 116 volts ac at 400 -5 Hz. Do not operate other electrical equipment during this test.

SUBTASK 29-00-00-840-110

(11) If you use the EMDP's for this check, make sure the main tank 1 (for the system A heat exchanger) and the main tank 2 (for the system B heat exchanger) have a minimum of 250 gallons (1675 pounds/760 kilograms) of fuel in them.

NOTE: This is necessary to prevent the hydraulic pumps from becoming too hot.

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SUBTASK 29-00-00-840-111

(12) Put the parking brakes on.

SUBTASK 29-00-00-840-112

(13) Put the FLT CONTROL A and B switches, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-226

(14) Put the SPOILER A and B switches, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-227

(15) If the airplane hydraulic pumps will be used to pressurize the hydraulic system, pressurize the hydraulic reservoirs to 20 psi minimum. To pressurize the reservoirs, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-00-00-860-228

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(16) Pressurize the hydraulic systems A and B with the electric motor-driven pump or with a portable hydraulic cart. To pressurize them, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

SUBTASK 29-00-00-840-113

(17) Operate the flaps 2 times to warm the hydraulic fluid.

SUBTASK 29-00-00-840-114

(18) Operate all of the control surfaces through a minimum of 10 cycles after the hydraulic fluid is warm.

SUBTASK 29-00-00-840-115

(19) Do these steps to put the airplane in its initial condition:

- (a) Put the reverse thrust levers in the STOWED position.
- (b) Put the stabilizer trim in the green band.

NOTE: The stabilizer indicator is on the control stand.

- (c) Set the aileron trim to zero.

NOTE: The aileron trim indicator is on the control wheel.

- (d) Set the rudder trim to zero.

NOTE: The rudder trim indicator is on the P8 panel.

- (e) Do these steps to turn off the antiskid system:

- 1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01345	LANDING GEAR AUTOBRAKE BITE CONT 2
A	18	C00583	LANDING GEAR AUTOBRAKE BITE CONT 1
E	16	C00196	LANDING GEAR ANTISKID INBD

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Row	Col	Number	Name
E	18	C00195	LANDING GEAR ANTISKID OUTBD

- (f) Put the YAW DAMPER switch, on the P5 panel, in the OFF position.
- (g) Put the A/P ENGAGE switches, on the mode control panel (MCP), in the OFF position.
- (h) Put the LANDING GEAR lever, on the P2 panel, in the OFF position.
- (i) Put the SPEED BRAKE lever, on the control stand, in the DOWN position.
- (j) Put the FLT CONTROL A and B switches, on the P5 panel, in the OFF position.
- (k) Put the SPOILER A and B switches, on the P5 panel, in the OFF position.
- (l) Set the FLAP position lever to 25 and let the flaps move.
- (m) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

- (n) Put the ALTERNATE FLAPS switch, on the P5 panel, in the ARM position.
- (o) Set the FLAP position lever to 40.

NOTE: The flaps will not move.

SUBTASK 29-00-00-860-229

- (20) Remove pressure from the hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

G. Hydraulic System B Sub-system Internal Leakage Check

SUBTASK 29-00-00-860-121

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure that hydraulic system B is pressurized. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-00-00-860-122

- (2) If you use the ammeter, set the ammeter to its highest range.

SUBTASK 29-00-00-210-046

- (3) Make sure the pressure in system B is a minimum of 2850 psi (19650 kPa).

SUBTASK 29-00-00-210-047

- (4) Make sure the FLT CONTROL B switch, on the P5 panel, is in the OFF position.

SUBTASK 29-00-00-210-029

- (5) Make sure the SPOILER B switch, on the P5 panel, is in the OFF position.

SUBTASK 29-00-00-790-009

- (6) If you use the ammeter or amp-clamp multimeter method, read the amperage and write it here:

Table 616/29-00-00-993-827

Amperage: _____ (Value 1)
Note: The amperage measured is the system B basic current, and must be subtracted from all other system B amperage readings BEFORE you use the result of the subtraction to find the equivalent flow from Figure 602.

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SUBTASK 29-00-00-200-002

(7) If you use the flow meter method, read the flow value and write it here:

Table 617/29-00-00-993-828

Flow: _____ cc/min (Value 1)
Note: This value is the system B basic flow.

SUBTASK 29-00-00-790-010

(8) Do these steps to find the leakage of the system B flight controls:

- (a) Put the FLT CONTROL B switch, on the P5 panel, in the ON position.
- (b) Make sure the control wheel is in the neutral position and do not operate any flight controls.
- (c) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage and write it here:

Table 618/29-00-00-993-829

Amperage: _____ (Value 2)

2) Subtract Value 1 from Value 2 and write it here:

Table 619/29-00-00-993-830

Amperage: _____ (Calculated) amperage)
--

3) Use Figure 602 for the applicable pump to convert the calculated amperage to flow and write it here:

Table 620/29-00-00-993-831

Flow: _____ cc/min (Value 3)
Note: This is the internal leakage for the system B flight controls.

- (d) If you use the flow meter method, do these steps:
 - 1) Read the flow and write it here:

Table 621/29-00-00-993-832

Flow: _____ cc/min (Value 2)

2) Subtract Value 1 from Value 2 and write it here:

Table 622/29-00-00-993-833

Calculated Flow: _____ cc/min (Value 3)
Note: This is the internal leakage for the system B flight controls

- (e) If Value 3 is more than 12,100 cc/min, do the steps to check Hydraulic System B Sub-system parts to find the part that has too much leakage. To do it, do this task: Part Internal Leakage Check, TASK 29-00-00-790-804.

SUBTASK 29-00-00-790-011

(9) Do these steps to find the leakage of the system B spoilers 3,5,8, and 10:

- (a) Put the SPOILER B switch, on the P5 panel, in the ON position

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(b) Put the FLT CONTROL B switch, on the P5 panel, in the OFF position.

NOTE: This removes system B hydraulic pressure from the elevator power control unit (PCU), elevator feel actuator, elevator autopilot (A/P) actuator, rudder PCU, aileron PCU and aileron A/P actuator.

(c) If you use the ammeter or amp-clamp multimeter method do these steps:

1) Read the amperage and write it here:

Table 623/29-00-00-993-834

Amperage: _____ (Value 4)

2) Subtract Value 1 from Value 4 and write it here:

Table 624/29-00-00-993-835

Amperage: _____ (Calculated) amperage)

3) Use (Figure 602) for the applicable pump to change the calculated amperage to flow and write it here:

Table 625/29-00-00-993-836

Flow: _____ cc/min (Value 5)

Note: This is the internal leakage for the system B spoilers 3, 5, 8, and 10.

(d) If you used the flow meter method do these steps:

1) Read the flow and write it here:

Table 626/29-00-00-993-837

Flow: _____ cc/min (Value 4)

2) Subtract Value 1 from Value 4 and write it here:

Table 627/29-00-00-993-838

Flow: _____ cc/min (Value 5)

Note: This is the internal leakage for the system B spoilers 3, 5, 8, and 10.

(e) If Value 5 is more than 1,000 cc/min, do the steps to check Hydraulic System B sub-system parts to find the part that has too much leakage. To do it, do this task: Part Internal Leakage Check, TASK 29-00-00-790-804.

SUBTASK 29-00-00-860-124

(10) Put the SPOILER B switch, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-790-012

(11) Do these steps to find the leakage of the control valve for the trailing edge (TE) flaps:

(a) Put the ALTERNATE FLAPS switch in the OFF position.

NOTE: The flaps will move to 40 units.

(b) Set the FLAP position lever to 25.

NOTE: Do not continue until the flaps have completed their travel.

(c) If you use the ammeter or amp-clamp multimeter method do these steps:

1) Read the amperage and write it here:

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Table 628/29-00-00-993-839

Amperage: _____ (Value 6)

2) Subtract Value 1 from Value 6 and write it here:

Table 629/29-00-00-993-840

Amperage: _____ (Calculated) amperage)
--

3) Use (Figure 602) for the applicable pump to change the calculated amperage to flow and write it here:

Table 630/29-00-00-993-841

Flow: _____ cc/min (Value 7)

Note: This is the internal leakage for the system B TE flaps.

(d) If you used the flow meter method do these steps:

1) Read the flow and write it here:

Table 631/29-00-00-993-842

Flow: _____ cc/min (Value 6)

2) Subtract Value 1 from Value 6 and write it here:

Table 632/29-00-00-993-843

Flow: _____ cc/min (Value 7)

Note: This is the internal leakage for the system B TE flaps.

(e) If Value 7 is more than 8,000 cc/min, do the steps to check Hydraulic System B sub-system parts to find the part that has too much leakage. To do it, do this task: Part Internal Leakage Check, TASK 29-00-00-790-804.

SUBTASK 29-00-00-790-013

(12) Do these steps to find the null leakage for spoilers 3,5,8, and 10:

- (a) Put the SPOILER B switch in the ON position.
- (b) Put the SPEED BRAKE lever half the distance between the ARMED and the FLIGHT DETENT positions.
- (c) If you use the ammeter or amp-clamp multimeter method do these steps:
 - 1) Read the amperage and write it here:

Table 633/29-00-00-993-844

Amperage: _____ (Value 8)

2) Subtract Value 1 from Value 8 and write it here:

Amperage: _____ (Calculated) amperage)

Table 634/29-00-00-993-845

Amperage: _____ (Calculated) amperage)
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3) Use (Figure 602) for the applicable pump to change the calculated amperage to flow and write it here:

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Table 635/29-00-00-993-846

Flow: _____ cc/min (Value 9)
Note: This is the null leakage for the system B spoilers 3, 5, 8, and 10.

- (d) If you used the flow meter method do these steps:
1) Read the flow and write it here:

Table 636/29-00-00-993-847

Flow: _____ cc/min (Value 8)

- 2) Subtract Value 1 from Value 9 and write it here:

Table 637/29-00-00-993-848

Flow: _____ cc/min (Value 9)
Note: This is the null leakage of the system B spoilers 3, 5, ,8 and 10.

- (e) If Value 9 is more than 8,000 cc/min, do the steps to check Hydraulic System B sub-system parts to find the part that has too much leakage. To do it, do this task: Part Internal Leakage Check, TASK 29-00-00-790-804.

SUBTASK 29-00-00-860-125

- (13) Put the SPEED BRAKE lever to the down-and-locked position.

SUBTASK 29-00-00-860-231

- (14) Put the SPOILER B switch to the OFF position.

SUBTASK 29-00-00-860-126

- (15) Put FLAP lever to the 0 position.

NOTE: The flaps will retract.

SUBTASK 29-00-00-860-127

- (16) Remove power from the hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-800-002

- (17) This completes the Hydraulic System B Sub-system Internal Leakage Check

H. Hydraulic System A Sub-system Internal Leakage Check

SUBTASK 29-00-00-480-013

- (1) Connect the equipment that is necessary to measure the current or flow to hydraulic system A.

SUBTASK 29-00-00-860-128

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Pressurize the hydraulic system A. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-00-00-210-048

- (3) Make sure that the FLT CONTROL A switch, on the P5 panel, is in the OFF position.

SUBTASK 29-00-00-210-049

- (4) Make sure that the SPOILER A switch, on the P5 panel, is in the OFF position.

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SUBTASK 29-00-00-210-030

(5) Make sure the pressure in system A is a minimum of 2850 psi (19650 kPa).

SUBTASK 29-00-00-790-079

(6) Do these steps to find the system A basic current or flow :

(a) If you use the ammeter or amp-clamp multimeter method, read the amperage and write it here:

Table 638/29-00-00-993-849

Amperage: _____ (Value 10)

Note: The amperage measured is the system A basic current, and must be subtracted from all other system A amperage readings before you use the result of the subtraction to find the equivalent flow from Figure 602.

(b) If you use the flow meter method, read the flow value and write it here:

Table 639/29-00-00-993-850

Flow: _____ cc/min (Value 10)

Note: This value is the system A basic flow.

SUBTASK 29-00-00-790-016

(7) Do these steps to find the leakage for the system A flight controls:

(a) Put the FLT CONTROL A switch, on the P5 panel, in the ON position.

(b) Make sure the control wheel is in the neutral position and do not operate any flight controls.

(c) If you use the ammeter or amp-clamp multimeter method do these steps:

1) Read the amperage and write it here:

Table 640/29-00-00-993-851

Amperage: _____ (Value 11)

2) Subtract Value 10 from Value 11 and write it here:

Table 641/29-00-00-993-852

Amperage: _____ (Calculated) amperage)
--

3) Use (Figure 602) for the applicable pump to change the calculated amperage to flow and write it here:

Table 642/29-00-00-993-853

Flow: _____ cc/min (Value 12)

Note: This value is the internal leakage for the system A flight controls.

(d) If you used the flow meter method do these steps:

1) Read the flow and write it here:

Table 643/29-00-00-993-854

Flow: _____ cc/min (Value 11)

2) Subtract Value 10 from Value 11 and write it here:

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Table 644/29-00-00-993-855

Flow: _____ cc/min (Value 12)
Note: This value is the internal leakage for the system A flight controls.

- (e) If Value 12 is more than 11,000 cc/min, do the steps to check Hydraulic System A sub-system parts to find the part that has too much leakage. To do it, do this task: (Part Internal Leakage Check, TASK 29-00-00-790-804).

SUBTASK 29-00-00-790-017

- (8) Do these steps to find the leakage for the system A spoilers 2,4,9, and 11:
 - (a) Put the SPOILER A switch, on the P5 panel, in the ON position.
 - (b) Put the FLT CONTROL A switch in the OFF position.

NOTE: This removes system A hydraulic pressure from the elevator power control unit (PCU), elevator feel actuator, elevator autopilot (A/P) actuator, rudder PCU, aileron PCU and aileron A/P actuator.

- (c) If you use the ammeter or amp-clamp multimeter method do these steps:
 - 1) Read the amperage and write it here:

Table 645/29-00-00-993-856

Amperage: _____ (Value 13)

- 2) Subtract Value 10 from Value 13 and write it here:

Table 646/29-00-00-993-857

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to change the calculated amperage to flow and write it here:

Table 647/29-00-00-993-858

Flow: _____ cc/min (Value 14)
Note: This value is the internal leakage of system A spoilers 2, 4, 9, and 11.

- (d) If you used the flow meter method do these steps:
 - 1) Read the flow and write it here:

Table 648/29-00-00-993-859

Flow: _____ cc/min (Value 13)

- 2) Subtract Value 10 from Value 13 and write it here:

Table 649/29-00-00-993-860

Flow: _____ cc/min (Value 14)
Note: This value is the internal leakage of system A spoilers 2, 4, 9, and 11.

- (e) If Value 14 is more than 1,000 cc/min, do the steps to check Hydraulic System A sub-system parts to find the part that has too much leakage. To do it, do this task: (Part Internal Leakage Check, TASK 29-00-00-790-8040).

SUBTASK 29-00-00-790-018

- (9) Do these steps to find the null leakage for spoilers 2, 4, 9, and 11:

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- (a) Make sure the SPOILER A switch is in the ON position.
(b) Put the SPEED BRAKE lever half the distance between the ARMED and the FLIGHT DETENT positions.
(c) If you use the ammeter or amp-clamp multimeter method do these steps:
1) Read the amperage and write it here:

Table 650/29-00-00-993-861

Amperage: _____ (Value 15)

- 2) Subtract Value 10 from Value 15 and write it here:

Table 651/29-00-00-993-862

Amperage: _____ (Calculated) amperage)

- 3) Use (Figure 602) for the applicable pump to change the calculated amperage to flow and write it here:

Table 652/29-00-00-993-863

Flow: _____ cc/min (Value 16)

Note: This is the null leakage for the system A spoilers 2, 4, 9, and 11.

- (d) If you used the flow meter method do these steps:
1) Read the flow and write it here:

Table 653/29-00-00-993-864

Flow: _____ cc/min (Value 15)

- 2) Subtract Value 10 from Value 15 and write it here:

Table 654/29-00-00-993-865

Flow: _____ cc/min (Value 16)

Note: This is the null leakage for the system A spoilers 2, 4, 9, and 11.

- (e) If Value 16 is more than 8,000 cc/min, do the steps to check Hydraulic System A sub-system parts to find the part that has too much leakage. To do it, do this task: Part Internal Leakage Check, TASK 29-00-00-790-804.

SUBTASK 29-00-00-860-129

- (10) Put the SPEED BRAKE lever to the down-and-locked position.

SUBTASK 29-00-00-860-130

- (11) Put the SPOILER A switch to the OFF position.

SUBTASK 29-00-00-790-020

- (12) Do these steps to find the leakage for the landing gear and steering system:
(a) Make sure that the FLT CONTROL A switch, on the P5 panel, is in the OFF position.
(b) Put the LANDING GEAR lever, on the P2 panel, in the DN position.
(c) If you use the ammeter or amp-clamp multimeter method do these steps:
1) Read the amperage and write it here:

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Table 655/29-00-00-993-866

Amperage: _____ (Value 17)

2) Subtract Value 10 from Value 17 and write it here:

Table 656/29-00-00-993-867

Amperage: _____ (Calculated) amperage)
--

3) Use (Figure 602) for the applicable pump to change the calculated amperage to flow and write it here:

Table 657/29-00-00-993-868

Flow: _____ cc/min (Value 18)

Note: This is the internal leakage of the landing gear and steering system.

(d) If you used the flow meter method do these steps:

1) Read the flow and write it here:

Table 658/29-00-00-993-869

Flow: _____ cc/min (Value 17)

2) Subtract Value 10 from Value 17 and write it here:

Table 659/29-00-00-993-870

Flow: _____ cc/min (Value 18)

Note: This is the internal leakage of the landing gear and steering system.

(e) If Value 18 is more than 2,100 cc/min, do the steps to check Hydraulic System A sub-system parts to find the part that has too much leakage. To do it, do this task: Part Internal Leakage Check, TASK 29-00-00-790-804.

SUBTASK 29-00-00-800-003

(13) This completes the Hydraulic System A Sub-system Internal Leakage Check. Continue with: Put the Airplane Back to its Usual Condition.

I. Put the Airplane Back to its Usual Condition

SUBTASK 29-00-00-860-131

(1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01345	LANDING GEAR AUTOBRAKE BITE CONT 2
A	18	C00583	LANDING GEAR AUTOBRAKE BITE CONT 1
E	16	C00196	LANDING GEAR ANTISKID INBD
E	18	C00195	LANDING GEAR ANTISKID OUTBD

SUBTASK 29-00-00-860-132

(2) Put the ALTERNATE FLAPS switch, on the P5 panel, in the OFF position.

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SUBTASK 29-00-00-860-232

- (3) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-860-233

- (4) Put the FLT CONTROL A and B, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-133

- (5) Put the SPOILER A and B switches, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-134

- (6) Remove power from the hydraulic systems A and B. To remove them, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-080-014

- (7) Remove the portable hydraulic cart, ammeter, or amp-clamp multimeter equipment from the airplane.

SUBTASK 29-00-00-790-083

- (8) Remove the locking pin from the nose gear steering by-pass valve.

SUBTASK 29-00-00-410-001

- (9) Install this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 29-00-00-610-006

- (10) If necessary, fill the systems A and B hydraulic reservoirs. To fill them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

END OF TASK

TASK 29-00-00-790-804

5. Part Internal Leakage Check

(Figure 601, Figure 602)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) Use this check to find the internal leakage of each part or a small group of parts.
- (3) To find the condition of the parts of the hydraulic system you compare the leakage you measured to the maximum leakage. If you find a leakage that is more than the maximum, you must replace the parts that have too much leakage. Refer to Chapter 27 (Flight Controls), Chapter 32 (Landing Gear), or Chapter 22 (Autoflight) for the applicable removal and installation procedures.
- (4) You must find the changes in the flow of hydraulic fluid (during different conditions of operation) to find the internal leakage rate for each part. There are three methods to measure the flow: the ammeter, the flowmeter, and the amp-clamp multimeter.

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- (a) To use the ammeter method, you connect an ammeter in series with one phase of the motor on the electric motor-driven pump (EMDP) (Figure 601). To find the flow you measure the current subtract the applicable system basic current, and use the (Figure 602) to change it to a flow.
 - (b) To use the flowmeter method, you install a flowmeter on a portable hydraulic cart and read the flow from it.
 - (c) To use the amp-clamp you put the amp-clamp adapter around one of the wires connected to a relay for the EMDP. You then read the current on the meter, subtract the other current readings as directed, and use the (Figure 602) to get the flow.
- (5) When you read the ammeter, make a record of the value (on the data sheets in this manual) to the nearest 0.1 ampere.
- (6) When you read the flowmeter, make a record of the value to the nearest 100 cc/minute.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
34-21-00-820-801	Air Data Inertial Reference System - Alignment from the FMC CDU (P/B 201)
34-21-00-820-802	Air Data Inertial Reference System - Alignment from the ISDU (P/B 201)
78-31-00-980-801-F00	Thrust Reverser Operation - Extend (Selection) (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1786	Flowmeter - Leakage Check, Hydraulic System Internal (Part #: 410DME-10AR, Supplier: 05172, A/P Effectivity: 737-ALL) (Part #: 410DME-10AR-M, Supplier: 05172, A/P Effectivity: 737-ALL) (Part #: HTT02, Supplier: H6394, A/P Effectivity: 737-ALL)
COM-1787	Ammeter - Leakage Check, A.C. Internal Hydraulic System (Part #: 433-2919001, Supplier: 32590, A/P Effectivity: 737-ALL)
COM-1793	Multimeter - Digital, 3 1/2 Digits (Part #: 187, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 87, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 87V, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: MODEL 21, Supplier: 89536, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: MODEL 27, Supplier: 89536, A/P Effectivity: 737-ALL)
COM-1797	Stethoscope - Mechanics, 12 Inch Probe (Part #: GA111D, Supplier: 55719, A/P Effectivity: 737-ALL) (Opt Part #: GA111C, Supplier: 55719, A/P Effectivity: 737-ALL)

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Reference	Description
COM-2531	Meter - Current, RMS (Part #: 321, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 322, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: LH41A, Supplier: 15566, A/P Effectivity: 737-ALL) (Part #: MODEL 33, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: MODEL 36, Supplier: 89536, A/P Effectivity: 737-ALL)
SPL-1788	Cable - Hydraulic Leakage Check (Part #: F80135-13, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: F80135-1, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
311	Area Aft of Pressure Bulkhead - Left
312	Area Aft of Pressure Bulkhead - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare for the Part Internal Leakage Check

SUBTASK 29-00-00-840-116

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES DURING THE LEAK CHECK. THE AILERONS, RUDDER, ELEVATOR FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED ON ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Make sure the ground locks are installed at the nose and main landing gear. To install them, do this task: (Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801).

SUBTASK 29-00-00-840-117

- (2) Make sure the main landing gear has blocks installed.

SUBTASK 29-00-00-840-118

- (3) Remove the blocks and the tow bar from the nose landing gear.

SUBTASK 29-00-00-840-119

- (4) Make sure that all cowls on the engine are closed.

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SUBTASK 29-00-00-860-234

- (5) Open this access panel to get access to the main electronics equipment compartment.

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 29-00-00-860-235

- (6) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

NOTE: If you use a ground cart for electrical power, it must supply a voltage of 114 to 116 volts ac at 400 -5 Hz. Do not operate other electrical equipment during this test.

SUBTASK 29-00-00-840-120

- (7) If you use the EMDP's for this check, make sure the main tank 1 (for the system A heat exchanger) and the main tank 2 (for the system B heat exchanger) have a minimum of 250 gallons (1675 pounds/760 kilograms) of fuel in them.

NOTE: This is necessary to prevent the hydraulic pumps from becoming too hot.

SUBTASK 29-00-00-840-121

- (8) Put the parking brakes on.

SUBTASK 29-00-00-840-122

- (9) Put the FLT CONTROL A and B switches, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-236

- (10) Put the SPOILER A and B switches, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-237

- (11) If the airplane hydraulic pumps will be used to pressurize the hydraulic system, check to make sure that the hydraulic reservoirs are pressurized to 20 psi minimum. To pressurize the reservoirs, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-00-00-860-238

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (12) Pressurize the hydraulic systems A and B with the electric motor-driven pump or with a portable hydraulic cart. To pressurize them, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

SUBTASK 29-00-00-840-123

- (13) Operate the flaps 2 times to warm the hydraulic fluid.

SUBTASK 29-00-00-840-124

- (14) Operate all of the control surfaces through a minimum of 10 cycles after the hydraulic fluid is warm.

SUBTASK 29-00-00-840-125

- (15) Do these steps to put the airplane in its initial condition:
(a) Put the reverse thrust levers in the STOWED position.

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- (b) Put the stabilizer trim in the green band.
NOTE: The stabilizer indicator is on the control stand.
- (c) Set the aileron trim to zero.
NOTE: The aileron trim indicator is on the control wheel.
- (d) Set the rudder trim to zero.
NOTE: The rudder trim indicator is on the P8 panel.
- (e) Do these steps to turn off the antiskid system:
 - 1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01345	LANDING GEAR AUTOBRAKE BITE CONT 2
A	18	C00583	LANDING GEAR AUTOBRAKE BITE CONT 1
E	16	C00196	LANDING GEAR ANTISKID INBD
E	18	C00195	LANDING GEAR ANTISKID OUTBD

- (f) Align the ADIRS. Do this task: Air Data Inertial Reference System - Alignment from the ISDU, TASK 34-21-00-820-802 or Air Data Inertial Reference System - Alignment from the FMC CDU, TASK 34-21-00-820-801
- (g) Put the YAW DAMPER switch, on the P5 panel, in the OFF position.
- (h) Put the A/P ENGAGE switches, on the mode control panel (MCP), in the OFF position.
- (i) Put the LANDING GEAR lever, on the P2 panel, in the OFF position.
- (j) Put the SPEED BRAKE lever, on the control stand, in the DOWN position.
- (k) Put the FLT CONTROL A and B switches, on the P5 panel, in the OFF position.
- (l) Put the SPOILER A and B switches, on the P5 panel, in the OFF position.
- (m) Set the FLAP position lever to 25 and let the flaps move.
- (n) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

- (o) Put the ALTERNATE FLAPS switch, on the P5 panel, in the ARM position.
- (p) Set the FLAP position lever to 40 (the flaps will not move).

SUBTASK 29-00-00-840-126

- (16) If you use the ammeter, COM-1787, then do these steps:

NOTE: When you read the ammeter, make a record of the value to the nearest 0.1 ampere. Use the (Figure 602) to change current to flow.

- (a) Make sure the person in the flight compartment and the person on the ground can speak to each other (Interphone, radio).

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WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGE AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(b) To do a test of hydraulic system B:

1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

(c) To do a test of hydraulic system A:

1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

(d) Disconnect the electrical connector from the electric motor-driven pump (EMDP) for the A or B hydraulic system.

(e) Connect one end of the cable, SPL-1788 to the EMDP.

(f) Connect the other end of the cable, SPL-1788 to the electrical connector.

CAUTION: PUT THE AMMETER IN THE SHORT CIRCUIT POSITION. THE CURRENT TO START THE EMDP IS APPROXIMATELY 180 AMPS. THIS WILL CAUSE DAMAGE TO THE AMMETER IF IT IS IN THE CIRCUIT.

(g) Put the switch on the ammeter, COM-1787 in the short-circuit position.

(h) To do a test of hydraulic system B:

1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

(i) To do a test of hydraulic system A:

1) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-00-00-840-127

(17) If you use the hydraulic system internal leakage check flowmeter, COM-1786 and portable hydraulic cart, STD-163, then do these steps:

NOTE: When you read the flowmeter, make a record of the value to the nearest 100 cc/minute.

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- (a) Connect the portable hydraulic cart, STD-163 to the ground service module for hydraulic system A or B.

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

- 1) Put the remote readout for the hydraulic system internal leakage check flowmeter, COM-1786 in the control cabin (if you have one).
- 2) Operate the portable hydraulic cart, STD-163.

SUBTASK 29-00-00-840-128

- (18) If you use the current meter, COM-2531 or digital multimeter, COM-1793, then do these steps:

NOTE: The current meter, COM-2531 or digital multimeter, COM-1793 is installed on one of the three wires that provide phased electrical power to the EMDP. These tools can either be installed at the EMDP in the wheel well or at the relay in the P91 and P92 panel.

NOTE: When you use the current meter, COM-2531 or digital multimeter, COM-1793, read the current on the meter and use the Hydraulic Systems A and B EMDP Characteristics to get the flow.

- (a) To install the current meter, COM-2531 or digital multimeter, COM-1793 in the P91 or P92 panel, do these steps:

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGE AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

- 1) To do a test of hydraulic system B:
 - a) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

- 2) To do a test of hydraulic system A:
 - a) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

WARNING: BE CAREFUL WHEN YOU INSTALL THE DIGITAL MULTIMETER, COM-1793 INTO THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES THAT MAY CAUSE INJURIES TO PERSONS.

- 3) To test hydraulic system B, get access to the R318 relay for the system B EMDP in the P91 panel.
- 4) To test hydraulic system A, get access to the R317 relay for the system A EMDP in the P92 panel.

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- 5) Put the digital multimeter, COM-1793 around one of the three wires that go forward from the relay.
6) To do a test of hydraulic system B:
a) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Table with 4 columns: Row, Col, Number, Name. Rows include C 8 C00768 ELEC HYD PUMP CONTROL SYS B and F 3 C00882 ELEC HYD PUMP SYS B

- 7) To do a test of hydraulic system A:
a) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Rows include C 8 C00767 ELEC HYD PUMP CONTROL SYS A and F 3 C00881 ELEC HYD PUMP SYS A

G. System B Part Internal Leakage Check

SUBTASK 29-00-00-860-138

- (1) Remove power from the hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-210-050

- (2) Make sure the pressure in system B is a minimum of 2850 psi (19650 kPa).

SUBTASK 29-00-00-210-051

- (3) Make sure the FLT CONTROL B switch, on the P5 panel, is in the OFF position.

SUBTASK 29-00-00-210-052

- (4) Make sure the SPOILER B switch, on the P5 panel, is in the OFF position.

SUBTASK 29-00-00-790-084

- (5) If you use the ammeter or amp-clamp multimeter method, read the amperage and write it here:

Table 660/29-00-00-993-871

Form with fields for Amperage: _____ (Value 1) and Note: This is the system B basic current. Includes a larger note: Note: The amperage measured is the system B basic current, and must be subtracted from all other system B amperage readings BEFORE you use the result of the subtraction to find the equivalent flow from Figure 602.

SUBTASK 29-00-00-970-018

- (6) If you use the flow meter method, read the flow value and write it here:

Table 661/29-00-00-993-872

Form with fields for Flow: _____ cc/min (Value 1) and Note: This value is the system B basic flow.

SUBTASK 29-00-00-790-023

- (7) Do these steps to find the leakage of the case drain for the trailing edge (TE) flap motor:

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- (a) Set the FLAP position lever to the 0 position.

NOTE: This step provides pressure to the flap motor. The flaps will stay at the 25 position.

- (b) If you use the ammeter or amp-clamp multimeter method, do these steps:

- 1) Read the amperage and write it here:

Amperage: _____ (Value 2)

Table 662/29-00-00-993-873

Amperage: _____ (Value 2)

- 2) Subtract Value 1 from Value 2 and write it here:

Table 663/29-00-00-993-874

Amperage: _____ (Calculated) amperage)

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 664/29-00-00-993-875

Flow: _____ cc/min (Value 3)

Note: This is the internal leakage for the case drain of the TE flap motor.

- (c) If you use the flow meter method, do these steps:

- 1) Read the flow and write it here:

Table 665/29-00-00-993-876

Flow: _____ cc/min (Value 2)

- 2) Subtract Value 1 from Value 2 and write it here:

Table 666/29-00-00-993-877

Calculated Flow: _____ cc/min (Value 3)

Note: This is the internal leakage for the case drain of the TE flap motor.

- (d) If Value 3 is more than 3000 cc/min., replace the TE flap motor.

SUBTASK 29-00-00-790-024

- (8) Do these steps to find the leakage of the control valve for the TE flaps:

- (a) Set the FLAP position lever to 25.

NOTE: The flaps will not move. They are already at the 25 position.

- (b) Put the ALTERNATE FLAPS switch, on the P5 panel, in the OFF position.

- (c) If you use the ammeter or amp-clamp multimeter method, do these steps:

- 1) Read the amperage and write it here:

Table 667/29-00-00-993-878

Amperage: _____ (Value 4)

- 2) Subtract Value 1 from Value 4 and write it here:

Table 668/29-00-00-993-879

Amperage: _____ (Calculated) amperage)

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- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 669/29-00-00-993-880

Flow: _____ cc/min (Value 5)
Note: This is the internal leakage for the system B TE flap control valve.

- (d) If you use the flow meter method, do these steps:
1) Read the flow and write it here:

Table 670/29-00-00-993-881

Flow: _____ cc/min (Value 4)

- 2) Subtract Value 1 from Value 4 and write it here:

Table 671/29-00-00-993-882

Flow: _____ cc/min (Value 5)
Note: This is the internal leakage for the system B TE flap control valve.

- (e) If Value 5 is more than 8000 cc/min., replace the control valve for the TE flaps .

SUBTASK 29-00-00-790-025

- (9) Do these steps to find the leakage of the leading edge flaps and slats:

- (a) Set the flap control lever to the 0 position.

NOTE: Stop until the flaps and slats fully retract.

- (b) If you use the ammeter or amp-clamp multimeter method, do these steps:

- 1) Read the amperage and write it here:

Table 672/29-00-00-993-883

Amperage: _____ (Value 6)

- 2) Subtract Value 1 from Value 6 and write it here:

Table 673/29-00-00-993-884

Amperage: _____ (Calculated) amperage)

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 674/29-00-00-993-885

Flow: _____ cc/min (Value 7)
Note: This is the null leakage for the LE flaps and slats.

- (c) If you use the flow meter method, do these steps:
1) Read the flow and write it here:

Table 675/29-00-00-993-886

Flow: _____ cc/min (Value 6)

- 2) Subtract Value 1 from Value 6 and write it here:

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Table 676/29-00-00-993-887

Flow: _____ cc/min (Value 7)
Note: This is the null leakage for the LE flaps and slats.

- (d) If Value 7 is more than 1000 cc/min., do the troubleshooting steps in the FIM for LE Flaps and Slats Fail to Operate During Normal Operation to find the bad parts.

SUBTASK 29-00-00-860-139

- (10) Do these steps to put the airplane back to its initial condition:

- (a) Set the FLAP position lever to 25.

NOTE: Stop until the flaps and slats become stable.

- (b) Put the ALTERNATE FLAPS switch, on the P5 panel, in the ARM position.

- (c) Set the FLAP position lever to 40.

NOTE: The flaps will not move.

SUBTASK 29-00-00-790-026

- (11) Do these steps to find the leakage of spoiler 3, 5, 8 and 10 when they are retracted:

- (a) Put the SPOILER B switch in the ON position.

- (b) Make sure the FLT CONTROL B switch is in the OFF position.

- (c) If you use the ammeter or amp-clamp multimeter method, do these steps:

- 1) Read the amperage and write it here:

Table 677/29-00-00-993-888

Amperage: _____ (Value 8)

- 2) Subtract Value 1 from Value 8 and write it here:

Table 678/29-00-00-993-889

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 679/29-00-00-993-890

Flow: _____ cc/min (Value 9)
Note: This is the internal leakage for the system B spoilers 3, 5, 8, and 10.

- (d) If you use the flow meter method, do these steps:

- 1) Read the flow and write it here:

Table 680/29-00-00-993-891

Flow: _____ cc/min (Value 8)

- 2) Subtract Value 1 from Value 8 and write it here:

Table 681/29-00-00-993-892

Flow: _____ cc/min (Value 9)
Note: This is the internal leakage for the system B spoilers 3, 5, 8, and 10.

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- (e) If Value 9 is more than 1000 cc/min., use a stethoscope, COM-1797 at the spoiler control valve and/or the spoiler actuator cylinder to detect, by sound, the leaky part and replace it.

NOTE: Quantitative measurement of individual spoiler leakage is not possible without disconnecting components.

SUBTASK 29-00-00-860-141

- (12) Put the SPOILER B switch in the OFF position.

SUBTASK 29-00-00-790-029

- (13) Do these steps to find the null leakage of the empennage and aileron flight control systems:

NOTE: The empennage and aileron systems contain these components; elevator power control unit (PCU), elevator feel actuator, elevator autopilot (A/P) actuator, rudder PCU, aileron PCU and aileron A/P actuator.

- (a) Put the FLT CONTROLS B switch in the ON position.
(b) If you use the ammeter or amp-clamp multimeter method, do these steps:
1) Read the amperage and write it here:

Table 682/29-00-00-993-898

Amperage: _____ (Value 14)

- 2) Subtract Value 1 from Value 14 and write it here:

Table 683/29-00-00-993-899

Amperage: _____ (Calculated) amperage)

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 684/29-00-00-993-900

Flow: _____ cc/min (Value 15)

Note: This is the null leakage of the empennage and aileron flight controls.

- (c) If you use the flow meter method, do these steps:
1) Read the flow and write it here:

Table 685/29-00-00-993-901

Flow: _____ cc/min (Value 14)

- 2) Subtract Value 1 from Value 14 and write it here:

Table 686/29-00-00-993-902

Flow: _____ cc/min (Value 15)

Note: This is the null leakage of the empennage and aileron flight controls.

SUBTASK 29-00-00-810-009

- (14) If Value 15 is more than 12,100 cc/min., do the steps in this task to isolate the bad parts, else continue at the steps to find the right thrust reverser leakage .

SUBTASK 29-00-00-790-030

- (15) Do these steps to find the leakage of the cylinder for the aileron PCU:
(a) Turn the control wheel fully clockwise.

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- (b) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage and write it here:

Table 687/29-00-00-993-903

Amperage: _____ (Value 16)

- 2) Subtract Value 1 from Value 16 and write it here:

Table 688/29-00-00-993-904

Amperage: _____ (Calculated) amperage)
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- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 689/29-00-00-993-905

Flow: _____ cc/min (Value 16a)

- 4) Subtract Value 15 from Value 16a and write it here:

Table 690/29-00-00-993-906

Flow: _____ cc/min (Value 17)

Note: This is the internal leakage of the cylinder for the aileron PCU.

- (c) If you use the flow meter method, do these steps:
 - 1) Read the flow and write it here:

Table 691/29-00-00-993-907

Flow: _____ cc/min (Value 16)

- 2) Subtract Value 1 from Value 16 and write it here:

Table 692/29-00-00-993-908

Flow: _____ cc/min (Value 16a)

- 3) Subtract Value 15 from Value 16a and write it here:

Table 693/29-00-00-993-909

Flow: _____ cc/min (Value 17)

Note: This is the internal leakage of the cylinder for the aileron PCU.

- (d) If Value 17 is more than 1,500 cc/min., replace the aileron PCU.

SUBTASK 29-00-00-970-025

- (16) Move the control wheel to its center position.

SUBTASK 29-00-00-790-031

- (17) Do these steps to find the leakage of the autopilot actuators for the aileron and elevator:

- (a) Do these steps with the DFCS BITE on the control display unit (CDU) to engage the autopilot one channel at a time:

NOTE: Engage the autopilot in BITE to make sure all the inputs are at zero.

NOTE: Follow the instructions in this procedure for the DFCS BITE.

- 1) Push the line select key (LSK) adjacent to INIT/REF.

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- 2) Push the LSK adjacent to INDEX.
- 3) Push the LSK adjacent to MAINT.
- 4) Push the LSK adjacent to DFCS.

NOTE: Stop until the BITE test is complete.

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- 5) Put the FMC transfer switch, on the P5 panel, to the BOTH ON L position.

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- 6) Push the LSK adjacent to EXTENDED MAINTENANCE.
- 7) Push the LSK adjacent to RIGGING.
- 8) Push the LSK adjacent to ELEVATOR.
- 9) Push the LSK adjacent to CONTINUE.

NOTE: Ignore the message on the screen.

- 10) Push the LSK adjacent to CONTINUE.
- 11) Push the LSK adjacent to ELEV AUTH SINGLE.

NOTE: Ignore instructions to pressurize pitot inputs.

- 12) Push the LSK adjacent to CONTINUE on screen 51.16.

NOTE: Stop until BITE test is complete. Ignore the instructions to set the stabilizer to test condition.

- 13) Push the LSK adjacent to CONTINUE on screen 51.17.

NOTE: Stop until BITE test is complete. A new 51.17 screen will appear with instructions to engage the A/P.

- 14) Engage the system B autopilot.

(b) If you use the ammeter or amp-clamp multimeter method, do these steps:

- 1) Read the amperage and write it here:

Table 694/29-00-00-993-910

Amperage: _____ (Value 18)

- 2) Subtract Value 1 from Value 18 and write it here:

Table 695/29-00-00-993-911

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 696/29-00-00-993-912

Flow: _____ cc/min (Value 18a)

- 4) Subtract Value 15 from Value 18a and write it here:

Table 697/29-00-00-993-913

Flow: _____ cc/min (Value 19)

Note: This is the internal leakage of the autopilot actuators for the aileron and the elevator.

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- (c) If you use the flow meter method, do these steps:
 - 1) Read the flow and write it here:

Table 698/29-00-00-993-914

Flow: _____ cc/min (Value 18)

- 2) Subtract Value 1 from Value 18 and write it here:

Table 699/29-00-00-993-915

Flow: _____ cc/min (Value 18a)

- 3) Subtract Value 15 from Value 18a and write it here:

Table 700/29-00-00-993-916

Flow: _____ cc/min (Value 19)

Note: This is the internal leakage of the autopilot actuators for the aileron and the elevator.

- (d) If Value 19 is more than 2,000 cc/min., do the steps in this task to isolate the bad part and replace it.

SUBTASK 29-00-00-860-240

- (18) Push the INIT/REF key on the CDU to get out of the DFCS BITE.

SUBTASK 29-00-00-860-241

- (19) Put the A/P ENGAGE switch, on the P7 panel, for system B in the OFF position.

SUBTASK 29-00-00-790-032

- (20) Do these steps to find the leakage of the cylinder for the elevator PCU:

- (a) Pull the control column fully aft.
- (b) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage and write it here:

Table 701/29-00-00-993-917

Amperage: _____ (Value 20)

- 2) Subtract Value 1 from Value 20 and write it here:

Table 702/29-00-00-993-918

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 703/29-00-00-993-919

Flow: _____ cc/min (Value 20a)

- 4) Subtract Value 15 from Value 20a and write it here:

Table 704/29-00-00-993-920

Flow: _____ cc/min (Value 21)

Note: This is the internal leakage of the cylinder for the elevator PCU.
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- (c) If you use the flow meter method, do these steps:

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1) Read the flow and write it here:

Table 705/29-00-00-993-921

Flow: _____ cc/min (Value 20)

2) Subtract Value 1 from Value 20 and write it here:

Table 706/29-00-00-993-922

Flow: _____ cc/min (Value 20a)

3) Subtract Value 15 from Value 20a and write it here:

Table 707/29-00-00-993-923

Flow: _____ cc/min (Value 21)

Note: This is the internal leakage of the cylinder for the elevator PCU.

(d) If Value 21 is more than 1,500 cc/min., replace the elevator PCU.

(e) Put the control column in its center position.

SUBTASK 29-00-00-790-033

(21) Do these steps to find the leakage of the cylinder for the main rudder PCU:

(a) Slowly push the right rudder pedal until it touches the forward quadrant stop.

NOTE: Hold the pedal in the full forward position until directed.

(b) If you use the ammeter or amp-clamp multimeter method, do these steps:

1) Read the amperage and write it here:

Table 708/29-00-00-993-924

Amperage: _____ (Value 22)

2) Subtract Value 1 from Value 22 and write it here:

Table 709/29-00-00-993-925

Amperage: _____ (Calculated) amperage)

3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 710/29-00-00-993-926

Flow: _____ cc/min (Value 22a)

4) Subtract Value 15 from Value 22a and write it here:

Table 711/29-00-00-993-927

Flow: _____ cc/min (Value 23)

Note: This is the internal leakage of the cylinder for the main rudder PCU.

(c) If you use the flow meter method, do these steps:

1) Read the flow and write it here:

Table 712/29-00-00-993-928

Flow: _____ cc/min (Value 22)

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2) Subtract Value 1 from Value 22 and write it here:

Table 713/29-00-00-993-929

Flow: _____ cc/min (Value 22a)

3) Subtract Value 15 from Value 22a and write it here:

Table 714/29-00-00-993-930

Calculated Flow: _____ cc/min (Value 23)

Note: This is the internal leakage of the cylinder for the main rudder PCU.

- (d) If Value 23 is more than 1,200 cc/min., replace the main rudder PCU.
(e) Put the rudder pedals in their center position.

SUBTASK 29-00-00-790-034

(22) Do these steps to find the internal leakage of the electrohydraulic servo valve for the yaw damper on the main rudder PCU:

- (a) Put the YAW DAMPER switch, on the P5 panel, in the ON position.
(b) If you use the ammeter or amp-clamp multimeter method, do these steps:
1) Read the amperage and write it here:

Table 715/29-00-00-993-931

Amperage: _____ (Value 24)

2) Subtract Value 1 from Value 24 and write it here:

Table 716/29-00-00-993-932

Amperage: _____ (Calculated) amperage)

3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Flow: _____ cc/min (Value 24a)

Table 717/29-00-00-993-933

Flow: _____ cc/min (Value 24a)

4) Subtract Value 15 from Value 24a and write it here:

Table 718/29-00-00-993-934

Flow: _____ cc/min (Value 25)

Note: This is the internal leakage of the electrohydraulic servo valve for the yaw damper.

- (c) If you use the flow meter method, do these steps:
1) Read the flow and write it here:

Table 719/29-00-00-993-935

Flow: _____ cc/min (Value 24)

2) Subtract Value 1 from Value 24 and write it here:

Table 720/29-00-00-993-936

Flow: _____ cc/min (Value 24a)

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3) Subtract Value 15 from Value 24a and write it here:

Table 721/29-00-00-993-937

Flow: _____ cc/min (Value 25)
Note: This is the internal leakage of the electrohydraulic servo valve for the yaw damper.

(d) If Value 25 is more than 2,000 cc/min., replace the electrohydraulic servo valve for the yaw damper.

SUBTASK 29-00-00-860-242

(23) Put the YAW DAMPER switch, on the P5 panel, in the OFF position.

SUBTASK 29-00-00-860-258

(24) Put the FLT CONTROL B switch in the OFF position.

SUBTASK 29-00-00-790-035

(25) Do these steps to find the leakage of the right thrust reverser:

(a) Extend the right thrust reverser. To extend it, do this task: Thrust Reverser Operation - Extend (Selection), TASK 78-31-00-980-801-F00.

NOTE: The following steps instruct the mechanic to retract the thrust reverser and record a measurement. The thrust reverser retracts for approximately five seconds. The valve for the thrust reverser stays open for ten seconds. The lamp on the pilots aft overhead panel is on when the valve is open. You must read the amperage or flow after the thrust reverser is retracted and before the valve closes.

(b) Move the reverse thrust lever forward and down (to retract the thrust reverser).

(c) If you use the ammeter or amp-clamp multimeter method, do these steps:

1) Read the amperage within 5 seconds after the thrust reverser has fully retracted and write it here:

Table 722/29-00-00-993-938

Amperage: _____ (Value 26)

2) Subtract Value 1 from Value 26 and write it here:

Table 723/29-00-00-993-939

Amperage: _____ (Calculated) amperage)
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3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 724/29-00-00-993-940

Flow: _____ cc/min (Value 27)
Note: This is the internal leakage of the right thrust reverser.

(d) If you use the flow meter method, do these steps:

1) Read the flow within 5 seconds after the thrust reverser has fully retracted and write it here:

Table 725/29-00-00-993-941

Flow: _____ cc/min (Value 26)

2) Subtract Value 1 from Value 26 and write it here:

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Table 726/29-00-00-993-942

Calculated Flow: _____ cc/min (Value 27)
Note: This is the internal leakage of the right thrust reverser.

- (e) If Value 27 is more than 300 cc/min., use a stethoscope, COM-1797stethoscope at the thrust reverser actuator cylinder to detect, by sound, the leaky part and replace it.

NOTE: Quantitative measurement of individual actuator leakage is not possible without disconnecting components.

SUBTASK 29-00-00-860-243

- (26) Set the FLAP position lever to 25.

SUBTASK 29-00-00-860-244

- (27) Put the ALTERNATE FLAPS switch, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-860-245

- (28) Set the FLAP position lever to 0.

SUBTASK 29-00-00-860-246

- (29) Remove power from the hydraulic system B. To remove power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-860-143

- (30) Put the FLT CONTROL B switch in the OFF position.

H. System A Part Internal Leakage Check

SUBTASK 29-00-00-480-014

- (1) Connect the equipment that is necessary to measure the amperage or flow to hydraulic system A.

SUBTASK 29-00-00-860-144

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES. THE AILERONS, RUDDER, ELEVATOR, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Pressurize the hydraulic system A. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-00-00-210-053

- (3) Make sure the pressure in system A is a minimum of 2850 psi.

SUBTASK 29-00-00-210-054

- (4) Make sure that the FLT CONTROL A switch, on the P5 panel, is in the OFF position.

SUBTASK 29-00-00-210-033

- (5) Make sure that the SPOILER A switch, on the P5 panel, is in the OFF position.

SUBTASK 29-00-00-790-085

- (6) If you use the ammeter or amp-clamp multimeter method, read the amperage and write it here:

Table 727/29-00-00-993-943

Amperage: _____ (Value 28)

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Note: Do not continue until the amperage value on the tool is stable.
Note: This amperage is the system A basic current, and must be subtracted from all other system A amperage readings BEFORE you find the equivalent flow.

SUBTASK 29-00-00-970-031

(7) If you use the flow meter method, read the flow value and write it here:

Table 728/29-00-00-993-944

Flow: _____ cc/min (Value 28)
Note: This value is the system A basic flow.

SUBTASK 29-00-00-790-037

(8) Do these steps to find the leakage of spoilers 2, 4, 9 and 11 when they are retracted:

- (a) Put the SPOILER A switch in the ON position.
- (b) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage and write it here:

Table 729/29-00-00-993-945

Amperage: _____ (Value 29)

2) Subtract Value 28 from Value 29 and write it here:

Table 730/29-00-00-993-946

Amperage: _____ (Calculated) amperage)
--

3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 731/29-00-00-993-947

Flow: _____ cc/min (Value 30)
Note: This is the internal leakage of spoiler 2, 4, 9, and 11.

(c) If you use the flow meter method, do these steps:

- 1) Read the flow and write it here:

Table 732/29-00-00-993-948

Flow: _____ cc/min (Value 29)

2) Subtract Value 28 from Value 29 and write it here:

Table 733/29-00-00-993-949

Flow: _____ cc/min (Value 30)
Note: This is the internal leakage of spoiler 2, 4, 9, and 11.

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SUBTASK 29-00-00-970-032

- (9) If Value 30 is more than 1000 cc/min., use a stethoscope, COM-1797stethoscope at the spoiler control valve and/or the spoiler actuator cylinder to detect, by sound, the leaky part and replace it.

NOTE: Quantitative measurement of individual spoiler leakage is not possible without disconnecting components.

SUBTASK 29-00-00-860-145

- (10) Put the SPOILER A switch in the OFF position.

SUBTASK 29-00-00-790-041

- (11) Do these steps to find the null leakage of the empennage and aileron flight control systems:

NOTE: The Empennage and Aileron Systems contain these components; elevator Power Control Unit (PCU), elevator feel actuator, elevator autopilot (A/P) actuator, rudder PCU, aileron PCU and aileron A/P actuator.

- (a) Put the FLT CONTROLS A switch in the ON position.
- (b) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage and write it here:

Table 734/29-00-00-993-950

Amperage: _____ (Value 35)

- 2) Subtract Value 28 from the Value 35 and write it here:

Table 735/29-00-00-993-951

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 736/29-00-00-993-952

Flow: _____ cc/min (Value 36)

Note: This is the null leakage of the empennage and aileron flight control systems.

- (c) If you use the flow meter method, do these steps:
 - 1) Read the flow and write it here:

Table 737/29-00-00-993-953

Flow: _____ cc/min (Value 35)

- 2) Subtract Value 28 from Value 35 and write it here:

Table 738/29-00-00-993-954

Flow: _____ cc/min (Value 36)

Note: This is the null leakage of the empennage and aileron flight control systems.

SUBTASK 29-00-00-970-035

- (12) If Value 36 is more than 11,000 cc/min., do the following steps to isolate the leaky part and replace it.

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SUBTASK 29-00-00-790-042

- (13) Do these steps to find the leakage of the cylinder for the aileron PCU:
 - (a) Turn the control wheel fully clockwise.
 - (b) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage and write it here:

Table 739/29-00-00-993-955

Amperage: _____ (Value 37)

- 2) Subtract Value 28 from Value 37 and write it here:

Table 740/29-00-00-993-956

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 741/29-00-00-993-957

Flow: _____ cc/min (Value 37a)

- 4) Subtract Value 36 from Value 37a and write it here:

Table 742/29-00-00-993-958

Flow: _____ cc/min (Value 38)

Note: This is the internal leakage of the cylinder of the aileron PCU.
--

- (c) If you use the flow meter method, do these steps:
 - 1) Read the flow and write it here:

Table 743/29-00-00-993-959

Flow: _____ cc/min (Value 37)

- 2) Subtract Value 28 from Value 37 and write it here:

Table 744/29-00-00-993-960

Flow: _____ cc/min (Value 37a)

- 3) Subtract Value 36 from Value 37a and write it here:

Table 745/29-00-00-993-961

Flow: _____ cc/min (Value 38)

Note: This is the internal leakage of the cylinder of the aileron PCU.
--

SUBTASK 29-00-00-970-036

- (14) If the Value 38 is more than 1500 cc/min., replace the aileron PCU.

SUBTASK 29-00-00-860-248

- (15) Move the control wheel to its center position.

SUBTASK 29-00-00-790-043

- (16) Do these steps to find the leakage of the autopilot actuators for the aileron and elevator:

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- (a) Do these steps with the DFCS BITE on the control display unit (CDU) to engage the autopilot one channel at a time:

NOTE: Engage the autopilot in BITE to make sure all the inputs are at zero.

NOTE: Follow the instructions in this procedure for the DFCS BITE.

- 1) Push the line select key (LSK) adjacent to INIT/REF.
- 2) Push the LSK adjacent to INDEX.
- 3) Push the LSK adjacent to MAINT.
- 4) Push the LSK adjacent to DFCS.

NOTE: Stop until the BITE test is complete.

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- 5) Put the FMC transfer switch, on the P5 panel, to the BOTH ON L position.

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- 6) Push the LSK adjacent to EXTENDED MAINTENANCE.
- 7) Push the LSK adjacent to RIGGING.
- 8) Push the LSK adjacent to ELEVATOR.
- 9) Push the LSK adjacent to CONTINUE.

NOTE: Ignore the message on the screen.

- 10) Push the LSK adjacent to CONTINUE.
- 11) Push the LSK adjacent to ELEV AUTH SINGLE.

NOTE: Ignore instructions to pressurize pitot inputs.

- 12) Push the LSK adjacent to CONTINUE on screen 51.16.

NOTE: Stop until BITE test is complete. Ignore the instructions to set the stabilizer to test condition.

- 13) Push the LSK adjacent to CONTINUE on screen 51.17.

NOTE: Stop until BITE test is complete. A new 51.17 screen will appear with instructions to engage the A/P.

- 14) Engage the system A autopilot.

- (b) If you use the ammeter or amp-clamp multimeter method, do these steps:

- 1) Read the amperage and write it here:

Table 746/29-00-00-993-962

Amperage: _____ (Value 39)

- 2) Subtract Value 28 from the Value 39 and write it here:

Table 747/29-00-00-993-963

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 748/29-00-00-993-964

Flow: _____ cc/min (Value 39a)

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4) Subtract Value 36 from the Value 39a and write it here:

Table 749/29-00-00-993-965

Flow: _____ cc/min (Value 40)
Note: This is the internal leakage of the autopilot actuators for the aileron and elevator.

(c) If you use the flow meter method, do these steps:

1) Read the flow and write it here:

Table 750/29-00-00-993-966

Flow: _____ cc/min (Value 39)

2) Subtract Value 28 from Value 39 and write it here:

Table 751/29-00-00-993-967

Flow: _____ cc/min (Value 39a)

3) Subtract Value 36 from Value 39a and write it here:

Table 752/29-00-00-993-968

Flow: _____ cc/min (Value 40)
Note: This is the internal leakage of the autopilot actuators for the aileron and elevator.

SUBTASK 29-00-00-970-037

(17) If the Value 40 is more than 2000 cc/min., do the steps in this task to isolate the bad part and replace it.

SUBTASK 29-00-00-860-249

(18) Push the INIT/REF key on the CDU.

SUBTASK 29-00-00-860-250

(19) Put the A/P ENGAGE switch for system A in the OFF position.

SUBTASK 29-00-00-790-044

(20) Do these steps to find the leakage of the cylinder for the PCU for the elevator:

(a) Pull the control column fully aft.

(b) If you use the ammeter or amp-clamp multimeter method, do these steps:

1) Read the amperage and write it here:

Table 753/29-00-00-993-969

Amperage: _____ (Value 41)

2) Subtract Value 28 from the Value 41 and write it here:

Table 754/29-00-00-993-970

Amperage: _____ (Calculated) amperage)
--

3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 755/29-00-00-993-971

Flow: _____ cc/min (Value 41a)

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4) Subtract Value 36 from the Value 41a and write it here:

Table 756/29-00-00-993-972

Flow: _____ cc/min (Value 42)
Note: This is the internal leakage of the cylinder of the elevator PCU.

(c) If you use the flow meter method, do these steps:

1) Read the flow and write it here:

Table 757/29-00-00-993-973

Flow: _____ cc/min (Value 41)

2) Subtract Value 28 from Value 41 and write it here:

Table 758/29-00-00-993-974

Flow: _____ cc/min (Value 41a)

3) Subtract Value 36 from Value 41a and write it here:

Table 759/29-00-00-993-975

Flow: _____ cc/min (Value 42)
Note: This is the internal leakage of the cylinder of the elevator PCU.

(d) Put the control column in its center position.

SUBTASK 29-00-00-970-038

(21) If the Value 42 is more than 1500 cc/min., replace the elevator PCU.

SUBTASK 29-00-00-790-045

(22) Do these steps to find the leakage of the for the main rudder PCU:

(a) Slowly push the right rudder pedal fully forward.

(b) If you use the ammeter or amp-clamp multimeter method, do these steps:

1) Read the amperage and write it here:

Table 760/29-00-00-993-976

Amperage: _____ (Value 43)

2) Subtract Value 28 from the Value 43 and write it here:

Table 761/29-00-00-993-977

Amperage: _____ (Calculated) amperage)
--

3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 762/29-00-00-993-978

Flow: _____ cc/min (Value 43a)

4) Subtract Value 36 from the Value 43a and write it here:

Table 763/29-00-00-993-979

Flow: _____ cc/min (Value 44)

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Note: This is the internal leakage for the main rudder PCU.

(c) If you use the flow meter method, do these steps:

1) Read the flow and write it here:

Table 764/29-00-00-993-980

Flow: _____ cc/min (Value 43)

2) Subtract Value 28 from Value 43 and write it here:

Table 765/29-00-00-993-981

Flow: _____ cc/min (Value 43a)

3) Subtract Value 36 from Value 43a and write it here:

Table 766/29-00-00-993-982

Flow: _____ cc/min (Value 44)

Note: This is the internal leakage for the main rudder PCU.

(d) Put the rudder pedals in their center position.

SUBTASK 29-00-00-970-039

(23) If the Value 44 is more than 1200 cc/min., replace the main rudder PCU.

SUBTASK 29-00-00-860-251

(24) Put the FLT CONTROL A switch in the OFF position.

SUBTASK 29-00-00-970-009

(25) Make sure the SPOILER A switch is in the OFF position.

(a) If you use the ammeter or amp-clamp multimeter method, do these steps:

1) Read the amperage and write it here:

Table 767/29-00-00-993-983

Amperage: _____ (Value 45)

(b) If you use the flow meter method, do these steps:

1) Read the flow and write it here:

Table 768/29-00-00-993-984

Flow: _____ cc/min (Value 45)

SUBTASK 29-00-00-790-046

(26) Do these steps to find the leakage of the left thrust reverser:

(a) Extend the left thrust reverser. To extend it, do this task: Thrust Reverser Operation - Extend (Selection), TASK 78-31-00-980-801-F00.

NOTE: The following steps instruct the mechanic to retract the thrust reverser and record a measurement. The thrust reverser retracts for approximately five seconds. The valve for the thrust reverser stays open for ten seconds. The lamp on the pilot's aft overhead panel is on when the valve is open. You must read the amperage or flow after the thrust reverser is retracted and before the valve closes.

(b) Move the reverse thrust lever forward and down (to retract the thrust reverser).

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- (c) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage within 5 seconds after the thrust reverser has fully retracted and write it here:

Table 769/29-00-00-993-985

Amperage: _____ (Value 46)

- 2) Subtract Value 45 from Value 46 and write it here:

Table 770/29-00-00-993-986

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 771/29-00-00-993-987

Flow: _____ cc/min (Value 47)

Note: This is the internal leakage of the left thrust reverser.

- (d) If you use the flow meter method, do these steps:
 - 1) Read the amperage within 5 seconds after the thrust reverser has fully retracted and write it here:

Table 772/29-00-00-993-988

Flow: _____ cc/min (Value 46)

- 2) Subtract Value 45 from Value 46 and write it here:

Table 773/29-00-00-993-989

Flow: _____ cc/min (Value 47)

Note: This is the internal leakage of the left thrust reverser.

SUBTASK 29-00-00-970-040

- (27) If the Value 47 is more than 300 cc/min., use a stethoscope, COM-1797stethoscope at the thrust reverser actuator cylinder to detect, by sound, the leaky component and replace it.

NOTE: Quantitative measurement of individual actuator leakage is not possible without disconnecting components,

SUBTASK 29-00-00-860-252

- (28) If the nose gear steering by-pass valve pin is installed, remove it.

SUBTASK 29-00-00-790-047

- (29) Do these steps to find the leakage for the nose landing gear and the steering system:

- (a) Put the LANDING GEAR handle in the DOWN position.
- (b) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage and write it here:

Table 774/29-00-00-993-990

Amperage: _____ (Value 48)

- 2) Subtract Value 45 from Value 48 and write it here:

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Table 775/29-00-00-993-991

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 776/29-00-00-993-992

Flow: _____ cc/min (Value 49)

Note: This is the internal leakage of the nose landing gear and steering system.
--

- (c) If you use the flow meter method, do these steps:
1) Read the flow and write it here:

Table 777/29-00-00-993-993

Flow: _____ cc/min (Value 48)

- 2) Subtract Value 45 from Value 48 and write it here:

Table 778/29-00-00-993-994

Flow: _____ cc/min (Value 49)

Note: This is the internal leakage of the nose landing gear and steering system.
--

SUBTASK 29-00-00-970-041

- (30) If the Value 49 is more than 2100 cc/min., do the steps to isolate the bad part and replace it.

SUBTASK 29-00-00-790-048

- (31) Do these steps to find the leakage for the left cylinder of the nose gear steering and the steering valve:
(a) Turn the steering tiller until the nose landing gear is fully left.
(b) If you use the ammeter or amp-clamp multimeter method, do these steps:
1) Read the amperage and write it here:

Table 779/29-00-00-993-995

Amperage: _____ (Value 50)

- 2) Subtract Value 45 from Value 50 and write it here:

Table 780/29-00-00-993-996

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 781/29-00-00-993-A14

Flow: _____ cc/min (Value 50a)

- 4) Subtract Value 50a from Value 49 and write it here:

Table 782/29-00-00-993-997

Flow: _____ cc/min (Value 51)

Note: This is the internal leakage of the left cylinder of the nose landing gear and steering system.

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- (c) If you use the flow meter method, do these steps:
 - 1) Read the flow and write it here:

Table 783/29-00-00-993-998

Flow: _____ cc/min (Value 50)

- 2) Subtract Value 50 from Value 48 and write it here:

Table 784/29-00-00-993-999

Flow: _____ cc/min (Value 51)

Note: This is the internal leakage of the left cylinder of the nose landing gear and steering system.

SUBTASK 29-00-00-970-042

- (32) If the Value 51 is more than 900 cc/min., replace the left nose gear steering valve.

SUBTASK 29-00-00-790-049

- (33) Do these steps to find the leakage for the right cylinder of the nose gear steering and the steering valve:
 - (a) Turn the steering tiller until the nose landing gear is fully right.
 - (b) If you use the ammeter or amp-clamp multimeter method, do these steps:
 - 1) Read the amperage and write it here:

Table 785/29-00-00-993-A01

Amperage: _____ (Value 52)

- 2) Subtract Value 45 from Value 52 and write it here:

Table 786/29-00-00-993-A02

Amperage: _____ (Calculated) amperage)
--

- 3) Use (Figure 602) for the applicable pump to convert the calculated amperage to flow and write it here:

Table 787/29-00-00-993-A13

Flow: _____ cc/min (Value 52a)

- 4) Subtract Value 52a from Value 49 and write it here:

Table 788/29-00-00-993-A03

Flow: _____ cc/min (Value 53)

Note: This is the internal leakage of the right cylinder of the nose landing gear and steering system.

- (c) If you use the flow meter method, do these steps:
 - 1) Read the flow and write it here:

Table 789/29-00-00-993-A04

Flow: _____ cc/min (Value 52)

- 2) Subtract Value 52 from Value 48 and write it here:

Table 790/29-00-00-993-A05

Flow: _____ cc/min (Value 53)

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Note: This is the internal leakage of the right cylinder of the nose landing gear and steering system.

(d) Put the nose landing gear in its center position.

SUBTASK 29-00-00-970-043

(34) If the Value 53 is more than 900 cc/min., replace the right nose gear steering valve.

I. Put the Airplane Back to its Usual Condition

SUBTASK 29-00-00-860-148

(1) Make sure the arm switch for the ALTERNATE FLAPS, on the P5 panel, is in the OFF position.

SUBTASK 29-00-00-860-253

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01345	LANDING GEAR AUTOBRAKE BITE CONT 2
A	18	C00583	LANDING GEAR AUTOBRAKE BITE CONT 1
E	16	C00196	LANDING GEAR ANTISKID INBD
E	18	C00195	LANDING GEAR ANTISKID OUTBD

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-860-149

(3) Put the FLT CONTROL and SPOILER switches, on the P5 panel, in the ON position.

SUBTASK 29-00-00-860-150

(4) Remove power from the hydraulic systems A and B. To remove them, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-00-00-080-015

(5) Remove the portable hydraulic cart or the ammeter equipment from the airplane.

SUBTASK 29-00-00-410-002

(6) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 29-00-00-610-007

(7) Service the systems A and B hydraulic reservoirs. To service them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

————— **END OF TASK** —————

TASK 29-00-00-790-808

6. Standby Hydraulic System Internal Leakage Check

(Figure 603, Figure 604, Figure 605)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) Use this check to find the general internal condition of the standby hydraulic system.

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- (3) To find the internal leakage of the standby system you will measure the flow (from the standby EMDP) before and after the standby rudder actuator is in operation. There are three methods to measure the flow from the standby EMDP: the ammeter, the flowmeter, and the amp-clamp multimeter.

NOTE: The standby rudder power control unit (PCU) is the only component that is checked in this procedure.

- (a) To use the ammeter method, you connect an ammeter in series with one phase of the motor on the standby EMDP (Figure 603). To find the flow you measure the current and use the (Figure 604) to change it to a flow.
- (b) To use the flowmeter method, you install a flowmeter at the outlet of the standby EMDP and read the flow from it.
- (c) To use the amp-clamp multimeter method, you put the amp-clamp adapter around one of the load wires connected to a circuit breaker, pump relay R68, or the standby hydraulic EMDP. You then read the current on the meter and use the (Figure 604) to get the flow.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
27-32-00-740-803	Stall Management Yaw Damper (SMYD) BITE Test - Ground Test (P/B 501)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-21-00-000-801	Standby Hydraulic System Pressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
29-21-51-000-803	Standby Hydraulic System Pressure Module Relief Valve Removal (P/B 401)
29-21-51-400-803	Standby Hydraulic System Pressure Module Relief Valve Installation (P/B 401)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1786	Flowmeter - Leakage Check, Hydraulic System Internal (Part #: 410DME-10AR, Supplier: 05172, A/P Effectivity: 737-ALL) (Part #: 410DME-10AR-M, Supplier: 05172, A/P Effectivity: 737-ALL) (Part #: HTT02, Supplier: H6394, A/P Effectivity: 737-ALL)
COM-1787	Ammeter - Leakage Check, A.C. Internal Hydraulic System (Part #: 433-2919001, Supplier: 32590, A/P Effectivity: 737-ALL)
COM-1793	Multimeter - Digital, 3 1/2 Digits (Part #: 187, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 87, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 87V, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: MODEL 21, Supplier: 89536, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Part #: MODEL 27, Supplier: 89536, A/P Effectivity: 737-ALL)

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Reference	Description
COM-2531	Meter - Current, RMS (Part #: 321, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: 322, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: LH41A, Supplier: 15566, A/P Effectivity: 737-ALL) (Part #: MODEL 33, Supplier: 89536, A/P Effectivity: 737-ALL) (Part #: MODEL 36, Supplier: 89536, A/P Effectivity: 737-ALL)
SPL-1791	Cable - Hydraulic Leakage Check (Part #: F80135-13, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700ER, -700QC, -800, -900, -900ER, -BBJ) (Opt Part #: F80135-10, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
SPL-1805	Test Box - Rudder Power Control Unit (Part #: C29002-17, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right
324	Vertical Fin - Rear Spar To Trailing Edge

E. Access Panels

Number	Name/Location
324DL	Trailing Edge Access

F. Prepare for the Check

SUBTASK 29-00-00-840-135

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES DURING THE INTERNAL LEAK CHECK. THE AILERONS, RUDDER, ELEVATOR FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED ON ALL OF THE LANDING GEAR. WITHOUT THE GROUND LOCKS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Make sure the ground locks are installed at the nose and main landing gear. To install them, do this task: (Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801).

SUBTASK 29-00-00-840-136

- (2) If you use the ammeter, COM-1787, then do these steps:

NOTE: When you read the ammeter, make a record of the value to the nearest 0.1 ampere. Use the Standby Hydraulic System EMDP Characteristics to change current to flow.

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- (a) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 2, C01449, STANDBY HYDRAULIC PUMP

- (b) Disconnect the electrical connector from the electric motor-driven pump (EMDP) for the standby hydraulic system.
(c) Connect one end of the cable, SPL-1791 to the standby EMDP.
(d) Connect the other end of the cable, SPL-1791 to the electrical connector.

CAUTION: PUT THE AMMETER IN THE SHORT CIRCUIT POSITION. THE CURRENT TO START THE EMDP IS APPROXIMATELY 180 AMPS. THIS WILL CAUSE DAMAGE TO THE AMMETER IF IT IS IN THE CIRCUIT.

- (e) Put the switch on the ammeter, COM-1787 in the short-circuit position.
(f) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 2, C01449, STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-840-137

- (3) If you use the hydraulic system internal leakage check flowmeter, COM-1786, then do these steps:

NOTE: When you read the flowmeter, make a record of the value to the nearest 100 cc/minute.

- (a) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 2, C01449, STANDBY HYDRAULIC PUMP

- (b) Install hydraulic system internal leakage check flowmeter, COM-1786 at the outlet of the standby EMDP.
(c) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 2, C01449, STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-840-138

- (4) If you use the current meter, COM-2531 or digital multimeter, COM-1793, then do these steps:

NOTE: When you use the current meter, COM-2531 or digital multimeter, COM-1793, read the current on the meter and use the (Figure 604) to get the flow.

- (a) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 2, C01449, STANDBY HYDRAULIC PUMP

- (b) Get access to the circuit breaker C1449, or pump relay R643 or the standby EMDP.

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- (c) Put the current meter, COM-2531 around one of the three wires connected to the load side of the circuit breaker C1449, pump relay R643, or standby EMDP.
- (d) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-860-259

- (5) Do these steps to install the C29002-18 test box, which is part of test box, SPL-1805, on the standby rudder PCU (Figure 605).

- (a) Make sure that power to hydraulic system A and B are off.
- (b) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

- (c) Make sure that power to the standby hydraulic system is off.
- (d) Remove this access panel to get access to the standby rudder PCU:

<u>Number</u>	<u>Name/Location</u>
324DL	Trailing Edge Access

- (e) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

- (f) Verify that all the toggle switches on the test box are in the OFF position.
- (g) Disconnect the D10013 connector from the standby rudder PCU.
- (h) Connect the C29002-19 adapter cable, which is part of test box, SPL-1805, to the standby rudder PCU, equipment number M1831.
- (i) Connect the C29002-20 adapter cable, which is part of test box, SPL-1805, to the D10013 connector.
- (j) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

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SUBTASK 29-00-00-860-260

- (6) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-860-261

- (7) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

NOTE: If you use a ground cart for electrical power, it must supply a voltage of 114 to 116 volts ac at 400 -5 Hz. Do not operate other electrical equipment during this test.

SUBTASK 29-00-00-860-262

- (8) Make sure the standby hydraulic reservoir is pressurized to a minimum of 20 psi. To pressurize it, do this task: (Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801).

SUBTASK 29-00-00-860-263

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER, LEADING EDGE SLATS, AND THRUST REVERSERS. THEY CAN MOVE QUICKLY WHEN YOU SUPPLY STANDBY HYDRAULIC POWER.

- (9) Put the arm switch for the ALTERNATE FLAPS, on the P5 panel, in the ARM position.

NOTE: The standby EMDP should turn on.

SUBTASK 29-00-00-860-264

- (10) Put the FLT CONTROL A switch, on the P5 panel, in the STDBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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SUBTASK 29-00-00-840-139

- (11) Operate the rudder for 12 cycles to ensure the temperature of the hydraulic fluid is more than 70°F.

SUBTASK 29-00-00-790-087

- (12) Do these steps to make sure the pressure relief valve in the standby pressure module is serviceable:

- (a) Make sure the standby pressure module does not make a hissing noise.
(b) Make sure the return line from the standby pressure module is not hot.
(c) If you hear a hissing noise or the return line is hot, replace the pressure relief valve.

These are the tasks:

Standby Hydraulic System Pressure Module Relief Valve Removal, TASK 29-21-51-000-803,

Standby Hydraulic System Pressure Module Relief Valve Installation, TASK 29-21-51-400-803.

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G. Standby Hydraulic Internal Leakage Check

SUBTASK 29-00-00-860-265

(1) Put the FLT CONTROL A switch, on the P5 panel, in the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

(a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

SUBTASK 29-00-00-790-088

(2) Put the FLT CONTROL B switch, on the P5 panel, in the OFF position.

SUBTASK 29-00-00-790-089

(3) If you use the ammeter or amp-clamp multimeter method do this step:

(a) Read the amperage and write it here:

Table 791/29-00-00-993-A06

Amperage: _____ (Value 1)
Note: This is the standby system basic flow.

SUBTASK 29-00-00-970-047

(4) If you use the flow meter method, read the flow value and write it here:

Table 792/29-00-00-993-A07

Flow: _____ cc/min (Value 1)
Note: This is the standby system basic flow.

SUBTASK 29-00-00-790-090

(5) Put the FLT CONTROL A switch in the STDBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253

(a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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(b) Stop until the amperage or flow is stable.

(c) If you use the ammeter or amp-clamp multimeter method, do these steps:

1) Read the amperage and write it here:

Table 793/29-00-00-993-A08

Amperage: _____ (Value 2)

2) Subtract Value 1 from Value 2 and write it here:

Table 794/29-00-00-993-A09

Amperage: _____ (Calculated) amperage)
--

3) Use (Figure 604) for the applicable pump to convert the calculated amperage to flow and write it here:

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Table 795/29-00-00-993-A10

Flow: _____ cc/min (Value 3)
Note: This is the null and seal leakage of the standby rudder PCU and yaw damper.

- (d) If you use the flow meter method, do these steps:
1) Read the flow and write it here:

Table 796/29-00-00-993-A11

Flow: _____ cc/min (Value 2)

- 2) Subtract Value 1 from Value 2 and write it here:

Table 797/29-00-00-993-A12

Calculated Flow: _____ cc/min (Value 3)
Note: This is the null and seal leakage of the standby rudder PCU and yaw damper.

- (e) If Value 3 is more than 1000 cc/min, replace the standby rudder PCU.

SUBTASK 29-00-00-710-030

- (6) Put the IRS L and R switch, on the P5 panel, to the NAV position.

SUBTASK 29-00-00-710-031

- (7) Put the YAW Damper switch, on the P5 panel, in the ON position.

SUBTASK 29-00-00-710-032

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER AND THE PCU ACTUATORS. THE RUDDER AND PCU ACTUATORS MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (8) Put the YAW DAMPER POWER switch, on the C29002-18 test box, to the ON position.

NOTE: The red indicator light on the test box should come on.

SUBTASK 29-00-00-710-033

- (9) Do these steps to find the seal leakage of the standby rudder PCU with the rudder to the left position:

- (a) Put the RUDDER TRAVEL DIRECTION switch on the test box to the LEFT position.

NOTE: The green indicator light on the test box should come on and the rudder should move to the left.

- (b) When the hydraulic flow becomes stable, record the amperage or the flow as Value 4:

NOTE: This value is the standby basic value and the standby rudder PCU null and seal leakage.

- (c) Push the left rudder pedal until it touches the forward quadrant stop and hold.

- (d) When the hydraulic flow becomes stable, record the amperage or the flow as Value 5:

NOTE: This value is the standby system basic value and the standby rudder PCU seal leakage value.

- (e) Put the left rudder pedal to the neutral position.

- (f) Calculate the difference between Value 5 and Value 4 and record it here:

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1) Value 6 : _____ (amps or flow)

NOTE: This value is the standby rudder PCU seal leakage with the rudder in the left position.

SUBTASK 29-00-00-350-003

(10) Make sure that Value 6 is between -1.2 amps and 2.5 amps or between -1200 cc/min and 2500 cc/min.

SUBTASK 29-00-00-350-004

(11) If Value 6 is not in the given range, replace the standby rudder PCU.

SUBTASK 29-00-00-710-034

(12) Do these steps to find the seal leakage of the standby rudder PCU with the rudder to the right position:

(a) Put the RUDDER TRAVEL DIRECTION switch on the test box to the RIGHT position.

NOTE: The green indicator light on the test box should come on and the rudder should move to the right.

(b) When the hydraulic flow becomes stable, record the amperage or the flow as Value 7:

NOTE: This value is the standby system basic and the standby rudder PCU null and seal leakage.

(c) Push the right rudder pedal until it touches the forward quadrant stop and hold.

(d) When the amperage or hydraulic flow becomes stable, record the amperage or the flow as Value 8: _____

NOTE: This value is the system basic and the standby rudder PCU seal leakage.

(e) Put the right rudder pedal to the neutral position.

(f) Calculate the difference between Value 8 and Value 7 and record it here:

1) Value 9 : _____ (amps or flow)

NOTE: This value is the standby rudder PCU seal leakage in the right rudder position.

SUBTASK 29-00-00-970-048

(13) Make sure that Value 9 is between -1.2 amps and 2.5 amps or between -1200 cc/min and 2500 cc/min.

SUBTASK 29-00-00-970-049

(14) If Value 9 is not in the given range, replace the standby rudder PCU.

SUBTASK 29-00-00-710-035

(15) Put the RUDDER TRAVEL DIRECTION switch, on the test box, in the OFF position.

NOTE: The green indicator light on the test box should go off.

SUBTASK 29-00-00-710-036

(16) Put the YAW DAMPER POWER switch, on the test box, to the OFF position.

NOTE: The red indicator light should go off.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-00-00-840-140

(1) Put the YAW DAMPER switch, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-840-160

(2) Put the FLT CONTROL A switch, on the P5 panel, to the OFF position.

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HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

SUBTASK 29-00-00-840-141

- (3) Put the FLT CONTROL B switch, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-840-142

- (4) Put the ALTERNATE FLAP switch, on the P5 panel, to the OFF position.

SUBTASK 29-00-00-840-143

- (5) Remove power from the standby hydraulic system. To remove it, do this task: (Standby Hydraulic System Power Removal, TASK 29-21-00-000-802)

SUBTASK 29-00-00-710-037

- (6) Remove the test box from the rudder PCU.

- (a) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

- (b) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

- (c) Verify that all the toggle switches on the test box are in the OFF position.
- (d) Disconnect the adapter cable from the D10013 connector.
- (e) Disconnect the adapter cable from the rudder PCU.
- (f) Connect the D10013 connector to the rudder PCU.
- (g) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C00285	YAW DAMPER AC
D	6	C01354	YAW DAMPER 2 DC
D	7	C00286	YAW DAMPER 1 DC

- (h) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

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SUBTASK 29-00-00-840-144

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER. THE RUDDER CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (7) Pressurize the standby hydraulic system. To pressurize it, do this task: (Standby Hydraulic System Pressurization, TASK 29-21-00-000-801).

SUBTASK 29-00-00-740-004

- (8) Do the stall management yaw damper (SMYD) servo test/sweep test for SMYD2 to ensure that the rudder PCU yaw damper is operational. To perform this test, do this task: Stall Management Yaw Damper (SMYD) BITE Test - Ground Test, TASK 27-32-00-740-803.

NOTE: This test is part of the SERVO TEST. The SERVO TEST is part of the SMYD GROUND test. Make sure that you use SMYD-2 and the standby hydraulic system.

NOTE: The SWEEP TEST requires that the YAW DAMPER be on. The IRU's must be on in order for the YAW DAMPER to be on.

SUBTASK 29-00-00-840-145

- (9) Remove power from the standby hydraulic system. To remove it, do this task: (Standby Hydraulic System Power Removal, TASK 29-21-00-000-802).

SUBTASK 29-00-00-860-283

- (10) Put the IRS L and R switch, on the P5 panel, to the NORMAL position.

SUBTASK 29-00-00-080-023

- (11) If you used the ammeter method, do these steps
 - (a) Disconnect the cable assembly from the standby EMDP and the electrical connector.
 - (b) Connect the electrical connector to the standby EMDP.

SUBTASK 29-00-00-080-024

- (12) If you used the flowmeter procedure, do these steps:
 - (a) Open this circuit breaker and install safety tag:

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP
 - (b) Remove the flowmeter from the standby EMDP pressure line.
 - (c) Remove the safety tag and close this circuit breaker:

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-00-00-080-025

- (13) If you used the amp-clamp multimeter method, do these steps:
 - (a) Remove the amp-clamp multimeter.
 - (b) Close the circuit breaker panel.

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SUBTASK 29-00-00-410-007

(14) Install this access panel:

<u>Number</u>	<u>Name/Location</u>
324DL	Trailing Edge Access

SUBTASK 29-00-00-610-013

(15) Service the system B hydraulic reservoir. To fill it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

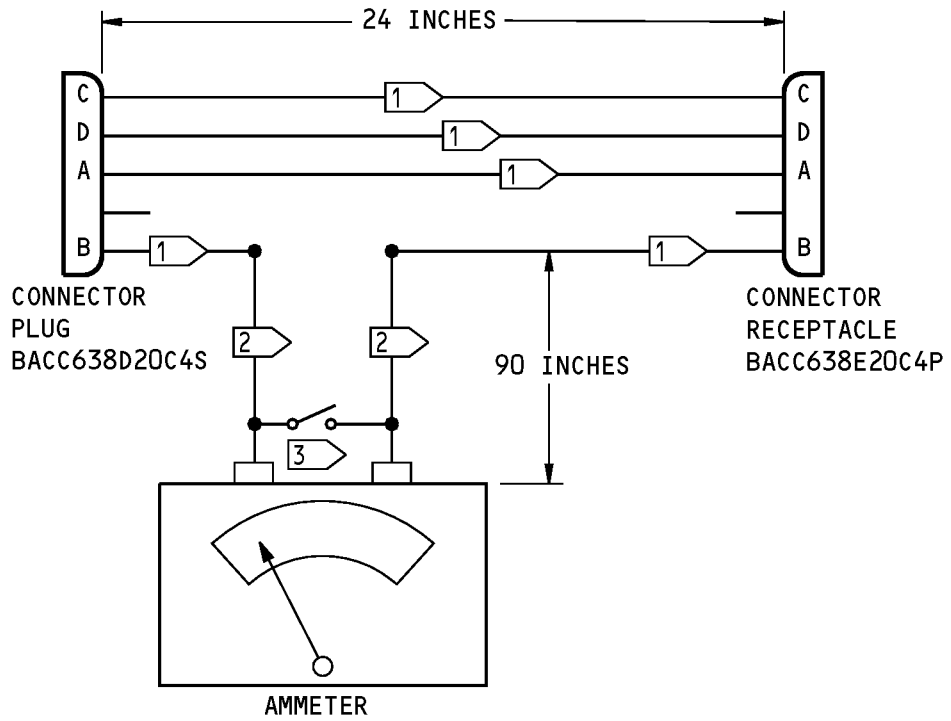
————— **END OF TASK** —————

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- 1 NO. 12 WIRE
- 2 NO. 10 WIRE
- 3 SHORT CIRCUIT SWITCH

**Ammeter Wiring Harness for the Standby Hydraulic Pump
Figure 603/29-00-00-990-806**

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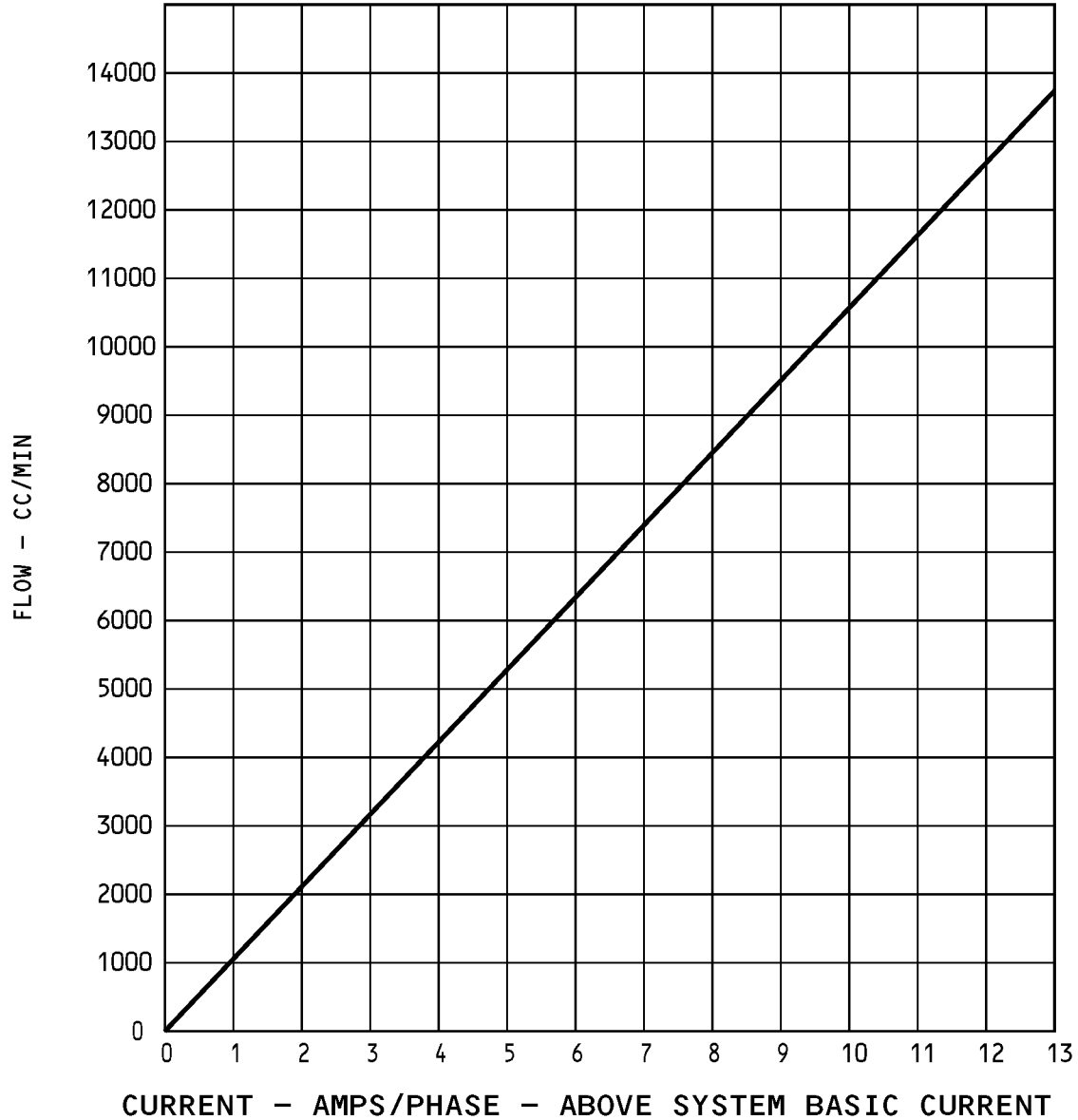
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Standby Hydraulic System EMDP Characteristics
Figure 604/29-00-00-990-811

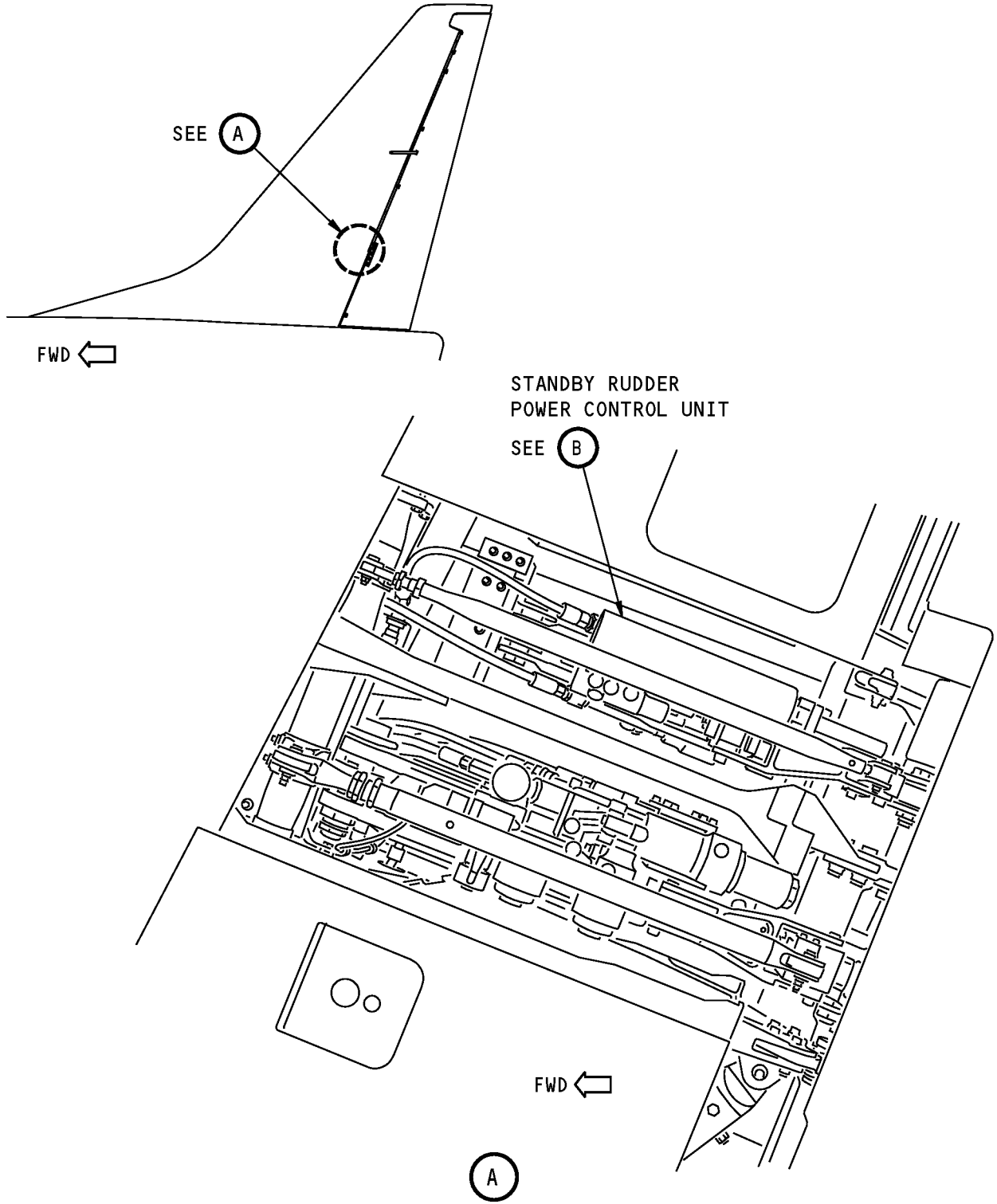
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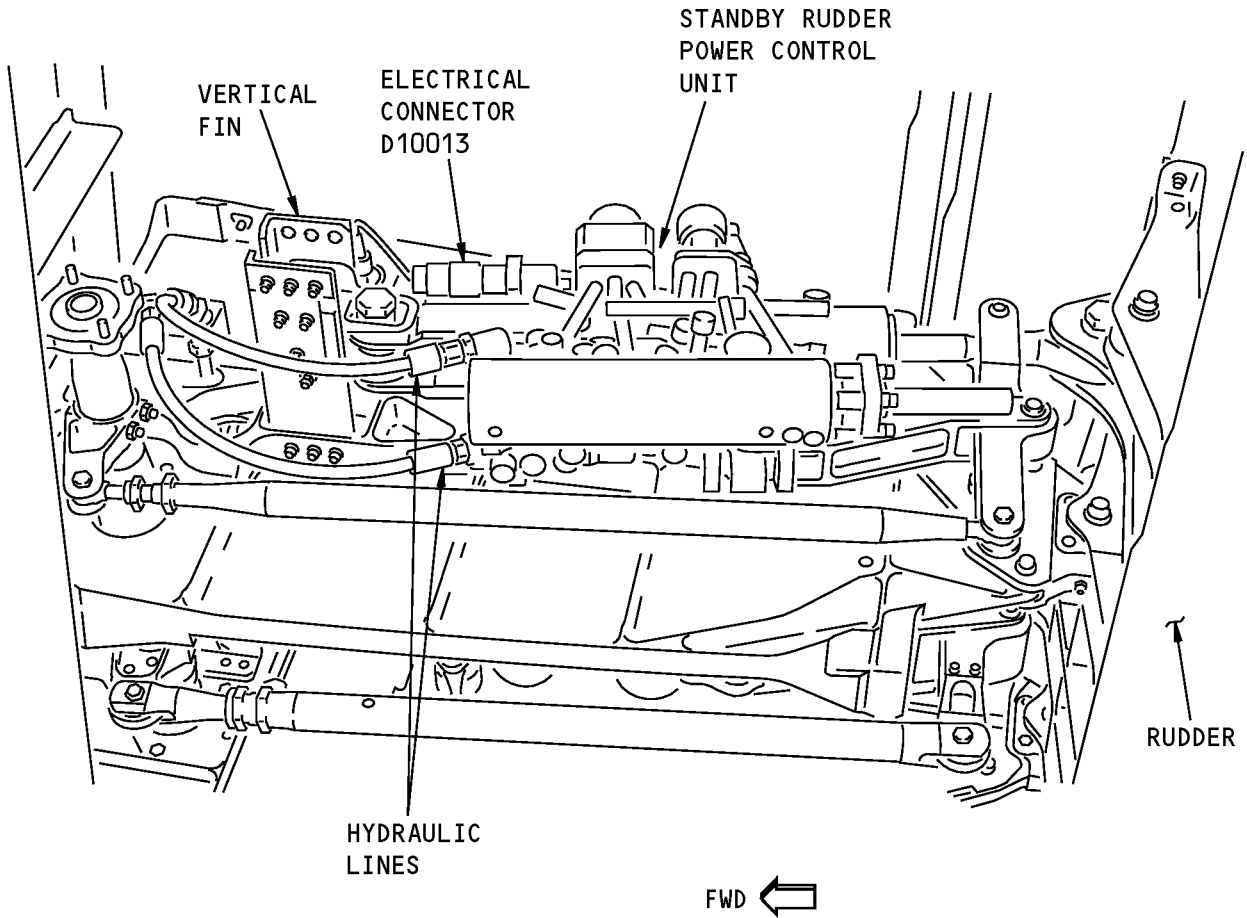
**Standby Rudder Power Control Unit Installation
Figure 605 (Sheet 1 of 2)/29-00-00-990-812**

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STANDBY RUDDER POWER CONTROL UNIT

(B)

**Standby Rudder Power Control Unit Installation
Figure 605 (Sheet 2 of 2)/29-00-00-990-812**

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HYDRAULIC POWER - CLEANING/PAINTING

1. General

- A. This procedure has a task to apply corrosion protection compounds to components of the hydraulic system.
- B. The high pressure hydraulic lines are unpainted corrosion resistant steel (CRES). Most low pressure hydraulic lines are 5000 or 6000 series aluminum alloys. Valves and fittings are either anodized aluminum or CRES. Service experience has shown that these components are relatively corrosion free unless they are exposed to severe operating environments.
- C. Some low pressure hydraulic lines and fittings that are exposed to severe operating environments are CRES or titanium. Service experience has shown that the titanium components are relatively corrosion free.
- D. Clamps are usually manufactured from solid nylon or silicon rubber cushioned steel.

TASK 29-00-00-916-801

2. Hydraulic Components - Corrosion Protection

A. References

Reference	Title
51-21-91-620-802	Application of Corrosion Inhibiting Compound (P/B 701)
SL 737-SL-29-37	CORROSION PROTECTION FOR HYDRAULIC COMPONENTS
SRM 51-10-02	Structural Repair Manual

B. Consumable Materials

Reference	Description	Specification
A00436	Sealant - Fuel Tank	BMS5-45 (Supersedes BMS 5-26)
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
G00009	Compound - Organic Corrosion Inhibiting	BMS3-23
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

C. Hydraulic Lines and Fittings - Corrosion Protection

SUBTASK 29-00-00-916-001

(1) For periodic inspections of the hydraulic lines, do the steps that follow:

(a) Examine the hydraulic lines for signs of corrosion.

NOTE: Corrosion on aluminum components is white in color. Corrosion on CRES components is black in color.

(b) If clamps are removed, do an inspection of the tubing for signs of corrosion on the surface where the clamp touches the tubing.

(c) If corrosion is found, remove the corrosion: SRM 51-10-02

CAUTION: DO NOT APPLY CORROSION INHIBITING COMPOUND, G00009 TO SILICONE RUBBER, OR RUBBER CLAMP CUSHIONS. IT CAN CAUSE DAMAGE TO SILICONE RUBBER.

(d) Use a cotton wiper, G00034 moist with corrosion inhibiting compound, G00009 to apply a thin layer of the compound to the hydraulic line. Application of Corrosion Inhibiting Compound, TASK 51-21-91-620-802

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SUBTASK 29-00-00-916-002

- (2) If the hydraulic lines have been cleaned with steam or high pressure water and detergent, do the steps that follow:
 - (a) Remove unwanted moisture with a cotton wiper, G00034.
 - (b) Use a cotton wiper, G00034 moist with corrosion inhibiting compound, G00009 to apply a thin layer of the compound to the hydraulic line. Application of Corrosion Inhibiting Compound, TASK 51-21-91-620-802

SUBTASK 29-00-00-916-003

- (3) If the hydraulic lines get a scratch or gouge during maintenance or repair work, do the step that follows:
 - (a) Use a cotton wiper, G00034 moist with corrosion inhibiting compound, G00009 to apply a thin layer of the compound to the hydraulic line. Application of Corrosion Inhibiting Compound, TASK 51-21-91-620-802

D. Improved Corrosion Protection

NOTE: SL 737-SL-29-37 gives corrosion protection for external threads and cavities of hydraulic actuators and components that are open to moisture. Batco 8401 Number 1 grease plus a bead of BMS 5-45, Type II, Class B-1/2, optional Class 3-2 sealant are applied. This grease was selected because of compatibility with O-ring seal material and fair resistance to BMS 3-11 hydraulic fluid.

SUBTASK 29-00-00-916-004

- (1) For applying the corrosion protection do the steps that follow:
 - (a) Apply a thin layer of the grease to the faying surfaces of threads or flanges.
 - (b) Assemble the component and clean off unwanted grease.
 - (c) Clean the areas where sealant will be applied with solvent, B00148 or equivalent.
 - (d) Apply a bead of sealant, A00436 to the joints that were greased.
 - (e) Allow the sealant to cure 48 hours and make sure that it has adhered to the surfaces.

————— **END OF TASK** —————

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AIRCRAFT MAINTENANCE MANUAL

HYDRAULICS - DDG MAINTENANCE PROCEDURES

1. General

- A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Procedures Guide (DDPG). These tasks prepare the airplane for flight with systems/components that are inoperative.
- B. This procedure also has the tasks that put the airplane back to its usual condition.
- C. These are the tasks for the components in the hydraulic system:
 - (1) MMEL 29-9 (DDPG) Preparation - Hydraulic Low Quantity Light (Standby System) Inoperative
 - (2) MMEL 29-9 (DDPG) Restoration - Hydraulic Low Quantity Light (Standby System) Inoperative
 - (3) MMEL 29-11 (DDPG) Preparation - Hydraulic System A Quantity Indication (Flight Deck) Inoperative
 - (4) MMEL 29-11 (DDPG) Restoration - Hydraulic System A Quantity Indication (Flight Deck) Inoperative
 - (5) MMEL 29-12 (DDPG) Preparation - Low Pressure Light (Standby System) Inoperative
 - (6) MMEL 29-12 (DDPG) Restoration - Low Pressure Light (Standby System) Inoperative
 - (7) MMEL 29-13 (DDPG) Preparation - Hydraulic Reservoir Pressurization System Sources Inoperative
 - (8) MMEL 29-13 (DDPG) Restoration - Hydraulic Reservoir Pressurization System Sources Inoperative
 - (9) MMEL 29-15 (DDPG) Preparation - Hydraulic System B Quantity Indication (Flight Deck) Inoperative
 - (10) MMEL 29-15 (DDPG) Restoration - Hydraulic System B Quantity Indication (Flight Deck) Inoperative

TASK 29-00-00-000-807

2. MMEL 29-9 (DDPG) Preparation - Hydraulic Low Quantity Light (Standby System) Inoperative

- A. General
 - (1) This task gives the maintenance steps which prepare the airplane for flight with the Hydraulic Low Quantity Light (Standby System) inoperative.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
12-15-11-610-801	Check of the Brake Accumulator Precharge Pressure (P/B 301)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

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D. Prepare for Hydraulic System B Quantity Level Check

SUBTASK 29-00-00-210-003

- (1) Make sure the leading edge flaps are up. If the flaps are not retracted, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 29-00-00-210-004

- (2) Make sure the trailing edge flaps and slats are retracted. If the flaps are not retracted, do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 29-00-00-210-005

- (3) Make sure the spoilers are in the down position.

SUBTASK 29-00-00-210-006

- (4) Make sure all flight controls are in the neutral position.

SUBTASK 29-00-00-210-007

- (5) Make sure the brake accumulator has a minimum of 2850 psig of pressure in it (with the hydraulic pumps off). To check the brake accumulator pressure, do this task: Check of the Brake Accumulator Precharge Pressure, TASK 12-15-11-610-801.

- (6) If the accumulator has less then 2850 psig of pressure, then pressurize hydraulic system B. Do this Task:Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803

SUBTASK 29-00-00-210-008

- (7) Make sure the thrust reversers are in the closed position. If the thrust reversers are not closed, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

E. Make Sure that the System B Hydraulic Reservoir Quantity Level is Satisfactory

SUBTASK 29-00-00-210-009

- (1) Make sure the hydraulic fluid quantity transmitter/indicator on the system B reservoir shows more than RFL (refill).

SUBTASK 29-00-00-610-002

- (2) If it is necessary, service the hydraulic reservoir. To service it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-00-00-860-088

- (3) Put an INOP placard on the LOW QUANTITY light for the standby hydraulic system.

END OF TASK

TASK 29-00-00-000-808

3. MMEL 29-9 (DDPG) Restoration - Hydraulic Low Quantity Light (Standby System) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Hydraulic Low Quantity Light (Standby System) inoperative.

B. Location Zones

Table with 2 columns: Zone, Area. Rows: 211 Flight Compartment - Left, 212 Flight Compartment - Right

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C. Hydraulic Low Quantity Light (Standby System) Repair

SUBTASK 29-00-00-810-004

- (1) Correct the fault.
 - (a) Find the fault code or description of the fault that occurred.
 - (b) Go to the applicable index or list in the FIM and find the FIM task number.
 - (c) Go to the task in the FIM and do the steps in the task.

SUBTASK 29-00-00-020-003

- (2) Remove the INOP placard from the LOW QUANTITY light for the standby hydraulic system.

————— END OF TASK —————

TASK 29-00-00-000-809

4. M MEL 29-11 (DDPG) Preparation - Hydraulic System A Quantity Indication (Flight Deck) Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Hydraulic System A Quantity Indication (Flight Deck) inoperative.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
12-15-11-610-801	Check of the Brake Accumulator Precharge Pressure (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-804	Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for Hydraulic System A Quantity Level Check

SUBTASK 29-00-00-210-010

- (1) Make sure the leading edge flaps are up. If the flaps are not retracted, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 29-00-00-210-011

- (2) Make sure the trailing edge flaps and slats are retracted. If the flaps are not retracted, do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 29-00-00-210-012

- (3) Make sure the spoilers are in the down position.

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SUBTASK 29-00-00-210-013

- (4) Make sure all flight controls are in the neutral position.

SUBTASK 29-00-00-210-014

- (5) Make sure the brake accumulator has a minimum of 2850 psig of pressure in it (with the hydraulic pumps off). To check the brake accumulator pressure, do this task: Check of the Brake Accumulator Precharge Pressure, TASK 12-15-11-610-801.
- (6) If the accumulator has less than 2850 psig of pressure, then pressurize hydraulic system B. Do this Task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803

SUBTASK 29-00-00-210-015

- (7) Make sure the thrust reversers are in the closed position. If the thrust reversers are not closed, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

E. Make Sure that the System A Hydraulic Reservoir Quantity Level is Satisfactory

SUBTASK 29-00-00-210-016

- (1) Make sure the hydraulic fluid quantity transmitter/indicator on the system A reservoir shows more than RFL (refill).

SUBTASK 29-00-00-610-003

- (2) If it is necessary, service the hydraulic reservoir. To service it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-00-00-860-089

- (3) Put an INOP placard on the HYD QTY SYS A indicator.

F. Make Sure that the Hydraulic System A Pressure Indication Operates Satisfactorily

SUBTASK 29-00-00-710-003

- (1) To check the engine driven pump pressure indication for hydraulic system A, do these steps:
 - (a) Make sure the HYD PUMPS A ELEC 2 switch on the forward overhead panel, P5 is set to the OFF position.

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED IN ALL THE LANDING GEARS BEFORE YOU PRESSURIZE THE HYDRAULIC SYSTEM. WITHOUT THE GROUND LOCKS, THE LANDING GEARS CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Make sure the ground lock assemblies are installed in the nose and main landing gears. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.
- (c) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.
- (d) Make sure the LOW PRESSURE light for the ENG 1 hydraulic pump is on.

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

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(WARNING PRECEDES)

CAUTION: DO NOT OPERATE THE EDP FOR MORE THAN 2 MINUTES UNLESS THE APPLICABLE FUEL TANK HAS A MINIMUM OF 1675 LBS (760 KG) OF FUEL IN IT. IF YOU OPERATE THE EDP FOR 2 MINUTES WITHOUT FUEL IN THE TANK, LET THE RESERVOIR GO BACK TO AMBIENT TEMPERATURE BEFORE YOU CONTINUE WITH THE TEST. IF YOU CONTINUE TO OPERATE THE EDP THE HYDRAULIC FLUID CAN GET TOO HOT.

- (e) Set this switch on the forward overhead panel, P5, to the ON position to pressurize system A (TASK 29-11-00-860-804):
1) HYD PUMPS A ENG 1
(f) Dry Motor the applicable engine to keep the hydraulic system pressurized. To Dry Motor the engine, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.
(g) Make sure the HYD P indication on the pilots center panel, P2, becomes stable 2850 - 3200 psig for system A.
(h) Make sure the LOW PRESSURE light for the ENG 1 hydraulic pump goes off.
(i) Set the HYD PUMPS A ENG 1 switch to the OFF position.
(j) Make sure the LOW PRESSURE light for the ENG 1 hydraulic pump comes on.

SUBTASK 29-00-00-710-004

- (2) To check the electric motor driven pump pressure indication for hydraulic system A, do these steps:
(a) Make sure the HYD PUMPS A ENG 1 switch on the forward overhead panel, P5 is set to the OFF position.
(b) Make sure the HYD PUMPS A ELEC 2 LOW PRESSURE light, on the P5 panel, is on.
(c) Set the HYD PUMPS A ELEC 2 switch on the forward overhead panel, P5 to the ON position (TASK 29-11-00-860-803).
(d) Make sure the HYD P indication on the pilots center panel, P2, becomes stable 2850 - 3200 psig for system A.
(e) Make sure the HYD PUMPS A ELEC 2 LOW PRESSURE light, on the P5 panel, goes off.
(f) Set the HYD PUMPS A ELEC 2 switch on the forward overhead panel, P5 to the OFF position (TASK 29-11-00-860-803).
(g) Make sure the HYD PUMPS A ELEC 2 LOW PRESSURE light, on the P5 panel, comes on.
(h) Set the HYD PUMPS A ENG 1 switch on the forward overhead panel, P5 to the on position.

END OF TASK

TASK 29-00-00-000-810

5. MMEL 29-11 (DDPG) Restoration - Hydraulic System A Quantity Indication (Flight Deck) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Hydraulic System A Quantity Indication (Flight Deck) inoperative.

B. Location Zones

Table with 2 columns: Zone, Area. Row 1: 211, Flight Compartment - Left. Row 2: 212, Flight Compartment - Right.

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C. Hydraulic System A Quantity (Flight Deck) Indication Repair

SUBTASK 29-00-00-810-005

- (1) Correct the fault.
 - (a) Find the fault code or description of the fault that occurred.
 - (b) Go to the applicable index or list in the FIM and find the FIM task number.
 - (c) Go to the task in the FIM and do the steps in the task.

SUBTASK 29-00-00-020-004

- (2) Remove the INOP placard from the HYD QTY SYS A indicator.

————— **END OF TASK** —————

TASK 29-00-00-000-811

6. M MEL 29-12 (DDPG) Preparation - Low Pressure Light (Standby System) Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Low Pressure Light (Standby System) inoperative.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-804	Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Deactivation

SUBTASK 29-00-00-860-090

- (1) Put an INOP placard on the LOW PRESSURE light for the standby hydraulic system.

E. Make Sure the Low Quantity Light for the Standby System Operates Satisfactorily

SUBTASK 29-00-00-860-091

- (1) Put the LIGHTS switch on the center instrument panel, P2, to the TEST position.

SUBTASK 29-00-00-210-017

- (2) Make sure the LOW QUANTITY LIGHT for the STANDBY HYD system, on the Flight Control Panel, P5, comes on bright.

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F. Make Sure the Electric Motor Driven Pump for the Standby System Operates Satisfactorily

SUBTASK 29-00-00-860-092

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Move the ALTERNATE FLAPS ARM switch to the ARM position.

NOTE: The standby hydraulic pump motor will operate when the ALTERNATE FLAPS ARM switch is in the ARM position.

SUBTASK 29-00-00-860-093

- (2) Momentarily put the Alternate flaps position switch to down. Make sure that the aft overhead LE Devices annunciator panel lights show all leading edge devices are fully extended in approximately one minute.

SUBTASK 29-00-00-710-007

- (3) Put the alternate flaps master and position switches to off.

G. Make Sure Hydraulic System B Engine Driven and Electric Motor Driven Pumps Operate Satisfactorily

SUBTASK 29-00-00-710-008

- (1) To check the engine driven pump for hydraulic system B, do these steps:
 - (a) Make sure the HYD PUMPS B ELEC 1 switch on the forward overhead panel, P5 is set to the OFF position.

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED IN ALL THE LANDING GEARS BEFORE YOU PRESSURIZE THE HYDRAULIC SYSTEM. WITHOUT THE GROUND LOCKS, THE LANDING GEARS CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Make sure the ground lock assemblies are installed in the nose and main landing gears. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.
- (c) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.
- (d) Make sure the LOW PRESSURE light for the ENG 2 hydraulic pump is on.

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THEAILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE THE EDP FOR MORE THAN 2 MINUTES UNLESS THE APPLICABLE FUEL TANK HAS A MINIMUM OF 1675 LBS (760 KG) OF FUEL IN IT. IF YOU OPERATE THE EDP FOR 2 MINUTES WITHOUT FUEL IN THE TANK, LET THE RESERVOIR GO BACK TO AMBIENT TEMPERATURE BEFORE YOU CONTINUE WITH THE TEST. IF YOU CONTINUE TO OPERATE THE EDP THE HYDRAULIC FLUID CAN GET TOO HOT.

- (e) Set this switch on the forward overhead panel, P5, to the ON position to pressurize system B (TASK 29-11-00-860-804):

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1) HYD PUMPS B ENG 2

- (f) Operate the applicable engine to keep the hydraulic system pressurized. To operate the engine, do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.

NOTE: The leading edge flaps and slats will retract during this step of the procedure.

- (g) Make sure the HYD P indication on the pilots center panel, P2, becomes stable 2850 - 3200 psig for system B.
- (h) Make sure the LOW PRESSURE light for the ENG 2 hydraulic pump goes off.
- (i) Set the HYD PUMPS B ENG 2 switch to the OFF position.
- (j) Make sure the LOW PRESSURE light for the ENG 2 hydraulic pump comes on.

SUBTASK 29-00-00-710-009

(2) To check the electric motor driven pump for hydraulic system B, do these steps:

- (a) Make sure the HYD PUMPS B ENG 2 switch on the forward overhead panel, P5 is set to the OFF position.
- (b) Make sure the HYD PUMPS B ELEC 1 LOW PRESSURE light, on the P5 panel, is on.
- (c) Set the HYD PUMPS B ELEC 1 switch on the forward overhead panel, P5 to the ON position (TASK 29-11-00-860-803).

NOTE: The leading edge flaps and slats will retract during this step of the procedure.

- (d) Make sure the HYD P indication on the pilots center panel, P2, becomes stable 2850 - 3200 psig for system B.
 - (e) Make sure the HYD PUMPS B ELEC 1 LOW PRESSURE light, on the P5 panel, goes off.
 - (f) Set the HYD PUMPS B ELEC 1 switch on the forward overhead panel, P5 to the OFF position (TASK 29-11-00-860-803).
 - (g) Make sure the HYD PUMPS B ELEC 1 LOW PRESSURE light, on the P5 panel, comes on.
- (3) Move the HYD PUMPS B ENG 2 switch on the forward overhead panel, P5 to the ON position.

————— END OF TASK —————

TASK 29-00-00-000-812

7. MMEL 29-12 (DDPG) Restoration - Low Pressure Light (Standby System) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Low Pressure Light (Standby System) inoperative.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Low Pressure Light (Standby System) Repair

SUBTASK 29-00-00-810-006

- (1) Correct the fault.
 - (a) Find the fault code or description of the fault that occurred.
 - (b) Go to the applicable index or list in the FIM and find the FIM task number.
 - (c) Go to the task in the FIM and do the steps in the task.

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SUBTASK 29-00-00-860-096

- (2) Remove the INOP placard on the LOW PRESSURE light for the standby hydraulic system.

————— END OF TASK —————

TASK 29-00-00-000-813

8. M MEL 29-13 (DDPG) Preparation - Hydraulic Reservoir Pressurization System Sources Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Hydraulic Reservoir Pressurization System Sources inoperative.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
36-00-00-860-801	Supply Pressure to the Pneumatic System (Selection) (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Deactivation

SUBTASK 29-00-00-020-005

- (1) Put a placard ONE RES PRESS SOURCE INOP on the hydraulic panel, P5.

E. Make Sure the Hydraulic Reservoirs are Pressurized

SUBTASK 29-00-00-860-097

- (1) Remove pressure from the pneumatic system. To remove it, do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806

SUBTASK 29-00-00-860-098

- (2) Remove pressure from the hydraulic reservoirs. To remove it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-00-00-420-007

- (3) Disconnect and install a cap on the applicable pneumatic source and the supply lines at the reservoir pressurization module.

NOTE: There are two pneumatic supply lines that connect to the pressurization module. One supply line is from the left environmental control system duct and the other is from the right environmental control system duct.

SUBTASK 29-00-00-860-099

- (4) Make sure the reservoir depressurization (vent) valve for each system reservoir is in the closed (non-vented) position.

NOTE: The two hydraulic reservoirs are pressurized at the same time when the two reservoir depressurization (vent) valves are closed.

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SUBTASK 29-00-00-860-100

- (5) Pressurize the pneumatic system. To pressurize it, do this task: Supply Pressure to the Pneumatic System (Selection), TASK 36-00-00-860-801.

SUBTASK 29-00-00-860-101

- (6) Monitor the dual duct pressure indicator on the P5-10, forward overhead panel for the pneumatic system L(R) that was not disconnected from the pressurization module.
 - (a) Make sure that the duct pressure needle shows 30 to 50 psi without user systems in operation. If you use the APU as the pneumatic source, make sure that the duct pressure needle shows 12 to 26 psi without user systems in operation.

NOTE: The APU uses an on demand bleed air system. When you move the APU Bleed air switch to the on position the APU pressurizes the duct, (Duct Pressurization Mode) to 12 to 26 psig.

- (b) Make sure that the pressure gage for the system A and system B hydraulic reservoirs show the same pressure as the applicable dual duct pressure indicator on the P5-10, forward overhead panel.

————— **END OF TASK** —————

TASK 29-00-00-000-814

9. M MEL 29-13 (DDPG) Restoration - Hydraulic Reservoir Pressurization System Sources Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Hydraulic Reservoir Pressurization System Sources inoperative.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Hydraulic Reservoir Pressurization System Sources Repair

SUBTASK 29-00-00-020-006

- (1) Remove the caps installed from the applicable pneumatic source and the supply lines at the pressurization module.

SUBTASK 29-00-00-420-008

- (2) Connect the pneumatic source and supply lines to the pressurization module.

SUBTASK 29-00-00-810-007

- (3) Correct the fault.
 - (a) Find the fault code or description of the fault that occurred.
 - (b) Go to the applicable index or list in the FIM and find the FIM task number.
 - (c) Go to the task in the FIM and do the steps in the task.

SUBTASK 29-00-00-020-007

- (4) Remove the placard ONE RES PRESS SOURCE INOP from the hydraulic panel, P5.

————— **END OF TASK** —————

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TASK 29-00-00-000-815

10. M MEL 29-15 (DDPG) Preparation - Hydraulic System B Quantity Indication (Flight Deck) Inoperative

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the Hydraulic System B Quantity Indication inoperative.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
12-15-11-610-801	Check of the Brake Accumulator Precharge Pressure (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
27-51-00-860-804	Retract the Trailing Edge Flaps (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-804	Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for Hydraulic System B Quantity Level Check

SUBTASK 29-00-00-210-018

- (1) Make sure the leading edge flaps are up. If the flaps are not retracted, do this task: Retract the Trailing Edge Flaps, TASK 27-51-00-860-804.

SUBTASK 29-00-00-210-019

- (2) Make sure the trailing edge flaps and slats are retracted. If the flaps are not retracted, do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 29-00-00-210-020

- (3) Make sure the spoilers are in the down position.

SUBTASK 29-00-00-210-021

- (4) Make sure all flight controls are in the neutral position.

SUBTASK 29-00-00-210-022

- (5) Make sure the brake accumulator has a minimum of 2850 psig of pressure in it (with the hydraulic pumps off). To check the brake accumulator pressure, do this task: Check of the Brake Accumulator Precharge Pressure, TASK 12-15-11-610-801.
- (6) If the accumulator has less then 2850 psig of pressure, then pressurize hydraulic system B. Do this Task:Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803

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SUBTASK 29-00-00-210-023

- (7) Make sure the thrust reversers are in the closed position. If the thrust reversers are not closed, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

E. Make Sure that the System B Hydraulic Reservoir Quantity Level is Satisfactory

SUBTASK 29-00-00-210-024

- (1) Make sure the hydraulic fluid quantity transmitter/indicator on the system B reservoir shows more than RFL (refill).

SUBTASK 29-00-00-610-004

- (2) If it is necessary, service the hydraulic reservoir. To service it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-00-00-860-102

- (3) Put an INOP placard on the HYD QTY SYS B indicator.

F. Make Sure that the Hydraulic System B Pressure Indication Operates Satisfactorily

SUBTASK 29-00-00-710-010

- (1) To check the engine driven pump pressure indication for hydraulic system B, do these steps:
 - (a) Make sure the HYD PUMPS B ELEC 1 switch on the forward overhead panel, P5 is set to the OFF position.

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED IN ALL THE LANDING GEARS BEFORE YOU PRESSURIZE THE HYDRAULIC SYSTEM. WITHOUT THE GROUND LOCKS, THE LANDING GEARS CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Make sure the ground lock assemblies are installed in the nose and main landing gears. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.
- (c) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.
- (d) Make sure the LOW PRESSURE light for the ENG 2 hydraulic pump is on.

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE THE EDP FOR MORE THAN 2 MINUTES UNLESS THE APPLICABLE FUEL TANK HAS A MINIMUM OF 1675 LBS (760 KG) OF FUEL IN IT. IF YOU OPERATE THE EDP FOR 2 MINUTES WITHOUT FUEL IN THE TANK, LET THE RESERVOIR GO BACK TO AMBIENT TEMPERATURE BEFORE YOU CONTINUE WITH THE TEST. IF YOU CONTINUE TO OPERATE THE EDP THE HYDRAULIC FLUID CAN GET TOO HOT.

- (e) Set this switch on the forward overhead panel, P5, to the ON position to pressurize system B TASK 29-11-00-860-804:
 - 1) HYD PUMPS B ENG 2
- (f) Dry Motor the applicable engine to keep the hydraulic system pressurized. To Dry Motor the engine, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.

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- (g) Make sure the HYD P indication on the pilots center panel, P2, becomes stable 2850 - 3200 psig for system B.
- (h) Make sure the LOW PRESSURE light for the ENG 2 hydraulic pump goes off.
- (i) Set the HYD PUMPS B ENG 2 switch to the OFF position.
- (j) Make sure the LOW PRESSURE light for the ENG 2 hydraulic pump comes on.

SUBTASK 29-00-00-710-011

- (2) To check the electric motor driven pump pressure indication for hydraulic system B, do these steps:
 - (a) Make sure the HYD PUMPS B ENG 2 switch on the forward overhead panel, P5 is set to the OFF position.
 - (b) Make sure the HYD PUMPS B ELEC 1 LOW PRESSURE light, on the P5 panel, is on.
 - (c) Set the HYD PUMPS B ELEC 1 switch on the forward overhead panel, P5 to the ON position (TASK 29-11-00-860-803).
 - (d) Make sure the HYD P indication on the pilots center panel, P2, becomes stable 2850 - 3200 psig for system B.
 - (e) Make sure the HYD PUMPS B ELEC 1 LOW PRESSURE light, on the P5 panel, goes off.
 - (f) Set the HYD PUMPS B ELEC 1 switch on the forward overhead panel, P5 to the OFF position (TASK 29-11-00-860-803).
 - (g) Make sure the HYD PUMPS B ELEC 1 LOW PRESSURE light, on the P5 panel, comes on.
 - (h) Set the HYD PUMPS B ENG 2 switch on the forward overhead panel, P5 to the on position.

