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MAIN HYDRAULIC POWER – INSPECTION/CHECK

1. General

   A. The inspection/check procedures for hydraulic systems No. 1, No. 2 and No. 3 are as follows:

      – [redacted]
      – Functional Check (Acidity and contamination) of the Hydraulic Fluid (Ref. TASK 29–10–00–750–802)
      – Visual Check of the Filter Differential Pressure Indicators (Ref. TASK 29–10–00–780–801)
      – Visual Check of the Filter Differential Pressure Indicators (Ref. TASK 29–10–00–780–802)
      – Internal Leak Check – Pressure Decay Rate (Ref. TASK 29–10–00–790–801)
      – External Leak Check – Static Leak Check of the EDP (Ref. TASK 29–10–00–790–802)
      – External Leak Check – Dynamic Leak Check of the EDP (Ref. TASK 29–10–00–790–804)
      – External Leak Check – Static Leak Check of the ACMP (Ref. TASK 29–10–00–790–805)
      – External Leak Check – Dynamic Leak Check of the ACMP (Ref. TASK 29–10–00–790–806)
      – External Leak Check – Static Leak Check of the Reservoir (Ref. TASK 29–10–00–790–807)
      – External Leak Check – Dynamic Leak Check of the Reservoir (Ref. TASK 29–10–00–790–808).

   B. The leakage tests of the flight control PCUs are in AMM Chapter 27 for the following:

      – Functional Check of Each Aileron PCU for Internal Leakage (Ref. TASK 27–14–01–720–801)
      – Leakage Test of the Aileron PCU (Ref. TASK 27–14–01–790–802)
      – Leakage Test of the Rudder PCU (Ref. TASK 27–23–01–790–801)
      – Leakage Test of the Elevator PCU (Ref. TASK 27–33–01–790–801)
      – Leakage Test of the Flight Spoiler and Spoileron PCUs (Ref. TASK 27–62–01–790–801).

TASK 29–10–00–750–801

1. Job Set–Up Information

Subtask 29–10–00–943–008

A. Tools and Equipment

REFERENCE	DESIGNATION
None specified	Container for hydraulic fluid
None specified	Sampling bottle
G601R291004–25 or equivalent	Sampling Adaptor

Subtask 29–10–00–946–010

B. Reference Information

REFERENCE	DESIGNATION
TASK 12–00–06–863–801	Pressurize Hydraulic Systems No. 1 and No. 2
TASK 12–00–06–863–802	Release Hydraulic Pressure – System No. 1 and No. 2
TASK 12–00–06–863–803	Pressurize Hydraulic System No. 3
TASK 12–00–06–863–804	Release Hydraulic System No. 3
TASK 12–12–29–611–803	Replenish the Reservoirs of the Hydraulic Systems
TASK 29–00–00–910–801	Hydraulic Safety Precautions
TASK 29–10–00–617–801	Flush Hydraulic System No. 1
TASK 29–10–00–617–802	Flush Hydraulic System No. 2
TASK 29–10–00–617–803	Flush Hydraulic System No. 3

2. Job Set–Up

Subtask 29–10–00–863–020

A. Pressurize hydraulic system No. 1, No. 2 or No. 3 as applicable (Ref. TASK 12–00–06–863–801 or TASK 12–00–06–863–803).

Subtask 29–10–00–910–010

WARNING: OBEY ALL THE HYDRAULIC SAFETY PRECAUTIONS WHEN YOU DO WORK ON ANY HYDRAULIC SYSTEM OR ON A HYDRAULIC SYSTEM COMPONENT. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURY TO PERSONS AND/OR DAMAGE TO EQUIPMENT.

B. Obey all the hydraulic safety precautions (Ref. TASK 29–00–00–910–801).

Subtask 29–10–00–680–003

C. Drain a sample of hydraulic fluid as follows:

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF ALL FLIGHT CONTROL SURFACES. FLIGHT CONTROL MOVEMENTS CAN CAUSE INJURIES TO PERSONS AND/OR DAMAGE EQUIPMENT.

(1) Make sure that all persons and equipment are clear of all the flight control surfaces. Operate all the flight controls through 5 complete cycles. Operate the hydraulic system for 20 minutes to get the operating temperature.

(2) For hydraulic systems No. 1 or No. 2, open the aft equipment compartment door (311BB).

(3) For hydraulic system No. 3, open the hydraulic service access panel (196BL).

(4) Make sure that the valve on the hydraulic fluid sampling hose is in the closed position.

(5) At the applicable ground service panel, connect the hydraulic fluid sampling hose to the return connection and put the end of the hose into the container.

(6) Open the valve on the sampling hose and do the following:

(a) For hydraulic system No. 1 or No. 2, drain and discard approximately 0.50 liter of fluid.

(b) For hydraulic system No. 3, drain and discard approximately 1.0 liter of fluid.

(7) Fill the sample container with hydraulic fluid to the specified level and close the valve on the sampling hose.

(8) Remove the sampling hose from the return connection.

