

CHAPTER 49

CLEANING INSTRUCTIONS – HYDRAULIC RIG UNITS VARIOUS

- 49.1** This chapter provides basic and specific cleaning requirements for selected GSE. Where there is a specific requirement or need to highlight particular problem areas detailed cleaning guides are provided as tables and figures in this chapter.
- 49.2** While Hydraulic Rig Units may appear to be quite innocuous, they are complex pieces of machinery. While all contamination and BRM must be removed, the main areas of concern are:
- external areas;
 - engine bay;
 - electronics;
 - cable bin; and
 - tyres (new, old and spares).
- 49.3** All points are not specific to all Hydraulic Rig Units.

External Areas

- 49.4** The cleaning instructions for Hydraulic Rig Units, illustrated in Figures 49-1 and 49-2, include the points detailed in Table 49-1.



Figure 49–1: Skydrol Hydraulic Rig Unit



Figure 49–2: 70GPM Hydraulic Rig Unit

Table 49–1: Hydraulic Rig Unit

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	The external canopy is to be washed and be and free of soil, plant and insect material.	
2	Mud and other debris collect in the inside area on the inner side of the wheel. Ensure that this area is cleaned well.	
3	Ensure axles and mounts on chassis are clean and free of soil, plant and insect material.	
4	Towbars are to be cleaned taking particular notice of any piping or hollow cavities.	
5	Remove the battery from the compartment and clean the leads.	
6	Clean the battery boxes and cradles and ensure they are free of dirt, dust, plant and insect material.	
7	Where possible/practical re-fit batteries after inspection by DA.	

Engine Bay

49.5 The cleaning instructions for a Hydraulic Rig Unit’s engine bay include the points detailed in Table 49-2.

Table 49–2: Cleaning Instructions for the Hydraulic Rig Unit’s Engine Bay

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Remove all non-affixed engine covers to allow access	
2	Remove belly plates (if fitted) to allow access from underside	
3	Air tanks are generally found underside and need to be cleaned – ensure topside of tanks are cleaned.	
4	Flush radiator and oil cooler fins (May require removal of shroud).	
5	Check air-filter (and pre-cleaner if applicable).	
6	Ensure all hydraulic hoses are accessible and clean	
7	Ensure any wiring harnesses and looming is clean – may require removal to clean.	
8	Ensure any fanbelt pulleys are clean (some have small holes in front)	
9	Chassis rails can be hollow – check for access or drainage points and flush to ensure clean.	
10	Check to ensure that sump and engine block is clean.	
11	Check wheel arches for hollow support framework – flush if required.	

Electronics

49.6 The cleaning instructions for Aircraft Hydraulic Unit’s electronics include the points detailed in Table 49-3.

EXTREME CAUTION
ELECTRICAL COMPONENTS

Do not use water or steam to clean any interiors areas of the Aircraft Hydraulic Unit’s electrical compartments – Use air clean only and only under the supervision of a qualified technician

49-3: Cleaning Instructions for Aircraft Hydraulic Unit’s Electronics

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Use air clean only and only under the supervision of a qualified technician	
2	Remove panels to allow access to the evaporator filter	
3	Remove panel to allow access the condenser filter.	

Cables

49.7 The cleaning instructions for a Hydraulic Rig Unit’s cables include the points detailed in Table 49-4.

Table 49-4: Cleaning Instructions for the Hydraulic Rig Unit's Cables and Hoses

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	All cables and hoses are to be fully extended and cleaned to ensure they are free of BRM	
2	Plastic-coated cabling and hoses should be wiped down and all cable ties removed.	
3	Electrical tape, which has been used to secure cabling and hoses, is to be removed and destroyed, as this provides an ideal area for plant and soil particles to collect	
4	The cable compartment is to be cleaned and free of BRM	

Tyres (New, Old and Spares)

49.8 The cleaning instructions for Tyres (New, Old and Spares), if applicable, include the points detailed in Table 49-5.