————— END OF TASK —————

TASK 29-00-00-000-816

11. MMEL 29-15 (DDPG) Restoration - Hydraulic System B Quantity Indication (Flight Deck) Inoperative

A. General

- (1) This task puts the airplane back to its usual condition after operation with the Hydraulic System B Quantity Indication inoperative.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Hydraulic System B Quantity (Flight Deck) Indication Repair

SUBTASK 29-00-00-810-008

- (1) Correct the fault.
 - (a) Find the fault code or description of the fault that occurred.
 - (b) Go to the applicable index or list in the FIM and find the FIM task number.
 - (c) Go to the task in the FIM and do the steps in the task.

SUBTASK 29-00-00-020-008

- (2) Remove the INOP placard from the HYD QTY SYS B indicator.

————— END OF TASK —————

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HYDRAULIC RESERVOIR PRESSURIZATION SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Hydraulic Reservoirs Pressurization
- (2) Hydraulic Reservoirs Depressurization.

B. Normally the reservoir pressurization system supplies bleed air pressure from either the engines, APU or external ground air cart to pressurize the system 'A' and system 'B' hydraulic reservoirs. The reservoir pressurization system can also be manually pressurized for ground maintenance by connection of an external ground air source to an air charging valve located in the right main landing gear wheel well. The air charging valve permits manual depressurization and pressurization of the reservoirs for ground maintenance.

C. The air volumes of the system 'A' and 'B' reservoirs are interconnected by a balance line, and therefore the reservoirs are maintained at the same pressure. The approximate operating range will vary between 12-65 psi depending on pneumatic source available and aircraft operation.

TASK 29-09-00-860-801

2. Hydraulic Reservoirs Pressurization

(Figure 201)

A. General

- (1) There are two methods for pressurizing the hydraulic reservoirs. The first method requires pressurization of the pneumatic system's crossover manifold using the engines, APU, or external ground air cart. The second method does not require pressurization of the pneumatic crossover manifold, but utilizes an external air source connected to the air charging valve manifold to pressurize the reservoirs for ground maintenance.

B. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-802	Supply Pressure to the Pneumatic System with an External Ground Air Source (P/B 201)
36-00-00-860-803	Supply Pressure to the Pneumatic System with the APU (P/B 201)
36-00-00-860-804	Supply Pressure to the Pneumatic System with One or Both Engines (P/B 201)

C. Tools/Equipment

Reference	Description
STD-77	Air Source - Regulated, Dry Filtered, 0-50 psig

D. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

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E. Reservoir Pressurization with the Pneumatic System Pressurized (Method 1)

SUBTASK 29-09-00-480-001

WARNING: MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-09-00-210-001

- (2) Get access to the air charging valve manifold assembly in the right main landing gear wheel well.
 - (a) Make sure the air charging valve is fully closed and a dust cap is installed on the valve stem.

SUBTASK 29-09-00-860-001

- (3) To pressurize the pneumatic crossover manifold, do either of these tasks:
 - (a) Do this task: Supply Pressure to the Pneumatic System with One or Both Engines, TASK 36-00-00-860-804.
 - (b) Do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.
 - (c) Do this task: Supply Pressure to the Pneumatic System with an External Ground Air Source, TASK 36-00-00-860-802.

SUBTASK 29-09-00-210-002

- (4) Make note of the reservoir pressure indication on the air pressure gauge in the right main landing gear wheel well, and the duct pressure indication on the bleed air pressure gauge in the flight compartment (P5-10 panel).

SUBTASK 29-09-00-210-003

- (5) Make sure the pressure difference between the reservoir air pressure gauge and the bleed air pressure gauge is not more than 10 psi.

NOTE: A pressure difference greater than 10 psi may be an indication of an air leak in the reservoir pressurization system. Normal reservoir pressure should be 45-50 psi, however, the approximate operating range can vary between 12-65 psi depending on pneumatic source available and aircraft operation.

SUBTASK 29-09-00-210-004

- (6) Make sure the reservoir air pressure indication remains stable and does not decrease.

NOTE: If the pressure decreases, there may be an air leak in the reservoir pressurization system.

F. Reservoir Pressurization with an External Air Source (Method 2)

SUBTASK 29-09-00-480-002

WARNING: MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

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SUBTASK 29-09-00-860-002

- (2) Make sure the pneumatic system is depressurized (engines, APU, and external air sources are off).

SUBTASK 29-09-00-010-001

- (3) Get access to the air charging valve manifold assembly in the right main landing gear wheel well.
 - (a) Remove the dust cap from the valve stem on the air charging valve.

SUBTASK 29-09-00-480-003

- (4) Connect the external ground 0-50 psig dry filtered regulated air source, STD-77 to the valve stem on the air charging valve.

SUBTASK 29-09-00-980-001

- (5) Turn the swivel nut on the air charging valve to the fully open position (1 to 2-1/4 turns).

SUBTASK 29-09-00-780-001

CAUTION: DO NOT USE MORE THAN 70 PSIG PRESSURE. IF YOU USE TOO MUCH PRESSURE, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (6) Supply and adjust the pressure of the external ground 0-50 psig dry filtered regulated air source, STD-77 to pressurize the reservoirs to 45-50 psi.
 - (a) Make sure the reservoir air pressure gauge in the right main landing gear wheel well shows approximately 45-50 psi.

SUBTASK 29-09-00-980-002

- (7) Turn the swivel nut on the air charging valve to the fully closed position (1 to 2-1/4 turns).
 - (a) Make sure the reservoir air pressure gauge indication is stable at approximately 45-50 psi.

SUBTASK 29-09-00-080-001

- (8) Disconnect the external ground 0-50 psig dry filtered regulated air source, STD-77 from the valve stem on the air charging valve.

SUBTASK 29-09-00-420-001

- (9) Re-install the dust cap to the valve stem on the air charging valve.

————— **END OF TASK** —————

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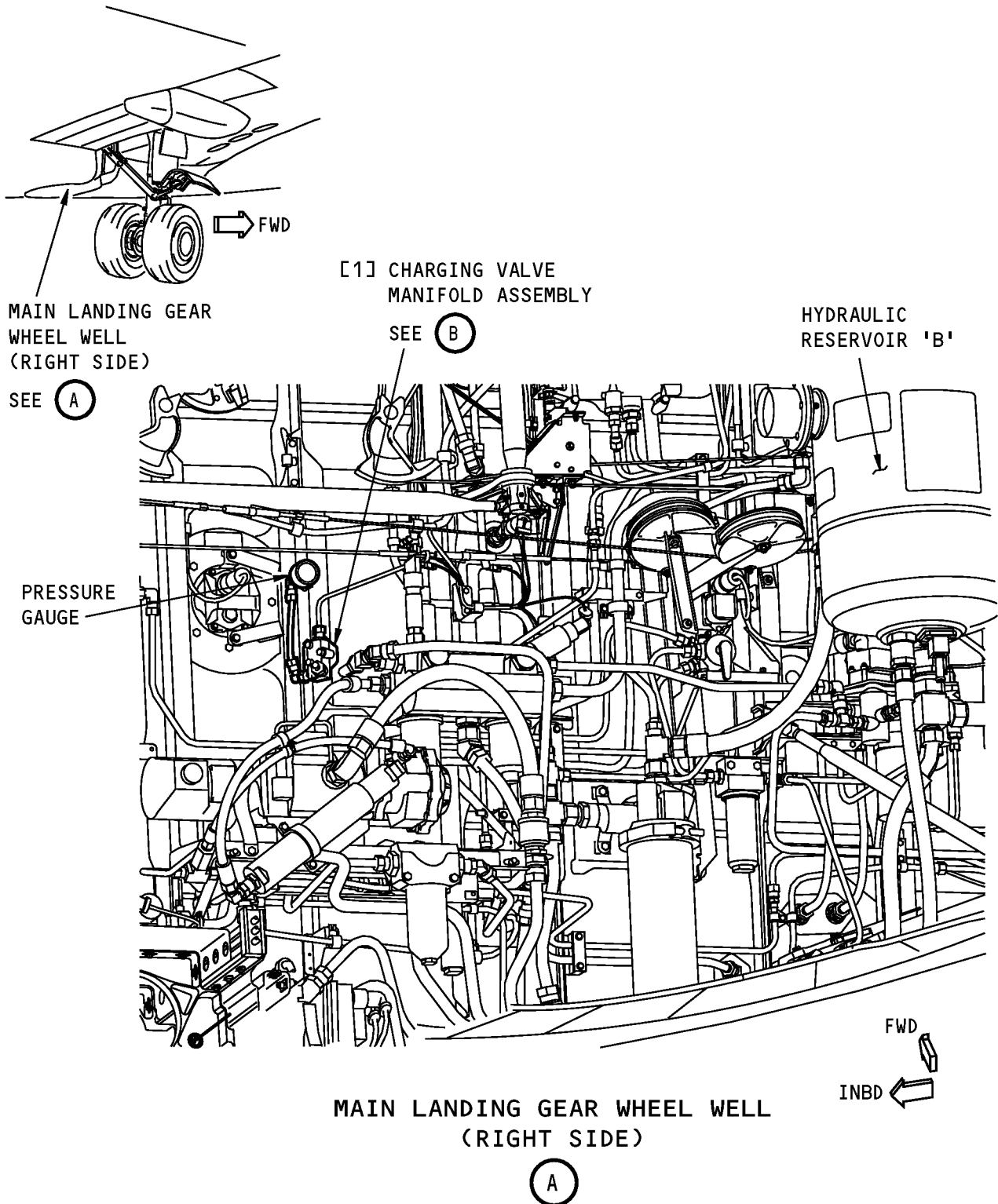
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**Charging Valve Manifold Assembly - Maintenance Practices
Figure 201 (Sheet 1 of 2)/29-09-00-990-802**

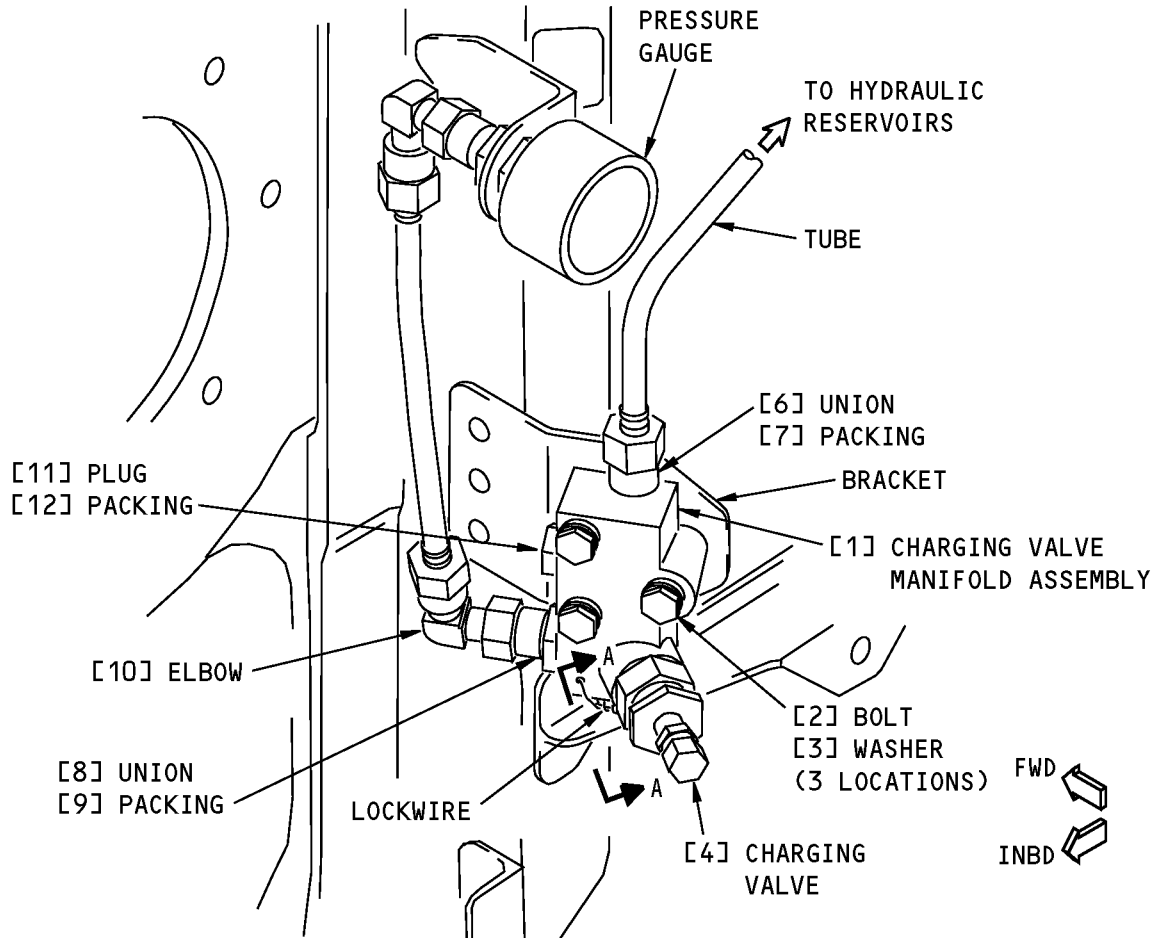
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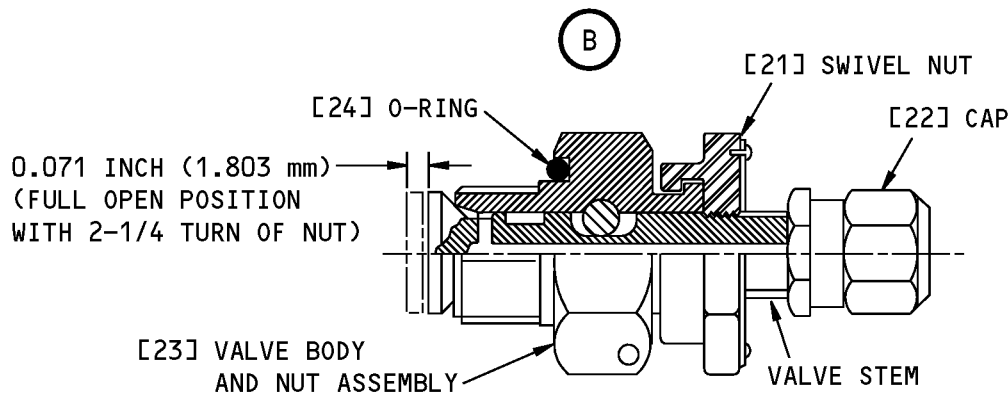
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CHARGING VALVE MANIFOLD ASSEMBLY



CHARGING VALVE

A-A

**Charging Valve Manifold Assembly - Maintenance Practices
Figure 201 (Sheet 2 of 2)/29-09-00-990-802**

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TASK 29-09-00-860-802

3. Hydraulic Reservoirs Depressurization

(Figure 201)

A. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Hydraulic Reservoirs Depressurization

SUBTASK 29-09-00-860-003

- (1) Do these tasks to remove hydraulic power supplied to the airplane:
 - (a) For the main hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
 - (b) For the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

SUBTASK 29-09-00-860-004

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-09-00-480-004

- (3) Put a container below the air charging valve to catch any trapped hydraulic fluid which may come out of the system.

SUBTASK 29-09-00-020-001

- (4) Remove the dust cap from the air charging valve.

SUBTASK 29-09-00-860-005

WARNING: PUT A RAG AROUND THE AIR CHARGING VALVE TO CATCH SPRAY OF HYDRAULIC FLUID. DO NOT GET HYDRAULIC FLUID IN YOUR MOUTH, EYES, SKIN, OR ON THE AIRPLANE. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Cover the air charging valve with a rag to help prevent a spray of hydraulic fluid when you release the pressure.

SUBTASK 29-09-00-980-003

- (6) Slowly turn the swivel nut on the air charging valve (1 to 2-1/4 turns) to the fully open position to release the pressure in the reservoirs.

SUBTASK 29-09-00-210-005

- (7) Make sure the reservoir air pressure gauge shows 0 psi.

SUBTASK 29-09-00-980-004

- (8) Turn the swivel nut on the air charging valve to the fully closed position.

SUBTASK 29-09-00-420-002

- (9) Re-install the dust cap to the air charging valve.

————— END OF TASK —————

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HYDRAULIC RESERVOIR PRESSURIZATION SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

- (1) Hydraulic Reservoir Pressurization System Leakage Test

TASK 29-09-00-860-803

2. Hydraulic Reservoir Pressurization System - Leakage Test

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-802	Supply Pressure to the Pneumatic System with an External Ground Air Source (P/B 201)
36-00-00-860-803	Supply Pressure to the Pneumatic System with the APU (P/B 201)
36-00-00-860-804	Supply Pressure to the Pneumatic System with One or Both Engines (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Reservoir Pressurization System Leakage Test

SUBTASK 29-09-00-480-005

WARNING: MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-09-00-210-006

- (2) Get access to the air charging valve manifold assembly in the right main landing gear wheel well.
(a) Make sure the air charging valve is fully closed and a dust cap is installed on the valve stem.

SUBTASK 29-09-00-860-006

- (3) To pressurize the pneumatic crossover manifold, do either of these tasks:
(a) Do this task: Supply Pressure to the Pneumatic System with One or Both Engines, TASK 36-00-00-860-804.
(b) Do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.
(c) Do this task: Supply Pressure to the Pneumatic System with an External Ground Air Source, TASK 36-00-00-860-802.

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SUBTASK 29-09-00-210-007

- (4) Make note of the reservoir pressure indication on the air pressure gauge in the right main landing gear wheel well, and the duct pressure indication on the bleed air pressure gauge in the flight compartment (P5-10 panel).

SUBTASK 29-09-00-210-008

- (5) Make sure the pressure difference between the reservoir air pressure gauge and the bleed air pressure gauge is not more than 10 psi.

NOTE: A pressure difference greater than 10 psi may be an indication of an air leak in the reservoir pressurization system. Normal reservoir pressure should be 45-50 psi, however, the approximate operating range can vary between 12-65 psi depending on pneumatic source available and aircraft operation.

SUBTASK 29-09-00-210-009

- (6) Make sure the reservoir air pressure indication remains stable and does not decrease.

NOTE: If the pressure decreases, there may be an air leak in the reservoir pressurization system.

SUBTASK 29-09-00-860-007

- (7) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-09-00-210-010

- (8) Make sure the reservoir air pressure indication remains stable and does not decrease for at least 15 minutes.

NOTE: If the pressure decreases, there may be an air leak in the reservoir pressurization system.

- (a) If the air pressure indication does not remain stable, then make sure the check valves in the cross-fitting assemblies are not contaminated.

NOTE: If contamination enters the cross fitting assembly, the check valve can stick open and cause the reservoir air pressure to decrease. The cross-fitting assembly must be replaced if the check valve is contaminated.

- (b) You can use a solution of soap and water to check that there are no air leaks at the pressurization tube connections between the air pressure filter assembly near the pneumatic crossover manifold duct in the left/right ECS bays and the air charging valve manifold assembly in the right main landing gear wheel well.

SUBTASK 29-09-00-860-008

- (9) If necessary, do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

————— **END OF TASK** —————

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AIR PRESSURE FILTER ASSEMBLY - MAINTENANCE PRACTICES

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Air Pressure Filter Assembly Removal
 - (2) Air Pressure Filter Assembly Installation
 - (3) Secondary Check Valve Removal
 - (4) Secondary Check Valve Installation
 - (5) Air Pressure Filter Element Removal
 - (6) Air Pressure Filter Element Installation
- C. There are two air pressure filter assemblies, one in the left and one in the right Enviromental Control Systems (ECS) bays, adjacent to the pneumatic system's crossover manifold duct.
- D. The air pressure filter assembly removes foreign material from the bleed air supplied by the pneumatic system air sources (engines, APU, or external air cart).
- E. The air pressure filter assembly consists of a filter case, a wire-wound metal filter element, two packings (o-rings), a filter head (housing), a reducer in the inlet port, and a check valve in the outlet port. The filter case is secured to the filter head with lockwire.
- F. The air pressure filter assembly consists of a filter case, a metal filter element, four packings (o-rings), a filter head (housing), a reducer in the inlet port, and a check valve in the outlet port. The filter case is secured to the filter head with lockwire.

TASK 29-09-01-000-801

2. Air Pressure Filter Assembly - Removal

(Figure 201 or Figure 202)

- A. General
 - (1) This task has instructions for the removal of the air pressure filter assembly. To remove the filter element only, do this task: Air Pressure Filter Element Removal, TASK 29-09-01-000-803.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

D. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

EFFECTIVITY
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E. Prepare for Removal

SUBTASK 29-09-01-860-001

- (1) Do these tasks to remove hydraulic power if supplied to the airplane:
 - (a) For the main hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
 - (b) For the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

SUBTASK 29-09-01-860-002

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-09-01-860-003

- (3) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-09-01-010-001

- (4) Get access to the air pressure filter assembly [1] in the left/right ECS bay:

NOTE: The air pressure filter assembly is adjacent to the pneumatic system's crossover manifold duct.

For the left air pressure filter assembly, open the

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door

For the right air pressure filter assembly, open the

<u>Number</u>	<u>Name/Location</u>
192CR	Air Conditioning Access Door

SUBTASK 29-09-01-210-001

- (5) Do not touch the air pressure filter assembly [1] until it has cooled.

NOTE: If the pneumatic system was in operation previously, allow time for the crossover manifold duct and air pressure filter assembly to become cool before you touch it.

F. Air Pressure Filter Assembly Removal

SUBTASK 29-09-01-020-011

- (1) Loosen the swivel nuts at the reducer [7] and check valve [8] on either end of the air pressure filter assembly [1].

SUBTASK 29-09-01-020-002

- (2) Remove the air pressure filter assembly [1].

SUBTASK 29-09-01-420-001

- (3) Install plugs/caps to the tube ends and reducers.

————— **END OF TASK** —————

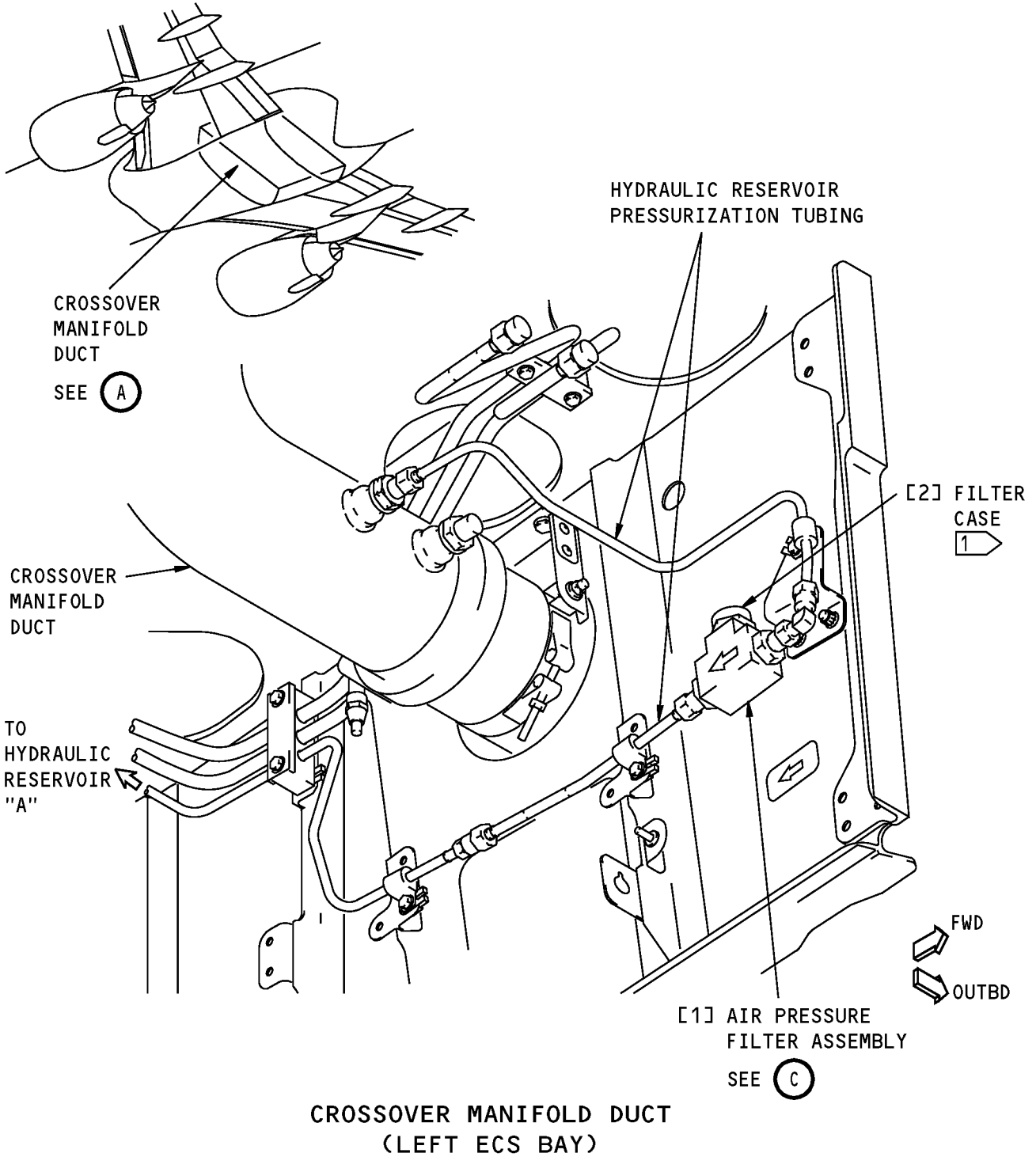
EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
SB 737-29-1106

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1 FILTER CASE INSTALLED UP

(A)

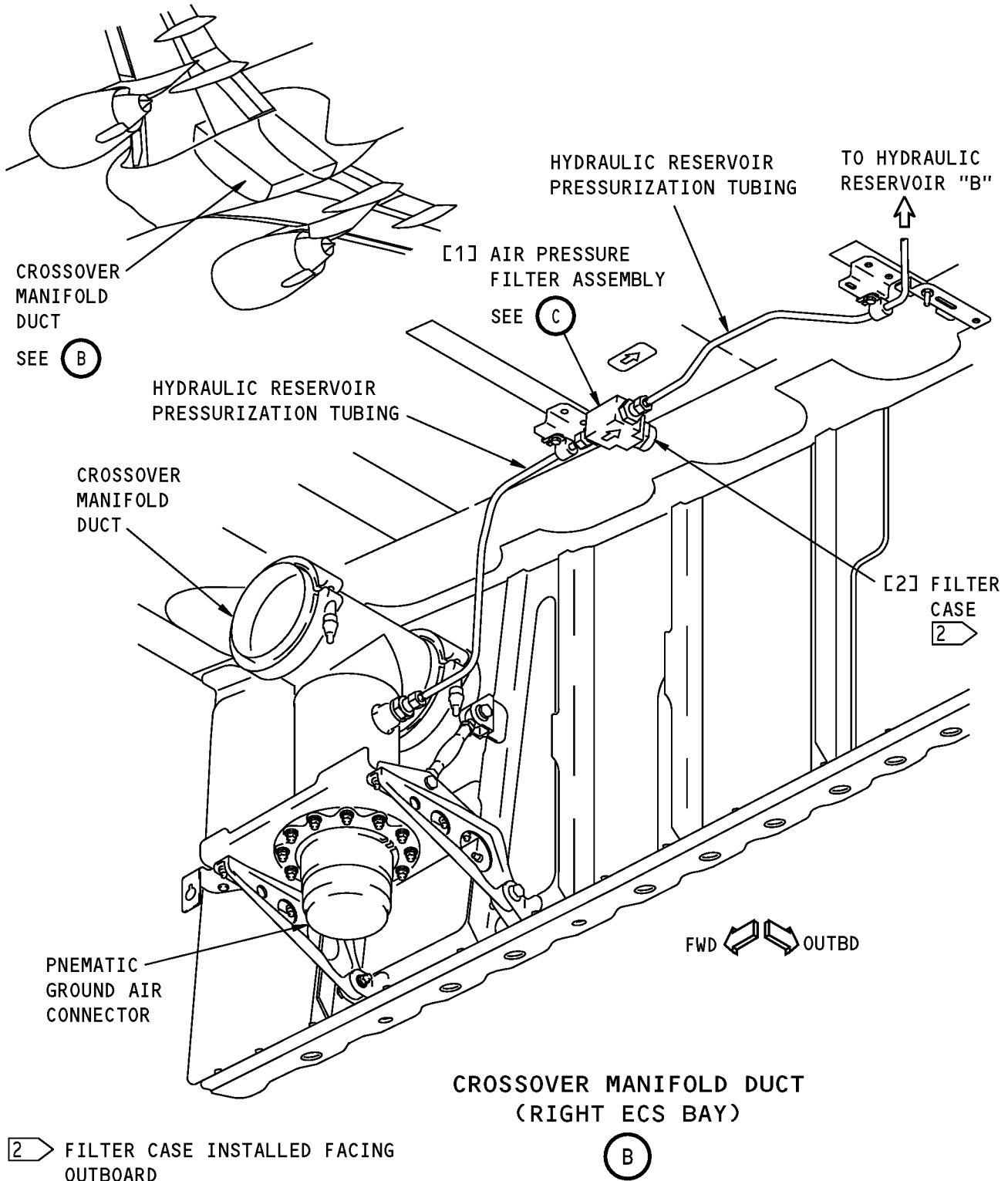
**Air Pressure Filter Assembly - Maintenance Practices
Figure 201 (Sheet 1 of 3)/29-09-01-990-802**

EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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**Air Pressure Filter Assembly - Maintenance Practices
Figure 201 (Sheet 2 of 3)/29-09-01-990-802**

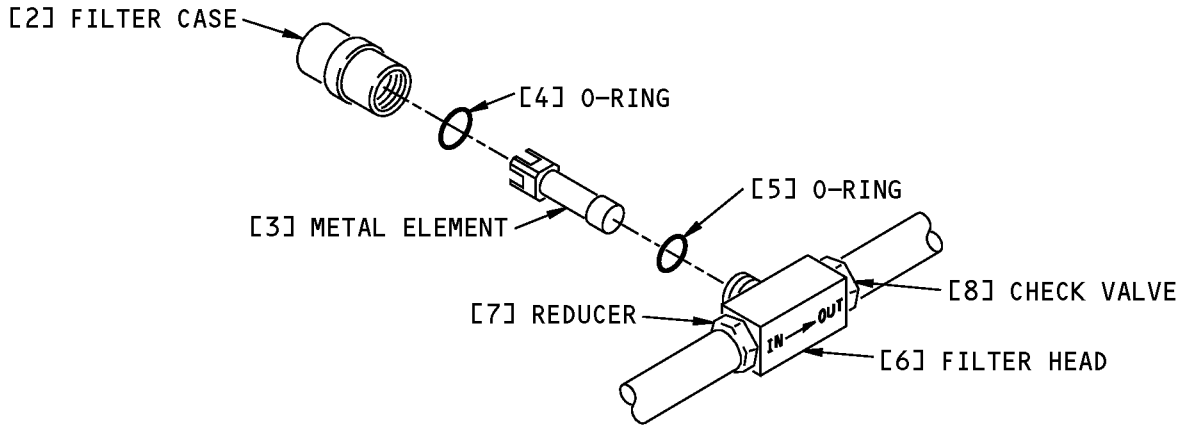
EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
SB 737-29-1106

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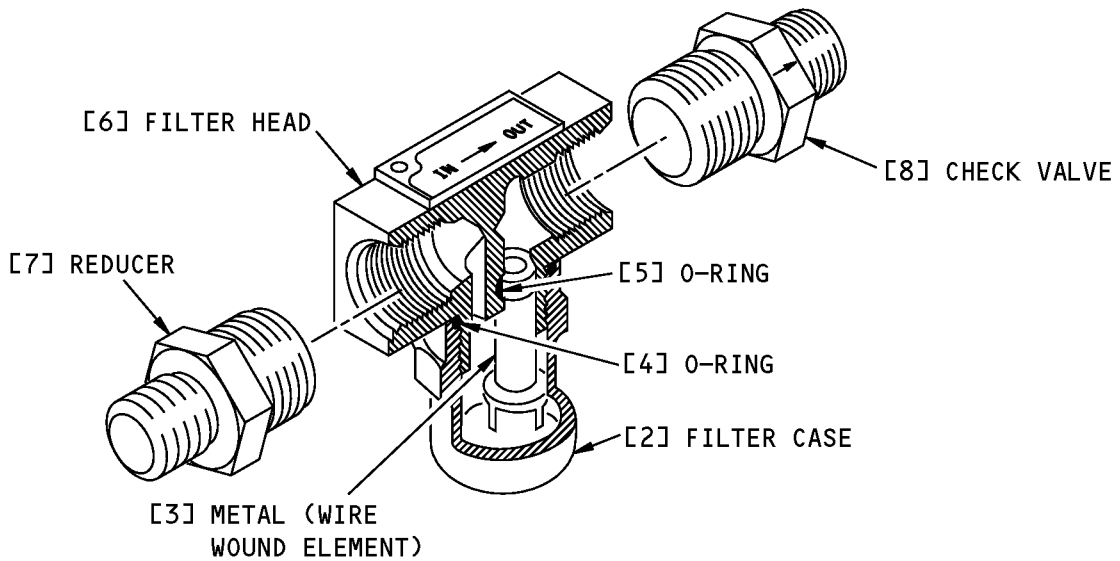
D633A101-HAP

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**AIR PRESSURE FILTER ASSEMBLY
(EXPLODED)**

(C)



**AIR PRESSURE FILTER ASSEMBLY
(CUTAWAY)**

(C)

**Air Pressure Filter Assembly - Maintenance Practices
Figure 201 (Sheet 3 of 3)/29-09-01-990-802**

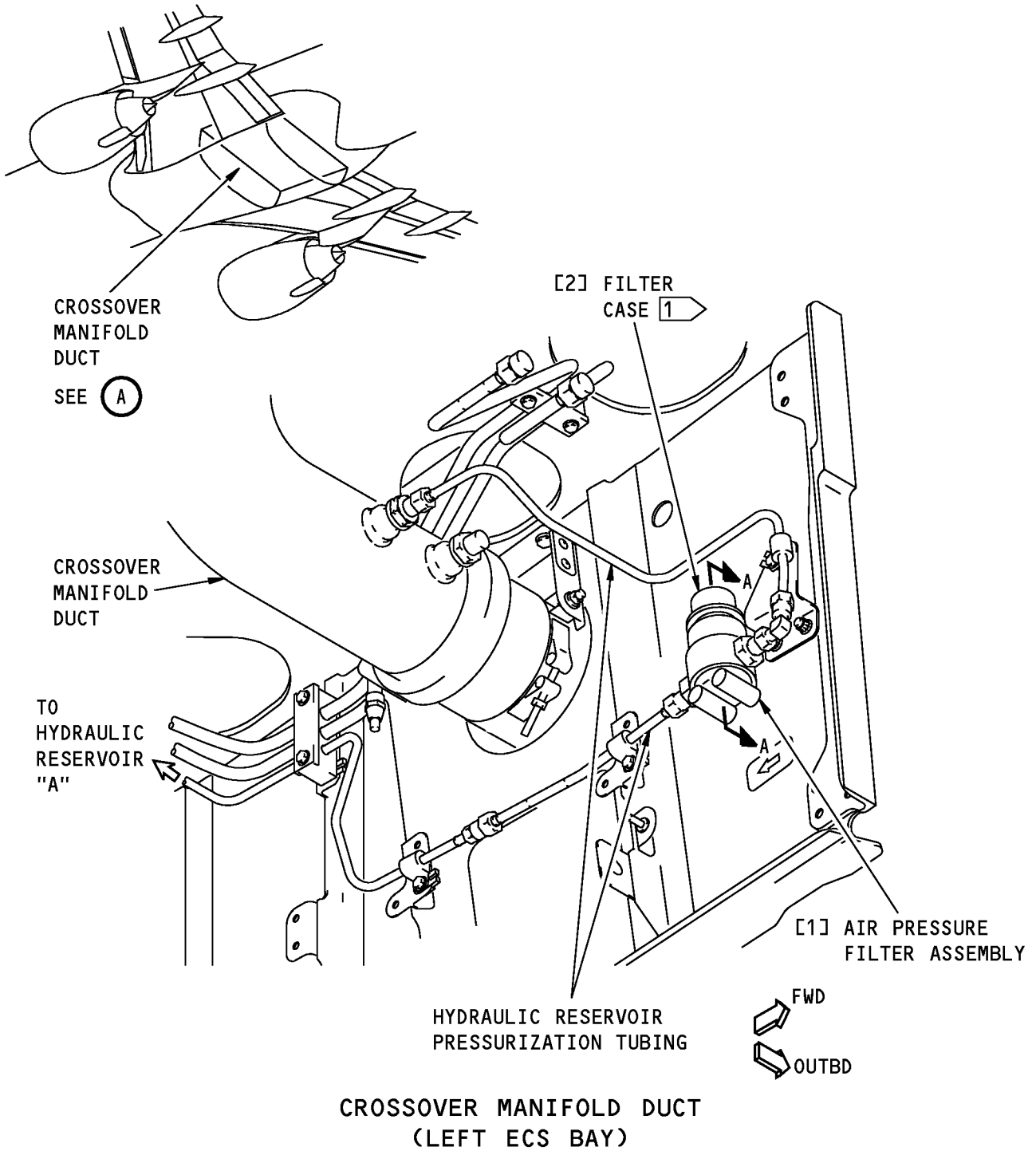
EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
SB 737-29-1106

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1 FILTER CASE INSTALLED UP

1843405 S0000326431_V1

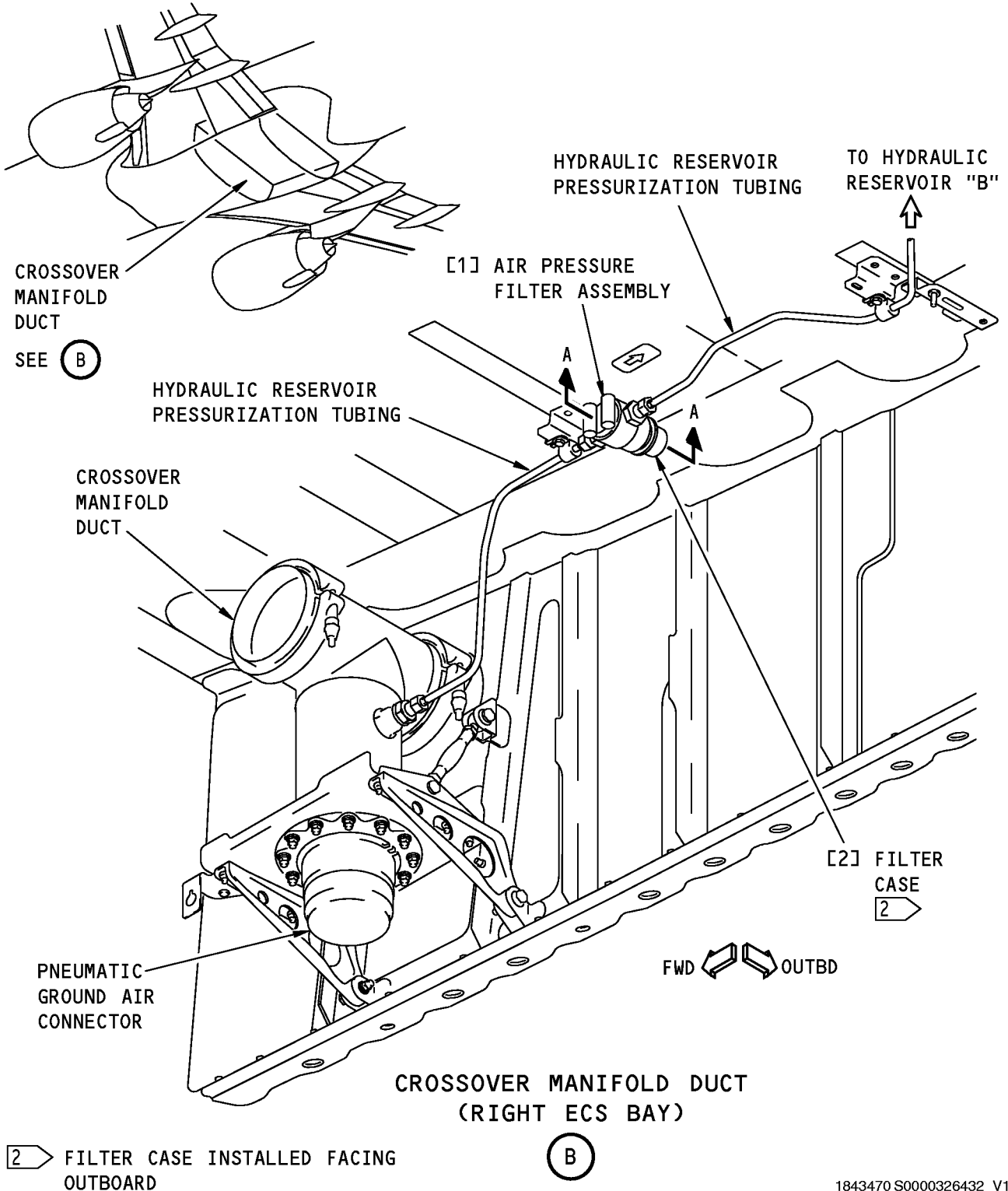
**Air Pressure Filter Assembly - Maintenance Practices
Figure 202 (Sheet 1 of 3)/29-09-01-990-804**

EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
SB 737-29-1106

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1843470 S0000326432_V1

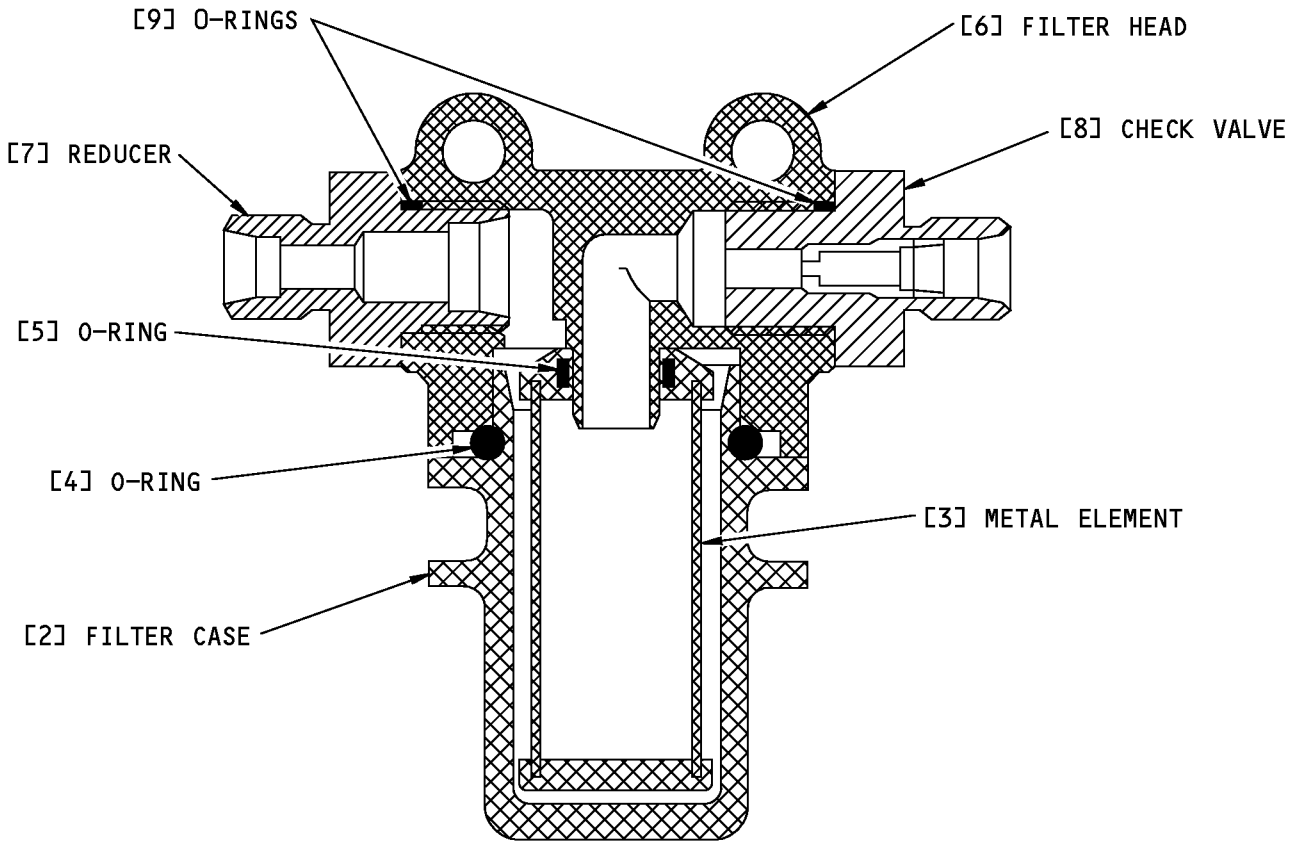
Air Pressure Filter Assembly - Maintenance Practices
Figure 202 (Sheet 2 of 3)/29-09-01-990-804

EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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**AIR PRESSURE FILTER ASSEMBLY
(EXAMPLE)
A-A**

1843740 S0000326430_V1

**Air Pressure Filter Assembly - Maintenance Practices
Figure 202 (Sheet 3 of 3)/29-09-01-990-804**

EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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TASK 29-09-01-400-801

3. Air Pressure Filter Assembly - Installation

(Figure 201 or Figure 202)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

C. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

D. Air Pressure Filter Assembly Installation

SUBTASK 29-09-01-020-007

- (1) Remove the plugs/caps from the tube ends and reducers.

SUBTASK 29-09-01-420-002

- (2) Align the air pressure filter assembly [1] with the tube ends.
 - (a) Make sure the IN-OUT flow arrow on the filter head [6] (housing) points in the same direction as the air flow arrow decal on the structure.
 - (b) For the left air pressure filter assembly [1], make sure the filter case [2] points upward.
 - (c) For the right air pressure filter assembly [1], make sure the filter case [2] points outboard.

SUBTASK 29-09-01-420-011

- (3) Tighten the swivel nuts to connect the tube ends to the reducer [7] and check valve [8] on the air pressure filter assembly [1].

E. Post-Installation Leakage Check

SUBTASK 29-09-01-860-004

- (1) Pressurize the pneumatic crossover manifold duct.

SUBTASK 29-09-01-790-001

- (2) Use a solution of soap and water to check that no air leaks at the swivel nut connections on the air pressure filter assembly [1].

SUBTASK 29-09-01-860-005

- (3) Depressurize the pneumatic cross manifold duct.

SUBTASK 29-09-01-860-006

- (4) If necessary, do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-09-01-410-001

- (1) Close the access to the air pressure filter assembly [1] in the left/right ECS bay:

EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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For the left air pressure filter assembly, close this access panel:

Number	Name/Location
192CL	Air Conditioning Access Door

For the right air pressure filter assembly, close this access panel:

Number	Name/Location
192CR	Air Conditioning Access Door

————— END OF TASK —————

TASK 29-09-01-000-802

4. Secondary Check Valve - Removal

(Figure 201 or Figure 202)

A. General

- (1) This task has instructions for the removal of the secondary check valve. The secondary check valve is part of the air pressure filter assembly. It is not necessary to remove the filter assembly to remove the check valve.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

D. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

E. Prepare for Removal

SUBTASK 29-09-01-860-007

- (1) Do these tasks to remove hydraulic power if supplied to the airplane:
 - (a) For the main hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
 - (b) For the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

SUBTASK 29-09-01-860-008

WARNING: YOU MUST RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT HIGH PRESSURE AIR IN THE PNEUMATIC DUCTS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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SUBTASK 29-09-01-860-009

(3) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-09-01-010-002

(4) Get access to the air pressure filter assembly in the left/right ECS bay:

NOTE: The air pressure filter assembly is adjacent to the pneumatic system's crossover manifold duct.

For the left air pressure filter assembly, open the

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door

For the right air pressure filter assembly, open the

<u>Number</u>	<u>Name/Location</u>
192CR	Air Conditioning Access Door

SUBTASK 29-09-01-210-002

WARNING: MAKE SURE THE PNEUMATIC SYSTEM COMPONENTS ARE SUFFICIENTLY COOL BEFORE YOU START THE MAINTENANCE PROCEDURES. THE COMPONENTS CAN GET VERY HOT. IF YOU TOUCH THE COMPONENTS BEFORE THEY ARE COOL, INJURY TO PERSONS CAN OCCUR.

(5) Do not touch the air pressure filter assembly until it has cooled.

F. Secondary Check Valve Removal

SUBTASK 29-09-01-020-008

(1) Loosen the swivel nut that connects the pneumatic tube to the secondary check valve.

SUBTASK 29-09-01-020-009

(2) Remove the secondary check valve from the filter assembly.

SUBTASK 29-09-01-420-008

(3) Install plugs/caps as needed to the tube ends, check valve, and filter assembly.

————— END OF TASK —————

TASK 29-09-01-400-802

5. Secondary Check Valve - Installation

(Figure 201 or Figure 202)

A. References

<u>Reference</u>	<u>Title</u>
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Consumable Materials

<u>Reference</u>	<u>Description</u>	<u>Specification</u>
C50122	Primer - Nonchromated Exterior Decorative Primer for Composite, Titanium and CRES Steel Surfaces	BMS 10-118A

EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-29-1106

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C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Check valve	29-11-52-20A-086	HAP 001-013, 015-026, 028-030
		29-11-52-20A-105	HAP 001-013, 015-026, 028-030
		29-11-52-20C-070	HAP 031-043, 054, 101-103
		29-11-61-10-270	HAP 001-013, 015-026, 028-043, 054, 101-103
9	O-ring	29-11-52-20A-125	HAP 001-013, 015-026, 028-030

D. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

E. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

F. Secondary Check Valve Installation

SUBTASK 29-09-01-020-010

(1) Remove any plugs/caps from the tube ends, filter assembly, and check valve.

SUBTASK 29-09-01-420-009

(2) Do these steps to install the secondary check valve in the air pressure filter assembly:

- (a) Put a thin coating of primer, BMS 10-11 Type 1 Class A, on the face of the check valve hex that will contact the filter head.
- (b) Put a thin coating of grease, MIL-PRF-27617 Type III, on the threads of the check valve.
- (c) Put the check valve in the outlet port of the filter assembly.
- (d) Tighten the check valve to 162-178 pound-inches (18.3-20.1 Newton-meters).

SUBTASK 29-09-01-420-016

(3) Do these steps to install the secondary check valve in the air pressure filter assembly:

- (a) Install a new new o-ring [9] on to the check valve [8].
- (b) Put a thin coating of primer, C50122 on the threads of the check valve [8].

NOTE: Keep primer off of o-ring and o-ring sealing surface.

- (c) Put the check valve in the outlet port of the filter assembly.
- (d) Tighten the check valve to 162-178 pound-inches (18.3-20.1 Newton-meters).

SUBTASK 29-09-01-420-010

(4) Tighten the swivel nut to connect the pneumatic tube end to the secondary check valve.

G. Post-Installation Leakage Check

SUBTASK 29-09-01-860-010

(1) Pressurize the hydraulic reservoir using method 1 (pneumatic system pressurized): Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801

<p>EFFECTIVITY</p> <p>HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST</p> <p>SB 737-29-1106</p>
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SUBTASK 29-09-01-790-002

- (2) Use a solution of soap and water to check for air leakage at the swivel nut connection on the check valve and at the check valve connection on the filter assembly.
- (3) If air leakage is found, then clean and retighten the check valve connections.

SUBTASK 29-09-01-860-011

- (4) Depressurize the pneumatic system: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806

SUBTASK 29-09-01-860-012

- (5) If necessary, depressurize the hydraulic reservoir: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-09-01-410-002

- (1) Close the access to the air pressure filter assembly in the left/right ECS bay:

For the left air pressure filter assembly, close this access panel:

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door

For the right air pressure filter assembly, close this access panel:

<u>Number</u>	<u>Name/Location</u>
192CR	Air Conditioning Access Door

————— END OF TASK —————

TASK 29-09-01-000-803

6. Air Pressure Filter Element Removal

(Figure 201 or Figure 202)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) This task has instructions for removal/cleaning of the filter element. To remove/clean the filter element, it is not necessary to remove the air pressure filter assembly.

B. References

Reference	Title
20-30-80-910-801	General Cleaning of Metal (Series 80) (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Consumable Materials

Reference	Description	Specification
B01000	Solvent - General Cleaning Of Metal (AMM 20-30-801/201) - Series 80	

EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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D. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

E. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

F. Prepare for Removal

SUBTASK 29-09-01-840-001

- (1) Do these tasks to remove hydraulic power if supplied to the airplane:
 - (a) For the main hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
 - (b) For the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

SUBTASK 29-09-01-864-001

WARNING: REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-09-01-864-002

- (3) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-09-01-010-003

- (4) Get access to the air pressure filter assembly [1] in the left/right ECS bay:

NOTE: The air pressure filter assembly is adjacent to the pneumatic system's crossover manifold duct.

For the left air pressure filter assembly, open the

Number	Name/Location
192CL	Air Conditioning Access Door

For the right air pressure filter assembly, open the

Number	Name/Location
192CR	Air Conditioning Access Door

SUBTASK 29-09-01-010-004

- (5) Do not touch the air pressure filter assembly [1] until it has cooled.

NOTE: If the pneumatic system was in operation previously, allow time for the crossover manifold duct and air pressure filter assembly to become cool before you touch it.

G. Filter Element Removal (for cleaning)

SUBTASK 29-09-01-030-001

- (1) Cut and remove the lockwire from the filter case [2].

SUBTASK 29-09-01-020-012

- (2) Unscrew the filter case [2].

EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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SUBTASK 29-09-01-020-013

(3) Remove the metal element [3].

SUBTASK 29-09-01-020-014

(4) Remove and discard o-ring [4] and o-ring [5].

SUBTASK 29-09-01-130-002

(5) Clean the metal element [3] with Series 80 solvent, B01000 (General Cleaning of Metal (Series 80), TASK 20-30-80-910-801) and fully dry it.

END OF TASK

TASK 29-09-01-400-803

7. Air Pressure Filter Element Installation

(Figure 201 or Figure 202)

A. General

(1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	O-ring	29-11-52-20A-081	HAP 001-013, 015-026, 028-030
		29-11-52-20A-135	HAP 001-013, 015-026, 028-030
		29-11-52-20C-050	HAP 031-043, 054, 101-103
		29-11-61-10-250	HAP 001-013, 015-026, 028-043, 054, 101-103
		29-11-61-10-255	HAP 001-013, 015-026, 028-043, 054, 101-103
5	O-ring	29-11-52-20A-082	HAP 001-013, 015-026, 028-030
		29-11-52-20A-130	HAP 001-013, 015-026, 028-030
		29-11-52-20C-055	HAP 031-043, 054, 101-103
		29-11-61-10-255	HAP 001-013, 015-026, 028-043, 054, 101-103

EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-29-1106

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E. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

F. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

G. Filter Element Installation (replacement)

SUBTASK 29-09-01-640-002

- (1) Lightly lubricate new o-ring [4], new o-ring [5], and the filter case [2] threads with MCS 352B fluid, D00054 or fluid, D00153.

SUBTASK 29-09-01-420-012

- (2) Install the new o-ring [4] and new o-ring [5] in the filter head [6] (housing).

SUBTASK 29-09-01-420-013

- (3) Install a serviceable metal element [3] into the filter head [6] (housing) and the filter case [2].

SUBTASK 29-09-01-420-014

- (4) Install the filter case [2] to the filter head [6] (housing) and tighten the filter case [2] 100-150 pound-inches (11.3-17.0 Newton-meters).

SUBTASK 29-09-01-420-017

- (5) Install the filter case [2] to the filter head [6] (housing) and tighten the filter case [2] to 75 pound-inches (8.4 Newton-meters).

SUBTASK 29-09-01-420-015

- (6) Install a new lockwire to the filter case [2] and filter head [6] (housing).

H. Post-Installation Leakage Check

SUBTASK 29-09-01-863-001

- (1) Pressurize the pneumatic crossover manifold duct.

SUBTASK 29-09-01-790-003

- (2) Use a solution of soap and water to check that no air leaks at the filter case or swivel nut connections on the air pressure filter assembly [1].

SUBTASK 29-09-01-863-002

- (3) Depressurize the pneumatic cross manifold duct.

SUBTASK 29-09-01-864-003

- (4) If necessary, do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

I. Put the Airplane Back to Its Usual Condition

SUBTASK 29-09-01-410-003

- (1) Close the access to the air pressure filter assembly [1] in the left/right ECS bay:

For the left air pressure filter assembly, close this access panel:

Number	Name/Location
192CL	Air Conditioning Access Door

EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-29-1106

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For the right air pressure filter assembly, close this access panel:

<u>Number</u>	<u>Name/Location</u>
192CR	Air Conditioning Access Door

————— **END OF TASK** —————

EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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AIR CHARGING VALVE MANIFOLD ASSEMBLY - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Air Charging Valve Manifold Assembly Removal
- (2) Air Charging Valve Manifold Assembly Installation

B. The air charging valve manifold assembly is located in the right main landing gear wheel well. The air charging valve permits manual depressurization and pressurization of the system 'A' and 'B' hydraulic reservoirs for ground maintenance via connection of an external air source.

TASK 29-09-02-000-801

2. Air Charging Valve Manifold Assembly - Removal

(Figure 201)

A. General

- (1) This task has instructions for the removal of the air charging valve and it's manifold assembly. It is not necessary to remove the manifold assembly to remove the air charging valve.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Removal

SUBTASK 29-09-02-480-001

WARNING: MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: (Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801).

SUBTASK 29-09-02-860-001

- (2) Do these tasks to remove hydraulic power if supplied to the airplane:
 - (a) For the main hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
 - (b) For the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

EFFECTIVITY

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SUBTASK 29-09-02-860-002

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-09-02-860-003

(4) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-09-02-010-001

(5) Get access to the air charging valve manifold assembly in the right main landing gear wheel well.

SUBTASK 29-09-02-210-001

(6) Do not touch the air charging valve manifold assembly until it has cooled.

NOTE: If the pneumatic system was in operation previously, allow time for the manifold assembly to become cool before you touch it.

E. Manifold Assembly Removal

SUBTASK 29-09-02-860-004

(1) Make sure the hydraulic reservoirs have been depressurized before you remove the manifold assembly (TASK 29-09-00-860-802).

(a) Remove the dust cap on the air charging valve then slowly unscrew the swivel nut to release any residual air pressure.

(b) Reinstall dust cap and tighten swivel nut.

(c) Make sure the air pressure gauge reads 0 psi.

SUBTASK 29-09-02-020-001

(2) Loosen the swivel nuts to disconnect the tubes from the unions on the manifold assembly.

SUBTASK 29-09-02-020-002

(3) Remove the three bolts and washers to remove the manifold assembly from the bracket.

SUBTASK 29-09-02-020-003

(4) Remove the two unions from the manifold assembly and keep them for later installation.

(a) Remove and discard the packings (o-rings) from the unions.

SUBTASK 29-09-02-420-001

(5) Install plugs/caps to the tube ends and manifold assembly ports.

F. Air Charging Valve Removal

SUBTASK 29-09-02-860-005

(1) Make sure the hydraulic reservoirs have been depressurized before you remove the air charging valve (TASK 29-09-00-860-802).

(a) Remove the dust cap on the air charging valve then slowly unscrew the swivel nut to release any residual air pressure.

(b) Reinstall dust cap and tighten swivel nut.

SUBTASK 29-09-02-020-004

(2) Remove the lockwire from the air charging valve and manifold assembly.

EFFECTIVITY

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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SUBTASK 29-09-02-020-005

- (3) Remove the air charging valve from the manifold assembly.
 - (a) Remove and discard the packing (o-ring) from the air charging valve.

————— **END OF TASK** —————

EFFECTIVITY

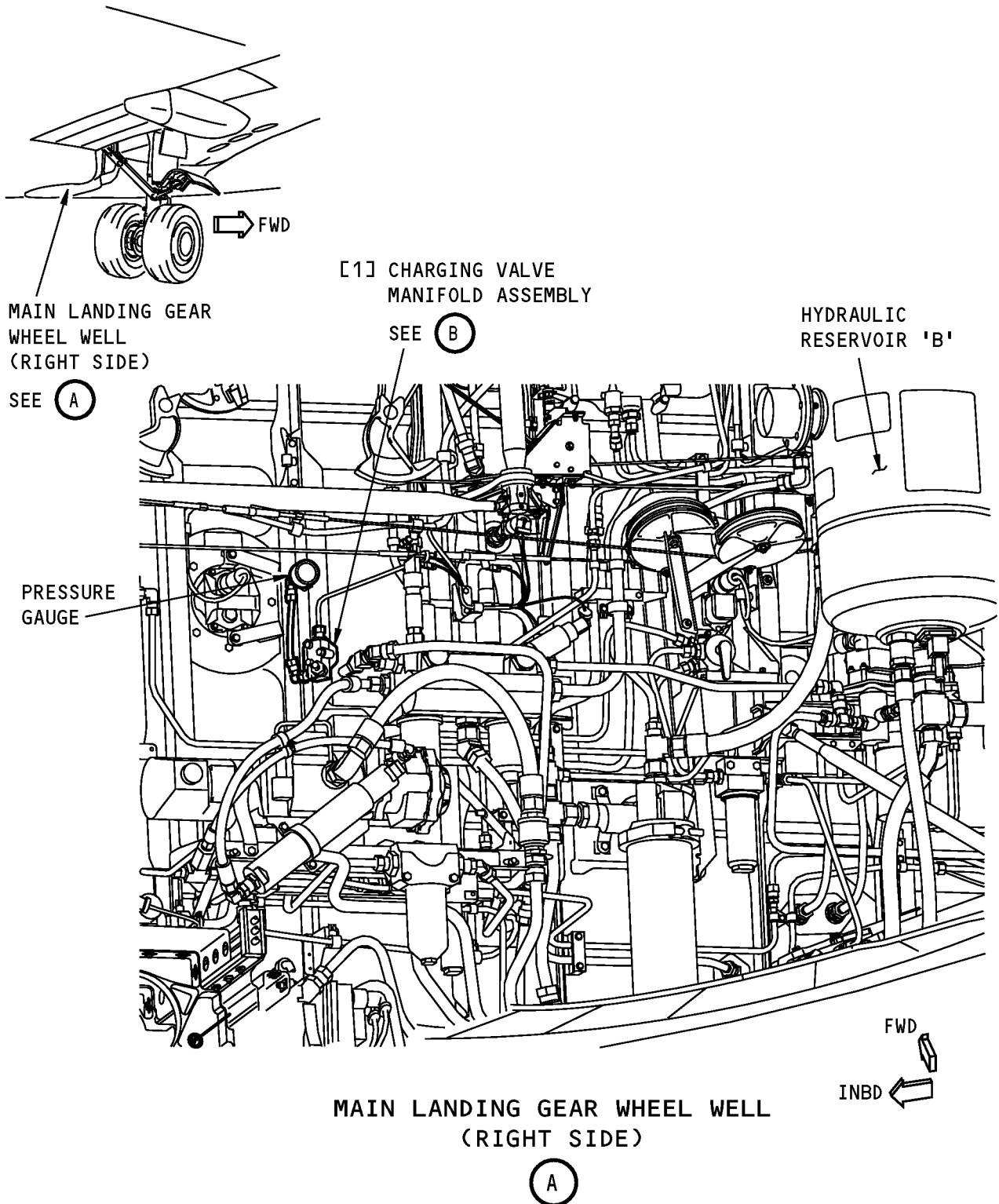
**HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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**Charging Valve Manifold Assembly - Maintenance Practices
Figure 201 (Sheet 1 of 2)/29-09-02-990-802**

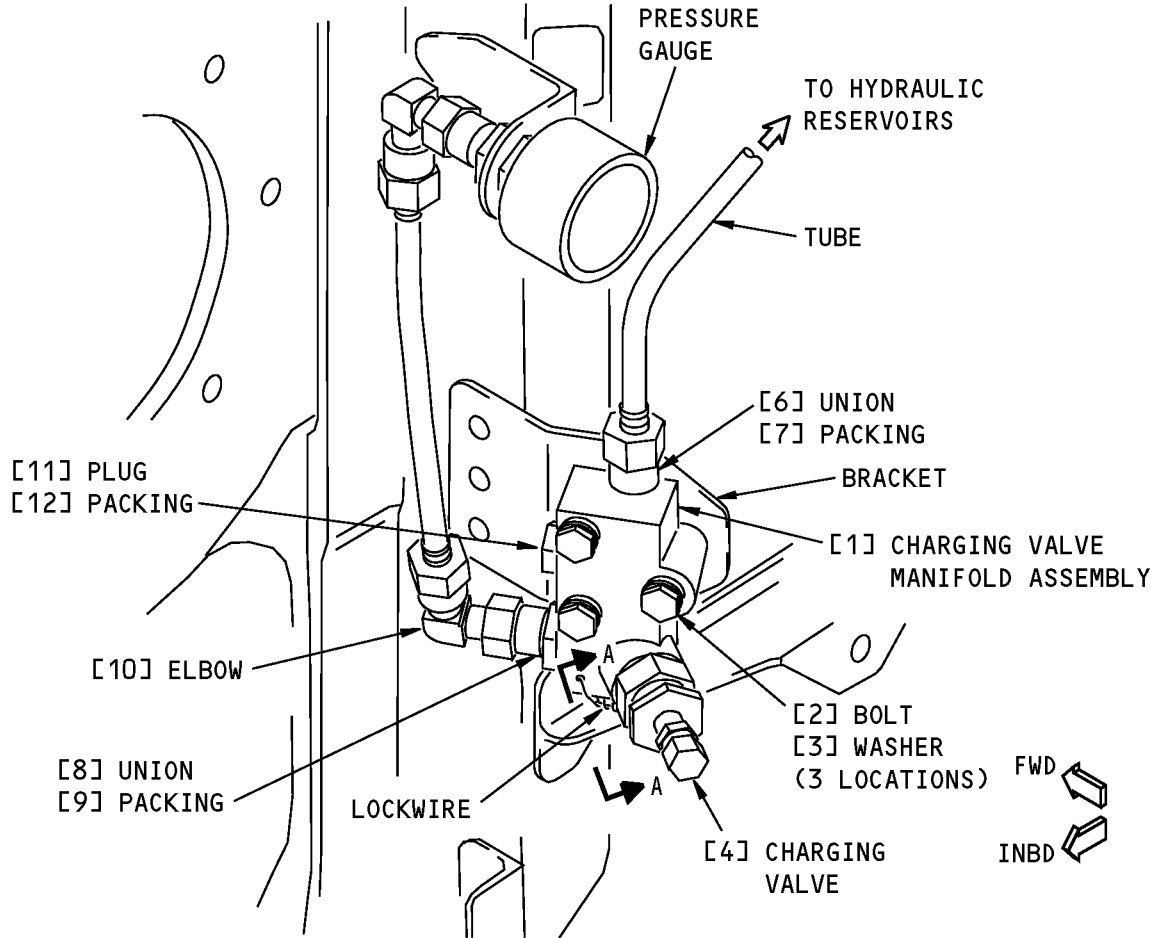
EFFECTIVITY
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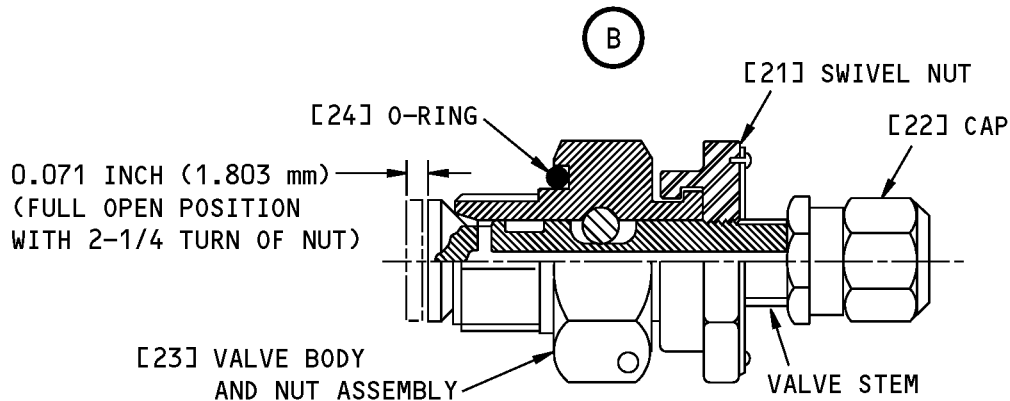
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CHARGING VALVE MANIFOLD ASSEMBLY



CHARGING VALVE
A-A

Charging Valve Manifold Assembly - Maintenance Practices
Figure 201 (Sheet 2 of 2)/29-09-02-990-802

EFFECTIVITY
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TASK 29-09-02-400-801

3. Air Charging Valve Manifold Assembly - Installation

(Figure 201)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Manifold Assembly Installation

SUBTASK 29-09-02-020-006

(1) Remove the plugs/caps from the tube ends and manifold assembly ports.

SUBTASK 29-09-02-640-001

(2) Lightly lubricate the new packings (o-rings) with MCS 352B fluid, D00054 or fluid, D00153.

SUBTASK 29-09-02-420-002

(3) Install the unions and packings (o-rings) to the manifold assembly ports, and tighten.

SUBTASK 29-09-02-420-003

(4) Install the manifold assembly to the bracket with the three bolts and washers, and tighten.

SUBTASK 29-09-02-420-004

(5) Connect the tube ends to the unions and tighten the swivel nuts.

E. Air Charging Valve Installation

SUBTASK 29-09-02-640-002

(1) Lightly lubricate the new packing (o-ring) with MCS 352B fluid, D00054 or fluid, D00153.

SUBTASK 29-09-02-420-005

(2) Install the packing (o-ring) and the air charging valve into the manifold assembly port, and tighten.

SUBTASK 29-09-02-420-006

(3) Install a new lockwire to the air charging valve and manifold assembly.

SUBTASK 29-09-02-420-007

(4) Make sure the dust cap is installed and the swivel nut is turned to the fully closed position on the air charging valve.

EFFECTIVITY

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F. Post-Installation Leakage Check

SUBTASK 29-09-02-860-006

(1) Pressurize the pneumatic crossover manifold duct.

SUBTASK 29-09-02-790-001

(2) Use a solution of soap and water to check that no air leaks at the swivel nut connections on the manifold assembly and at the air charging valve.

SUBTASK 29-09-02-860-007

(3) Depressurize the pneumatic cross manifold duct.

SUBTASK 29-09-02-860-008

(4) If necessary, do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

————— **END OF TASK** —————

EFFECTIVITY

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AIRCRAFT MAINTENANCE MANUAL

AIR PRESSURE GAUGE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) Air Pressure Gauge Removal
- (2) Air Pressure Gauge Installation

B. An air pressure gauge for the system 'A' and system 'B' hydraulic reservoirs is located in the right main landing gear wheel well against the forward bulkhead (rear spar). The air pressure gauge is connected to the air charging valve manifold assembly.

TASK 29-09-03-000-801

2. Air Pressure Gauge - Removal

(Figure 401)

A. General

- (1) This task has instructions for the removal of the air pressure gauge.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Removal

SUBTASK 29-09-03-480-001

WARNING: MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-09-03-860-001

- (2) Do these tasks to remove hydraulic power if supplied to the airplane:
 - (a) For the main hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
 - (b) For the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

EFFECTIVITY

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AIRCRAFT MAINTENANCE MANUAL

SUBTASK 29-09-03-860-002

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-09-03-860-003

(4) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-09-03-010-001

(5) Get access to the air pressure gauge in the right main landing gear wheel well.

E. Air Pressure Gauge Removal

SUBTASK 29-09-03-860-004

(1) Make sure the hydraulic reservoirs have been depressurized before you remove the air pressure gauge (TASK 29-09-00-860-802).

(a) Remove the dust cap on the air charging valve then slowly unscrew the swivel nut to release any residual air pressure.

(b) Reinstall dust cap and tighten swivel nut.

(c) Make sure the air pressure gauge reads 0 psi.

SUBTASK 29-09-03-020-001

(2) Loosen the swivel nut to disconnect the elbow from the air pressure gauge.

SUBTASK 29-09-03-020-002

(3) Remove the nut and washer to remove the air pressure gauge from the bracket.

SUBTASK 29-09-03-420-001

(4) Install plug/cap to the tube end and air pressure gauge port.

————— **END OF TASK** —————

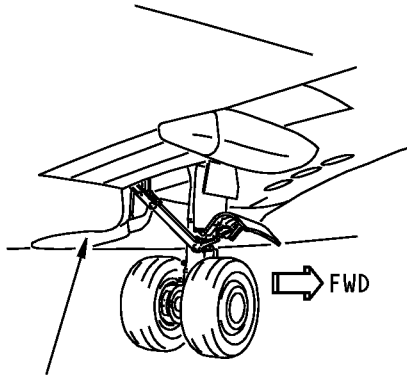
EFFECTIVITY

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MAIN LANDING GEAR
WHEEL WELL
(RIGHT SIDE)

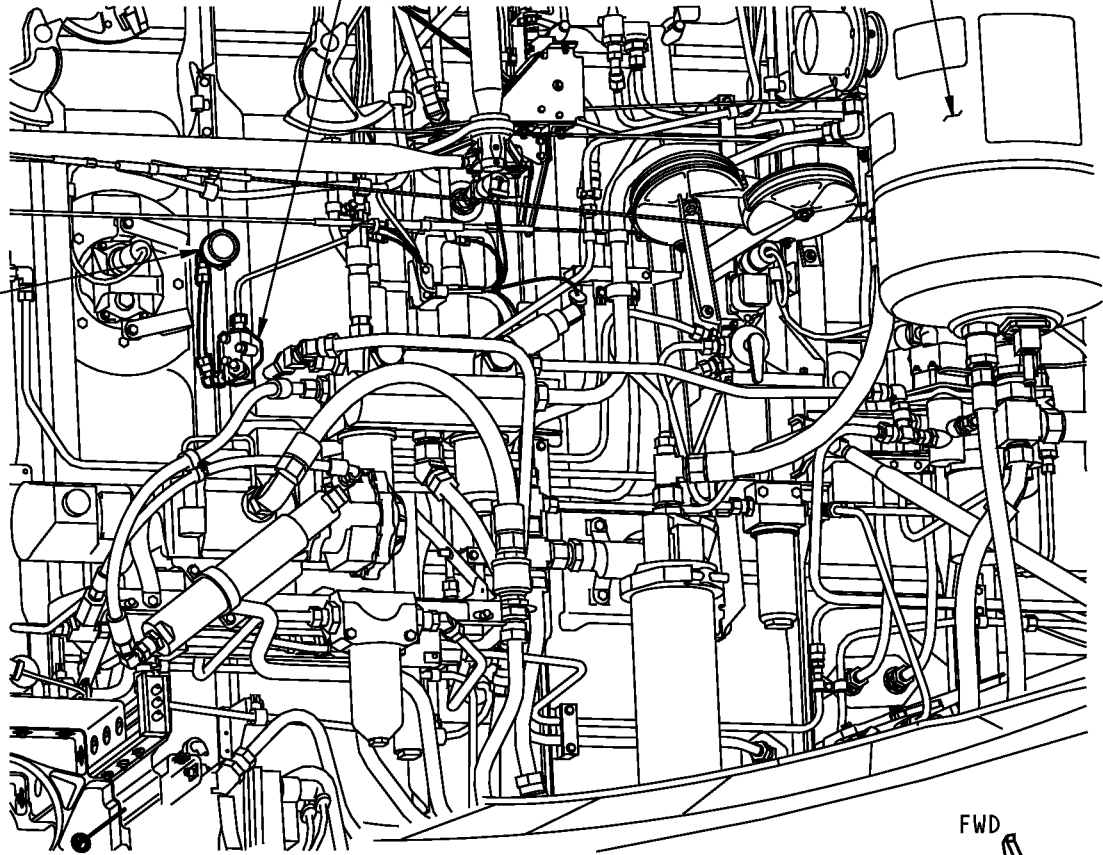
CHARGING VALVE
MANIFOLD ASSEMBLY

HYDRAULIC
RESERVOIR 'B'

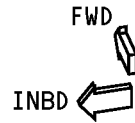
SEE (A)

[1] PRESSURE
GAUGE

SEE (B)



MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)



(A)

**Hydraulic Reservoir Pressure Gauge Installation
Figure 401 (Sheet 1 of 2)/29-09-03-990-802**

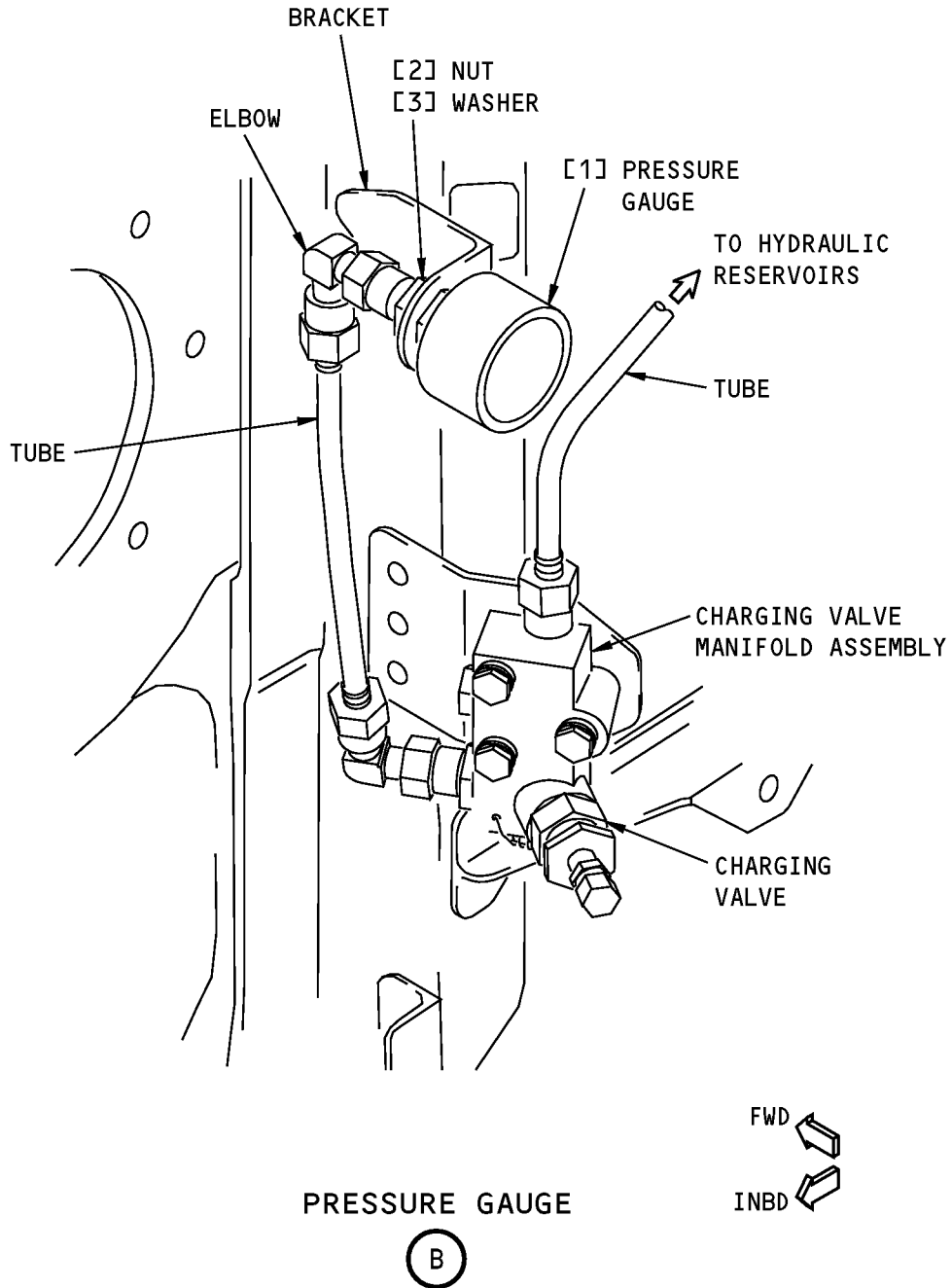
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**Hydraulic Reservoir Pressure Gauge Installation
Figure 401 (Sheet 2 of 2)/29-09-03-990-802**

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TASK 29-09-03-400-801

3. Air Pressure Gauge - Installation

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Air Pressure Gauge Installation

SUBTASK 29-09-03-020-003

(1) Remove the plug/cap from the tube end and air pressure gauge port.

SUBTASK 29-09-03-420-002

(2) Install the air pressure gauge to the bracket with the nut and washer, and tighten.

NOTE: The 'green' band on the gauge scale should point to the 12 o'clock position (vertical) for ease of readout.

SUBTASK 29-09-03-420-003

(3) Connect the elbow to the air pressure gauge and tighten the swivel nut.

D. Post-Installation Leakage Check

SUBTASK 29-09-03-860-005

(1) Pressurize the pneumatic crossover manifold duct.

SUBTASK 29-09-03-790-001

(2) Use a solution of soap and water to check that no air leaks at the swivel nut connection.

SUBTASK 29-09-03-210-001

(3) Make sure the air pressure gauge reads 45-50 psi.

SUBTASK 29-09-03-860-006

(4) Depressurize the pneumatic cross manifold duct.

SUBTASK 29-09-03-860-007

(5) If necessary, do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

END OF TASK

EFFECTIVITY

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CROSS FITTING ASSEMBLY - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Cross Fitting Assembly Removal
- (2) Cross Fitting Assembly Installation

B. There are two cross fitting assemblies installed between the system 'A' and the system 'B' hydraulic reservoirs in the right main landing gear wheel well. Each cross fitting assembly consists of a check valve assembly, a restrictor (orifice), and a manifold (cross) with a swivel nut.

TASK 29-09-04-000-801

2. Cross Fitting Assembly - Removal

(Figure 201)

A. General

- (1) This task has instructions for the removal of the cross fitting assembly.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Removal

SUBTASK 29-09-04-480-001

WARNING: MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-09-04-860-001

(2) Do these tasks to remove hydraulic power if supplied to the airplane:

- (a) For the main hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
- (b) For the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

<p>EFFECTIVITY</p> <p>HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST</p> <p>SB 737-29-1106</p>
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SUBTASK 29-09-04-860-002

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-09-04-860-003

(4) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-09-04-010-001

(5) Get access to the cross fitting assembly in the right main landing gear wheel well.

SUBTASK 29-09-04-210-001

(6) Do not touch the cross fitting assembly until it has cooled.

NOTE: If the pneumatic system was in operation previously, allow time for the cross fitting assembly to become cool before you touch it.

E. Cross Fitting Assembly Removal

SUBTASK 29-09-04-860-004

(1) Make sure the hydraulic reservoirs have been depressurized before you remove the cross fitting assembly (TASK 29-09-00-860-802).

(a) Remove the dust cap on the air charging valve then slowly unscrew the swivel nut to release any residual air pressure.

(b) Reinstall dust cap and tighten swivel nut.

(c) Make sure the air pressure gauge reads 0 psi.

SUBTASK 29-09-04-020-001

(2) Loosen the swivel nuts to disconnect the elbows from the check valve and the restrictor (orifice) on the cross fitting assembly.

SUBTASK 29-09-04-020-002

(3) Loosen the swivel nuts to disconnect the pressure relief valve and adjacent hydraulic reservoir tubing from the cross fitting assembly.

SUBTASK 29-09-04-020-003

(4) Remove the cross fitting assembly.

SUBTASK 29-09-04-420-001

(5) Install plugs/caps to the tube ends and cross fitting assembly ports.

————— **END OF TASK** —————

EFFECTIVITY

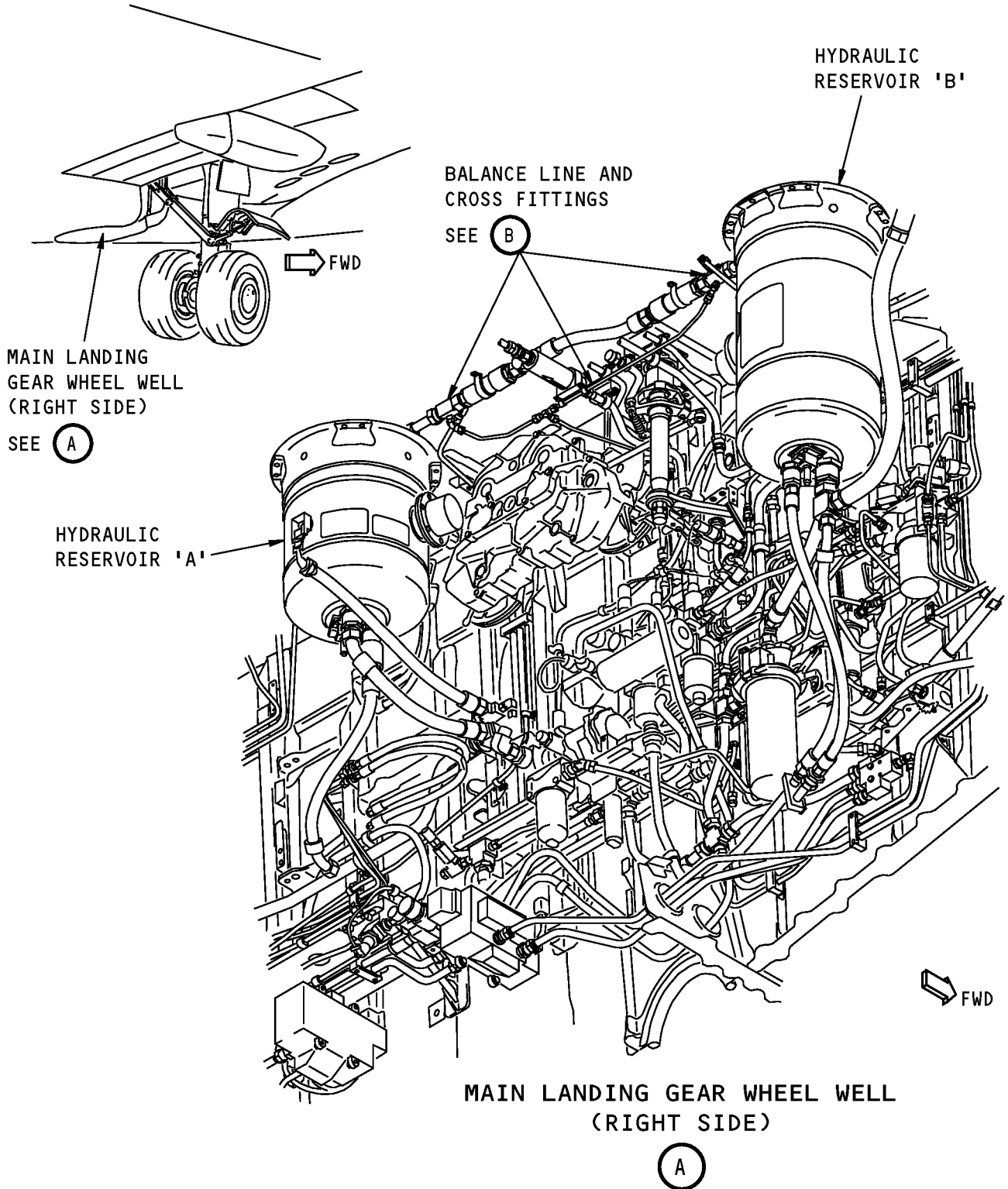
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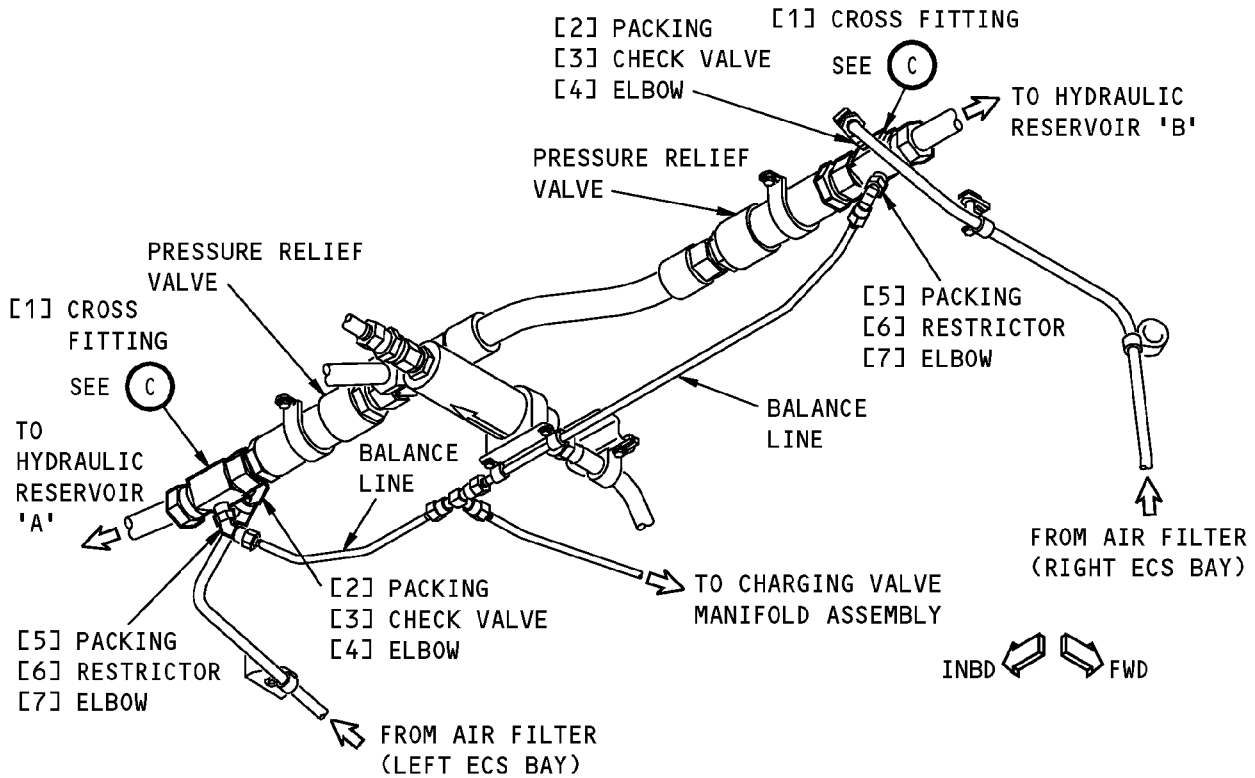
**Cross Fitting, Restrictor and Check Valve - Maintenance Practices
Figure 201 (Sheet 1 of 2)/29-09-04-990-802**

EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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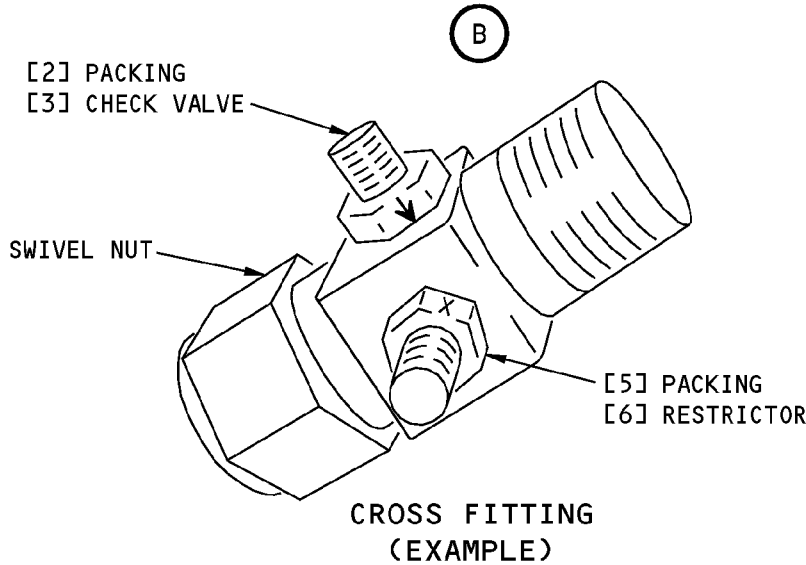
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BALANCE LINE AND CROSS FITTINGS



Cross Fitting, Restrictor and Check Valve - Maintenance Practices
Figure 201 (Sheet 2 of 2)/29-09-04-990-802

EFFECTIVITY
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TASK 29-09-04-400-801

3. Cross Fitting Assembly - Installation

(Figure 201)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Cross Fitting Assembly Installation

SUBTASK 29-09-04-020-004

- (1) Remove the plugs/caps from the tube ends and cross fitting assembly ports.

SUBTASK 29-09-04-420-002

- (2) Put the cross fitting assembly between the pressure relief valve and adjacent hydraulic reservoir tubing and loosely connect the swivel nuts.

SUBTASK 29-09-04-420-003

- (3) Adjust the cross fitting assembly to align the check valve and restrictor (orifice) with the elbows.

NOTE: The 'green' colored tube (bleed air line) connects to the check valve, while the 'silver' colored tube (balance line) connects to the restrictor (orifice).

- (a) Tighten the swivel nut at each elbow.

SUBTASK 29-09-04-420-004

- (4) Tighten the swivel nuts at the pressure relief valve and adjacent hydraulic reservoir tubing.

D. Post-Installation Leakage Check

SUBTASK 29-09-04-860-005

- (1) Pressurize the pneumatic crossover manifold duct.

SUBTASK 29-09-04-790-001

- (2) Use a solution of soap and water to check that no air leaks at the swivel nut connections on the cross fitting assembly.

SUBTASK 29-09-04-860-006

- (3) Depressurize the pneumatic cross manifold duct.

SUBTASK 29-09-04-860-007

- (4) If necessary, do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

END OF TASK

EFFECTIVITY

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AIRCRAFT MAINTENANCE MANUAL

PRESSURE RELIEF VALVE - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Pressure Relief Valve Removal
- (2) Pressure Relief Valve Installation
- (3) Pressure Relief Valve Operational Test

B. There are two pressure relief valves installed between the system 'A' and the system 'B' hydraulic reservoirs in the right main landing gear wheel well. The pressure relief valves protect the hydraulic reservoirs from overpressurization. The pressure relief valves open when the reservoir air pressure increases to 60-65 psi. Excess air pressure from the reservoir is vented thru the pressure relief valve to the APU fuel line shroud drain mast and overboard. The pressure relief valve closes once the reservoir overpressurization condition has been relieved.

TASK 29-09-05-000-801

2. Pressure Relief Valve - Removal

(Figure 201)

A. General

- (1) This task has instructions for the removal of the pressure relief valve.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Removal

SUBTASK 29-09-05-480-001

WARNING: MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-09-05-860-001

- (2) Do these tasks to remove hydraulic power if supplied to the airplane:
 - (a) For the main hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
 - (b) For the standby hydraulic system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

EFFECTIVITY

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SUBTASK 29-09-05-860-002

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-09-05-860-003

(4) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-09-05-010-001

(5) Get access to the pressure relief valves in the right main landing gear wheel well.

SUBTASK 29-09-05-210-001

(6) Do not touch the pressure relief valve until it has cooled.

NOTE: If the pneumatic system was in operation previously, allow time for the pressure relief valve to become cool before you touch it.

E. Pressure Relief Valve Removal

SUBTASK 29-09-05-860-004

(1) Make sure the hydraulic reservoirs have been depressurized before you remove the pressure relief valve (TASK 29-09-00-860-802).

(a) Remove the dust cap on the air charging valve then slowly unscrew the swivel nut to release any residual air pressure.

(b) Reinstall dust cap and tighten swivel nut.

(c) Make sure the air pressure gauge reads 0 psi.

SUBTASK 29-09-05-020-001

(2) Remove the screws, washers, and clamp from the pressure relief valve.

SUBTASK 29-09-05-020-002

(3) Loosen the swivel nuts on each end of the pressure relief valve.

SUBTASK 29-09-05-020-003

(4) Remove the pressure relief valve.

SUBTASK 29-09-05-020-004

(5) Remove the unions and packings (o-rings) from the pressure relief valve.

(a) Discard the packings but keep the unions for re-installation.

SUBTASK 29-09-05-420-001

(6) Install plugs/caps to the tube ends and pressure relief valve ports.

————— **END OF TASK** —————

EFFECTIVITY

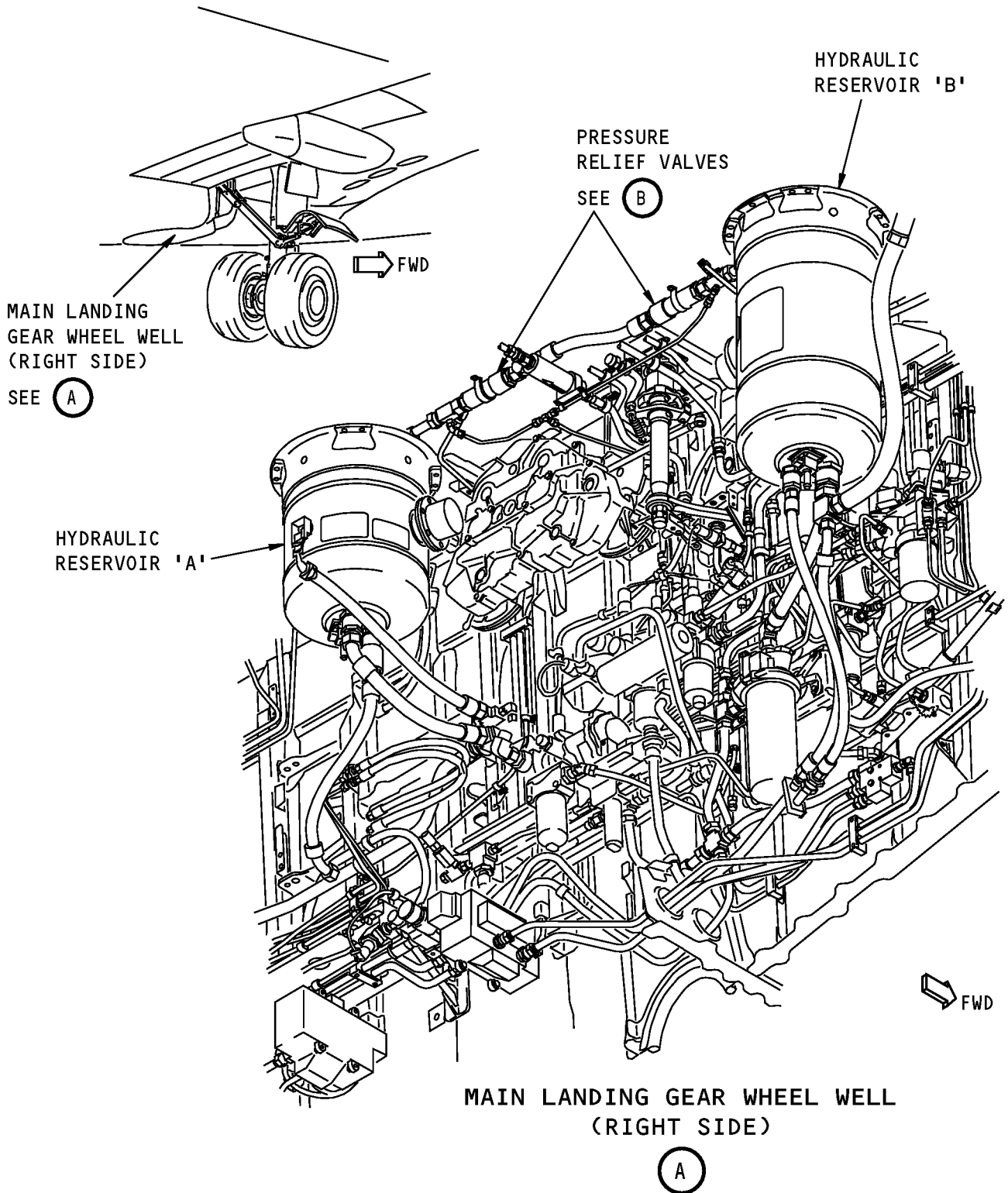
**HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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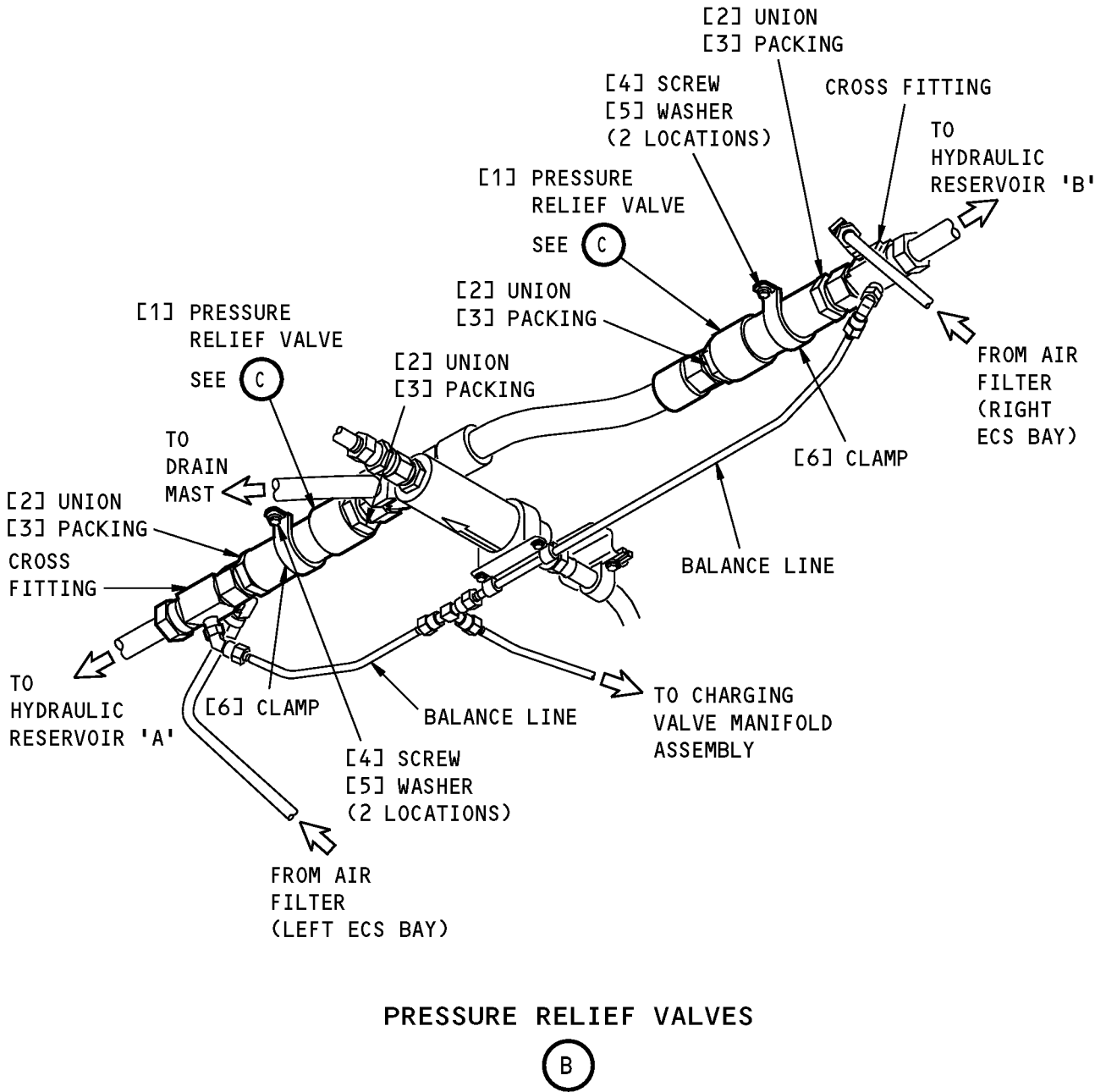
**Pressure Relief Valve - Maintenance Practices
Figure 201 (Sheet 1 of 3)/29-09-05-990-802**

EFFECTIVITY
HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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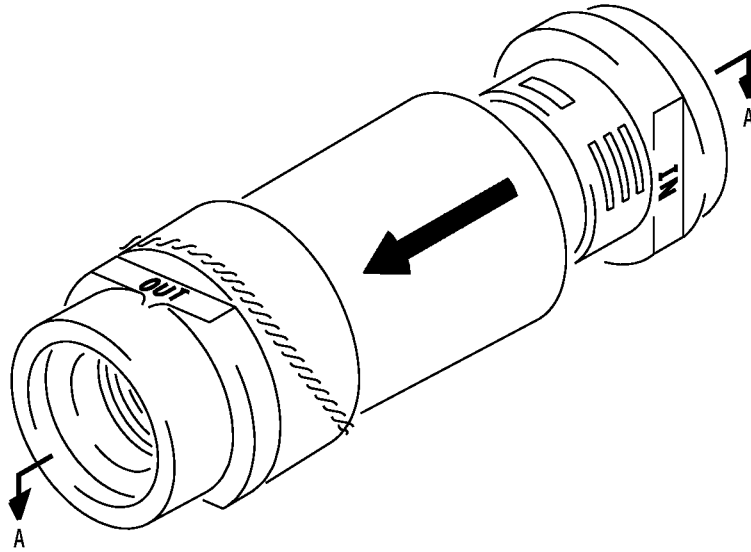
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**Pressure Relief Valve - Maintenance Practices
Figure 201 (Sheet 2 of 3)/29-09-05-990-802**

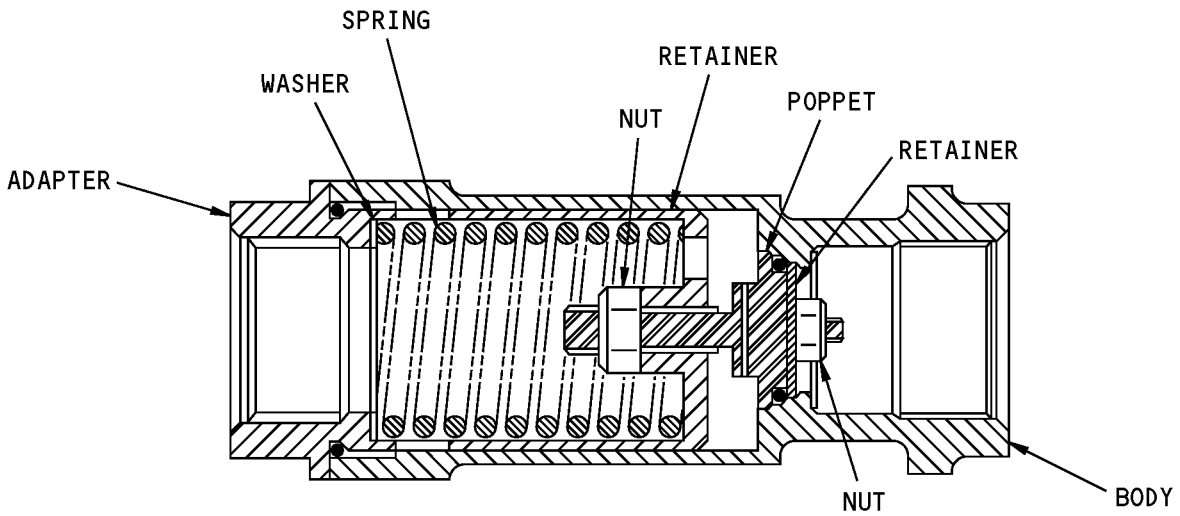
EFFECTIVITY
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**PRESSURE RELIEF VALVE
(EXAMPLE)**

(C)



A-A

**Pressure Relief Valve - Maintenance Practices
Figure 201 (Sheet 3 of 3)/29-09-05-990-802**

EFFECTIVITY
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TASK 29-09-05-400-801

3. Pressure Relief Valve - Installation

(Figure 201)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Pressure Relief Valve Installation

SUBTASK 29-09-05-020-005

- (1) Remove the plugs/caps from the tube ends and pressure relief valve ports.

SUBTASK 29-09-05-640-001

- (2) Lightly lubricate the new packings (o-rings) with MCS 352B fluid, D00054 or fluid, D00153.

SUBTASK 29-09-05-420-002

- (3) Install the packings (o-rings) and the unions to the pressure relief valve ports, and tighten.

SUBTASK 29-09-05-420-003

- (4) Install the pressure relief valve and tighten the swivel nuts.

NOTE: The 'IN-OUT' flow arrow on the pressure relief valve must point away from the adjacent cross fitting assembly. The inlet side of the pressure relief valve is adjacent to the cross fitting assembly. The outlet side of the pressure relief valve is adjacent to the APU fuel line shroud drain mast tubing.

SUBTASK 29-09-05-420-004

- (5) Install the clamp, washers, and screws to the pressure relief valve.

E. Post-Installation Leakage Check

SUBTASK 29-09-05-860-005

- (1) Pressurize the pneumatic crossover manifold duct.

SUBTASK 29-09-05-790-001

- (2) Use a solution of soap and water to check that no air leaks at the swivel nut connection on the inlet side of the pressure relief valve.

SUBTASK 29-09-05-860-006

- (3) Depressurize the pneumatic cross manifold duct.

EFFECTIVITY

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SUBTASK 29-09-05-860-007

(4) If necessary, do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

————— **END OF TASK** —————

TASK 29-09-05-700-801

4. Pressure Relief Valve - Operational Test

(Figure 201)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Tools/Equipment

Reference	Description
STD-77	Air Source - Regulated, Dry Filtered, 0-50 psig

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Test

SUBTASK 29-09-05-860-008

(1) Make sure the pneumatic system is depressurized (engines, APU, and external air sources are off).

SUBTASK 29-09-05-010-002

(2) Get access to the pressure relief valves in the right main landing gear wheel well.

SUBTASK 29-09-05-860-009

(3) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

(a) Make sure the reservoir air pressure gauge shows 0 psi.

SUBTASK 29-09-05-020-006

(4) Loosen the swivel nuts at the 'tee' fitting in the balance line, and remove the 'tee' fitting.

SUBTASK 29-09-05-420-005

(5) Install a cap (p/n BACC14AD04JL) to 'port 1' on the 'tee' fitting.

E. Test the Left Pressure Relief Valve (Reservoir 'A')

SUBTASK 29-09-05-420-006

(1) Re-install the 'tee' fitting so that 'port 3' connects to the 'left' branch of the balance line and the uncapped 'port 2' connects to the tubing going to the air charging valve manifold assembly.

NOTE: This will permit testing of the left pressure relief valve (reservoir 'A'), while isolating the right pressure relief valve (reservoir 'B').

SUBTASK 29-09-05-010-003

(2) Get access to the air charging valve manifold assembly in the right main landing gear wheel well.

(a) Remove the dust cap from the valve stem on the air charging valve.

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SUBTASK 29-09-05-480-002

- (3) Connect the external ground 0-50 psig dry filtered regulated air source, STD-77 to the valve stem on the air charging valve.

SUBTASK 29-09-05-980-001

- (4) Turn the swivel nut on the air charging valve to the fully open position (1 to 2-1/4 turns).

SUBTASK 29-09-05-780-001

CAUTION: DO NOT USE MORE THAN 70 PSIG PRESSURE. IF YOU USE TOO MUCH PRESSURE, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (5) Slowly supply and adjust the pressure of the external ground 0-50 psig dry filtered regulated air source, STD-77 to pressurize the reservoir 'A' to 45-50 psi.
 - (a) Make sure the reservoir air pressure gauge in the right main landing gear wheel well shows approximately 45-50 psi.
 - (b) Make sure the left pressure relief valve is still closed.

SUBTASK 29-09-05-780-002

CAUTION: DO NOT USE MORE THAN 70 PSIG PRESSURE. IF YOU USE TOO MUCH PRESSURE, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (6) Slowly increase the pressure but do not exceed 70 psi.
 - (a) Make sure the left pressure relief valve opened at 60-65 psi (crack pressure).

SUBTASK 29-09-05-780-003

- (7) Slowly decrease the pressure until the left pressure relief valve closes.
 - (a) Make sure the left pressure relief valve closed at minimum 55 psi (reseat pressure).

SUBTASK 29-09-05-780-004

- (8) Decrease the pressure to 0 psi as indicated by the reservoir air pressure gauge.

SUBTASK 29-09-05-020-007

- (9) Remove the 'tee' fitting from the 'left' branch of the balance line.

F. Test the Right Pressure Relief Valve (Reservoir 'B')

SUBTASK 29-09-05-420-007

- (1) Re-install the 'tee' fitting so that 'port 3' connects to the 'right' branch of the balance line and the uncapped 'port 2' connects to the tubing going to the air charging valve manifold assembly.

NOTE: This will permit testing of the right pressure relief valve (reservoir 'B'), while isolating the left pressure relief valve (reservoir 'A').

SUBTASK 29-09-05-010-004

- (2) Get access to the air charging valve manifold assembly in the right main landing gear wheel well.
 - (a) Remove the dust cap from the valve stem on the air charging valve.

SUBTASK 29-09-05-480-003

- (3) Connect the external ground 0-50 psig dry filtered regulated air source, STD-77 to the valve stem on the air charging valve.

SUBTASK 29-09-05-980-002

- (4) Turn the swivel nut on the air charging valve to the fully open position (1 to 2-1/4 turns).

EFFECTIVITY

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SUBTASK 29-09-05-780-005

CAUTION: DO NOT USE MORE THAN 70 PSIG PRESSURE. IF YOU USE TOO MUCH PRESSURE, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (5) Slowly supply and adjust the pressure of the external ground 0-50 psig dry filtered regulated air source, STD-77 to pressurize the reservoir 'B' to 45-50 psi.
 - (a) Make sure the reservoir air pressure gauge in the right main landing gear wheel well shows approximately 45-50 psi.
 - (b) Make sure the right pressure relief valve is still closed.

SUBTASK 29-09-05-780-006

CAUTION: DO NOT USE MORE THAN 70 PSIG PRESSURE. IF YOU USE TOO MUCH PRESSURE, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (6) Slowly increase the pressure but do not exceed 70 psi.
 - (a) Make sure the right pressure relief valve opened at 60-65 psi (crack pressure).

SUBTASK 29-09-05-780-007

- (7) Slowly decrease the pressure until the right pressure relief valve closes.
 - (a) Make sure the right pressure relief valve closed at minimum 55 psi (reseal pressure).

SUBTASK 29-09-05-780-008

- (8) Decrease the pressure to 0 psi as indicated by the reservoir air pressure gauge.

SUBTASK 29-09-05-020-008

- (9) Remove the 'tee' fitting from the 'right' branch of the balance line.

G. Put Airplane Back to Its Usual Condition

SUBTASK 29-09-05-020-009

- (1) Remove the 'tee' fitting from tubing connected to air charging valve manifold.

SUBTASK 29-09-05-020-010

- (2) Remove the cap (p/n BACC16AD04JL) from the 'port 3' on the 'tee' fitting.

SUBTASK 29-09-05-420-008

- (3) Re-install the 'tee' fitting to the 'left' and 'right' branches of the balance line and tubing connected to the air charging valve manifold.

SUBTASK 29-09-05-080-001

- (4) Disconnect the external ground 0-50 psig dry filtered regulated air source, STD-77 from the valve stem on the air charging valve.

SUBTASK 29-09-05-980-003

- (5) Turn the swivel nut on the air charging valve to the fully closed position (1 to 2-1/4 turns).
 - (a) Re-install the dust cap to the valve stem on the air charging valve.

————— END OF TASK —————

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HYDRAULIC SYSTEMS A AND B - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Hydraulic System A or B Pressurization
 - (a) This task gives the alternative tasks you can use to pressurize the hydraulic system A or B.
- (2) Hydraulic System A or B Pressurization with a Portable Hydraulic Cart
- (3) Hydraulic System A or B Pressurization with an Electric Motor-Driven Pump (EMDP)
- (4) Hydraulic System A or B Pressurization with an Engine Driven Pump (EDP)
- (5) Hydraulic System A or B Power Removal
 - (a) This task stops the hydraulic pumps or the portable hydraulic cart when the hydraulic pressure is not necessary. This procedure does not remove the pressure which stays in the hydraulic system . If you loosen the hydraulic connections or open the hydraulic system, you must do this task: Hydraulic Reservoirs Depressurization (TASK 29-11-01-860-801 or TASK 29-09-00-860-801).
- (6) Hydraulic System A or B Flushing
 - (a) This task flushes the hydraulic system A or B after you replace a defective hydraulic pumps.

B. This procedure is applicable for hydraulic systems A and B.

TASK 29-11-00-860-801

2. Hydraulic System A or B Pressurization

A. Procedure

SUBTASK 29-11-00-860-001

- (1) Do one of these steps to pressurize the applicable hydraulic system:
 - Do this task: Hydraulic System A or B Pressurization with a Portable Hydraulic Cart, TASK 29-11-00-860-802.
 - Do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.
 - Do this task: Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.

————— **END OF TASK** —————

TASK 29-11-00-860-802

3. Hydraulic System A or B Pressurization with a Portable Hydraulic Cart

(Figure 201)

A. References

Reference	Title
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.

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C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

D. Access Panels

Number	Name/Location
192BL	ECS Ram Air Inlet Mixing Duct Panel - Forward
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

E. Procedure

SUBTASK 29-11-00-480-001

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED IN ALL THE LANDING GEARS BEFORE YOU PRESSURIZE THE HYDRAULIC SYSTEM. WITHOUT THE GROUND LOCKS, THE LANDING GEARS CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure the ground lock assemblies are installed in the nose gear and main landing gears. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-11-00-010-001

- (2) Open these applicable access panels:

Number	Name/Location
192BL	ECS Ram Air Inlet Mixing Duct Panel - Forward
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

SUBTASK 29-11-00-480-002

- (3) Connect the portable hydraulic cart, STD-163 to the ground service disconnect:
 - (a) Connect the pressure line of the portable hydraulic cart, STD-163 to the pressure connection of the ground service disconnect module.
 - (b) Connect the return line of the portable hydraulic cart, STD-163 to the return connection of the ground service disconnect module.

SUBTASK 29-11-00-860-002

- (4) Operate the portable hydraulic cart, STD-163 to pressurize the hydraulic system.

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

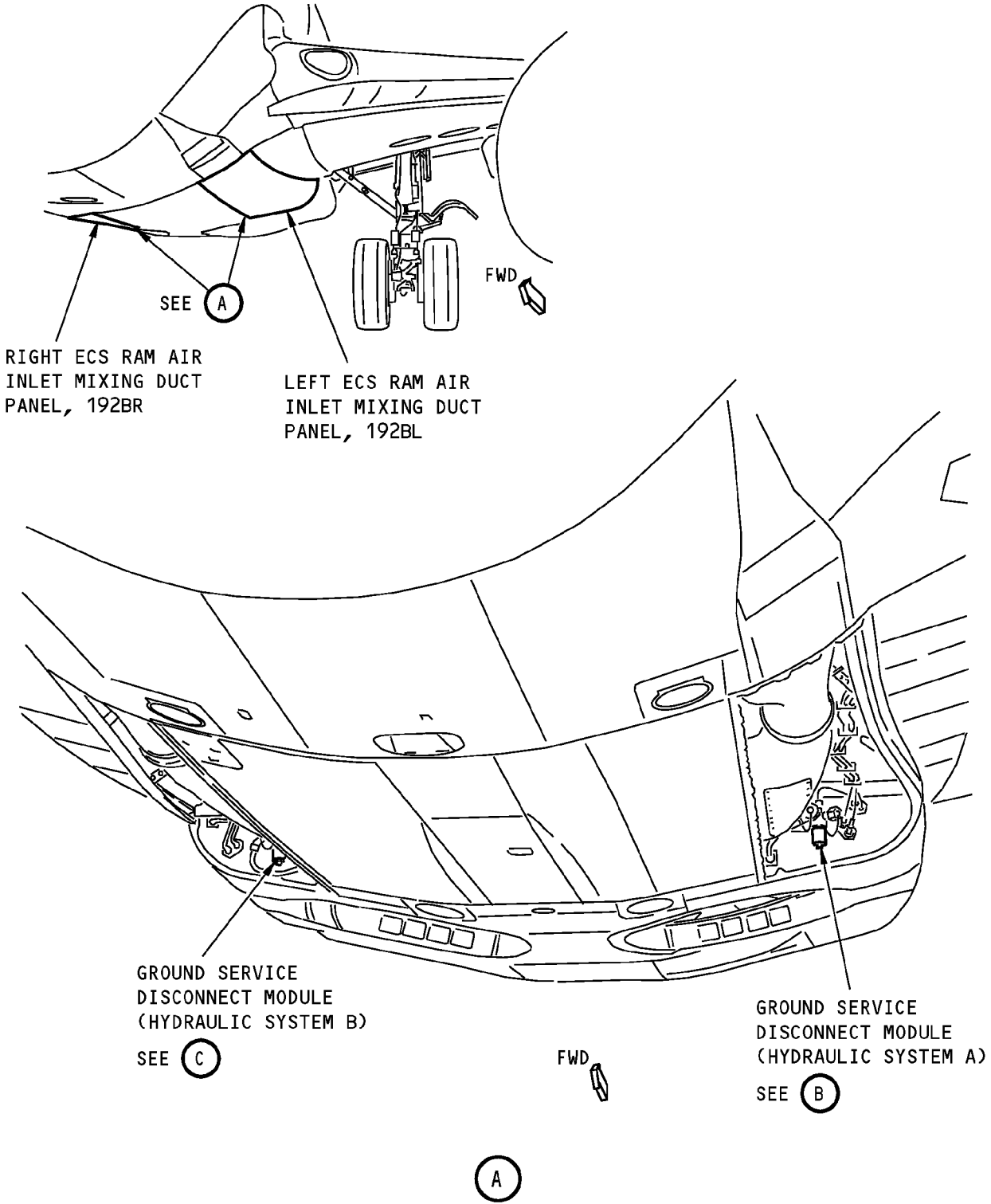
END OF TASK

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RIGHT ECS RAM AIR
INLET MIXING DUCT
PANEL, 192BR

LEFT ECS RAM AIR
INLET MIXING DUCT
PANEL, 192BL

GROUND SERVICE
DISCONNECT MODULE
(HYDRAULIC SYSTEM B)

GROUND SERVICE
DISCONNECT MODULE
(HYDRAULIC SYSTEM A)

Ground Service Disconnect Module
Figure 201 (Sheet 1 of 2)/29-11-00-990-801

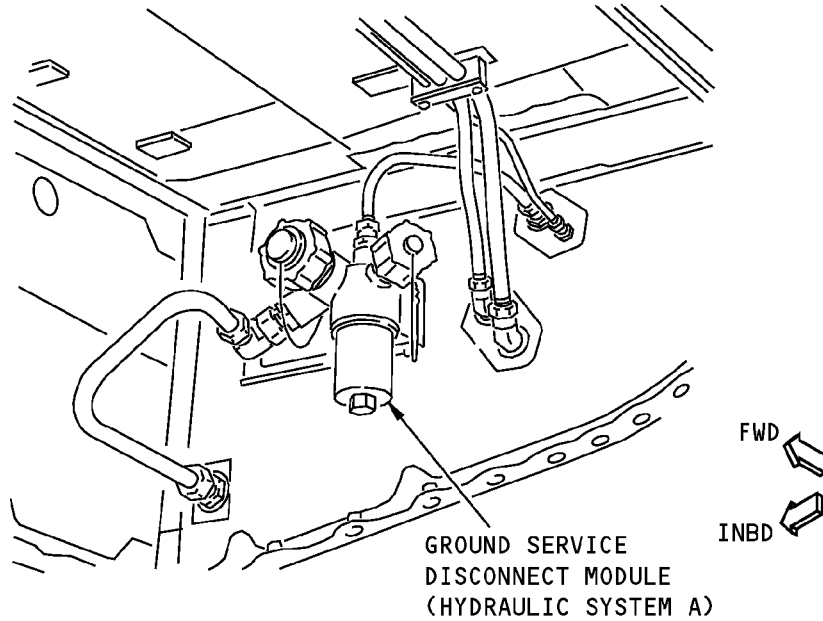
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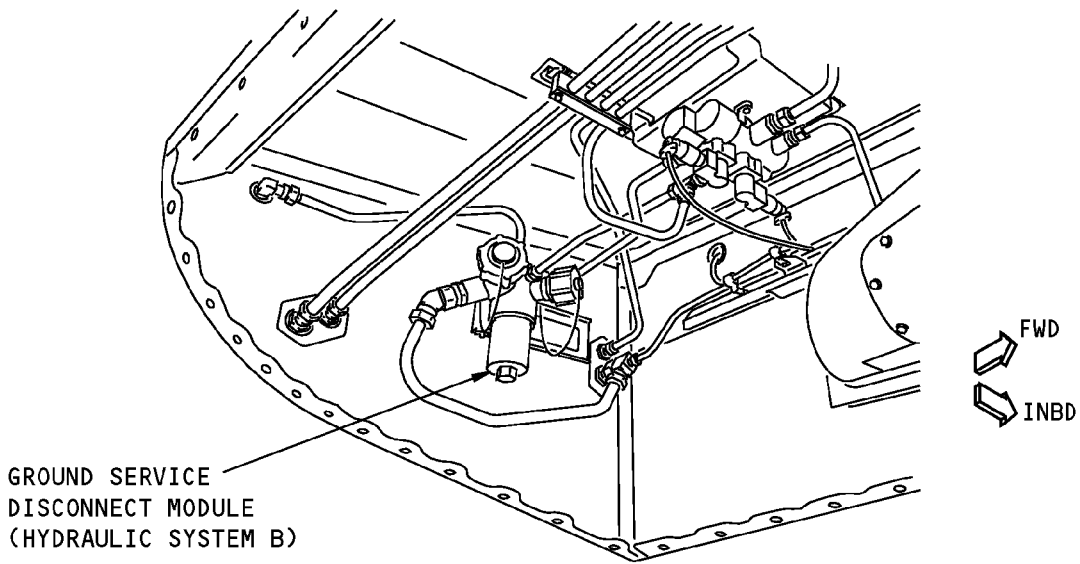
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B



C

**Ground Service Disconnect Module
Figure 201 (Sheet 2 of 2)/29-11-00-990-801**

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TASK 29-11-00-860-803

4. Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP)

(Figure 202)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Procedure

SUBTASK 29-11-00-480-003

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED IN ALL THE LANDING GEARS BEFORE YOU PRESSURIZE THE HYDRAULIC SYSTEM. WITHOUT THE GROUND LOCKS, THE LANDING GEARS CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure the ground lock assemblies are installed in the nose gear and main landing gears. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-11-00-860-003

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-00-860-004

WARNING: DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (3) For the hydraulic system A;

Make sure that this circuit breaker is closed:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-11-00-860-005

- (4) For the hydraulic system B;

Make sure that this circuit breaker is closed:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the p92 front panel.