3. Procedure

Refer to Figure 601

Subtask 29–10–00–730–002

A. Do a Hydraulic Fluid Inspection as follows:

NOTE: Test results are not required at completion of the task or for aircraft release. Refer to Figure to act on test results once received, or as required per operators established Hydraulic Sampling Program.

(1) Send the hydraulic fluid sample to a material laboratory for analysis.

(2) Get a laboratory analysis report (results) based on the hydraulic fluid sample taken.

(3) Refer to Figure to make sure that the hydraulic fluid physical and chemical properties are within acceptable limits:

(4) If the sample hydraulic fluid is within serviceable limits, replenish the applicable hydraulic system reservoir (Ref. TASK 12–12–29–611–803).

(5) If the sample hydraulic fluid is not within serviceable limits, flush the applicable hydraulic system. Do the applicable procedure that follows:

- Flush Hydraulic System No. 1 (Ref. TASK 29–10–00–617–801)
- Flush Hydraulic System No. 2 (Ref. TASK 29–10–00–617–802)

– Flush Hydraulic System No. 3 (Ref. TASK 29–10–00–617–803).

4. Close Out

Subtask 29–10–00–863–007

A. Release the pressure from hydraulic systems No. 1, No. 2 and No. 3 (Ref. TASK 12–00–06–863–802 and TASK 12–00–06–863–804).

Subtask 29–10–00–941–016

B. Remove all tools, equipment, and unwanted materials from the work area.

Subtask 29–10–00–410–010

C. For hydraulic systems No. 1 or No. 2, close the aft equipment compartment door (311BB).

Subtask 29–10–00–410–011

D. For hydraulic system No. 3, close the hydraulic service access panel (196BL).

HYDRAULIC FLUID PARAMETER	TEST METHOD	RECOMMENDED IN SERVICE LIMITS	VALUES[1]	TIME FRAMES[2]
Appearance	Visual Inspection	No cloudiness, phase separation or precipitation allowed. Any color is acceptable	Not applicable	If cloudiness, phase separation or precipitation are found flush system as per AMM
Moisture Content, % by weight	ASTM D1744	0.0 to 0.60	0.61 to 0.80	30 calendar days or 200 FH W.C.F to flush system as per AMM
			0.81 and above	Flush system as per AMM
Neutralization Number, mg KOH/gm	ASTM D974	1.0 Recommended PERMITTED: 1.5 Max	1.0 to 1.5	15 calendar days or 100 FH W.C.F to flush system as per AMM
			1.6 and above	Flush system as per AMM
Chlorine Content, ppm (optional in AMM, required in MRB)	X–ray Fluorescence	200	201 to 250	15 calendar days or 100 FH W.C.F to flush system as per AMM
			251 and above	Flush system as per AMM
Particle Contamination	ARP 598	NAS 1638, Class 8 recommended PERMITTED: NAS 1638, Class 9	Class 8	Perform sample check with in 3000 FH
			Class 9	30 calendar days or 200 FH W.C.F to flush system as per AMM
			Class 10 and above	Flush system as per AMM

1. Values: represent the level of contamination allowed for a limited duration.
2. Time frames: represent the additional time the aircraft can remain into service from discovery of the contamination up to new results availability (including corrective action, new sample removal and new analysis).

NAS 1638 Maximum Contamination Limits
(Based on a 100 ml sample size)

Particle Size Range (Micrometers)					
Class	**5 to 15**	**15 to 25**	**25 to 50**	**50 to 100**	**Over 100**
8	64,000	11,400	2,025	360	64
9	128,000	22,800	4,050	720	128
10	256,000	45,600	8,100	1,440	256

NOTE

Metallic particle contamination can cause hydraulic pump failure and damage to sensitive components, specially powered flight controls units.

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Functional Check (Acidity and Contamination)
Figure 601

TASK 29–10–00–750–802
Functional Check (acidity and contamination) of the system No. 1, 2 and 3 Hydraulic Fluid

1. Reason for the Job

Refer to MRB 29–00–00–01.

2. Job Set–Up Information

Subtask 29–10–00–750–001

A. Tools and Equipment

REFERENCE	DESIGNATION
None specified	Container for hydraulic fluid
None specified	Sampling bottle
G601R291004–25 or equivalent	Sampling Adaptor

B. Reference Information

REFERENCE	DESIGNATION
TASK 12–00–06–863–801	Pressurize Hydraulic Systems No. 1 or No. 2
TASK 12–00–06–863–802	Release Hydraulic Pressure – Systems No. 1 and No. 2
TASK 12–00–06–863–803	Pressurize Hydraulic System 3
TASK 12–00–06–863–804	Release Hydraulic Pressure – System No. 3
TASK 12–12–29–611–803	Replenish the Reservoirs of the Hydraulic Systems
TASK 29–00–00–910–801	Hydraulic Safety Precautions
TASK 29–10–00–617–801	Flush Hydraulic System No. 1
TASK 29–10–00–617–802	Flush Hydraulic System No. 2
TASK 29–10–00–617–803	Flush Hydraulic System No. 3

3. Job Set–Up

Subtask 29–10–00–863–002

A. Pressurize hydraulic system No. 1, No. 2 or No. 3 as applicable (Ref. TASK 12–00–06–863–801 or TASK 12–00–06–863–803).