49-5: Cleaning Instructions for Tyres (New, Old and Spares)

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	All tyres are to be washed and scrubbed to remove all BRM.	
2	Damaged tyres are to be inspected and their suitability for return to Australia determined. If necessary, damaged tyres (for example, perished, cracked or split) are to be removed and disposed of in accordance with the tyre disposal policy.	
3	Cracked tyres have the risk of containing BRM therefore perished tyres are to be subject to disposal.	
4	All tyres are to be treated with an approved residual insecticide after cleaning.	
5	Fitted tyres that are damaged should be replaced with new tyres.	
6	Used and fitted tyres on rims are to be individually verified that the tyres are on rims, inflated with beading sealed and that the tyres are clean, free of water and other BRM.	
7	Tyres that are not fitted to rims are to be stored in such a manner that water cannot collect inside the tyre. The preferred DA solution is that tyres are stored within containers. Tyres not fitted on rims will require fumigation on return to Australia.	
8	DA considers a Non-Commercial consignment of tyres to contain a maximum of 8 tyres (inclusive of the wheels on the vehicle) and may be imported with an accompanying vehicle. If tyres are to be transported back to Australia in containers or crates, please refer to the DA BICON (Biosecurity Import Conditions system) internet site (http://www.agriculture.gov.au/import/online-services/bicon) for the commodity "tyres".	

Annexes:

- A. Cleaning Instructions - ADP 5028 Aircraft Hydraulic Unit
- B. Cleaning Instructions - HI 70g Aircraft Hydraulic Unit
- C. Cleaning Instructions - Rexroth 35GPM Aircraft Hydraulic Unit
- D. Cleaning Instructions - Berendsen 10GPM Dual Hydraulic Unit
- E. Cleaning Instructions – F35A Hydraulic Test Unit

ANNEX A TO CHAPTER 49

CLEANING INSTRUCTIONS – ADP 5028 AIRCRAFT HYDRAULIC UNIT

1. This chapter provides basic and specific cleaning requirements for selected GSE. Where there is a specific requirement or need to highlight particular problem areas detailed cleaning guides are provided as tables and figures in this Annex.
2. The cleaning requirements that follow are in addition to those points for aircraft air-conditioners that are included Chapter 49 of this publication.

External Areas

3. The cleaning instructions for the ADP 5028 Aircraft Hydraulic Unit, illustrated in Figures 49A-1 to 49A-3, include the points detailed in Table 49A-1.



Figure 49A-1: ADP 5028 Aircraft Hydraulic Unit



Figure 49A-2: ADP 5028 Hydraulic Unit's Battery Box



Figure 49A-3: ADP 5028 Hydraulic Unit with Canopy removed

Table 49A-1: ADP 5028 Aircraft Hydraulic Unit's External Areas

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	The external canopy is to be washed and be and free of soil, plant and insect material.	
2	After external cleaning, the canopy is to be removed for internal cleaning. Removal is only to be conducted under the supervision of a qualified technician (refer Figure 49A-3).	
3	Refer to Chapter 49 for detailed cleaning guidelines.	

Electronics

- The cleaning instructions for ADP 5028 Aircraft Hydraulic Unit's electronics, illustrated in Figures 49A-4 to 49A-6, include the points detailed in Table 49A-2.

**EXTREME CAUTION
ELECTRICAL COMPONENTS**

Do not use water or steam to clean any interiors areas of the Aircraft Hydraulic Unit's electrical compartments – Use air clean only and only under the supervision of a qualified technician