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SUBTASK 29-11-00-860-006

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE THE EMDP FOR MORE THAN 2 MINUTES UNLESS THE APPLICABLE FUEL TANK HAS A MINIMUM OF 1675 LBS (760 KG) OF FUEL IN IT. IF YOU OPERATE THE EMDP FOR 2 MINUTES WITHOUT FUEL IN THE TANK, LET THE RESERVOIR GO BACK TO AMBIENT TEMPERATURE BEFORE YOU CONTINUE WITH THE TEST. IF YOU CONTINUE TO OPERATE THE EMDP THE HYDRAULIC FLUID CAN GET TOO HOT.

CAUTION: DO NOT START THE PUMP MORE THAN FIVE TIMES IN A FIVE MINUTE PERIOD. THE PUMP CAN BECOME TOO HOT. THIS CAN CAUSE DAMAGE TO THE PUMP.

- (5) Set this switch on the forward overhead panel, P5, to the ON position:
- (a) For the hydraulic system A; HYD PUMPS A ELEC 2
 - (b) For the hydraulic system B; HYD PUMPS B ELEC 1

————— **END OF TASK** —————

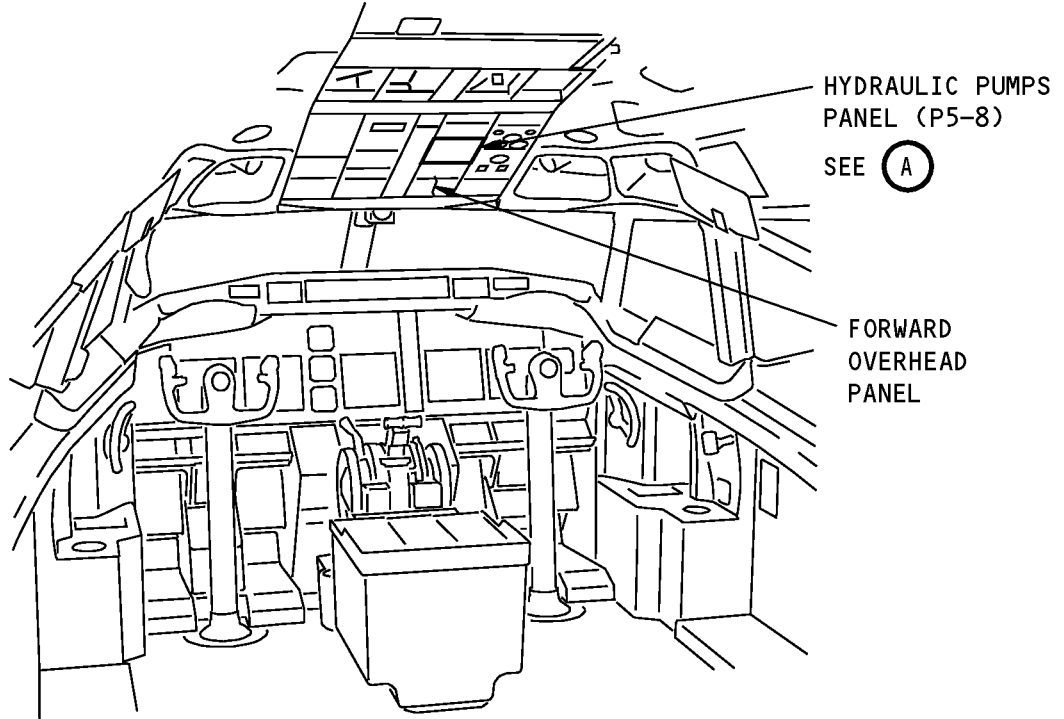
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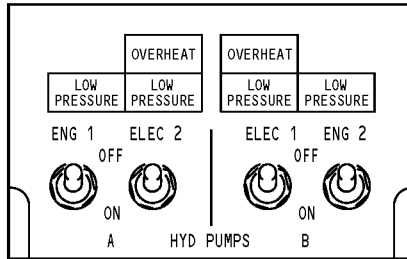
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FLIGHT COMPARTMENT



HYDRAULIC PUMPS PANEL (P5-8)

A

**Hydraulic System Control Panel
Figure 202/29-11-00-990-802**

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TASK 29-11-00-860-804

5. Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP)

(Figure 202)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Procedure

SUBTASK 29-11-00-480-004

WARNING: MAKE SURE THE GROUND LOCKS ARE INSTALLED IN ALL THE LANDING GEARS BEFORE YOU PRESSURIZE THE HYDRAULIC SYSTEM. WITHOUT THE GROUND LOCKS, THE LANDING GEARS CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Make sure the ground lock assemblies are installed in the nose gear and main landing gears. To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-11-00-860-007

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-00-860-008

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN HYDRAULIC POWER IS SUPPLIED.

CAUTION: DO NOT OPERATE THE EDP FOR MORE THAN 2 MINUTES UNLESS THE APPLICABLE FUEL TANK HAS A MINIMUM OF 1675 LBS (760 KG) OF FUEL IN IT. IF YOU OPERATE THE EDP FOR 2 MINUTES WITHOUT FUEL IN THE TANK, LET THE RESERVOIR GO BACK TO AMBIENT TEMPERATURE BEFORE YOU CONTINUE WITH THE TEST. IF YOU CONTINUE TO OPERATE THE EDP THE HYDRAULIC FLUID CAN GET TOO HOT.

- (3) Set this switch on the forward overhead panel, P5, to the ON position:
 - (a) For the hydraulic system A; HYD PUMPS A ENG 1
 - (b) For the hydraulic system B; HYD PUMPS B ENG 2

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SUBTASK 29-11-00-860-009

WARNING: DO NOT USE THIS TASK TO PRESSURIZE THE HYDRAULIC SYSTEM IF THE AIRPLANE IS LOCATED WHERE AN ENGINE-RUN CANNOT BE SAFELY PERFORMED. OPERATING THE ENGINES IN AN UNSAFE LOCATION CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Operate or motor the applicable engine to keep the hydraulic system pressurized.
 - (a) To operate the engine, do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.
 - (b) To motor the engine, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.

SUBTASK 29-11-00-210-001

- (5) Make sure the hydraulic pressure becomes stable between 2850 and 3200 psig.

————— **END OF TASK** —————

TASK 29-11-00-860-805

6. Hydraulic System A or B Power Removal

(Figure 201, Figure 202)

A. General

- (1) This task stops the hydraulic pumps or the portable hydraulic cart when the hydraulic pressure is not necessary. This procedure does not remove the pressure which stays in the hydraulic power sources stop. If you will loosen the hydraulic connections or open the hydraulic system, you must, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.

D. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
192BL	ECS Ram Air Inlet Mixing Duct Panel - Forward
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

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F. Hydraulic System Power Removal from a Portable Hydraulic Cart

SUBTASK 29-11-00-860-010

- (1) Adjust the pressure of the portable hydraulic cart, STD-163 to zero.

SUBTASK 29-11-00-080-001

- (2) Disconnect the pressure and return lines of the portable hydraulic cart, STD-163 from the pressure and return connections of the ground service disconnect module.

SUBTASK 29-11-00-420-001

- (3) Install caps on the pressure and return connections of the ground service disconnect module.

SUBTASK 29-11-00-410-001

- (4) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
192BL	ECS Ram Air Inlet Mixing Duct Panel - Forward
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

G. Hydraulic System Power Removal from an Electric Motor-Driven Pump (EMDP)

SUBTASK 29-11-00-860-011

- (1) Set this switch on the forward overhead panel, P5, to the OFF position:
 - (a) For the hydraulic system A; HYD PUMPS A ELEC 2
 - (b) For the hydraulic system B; HYD PUMPS B ELEC 1

SUBTASK 29-11-00-865-001

WARNING: DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

- (2) Make sure that these circuit breakers are open:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	3	C00882	ELEC HYD PUMP SYS B

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP
F	3	C00881	ELEC HYD PUMP SYS A

H. Hydraulic System Power Removal from an Engine Driven Pump (EDP)

SUBTASK 29-11-00-860-012

- (1) Stop the applicable engine. To stop it, do this task: Stop the Engine Procedure (Usual Engine Stop), TASK 71-00-00-700-819-F00.

SUBTASK 29-11-00-860-013

- (2) Keep the HYD PUMPS ENG switch for the applicable hydraulic system in the ON position.

NOTE: The HYD PUMPS ENG switches should be left in the ON position. This will increase the life of the depressurization solenoid which becomes energized when the HYD PUMPS ENG switch is put in the OFF position.

————— **END OF TASK** —————

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TASK 29-11-00-170-801

7. Hydraulic System A or B Flushing

A. General

- (1) This procedure flushes the hydraulic system after you replace a defective hydraulic pump.
- (2) When you do this procedure, if you find metal contamination because of a damaged pump, then replace the case drain filter element again, after one week of usual operation. After two months of operation, replace all the filter elements in the system.
- (3) If the contamination of the hydraulic fluid is from a chemical source, replace the fluid and the filter elements.

B. References

Reference	Title
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-27-000-801	Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal (P/B 401)
29-11-27-400-801	Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation (P/B 401)
29-11-41-000-801	EMDP Case Drain Filter Element Removal (P/B 401)
29-11-41-400-801	EMDP Case Drain Filter Element Installation (P/B 401)
29-11-51-000-801	EDP Case Drain Filter Element Removal (P/B 401)
29-11-51-400-801	EDP Case Drain Filter Element Installation (P/B 401)
29-11-61-000-801	Return Filter Element Removal (P/B 401)
29-11-61-400-801	Return Filter Element Installation (P/B 401)
29-11-71-000-802	Hydraulic Systems A and B Pressure Filter Module Element Removal (P/B 401)
29-11-71-400-802	Hydraulic Systems A and B Pressure Module Filter Element Installation (P/B 401)
29-22-21-020-801	PTU Pressure Filter Element Removal (P/B 401)
29-22-21-400-801	PTU Pressure Filter Module Installation (P/B 401)

C. Procedure

SUBTASK 29-11-00-860-014

- (1) Remove hydraulic power from the applicable hydraulic system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-00-860-015

- (2) Release the pressure from the applicable hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-00-900-001

- (3) Do these steps to replace the pressure, return, acoustic, and case drain filter elements which have a relation to the defective pump:

NOTE: Do only the steps necessary to replace the filter elements for the applicable pumps.

- (a) Replace the filter element of the case drain filter module for the engine driven pump (EDP).

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These are the tasks: EDP Case Drain Filter Element Removal, TASK 29-11-51-000-801, EDP Case Drain Filter Element Installation, TASK 29-11-51-400-801

- (b) Replace the filter element of the case drain filter module for the electric motor-driven pump (EMDP)

These are the tasks: EMDP Case Drain Filter Element Removal, TASK 29-11-41-000-801, EMDP Case Drain Filter Element Installation, TASK 29-11-41-400-801

- (c) Replace the filter element of the pressure module.

These are the tasks: Hydraulic Systems A and B Pressure Filter Module Element Removal, TASK 29-11-71-000-802, Hydraulic Systems A and B Pressure Module Filter Element Installation, TASK 29-11-71-400-802

- (d) Replace the filter element of the return module.

These are the tasks: Return Filter Element Removal, TASK 29-11-61-000-801, Return Filter Element Installation, TASK 29-11-61-400-801

- (e) Replace the EMDP acoustic Filter.

These are the tasks: Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal, TASK 29-11-27-000-801 Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation, TASK 29-11-27-400-801

- (f) Replace the PTU Pressure Filter Element. These are the tasks: PTU Pressure Filter Element Removal, TASK 29-22-21-020-801 PTU Pressure Filter Module Installation, TASK 29-22-21-400-801

SUBTASK 29-11-00-860-016

- (4) To pressurize the applicable hydraulic system with the pump which you replaced, do one of these steps:

- (a) Do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.
- (b) Do this task: Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.

SUBTASK 29-11-00-860-017

- (5) Operate all the systems which operate with the hydraulic pressure (but not the landing gear) not less than six times at a fast rate.

SUBTASK 29-11-00-860-018

- (6) Remove hydraulic power from the applicable hydraulic system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-00-860-019

- (7) Release the pressure from the applicable hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-00-900-002

- (8) Do these steps to replace the pressure, return, and case drain filter elements which has a relation to the defective pump:

NOTE: Do only the steps necessary to replace the filter elements for the applicable pumps.

- (a) Replace the filter element of the case drain filter module for the engine driven pump (EDP).
These are the tasks: EDP Case Drain Filter Element Removal, TASK 29-11-51-000-801, EDP Case Drain Filter Element Installation, TASK 29-11-51-400-801

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- (b) Replace the filter element of the case drain filter module for the electric motor-driven pump (EMDP).

These are the tasks: EMDP Case Drain Filter Element Removal, TASK 29-11-41-000-801, EMDP Case Drain Filter Element Installation, TASK 29-11-41-400-801

- (c) Replace the filter element of the pressure filter module.

These are the tasks: Hydraulic Systems A and B Pressure Filter Module Element Removal, TASK 29-11-71-000-802, Hydraulic Systems A and B Pressure Module Filter Element Installation, TASK 29-11-71-400-802

- (d) Replace the filter element of the return filter module.

These are the tasks: Return Filter Element Removal, TASK 29-11-61-000-801, Return Filter Element Installation, TASK 29-11-61-400-801

SUBTASK 29-11-00-860-020

- (9) Do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

————— **END OF TASK** —————

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HYDRAULIC SYSTEMS A AND B - ADJUSTMENT/TEST

1. General

A. This procedure has these tasks:

- (1) Operational Test of Hydraulic Systems A and B - Use this test to do a quick check of hydraulic systems A and B.
- (2) System Test of Hydraulic Systems A and B - Use this test to make sure hydraulic systems A and B operate correctly.

TASK 29-11-00-700-801

2. Operational Test of the Hydraulic Systems A and B

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Prepare for the Test

SUBTASK 29-11-00-860-021

CAUTION: DO NOT OPERATE THE SYSTEM A OR B HYDRAULIC PUMPS FOR MORE THAN TWO MINUTES WITHOUT FUEL IN THE FUEL TANKS. THE NO. 1 (FOR SYSTEM A) AND NO. 2 (FOR SYSTEM B) FUEL TANKS MUST HAVE A MINIMUM OF 250 GALLONS (1675 POUNDS/760 KILOGRAMS) OF FUEL IN THEM. IF THERE IS NOT SUFFICIENT FUEL IN THE FUEL TANKS, THE HYDRAULIC FLUID WILL BECOME TOO HOT.

- (1) Make sure the No. 1 and No. 2 fuel tanks each have 250 gallons (1675 pounds/760 kilograms) of fuel in them.

SUBTASK 29-11-00-860-022

- (2) Make sure the flap control lever is in the FLAP UP position.

SUBTASK 29-11-00-860-023

- (3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-00-860-024

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRICAL SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the p92 front panel.

SUBTASK 29-11-00-210-002

- (5) Make sure the supply shutoff valves for the engine driven pump (EDP) are open.

SUBTASK 29-11-00-860-025

- (6) Make sure the hydraulic reservoirs are full. To fill them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-00-860-026

- (7) If it is necessary, pressurize the hydraulic reservoirs. To pressurize them, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

D. Operational Test of the Hydraulic System A and B

SUBTASK 29-11-00-710-001

- (1) Do the operational test of the hydraulic systems A and B:
 - (a) Make sure the four LOW PRESSURE lights on the forward overhead panel, P5, are on.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THEAILERONS, RUDDER, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Pressurize the applicable hydraulic system with an electric motor-driven pump (EMDP):
 - 1) For hydraulic system A, set the HYD PUMPS A ELEC 2 switch to the ON position.
 - 2) For hydraulic system B, set the HYD PUMPS B ELEC 1 switch to the ON position.
 - 3) Make sure the HYD P indicator for the applicable hydraulic system becomes stable between 2850 and 3200.

NOTE: The HYD P indicator is shown on the pilots center panel, P2.

- 4) Make sure the applicable LOW PRESSURE light goes off.
- (c) Set the HYD PUMPS A ELEC 2 or HYD PUMPS B ELEC 1 to the OFF position.
 - 1) Operate the rudder until the hydraulic pressure is zero.
 - 2) Make sure the applicable LOW PRESSURE light comes on.

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WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THEAILERONS, RUDDER, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (d) Pressurize the applicable hydraulic system with an engine driven pump (EDP):
 - 1) For hydraulic system A, set the HYD PUMPS A ENG 1 switch to the ON position.
 - 2) For hydraulic system B, set the HYD PUMPS B ENG 2 switch to the ON position.
 - 3) Motor the applicable engine to pressurize hydraulic system A or B, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.
 - 4) Make sure the applicable LOW PRESSURE light goes off.
 - 5) Make sure the HYD P indicator for the applicable hydraulic system becomes stable between 2850 and 3200.

NOTE: The HYD P indicator is shown on the pilots center panel, P2.

- 6) Set the HYD PUMPS A ENG 1 or HYD PUMPS B ENG 2 to the OFF position.
- 7) Operate the rudder until the hydraulic pressure is zero.
- 8) Make sure the applicable LOW PRESSURE light comes on.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-860-027

- (1) Do this task: (Hydraulic System A or B Power Removal, TASK 29-11-00-860-805).

SUBTASK 29-11-00-860-028

- (2) Do this task: (Stop the Engine Procedure (Usual Engine Stop), TASK 71-00-00-700-819-F00).

————— **END OF TASK** —————

TASK 29-11-00-700-802

3. System Test of the Hydraulic Systems A and B

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-11-000-801-001	Hydraulic Systems A and B Engine-Driven Pump (EDP) Removal (P/B 401)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

B. Tools/Equipment

Reference	Description
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.

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C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Test

SUBTASK 29-11-00-860-044

- (1) If the hydraulic system is to be opened, make sure hydraulic pressure is removed and hydraulic reservoirs are depressurized as follows:
 - (a) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
 - (b) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-00-860-030

CAUTION: DO NOT OPERATE THE SYSTEM A OR B HYDRAULIC PUMPS FOR MORE THAN TWO MINUTES WITHOUT FUEL IN THE FUEL TANKS. THE NO. 1 (FOR SYSTEM A) AND NO. 2 (FOR SYSTEM B) FUEL TANKS MUST HAVE A MINIMUM OF 250 GALLONS (1675 POUNDS/760 KILOGRAMS) OF FUEL IN THEM. IF THERE IS NOT SUFFICIENT FUEL IN THE FUEL TANKS, THE HYDRAULIC FLUID WILL BECOME TOO HOT.

- (2) Make sure the No. 1 and No. 2 fuel tanks each have 250 gallons (1675 pounds/760 kilograms) of fuel in them.

SUBTASK 29-11-00-860-031

- (3) Make sure the flap control lever is in the FLAP UP position.

SUBTASK 29-11-00-860-032

- (4) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-00-860-033

- (5) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-11-00-860-034

- (6) Make sure these switches on the forward overhead panel, P5 are in the OFF position:
 - (a) HYD PUMPS A ENG 1
 - (b) HYD PUMPS B ENG 2
 - (c) HYD PUMPS A ELEC 2
 - (d) HYD PUMPS B ELEC 1

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SUBTASK 29-11-00-010-002

- (7) Open the fan cowl panel for the applicable engine. To open it, do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 29-11-00-480-005

- (8) Install the portable hydraulic cart, STD-163:

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

- (a) Disconnect the pressure line and supply line from the applicable engine driven pump (EDP).
- (b) Cap pressure and supply ports on EDP.
- (c) Connect the pressure line of the portable hydraulic cart, STD-163 to the pressure line that you disconnected from the EDP.
- (d) Connect the return line of the portable hydraulic cart, STD-163 to the supply line that you disconnected from the EDP.

SUBTASK 29-11-00-860-035

- (9) Make sure the supply shutoff valves for the engine driven pump (EDP) are open.

E. System Test of the Hydraulic Systems A and B

SUBTASK 29-11-00-710-002

- (1) Do the pressure test of the hydraulic system A or B:

- (a) Make sure the two LOW PRESSURE lights for the applicable hydraulic system on the forward overhead panel, P5, are on.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THEAILERONS, RUDDER, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Slowly increase the pressure from the portable hydraulic cart, STD-163 to 3000 psig.
 - 1) Make sure the applicable LOW PRESSURE light (ENG 1 or ENG 2) goes off when the pressure is between 1200 and 1600 psig.
 - 2) Make sure the applicable HYD P indicator shows between 2850 and 3200 psig.

NOTE: The HYD P indicator is shown on the pilots center panel, P2.

- (c) Slowly decrease the pressure from the portable hydraulic cart, STD-163.
 - 1) Make sure the applicable LOW PRESSURE light (ENG 1 or ENG 2) comes on when the pressure is between 1100 and 1500 psig.
- (d) Remove pressure from the applicable hydraulic system. (TASK 29-11-00-860-805)

SUBTASK 29-11-00-480-006

- (2) Do these steps to remove the portable hydraulic cart, STD-163:

- (a) Disconnect the pressure line of the portable hydraulic cart, STD-163 from the pressure line that you disconnected from the EDP.
- (b) Disconnect the return line of the portable hydraulic cart, STD-163 from the supply line that you disconnected from the EDP.

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- (c) Connect the pressure line and supply line to the applicable EDP.
(TASK 29-11-11-000-801-001)

SUBTASK 29-11-00-860-037

- (3) Make sure the hydraulic reservoirs are full. To fill them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-00-710-003

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THE AILERONS, RUDDER, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (4) Pressurize the applicable hydraulic system with the electric motor driven pump
(TASK 29-11-00-860-803) :

- (a) For hydraulic system A, set the HYD PUMPS A ELEC 2 switch to the ON position.
(b) For hydraulic system B, set the HYD PUMPS B ELEC 1 switch to the ON position.
(c) Make sure the HYD P indicator for the applicable hydraulic system becomes stable between 2850 and 3200 psig.

NOTE: The HYD P indicator is shown on the pilots center panel, P2.

- (d) Set the HYD PUMPS A ELEC 2 or HYD PUMPS B ELEC 1 to the OFF position.
(e) Make sure the applicable LOW PRESSURE light (ELEC 1 or ELEC 2) comes on when the pressure is between 1100 and 1500 psig.

SUBTASK 29-11-00-720-001

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THE AILERONS, RUDDER, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Motor the applicable engine to pressurize hydraulic system A or B, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.

- (a) For hydraulic system A, set the HYD PUMPS A ENG 1 switch to the ON position.
(b) For hydraulic system B, set the HYD PUMPS B ENG 2 switch to the ON position.
(c) Make sure the applicable LOW PRESSURE light (ENG 1 or ENG 2) goes off.
(d) Make sure the HYD P indicator for the applicable hydraulic system becomes stable between 2850 and 3200 psig.

NOTE: The HYD P indicator is shown on the pilots center panel, P2.

- (e) Set the HYD PUMPS A ENG 1 or HYD PUMPS B ENG 2 to the OFF position.
(f) Make sure the applicable LOW PRESSURE light (ENG 1 or ENG 2) comes on.

NOTE: If it is necessary, operate the flight controls to remove pressure from the hydraulic systems.

- (g) Set the HYD PUMPS A ENG 1 or HYD PUMPS B ENG 2 back to the ON position.
(h) Make sure the applicable LOW PRESSURE light (ENG 1 or ENG 2) goes off.
(i) Make sure the HYD P indicator for the applicable hydraulic system becomes stable between 2850 and 3200 psig.

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(j) Make sure there is no hydraulic leakage at the EDP.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-00-860-038

(1) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-00-860-040

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

END OF TASK

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HYDRAULIC SYSTEMS A, B, AND STANDBY - INSPECTION/CHECK

1. General

- A. This procedure has one task. This task does a check of the hydraulic fluid.
- B. The operational environment of the airplane hydraulic system can affect the service life of the hydraulic fluid. You make a decision to take a sample of the hydraulic fluid for analysis if you find that it is necessary from your service experience. Make sure that the fluid analysis results agree with the fluid specification limits shown in the BMS 3-11 hydraulic fluid property limits table shown below. If the fluid properties are greater than the limits in table, replace some quantity of fluid with new fluid until the fluid properties agree with the limits shown. You make a decision on the quantity of fluid to be replaced.
- C. A polyethylene bottle or a glass bottle can be used to collect the hydraulic fluid.

TASK 29-11-00-200-801

2. Hydraulic Fluid Check

A. General

- (1) You must supply clean bottles which will hold the fluid samples. If you do not do this, it is possible that the fluid samples will not be correct.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-801	Standby Hydraulic System Pressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Supply Clean Bottles.

SUBTASK 29-11-00-110-001

- (1) Supply clean sample bottles from a satisfactory laboratory, or supply clean bottles from a vendor (for example, Fisher, Catalog #02-893-5D or equivalent). Use non-powdered gloves to prevent contamination during the sampling procedure. Remove the bottle cap immediately before you collect the sample. Place the cap face down on a clean (lint-free, dirt-free) surface during sampling.

E. Prepare for the Check

SUBTASK 29-11-00-680-006

- (1) Pressurize the hydraulic reservoirs. To pressurize them, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

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SUBTASK 29-11-00-860-041

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THE AILERONS, RUDDERS, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Supply hydraulic power to hydraulic systems A and system B with the applicable electric motor-driven pump:
 - (a) To supply power to systems A and system B, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-11-00-860-045

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THE AILERONS, RUDDERS, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Supply hydraulic power to the standby hydraulic system:
 - (a) To supply power to the standby system, do this task: Standby Hydraulic System Pressurization, TASK 29-21-00-000-801

SUBTASK 29-11-00-860-042

- (4) Operate all of the flight controls 6 to 8 times to mix the hydraulic fluid.

SUBTASK 29-11-00-860-043

- (5) Remove hydraulic power from the hydraulic systems:

NOTE: Get the samples of the hydraulic fluid not more than one hour after you remove power from the hydraulic systems.

- (a) To remove power from hydraulic system A and system B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805
- (b) To remove hydraulic power from the standby system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

SUBTASK 29-11-00-680-007

- (6) Depressurize the hydraulic reservoirs. To depressurize them, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

F. Procedure

SUBTASK 29-11-00-680-001

- (1) Open the sampling valve on the reservoir to supply a smooth flow of fluid.

SUBTASK 29-11-00-680-002

- (2) Drain a minimum of one pint of hydraulic fluid before you get a sample.

SUBTASK 29-11-00-020-001

- (3) Remove the cap from the bottle and put the cap face down on a clean (lint-free dirt-free) surface.

SUBTASK 29-11-00-680-003

- (4) Do these steps to fill the bottle.
 - (a) Put the bottle in the fluid flow but do not touch the sample valve.

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(b) When the bottle is full, remove the it from the fluid flow.

NOTE: Do not close the sample valve while the bottle is in the fluid flow. This can loosen the contamination which can get into the sample.

SUBTASK 29-11-00-420-002

(5) Install the cap on the bottle.

SUBTASK 29-11-00-680-005

(6) Close the sampling valve.

SUBTASK 29-11-00-420-003

(7) Safety the sampling valve with a lockwire.

SUBTASK 29-11-00-930-001

(8) Identify the bottle with this data:

- (a) Airplane model
- (b) Airplane number
- (c) Hydraulic system number
- (d) Date
- (e) Location.

NOTE: After you remove a fluid sample from the hydraulic reservoir, you can make an analysis of the fluid properties which show in (Table 601). If one of the fluid properties is more than the limit, replace a sufficient quantity of the fluid until the property is less than the limit. You must make a decision about the quantity of fluid you replace.

Table 601/29-11-00-993-803 Hydraulic Fluid, BMS 3-11, Property Limits

FLUID PROPERTIES	IN-SERVICE FLUID LIMITS	TEST PROCEDURE
Visual	Must be transparent. No phase separation or precipitation. All colors are satisfactory	Visual
Specific Gravity 77°F/77°F (25°C/25°C)	0.970 - 1.066	ASTM D1217 or ASTM D4052
Percent of Water By Weight	0.8 max.	ASTM D6304 or Infrared
Neutralization No. mg KOH/gm	1.5 max.	ASTM D974
Viscosity, cs at 100°F (at 37.78°C)	6.0 to 12.5	ASTM D445
Organic Contamination	Not Found By Infrared	Infrared ^{*[1]}
Elemental Contamination ^{*[2]*[3]}		A Procedure with the Precision that Follows:
Calcium Potassium Sodium Chlorine Sulfur	50 ppm max. 50 ppm max. 50 ppm max. 200 ppm max. 500 ppm max.	± 4 ppm ± 2 ppm ± 3 ppm ± 20 ppm ± 10 ppm ^{*[4]}
Particulate Contamination	NAS 1638, Class 9 ^{*[5]}	SAE ARP 598
Particle Size Range (Microns)	Maximum Number of Particles Allowed	
5 to 15 15 to 25 25 to 50 50 to 100 Over 100	128,000 22,800 4,050 720 128	

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- *[1] If you think there is contamination, do the procedure in Boeing Document D6-24429, An Analytical Method for Contaminates in BMS 3-11 Fluids and Their Mixtures Using Differential IR Spectroscopy.
- *[2] Contamination is a quantity that is more than that in the base stock or the group of items which you add. Compare the data from the fluid analysis with the limits put on the new fluid.
- *[3] Analysis is only required if contamination is suspected. If contamination exceeds the maximum values specified, flush the system until values are below the maximum limit.
- *[4] The precision of ± 10 ppm is applicable to total values in the range from 0 to 1000 ppm. In the range from 1000 to 3000 ppm, the precision will decrease to ± 50 ppm with some equipment.
- *[5] These are the maximum contamination limits based on a 100 milliliter sample size.

SUBTASK 29-11-00-610-001

- (9) Service the hydraulic reservoirs. To service them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

————— **END OF TASK** —————

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HYDRAULIC RESERVOIR PRESSURIZATION SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
 - (1) Hydraulic Reservoirs Pressurization
 - (2) Hydraulic Reservoirs Depressurization.
- B. The pressurization system for the hydraulic reservoirs supplies pressure to all hydraulic system reservoirs when the pneumatic manifold is pressurized. Bleed air from one or two engines and the APU pressurizes the pneumatic manifold. External air supplied through the ground service connector can also pressurize the pneumatic manifold. The air volumes of A and B reservoirs are interconnected, and B reservoir is connected to the standby reservoir by a balance line. Therefore, all reservoirs are maintained at the same pressure whenever the two depressurization valves are closed.
- C. You can pressurize and release the pressure from the system B and standby reservoirs together. You can pressurize or release the pressure from the system A reservoir independently.
- D. The approximate operating range will vary between 12-65 psi depending on pneumatic source available and aircraft operation.

TASK 29-11-01-860-801

2. Hydraulic Reservoirs Pressurization

(Figure 201)

A. Tools/Equipment

Reference	Description
STD-77	Air Source - Regulated, Dry Filtered, 0-50 psig

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Procedure

SUBTASK 29-11-01-860-005

- (1) Make sure the reservoir depressurization (vent) valve for each system reservoir is in the closed (non-vented) position.

NOTE: The two hydraulic reservoirs are pressurized at the same time when the two reservoir depressurization (vent) valves are closed.

SUBTASK 29-11-01-480-001

CAUTION: DO NOT USE MORE THAN 70 PSIG PRESSURE. IF YOU USE TOO MUCH PRESSURE, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (2) Connect the 0-50 psig dry filtered regulated air source, STD-77 to the valve for manual air pressurization.

NOTE: The valve is on the reservoir pressurization module.

SUBTASK 29-11-01-860-006

- (3) Turn the nut on the valve body to pressurize the reservoir.

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SUBTASK 29-11-01-860-007

- (4) Adjust the pressure of the 0-50 psig dry filtered regulated air source, STD-77 to pressurize the reservoir to 46 +/- 1 psig.

SUBTASK 29-11-01-860-008

- (5) Close the valve for manual air pressurization.

SUBTASK 29-11-01-210-003

- (6) Make sure the pressure in the reservoir stays stable.

NOTE: The air pressure lines between the reservoir pressurization module and the reservoirs contain vent orifices. These orifices bleed the air pressure out of the lines after the air source is removed. The check valves in the depressurization valves hold air pressure in each reservoir.

SUBTASK 29-11-01-080-003

- (7) Disconnect the 0-50 psig dry filtered regulated air source, STD-77 from the valve for the manual air pressurization.

————— **END OF TASK** —————

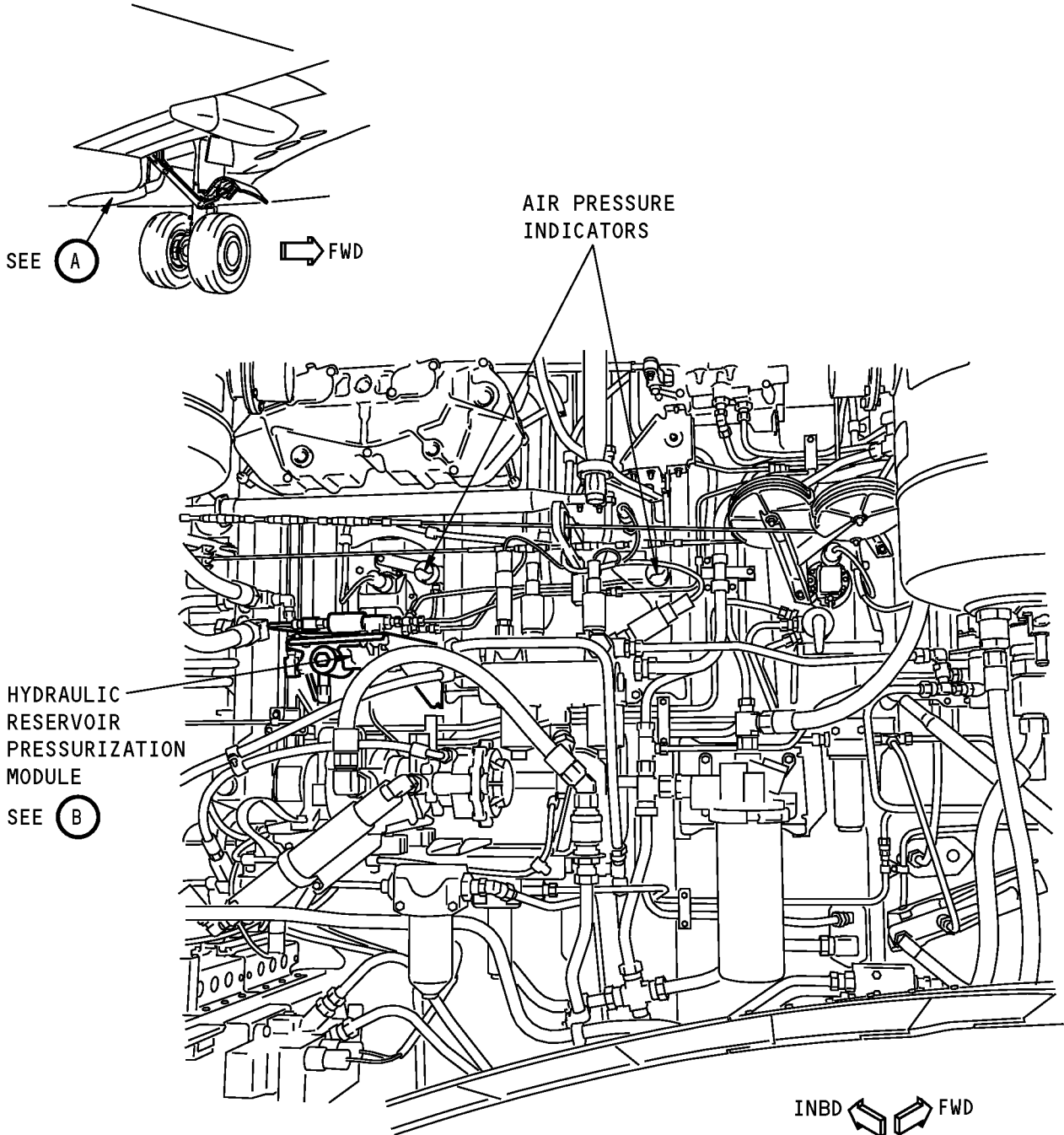
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**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

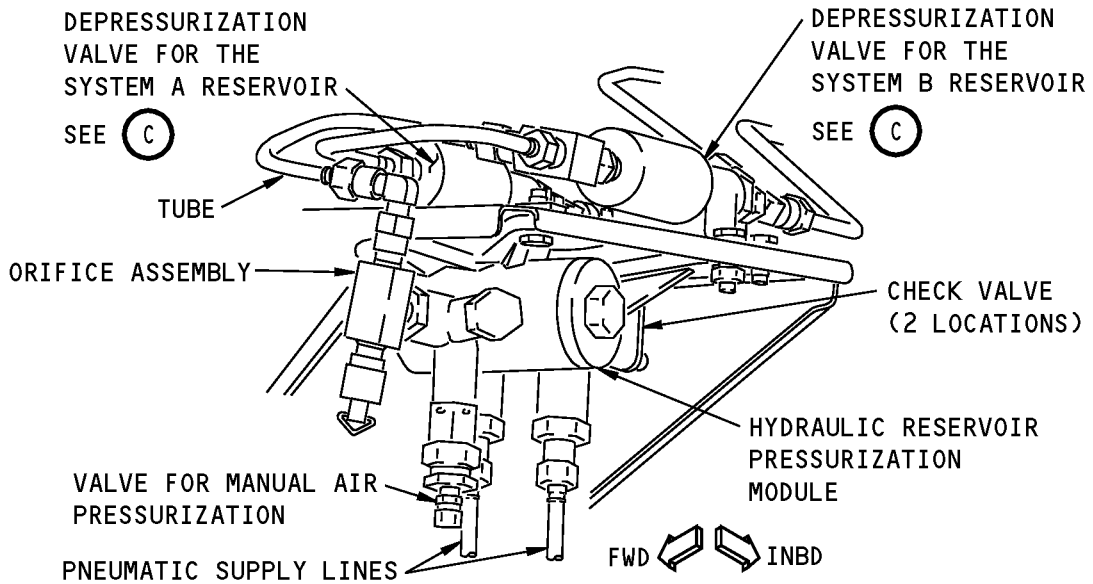
(A)

**Hydraulic Reservoir Pressurization Module
Figure 201 (Sheet 1 of 3)/29-11-01-990-801**

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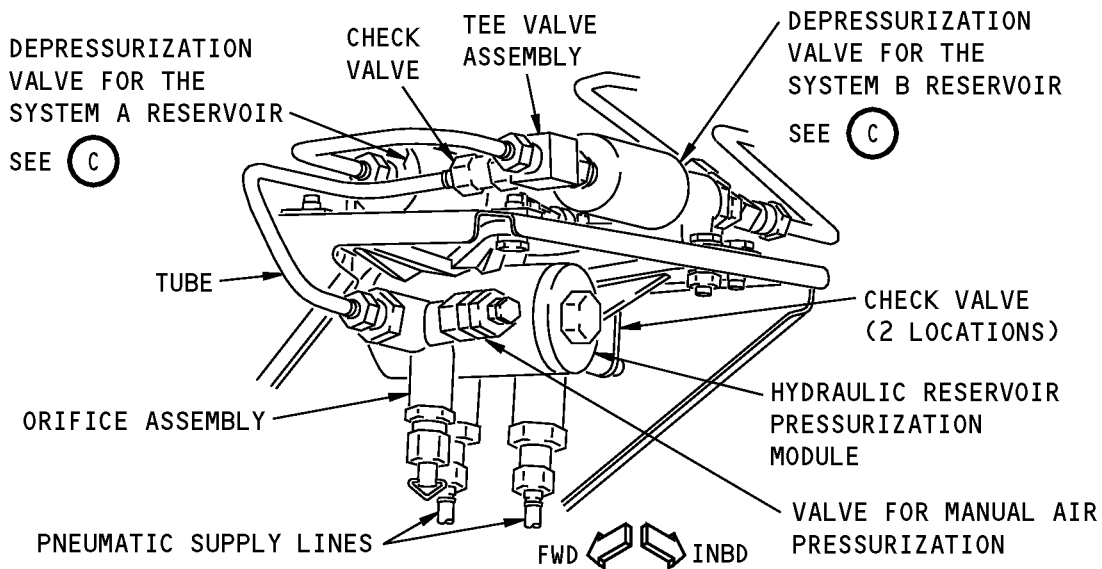
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HYDRAULIC RESERVOIR PRESSURIZATION MODULE

(B) 1



HYDRAULIC RESERVOIR PRESSURIZATION MODULE

(B) 2

- 1 PRESSURIZATION MODULE WITHOUT FILTER DRAIN VENT
- 2 PRESSURIZATION MODULE WITH FILTER DRAIN VENT

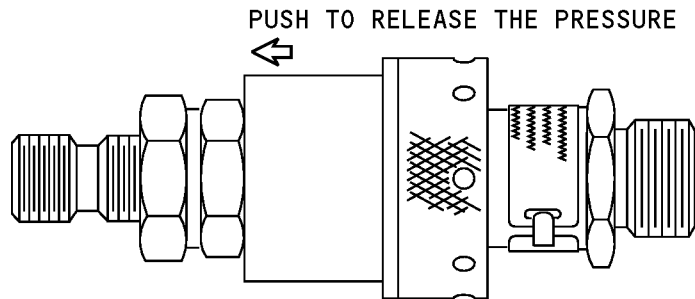
**Hydraulic Reservoir Pressurization Module
Figure 201 (Sheet 2 of 3)/29-11-01-990-801**

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DEPRESSURIZATION (VENT) VALVE



Hydraulic Reservoir Pressurization Module
Figure 201 (Sheet 3 of 3)/29-11-01-990-801

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TASK 29-11-01-860-802

3. Hydraulic Reservoirs Depressurization

(Figure 201)

A. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1795	Lockset - Reservoir Vent Valve (Part #: B29002-5, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700QC, -800, -900, -BBJ)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Hydraulic Reservoir Depressurization

SUBTASK 29-11-01-860-009

- (1) Make sure that hydraulic power for the systems A, B, and standby is removed. To remove hydraulic power from the systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

To remove hydraulic power from the standby system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

SUBTASK 29-11-01-860-010

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 29-11-01-480-002

WARNING: PUT A RAG AROUND THE MANUAL DEPRESSURIZATION VALVES TO CATCH SPRAY OF HYDRAULIC FLUID. DO NOT GET HYDRAULIC FLUID IN YOUR MOUTH, EYES, SKIN, OR ON THE AIRPLANE. IT CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Put a container below the vents to catch hydraulic fluid.

SUBTASK 29-11-01-860-011

- (4) Slowly open the depressurization (vent) valve to prevent a spray of hydraulic fluid.

SUBTASK 29-11-01-480-003

- (5) Install the lockset, SPL-1795 on the system A and/or B depressurization (vent) valves when the valves are fully open.

NOTE: You can release the pressure from one or two reservoirs. The pressure is removed from the reservoirs when the air flow from the depressurization valve stops.

<p>EFFECTIVITY</p> <p>HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106</p>
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E. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-01-080-004

(1) Remove the lockset, SPL-1795 from the system A and/or B depressurization (vent) valves.

END OF TASK

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HYDRAULIC RESERVOIR PRESSURIZATION SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

- (1) A leakage test of the pressurization system for the hydraulic reservoir.

TASK 29-11-01-700-801

2. Hydraulic Reservoir Pressurization Leakage Test

(Figure 501, Figure 502)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-02-000-801	Hydraulic Reservoir Pressurization Module Removal (P/B 401)
29-11-02-400-801	Hydraulic Reservoir Pressurization Module Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1115	Source - Nitrogen, 0-100 PSIG
STD-1292	Gauge - Pressure, 0-200 PSIG (0-1379 KPa)

C. Consumable Materials

Reference	Description	Specification
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Procedure

SUBTASK 29-11-01-860-001

- (1) Make sure the two engines and the APU are off.

SUBTASK 29-11-01-420-005

- (2) Attach the DO-NOT-USE tag to the pneumatic ground service connector.

SUBTASK 29-11-01-860-018

- (3) Release the pressure from the hydraulic reservoirs. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802.

SUBTASK 29-11-01-860-002

- (4) Make sure the reservoirs for the hydraulic systems A and B are filled with hydraulic fluid. To fill them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-01-210-001

- (5) Do a check of the vent caps for the pneumatic supply lines:

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- (a) Remove the vent caps from the pneumatic supply lines from the right and left pneumatic ducts.

NOTE: One vent cap is installed at approximately RBL 25 on the forward bulkhead. The other vent cap is installed at approximately LBL 30 on the forward bulkhead.

- (b) Make sure the vents are free of corrosion and material that can cause blockage.
- (c) If there is corrosion and blockage, then replace them with new vent caps.
- (d) Install the vent caps.

SUBTASK 29-11-01-020-001

- (6) Disconnect the pneumatic supply lines from the hydraulic reservoir pressurization module.

SUBTASK 29-11-01-420-006

- (7) Install plugs on pneumatic supply lines.

SUBTASK 29-11-01-210-002

- (8) Do a check of the vent cap assembly for the hydraulic reservoir pressurization module:
 - (a) Remove the vent cap assembly from the orifice assembly.
 - (b) Make sure the vent cap assembly is free of corrosion and material that can cause blockage.
 - (c) If there is corrosion and blockage, then replace it with a new vent cap assembly.

NOTE: Do not install the new vent cap assembly until you complete this task.

SUBTASK 29-11-01-080-001

- (9) Install the BACC14AD04D cap in the location of the vent cap assembly for the orifice assembly.

SUBTASK 29-11-01-080-002

- (10) Connect a nitrogen 0-100 PSIG nitrogen source, STD-1115 to the valve for the manual air pressurization.

SUBTASK 29-11-01-860-003

- (11) Do these steps to slowly pressurize the reservoirs:
 - (a) Turn the nut on the valve for the manual air pressurization.

CAUTION: DO NOT USE MORE THAN 70 PSI PRESSURE. IF YOU USE TOO MUCH PRESSURE, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (b) Adjust the pressure regulator for the nitrogen 0-100 PSIG nitrogen source, STD-1115 until the relief valves for the hydraulic reservoirs open.
- (c) Make sure the two relief valves open at 60 to 65 psi.
- (d) Reduce pressure to 50 psig.

SUBTASK 29-11-01-790-001

- (12) Do these steps to check for air leakage at the ports for the pneumatic supply lines:

NOTE: For pressurization modules that have a filter drain vent, block it.

- (a) Apply Snoop Leak Detector compound, G00091 to the ports for the pneumatic supply lines on the hydraulic reservoir pressurization module.
- (b) Make sure there is no air leakage at the ports for the pneumatic supply lines.

NOTE: If there is air leakage, the Snoop Leak Detector compound, G00091 will have bubbles.

EFFECTIVITY

HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

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- (c) If there is air leakage at the ports for the pneumatic supply lines, then do these checks:

NOTE: On pressurization modules with the filter drain vent, make sure the vent is no longer restricted.

- 1) If there is air leakage at one or both of the ports, then replace the applicable check valve or check valves.

- 2) If necessary, replace the Hydraulic Reservoir Pressurization Module.

These are the tasks:

- Hydraulic Reservoir Pressurization Module Removal, TASK 29-11-02-000-801,
- Hydraulic Reservoir Pressurization Module Installation, TASK 29-11-02-400-801.

SUBTASK 29-11-01-860-004

- (13) Make sure that the reservoir pressure is greater than 50 psi.

- (a) If the reservoir pressure is less than 50 psi, supply pressure with nitrogen 0-100 PSIG nitrogen source, STD-1115.

- (b) Close the shutoff valve for the 0-100 PSIG nitrogen source, STD-1115.

SUBTASK 29-11-01-790-002

- (14) Do a leakage check of the lines with gauge, STD-1292 for the hydraulic reservoirs A and B (Figure 501, Figure 502):

- (a) Make sure the gage pressure does not decrease more than 5 psi in five minutes.

- (b) If the gage pressure decreases more than 5 psi in five minutes, then do these steps:

- 1) Pressurize the hydraulic reservoir to 50 psi with 0-100 PSIG nitrogen source, STD-1115.

- 2) Apply Snoop Leak Detector compound, G00091 to all fittings and valves on the hydraulic reservoir, and all lines back to the hydraulic reservoir pressurization module.

- 3) Make sure that there is no leakage at all the fitting and valves on the hydraulic reservoir, and all the lines back to the hydraulic reservoir pressurization module.

NOTE: If there is leakage, the Snoop Leak Detector compound, G00091 will have bubbles.

- 4) If there is leakage, tighten the fittings or replace the applicable component that causes the leakage.

SUBTASK 29-11-01-860-013

- (15) Depressurize the reservoirs. To depressurize them, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802.

SUBTASK 29-11-01-020-002

- (16) Remove the BACC14AD04D cap from the orifice assembly.

SUBTASK 29-11-01-420-003

- (17) Install a clean vent cap assembly on to the orifice assembly.

SUBTASK 29-11-01-860-014

CAUTION: DO NOT USE MORE THAN 70 PSI PRESSURE. IF YOU USE TOO MUCH PRESSURE, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (18) Adjust the pressure regulator for the 0-100 PSIG nitrogen source, STD-1115 until the reservoir pressure is 50 psi.

SUBTASK 29-11-01-860-015

- (19) Close the shutoff valve for the 0-100 PSIG nitrogen source, STD-1115.

EFFECTIVITY

HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

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SUBTASK 29-11-01-790-003

(20) If the gage pressure decreases more than 5 psi in 5 minutes, then do this step (Figure 501, Figure 502):

(a) Replace the check valve in the tee valve assembly.

SUBTASK 29-11-01-080-006

(21) Remove the nitrogen 0-100 PSIG nitrogen source, STD-1115.

SUBTASK 29-11-01-860-016

(22) Depressurize the reservoirs. To depressurize them, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802.

SUBTASK 29-11-01-010-001

(23) Remove plugs on pneumatic supply lines.

SUBTASK 29-11-01-420-001

(24) Connect the pneumatic supply lines to the hydraulic reservoir pressurization module.

SUBTASK 29-11-01-860-017

(25) Pressurize the hydraulic system A and B reservoirs. To pressurize them, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802.

SUBTASK 29-11-01-420-004

(26) Make sure there is no leakage of air at the connections to the reservoir pressurization module.

————— **END OF TASK** —————

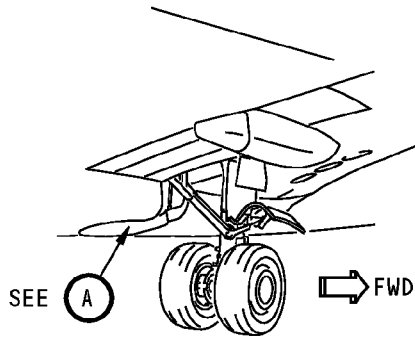
EFFECTIVITY

HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

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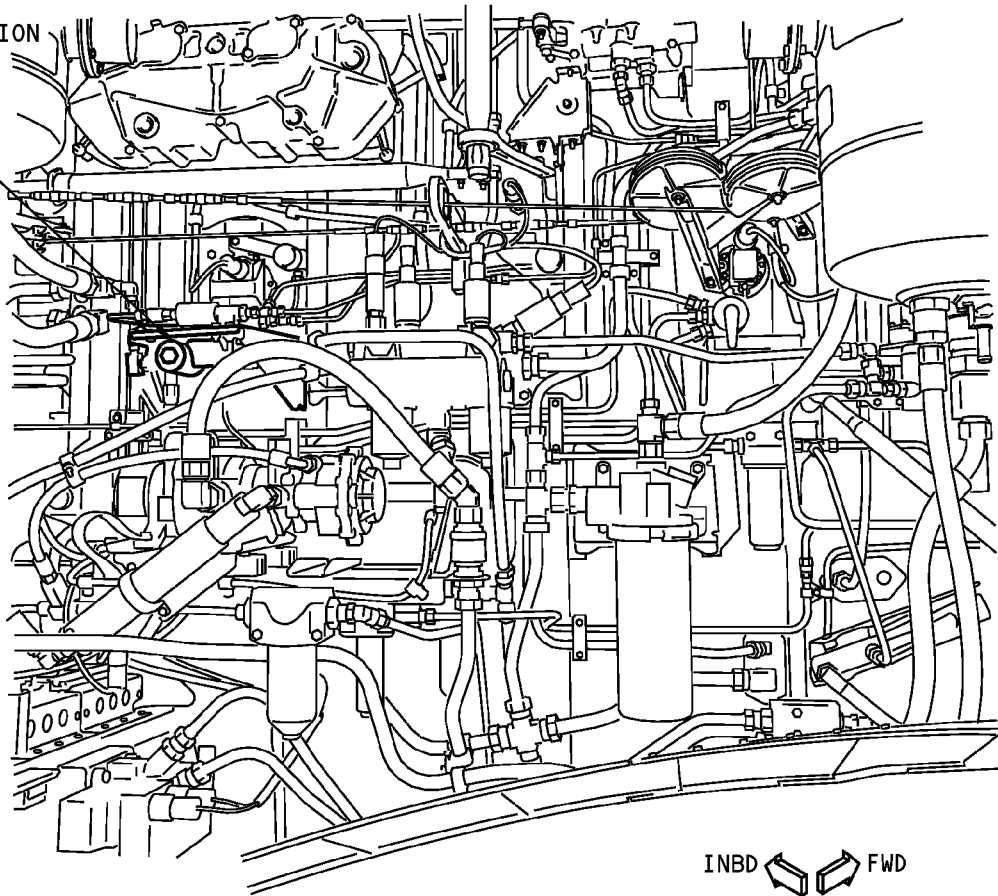
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MODULE

SEE (B)



**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

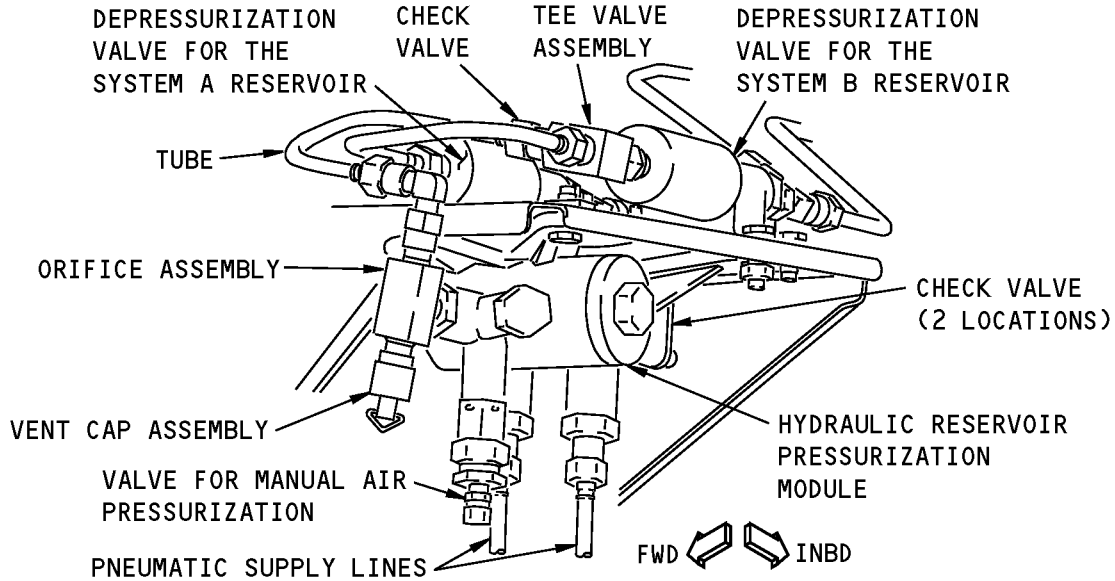
(A)

**Hydraulic Reservoir Pressurization Module
Figure 501 (Sheet 1 of 2)/29-11-01-990-802**

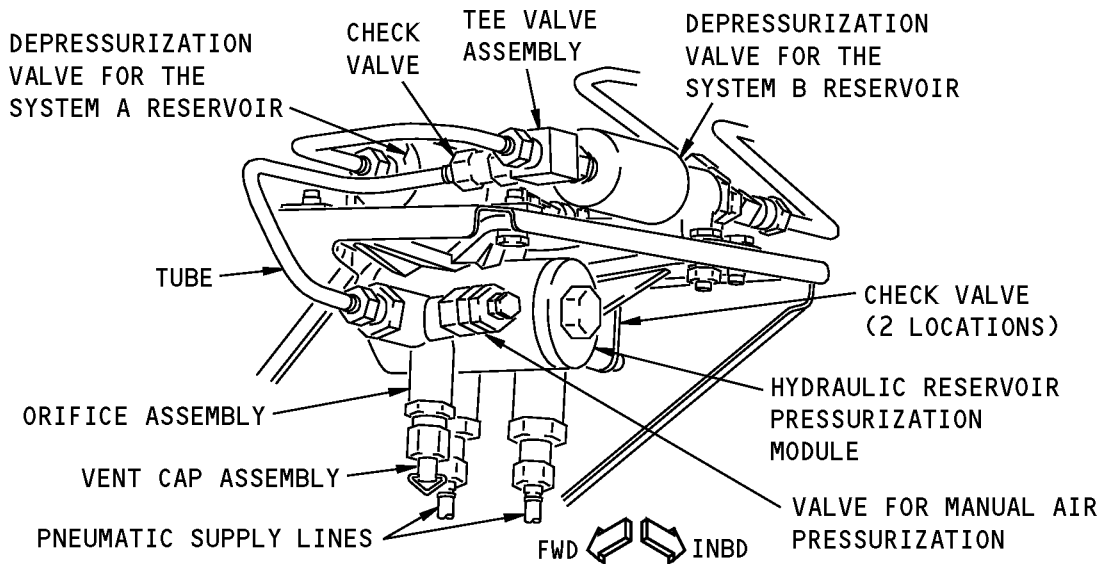
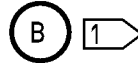
EFFECTIVITY
HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

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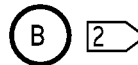
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HYDRAULIC RESERVOIR PRESSURIZATION MODULE



HYDRAULIC RESERVOIR PRESSURIZATION MODULE



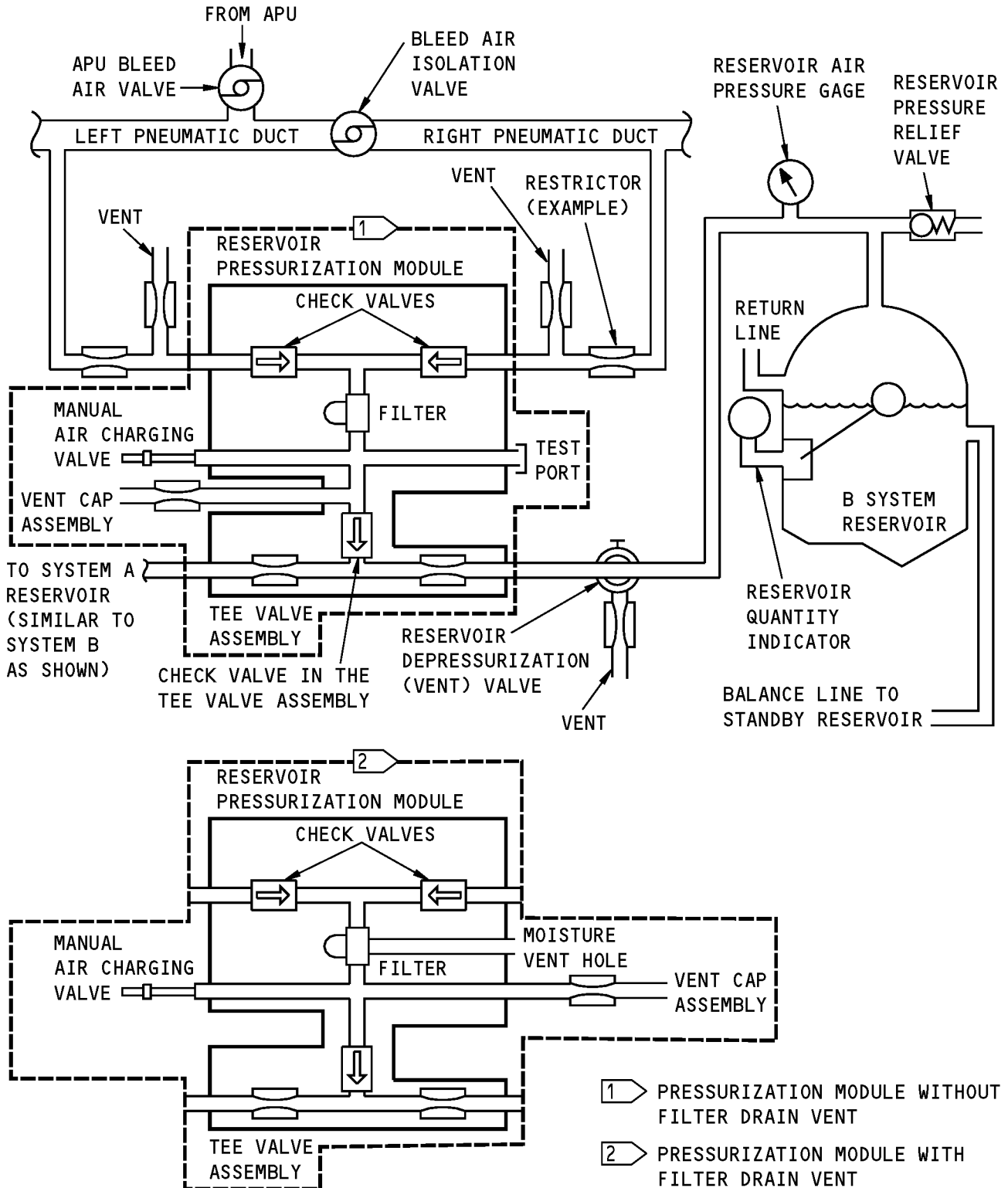
- PRESSURIZATION MODULE WITHOUT FILTER DRAIN VENT
- PRESSURIZATION MODULE WITH FILTER DRAIN VENT

**Hydraulic Reservoir Pressurization Module
Figure 501 (Sheet 2 of 2)/29-11-01-990-802**

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Hydraulic Reservoir Pressurization System Schematic
Figure 502/29-11-01-990-803

EFFECTIVITY
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HYDRAULIC RESERVOIR PRESSURIZATION MODULE - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A removal of the hydraulic reservoir pressurization module
 - (2) An installation of the hydraulic reservoir pressurization module
 - (3) A removal of the hydraulic reservoir pressurization module filter
 - (4) An installation of the hydraulic reservoir pressurization module filter
 - (5) A Hydraulic Reservoir Pressurization Module Leak Check.
- C. The hydraulic reservoir pressurization module is referred to as the "pressurization module" in this procedure.

TASK 29-11-02-000-801

2. Hydraulic Reservoir Pressurization Module Removal

(Figure 401)

A. References

Reference	Title
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for the Removal

SUBTASK 29-11-02-860-001

WARNING: MAKE SURE THAT YOU REMOVE PRESSURE FROM THE PNEUMATIC MANIFOLD. IF YOU DO NOT REMOVE PRESSURE, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR WHEN YOU DISCONNECT THE PRESSURIZATION MODULE.

- (1) Set the ENG 1, ENG 2, and APU BLEED switches, on the forward overhead panel P5, to the OFF position (TASK 36-00-00-860-806).

SUBTASK 29-11-02-860-002

- (2) Attach the DO-NOT-USE tag to the pneumatic ground service connector.

SUBTASK 29-11-02-860-003

- (3) Release the pressure from the hydraulic reservoirs. To release it, do this task: (Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802).

D. Pressurization Module Removal

SUBTASK 29-11-02-020-001

- (1) Disconnect the hydraulic tube [1] from the orifice assembly [13].

SUBTASK 29-11-02-020-002

- (2) Disconnect the pneumatic supply lines [10] from the pressurization module [2]

<p>EFFECTIVITY</p> <p>HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106</p>
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SUBTASK 29-11-02-020-003

- (3) Install caps on the pneumatic supply lines [10] and the tube [1] and the ports in the pressurization module [2].

SUBTASK 29-11-02-020-004

- (4) Remove the pressurization module [2]:
- (a) Remove the bolts [3] and washers [4] from the pressurization module [2].
 - (b) Remove the pressurization module [2] from the airplane.

SUBTASK 29-11-02-020-005

- (5) Remove these parts from the pressurization module [2] if they are necessary for the replacement pressurization module [2]:
- (a) Remove the orifice assembly [13] from the pressurization module [2].
 - 1) Remove the nut [14], retainer [18], packing [17], backup ring [16], and packing [15].
 - 2) Make a record of position of the packing [17], backup ring [16], and packing [15].
 - 3) Discard the backup ring [16] and packings [15] [17].
 - (b) Remove the plug [7] and packing [11] from the test port [12].
 - 1) Discard the packing [11].
 - (c) Remove the reducers [9] and packings [7] from the pneumatic supply ports.
 - 1) Discard the packings [7].

————— **END OF TASK** —————

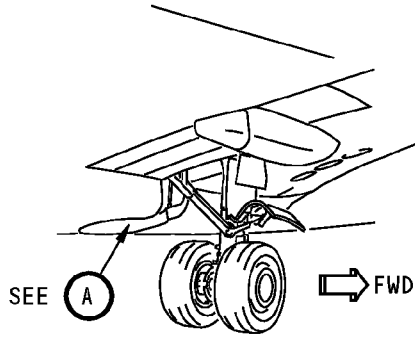
EFFECTIVITY

HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

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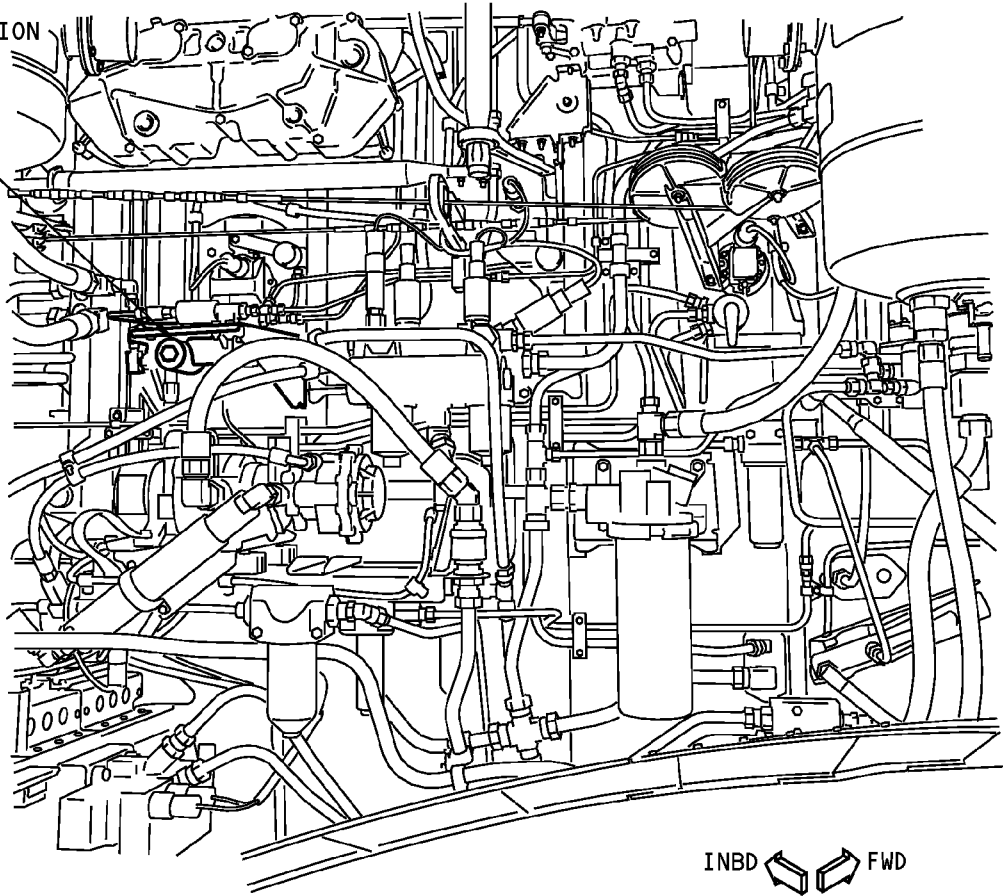
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HYDRAULIC
RESERVOIR
PRESSURIZATION
MODULE

SEE **(B)**



**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

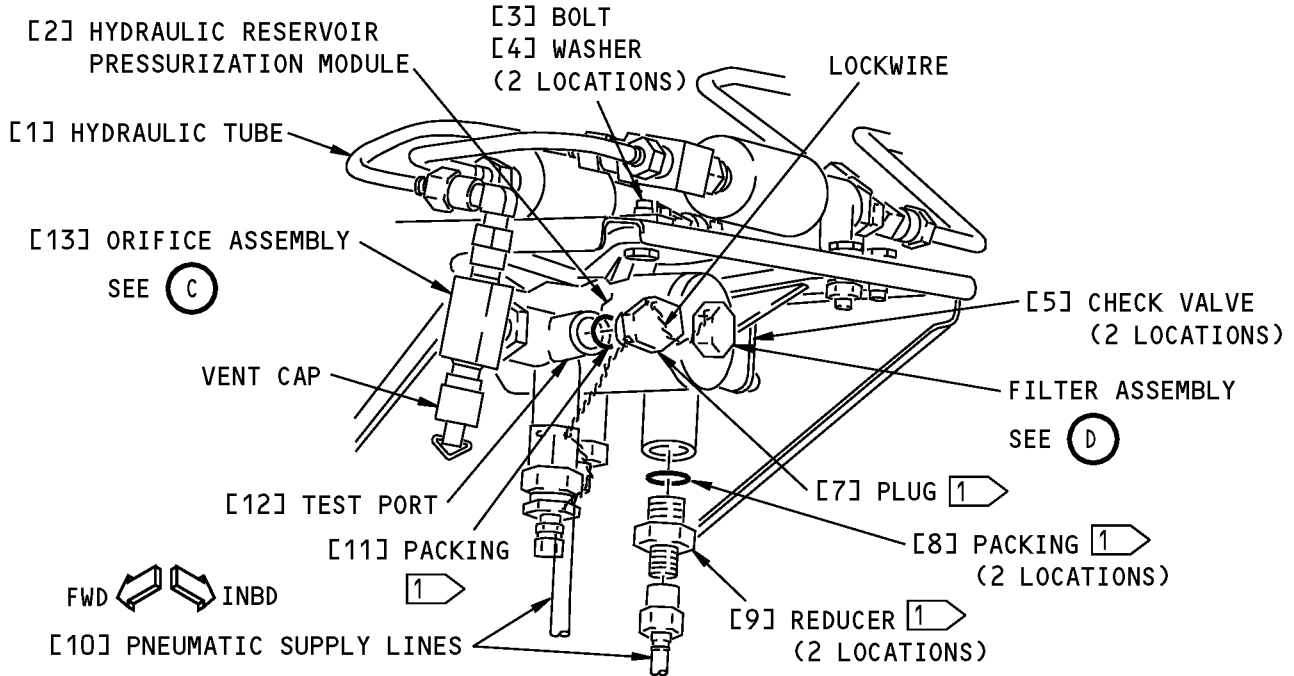
(A)

**Hydraulic Reservoir Pressurization Module Installation
Figure 401 (Sheet 1 of 3)/29-11-02-990-801**

EFFECTIVITY
HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

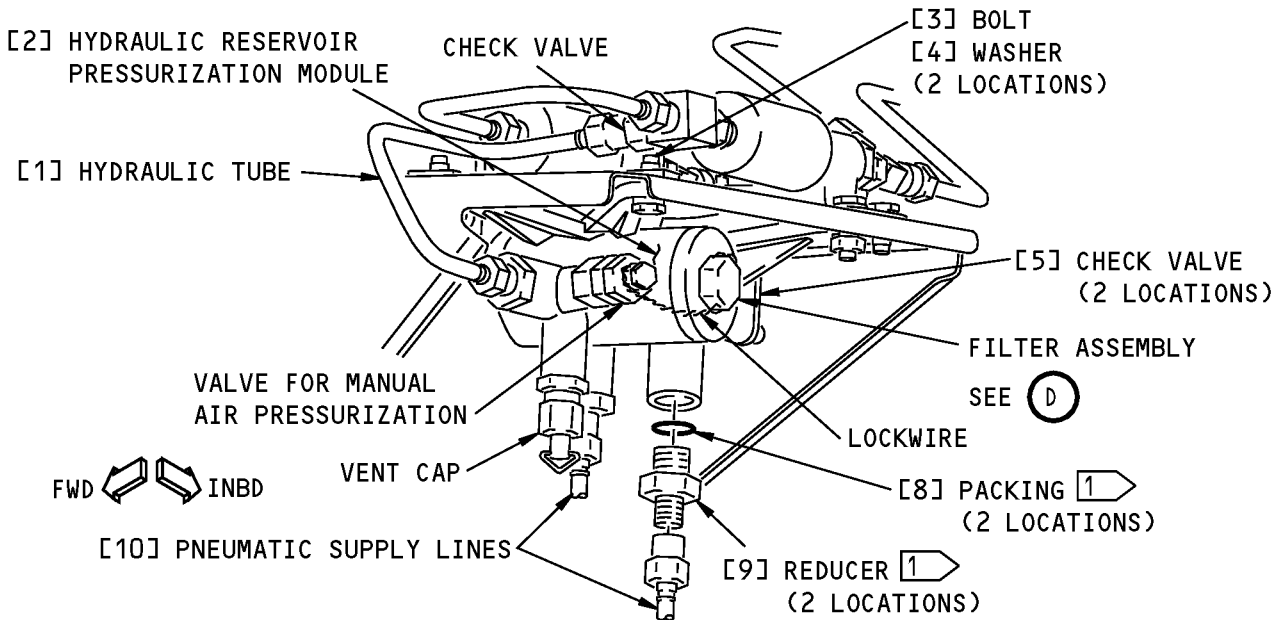
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HYDRAULIC RESERVOIR PRESSURIZATION MODULE

(B) 2



HYDRAULIC RESERVOIR PRESSURIZATION MODULE

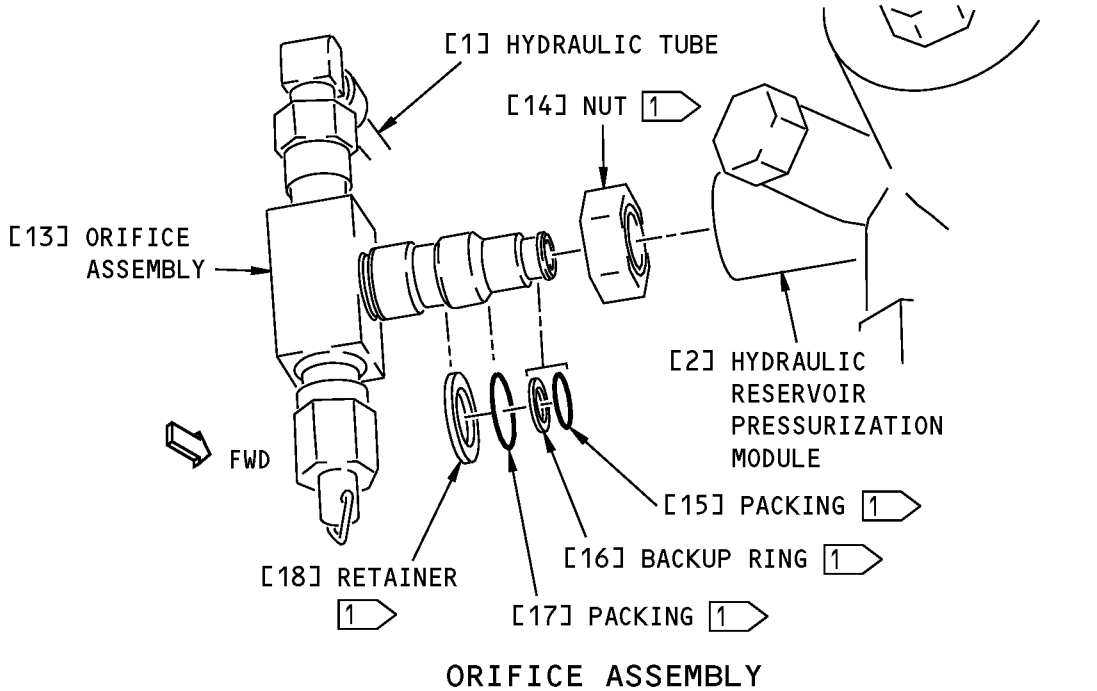
(B) 3

Hydraulic Reservoir Pressurization Module Installation
Figure 401 (Sheet 2 of 3)/29-11-02-990-801

EFFECTIVITY
 HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

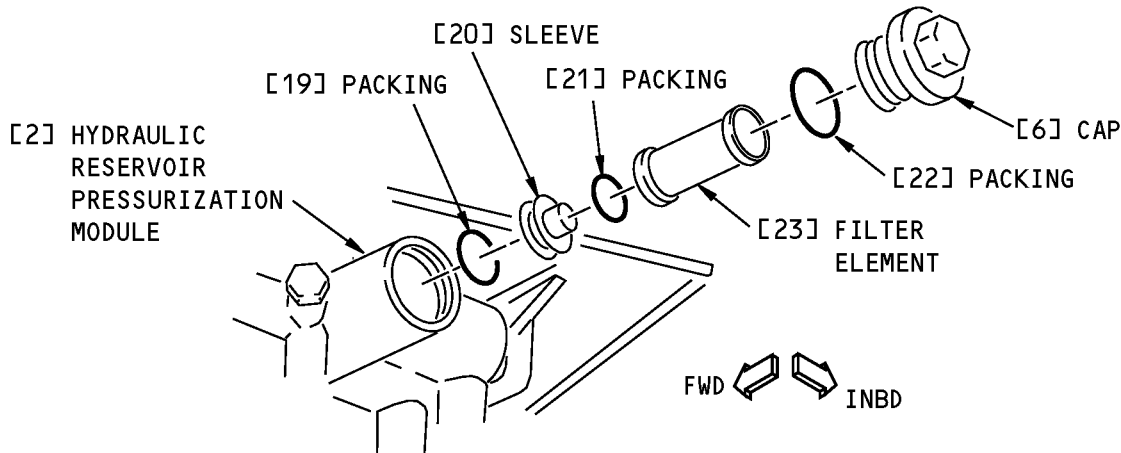
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ORIFICE ASSEMBLY

(C)



FILTER ASSEMBLY

(D)

- 1 REMOVAL OF THESE COMPONENTS IS NOT NECESSARY IF THEY ARE INSTALLED ON THE REPLACEMENT HYDRAULIC RESERVOIR PRESSURIZATION MODULE.
- 2 PRESSURIZATION MODULE WITHOUT FILTER DRAIN VENT, PRE-SB 737-29-1094 (PRR38275-21)
- 3 PRESSURIZATION MODULE WITH FILTER DRAIN VENT, POST-SB 737-29-1094 (PRR38275-21)

Hydraulic Reservoir Pressurization Module Installation
Figure 401 (Sheet 3 of 3)/29-11-02-990-801

EFFECTIVITY
 HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

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TASK 29-11-02-400-801

3. Hydraulic Reservoir Pressurization Module Installation

(Figure 401)

A. Consumable Materials

Reference	Description	Specification
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~C32 (QQ-N-281)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Module	29-11-02-01-165 29-11-02-01-170	HAP 001-013, 015-026 HAP 001-013, 015-026, 028-030
8	Packing	29-11-02-01-045 29-11-02-01-135 29-11-02-01-140	HAP 001-013, 015-026, 028-030 HAP 001-013, 015-026 HAP 028-030
11	Packing	29-11-02-01-240	HAP 001-013, 015-026, 028-030

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-11-02-640-001

(1) Install these parts in the new pressurization module [2] if they are not installed:

(a) The orifice assembly [13]:

- 1) Lubricate the threads, packing [17], packing [15], and backup ring [16] with fluid, D00153.
- 2) Install the nut [14], retainer [18], packing [17], backup ring [16], and packing [15] on the orifice assembly [13].
- 3) Install the orifice assembly [13] on the pressurization module [2] but do not tighten it.

(b) The plug [7] in the test port [12]:

- 1) Lubricate the packing [11] with fluid, D00153.
- 2) Install the packing [11] on the plug [7].
- 3) Install the plug [7] on the pressurization module [2].
- 4) Install lockwire, G01912.

EFFECTIVITY
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- (c) The reducers [9] in the pneumatic supply ports:
 - 1) Lubricate the packing [8] with fluid, D00153.
 - 2) Lubricate the threads of the reducers [9] with primer, C00259.
 - 3) Install the packing [8] on the reducers [9].
 - 4) Install the reducers [9] in the pressurization module [2].

SUBTASK 29-11-02-420-001

- (2) Install the pressurization module [2]:
 - (a) Put the pressurization module [2] in its position.
 - (b) Install the bolts [3] and washers [4] to attach the pressurization module [2] to the bracket.

SUBTASK 29-11-02-420-002

- (3) Remove the caps from the hydraulic tube [1] and the pneumatic supply lines [10].

SUBTASK 29-11-02-420-003

- (4) Connect the hydraulic tube [1] to the orifice assembly [13]:
 - (a) Adjust the orifice assembly [13] until you can connect the hydraulic tube [1].
 - (b) Tighten the orifice assembly [13].

SUBTASK 29-11-02-420-004

- (5) Connect the pneumatic supply lines [10] to the pressurization module [2].

E. Hydraulic Reservoir Pressurization Module Installation Test

SUBTASK 29-11-02-420-005

- (1) Remove the DO-NOT-USE tag from the connector for the ground pneumatic air.

SUBTASK 29-11-02-790-001

- (2) Do this task: Hydraulic Reservoir Pressurization Module Leak Check, TASK 29-11-02-790-801.

————— END OF TASK —————

TASK 29-11-02-000-802

4. Hydraulic Reservoir Pressurization Module Filter Removal

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

EFFECTIVITY
 HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

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D. Prepare for the Removal

SUBTASK 29-11-02-860-004

WARNING: MAKE SURE THAT YOU REMOVE PRESSURE FROM THE PNEUMATIC MANIFOLD. IF YOU DO NOT REMOVE PRESSURE, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR WHEN YOU DISCONNECT THE PRESSURIZATION MODULE.

- (1) Set the ENG 1, ENG 2, and APU BLEED switches, on the forward overhead panel P5, to the OFF position (TASK 36-00-00-860-806).

SUBTASK 29-11-02-860-005

- (2) Attach the DO-NOT-USE tag to the connector for the ground pneumatic air.

SUBTASK 29-11-02-860-006

- (3) Release the pressure from the hydraulic reservoirs. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802.

E. Pressurization Module Filter Removal

SUBTASK 29-11-02-840-001

- (1) Remove the sealant that is around the filter cap [6] with a wooden or plastic scraper.

SUBTASK 29-11-02-020-006

- (2) Remove the filter cap [6], packing [22], filter element [23], packing [21], sleeve [20], and packing [19] from the pressurization module [2].
 - (a) Discard packings.

————— END OF TASK —————

TASK 29-11-02-400-802

5. Hydraulic Reservoir Pressurization Module Filter Installation

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
20-30-80-910-801	General Cleaning of Metal (Series 80) (P/B 201)
20-30-83-910-801	General Cleaning of Composites (Series 83) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1121	Compressor - Air, Portable, Explosion Proof

D. Consumable Materials

Reference	Description	Specification
A00363	Adhesive - Silicone - RTV 162	MIL-A-46146B
B01000	Solvent - General Cleaning Of Metal (AMM 20-30-801/201) - Series 80	
B01003	Solvent - General Cleaning Of Composites (AMM 20-30-83/201) - Series 83	

EFFECTIVITY
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(Continued)

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~C32 (QQ-N-281)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
19	Packing	29-11-02-01-230	HAP 001-013, 015-026, 028-030
21	Packing	29-11-02-01-220	HAP 001-013, 015-026, 028-030
22	Packing	29-11-02-01-205	HAP 001-013, 015-026, 028-030
23	Element	29-11-02-01-210 29-11-02-01-215	HAP 001-013, 015-026, 028-030 HAP 001-013, 015-026, 028-030

F. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

G. Procedure

SUBTASK 29-11-02-110-001

- (1) Clean the filter cavity of the pressurization module [2] with Series 80 solvent, B01000 (TASK 20-30-80-910-801).
 - (a) Dry the filter cavity with a clean cloth or portable explosion-proof air compressor, STD-1121 at 20 psi maximum.

SUBTASK 29-11-02-110-002

- (2) Clean the filter element [23], filter cap [6], and sleeve [20] with Series 83 solvent, B01003 (TASK 20-30-83-910-801) and a brush.
 - (a) Dry the parts with a clean cloth or portable explosion-proof air compressor, STD-1121 at 20 psi maximum.

SUBTASK 29-11-02-640-002

- (3) Lubricate the packings and threads of the filter cap [6] with fluid, D00153.

SUBTASK 29-11-02-420-006

- (4) Install the packing [19], sleeve [20], packing [21], filter element [23], packing [22], and filter cap [6] on the pressurization module [2].
 - (a) Tighten filter cap (6) to 75-95 in-lbs.
 - (b) Install lockwire, G01912.

<p>EFFECTIVITY</p> <p>HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106</p>
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H. Hydraulic Pressurization Module Filter Installation Test

SUBTASK 29-11-02-420-007

(1) Remove the DO-NOT-USE tag from the pneumatic ground service connector. .

SUBTASK 29-11-02-790-002

(2) Do this task: Hydraulic Reservoir Pressurization Module Leak Check, TASK 29-11-02-790-801.

SUBTASK 29-11-02-110-003

(3) Clean the area around the filter cap [6] with Series 83 solvent, B01003 (TASK 20-30-80-910-801).

SUBTASK 29-11-02-390-001

(4) Apply RTV 162 adhesive, A00363 around the filter cap [6].

————— END OF TASK —————

TASK 29-11-02-790-801

6. Hydraulic Reservoir Pressurization Module Leak Check

A. References

Reference	Title
29-11-01-700-801	Hydraulic Reservoir Pressurization Leakage Test (P/B 501)
36-00-00-860-801	Supply Pressure to the Pneumatic System (Selection) (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Procedure

SUBTASK 29-11-02-860-007

(1) Do this task: Supply Pressure to the Pneumatic System (Selection), TASK 36-00-00-860-801.

SUBTASK 29-11-02-790-003

(2) Use a solution of soap and water to make sure that the filter cap [6] does not have a leak.

SUBTASK 29-11-02-210-001

(3) Make sure the reservoir gauges (near the pressurization module) show approximately the same pressure as the bleed air gauge on the forward overhead panel P5.

SUBTASK 29-11-02-280-001

(4) Make sure there is continuous flow of air from the vent cap at the left end of the pressurization module [2].

SUBTASK 29-11-02-280-002

(5) Make sure there is a continuous flow of air from the vent caps at the right and left pneumatic ducts.

NOTE: You can find the vent caps at approximately RBL 25 and LBL 30 on the forward bulkhead.

(a) If there is no continuous flow of air from the vent caps, then, do this task: Hydraulic Reservoir Pressurization Leakage Test, TASK 29-11-01-700-801.

EFFECTIVITY

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SUBTASK 29-11-02-860-008

(6) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

————— **END OF TASK** —————

EFFECTIVITY

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HYDRAULIC RESERVOIR PRESSURIZATION MODULE - INSPECTION/CHECK

1. General

A.

TASK 29-11-02-200-801

2. Hydraulic Reservoir Pressurization Module - Inspection/Check

A. References

Reference	Title
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-02-000-801	Hydraulic Reservoir Pressurization Module Removal (P/B 401)
29-11-02-000-802	Hydraulic Reservoir Pressurization Module Filter Removal (P/B 401)
29-11-02-400-801	Hydraulic Reservoir Pressurization Module Installation (P/B 401)
29-11-02-400-802	Hydraulic Reservoir Pressurization Module Filter Installation (P/B 401)
29-11-02-790-801	Hydraulic Reservoir Pressurization Module Leak Check (P/B 401)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Prepare for the Inspection

SUBTASK 29-11-02-860-009

WARNING: MAKE SURE THAT YOU REMOVE PRESSURE FROM THE PNEUMATIC MANIFOLD. IF YOU DO NOT REMOVE PRESSURE, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Set the ENG 1, ENG 2, and APU BLEED switches, on the forward overhead panel P5, to the OFF position (TASK 36-00-00-860-806).

SUBTASK 29-11-02-860-010

(2) Attach the DO-NOT-USE tag to the connector for the pneumatic ground service connector.

SUBTASK 29-11-02-860-011

(3) Release the pressure from the hydraulic reservoirs. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802.

C. Hydraulic Pressurization Module Filter Inspection

SUBTASK 29-11-02-020-007

(1) Remove the filter from the hydraulic pressurization module. To remove the filter, do this task: Hydraulic Reservoir Pressurization Module Filter Removal, TASK 29-11-02-000-802

SUBTASK 29-11-02-212-001

(2) Inspect the filter for corrosion.

(a) If corrosion is found, install a new filter.

SUBTASK 29-11-02-420-008

(3) Install the filter in the hydraulic pressurization module. To install the filter, do this task: Hydraulic Reservoir Pressurization Module Filter Installation, TASK 29-11-02-400-802

HAP 001-013, 015-026 PRE SB 737-29-1094 AND PRE SB 737-29-1106

D. Hydraulic Pressurization Module Orifice Inspection

SUBTASK 29-11-02-020-008

(1) Do the steps that follow to remove the orifice assembly from the hydraulic pressurization module:

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HAP 001-013, 015-026 PRE SB 737-29-1094 AND PRE SB 737-29-1106 (Continued)

- (a) Disconnect the hydraulic tube from the orifice assembly: Hydraulic Reservoir Pressurization Module Removal, TASK 29-11-02-000-801 SUBTASK 29-11-02-020-001
- (b) Do the steps necessary to remove the orifice assembly: Hydraulic Reservoir Pressurization Module Removal, TASK 29-11-02-000-801 SUBTASK 29-11-02-020-005

SUBTASK 29-11-02-212-002

- (2) Inspect the orifice assembly for corrosion.

SUBTASK 29-11-02-100-001

- (3) Remove all blockage or corrosion found in the orifice assembly.

SUBTASK 29-11-02-420-009

- (4) Do the steps necessary to install the orifice assembly in the pressurization module: Hydraulic Reservoir Pressurization Module Installation, TASK 29-11-02-400-801 SUBTASK 29-11-02-640-001

SUBTASK 29-11-02-420-010

- (5) Do the necessary steps to connect the hydraulic tube to the orifice assembly: Hydraulic Reservoir Pressurization Module Installation, TASK 29-11-02-400-801 SUBTASK 29-11-02-420-003

HAP 001-013, 015-026, 028-030 PRE SB 737-29-1106

E. Return the Airplane to its Usual Condition

SUBTASK 29-11-02-860-012

- (1) Remove the DO-NOT-USE tag from the connector for the ground pneumatic air.

SUBTASK 29-11-02-790-004

- (2) Do this task: Hydraulic Reservoir Pressurization Module Leak Check, TASK 29-11-02-790-801.

————— **END OF TASK** —————

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HYDRAULIC RESERVOIR PRESSURIZATION MODULE - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. The procedure contains this task:
 - (1) Vent Cap Check - Use this check to make sure the vent cap is not clogged.

TASK 29-11-03-220-801

2. Vent Cap Check

(Figure 601)

- A. General
 - (1) This procedure is a scheduled maintenance task.
- B. References

Reference	Title
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for the Check

SUBTASK 29-11-03-860-001

WARNING: MAKE SURE THAT YOU REMOVE PRESSURE FROM THE PNEUMATIC MANIFOLD. IF YOU DO NOT REMOVE PRESSURE, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR WHEN YOU DISCONNECT THE VENT CAP.

- (1) Set the ENG 1, ENG 2, and APU BLEED switches, on the forward overhead panel P5, to the OFF position (TASK 36-00-00-860-806).

SUBTASK 29-11-03-860-002

- (2) Attach the DO-NOT-USE tag to the connector for the pneumatic ground service connector.

SUBTASK 29-11-03-860-003

- (3) Release the pressure from the hydraulic reservoirs. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802.

E. Procedure

SUBTASK 29-11-03-020-001

- (1) Remove the vent cap from the orifice assembly.

SUBTASK 29-11-03-200-001

- (2) Inspect the vent cap.

SUBTASK 29-11-03-100-001

- (3) Clean the vent cap if it is clogged.

SUBTASK 29-11-03-210-001

- (4) Inspect the orifice assembly.

SUBTASK 29-11-03-160-001

- (5) Clean the orifice assembly, if it is clogged.

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SUBTASK 29-11-03-410-001

(6) Install the vent cap on orifice assembly.

SUBTASK 29-11-03-840-001

(7) Remove the DO-NOT-USE tag from the connector for the pneumatic ground service connector.

————— **END OF TASK** —————

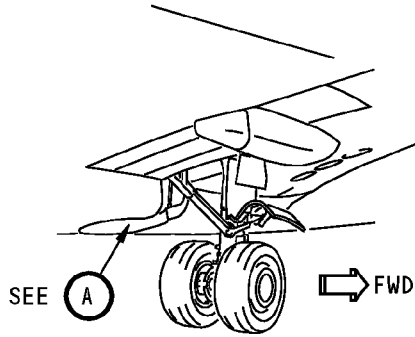
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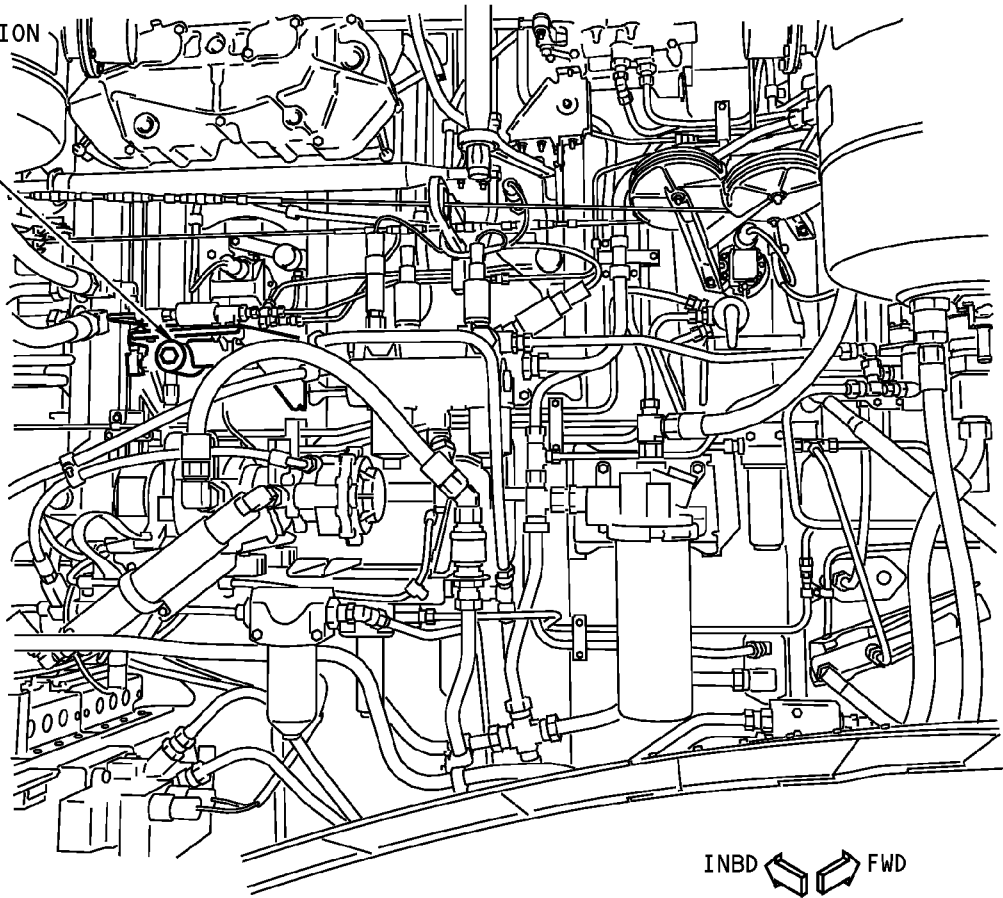
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HYDRAULIC
RESERVOIR
PRESSURIZATION
MODULE

SEE **(B)**



**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

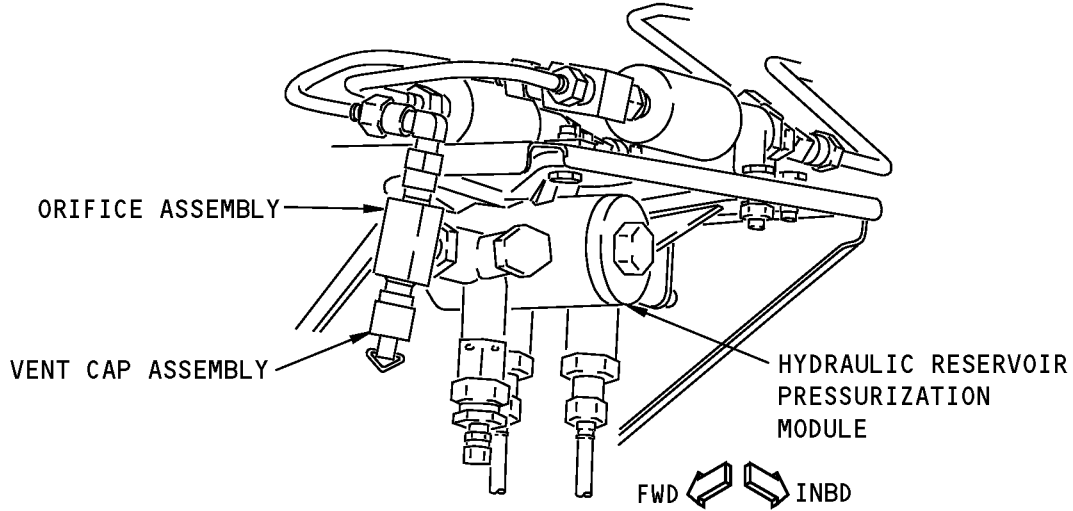
(A)

**Hydraulic Reservoir Pressurization Module
Figure 601 (Sheet 1 of 2)/29-11-03-990-801**

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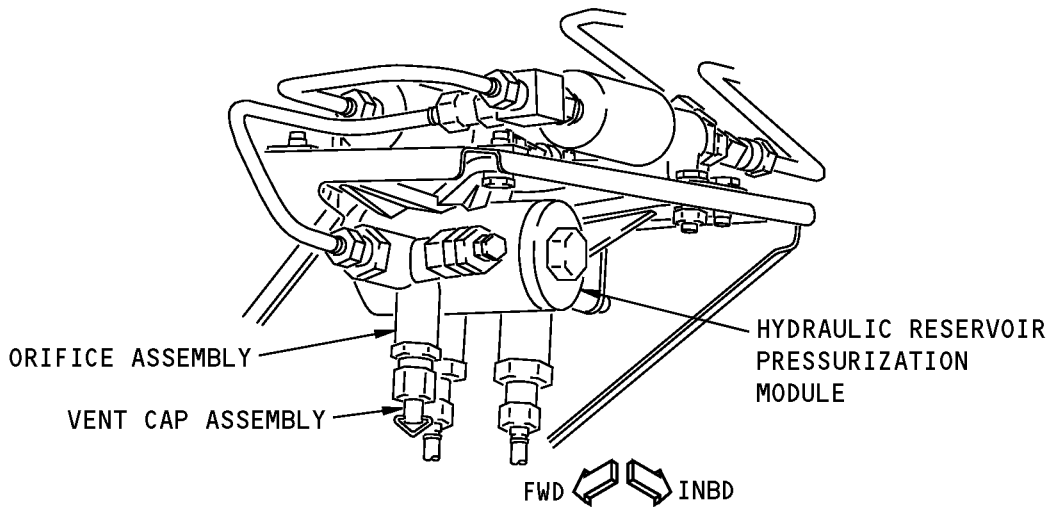
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HYDRAULIC RESERVOIR PRESSURIZATION MODULE

B 1



HYDRAULIC RESERVOIR PRESSURIZATION MODULE

B 2

- 1 PRESSURIZATION MODULE WITHOUT FILTER DRAIN VENT
- 2 PRESSURIZATION MODULE WITH FILTER DRAIN VENT

**Hydraulic Reservoir Pressurization Module
Figure 601 (Sheet 2 of 2)/29-11-03-990-801**

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HEAT EXCHANGER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of a heat exchanger
- (2) An installation of a heat exchanger.

B. The heat exchanger for hydraulic system A is installed in the bottom of the fuel tank on the left wing. The heat exchanger for hydraulic system B is installed in the bottom of the fuel tank on the right wing. This procedure is applicable for the hydraulic systems A and B.

TASK 29-11-04-000-801

2. Heat Exchanger Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
28-11-00-910-802	Purging and Fuel Tank Entry (P/B 201)
28-11-11-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Fuel Tank Defueling (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

C. Prepare for the Removal

SUBTASK 29-11-04-860-002

- (1) Remove hydraulic power from system A and system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-04-860-003

- (2) Release pressure from the applicable hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-04-860-004

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-11-04-650-001

- (4) Defuel the applicable fuel tank. To defuel it, do this task: (Fuel Tank Defueling, TASK 28-26-00-650-801).

SUBTASK 29-11-04-100-001

- (5) During this procedure, if you get hydraulic fluid on the airplane, clean it off immediately. To clean it, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

SUBTASK 29-11-04-010-001

- (6) Remove the applicable main fuel tank access door. To remove it, do this task: Main Tank Access Door Removal, TASK 28-11-11-000-801.

SUBTASK 29-11-04-650-002

WARNING: OBEY ALL OF THE FUEL TANK PURGING AND ENTRY PRECAUTIONS. IF YOU DO NOT, INJURY TO PERSONS AND DAMAGE TO THE AIRPLANE CAN OCCUR.

- (7) Prepare the fuel tank before you get into it. To prepare it, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-910-802.

D. Heat Exchanger Removal

SUBTASK 29-11-04-020-001

- (1) Disconnect the hydraulic lines (see figure 601, task 29-11-04-200-801) from the inlet port [11] and outlet port [13] (outside the fuel tank).

SUBTASK 29-11-04-020-002

- (2) Remove the nuts [10], washers [9], washers [8], and bolts [7] from the heat exchanger [1].

SUBTASK 29-11-04-020-003

- (3) Remove the nut [5], washer [4], washer [3], bolt [2], and washer [6] from the heat exchanger [1].

SUBTASK 29-11-04-020-004

- (4) Remove the nut [5], washer [4], bolt [16], washer [3], bonding jumper [14], washer [15], and washer [6] from the heat exchanger [1].

SUBTASK 29-11-04-020-005

- (5) Remove the heat exchanger [1] through the main fuel tank access door.

NOTE: Do not discard the washer [6].

- (a) Keep a record of number of washers [6] for installation.

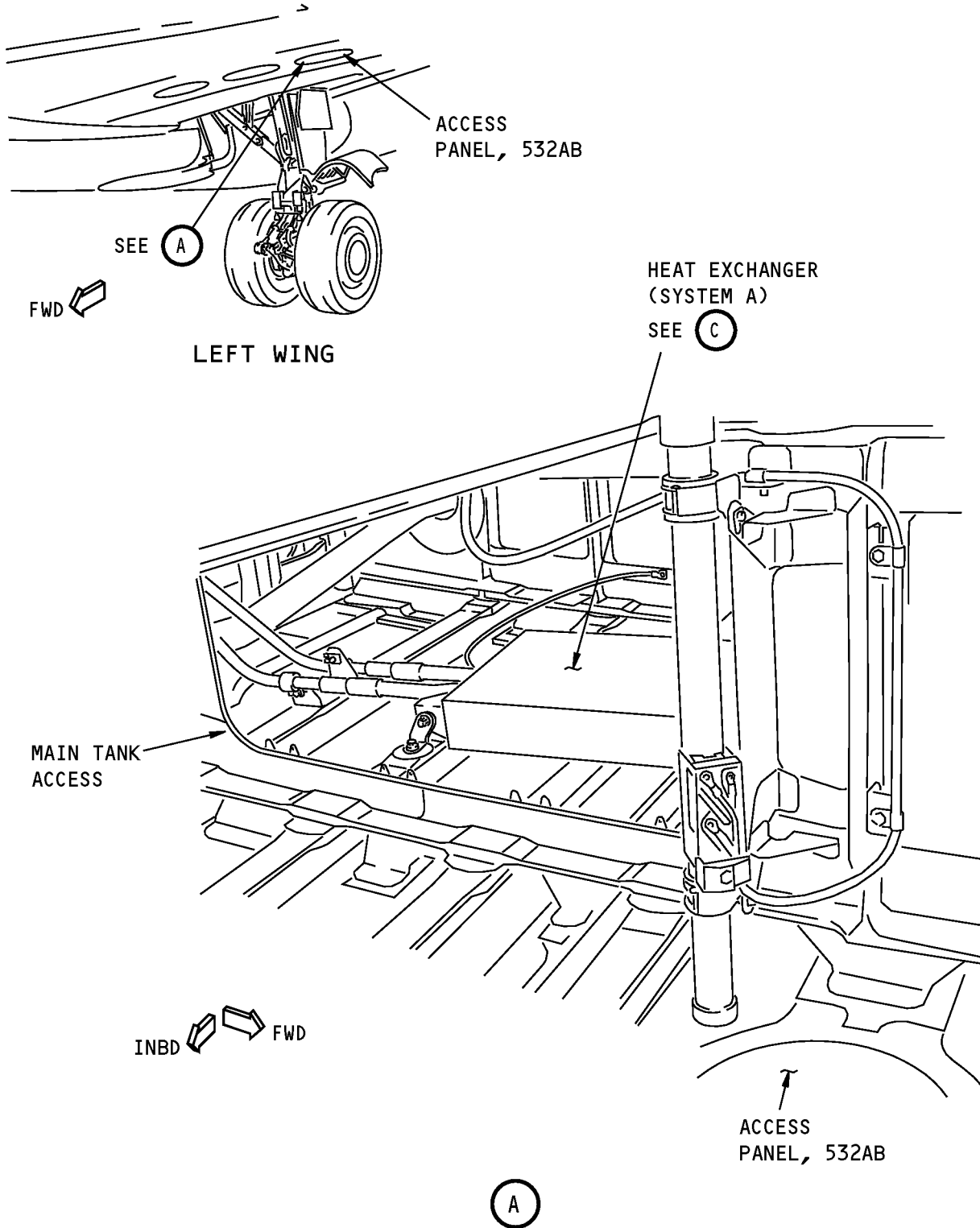
————— **END OF TASK** —————

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**Heat Exchanger Installation
Figure 401 (Sheet 1 of 4)/29-11-04-990-801**

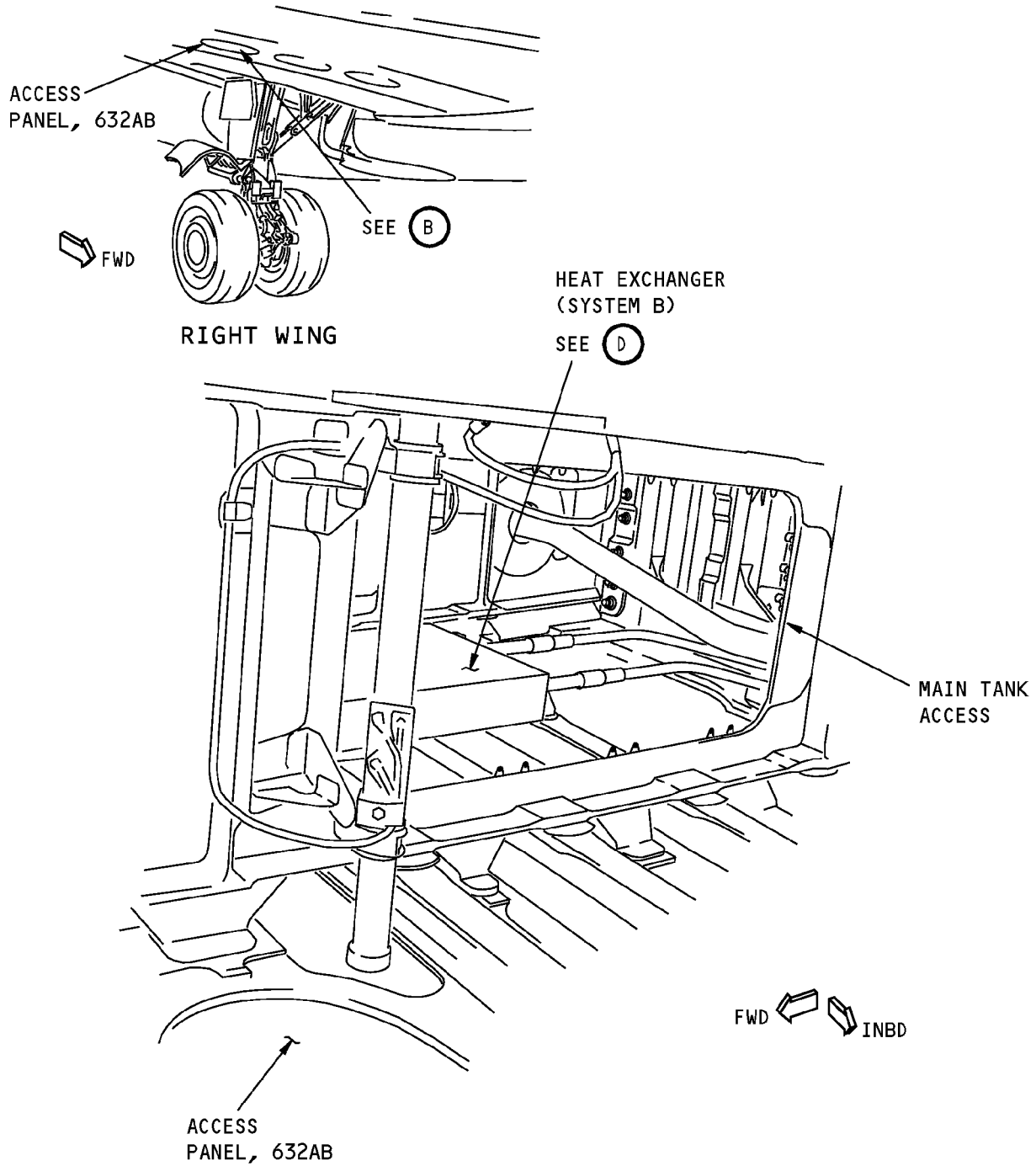
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(B)

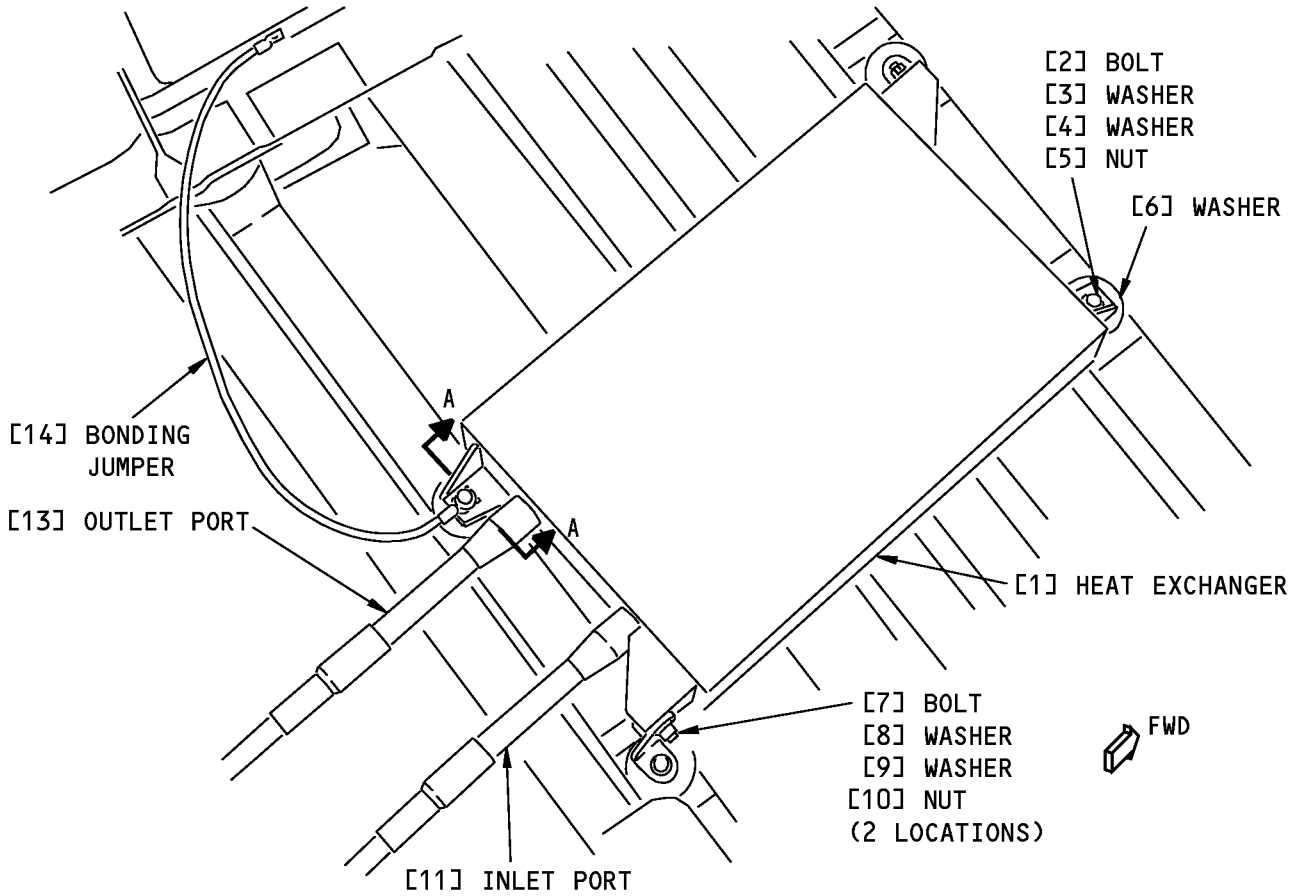
**Heat Exchanger Installation
Figure 401 (Sheet 2 of 4)/29-11-04-990-801**

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**HEAT EXCHANGER
(SYSTEM A)**

(C)

G06737 S0006572729_V2

**Heat Exchanger Installation
Figure 401 (Sheet 3 of 4)/29-11-04-990-801**

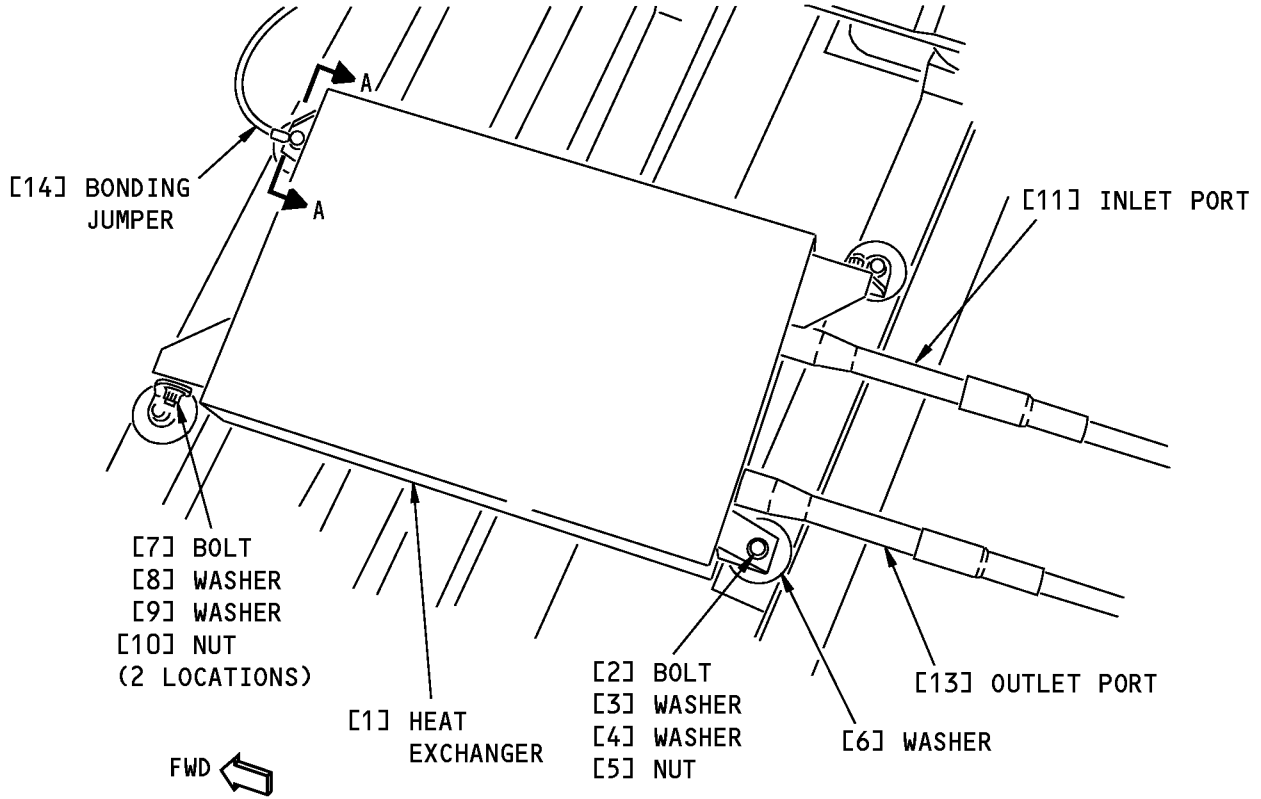
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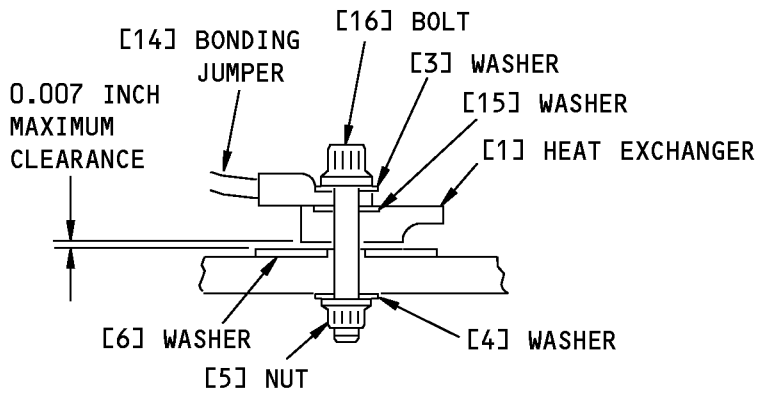
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**HEAT EXCHANGER
(SYSTEM B)**

(D)



(EXAMPLE)

A-A

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Heat Exchanger Installation
Figure 401 (Sheet 4 of 4)/29-11-04-990-801

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TASK 29-11-04-400-801

3. Heat Exchanger Installation

(Figure 401)

A. References

Reference	Title
12-11-00-650-801	Precautions and Limits for the Refuel Operation (P/B 301)
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-51-760-801	Electrical Resistance Specifications in the Fuel Tank Check (P/B 401)
28-11-00-910-802	Purging and Fuel Tank Entry (P/B 201)
28-11-11-400-801	Main Tank Access Door Installation (P/B 401)
29-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)

C. Consumable Materials

Reference	Description	Specification
A00436	Sealant - Fuel Tank	BMS5-45 (Supersedes BMS 5-26)
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142

D. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Heat Exchanger Installation

SUBTASK 29-11-04-650-003

WARNING: OBEY ALL OF THE FUEL TANK PURGING AND ENTRY PRECAUTIONS. IF YOU DO NOT, INJURY TO PERSONS AND DAMAGE TO THE AIRPLANE CAN OCCUR.

- (1) Prepare the fuel tank before you get into it. To prepare it, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-910-802.

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SUBTASK 29-11-04-420-001

- (2) Put the heat exchanger [1] through the main tank access door.

NOTE: Put the end of the heat exchanger [1] with the inlet port [11] and outlet port [13] in first.

SUBTASK 29-11-04-420-002

- (3) Temporarily install washer [6], washer [4], washer [3], bolt [2], and nut [5].

SUBTASK 29-11-04-420-003

- (4) Temporarily install washer [6], washer [15], bonding jumper [14], washer [3], bolt [16], washer [4], and nut [5].

SUBTASK 29-11-04-420-004

- (5) If necessary, install an additional washer [15] to provide clearance between the bonding jumper [14] and heat exchanger [1].

SUBTASK 29-11-04-420-006

- (6) Measure the clearance between the washer [6] and the heat exchanger [1].
 - (a) If the clearance is more than 0.007 inch, add additional washer [6] to fill the clearance.

SUBTASK 29-11-04-420-007

- (7) Tighten the nuts [5].

SUBTASK 29-11-04-420-008

- (8) Install the washers [8], washers [9], bolts [7], and nuts [10].

