



SERVICES CULTURE ÉDITIONS
RESSOURCES POUR
L'ÉDUCATION NATIONALE

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Base Nationale des Sujets d'Examens de l'enseignement
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LEXIQUE

- Back-up de secours, de rechange
- By-pass valve Clapet de dérivation
- Cap vented Trou d'aération
- Cross-feed Intercommunication
- Grooves Rainures
- Nipples Embout, raccord
- Slosh baffles Chicanes anti-ballotement
- Strainer filter Filtre épurateur
- Well Puits

EPREUVE EP2 DOSSIER RESSOURCE

Ce dossier comprend un extrait d'AMM d'ATR (ATA 29):
1 partie descriptive : Main hydraulic power-green
1 carte de travail : Cross-feed valve removal and installation

ON A/C ALL

Section 29-11 : MAIN HYDRAULIC POWER - GREEN

1. General

The main green hydraulic power system provides hydraulic power to operate :

- Landing gear retraction and extension
- Normal wheel brake

The system is pressurized by :

- its own electric pump normally ;
- by the blue electric pump, through the cross-feed valve, in case of failure of its electric pump.

The green system is operated by pressing the GREEN PUMP pushbutton on the HYD PWR panel. On the same panel the caution lights LO LEVEL, OVHT and LO PR illuminate whenever a fluid low level, a fluid overheat, or low pressure occur.

2. Component Description

A. Reservoir 6007GX

The hydraulic fluid reservoir, located in the rear area of the left main gear well, supplies both the green and blue systems.

The unpressurized type reservoir is cylindrical in shape, internally divided in two equal sections (green and blue) by a diaphragm, which is open in the upper side in order to allow simultaneous refilling of both the sections. The upper part of the reservoir is equipped with a filler port provided with :

- a cap vented to the atmosphere ;
- a strainer filter.

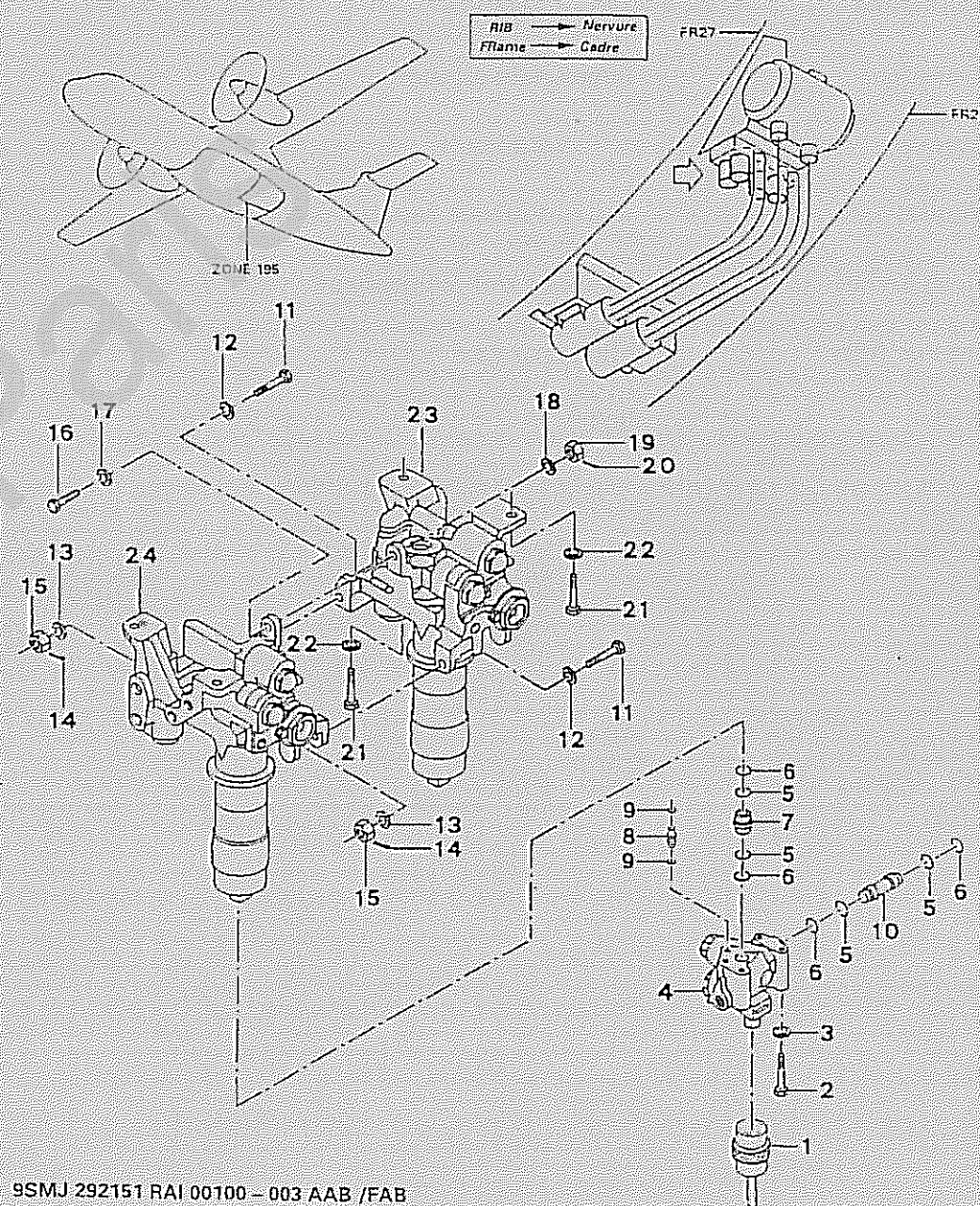
Two low level switches are installed near the filler port, one for each section.