Figure 49A-4: ADP 5028 Aircraft Hydraulic Unit's Control Panel Compartment



Figure 49A-5: ADP 5028 Aircraft Hydraulic Unit's Control Panel

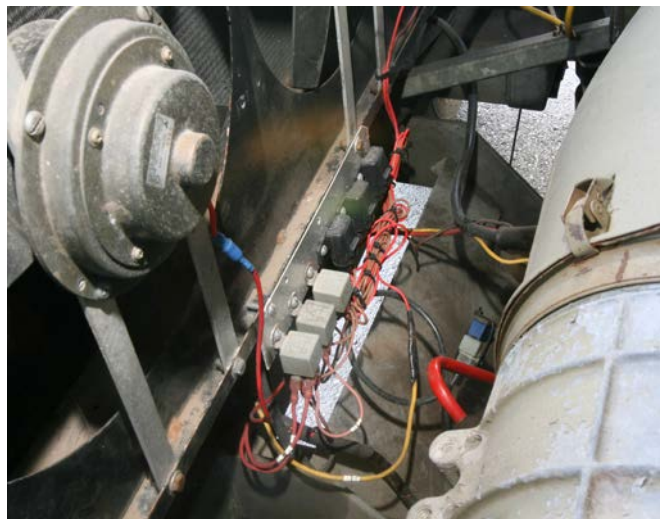


Figure 49A-6: ADP 5028 Aircraft Hydraulic Unit's Electronics

49A-2: Cleaning Instructions for ADP 5028 Aircraft Hydraulic Unit's Electronics

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Use air clean only and only under the supervision of a qualified technician	
2	Remove panel to allow access the evaporator filter	
3	Remove panel to allow access the condenser filter (refer Figure 49A-5)	

Engine and Engine Bay

5. The cleaning instructions for ADP 5028 Aircraft Hydraulic Unit's engine and engine bay, illustrated in Figures 49A-7 and 49A-8, include the points detailed in Table 49A-3.



Figure 49A-7: ADP 5028 Hydraulic Unit's Engine Bay



Figure 49A-8: ADP 5028 Hydraulic Unit's Engine

49A-3: Cleaning Instructions for ADP 5028 Aircraft Hydraulic Unit's Engine and Engine Bay

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Use air clean only and only under the supervision of a qualified technician. Do not direct high-pressure water jets at any of the engine openings/breathers, or at any of the electrical/electronic components.	
2	Ensure that water is not directly applied to the starter motor and alternator (refer Figure 49A-7)	
3	Refer to Chapter 49 for detailed cleaning guidelines.	

Cable Bin

6. The cleaning instructions for a Hydraulic Unit's cable bin, illustrated in Figure 49A-9, include the points detailed in Table 49A-4.