SUBTASK 29-11-04-420-009

- (9) Connect the hydraulic lines(See Figure 601, Task 29-11-04-200-801) to the inlet port [11] and the outlet port [13] (outside the fuel tank).

SUBTASK 29-11-04-940-001

- (10) Make sure you remove all of the tools, unwanted parts, and unwanted objects from the wing fuel tank.

F. Heat Exchanger Installation Test

SUBTASK 29-11-04-860-011

- (1) Measure the resistance between the bonding jumper structure attach point [14] and the heat exchanger [1].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

- (a) If the resistance is greater than 0.0025 ohm, do a check of the electrical bond between the bonding jumper structure attach point [14] and the heat exchanger [1].
 - 1) Rework the bonding jumper connections as required to make sure the resistance is not more than 0.0025 ohm.

SUBTASK 29-11-04-765-002

- (2) Measure the electrical bonding resistance between each of the penetration fittings on the hydraulic lines and the structure outside the fuel tank with a bonding meter, COM-1550 (TASK 20-10-51-760-801).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

- (a) Make sure the electrical fay surface bonding resistance is less than 0.001 ohm (1 milliohm).

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- 1) Rework the bonding surfaces as required to make sure the resistance is not more than 0.001 ohm.

SUBTASK 29-11-04-211-001

- (3) Check the seals on the penetration fittings.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 29-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

- (a) If necessary, replace the fillet seal on the penetration fittings on the outside of the tank with sealant, A02315.
- (b) If necessary, replace the full bodied fillet seal on the inside of the tank with sealant, A00436.

SUBTASK 29-11-04-860-005

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (4) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-11-04-860-006

- (5) Pressurize the application hydraulic system reservoir. To pressure it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-04-860-008

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU APPLY HYDRAULIC POWER. THEAILERONS, RUDDERS, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU APPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Pressurize the hydraulic system with the applicable electric motor-driven pump (EMDP). To pressurize it, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-11-04-790-001

- (7) Make sure that there is no hydraulic fluid leakage at the hydraulic lines(See Figure 601, Task 29-11-04-200-801) or from the heat exchanger [1].

G. Put the Airplanes Back to Its Usual Condition

SUBTASK 29-11-04-860-010

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

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SUBTASK 29-11-04-410-001

- (2) Install the applicable main tank access door, to install it, do this task: Main Tank Access Door Installation, TASK 28-11-11-400-801.

SUBTASK 29-11-04-610-001

- (3) Fill the fuel tank. To fill it, do this task: Precautions and Limits for the Refuel Operation, TASK 12-11-00-650-801.

SUBTASK 29-11-04-610-002

- (4) Fill the applicable hydraulic system reservoir if it is necessary. To fill it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

————— **END OF TASK** —————

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HEAT EXCHANGER - INSPECTION/CHECK

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains a functional check of the bonding resistance between the structure and the hydraulic line spar penetrations.

TASK 29-11-04-200-801

2. Hydraulic Lines to Heat Exchanger - Bonding Resistance Check

(Figure 601)

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
20-10-51-760-801	Electrical Resistance Specifications in the Fuel Tank Check (P/B 401)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)

D. Location Zones

Zone	Area
532	Left Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing BL 643.50
632	Right Wing - Main Tank, Rib 5 to Rib 22, Wing Station 204.25 to Wing Station 643.50

E. Access Panels

Number	Name/Location
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

F. Procedure

SUBTASK 29-11-04-981-001

- (1) If the flaps are not extended, do these steps:

WARNING: MAKE SURE ALL PERSONS AND EQUIPMENT ARE CLEAR OF THE FLIGHT CONTROLS SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Supply hydraulic power to hydraulic system A and B .
- (b) Put the flap control lever in the ten unit position.

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SUBTASK 29-11-04-981-002

- (2) Remove hydraulic power from system A and system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-04-560-001

- (3) Get access to the inlet and outlet hydraulic lines for the main tank heat exchangers (outside the fuel tank).

Open this access panel:

<u>Number</u>	<u>Name/Location</u>
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

SUBTASK 29-11-04-765-001

- (4) Measure the electrical bonding resistance between each of the penetration fittings on the hydraulic lines and the structure with a bonding meter, COM-1550 (TASK 20-10-51-760-801).
 - (a) Make sure the electrical fay surface bonding resistance is less than 0.001 ohm (1 milliohm).

SUBTASK 29-11-04-410-002

- (5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
551DB	Lower Inboard Fixed Trailing Edge, Lube Actuator & MLG Beam Outboard Attach Pin Access Panel

————— **END OF TASK** —————

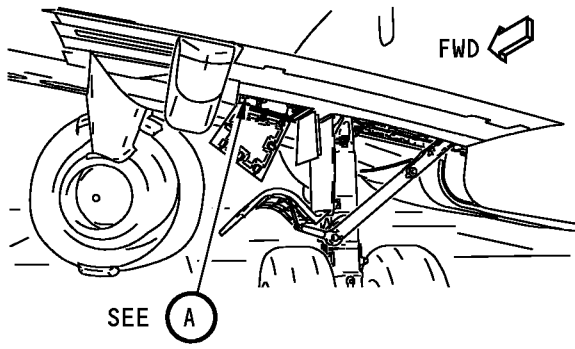
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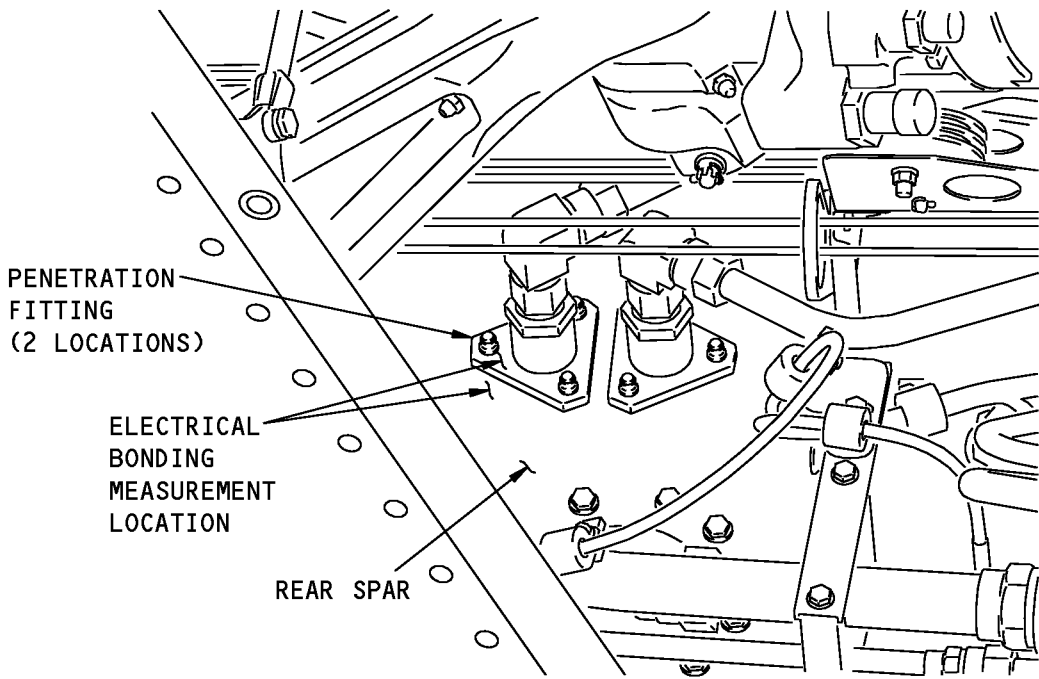
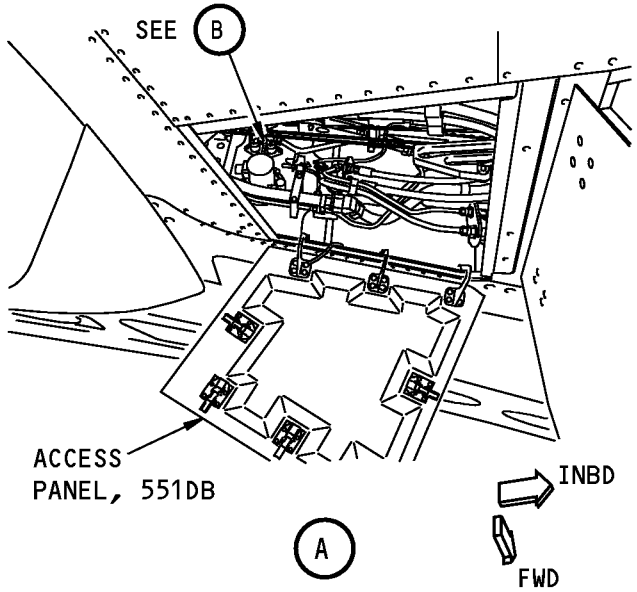
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LEFT WING



**PENETRATION FITTINGS OF HYDRAULIC LINES
BONDING MEASUREMENT**

(B)

**Hydraulic Lines to Heat Exchanger - Bonding Resistance Measurement
Figure 601/29-11-04-990-802**

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GROUND SERVICE DISCONNECT FILTER - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) Ground service disconnect filter removal.
- (2) Ground service disconnect filter installation.

B. The ground service disconnect module is used to supply hydraulic power to the airplane from a hydraulic test stand. There are two ground service disconnect modules one for hydraulic system A and one for hydraulic system B. This procedure tells you how to replace the filter that is in the module.

TASK 29-11-08-000-801

2. Ground Service Disconnect Filter Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

C. Access Panels

Number	Name/Location
192BL	ECS Ram Air Inlet Mixing Duct Panel - Forward
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

D. Prepare for the Removal

SUBTASK 29-11-08-840-001

- (1) Remove hydraulic power from the applicable system. To remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-08-840-002

- (2) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-08-010-001

- (3) Open the applicable access panels:

Number	Name/Location
192BL	ECS Ram Air Inlet Mixing Duct Panel - Forward
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

E. Procedure

SUBTASK 29-11-08-020-001

- (1) Remove the lockwire that attaches the filter bowl [9] to the filter module.

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SUBTASK 29-11-08-020-002

(2) Remove the filter assembly [1] (filter bowl [9] with filter element [6] in it) from the filter module.

SUBTASK 29-11-08-020-003

(3) Remove the packings [4] and [8] and backup rings [5], and [7] from the filter module and the filter assembly [1].

(a) Discard the filter element [6] and the packings [4] and [8].

SUBTASK 29-11-08-140-001

(4) Clean the filter bowl [9].

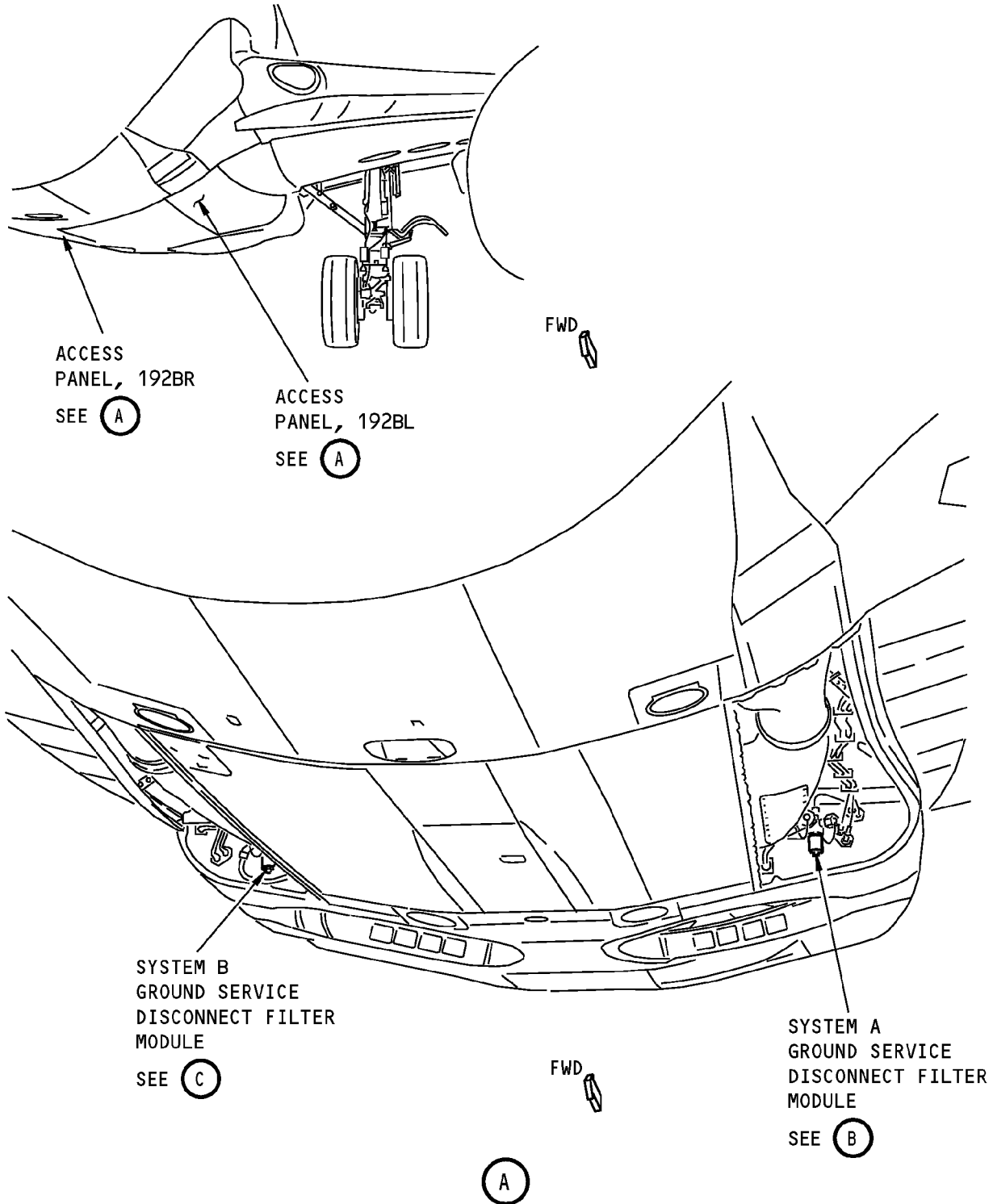
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**Ground Service Disconnect Filter Installation
Figure 401 (Sheet 1 of 3)/29-11-08-990-801**

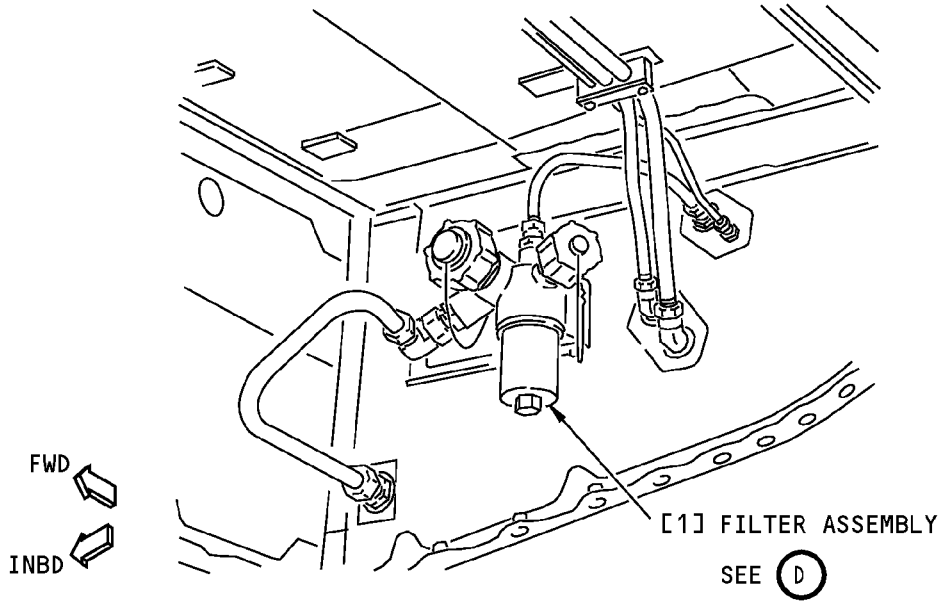
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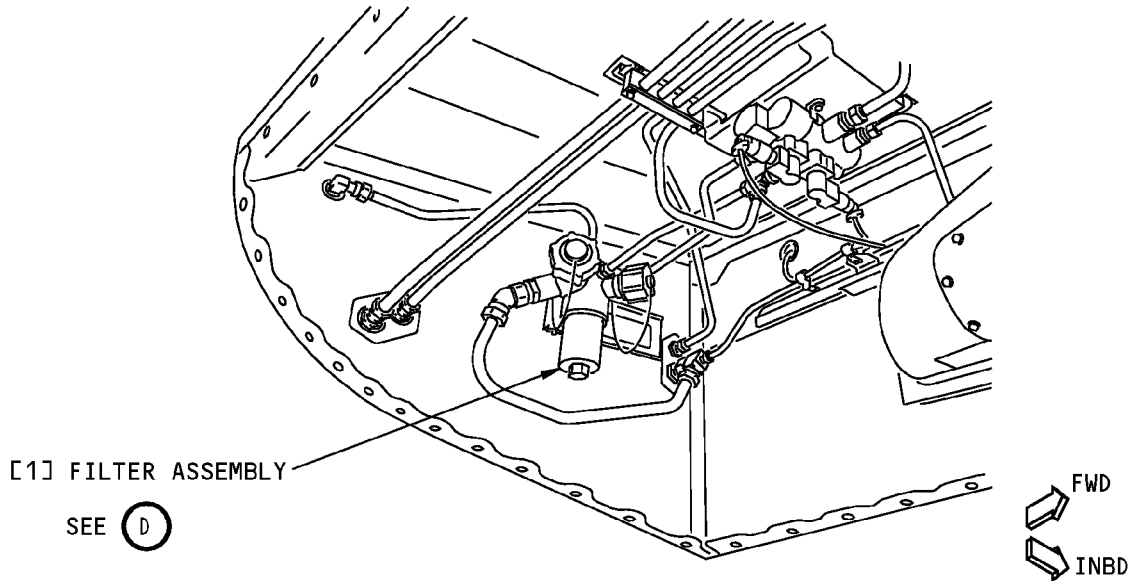
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SYSTEM A GROUND SERVICE DISCONNECT FILTER MODULE

(B)



SYSTEM B GROUND SERVICE DISCONNECT FILTER MODULE

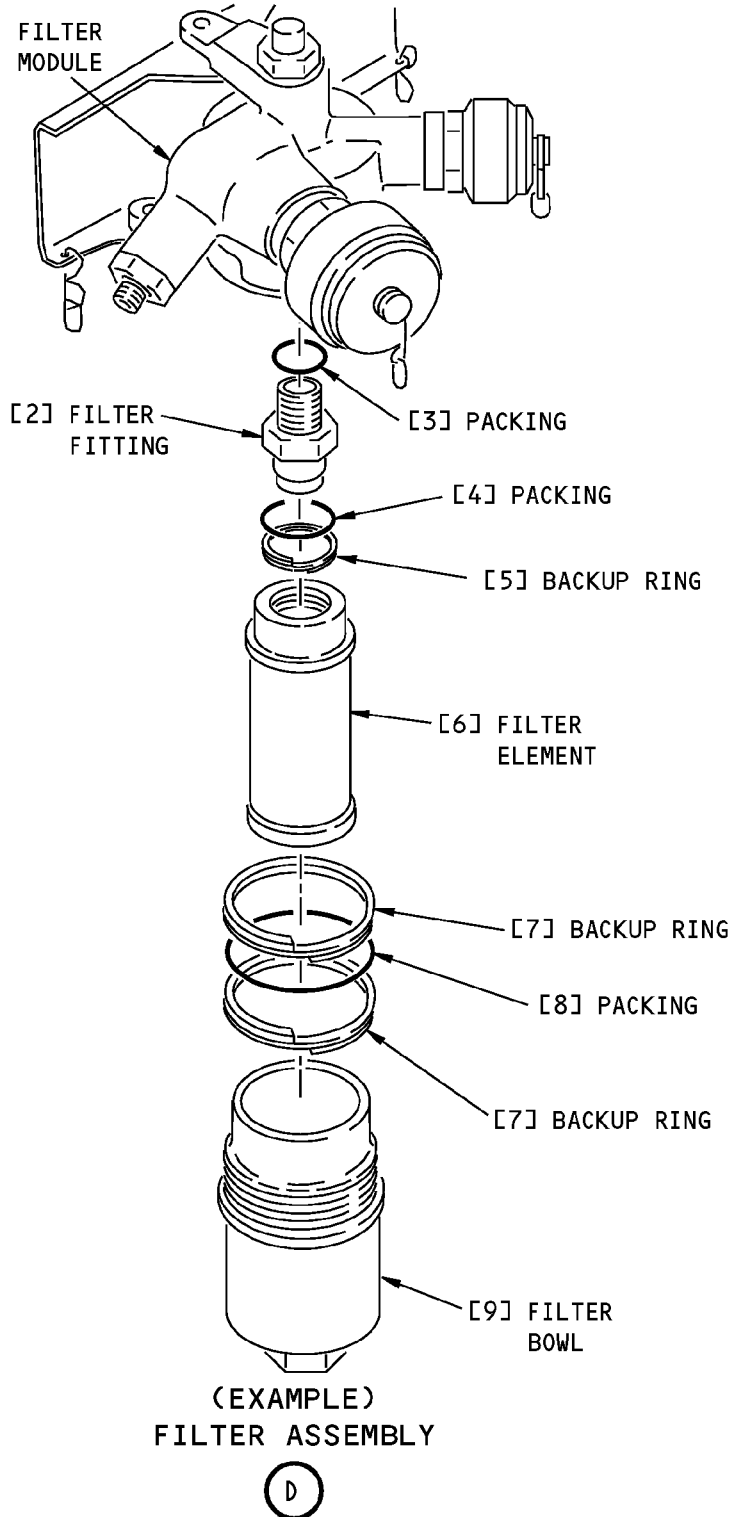
(C)

**Ground Service Disconnect Filter Installation
Figure 401 (Sheet 2 of 3)/29-11-08-990-801**

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**Ground Service Disconnect Filter Installation
Figure 401 (Sheet 3 of 3)/29-11-08-990-801**

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TASK 29-11-08-400-801

3. Ground Service Disconnect Filter Installation

(Figure 401)

A. References

Reference	Title
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
131	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Left
132	Center Section Wing Box, Body Station 540.00 to Body Station 663.75 - Right

D. Access Panels

Number	Name/Location
192BL	ECS Ram Air Inlet Mixing Duct Panel - Forward
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

E. Procedure

SUBTASK 29-11-08-420-001

- (1) Make sure the filter fitting [2] in the module is tight. If it is not tight, do these steps:
 - (a) Remove the filter fitting [2].
 - (b) Discard the packing [3].
 - (c) Lubricate the new packing [3] with fluid, D00153 or MCS 352B fluid, D00054.
 - (d) Install a new packing [3].
 - (e) Install the filter fitting [2] in the module and tighten it to 50-200 pound-inches (5.65-22.6 newton-meters).

SUBTASK 29-11-08-640-001

- (2) Lubricate the packing [4] and the backup ring [5] with fluid, D00153 or MCS 352B fluid, D00054 .

SUBTASK 29-11-08-420-002

- (3) Install the packing [4] and the backup ring [5] on the filter element [6].
 - (a) Put the backup ring [5] below the packing [4].

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SUBTASK 29-11-08-640-002

(4) Lubricate the packing [8] and the backup rings [7] with fluid, D00153 or MCS 352B fluid, D00054.

SUBTASK 29-11-08-420-003

(5) Install the packing [8] and the backup rings [7] in the module.

SUBTASK 29-11-08-420-004

CAUTION: PUT HYDRAULIC FLUID IN THE FILTER BOWL BEFORE YOU PUT THE FILTER ELEMENT IN THE FILTER BOWL. AIR TRAPPED BELOW THE FILTER ELEMENT CAN CAUSE DAMAGE TO THE FILTER ELEMENT.

(6) Fill the filter bowl [9] approximately 1/3 full with fluid, D00153.

SUBTASK 29-11-08-420-005

(7) Put the filter element [6] in the filter bowl [9].

SUBTASK 29-11-08-420-006

(8) Install the filter bowl [9] on the filter module.

(a) Tighten the filter bowl [9] to 50-75 pound-inches (5.65-8.47 newton-meters) and install lockwire.

F. Ground Service Disconnect Filter Installation Test

SUBTASK 29-11-08-840-004

(1) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-08-840-003

(2) With a portable hydraulic cart, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801

SUBTASK 29-11-08-790-001

(3) Make sure the filter bowl [9] does not have a leak.

SUBTASK 29-11-08-860-001

(4) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

G. Put the Airplane Back to its Usual Condition

SUBTASK 29-11-08-410-001

(1) Close the applicable access panels:

<u>Number</u>	<u>Name/Location</u>
192BL	ECS Ram Air Inlet Mixing Duct Panel - Forward
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

————— **END OF TASK** —————

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HYDRAULIC SYSTEMS A AND B ENGINE-DRIVEN PUMP (EDP) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
- (1) The removal of the hydraulic systems A and B engine-driven pump
 - (2) The installation of the hydraulic systems A and B engine-driven pump.
- B. Flow restrictions in hydraulic lines can cause damage to the EDP. If the EDP fails shortly after replacement, check for restrictions in the hydraulic lines. These are some causes of flow restrictions:
- (1) Supply plumbing
 - (a) Damaged quick disconnect
 - (b) Kinked supply hose
 - (c) Internally collapsed supply hose
 - (d) Debris in the line
 - (2) Case drain plumbing
 - (a) Reversed case drain filter/check valve assembly
 - (b) Kinked case drain hose
 - (c) Debris in the line
 - (d) Incompletely connected quick disconnect
 - (3) Reservoir Pressurization system
 - (a) System faults (FIM 29-10 TASK 813)
 - (b) Icing
 - (4) Incorrectly installed unions and restrictors

TASK 29-11-11-000-801-001

2. Hydraulic Systems A and B Engine-Driven Pump (EDP) Removal

(Figure 401)

A. General

- (1) Each engine has one engine-driven pump located on the accessory gearbox (AGB) at the 7 o'clock position.
- (2) The Engine 1 and Engine 2 engine-driven pumps are the same.
- (3) The hydraulic hose connections have self-sealing disconnects to prevent leakage of hydraulic fluid and to keep air out of the hydraulic system.
- (4) For this procedure the hydraulic systems A and B engine-driven pump will be referred to as the pump.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

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C. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)

D. Location Zones

Zone	Area
410	Subzone - Engine 1
420	Subzone - Engine 2

E. Prepare for the Removal

SUBTASK 29-11-11-860-001-001

- (1) For the applicable hydraulic system, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-11-860-002-001

- (2) Release pressure from the applicable hydraulic reservoir. To release the pressure, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-11-860-003-001

- (3) For engine 1, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	15	C00779	HYD SYS ENG PUMP DEPRESS VALVE 1

SUBTASK 29-11-11-860-004-001

- (4) For engine 2, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	17	C00780	HYDRAULIC SYSTEM ENG PUMP DEPRESS VALVE 2

SUBTASK 29-11-11-010-001-001

- (5) For the left fan cowl panel, do this task: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

F. Remove the Pump

SUBTASK 29-11-11-020-001-001

- (1) Disconnect the electrical connector, DP1204, [4] from the receptacle on the pump [3].

NOTE: For the specific steps to disconnect and give protection to the electrical connector, refer to (TASK 70-30-01-910-802-F00).

SUBTASK 29-11-11-480-001-001

- (2) Put a 1 U.S.-gal (3.81 l) oil resistant container, STD-203 under the pump [3] to catch spills.

SUBTASK 29-11-11-020-002-001

- (3) Disconnect the hydraulic case drain line [1] from the union [6].

NOTE: This connection uses a threaded fitting.

NOTE: Keep the union with the EDP and the disconnect with the hose assembly.

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SUBTASK 29-11-11-020-003-001

- (4) Disconnect the hydraulic supply [5] line from the union [12].

NOTE: This connection uses a threaded fitting.

SUBTASK 29-11-11-020-004-001

- (5) At the two lowest locations on the hydraulic pressure line [2], remove the two bolts [11] and clamp [10] that attach the line to the fan case brackets.

SUBTASK 29-11-11-020-005-001

- (6) Disconnect the hydraulic pressure line [2] from the quick-release fitting [16].

NOTE: This connection uses a quick-release fitting.

SUBTASK 29-11-11-020-006-001

- (7) Do these steps to remove the pump [3]:

NOTE: To remove the pump, it can be necessary to loosen the engine wiring harnesses to get access. To loosen the harnesses, pull them out of their retainer clips and move the harnesses aft.

CAUTION: MAKE SURE YOU GIVE SUPPORT TO THE PUMP AS YOU LOOSEN THE CLAMP RING. IF YOU DO NOT, THE PUMP CAN FALL. DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) As you give support to the pump, loosen the clamp ring nut [9] on the clamp ring [8].

WARNING: BE CAREFUL WHEN YOU MOVE THE PUMP. HYDRAULIC FLUID COULD LEAK FROM THE OPEN PORTS OF THE PUMP. MAKE SURE YOU WEAR PROTECTIVE CLOTHES AND GLOVES WHEN YOU MOVE THE PUMP. INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT COULD OCCUR.

- (b) Move the pump [3] forward until the spline is free of the adapter plate [17].

- (c) Move the pump [3] outboard until it is free of the engine.

SUBTASK 29-11-11-020-007-001

- (8) Remove the quick-release fitting [16] from the hydraulic pressure union [15] on the hydraulic pump [3].

SUBTASK 29-11-11-020-008-001

- (9) If the replacement pump [3] does not have the hydraulic pressure union [15], the hydraulic supply union [12] and the hydraulic case drain union [6] installed, do these steps:

- (a) Remove the hydraulic pressure union [15].

1) Discard the O-ring [14].

- (b) Remove the hydraulic supply union [12].

1) Discard the O-ring [13].

- (c) Remove the hydraulic case drain union [6].

1) Discard the O-ring [7].

SUBTASK 29-11-11-910-001-001

- (10) If the new pump will not be immediately installed, give protection to the gearbox mount pad on the accessory gearbox.

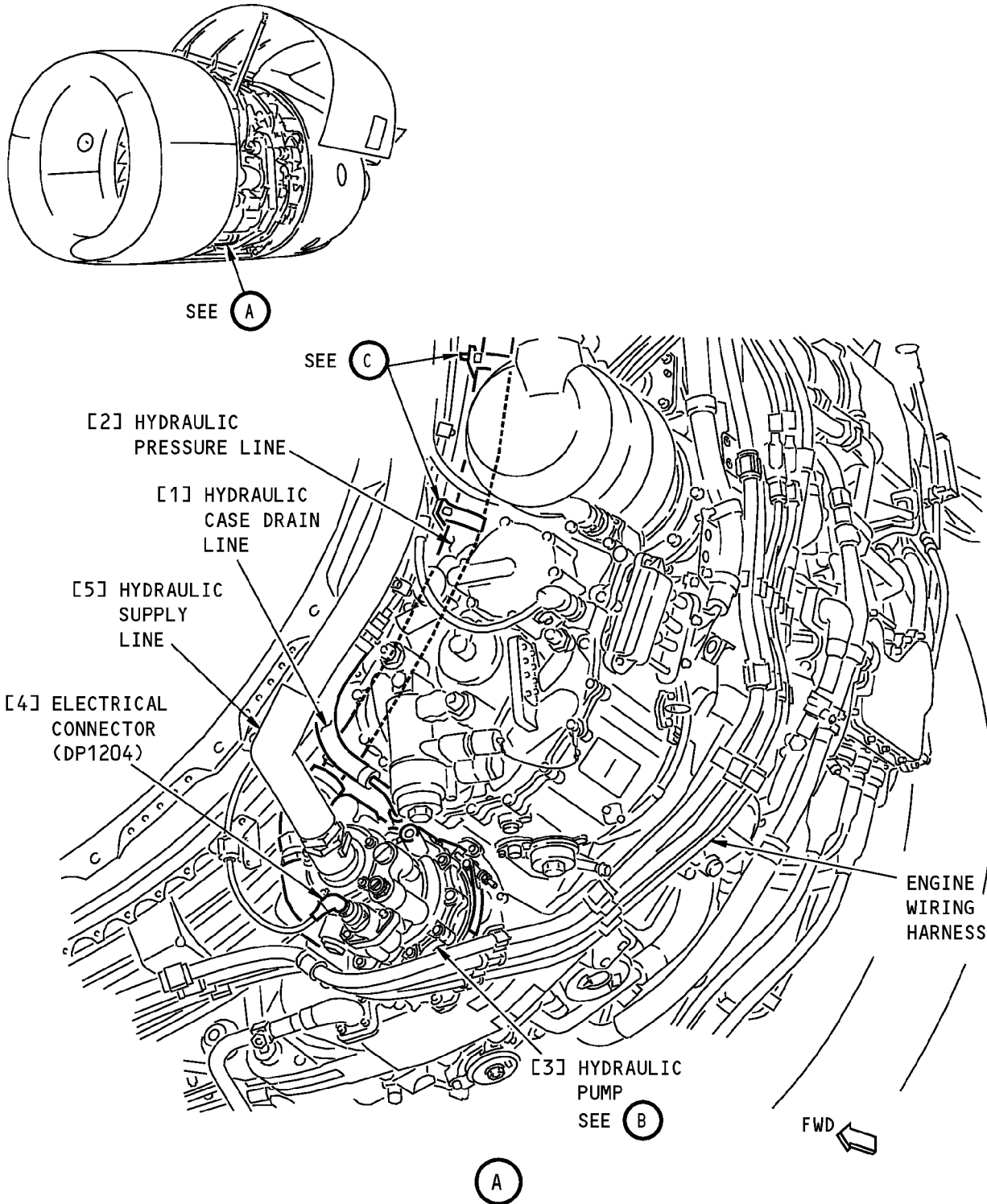
————— **END OF TASK** —————

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**Hydraulic Systems A and B Engine-Driven Pump (EDP) Installation
Figure 401 (Sheet 1 of 2)/29-11-11-990-801-001**

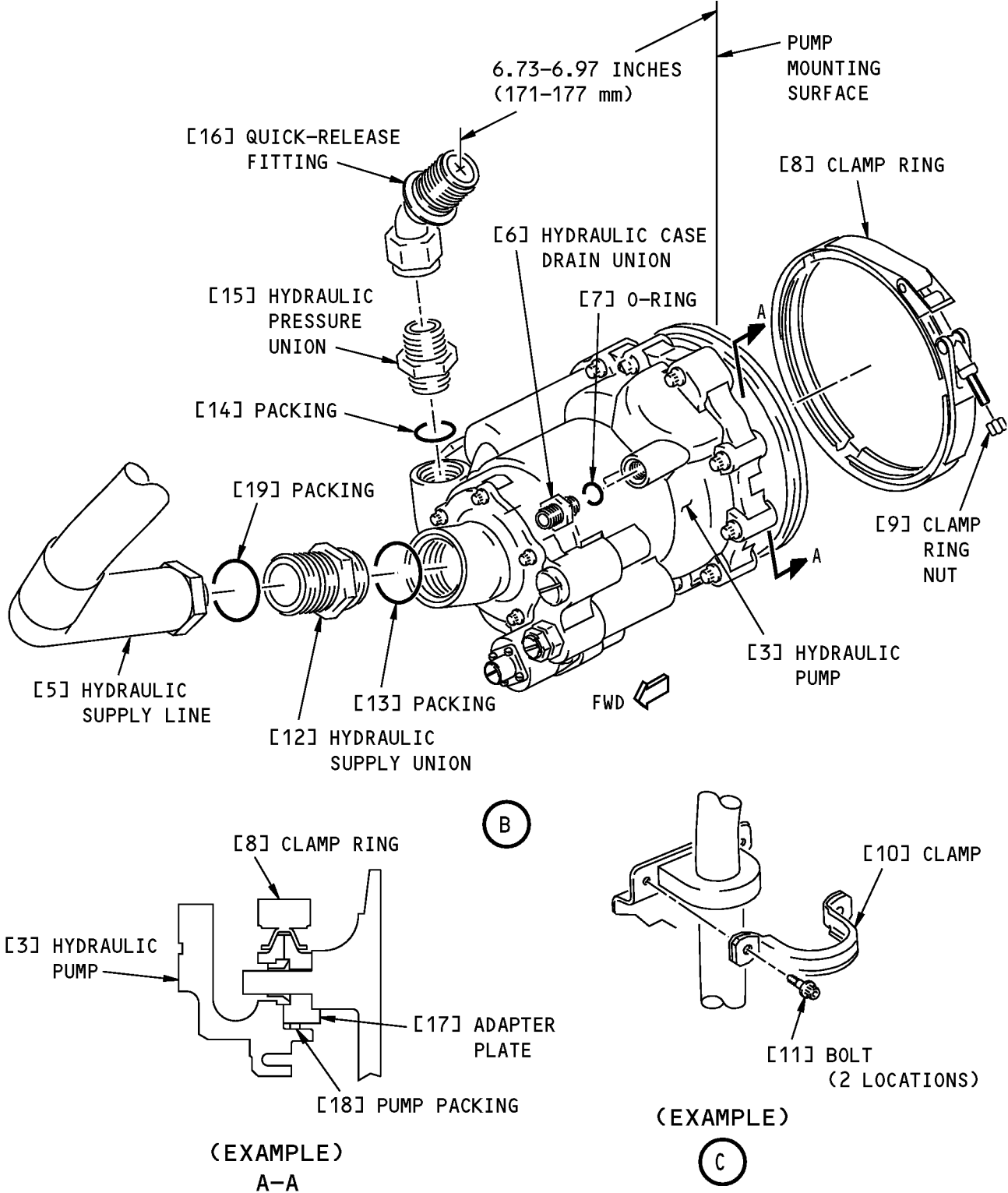
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Hydraulic Systems A and B Engine-Driven Pump (EDP) Installation
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TASK 29-11-11-400-801-001

3. Hydraulic Systems A and B Engine-Driven Pump (EDP) Installation

(Figure 401)

A. General

- (1) Each engine has one engine-driven pump located on the accessory gearbox (AGB) at the 7 o'clock position.
- (2) The Engine 1 and Engine 2 engine-driven pumps are the same.
- (3) The hydraulic hose connections have self-sealing disconnects to prevent leakage of hydraulic fluid and to keep air out of the hydraulic system.
- (4) For this procedure the hydraulic systems A and B engine-driven pump will be referred to as the pump.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-170-801	Hydraulic System A or B Flushing (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

D. Location Zones

Zone	Area
410	Subzone - Engine 1
420	Subzone - Engine 2

E. Prepare to Install the Pump

SUBTASK 29-11-11-210-001-001

- (1) Visually examine the packing [18] on the front mounting face of the pump for damage.
 - (a) Replace the pump packing [18] if you find damage.

F. Install the Pump

SUBTASK 29-11-11-420-001-001

- (1) If the replacement pump [3] does not have unions installed, do these steps:
 - (a) Lubricate the O-ring [7], O-ring [13] and O-ring [14] with MCS 352B fluid, D00054 or fluid, D00153.

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- (b) Lubricate the threads of the hydraulic case drain union [6], hydraulic pressure union [15] and hydraulic supply union [12] with MCS 352B fluid, D00054 or fluid, D00153.
- (c) Install the O-ring [7] on the hydraulic case drain union [6].
- (d) Install the O-ring [14] on the hydraulic pressure union [15].
- (e) Install the O-ring [13] on the hydraulic supply union [12].

NOTE: The hydraulic supply union [12] has two sets of threads on one side and one set of threads on the other. The O-ring [13] must be installed on the side of the supply union [12] with one set of threads. This is the side that is installed into the pump [3].

- (f) Install the hydraulic supply union [12] in the forward port of the pump [3].
 - 1) Tighten the supply union [12] to 855-945 pound-inches (71-79 pounds-feet) (97-107 Newton meters).
- (g) Install the hydraulic case drain union [6] in the center port of the pump [3]. Make sure that the small knurled end of the disconnect is closest to the EDP.
 - 1) Tighten the union [6] to 162 in-lb (18 N·m) - 178 in-lb (20 N·m).
- (h) Install the hydraulic pressure union [15] in the inboard port of the pump [3].
 - 1) Tighten the pressure union [15] to 428-473 pound-inches (48.3-53.4 Newton meters).

NOTE: Make sure the center of the quick-release fitting [16] is 6.73-6.97 inches (171-177 mm) from the pump mounting surface. If it is not, remove the fitting [16] and use the steps below.

CAUTION: MAKE SURE YOU FOLLOW THE STEPS BELOW TO CORRECTLY ORIENT THE QUICK RELEASE FITTING ON THE HYDRAULIC PRESSURE UNION. IF YOU DO NOT, THE HYDRAULIC PRESSURE HOSE COULD BECOME MISALIGNED DURING INSTALLATION. MISALIGNMENT CAN CAUSE HOSE OR FITTING FAILURE.

- (i) Install the quick-release fitting [16] on the hydraulic pressure union [15] as follows:
 - 1) Lubricate the threads of the pressure union [15] with MCS 352B fluid, D00054 or fluid, D00153.
 - 2) Loosely attach the quick-release fitting [16] to the pressure union [15].
 - 3) Orient the quick-release fitting [16] until the center of the quick disconnect elbow fitting is 6.73-6.97 inches (171-177 mm) from the pump mounting surface.

CAUTION: USE TWO WRENCHES TO TIGHTEN THE FITTING NUT. USE ONE TO HOLD THE UNION, AND THE OTHER TO TIGHTEN THE FITTING. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE UNION AND FITTING CAN OCCUR.

- 4) Tighten the quick release fitting [16] to 855-945 pound-inches (71-79 pounds-feet) (97-107 Newton meters).
- 5) Do a check of the quick-release fitting [16] again to make sure the center of the fitting is 6.73-6.97 inches (171-177 mm) from the pump mounting surface.

SUBTASK 29-11-11-420-002-001

CAUTION: DO NOT PUT GREASE IN THE ACCESSORY GEARBOX (AGB) SPLINE CAVITY OR APPLY GREASE TO THE PUMP SPLINES. DAMAGE TO THE PUMP, SPLINE OR AGB CAN OCCUR.

- (2) Do these steps to install the pump [3]:

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- (a) Loosely install the clamp ring [8] on the AGB adapter plate flanges.
- (b) Install the pump [3] on the adapter plate.

NOTE: Make sure you align the indexing pins on the pump [3] with the index holes on the adapter plate.

- (c) Attach the pump [3] with the clamp ring [8].
 - 1) Tighten the clamp ring nut [9] to 45-55 pound-inches (5.1-6.2 Newton meters).

SUBTASK 29-11-11-020-009-001

- (3) Connect the hydraulic pressure line [2] to the quick-release fitting [16].

SUBTASK 29-11-11-420-003-001

CAUTION: USE TWO WRENCHES TO TIGHTEN THE FITTING NUT. USE ONE TO HOLD THE UNION, AND THE OTHER TO TIGHTEN THE FITTING. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE UNION AND FITTING CAN OCCUR.

- (4) Connect the hydraulic case drain line [1] to the hydraulic case drain union [6].
 - (a) Tighten the hydraulic case drain line [1] to 257-283 pound-inches (29.03-31.97 Newton meters).

SUBTASK 29-11-11-420-004-001

CAUTION: USE TWO WRENCHES TO TIGHTEN THE FITTING NUT. USE ONE TO HOLD THE UNION, AND THE OTHER TO TIGHTEN THE FITTING. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE UNION AND FITTING CAN OCCUR.

- (5) Connect the hydraulic supply line [5] to the hydraulic supply union [12].

NOTE: Inspect the packing [19] on the hydraulic supply line [5] for damage. If necessary, replace the packing [19].

 - (a) Tighten the hydraulic supply line [5] to 1520-1680 pound-inches (172-190 Newton meters).

SUBTASK 29-11-11-020-010-001

- (6) At the two lowest locations on the hydraulic pressure line [2], use the two bolts [11] and clamp [10] to attach the hose to each fan case bracket.
 - (a) If the lower forward bracket bolt uses a nut, then tighten the lower forward bolt [11] to 82-88 pound-inches (9.2-9.9 Newton meters).
 - (b) If the lower forward bracket bolt uses a nutplate, then tighten the lower forward bolt [11] to 97-103 pound inches (10.9-11.6 Newton meters).
 - (c) Tighten the remaining bolts [11] to 97-103 pound inches (10.9-11.6 Newton meters).

SUBTASK 29-11-11-020-011-001

- (7) Connect the electrical connector [4], DP1204, to the pump [3].

SUBTASK 29-11-11-680-001-001

- (8) Do this task for the applicable system: Hydraulic System A or B Flushing, TASK 29-11-00-170-801.

G. Engine-Driven Pump Installation Test

SUBTASK 29-11-11-860-007-001

- (1) For engine 1, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	15	C00779	HYD SYS ENG PUMP DEPRESS VALVE 1

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SUBTASK 29-11-11-860-008-001

- (2) For engine 2, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C00780	HYDRAULIC SYSTEM ENG PUMP DEPRESS VALVE 2

SUBTASK 29-11-11-710-001-001

- (3) Pressurize the applicable hydraulic reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801

SUBTASK 29-11-11-710-002-001

- (4) Make sure that all hydraulic pumps are not operating.

SUBTASK 29-11-11-710-003-001

- (5) Set the engine pump switch, for the applicable system, to the ON position.

SUBTASK 29-11-11-710-005-001

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM THE FLIGHT CONTROL SURFACES. THEAILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER AND NOSE GEAR CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Dry-motor the applicable engine to pressurize the hydraulic system. To dry-motor an engine, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.
 - (a) Make sure the hydraulic pressure becomes stable at 2850-3200 psi.

NOTE: You can view the hydraulic pressure, for the applicable system, on the display unit for the engine display.

SUBTASK 29-11-11-710-006-001

- (7) Set the engine pump switch, for the applicable engine, to the OFF position until the hydraulic pressure goes to zero.

SUBTASK 29-11-11-710-007-001

- (8) Set the engine pump switch, for the applicable system, to the ON position and make sure the pressure becomes stable at 2850-3200 psi.

SUBTASK 29-11-11-710-009-001

- (9) Stop the engine. To stop the engine, do this task: Stop the Engine Procedure (Usual Engine Stop), TASK 71-00-00-700-819-F00

SUBTASK 29-11-11-710-010-001

- (10) Make sure that the pump does not have a hydraulic leak.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-11-840-001-001

- (1) Remove power from the applicable hydraulic system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 29-11-11-860-009-001

- (2) Do the servicing for the system A and B reservoirs if it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

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SUBTASK 29-11-11-410-001-001

- (3) For the left fan cowl panel, do this task: Close the Fan Cowl Panels,
TASK 71-11-02-410-801-F00.

————— **END OF TASK** —————

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HYDRAULIC SYSTEMS A AND B ELECTRIC MOTOR-DRIVEN PUMP (EMDP) - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of an electric motor-driven pump (EMDP)
 - (2) An installation of an EMDP.
- B. This procedure is applicable for the hydraulic systems A and B EMDPs.
- C. Other Boeing documents may use the term ACMP (Alternating Current Motor Pump) instead of EMDP.

TASK 29-11-21-000-801-001

2. Electric Motor-Driven Pump (EMDP) Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-27-000-801	Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5 Gallon (19 Liters)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for the Removal

SUBTASK 29-11-21-860-001-001

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) For the hydraulic system A EMDP,
Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-11-21-860-002-001

- (2) For the hydraulic system B EMDP,

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Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

SUBTASK 29-11-21-860-003-001

- (3) Release the pressure from the hydraulic reservoirs. To release them, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-21-020-001-001

CAUTION: MAKE SURE THAT YOU PULL DOWN ON THE KNURLED RING OF THE SELF-SEAL DISCONNECT BEFORE YOU TURN IT FOR REMOVAL. IF YOU DO NOT DO THIS, TOO MUCH TORQUE WILL BE NECESSARY TO TURN THE RING WHICH WILL DAMAGE THE SELF-SEAL DISCONNECT.

- (4) Disconnect the supply line [13] of the EMDP [6] at the quick-disconnect [1] of the applicable reservoir.

NOTE: The quick-disconnect [1] for the hydraulic system A is on the bottom of the hydraulic A reservoir. The quick-disconnect [1] for the hydraulic system B is on the inboard side of the hydraulic system B reservoir.

E. EMDP Removal

SUBTASK 29-11-21-020-002-001

- (1) Disconnect the electrical connector [16] from the EMDP [6].

SUBTASK 29-11-21-020-003-001

- (2) Disconnect the supply line [13] from the EMDP [6].
 - (a) Drain the hydraulic fluid into a 5 gallon (19 liters) fuel resistant container, STD-1054.
 - (b) Install a plug on the supply line [13] and a cap on the EMDP supply port.

SUBTASK 29-11-21-020-004-001

- (3) Disconnect the case drain line [9] from the EMDP [6].
 - (a) Drain the hydraulic fluid into 5 gallon (19 liters) fuel resistant container, STD-1054.
 - (b) Install a plug on the case drain line [9] and a cap on the EMDP case drain port.

SUBTASK 29-11-21-860-004-001

- (4) Remove the acoustic filter [12] from the EMDP [6]. To remove it, do this task: Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal, TASK 29-11-27-000-801.
 - (a) Install a plug on the acoustic filter assembly [12] and a cap on union [11] on the EMDP.

SUBTASK 29-11-21-860-005-001

- (5) For the hydraulic system A EMDP, remove the pins [5], washers [4], and pins [3] that connect the two cables [2] to the airplane structure.

SUBTASK 29-11-21-020-005-001

- (6) Remove the EMDP [6]:
 - (a) Remove the bolt [26], washer [25], and washer [23] from the EMDP [6] and the bonding jumper [24].
 - (b) Remove the bolt [22], washer [21], and washer [20] from the EMDP [6].

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- (c) Remove the nuts [19], washers [17], and bolts [18] from the EMDP [6].
- (d) Remove the EMDP [6] from the airplane.

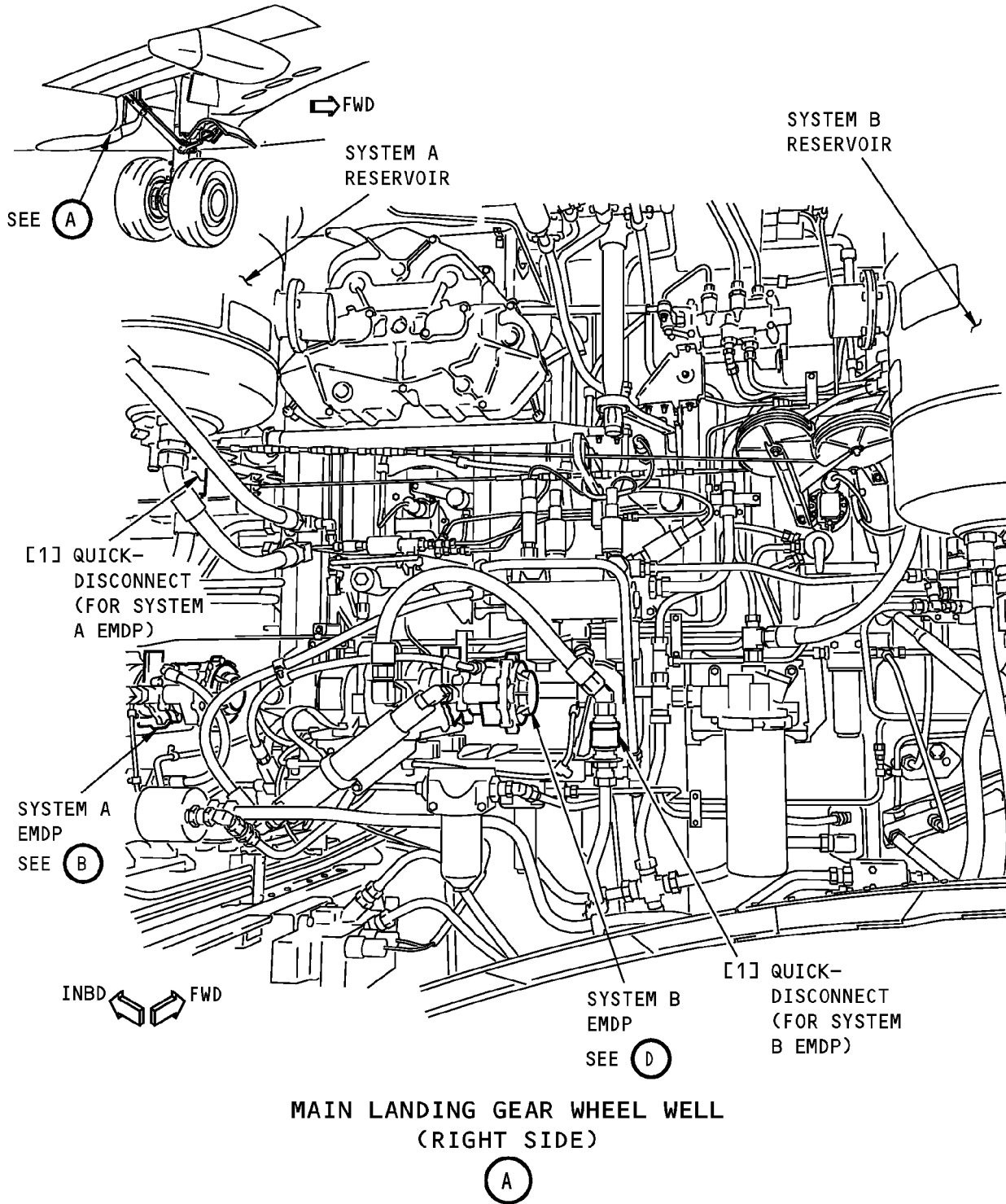
————— **END OF TASK** —————

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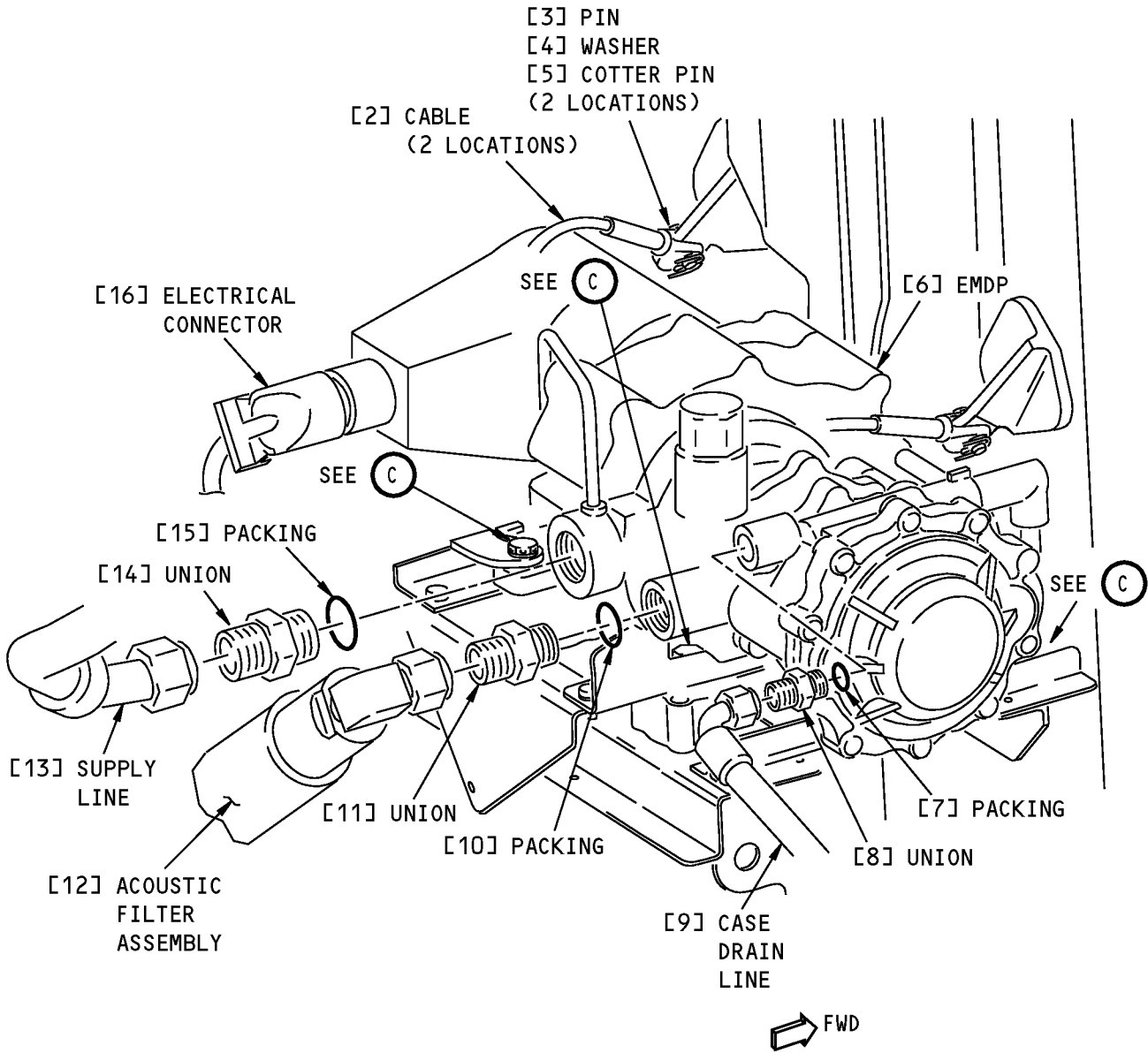


Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Installation
Figure 401 (Sheet 1 of 5)/29-11-21-990-801-001

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SYSTEM A EMDP

(B)

**Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Installation
Figure 401 (Sheet 2 of 5)/29-11-21-990-801-001**

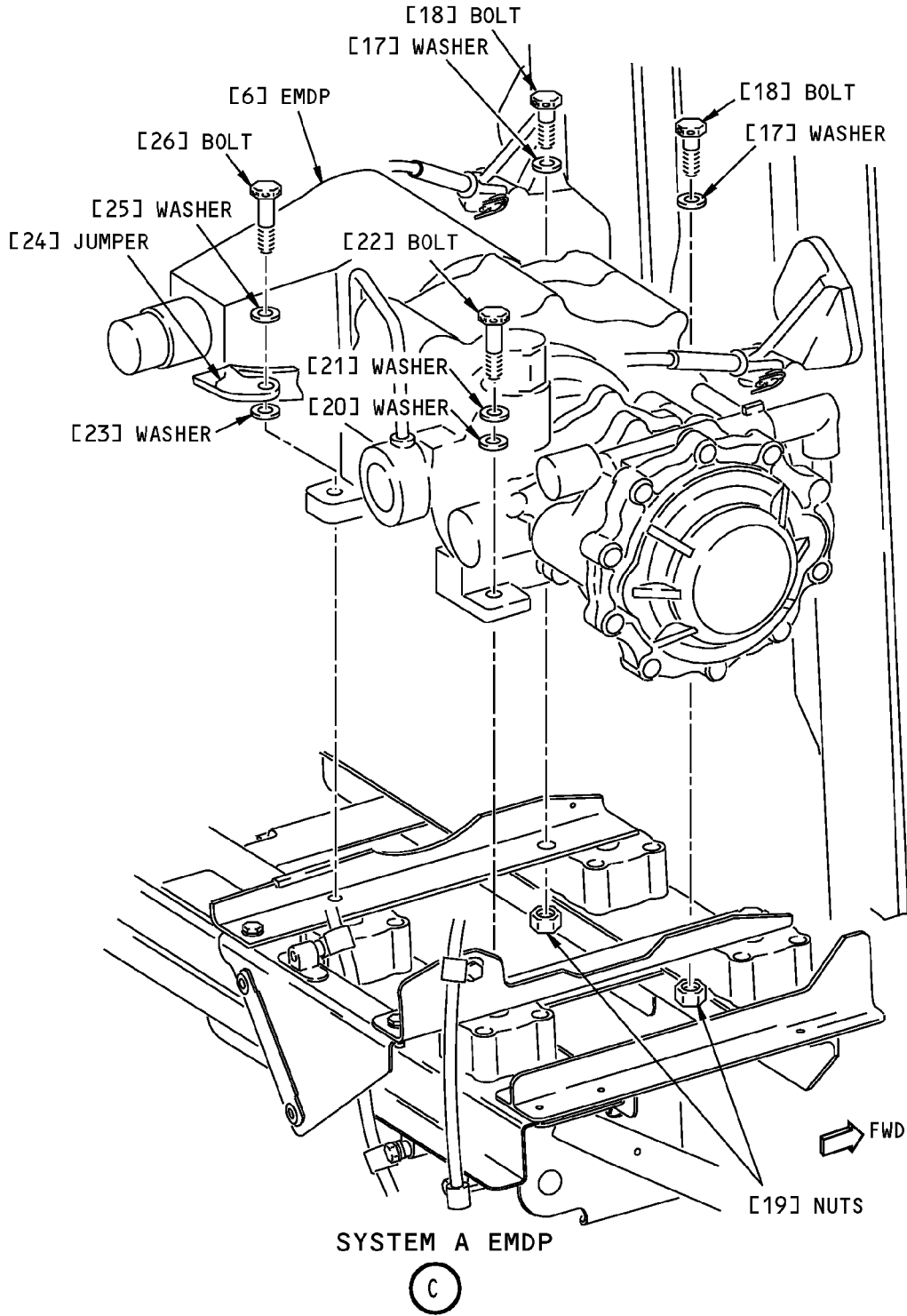
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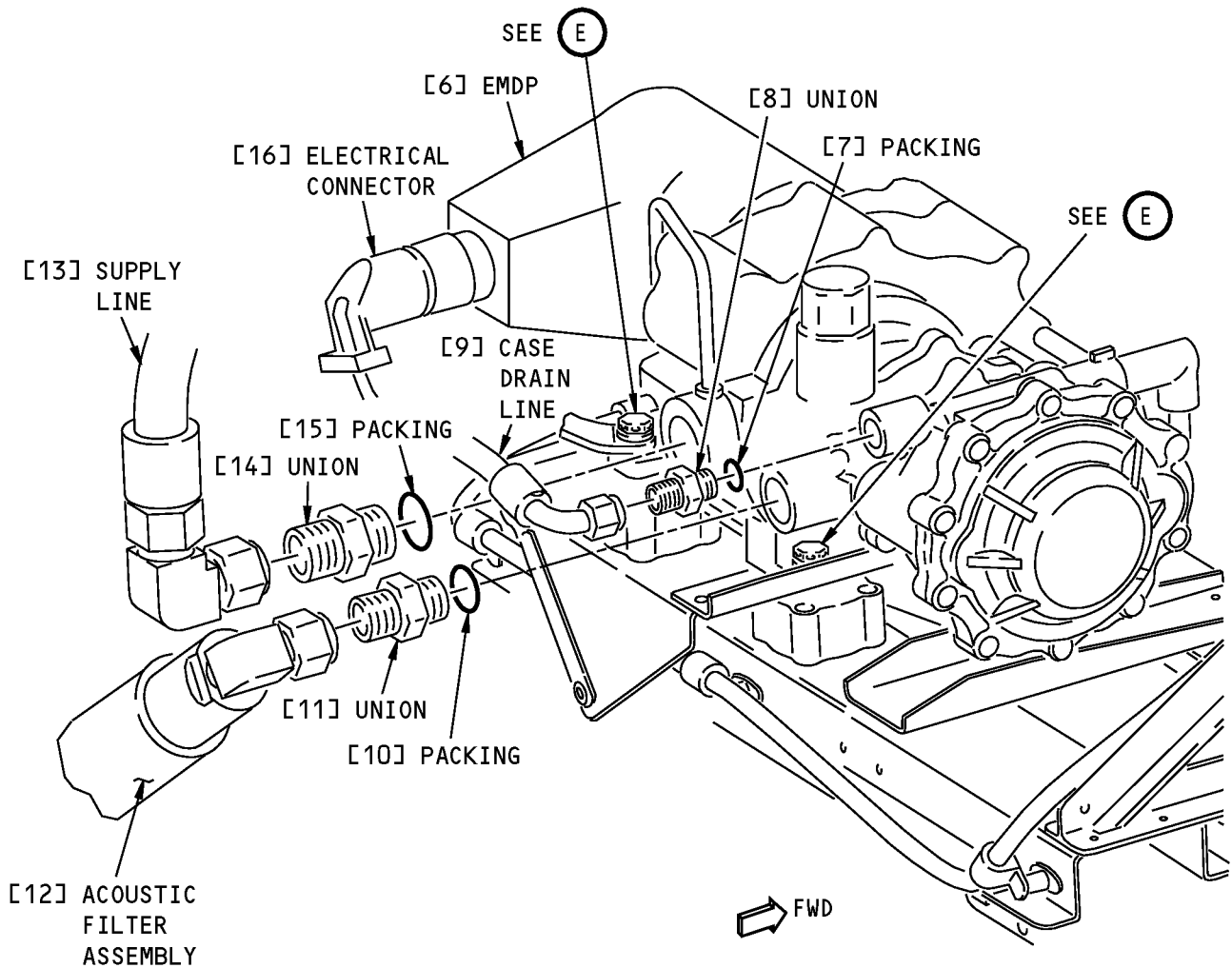
**Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Installation
Figure 401 (Sheet 3 of 5)/29-11-21-990-801-001**

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SYSTEM B EMDP

D

**Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Installation
Figure 401 (Sheet 4 of 5)/29-11-21-990-801-001**

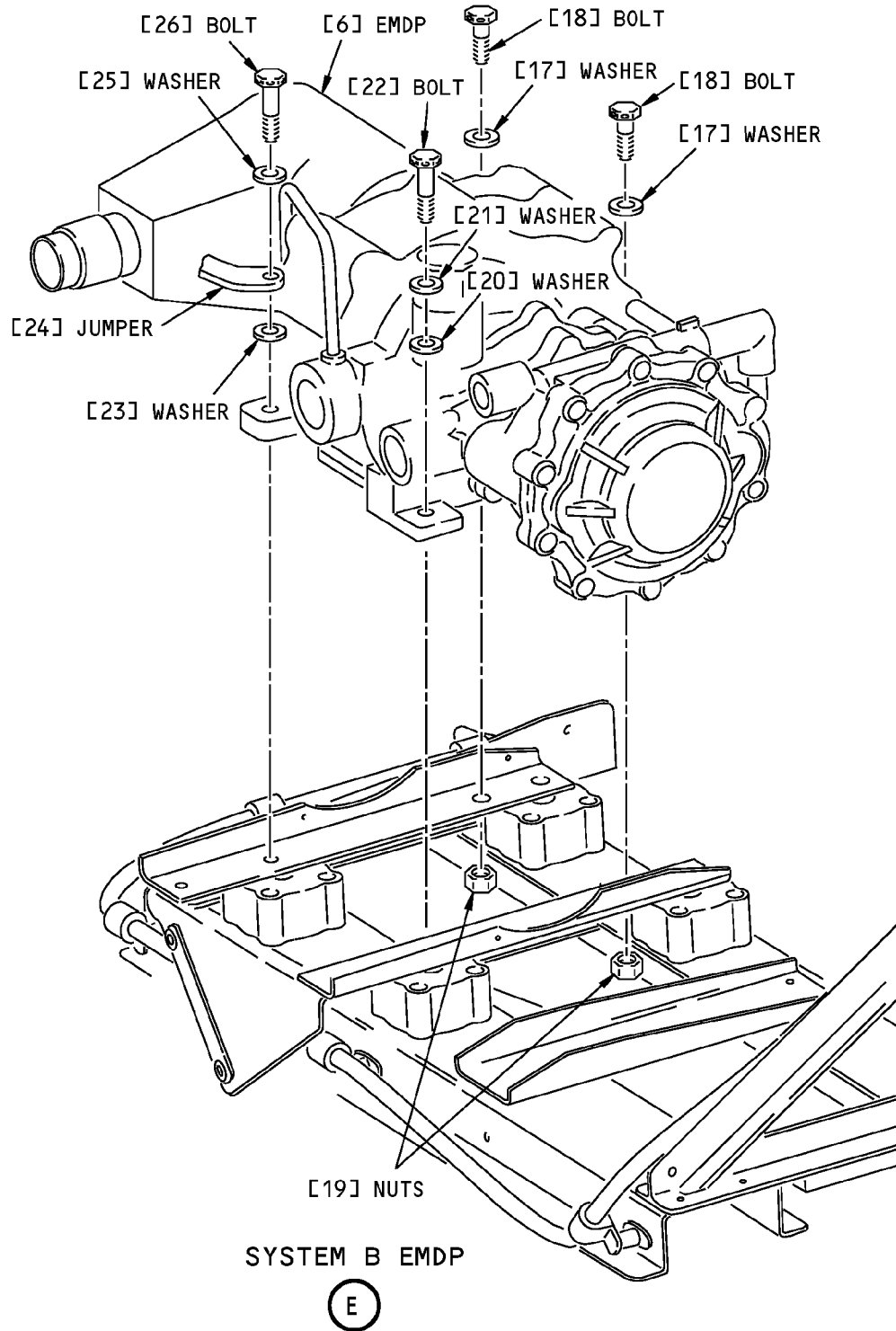
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Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Installation
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TASK 29-11-21-400-801-001

3. Electric Motor-Driven Pump (EMDP) Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-34-110-802	Clean Bare, Clad, or Plated Metal with Solvent (P/B 701)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-170-801	Hydraulic System A or B Flushing (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-27-400-801	Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Meter - Bonding (Approved Explosion Proof & Intrinsically Safe) (Part #: C15292 (MODEL T477W), Supplier: 01014, A/P Effectivity: 737-ALL) (Part #: M1, Supplier: 3AD17, A/P Effectivity: 737-ALL) (Part #: M1B, Supplier: 3AD17, A/P Effectivity: 737-ALL)

C. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142
C00064	Coating - Aluminum Chemical Conversion	BAC5719, Type II, Class A (MIL-C-5541, Class A)
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~C32 (QQ-N-281)

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

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E. Prepare for the Installation

SUBTASK 29-11-21-220-001-001

- (1) If you replace the EMDP [6] because of mechanical malfunction, flush the hydraulic lines. To flush the applicable system, do this task: Hydraulic System A or B Flushing, TASK 29-11-00-170-801
- (2) If the unions and packings are not installed in the EMDP [6], then do these steps:
 - (a) Lubricate the unions and packings with fluid, D00153.
 - (b) Install the packing [15] and union [14] in the supply port.
 - 1) Tighten the union [14] to 428-473 pound-inches (48.3-53.4 Newton meters).
 - (c) Install the packing [10] and union [11] in the pressure output port.
 - 1) Tighten the union [11] to 665-735 pound-inches (75.1-83.0 Newton meters).
 - (d) Install the packing [7] and union [8] in the case drain port.
 - 1) Tighten the union [8] to 162-179 pound-inches (18.2-20.2 Newton meters).

SUBTASK 29-11-21-110-001-001

- (3) Clean the mounting bolts, the washers, the mating surfaces of the EMDP, and the mating surfaces for the bonding jumper [24]. To clean them, do this task: Clean Bare, Clad, or Plated Metal with Solvent, TASK 20-10-34-110-802.

SUBTASK 29-11-21-210-001-001

- (4) Make sure the EMDP is full of hydraulic fluid and does not have contamination.

F. EMDP Installation

SUBTASK 29-11-21-420-001-001

- (1) Install the EMDP [6]:
 - (a) Put the EMDP [6] on the bracket.
 - (b) Install the bolts [18], washers [17], and nuts [19] to the EMDP [6].
 - (c) Install the bolt [22], washer [21], and washer [20] to the EMDP [6].
 - 1) Install lockwire, G01912.
 - (d) Apply coating, C00064 to the aluminum surfaces before you install the bonding jumper [24].
 - (e) Install the bolt [26], washer [25], and washer [23] to the EMDP [6] and bonding jumper [24].
 - 1) Install lockwire, G01912.
 - (f) Use a bonding meter, COM-1550 to make sure the maximum resistance between the EMDP [6], bonding jumper terminal, and airplane structure is 0.0001 ohm.
 - (g) Seal the bolt [26] head with sealant, A02315.

SUBTASK 29-11-21-020-006-001

- (2) Remove the caps and plugs.

SUBTASK 29-11-21-420-002-001

- (3) Connect the supply line [13] to the EMDP supply port.
 - (a) Tighten the supply line [13] to 428-473 pound-inches (48.3-53.4 Newton meters).

SUBTASK 29-11-21-420-003-001

- (4) Install the acoustic filter. To install it, do this task: Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation, TASK 29-11-27-400-801.

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SUBTASK 29-11-21-420-004-001

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

(5) Connect the supply line [13] to the quick-disconnect [1].

SUBTASK 29-11-21-860-006-001

(6) Make sure the hydraulic fluid is up to the case drain port.

SUBTASK 29-11-21-420-005-001

(7) Connect the case drain line [9] to the EMDP case drain port.

(a) Tighten the case drain line [9] to 162-179 pound-inches (18.2-20.2 Newton meters).

SUBTASK 29-11-21-420-006-001

(8) For the hydraulic system A EMDP, install the pins [3], washers [4], and cotter pins [5] to connect the two cables [2] to the airplane structure.

NOTE: Adjust the cable to provide maximum clearance from the EMDP.

SUBTASK 29-11-21-420-029-001

(9) Make an inspection of the electrical contacts of the electrical connector [16]. If damaged, repair as necessary.

SUBTASK 29-11-21-420-030-001

CAUTION: THE MINIMUM SEPARATION BETWEEN THE HOSES OF THE PUMP AND THE ADJACENT WIRE BUNDLES MUST BE 0.50 INCH (12.7 MM) THROUGH THE FULL RANGE OF WIRE BUNDLE MOVEMENT. A SEPARATION OF LESS THAN 0.50 INCH (12.7 MM) CAN CAUSE THE WIRE BUNDLE OR HYDRAULIC HOSE TO CHAFE WHICH CAN RESULT IN WIRE OR HOSE FAILURE.

(10) Connect the electrical connector [16] to the EMDP [6]. Make sure the minimum separation between the hoses of the System B pump and the adjacent wire bundles is 0.50 inch (12.7 mm).

G. Hydraulic System A and B Electric Motor-Driven Pump Installation Test

SUBTASK 29-11-21-860-007-001

(1) Do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-21-860-008-001

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) For the hydraulic system A EMDP,

Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

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Row	Col	Number	Name
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-11-21-860-009-001

(3) For the hydraulic system B EMDP,

Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

SUBTASK 29-11-21-860-010-001

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND THE NOSE GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE NOSE GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEMS. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN THE HYDRAULIC POWER IS SUPPLIED.

(4) Pressurize hydraulic system with the applicable EMDP. To pressurize it, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-11-21-860-011-001

(5) Operate the rudder slowly, through full travel, a minimum of ten cycles.

NOTE: This will bleed the EMDP and system of air.

SUBTASK 29-11-21-210-002-001

(6) Make sure the HYD P indicator on the pilots center panel, P2, becomes stable between 2850 and 3200 psig.

SUBTASK 29-11-21-210-003-001

(7) Make sure that there is no hydraulic leakage at the EMDP.

SUBTASK 29-11-21-210-010-001

CAUTION: THE MINIMUM SEPARATION BETWEEN THE HOSES OF THE PUMP AND THE ADJACENT WIRE BUNDLES MUST BE 0.50 INCH (12.7 MM) THROUGH THE FULL RANGE OF WIRE BUNDLE MOVEMENT. A SEPARATION OF LESS THAN 0.50 INCH (12.7 MM) CAN CAUSE THE WIRE BUNDLE OR HYDRAULIC HOSE TO CHAFE WHICH CAN RESULT IN WIRE OR HOSE FAILURE.

(8) Make sure that the minimum separation between the hoses of the System B pump is a minimum of 0.50 inch (12.7 mm) while the system is pressurized.

SUBTASK 29-11-21-860-012-001

(9) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-21-600-001-001

(10) Fill the hydraulic reservoir. To fill it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

————— END OF TASK —————

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HYDRAULIC SYSTEMS A AND B ELECTRIC MOTOR DRIVEN PUMP (EMDP) - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A test of the Electric Motor-Driven Pump (EMDP).
 - (a) You must use the engine generators or the APU generator to do this procedure. You can not do the test with external ground power.
 - (2) An operational test of the Ground Fault Protection System for the EMDP.

TASK 29-11-21-700-801

2. Electric Motor-Driven Pump (EMDP) Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Electric Motor-Driven Pump (EMDP) Test

SUBTASK 29-11-21-860-013

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-21-860-014

CAUTION: DO NOT OPERATE THE SYSTEM A OR THE SYSTEM B EMDP FOR MORE THAN 2 MINUTES IF THE NO. 1 OR THE NO. 2 FUEL TANK (RESPECTIVELY) CONTAINS LESS THAN 250 GALLONS (1675 POUNDS, 760 KG) OF FUEL. YOU MUST LET THE RESERVOIR TEMPERATURE DECREASE TO AMBIENT TEMPERATURE BEFORE YOU OPERATE THE PUMP AGAIN. DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (2) Set the ELEC 1 and the ELEC 2 HYD PUMP switches, on the forward overhead panel, P5 to the ON position.

SUBTASK 29-11-21-860-078

- (3) Set the BUS TRANSFER switch, on the P5-4 panel, to the OFF position.

SUBTASK 29-11-21-860-015

- (4) Set the ENG 1 and the ENG 2 HYD PUMP switches, on the P5 panel, to the OFF position (if the engines are in operation).

SUBTASK 29-11-21-860-016

- (5) Set the FLT CONTROL and SPOILER system A and B switches, on the P5 panel, to the OFF position.

SUBTASK 29-11-21-710-001

- (6) Make sure the HYD P indicator for each hydraulic system on the pilots center panel, P2, is 2850-3200 psig.

SUBTASK 29-11-21-860-017

- (7) Set the applicable switch, on the P5 panel, to the OFF position to remove electrical power from the system A EMDP:

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- (a) The GEN 2 switch (if the engine is your supply of electrical power).
(b) The right APU GEN switch (if the APU is your supply of electrical power).

SUBTASK 29-11-21-710-002

- (8) Make sure the HYD PUMPS A ELEC 2 LOW PRESSURE light, on the P5 panel, comes on.

SUBTASK 29-11-21-860-018

- (9) Set the GEN 2 or the right APU GEN switch back to the ON position.

SUBTASK 29-11-21-710-003

- (10) Make sure the HYD PUMPS A ELEC 2 LOW PRESSURE light goes out.

SUBTASK 29-11-21-860-019

- (11) Set the applicable switch, on the P5 panel, to the OFF position to remove electrical power from the system B pump:

- (a) GEN 1 (if the engine is your supply of electrical power).
(b) The left APU GEN switch (if the APU is your supply of electrical power).

SUBTASK 29-11-21-710-004

- (12) Make sure the HYD PUMPS B ELEC 1 LOW PRESSURE light, on the P5 panel, comes on.

SUBTASK 29-11-21-860-020

- (13) Set the GEN 1 or the left APU GEN switch back to the ON position.

SUBTASK 29-11-21-710-005

- (14) Make sure the HYD PUMPS B ELEC 1 LOW PRESSURE light goes out.

D. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-21-860-021

- (1) Set the ENG 1 and the ENG 2 HYD PUMP switches, on the P5 panel, to the ON position.

SUBTASK 29-11-21-860-022

- (2) Set the FLT CONTROL and the SPOILER systems A and B switches, on the P5 panel, to the ON position.

SUBTASK 29-11-21-860-079

- (3) Set the ELEC 1 and ELEC 2 HYD PUMP switches to the OFF position.

SUBTASK 29-11-21-860-023

- (4) Set the BUS TRANSFER switch, on the P5-4 panel, to the AUTO position.

END OF TASK

TASK 29-11-21-700-802

3. Ground Fault Protection System Test

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Table with 2 columns: Reference, Title. Row 1: 24-22-00-860-811, Supply Electrical Power (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
SPL-1792	Equipment - Test, Ground Fault Protection System, Hydraulic System "A" and "B" (Part #: F72917-19, Supplier: 81205, A/P Effectivity: 737-100, -200, -200C, -300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Prepare for the Test

SUBTASK 29-11-21-860-036

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-21-860-037

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) For hydraulic system A, open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-11-21-860-038

- (3) For hydraulic system B, open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

SUBTASK 29-11-21-860-039

- (4) Make sure the reset switch for the system B electric 1 hydraulic pump ground fault detector (M1106), in the P91 panel and the system A electric 2 hydraulic pump ground fault detector (M1105), in the P92 panel are reset.

SUBTASK 29-11-21-860-040

- (5) Make sure these switches on the forward overhead panel, P5, are set to the OFF position:
 - (a) For the hydraulic system A; HYD PUMPS A ELEC 2
 - (b) For the hydraulic system B; HYD PUMPS B ELEC 1

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F. System A Ground Fault Detector Test

SUBTASK 29-11-21-020-013

WARNING: YOU MUST CONNECT THE GROUNDING CABLE FOR THE TEST EQUIPMENT TO THE AIRPLANE GROUND BEFORE YOU CONNECT THE ELECTRICAL CONNECTOR FOR THE PUMP TO THE TEST EQUIPMENT. INJURY TO PERSONS CAN OCCUR.

(1) Disconnect the electrical connector from the system A EMDP.

SUBTASK 29-11-21-480-001

(2) Connect the test equipment, SPL-1792 ground clip (green) to the ground strap on the EMDP.

SUBTASK 29-11-21-480-002

(3) Connect the test equipment, SPL-1792 conductor return clip (black) to the ground strap on the EMDP.

SUBTASK 29-11-21-480-003

(4) Connect the test equipment, SPL-1792 connector to the electrical connector for the EMDP.

SUBTASK 29-11-21-860-041

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-11-21-860-042

(6) Set the HYD PUMPS A ELEC 2 switch, on the P5 panel, to the ON position.

SUBTASK 29-11-21-860-043

(7) Set the test switch S2, on the test equipment, SPL-1792, to the NO TRIP position.

SUBTASK 29-11-21-860-044

(8) Push and hold the test switch S1, on the test equipment, SPL-1792.

(a) Make sure the light L1 comes on.

SUBTASK 29-11-21-860-045

(9) Release the test switch S1.

SUBTASK 29-11-21-860-046

(10) Put the test switch S2 to the TRIP position.

(a) Make sure the light L1 goes off.

SUBTASK 29-11-21-860-047

(11) Put the test switch S2 to the NO TRIP position.

(a) Make sure the light L1 stays off.

SUBTASK 29-11-21-860-048

(12) Momentarily push the reset switch on the ground fault detector for hydraulic system A.

NOTE: The reset switch on the ground fault detector (M1105) is located in the equipment center on the P92 panel.

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SUBTASK 29-11-21-860-049

(13) Push and hold the test switch S1.

(a) Make sure the light L1 comes on.

SUBTASK 29-11-21-860-050

(14) Release the test switch S1.

SUBTASK 29-11-21-860-051

(15) Set the HYD PUMPS A ELEC 2 switch, on the P5 panel, to the OFF position.

(a) Make sure the test light L1 goes off.

SUBTASK 29-11-21-860-052

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(16) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-11-21-080-001

(17) Disconnect the test equipment, SPL-1792 connector from the electrical connector for the system A EMDP.

G. System B Ground Fault Detector Test

SUBTASK 29-11-21-020-014

WARNING: YOU MUST CONNECT THE GROUNDING CABLE FOR THE TEST EQUIPMENT TO THE AIRPLANE GROUND BEFORE YOU CONNECT THE ELECTRICAL CONNECTOR FOR THE PUMP TO THE TEST EQUIPMENT. INJURY TO PERSONS CAN OCCUR.

(1) Disconnect the electrical connector from the system B EMDP.

SUBTASK 29-11-21-480-004

(2) Connect the test equipment, SPL-1792 connector to the electrical connector for the EMDP.

SUBTASK 29-11-21-860-053

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

SUBTASK 29-11-21-860-054

(4) Set the HYD PUMPS B ELEC 1 switch, on the P5 panel, to the ON position.

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SUBTASK 29-11-21-860-055

(5) Set the test switch S2, on the test equipment, SPL-1792, to the NO TRIP position.

SUBTASK 29-11-21-860-056

(6) Push and hold the test switch S1, on the test equipment, SPL-1792.

(a) Make sure the light L1 comes on.

SUBTASK 29-11-21-860-057

(7) Release the test switch S1.

SUBTASK 29-11-21-860-058

(8) Put the test switch S2 to the TRIP position.

(a) Make sure the light L1 goes off.

SUBTASK 29-11-21-860-059

(9) Put the test switch S2 to the NO TRIP position.

(a) Make sure the light L1 stays off.

SUBTASK 29-11-21-860-060

(10) Momentarily push the reset switch on the ground fault detector for hydraulic system B.

NOTE: The reset switch on the ground fault detector (M1106) is located in the equipment center on the P91 panel.

SUBTASK 29-11-21-860-061

(11) Push and hold the test switch S1.

(a) Make sure the light L1 comes on.

SUBTASK 29-11-21-860-062

(12) Release the test switch S1.

SUBTASK 29-11-21-860-063

(13) Set the HYD PUMPS B ELEC 1 switch, on the P5 panel, to the OFF position.

(a) Make sure the test light L1 goes off.

SUBTASK 29-11-21-860-064

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(14) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

SUBTASK 29-11-21-080-002

(15) Disconnect the test equipment, SPL-1792 connector from the electrical connector for the system B EMDP.

SUBTASK 29-11-21-080-003

(16) Disconnect the test equipment, SPL-1792 from the ground strap.

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SUBTASK 29-11-21-420-018

(17) Reconnect the electrical connectors to the system B and the system A EMDP.

SUBTASK 29-11-21-860-065

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(18) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

————— **END OF TASK** —————

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HYDRAULIC SYSTEMS A AND B ELECTRIC MOTOR-DRIVEN PUMP (EMDP) ACOUSTIC FILTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the hydraulic systems A and B electric motor driven pump (EMDP) acoustic filter
 - (2) An installation of the hydraulic systems A and B EMDP acoustic filter.
- B. In this procedure the EMDP acoustic filter is referred to as the acoustic filter.
- C. This procedure is applicable for hydraulic systems A and B acoustic filters.

TASK 29-11-27-000-801

2. Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-21-000-801-001	Electric Motor-Driven Pump (EMDP) Removal (P/B 401)
29-11-21-400-801-001	Electric Motor-Driven Pump (EMDP) Installation (P/B 401)
29-11-71-000-802	Hydraulic Systems A and B Pressure Filter Module Element Removal (P/B 401)
29-11-71-400-802	Hydraulic Systems A and B Pressure Module Filter Element Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
A50067	Adhesive - Silicone Rubber - RTV 102 (White)	MIL-A-46106
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Packing	29-11-27-01-050	HAP ALL
8	Packing	29-11-27-01-055	HAP ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

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E. Prepare for the Removal

SUBTASK 29-11-27-860-001

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
F	3	C00882	ELEC HYD PUMP SYS B

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-11-27-840-001

- (2) Remove hydraulic power from the applicable system A or B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-27-860-002

- (3) Remove the pressure from the applicable hydraulic system A or B. To remove it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-27-020-001

- (4) Disconnect the supply line [10] at the quick-disconnect [1].

SUBTASK 29-11-27-480-001

- (5) Use a container to catch hydraulic fluid from the disconnected line.

SUBTASK 29-11-27-160-001

- (6) If it is necessary, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

F. Procedure

SUBTASK 29-11-27-020-002

- (1) Remove the mounting clamp [4].
(a) Remove the bolts [3]

SUBTASK 29-11-27-020-003

- (2) Disconnect the pressure line [6] from the acoustic filter assembly [5].

SUBTASK 29-11-27-020-004

- (3) Remove the acoustic filter assembly [5] from the EMDP [2].

SUBTASK 29-11-27-210-001

- (4) Do a check of the acoustic filter assembly [5] for metal particle contamination as follows;
(a) Use the wrenching flats on the barrel and head then disassemble the filter.
(b) Remove and discard the packing [7] and packing [8] and the backup rings [9].
(c) Flush all surfaces using solvent, B00184 or equivalent.
(d) Examine all surfaces, the packing grooves and the threads for defects or contamination.

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- (e) Install new packing [7] and packing [8], and backup rings [9].
- (f) Apply MCS 352B fluid, D00054 or fluid, D00153 to the threads of the head then assemble the unit.
- (g) Tighten the head to 480 pound-inches (54.2 Newton meters)
- (h) Apply RTV 102 adhesive, A50067 or equivalent to the barrel and head joint.
- (i) Install lockwire to secure the head to the barrel.

SUBTASK 29-11-27-860-003

- (5) Do these steps if the filter contains metal particles:
 - (a) These are the tasks: Electric Motor-Driven Pump (EMDP) Removal, TASK 29-11-21-000-801-001, Electric Motor-Driven Pump (EMDP) Installation, TASK 29-11-21-400-801-001.
 - (b) Flush the hydraulic lines between the filter and the pump.

SUBTASK 29-11-27-210-002

- (6) Do a check on the pressure module filter element for metal particles. To do the check, do this task: Hydraulic Systems A and B Pressure Filter Module Element Removal, TASK 29-11-71-000-802.

SUBTASK 29-11-27-420-006

- (7) Install pressure module filter element. To install, do this task: Hydraulic Systems A and B Pressure Module Filter Element Installation, TASK 29-11-71-400-802

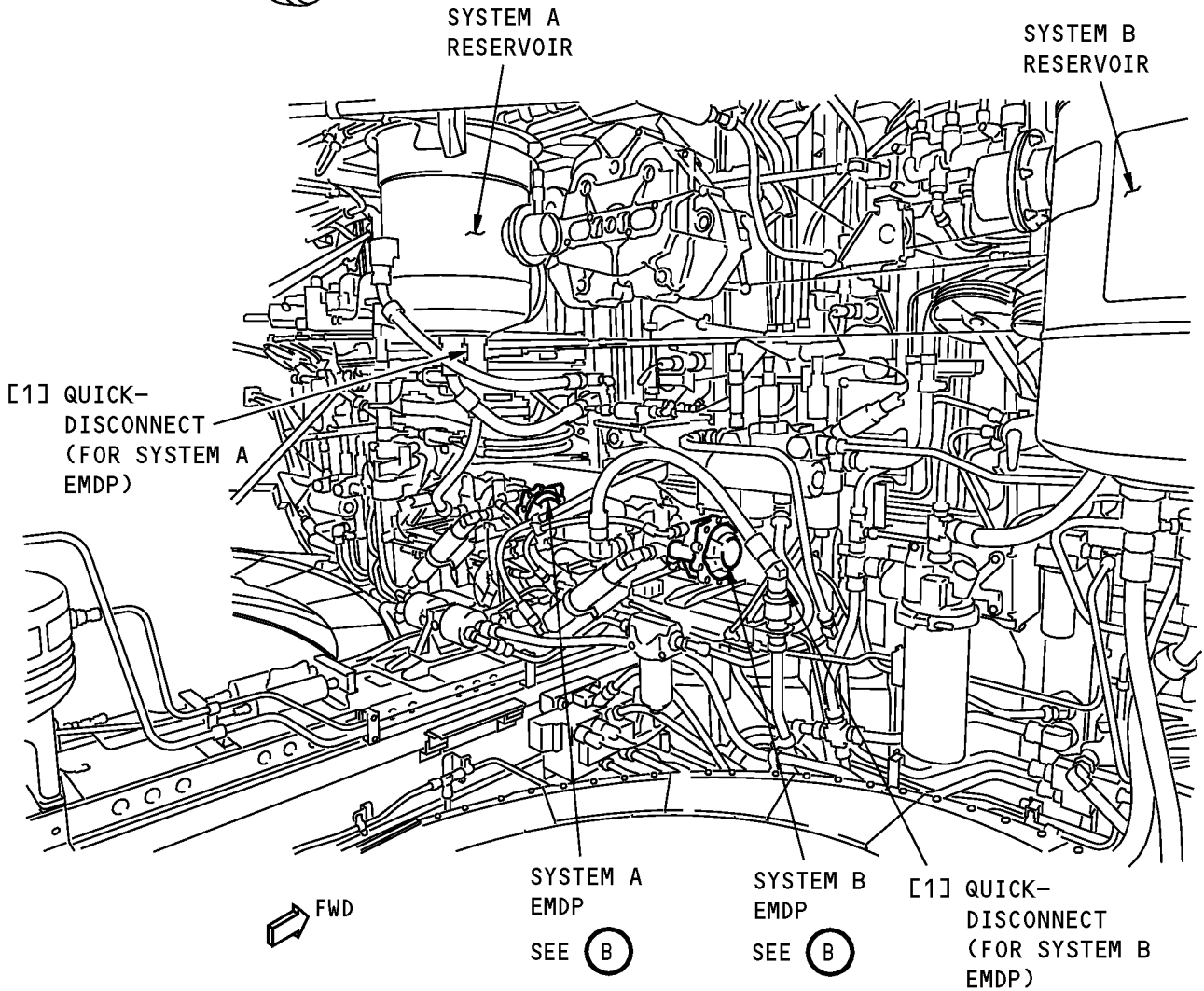
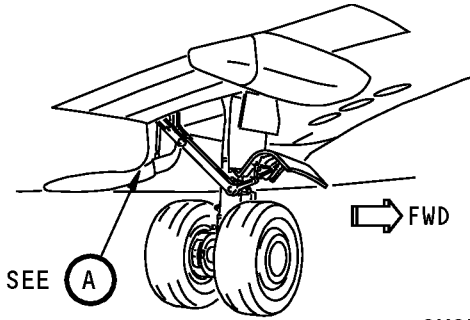
————— **END OF TASK** —————

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MAIN LANDING GEAR WHEEL WELL

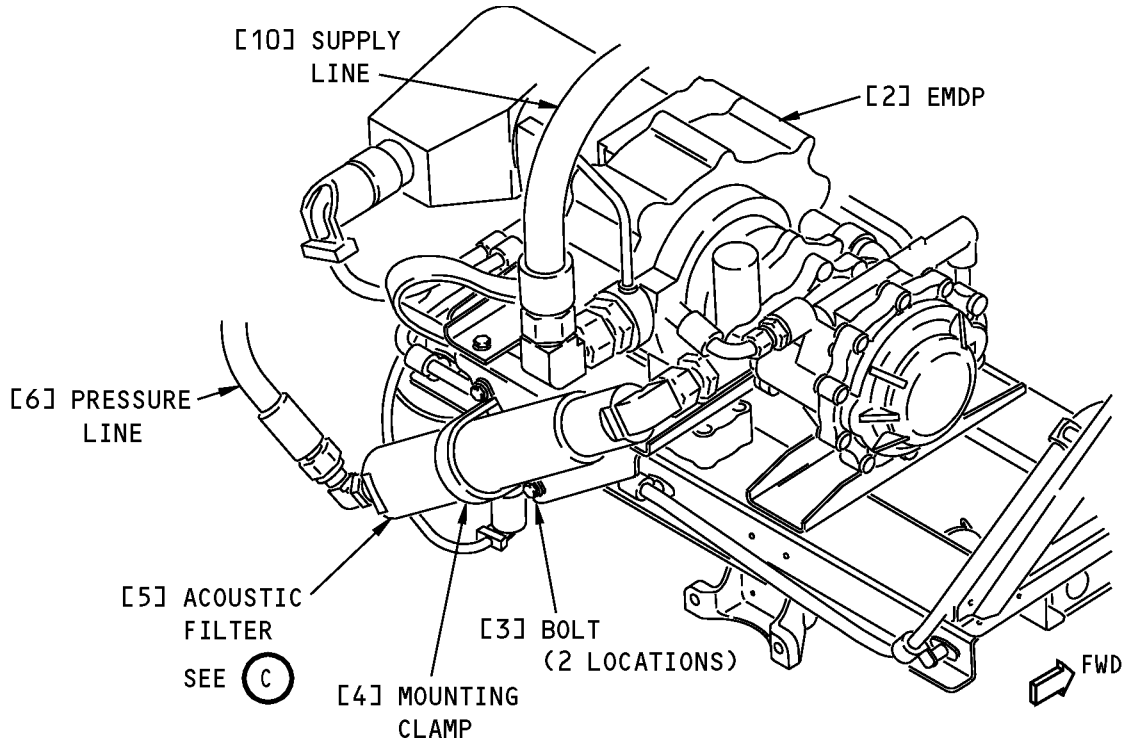
A

Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation
Figure 401 (Sheet 1 of 2)/29-11-27-990-801

EFFECTIVITY
HAP ALL

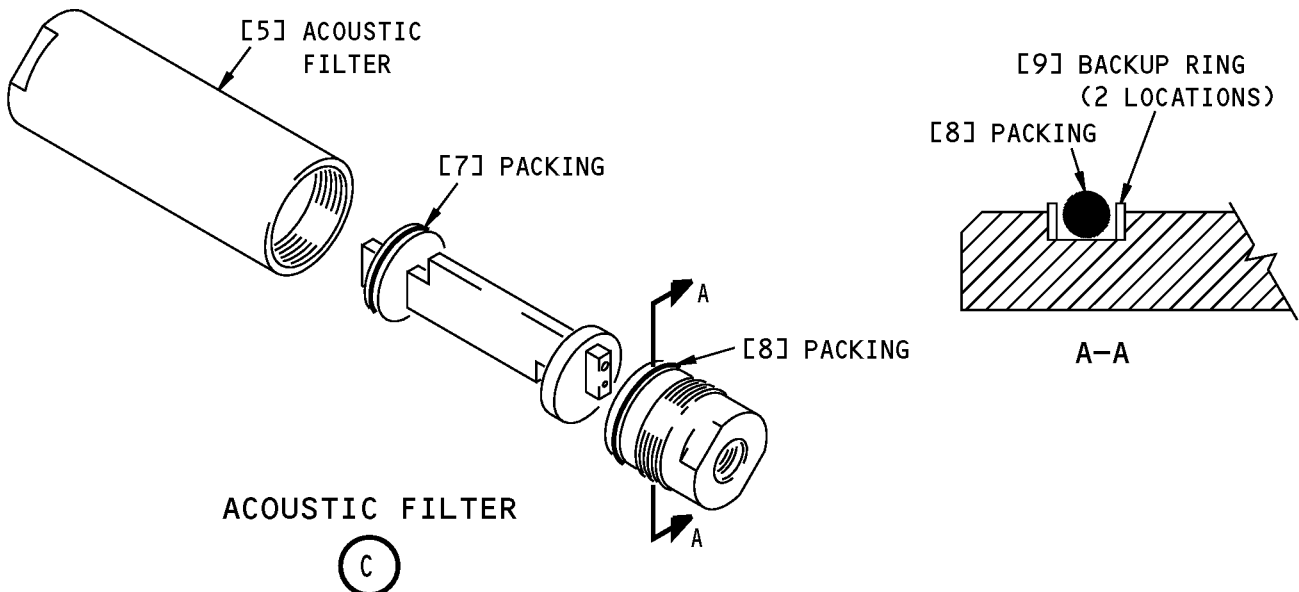
29-11-27

AIRCRAFT MAINTENANCE MANUAL



**HYDRAULIC SYSTEM A EMDP
(HYDRAULIC SYSTEM B EMDP IS EQUIVALENT)**

(B)



Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation
Figure 401 (Sheet 2 of 2)/29-11-27-990-801

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TASK 29-11-27-400-801

3. Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation

(Figure 401)

A. References

Reference	Title
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Filter assembly	29-11-27-01-020	HAP ALL
		29-11-27-01-045	HAP ALL

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Install the Acoustic Filter

SUBTASK 29-11-27-420-001

(1) Put the acoustic filter assembly [5] in its mounting position on the EMDP [2].

SUBTASK 29-11-27-420-007

(2) Install the mounting clamp [4].

- (a) Put the mounting clamp [4] in its position.
- (b) Install the bolts [3].

SUBTASK 29-11-27-420-002

(3) Connect the acoustic filter assembly [5] to the EMDP [2].

- (a) Tighten the acoustic filter assembly [5] to 665 in-lb (75 N·m) to 735 in-lb (83 N·m).

SUBTASK 29-11-27-420-004

(4) Connect the pressure line [6] to the acoustic filter assembly [5].

- (a) Tighten the pressure line [6] to 475 in-lb (54 N·m) to 525 in-lb (59 N·m).

NOTE: For hydraulic system A acoustic filter only, position the pressure line [6] so that it provides the maximum clearance between the pressure line and the filter bowl clamp on the system A return filter module.

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SUBTASK 29-11-27-420-005

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

(5) Connect the supply line [10] at the quick-disconnect [1].

SUBTASK 29-11-27-860-004

(6) Pressurize the applicable hydraulic system A or B reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-27-860-005

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 3, C00882, ELEC HYD PUMP SYS B

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 2, C01449, STANDBY HYDRAULIC PUMP. Row 2: F, 3, C00881, ELEC HYD PUMP SYS A

SUBTASK 29-11-27-860-006

(8) Pressure the applicable hydraulic system A or B. To pressurize it, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-11-27-210-003

(9) Make sure the acoustic filter and its connections do not leak.

SUBTASK 29-11-27-860-007

(10) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

END OF TASK

EFFECTIVITY HAP ALL [Table area]

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HYDRAULIC SYSTEMS A AND B RESERVOIRS - REMOVAL/INSTALLATION

1. General

A. There are four tasks in this procedure:

- (1) Hydraulic system A reservoir removal.
- (2) Hydraulic system A reservoir installation.
- (3) Hydraulic system B reservoir removal.
- (4) Hydraulic system B reservoir installation.

TASK 29-11-31-000-801

2. Hydraulic System A Reservoir Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-33-12-000-801	Hydraulic Fluid Quantity Transmitter/Indicator Removal (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1158	Container - 20 Gallon (76 Liter)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Removal

SUBTASK 29-11-31-860-001

- (1) Remove power from Hydraulic System A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-31-930-001

- (2) Put the DO-NOT-OPERATE tags on the applicable hydraulic system pump switches.

SUBTASK 29-11-31-860-002

- (3) Depressurize the system A hydraulic reservoir. To depressurize it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-31-020-001

- (4) Open the drain valve.

SUBTASK 29-11-31-680-001

- (5) Drain the fluid from the system A reservoir [3] into a 20 gallon (76 liter) container, STD-1158.

NOTE: The system A reservoir capacity is approximately 5.7 gallons (21.6 liters).

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SUBTASK 29-11-31-160-001

(6) Do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

E. Procedure

SUBTASK 29-11-31-020-002

(1) Disconnect the reservoir pressurization line [4].

SUBTASK 29-11-31-020-003

(2) Disconnect the hydraulic lines [11], [12] and [18] from the system A reservoir [3].

SUBTASK 29-11-31-020-004

(3) Install protective covers on all the fittings and the hoses.

SUBTASK 29-11-31-020-005

(4) Disconnect the electrical connector [6] from the fluid quantity transmitter.

SUBTASK 29-11-31-020-006

(5) Install a cap on the electrical connector [6] to prevent contamination or damage.

SUBTASK 29-11-31-020-007

(6) Install a cap on the fluid quantity transmitter to prevent contamination or damage.

SUBTASK 29-11-31-020-008

(7) Remove the bolts [1] and the washers [2].

SUBTASK 29-11-31-020-009

(8) Remove the system A reservoir [3].

SUBTASK 29-11-31-020-010

(9) If it is necessary to keep components for installation on the replacement reservoir [3], do these steps:

(a) Remove the disconnect coupling [8], reducer [14], and reducer [20].

(b) Remove the drain valve [17].

(c) Do this task: Hydraulic Fluid Quantity Transmitter/Indicator Removal, TASK 29-33-12-000-801.

(d) Install caps on all the open ports of the reservoir A [3].

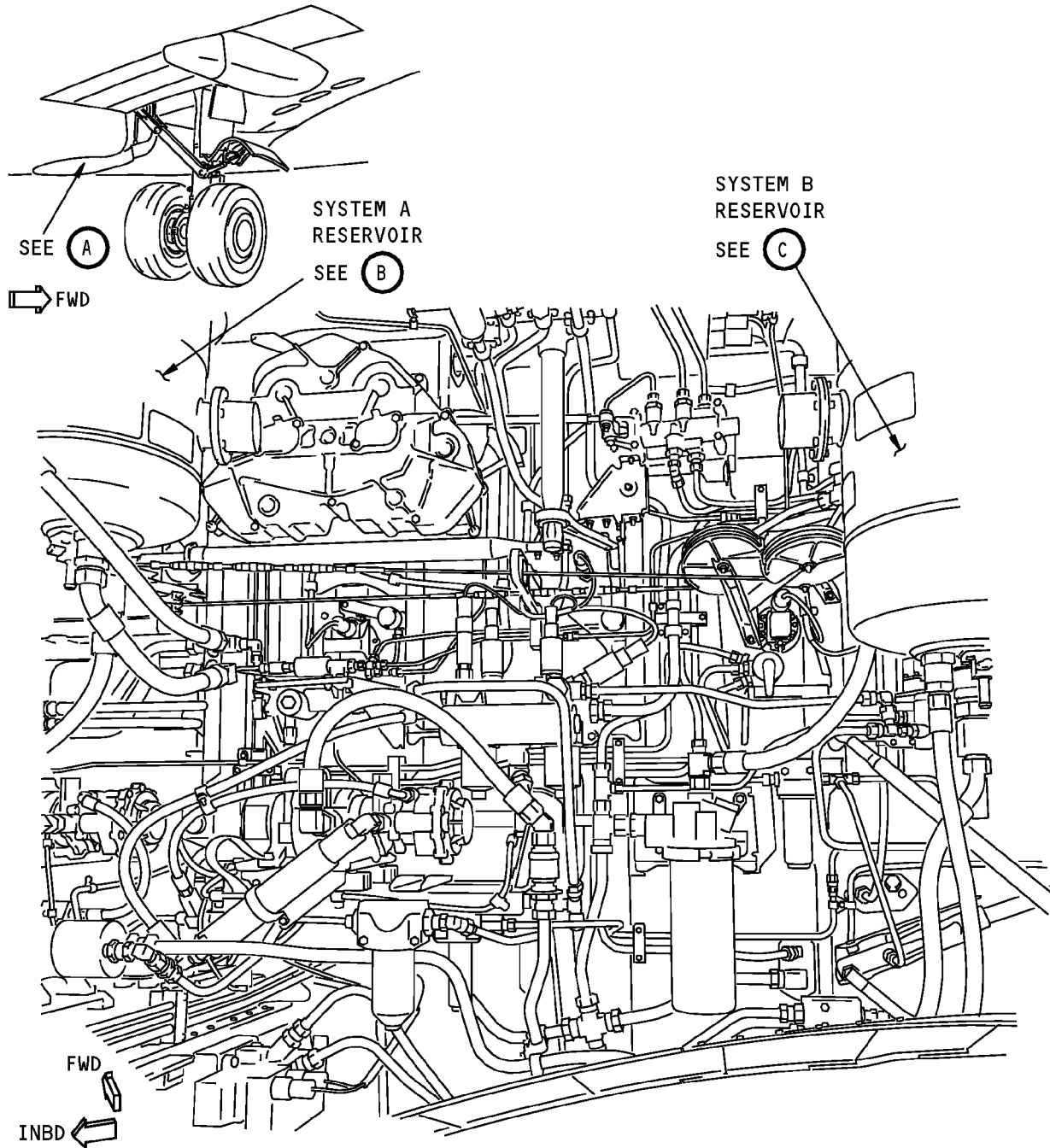
END OF TASK

EFFECTIVITY
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**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

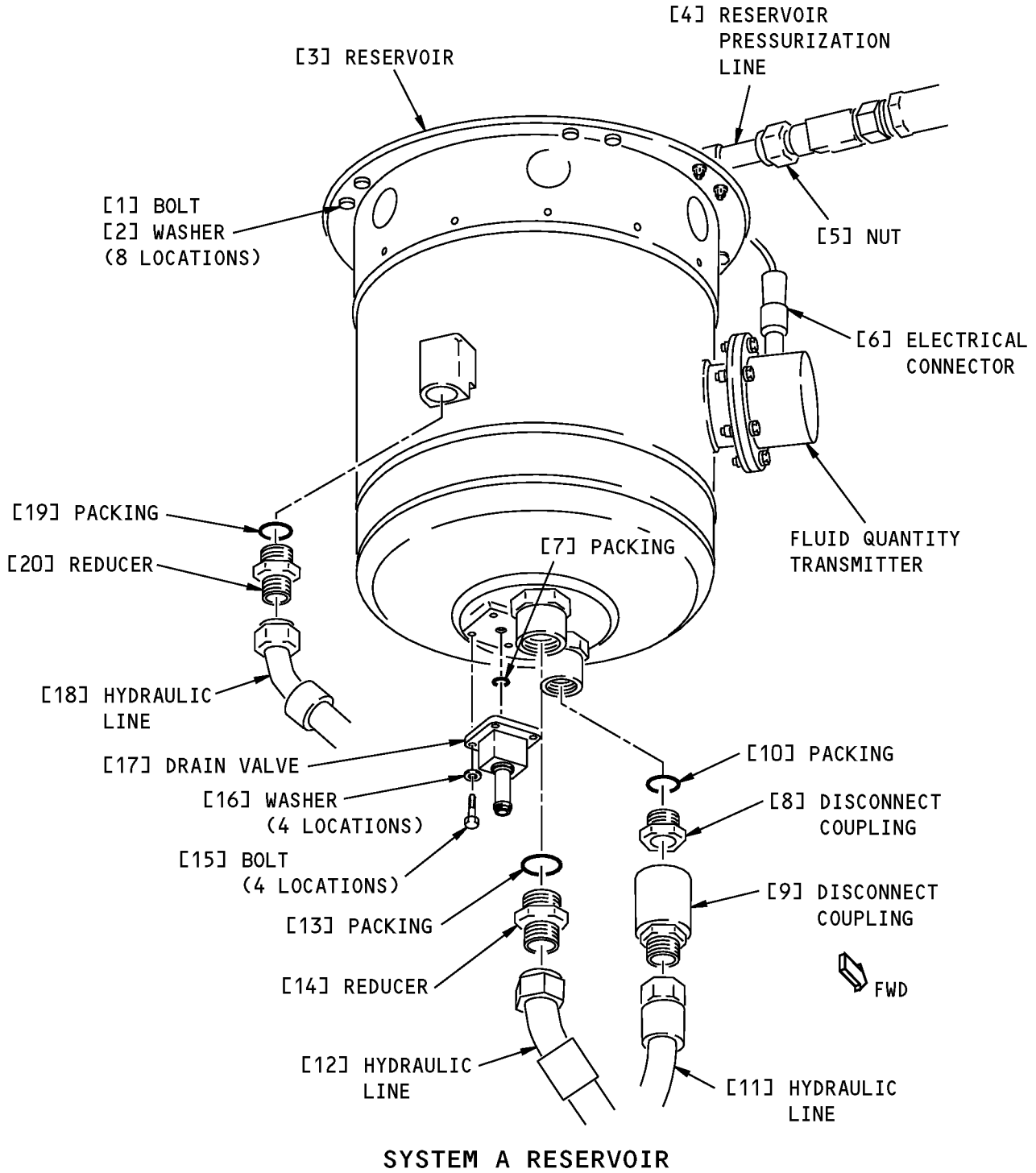
(A)

**Hydraulic System A and B Reservoirs Installation
Figure 401 (Sheet 1 of 3)/29-11-31-990-801**

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SYSTEM A RESERVOIR

(B)

Hydraulic System A and B Reservoirs Installation
Figure 401 (Sheet 2 of 3)/29-11-31-990-801

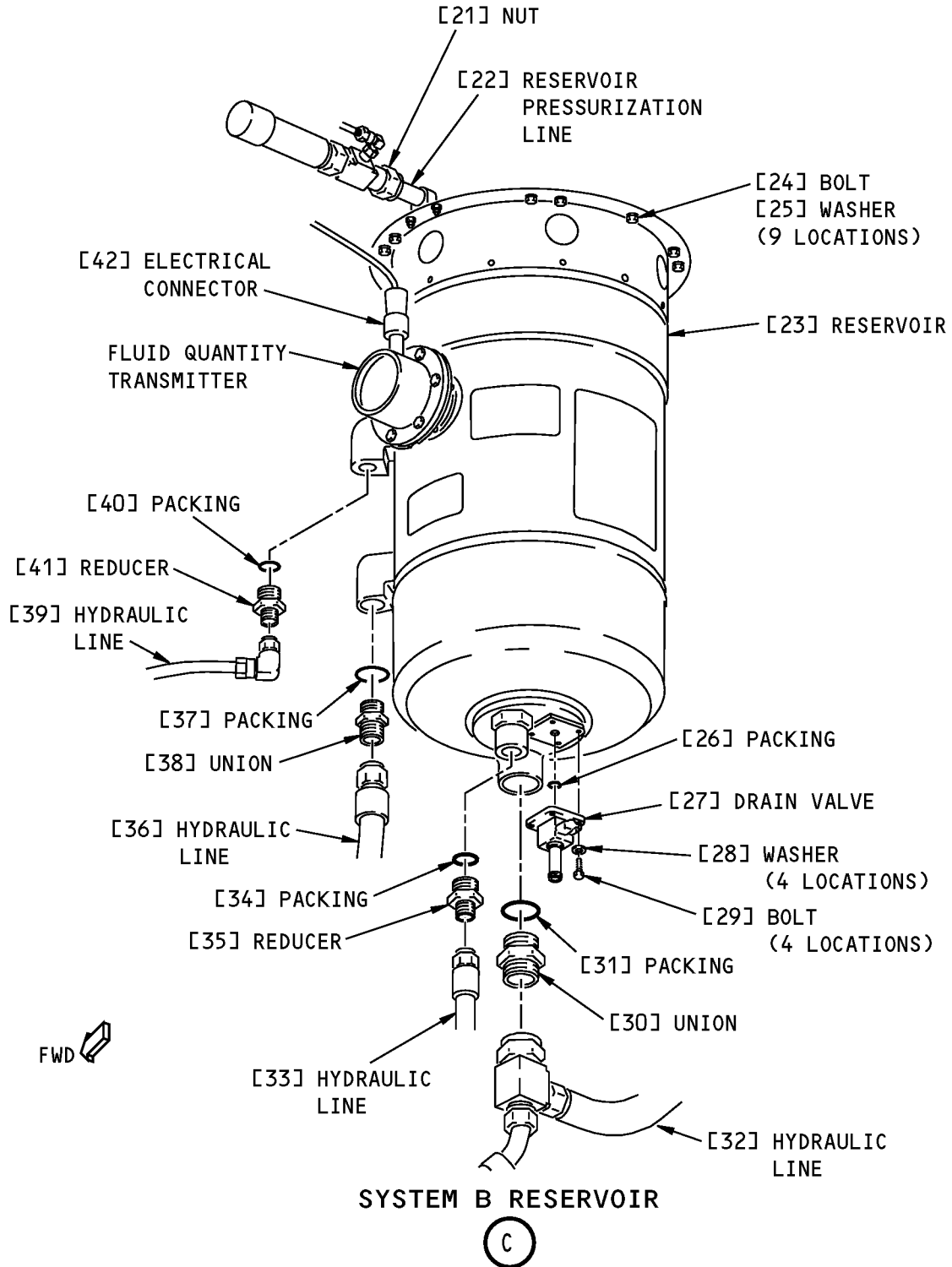
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**Hydraulic System A and B Reservoirs Installation
Figure 401 (Sheet 3 of 3)/29-11-31-990-801**

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TASK 29-11-31-400-801

3. Hydraulic System A Reservoir Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-33-12-400-801	Hydraulic Fluid Quantity Transmitter/Indicator Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Installation

SUBTASK 29-11-31-210-001

(1) Make sure the surfaces of the system A reservoir [3] are clean.

SUBTASK 29-11-31-210-002

(2) Make sure that unwanted material does not get in the reservoir [3].

SUBTASK 29-11-31-420-001

(3) If it is necessary to install components on the replacement reservoir A [3], do these steps:

(a) Install the drain valve [17]:

- 1) Remove the caps from the ports on the reservoir A [3].
- 2) Apply MCS 352B fluid, D00054 or fluid, D00153 on the packing [7].
- 3) Install the new packing [7] in the groove of the flange of the drain valve [17].
- 4) Put the drain valve [17] on the flange.
- 5) Install the bolts [15] and the washers [16].
- 6) Install the lockwire.
- 7) Put the drain valve handle in the CLOSED position.
- 8) Install the lockwire.

(b) Install the reducers [14], [20] and coupling [8]:

- 1) Remove the caps from the ports on the reservoir A [3].

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- 2) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packings [10], [13] and [19], and the reducers [14] and [20] and coupling [8].
3) Install the new packings [10], [13] and [19], and the reducers [14] and [20] and coupling [8] in the reservoir ports.
(c) Do this task: Hydraulic Fluid Quantity Transmitter/Indicator Installation, TASK 29-33-12-400-801.

E. Procedure

SUBTASK 29-11-31-420-002

- (1) Put the hydraulic reservoir A [3] in its mounting position.

SUBTASK 29-11-31-420-003

- (2) Install the bolts [1] and the washers [2].

SUBTASK 29-11-31-420-004

- (3) Remove the caps from the electrical connector [6], fluid quantity transmitter, hydraulic lines [11], [12], [18], [4] and the ports on the reservoir A [3].

SUBTASK 29-11-31-420-005

- (4) Connect the electrical connector [6] to the fluid quantity transmitter.

SUBTASK 29-11-31-420-006

- (5) Connect all the hydraulic lines [11], [12] and [18] to the hydraulic reservoir A [3].

SUBTASK 29-11-31-420-007

- (6) Connect the reservoir pressurization line [4].

F. Hydraulic System A Reservoir Installation Test

SUBTASK 29-11-31-610-001

- (1) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-31-860-003

- (2) Pressurize the hydraulic system A reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-31-790-001

- (3) Do a check for leaks.

SUBTASK 29-11-31-930-002

- (4) Remove the DO-NOT-OPERATE tags from the hydraulic pump switches.

END OF TASK

TASK 29-11-31-000-802

4. Hydraulic System B Reservoir Removal

(Figure 401)

A. References

Table with 2 columns: Reference and Title. Rows include tasks like 'Clean the External Surfaces of the Airplane (P/B 201)', 'Hydraulic Reservoirs Depressurization (P/B 201)', etc.

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(Continued)

Reference	Title
29-33-12-000-801	Hydraulic Fluid Quantity Transmitter/Indicator Removal (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1158	Container - 20 Gallon (76 Liter)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Removal

SUBTASK 29-11-31-860-004

- (1) Do these steps to remove power from Hydraulic System B and the Standby Hydraulic System:
 - (a) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
 - (b) Do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 29-11-31-930-003

- (2) Put the DO-NOT-OPERATE tags on the applicable hydraulic system pump switches.

SUBTASK 29-11-31-860-005

- (3) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-31-020-011

- (4) Open the drain valve.

SUBTASK 29-11-31-680-002

- (5) Drain the fluid from the system B reservoir [23] into a 20 gallon (76 liter) container, STD-1158.

NOTE: The system B reservoirs capacity is approximately 8.2 gallons (31.1 liters).

SUBTASK 29-11-31-160-002

- (6) Do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

E. Procedure

SUBTASK 29-11-31-020-012

- (1) Disconnect the reservoir pressurization line [22].

SUBTASK 29-11-31-020-013

- (2) Disconnect the hydraulic lines [32], [33], [36] and [39] from the system B reservoir [23].

SUBTASK 29-11-31-020-014

- (3) Install protective covers on the fittings and the hoses.

SUBTASK 29-11-31-020-015

- (4) Disconnect the electrical connector [42] from the fluid quantity transmitter.

SUBTASK 29-11-31-020-016

- (5) Remove the bolts [24] and the washers [25].

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SUBTASK 29-11-31-020-017

(6) Remove the system B reservoir [23].

SUBTASK 29-11-31-020-018

(7) If it is necessary to keep components for installation on the replacement reservoir [23], do these steps:

- (a) Remove unions [30], [38], and reducers [35], [41].
- (b) Remove the drain valve [27].
- (c) Do this task: Hydraulic Fluid Quantity Transmitter/Indicator Removal, TASK 29-33-12-000-801.
- (d) Install caps on all the open ports of the system B reservoir [3].

————— END OF TASK —————

TASK 29-11-31-400-802

5. Hydraulic System B Reservoir Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-33-12-400-801	Hydraulic Fluid Quantity Transmitter/Indicator Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for Installation

SUBTASK 29-11-31-210-003

(1) Make sure the surfaces of the system B reservoir [23] are clean.

SUBTASK 29-11-31-210-004

(2) Make sure that unwanted material does not get in the system B reservoir [23].

SUBTASK 29-11-31-420-008

(3) If it is necessary to install components on the replacement reservoir B [23], do these steps:

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- (a) Install the drain valve [27]:
 - 1) Remove the caps from the ports on the reservoir [23].
 - 2) Apply MCS 352B fluid, D00054 or fluid, D00153 on the new packing [26].
 - 3) Install the new packing [26] in the groove of the flange of the drain valve [27].
 - 4) Put the drain valve [27] on the flange.
 - 5) Install the bolts [29] and the washers [28].
 - 6) Install the lockwire.
 - 7) Put the drain valve handle in the CLOSED position.
 - 8) Install the lockwire.
- (b) Install the reducers [35], and [41] and unions [30], and [38]:
 - 1) Remove the caps from the ports on the reservoir [23].
 - 2) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packings [31], [34], [37] and [40], and the reducers [35], and [41] and the unions [30], and [38].
 - 3) Install the new packings [31], [34], [37] and [40], the unions [30] and [38], and the reducers [35] and [41].
- (c) Do this task: Hydraulic Fluid Quantity Transmitter/Indicator Installation, TASK 29-33-12-400-801.

E. Procedure

SUBTASK 29-11-31-420-009

- (1) Put the hydraulic system B reservoir [23] in its mounting position.

SUBTASK 29-11-31-420-010

- (2) Install the bolts [24] and the washers [25].

SUBTASK 29-11-31-420-011

- (3) Remove the caps from the electrical connector [42], fluid quantity transmitter, hydraulic lines [32], [33], [36], [39] and the ports on the reservoir B [23].

SUBTASK 29-11-31-420-012

- (4) Connect the electrical connector [42] to the fluid quantity transmitter.

SUBTASK 29-11-31-420-013

- (5) Connect all the hydraulic lines [32], [33], [36] and [39] to the hydraulic reservoir B [23].

SUBTASK 29-11-31-420-014

- (6) Connect the reservoir pressurization line [22].

F. Hydraulic System B Reservoir Installation Test

SUBTASK 29-11-31-610-002

- (1) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-31-860-006

- (2) Pressurize the hydraulic system B reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-31-790-002

- (3) Do a check for leaks.

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SUBTASK 29-11-31-930-004

(4) Remove the DO-NOT-OPERATE tags from the hydraulic pump switches.

————— **END OF TASK** —————

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SYSTEMS A AND B ELECTRIC MOTOR DRIVEN PUMP (EMDP) CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
B. This procedure has these tasks:
(1) A removal of a EMDP case drain filter element
(2) An installation of a EMDP case drain filter element
(3) A removal of a EMDP case drain filter module
(4) An installation of a EMDP case drain filter module
(5) A metal contamination check of the EMDP case drain filter.
C. The EMDP case drain filter module is referred to as the "filter" in this procedure.
D. This procedure is applicable for the hydraulic systems A and B filter.

TASK 29-11-41-000-801

2. EMDP Case Drain Filter Element Removal

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Table with 2 columns: Reference, Title. Rows include 29-09-00-860-802, 29-11-00 P/B 501, 29-11-00-170-801, 29-11-00-860-805, 29-11-01-860-802, 29-11-21 P/B 401 Config 1.