The reservoir is also equipped with :

- a sight glass
- a return module for each system
- slosh baffles which prevent fluid sloshing during sideslip

maneuvers and

minimize fluid emulsion in case of considerable return fluid flow.



005 OPERATIONAL TEST

1. ON PANEL 126VU, MAKE CERTAIN THAT THE FOLLOWING CIRCUIT BREAKER IS CLOSED:
4GX GREEN HYD PUMP/AC WILD ELEC PWR
2. ON PANEL 121VU, MAKE CERTAIN THAT THE FOLLOWING CIRCUIT BREAKERS ARE CLOSED:
1GE HYD PWR / X FEED
1GN PRESS IND, HYD PWR
3. ON PANEL 26VU PRESS THE GREEN PUMP SWITCH.
4. VERIFY THAT THE TRIPLE INDICATOR READS 3000 PSI FOR THE SYSTEM ACTIVATED AND 0 FOR OTHER ONE.
5. ON PANEL 26VU PRESS THE CROSS FEED PUSHBUTTON SWITCH.
6. VERIFY ON THE TRIPLE INDICATOR THAT THE HYDRAULIC PRESSURE OF THE DEACTIVATED SYSTEM INCREASES TO 3000 PSI.
7. RELEASE THE CROSS FEED PUSHBUTTON SWITCH, THE HYDRAULIC PRESSURE OF THE DEACTIVATED SYSTEM WILL DROP TO 0.

006 DE-ENERGIZATION OF AIRCRAFT AC AND DC NETWORKS

SEE JOB INSTRUCTION CARD

007 CLOSE UP

1. REMOVE SAFETY CLIPS AND TAGS AND CLOSE THE FOLLOWING CIRCUIT BREAKERS:
ON PANEL 126VU
- 1GX
- 4GX
ON PANEL 121VU
- 1GE
- 1GN
- 4GF
ON PANEL 124VU
- 2GF
ON PANEL 129VU
- 10GF
2. CLOSE ACCESS PANEL 195CL.

B. Green Electric Pump 10 GX

1) Description

The green electric pump is located in the left main gear well.

The pump is a conventional axial piston type wherein a cylinder barrel with 9 pistons is driven by a wild frequency electric motor. The pump has an air cooled case drain. The pump is internally provided with a boost impeller in the suction line which accelerates the fluid to the speed of the cylinder barrel bores, since the reservoir is of unpressurized type.

A by-pass valve is installed in order to avoid a high frequency condition of electric motor at starting or peak demand condition.

This by-pass valve closes when the electric motor of hydraulic pump reaches 5000 rpm.

The pump is also provided with an external pump leakage drain line, consisting of a transparent hose that is looped in order to collect oil leaks and show leakage amount.

2) Data

- nominal fluid flow : 7,9 L/min (2.1 USG per min) at 197 bar (2850 psi);
- nominal pressure : 206,9 bar (3000 psi) at zero fluid flow ;
- electric motor speed 6700 thru 9700 rpm.

C. Pressure Module 6005 GX

The pressure module consisting of two hydraulically separate modules (green and blue) is located in the left main gear well. The green module internal pressure line is equipped with:

- a check valve
- a pressure filter
- a relief valve

The green module internal case drain line is provided with :

- a bypassing filter
- a check valve.