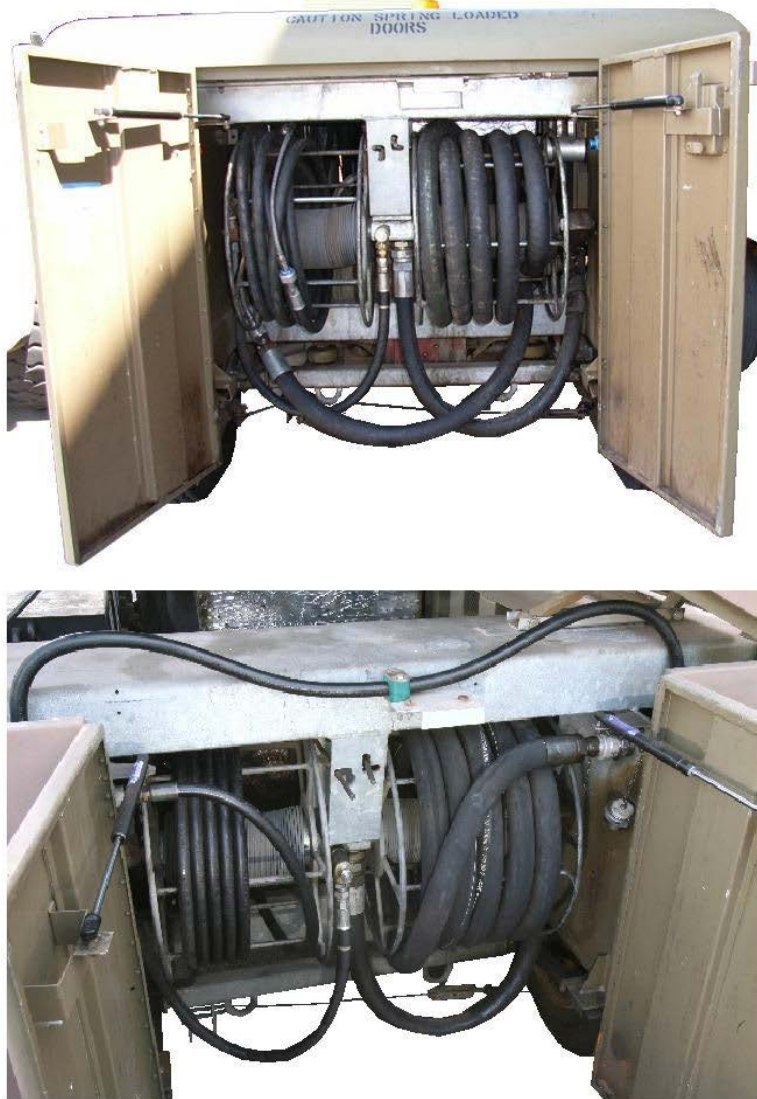


Figure 49A-9: ADP 5028 Hydraulic Unit's Cable Bin

Table 49A-4: Cleaning Instructions for the ADP 5028 Hydraulic Unit's Cable Bin

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	All cables are to be fully extended and cleaned to ensure they are free of BRM	
2	Refer to Chapter 49 for detailed cleaning guidelines.	

ANNEX B TO CHAPTER 49

CLEANING INSTRUCTIONS – HYDRAULIC INTERNATIONAL 70G

AIRCRAFT HYDRAULIC UNIT

1. This chapter provides basic and specific cleaning requirements for selected GSE. Where there is a specific requirement or need to highlight particular problem areas detailed cleaning guides are provided as tables and figures in this Annex.
2. The cleaning requirements that follow are in addition to those points for aircraft air-conditioners that are included Chapter 49 of this publication.

External Areas

3. The cleaning instructions for the HI 70G Aircraft Hydraulic Unit, illustrated in Figures 49B-1 to 49B-2, include the points detailed in Table 49B-1.



Figure 49B-1: HI 70G Hydraulic Unit's Lower External Areas



Figure 49B-3: HI 70G Hydraulic Unit's Battery Box

Table 49B-1: HI 70G Aircraft Hydraulic Unit's External Areas

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Clean forklift points of all soil matter and check for any animal or insect infestation (refer Figure 49B-2).	
2	Clean the battery boxes and cradles and ensure they are free of dirt, dust, plant and insect material (refer Figure 49B-3).	
3	Refer to Chapter 49 for detailed cleaning guidelines	

Electronics

4. The cleaning instructions for HI 70G Aircraft Hydraulic Unit's electronics, illustrated in Figure 49B-3, include the points detailed in Table 49B-2.

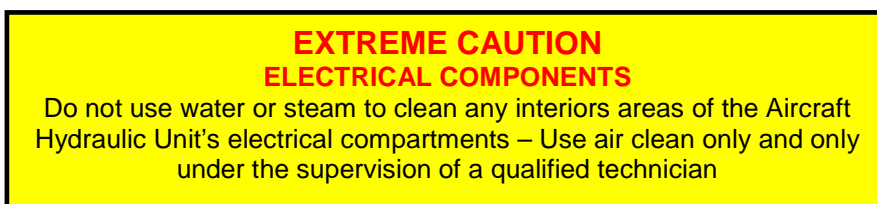


Figure 49B-3: HI 70G Aircraft Hydraulic Unit's Control Panel

49B-2: Cleaning Instructions for HI 70G Aircraft Hydraulic Unit's Electronics

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Use air clean only and only under the supervision of a qualified technician	
2	Remove panel to allow access the evaporator filter	

Engine and Engine Bay

5. The cleaning instructions for HI 70G Aircraft Hydraulic Unit's engine and engine bay, illustrated in Figures 49B-4 to 49B-6, include the points detailed in Table 49B-3.