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Table with 2 columns: Reference, Description. Row: COM-7293, Pick - O-Ring, 90-degree Tip (Part #: YA145-2, Supplier: 55719, A/P Effectivity: 737-ALL)

D. Location Zones

Table with 2 columns: Zone, Area. Rows: 133, Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left; 134, Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

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E. Prepare for the Removal

SUBTASK 29-11-41-860-001

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-11-41-840-001

- (2) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-41-860-002

- (3) Remove pressure from the applicable hydraulic reservoir. To remove it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-41-860-013

- (4) Disconnect the supply line at the system A EMDP quick-disconnect or the system B EMDP quick-disconnect, as applicable.

F. Procedure

NOTE: If necessary, the filter element can be removed from the filter module after removing the module from the airplane. These are the tasks: EMDP Case Drain Filter Module Removal, TASK 29-11-41-000-802 and EMDP Case Drain Filter Module Installation, TASK 29-11-41-400-802.

SUBTASK 29-11-41-020-001

- (1) Remove the filter bowl [13] from the filter head.

NOTE: Remove the filter [12] with the filter bowl [13].

- (a) Put a container below the filter bowl [13] to catch any hydraulic fluid.

SUBTASK 29-11-41-020-002

- (2) Remove the filter [12] from the filter bowl [13].

SUBTASK 29-11-41-020-003

- (3) Remove the packing [9] from the filter [12].

SUBTASK 29-11-41-020-004

- (4) Remove the packing [11], and the backup rings [10] from the filter head.

NOTE: An o-ring pick, COM-7293 may be used to remove the packing. Make sure you do not scratch the filter head.

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SUBTASK 29-11-41-210-001

- (5) Examine the filter [12] element, the filter bowl [13], and the fluid in the filter bowl for metal contamination.
- (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: HYDRAULIC SYSTEMS A AND B - ADJUSTMENT/TEST, PAGEBLOCK 29-11-00/501. Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.

- (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do this task: HYDRAULIC SYSTEMS A AND B ELECTRIC MOTOR-DRIVEN PUMP (EMDP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-21/401

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.

CAUTION: FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Hydraulic System A or B Flushing, TASK 29-11-00-170-801).

SUBTASK 29-11-41-140-001

- (6) Clean the filter bowl [13].

————— END OF TASK —————

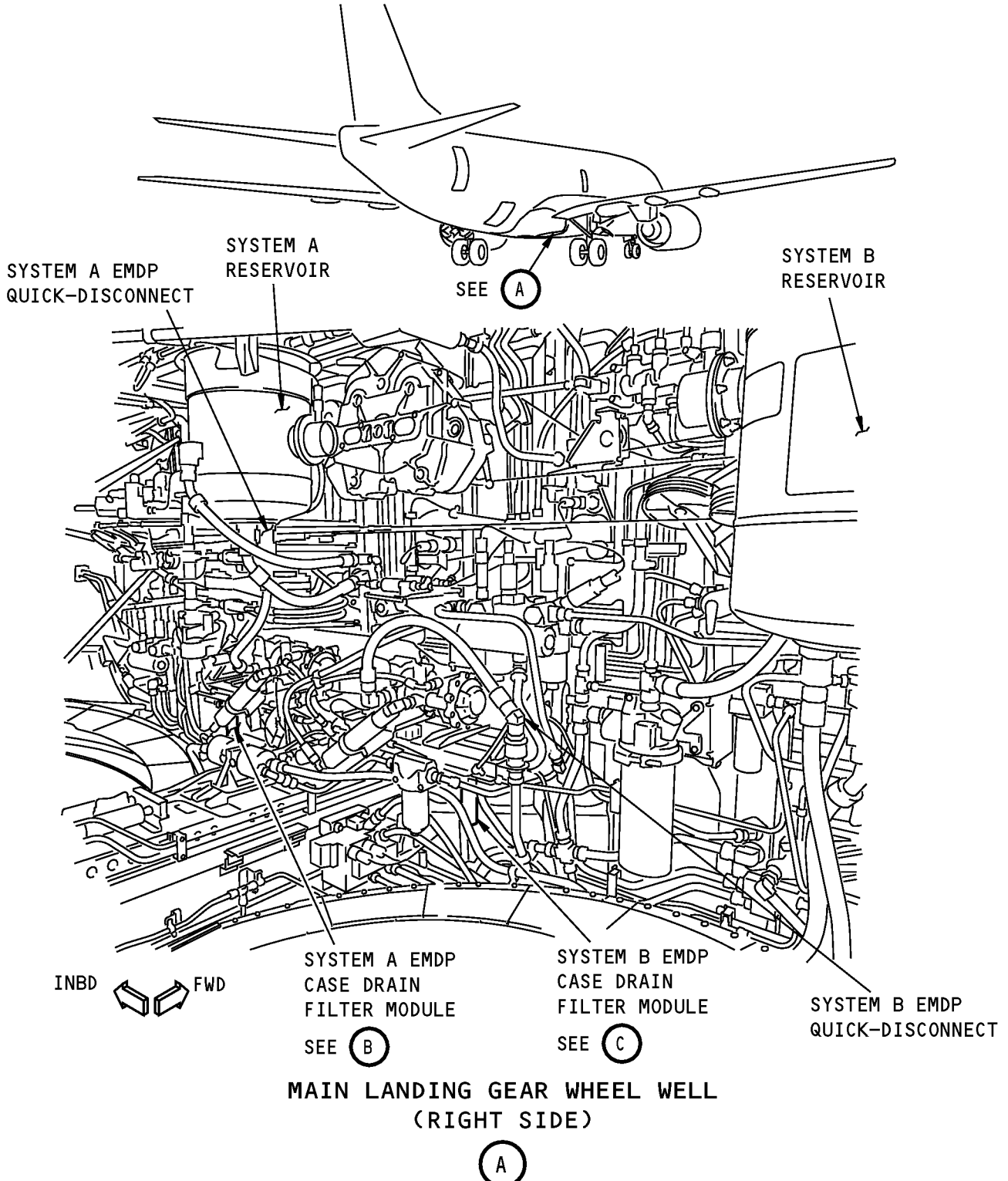
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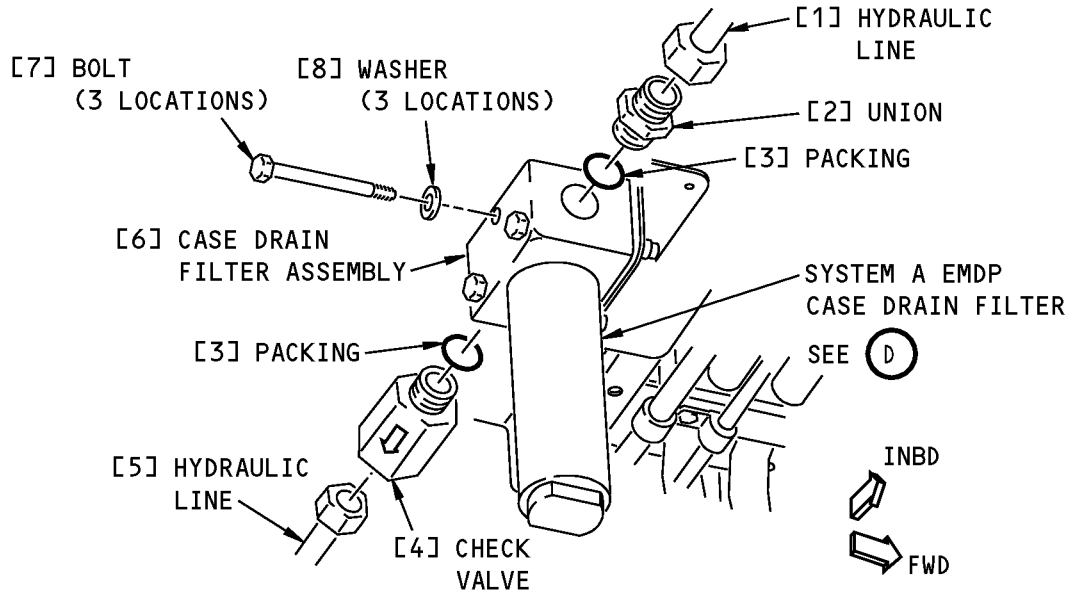


**Systems A and B Electric Motor-Driven Pump (EMDP) Case Drain Filter Installation
Figure 401 (Sheet 1 of 3)/29-11-41-990-801**

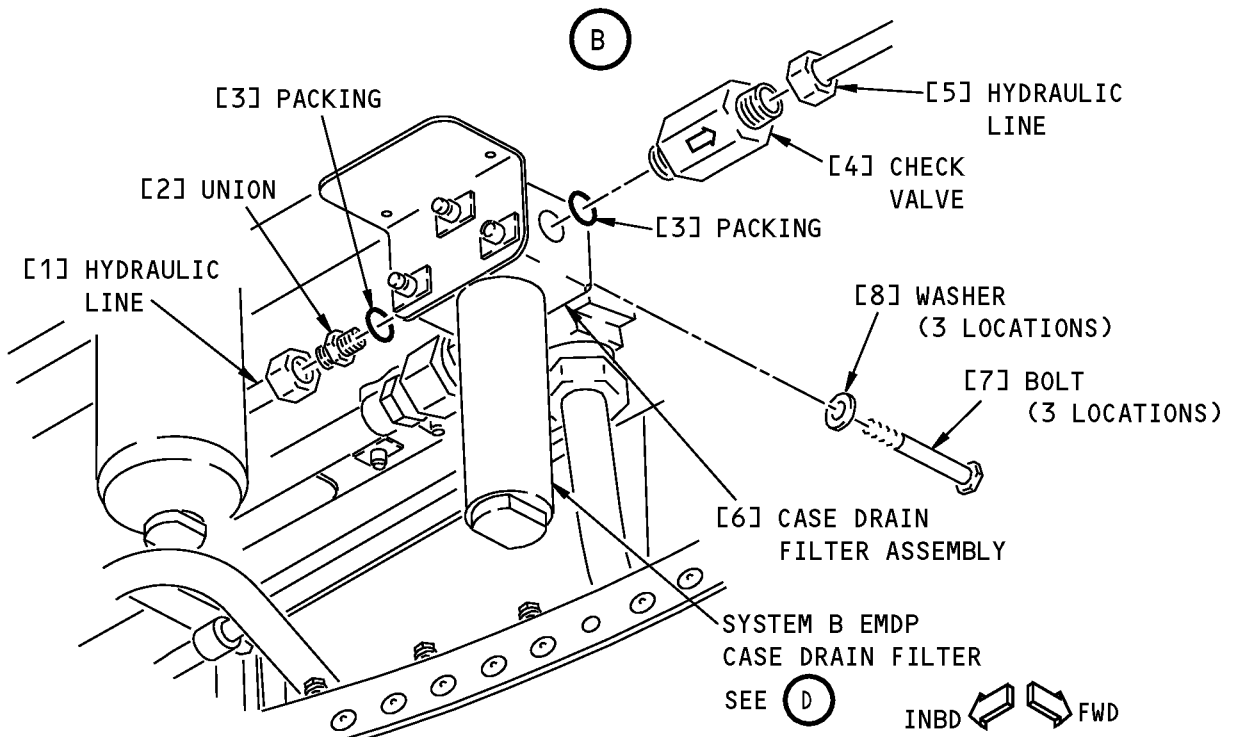
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SYSTEM A EMDP CASE DRAIN FILTER MODULE



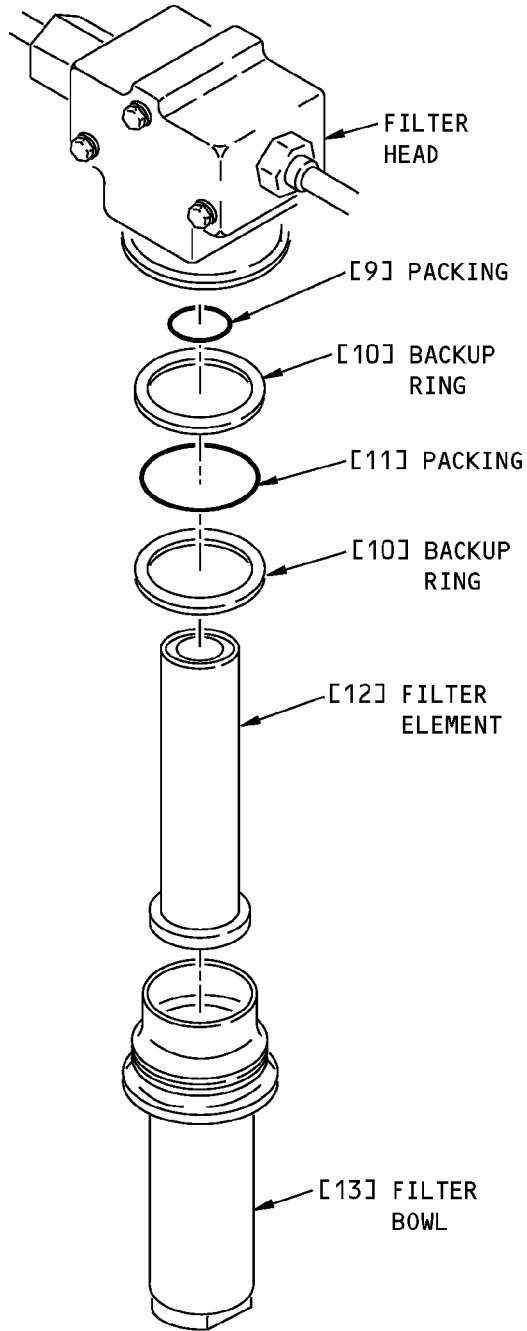
SYSTEM B EMDP CASE DRAIN FILTER MODULE

Systems A and B Electric Motor-Driven Pump (EMDP) Case Drain Filter Installation
Figure 401 (Sheet 2 of 3)/29-11-41-990-801

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**CASE DRAIN FILTER
(EXAMPLE)**

D

**Systems A and B Electric Motor-Driven Pump (EMDP) Case Drain Filter Installation
Figure 401 (Sheet 3 of 3)/29-11-41-990-801**

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TASK 29-11-41-400-801

3. EMDP Case Drain Filter Element Installation

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-44-400-801	Lockwires Installation (P/B 401)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	Packing	29-11-41-01-055	HAP ALL
		29-11-41-02-055	HAP ALL
11	Packing	29-11-41-01-060	HAP ALL
		29-11-41-02-060	HAP ALL
12	Filter	29-11-41-01-050	HAP ALL
		29-11-41-02-050	HAP ALL

E. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

F. Procedure

SUBTASK 29-11-41-640-001

(1) Lubricate the two backup rings [10] and the new packing [11] with fluid, D00153.

SUBTASK 29-11-41-420-001

(2) Install the two backup rings [10] and the new packing [11] in the filter head.

SUBTASK 29-11-41-640-002

(3) Lubricate the new packing [9] with fluid, D00153.

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SUBTASK 29-11-41-420-002

(4) Install the new packing [9] in the filter [12].

SUBTASK 29-11-41-020-005

(5) Put the filter [12] in the filter bowl [13].

SUBTASK 29-11-41-640-003

(6) Lubricate the threads of the filter bowl [13] with fluid, D00153.

SUBTASK 29-11-41-420-003

(7) Put the filter bowl [13] and filter [12] under the filter assembly [6].

(a) Raise the filter [12] from the filter bowl [13] and push it onto the filter assembly outlet.

SUBTASK 29-11-41-020-006

(8) Install the filter bowl [13] on the filter head.

(a) Tighten the filter bowl [13] to 96-120 pound-inches (10.8-13.5 newton-meters) pound-inches.

SUBTASK 29-11-41-420-010

(9) Install lockwire on the filter bowl [13]. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801.

G. EMDP Case Drain Filter Element Installation Test

SUBTASK 29-11-41-860-014

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

(1) Connect the supply line at the system A EMDP quick-disconnect or the system B EMDP quick-disconnect, as applicable.

SUBTASK 29-11-41-600-001

(2) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-41-860-003

(3) Pressurize the applicable hydraulic reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-41-860-004

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(4) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-11-41-860-005

(5) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-41-860-006

(6) Pressurize the applicable hydraulic system with the EMDP. To pressurize the system, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-11-41-210-002

(7) Make sure the applicable EMDP operates.

SUBTASK 29-11-41-210-003

(8) Make sure the case drain filter assembly [6] does not have leaks.

END OF TASK

TASK 29-11-41-000-802

4. EMDP Case Drain Filter Module Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

<u>Zone</u>	<u>Area</u>
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for the Removal

SUBTASK 29-11-41-860-008

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-11-41-840-002

- (2) Remove hydraulic power from the applicable system, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-41-860-009

- (3) Release the pressure from the applicable hydraulic reservoir, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

D. Procedure

SUBTASK 29-11-41-020-007

- (1) Disconnect the hydraulic lines [1] and [5] from the case drain filter assembly [6].

SUBTASK 29-11-41-680-001

- (2) Drain the hydraulic fluid into a container.

SUBTASK 29-11-41-160-001

- (3) Clean all hydraulic fluid from the installation area if it is necessary (TASK 12-40-00-100-801).

SUBTASK 29-11-41-020-008

- (4) If it is necessary to keep components for installation on the replacement filter assembly, do these steps:
 - (a) Remove the union [2], check valve [4] and the packings [3] from the ports of the filter assembly [6].

SUBTASK 29-11-41-020-009

- (5) Install caps on the hydraulic lines [1] and [5] to prevent contamination.

SUBTASK 29-11-41-020-010

- (6) Install caps on the open ports on the case drain filter assembly [6] to prevent contamination.

SUBTASK 29-11-41-020-011

- (7) Remove bolts [7] and washers [8] that attach the case drain filter assembly [6] to the airplane.

SUBTASK 29-11-41-020-012

- (8) Remove the case drain filter assembly [6] from the airplane.

END OF TASK

TASK 29-11-41-400-802

5. EMDP Case Drain Filter Module Installation

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

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B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Packing	29-11-41-01-030 29-11-41-02-030	HAP ALL HAP ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Procedure

SUBTASK 29-11-41-420-005

- (1) If it is necessary to install components on the replacement filter assembly, do these steps:
 - (a) If plugs are installed in the ports for the hydraulic tube [1], and hydraulic tube [5] remove them.
 - (b) Apply fluid, D00153, to the new packings [3], and to the threads on the union [2], and the check valve [4].
 - (c) Install the new packing [3] on the union [2].
 - (d) Install the new packing [3] on the check valve [4].
 - (e) Install the packing [3] and the union [2] in the inlet port of the case drain filter assembly [6].

CAUTION: MAKE SURE YOU INSTALL THE CHECK VALVE IN THE "OUT" PORT, AND THE ARROW ON THE CHECK VALVE MATCHES THE ARROW ON THE FILTER HEAD. FAILURE TO DO THIS CAN CAUSE DAMAGE TO THE EMDP.

- (f) Install the packing [3] and the check valve [4] in the outlet port of the case drain filter assembly [6].

SUBTASK 29-11-41-640-004

- (2) Lubricate the threaded fittings with fluid, D00153.

SUBTASK 29-11-41-420-006

CAUTION: MAKE SURE THE ARROW ON THE FILTER HEAD WILL POINT OUTBOARD. FAILURE TO DO THIS CAN CAUSE DAMAGE TO THE EMDP.

- (3) Put the case drain filter assembly [6] in its position.

SUBTASK 29-11-41-420-007

- (4) Install the bolts [7] and the washers [8] to attach the case drain filter assembly [6] to the airplane.

SUBTASK 29-11-41-020-013

- (5) If caps are installed in the hydraulic lines [1] and [5] remove them.

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SUBTASK 29-11-41-420-008

(6) Connect the hydraulic lines [1] and [5] to the case drain filter assembly [6].

SUBTASK 29-11-41-420-009

(7) Make sure the filter bowl [13] has lockwire installed.

F. EMDP Case Drain Filter Module Installation Test

SUBTASK 29-11-41-610-002

(1) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-41-840-003

(2) Pressurize the applicable hydraulic reservoir, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-41-860-010

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-41-860-011

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(4) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-11-41-790-001

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THE AILERONS, RUDDER, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Put the applicable switch, on the forward overhead panel, P5, in the ON position.

- (a) ELEC 2 for system A.
- (b) ELEC 1 for system B.

SUBTASK 29-11-41-790-002

(6) Make sure the case drain filter module does not have a leak.

SUBTASK 29-11-41-840-004

(7) Put the ELEC 2 or ELEC 1 switch in the OFF position.

SUBTASK 29-11-41-860-012

(8) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

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SUBTASK 29-11-41-600-002

(9) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

END OF TASK

TASK 29-11-41-700-801

6. EMDP Case Drain Filter - Metal Contamination Check

(Figure 401)

A. General

(1) Do this task if you found unacceptable metal contamination in the case drain filter for the EMDP.

B. References

Reference	Title
29-11-21-000-801-001	Electric Motor-Driven Pump (EMDP) Removal (P/B 401)
29-11-21-400-801-001	Electric Motor-Driven Pump (EMDP) Installation (P/B 401)
29-11-27-000-801	Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal (P/B 401)
29-11-27-400-801	Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation (P/B 401)
29-11-71-000-802	Hydraulic Systems A and B Pressure Filter Module Element Removal (P/B 401)
29-11-71-400-802	Hydraulic Systems A and B Pressure Module Filter Element Installation (P/B 401)
29-22-00-730-801	Power Transfer Unit (PTU) System Test (P/B 501)
29-22-11-000-801	Power Transfer Unit (PTU) Removal (P/B 401)
29-22-11-400-801	Power Transfer Unit Installation (P/B 401)
29-22-21-020-801	PTU Pressure Filter Element Removal (P/B 401)
29-22-21-400-802	PTU Pressure Filter Element Installation (P/B 401)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-11-41-170-001

(1) Flush the hydraulic lines between the case drain filter and the hydraulic pump.

SUBTASK 29-11-41-210-004

(2) Look for metal contamination in the pressure filter for the EMDP, do this task: Hydraulic Systems A and B Pressure Filter Module Element Removal, TASK 29-11-71-000-802.

(a) If you find metal contamination, do these steps:

- 1) Flush the hydraulic lines between the pressure filter and the EMDP.
- 2) Install a new pressure filter element

These are the tasks: Hydraulic Systems A and B Pressure Filter Module Element Removal, TASK 29-11-71-000-802, Hydraulic Systems A and B Pressure Module Filter Element Installation, TASK 29-11-71-400-802.

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3) Install a new EMDP

These are the tasks: Electric Motor-Driven Pump (EMDP) Removal, TASK 29-11-21-000-801-001, Electric Motor-Driven Pump (EMDP) Installation, TASK 29-11-21-400-801-001,

- (b) If you do not find metal contamination in the pressure filter of the EMDP, do this task: Hydraulic Systems A and B Pressure Module Filter Element Installation, TASK 29-11-71-400-802.

SUBTASK 29-11-41-210-005

- (3) Look for metal contamination in the acoustic filter for the EMDP, do this task: Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal, TASK 29-11-27-000-801.

- (a) If you find metal contamination, do these steps:

1) Clean the acoustic filter.

- a) These are the tasks: Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal, TASK 29-11-27-000-801, Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation, TASK 29-11-27-400-801,

2) Install a new EMDP

These are the tasks: Electric Motor-Driven Pump (EMDP) Removal, TASK 29-11-21-000-801-001, Electric Motor-Driven Pump (EMDP) Installation, TASK 29-11-21-400-801-001

- (b) If you do not find metal contamination in the acoustic filter, do this task: Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation, TASK 29-11-27-400-801.

SUBTASK 29-11-41-210-006

- (4) If the acoustic filter and the pressure filter for the EMDP do not have metal contamination, then do these steps:

- (a) Look for metal contamination in the pressure filter for the PTU, do this task: PTU Pressure Filter Element Removal, TASK 29-22-21-020-801.

- (b) If you find metal contamination, do these steps:

1) Flush the hydraulic lines between the pressure filter and the PTU.

2) Install a new PTU pressure filter element

These are the tasks: PTU Pressure Filter Element Removal, TASK 29-22-21-020-801, PTU Pressure Filter Element Installation, TASK 29-22-21-400-802

3) Install a new PTU

These are the tasks: Power Transfer Unit (PTU) Removal, TASK 29-22-11-000-801, Power Transfer Unit Installation, TASK 29-22-11-400-801,

- (c) If the pressure filter for the PTU does not have metal contamination, do these steps:

1) Do this task: Power Transfer Unit (PTU) System Test, TASK 29-22-00-730-801.

2) If the PTU does not operate correctly, replace the PTU.

These are the tasks: Power Transfer Unit (PTU) Removal, TASK 29-22-11-000-801, Power Transfer Unit Installation, TASK 29-22-11-400-801 .

————— END OF TASK —————

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AIRCRAFT MAINTENANCE MANUAL

ENGINE DRIVEN PUMP (EDP) CASE DRAIN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A removal of a EDP case drain filter element.
 - (2) An installation of a EDP case drain filter element.
 - (3) A removal of a EDP case drain filter.
 - (4) An installation of a EDP case drain filter.

TASK 29-11-51-000-801

2. EDP Case Drain Filter Element Removal

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) Each engine has one case drain filter for each engine-driven pump located at the 11 o'clock position.
- (3) The case drain filter module on Engine 1 is for hydraulic system A. The case drain filter module on Engine 2 is for hydraulic system B.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00 P/B 501	HYDRAULIC SYSTEMS A AND B - ADJUSTMENT/TEST
29-11-00-170-801	Hydraulic System A or B Flushing (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-11 P/B 401 Config 1	HYDRAULIC SYSTEMS A AND B ENGINE-DRIVEN PUMP (EDP) - REMOVAL/INSTALLATION
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
410	Subzone - Engine 1
413	Engine 1 - Fan Cowl, Left
420	Subzone - Engine 2
423	Engine 2 - Fan Cowl, Left

D. Prepare for the Removal

SUBTASK 29-11-51-860-001

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-51-860-002

- (2) Remove pressure from the applicable hydraulic reservoir. To remove it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

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SUBTASK 29-11-51-860-003

- (3) To get access to the case drain filter, open the left fan cowl panel as follows: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

E. Procedure

SUBTASK 29-11-51-020-001

- (1) Remove the filter bowl [8] from the filter head.
 - (a) Remove the filter bowl [8] with the filter [7] .
 - (b) Drain the hydraulic fluid into a container.

SUBTASK 29-11-51-020-002

- (2) Remove the filter [7].

SUBTASK 29-11-51-020-003

- (3) Remove the packing [6] from the filter [7].

SUBTASK 29-11-51-020-004

- (4) Remove the packing [10], and the backup rings [5] from the filter head.

SUBTASK 29-11-51-210-003

- (5) Examine the filter [7] element, the filter bowl [8], and the fluid in the filter bowl for metal contamination.
 - (a) If you find a small quantity of metal particles that have equal dimensions, then replace the filter and do an operational test of the pump, do this task: (HYDRAULIC SYSTEMS A AND B - ADJUSTMENT/TEST, PAGEBLOCK 29-11-00/501). Examine the filter again at the scheduled filter change interval.

NOTE: It is not necessary to replace a pump if the quantity of metal particles is small and they have equal dimensions. The filter can have more particles during initial operation of a new pump while mating parts wear away small surface defects. It is not necessary to replace the pump if more small particles are found at the next filter change after installation of a new pump.

- (b) If you find a large quantity of small metal particles, large metal particles that are not of equal dimensions, or a large quantity of steel particles, then replace the pump at the next maintenance opportunity, do this task: (HYDRAULIC SYSTEMS A AND B ENGINE-DRIVEN PUMP (EDP) - REMOVAL/INSTALLATION, PAGEBLOCK 29-11-11/401).

NOTE: A large quantity of small metal particles, or large metal particles that are not of equal dimensions, can be an indication of an unsatisfactory pump. The particles are usually bronze mixed with a small quantity of steel. A large quantity of steel particles is an indication of unsatisfactorily worn bearings.

- (c) Write down the results of the filter inspection and give them to the pump overhaul facility.

NOTE: The filter inspection results can be used as an aid to find the condition of the pump. A pump with an unsatisfactory bearing can pass the functional test and be returned to service with no fault found. Giving the filter inspection data to the overhaul facility can prevent the return of an unsatisfactory pump to service.

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CAUTION: FLUSH THE HYDRAULIC LINES TO REMOVE METAL CONTAMINATION. IF A LARGE QUANTITY OF METAL CONTAMINATION STAYS IN THE LINES, THE FILTER CAN BECOME BLOCKED. A BLOCKED FILTER CAN CAUSE DAMAGE TO THE PUMP.

- (d) If a pump is removed because metal contamination is found in the filter, then flush the hydraulic lines and replace the related filter elements, do this task: (Hydraulic System A or B Flushing, TASK 29-11-00-170-801).

SUBTASK 29-11-51-160-001

- (6) Clean the filter bowl [8].

————— END OF TASK —————

TASK 29-11-51-400-801

3. EDP Case Drain Filter Element Installation

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-44-400-801	Lockwires Installation (P/B 401)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Packing	29-11-51-01-200	HAP 001-007
		29-11-51-01A-200	HAP 008-013, 015-026, 028-054, 101-999
7	Filter	29-11-51-01-195	HAP 001-007
		29-11-51-01A-195	HAP 008-013, 015-026, 028-054, 101-999
10	Packing	29-11-51-01-205	HAP 001-007
		29-11-51-01A-205	HAP 008-013, 015-026, 028-054, 101-999

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E. Location Zones

<u>Zone</u>	<u>Area</u>
410	Subzone - Engine 1
413	Engine 1 - Fan Cowl, Left
420	Subzone - Engine 2
423	Engine 2 - Fan Cowl, Left

F. Procedure

SUBTASK 29-11-51-640-001

- (1) Apply MCS 352B fluid, D00054 or fluid, D00153 to the backup rings [5], and new packing [10].

SUBTASK 29-11-51-420-001

- (2) Install the backup rings [5] and the new packing [10] in the filter head groove.

SUBTASK 29-11-51-640-002

- (3) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [6].

SUBTASK 29-11-51-420-002

- (4) Install the new packing [6] in the filter element groove.

SUBTASK 29-11-51-420-003

- (5) Install the filter [7] in the filter bowl [8].

SUBTASK 29-11-51-640-003

- (6) Apply MCS 352B fluid, D00054 or fluid, D00153 to the threads of the filter bowl [8].

SUBTASK 29-11-51-420-004

- (7) Install the filter bowl [8] into the filter head.

(a) Tighten the filter bowl [8] to 96-120 pound-inches (10.8-13.6 newton-meters).

(b) Install lockwire. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801.

G. EDP Case Drain Filter Element Installation Test

SUBTASK 29-11-51-860-004

- (1) Pressurize the applicable hydraulic reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-51-860-005

- (2) Pressurize the applicable system with the engine driven pump. To pressurize the system, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.

SUBTASK 29-11-51-860-006

- (3) Make sure the hydraulic pressure becomes stable between 2850 and 3200 psi.

SUBTASK 29-11-51-790-001

- (4) Make sure the case drain filter assembly does not have a leak.

SUBTASK 29-11-51-410-001

- (5) For the engine left fan cowl panel, do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 29-11-51-860-007

- (6) Remove the hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

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SUBTASK 29-11-51-600-001

(7) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

END OF TASK

TASK 29-11-51-000-802

4. EDP Case Drain Filter Module Removal

(Figure 401)

A. General

- (1) Each engine has one case drain filter module for each engine-driven pump located at the 11 o'clock position.
- (2) The case drain filter module on Engine 1 is for hydraulic system A. The case drain filter module on Engine 2 is for hydraulic system B.

B. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
71-11-02-010-801-F00	Open the Fan Cowl Panels (P/B 201)

C. Location Zones

Zone	Area
410	Subzone - Engine 1
413	Engine 1 - Fan Cowl, Left
420	Subzone - Engine 2
423	Engine 2 - Fan Cowl, Left

D. Procedure

SUBTASK 29-11-51-860-008

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-51-860-009

- (2) Remove pressure from the applicable hydraulic reservoir. To remove it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-51-860-010

- (3) To get access to the EDP case drain filter module, open the left fan cowl panel as follows: Open the Fan Cowl Panels, TASK 71-11-02-010-801-F00.

SUBTASK 29-11-51-020-005

- (4) Disconnect the hydraulic lines from the filter [9].

SUBTASK 29-11-51-680-001

- (5) Drain the hydraulic fluid into a container.

SUBTASK 29-11-51-160-002

- (6) Clean all hydraulic fluid from the installation area if it is necessary (TASK 12-40-00-100-801).

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SUBTASK 29-11-51-020-006

(7) If it is necessary to keep components for installation on the replacement filter assembly, do these steps:

- (a) Remove the union [12], check valve [14], packing [13], and packing [15] from the ports of the filter [9] assembly.

SUBTASK 29-11-51-420-005

(8) Install caps on the hydraulic lines.

SUBTASK 29-11-51-020-007

(9) Remove the mounting bolts [1] and washers [2].

SUBTASK 29-11-51-020-008

(10) Remove the filter [9].

————— **END OF TASK** —————

TASK 29-11-51-400-802

5. EDP Case Drain Filter Module Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-804	Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
71-11-02-410-801-F00	Close the Fan Cowl Panels (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	Filter	29-11-51-01-170	HAP 001-007
		29-11-51-01A-170	HAP 008-013, 015-026, 028-054, 101-999
13	Packing	29-11-51-01-135	HAP 001-007
		29-11-51-01A-135	HAP 008-013, 015-026, 028-054, 101-999
15	Packing	29-11-51-01-085	HAP 001-007
		29-11-51-01A-085	HAP 008-013, 015-026, 028-054, 101-999

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D. Location Zones

Zone	Area
410	Subzone - Engine 1
413	Engine 1 - Fan Cowl, Left
420	Subzone - Engine 2
423	Engine 2 - Fan Cowl, Left

E. Procedure

SUBTASK 29-11-51-420-006

- (1) If it is necessary to install components on the replacement filter assembly, do these steps:
 - (a) If plugs are installed in the ports of the filter [9] assembly remove them.
 - (b) Apply fluid, D00153, to the new packing [13], packing [15] and to the threads on the union [12], and the check valve [14].
 - (c) Install the new packing [13] on the union [12].
 - (d) Install the new packing [15] on the check valve [14].
 - (e) Install the packing [13] and the union [12] in the inlet port of filter [9].
 - 1) Tighten the union [12] to 162-178 pound-inches (18.3-20.1 newton-meters).

CAUTION: MAKE SURE YOU INSTALL THE CHECK VALVE IN THE "OUT" PORT, AND THE ARROW ON THE CHECK VALVE MATCHES THE ARROW ON THE FILTER HEAD. FAILURE TO DO THIS CAN CAUSE DAMAGE TO THE EDP.

- (f) Install the packing [15] and the check valve [14] in the outlet port of the filter [9].
 - 1) Tighten the check valve [14] to 162-178 pound-inches (18.3-20.1 newton-meters).

SUBTASK 29-11-51-420-007

CAUTION: MAKE SURE THE ARROW ON THE FILTER HEAD WILL POINT AFT. FAILURE TO DO THIS CAN CAUSE DAMAGE TO THE EDP.

- (2) Put the filter [9] on the mounting bracket.

SUBTASK 29-11-51-420-008

- (3) Install the bolts [1] and washers [2].

SUBTASK 29-11-51-020-009

- (4) Remove the caps from the hydraulic lines.

SUBTASK 29-11-51-420-009

- (5) Connect the hydraulic lines to the filter [9] assembly.

F. EDP Case Drain Filter Module Installation Test

SUBTASK 29-11-51-860-011

- (1) Pressurize the applicable hydraulic reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-51-860-012

- (2) Pressurize the applicable system with the engine driven pump. To pressurize the system, do this task: Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.

SUBTASK 29-11-51-790-002

- (3) Examine the filter and connections for leaks.

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SUBTASK 29-11-51-410-002

- (4) For the left fan cowl panel, do this task: Close the Fan Cowl Panels, TASK 71-11-02-410-801-F00.

SUBTASK 29-11-51-860-013

- (5) Remove the hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-51-600-002

- (6) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

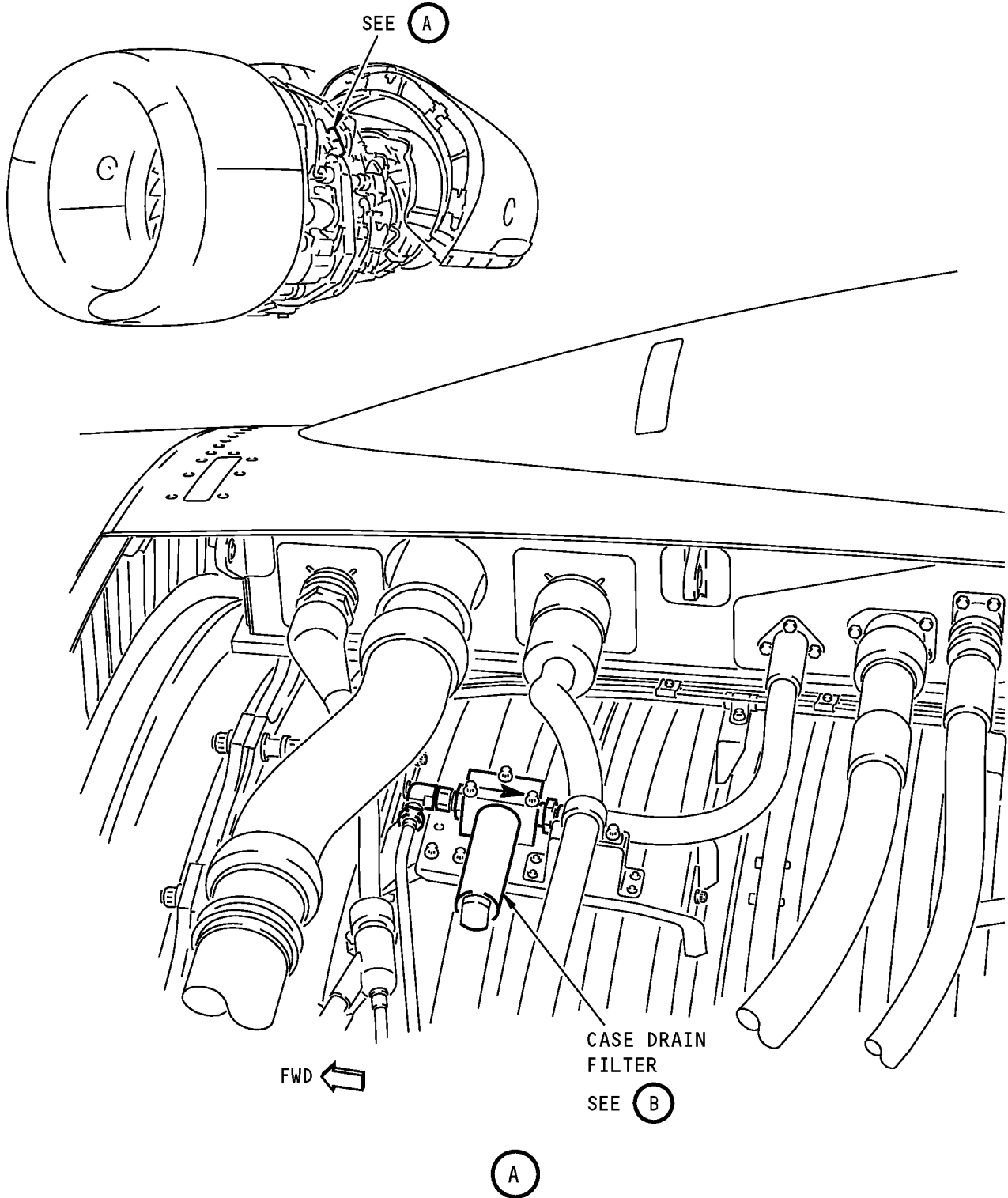
END OF TASK

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Hydraulic Systems A and B Engine-Driven Pump (EDP) Case Drain Filter Installation
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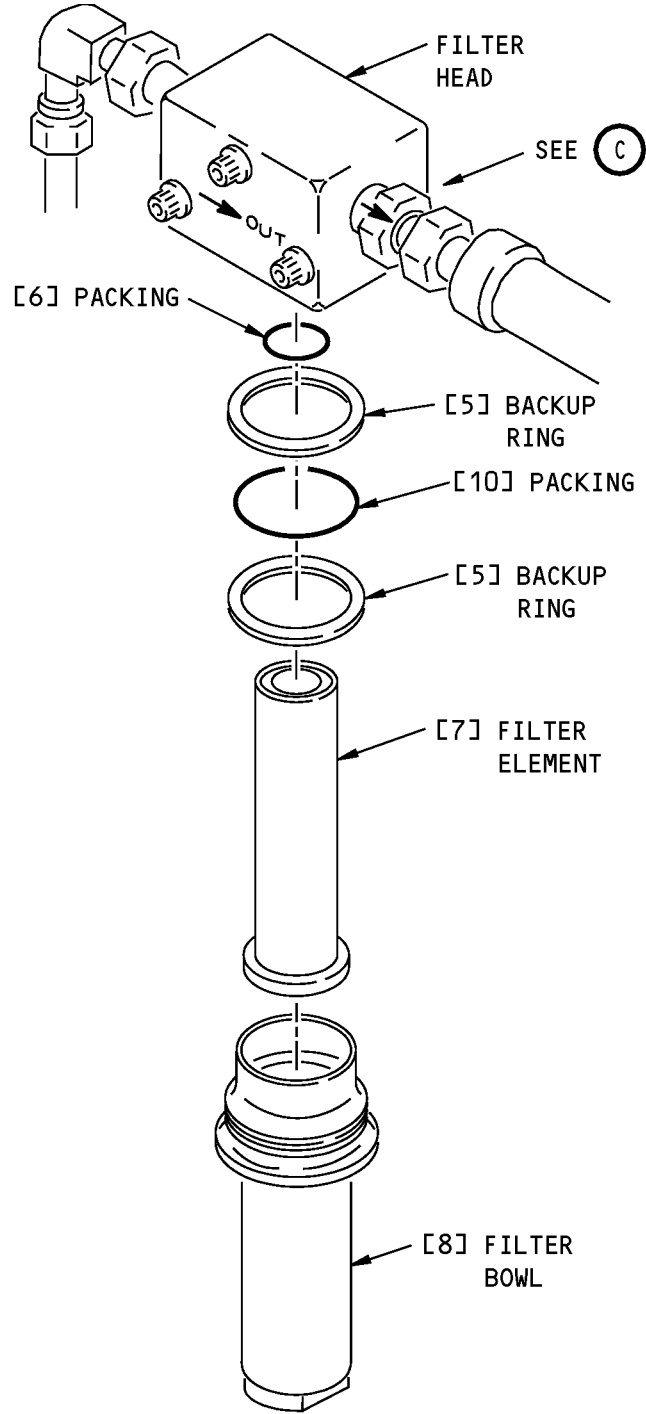
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CASE DRAIN FILTER

(B)

**Hydraulic Systems A and B Engine-Driven Pump (EDP) Case Drain Filter Installation
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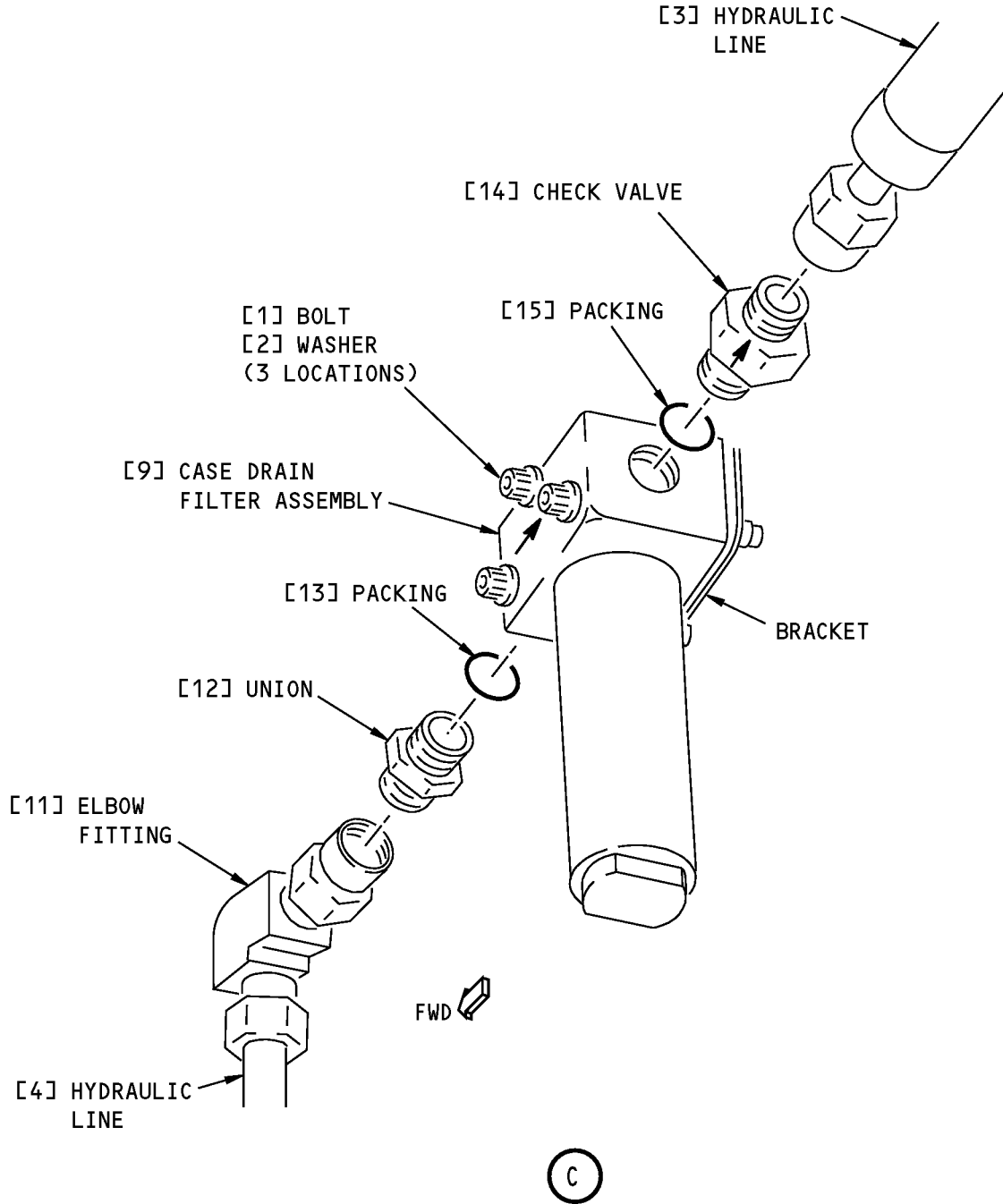
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**Hydraulic Systems A and B Engine-Driven Pump (EDP) Case Drain Filter Installation
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HYDRAULIC SYSTEMS A AND B RETURN FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

A. This procedure contains these tasks:

- (1) A removal of the return filter element.
- (2) An installation of the return filter element.
- (3) A removal of the return filter module.
- (4) An installation of the return filter module.

B. In this procedure, the return filter module is referred to as the "filter module" and the return filter element is referred to as the "filter element".

TASK 29-11-61-000-801

2. Return Filter Element Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for the Removal

SUBTASK 29-11-61-840-001

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-61-860-002

- (2) Remove pressure from the applicable hydraulic reservoir. To remove it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

D. Procedure

SUBTASK 29-11-61-020-002

- (1) Remove the nut [10] from the clamp [9].
 - (a) Put a container below the filter bowl [11] to catch hydraulic fluid.

SUBTASK 29-11-61-020-003

- (2) Remove the clamp [9].

SUBTASK 29-11-61-020-004

- (3) Remove the filter bowl [11].

SUBTASK 29-11-61-020-005

- (4) Remove the filter element [15].

NOTE: Shut off valve will close when the filter element is removed.

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SUBTASK 29-11-61-020-006

(5) Discard the filter element [15].

SUBTASK 29-11-61-020-013

(6) Remove and discard packings [14] and [16].

SUBTASK 29-11-61-020-007

(7) Fully clean the filter bowl [11].

————— **END OF TASK** —————

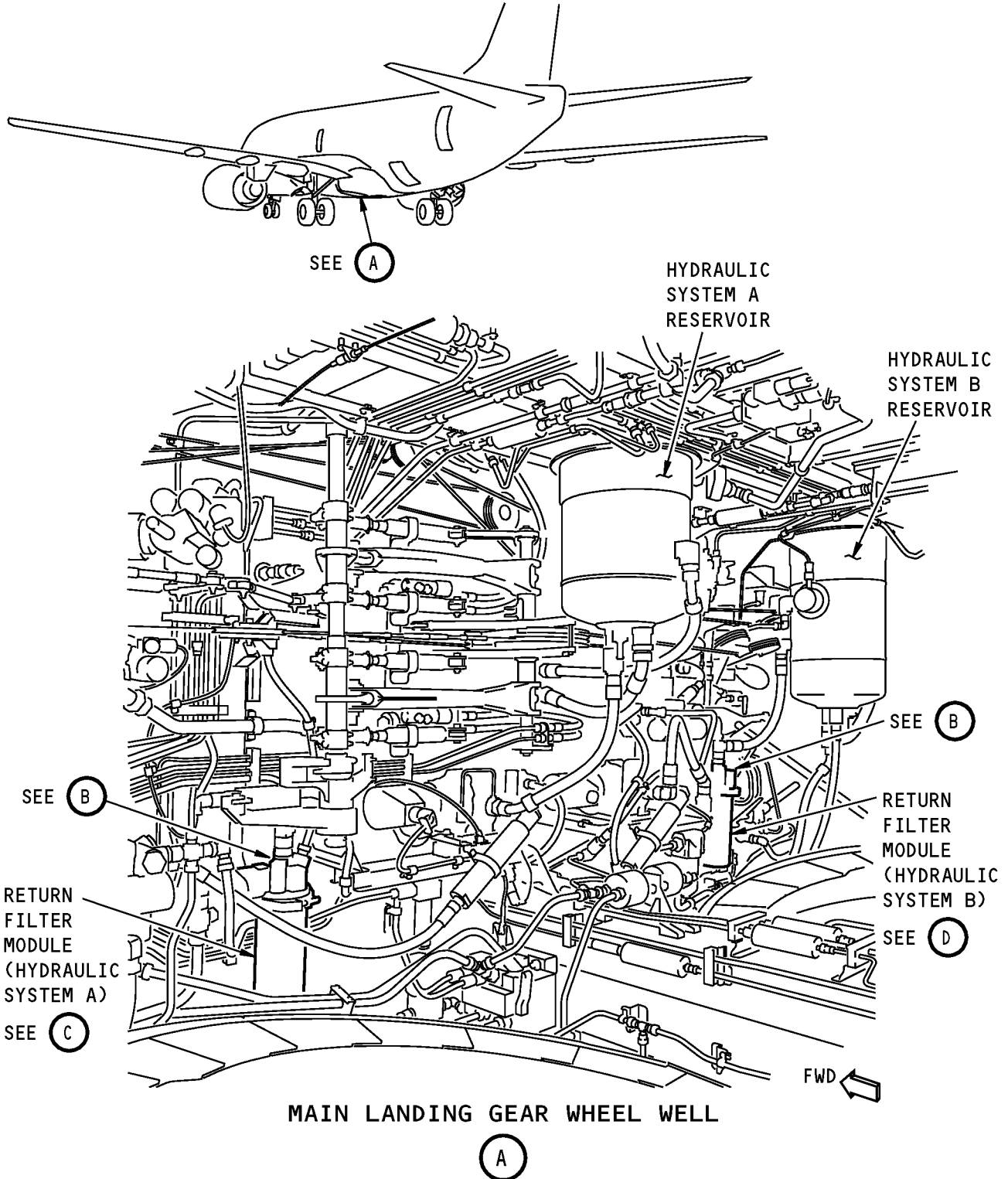
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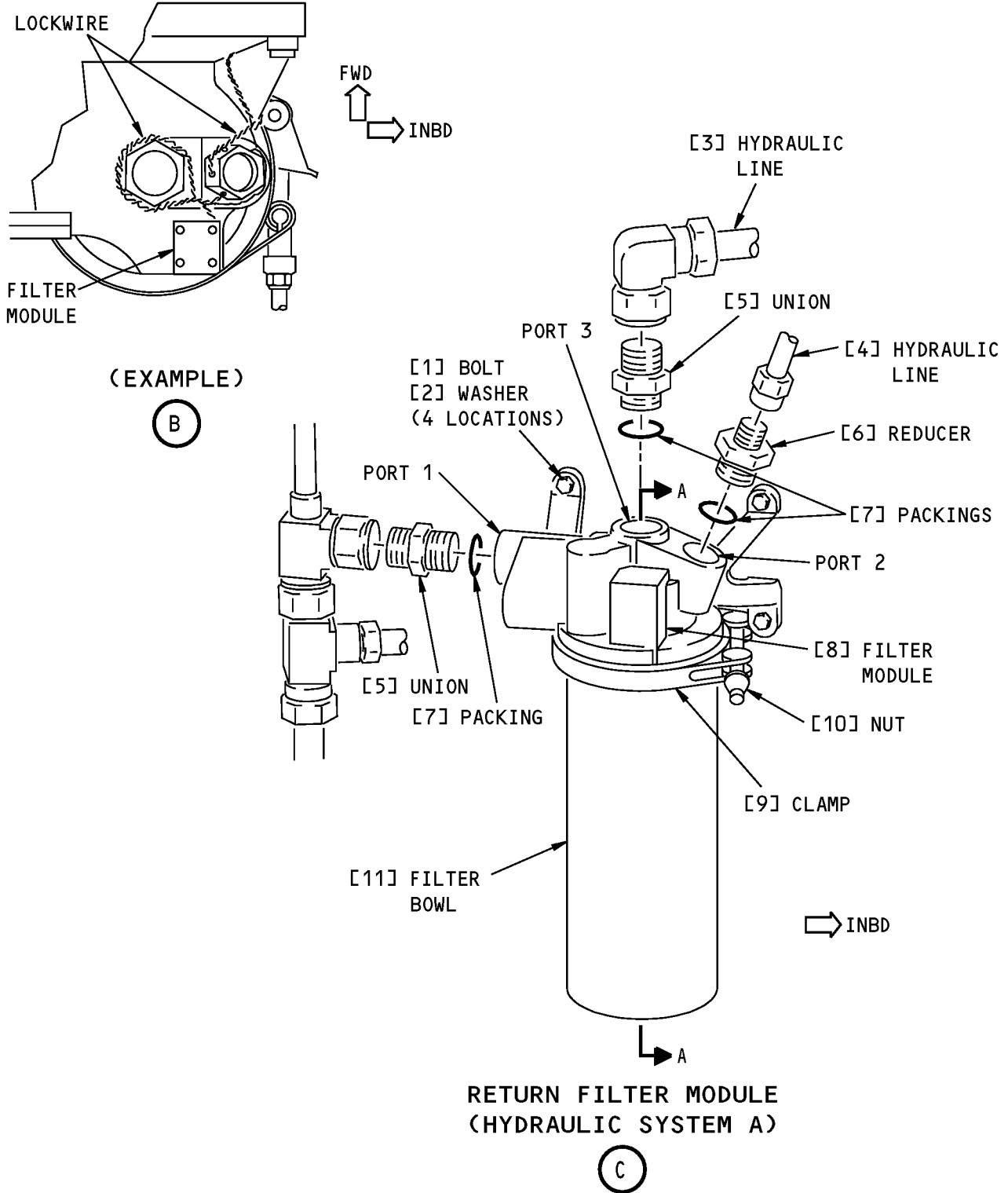
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**Hydraulic Systems A and B Return Filter Module and Components Installation
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Hydraulic Systems A and B Return Filter Module and Components Installation
Figure 401 (Sheet 2 of 3)/29-11-61-990-801

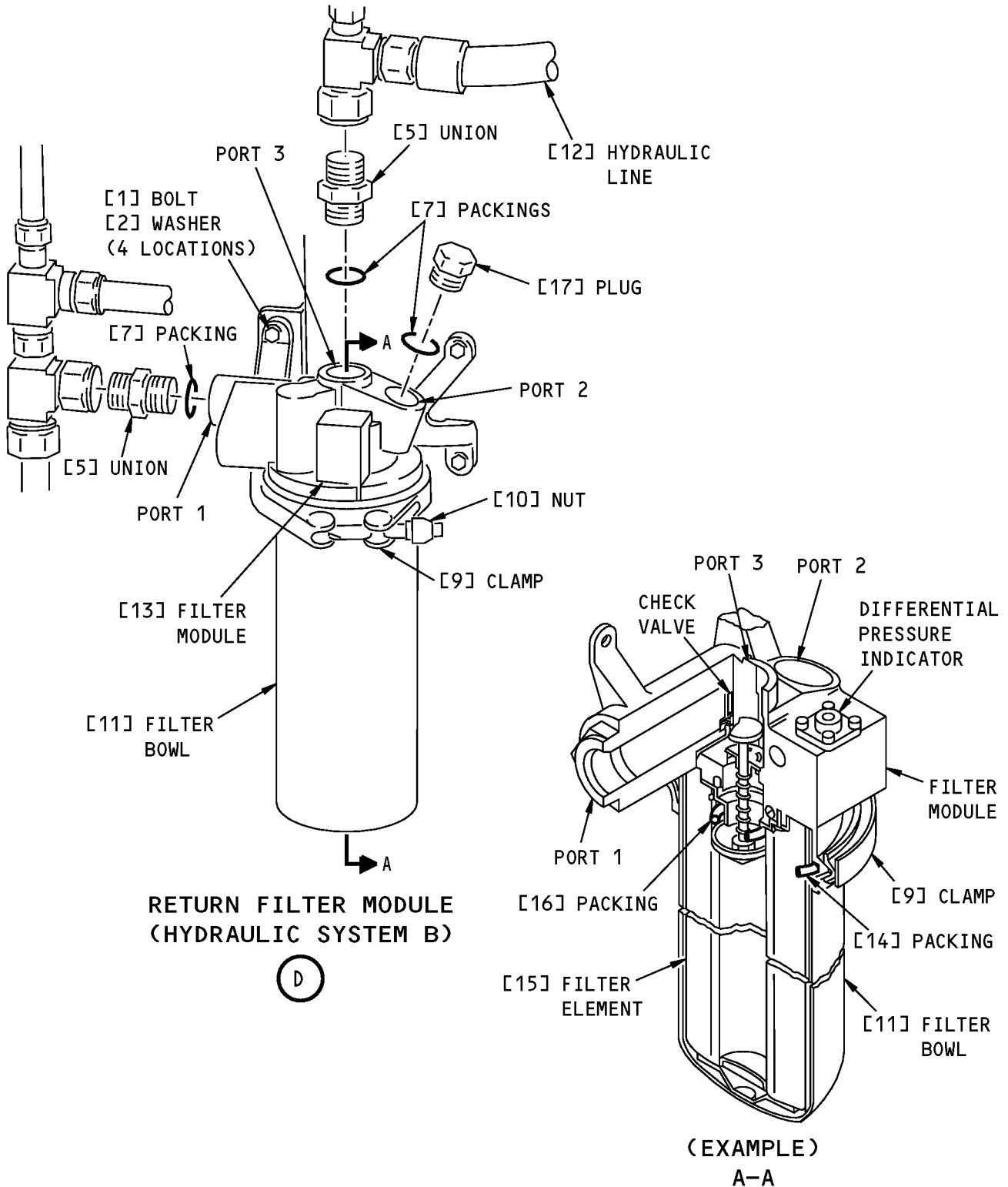
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**Hydraulic Systems A and B Return Filter Module and Components Installation
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TASK 29-11-61-400-801

3. Return Filter Element Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-11-61-640-001

(1) Apply fluid, D00153 to the new packing [14] and to new packing [16].

SUBTASK 29-11-61-420-003

(2) Install the new packing [14] and new packing [16] on the head of the filter bowl [11].

SUBTASK 29-11-61-420-004

(3) Put the filter element [15] in the filter bowl [11].

SUBTASK 29-11-61-420-005

(4) Install the filter bowl [11] in the filter head.

SUBTASK 29-11-61-420-006

(5) Install the clamp [9] around the filter bowl [11] and the filter head.

NOTE: For system A return filter module only, position the clamp so that the opening of the clamp is inboard and the nut is accessible, providing maximum clearance from the system A electric motor-driven pump (EMDP) pressure hose.

SUBTASK 29-11-61-420-007

(6) Install the nut [10] on the clamp [9].

SUBTASK 29-11-61-420-008

(7) Tighten the nut [10] on the clamp [9] to 120-144 pound-inches (13.55-16.26 Newton meters) (for filter assembly from Aircraft Porus Media manufacturer) or 60-70 pound-inches (6.77-7.9 Newton meters) (for filter assembly from Purolator manufacturer).

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SUBTASK 29-11-61-860-003

(8) Push the differential pressure indicator if it is necessary.

SUBTASK 29-11-61-600-001

(9) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

E. Return Filter Element Installation Test

SUBTASK 29-11-61-860-004

(1) Pressurize the applicable hydraulic reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-61-860-005

(2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-61-860-006

(3) Pressurize the applicable hydraulic system. To pressurize the system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-61-790-001

(4) Examine the filter module for leaks.

SUBTASK 29-11-61-610-001

(5) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

————— **END OF TASK** —————

TASK 29-11-61-000-802

4. Return Filter Module Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for the Removal

SUBTASK 29-11-61-840-002

(1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-61-860-007

(2) Release the pressure from the applicable hydraulic reservoir, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

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D. Procedure

SUBTASK 29-11-61-020-008

(1) Do this step to remove system A filter module [8]:

- (a) Disconnect the hydraulic line [3], hydraulic line [4] and disconnect the port 1 union [5] from the hydraulic line.

SUBTASK 29-11-61-020-009

(2) Do this step to remove system B filter module [13]:

- (a) Disconnect the hydraulic line [12], and disconnect union [5] from the port 1 hydraulic line.

SUBTASK 29-11-61-020-010

(3) Install plugs in the disconnected hydraulic lines.

SUBTASK 29-11-61-680-001

(4) Drain the hydraulic fluid into a container.

SUBTASK 29-11-61-160-001

(5) If it is necessary, do this task: Clean the External Surfaces of the Airplane,
TASK 12-40-00-100-801

SUBTASK 29-11-61-020-011

(6) Remove the bolts [1] and washers [2].

SUBTASK 29-11-61-020-012

(7) Remove the filter module [8] or filter module [13].

————— **END OF TASK** —————

TASK 29-11-61-400-802

5. Return Filter Module Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-44-400-801	Lockwires Installation (P/B 401)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

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C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-11-61-420-002

(1) Install the return filter module.

(a) If packings and fittings are not installed on the filter module then do these steps:

1) For system A filter module [8]:

- a) Apply fluid, D00153 to the new packings [7], unions [5] and reducer [6].
- b) Install new packing [7] and union [5] in port 1, and packing [7] and reducer [6] in port 2, and new packing [7] and union [5] in port 3.
- c) Install lockwire on reducer [6] in port 2 and on union in port 3. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801.

2) For system B filter module [13] do these steps:

- a) Apply fluid, D00153 to the new packings [7], unions [5] and port 2 plug [17].
- b) Install new packing [7] and union [5] in port 1, and packing [7] and union [5] in port 3, and install packing [7] and plug [17] in port 2.
- c) Install lockwire on plug [17] in port 2 and on union [5] in port 3. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801.

(b) Attach the filter module [8] or filter module [13] to the structure with bolts [1] and washers [2].

(c) Remove the plugs from the hydraulic lines.

(d) For filter module [8] connect the hydraulic line [3] to port 3, connect hydraulic line [4] to port 2 and connect the union [5] in port 1 to the hydraulic line.

(e) For filter module [13] connect the hydraulic line [12] to port 3, and connect the union [5] in port 1 to the hydraulic line.

(f) For the system A filter module [8] only:

- 1) Loosen the nut [10] from the clamp [9].
- 2) Position the clamp [9] so that the opening of the clamp is inboard and the nut [10] is accessible, providing the maximum clearance from the system A EMDP pressure hose.
- 3) Tighten the nut [10] on the clamp [9] to 120-144 pound-inches [13.56-16.27 N-M] (for filter assembly from Aircraft Porus Media manufacturer) or 60-70 pound-inches [6.78-7.91 N-M] (for filter assembly from Purolator manufacturer).

E. Return Filter Module Installation Test

SUBTASK 29-11-61-600-002

(1) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-61-860-008

(2) Pressurize the applicable reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

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SUBTASK 29-11-61-860-009

- (3) Pressurize the applicable hydraulic system. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-61-790-002

- (4) Examine the filter module and hydraulic line connections for leaks.

————— **END OF TASK** —————

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HYDRAULIC SYSTEMS A AND B RETURN FILTER MODULE - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has this task:

- (1) Inspection of the Differential Pressure Indicator of the A and B System Return Filter Modules

TASK 29-11-61-210-801

2. Inspection of the Differential Pressure Indicator of the A and B System Return Filter Modules

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
29-11-61-000-801	Return Filter Element Removal (P/B 401)
29-11-61-400-801	Return Filter Element Installation (P/B 401)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-11-61-010-001

- (1) Get access to the main wheel well.

SUBTASK 29-11-61-210-001

- (2) Do a general visual inspection of the differential pressure indication of the A and B system return filter modules.

- (a) Make sure the differential pressure indicator is not visible, if it is

These are the tasks: Return Filter Element Removal, TASK 29-11-61-000-801, Return Filter Element Installation, TASK 29-11-61-400-801.

————— **END OF TASK** —————

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HYDRAULIC SYSTEMS A AND B PRESSURE MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) The removal of the hydraulic systems A and B pressure module
 - (2) The installation of the hydraulic systems A and B pressure module
 - (3) The removal of the hydraulic systems A and B pressure module filter element
 - (4) The installation of the hydraulic systems A and B pressure module filter element
 - (5) The removal of the hydraulic systems A and B pressure module check valve
 - (6) The installation of the hydraulic systems A and B pressure module check valve
 - (7) The removal of the hydraulic systems A and B pressure module relief valve
 - (8) The installation of the hydraulic systems A and B pressure module relief valve

TASK 29-11-71-000-801

2. Hydraulic Systems A and B Pressure Module Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
20-10-51-000-801	Flareless Tubing Assembly Removal (P/B 401)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1154	Container - 5 Gallon (19 Liters)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for the Removal

SUBTASK 29-11-71-860-001

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-71-860-002

- (2) Depressurize the applicable hydraulic reservoir. To depressurize it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

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SUBTASK 29-11-71-860-003

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) For the Hydraulic System A,

Open these circuit breakers and install safety tags:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-11-71-860-004

(4) For the Hydraulic System B,

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

E. Procedure

SUBTASK 29-11-71-440-001

(1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 29-11-71-020-001

(2) Disconnect the applicable hydraulic system electrical connectors from the pressure switches and the pressure transducer:

- (a) Hydraulic System A: Disconnect electrical connectors [1], [2], and [3].
- (b) Hydraulic System B: Disconnect electrical connectors [1], [2], [3], and [31].

SUBTASK 29-11-71-020-002

(3) Disconnect the applicable hydraulic system hydraulic lines, do this task: Flareless Tubing Assembly Removal, TASK 20-10-51-000-801

- (a) Hydraulic System A: Disconnect hydraulic lines [10], [13], [20], [24], [27], and [30].
- (b) Hydraulic System B: Disconnect hydraulic lines [10], [13], [20], [24], and [27].

SUBTASK 29-11-71-680-001

(4) Drain hydraulic fluid into a 5 gallon (19 liter) container, STD-1154.

SUBTASK 29-11-71-160-001

(5) Do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

SUBTASK 29-11-71-020-003

(6) Install plugs to the hydraulic lines on the applicable hydraulic system to prevent contamination and damage:

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- (a) Hydraulic System A: Install plugs to hydraulic lines [10], [13], [20], [24], [27], and [30] to prevent contamination or damage.
- (b) Hydraulic System B: Install plugs to hydraulic lines [10], [13], [20], [24], and [27] to prevent contamination or damage.

SUBTASK 29-11-71-020-004

- (7) Remove the unions from the pressure module [57] on the applicable hydraulic system:
 - (a) Hydraulic System A: Remove unions [8], [11], [18], [22], [25], and [28] from the pressure module [57].
 - 1) Discard packing [9], packing [12], packing [19], packing [23], packing [26], and packing [29].
 - (b) Hydraulic System B: Remove unions [8], [11], [18], [22], and [25] from the pressure module [57].
 - 1) Discard packing [9], packing [12], packing [19], packing [23], and packing [26].

SUBTASK 29-11-71-420-001

- (8) Install plugs in the open ports of the pressure module [57] to prevent contamination or damage.

SUBTASK 29-11-71-020-005

- (9) Remove the bolts [4] and [14], and the washers [5] and [15].

SUBTASK 29-11-71-020-006

- (10) Remove the pressure module [57].

————— **END OF TASK** —————

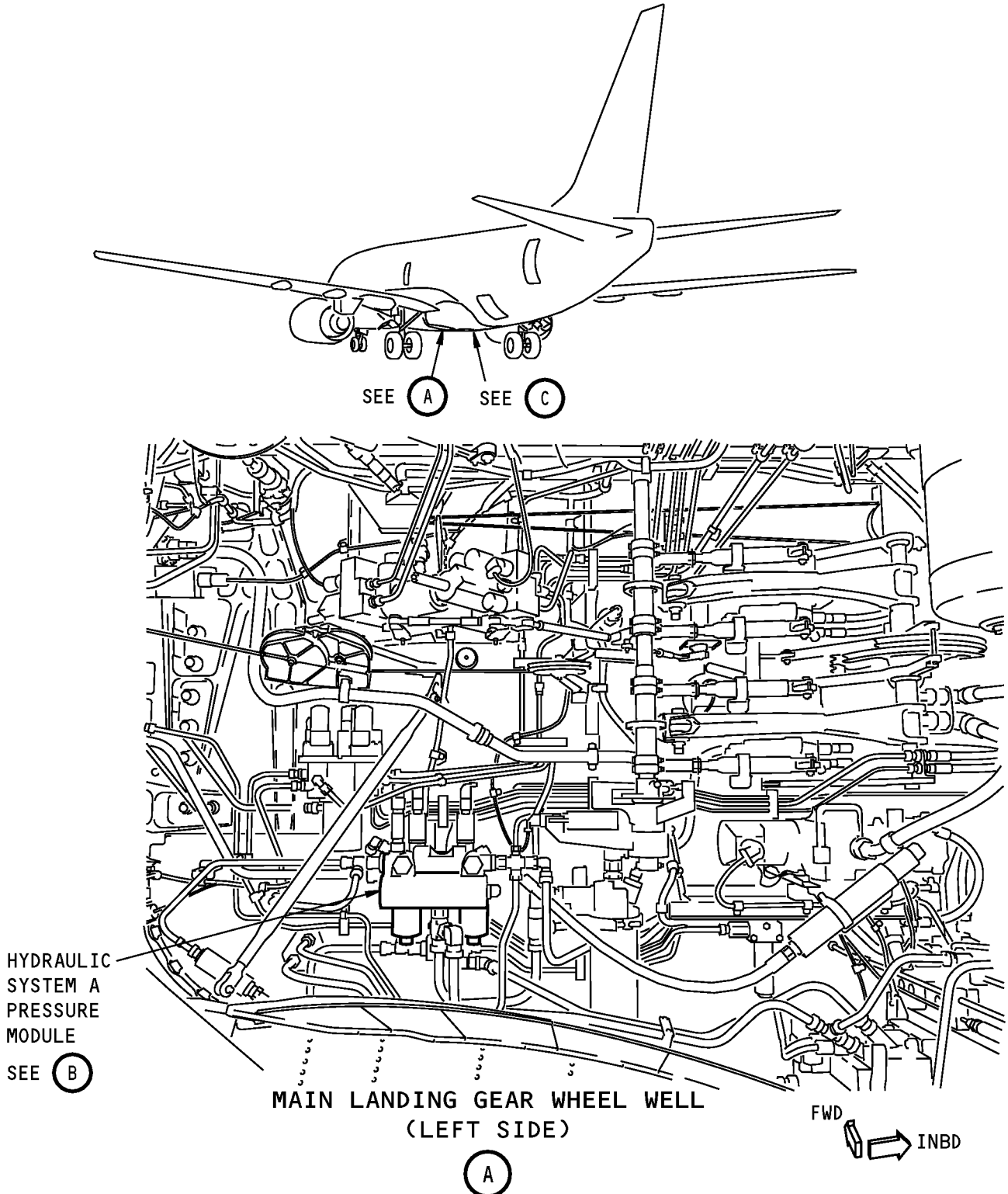
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**Hydraulic Systems A and B Pressure Module and Components Installation
Figure 401 (Sheet 1 of 6)/29-11-71-990-801**

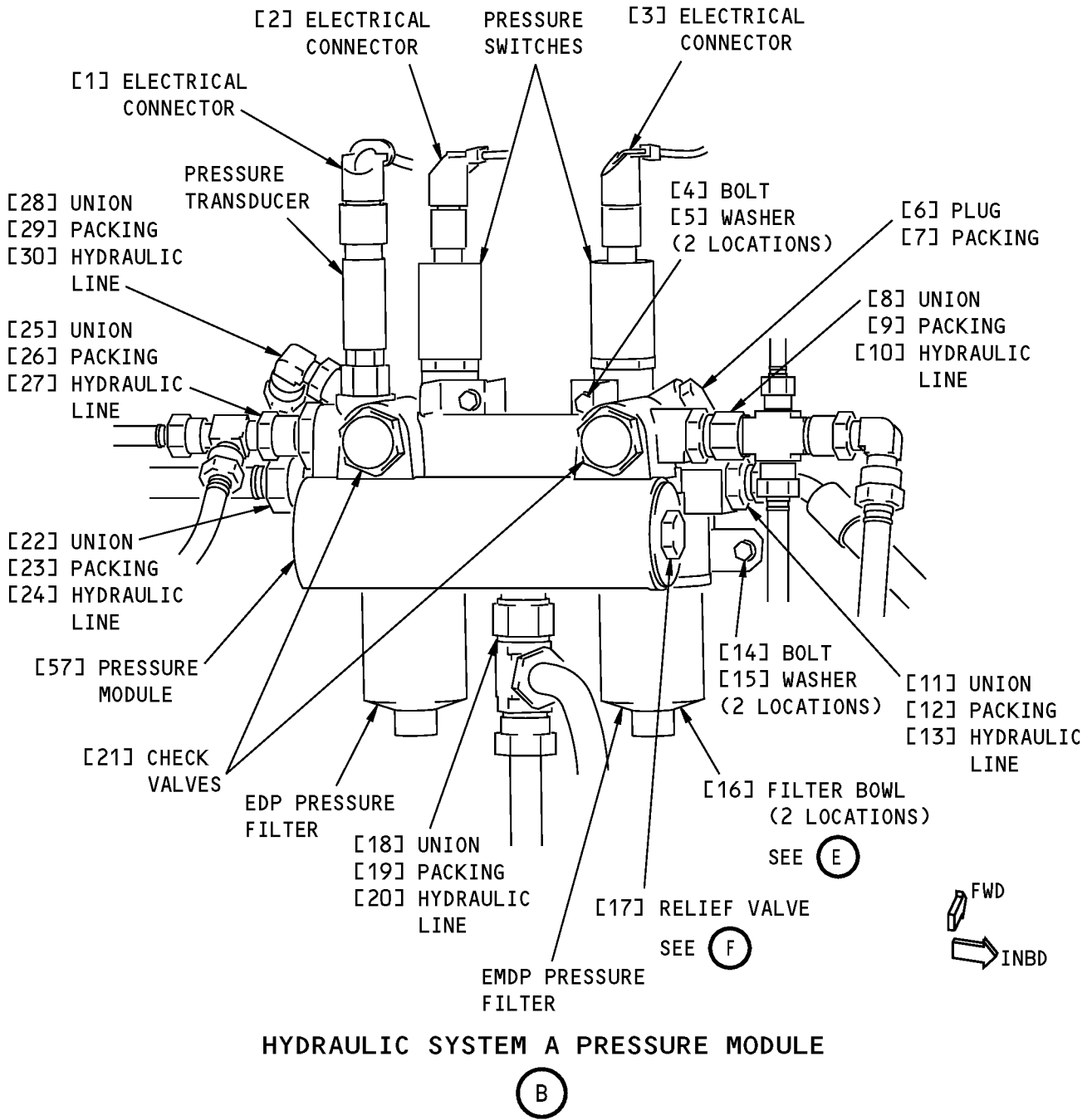
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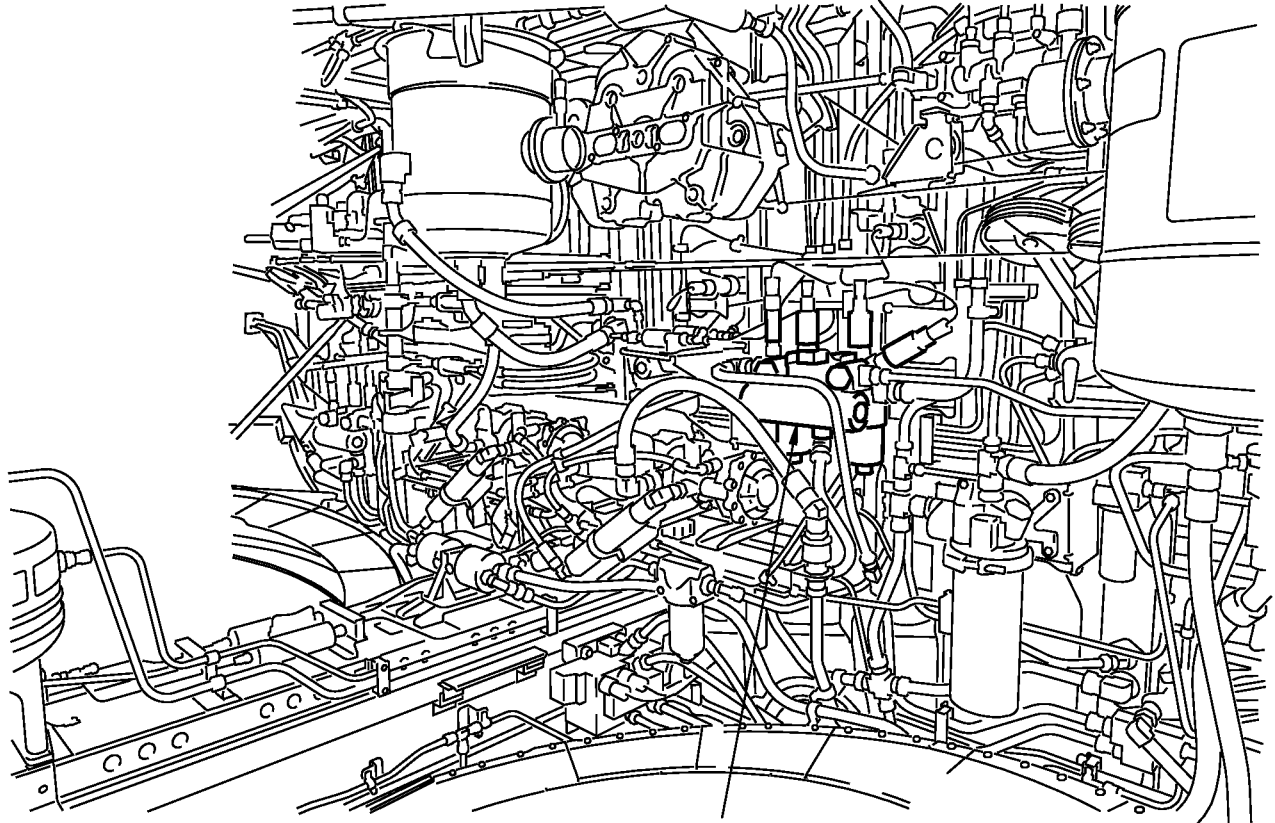
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Hydraulic Systems A and B Pressure Module and Components Installation
Figure 401 (Sheet 2 of 6)/29-11-71-990-801

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INBD  FWD

HYDRAULIC
SYSTEM B
PRESSURE
MODULE

SEE 

MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)



**Hydraulic Systems A and B Pressure Module and Components Installation
Figure 401 (Sheet 3 of 6)/29-11-71-990-801**

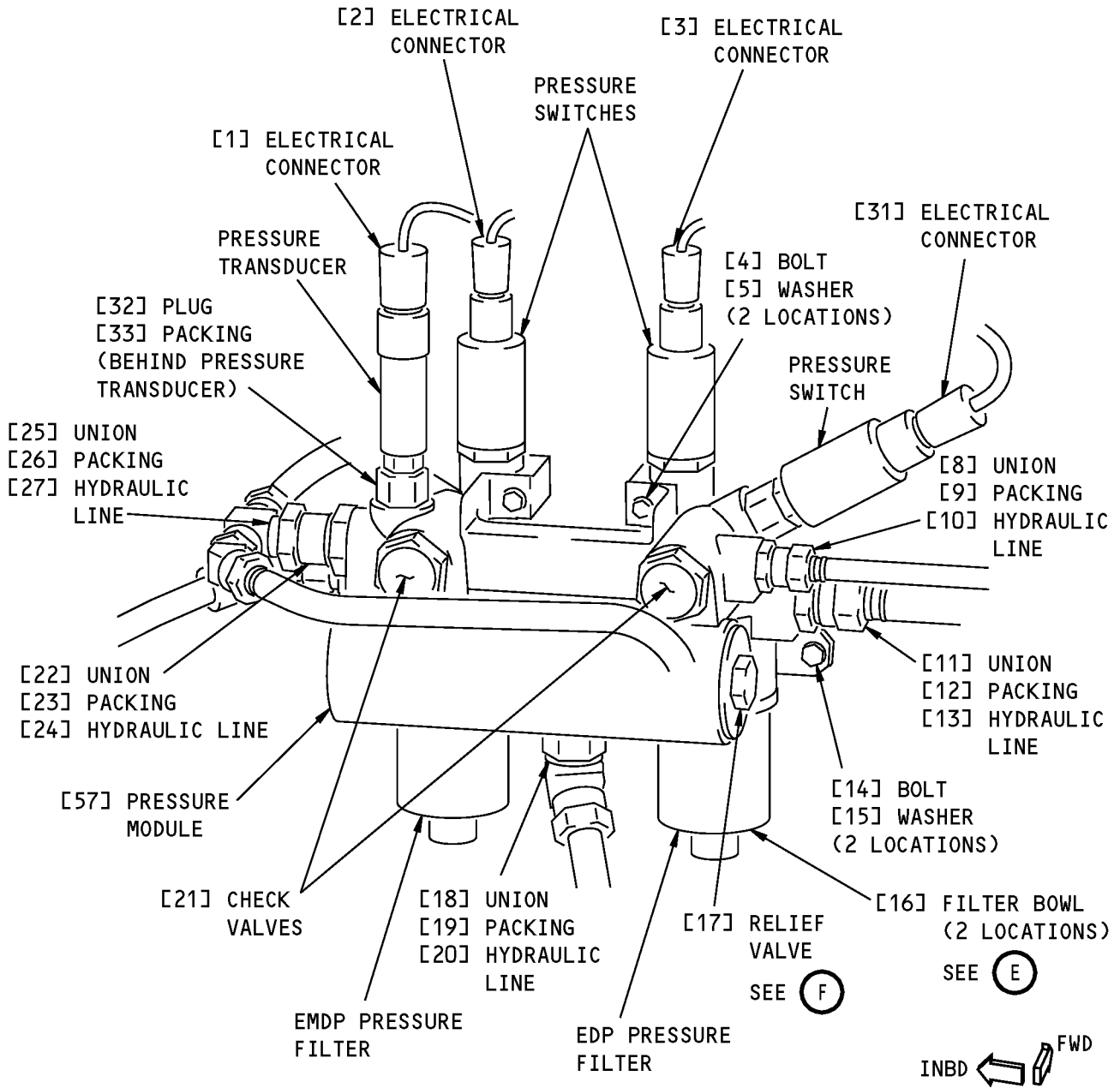
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HYDRAULIC SYSTEM B PRESSURE MODULE

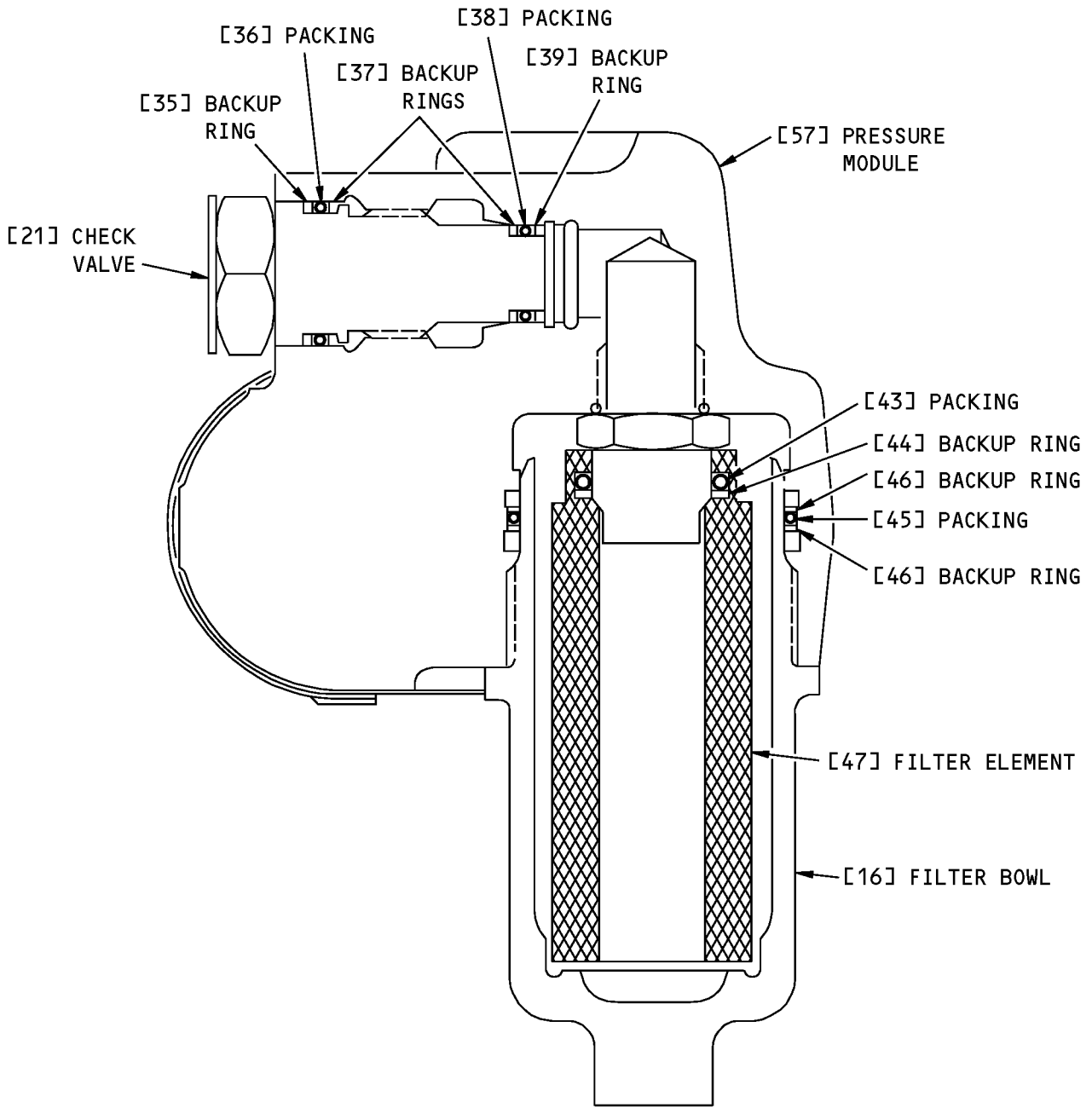
(D)

Hydraulic Systems A and B Pressure Module and Components Installation
Figure 401 (Sheet 4 of 6)/29-11-71-990-801

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**FILTER
(EXAMPLE)**

E

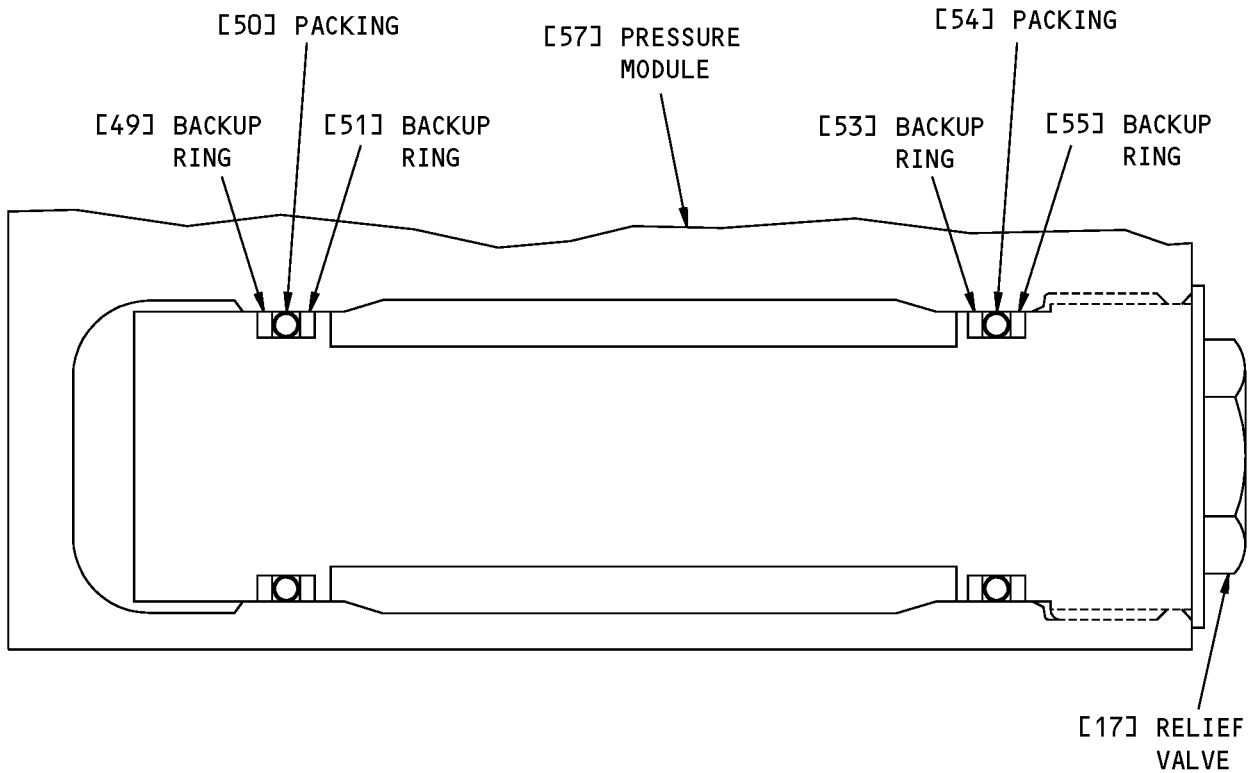
**Hydraulic Systems A and B Pressure Module and Components Installation
Figure 401 (Sheet 5 of 6)/29-11-71-990-801**

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RELIEF VALVE
(EXAMPLE)

F

Hydraulic Systems A and B Pressure Module and Components Installation
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TASK 29-11-71-400-801

3. Hydraulic Systems A and B Pressure Module Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-51-000-802	Flareless Fittings in Pressurized Areas Installation (P/B 401)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-804	Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Packing	29-11-71-01-045	HAP ALL
9	Packing	29-11-71-01-045	HAP ALL
12	Packing	29-11-71-01-075	HAP ALL
19	Packing	29-11-71-01-070	HAP ALL
23	Packing	29-11-71-01-075	HAP ALL
26	Packing	29-11-71-01-070	HAP ALL
29	Packing	29-11-71-01-045	HAP ALL
33	Packing	29-11-71-01-045	HAP ALL
57	Pressure module	29-11-71-01-105	HAP ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
212	Flight Compartment - Right

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E. Procedure

SUBTASK 29-11-71-210-001

CAUTION: MAKE SURE UNWANTED MATERIAL DOES NOT GO INTO THE PRESSURE MODULE PORTS OR THE HYDRAULIC LINES DURING THE INSTALLATION. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

(1) Make sure unwanted material does not go into the pressure module ports or the hydraulic lines.

SUBTASK 29-11-71-640-001

(2) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packings and to the threads of the plug and union for the applicable hydraulic system:

- (a) Hydraulic System A: Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [7], packing [9], packing [12], packing [19], packing [23], packing [26], and packing [29] and to the threads of the plug [6] and unions for [8], [11], [18], [22], [25], and [28].
- (b) Hydraulic System B: Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [9], packing [12], packing [19], packing [23], packing [26], and packing [33] and to the threads of unions [8], [11], [18], [22], and [25] and plug [32].

SUBTASK 29-11-71-420-002

(3) Install the new packings on the plug and the unions for the applicable hydraulic system:

- (a) For Hydraulic System A, do these steps:
 - 1) Install new packing [7] on plug [6].
 - 2) Install new packing [9] to union [8].
 - 3) Install new packing [12] on union [11].
 - 4) Install new packing [19] on union [18].
 - 5) Install new packing [23] on union [22].
 - 6) Install new packing [26] on union [25].
 - 7) Install new packing [29] on union [28].
- (b) For Hydraulic System B, do these steps:
 - 1) Install new packing [9] on union [8].
 - 2) Install new packing [12] on union [11].
 - 3) Install new packing [19] on union [18].
 - 4) Install new packing [23] on union [22].
 - 5) Install new packing [26] on union [25].
 - 6) Install new packing [33] on plug [32].

SUBTASK 29-11-71-010-001

(4) If shipping plugs are in ports of the pressure module [57], remove them.

SUBTASK 29-11-71-210-002

(5) Install plug and unions in the pressure module [57] for the applicable hydraulic system:

- (a) Hydraulic System A: Install plug [6] and unions [8], [11], [18], [22], [25], and [28] in the correct ports of the pressure module [57].
- (b) Hydraulic System B: Install unions [8], [11], [18], [22], and [25] and plug [32] in the correct ports of the pressure module [57].

SUBTASK 29-11-71-210-003

(6) Make sure the check valves [21] are installed in the pressure module [57].

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SUBTASK 29-11-71-420-003

(7) Put the pressure module pressure module [57] in its mounting position.

SUBTASK 29-11-71-420-004

(8) Install the bolts [4] and [14], and the washers [5] and [15].

SUBTASK 29-11-71-760-001

(9) Make sure the resistance between the pressure module [57] and the bracket is not more than 0.001 ohm.

SUBTASK 29-11-71-020-007

(10) Remove the plugs from the hydraulic lines on the applicable hydraulic system:

(a) Hydraulic System A: Remove plugs from hydraulic lines [10], [13], [20], [24], [27], and [30].

(b) Hydraulic System B: Remove plugs from hydraulic lines [10], [13], [20], [24], and [27].

SUBTASK 29-11-71-420-005

(11) Connect the hydraulic lines to the pressure module [57] on the applicable hydraulic system, do this task: Flareless Fittings in Pressurized Areas Installation, TASK 20-10-51-000-802.

(a) Hydraulic System A: Connect the hydraulic lines [10], [13], [20], [24], [27], and [30] to the pressure module [57].

(b) Hydraulic System B: Connect the hydraulic lines [10], [13], [20], [24], and [27] to the pressure module [57].

SUBTASK 29-11-71-420-006

(12) Connect the electrical connectors to the pressure switches and the pressure transducer on the applicable hydraulic system.

(a) Hydraulic System A: Connect electrical connectors [1], [2], [3], and [31] to the pressure switches and pressure transducer.

(b) Hydraulic System B: Connect electrical connectors [1], [2], and [3] to the pressure switches and pressure transducer.

F. Hydraulic System A and B Pressure Module Installation Test

SUBTASK 29-11-71-860-005

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-71-860-006

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) For the Hydraulic System A,

Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	3	C00881	ELEC HYD PUMP SYS A

SUBTASK 29-11-71-860-007

(3) For the Hydraulic System B,

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Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B
F	3	C00882	ELEC HYD PUMP SYS B

SUBTASK 29-11-71-860-008

- (4) Pressurize the applicable hydraulic reservoir, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-71-710-001

- (5) Do an operational check of the system A pressure module [57]:
- (a) Make sure the ENG 1 HYD PUMPS switch, on the P5 panel, is ON.
 - (b) Make sure the ELEC 2 HYD PUMPS switch, on the P5 panel, is OFF.
 - (c) Make sure the ENG 1 and ELEC 2 LOW PRESSURE lights, on the P5 panel, are on.
 - (d) Pressurize hydraulic system A with EDP, do this task: Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.
 - (e) Make sure the ENG 1 LOW PRESSURE light goes off.
 - (f) Make sure the ELEC 2 LOW PRESSURE light stays on.
 - (g) Examine the module and the connections for leaks.
 - (h) Remove hydraulic system A power. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
 - (i) Operate the rudder until the ENG 1 LOW PRESSURE light comes on.
 - (j) Pressurize system A with EMDP, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803
 - (k) Make sure the ELEC 2 LOW PRESSURE light goes off.
 - (l) Make sure the ENG 1 LOW PRESSURE light stays on.
 - (m) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
 - (n) Make sure the ELEC 2 LOW PRESSURE light comes on.

SUBTASK 29-11-71-710-002

- (6) Do an operational check of system B pressure module [57]:
- (a) Make sure the ENG 2 HYD PUMPS switch, on the P5 panel, is ON.
 - (b) Make sure the ELEC 1 HYD PUMPS switch, on the P5 panel, is OFF.
 - (c) Make sure the ENG 2 and ELEC 1 LOW PRESSURE lights, on the P5 panel, are on.
 - (d) Pressurize hydraulic system B with EDP, do this task: Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804.
 - (e) Make sure the ENG 2 LOW PRESSURE light goes off.
 - (f) Make sure the ELEC 1 LOW PRESSURE light stays on.

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- (g) Examine the module and the connections for leaks.
(h) Remove hydraulic system B power. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
(i) Operate the rudder until the ENG 2 LOW PRESSURE light comes on.
(j) Pressurize system B with EMDP, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803
(k) Make sure the ELEC 1 LOW PRESSURE light goes off.
(l) Make sure the ENG 2 LOW PRESSURE light stays on.
(m) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
(n) Make sure the ELEC 1 LOW PRESSURE light comes on.

G. Put the Airplane Back to its Usual Condition.

SUBTASK 29-11-71-610-001

- (1) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-71-860-009

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

TASK 29-11-71-000-802

4. Hydraulic Systems A and B Pressure Filter Module Element Removal

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.
(2) There is one pressure modules for each hydraulic system. Each pressure module has two filter assemblies, one filter is for the electric motor driven pump and the other filter is for the engine driven pump. The procedure to remove and install each filter is similiar.

B. References

Table with 2 columns: Reference and Title. Lists various task numbers and their corresponding titles related to hydraulic systems and filter removal.

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C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for the Removal

SUBTASK 29-11-71-860-010

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-71-860-011

- (2) Depressurize the applicable hydraulic reservoir. To depressurize, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

E. Procedure

SUBTASK 29-11-71-020-016

- (1) Remove the lockwire from the filter bowl [16].

SUBTASK 29-11-71-020-008

- (2) Remove the filter bowl [16].

- (a) Put a container under the filter bowl [16] to catch any hydraulic fluid.

SUBTASK 29-11-71-020-009

- (3) Remove the filter [47].

SUBTASK 29-11-71-160-002

- (4) Clean the filter bowl [16].

SUBTASK 29-11-71-020-010

- (5) Discard the packing [43] and packing [45].

SUBTASK 29-11-71-210-004

- (6) Examine the filter [47] for metal contamination.

- (a) If the filter [47] for EMDP contains metal contamination, These are the tasks: Electric Motor-Driven Pump (EMDP) Removal, TASK 29-11-21-000-801-001, Electric Motor-Driven Pump (EMDP) Installation, TASK 29-11-21-400-801-001.
 - (b) If the filter [47] for the EDP contains metal contamination, These are the tasks: Hydraulic Systems A and B Engine-Driven Pump (EDP) Removal, TASK 29-11-11-000-801-001, Hydraulic Systems A and B Engine-Driven Pump (EDP) Installation, TASK 29-11-11-400-801-001.
 - (c) If metal contamination is found in the pressure filter, flush the hydraulic lines between the pressure module [57] and the hydraulic pump that was removed.
 - (d) If metal contamination is found in the EMDP pressure filter, examine the EMDP acoustic filter:
 - 1) These are the tasks: Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Removal, TASK 29-11-27-000-801, Hydraulic Systems A and B Electric Motor-Driven Pump (EMDP) Acoustic Filter Installation, TASK 29-11-27-400-801

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SUBTASK 29-11-71-020-011

(7) Discard the filter [47].

————— **END OF TASK** —————

TASK 29-11-71-400-802

5. Hydraulic Systems A and B Pressure Module Filter Element Installation

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-44-400-801	Lockwires Installation (P/B 401)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
43	Packing	29-11-71-01-200	HAP ALL
		29-11-71-02-200	HAP ALL
45	Packing	29-11-71-01-185	HAP ALL
		29-11-71-02-185	HAP ALL
47	Filter	29-11-71-01-190	HAP ALL

E. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

F. Procedure

SUBTASK 29-11-71-640-002

(1) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [45] and the backup rings [46].

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SUBTASK 29-11-71-420-007

(2) Install the new packing [45] and the backup rings [46] in the groove in the pressure module [57].

SUBTASK 29-11-71-640-003

(3) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [43] and the backup ring [44].

SUBTASK 29-11-71-420-008

(4) Install the new packing [43] and the backup ring [44] in the groove at the top of the filter [47] with the packing [43] at the top.

SUBTASK 29-11-71-640-004

(5) Lightly apply MCS 352B fluid, D00054 or fluid, D00153 to the threads of the filter bowl [16].

SUBTASK 29-11-71-610-002

(6) Fill the filter bowl [16] approximately half full with fluid, D00153.

SUBTASK 29-11-71-420-009

(7) Put the filter [47] in the pressure module [57].

SUBTASK 29-11-71-420-010

(8) Tighten the filter bowl [16] 350 to 375 pound-inches (40 to 42 newton-meters).

SUBTASK 29-11-71-420-011

(9) Install a lockwire. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801.

G. Hydraulic System A and B Pressure Module Filter Element Installation Test

SUBTASK 29-11-71-600-001

(1) If it is necessary to service the applicable hydraulic system, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-71-860-012

(2) Supply electrical power, do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-71-860-013

(3) Pressurize the applicable hydraulic reservoir, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-71-860-014

(4) Pressurize the applicable hydraulic system with the hydraulic pump that is associated with the installed filter element:

NOTE: The hydraulic pressure module has separate hydraulic circuits and separate filter elements for the electric motor driven pump (EMDP) and the engine driven pump (EDP). The correct pump must be operated to do the leakage check.

(a) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-71-790-001

(5) Examine the pressure module filter for leaks.

SUBTASK 29-11-71-860-015

(6) Remove hydraulic power, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-71-860-016

(7) Remove electrical power, do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— **END OF TASK** —————

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TASK 29-11-71-000-803

6. Hydraulic Systems A and B Pressure Module Check Valve Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for the Removal

SUBTASK 29-11-71-860-017

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-71-860-018

- (2) Depressurize the applicable hydraulic reservoir. To depressurize it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

D. Procedure

SUBTASK 29-11-71-020-012

- (1) Remove the check valve [21] from the pressure module [57].

SUBTASK 29-11-71-420-012

- (2) Install a plug in the open port of the pressure module [57] to prevent contamination or damage.

————— **END OF TASK** —————

TASK 29-11-71-400-803

7. Hydraulic Systems A and B Pressure Module Check Valve Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-44-400-801	Lockwires Installation (P/B 401)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

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B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
36	Packing	29-11-71-01-140	HAP ALL
38	Packing	29-11-71-01-150	HAP ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Procedure

SUBTASK 29-11-71-640-005

- (1) Apply MCS 352B fluid, D00054 or fluid, D00153 to a new packing [36] and packing [38], and the backup rings [35], [37] and [39].

SUBTASK 29-11-71-420-013

- (2) Install the new packing [36] and packing [38], and the backup rings [35], [37] and [39] in each groove on the check valve [21].

SUBTASK 29-11-71-640-006

- (3) Apply MCS 352B fluid, D00054 or fluid, D00153 to the threads of the check valve [21].

SUBTASK 29-11-71-020-013

- (4) Remove the plug from the pressure module [57].

SUBTASK 29-11-71-420-014

- (5) Install the check valve [21] in the pressure module [57].

SUBTASK 29-11-71-420-015

- (6) Tighten the check valve [21] to 200-250 pound-inches (22.6-28.2 Newton-meters).

F. Hydraulic Systems A and B Pressure Module Check Valve Installation Test

SUBTASK 29-11-71-600-002

- (1) If it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-11-71-860-019

- (2) Pressurize the applicable hydraulic reservoir, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-71-860-020

- (3) Pressurize the applicable hydraulic system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

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SUBTASK 29-11-71-860-021

- (4) Do these steps if you replace the check valve [21] for the electric motor-driven pump:
 - (a) Operate the engine driven pump.
 - (b) Make sure the LOW PRESSURE light for the electrical pump stays on.

SUBTASK 29-11-71-860-022

- (5) Do these steps if you replace the check valve [21] for the engine driven pump:
 - (a) Operate the electric motor-driven pump.
 - (b) Make sure the LOW PRESSURE light for the engine driven pump stays on.

SUBTASK 29-11-71-790-002

- (6) Examine the check valve [21] for leaks.

SUBTASK 29-11-71-420-016

- (7) Install a lockwire. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801.

————— END OF TASK —————

TASK 29-11-71-000-804

8. Hydraulic Systems A and B Pressure Module Relief Valve Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for the Removal

SUBTASK 29-11-71-860-023

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-71-860-024

- (2) Depressurize the applicable hydraulic reservoir. To depressurize, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

D. Procedure

SUBTASK 29-11-71-020-014

- (1) Remove the relief valve [17] from the pressure module [57].

SUBTASK 29-11-71-420-017

- (2) Install a plug in the open port of the pressure module [57] to prevent contamination or damage.

————— END OF TASK —————

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TASK 29-11-71-400-804

9. Hydraulic Systems A and B Pressure Module Relief Valve Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwires Installation (P/B 401)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
54	Packing	29-11-71-01-165	HAP ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Procedure

SUBTASK 29-11-71-640-007

- (1) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [50] and packing [54], and the backup rings [49], [51], [53] and [55].

SUBTASK 29-11-71-420-018

- (2) Install the new packing [50] and packing [54] and the backup rings [49], [51], [53] and [55] in each groove of the relief valve [17].

SUBTASK 29-11-71-640-008

- (3) Apply MCS 352B fluid, D00054 or fluid, D00153 to the threads of the relief valve [17].

SUBTASK 29-11-71-020-015

- (4) Remove the plug from the pressure module [57].

SUBTASK 29-11-71-420-019

- (5) Install the relief valve [17] in the pressure module housing.

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SUBTASK 29-11-71-420-020

- (6) Tighten the relief valve [17] to 350-375 pound-inches (39.5-42.4 Newton-meters).

F. Hydraulic Systems A and B Pressure Module Relief Valve Installation Test

SUBTASK 29-11-71-600-003

- (1) If it is necessary, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-71-860-025

- (2) Pressurize the applicable hydraulic system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-11-71-790-003

- (3) Examine the relief valve [17] for leaks.

SUBTASK 29-11-71-860-026

- (4) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-71-420-021

- (5) Install the lockwire on the relief valve [17]. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801.

————— **END OF TASK** —————

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ENGINE DRIVEN PUMP (EDP) SUPPLY SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) EDP Supply Shutoff Valve Removal
 - (2) EDP Supply Shutoff Valve Installation

TASK 29-11-81-000-801

2. EDP Supply Shutoff Valve Removal

(Figure 401)

A. General

- (1) Supply shutoff valves for the hydraulic fluid are installed in the supply lines to each engine-driven pump (EDP).
- (2) The supply shutoff valves (referred to as the valves) are mounted in the rear spar area immediately outboard of the wheel wells.
- (3) A container of about 10-gallon capacity will be necessary to catch fluid when removing the valve.

B. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-11-81-840-001

- (1) Remove hydraulic power from the applicable system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-11-81-420-006

- (2) For the applicable engine, attach a DO-NOT-OPERATE tag on engine start lever.

SUBTASK 29-11-81-420-007

- (3) For Engine NO. 1

Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

SUBTASK 29-11-81-420-008

- (4) For Engine NO. 2

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Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

SUBTASK 29-11-81-860-001

(5) Release the pressure from the applicable hydraulic reservoir.

NOTE: The system A reservoir is connected to the No. 1 engine. The system B reservoir is connected to the No. 2 engine.

(a) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-11-81-680-001

(6) Drain the applicable reservoir.

- (a) Open the drain valve at the bottom of the applicable reservoir and drain into a container.
- (b) When the hydraulic fluid has drained, close the drain valve.

SUBTASK 29-11-81-100-001

(7) If you get hydraulic fluid on the airplane, do the step that follows:

(a) Do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

SUBTASK 29-11-81-860-002

(8) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	18	C00348	HYDRAULIC SYSTEM SHUTOFF VALVE ENG 2
C	19	C00347	HYDRAULIC SYSTEM SHUTOFF VALVE ENG 1

SUBTASK 29-11-81-020-001

(9) Disconnect the electrical connector [4] from the shutoff valve [5].

SUBTASK 29-11-81-480-001

(10) Install protective cap on the electrical connector [4].

SUBTASK 29-11-81-020-002

(11) Remove the bolts [8], the washers [2], the washer [7], the jumper [6] and the nuts [3] from the adapter flanges that are on the sides of the shutoff valve [5].

SUBTASK 29-11-81-020-003

(12) Pull the shutoff valve [5] out from between the adapter flanges.

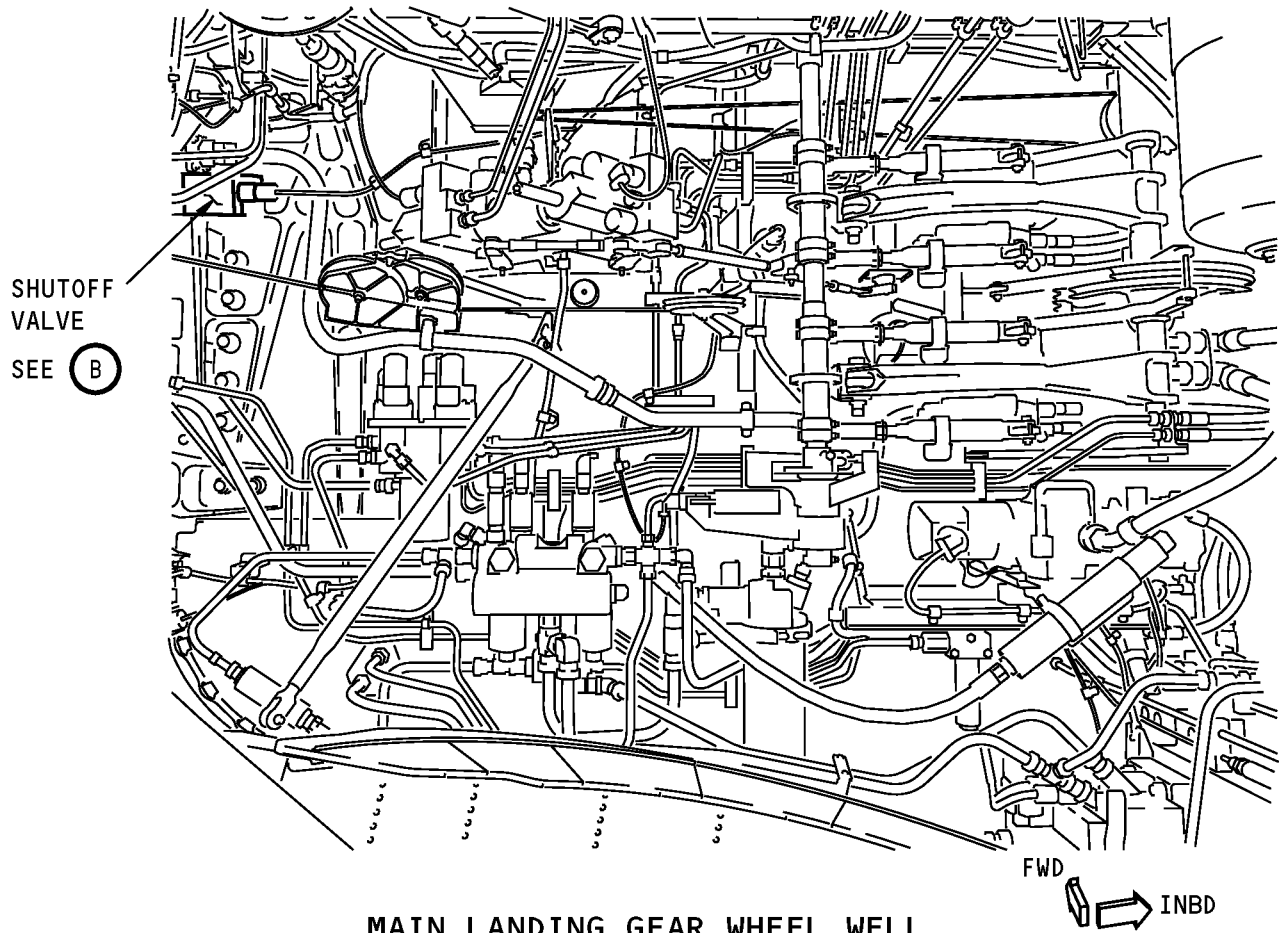
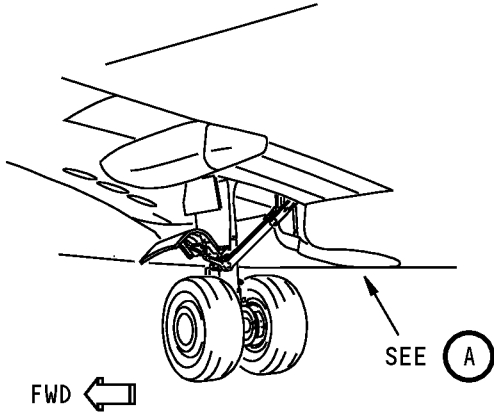
SUBTASK 29-11-81-020-004

(13) Remove the packings [1].

————— END OF TASK —————

EFFECTIVITY HAP ALL

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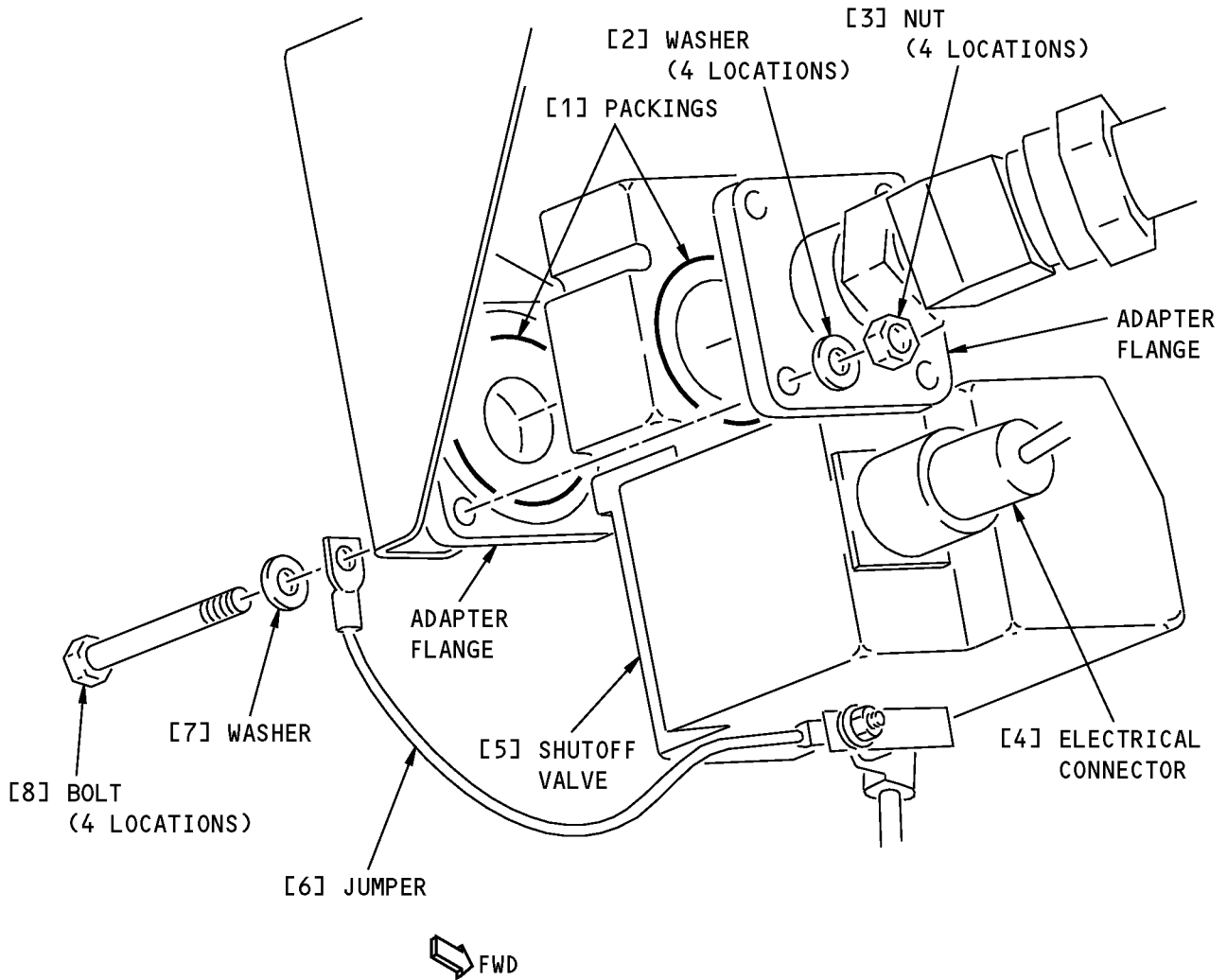
**MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)**

(A)

**Engine-Driven Pump (EDP) Supply Shutoff Valve Installation
Figure 401 (Sheet 1 of 2)/29-11-81-990-801**

EFFECTIVITY
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**LEFT EDP SHUTOFF VALVE
(RIGHT EDP SHUTOFF VALVE IS EQUIVALENT)**

(B)

**Engine-Driven Pump (EDP) Supply Shutoff Valve Installation
Figure 401 (Sheet 2 of 2)/29-11-81-990-801**

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TASK 29-11-81-400-801

3. EDP Supply Shutoff Valve Installation

(Figure 401)

A. References

Reference	Title
SWPM 20-60-03	Special Protection of Electrical Connectors

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)
G50170	Compound - Corrosion Inhibiting Compound, Soft Film, Exterior Use - AV25	
G50171	Compound - Corrosion Inhibiting Compound, Interior Application - D5026NS or ZC-026	

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-11-81-640-001

- (1) Lubricate the new packings [1] with fluid, D00153 and put them in their positions on the shutoff valve [5].

SUBTASK 29-11-81-420-001

- (2) Carefully put the shutoff valve [5] between the adapter flanges.
 - (a) Make sure the packings [1] do not get damaged or move out of their positions when you install the shutoff valve [5].

SUBTASK 29-11-81-420-002

- (3) Put the bonding jumper [6] in its position on the shutoff valve [5].

SUBTASK 29-11-81-420-003

- (4) Install the bolts [8], the washers [2], the washer [7], and the nuts [3].

SUBTASK 29-11-81-760-001

- (5) Make sure the resistance between the bonding jumper [6] and the airplane structure is not more than 0.001 ohm.

SUBTASK 29-11-81-420-004

- (6) Remove the protective cap from the electrical connector [4].

SUBTASK 29-11-81-210-001

- (7) Before you connect the electrical connector [4], examine the connector for corrosion.

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WARNING: DO THE STEPS BELOW IF THE AIRPLANE OPERATES AT AIRPORTS WHERE DEICING FLUID THAT CONTAIN POTASSIUM FORMATE IS USED. ALSO DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTOR IS PART OF A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- (a) If there was corrosion, refer to (SWPM 20-60-03) to correct the problem.
- (b) Apply the D5026NS or ZC-026 compound, G50171 to the connector (SWPM 20-60-03).

SUBTASK 29-11-81-420-012

- (8) Connect the electrical connector [4] to the shutoff valve [5].

NOTE: Corrosion inhibiting compound is applied to the exterior of the mated electrical connectors after the operational test is completed.

SUBTASK 29-11-81-710-001

- (9) Do this task: EDP Supply Shutoff Valve Operational Test, TASK 29-11-81-710-801.

SUBTASK 29-11-81-390-002

- (10) Apply the AV25 compound, G50170 to the mated electrical connector [4] assembly completely, until the compound drips from the connector. SWPM 20-60-03

NOTE: Do not remove the excess corrosion inhibiting compound.

SUBTASK 29-11-81-090-001

- (11) For the applicable engine, remove the DO-NOT-OPERATE tag on engine start lever.

————— **END OF TASK** —————

TASK 29-11-81-710-801

4. EDP Supply Shutoff Valve Operational Test

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-11-81-611-001

- (1) Make sure the hydraulic system is fully operational. If necessary, do this task to service the reservoir: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

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SUBTASK 29-11-81-863-001

- (2) Make sure the hydraulic system is fully operational. If necessary, do this task to pressurize the hydraulic reservoir: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-11-81-861-001

- (3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-11-81-865-001

- (4) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	18	C00348	HYDRAULIC SYSTEM SHUTOFF VALVE ENG 2
C	19	C00347	HYDRAULIC SYSTEM SHUTOFF VALVE ENG 1

SUBTASK 29-11-81-865-002

- (5) For Engine NO. 1

Make sure that this circuit breaker is closed:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

SUBTASK 29-11-81-865-003

- (6) For Engine NO. 2

Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

SUBTASK 29-11-81-860-009

CAUTION: DO NOT TURN THE FIRE HANDLE. IF YOU TURN THE FIRE HANDLE, THE EXTINGUISHING BOTTLES WILL RELEASE THEIR CONTENTS. THIS CAN CAUSE DAMAGE TO THE ENGINE.

- (7) Push the override button behind the fire handle for the applicable engine and pull the handle (on the P-8 panel).

- (a) Make sure the shutoff valve [5] operates.

SUBTASK 29-11-81-860-010

- (8) Push in the fire handle for the applicable engine.

- (a) Make sure the shutoff valve [5] operates.
- (b) Examine the shutoff valve [5] for leaks.