The module external casing incorporates also threaded ports for the installation of :

- a low pressure switch
- a pressure transmitter
- an overheat sensor

D. Return Module 6029 GX

The return module, bolted to the rear side of the reservoir, receives fluid from the users of the green system.

Fluid is returned to the section of the reservoir through a return filter.

The green return module is provided with :

- a low pressure filter ;
- a check valve, which prevents cavitation of landing gear actuators in an emergency extension occurrence.

- a proper restrictor, installed to absorb the delta p present in return lines when actuating hydraulic system users.

E. Valves

(1) Relief valve

A pressure relief valve is installed on the green pressure module. It provides overpressure protection of the green system :

- opening: 245 bar (3553 psi) ;
- closing: 216 bar (3133 psi).

(2) Check valves

Check valves are fitted wherever required to protect or isolate certain items in particular on the pressure line of the pump.

(3) Cross-feed valve

A solenoid cross-feed valve is installed on the HP module, between the green and blue module, for interconnecting the blue and green systems.

003 INSTALLATION

1. MAKE CERTAIN THAT ALL PARTS ARE THOROUGHLY CLEAN PRIOR TO ASSEMBLY.

CAUTION: BEFORE INSTALLATION LUBRICATE NEW BACK-UP RINGS AND PACKINGS WITH HYDRAULIC FLUID.

2. CAREFULLY CLEAN THE PACKING GROOVES.
3. INSTALL THE PACKINGS (9) OF NIPPLE (8).
4. INSTALL PACKINGS (6) AND BACK-UP RINGS (5) ON NIPPLES (7) AND (10).
5. INSTALL NIPPLES (8) (7) AND (10) ON VALVE (4)
6. POSITION THE CROSS-FEED VALVE (4).
7. INSTALL BOLTS (2) AND WASHERS (3) (GREEN PRESSURE MODULE SIDE ONLY).
8. POSITION BLUE PRESSURE MODULE (23) AND VERIFY THAT NIPPLE (10) IS INSTALLED ON ITS SEAT.
9. INSTALL BOLTS (11), WASHERS (12) (13), NUTS (15) AND COTTER PIN (14).
10. INSTALL BOLT (16), WASHERS (17) (18), NUTS (19) AND COTTER PIN (20).
11. INSTALL BOLTS (21) AND WASHERS (22).
12. INSTALL BOLTS (2) AND WASHERS (3) (BLUE PRESSURE MODULE (23)).
13. TIGHTEN THE FOUR BOLTS (2) TO FINAL TORQUE VALUE 0.6 THRU 0.7 DAN.M (53 THRU 62 LBF.IN)
14. CONNECT THE FOLLOWING LINES ON BLUE PRESSURE MODULE (23):
 - DELIVERY AND CASE DRAIN
 - GROUND SERVICE PANEL
 - RETURN RELIEF VALVE
15. CONNECT THE FOLLOWING ELECTRICAL CONNECTORS:
 - 11GNA PRESSURE SWITCH
 - 9GNA PRESSURE TRANSMITTER
 - 7GRA OVERHEAT SENSOR
 - 3GEA CROSS-FEED VALVE

004 ENERGIZATION OF AIRCRAFT AC AND DC NETWORKS

SEE JOB INSTRUCTION CARD

JIC : 244000-EAD-10000

002 REMOVAL

1. DISCONNECT THE FOLLOWING ELECTRICAL CONNECTORS:

- 11GNA PRESSURE SWITCH
- 9GNA PRESSURE TRANSMITTER
- 7GRA OVERHEAT SENSOR
- 3GEA CROSS FEED VALVE (1)

2. DISCONNECT THE FOLLOWING LINES ON BLUE PRESSURE MODULE (23):

- DELIVERY AND CASE DRAIN
- GROUND SERVICE PANEL
- RETURN RELIEF VALVE

3. REMOVE BOLTS (2) AND WASHERS (3).

4. REMOVE BOLTS (21) AND WASHERS (22).

5. REMOVE COTTER PINS (14), NUTS (15) AND WASHERS (13).

6. WITHDRAW BOLTS (11) AND WASHERS (12).

7. REMOVE COTTER PIN (20), NUT (19) AND WASHER (18)

8. WITHDRAW BOLT (16) AND WASHER (17).

CAUTION: WHEN REMOVING CROSS FEED VALVE (4) DO NOT DAMAGE NIPPLES (7) (8) (10).