Figure 49B-4: HI 70G Hydraulic Unit's Engine Bay

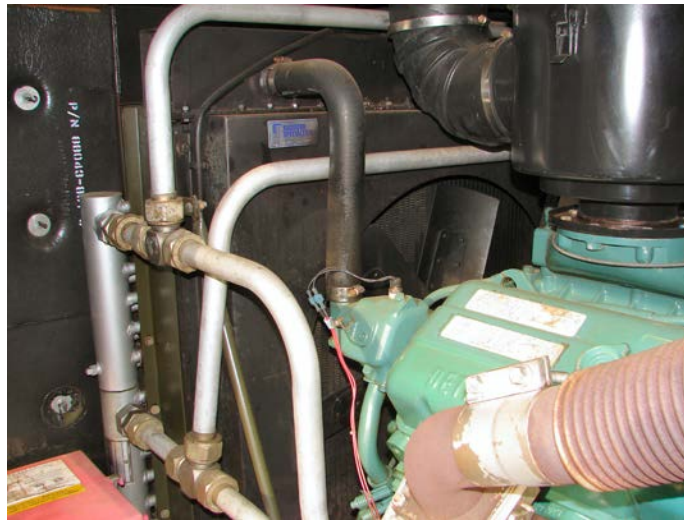


Figure 49B-5: HI 70G Hydraulic Unit's Radiator



Figure 49B-6: HI 70G Hydraulic Unit's Hydraulic Hoses

Table 49B-3: Cleaning Instructions for HI 70G Aircraft Hydraulic Unit's Engine and Engine Bay

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Use air clean only and only under the supervision of a qualified technician. Do not direct high-pressure water jets at any of the engine openings/breathers, or at any of the electrical/electronic components.	
2	Refer to Chapter 49 for detailed cleaning guidelines	

Cables

6. The cleaning instructions for a Hydraulic Unit's cables, illustrated in Figure 49B-7, include the points detailed in Table 49B-4.

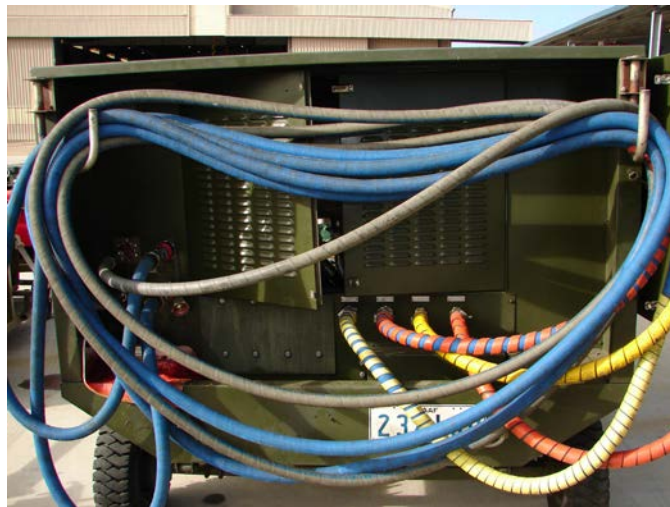


Figure 49B-7: HI 70G Hydraulic Unit's Cables

Table 49B-4: Cleaning Instructions for the HI 70G Hydraulic Unit's Cables

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	All cables are to be fully extended and cleaned to ensure they are free of BRM	
2	The cable compartment is to be cleaned are free of BRM	
3	Refer to Chapter 49 for detailed cleaning guidelines.	

ANNEX C TO CHAPTER 49

CLEANING INSTRUCTIONS – REXROTH 35 GPM AIRCRAFT

HYDRAULIC UNIT

1. This chapter provides basic and specific cleaning requirements for selected GSE. Where there is a specific requirement or need to highlight particular problem areas detailed cleaning guides are provided as tables and figures in this annex.
2. The cleaning requirements that follow are in addition to those points for aircraft air-conditioners that are included Chapter 49 of this publication.

External Areas

3. The cleaning instructions for the Rexroth 35 GPM Aircraft Hydraulic Unit, illustrated in Figures 49C-1 and 49C-2, include the points detailed in Table 49C-1.



Figure 49C-1: Rexroth 35GPM Hydraulic Rig Unit



Figure 49C-2: Rexroth 35GPM Hydraulic Rig Unit's Battery Box

Table 49C-1: Rexroth 35 GPM Aircraft Hydraulic Unit's External Areas

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	All areas of this unit may be washed with low pressure water except for the electrical components detailed in Chapter 1.4 below.	
2	Refer to Chapter 49 for detailed cleaning guidelines	

Electronics

4. The cleaning instructions for Rexroth 35 GPM Aircraft Hydraulic Unit's electronics, illustrated in Figures 49C-3 and 49C-4, include the points detailed in Table 49C-2.