SUBTASK 29-11-81-862-001

- (9) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

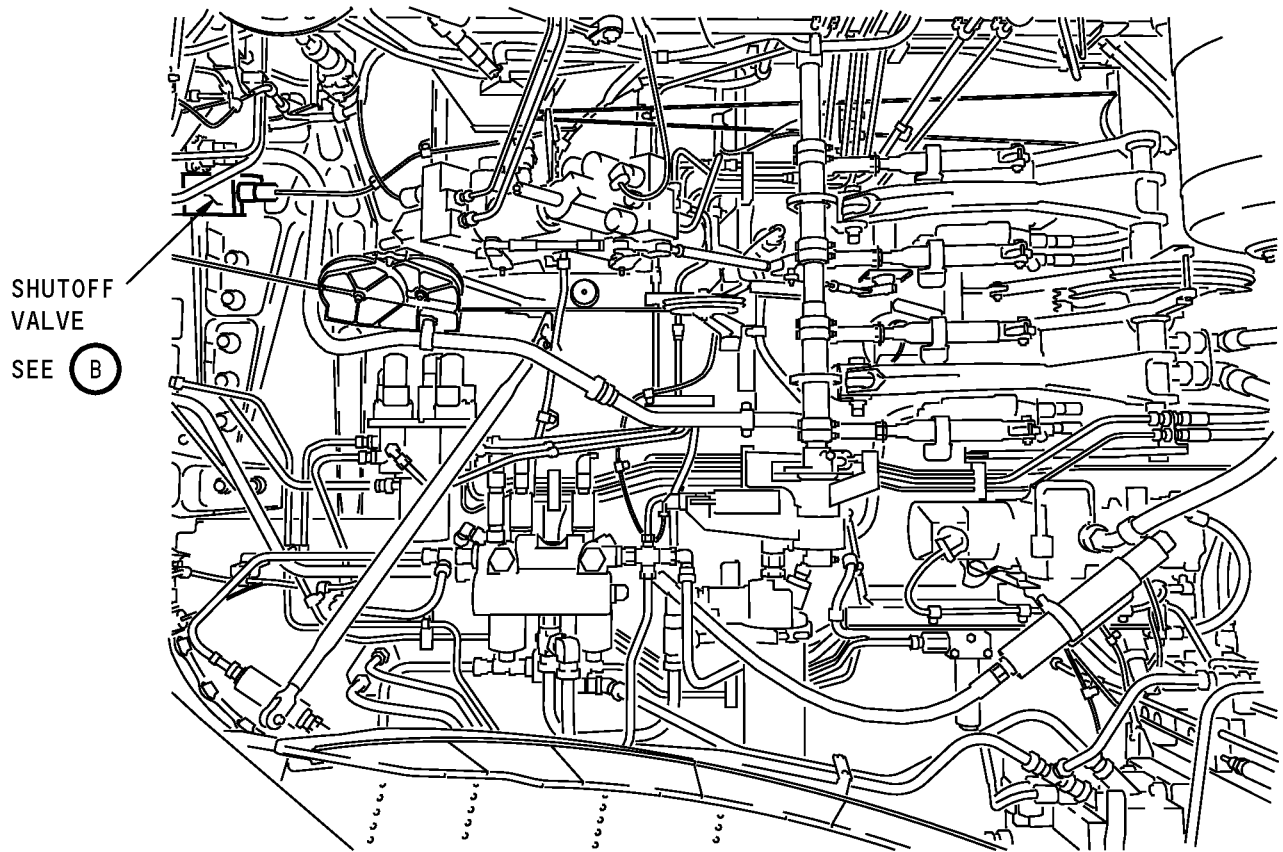
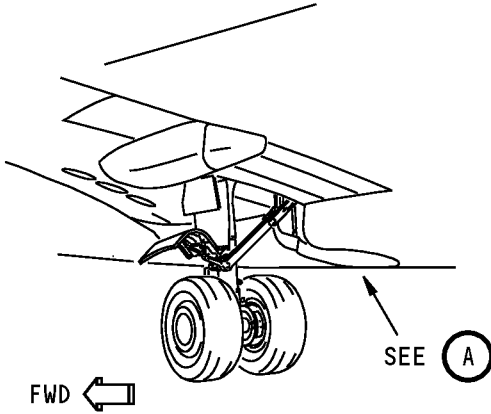
END OF TASK

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**MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)**

(A)

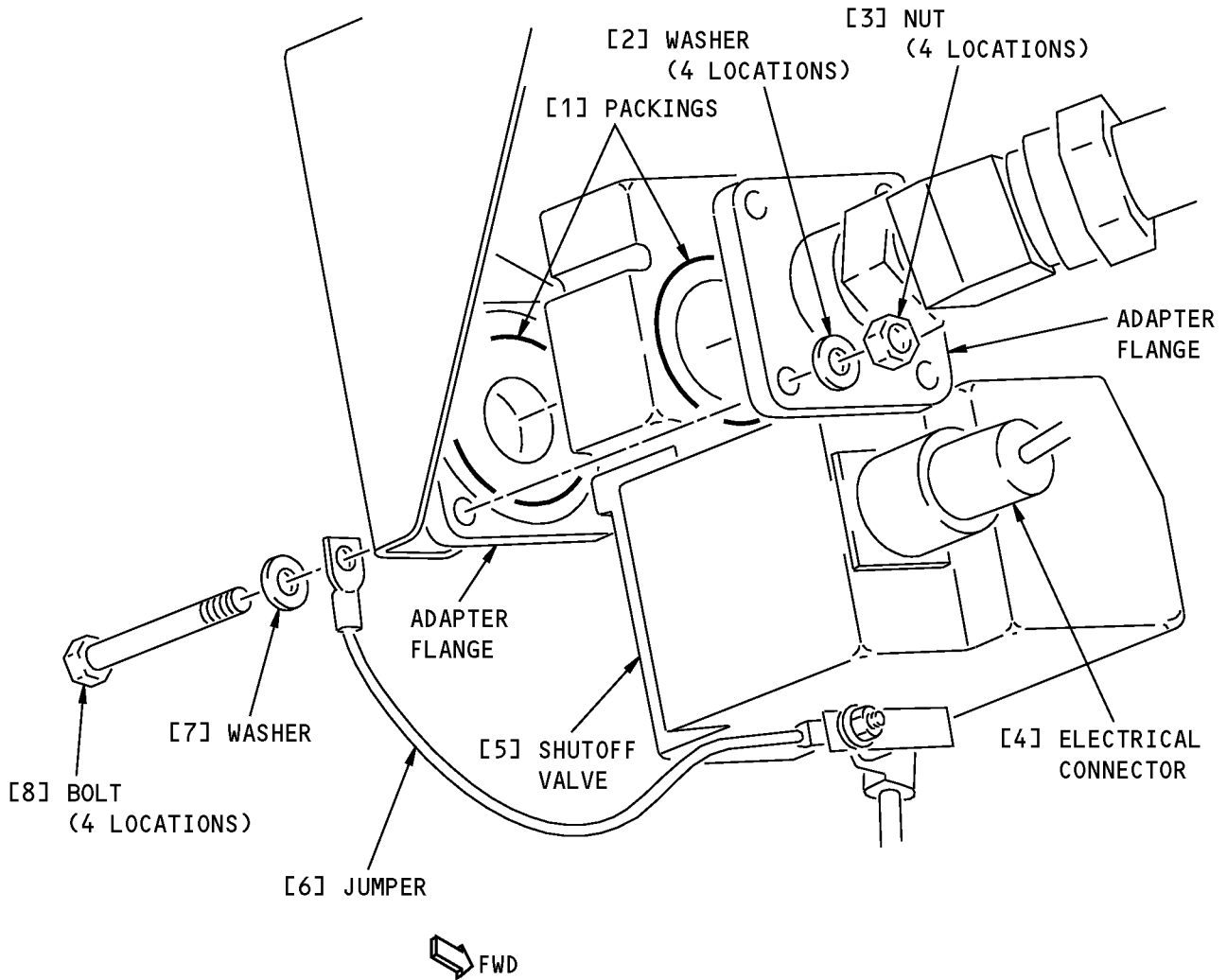
**Engine-Driven Pump (EDP) Supply Shutoff Valve Installation
Figure 402 (Sheet 1 of 2)/29-11-81-990-802**

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LEFT EDP SHUTOFF VALVE
(RIGHT EDP SHUTOFF VALVE IS EQUIVALENT)

(B)

Engine-Driven Pump (EDP) Supply Shutoff Valve Installation
Figure 402 (Sheet 2 of 2)/29-11-81-990-802

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AIRCRAFT MAINTENANCE MANUAL

HYDRAULIC PUMPS MODULE, P5-8 - REMOVAL/INSTALLATION

1. General

- A. The hydraulic pumps module is panel P5-8 and is located on the right middle section of the P5 forward overhead panel in the flight deck.
- B. This procedure has these tasks:
 - (1) Removal of the hydraulic pumps module, P5-8.
 - (2) Installation of the hydraulic pumps module, P5-8.

TASK 29-11-91-000-801

2. Removal of the Hydraulic Pumps Module, P5-8

Figure 401

A. Location Zones

<u>Zone</u>	<u>Area</u>
211	Flight Compartment - Left
212	Flight Compartment - Right

B. Procedure

SUBTASK 29-11-91-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C00780	HYDRAULIC SYSTEM ENG PUMP DEPRESS VALVE 2
B	15	C00779	HYD SYS ENG PUMP DEPRESS VALVE 1

SUBTASK 29-11-91-010-001

- (2) Get access to the electrical connectors on the back of the P5-8 hydraulic pumps module [1] on the P5 forward overhead panel:
 - (a) Loosen the 1/4-turn fasteners that hold the P5 forward overhead panel in position and let the panel rotate downward.

SUBTASK 29-11-91-020-001

- (3) Remove the P5-8 hydraulic pumps module [1] from the P5 forward overhead panel as follows:
 - (a) Disconnect the electrical connectors D642 and D2486 at the back of the module.

WARNING: HOLD THE HYDRAULIC PUMPS MODULE WHEN YOU LOOSEN THE 1/4-TURN FASTENERS. IF THE MODULE FALLS, INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (b) Hold the hydraulic pumps module [1] in place and loosen the 1/4-turn fasteners that hold the hydraulic pumps module [1] to the P5 forward overhead panel.
- (c) Remove the hydraulic pumps module [1].

————— **END OF TASK** —————

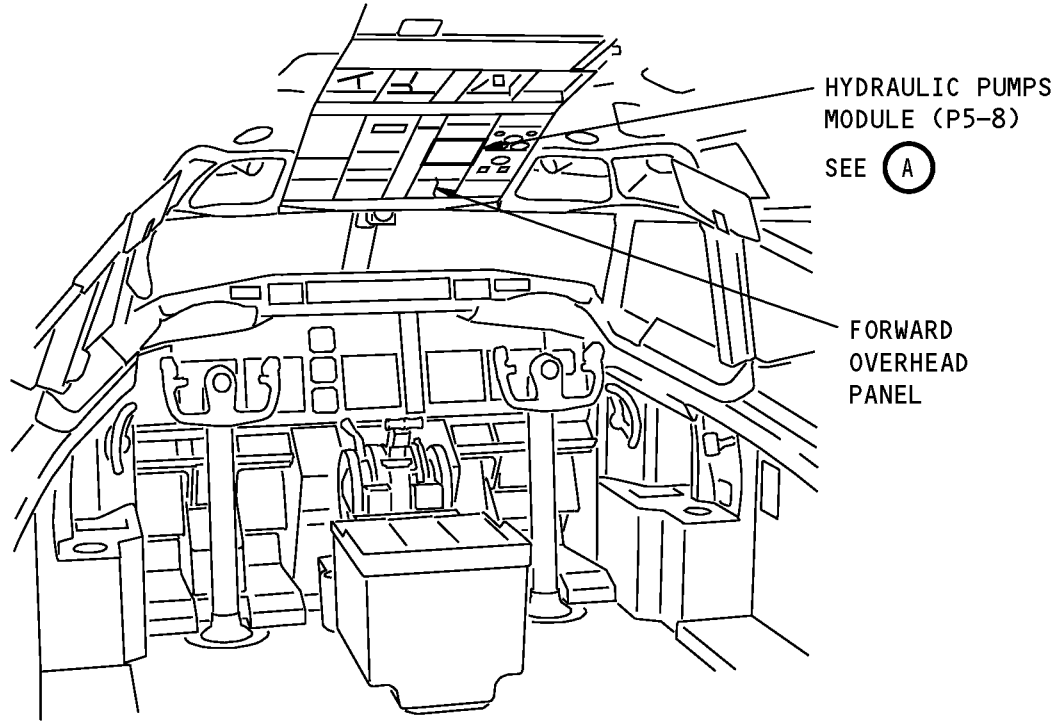
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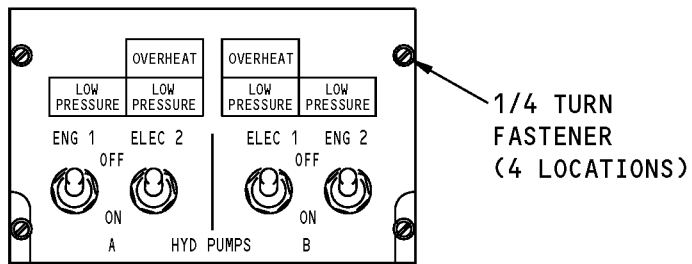
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FLIGHT COMPARTMENT



[1] HYDRAULIC PUMPS MODULE

HYDRAULIC PUMPS MODULE (P5-8)



**Hydraulic Pumps Module Installation
Figure 401/29-11-91-990-801**

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TASK 29-11-91-400-801

3. Installation of the Hydraulic Pumps Module, P5-8

Figure 401

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00-700-801	Operational Test of the Hydraulic Systems A and B (P/B 501)

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Hydraulic Pumps Module Installation

SUBTASK 29-11-91-010-002

(1) If it has not already been done, lower the P5 forward overhead panel.

SUBTASK 29-11-91-420-001

(2) Install the P5-8 hydraulic pumps module [1] into the P5 forward overhead panel as follows:

- (a) Put the hydraulic pumps module [1] into the P5 forward overhead panel and hold it in position.
- (b) Turn the 1/4-turn fasteners on the hydraulic pumps module [1] to hold the module to the P5 forward overhead panel.
- (c) Connect the electrical connectors D642 and D2486 to the module.

SUBTASK 29-11-91-410-001

(3) Lift the P5 forward overhead panel to the closed position and turn the 1/4-turn fasteners.

SUBTASK 29-11-91-860-002

(4) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	17	C00780	HYDRAULIC SYSTEM ENG PUMP DEPRESS VALVE 2
B	15	C00779	HYD SYS ENG PUMP DEPRESS VALVE 1

D. Hydraulic Pumps Module Installation Test

SUBTASK 29-11-91-860-003

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811, if necessary.

SUBTASK 29-11-91-710-001

(2) Do a test of the P5-8 hydraulic pumps module [1] switches and low pressure lights, do this task: Operational Test of the Hydraulic Systems A and B, TASK 29-11-00-700-801.

SUBTASK 29-11-91-710-002

(3) Do a test of the P5-8 hydraulic pumps module [1] overheat indicator lights.

- (a) Press the overheat indicator light(s) on the P5-8 panel.
 - 1) Make sure the light(s) comes on.

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(b) Release the overheat indicator light(s) on the P5-8 panel.

1) Make sure the light(s) go off.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 29-11-91-860-004

(1) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— **END OF TASK** —————

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AIRCRAFT MAINTENANCE MANUAL

RESERVOIR MANUAL FILL PUMP - REMOVAL/INSTALLATION

1. General

A. This procedure contains these two tasks:

- (1) Reservoir Manual Fill Pump Removal
- (2) Reservoir Manual Fill Pump Installation

TASK 29-18-01-000-801

2. Reservoir Manual Fill Pump Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1154	Container - 5 Gallon (19 Liters)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-18-01-860-001

- (1) Put the reservoir fill selector valve to the CLOSED position.

SUBTASK 29-18-01-020-001

- (2) Disconnect the hydraulic lines, [2] and [5], from the reservoir manual fill pump [1].

SUBTASK 29-18-01-680-001

- (3) Drain the hydraulic fluid into a 5 gallon (19 liter) container, STD-1154.

SUBTASK 29-18-01-160-001

- (4) Do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

SUBTASK 29-18-01-420-001

- (5) Install caps on the hydraulic lines [2] and [5] to prevent contamination or damage.

SUBTASK 29-18-01-420-002

- (6) Install covers on the inlet and outlet ports of the reservoir manual fill pump [1] to prevent contamination or damage.

NOTE: If the replacement pump does not have unions in the inlet and outlet ports, remove the unions [4] and [7] and remove and discard packings [3] and [6].

SUBTASK 29-18-01-020-002

- (7) Remove the bolts [8], the washers [9] (under the bolthead), the washers [10] (under the nut), and the nuts [11].

SUBTASK 29-18-01-020-003

- (8) Remove the reservoir manual fill pump [1].

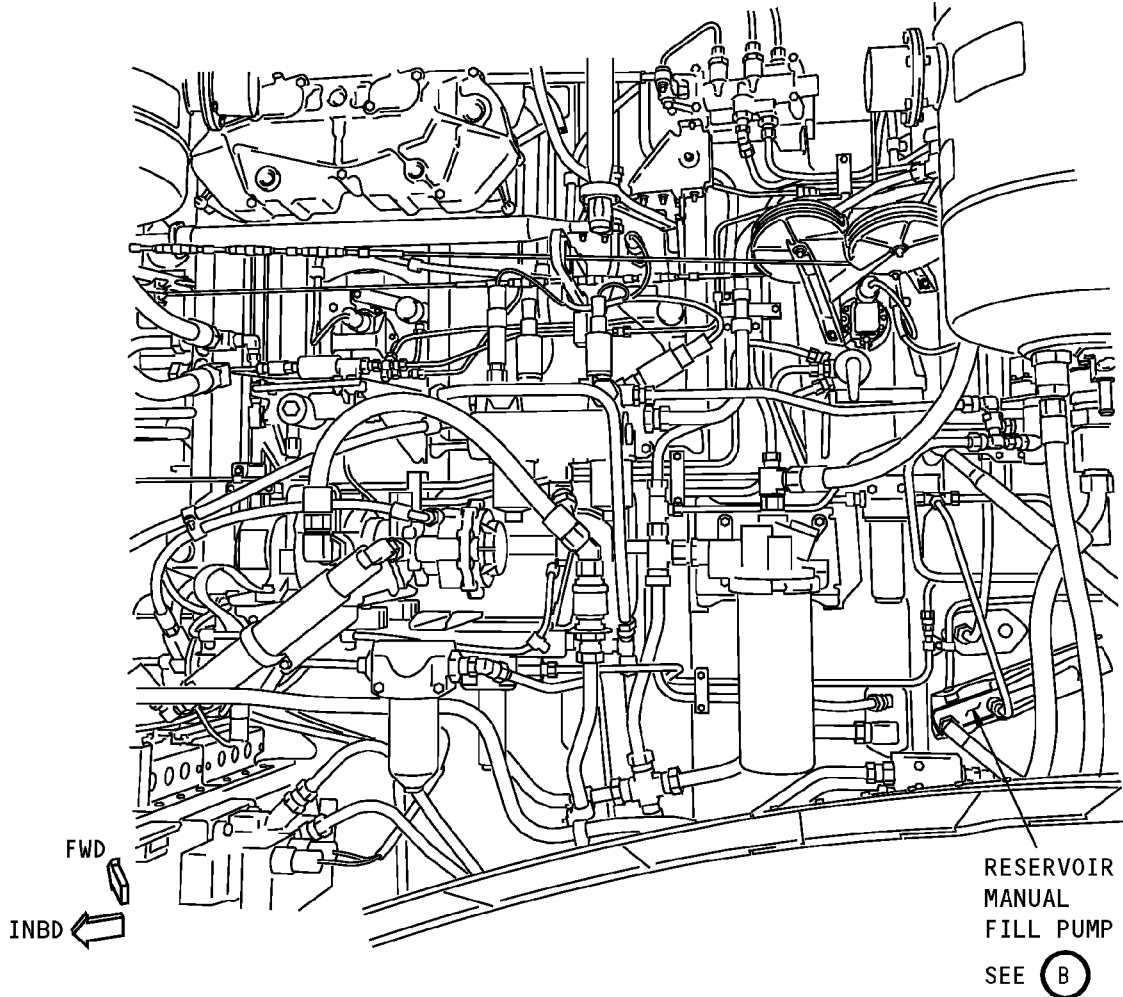
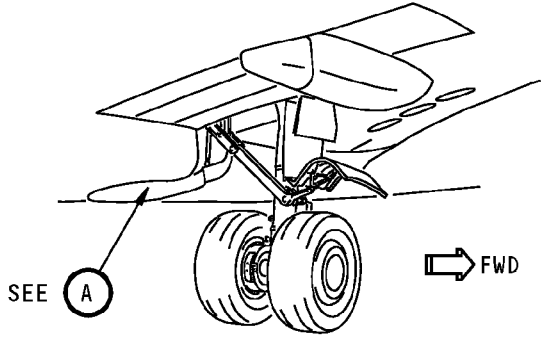
————— **END OF TASK** —————

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**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

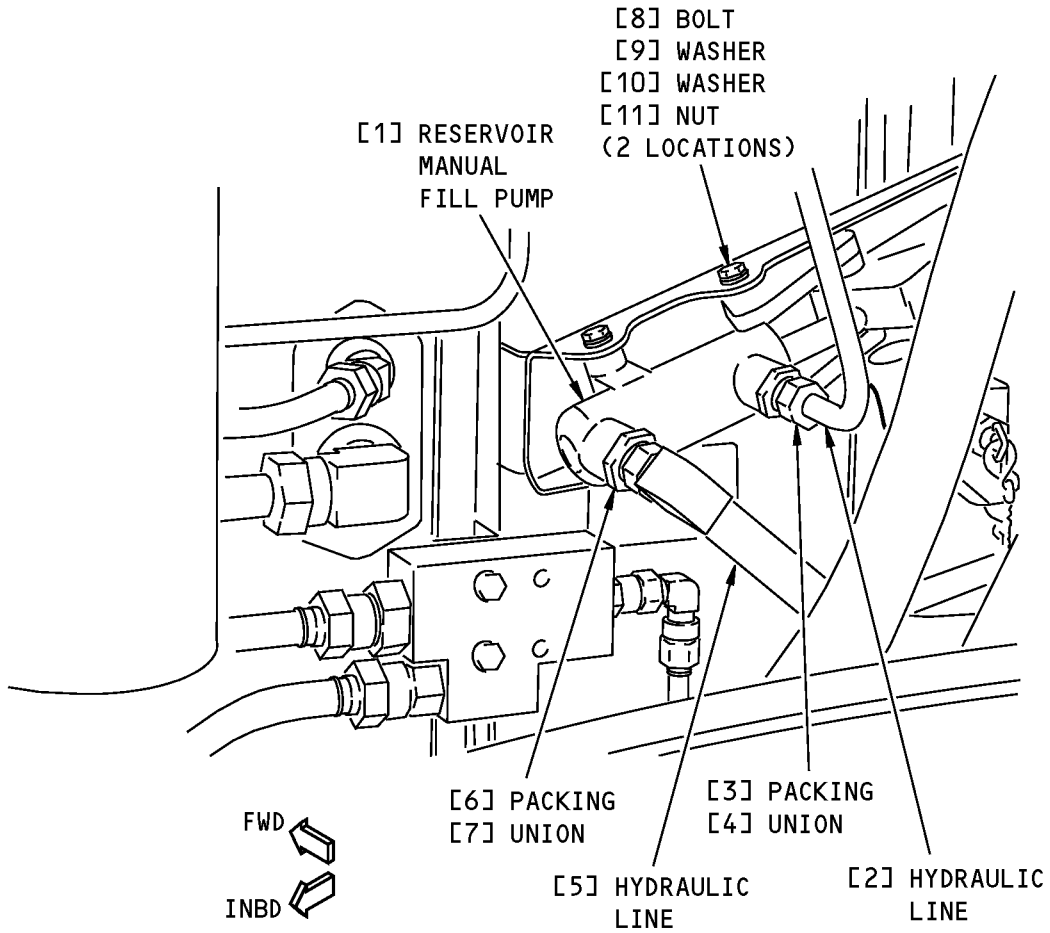
(A)

**Reservoir Manual Fill Pump Installation
Figure 401 (Sheet 1 of 2)/29-18-01-990-801**

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RESERVOIR MANUAL FILL PUMP

B

**Reservoir Manual Fill Pump Installation
Figure 401 (Sheet 2 of 2)/29-18-01-990-801**

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TASK 29-18-01-400-801

3. Reservoir Manual Fill Pump Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-18-01-020-004

- (1) Remove the covers from the pump inlet and outlet ports of the reservoir manual fill pump [1].

SUBTASK 29-18-01-420-007

- (2) If the replacement pump does not have unions already installed in the inlet and outlet ports, do these steps:
 - (a) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packings [3] and [6] and the unions [4] and [7].
 - (b) Install the new packing [6] and the union [7] in the inlet port and the new packing [3] and the union [4] in the outlet port.

SUBTASK 29-18-01-420-004

- (3) Put the reservoir manual fill pump [1] in its mounting position.

SUBTASK 29-18-01-420-005

- (4) Install the reservoir manual fill pump [1] with the bolts [8], the washers [9] (under the bolthead), the washers [10] (under the nut) and the nuts [11].

SUBTASK 29-18-01-020-005

- (5) Remove the caps from the hydraulic lines [2] and [5].

SUBTASK 29-18-01-420-006

- (6) Connect hydraulic lines [2] and [5] to the inlet and outlet ports of the reservoir manual fill pump [1].

E. Reservoir Manual Fill Pump Installation Test

SUBTASK 29-18-01-610-001

- (1) Pump a small quantity of fluid through the reservoir manual fill pump [1] (TASK 12-12-00-610-801).

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SUBTASK 29-18-01-790-001

(2) Examine the reservoir manual fill pump [1] connections for leaks.

————— **END OF TASK** —————

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HAP ALL

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AIRCRAFT MAINTENANCE MANUAL

RESERVOIR FILL FILTER MODULE AND COMPONENTS - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these four tasks:
 - (1) A removal of the reservoir fill filter module
 - (2) An installation of the reservoir fill filter module
 - (3) A removal of the reservoir fill filter element
 - (4) An installation of the reservoir fill filter element.

TASK 29-18-11-000-801

2. Reservoir Fill Filter Module Removal

(Figure 401)

A. General

- (1) In this procedure, the reservoir fill filter module is referred to as the "filter module" and the reservoir fill filter element is referred to as the "filter element".

B. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-18-11-020-001

- (1) Remove the filter assembly [1]:
 - (a) Put the reservoir fill selector valve to the CLOSED position.
 - (b) Disconnect hydraulic line [2] and hydraulic line [5] from the inlet and outlet ports of the fill filter module head.
 - (c) Drain hydraulic fluid into a container.
 - (d) Install caps on the hydraulic line [2] and hydraulic line [5].
 - (e) Install caps on the unions [4] of the filter head inlet and outlet ports.

NOTE: If new filter module does not have unions installed, remove unions [4] and packings [3] and discard packings [3].
 - (f) Remove the filter module bolts [12] and washers [13].
 - (g) Remove the reservoir fill filter assembly [1].
 - (h) If it is necessary, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

————— **END OF TASK** —————

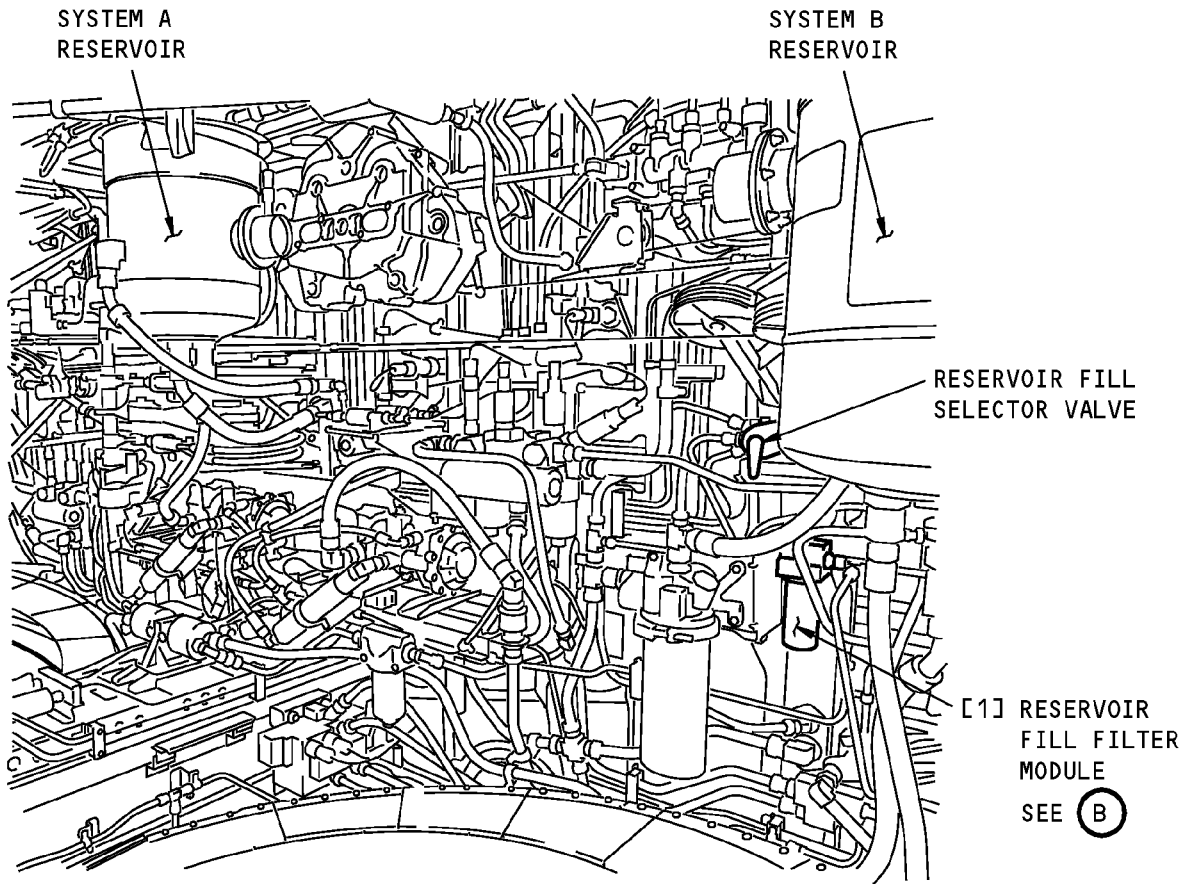
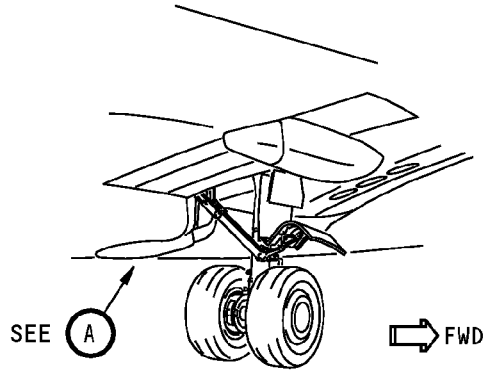
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AIRCRAFT MAINTENANCE MANUAL**



INBD  FWD

**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

(A)

**Reservoir Fill Filter Module Installation
Figure 401 (Sheet 1 of 2)/29-18-11-990-801**

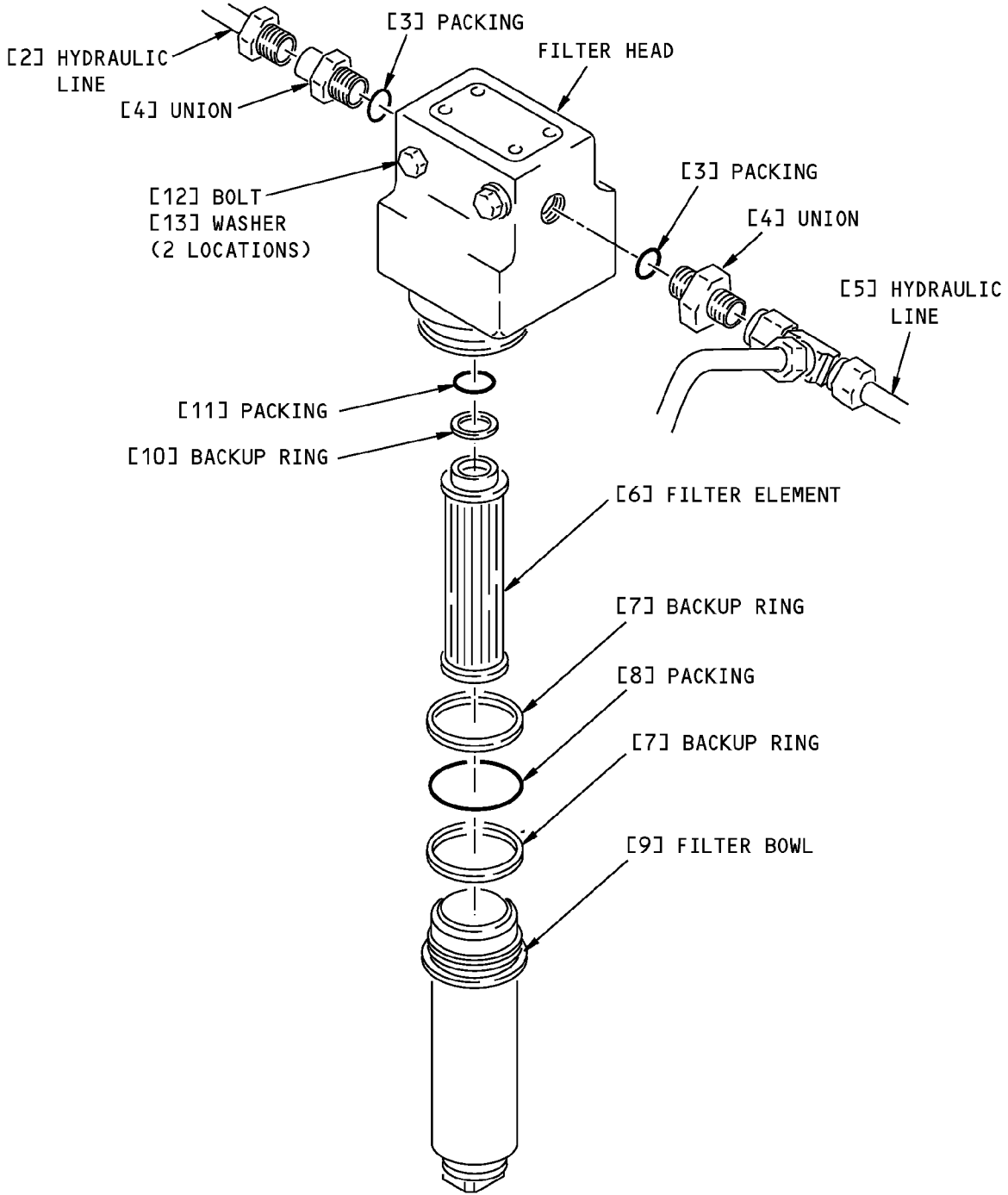
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RESERVOIR FILL FILTER MODULE

(B)

**Reservoir Fill Filter Module Installation
Figure 401 (Sheet 2 of 2)/29-18-11-990-801**

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TASK 29-18-11-400-801

3. Reservoir Fill Filter Module Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Packing	29-18-11-01-025	HAP ALL

D. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Procedure

SUBTASK 29-18-11-420-001

(1) Install the filter module [1].

- (a) If packings [3] and unions [4] are not already installed on the filter head, do the following:
 - 1) Apply fluid, D00153 to the packings [3] and the unions [4].
 - 2) Install packings [3] and unions [4] in the inlet and outlet ports of the filter module.
- (b) Install the filter module [1] to the structure with bolts [12] and washers [13].
- (c) Remove the caps from the hydraulic line [2] and hydraulic line [5].
- (d) Remove any caps or plugs that may be installed on the filter head inlet and outlet ports.
- (e) Connect the hydraulic line [2] and hydraulic line [5] to the inlet and outlet ports of filter assembly [1].

F. Reservoir Fill Filter Module Installation Test

SUBTASK 29-18-11-790-001

- (1) To service the hydraulic reservoir, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.
 - (a) While you service the reservoir examine the filter assembly [1] and hydraulic line [2] and hydraulic line [5] for leaks.

————— END OF TASK —————

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TASK 29-18-11-000-802

4. Reservoir Fill Filter Element Removal

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Procedure

SUBTASK 29-18-11-020-002

(1) Remove the element [6].

- (a) Put the reservoir fill selector valve to the CLOSED position.
- (b) Put a container below the filter bowl [9] to catch any hydraulic fluid.
- (c) Remove the filter bowl [9] with the filter element [6].
- (d) Discard the filter element [6].
- (e) Remove and discard packing [8] and packing [11].
- (f) Remove backup rings [7] and [10].
- (g) Clean the filter bowl [9].

————— END OF TASK —————

TASK 29-18-11-400-802

5. Reservoir Fill Filter Element Installation

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

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D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Element	29-18-11-01-060	HAP ALL
		29-18-11-01-110	HAP ALL
8	Packing	29-18-11-01-070	HAP ALL
		29-18-11-01-095	HAP ALL
		29-18-11-01-105	HAP ALL
11	Packing	29-18-11-01-055	HAP ALL
		29-18-11-01-105	HAP ALL

E. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

F. Procedure

SUBTASK 29-18-11-420-002

- (1) Install the filter element [6].
 - (a) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [8] and new packing [11], backup rings [7] and [10], and to the threads of filter bowl [9].
 - (b) Install the new packing [11] and backup ring [10] in the groove in the top end of the filter element [6].
 - (c) Install the backup ring [7], the new packing [8] and the backup ring [7] in the groove in the filter head.
 - (d) Put the filter element [6] in the filter bowl [9].
 - (e) Install the filter bowl [9] into the filter head.
 - (f) Tighten the filter bowl [9] to 50-75 inch-pounds(5.6-8.5 Newton-meters).

G. Reservoir Fill Filter Element Installation Test

SUBTASK 29-18-11-790-002

- (1) To service the hydraulic reservoirs, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.
 - (a) While you service the reservoir examine the filter assembly [1] for leaks.

————— END OF TASK —————

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RESERVOIR FILL SELECTOR VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the reservoir fill selector valve
- (2) An installation of the reservoir fill selector valve.

TASK 29-18-21-000-801

2. Reservoir Fill Selector Valve Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for the Removal

SUBTASK 29-18-21-860-001

- (1) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

D. Reservoir Fill Selector Valve Removal

SUBTASK 29-18-21-020-001

- (1) Disconnect the hydraulic line [1], hydraulic line [15], hydraulic line [10] from the reservoir fill selector valve [6].

SUBTASK 29-18-21-680-001

- (2) Put a container below the reservoir fill selector valve [6] to drain hydraulic fluid.

SUBTASK 29-18-21-160-001

- (3) Clean all hydraulic fluid from the installation area if it is necessary. To clean it, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

SUBTASK 29-18-21-420-001

- (4) Install plugs to the hydraulic lines and caps to the ports of the reservoir fill selector valve [6].

NOTE: If new selector valve does not have unions and check valve installed, remove unions [11], [14] and check valve [2] and remove and discard packings [3], [12], [13].

SUBTASK 29-18-21-020-002

- (5) Remove the reservoir fill selector valve [6]:
 - (a) Remove the nuts [9], washers [8], washers [5], bolts [4], and spacers [7] from the reservoir fill selector valve [6].
 - (b) Remove the reservoir fill selector valve [6] from the airplane.

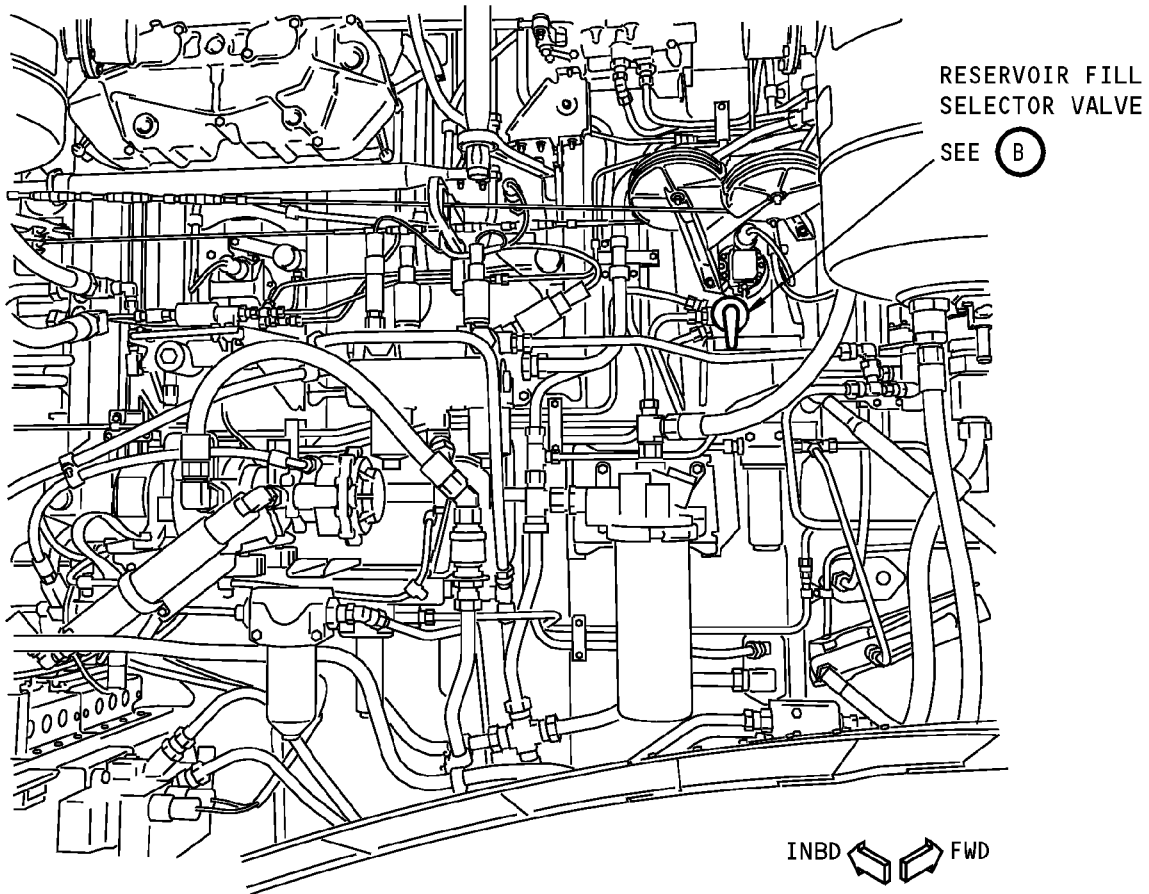
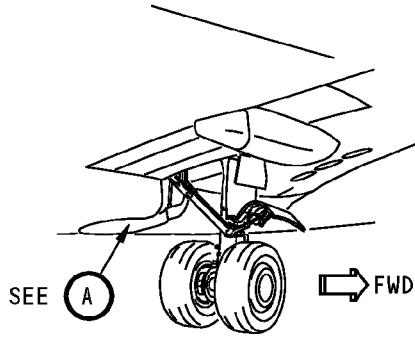
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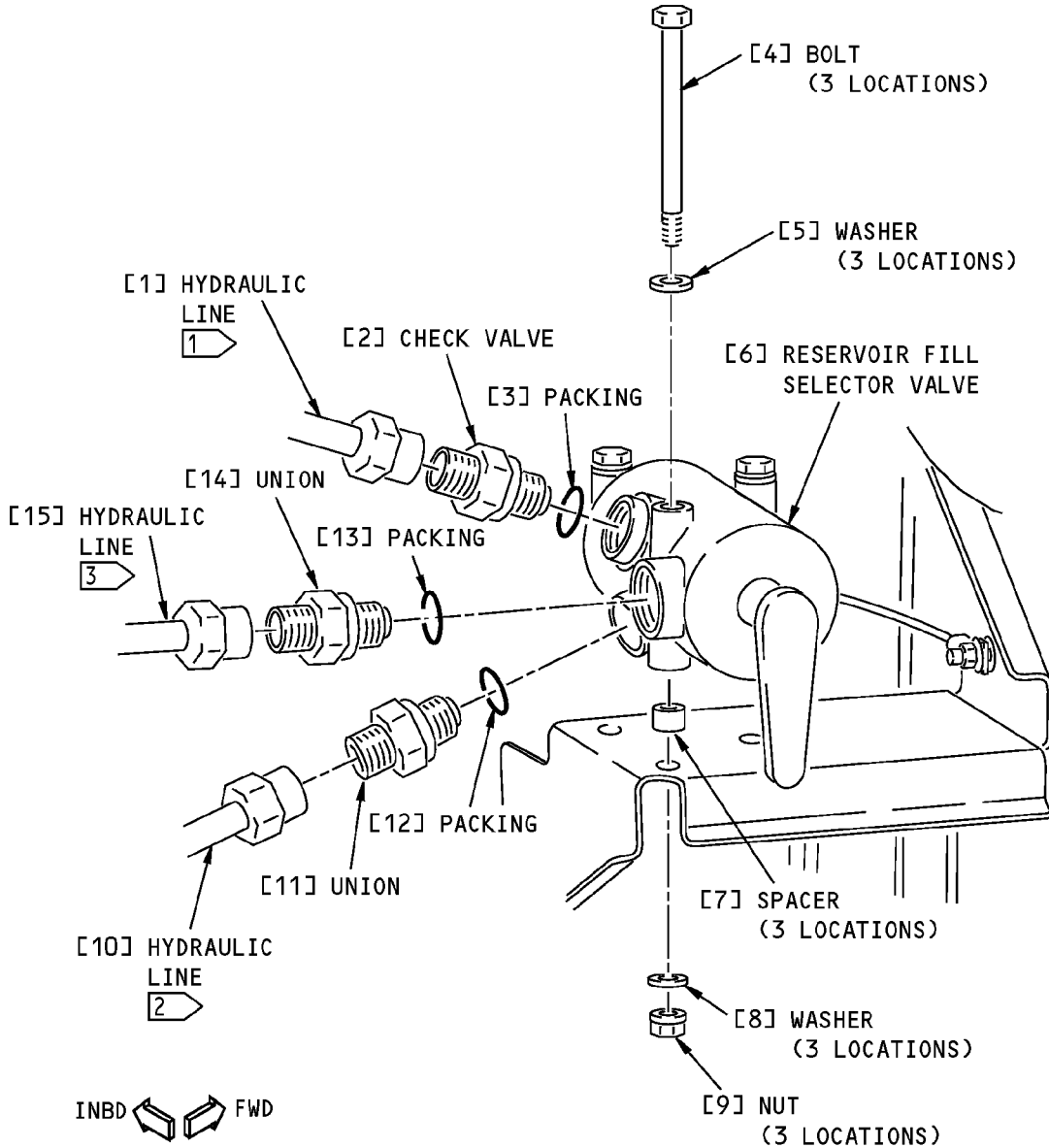
**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

A

**Reservoir Fill Selector Valve Installation
Figure 401 (Sheet 1 of 2)/29-18-21-990-801**

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RESERVOIR FILL SELECTOR VALVE

B

- [1] TO THE SYSTEM A RESERVOIR
- [2] TO THE STANDBY AND THE SYSTEM B RESERVOIR
- [3] TO THE RESERVOIR FILL FILTER MODULE

**Reservoir Fill Selector Valve Installation
Figure 401 (Sheet 2 of 2)/29-18-21-990-801**

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AIRCRAFT MAINTENANCE MANUAL

TASK 29-18-21-400-801

3. Reservoir Fill Selector Valve Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Reservoir Fill Selector Valve Installation

SUBTASK 29-18-21-420-002

- (1) If the check valve, unions, and packings are not installed on the new reservoir fill selector valve [6], then do these steps:
 - (a) Lubricate the new packing [3], new packing [13], new packing [12], new union [14], and new union [11] with fluid, D00153.
 - (b) Remove the caps from the reservoir fill selector valve [6].
 - (c) Install the new check valve [2] and new packing [3] on the port of the reservoir fill selector valve [6].
 - (d) Install the new union [14] and new packing [13] on the port of the reservoir fill selector valve [6].
 - (e) Install the new union [11] and new packing [12] on the port of the reservoir fill selector valve [6].

SUBTASK 29-18-21-420-003

- (2) Install the reservoir fill selector valve [6]:
 - (a) Put the reservoir fill selector valve [6] in its position.
 - (b) Install the spacers [7], bolts [4], washers [5], washers [8], and nuts [9] that attach the reservoir fill selector valve [6] to the airplane structure.

SUBTASK 29-18-21-080-001

- (3) Remove the plugs from the hydraulic lines [1], [10], [15].

SUBTASK 29-18-21-420-004

- (4) Connect the hydraulic line [1], hydraulic line [10], and hydraulic line [15] to the reservoir fill selector valve [6].

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E. Reservoir Fill Selector Valve Installation Test

SUBTASK 29-18-21-610-001

(1) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-18-21-790-001

(2) Make sure that there is no hydraulic leakage at the reservoir fill selector valve.

————— **END OF TASK** —————

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AIRCRAFT MAINTENANCE MANUAL

STANDBY HYDRAULIC SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
(1) Standby Hydraulic System Pressurization
(2) Standby Hydraulic System Power Removal.

TASK 29-21-00-000-801

2. Standby Hydraulic System Pressurization

(Figure 201)

A. References

Table with 2 columns: Reference, Title. Row: 24-22-00-860-811, Supply Electrical Power (P/B 201)

B. Location Zones

Table with 2 columns: Zone, Area. Rows: 211, Flight Compartment - Left; 212, Flight Compartment - Right

C. Procedure

SUBTASK 29-21-00-860-001

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-00-860-002

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Row: C, 11, C00362, FLIGHT CONTROL SHUTOFF VALVES STBY RUD

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Row: F, 2, C01449, STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

SUBTASK 29-21-00-860-003

- (3) To pressurize the standby hydraulic system, do one of these steps:
(a) Set the FLT CONTROL A switch on the flight controls panel (P5-3) to the STBY RUD position.

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HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

- (b) Set the FLT CONTROL B switch on the flight controls panel (P5-3) to the STBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

- (c) Set the ALTERNATE FLAPS on the forward overhead panel to the ARM position.

————— **END OF TASK** —————

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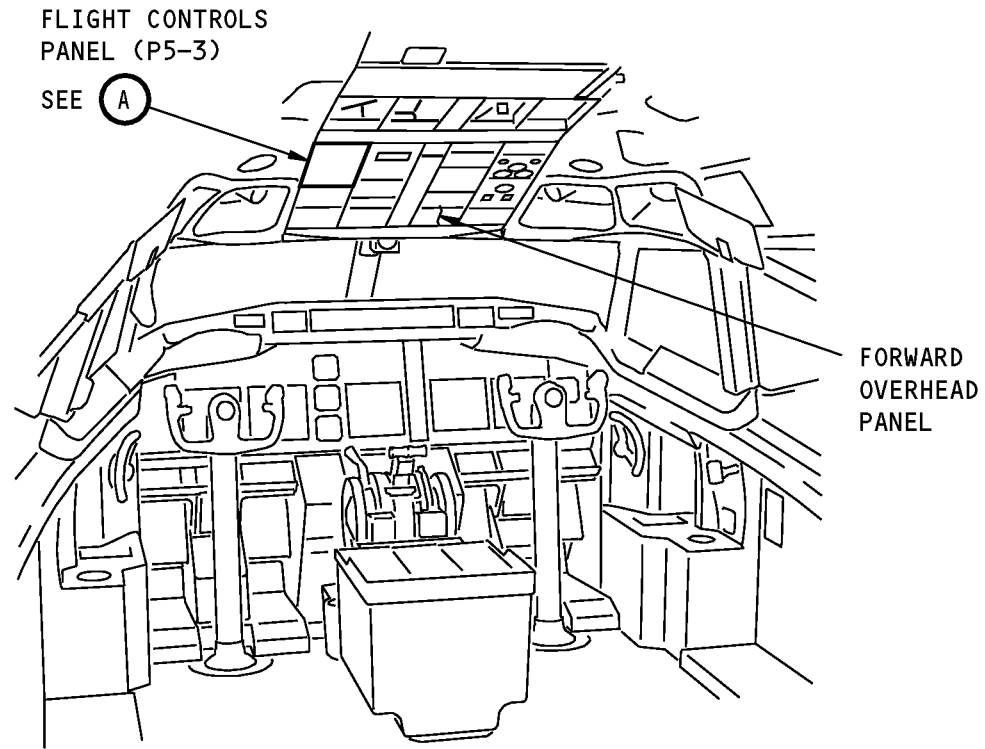
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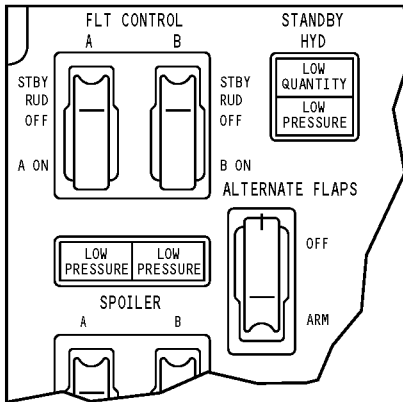
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FLIGHT COMPARTMENT



FLIGHT CONTROLS PANEL (P5-3)



Standby Hydraulic System Control Switches
Figure 201 (Sheet 1 of 2)/29-21-00-990-801

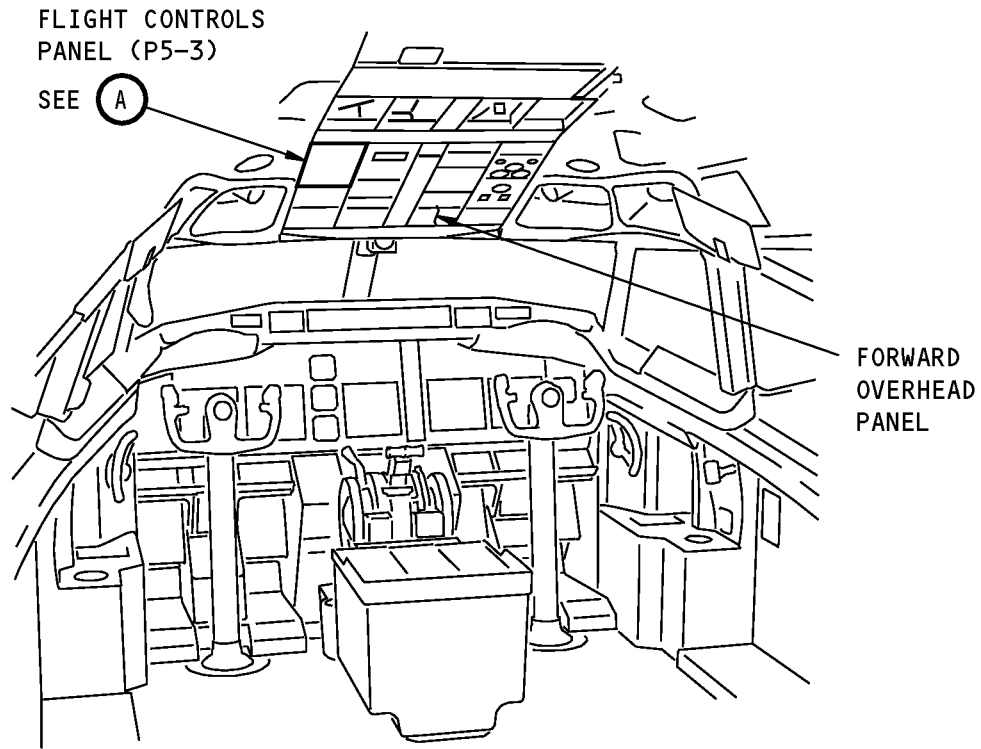
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HAP 001-013, 015-026, 028-030 PRE SB 737-27-1253

29-21-00

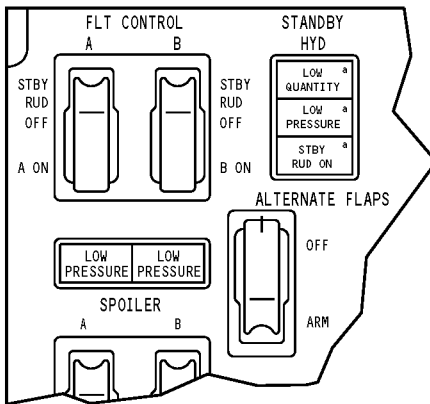
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AIRCRAFT MAINTENANCE MANUAL**



FLIGHT COMPARTMENT



FLIGHT CONTROLS PANEL (P5-3)

(A)

**Standby Hydraulic System Control Switches
Figure 201 (Sheet 2 of 2)/29-21-00-990-801**

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HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST
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TASK 29-21-00-000-802

3. Standby Hydraulic System Power Removal

(Figure 201)

A. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

B. Procedure

SUBTASK 29-21-00-860-004

(1) To remove power from the standby hydraulic system, do these steps:

- (a) Set the FLT CONTROL A switch on the flight controls panel (P5-3) to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

- (b) Set the FLT CONTROL B switch on the flight controls panel (P5-3) to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.
- (c) Set the ALTERNATE FLAPS on the forward overhead panel to the OFF position.

END OF TASK

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AIRCRAFT MAINTENANCE MANUAL

STANDBY HYDRAULIC SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Operational Test of the Standby Hydraulic System - Use this test to do a quick check of the standby hydraulic system.
 - (2) System Test of the Standby Hydraulic System - Use this test to make sure the hydraulic system operates correctly.
 - (3) Operational Test of the Standby Hydraulic Actuation System - Use this test to do a check of the standby hydraulic system and standby rudder.

TASK 29-21-00-700-801

2. Operational Test of the Standby Hydraulic System

- A. General
 - (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
32-09-00-860-801	Put the Airplane in the Air Mode (P/B 201)
32-09-00-860-802	Return the Airplane to the Ground Mode (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Test

SUBTASK 29-21-00-860-005

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-00-860-006

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

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AIRCRAFT MAINTENANCE MANUAL

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

SUBTASK 29-21-00-860-034

(3) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	4	C01392	STICK SHAKER LEFT

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C01393	STICK SHAKER RIGHT

SUBTASK 29-21-00-860-023

(4) Pressurize the hydraulic system B reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-21-00-860-007

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-21-00-860-008

(6) Set the flap control lever to the one-unit position.

SUBTASK 29-21-00-860-009

(7) Remove pressure from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

E. Operational Test of the Standby Hydraulic System

SUBTASK 29-21-00-710-001

(1) Do the operational test of the standby hydraulic system:

(a) Set both the FLT CONTROL A and FLT CONTROL B switches on the forward overhead panel, P5, to the off position.

1) Make sure both the A and B flight control low pressure lights on the forward overhead panel, P5, are on.

(b) Set the FLT CONTROL A switch on the forward overhead panel, P5, to the STDBY RUD position.

1) Make sure the STANDBY HYD LOW PRESSURE Light on the forward overhead panel, P5, is on.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

- 1) Make sure the standby electric motor-driven pump (EMDP) operates.
- 2) Make sure the STANDBY HYD LOW PRESSURE Light on the forward overhead panel, P5, goes off.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 3) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

- 4) Move the rudder pedals to the left forward stop and to the right forward stop at a high rate of 5 cycles.
- 5) Put in full left pedal and slowly release.
- 6) Make sure that the rudder pedals are centered.
- 7) Put in full right pedal and slowly release.
- 8) Make sure that the rudder pedals are centered.
- 9) Do a visual check of the rudder control surface, to make sure it is in the approximate neutral position, within the deadband range of the Standby Rudder PCU, +/- 1.75 degrees or 1.65 inches.

(d) Set the FLT CONTROL A switch to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

- 2) Make sure the standby EMDP stops.

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)

- (e) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

- (f) Set the FLT CONTROL B switch on the forward overhead panel, P5, to the STDBY RUD position.
 - 1) Make sure the STANDBY HYD LOW PRESSURE light is on.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (g) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

- 1) Make sure the standby EMDP operates.
- 2) Make sure the STANDBY HYD LOW PRESSURE light goes off.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 3) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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- (h) Set the FLT CONTROL B switch to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

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2) Make sure the standby EMDP stops.

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(i) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

(j) Set the ALTERNATE FLAPS on the forward overhead panel, P5, to the ARM position.

- 1) Make sure the STANDBY HYD LOW PRESSURE light is on.
- 2) If it is necessary, operate the rudder to remove pressure from the standby hydraulic system.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(k) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

- 1) Make sure the standby EMDP operates.
- 2) Make sure the STANDBY HYD LOW PRESSURE light goes off.

(l) Set the ALTERNATE FLAPS to the OFF position.

- 1) Make sure the standby EMDP stops.

(m) Set the FLT CONTROL A switch to the ON position.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(n) Put the airplane in the air mode. To put the airplane in the air mode, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801

- 1) Make sure the standby EMDP operates.

(o) Put the airplane in the ground mode. To put the airplane in the ground mode, do this task: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802

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- 1) Make sure the standby EMDP stops.
- (p) Set the FLT CONTROL A switch to the OFF position.
- (q) Set the FLT CONTROL B switch to the ON position.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU PUSH THE AIR SENSING SWITCH. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (r) Put the airplane in the air mode. To put the airplane in the air mode, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801
 - 1) Make sure the standby EMDP operates.
- (s) Put the airplane in the ground mode. To put the airplane in the ground mode, do this task: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802
 - 1) Make sure the standby EMDP stops.
- (t) Set the FLT CONTROL A switch to the ON position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-21-00-860-035

- (1) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	4	C01392	STICK SHAKER LEFT

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C01393	STICK SHAKER RIGHT

SUBTASK 29-21-00-860-010

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (2) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-21-00-860-011

- (3) Set the flap control lever to the FLAP UP position.

SUBTASK 29-21-00-860-012

- (4) Remove power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

————— **END OF TASK** —————

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TASK 29-21-00-700-802

3. System Test of the Standby Hydraulic System

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
32-09-00-840-802	Return the Airplane Systems Back to Their Normal On Ground Condition (P/B 201)
32-09-00-860-801	Put the Airplane in the Air Mode (P/B 201)
32-09-00-860-802	Return the Airplane to the Ground Mode (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-8419	Adapter - Tee, Standby Hydraulic System Test (Part #: C29005-1, Supplier: 81205, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Access Panels

Number	Name/Location
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

E. Prepare for the Test

SUBTASK 29-21-00-860-013

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-00-860-024

(2) Pressurize the hydraulic system B reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

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SUBTASK 29-21-00-860-014

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-21-00-860-015

- (4) Set the flap control lever to the one-unit position.

SUBTASK 29-21-00-860-016

- (5) Remove hydraulic power from system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-21-00-860-017

- (6) Set the FLT CONTROL A, B, and ALTERNATE FLAPS switches on the forward overhead panel, P5, to the OFF position.

SUBTASK 29-21-00-480-001

- (7) Install the portable hydraulic cart, STD-163:

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

- (a) Disconnect the pressure line for the standby electric motor-driven pump (EMDP).
- (b) Connect the pressure line of the portable hydraulic cart, STD-163 to the pressure line for the standby EMDP.

NOTE: Do not connect the portable hydraulic cart, STD-163 to the flexible line from the standby EMDP.

- (c) You can connect the supply line of the portable hydraulic cart, STD-163 to the either the system B ground service return port, or the standby system reservoir. Connect the supply line to the airplane at one of these locations:

NOTE: The system B reservoir and the standby reservoir are connected by a balance line.

- 1) To connect the supply line of the portable hydraulic cart, STD-163 to the system B ground service return port, do these steps.
 - a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward
 - b) Connect the supply line of the portable hydraulic cart, STD-163 to the system B ground service return port located forward of the right wheel well.
- 2) To connect the supply line of the portable hydraulic cart, STD-163 to the standby system reservoir, do these steps.
 - a) Disconnect the supply line for the standby system EMDP at the quick disconnect fitting below the standby reservoir.

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CAUTION: MAKE SURE THAT THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY, DISCONNECT THE SELF-SEAL DISCONNECT, AND MAKE SURE THAT THE POPPET IS STRAIGHT. AFTER YOU INSTALL IT, MAKE SURE THAT THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 IN. (1.52 MM). IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL DECREASE OR STOP. THIS CAN CAUSE DAMAGE TO THE RESERVOIR, AND THE PUMP.

- b) Connect the supply line of the portable hydraulic cart, STD-163 to the quick disconnect fitting on the bottom of the standby reservoir.

SUBTASK 29-21-00-020-001

- (8) Disconnect the electrical connector from the standby EMDP.

F. System Test of the Standby Hydraulic System

SUBTASK 29-21-00-730-001

- (1) Do a pressure test of the standby hydraulic system:
 - (a) Set the ALTERNATE FLAPS switch on the forward overhead panel, P5, to the ARM position.
 - 1) Make sure the STANDBY HYD LOW PRESSURE light on the forward overhead panel, P5, is on.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Slowly increase the pressure from the portable hydraulic cart, STD-163 to 3000 psig.
 - 1) Make sure the STANDBY HYD LOW PRESSURE light goes off when the pressure is between 1100 and 1500 psig.
- (c) Slowly decrease the pressure from the portable hydraulic cart, STD-163.
 - 1) Make sure the STANDBY HYD LOW PRESSURE light comes on when the pressure is between 1500 and 1000 psig.
- (d) Release all the pressure from the standby hydraulic system.

NOTE: If it is necessary, operate the rudder to remove pressure from the standby hydraulic system.
- (e) Set the ALTERNATE FLAPS switch on the forward overhead panel, P5, to the OFF position.

SUBTASK 29-21-00-080-001

- (2) Remove the portable hydraulic cart, STD-163 from the airplane:
 - (a) Disconnect the supply line of the portable hydraulic cart, STD-163 from the airplane.
 - 1) If the supply line is connected to the system B ground service return port, do these steps.
 - a) Disconnect the supply line of the portable hydraulic cart, STD-163 from the system B ground service return port located forward of the right wheel well.
 - b) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
192BR	ECS Ram Air Inlet Mixing Duct Panel - Forward

- 2) If the supply line is connected to the standby system reservoir, do these steps.

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- a) Disconnect the supply line of the portable hydraulic cart, STD-163 from the quick disconnect fitting on the bottom of standby system reservoir.

CAUTION: MAKE SURE THAT THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY, DISCONNECT THE SELF-SEAL DISCONNECT, AND MAKE SURE THAT THE POPPET IS STRAIGHT. AFTER YOU INSTALL IT, MAKE SURE THAT THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 IN. (1.52 MM). IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL DECREASE OR STOP. THIS CAN CAUSE DAMAGE TO THE RESERVOIR, AND THE PUMP.

- b) Connect the supply line for the standby EMDP to the quick disconnect fitting on the bottom of the standby reservoir.
- (b) Disconnect the pressure line of the portable hydraulic cart, STD-163 from the pressure line for the standby EMDP.

SUBTASK 29-21-00-480-002

- (3) Connect the adapter, SPL-8419 to the pressure line from the standby EMDP.
 - (a) Connect the pressure line from the standby EMDP to the pressure port on the Standby EMDP.

SUBTASK 29-21-00-420-001

- (4) Connect the electrical connector to the standby EMDP.

SUBTASK 29-21-00-730-002

- (5) Do a system test of the standby hydraulic system:

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Set the FLT CONTROL A switch on the forward overhead panel, P5, to the STDBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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- 2) Make sure the pressure becomes stable at 2850-3200 psig.
- (b) Set the FLT CONTROL A switch to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

- 2) Make sure the standby EMDP stops.
- (c) Set the FLT CONTROL B switch on the forward overhead panel, P5, to the STDBY RUD position.

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HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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- 2) Make sure the standby EMDP operates.
- (d) Set the FLT CONTROL B switch to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

- 2) Make sure the standby EMDP stops.
- (e) Set the ALTERNATE FLAPS switch on the forward overhead panel, P5, to the ARM position.
 - 1) Make sure the standby EMDP operates.
- (f) Set the ALTERNATE FLAPS switch to the OFF position.
 - 1) Make sure the standby EMDP stops.
- (g) Set the FLT CONTROL A switch to the ON position.
 - 1) Make sure the standby EMDP does not operate.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS BEFORE YOU PUSH THE AIR SENSING SWITCH. RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (h) Put the airplane in the air mode. To put the airplane in the air mode, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801
 - 1) Make sure the standby EMDP operates.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

- (i) Put the airplane in the ground mode. To put the airplane in the ground mode, do this task: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802
 - 1) Make sure the standby EMDP stops.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

- (j) Set the FLT CONTROL A switch to the OFF position.

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- (k) Set the FLT CONTROL B switch to the ON position.
 - 1) Make sure the standby EMDP does not operate.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS BEFORE YOU PUSH THE AIR SENSING SWITCH. RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (l) Put the airplane in the air mode. To put the airplane in the air mode, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801
 - 1) Make sure the standby EMDP operates.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

- (m) Put the airplane in the ground mode. To put the airplane in the ground mode, do this task: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802
 - 1) Make sure the standby EMDP stops.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

- (n) Set the FLT CONTROL B switch to the OFF position.
- (o) Release the pressure from the standby hydraulic system.

NOTE: If it is necessary, operate the rudder to remove pressure from the standby hydraulic system.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-21-00-080-002

- (1) Remove the adapter, SPL-8419 from the pressure line.
 - (a) Connect the pressure line from the standby EMDP to the pressure line on the Standby EMDP after you remove the adapter, SPL-8419.

SUBTASK 29-21-00-860-022

- (2) Put the airplane systems back to their normal on-ground condition. To do this, (TASK 32-09-00-840-802)

SUBTASK 29-21-00-860-019

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER.AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

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SUBTASK 29-21-00-860-020

(4) Set the flap control lever to the UP position.

SUBTASK 29-21-00-860-021

(5) Remove hydraulic power from system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

————— END OF TASK —————

TASK 29-21-00-700-803

4. Operational Test of the Standby Hydraulic Actuation System

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) This test makes sure the standby hydraulic pump and the related indications operate correctly. This test checks the standby hydraulic pumps low pressure indications thru the system A and system B flight control switches, alternate flaps switch and the auto standby system relay.
- (3) When you do the steps that use the system A (B) flight control switches, do the steps for one systems switch then repeat the steps again for the other system switch.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
32-00-01-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-01-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-09-00-860-801	Put the Airplane in the Air Mode (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Test

SUBTASK 29-21-00-860-025

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-00-860-026

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)

- (2) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

SUBTASK 29-21-00-860-036

- (3) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
E	4	C01392	STICK SHAKER LEFT

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
B	6	C01393	STICK SHAKER RIGHT

SUBTASK 29-21-00-860-027

- (4) Pressurize the hydraulic system B reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-21-00-860-028

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-21-00-480-003

WARNING: MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL OF THE LANDING GEAR. WITHOUT THE PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) To install them, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-01-480-801.

SUBTASK 29-21-00-860-029

CAUTION: MAKE SURE THAT THE INBOARD FAN COWL PANEL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE CLOSED AND IN THE STOWED POSITION OR REMOVED BEFORE YOU EXTEND THE LEADING EDGE FLAPS AND SLATS. THERE IS NOT SUFFICIENT CLEARANCE FOR THE FLAPS AND SLATS TO EXTEND IF THE INBOARD FAN COWL PANEL AND THE INBOARD AND OUTBOARD THRUST REVERSERS ARE IN THE OPEN POSITION. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (7) Set the flap control lever to the one-unit position.

SUBTASK 29-21-00-860-030

- (8) Remove pressure from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

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E. Operational Test of the Standby Hydraulic System

SUBTASK 29-21-00-710-002

(1) Do the operational test of the standby hydraulic system:

(a) Set the FLT CONTROL A (B) switch on the forward overhead panel, P5, to the STDBY RUD position.

1) Make sure the STANDBY HYD LOW PRESSURE light on the forward overhead panel, P5, comes on.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

(b) Set the FLT CONTROL A(B) Switch on the forward overhead panel, P5, to the OFF position.

1) Make sure the STANDBY HYD LOW PRESSURE light on the forward overhead panel, P5, goes off.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

(c) Set the ALTERNATE FLAPS switch on the forward overhead panel, P5, to the ARM position.

1) Make sure the STANDBY HYD LOW PRESSURE light comes on.

2) If it is necessary, operate the rudder to remove the pressure from the standby hydraulic system.

(d) Set the AITERNATE FLAPS switch on the forward overhead panel, P5, to the OFF position.

1) Make sure the STANDBY HYD LOW PRESSURE light on the forward overhead panel, P5, goes off.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. RUDDER, THRUST REVERSERS, AND LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(e) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

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- (f) Set the FLT CONTROL A (B) switch on the forward overhead panel, P5, to the STDBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

- 2) Make sure the standby electric motor-driven pump (EMDP) operates.
- 3) Make sure the STANDBY HYD LOW PRESSURE light on the forward overhead panel, P5, momentarily comes on then goes off.
- 4) Move the rudder pedals.
- a) Move the rudder pedals to the left forward stop and to the right forward stop at a high rate for 5 cycles.
- b) Put in full left pedal and slowly release.
- c) Make sure that the rudder pedals are centered.
- d) Put in full right pedal and slowly release.
- e) Make sure that the rudder pedals are centered.
- f) Do a visual check of the rudder control surface to make sure it is in the approximate neutral position, within the deadband range of the Standby Rudder Control Unit (SPCU).

NOTE: The purpose of the visual check is to examine for a large rudder offset from the neutral position that may result from a failure in the input linkage to the standby rudder control unit. The visual check can be done from the ground without physical measurement of the position of the rudder surface.

- (g) Set the FLT CONTROL A(B) switch on the forward overhead panel, P5, to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

- 2) Make sure the standby EMDP stops.
- (h) Set the ALTERNATE FLAPS switch on the forward overhead panel, P5, to the ARM position.
- 1) Make sure the standby EMDP operates.
- 2) Make sure the STANDBY HYD LOW PRESSURE light on the forward overhead panel, P5, momentarily comes on then goes off.
- (i) Set the ALTERNATE FLAPS switch on the forward overhead panel, P5, to the OFF position.
- 1) Make sure the standby EMDP stops.
- (j) Set the FLT CONTROL A(B) switch to ON position.

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WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF LEADING EDGE SLATS BEFORE YOU SUPPLY HYDRAULIC POWER. LEADING EDGE SLATS CAN MOVE QUICKLY WHEN YOU PUSH THE AIR SENSING SWITCH. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (k) Put the airplane in the air mode. To put the airplane in the air mode, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801
1) Make sure the standby EMDP operates.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 2) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

- (l) Put the airplane in ground mode.
1) Make sure the standby EMDP stops.
(m) Set the FLT CONTROL A(B) switch to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

SUBTASK 29-21-00-860-039

- (2) Do the operational test for hydraulic system B, if not accomplished.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-21-00-860-038

- (1) Make sure the FLT CONTROL A and FLT CONTROL B switches on the forward overhead panel, P5, are in the ON position.

SUBTASK 29-21-00-860-037

- (2) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-2

Table with 4 columns: Row, Col, Number, Name. Row E, Col 4, Number C01392, Name STICK SHAKER LEFT

F/O Electrical System Panel, P6-1

Table with 4 columns: Row, Col, Number, Name. Row B, Col 6, Number C01393, Name STICK SHAKER RIGHT

SUBTASK 29-21-00-860-031

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER.AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (3) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

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SUBTASK 29-21-00-860-032

- (4) Set the flap control lever to the FLAP UP position.

SUBTASK 29-21-00-860-033

- (5) Remove power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-21-00-080-003

- (6) If not necessary, remove the lock pin from the towing lever for the nose wheel steering mechanism. To remove it, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-01-080-801.

————— **END OF TASK** —————

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STANDBY HYDRAULIC SYSTEM ELECTRIC MOTOR-DRIVEN PUMP (EMDP) - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the standby hydraulic system electric motor-driven pump (EMDP)
- (2) An installation of the standby hydraulic EMDP.

TASK 29-21-21-000-801

2. Standby Hydraulic System Electric Motor-Driven Pump (EMDP) Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

B. Location Zones

Zone	Area
194	Lower Wing-To-Body Fairing - Aft of Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Access Panels

Number	Name/Location
194DR	Aft Wing To Body Fairing Panel

D. Prepare for the Removal

SUBTASK 29-21-21-860-001

- (1) Remove hydraulic power from standby hydraulic system. To remove it, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 29-21-21-860-002

- (2) Release the pressure from the standby hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-21-21-860-003

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
F	3	C00882	ELEC HYD PUMP SYS B

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

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<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	3	C00881	ELEC HYD PUMP SYS A

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

SUBTASK 29-21-21-020-001

- (4) Disconnect the supply line for the standby hydraulic system EMDP from the standby hydraulic reservoir at the quick-disconnect.

NOTE: The quick-disconnect is at the bottom of the standby hydraulic reservoir.

SUBTASK 29-21-21-010-001

- (5) Open this access panel to get access to the standby hydraulic system EMDP:

<u>Number</u>	<u>Name/Location</u>
194DR	Aft Wing To Body Fairing Panel

E. Standby Hydraulic EMDP Removal

SUBTASK 29-21-21-020-002

- (1) Remove the standby hydraulic EMDP [13]:
 - (a) Disconnect the electrical connector [12] from the standby hydraulic EMDP [13].
 - (b) Put a container below the standby hydraulic EMDP [13] to catch hydraulic fluid.
 - (c) Disconnect the supply line [11], pressure line [10], and case drain line [6] from the standby hydraulic EMDP [13].
 - (d) Install caps and plugs on the hydraulic lines and ports.
 - (e) Remove the bolts [2] and [14] and washers [1] and [15] that attach the standby hydraulic EMDP [13] to the airplane structure.
 - (f) Remove the standby hydraulic EMDP [13] from the airplane.
 - (g) Remove reducers [4], [5], [9].
 - (h) Remove and discard packing [3], [7], [8] and cap ports.

————— **END OF TASK** —————

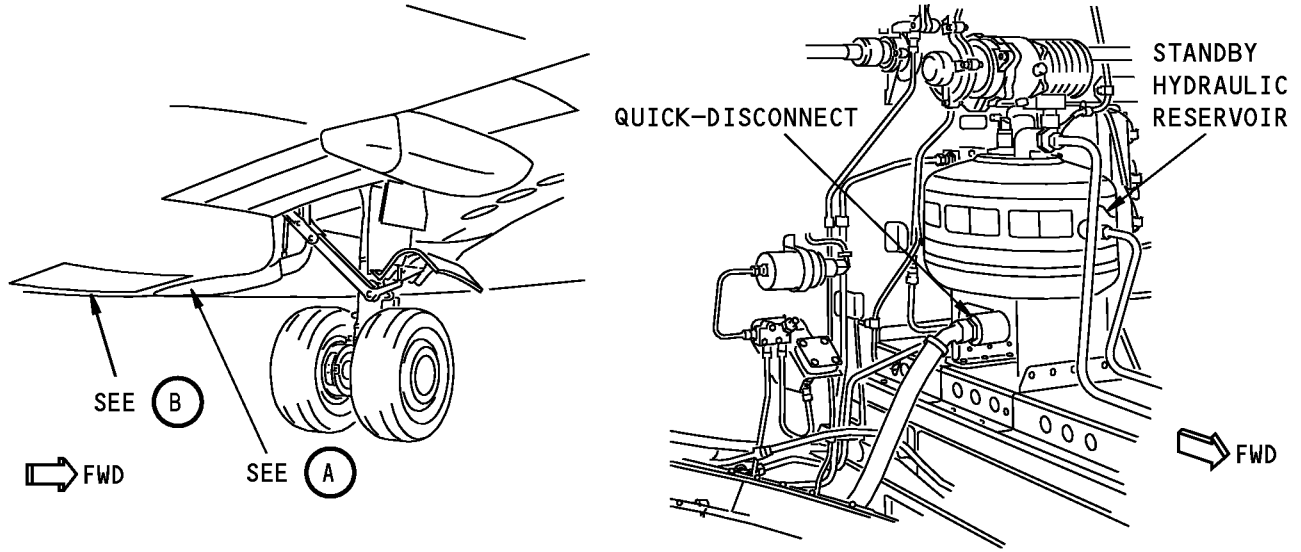
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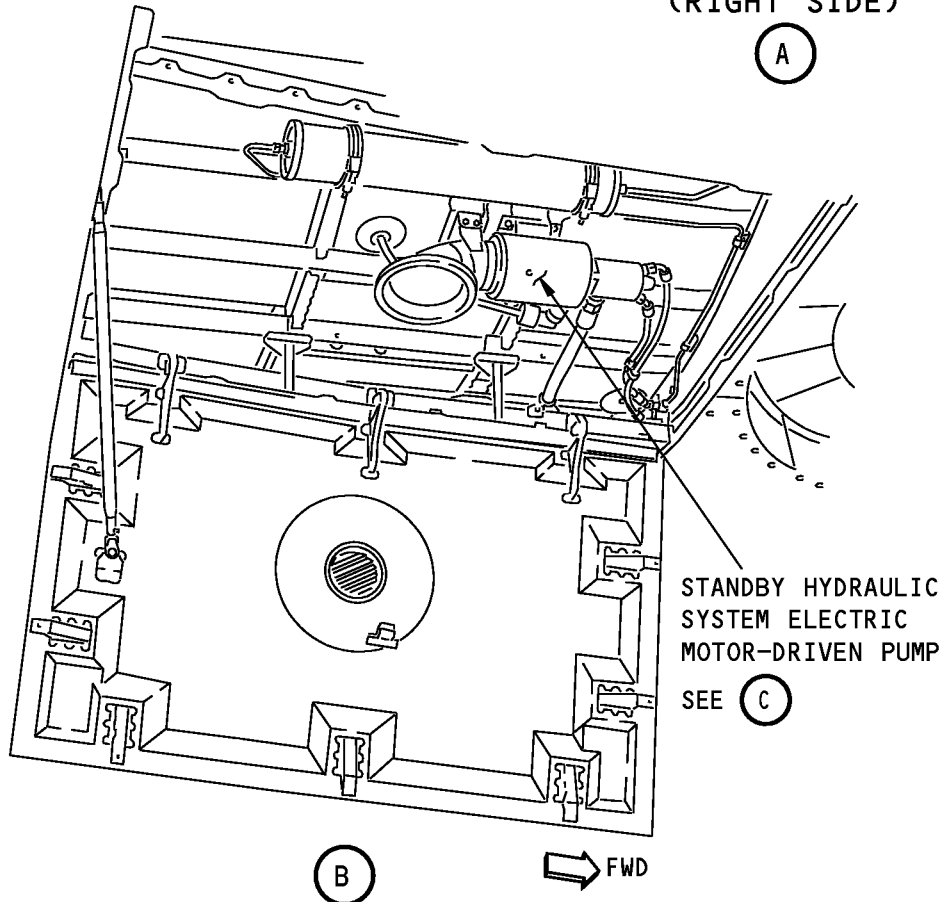
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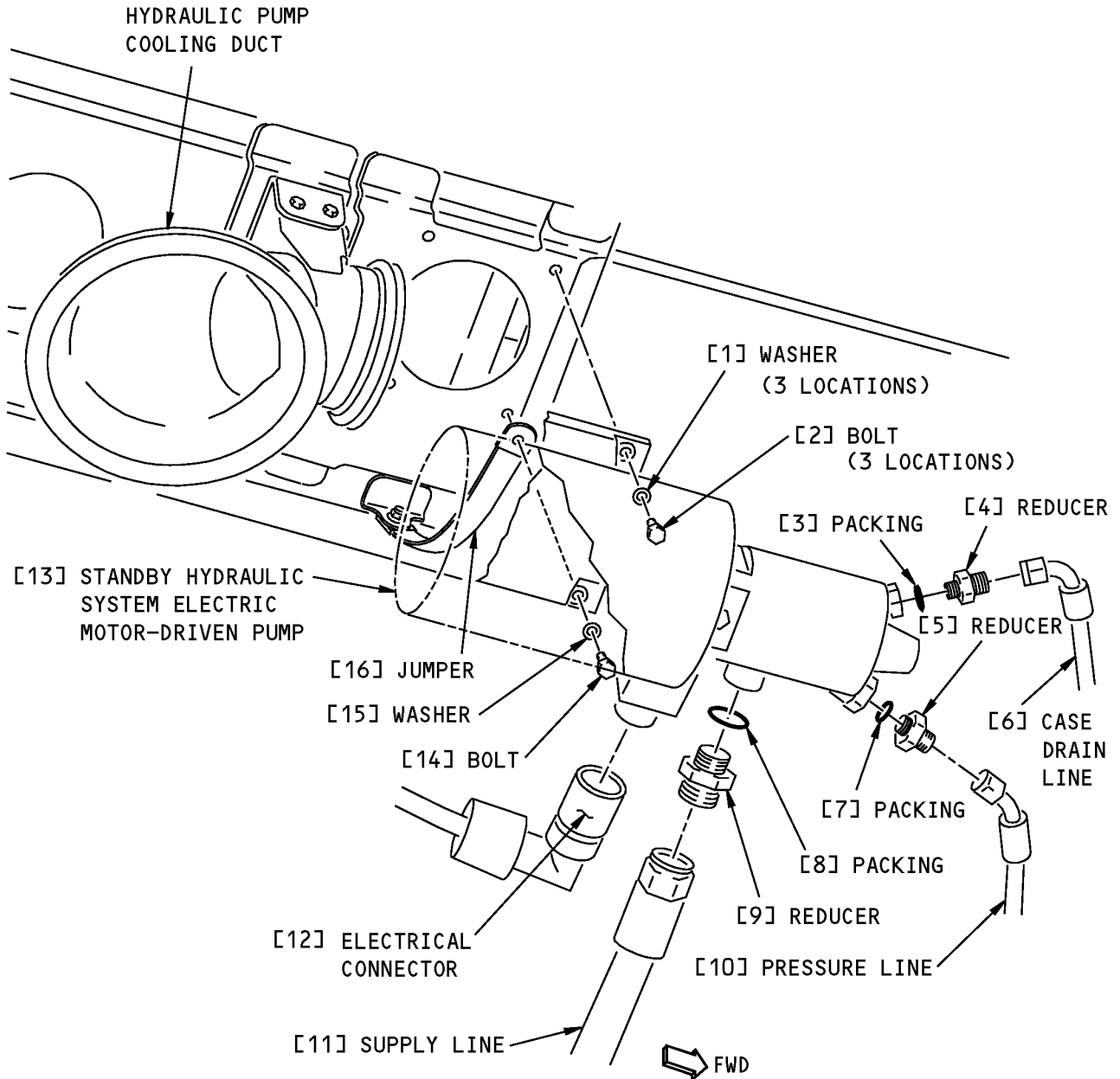
**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**



Standby Hydraulic System Electric Motor-Driven Pump (EMDP) Installation
Figure 401 (Sheet 1 of 2)/29-21-21-990-801

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**STANDBY HYDRAULIC SYSTEM
ELECTRIC MOTOR-DRIVEN PUMP (EMDP)**

(C)

**Standby Hydraulic System Electric Motor-Driven Pump (EMDP) Installation
Figure 401 (Sheet 2 of 2)/29-21-21-990-801**

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TASK 29-21-21-400-801

3. Standby Hydraulic System Electric Motor-Driven Pump (EMDP) Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-34-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
194	Lower Wing-To-Body Fairing - Aft of Wheel Well
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Access Panels

Number	Name/Location
194DR	Aft Wing To Body Fairing Panel

E. Standby Hydraulic EMDP Installation

SUBTASK 29-21-21-640-001

- (1) If the packings and reducers are not installed on the standby hydraulic EMDP [13], then do these steps:
 - (a) Lubricate the packings and reducers with fluid, D00153.
 - (b) Install the packing [3], reducer [4], packing [7], reducer [5], packing [8], and reducer [9] on the standby hydraulic EMDP [13].

SUBTASK 29-21-21-100-001

- (2) Clean the bolts [2] and [14], washers [1] and [16], and contact surfaces. To clean them, do this task: Hand Clean Metal Surfaces with Abrasives, TASK 20-10-34-120-801.

SUBTASK 29-21-21-860-004

- (3) Fill the standby hydraulic EMDP [13] half full with hydraulic fluid through the supply port.

SUBTASK 29-21-21-420-001

- (4) Install the standby hydraulic EMDP [13]:

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- (a) Put the standby hydraulic EMDP [13] in its position.
- (b) Install the washers [1] and [15], bolts [2] and [14], and jumper [16] that attach the standby hydraulic EMDP [13] to the airplane structure.
- (c) Bond and seal jumper [16] terminal connections.
- (d) Remove the plugs from the standby hydraulic EMDP [13].
- (e) Remove the caps from the supply line [11], pressure line [10], and case drain line [6].
- (f) Connect the supply line [11], pressure line [10], and case drain line [6] to the standby hydraulic EMDP [13].
- (g) Remove cap from electrical connector.
- (h) Connect the electrical connector [12] to the standby hydraulic EMDP [13].

F. Standby Hydraulic System Electric Motor - Driven Pump (EMDP) Installation Test

SUBTASK 29-21-21-760-001

- (1) Check to make sure that the maximum resistance between bonded parts are 0.0005 OHM.

SUBTASK 29-21-21-610-001

- (2) Fill the standby hydraulic reservoir and hydraulic system B reservoir if it is necessary. To do it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-21-21-860-005

- (3) Pressurize the standby system reservoir. To pressure it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-21-21-860-006

- (4) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-21-860-007

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	3	C00882	ELEC HYD PUMP SYS B

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP
F	3	C00881	ELEC HYD PUMP SYS A

NOTE: The Standby Hydraulic Pump circuit breaker is located behind the P92 front panel.

SUBTASK 29-21-21-860-008

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Pressurize the standby hydraulic system to bleed the air out of standby hydraulic EMDP:

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- (a) Set the FLT CONTROL A or FLT CONTROL B switch on the P5 panel to the STDBY RUD position.
- (b) Make sure that the standby EMDP operates.
- (c) Make sure the low pressure light is not on.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (d) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

- (e) Operate the rudder slowly through a minimum of two full cycles.
- (f) Set the FLT CONTROL A or FLT CONTROL B switch to the OFF position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (g) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

- (h) Make sure that there is no hydraulic leakage at the standby hydraulic EMDP.

SUBTASK 29-21-21-860-009

- (7) Remove power from the standby hydraulic system. To remove it, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 29-21-21-410-001

- (8) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
194DR	Aft Wing To Body Fairing Panel

END OF TASK

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STANDBY HYDRAULIC SYSTEM RESERVOIR - REMOVAL/INSTALLATION

1. General

- A. There are two tasks in this procedure. There is a task for the removal and a task for the installation of the standby hydraulic system reservoir.
- B. The standby reservoir is installed on the keel beam between the left and right wheel wells.

TASK 29-21-31-000-801

2. Standby Hydraulic System Reservoir Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-33-21-000-801	Standby Reservoir Low Quantity Switch Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-6107	Drain Hose - Hydraulic Reservoir (Part #: C29004-1, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-1154	Container - 5 Gallon (19 Liters)
STD-3901	Container - Hydraulic Fluid Resistant, 50 Gallon (190 l)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Access Panels

Number	Name/Location
194HL	Aft Wing To Body Fairing Panel

E. Prepare for the Removal

SUBTASK 29-21-31-860-001

- (1) Release pressure from the system B hydraulic reservoir. To release pressure, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-21-31-020-014

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 29-21-31-860-007

- (3) Put alternate flap switch to off, install DO-NOT-OPERATE tag.

SUBTASK 29-21-31-860-002

- (4) Put the FLT CONTROL A and B switches on the P5 panel to OFF.

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SUBTASK 29-21-31-420-001

- (5) Attach DO-NOT-OPERATE tags on the FLT CONTROL switches.

SUBTASK 29-21-31-020-001

- (6) Drain the hydraulic fluid for the standby hydraulic system as follows:

- (a) Do the steps of either Method 1 or Method 2 to drain the hydraulic fluid from the standby system reservoir [1]:

- 1) Do these steps to accomplish Method 1:

CAUTION: MAKE SURE THAT YOU PULL DOWN ON THE KNURLED RING OF THE SELF-SEAL DISCONNECT BEFORE YOU TURN IT FOR REMOVAL. IF YOU DO NOT DO THIS, TOO MUCH TORQUE WILL BE NECESSARY TO TURN THE RING WHICH WILL DAMAGE THE SELF-SEAL DISCONNECT.

- (b) Disconnect the supply line [21] for the standby hydraulic pump at the quick-disconnect [15] at the bottom of the standby hydraulic reservoir [1].

- (c) Connect a drain hose, SPL-6107 to the quick-disconnect on the bottom of the standby reservoir [1].

- (d) Put the end of the drain hose, SPL-6107 into a 5 gallon (19 liter) container, STD-1154.

- (e) Drain the hydraulic fluid into the 5 gallon (19 liter) container, STD-1154.

NOTE: System B reservoir will drain also.

NOTE: The standby hydraulic reservoir [1] contains approximately 3.5 gallons (13.2 liters).

- (f) Disconnect the drain hose, SPL-6107 from the quick-disconnect on the bottom of the standby reservoir [1].

CAUTION: MAKE SURE THAT THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY, DISCONNECT THE SELF-SEAL DISCONNECT, AND MAKE SURE THAT THE POPPET IS STRAIGHT. AFTER YOU INSTALL IT, MAKE SURE THAT THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 IN. (1.52 MM). IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL DECREASE OR STOP. THIS CAN CAUSE DAMAGE TO THE RESERVOIR, AND THE PUMP.

- (g) Reconnect the supply line [12] at the quick-disconnect on the bottom of the standby hydraulic reservoir [1].

- (7) Do these steps to accomplish Method 2:

- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
194HL	Aft Wing To Body Fairing Panel

- (b) Put a 5 gallon (19 liter) container, STD-1154 below the standby EMDP.

- (c) Disconnect the supply line at the standby EMDP.

- (d) Put the disconnected end of the supply line into the 5 gallon (19 liter) container, STD-1154.

- (e) Allow the hydraulic fluid from the standby reservoir to drain into the 5 gallon (19 liter) container, STD-1154.

- (f) Reconnect the supply line to the standby EMDP.

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Close this access panel:

<u>Number</u>	<u>Name/Location</u>
194HL	Aft Wing To Body Fairing Panel

- (g) Drain the hydraulic fluid collected from the standby hydraulic reservoir into a 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

SUBTASK 29-21-31-160-001

- (8) If you get hydraulic fluid on the airplane, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

F. Procedure

SUBTASK 29-21-31-020-002

- (1) Disconnect the electrical connector from the low quantity switch [2].

SUBTASK 29-21-31-020-003

- (2) Install a cap on the electrical connector to prevent contamination or damage.

SUBTASK 29-21-31-020-004

- (3) Remove the nut [11] and washer [10] to disconnect the bonding jumper [9] from the standby reservoir [1].

SUBTASK 29-21-31-020-005

- (4) Disconnect these tubes from the standby reservoir [1]:

- (a) Tube assembly [5]
- (b) Tube assembly [6]

SUBTASK 29-21-31-020-006

- (5) Disconnect the L-Fitting [22] from union [20].

SUBTASK 29-21-31-020-007

- (6) Install caps on the openings in the standby reservoir [1] and on the tube assembly [5], tube assembly [6] and L-Fitting [22] to prevent contamination.

SUBTASK 29-21-31-020-008

- (7) Remove the nut [19], washer [18], bolt [16] to disconnect the clamp [17] and tube assembly from the standby reservoir [1].

SUBTASK 29-21-31-020-009

- (8) Remove the bolts [12] and washers [13], bolts [14] and washers [13] that attach the standby reservoir [1] to the structure.

SUBTASK 29-21-31-020-010

- (9) Remove the standby reservoir [1].

SUBTASK 29-21-31-020-011

- (10) If it is necessary, to keep the components for installation on the replacement standby reservoir [1], do these steps:

- (a) To remove the low quantity switch [2], do this task: Standby Reservoir Low Quantity Switch Removal, TASK 29-33-21-000-801.

SUBTASK 29-21-31-020-012

- (11) If it is necessary, remove the reducer [4] and packing [3], check valve [7] and packing [8], union [20] and packing [8] from the standby reservoir [1].

- (a) Disgard packings [3] and [8].

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SUBTASK 29-21-31-020-013

(12) Install caps on the ports in the standby reservoir [1] to prevent contamination.

————— **END OF TASK** —————

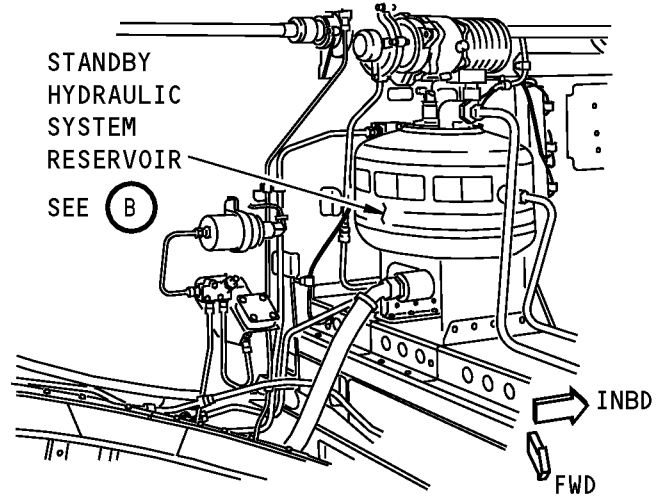
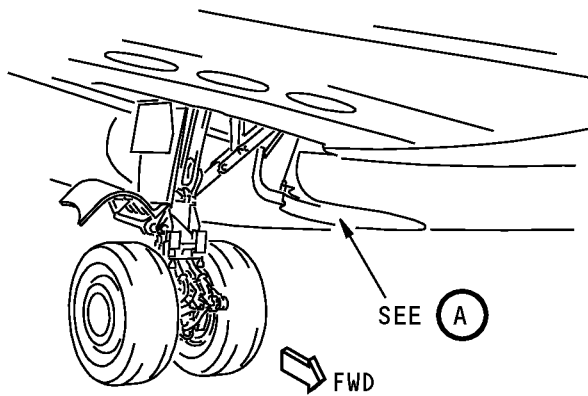
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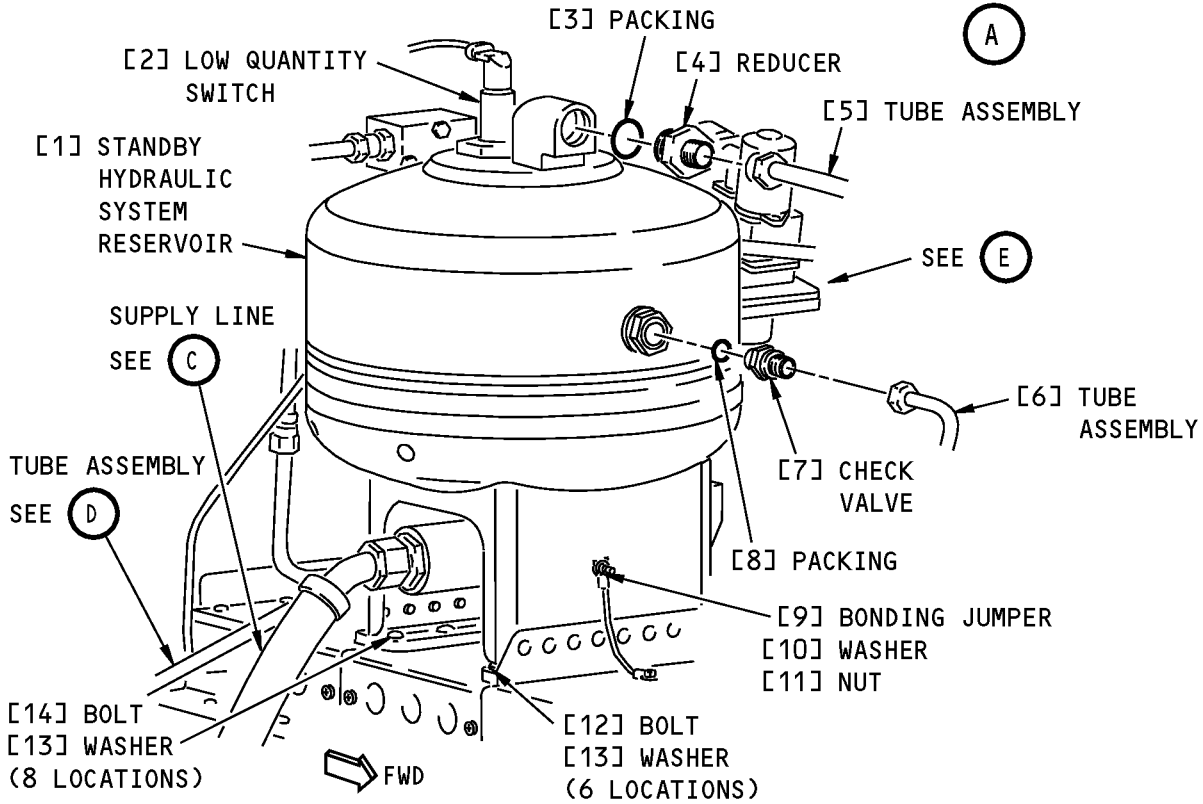
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MAIN LANDING GEAR WHEEL WELL (RIGHT SIDE)



STANDBY HYDRAULIC SYSTEM RESERVOIR

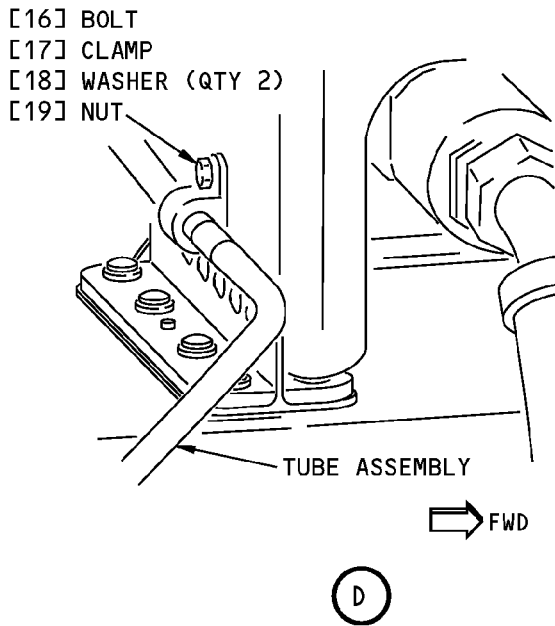
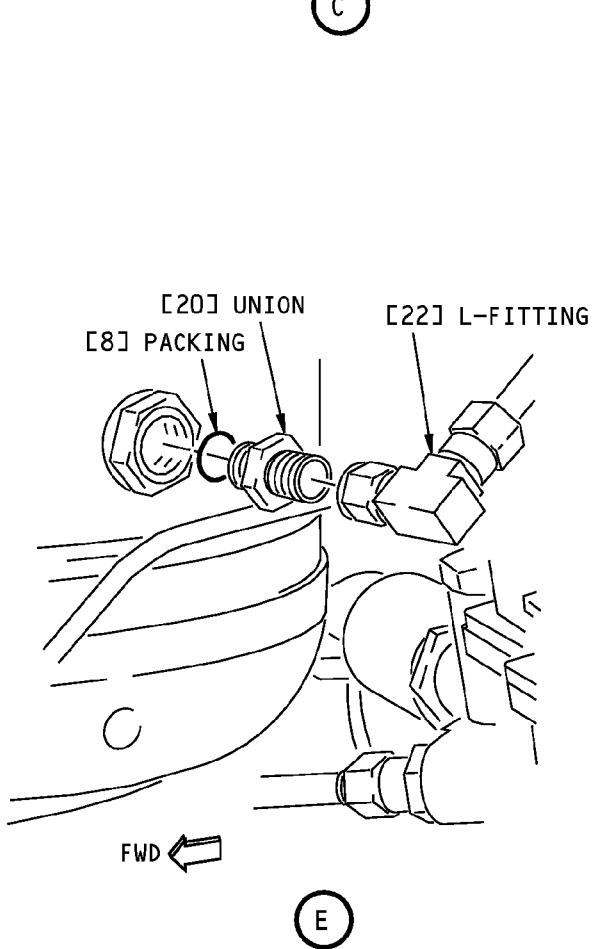
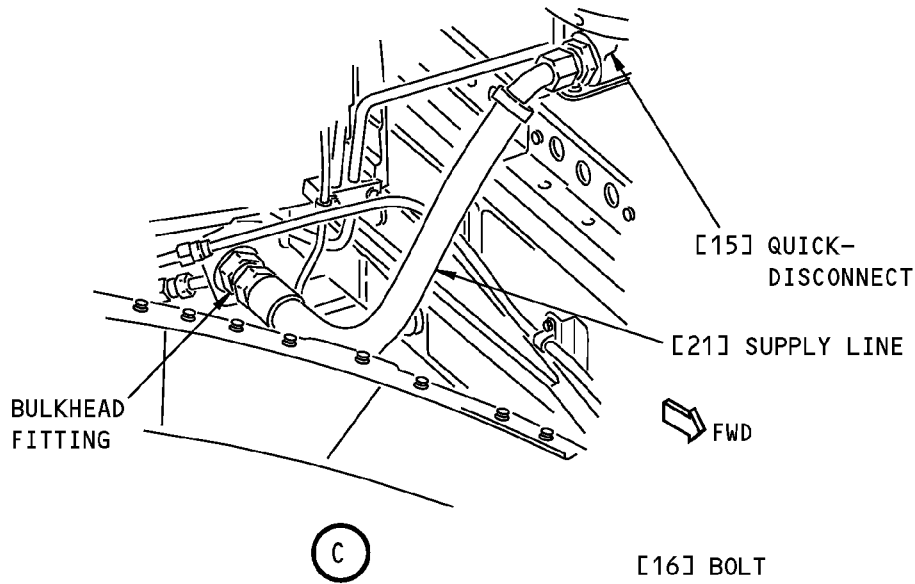
(B)

**Standby Hydraulic System Reservoir Installation
Figure 401 (Sheet 1 of 2)/29-21-31-990-801**

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**Standby Hydraulic System Reservoir Installation
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TASK 29-21-31-400-801

3. Standby Hydraulic System Reservoir Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-33-21-400-801	Standby Reservoir Low Quantity Switch Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1795	Lockset - Reservoir Vent Valve (Part #: B29002-5, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700QC, -800, -900, -BBJ)

C. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS 3-27
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

D. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

E. Procedure

SUBTASK 29-21-31-210-001

CAUTION: MAKE SURE THE RESERVOIR MOUNTING SURFACES ARE CLEAN AND UNWANTED MATERIAL DOES NOT GO INTO THE RESERVOIR OR THE HYDRAULIC LINES. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Make sure there are no unwanted materials on the reservoir surfaces and in the reservoir or the hydraulic lines.

SUBTASK 29-21-31-420-002

- (2) If it is necessary to install the reducer [4] and packing [3], check valve [7] and packing [8], union [20] and packing [8] in the ports of the standby reservoir [1], do these steps:
 - (a) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [3], new packings [8], and to the threads of reducer [4], check valve [7] and union [20].

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- (b) Install the new packing [3] on reducer [4], new packing [8] on check valve [7], new packing [8] and on union [20].
- (c) Remove the caps from the ports on the standby reservoir [1].
- (d) Install the new packing [3] and reducer [4], new packing [8] and check valve [7], and new packing [8] and union [20] in the ports on the standby reservoir [1].

SUBTASK 29-21-31-420-003

- (3) If it is necessary to install the components on the replacement standby reservoir [1], do these steps:
 - (a) Remove the caps from the ports on the standby reservoir [1].
 - (b) For the low quantity switch, do this task: Standby Reservoir Low Quantity Switch Installation, TASK 29-33-21-400-801.

SUBTASK 29-21-31-420-004

- (4) Hold the standby reservoir [1] in its position while you do these steps:
 - (a) Apply compound, C00913 to the shank and threads of bolts [12] and bolts [14].
 - (b) Install the bolts [12] and washers [13], bolts [14] and washers [13].

SUBTASK 29-21-31-420-005

- (5) Remove the caps from the openings in the standby reservoir [1] and from the tube assembly [5], tube assembly [6], and the L-Fitting [22].

SUBTASK 29-21-31-420-006

- (6) Connect these tubes to the standby reservoir [1]:
 - (a) Tube assembly [5]
 - (b) Tube assembly [6]
 - (c) L-Fitting [22]

SUBTASK 29-21-31-420-007

- (7) Remove the cap from the supply line [21].

SUBTASK 29-21-31-420-013

- (8) Connect the supply line [21] to bulkhead fitting.

SUBTASK 29-21-31-420-008

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

- (9) Connect the supply line [21] to the standby reservoir quick-disconnect [15] at the bottom of the standby reservoir [1].

SUBTASK 29-21-31-420-009

- (10) Remove the cap from the electrical connector for the low quantity switch [2].

SUBTASK 29-21-31-420-010

- (11) Connect the electrical connector to the low quantity switch [2].

SUBTASK 29-21-31-420-011

- (12) Do these steps to install the bonding jumper [9]:

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- (a) Install the bonding jumper [9], washer [10] and nut [11] on the standby reservoir [1].

NOTE: The maximum resistance, across the bonding jumper [9], between the reservoir [1] and the adjacent structure is .0005 ohms.

- (b) Apply sealant, A02315 to the jumper terminal connection.

F. Standby System Reservoir Installation Test

SUBTASK 29-21-31-210-002

- (1) Make sure the STANDBY HYD LOW QUANTITY (P5), FLT CONT (P2) and left and right MASTER CAUTION (P2) lights are on.

SUBTASK 29-21-31-610-001

- (2) Do the servicing for the standby and system B hydraulic reservoirs:

- (a) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-21-31-080-001

- (3) Remove the lockset, SPL-1795.

SUBTASK 29-21-31-420-012

- (4) Close the system B hydraulic reservoir depressurization valve.

SUBTASK 29-21-31-860-003

- (5) Pressurize the standby and system B hydraulic reservoirs. To pressurize the reservoirs, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-21-31-930-001

- (6) Remove the DO-NOT-OPERATE tags from the pump switches.

SUBTASK 29-21-31-860-004

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER AND THE LEADING EDGE FLAPS AND SLATS. THE RUDDER AND THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (7) Put the FLT CONTROL B switch (P5) to STDBY RUD.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

SUBTASK 29-21-31-860-005

- (8) Operate the rudder full travel in each direction for a minimum of three times.

- (a) Make sure the STDBY HYD LOW QUANTITY light stays off.

SUBTASK 29-21-31-860-006

- (9) Put the FLT CONTROL B switch (P5) to OFF.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

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SUBTASK 29-21-31-790-001

(10) Do a check of the standby reservoir [1] and all connections for leaks.

————— **END OF TASK** —————

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STANDBY EMDP CASE DRAIN FILTER - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these tasks:
 - (1) Remove the filter element.
 - (2) Install the filter element.
 - (3) Remove the filter as a unit.
 - (4) Install the filter as a unit.

TASK 29-21-41-000-801

2. Standby EMDP Case Drain Filter Element Removal

(Figure 401)

- A. General
 - (1) This procedure is a scheduled maintenance task.
- B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
29-21-21-000-801	Standby Hydraulic System Electric Motor-Driven Pump (EMDP) Removal (P/B 401)
29-21-21-400-801	Standby Hydraulic System Electric Motor-Driven Pump (EMDP) Installation (P/B 401)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Procedure

SUBTASK 29-21-41-860-001

- (1) Open these circuit breakers and install safety tags:

Standby Power Control Unit, M01720

Row	Col	Number	Name
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

SUBTASK 29-21-41-840-001

- (2) Do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 29-21-41-860-002

- (3) Release the pressure from the system B reservoir, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

NOTE: The standby reservoir is pressurized through the system B reservoir.

SUBTASK 29-21-41-480-001

- (4) Put a container below the filter bowl [11] to catch the hydraulic fluid.

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SUBTASK 29-21-41-020-009

(5) Remove the lockwire from the filter bowl [11].

SUBTASK 29-21-41-020-001

(6) Remove the filter bowl [11] and the filter element filter [10] from the filter head.

SUBTASK 29-21-41-020-002

(7) Remove the filter [10] from the filter bowl [11].

SUBTASK 29-21-41-210-002

(8) Look for metal contamination on the filter [10] and in the filter bowl [11].

SUBTASK 29-21-41-900-001

(9) If you find metal contamination, replace the standby EMDP.

- (a) Flush lines from pump to case drain. These are the tasks: Standby Hydraulic System Electric Motor-Driven Pump (EMDP) Removal, TASK 29-21-21-000-801, Standby Hydraulic System Electric Motor-Driven Pump (EMDP) Installation, TASK 29-21-21-400-801

SUBTASK 29-21-41-020-003

(10) Discard the filter [10].

SUBTASK 29-21-41-020-011

(11) Remove packings [7], [9] and backup rings [8].

- (a) Discard packings [7], [9]

SUBTASK 29-21-41-140-001

(12) Clean the filter bowl [11].

SUBTASK 29-21-41-020-010

(13) Discard packing [7] and packing [9].

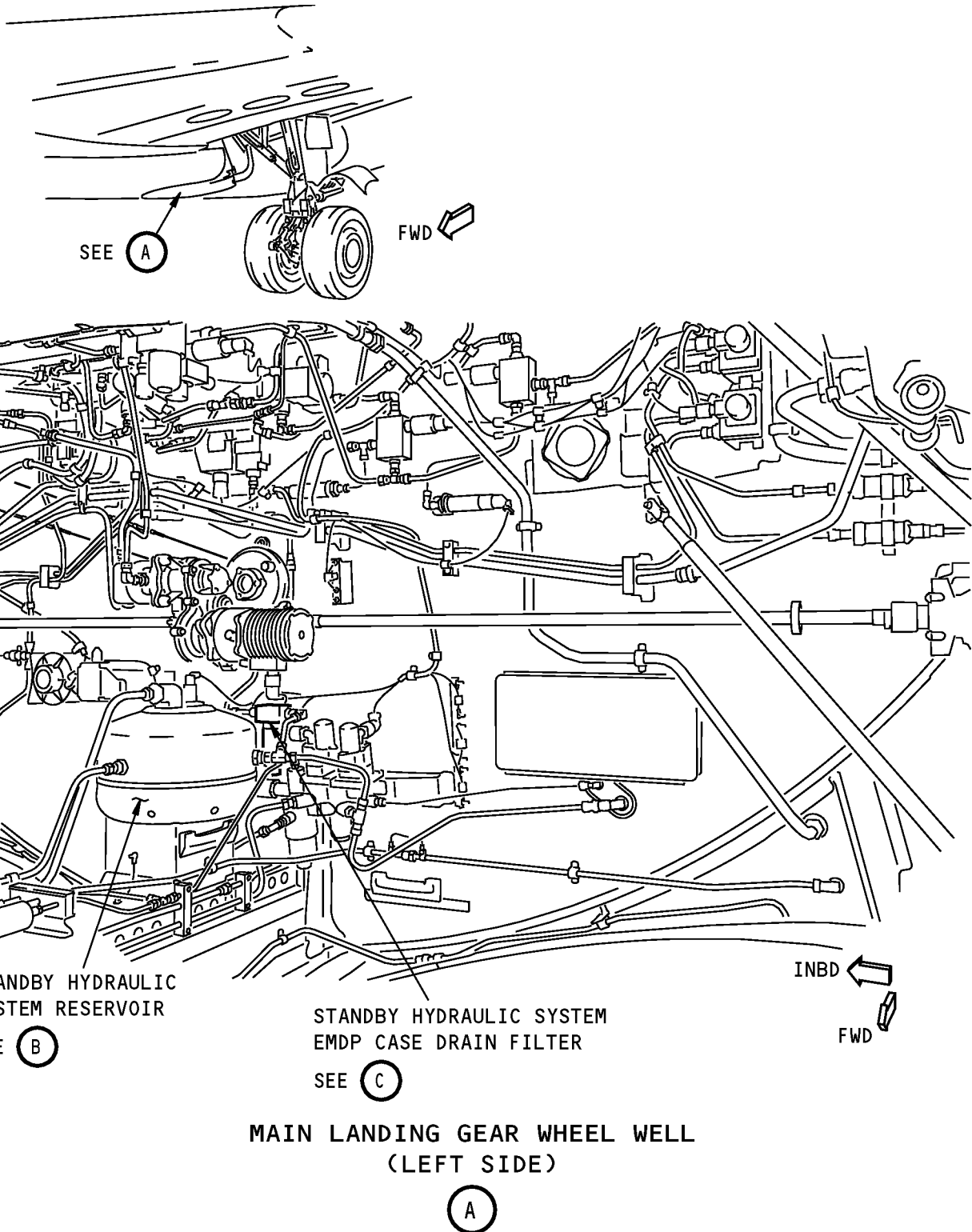
————— **END OF TASK** —————

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**Standby Hydraulic System EMDP Case Drain Filter Installation
Figure 401 (Sheet 1 of 3)/29-21-41-990-801**

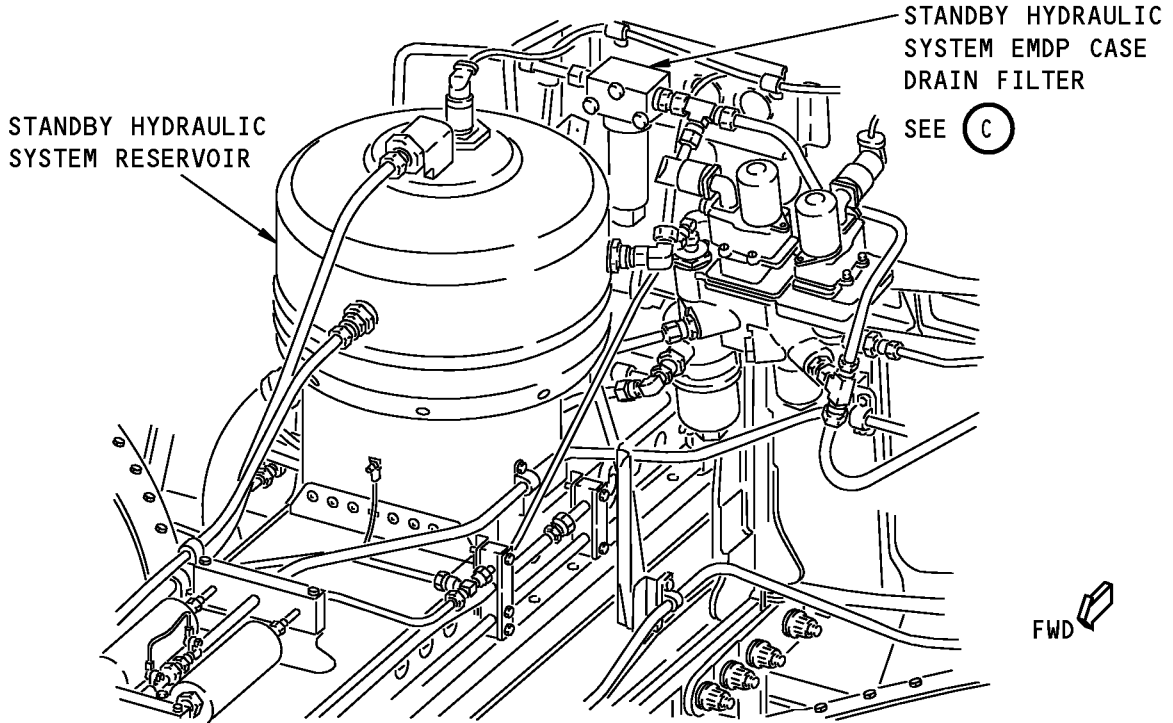
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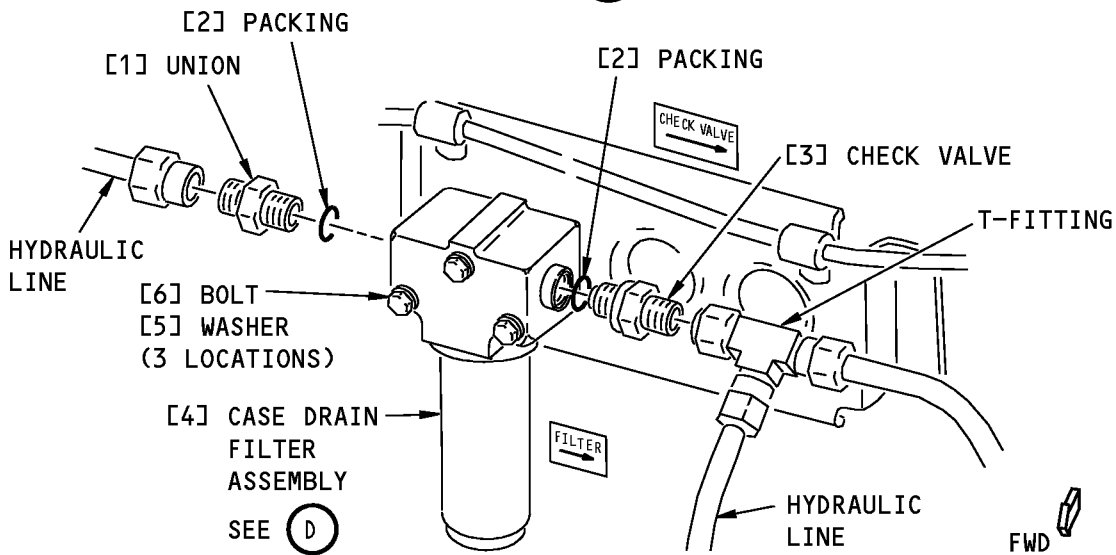
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AIRCRAFT MAINTENANCE MANUAL



STANDBY HYDRAULIC SYSTEM RESERVOIR

(B)



STANDBY HYDRAULIC SYSTEM EMDP CASE DRAIN FILTER

(C)

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Standby Hydraulic System EMDP Case Drain Filter Installation
Figure 401 (Sheet 2 of 3)/29-21-41-990-801

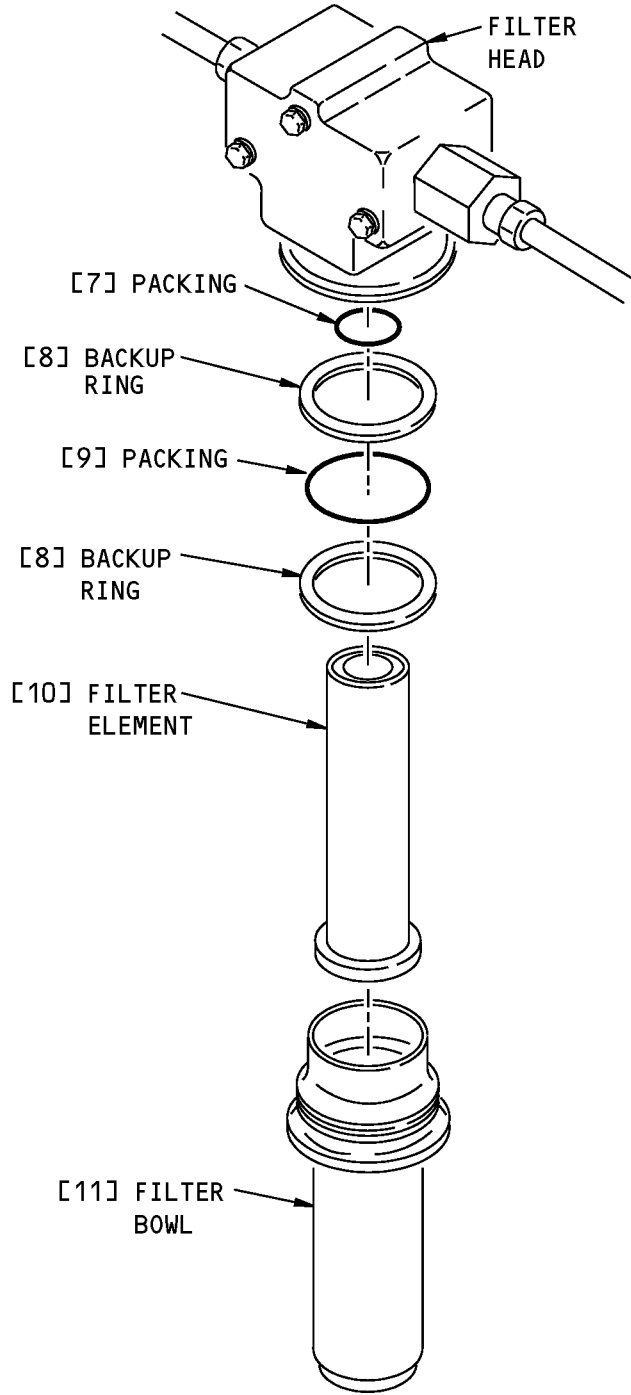
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CASE DRAIN FILTER ASSEMBLY



**Standby Hydraulic System EMDP Case Drain Filter Installation
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TASK 29-21-41-400-801

3. Standby EMDP Case Drain Filter Element Installation

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-21-00-000-801	Standby Hydraulic System Pressurization (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Packing	29-11-52-01-050	HAP ALL
9	Packing	29-11-52-01-055	HAP ALL
10	Filter	29-11-52-01-045	HAP ALL

E. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

F. Procedure

SUBTASK 29-21-41-640-001

(1) Lubricate the backup rings [8], and the new packing [9] with fluid, D00153 or MCS 352B fluid, D00054.