9. SEPARATE WITH CARE BLUE PRESSURE MODULE (23) FROM GREEN PRESSURE MODULE (24) AND REMOVE CROSS FEED VALVE (4).

10. REMOVE NIPPLE (7) FROM CROSS FEED VALVE (4).

11. REMOVE AND DISCARD BACK-UP RINGS (5) AND PACKINGS (6).

12. REMOVE NIPPLE (8) FROM CROSS FEED VALVE (4).

13. REMOVE AND DISCARD PACKINGS (9).

14. REMOVE NIPPLE (10) FROM CROSS FEED VALVE (4)

15. REMOVE AND DISCARD BACK-UP RINGS (5) AND PACKINGS (6).

F. Filters

Filters are used to maintain hydraulic fluid in a state of cleanliness.

The maximum acceptable level of contamination is the equivalent of NAS 1638 class 8.

All filters are of disposable type.

Each filter is equipped with :

- a shut-off valve diaphragm which prevents hydraulic fluid loss and minimize air entry when the filter bowl is removed for element replacement.

- a clogging indicator with a red button which comes out when a preset differential pressure value is reached ;

- a thermal lockout ring which prevents clogging indicator operation at low temperatures ;

- a check valve.

(a) Pressure filter

- a 15 micron nonbypassing filter is installed in the pressure line on the pressure module. Its clogging indicator comes out at delta p 6,9 bar (100 psi).

(b) Return filter

- a 5 micron bypassing filter is installed in the return module.

Its clogging indicator comes out at delta p 4.4 bar +/- .2 (63.82 +/- 2.9 psi).

The bypass valve opens at 5.0 +/- .2 bar (72.53 +/- 2.9 psi).

(c) Case Drain filter

- a 15 micron bypassing filter, installed on the pressure module in the pump case drain line, allows it monitoring of pump wear. Its clogging indicator comes out at delta p 2,5 bar (36.3 psi). The bypass valve opens at 3,5 bar (50.8 psi).

In addition to the above described filters, the hydraulic system is also provided with an acoustic type filter. This is located downstream the AC pump, between pressure port an relevant hose and is intended to reduce the noise.

G. Accumulator 6003 GX

The green system accumulator is cylindrical in shape, welded-steel, fluid and compressed nitrogen, piston-separated type. It is installed in left main gear well and acts as shock absorber against system pressure surges.

The accumulator is initially charged with dry nitrogen to 103.4 bar (1500 psi) at 20° C (68F). A pressure gauge is installed near the accumulator.

H. Ground Service Panel

Ground power pressure and suction quick disconnect fittings, for applying external hydraulic power to the green system, or for reservoir refilling and drainage, are provided on a common ground service panel located in the left main gear well.

3. Alert

Whenever a caution light (LO LEVEL, LO PR, OVHT) on the HYD PWR panel comes on, simultaneously a caution signal is received by the Crew Alerting System, the following visual and acoustic alerts provides :

- illumination of the amber HYD light on the CAP ;
- illumination of the amber CAUTION light ;
- at the same time the two flight compartment loudspeakers emit a warning in form of a single chime (gong).

For further information ref. 29-30-00.

4. Controls and Indicating

CROSS-FEED VALVE REMOVAL AND INSTALLATION

TECHNICAL DATA

ZONING DATA

ZONE :195

ACCESS :195 CL

195 EL

PREPARATION

WORK:SKILLMENMAN-HOURS

ELAPSED TIME:

SPARE:01 CROSS-FEED VALVE 291253-05-050

EXPENDABLE:06 PACKING 291253-05-XXX

04 BACK-UP RING291253-05-XXX

PUBLICATION

JIC:24-40-00-EAD-10000

TASK DESCRIPTION

001 PREPARATION

1. OPEN SAFETY CLIPS AND TAGS THE FOLLOWING CIRCUIT BREAKERS:
 - ON PANEL 126VU
 - 1GX *BLUE HYD PUMP PWR SPLY
 - 4GX GREEN HYD PUMP PWR SPLY
 - ON PANEL 121VU
 - 1GE HYD PWR/XFEED
 - 1GN HYD PWR/PRESS IND
 - 4GF HYD PWR/AUX PUMP CTL & IND/NORM
 - ON PANEL 124VU
 - 2GF PWR SPLY ON PRIM DC BUS2/AUX HYD PUMP NORM PWR SPLY
 - ON PANEL 129VU
 - 10GF AUX HYD PUMP GND PWR SPLY
2. OPEN ACCESS PANEL 195EL.
3. CHECK CORRECT FLUID LEVEL IN THE RESERVOIR VIA SIGHT GLASS INDICATOR.
4. CLOSE ACCESS PANEL 195EL.
5. OPEN ACCESS PANEL 195CL.