CAUTION
ELECTRICAL COMPONENTS

Do not use water or steam to clean any interiors areas of the Aircraft Hydraulic Unit's electrical compartments – Use air clean only and only under the supervision of a qualified technician



Figure 49C-3: Rexroth 35GPM Hydraulic Rig Unit's Control Panel



Figure 49C-4: Rexroth 35GPM Hydraulic Rig Unit's Electronic Control Box

49C-2: Cleaning Instructions for Rexroth 35 GPM Aircraft Hydraulic Unit's Electronics

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Use air clean only and only under the supervision of a qualified technician	
2	Refer to Chapter 49 for detailed cleaning guidelines	

Engine and Engine Bay

5. The cleaning instructions for Rexroth 35 GPM Aircraft Hydraulic Unit's engine and engine bay, illustrated in Figures 49C-5 and 49C-6, include the points detailed in Table 49C-3.



Figure 49C-5: Rexroth 35 GPM Hydraulic Unit's Engine Bay



Figure 49C-6: Rexroth 35 GPM Hydraulic Unit's Hydraulics

49C-3: Cleaning Instructions for Rexroth 35 GPM Aircraft Hydraulic Unit's Engine Bay

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Do not direct high-pressure water jets at any of the engine openings/breathers, or at any of the electrical/electronic components.	
2	Ensure that water is not directly applied to the starter motor and alternator or to air-filter openings	
3	Refer to Chapter 49 for detailed cleaning guidelines	

ANNEX D TO CHAPTER 49

CLEANING INSTRUCTIONS – BERENDSEN 10GPM DUAL HYDRAULIC UNIT

1. This chapter provides basic and specific cleaning requirements for selected GSE. Where there is a specific requirement or need to highlight particular problem areas detailed cleaning guides are provided as tables and figures in this Annex.
2. The cleaning requirements that follow are in addition to those points for aircraft air-conditioners that are included Chapter 49 of this publication.

External Areas

3. The cleaning instructions for the Berendsen 10 GPM Aircraft Hydraulic Unit, illustrated in Figures 49D-1 to 49D-3, include the points detailed in Table 49D-1.



Figure 49D-1: Berendsen 10 GPM Hydraulic Rig Right Side External Areas



Figure 49D-2: Berendsen 10 GPM Hydraulic Rig Left Side External Areas



Figure 49D-3: Berendsen 10 GPM Hydraulic Rig Front (Left) and Rear (Right) Views

Table 49D-1: Berendsen 10 GPM Aircraft Hydraulic Unit's External Areas

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	All areas of this unit may be washed with low pressure water except for the electrical components detailed in Chapter 1.4 below.	
2	Refer to Chapter 49 for detailed cleaning guidelines	

Electronics

- The cleaning instructions for Berendsen 10 GPM Aircraft Hydraulic Unit's electronics, illustrated in Figures 49D-4 to 49D-6, include the points detailed in Table 49D-2.

CAUTION
ELECTRICAL COMPONENTS
 Do not use water or steam to clean any interiors areas of the Aircraft Hydraulic Unit's electrical compartments – Use air clean only and only under the supervision of a qualified technician



Figure 49D-4: Berendsen 10 GPM Hydraulic Rig's Main Control Panel



Figure 49D-5: Berendsen 10 GPM Hydraulic Rig's Dual Pump Control Panel



Figure 49D-6: Berendsen 10 GPM Hydraulic Rig's Dual System Connectors Panel

49D-2: Cleaning Instructions for Berendsen 10 GPM Aircraft Hydraulic Unit's Electronics

Serial	Comments or Tasks	Technical Time (hours)
1	Use air clean only and only under the supervision of a qualified technician	
2	Refer to Chapter 49 for detailed cleaning guidelines	

Engine and Engine Bay

- The cleaning instructions for Berendsen 10 GPM Aircraft Hydraulic Unit's engine and engine bay, illustrated in Figures 49D-7 to 49D-11, include the points detailed in Table 49D-3.