SUBTASK 29-21-41-420-001

(2) Install the backup rings [8], and the new packing [9] in the filter head.

SUBTASK 29-21-41-640-002

(3) Lubricate the new packing [7] with fluid, D00153 or MCS 352B fluid, D00054.

SUBTASK 29-21-41-640-003

(4) Install the new packing [7] in the filter [10].

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SUBTASK 29-21-41-020-004

(5) Put the filter [10] in the filter bowl [11].

SUBTASK 29-21-41-640-004

(6) Lubricate the threads of the filter bowl [11] with MCS 352B fluid, D00054 or fluid, D00153.

SUBTASK 29-21-41-980-001

(7) Put the filter bowl [11] and the filter [10] in their positions under the filter module.

(a) Raise the filter [10] from the filter bowl [11] and press it onto the filter head.

SUBTASK 29-21-41-020-005

(8) Install the filter bowl [11] on the filter head and tighten it to 96-120 pound-inches (10.8-13.5 newton-meters).

SUBTASK 29-21-41-420-008

(9) Install a lockwire on the filter bowl [11].

SUBTASK 29-21-41-100-001

(10) To clean the area near the case drain filter of hydraulic fluid spilled during filter change, refer to this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

G. Standby Hydraulic System EMDP Case Drain Filter Element Installation Test

SUBTASK 29-21-41-860-003

(1) Pressurize the system B reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-21-41-860-004

(2) Remove the safety tags and close these circuit breakers:

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

SUBTASK 29-21-41-860-005

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-41-860-006

(4) Do this task: Standby Hydraulic System Pressurization, TASK 29-21-00-000-801.

SUBTASK 29-21-41-210-003

(5) Make sure the standby EMDP operates.

SUBTASK 29-21-41-790-001

(6) Make sure the case drain filter [4] does not have leaks.

SUBTASK 29-21-41-610-001

(7) Fill the system B reservoir, if it is necessary.

(a) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-21-41-860-007

(8) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— **END OF TASK** —————

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TASK 29-21-41-000-802

4. Standby EMDP Case Drain Filter Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

C. Prepare for the Removal

SUBTASK 29-21-41-860-008

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

Standby Power Control Unit, M01720

Row	Col	Number	Name
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

SUBTASK 29-21-41-860-009

- (2) Remove pressure from standby hydraulic reservoir, to do it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

NOTE: The standby reservoir is pressurized through the system B reservoir.

D. Procedure

SUBTASK 29-21-41-020-006

- (1) Disconnect the hydraulic lines from the case drain filter [4].
 - (a) Put caps on the hydraulic lines to prevent contamination or damage.

SUBTASK 29-21-41-020-007

- (2) Remove the bolts [6] and the washers [5] that attach the case drain filter [4] to the airplane.

SUBTASK 29-21-41-020-008

- (3) Remove the case drain filter [4] from the airplane.

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SUBTASK 29-21-41-020-012

- (4) Remove union [1], check valve [3], packings [2].
 - (a) Disgard packings [2].

————— **END OF TASK** —————

TASK 29-21-41-400-802

5. EMDP Case Drain Filter Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange~ able & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	29-11-52-01-023	HAP ALL
4	Filter	29-11-41-02-035	HAP ALL
		29-11-52-01-005	HAP ALL

D. Procedure

SUBTASK 29-21-41-640-005

- (1) Lubricate the new packings [2] and the threaded fittings of the union [1] and the check valve [3] with fluid, D00153 or fluid, D00153.

SUBTASK 29-21-41-420-003

- (2) Install the new packing [2] and the union [1] in the inlet port of the case drain filter [4].

SUBTASK 29-21-41-420-004

- (3) Install the new packing [2] and the check valve [3] in the outlet port of the case drain filter [4].

SUBTASK 29-21-41-420-005

- (4) Put the case drain filter [4] in its position.

NOTE: The arrow on the filter [4] must point in the same direction as the arrow on the airplane.

SUBTASK 29-21-41-420-006

- (5) Install the bolts [6] and the washers [5] to attach the case drain filter [4] to the airplane.

SUBTASK 29-21-41-420-009

- (6) Install hydraulic lines to case drain filter [4].

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SUBTASK 29-21-41-420-007

(7) Make sure the filter bowl [11] has lockwire installed.

SUBTASK 29-21-41-610-002

(8) Fill the applicable hydraulic reservoir, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-21-41-100-002

(9) To clean the area near the case drain filter of hydraulic fluid spilled during filter assembly change, refer to this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

E. Leak Check for the Case Drain Filter Assembly

SUBTASK 29-21-41-860-010

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-41-860-011

WARNING: BE CAREFUL WHEN YOU OPEN/CLOSE CIRCUIT BREAKERS INSIDE THE P91 AND P92 PANELS AND POWER IS SUPPLIED TO THE PANELS. THERE IS A POTENTIAL FOR ELECTRIC SHOCK HAZARD. POSSIBLE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

SUBTASK 29-21-41-790-002

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACES BEFORE YOU SUPPLY HYDRAULIC POWER. THE AILERONS, RUDDER, ELEVATORS, FLAPS, SLATS, SPOILERS, LANDING GEAR, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) To look for leakage at the case drain filter [4] for the standby EMDP, do these steps:

(a) Put the FLT CONTROL A or the FLT CONTROL B switch in the STDBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

(b) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

(c) Make sure the case drain filter does not have a leak.

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(d) Put the FLT CONTROL switch in the ON position.

SUBTASK 29-21-41-860-012

(4) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

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STANDBY HYDRAULIC SYSTEM PRESSURE MODULE - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure contains these tasks:
 - (1) The removal of the standby hydraulic system pressure module.
 - (2) The installation of the standby hydraulic system pressure module.
 - (3) The removal of the standby hydraulic system pressure filter.
 - (4) The installation of the standby hydraulic system pressure filter.
 - (5) The removal of the pressure relief valve
 - (6) The installation of the pressure relief valve.
- C. In this procedure the standby hydraulic system pressure module is referred to as the "pressure module", the standby hydraulic system pressure filter is referred to as the "pressure filter" and the pressure relief valve is referred to as the "relief valve".

TASK 29-21-51-000-801

2. Standby Hydraulic System Pressure Module Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1154	Container - 5 Gallon (19 Liters)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Prepare for Removal

SUBTASK 29-21-51-860-001

- (1) Remove the power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-21-51-860-002

- (2) Release pressure from system B and standby hydraulic reservoirs, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-21-51-860-003

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	11	C00362	FLIGHT CONTROL SHUTOFF VALVES STBY RUD

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Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

E. Procedure

SUBTASK 29-21-51-020-001

(1) Remove the pressure module [1]:

- (a) Disconnect the electrical connector, [4] (from the leading edge standby shutoff valve), electrical connector [16] (from the low pressure switch) and electrical connector [5] (from the standby rudder shutoff valve).
- (b) Install caps on electrical connectors.
- (c) Disconnect the hydraulic lines [8], [13], [14], [15] from the ports of the pressure module [1].
- (d) Disconnect T-fitting from check valve [9].
- (e) Remove reducer [7], unions [12], check valve [9], and packings [6].
 - 1) Disgard packings [6].
- (f) Drain the hydraulic fluid into a 5 gallon (19 liter) container, STD-1154.
- (g) Install plugs in hydraulic line [8], hydraulic line [13], hydraulic line [14] and hydraulic line [15] and install a plug in the T fitting.
- (h) If it is necessary, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.
- (i) Install caps on the open fittings of the pressure module [1].
- (j) Remove the mounting bolts [2] and the washers [3].
- (k) Remove the pressure module [1].

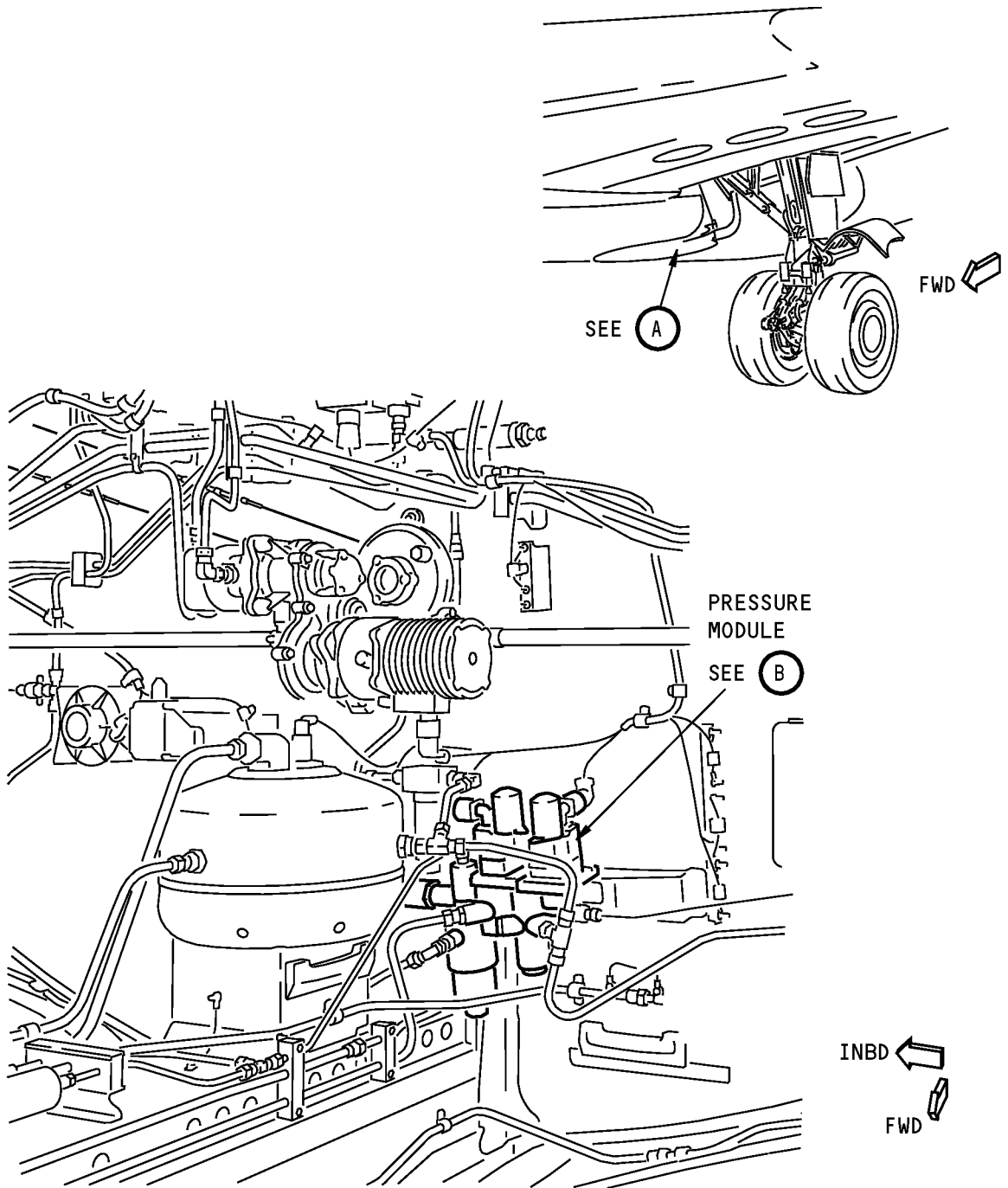
————— **END OF TASK** —————

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**MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)**

A

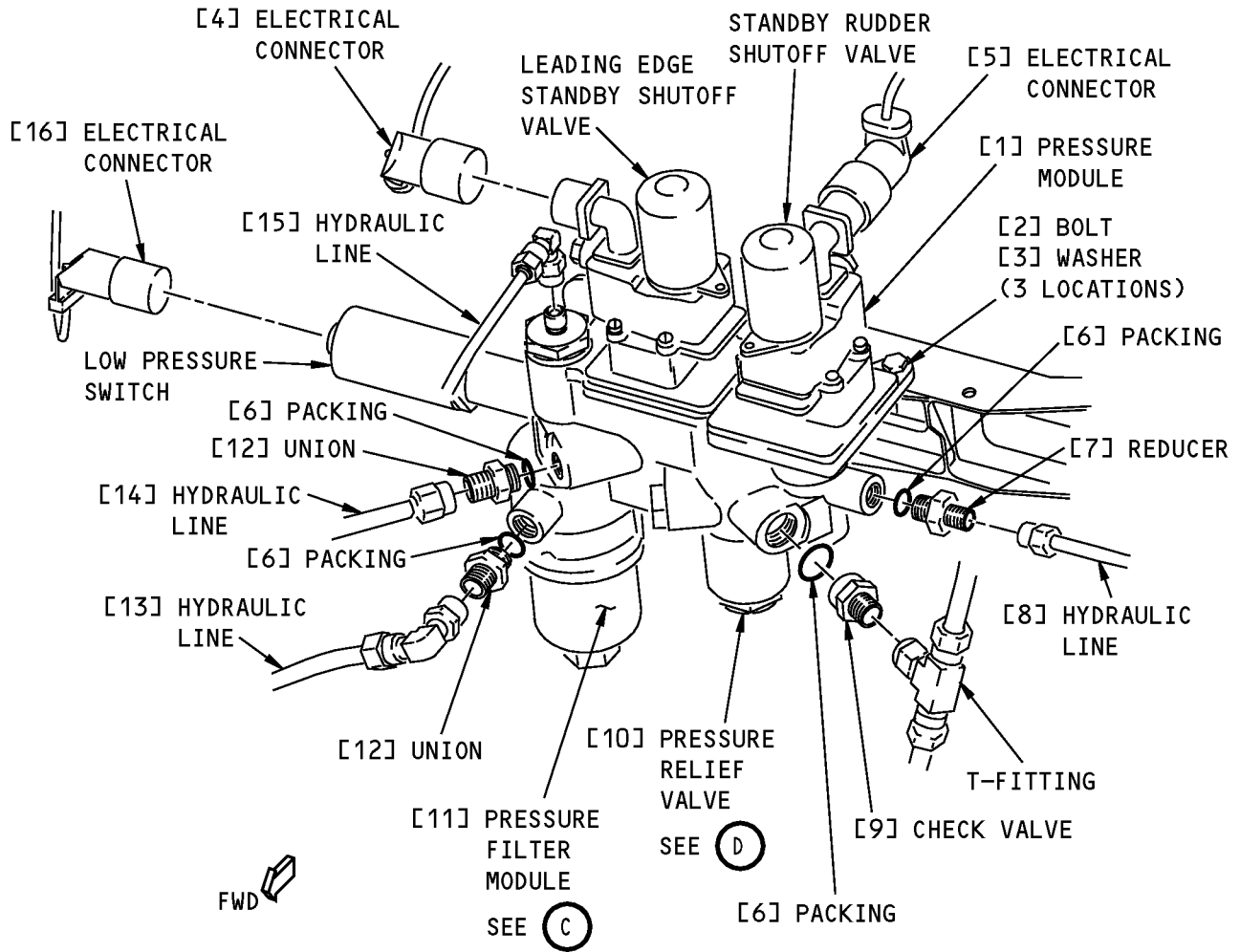
**Standby Hydraulic System Pressure Module Installation
Figure 401 (Sheet 1 of 3)/29-21-51-990-801**

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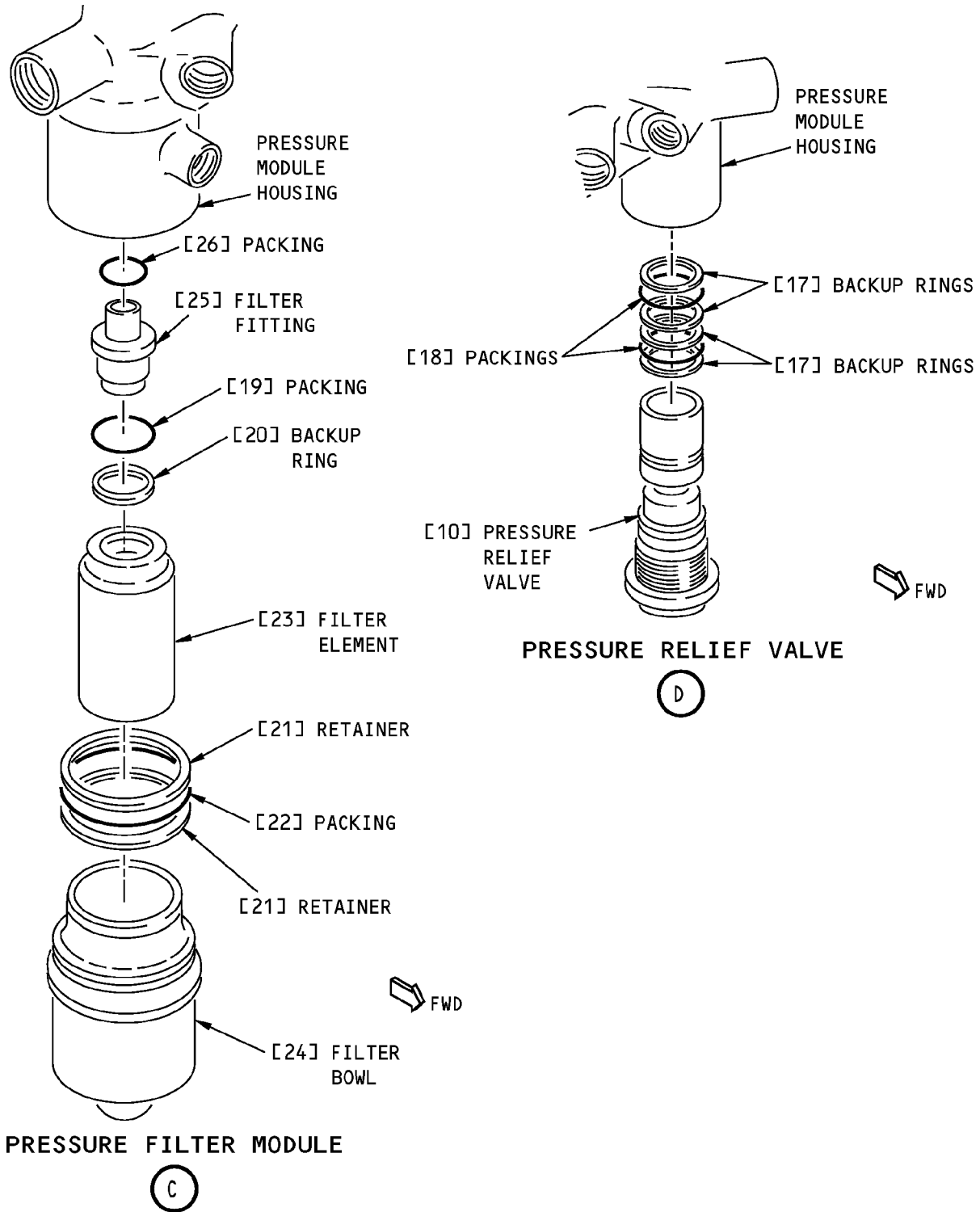
**PRESSURE MODULE FOR THE STANDBY
HYDRAULIC SYSTEM**

(B)

**Standby Hydraulic System Pressure Module Installation
Figure 401 (Sheet 2 of 3)/29-21-51-990-801**

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Standby Hydraulic System Pressure Module Installation
Figure 401 (Sheet 3 of 3)/29-21-51-990-801

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TASK 29-21-51-400-801

3. Standby Hydraulic System Module Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pressure module	29-21-51-01-030	HAP ALL
6	Packing	29-21-51-01-025	HAP ALL

D. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

E. Procedure

SUBTASK 29-21-51-210-001

CAUTION: MAKE SURE THAT UNWANTED MATERIAL DOES NOT GO INTO THE MODULE HOUSING OR THE HYDRAULIC LINES DURING THE INSTALLATION. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Make sure unwanted material does not go into the pressure module [1] or the hydraulic lines [8], [13], [14], [15], or the T fitting.

SUBTASK 29-21-51-420-001

- (2) If the packings, unions, reducers and check valve are not already installed on the pressure module, then do these step:
 - (a) Apply fluid, D00153 or MCS 352B fluid, D00054 to packings [6], to the threads of the unions [12], reducer [7], and check valve [9].
 - (b) Install the packings [6], unions [12], reducer [7] and check valve [9] into the pressure module [1].

SUBTASK 29-21-51-420-002

- (3) Install the pressure module [1].
 - (a) Put the pressure module [1] in its mounting position.

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- (b) Install the bolts [2] and the washers [3].
- (c) Remove the plugs from the hydraulic lines [8], [13], [14], [15] and and from the T fitting.
- (d) Remove any caps that may have been installed on the pressure module fittings during the removal procedure.
- (e) Connect the hydraulic lines [8], [13], [14], [15] to the ports of the pressure module [1], and connect the check valve [9] to the T fitting.
- (f) Remove caps from electrical connectors.
- (g) Connect the electrical connectors [4], [5] and [16].

SUBTASK 29-21-51-710-001

(4) Do the operational test of the Standby Hydraulic System Module:

(a) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	11	C00362	FLIGHT CONTROL SHUTOFF VALVES STBY RUD

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

(b) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER AND THE LEADING EDGE FLAPS AND SLATS BEFORE PRESSURIZATION. THE RUDDER AND THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (c) To pressurize the standby hydraulic system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.
- (d) Put the FLT CONTROL A switch, on the P5 panel, to STDBY RUD.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

(e) Put the ALTERNATE FLAPS arm switch, on the P5 panel, to ARM.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER, THE LEADING EDGE FLAPS AND THE SLATS BEFORE OPERATION. THE RUDDER, THE LEADING EDGE FLAPS AND THE SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (f) Operate the leading edge flaps and slats and the rudder:
 - 1) Operate the rudder to full travel slowly a minimum of three times.
 - 2) Put the FLT CONTROL switch A, on the P5 panel, to ON.

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WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE TRAILING EDGE (TE) FLAPS AND THE LEADING EDGE (LE) FLAPS AND SLATS BEFORE YOU OPERATE THE ALTERNATE FLAPS CONTROL SWITCH. THE TE FLAPS CAN MOVE QUICKLY. THE LE FLAPS AND SLATS CAN MOVE MORE QUICKLY THAN THE TE FLAPS. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- 3) Put the ALTERNATE FLAPS control switch to DOWN.
- 4) Put the ALTERNATE FLAPS control switch to OFF when the trailing edge flaps are extended to 10 degrees.
- 5) Make sure all leading edge flaps and slats are extended.
- 6) Put the ALTERNATE FLAPS control switch to UP.
- 7) Put the ALTERNATE FLAPS control switch to OFF when the trailing edge flaps are fully retracted.
- 8) Put the ALTERNATE FLAPS arm switch to OFF.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER, THE LEADING EDGE FLAPS AND THE SLATS BEFORE PRESSURIZATION. THE RUDDER, THE LEADING EDGE FLAPS AND THE SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- 9) To pressurize the System B hydraulic system, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.
- 10) Make sure the leading edge flaps and slats fully retracts.
- (g) Examine the pressure module [1] and all hydraulic line connections to the pressure module for leaks.

SUBTASK 29-21-51-860-004

- (5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 29-21-51-860-005

- (6) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

————— END OF TASK —————

TASK 29-21-51-000-802

4. Standby Hydraulic System Pressure Module Filter Removal

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) The standby pressure module is installed on the center of the aft wheel well bulkhead above the keel beam.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

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C. Consumable Materials

Reference	Description	Specification
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~ C32

D. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

E. Prepare for Removal.

SUBTASK 29-21-51-860-006

- (1) Remove the power from hydraulic systems A and B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-21-51-860-007

- (2) Release pressure from system B and standby hydraulic reservoirs, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-21-51-860-008

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	11	C00362	FLIGHT CONTROL SHUTOFF VALVES STBY RUD

Standby Power Control Unit, M01720

Row	Col	Number	Name
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

F. Procedure

SUBTASK 29-21-51-480-001

- (1) Put a container below the filter bowl [24] to catch the hydraulic fluid.

SUBTASK 29-21-51-020-002

- (2) Remove the filter element filter [23]:
 - (a) Remove the lockwire, G01048.
 - (b) Remove the filter bowl [24].
 - (c) Remove the filter [23].
 - (d) Discard the filter [23].
 - (e) Discard packing [19] and packing [22].

END OF TASK

TASK 29-21-51-400-802

5. Standby Hydraulic System Pressure Module Filter Installation

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.

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B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-21-00-000-801	Standby Hydraulic System Pressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~ C32

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
19	Packing	29-21-51-01-115	HAP ALL
22	Packing	29-21-51-01-130	HAP ALL
23	Filter	29-21-51-01-110	HAP ALL

E. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

F. Procedure

SUBTASK 29-21-51-420-003

- (1) Install the filter module element.
 - (a) Lightly apply MCS 352B fluid, D00054 or fluid, D00153 to the threads of the filter bowl [24] and the new packing [19] and new packing [22].
 - (b) Install packing [19] and the backup ring [20] in the groove on top of the filter [23].
 - (c) Install the retainer [21] and the packing [22] in the groove in the module housing.
 - (d) Fill the filter bowl [24] approximately half full with fluid, D00153.
 - (e) Put the filter [23] in the pressure module housing.
 - (f) Install the filter bowl [24] into the pressure module housing.
 - (g) Tighten the filter bowl [24] to 350-375 pound-inches (40-42 newton-meters).
 - (h) Install the lockwire, G01048.

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G. Standby Hydraulic System Pressure Module Filter Installation Test

SUBTASK 29-21-51-860-009

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	11	C00362	FLIGHT CONTROL SHUTOFF VALVES STBY RUD

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

SUBTASK 29-21-51-860-010

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-51-860-011

- (3) To pressurize the standby system, do this task: Standby Hydraulic System Pressurization, TASK 29-21-00-000-801.

SUBTASK 29-21-51-210-002

- (4) Examine the pressure filter module [11] for leaks.

SUBTASK 29-21-51-710-002

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER AND THE LEADING EDGE FLAPS AND SLATS BEFORE PRESSURIZATION. THE RUDDER AND THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) Put the FLT CONTROL A switch to STDBY RUD.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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SUBTASK 29-21-51-860-025

- (6) Slowly operate the rudder to full travel.

SUBTASK 29-21-51-860-026

- (7) Put the FLT CONTROL switch A to ON.

SUBTASK 29-21-51-860-027

- (8) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-21-51-860-013

- (9) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 29-21-51-860-014

- (10) Remove pressure from the standby system, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

————— **END OF TASK** —————

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TASK 29-21-51-000-803

6. Standby Hydraulic System Pressure Module Relief Valve Removal

(Figure 401)

A. References

Reference	Title
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

B. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

C. Prepare for the Removal

SUBTASK 29-21-51-860-015

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	11	C00362	FLIGHT CONTROL SHUTOFF VALVES STBY RUD

Standby Power Control Unit, M01720

Row	Col	Number	Name
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

SUBTASK 29-21-51-860-016

- (2) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-21-51-860-017

- (3) Release pressure from the system B and the standby hydraulic reservoirs, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

D. Procedure

SUBTASK 29-21-51-020-003

- (1) Remove the relief valve [10] from the pressure module [1].
 (a) Install a plug in the open port of pressure module [1].

END OF TASK

TASK 29-21-51-400-803

7. Standby Hydraulic System Pressure Module Relief Valve Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)

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B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
18	Packing	29-11-61-01-115	HAP 001-013, 015-026, 028-053, 101, 104-999

D. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

E. Procedure

SUBTASK 29-21-51-420-004

- (1) If packing packings [18] and backup rings [17] are not already installed on the relief valve, do these steps:
 - (a) Apply MCS 352B fluid, D00054 or fluid, D00153 to the packings [18] and the threads of the relief valve [10].
 - (b) Install the packings [18] with the backup rings [17] in the groove of the relief valve [10].

SUBTASK 29-21-51-020-004

- (2) Remove the plug from the relief valve port of the pressure module if it was installed during the relief valve removal procedure.

SUBTASK 29-21-51-420-005

- (3) Install the relief valve [10] into the pressure module housing.
 - (a) Tighten the relief valve [10] to 50-200 pound-inches.

F. Standby Hydraulic System Pressure Module Relief Valve Installation Test

SUBTASK 29-21-51-860-018

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-21-51-860-019

- (2) Pressurize the system B and the standby hydraulic reservoirs, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-21-51-860-020

- (3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
C	11	C00362	FLIGHT CONTROL SHUTOFF VALVES STBY RUD

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Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL
B	2	C01411	SPCU STANDBY

SUBTASK 29-21-51-860-021

(4) Do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-21-51-860-022

(5) Put one of these switches on the P5 panel to the specified position:

(a) The FLT CONTROL A switch to STDBY RUD

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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(b) The FLT CONTROL B switch to STDBY RUD

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- 1) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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(c) The ALTERNATE FLAPS arm switch to ARM

SUBTASK 29-21-51-790-001

(6) Examine the relief valve [10] for leaks.

SUBTASK 29-21-51-860-023

(7) Put the FLIGHT CONTROL A or B switch to ON or the ALTERNATE FLAPS arm switch to OFF.

SUBTASK 29-21-51-860-024

(8) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— **END OF TASK** —————

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HYDRAULIC POWER TRANSFER UNIT (PTU) SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) An operational test of the power transfer unit (PTU)
 - (2) A system test of the PTU.

TASK 29-22-00-710-801

2. Power Transfer Unit Operational Test

- A. General
 - (1) This procedure is a scheduled maintenance task.
- B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-22-11-000-801	Power Transfer Unit (PTU) Removal (P/B 401)
29-22-11-400-801	Power Transfer Unit Installation (P/B 401)
29-22-21-020-801	PTU Pressure Filter Element Removal (P/B 401)
29-22-21-400-802	PTU Pressure Filter Element Installation (P/B 401)
32-09-00-840-802	Return the Airplane Systems Back to Their Normal On Ground Condition (P/B 201)
32-09-00-860-801	Put the Airplane in the Air Mode (P/B 201)
32-09-00-860-802	Return the Airplane to the Ground Mode (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Test

SUBTASK 29-22-00-860-001

- (1) Pressurize the hydraulic reservoirs. To pressurize them, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-22-00-860-002

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-22-00-860-003

- (3) Make sure the two Stall Warning Vanes (AOA) are at the zero position.

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SUBTASK 29-22-00-860-004

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND LANDING GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THE AILERONS, ELEVATORS, RUDDER, FLAPS, SLATS, SPOILERS, STABILIZER, AND THE LANDING GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEM. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN THE HYDRAULIC POWER IS SUPPLIED.

- (4) Supply hydraulic power to systems A and B. To supply them, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-22-00-860-005

- (5) Move the flap control lever to the 5 unit position.

SUBTASK 29-22-00-860-006

- (6) Remove the hydraulic power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

E. PTU Operational Test

SUBTASK 29-22-00-860-007

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (1) Put the ALTERNATE FLAPS arm switch on the P5 panel in the ARM position.
 - (a) Make sure the standby hydraulic pump operates.

SUBTASK 29-22-00-710-001

- (2) Momentarily move the ALTERNATE FLAPS control switch on the P5 panel to the DOWN position.
 - (a) Make sure the leading edge slats move to the fully extended position.

NOTE: The LE FLAPS TRANSIT light will stay on.

NOTE: The LE devices can retract a small amount when you move them to the fully extended position.

SUBTASK 29-22-00-860-008

- (3) Put the ALTERNATE FLAPS arm switch in the OFF position.
 - (a) Make sure the standby hydraulic pump stops.

SUBTASK 29-22-00-210-001

CAUTION: MAKE SURE THE SYSTEM B HYDRAULIC RESERVOIR IS PRESSURIZED. THE CHECK VALVE FOR THE PTU CAN BE DAMAGED IF YOU OPERATE THE PTU WITHOUT PRESSURE IN THE HYDRAULIC RESERVOIR.

- (4) Look at the pressure gages for the system B hydraulic reservoir (above the electric motor driven pump in the main wheel well).
 - (a) Make sure the system B hydraulic reservoir has a pressure of 45-65 psig.

SUBTASK 29-22-00-860-009

WARNING: MAKE SURE THAT CHOCKS ARE INSTALLED AT THE WHEELS. PUTTING THE AIRPLANE IN THE AIR MODE WILL CAUSE THE BRAKES TO RELEASE. THIS MAY CAUSE THE AIRPLANE TO MOVE SUDDENLY. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF CHOCKS ARE NOT INSTALLED ON THE WHEELS.

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(WARNING PRECEDES)

WARNING: IF THE ENGINE-DRIVEN PUMP (EDP) IS USED TO PRESSURIZED THE HYDRAULIC SYSTEM, DO NOT LIFT THE AIRPLANE ON JACKS TO PUT THE AIRPLANE IN THE AIR MODE. THE AIRPLANE MAY MOVE SUDDENLY IF THE ENGINE IS RUN WITH THE AIRPLANE ON JACKS. THIS MAY CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (5) Put the airplane in the air mode. To do it, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801.

NOTE: When the airplane is put in the air mode with the engines running, the engines will advance to flight idle speed.

SUBTASK 29-22-00-210-002

- (6) Make sure the PTU starts.

SUBTASK 29-22-00-210-003

- (7) Make sure the leading edge slats retract to the intermediate position.

SUBTASK 29-22-00-860-010

- (8) Put the airplane in the ground mode. To do it, do this task: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802.

SUBTASK 29-22-00-710-002

- (9) Do the steps that follow to check the PTU check valve:
- Remove pressure from the hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
 - Put the airplane in the air mode. To do it, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801.
 - Supply hydraulic power to system B with the EMDP. To supply it, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.
 - Move the flap control lever to the 1 unit position.
 - Make sure the PTU control valve is open.
 - Feel and listen to the PTU to make sure it does not operate.
 - Make sure the hydraulic pressure in system A does not increase.
 - If the PTU operates or the pressure in hydraulic system A increases, then do these steps:
 - Replace the PTU check valve.
 - Replace the PTU. To replace it, These are the tasks: Power Transfer Unit (PTU) Removal, TASK 29-22-11-000-801, Power Transfer Unit Installation, TASK 29-22-11-400-801
 - Replace the PTU pressure filter element. To replace it, These are the tasks: PTU Pressure Filter Element Removal, TASK 29-22-21-020-801, PTU Pressure Filter Element Installation, TASK 29-22-21-400-802.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-22-00-860-019

- (1) Move the flap control lever on the control stand to the UP position.

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SUBTASK 29-22-00-860-020

- (2) Remove the hydraulic power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-00-860-021

- (3) Return the airplane to its usual on-ground condition. To do it, do this task: Return the Airplane Systems Back to Their Normal On Ground Condition, TASK 32-09-00-840-802.

————— END OF TASK —————

TASK 29-22-00-730-801

3. Power Transfer Unit (PTU) System Test

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-22-11-000-801	Power Transfer Unit (PTU) Removal (P/B 401)
29-22-11-400-801	Power Transfer Unit Installation (P/B 401)
29-22-21-020-801	PTU Pressure Filter Element Removal (P/B 401)
29-22-21-400-802	PTU Pressure Filter Element Installation (P/B 401)
32-09-00-860-801	Put the Airplane in the Air Mode (P/B 201)
32-09-00-860-802	Return the Airplane to the Ground Mode (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1139	Timer - Stop Watch, Accurate to 1 Second

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Prepare for the Test

SUBTASK 29-22-00-610-001

- (1) Fill the hydraulic reservoirs if it is necessary. To fill them, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-22-00-860-022

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

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SUBTASK 29-22-00-860-023

(3) Make sure the two Stall Warning Vanes (AOA) are at the zero position.

SUBTASK 29-22-00-860-024

WARNING: MAKE SURE THAT THE CHOCKS ARE INSTALLED AT THE WHEELS. OPENING THE FOLLOWING CIRCUIT BREAKERS MAY CAUSE THE BRAKES TO RELEASE. THIS MAY CAUSE THE AIRPLANE TO MOVE SUDDENLY. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT MAY OCCUR IF CHOCKS ARE NOT INSTALLED AT THE WHEELS.

(4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	16	C01356	LANDING GEAR AIR/GND SYS 1

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-22-00-860-025

(5) Retract the flaps if they are not fully retracted:

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (a) Pressurize hydraulic power to the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801
- (b) Move the flap control lever on the control stand to the UP position.
- (c) Make sure the flaps are in the fully retracted position.
- (d) Remove the hydraulic power from the hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-00-730-001

(6) Make sure the position indicator on the PTU control valve is in the closed position.

NOTE: The position indicator will point approximately 45° forward of inboard when the valve is open. The position indicator will point approximately 45° aft of inboard when the valve is closed.

F. PTU System Test

SUBTASK 29-22-00-730-002

(1) Move the ALTERNATE FLAPS arm switch on the P5 panel to the ARM position.

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SUBTASK 29-22-00-860-026

WARNING: MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF THE SLATS AND FLAPS DURING THIS PROCEDURE. THE SLATS AND FLAPS WILL MOVE DURING THIS PROCEDURE.

- (2) Move the ALTERNATE FLAPS control switch to the DOWN position to extend the trailing edge flaps to the 1 unit position.
 - (a) Move the ALTERNATE FLAPS arm switch to the OFF position.
 - (b) Make sure the PTU control valve moves to the open position.

HAP 001-013, 015-026, 028-036, 101-999

SUBTASK 29-22-00-730-003

- (3) Move the ALTERNATE FLAPS arm switch to the ARM position.
 - (a) Move the ALTERNATE FLAPS control switch to the DOWN position to extend the trailing edge flaps to the 15 unit position.
 - (b) Make sure the PTU control valve moves to the closed position.

SUBTASK 29-22-00-860-027

- (4) Move the ALTERNATE FLAPS control switch to the UP position to retract the trailing edge flaps to the 1 unit position.

SUBTASK 29-22-00-860-028

- (5) Move the ALTERNATE FLAPS arm switch to the OFF position.
 - (a) Make sure the PTU control valve moves to the open position.

HAP ALL

SUBTASK 29-22-00-730-004

- (6) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	16	C01356	LANDING GEAR AIR/GND SYS 1

- (a) Make sure the PTU control valve moves to the closed position.

SUBTASK 29-22-00-860-029

- (7) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

- (a) Make sure the PTU control valve stays in the closed position.

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SUBTASK 29-22-00-860-030

(8) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C01355	LANDING GEAR AIR/GND SYS 2

(a) Make sure the PTU control valve moves to the open position.

SUBTASK 29-22-00-860-031

(9) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C01355	LANDING GEAR AIR/GND SYS 2

(a) Make sure the PTU control valve moves to the closed position.

SUBTASK 29-22-00-860-032

CAUTION: PRESSURIZE THE SYSTEM B HYDRAULIC RESERVOIR. THE CHECK VALVE FOR THE PTU CAN BE DAMAGED IF YOU OPERATE THE PTU WITHOUT 45-65 PSIG IN THE HYDRAULIC RESERVOIR.

(10) Pressurize the hydraulic reservoirs. To pressurize them, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-22-00-860-033

WARNING: KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(11) Pressurize hydraulic power to the hydraulic system A at 3000 psig with a ground service cart or the engine driven pump (EDP). To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: The electric motor driven pump does not have the capacity to operate the PTU correctly.

(a) Make sure the PTU does not operate.

SUBTASK 29-22-00-860-045

(12) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

SUBTASK 29-22-00-730-005

WARNING: MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE FLAPS AND SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

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(WARNING PRECEDES)

(13) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	16	C01356	LANDING GEAR AIR/GND SYS 1

(a) Make sure the PTU operates (after approximately 0.5 second).

SUBTASK 29-22-00-860-047

WARNING: MAKE SURE THAT CHOCKS ARE INSTALLED AT THE WHEELS. PUTTING THE AIRPLANE IN THE AIR MODE WILL CAUSE THE BRAKES TO RELEASE. THIS MAY CAUSE THE AIRPLANE TO MOVE SUDDENLY. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF CHOCKS ARE NOT INSTALLED ON THE WHEELS.

WARNING: IF THE ENGINE-DRIVEN PUMP (EDP) IS USED TO PRESSURIZED THE HYDRAULIC SYSTEM, DO NOT LIFT THE AIRPLANE ON JACKS TO PUT THE AIRPLANE IN THE AIR MODE. THE AIRPLANE MAY MOVE SUDDENLY IF THE ENGINE IS RUN WITH THE AIRPLANE ON JACKS. THIS MAY CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(14) Put the airplane in the air mode. To do it, do this task: (Put the Airplane in the Air Mode, TASK 32-09-00-860-801).

NOTE: When the airplane is put in the air mode with the engines running, the engines will advance to flight idle speed.

SUBTASK 29-22-00-730-006

WARNING: MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE FLAPS AND SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(15) Turn the left Stall Warning (AOA) Vane counterclockwise until the leading edge slats extend.

(a) Make sure the leading edge slats extend fully, equally and smoothly.

(b) Use a stopwatch, STD-1139 to make sure the time necessary to extend the leading edge slats is not more than 4 seconds.

SUBTASK 29-22-00-730-007

WARNING: MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE FLAPS AND SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(16) Turn the left Stall Warning (AOA) Vane back to its zero position.

SUBTASK 29-22-00-860-048

(17) Put the airplane in the ground mode. To do it, do this task: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802.

SUBTASK 29-22-00-860-034

(18) Move the ALTERNATE FLAPS arm switch to the ARM position.

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SUBTASK 29-22-00-860-035

- (19) Move the ALTERNATE FLAPS control switch to the UP position to fully retract the trailing edge flaps.

SUBTASK 29-22-00-860-036

- (20) Remove hydraulic power from the hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-00-860-046

- (21) Move the flap control lever to the 1 unit position.

SUBTASK 29-22-00-860-037

WARNING: MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF THE SLATS AND FLAPS DURING THIS PROCEDURE. THE SLATS AND FLAPS WILL MOVE DURING THIS PROCEDURE.

- (22) Provide hydraulic pressure to system B with the EDP. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-22-00-730-008

- (23) Move the ALTERNATE FLAPS arm switch to the OFF position.

- (a) Make sure the PTU control valve stays closed.

SUBTASK 29-22-00-860-044

- (24) Remove hydraulic power from system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 29-22-00-870-001

- (25) Move the rudder pedals (if it is necessary) until the hydraulic pressure in system A and in system B is less than 200 psig.

- (a) Make sure the PTU control valve opens.

SUBTASK 29-22-00-860-040

- (26) Pressurize hydraulic power to the hydraulic system B with the EMDP or a ground service cart. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

NOTE: You cannot use the EDP because the EDP pressure switch must indicate low pressure.

- (a) Feel and listen to the PTU to make sure it does not operate.
- (b) Make sure the hydraulic pressure in system A does not increase.
- (c) If the PTU operates or the pressure in hydraulic system A increases, then do these steps:
- 1) Replace the PTU. These are the tasks: Power Transfer Unit (PTU) Removal, TASK 29-22-11-000-801, Power Transfer Unit Installation, TASK 29-22-11-400-801
 - 2) Replace the PTU check valve.
 - 3) Replace the PTU pressure filter element. These are the tasks: PTU Pressure Filter Element Removal, TASK 29-22-21-020-801, PTU Pressure Filter Element Installation, TASK 29-22-21-400-802

G. Put the Airplane Back to Its Usual Condition

SUBTASK 29-22-00-860-041

- (1) Move the flap control lever to the UP position to retract the flaps and slats.

SUBTASK 29-22-00-860-042

- (2) Remove hydraulic power from the hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

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SUBTASK 29-22-00-860-043

(3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	16	C01356	LANDING GEAR AIR/GND SYS 1

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

————— **END OF TASK** —————

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POWER TRANSFER UNIT (PTU) - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the power transfer unit (PTU)
- (2) An installation of the PTU.

TASK 29-22-11-000-801

2. Power Transfer Unit (PTU) Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

B. Tools/Equipment

Reference	Description
STD-3901	Container - Hydraulic Fluid Resistant, 50 Gallon (190 l)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for the Removal

SUBTASK 29-22-11-860-001

- (1) Remove power from the standby hydraulic system. To remove it, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 29-22-11-860-002

- (2) Remove power from hydraulic systems A and B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-11-860-003

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-22-11-860-004

- (4) Depressurize the hydraulic reservoirs for hydraulic systems A, B and Standby. To depressurize the systems, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-22-11-650-001

- (5) Open the drain valve on the system B reservoir.

SUBTASK 29-22-11-010-001

- (6) Fully drain the system B reservoir in a 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

E. PTU Removal

SUBTASK 29-22-11-650-002

- (1) Do these steps to disconnect the hydraulic lines [1], [6], [7], [15], [17] and [21] from the PTU [10]:
- (a) Put a container below the hydraulic lines [1], [6], [7], [15], [17] and [21] to catch the hydraulic fluid.
 - (b) Disconnect the hydraulic lines [1], [6], [7], [15], [17] and [21] from the PTU [10].
 - (c) Install caps on the hydraulic lines [1], [6], [7], [15], [17] and [21].

SUBTASK 29-22-11-650-003

- (2) Remove the PTU [10]:
- (a) Remove the bolts [11] and the washers [12] that attach the PTU [10] to the airplane structure.
 - (b) Remove the PTU [10].

HAP 012, 013, 015-026, 028-054, 101-999; HAP 001-011 POST SB 737-29-1084

SUBTASK 29-22-11-020-002

- (3) Remove the check valve [24] from the union [2].

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SUBTASK 29-22-11-650-004

- (4) Remove the unions [2], [5], [8], [13], [16], [20] and port drain [22].
- (a) Discard the packings [3], [4], [9], [14], [18], [19] and [23].
 - (b) Install the plugs in the hydraulic ports.

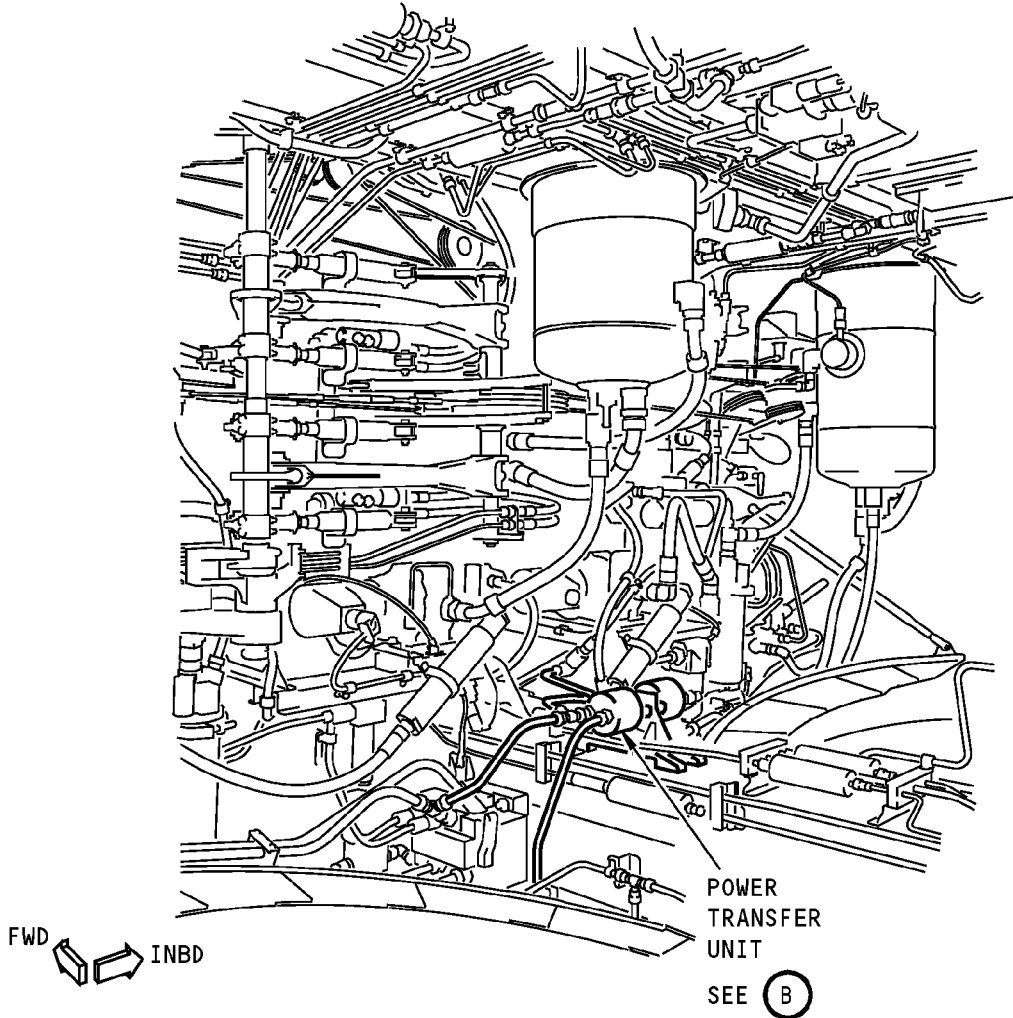
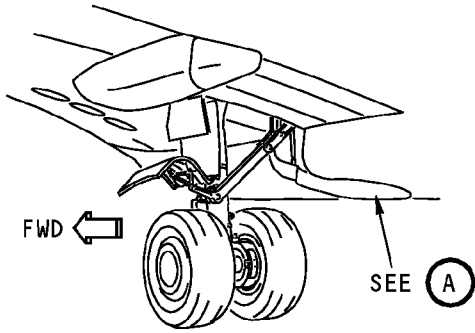
————— **END OF TASK** —————

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MAIN LANDING GEAR WHEEL WELL

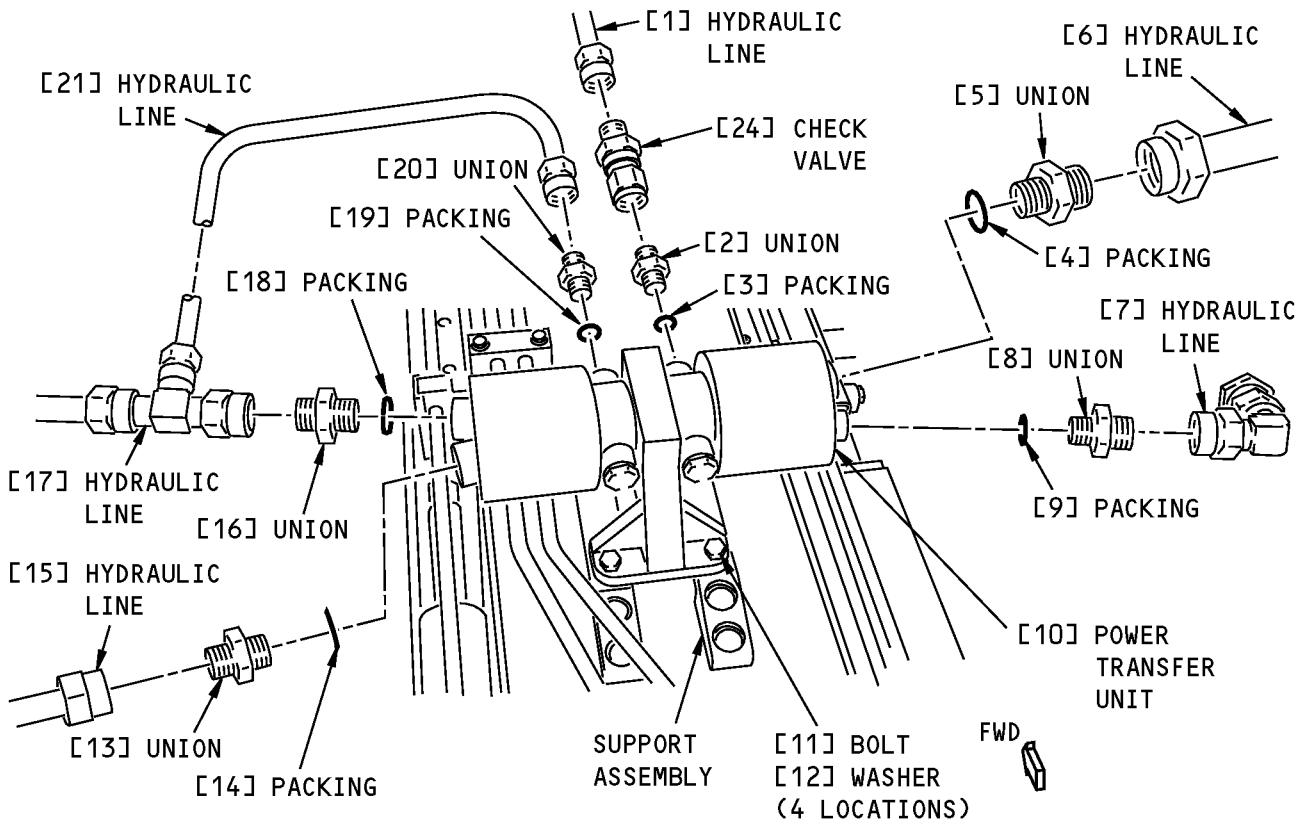
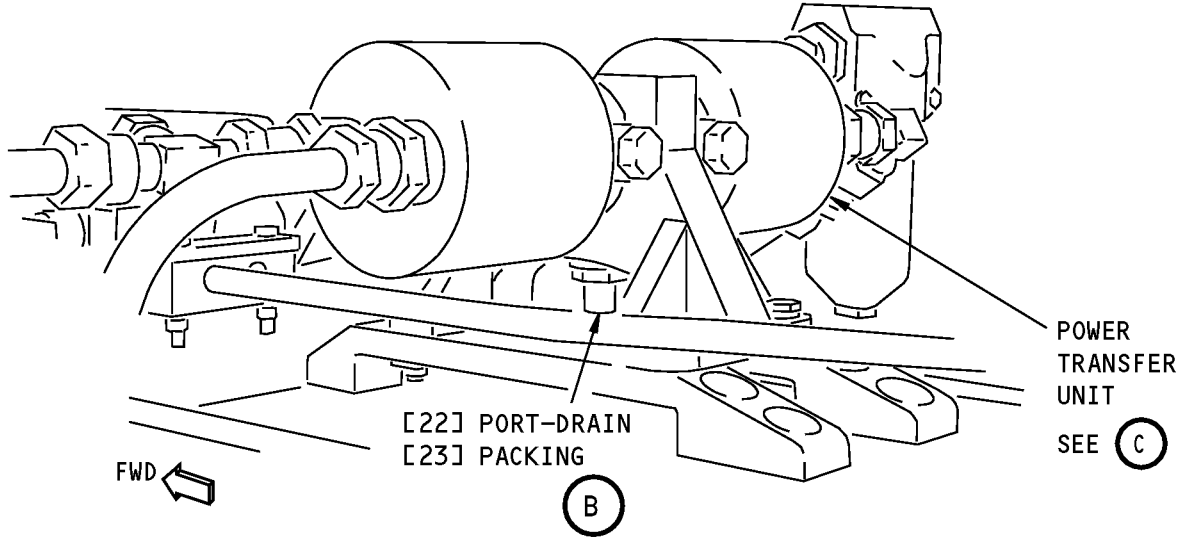
(A)

**Power Transfer Unit Installation
Figure 401 (Sheet 1 of 3)/29-22-11-990-801**

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POWER TRANSFER UNIT

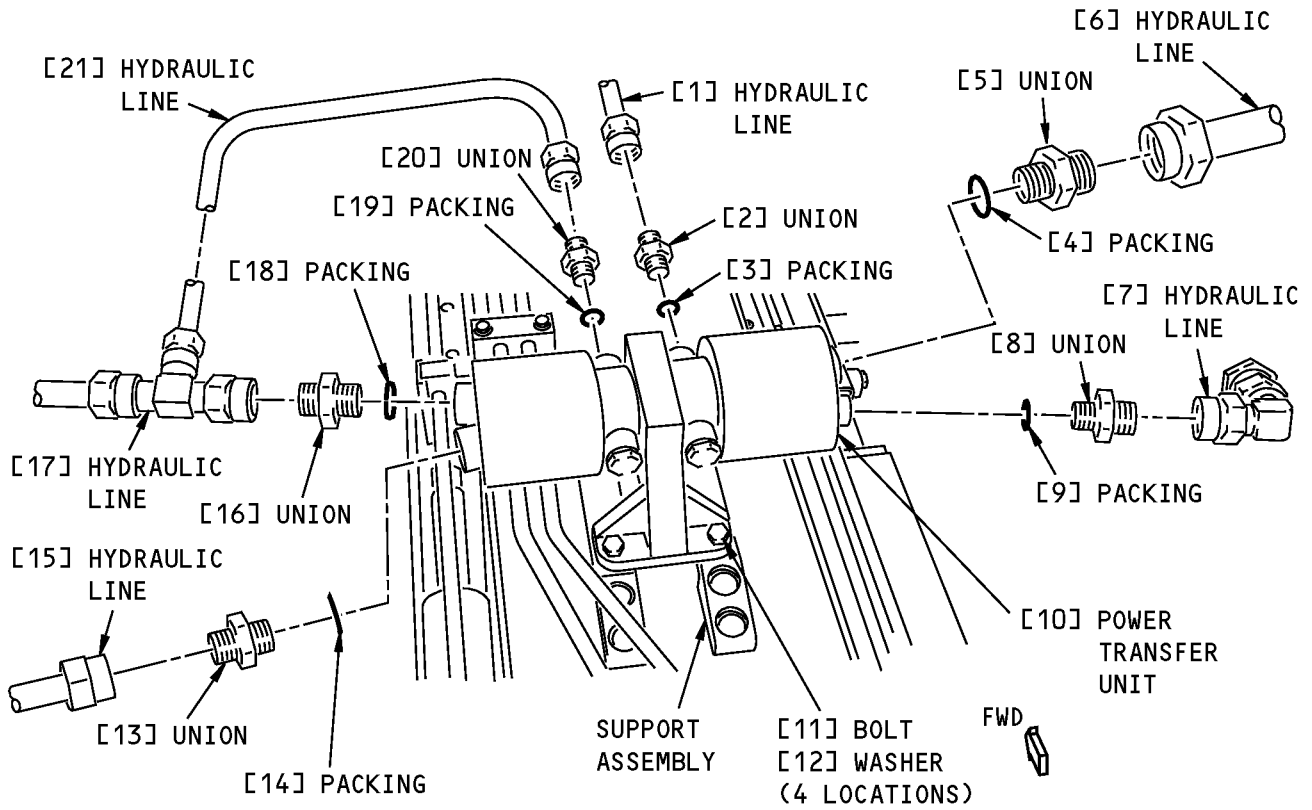
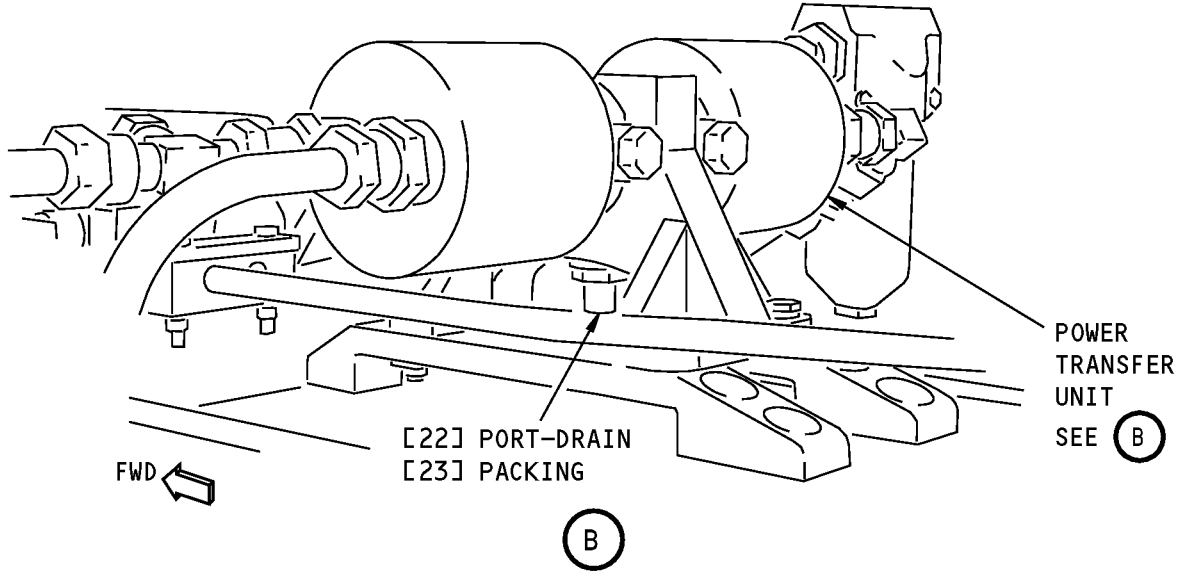
(C)

**Power Transfer Unit Installation
Figure 401 (Sheet 2 of 3)/29-22-11-990-801**

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POWER TRANSFER UNIT

**Power Transfer Unit Installation
Figure 401 (Sheet 3 of 3)/29-22-11-990-801**

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TASK 29-22-11-400-801

3. Power Transfer Unit Installation

(Figure 401)

A. References

Reference	Title
29-11-61-000-801	Return Filter Element Removal (P/B 401)
29-11-61-400-801	Return Filter Element Installation (P/B 401)
29-22-00-710-801	Power Transfer Unit Operational Test (P/B 501)
29-22-21-020-801	PTU Pressure Filter Element Removal (P/B 401)
29-22-21-400-802	PTU Pressure Filter Element Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare to Install the pump

SUBTASK 29-22-11-200-001

- (1) If you replace the PTU [10] because of mechanical malfunction, then follow these steps.
 - (a) Replace the PTU pressure filter. To replace it, these are the tasks: PTU Pressure Filter Element Removal, TASK 29-22-21-020-801 PTU Pressure Filter Element Installation, TASK 29-22-21-400-802
 - (b) Replace the A system return filter. To replace it, these are the tasks: Return Filter Element Removal, TASK 29-11-61-000-801 Return Filter Element Installation, TASK 29-11-61-400-801
 - (c) Replace the B system return filter. To replace it, these are the tasks: Return Filter Element Removal, TASK 29-11-61-000-801 Return Filter Element Installation, TASK 29-11-61-400-801

E. PTU Installation

SUBTASK 29-22-11-640-001

- (1) Install the hydraulic fittings in the PTU [10]:
 - (a) Remove the plugs from the hydraulic ports in the PTU [10].
 - (b) Apply fluid, D00153 or MCS 352B fluid, D00054 to the new packings [3], [4], [9], [14], [18], [19], and [23].

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- (c) Install the new packings [3], [4], [9], [14], [18], [19], and [23], and the unions [2], [5], [8], [13], [16], [20] and port drain [22] in the PTU [10].

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SUBTASK 29-22-11-420-003

- (2) Install the check valve [24] on the union [2].

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SUBTASK 29-22-11-100-001

- (3) Fill the PTU [10] (motor and pump) with fluid, D00153 until it is approximately one-half full.

SUBTASK 29-22-11-420-001

CAUTION: INSTALL THE PTU WITH THE MOTOR ON THE LEFT SIDE OF THE AIRPLANE. THE SYSTEM WILL NOT OPERATE IF YOU INSTALL IT INCORRECTLY.

- (4) Install the PTU [10]:
(a) Put the PTU [10] in its position in the airplane with the pump on the left side.
(b) Install the bolts [11] and the washers [12] to attach the PTU [10] to the airplane structure.
(c) Connect the hydraulic lines [1], [6], [7], [15], [17], and [21] to the PTU [10].

F. PTU Installation Test

SUBTASK 29-22-11-860-005

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

Table with 4 columns: Row, Col, Number, Name. Rows include HYDRAULIC SYSTEM PTU VALVE CONT 1 and CONT 2.

Power Distribution Panel Number 1, P91

Table with 4 columns: Row, Col, Number, Name. Row includes ELEC HYD PUMP CONTROL SYS B.

Power Distribution Panel Number 2, P92

Table with 4 columns: Row, Col, Number, Name. Rows include ELEC HYD PUMP CONTROL SYS A and STANDBY HYDRAULIC PUMP.

SUBTASK 29-22-11-610-001

- (2) Do this task: Power Transfer Unit Operational Test, TASK 29-22-00-710-801.
(a) While you do the operational test of the PTU [10], make sure there are no leaks at the hydraulic tube connections to the PTU [10].
(3) If you replaced the PTU [10] because of mechanical malfunction, then follow these steps.

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- (a) Replace the PTU pressure filter. To replace it, these are the tasks: PTU Pressure Filter Element Removal, TASK 29-22-21-020-801 PTU Pressure Filter Element Installation, TASK 29-22-21-400-802
- (b) Replace the A system return filter. To replace it these are the tasks: Return Filter Element Removal, TASK 29-11-61-000-801 Return Filter Element Installation, TASK 29-11-61-400-801
- (c) Replace B system return filter. To replace it these are the tasks: Return Filter Element Removal, TASK 29-11-61-000-801 Return Filter Element Installation, TASK 29-11-61-400-801

————— **END OF TASK** —————

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PTU PRESSURE FILTER MODULE - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) A removal of the power transfer unit (PTU) pressure filter module
 - (2) An installation of the PTU pressure filter module
 - (3) A removal of the PTU pressure filter element
 - (4) An installation of the PTU pressure filter element
 - (5) An operational test of the PTU pressure filter module.
- C. In this procedure, the PTU pressure filter module is referred to as the "filter module" and the PTU pressure filter element is referred to as the "filter element".

TASK 29-22-21-000-801

2. PTU Pressure Filter Module Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Prepare for the Removal

SUBTASK 29-22-21-860-001

- (1) Remove power from hydraulic systems A and B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-21-860-002

- (2) Make sure these switches on the forward overhead panel, P5, are OFF:
 - (a) HYD PUMPS B ENG 2
 - (b) HYD PUMPS B ELEC 1
 - (c) FLT CONTROL B
 - (d) ALTERNATE FLAPS

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SUBTASK 29-22-21-860-003

- (3) Release pressure from the system B hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

E. Procedure

SUBTASK 29-22-21-860-020

- (1) Put a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 below the filter assembly [7] to catch the hydraulic fluid.

SUBTASK 29-22-21-020-003

- (2) Disconnect the hydraulic lines [4] from the inlet and outlet ports of the filter assembly [7].

SUBTASK 29-22-21-020-004

- (3) Install caps on the hydraulic lines [4] to prevent contamination and damage.

SUBTASK 29-22-21-020-012

- (4) Remove the reducers [3] and packings [2] from the filter assembly [7].

SUBTASK 29-22-21-020-013

- (5) Discard the packings [2].

SUBTASK 29-22-21-020-005

- (6) Install the plugs on the inlet and outlet ports of the filter assembly [7] to prevent contamination and damage.

SUBTASK 29-22-21-020-006

- (7) Remove the nuts [5], washers [6], washers [9], and bolts [10] that attach the filter assembly [7] to airplane structure.

SUBTASK 29-22-21-020-007

- (8) Remove the filter assembly [7] from the airplane.

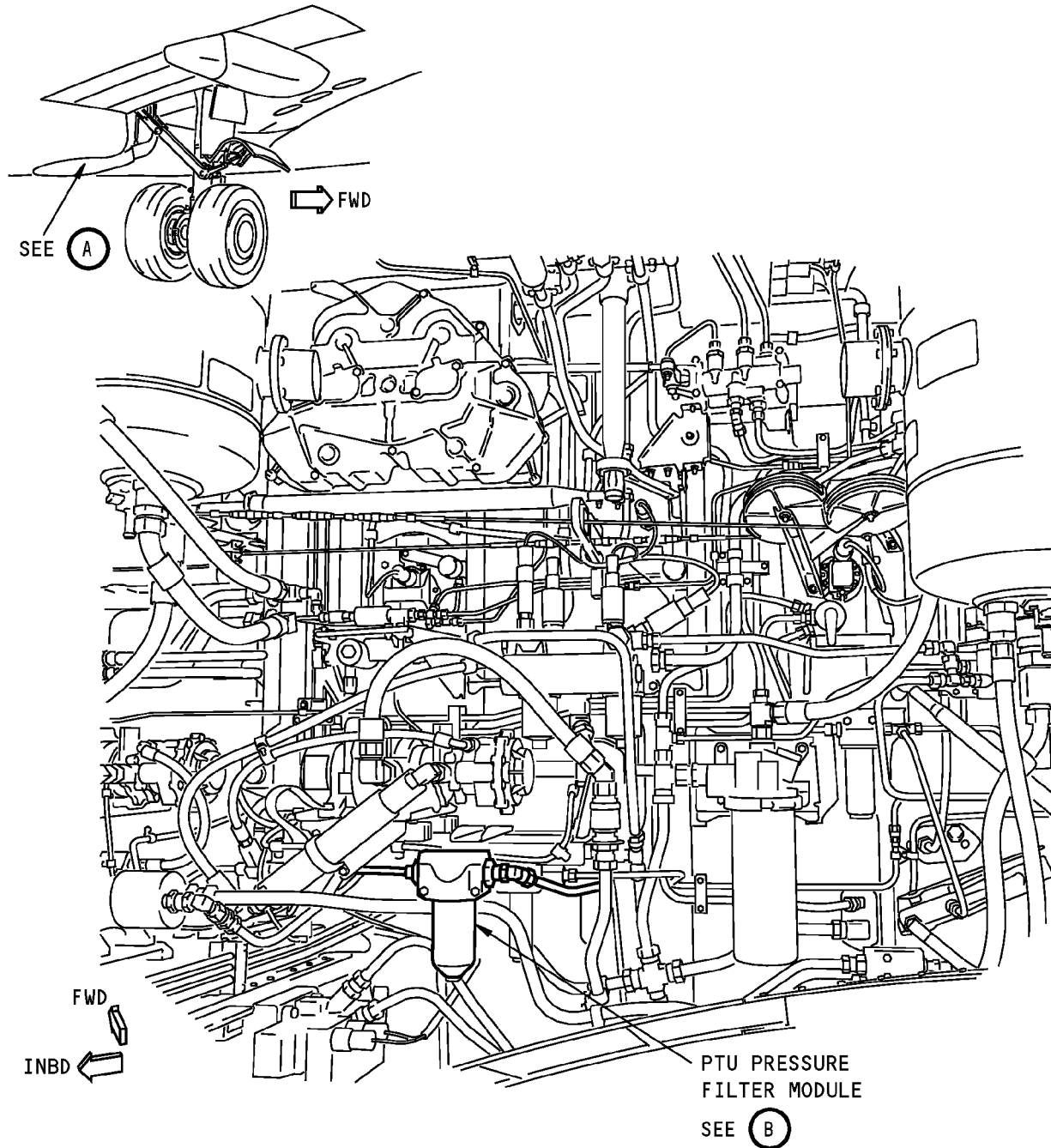
————— **END OF TASK** —————

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**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

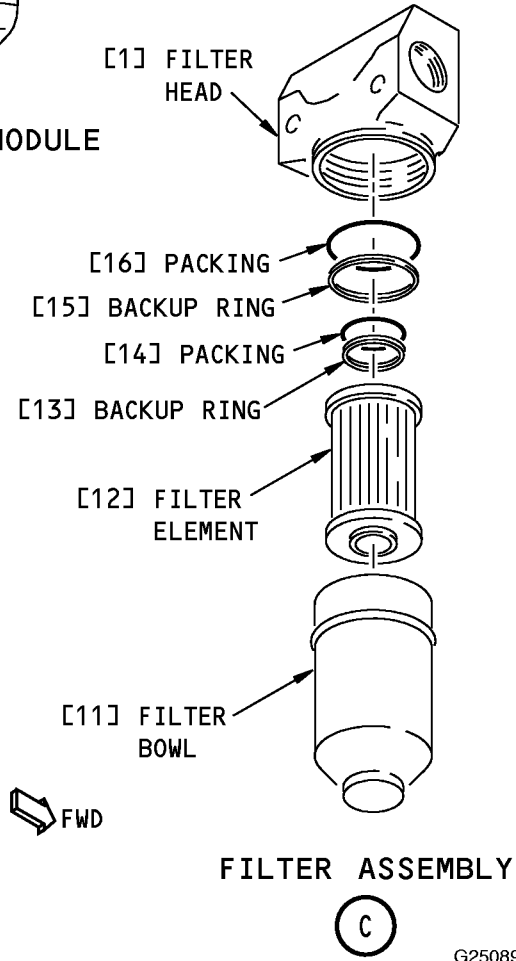
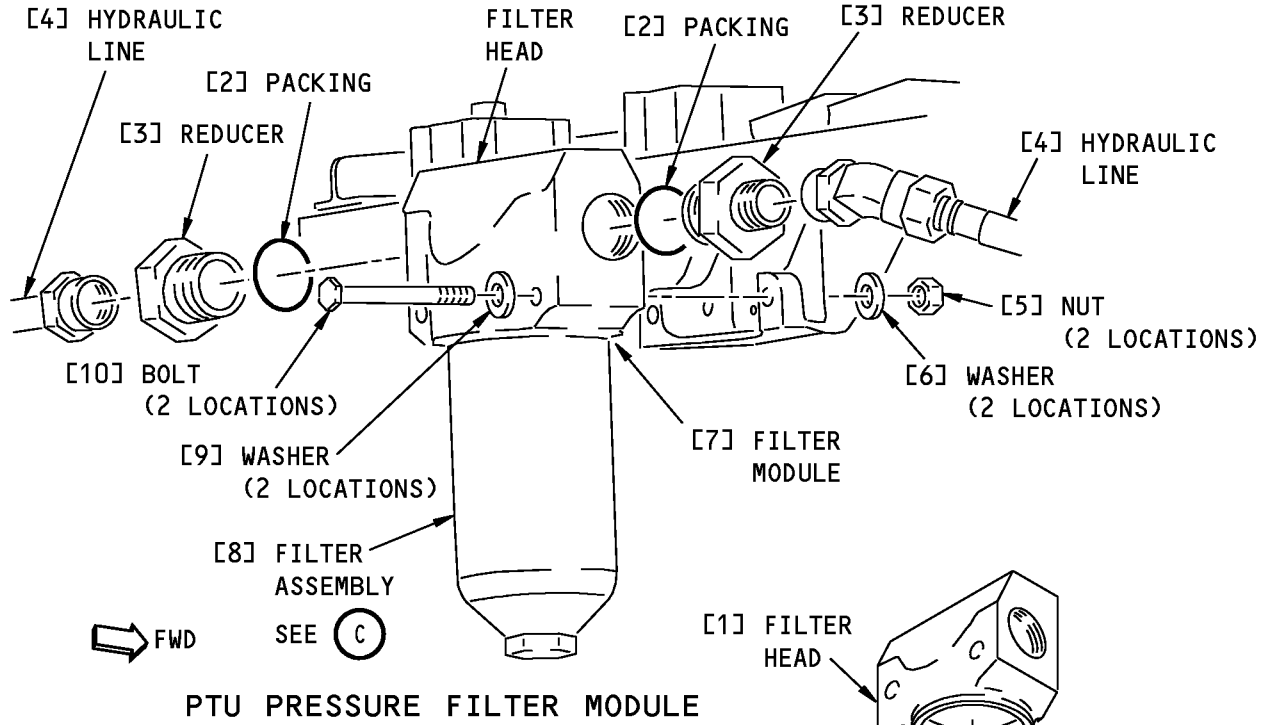
A

**Power Transfer Unit (PTU) Pressure Filter Module Installation
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Power Transfer Unit (PTU) Pressure Filter Module Installation
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TASK 29-22-21-400-801

3. PTU Pressure Filter Module Installation

(Figure 401)

A. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Packing	29-22-21-01-030	HAP ALL
7	Filter assembly	29-22-21-01-005	HAP ALL

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-22-21-420-001

- (1) If the reducers and packings are not installed in the filter assembly [7], then do these steps:
 - (a) Apply fluid, D00153 to the reducers [3] and the packings [2].
 - (b) Remove the plugs from the inlet and outlet ports of the filter assembly [7].
 - (c) Install the new packings [2] and the reducers [3] in the inlet and outlet ports of the filter assembly [7].

SUBTASK 29-22-21-420-004

- (2) Put the filter assembly [7] in its position with the flow direction arrow outboard. Filter bowl down.

SUBTASK 29-22-21-420-005

- (3) Install the bolts [10], washers [9], washers [6], and nuts [5] to attach the filter assembly [7] to the airplane structure.

SUBTASK 29-22-21-420-006

- (4) Remove the caps from the hydraulic lines [4].

SUBTASK 29-22-21-420-007

- (5) Connect the hydraulic lines [4] to the filter assembly [7].

E. PTU Pressure Filter Module Installation Test

SUBTASK 29-22-21-710-001

- (1) Do this task: PTU Pressure Filter Module Operational Test, TASK 29-22-21-710-801.

————— **END OF TASK** —————

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TASK 29-22-21-020-801

4. PTU Pressure Filter Element Removal

(Figure 401)

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-170-801	Hydraulic System A or B Flushing (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)
29-22-11-000-801	Power Transfer Unit (PTU) Removal (P/B 401)
29-22-11-400-801	Power Transfer Unit Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Prepare for the Removal

SUBTASK 29-22-21-860-021

- (1) Remove power from the standby hydraulic system. To remove it, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802

SUBTASK 29-22-21-860-004

- (2) Remove power from hydraulic systems A and B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-21-860-005

- (3) Make sure these switches on the forward overhead panel, P5, are OFF:
 - (a) HYD PUMPS B ENG 2
 - (b) HYD PUMPS A ENG 1
 - (c) HYD PUMPS B ELEC 1
 - (d) HYD PUMPS A ELEC 2
 - (e) FLT CONTROL B
 - (f) FLT CONTROL A
 - (g) ALTERNATE FLAPS

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SUBTASK 29-22-21-860-022

(4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2
A	17	C00780	HYDRAULIC SYSTEM ENG PUMP DEPRESS VALVE 2
B	15	C00779	HYD SYS ENG PUMP DEPRESS VALVE 1

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-22-21-860-006

(5) Release pressure from the system B hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

F. Procedure

SUBTASK 29-22-21-020-010

(1) Remove the lockwire from the filter assembly [7].

SUBTASK 29-22-21-940-001

(2) Put a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110 below the filter assembly [7] to catch the hydraulic fluid.

SUBTASK 29-22-21-020-008

(3) Remove the filter bowl [11] and the filter [12] from the filter head [1].

SUBTASK 29-22-21-020-014

(4) Remove the filter [12].

SUBTASK 29-22-21-020-009

(5) Remove the packing [16], backup ring [15], packing [14], and backup ring [13].

SUBTASK 29-22-21-020-015

(6) Discard packing [14] and packing [16].

SUBTASK 29-22-21-210-001

(7) Examine the filter [12] and filter bowl [11] for metal contamination.

(a) If you find contamination, then do these steps:

- 1) Replace the power transfer unit (PTU). These are the tasks: Power Transfer Unit (PTU) Removal, TASK 29-22-11-000-801, Power Transfer Unit Installation, TASK 29-22-11-400-801,
- 2) Flush the system B hydraulic lines. To flush it, do this task: Hydraulic System A or B Flushing, TASK 29-11-00-170-801.

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SUBTASK 29-22-21-160-001

(8) Discard the filter [12].

SUBTASK 29-22-21-100-001

(9) Clean the filter bowl [11].

————— **END OF TASK** —————

TASK 29-22-21-400-802

5. PTU Pressure Filter Element Installation

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Filter assembly	29-22-21-01-005	HAP ALL
12	Filter	29-22-21-01-060	HAP ALL
14	Packing	29-22-21-01-050	HAP ALL
16	Packing	29-22-21-01-040	HAP ALL

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

E. Procedure

SUBTASK 29-22-21-160-002

(1) Make sure the filter bowl [11] is clean.

SUBTASK 29-22-21-640-001

(2) Apply fluid, D00153 to the backup ring [15], backup ring [13], packing [16], and the packing [14].

SUBTASK 29-22-21-420-008

(3) Install the new packing [16] and backup ring [15] in the filter head [1].

SUBTASK 29-22-21-420-009

(4) Install the new packing [14] and backup ring [13] in the filter [12].

SUBTASK 29-22-21-420-010

(5) Install the filter [12] in the filter bowl [11].

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SUBTASK 29-22-21-640-002

(6) Apply fluid, D00153 to the threads of the filter bowl [11].

SUBTASK 29-22-21-420-011

(7) Install the filter bowl [11] on the filter head [1].

SUBTASK 29-22-21-420-012

(8) Tighten the filter bowl to 20-30 pound-feet (27-41 newton-meters).

SUBTASK 29-22-21-860-023

(9) Close these circuit breakers:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2
A	17	C00780	HYDRAULIC SYSTEM ENG PUMP DEPRESS VALVE 2
B	15	C00779	HYD SYS ENG PUMP DEPRESS VALVE 1

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A
F	2	C01449	STANDBY HYDRAULIC PUMP

F. PTU Pressure Filter Element Installation Test

SUBTASK 29-22-21-710-002

(1) Do this task: PTU Pressure Filter Module Operational Test, TASK 29-22-21-710-801.

SUBTASK 29-22-21-420-014

(2) Install a lockwire on the filter assembly [7].

————— END OF TASK —————

TASK 29-22-21-710-801

6. PTU Pressure Filter Module Operational Test

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

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B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Procedure

SUBTASK 29-22-21-860-007

- (1) Pressurize the hydraulic reservoirs. To pressurize them, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-22-21-860-008

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-22-21-860-009

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-22-21-860-010

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND LANDING GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THEAILERONS, ELEVATORS, RUDDER FLAPS, SLATS, SPOILERS, STABILIZER, AND THE LANDING GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEM. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN THE HYDRAULIC POWER IS SUPPLIED.

- (4) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-22-21-860-011

- (5) Move the flap control lever to the UP position to fully retract the flaps and slats.

SUBTASK 29-22-21-860-012

- (6) Move the flap control lever to the 5 unit position to extend the leading edge slats to the EXTEND position.

SUBTASK 29-22-21-860-013

- (7) Remove power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

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SUBTASK 29-22-21-860-014

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND LANDING GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THEAILERONS, ELEVATORS, RUDDER FLAPS, SLATS, SPOILERS, STABILIZER, AND THE LANDING GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEM. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN THE HYDRAULIC POWER IS SUPPLIED.

- (8) Pressurize the hydraulic system A. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-22-21-210-002

CAUTION: MAKE SURE THE SYSTEM B HYDRAULIC RESERVOIR IS PRESSURIZED. THE CHECK VALVE FOR THE PTU CAN BE DAMAGED IF YOU OPERATE THE PTU WITHOUT PRESSURE IN THE HYDRAULIC RESERVOIR.

- (9) Look at the pressure gages for the system B hydraulic reservoir.

NOTE: The pressure gages is above the electric motor driven pump (EMDP). The EMDP is installed in the main wheel well.

- (a) Make sure the system B reservoir has a pressure of 45-65 psig.

SUBTASK 29-22-21-710-003

WARNING: MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE SLATS DURING THIS PROCEDURE. THE SLATS CAN MOVE AUTOMATICALLY (UNLESS OTHERWISE INHIBITED) WHEN THE HYDRAULIC SYSTEM IS PRESSURIZED, THE TRAILING EDGE FLAPS ARE EXTENDED AND THE AIR/GROUND RELAYS SENSE AN AIRBORNE CONDITION. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (10) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C01355	LANDING GEAR AIR/GND SYS 2

SUBTASK 29-22-21-210-003

- (11) Make sure the PTU starts.

SUBTASK 29-22-21-710-004

- (12) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C01355	LANDING GEAR AIR/GND SYS 2

SUBTASK 29-22-21-210-004

- (13) Make sure the PTU stops.

SUBTASK 29-22-21-790-001

- (14) Examine the filter module and connections for leaks.

SUBTASK 29-22-21-860-015

- (15) Remove power from hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

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SUBTASK 29-22-21-610-001

(16) If it is necessary, fill the hydraulic reservoirs. To fill it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

D. Put the Airplane Back to Its Usual Condition

SUBTASK 29-22-21-860-016

WARNING: KEEP PERSONS AND EQUIPMENT AWAY FROM ALL CONTROL SURFACES AND LANDING GEAR WHEN HYDRAULIC POWER IS SUPPLIED. THEAILERONS, ELEVATORS, RUDDER FLAPS, SLATS, SPOILERS, STABILIZER, AND THE LANDING GEAR ARE SUPPLIED WITH POWER BY THE HYDRAULIC SYSTEM. INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT CAN OCCUR WHEN THE HYDRAULIC POWER IS SUPPLIED.

(1) Pressurize the hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801

SUBTASK 29-22-21-860-017

(2) Move the flap control lever to the UP position to fully retract the flaps.

SUBTASK 29-22-21-860-018

(3) Remove power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-21-860-019

(4) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

————— **END OF TASK** —————

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POWER TRANSFER UNIT (PTU) CONTROL VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the control valve for the Power Transfer Unit (PTU)
- (2) An installation of the control valve for the PTU.

B. The PTU control valve will be referred to the "control valve" throughout this procedure.

TASK 29-22-31-000-801

2. Power Transfer Unit (PTU) Control Valve Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1110	Container - Hydraulic Fluid Resistant, 5 Gallon (19 Liters)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Prepare for Removal

SUBTASK 29-22-31-860-001

- (1) Remove power from hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-31-860-002

- (2) Make sure that these switches, on the P5 panel, are in the OFF position:
 - (a) The ENG 1 HYD PUMPS A switch
 - (b) The ELEC 2 HYD PUMPS A switch
 - (c) The FLT CONTROL A switch.

SUBTASK 29-22-31-860-003

- (3) Depressurize the hydraulic system A reservoir. To depressurize it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

E. Procedure

SUBTASK 29-22-31-020-001

- (1) Disconnect the electrical connector [2] from the control valve [1].

SUBTASK 29-22-31-020-002

- (2) Disconnect the hydraulic lines from the control valve [1].

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SUBTASK 29-22-31-680-001

(3) Drain hydraulic fluid into a 5 gallon (19 liters) hydraulic fluid resistant container, STD-1110.

SUBTASK 29-22-31-160-001

(4) Clean all hydraulic fluid from the installation area if it is necessary, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801

SUBTASK 29-22-31-020-003

(5) Remove the mounting bolts [4] and washers [5].

SUBTASK 29-22-31-020-005

(6) Remove the control valve [1].

SUBTASK 29-22-31-020-006

(7) Remove the unions [6] and packings [7] from the ports on the control valve [1].

SUBTASK 29-22-31-020-008

(8) Discard the packings [7].

SUBTASK 29-22-31-020-007

(9) Install caps on the electrical connector, hydraulic lines and the open ports on the control valve [1] to prevent contamination or damage.

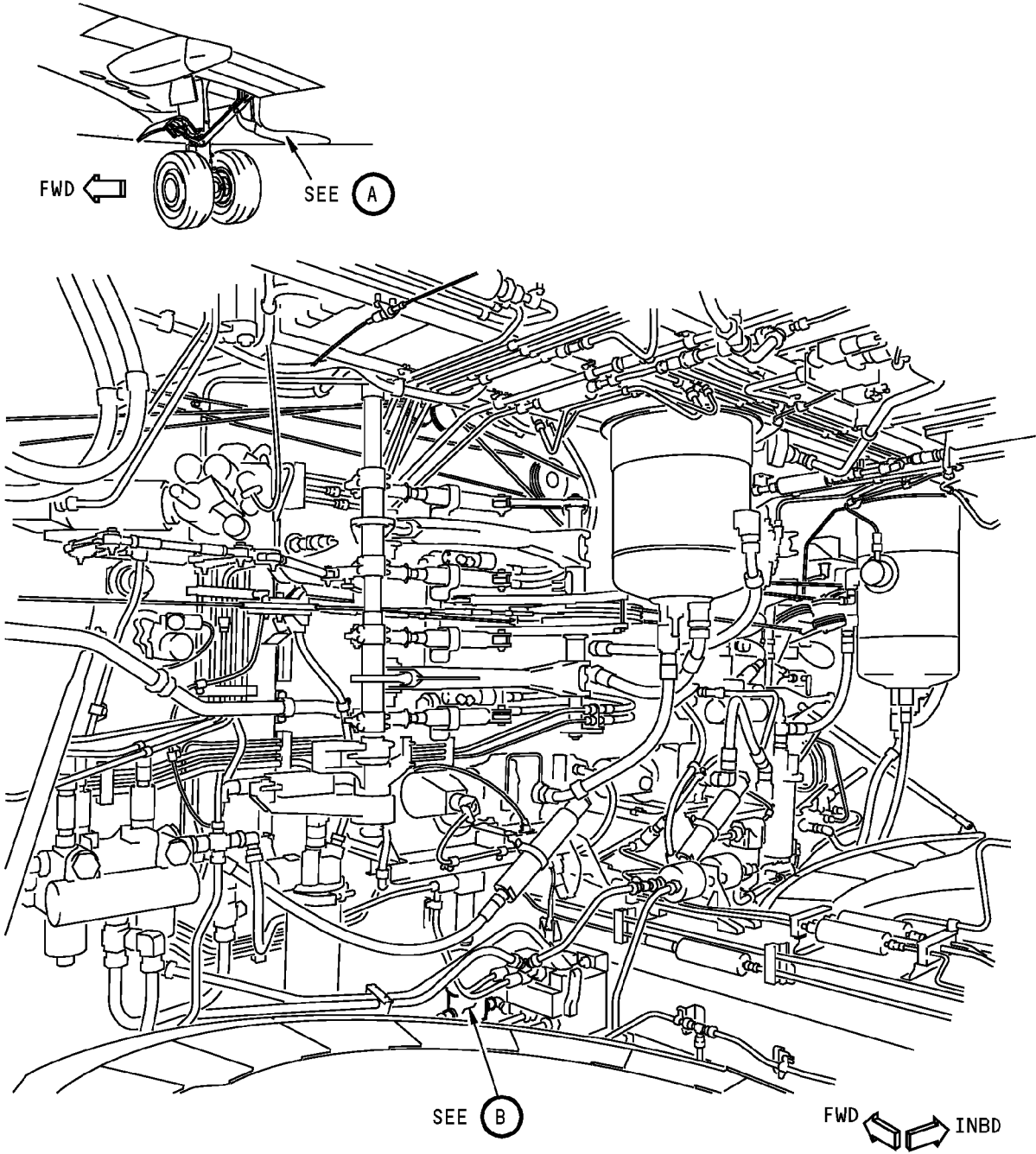
————— **END OF TASK** —————

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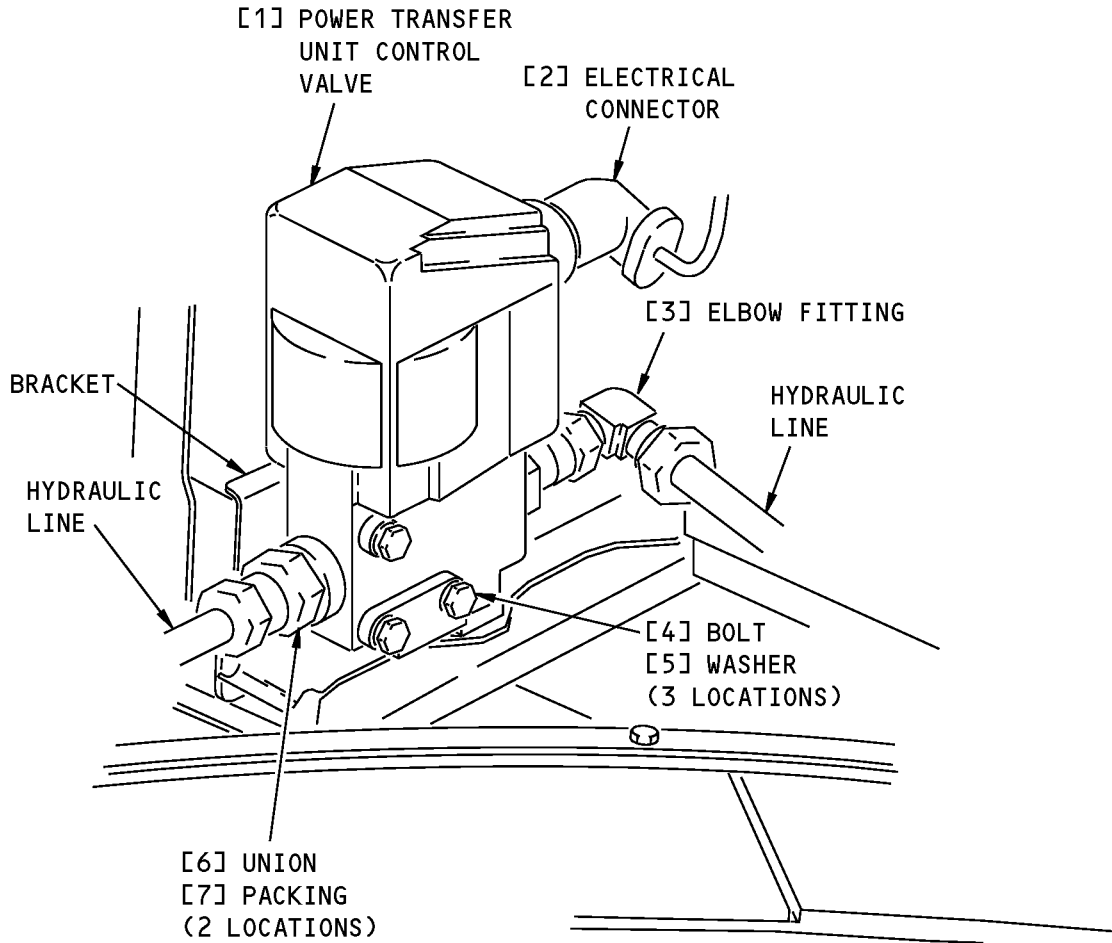
**MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)**

A

**Power Transfer Unit (PTU) Control Valve Installation
Figure 401 (Sheet 1 of 2)/29-22-31-990-801**

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PTU CONTROL VALVE

(B)

**Power Transfer Unit (PTU) Control Valve Installation
Figure 401 (Sheet 2 of 2)/29-22-31-990-801**

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TASK 29-22-31-400-801

3. Power Transfer Unit (PTU) Control Valve Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
20-10-34-110-802	Clean Bare, Clad, or Plated Metal with Solvent (P/B 701)
20-40-11-760-802	Measurement of Airplane Electrical Resistance to Ground (P/B 201)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
32-09-00-860-801	Put the Airplane in the Air Mode (P/B 201)
32-09-00-860-802	Return the Airplane to the Ground Mode (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Procedure

SUBTASK 29-22-31-640-001

(1) Apply fluid, D00153 to the new packings [7] and to the threads on the unions [6].

SUBTASK 29-22-31-420-001

(2) Install the new packings [7] on the unions [6].

SUBTASK 29-22-31-420-002

(3) Remove the caps from the open ports on the control valve [1].

SUBTASK 29-22-31-420-003

(4) Install the unions [6] in the ports on the control valve [1].

SUBTASK 29-22-31-160-002

(5) Clean the mounting surfaces, do this task: Clean Bare, Clad, or Plated Metal with Solvent, TASK 20-10-34-110-802.

SUBTASK 29-22-31-420-004

(6) Put the control valve [1] in its position.

SUBTASK 29-22-31-420-005

(7) Install the mounting bolts [4] and washers [5].

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SUBTASK 29-22-31-420-006

(8) Remove the caps from the hydraulic lines.

SUBTASK 29-22-31-420-007

(9) Connect the hydraulic lines to the control valve [1].

SUBTASK 29-22-31-280-001

(10) Make sure that the electrical resistance is 0.0005 ohm maximum between the valve and the mounting structure. To check the resistance, do this task: Measurement of Airplane Electrical Resistance to Ground, TASK 20-40-11-760-802.

SUBTASK 29-22-31-420-009

(11) Remove the cap from the electrical connector [2].

SUBTASK 29-22-31-420-010

(12) Connect the electrical connector [2] to the control valve [1].

E. Power Transfer Unit (PTU) Control Valve Installation Test

SUBTASK 29-22-31-860-004

(1) Pressurize the reservoirs for hydraulic system A and system B. To pressurize the reservoirs, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-22-31-860-005

(2) Do this task: (Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-22-31-860-006

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-22-31-860-007

(4) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C01355	LANDING GEAR AIR/GND SYS 2
C	16	C01356	LANDING GEAR AIR/GND SYS 1

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SUBTASK 29-22-31-210-001

- (5) Pressurize hydraulic system A and system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-22-31-860-008

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE AUTOMATICALLY. THIS CAN OCCUR WHEN THE HYDRAULIC SYSTEM IS PRESSURIZED, THE TRAILING EDGE FLAPS ARE IN POSITION 1, 2, OR 5, AND THE NOSE OR MAIN LANDING GEAR AIR/GROUND RELAYS SENSE AN AIRBORNE CONDITION. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Move the flap control lever to the 1-unit detent.

SUBTASK 29-22-31-210-003

- (7) Make sure the control valve [1] is closed.

NOTE: The position indicator arm on PTU control valve should move and point to the CLOSED position that is marked on the valve nameplate.

SUBTASK 29-22-31-860-009

- (8) Remove power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-31-860-010

- (9) Put the airplane in the Air Mode. To do it, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801.

- (a) Make sure that the PTU control valve opens.

NOTE: The position indicator arm on the PTU control valve should move and point to the OPEN position that is marked on the valve nameplate.

SUBTASK 29-22-31-860-017

- (10) Move the ALTERNATE FLAPS arm switch, on the P5 panel, to the ARM position.

SUBTASK 29-22-31-860-011

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (11) Move the ALTERNATE FLAPS control switch to the up position. This should fully retract the trailing edge flaps.

SUBTASK 29-22-31-210-004

- (12) Make sure that the PTU control valve closes.

NOTE: The position indicator should move and point to the closed position. The position indicator will point approximately 45° aft of inboard when the valve is closed.

SUBTASK 29-22-31-790-001

- (13) Examine the PTU control valve and all connections for leaks.

SUBTASK 29-22-31-869-001

- (14) Move the ALTERNATE FLAPS control switch to the OFF position.

SUBTASK 29-22-31-860-018

- (15) Move the ALTERNATE FLAPS arm switch, on the P5 panel, to the OFF position.

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SUBTASK 29-22-31-860-019

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(16) Move the flap control lever to the FLAP UP detent.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-22-31-860-012

(1) Remove power from hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-31-860-013

(2) Return the aiplane to the Ground Mode. To do it, do this task: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802.

SUBTASK 29-22-31-860-014

(3) Do the servicing for the system A and B reservoirs if it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-22-31-860-015

(4) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-22-31-860-016

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— **END OF TASK** —————

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ENGINE DRIVEN PUMP (EDP) PRESSURE SWITCH AUTO SLAT SYSTEM - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the Engine Driven Pump (EDP) pressure switch for the auto slat system
- (2) An installation of the EDP pressure switch for the auto slat system.

B. The EDP pressure switch will be referred to as the "pressure switch" in this procedure.

TASK 29-22-41-000-801

2. Engine Driven Pump (EDP) Pressure Switch Auto Slat System Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for Removal

SUBTASK 29-22-41-860-001

- (1) Remove power from hydraulic system B, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-41-860-002

- (2) Depressurize the system B hydraulic reservoir. To depressurize, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-22-41-860-003

- (3) Make sure these switches, on the P5 panel, are in the OFF position:
 - (a) ELEC 1 HYD PUMPS B
 - (b) FLT CONTROL B
 - (c) ALTERNATE FLAPS

SUBTASK 29-22-41-860-004

- (4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

D. Procedure

SUBTASK 29-22-41-020-001

- (1) Disconnect the electrical connector [2] from the pressure switch [1].

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SUBTASK 29-22-41-020-002

(2) Remove the pressure switch [1].

SUBTASK 29-22-41-020-003

(3) Remove the packing [3] from the pressure switch [1].

SUBTASK 29-22-41-020-004

(4) Install protective caps on the electrical connector and the open port on the pressure module to prevent contamination or damage.

————— **END OF TASK** —————

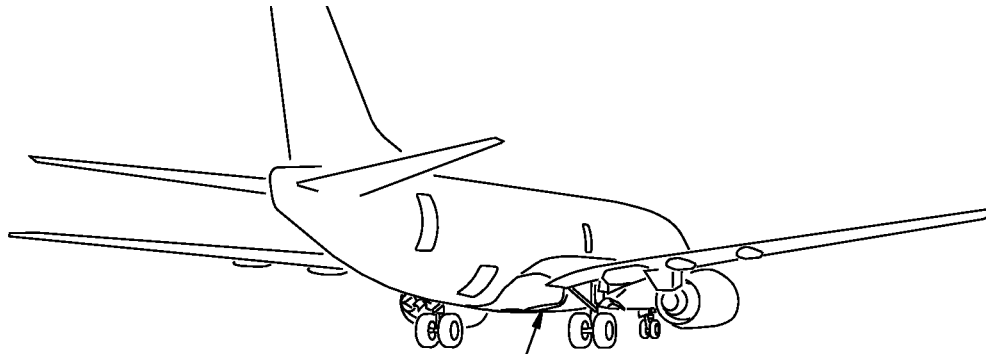
EFFECTIVITY
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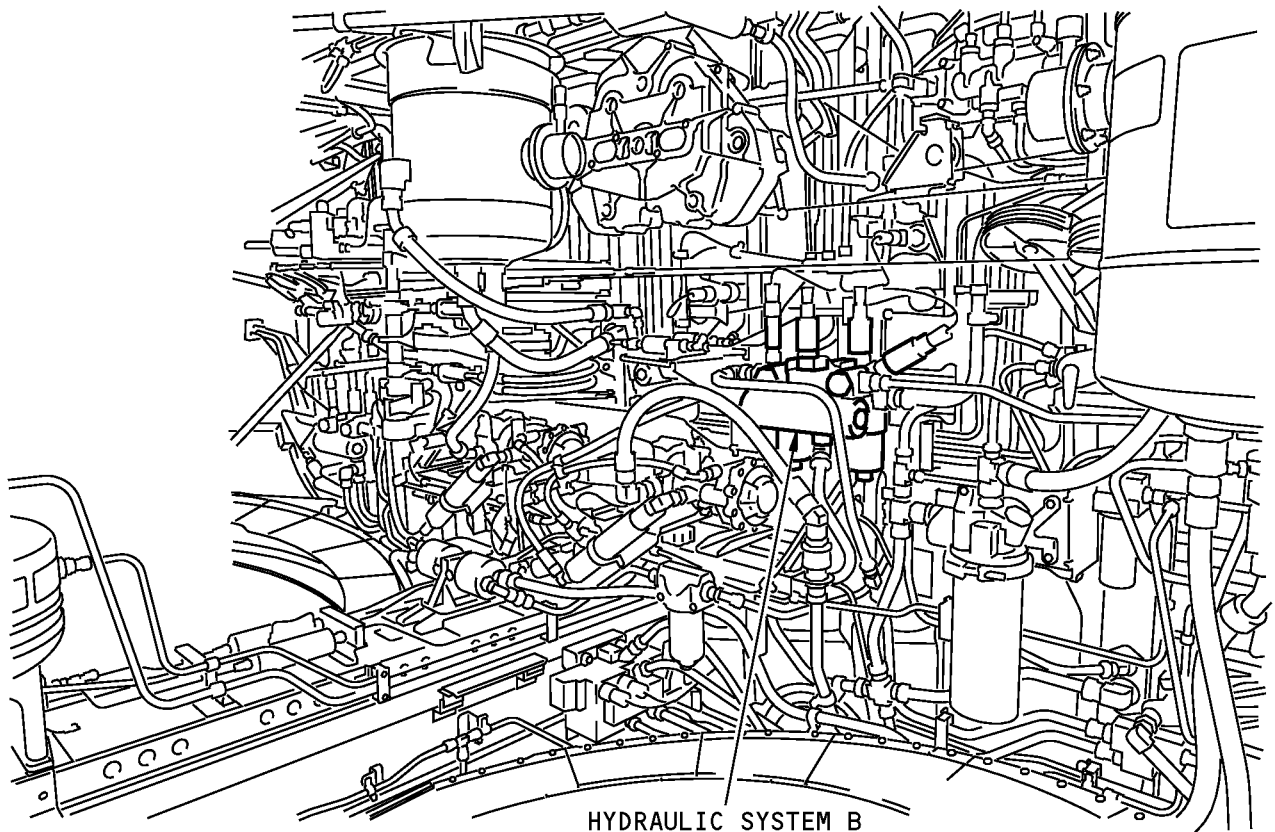
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SEE (A)



HYDRAULIC SYSTEM B
PRESSURE MODULE

SEE (B)



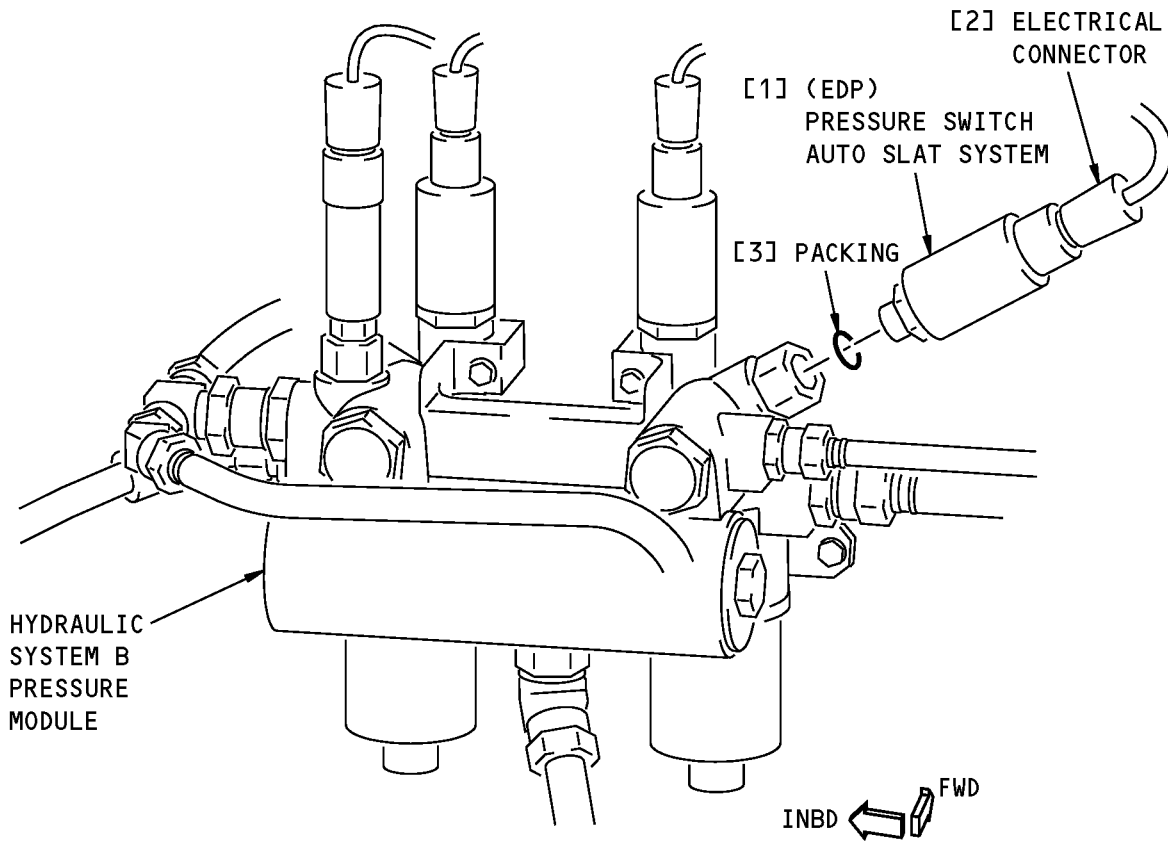
MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)

(A)

Engine-Driven Pump (EDP) Pressure Switch Auto Slat System Installation
Figure 401 (Sheet 1 of 2)/29-22-41-990-801

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HYDRAULIC SYSTEM B PRESSURE MODULE

B

**Engine-Driven Pump (EDP) Pressure Switch Auto Slat System Installation
Figure 401 (Sheet 2 of 2)/29-22-41-990-801**

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TASK 29-22-41-400-801

3. Engine Driven Pump (EDP) Pressure Switch Auto Slat System Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
32-09-00-860-801	Put the Airplane in the Air Mode (P/B 201)
32-09-00-860-802	Return the Airplane to the Ground Mode (P/B 201)
SWPM 20-60-03	Special Protection of Electrical Connectors

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~C32 (QQ-N-281)
G50171	Compound - Corrosion Inhibiting Compound, Interior Application - D5026NS or ZC-026	

C. Location Zones

Zone	Area
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-22-41-640-001

- (1) Lubricate the new packing [3] with fluid, D00153.

SUBTASK 29-22-41-420-001

- (2) Do these steps to install the pressure switch [1] in the hydraulic system B pressure module:
 - (a) Install the new packing [3] on the pressure switch [1].
 - (b) Remove the plug from the pressure module.
 - (c) Put the pressure switch [1] in the pressure module.
 - (d) Tighten the pressure switch [1].
 - (e) Install the lockwire, G01912.

SUBTASK 29-22-41-420-002

- (3) Remove the cap from the electrical connector [2].

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SUBTASK 29-22-41-210-006

- (4) Before you connect the electrical connector [2], examine the connector for corrosion.

WARNING: DO THE STEPS BELOW IF THE AIRPLANE OPERATES AT AIRPORTS WHERE DEICING FLUID THAT CONTAIN POTASSIUM FORMATE IS USED. ALSO DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTOR IS PART OF A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

- (a) If there was corrosion, refer to (SWPM 20-60-03) to correct the problem.
- (b) Apply the D5026NS or ZC-026 compound, G50171 to the connector (SWPM 20-60-03).

SUBTASK 29-22-41-420-003

- (5) Connect the electrical connector [2] to the pressure switch [1].

E. Engine Driven Pump (EDP) Pressure Switch Auto Slat System Installation Test

SUBTASK 29-22-41-860-005

- (1) Pressurize the reservoirs for hydraulic system A and system B. To pressurize the reservoirs, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-22-41-860-006

- (2) Do this task: (Supply Electrical Power, TASK 24-22-00-860-811).

SUBTASK 29-22-41-860-007

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

- (3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-22-41-860-008

- (4) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
A	15	C01081	HYDRAULIC SYSTEM PTU VALVE CONT 1

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	15	C01355	LANDING GEAR AIR/GND SYS 2
C	16	C01356	LANDING GEAR AIR/GND SYS 1

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SUBTASK 29-22-41-210-001

- (5) Pressurize hydraulic system A and system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-22-41-860-009

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE AUTOMATICALLY. THIS CAN OCCUR WHEN THE HYDRAULIC SYSTEM IS PRESSURIZED, THE TRAILING EDGE FLAPS ARE IN POSITION 1, 2, OR 5, AND THE NOSE OR MAIN LANDING GEAR AIR/GROUND RELAYS SENSE AN AIRBORNE CONDITION. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Move the flap control lever to the 1-unit detent.

SUBTASK 29-22-41-210-003

- (7) Make sure the PTU control valve is closed.

NOTE: The position indicator will point approximately 45° forward of inboard when the valve is open. The position indicator will point approximately 45° aft of inboard when the valve is closed.

SUBTASK 29-22-41-860-010

- (8) Remove power from hydraulic system B. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-41-860-011

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE AUTOMATICALLY. THIS CAN OCCUR WHEN THE HYDRAULIC SYSTEM IS PRESSURIZED, THE TRAILING EDGE FLAPS ARE IN POSITION 1, 2, OR 5, AND THE NOSE OR MAIN LANDING GEAR AIR/GROUND RELAYS SENSE AN AIRBORNE CONDITION. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (9) Put the airplane in the Air Mode. To do it, do this task: Put the Airplane in the Air Mode, TASK 32-09-00-860-801.

- (a) Make sure that the PTU control valve opens.

NOTE: The position indicator will point approximately 45° forward of inboard when the valve is open. The position indicator will point approximately 45° aft of inboard when the valve is closed.

SUBTASK 29-22-41-210-005

- (10) Pressurize hydraulic system B. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-22-41-860-012

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE FLAPS AND SLATS. THE LEADING EDGE FLAPS AND SLATS CAN MOVE QUICKLY. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (11) Move the flap control lever to the FLAP UP detent.

SUBTASK 29-22-41-210-004

- (12) Make sure that the PTU control valve closes.

NOTE: The position indicator will point approximately 45° forward of inboard when the valve is open. The position indicator will point approximately 45° aft of inboard when the valve is closed.

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SUBTASK 29-22-41-790-001

(13) Examine the EDP pressure switch and all connections for leaks.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 29-22-41-860-013

(1) Remove power from hydraulic system A. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-22-41-860-014

(2) Return the aiplane to the Ground Mode. To do it, do this task: Return the Airplane to the Ground Mode, TASK 32-09-00-860-802.

SUBTASK 29-22-41-860-015

(3) Do the servicing for the system A and B reservoirs if it is necessary, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-22-41-860-016

(4) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	16	C01085	HYDRAULIC SYSTEM PTU VALVE CONT 2

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

————— **END OF TASK** —————

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SYSTEM PRESSURE TRANSMITTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of the system pressure transmitter
 - (2) An installation of the system pressure transmitter.
- B. The pressure transmitters for systems A and B are equivalent units. The pressure transmitters are installed on the Hydraulic System Pressure Module assembly located on the forward bulkhead of the Main Landing Gear wheel well. You can get access to the system A transmitter through the left wheel well and the system B transmitter through the right wheel well.

TASK 29-31-12-000-801

2. System Pressure Transmitter Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Procedure

SUBTASK 29-31-12-860-001

- (1) Remove the power from the applicable hydraulic system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 29-31-12-860-002

- (2) Remove the pressure from the applicable system hydraulic reservoir. To remove it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-31-12-860-003

- (3) To remove the pressure transmitter for hydraulic system A, do these steps:
 - (a) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
D	5	C01359	DISPLAY DEU 1 PRI

- (b) Remove the electrical connector [2] from the pressure transmitter [1].
- (c) Install a protective cap on the electrical connector [2].
- (d) Remove the pressure transmitter [1].
- (e) Remove and discard the o-ring [4].

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SUBTASK 29-31-12-860-004

(4) To remove the pressure transmitter for hydraulic system B, do these steps:

(a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	11	C01360	DISPLAY DEU 2 PRI

(b) Remove the electrical connector [7] from the pressure transmitter [6].

(c) Install a protective cap on the electrical connector [7].

(d) Remove the pressure transmitter [6].

(e) Remove and discard the o-ring [5].

————— END OF TASK —————

TASK 29-31-12-400-801

3. System Pressure Transmitter Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwires Installation (P/B 401)
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-801	Hydraulic System A or B Pressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-31-12-640-001

(1) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new O-ring [4] for system A or new o-ring [5] for system B..

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SUBTASK 29-31-12-420-001

(2) Install the O-ring in the transmitter port.

SUBTASK 29-31-12-420-010

(3) Install the transmitter [1].

SUBTASK 29-31-12-420-008

(4) Remove the protective cap from the electrical connector.

SUBTASK 29-31-12-420-007

(5) Connect the electrical connector to the pressure transmitter.

SUBTASK 29-31-12-420-009

(6) Install lockwire to the pressure transmitter. To install it, do this task: Lockwires Installation, TASK 20-10-44-400-801

SUBTASK 29-31-12-860-005

(7) If you installed the pressure transmitter for hydraulic system A, do this step:

(a) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01359	DISPLAY DEU 1 PRI

SUBTASK 29-31-12-860-006

(8) If you installed the pressure transmitter for hydraulic system B, do this step:

(a) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	11	C01360	DISPLAY DEU 2 PRI

E. System Pressure Transmitter Installation Test

SUBTASK 29-31-12-860-007

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-31-12-860-008

(2) Pressurize the applicable hydraulic reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801

SUBTASK 29-31-12-860-009

(3) Pressurize the applicable hydraulic system. To pressurize it, do this task: Hydraulic System A or B Pressurization, TASK 29-11-00-860-801.

SUBTASK 29-31-12-790-001

(4) Examine all connections for leaks.