Subtask 29–10–00–910–002

WARNING: OBEY ALL THE HYDRAULIC SAFETY PRECAUTIONS WHEN YOU DO WORK ON ANY HYDRAULIC SYSTEM OR ON A HYDRAULIC SYSTEM COMPONENT. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURY TO PERSONS AND/OR DAMAGE TO EQUIPMENT.

B. Obey all the hydraulic safety precautions (Ref. TASK 29–00–00–910–801).

Subtask 29–10–00–010–001

C. For hydraulic systems No. 1 or No. 2, open the aft equipment compartment door (311BB).

D. For hydraulic system No. 3, open the hydraulic service access panel (196BL).

4. Procedure

Refer to Figure 602

Subtask 29–10–00–750–002

A. To get a hydraulic fluid sample from hydraulic systems No. 1, No. 2 and No. 3, do the steps that follow:

WARNING: MAKE SURE THAT ALL PERSONS AND EQUIPMENT ARE CLEAR OF ALL FLIGHT CONTROL SURFACES. FLIGHT CONTROL MOVEMENTS CAN CAUSE INJURIES TO PERSONS AND/OR DAMAGE EQUIPMENT.

(1) Operate the hydraulic system for 20 minutes to get the operating temperature.

(2) Make sure to operate all the flight controls through 5 complete cycles.

(3) Make sure that the valve on the hydraulic fluid sampling hose is in the closed position.

(4) At the applicable ground service panel, connect the hydraulic fluid sampling hose to the return connection and put the end of the hose into the container.

(5) Open the valve on the sampling hose and do the steps that follow:

(a) For hydraulic system No. 1 or No. 2, drain and discard approximately 0.50 liter of fluid.

(b) For hydraulic system No. 3, drain and discard approximately 1.0 liter of fluid.

(6) Fill the sample container with hydraulic fluid to the specified level and close the valve on the sampling hose.

(7) Remove the sampling hose from the return connection.

B. Do the functional check of the hydraulic fluid for acidity and contamination as follows:

NOTE: Test results are not required at completion of the task or for aircraft release. Refer to Figure to act on test results once received, or as required per operators established Hydraulic Sampling Program.

(1) Send the hydraulic fluid sample to a material laboratory for analysis.

(2) Get a laboratory analysis report (results) based on the hydraulic fluid sample taken.

(3) Refer to Figure to make sure that the hydraulic fluid physical and chemical properties are within acceptable limits:

(4) If the hydraulic fluid sample is within serviceable limits, replenish the applicable hydraulic system reservoir (Ref. TASK 12–12–29–611–803).

(5) If the hydraulic fluid sample is not within the serviceable limits, flush the applicable hydraulic system as follows:

(a) Flush hydraulic system No. 1 (Ref. TASK 29–10–00–617–801).

(b) Flush hydraulic system No. 2 (Ref. TASK 29–10–00–617–802).

(c) Flush hydraulic system No. 3 (Ref. TASK 29–10–00–617–803).

5. Close Out

Subtask 29–10–00–863–003

A. Release the pressure from hydraulic systems No. 1, No. 2 and No. 3 (Ref. TASK 12–00–06–863–802 and TASK 12–00–06–863–804).

Subtask 29–10–00–941–005

B. Remove all tools, equipment, and unwanted materials from the work area.

Subtask 29–10–00–410–005

C. For hydraulic systems No. 1 or No. 2, close the aft equipment compartment door (311BB).

Subtask 29–10–00–410–006

D. For hydraulic system No. 3, close the hydraulic service access panel (196BL).

HYDRAULIC FLUID PARAMETER	TEST METHOD	RECOMMENDED IN SERVICE LIMITS	VALUES[1]	TIME FRAMES[2]
Appearance	Visual Inspection	No cloudiness, phase separation or precipitation allowed. Any color is acceptable	Not applicable	If cloudiness, phase separation or precipitation are found flush system as per AMM
Moisture Content, % by weight	ASTM D1744	0.0 to 0.60	0.61 to 0.80	30 calendar days or 200 FH W.C.F to flush system as per AMM
			0.81 and above	Flush system as per AMM
Neutralization Number, mg KOH/gm	ASTM D974	1.0 Recommended PERMITTED: 1.5 Max	1.0 to 1.5	15 calendar days or 100 FH W.C.F to flush system as per AMM
			1.6 and above	Flush system as per AMM
Chlorine Content, ppm (optional in AMM, required in MRB)	X–ray Fluorescence	200	201 to 250	15 calendar days or 100 FH W.C.F to flush system as per AMM
			251 and above	Flush system as per AMM
Particle Contamination	ARP 598	NAS 1638, Class 8 recommended PERMITTED: NAS 1638, Class 9	Class 8	Perform sample check with in 3000 FH
			Class 9	30 calendar days or 200 FH W.C.F to flush system as per AMM
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1. Values: represent the level of contamination allowed for a limited duration.
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Class	**5 to 15**	**15 to 25**	**25 to 50**	**50 to 100**	**Over 100**
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Functional Check (Acidity and Contamination)
Figure 602