Figure 49D-7: Berendsen 10 GPM Hydraulic Rig Right Side Doors Open



Figure 49D-8: Berendsen 10 GPM Hydraulic Unit's Engine Bay



Figure 49D-9: Berendsen 10 GPM Hydraulic Rig Left Side Doors Open



Figure 49D-10: Berendsen 10 GPM Hydraulic Unit's Hydraulics



Figure 49D-11: Berendsen 10 GPM Hydraulic Unit's Hydraulics

49D-3: Cleaning Instructions for Berendsen 10 GPM Aircraft Hydraulic Unit's Engine Bay

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Do not direct high-pressure water jets at any of the engine openings/breathers, or at any of the electrical/electronic components.	
2	Ensure that water is not directly applied to the starter motor and alternator or to air-filter openings	
3	Refer to Chapter 49 for detailed cleaning guidelines	

ANNEX E TO CHAPTER 49 (DRAFT VERSION 0.1)

CLEANING INSTRUCTIONS – F-35A JOINT STRIKE FIGHTER

AIRCRAFT HYDRAULIC TEST UNIT

1. This Annex provides cleaning requirements specific to the F-35A Hydraulic Test Unit. Detailed cleaning guides are provided as tables and figures in this Annex.
2. The cleaning requirements that follow are in addition to those generic points for aircraft Hydraulic Test Units that are included in Chapter 49 of this publication.

External Areas

3. The cleaning instructions for the Joint Strike Fighter (JSF) Aircraft Hydraulic Unit, illustrated in Figure 49E-1, Figure 49E-2 and Figure 49E-3, include the points detailed in Table 49E-1.



Figure 49E-1: JSF Hydraulic Unit Front Left



Figure 49E-2: JSF Hydraulic Unit Front Right



Figure 49E-3: JSF Hydraulic Unit Front - Radiator

Table 49E-1: JSF Aircraft Hydraulic Unit - External Areas

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
1	Unhook front and left side hydraulic hoses (See Figure 49E-3) and lay out for cleaning in accordance with Chapter 49, Table 49-4.	
2	With all panels closed, all areas of this unit may be washed with low pressure water except for the electrical components detailed in 49E.4 below.	
3	Refer to Chapter 49 for further cleaning guidelines.	
	Total	

Electrics and Electronics

- The cleaning instructions for the JSF Aircraft Hydraulic Test Unit's electrics and electronics, illustrated in Figure 49E-4 and Figure 49E-5, include the points detailed in Table 49E-2.

CAUTION
ELECTRICAL COMPONENTS

Do not use water or steam to clean any interior areas of the Aircraft Hydraulic Unit's electrical compartments. Use air clean only and only under the supervision of a qualified technician.



Figure 49E-4: JSF Hydraulic Unit – Electronic Control Panel



Figure 49E-5: JSF Hydraulic Unit – Battery Compartment Right Side Centre Lower Panel

Table 49E-2: Cleaning Instructions for JSF Hydraulic Unit – Electrics and Electronics

Serial	Comments or Tasks	Technical Time (hours)
1	Use air clean only and only under the supervision of a qualified technician.	
2	Refer to Chapter 49 for generic cleaning guidelines.	
	Total	

Engine and Hydraulics

- The engine, hydraulic pump and hydraulic reservoir are contained in one bay accessed by the three left side panels. The engine sits midway between the front panel – see Figure 49E-6 (circled) - and the adjacent centre panel. Cleaning instructions for the JSF Aircraft Hydraulic Test Unit’s engine and hydraulics bay, illustrated in Figure 49E-6, Figure 49E-7 and Figure 49E-8, include the points detailed in Table 49E-3.



Figure 49E-6: JSF Hydraulic Unit – Front Engine Bay Panel (Circled)



Figure 49E-7: JSF Aircraft Hydraulic Unit – Hydraulic Pump Centre Panel (Circled)



Figure 49E-8: JSF Aircraft Hydraulic Unit – Hydraulic Reservoir – Rear Panel (Circled)

Table 49E-3: Cleaning Instructions for JSF Aircraft Hydraulic Unit - Engine and Hydraulics

Serial	Comments or Tasks	Technical Time (hours)
1	Do not direct high-pressure water onto any of the engine openings/breathers, or at any of the electrical/electronic components.	
2	Ensure that water is not directly applied to the starter motor and	

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49E-5

<i>Serial</i>	<i>Comments or Tasks</i>	<i>Technical Time (hours)</i>
	alternator or to air-filter openings.	
3	Refer to Chapter 49 for further generic cleaning guidelines.	
	Total	

Tyres

6. Tyres are to be cleaned in accordance with Chapter 49 Table 49-5.

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