SUBTASK 29-31-12-860-010

(5) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

————— **END OF TASK** —————

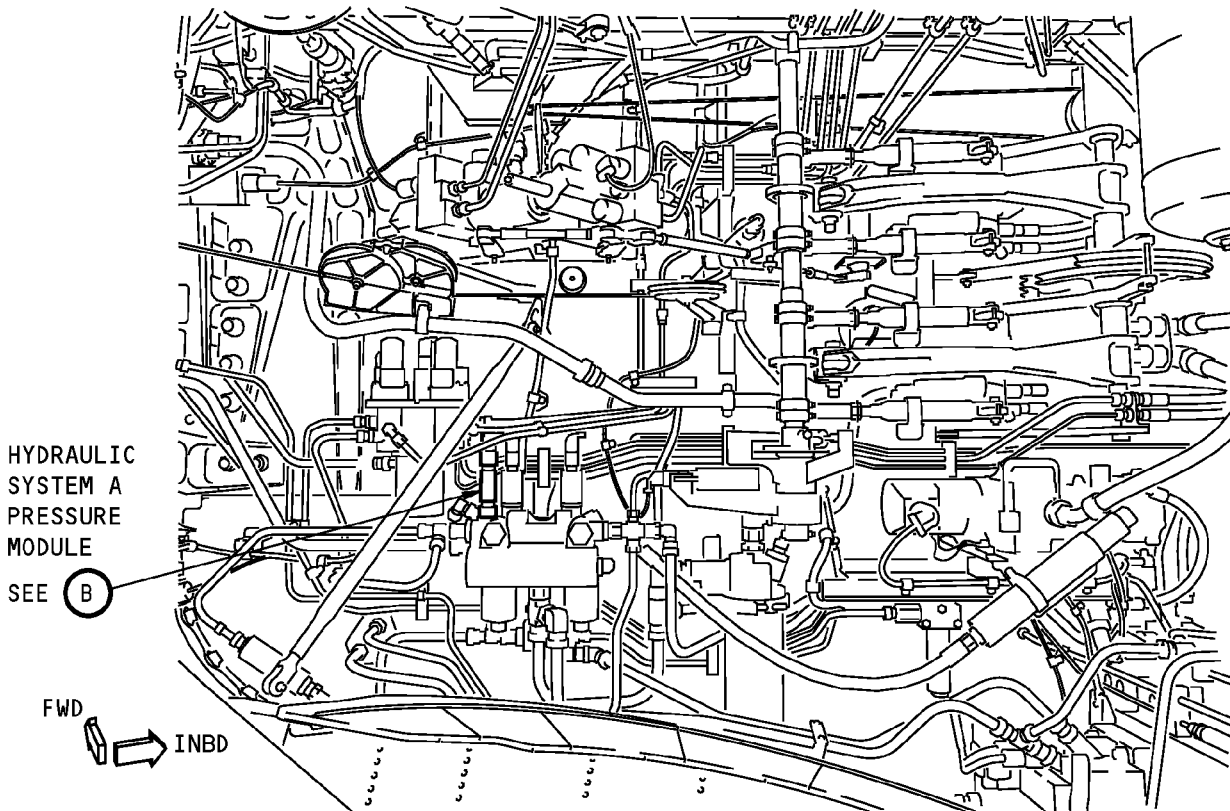
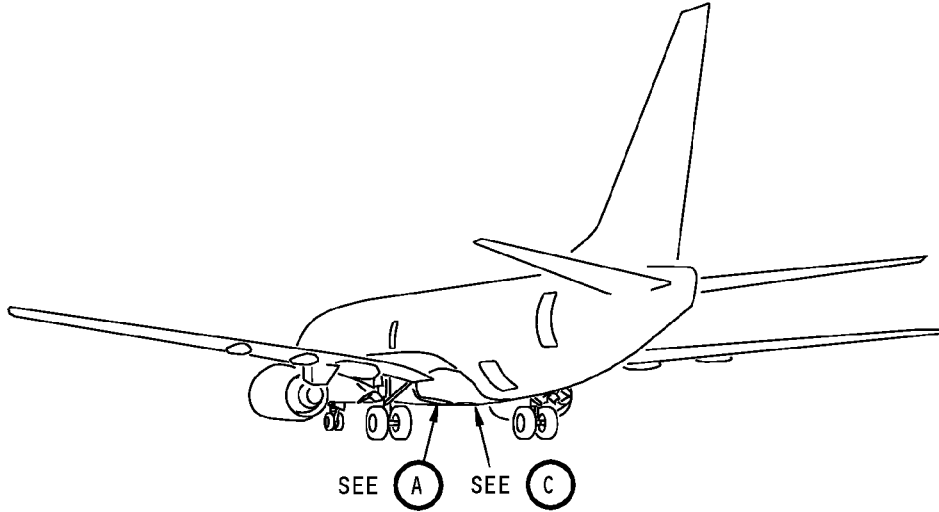
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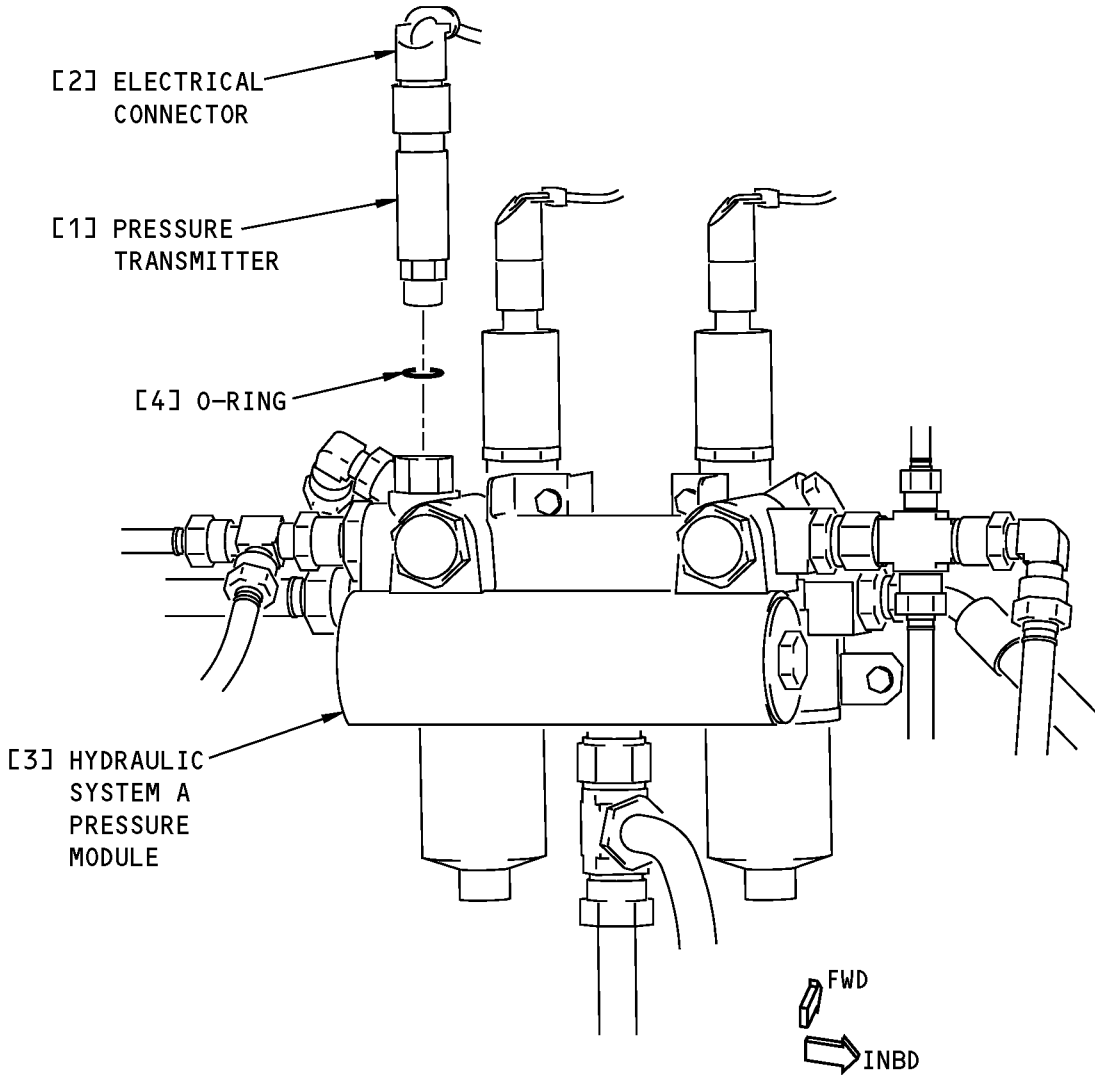
**MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)**

(A)

**System Pressure Transmitter Installation
Figure 401 (Sheet 1 of 4)/29-31-12-990-801**

EFFECTIVITY
HAP ALL

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HYDRAULIC SYSTEM A PRESSURE MODULE

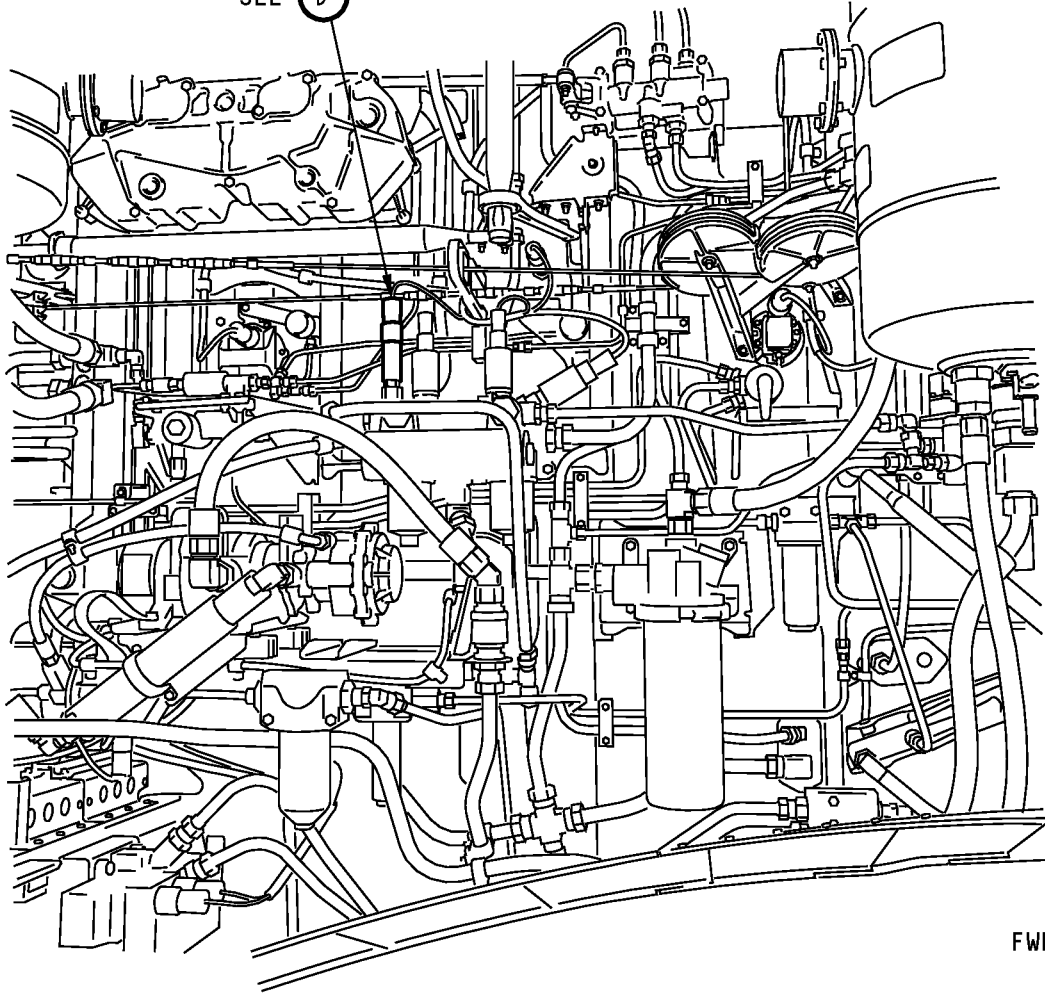
B

**System Pressure Transmitter Installation
Figure 401 (Sheet 2 of 4)/29-31-12-990-801**

EFFECTIVITY
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HYDRAUC
SYSTEM B
PRESSURE
MODULE
SEE (D)



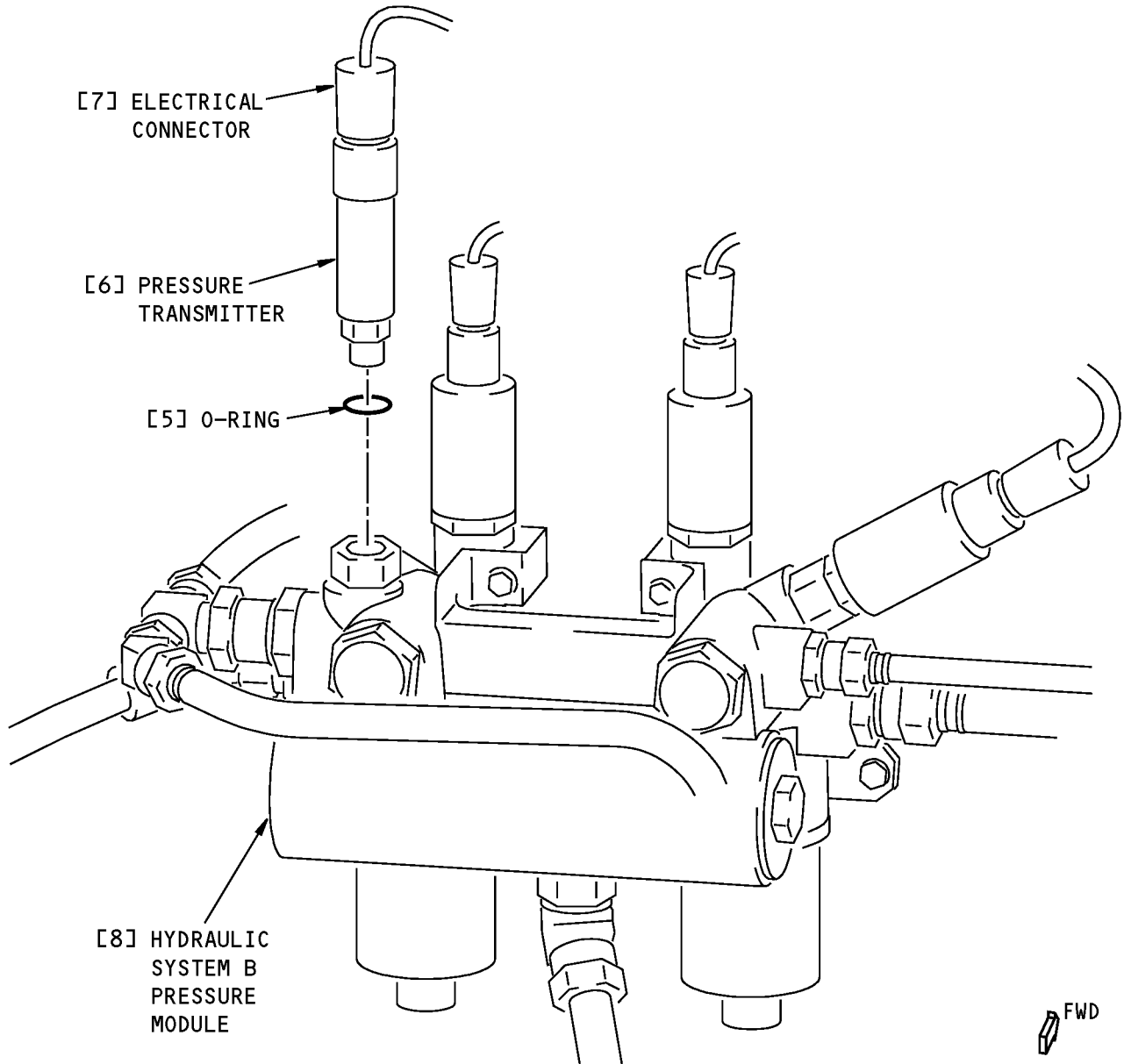
**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

(C)

**System Pressure Transmitter Installation
Figure 401 (Sheet 3 of 4)/29-31-12-990-801**

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HYDRAULIC SYSTEM B PRESSURE MODULE



**System Pressure Transmitter Installation
Figure 401 (Sheet 4 of 4)/29-31-12-990-801**

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HYDRAULIC FLUID OVERHEAT WARNING SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:

NOTE: The Operator/Airline has the option between the Preferred Method or the Alternate Method to complete this task.

- (1) Case Drain Overheat Switch Test (Preferred Method)

NOTE: This test functionally checks the case drain line overheat switches for the Hydraulic System A or B electric motor-driven pump (EMDP) and the associated OVERHEAT lights (ELEC 1 & 2) on the Hydraulic Panel (P5).

- (2) Case Drain Overheat Switch Test (Alternate Method)

NOTE: This test functionally checks the OVERHEAT lights (ELEC 1 & 2) on the Hydraulic Panel (P5) and the associated wiring. It requires the replacement of the case drain line overheat switches for the Hydraulic System A or B electric motor-driven pump (EMDP) with a New or Serviceable switch.

TASK 29-32-00-730-802

2. Case Drain Overheat Switch Test (Preferred Method)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) This test will functionally check the hydraulic system A & B case drain overheat switches and the associated OVERHEAT lights (ELEC 1 & 2) on the Hydraulic Panel (P5).
- (3) With increasing temperature, the overheat switch contacts close at 220 + /-5 degrees F (104.4 + /- 2.8 degrees C). With decreasing temperature, overheat switch contacts open at minimum 165 degrees F (73.9 degrees C). The OVERHEAT lights (ELEC 1 & 2) come on when the overheat switches are closed.

B. References

Reference	Title
29-32-12-000-801	Hydraulic Fluid Overheat Warning Switch Removal (P/B 401)
29-32-12-400-801	Hydraulic Fluid Overheat Warning Switch Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1552	Kit - Heater Probes, TEMPCAL (Part #: BH24944-7, Supplier: 98869, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800)
COM-3924	Tester - Thermo Switch, K-Type Thermocouple Switches (Part #: H294, Supplier: 98869, A/P Effectivity: 737-ALL) (Part #: H394 SERIES, Supplier: 98869, A/P Effectivity: 737-ALL)
COM-3950	Kit - Heater Probe, TEMPCAL (737-600 Only) (Part #: BH24944-11, Supplier: 98869, A/P Effectivity: 737-600)
COM-3951	Kit - Heater Probes, TEMPCAL (737-700 Only) (Part #: BH24944-12, Supplier: 98869, A/P Effectivity: 737-700, -700C, -700ER, -700QC)

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Reference	Description
COM-3952	Kit - Heater Probes, TEMPCAL (737-800 Only) (Part #: BH24944-13, Supplier: 98869, A/P Effectivity: 737-800)

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Case Drain Overheat Switch Test (Hydraulic System A)

SUBTASK 29-32-00-020-002

(1) Remove the system A case drain overheat switch (S798). To remove it, do this task: Hydraulic Fluid Overheat Warning Switch Removal, TASK 29-32-12-000-801.

(a) Make sure that this circuit breaker is open:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	12	C00318	INDICATOR MASTER DIM SECT 6

(b) Reconnect electrical connector D2688 to the overheat switch (S798).

(c) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 29-32-00-480-001

(2) Connect the K-Type thermocouple switch tester, COM-3924 and heater probe BH16440-40 to the overheat switch.

NOTE: The heater probe BH16440-40 is for use with the hydraulic fluid overheat warning switches, and is found in either of these heater probe kits: TEMPCAL heater probe kit, COM-1552, TEMPCAL heater probe kit, COM-3950, TEMPCAL heater probe kit, COM-3951, TEMPCAL heater probe kit, COM-3952

SUBTASK 29-32-00-720-001

(3) Do these steps to functionally check the overheat switch:

NOTE: The following steps should be repeated twice.

(a) Do a check of the overheat switch's actuation "closed" temperature:

- 1) Stabilize the overheat switch temperature at 200 +/-5 degrees F (93.3 +/-2.8 degrees C) for a minimum of two (2) minutes.
- 2) Slowly increase the overheat switch temperature at a rate of 5 +/-1 degrees F/minute (2.8 +/-0.6 degrees C/minute) until the OVERHEAT light (ELEC 2) on the Hydraulic Panel (P5) comes on.
- 3) Make a record of the temperature when OVERHEAT light (ELEC 2) came on.

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- 4) Make sure the overheat switch actuated "closed" at a temperature of 220 +/-5 degrees F (104.4 +/-2.8 degrees C) when the OVERHEAT light (ELEC 2) came on.
(b) Do a check of the overheat switch's actuation "open" temperature:
1) Slowly decrease the overheat switch temperature at a rate of 5 +/-1 degrees F/minute (2.8 +/-0.6 degrees C/minute) until the OVERHEAT light (ELEC 2) on the Hydraulic Panel (P5) goes off.
2) Make a record of the temperature when OVERHEAT light (ELEC 2) went off.
3) Make sure the overheat switch actuated "open" at a temperature no less than 165 degrees F (73.9 degrees C) when the OVERHEAT light (ELEC 2) went off.
(c) Make sure there is no less than 5 degrees F (2.8 degrees C) of temperature differential between the recorded temperatures of the overheat switch "closed" and "open" actuations.
(d) Do each of the above steps a second time.

SUBTASK 29-32-00-080-001

- (4) Disconnect the K-Type thermocouple switch tester, COM-3924 and heater probe BH16440-40 from the overheat switch.

SUBTASK 29-32-00-420-001

- (5) Reinstall the system A case drain overheat switch (S798):

- (a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 12, C00318, INDICATOR MASTER DIM SECT 6

- (b) Disconnect electrical connector D2688 from overheat switch (S798).
(c) Install the system A case drain overheat switch (S798). To install it, do this task: Hydraulic Fluid Overheat Warning Switch Installation, TASK 29-32-12-400-801.
(d) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 12, C00318, INDICATOR MASTER DIM SECT 6

F. Case Drain Overheat Switch Test (Hydraulic System B)

SUBTASK 29-32-00-020-003

- (1) Remove the system B case drain overheat switch (S799). To remove it, do this task: Hydraulic Fluid Overheat Warning Switch Removal, TASK 29-32-12-000-801.

- (a) Make sure that this circuit breaker is open:

F/O Electrical System Panel, P6-3

Table with 4 columns: Row, Col, Number, Name. Row 1: F, 11, C00317, INDICATOR MASTER DIM SECT 5

- (b) Reconnect electrical connector D2690 to the overheat switch (S799).

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(c) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

SUBTASK 29-32-00-480-002

(2) Connect the K-Type thermocouple switch tester, COM-3924 and heater probe BH16440-40 to the overheat switch.

NOTE: The heater probe BH16440-40 is for use with the hydraulic fluid overheat warning switches, and is found in either of these heater probe kits: TEMPCAL heater probe kit, COM-1552, TEMPCAL heater probe kit, COM-3950, TEMPCAL heater probe kit, COM-3951, TEMPCAL heater probe kit, COM-3952

SUBTASK 29-32-00-720-002

(3) Do these steps to functionally check the overheat switch:

NOTE: The following steps should be repeated twice.

(a) Do a check of the overheat switch's actuation "closed" temperature:

- 1) Stabilize the overheat switch temperature at 200 +/-5 degrees F (93.3 +/-2.8 degrees C) for a minimum of two (2) minutes.
- 2) Slowly increase the overheat switch temperature at a rate of 5 +/-1 degrees F/minute (2.8 +/-0.6 degrees C/minute) until the OVERHEAT light (ELEC 1) on the Hydraulic Panel (P5) comes on.
- 3) Make a record of the temperature when OVERHEAT light (ELEC 1) came on.
- 4) Make sure the overheat switch actuated "closed" at a temperature of 220 +/-5 degrees F (104.4 +/-2.8 degrees C) when the OVERHEAT light (ELEC 1) came on.

(b) Do a check of the overheat switch's actuation "open" temperature:

- 1) Slowly decrease the overheat switch temperature at a rate of 5 +/-1 degrees F/minute (2.8 +/-0.6 degrees C/minute) until the OVERHEAT light (ELEC 1) on the Hydraulic Panel (P5) goes off.
- 2) Make a record of the temperature when OVERHEAT light (ELEC 1) went off.
- 3) Make sure the overheat switch actuated "open" at a temperature no less than 165 degrees F (73.9 degrees C) when the OVERHEAT light (ELEC 1) went off.

(c) Make sure there is no less than 5 degrees F (2.8 degrees C) of temperature differential between the recorded temperatures of the overheat switch "closed" and "open" actuations.

(d) Do each of the above steps a second time.

SUBTASK 29-32-00-080-002

(4) Disconnect the K-Type thermocouple switch tester, COM-3924 and heater probe BH16440-40 from the overheat switch.

SUBTASK 29-32-00-420-002

(5) Reinstall the system B case drain overheat switch (S799):

(a) Make sure that this circuit breaker is open:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

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- (b) Disconnect electrical connector D2690 from overheat switch (S799).
- (c) Install the system B case drain overheat switch (S799). To install it, do this task: Hydraulic Fluid Overheat Warning Switch Installation, TASK 29-32-12-400-801.
- (d) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	11	C00317	INDICATOR MASTER DIM SECT 5

————— END OF TASK —————

TASK 29-32-00-730-803

3. Case Drain Overheat Switch Test (Alternate Method)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) This test will functionally check the OVERHEAT lights (ELEC 1 & 2) on the Hydraulic Panel (P5) and the associated wiring.

NOTE: The case drain overheat switch for hydraulic system A & B must be replaced with either a New or Serviceable switch when this test method is chosen.

B. References

Reference	Title
29-32-12-000-801	Hydraulic Fluid Overheat Warning Switch Removal (P/B 401)
29-32-12-400-801	Hydraulic Fluid Overheat Warning Switch Installation (P/B 401)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Case Drain Overheat Switch Test (Hydraulic System A)

SUBTASK 29-32-00-020-004

- (1) Remove the system A case drain overheat switch (S798). To remove it, do this task: Hydraulic Fluid Overheat Warning Switch Removal, TASK 29-32-12-000-801.
 - (a) Make sure that this circuit breaker is open:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	12	C00318	INDICATOR MASTER DIM SECT 6

- (b) On connector D2688 install a jumper wire from pin A to pin B.

NOTE: This will simulate a closed case drain overheat switch.

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- (c) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	12	C00318	INDICATOR MASTER DIM SECT 6

- (d) Make sure the OVERHEAT light (ELEC 2) on the Hydraulic Panel (P5) came on.

- (e) Make sure that this circuit breaker is open:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	12	C00318	INDICATOR MASTER DIM SECT 6

- (f) On connector D2688 remove the jumper wire from pin A to pin B.

- (g) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	12	C00318	INDICATOR MASTER DIM SECT 6

- (h) Make sure the OVERHEAT light (ELEC 2) on the Hydraulic Panel (P5) went off.

- (i) Install a New or Serviceable system A case drain overheat switch (S798). To install it, do this task: Hydraulic Fluid Overheat Warning Switch Installation, TASK 29-32-12-400-801.

E. Case Drain Overheat Switch Test (Hydraulic System B)

SUBTASK 29-32-00-020-005

- (1) Remove the system B case drain overheat switch (S799). To remove it, do this task: Hydraulic Fluid Overheat Warning Switch Removal, TASK 29-32-12-000-801.

- (a) Make sure that this circuit breaker is open:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

- (b) On connector D2690 install a jumper wire from pin A to pin B.

NOTE: This will simulate a closed case drain overheat switch.

- (c) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

- (d) Make sure the OVERHEAT light (ELEC 1) on the Hydraulic Panel (P5) came on.

- (e) Make sure that this circuit breaker is open:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

- (f) On connector D2690 remove the jumper wire from pin A to pin B.

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(g) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

(h) Make sure the OVERHEAT light (ELEC 1) on the Hydraulic Panel (P5) went off.

(i) Install a New or Serviceable system B case drain overheat switch (S799). To install it, do this task: Hydraulic Fluid Overheat Warning Switch Installation, TASK 29-32-12-400-801.

————— **END OF TASK** —————

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HYDRAULIC FLUID OVERHEAT WARNING SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the hydraulic fluid overheat warning switch (referred as the overheat switch in this procedure)
- (2) An installation of the hydraulic fluid overheat warning switch.

B. There is one overheat switch for hydraulic system A and hydraulic system B. The overheat switches are installed in systems A and B EMDP case drain lines. You can find these overheat switches directly below the pump on the forward wheel well bulkhead.

TASK 29-32-12-000-801

2. Hydraulic Fluid Overheat Warning Switch Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Procedure

SUBTASK 29-32-12-860-001

- (1) Release the pressure from the applicable reservoir, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-32-12-860-002

- (2) For hydraulic system A,

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	11	C00317	INDICATOR MASTER DIM SECT 5
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 29-32-12-860-008

- (3) For hydraulic system B,

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	11	C00317	INDICATOR MASTER DIM SECT 5
F	12	C00318	INDICATOR MASTER DIM SECT 6

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SUBTASK 29-32-12-020-001

- (4) Disconnect the supply line quick-disconnect to prevent high leakage of fluid.

NOTE: You can find the quick-disconnect for system A at the reservoir and the quick-disconnect for system B at the EMDP.

SUBTASK 29-32-12-020-002

- (5) Remove the electrical connector from the overheat switch [2].

SUBTASK 29-32-12-480-001

- (6) Install a protective cap on the electrical connector.

SUBTASK 29-32-12-020-003

- (7) Remove the overheat switch [2] from the switch tee.

SUBTASK 29-32-12-020-004

- (8) Discard the packing [1].

SUBTASK 29-32-12-420-001

- (9) Install a cover on the open port of the tee fitting.

————— **END OF TASK** —————

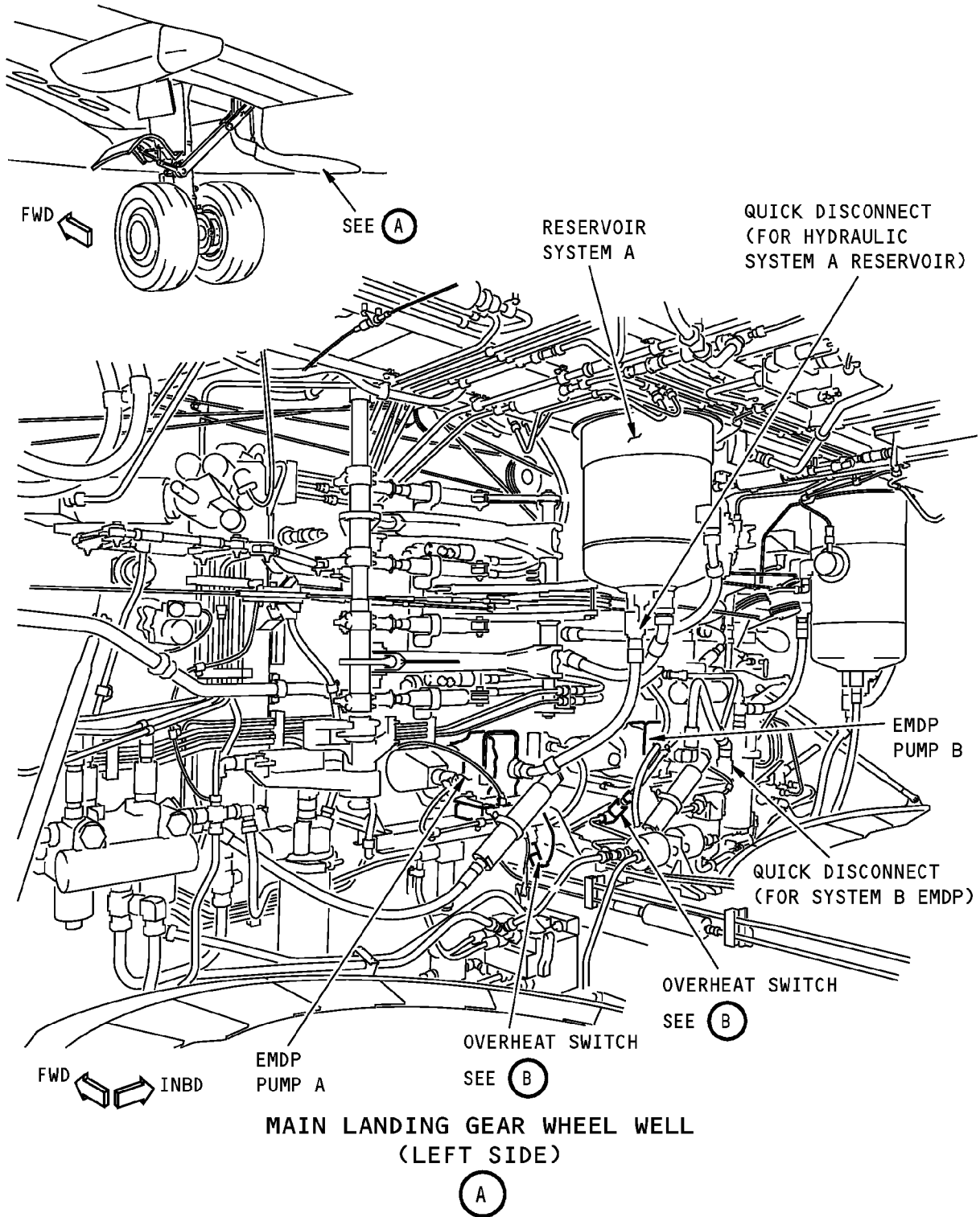
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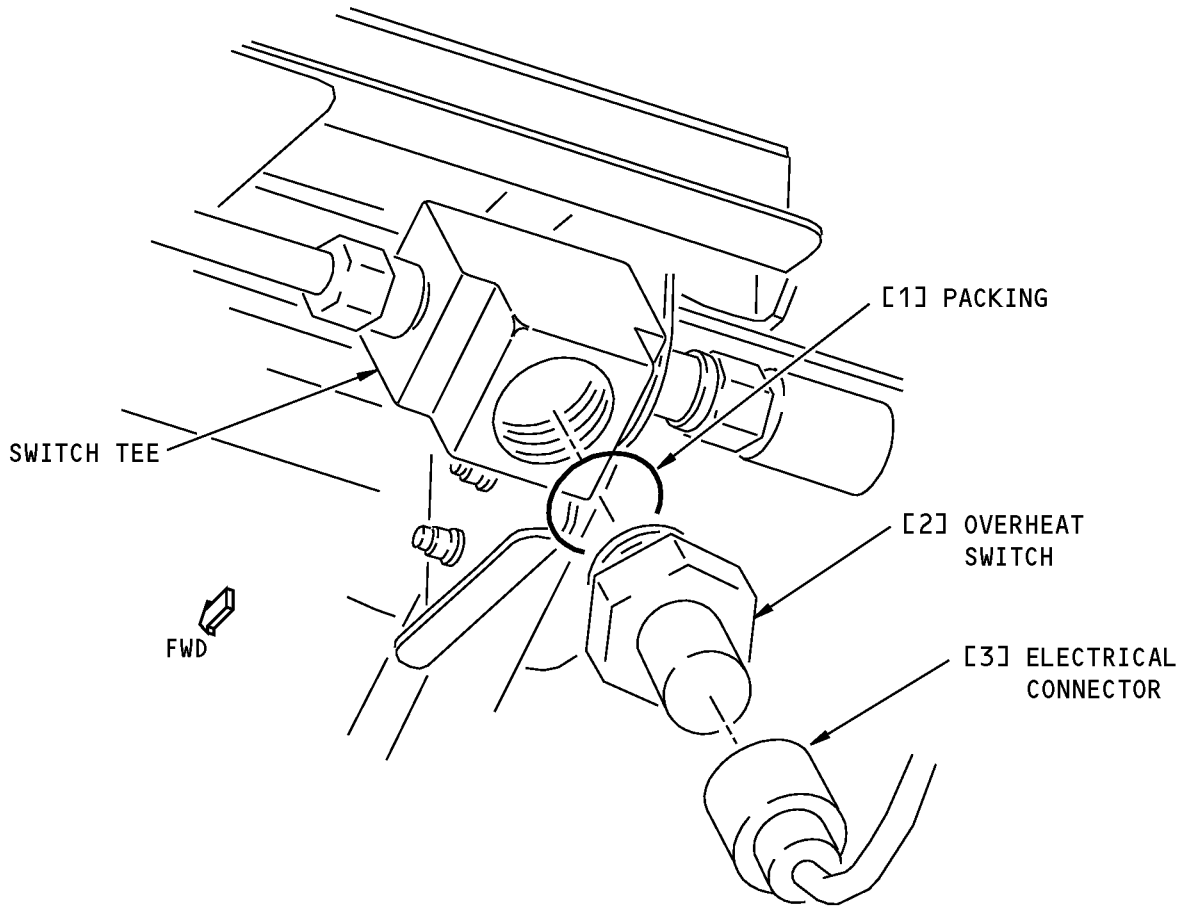
**Hydraulic Fluid Overheat Warning Switch Installation
Figure 401 (Sheet 1 of 2)/29-32-12-990-801**

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**OVERHEAT SWITCH
(EXAMPLE)**

B

**Hydraulic Fluid Overheat Warning Switch Installation
Figure 401 (Sheet 2 of 2)/29-32-12-990-801**

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TASK 29-32-12-400-801

3. Hydraulic Fluid Overheat Warning Switch Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-00-860-803	Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-32-12-640-001

(1) Apply fluid, D00153 to the new packings [1] and the fittings threads.

SUBTASK 29-32-12-420-002

(2) Install the new packing [1] and the overheat switch [2] in the open port of the tee fitting.

SUBTASK 29-32-12-080-001

(3) Remove the protective cap from the electrical connector.

SUBTASK 29-32-12-420-004

(4) Connect the electrical connector [3] to the overheat switch [2].

SUBTASK 29-32-12-860-003

(5) For hydraulic system A:

(a) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 29-32-12-860-009

(6) For hydraulic system B:

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(a) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

SUBTASK 29-32-12-420-005

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

(7) Connect the supply line quick-disconnect.

E. Hydraulic Fluid Overheat Warning Switch Installation Test

SUBTASK 29-32-12-600-001

(1) If it is necessary fill the hydraulic reservoir. To fill it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-32-12-860-004

(2) Pressurize the applicable hydraulic reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-32-12-860-005

(3) For the applicable hydraulic system, do this task: Hydraulic System Pressurization with an Electric Motor-Driven Pump (EMDP), TASK 29-11-00-860-803.

SUBTASK 29-32-12-790-001

(4) Examine the overheat switch [2] for leaks.

SUBTASK 29-32-12-860-006

(5) For the applicable hydraulic system, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-32-12-860-007

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— END OF TASK —————

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HYDRAULIC FLUID QUANTITY TRANSMITTER/INDICATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the hydraulic fluid quantity transmitter/indicator
- (2) An installation of the hydraulic fluid quantity transmitter/indicator.

TASK 29-33-12-000-801

2. Hydraulic Fluid Quantity Transmitter/Indicator Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

B. Tools/Equipment

Reference	Description
STD-3901	Container - Hydraulic Fluid Resistant, 50 Gallon (190 l)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-33-12-860-002

- (1) Remove the power from the applicable hydraulic system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.

SUBTASK 29-33-12-860-010

- (2) If the hydraulic system B fluid quantity transmitter/indicator is being removed, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 29-33-12-860-003

- (3) Release the pressure from the applicable hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-33-12-020-002

WARNING: DO NOT CLOSE THE DRAIN VALVE UNTIL YOU REPLACE THE TRANSMITTER. IF YOU CLOSE THE DRAIN VALVE, FLUID CAN COLLECT IN THE RESERVOIR AND GET ON PERSONS AND EQUIPMENT WHEN YOU REMOVE THE TRANSMITTER. THIS CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) Open the drain valve.

NOTE: Do not close the drain valve until you replace the transmitter [1].

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SUBTASK 29-33-12-860-004

- (5) Drain the applicable system reservoir into a 50 Gallon (190 l) hydraulic fluid resistant container, STD-3901.

SUBTASK 29-33-12-860-005

- (6) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	11	C01360	DISPLAY DEU 2 PRI

SUBTASK 29-33-12-020-003

- (7) Disconnect the electrical connector [2].

SUBTASK 29-33-12-020-006

- (8) Install a protective cap on the electrical connector [2].

SUBTASK 29-33-12-020-007

- (9) Remove the mounting bolts [3], the washers [4] (under the bolthead), the washers [6] (under the nut) and the nut [7].

SUBTASK 29-33-12-020-005

CAUTION: MAKE SURE THE TRANSMITTER FLOAT DOES NOT TOUCH THE INTERNAL STAND PIPE. IF THE TRANSMITTER FLOAT TOUCHES THE INTERNAL STAND PIPE, DAMAGE TO THE TRANSMITTER FLOAT CAN OCCUR.

- (10) Carefully remove the transmitter [1] from the reservoir through the reservoir opening.

SUBTASK 29-33-12-020-008

- (11) Remove the packing [5].

SUBTASK 29-33-12-020-009

- (12) Discard the packing [5].

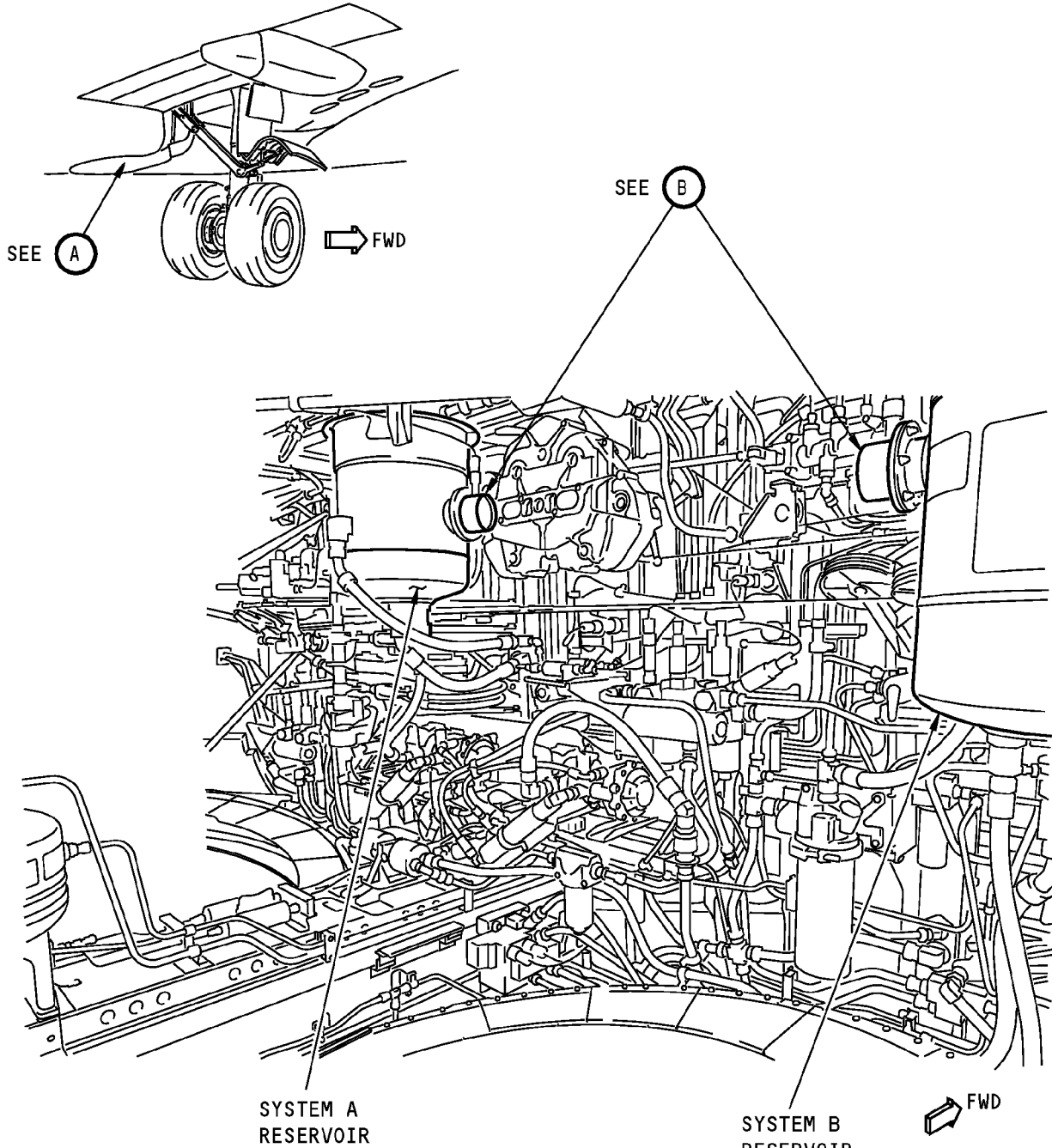
————— **END OF TASK** —————

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SYSTEM A
RESERVOIR

SYSTEM B
RESERVOIR

FWD

MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)

A

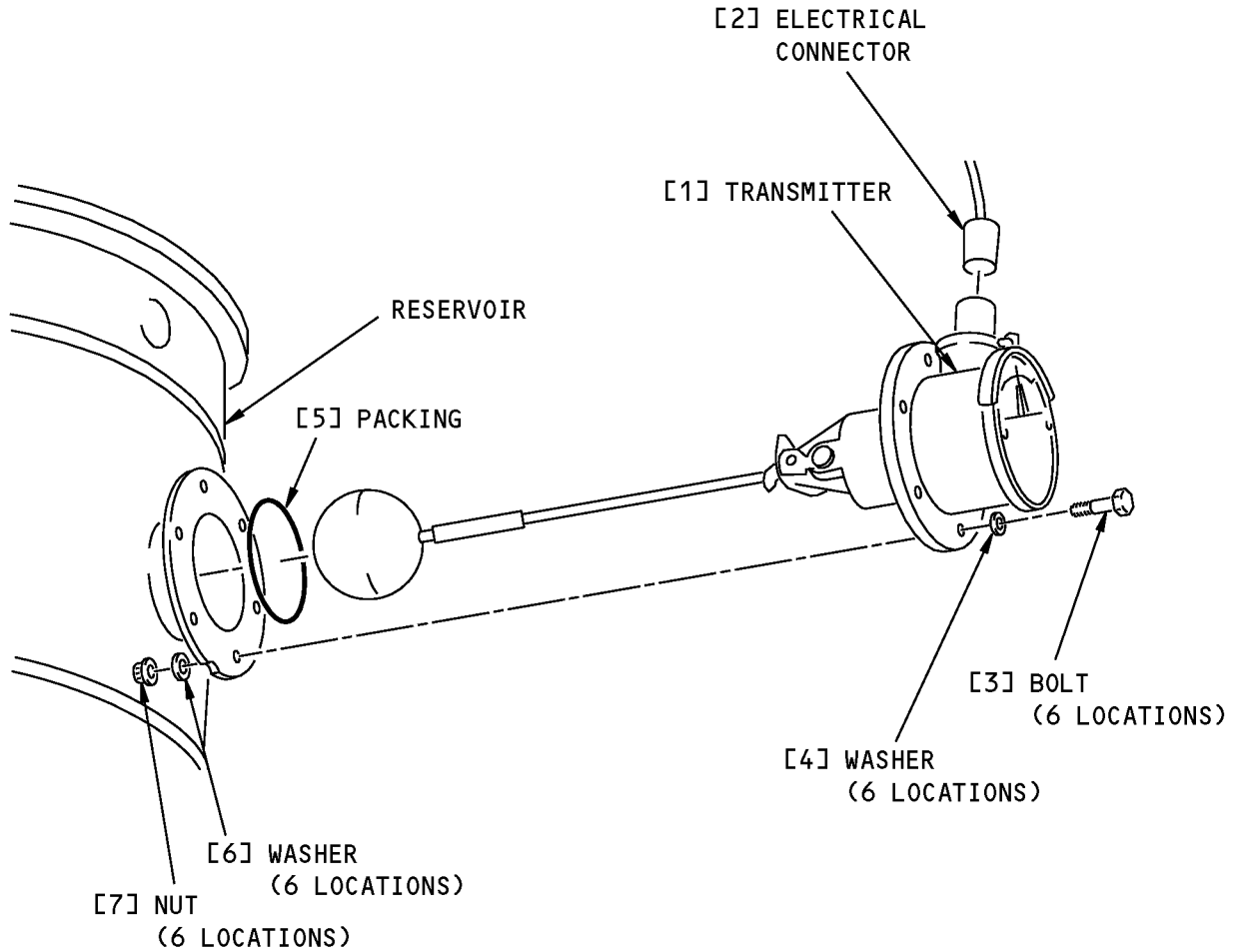
Hydraulic Fluid Quantity Transmitter/Indicator Installation
Figure 401 (Sheet 1 of 2)/29-33-12-990-801

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EXAMPLE

(B)

**Hydraulic Fluid Quantity Transmitter/Indicator Installation
Figure 401 (Sheet 2 of 2)/29-33-12-990-801**

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TASK 29-33-12-400-801

3. Hydraulic Fluid Quantity Transmitter/Indicator Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Procedure

SUBTASK 29-33-12-210-003

- (1) Make sure the mounting surfaces on the reservoir flange and the transmitter [1] are clean and free of nicks.

SUBTASK 29-33-12-420-003

- (2) Install the new packing [5] on the flange of the transmitter [1].

SUBTASK 29-33-12-420-004

CAUTION: MAKE SURE THE TRANSMITTER FLOAT DOES NOT TOUCH THE INTERNAL STAND PIPE. IF THE TRANSMITTER FLOAT TOUCHES THE INTERNAL STAND PIPE, DAMAGE TO THE TRANSMITTER FLOAT CAN OCCUR.

- (3) Carefully install the float of the transmitter [1] in the reservoir opening.

SUBTASK 29-33-12-420-005

- (4) Put the transmitter [1] in its mounting position.

SUBTASK 29-33-12-420-010

- (5) Remove the protective cap from the electrical connector.

SUBTASK 29-33-12-420-006

- (6) Install the bolts [3], the washers [4] (under the bolthead), the washers [6] (under the nut) and the nuts [7].

SUBTASK 29-33-12-420-007

- (7) Install the electrical connector [2].

SUBTASK 29-33-12-420-008

- (8) Close the reservoir drain valve.

SUBTASK 29-33-12-420-009

- (9) Install the lockwire.

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D. Hydraulic Fluid Quantity Transmitter/Indicator Installation Test

SUBTASK 29-33-12-860-006

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-33-12-860-007

(2) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	5	C01359	DISPLAY DEU 1 PRI

F/O Electrical System Panel, P6-1

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	11	C01360	DISPLAY DEU 2 PRI

SUBTASK 29-33-12-210-004

(3) Make sure the indicators in the flight deck and at the reservoir show zero.

NOTE: It is a failure indication if the indicators show a value below zero.

SUBTASK 29-33-12-610-002

(4) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-33-12-860-008

(5) Do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-33-12-790-001

(6) Examine the connections for leaks.

SUBTASK 29-33-12-210-005

(7) With the indicators on the reservoir transmitters [1] serviced to the F (full) position, make sure the quantity indication shown on the engine display in the flight deck shows 100 ± 9%.

SUBTASK 29-33-12-860-009

(8) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— END OF TASK —————

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HYDRAULIC FLUID QUANTITY TRANSMITTER/INDICATOR - INSPECTION/CHECK

1. General

- A. This procedure has a task for the inspection of the hydraulic fluid quantity transmitter.
- B. A hydraulic fluid quantity transmitter is installed on the side of both the system A and B reservoir. The transmitter sends signals to the systems display. The quantity information shows as a percentage of full on the systems display, for the hydraulic systems A and B.

TASK 29-33-12-200-801

2. Hydraulic Fluid Quantity Transmitter/Indicator Inspection

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

D. Procedure

SUBTASK 29-33-12-860-001

- (1) Release pressure from the applicable hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-33-12-020-001

- (2) Open the drain valve on the bottom of the hydraulic reservoir.

SUBTASK 29-33-12-680-001

- (3) Drain the fluid into a 10 gallon (38 l) fuel resistant container, STD-200.

SUBTASK 29-33-12-420-001

- (4) Close the drain valve.

SUBTASK 29-33-12-420-002

- (5) Install lockwire.

SUBTASK 29-33-12-610-001

- (6) Slowly fill the applicable hydraulic reservoir with the fluid quantity specified below. To fill it, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

NOTE: The fluid quantities are correct only if all supply and return lines to the reservoir are full.

- (a) The fluid quantity must be 5.7 gallons (21.6 liters) for system A.
- (b) The fluid quantity must be 8.2 gallons (31.1 liters) for system B.

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SUBTASK 29-33-12-210-001

- (7) Make sure the fluid level on the transmitter indicator and the cockpit indicator increases as you fill the reservoir.
- (a) If the fluid level does not increase, refer to the Observed Fault List in the FIM.

SUBTASK 29-33-12-210-002

- (8) Make sure the indicators on the transmitters show full when the system A reservoir is 5.7 gallons (21.6 liters) and system B reservoir is 8.2 gallons (31.1 liters).
- (a) When the indicators on the reservoir transmitters show full, make sure that the HYD Q % indicators on the Systems display show $100 \pm 9\%$.
- (b) If the transmitters and/or the engine display fail to meet these requirements, refer to the the Observed Fault List in the FIM.

————— **END OF TASK** —————

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STANDBY HYDRAULIC SYSTEM RESERVOIR LOW QUANTITY SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the low quantity switch for the standby hydraulic system reservoir
- (2) An installation of the low quantity switch.

B. The low quantity switch is installed on top of the standby hydraulic reservoir found above the keel beam in the wheel well area.

TASK 29-33-21-000-801

2. Standby Reservoir Low Quantity Switch Removal

(Figure 401)

A. References

Reference	Title
12-40-00-100-801	Clean the External Surfaces of the Airplane (P/B 201)
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1795	Lockset - Reservoir Vent Valve (Part #: B29002-5, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700QC, -800, -900, -BBJ)
STD-1154	Container - 5 Gallon (19 Liters)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Prepare for the Removal

SUBTASK 29-33-21-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	12	C00132	MASTER CAUTION ANNUNCIATOR BUS 1
B	13	C00131	MASTER CAUTION ANNUNCIATOR BAT
D	12	C00310	INDICATOR MASTER DIM BAT
D	13	C00311	INDICATOR MASTER DIM BUS 1
D	14	C00312	INDICATOR MASTER DIM BUS 2
E	11	C00313	INDICATOR MASTER DIM SECT 1
E	12	C00314	INDICATOR MASTER DIM SECT 2
E	13	C00315	INDICATOR MASTER DIM SECT 3
E	14	C00316	INDICATOR MASTER DIM SECT 4

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<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 29-33-21-860-002

- (2) Remove the hydraulic power from system B and the standby system:
 - (a) Do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805.
 - (b) Do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

SUBTASK 29-33-21-860-003

- (3) Release pressure from the system B hydraulic reservoir:
 - (a) Do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

SUBTASK 29-33-21-480-001

- (4) Install the lockset, SPL-1795 on the system B depressurization valve when the valve is open.

SUBTASK 29-33-21-020-001

- (5) Do these steps to drain the standby hydraulic reservoir:

CAUTION: MAKE SURE THAT YOU PULL DOWN ON THE KNURLED RING OF THE SELF-SEAL DISCONNECT BEFORE YOU TURN IT FOR REMOVAL. IF YOU DO NOT DO THIS, TOO MUCH TORQUE WILL BE NECESSARY TO TURN THE RING WHICH WILL DAMAGE THE SELF-SEAL DISCONNECT.

- (a) Disconnect the supply line for the standby hydraulic pump at the quick-disconnect at the bottom of the standby hydraulic reservoir.
- (b) If a spare quick-disconnect hose assembly is available, do the following steps:
 - 1) Put the hose end of the spare quick-disconnect hose assembly into 5 gallon (19 liter) container, STD-1154.
 - 2) Connect the quick-disconnect end of the spare hose assembly to the standby reservoir.
- (c) If a spare quick-disconnect hose is not available, do the following steps:
 - 1) Disconnect the supply hose at the standby hydraulic pump.

NOTE: To disconnect the supply hose from the pump, follow the steps in the standby hydraulic pump removal procedure (reference 29-21-21-4) to remove the supply hose.

- 2) Put the end of the standby pump supply hose into a 5 gallon (19 liter) container, STD-1154.

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

- 3) Connect the quick-disconnect end of the supply hose to the standby reservoir.

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(d) Drain the hydraulic fluid into the 5 gallon (19 liter) container, STD-1154.

NOTE: The standby hydraulic reservoir contains approximately 3.6 gallons (13.6 liters).

SUBTASK 29-33-21-080-002

(6) If a spare quick-disconnect hose assembly was used to drain the standby hydraulic reservoir, do these steps:

(a) Remove the spare quick-disconnect hose assembly.

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

(b) Connect the supply line for the standby hydraulic pump at the quick-disconnect at the bottom of the standby hydraulic reservoir.

SUBTASK 29-33-21-080-003

(7) If the supply hose to the standby hydraulic pump was disconnected to drain the standby reservoir, connect it to the supply port of the pump.

NOTE: To connect the supply hose to the pump, follow the steps in the standby hydraulic pump installation procedure (reference 29-21-21-4) to install the supply hose.

SUBTASK 29-33-21-420-007

CAUTION: MAKE SURE THE DISCONNECT POPPET IS STRAIGHT BEFORE YOU INSTALL THE HOSE HALF OF THE SELF-SEAL DISCONNECT. IF TOO MUCH TORQUE IS NECESSARY TO DO THE INSTALLATION, DISCONNECT THE SELF-SEAL DISCONNECT AND AGAIN MAKE SURE THE POPPET IS STRAIGHT. AFTER THE INSTALLATION, MAKE SURE THE INDICATOR PINS EXTEND A MINIMUM OF 0.06 INCH. IF THE INDICATOR PINS ARE NOT CORRECTLY EXTENDED, FLUID FLOW WILL BE DECREASED OR STOPPED. THIS CAN CAUSE DAMAGE TO THE RESERVOIR OR THE PUMP.

(8) Connect the supply line for the standby hydraulic pump at the quick-disconnect at the bottom of the standby hydraulic reservoir.

SUBTASK 29-33-21-160-001

(9) If you get hydraulic fluid on the airplane, do this task: Clean the External Surfaces of the Airplane, TASK 12-40-00-100-801.

E. Procedure

SUBTASK 29-33-21-020-002

(1) Remove the electrical connector [1] from the low quantity switch [2].

SUBTASK 29-33-21-480-002

(2) Install a protective cap on the electrical connector.

SUBTASK 29-33-21-020-003

(3) Remove the low quantity switch [2] from the standby hydraulic system reservoir [4].

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SUBTASK 29-33-21-020-004

(4) Remove the packing [3].

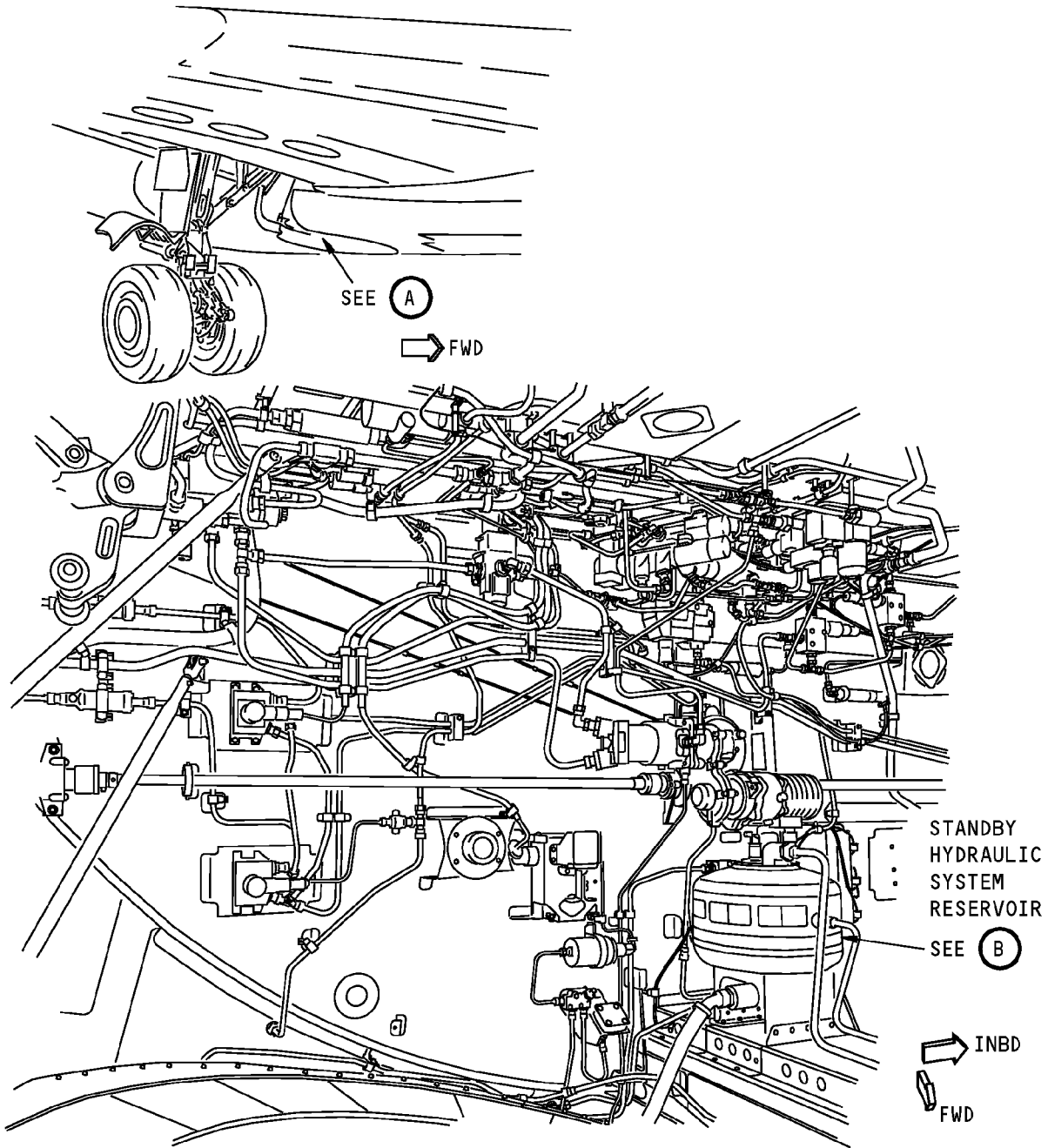
————— **END OF TASK** —————

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**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

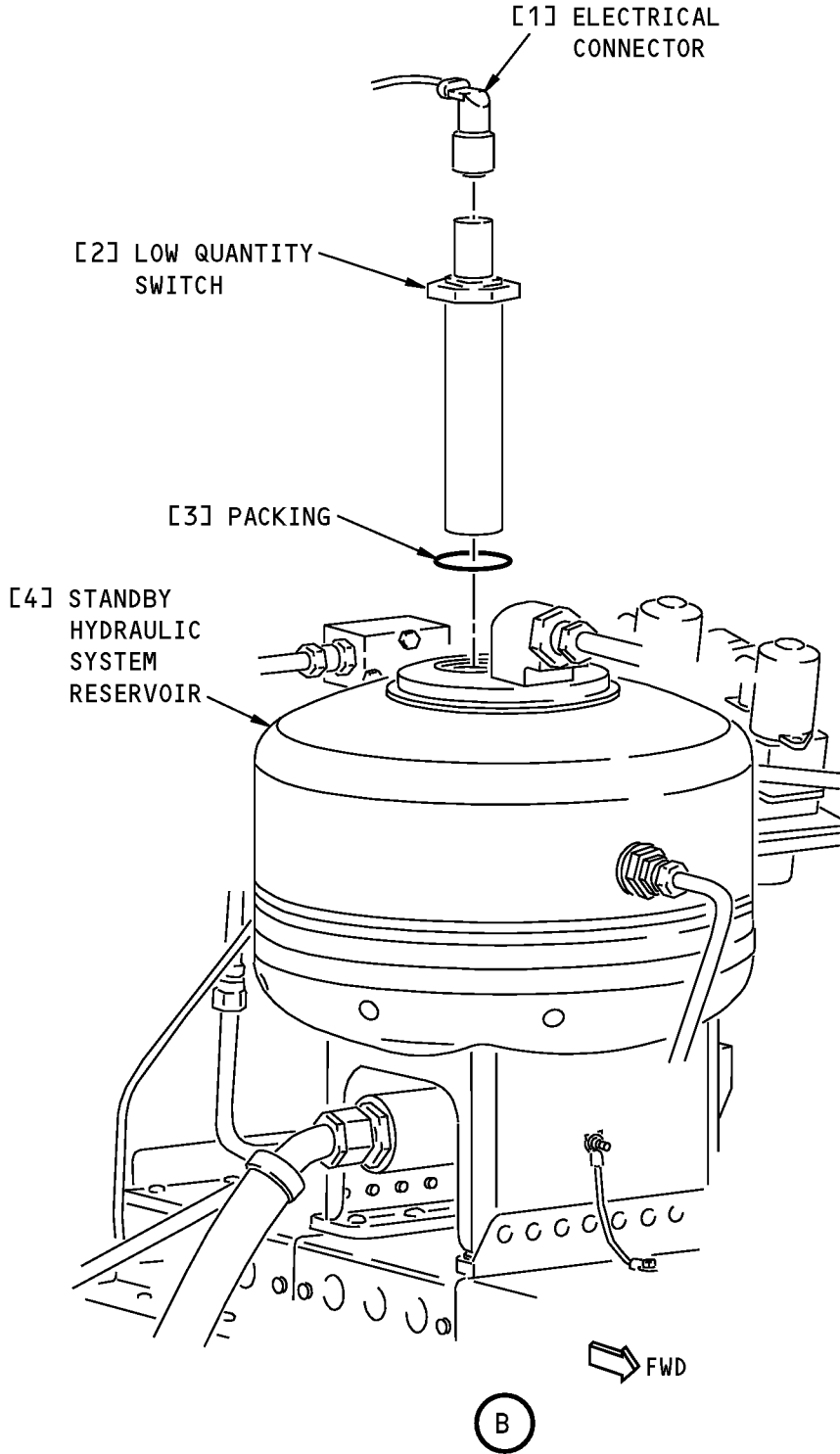
(A)

**Standby Hydraulic System Reservoir Low Quantity Switch Installation
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**Standby Hydraulic System Reservoir Low Quantity Switch Installation
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TASK 29-33-21-400-801

3. Standby Reservoir Low Quantity Switch Installation

(Figure 401)

A. References

Reference	Title
12-12-00-610-801	Hydraulic Reservoir Servicing (P/B 301)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
SWPM 20-60-03	Special Protection of Electrical Connectors

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1795	Lockset - Reservoir Vent Valve (Part #: B29002-5, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700QC, -800, -900, -BBJ)

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)
G50170	Compound - Corrosion Inhibiting Compound, Soft Film, Exterior Use - AV25	
G50171	Compound - Corrosion Inhibiting Compound, Interior Application - D5026NS or ZC-026	

D. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

E. Procedure

SUBTASK 29-33-21-640-001

- (1) Apply MCS 352B fluid, D00054 or fluid, D00153 to the new packing [3].

SUBTASK 29-33-21-420-001

- (2) Install the new packing [3] on the low quantity switch [2].

SUBTASK 29-33-21-420-002

- (3) Install the low quantity switch [2] in the port on top of the standby hydraulic reservoir [4].

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(a) Tighten the low quantity switch [2].

SUBTASK 29-33-21-390-001

(4) Apply a fillet seal of sealant, A00247 around the hex nut of the low quantity switch [2].

SUBTASK 29-33-21-420-008

(5) Remove the protective cap from the electrical connector [1].

SUBTASK 29-33-21-210-004

(6) Before you connect the electrical connector [1], examine the connector for corrosion.

WARNING: DO THE STEPS BELOW IF THE AIRPLANE OPERATES AT AIRPORTS WHERE DEICING FLUID THAT CONTAIN POTASSIUM FORMATE IS USED. ALSO DO THE STEPS FOR ALL AIRPLANES THAT YOU FOUND CORROSION IN THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL. THE ELECTRICAL CONNECTOR IS PART OF A SYSTEM THAT IS NECESSARY FOR SAFE FLIGHT.

(a) If there was corrosion, refer to (SWPM 20-60-03) to correct the problem.

(b) Apply the D5026NS or ZC-026 compound, G50171 to the connector (SWPM 20-60-03).

SUBTASK 29-33-21-420-003

(7) Install the electrical connector [1] to the low quantity switch [2].

SUBTASK 29-33-21-420-004

(8) Remove the cap from the hydraulic reservoir quick-disconnect.

F. Standby Hydraulic System Reservoir Low Quantity Switch Installation Test

SUBTASK 29-33-21-860-004

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-33-21-860-005

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C00132	MASTER CAUTION ANNUNCIATOR BUS 1
B	13	C00131	MASTER CAUTION ANNUNCIATOR BAT
D	12	C00310	INDICATOR MASTER DIM BAT
D	13	C00311	INDICATOR MASTER DIM BUS 1
D	14	C00312	INDICATOR MASTER DIM BUS 2
E	11	C00313	INDICATOR MASTER DIM SECT 1
E	12	C00314	INDICATOR MASTER DIM SECT 2
E	13	C00315	INDICATOR MASTER DIM SECT 3
E	14	C00316	INDICATOR MASTER DIM SECT 4
F	11	C00317	INDICATOR MASTER DIM SECT 5
F	12	C00318	INDICATOR MASTER DIM SECT 6

SUBTASK 29-33-21-210-001

(3) Make sure the STANDBY HYD LOW QUANTITY light, on the P5 panel, is on.

SUBTASK 29-33-21-610-001

(4) Fill the standby and the system B reservoirs, do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-33-21-210-002

(5) Make sure the STANDBY HYD LOW QUANTITY light goes off.

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SUBTASK 29-33-21-080-001

- (6) Remove the lockset, SPL-1795 from the depressurization valve.

SUBTASK 29-33-21-860-006

- (7) Close the system B depressurization valve.

SUBTASK 29-33-21-860-007

- (8) Pressurize the standby and system B hydraulic reservoirs:

- (a) Do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801.

SUBTASK 29-33-21-860-009

- (9) Remove the DO-NOT-OPERATE tags from the pump switches.

SUBTASK 29-33-21-860-010

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF THE RUDDER, LEADING EDGE SLATS, AND THRUST REVERSERS. THEY CAN MOVE QUICKLY WHEN YOU SUPPLY STANDBY HYDRAULIC POWER.

- (10) Put the FLT CONTROL B switch (P5) to STDBY RUD.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

HAP ALL

SUBTASK 29-33-21-860-011

- (11) Operate the rudder full travel in each direction for a minimum of three times.

- (a) Make sure the STDBY HYD LOW QUANTITY light stays off.

SUBTASK 29-33-21-860-012

- (12) Put the FLT CONTROL B switch (P5) to OFF.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

- (a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is off.

HAP ALL

SUBTASK 29-33-21-790-001

- (13) Examine all the connections for leaks.

SUBTASK 29-33-21-210-003

- (14) Do a check of the system B hydraulic quantity.

SUBTASK 29-33-21-610-002

- (15) Do the servicing for hydraulic system B if it is necessary:

- (a) Do this task: Hydraulic Reservoir Servicing, TASK 12-12-00-610-801.

SUBTASK 29-33-21-860-008

- (16) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

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SUBTASK 29-33-21-620-002

CAUTION: IF THE AIRPLANE IS EXPOSED TO RUNWAY DEICING FLUIDS THAT CONTAIN POTASSIUM FORMATE, CORROSION OF THE ELECTRICAL CONNECTORS IN THE MAIN WHEEL WELL CAN OCCUR. CORROSION CAN CAUSE INCORRECT FUNCTION OF CRITICAL SYSTEMS NECESSARY FOR SAFE FLIGHT.

- (17) Do the step below if the airplane is exposed to deicing fluid at anytime during the year. Refer to SB 737-24A1148.
- (a) Apply AV25 compound, G50170 to the connector assembly (SWPM 20-60-03).

————— **END OF TASK** —————

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PUMP LOW PRESSURE WARNING SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has a test of the pump low pressure warning system. This procedure is applicable for hydraulic systems A, B, and standby.
- C. The test of the pump low pressure warning system is a check for electrical continuity between the low pressure lights and the pressure switches. It is also a check for correct operation and pressure settings of the pressure switches. The pressure settings of the switches are not adjustable.
- D. Do a check of the engine driven pumps (EDPs) and electric motor-driven pumps (EMDPs), one at a time, to get an accurate check of the pressures and light operations.

NOTE: If you stop an EDP when the EMDP is on, it is possible the LOW PRESSURE light for the EDP will not come on for two minutes or more. This is because pressure is caught in the line between the EDP and the pressure module. With the EMDP in operation, this pressure can only bleed back through the blocking valve in the EDP. If this is your problem, ignore it, the system is O.K.

TASK 29-34-00-700-801

2. Pump Low Pressure Warning System Test

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)

B. Tools/Equipment

Reference	Description
STD-163	Portable Hydraulic Cart, Systems Test, Capable of 3000 PSI and a minimum flow of 30 GPM.

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for the Test

SUBTASK 29-34-00-860-001

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

E. Pump Low Pressure Warning System Test for Hydraulic System A or B

SUBTASK 29-34-00-860-002

- (1) Set the LIGHTS switch, on the P2 panel, to the TEST position.

SUBTASK 29-34-00-210-001

- (2) Make sure these lights come on:
 - (a) The two MASTER CAUTION lights (Captain's and First Officer's lightshield)
 - (b) The HYD light (First Officer's lightshield)
 - (c) The LOW PRESSURE lights (ENG 1 and ELEC 2 for system A; ELEC 1 and ENG 2 for system B), on the P5 panel, for the applicable system.

NOTE: Other annunciator lights will come on but you can ignore those lights.

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SUBTASK 29-34-00-860-003

- (3) Set the LIGHTS switch back to the DIM or BRT position.

SUBTASK 29-34-00-480-001

- (4) Install the portable hydraulic cart, STD-163:

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

- (a) Disconnect the pressure line from the applicable engine driven pump (EDP) or electric motor-driven pump (EMDP).
- (b) Install a cap on the pressure port of the EDP or EMDP.
- (c) Connect the pump pressure line to the portable hydraulic cart, STD-163.
- (d) Connect the return hose of the portable hydraulic cart, STD-163 to the return port of the ground service module for the applicable system.

SUBTASK 29-34-00-210-002

- (5) Make sure the applicable LOW PRESSURE lights (ENG 1 and ELEC 2 for system A; ENG 2 and ELEC 1 for system B) come on.

SUBTASK 29-34-00-780-001

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (6) Slowly increase the hydraulic pressure.
 - (a) Make sure the MASTER CAUTION and the applicable LOW PRESSURE lights (ENG 1 and ELEC 2 for system A; ELEC 1 and ENG 2 for system B) go off between 1300 and 1600 psig.

SUBTASK 29-34-00-780-002

- (7) Slowly decrease the pressure.
 - (a) Make sure the MASTER CAUTION and the applicable LOW PRESSURE lights (ENG 1 and ELEC 2 for system A; ELEC 1 and ENG 2 for system B) come on between 1500 and 1200 psig.

SUBTASK 29-34-00-080-001

- (8) Remove the portable hydraulic cart, STD-163:
 - (a) Disconnect the portable hydraulic cart, STD-163 from the pressure line.
 - (b) Remove the cap from the pressure port of the EDP or EMDP.
 - (c) Connect the pressure line to the pressure port of the applicable EDP or EMDP.
 - (d) Disconnect the return hose of the portable hydraulic cart, STD-163 from the ground service module.

F. Pump Low Pressure Warning System Test for the Standby Hydraulic System

SUBTASK 29-34-00-860-004

- (1) Set the LIGHTS switch, on the P2 panel, to the TEST position.
 - (a) Make sure the STANDBY HYD LOW PRESSURE light comes on.

SUBTASK 29-34-00-860-005

- (2) Set the LIGHTS switch back to the DIM or BRT position.

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SUBTASK 29-34-00-860-006

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(3) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-34-00-860-007

(4) Set the ALTERNATE FLAPS arm switch to the ARM position.

(a) Make sure the STANDBY HYD LOW PRESSURE light, on the P5 panel, comes on.

SUBTASK 29-34-00-480-002

(5) Install the portable hydraulic cart, STD-163:

NOTE: Do not operate the EDPs or EMDPs with the portable hydraulic cart return and pressure lines connected. This may prevent the pumps from receiving enough hydraulic fluid from their respective reservoirs and cavitate the pump.

- (a) Disconnect the pressure line of the standby electric motor-driven pump (EMDP) at the disconnect half on the aft bulkhead.
- (b) Attach the pressure hose of the portable hydraulic cart, STD-163 to the disconnect half on the aft bulkhead.
- (c) Attach the return hose for the portable hydraulic cart, STD-163 to the return port of the hydraulic system B ground service.

SUBTASK 29-34-00-780-003

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Slowly increase the hydraulic pressure.

(a) Make sure the STANDBY HYD LOW PRESSURE light goes off between 1100 and 1600 psig.

SUBTASK 29-34-00-780-004

(7) Slowly decrease the pressure.

(a) Make sure the STANDBY HYD LOW PRESSURE light comes on at 1500 to 1000 psig.

SUBTASK 29-34-00-080-002

(8) Remove the portable hydraulic cart, STD-163:

- (a) Remove the pressure hose of the portable hydraulic cart, STD-163 from the disconnect half on the aft bulkhead.
- (b) Connect the pressure line of the standby EMDP to the disconnect half on the aft bulkhead.
- (c) Disconnect the return hose of the portable hydraulic cart, STD-163 from the hydraulic system B ground service module.

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SUBTASK 29-34-00-860-008

(9) Set the ALTERNATE FLAPS arm switch to the OFF position.

SUBTASK 29-34-00-860-009

(10) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

————— **END OF TASK** —————

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HYDRAULIC SYSTEMS A AND B EDP LOW PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of an EDP low pressure switch
 - (2) An installation of an EDP low pressure switch.
- B. The hydraulic systems A and B EDP low pressure switch is referred to as the "EDP low pressure switch" in this procedure.
- C. The EDP low pressure switch for engine driven pump (EDP) No. 1 is on the hydraulic system A pressure modules. The EDP low pressure switch for the EDP No. 2 is on the hydraulic system B pressure module.
- D. This procedure is applicable for the EDP low pressure switch on the hydraulic system A pressure module and hydraulic system B pressure module.

TASK 29-34-11-000-801

2. Engine Driven Pump (EDP) Low Pressure Switch Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)

B. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right

C. Prepare for the Removal

SUBTASK 29-34-11-860-008

- (1) For the applicable hydraulic system, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 29-34-11-860-001

- (2) For the applicable hydraulic system, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

SUBTASK 29-34-11-860-002

- (3) For the EDP low pressure switch on the hydraulic system A pressure module, do this step:

Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	12	C00318	INDICATOR MASTER DIM SECT 6

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

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SUBTASK 29-34-11-860-003

- (4) For the EDP low pressure switch on the hydraulic system B pressure module, do this step:
Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

D. EDP Low Pressure Switch Removal

SUBTASK 29-34-11-020-003

- (1) Disconnect the electrical connector [2] from the EDP low pressure switch [3].

SUBTASK 29-34-11-020-001

- (2) Install a cap on the electrical connector [2].

SUBTASK 29-34-11-020-002

- (3) Remove the EDP low pressure switch [3] from the applicable pressure module [5].
 - (a) Remove the rings [1] and packing [4].
 - (b) Discard the rings [1] and packing [4].
 - (c) Install a plug on the open port of the pressure module [5].

————— **END OF TASK** —————

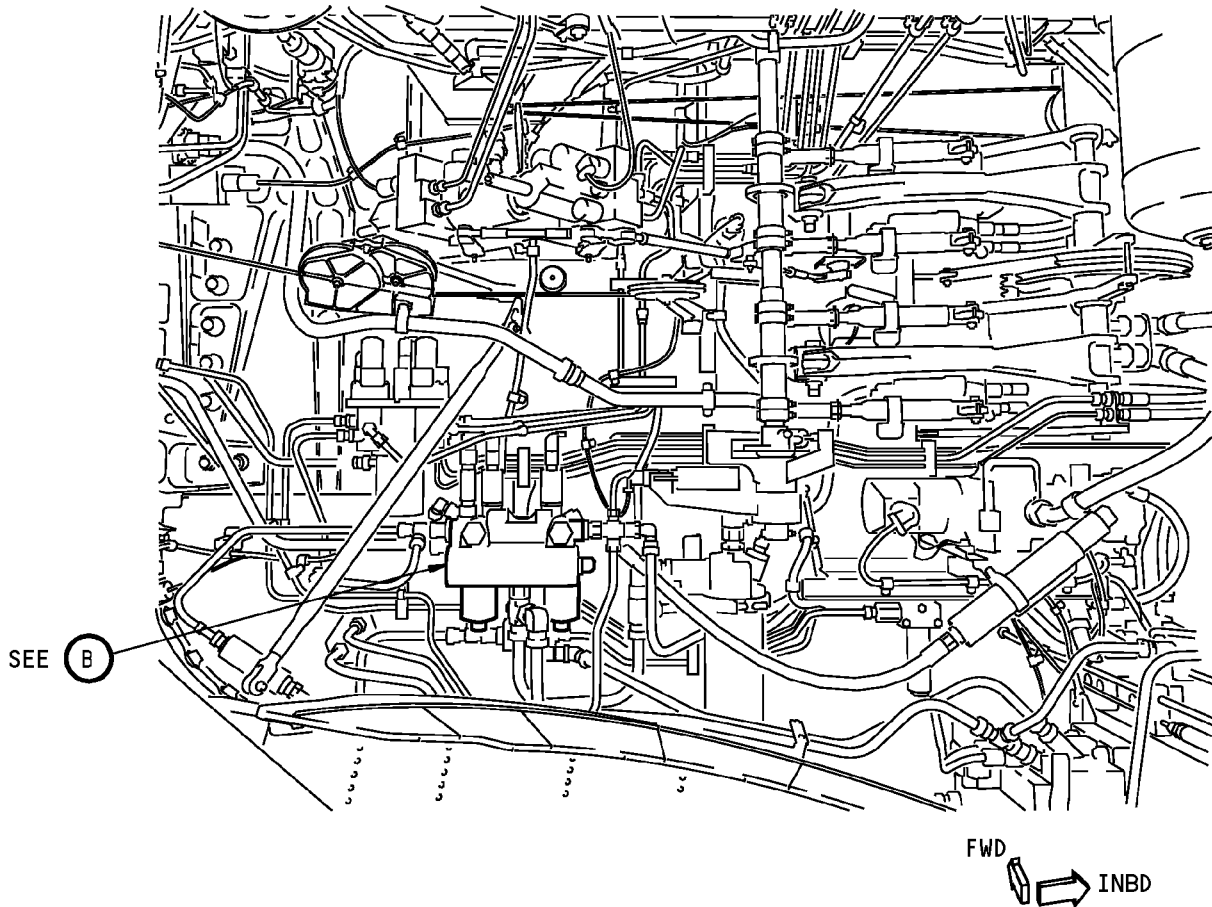
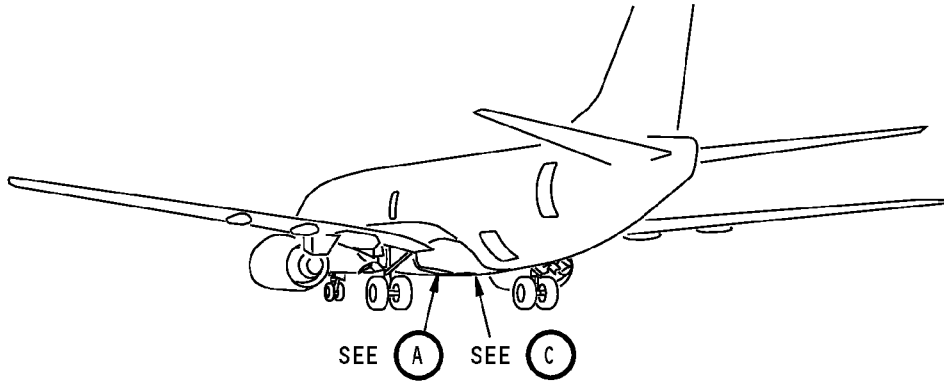
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**MAIN LANDING GEAR WHEEL WELL
(LEFT SIDE)**

A

**Hydraulic Systems A and B EDP Low Pressure Switch Installation
Figure 401 (Sheet 1 of 4)/29-34-11-990-801**

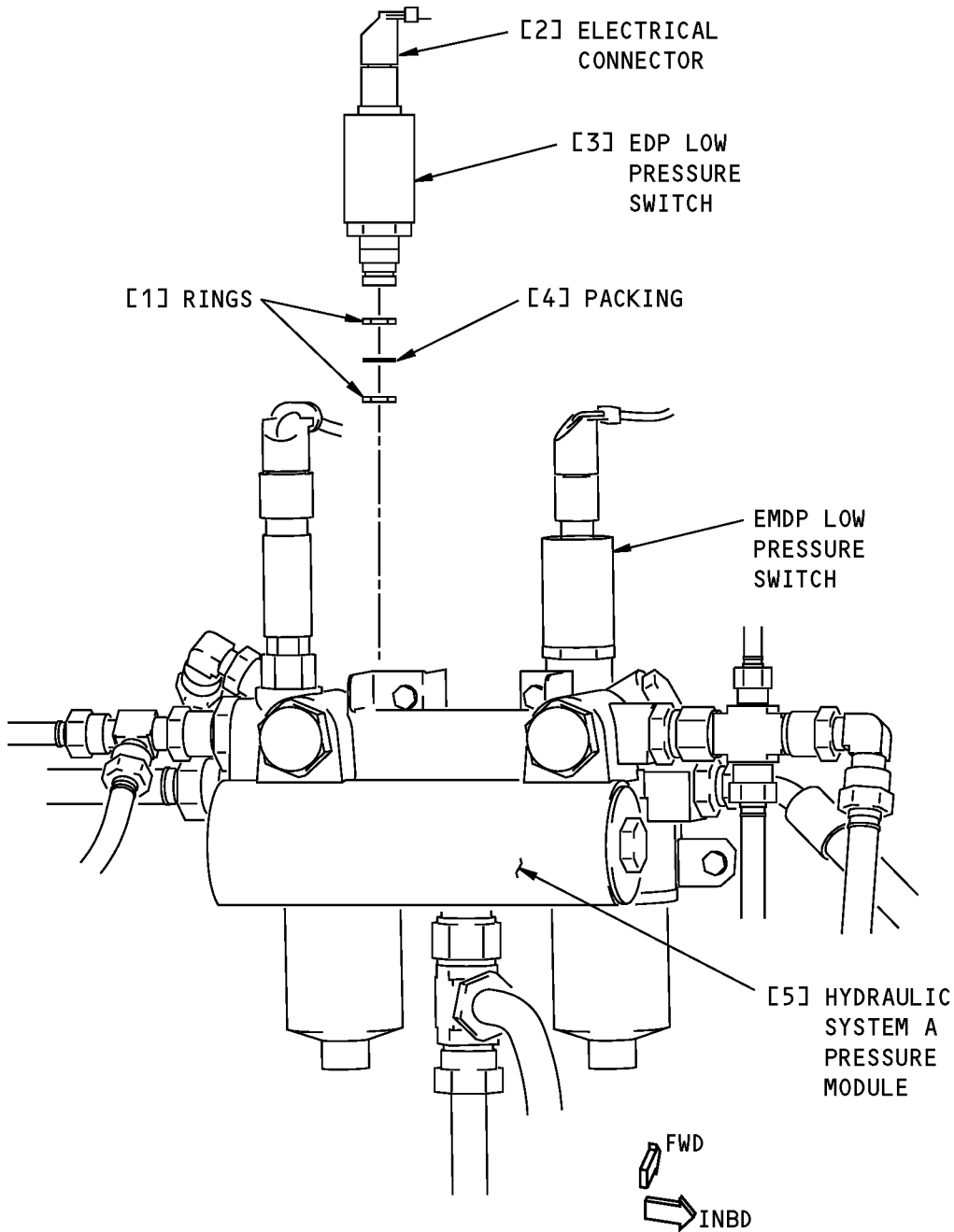
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HYDRAULIC SYSTEM A PRESSURE MODULE

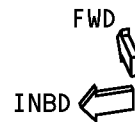
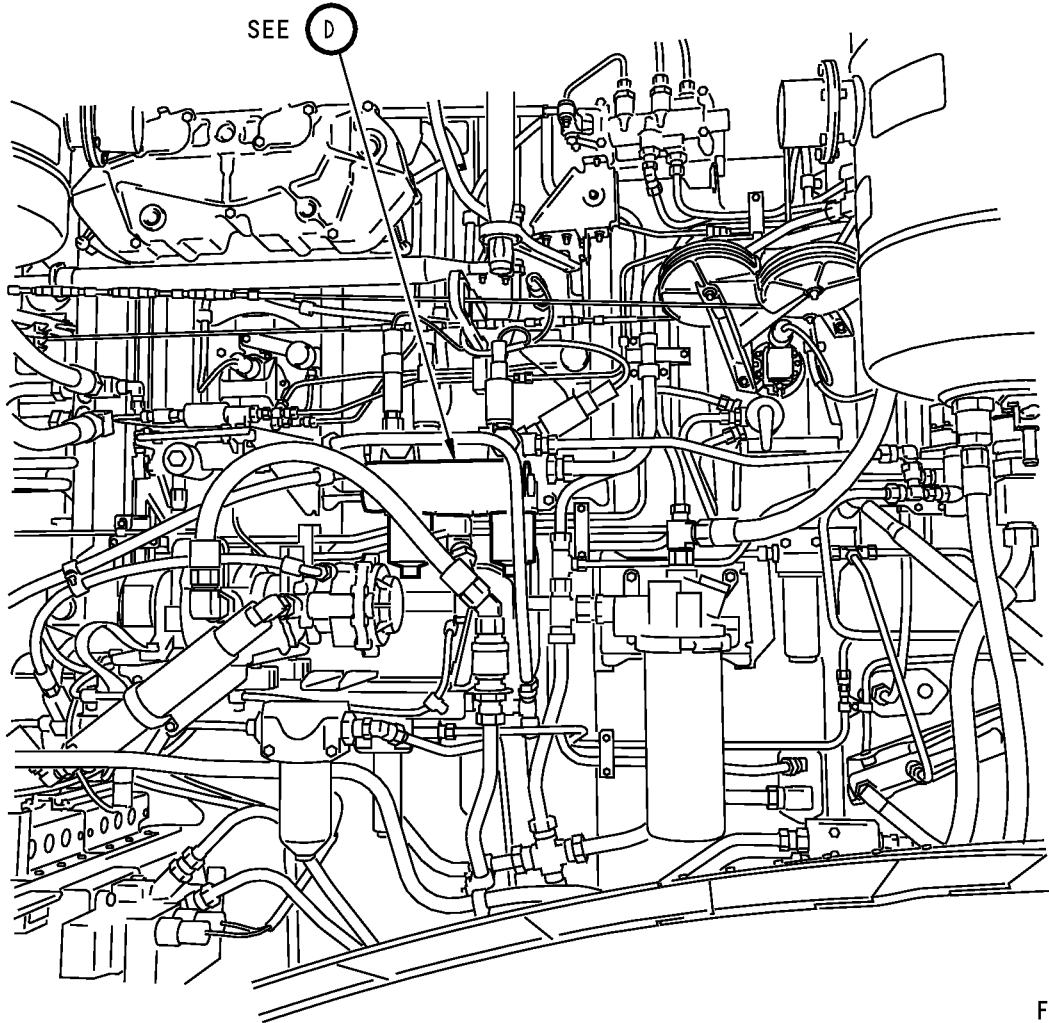
(B)

**Hydraulic Systems A and B EDP Low Pressure Switch Installation
Figure 401 (Sheet 2 of 4)/29-34-11-990-801**

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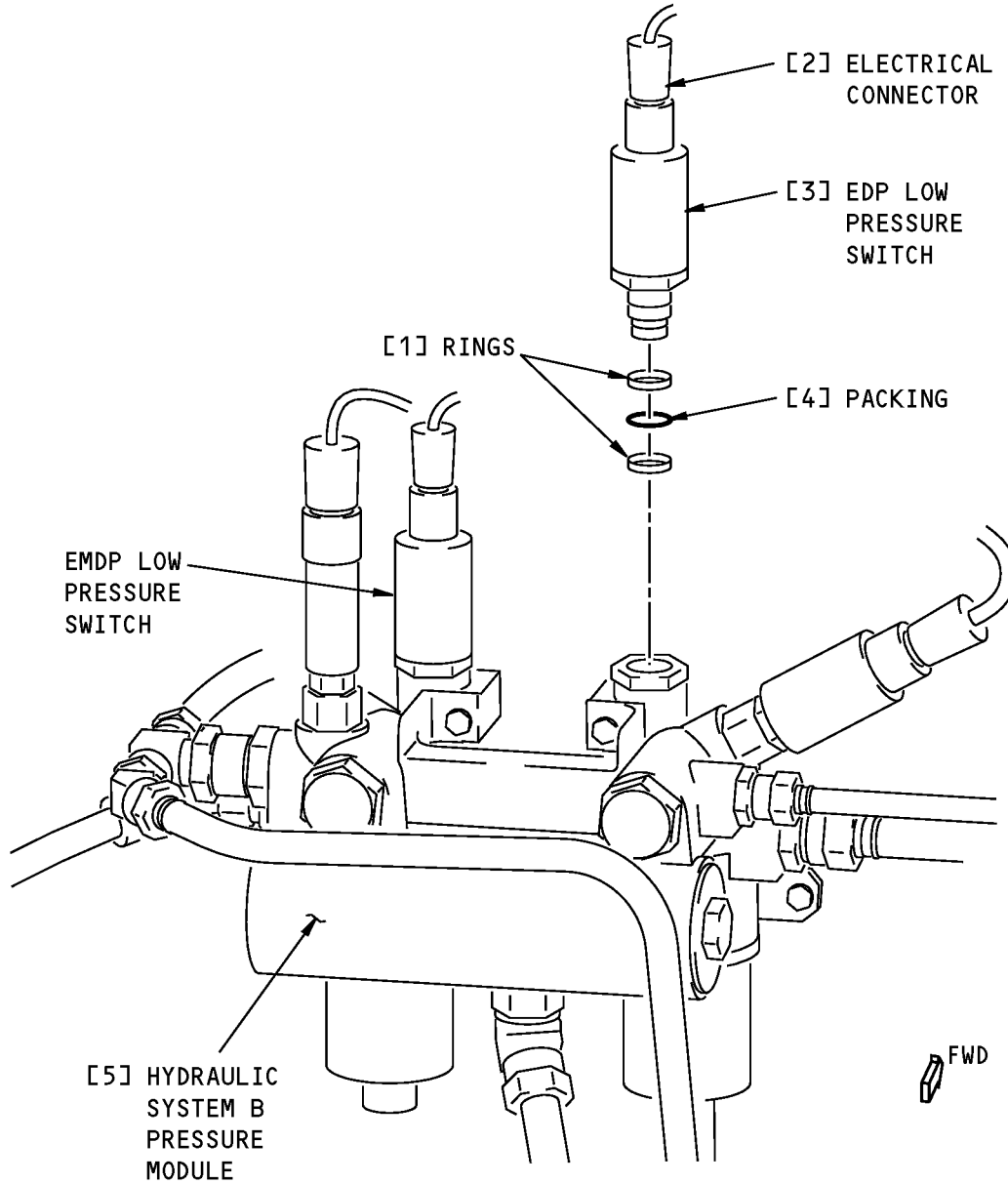
**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

C

**Hydraulic Systems A and B EDP Low Pressure Switch Installation
Figure 401 (Sheet 3 of 4)/29-34-11-990-801**

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HYDRAULIC SYSTEM B PRESSURE MODULE

D

Hydraulic Systems A and B EDP Low Pressure Switch Installation
Figure 401 (Sheet 4 of 4)/29-34-11-990-801

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TASK 29-34-11-400-801

3. Engine Driven Pump (EDP) Low Pressure Switch Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
29-11-00-860-804	Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP) (P/B 201)
29-11-00-860-805	Hydraulic System A or B Power Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N~C32 (QQ-N-281)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. EDP Low Pressure Switch Installation

SUBTASK 29-34-11-640-001

(1) Lubricate the new rings [1] and new packing [4] with fluid, D00153.

SUBTASK 29-34-11-420-001

(2) Install the EDP low pressure switch [3] in the applicable pressure module [5]:

- (a) Install the new rings [1] and new packing [4] on the EDP low pressure switch [3].
- (b) Remove the plug from the pressure module [5].
- (c) Put the EDP low pressure switch [3] in the pressure module [5].
- (d) Tighten the EDP low pressure switch [3] to 350-375 pound-inches.
- (e) Install the lockwire, G01912.

SUBTASK 29-34-11-420-003

(3) Remove the cap from the electrical connector [2].

SUBTASK 29-34-11-420-002

(4) Connect the electrical connector [2] to the EDP low pressure switch [3].

SUBTASK 29-34-11-860-004

(5) For the EDP low pressure switch on the hydraulic system A pressure module, do this step:

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Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	12	C00318	INDICATOR MASTER DIM SECT 6

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-34-11-860-005

- (6) For the EDP low pressure switch on the hydraulic system B pressure module, do this step:

Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

E. EDP Low Pressure Switch Installation Test

SUBTASK 29-34-11-860-006

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-34-11-710-001

- (2) Make sure the applicable LOW PRESSURE light (ENG 1 or ENG 2), on the P5 panel, is on.

NOTE: The ENG 1 LOW PRESSURE light is for hydraulic system A EDP. The ENG 2 LOW PRESSURE light is for hydraulic system B EDP.

SUBTASK 29-34-11-710-002

- (3) Provide hydraulic power with the EDP for the applicable hydraulic system. To provide power, do this task: Hydraulic System A or B Pressurization with an Engine-Driven Pump (EDP), TASK 29-11-00-860-804

SUBTASK 29-34-11-710-003

- (4) Make sure the applicable LOW PRESSURE light (ENG 1 or ENG 2) goes off.

SUBTASK 29-34-11-790-001

- (5) Make sure that there is no leak at the applicable EDP low pressure switch.

SUBTASK 29-34-11-860-007

- (6) Remove hydraulic power from the applicable hydraulic system. To remove it, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 29-34-11-710-004

- (7) Make sure the applicable LOW PRESSURE light (ENG 1 or ENG 2), on the P5 panel, is on.

NOTE: The ENG 1 LOW PRESSURE light is for hydraulic system A EDP. The ENG 2 LOW PRESSURE light is for hydraulic system B EDP.

END OF TASK

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HYDRAULIC SYSTEMS A AND B EMDP LOW PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
(1) A removal of a hydraulic system A or B EMDP low pressure switch
(2) An installation of a hydraulic system A or B EMDP low pressure switch.
B. The hydraulic system A or B EMDP low pressure switch is referred to as the "EMDP low pressure switch" in this procedure.
C. The EMDP low pressure switch for electric motor driven pump (EMDP) No. 2 is on the hydraulic system A pressure modules. The EMDP low pressure switch for the EMDP No. 1 is on the hydraulic system B pressure module.
D. This procedure is applicable for the EMDP low pressure switch on the hydraulic system A pressure module and hydraulic system B pressure module.

TASK 29-34-21-000-801

2. Hydraulic System A or B EMDP Low Pressure Switch Removal

(Figure 401)

A. References

Table with 2 columns: Reference, Title. Rows include 29-09-00-860-802, 29-11-00-860-805, 29-11-01-860-802.

B. Location Zones

Table with 2 columns: Zone, Area. Rows include 133, 134, 211, 212.

C. Prepare for the Removal

SUBTASK 29-34-21-860-007

- (1) For the applicable hydraulic system, do this task: Hydraulic System A or B Power Removal, TASK 29-11-00-860-805

SUBTASK 29-34-21-860-001

- (2) For the applicable hydraulic system, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802

SUBTASK 29-34-21-860-002

- (3) For the EMDP low pressure switch on the hydraulic system A pressure module, do this step: Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Table with 4 columns: Row, Col, Number, Name. Row F, Col 12, Number C00318, Name INDICATOR MASTER DIM SECT 6

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-34-21-860-003

- (4) For the EMDP low pressure switch on the hydraulic system B pressure module, do this step:
Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

D. EMDP Low Pressure Switch Removal

SUBTASK 29-34-21-020-003

- (1) Disconnect the electrical connector [2] from the EMDP low pressure switch [3].

SUBTASK 29-34-21-020-001

- (2) Install a cap on the electrical connector [2].

SUBTASK 29-34-21-020-002

- (3) Remove the EMDP low pressure switch [3] from the applicable pressure module [5].
 (a) Discard the rings [1] and packing [4].
 (b) Install a plug on the open port of the pressure module [5].

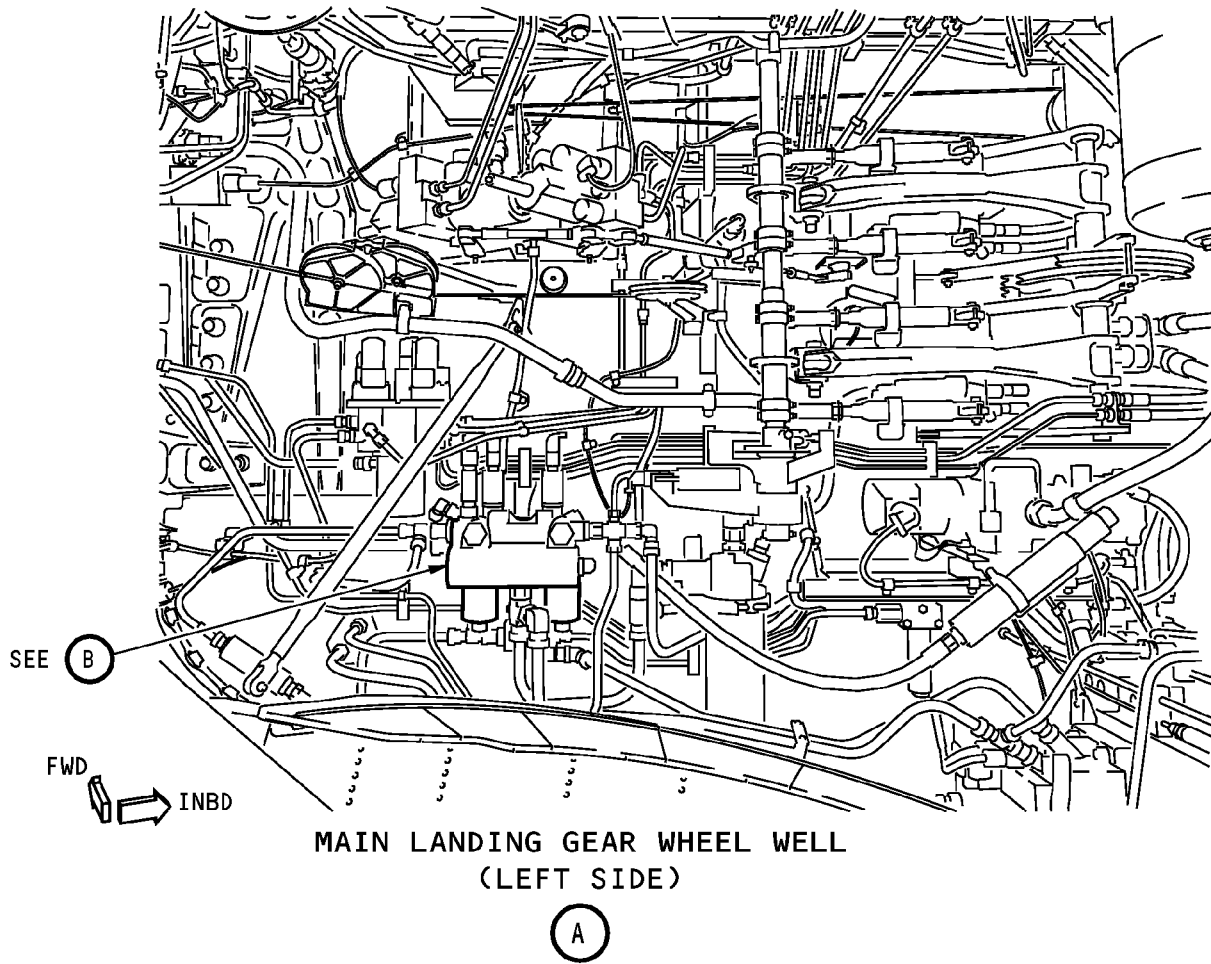
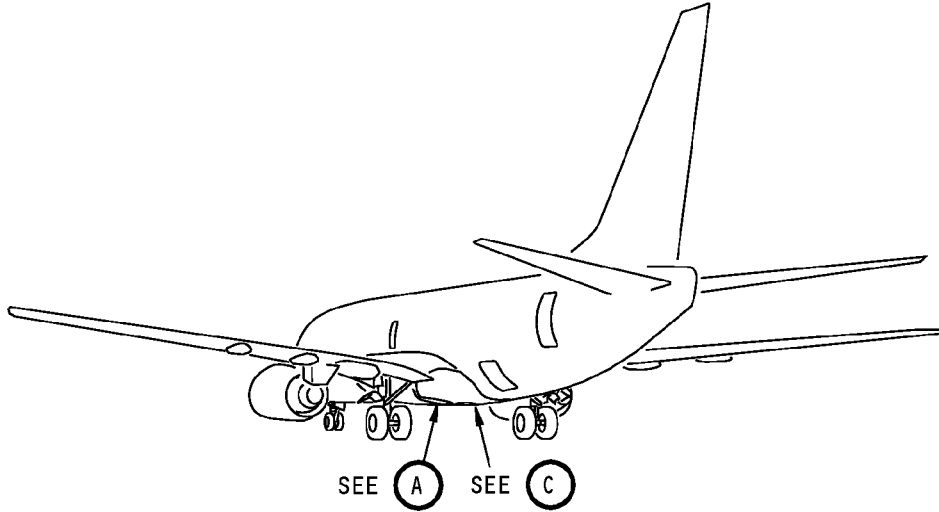
————— **END OF TASK** —————

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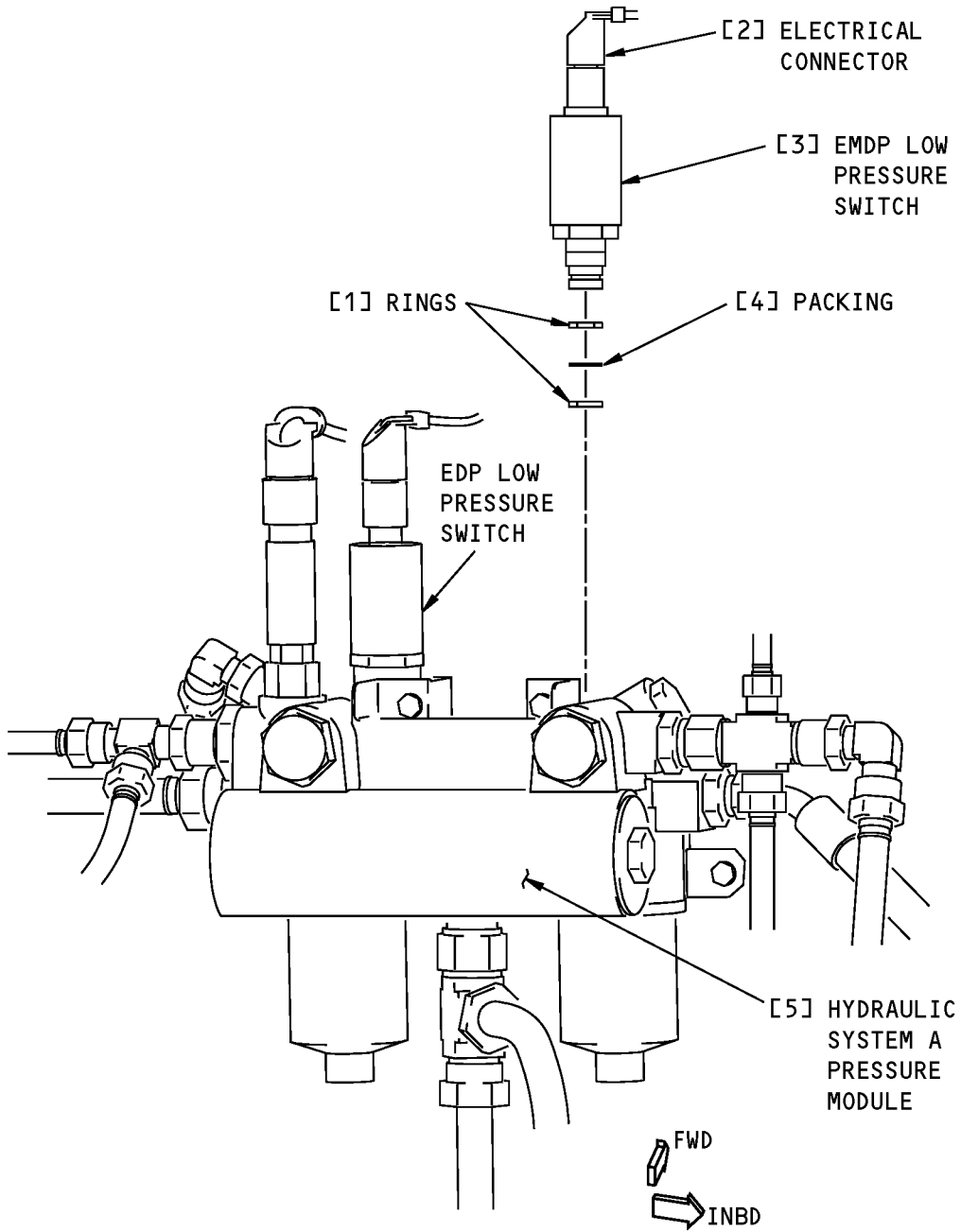
**Hydraulic Systems A and B EMDP Low Pressure Switch Installation
Figure 401 (Sheet 1 of 4)/29-34-21-990-801**

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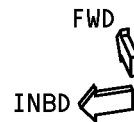
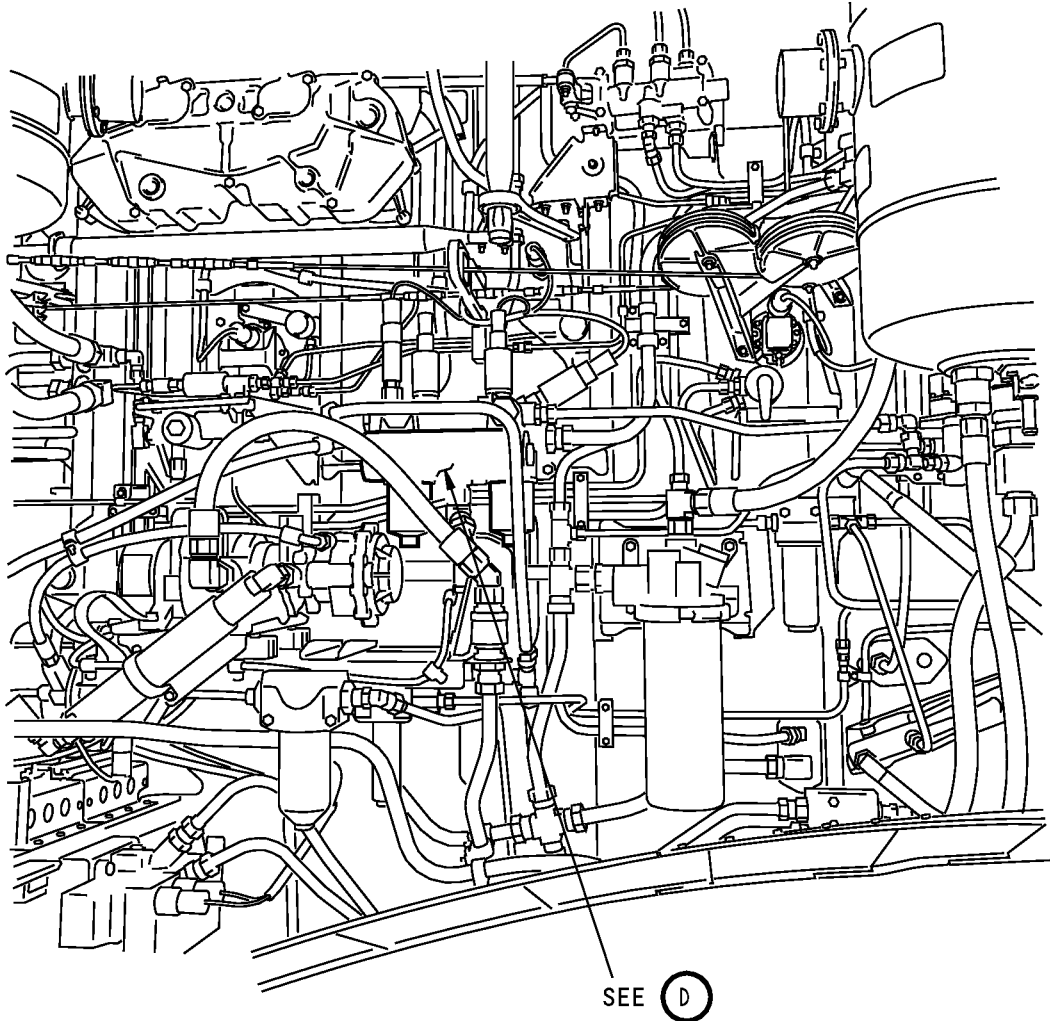
HYDRAULIC SYSTEM A PRESSURE MODULE

(B)

**Hydraulic Systems A and B EMDP Low Pressure Switch Installation
Figure 401 (Sheet 2 of 4)/29-34-21-990-801**

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**MAIN LANDING GEAR WHEEL WELL
(RIGHT SIDE)**

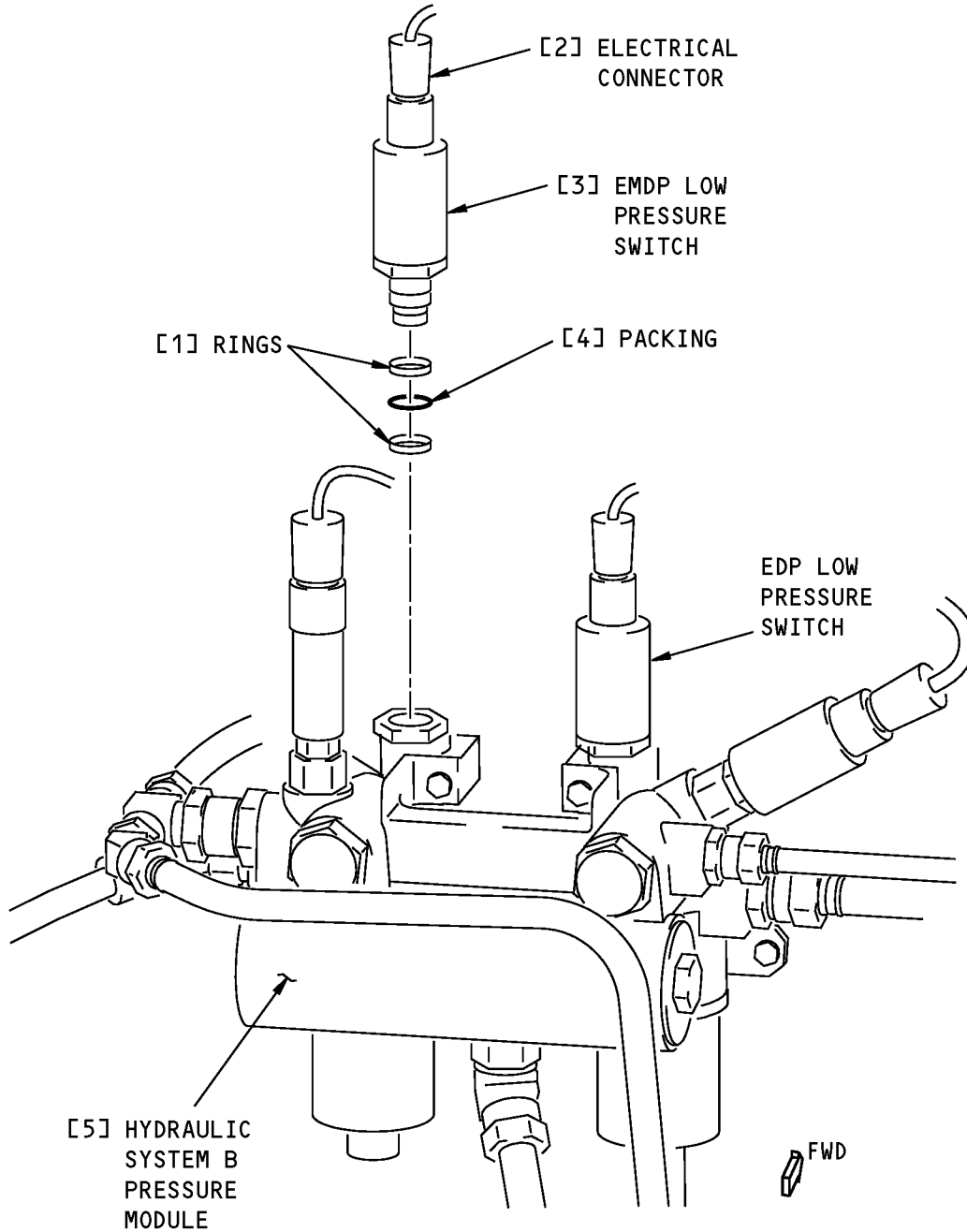
C

**Hydraulic Systems A and B EMDP Low Pressure Switch Installation
Figure 401 (Sheet 3 of 4)/29-34-21-990-801**

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HYDRAULIC SYSTEM B PRESSURE MODULE

D

**Hydraulic Systems A and B EMDP Low Pressure Switch Installation
Figure 401 (Sheet 4 of 4)/29-34-21-990-801**

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TASK 29-34-21-400-801

3. Hydraulic System A or B EMDP Low Pressure Switch Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
134	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. EMDP Low Pressure Installation

SUBTASK 29-34-21-640-001

(1) Lubricate the new rings [1] and new packing [4] with fluid, D00153.

SUBTASK 29-34-21-420-001

(2) Install the EMDP low pressure switch [3] in the applicable pressure module [5]:

- (a) Install the new rings [1] and new packing [4] on the EMDP low pressure switch [3].
- (b) Remove the plug from the pressure module [5].
- (c) Put the EMDP low pressure switch [3] in the pressure module [5].
- (d) Tighten the EMDP low pressure switch [3] to 350-375 pound-inches [39.6 - 42.4 newton-meters].

SUBTASK 29-34-21-420-003

(3) Remove the cap from the electrical connector [2].

SUBTASK 29-34-21-420-002

(4) Connect the electrical connector [2] to the EMDP low pressure switch [3].

SUBTASK 29-34-21-860-004

(5) For the EMDP low pressure switch on the hydraulic system A pressure module, do this step:
Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
F	12	C00318	INDICATOR MASTER DIM SECT 6

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00767	ELEC HYD PUMP CONTROL SYS A

SUBTASK 29-34-21-860-005

- (6) For the EMDP low pressure switch on the hydraulic system B pressure module, do this step:
Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C00317	INDICATOR MASTER DIM SECT 5

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C00768	ELEC HYD PUMP CONTROL SYS B

E. EMDP Low Pressure Switch Installation Test

SUBTASK 29-34-21-860-006

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-34-21-710-001

CAUTION: DO NOT OPERATE THE HYDRAULIC SYSTEMS A AND B ELECTRIC MOTOR-DRIVEN PUMPS FOR MORE THAN TWO MINUTES WITHOUT FUEL IN THE FUEL TANKS. THE NO. 1 (FOR HYDRAULIC SYSTEM A) AND NO. 2 (FOR HYDRAULIC SYSTEM B) FUEL TANKS MUST HAVE A MINIMUM OF 250 GALLONS (1675 POUNDS/760 KILOGRAMS) OF FUEL IN THEM. IF THERE IS NOT SUFFICIENT FUEL IN THE FUEL TANKS, THE ELECTRIC MOTOR-DRIVEN PUMPS WILL BECOME TOO HOT. THIS CAN CAUSE DAMAGE TO THE ELECTRIC MOTOR-DRIVEN PUMPS.

- (2) Do the EMDP low pressure switch installation test:
 - (a) Make sure the applicable LOW PRESSURE light (ELEC 1 or ELEC 2), on the P5 panel, is on.

NOTE: The ELEC 2 LOW PRESSURE light is for the hydraulic system A EMDP. The ELEC 1 LOW PRESSURE light is for the hydraulic system B EMDP.

WARNING: MAKE SURE THAT PERSONS AND EQUIPMENT ARE CLEAR OF ALL CONTROL SURFACE BEFORE YOU SUPPLY HYDRAULIC POWER. AILERONS, RUDDERS, ELEVATORS, FLAPS, SPOILERS, SLATS, AND THRUST REVERSERS CAN MOVE QUICKLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Put the applicable ELEC (1 or 2) HYD PUMPS switch to the ON position.
 - 1) Make sure the applicable LOW PRESSURE light (ELEC 1 or ELEC 2) goes off.
- (c) Put the applicable ELEC (1 or 2) HYD PUMPS switch to the OFF position.
 - 1) Make sure the applicable LOW PRESSURE light (ELEC 1 or ELEC 2) comes on.

SUBTASK 29-34-21-790-001

- (3) Make sure that there is no leakage at the applicable EMDP low pressure switch.

————— **END OF TASK** —————

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AIRCRAFT MAINTENANCE MANUAL

STANDBY HYDRAULIC SYSTEM ELECTRIC MOTOR DRIVEN PUMP (EMDP) LOW PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) A removal of a standby hydraulic system EMDP low pressure switch.
 - (2) An installation of a standby hydraulic system EMDP low pressure switch.
- B. The EMDP low pressure switch for standby electric motor driven pump (EMDP) is on the standby hydraulic system pressure module.
- C. The standby system EMDP low pressure switch will be referred to as the low pressure switch throughout this procedure.

TASK 29-34-31-000-801

2. Standby System EMDP Low Pressure Switch Removal

(Figure 401)

A. References

Reference	Title
29-09-00-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-11-01-860-802	Hydraulic Reservoirs Depressurization (P/B 201)
29-21-00-000-802	Standby Hydraulic System Power Removal (P/B 201)

B. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

C. Prepare for the Removal

SUBTASK 29-34-31-860-001

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
D	11	C00133	INDICATOR MASTER DIM DIM/TST CONT
E	14	C00316	INDICATOR MASTER DIM SECT 4

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-34-31-860-002

- (2) Remove the hydraulic power from the standby system. To remove it, do this task: Standby Hydraulic System Power Removal, TASK 29-21-00-000-802.

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SUBTASK 29-34-31-860-003

- (3) Release pressure from the system B hydraulic reservoir. To release it, do this task: Hydraulic Reservoirs Depressurization, TASK 29-11-01-860-802 or Hydraulic Reservoirs Depressurization, TASK 29-09-00-860-802.

D. Procedure

SUBTASK 29-34-31-020-001

- (1) Disconnect the electrical connector [2] from the low pressure switch [1].

SUBTASK 29-34-31-020-002

- (2) Install a cap on the electrical connector [2] to prevent contamination or damage.

SUBTASK 29-34-31-020-003

- (3) Remove the low pressure switch [1] from the standby system pressure module.

SUBTASK 29-34-31-020-010

- (4) Remove packing [4] from the low pressure switch [1].

SUBTASK 29-34-31-020-004

- (5) Discard packing [4].

SUBTASK 29-34-31-020-005

- (6) Remove the backup rings [3] from the low pressure switch [1].

SUBTASK 29-34-31-020-006

- (7) Install a cap in the open port on the standby system pressure module.

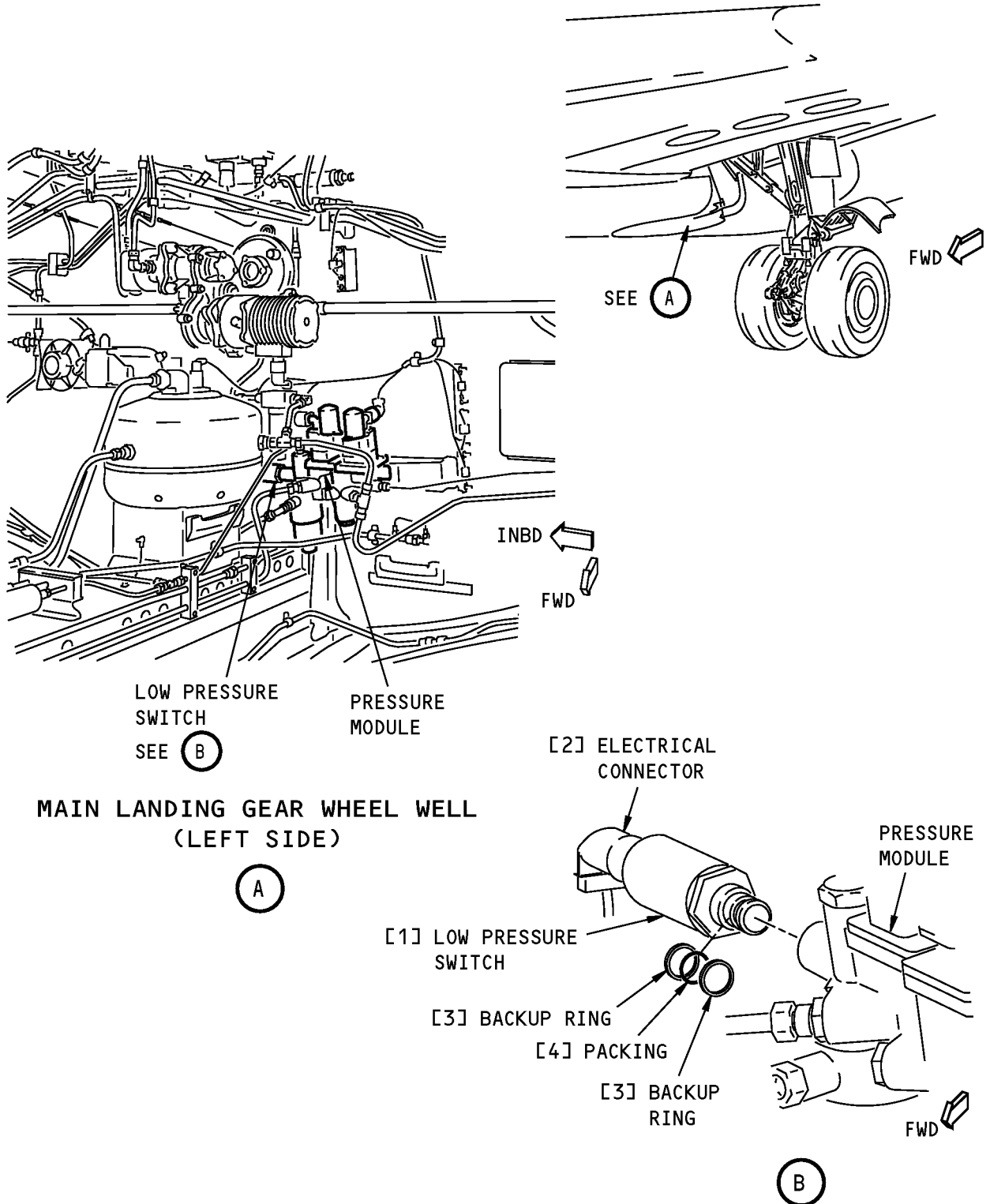
————— **END OF TASK** —————

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Standby Hydraulic System Electric-Motor-Driven-Pump (EMDP) Low Pressure Switch Installation
Figure 401/29-34-31-990-801

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AIRCRAFT MAINTENANCE MANUAL

TASK 29-34-31-400-801

3. Standby System EMDP Low Pressure Switch Installation

(Figure 401)

A. References

Reference	Title
20-10-44-400-801	Lockwires Installation (P/B 401)
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
29-09-00-860-801	Hydraulic Reservoirs Pressurization (P/B 201)
29-11-01-860-801	Hydraulic Reservoirs Pressurization (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchangeable & intermixable with Type V)

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

D. Procedure

SUBTASK 29-34-31-640-001

(1) Apply fluid, D00153 to the new packing [4] and new backup rings [3].

SUBTASK 29-34-31-020-007

(2) Install the new packing [4] and the backup rings [3] in the low pressure switch [1].

SUBTASK 29-34-31-640-002

(3) Apply fluid, D00153 to the threads of the low pressure switch [1].

SUBTASK 29-34-31-020-008

(4) Remove the cap from the standby system pressure module.

SUBTASK 29-34-31-020-009

(5) Install the low pressure switch [1] on the standby system pressure module.

SUBTASK 29-34-31-420-001

(6) Tighten the low pressure switch [1] to 350-375 pound-inches [39.6 - 42.4 newton-meters].

SUBTASK 29-34-31-420-004

(7) Install a lockwire on the low pressure switch [1] (TASK 20-10-44-400-801).

SUBTASK 29-34-31-420-002

(8) Remove cap from electrical connector [2].

SUBTASK 29-34-31-420-003

(9) Connect the electrical connector [2] to the low pressure switch [1].

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E. Standby Hydraulic System EMDP Low Pressure Switch Installation Test

SUBTASK 29-34-31-860-004

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 29-34-31-860-005

(2) Pressurize the standby system reservoir. To pressurize it, do this task: Hydraulic Reservoirs Pressurization, TASK 29-11-01-860-801 or Hydraulic Reservoirs Pressurization, TASK 29-09-00-860-801

SUBTASK 29-34-31-860-006

(3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	11	C00133	INDICATOR MASTER DIM DIM/TST CONT
E	14	C00316	INDICATOR MASTER DIM SECT 4

SUBTASK 29-34-31-860-007

(4) Put the FLT CONTROL A or B switch, on the P5 panel, to the STDBY RUD position.

HAP 031-054, 101-999; HAP 001-013, 015-026, 028-030 POST SB 737-27-1253; AIRPLANES WITH 'STBY RUD ON' LIGHT ON THE P5-3 PANEL

(a) Make sure the STANDBY HYD STBY RUD ON light on the forward overhead panel, P5, is on.

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SUBTASK 29-34-31-210-001

(5) Make sure the STANDBY HYD LOW PRESSURE light, on the P5 panel, comes on.

SUBTASK 29-34-31-860-008

WARNING: BE CAREFUL WHEN YOU ACCESS THE (ROW F) CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. IF POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER BEFORE YOU ACCESS THE CIRCUIT BREAKERS ON THE INSIDE OF THE P91 AND P92 PANELS. THE P91 AND P92 PANELS CONTAIN HIGH VOLTAGES AND CURRENTS THAT MAY CAUSE INJURIES TO PERSONS.

(6) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	2	C01449	STANDBY HYDRAULIC PUMP

SUBTASK 29-34-31-210-002

(7) Make sure the STANDBY HYD LOW PRESSURE light goes off.

SUBTASK 29-34-31-860-009

(8) Put the FLT CONTROL A or B switch to the ON position.

SUBTASK 29-34-31-210-003

(9) Make sure the STANDBY HYD LOW PRESSURE light stays off.

SUBTASK 29-34-31-790-001

(10) Make sure that there is no leakage at the low pressure switch.

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SUBTASK 29-34-31-860-010

(11) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

————— **END OF TASK** —————

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