

Holmatro SPU 16 BC - technical information

New policy number: **998**
 Old instruction number:
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 Reviewed as current:
 Owner: **Assistant Director, Property and TSS**
 Responsible work team: **Fleet Liaison Engineering and Equipment Team**

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1 Introduction

- 1.1 This policy describes the Holmatro SPU 16 and explains its operation, maintenance and testing.
- 1.2 Two SPUs are carried on all FRUs and three batteries, two fitted and one in the docking station.



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2 Description

2.1 Power unit – SPU 16 BC

The power unit is powered by a battery that drives an electric motor, that runs a hydraulic 3-stage axial piston pump and can operate one rescue tool.

Technical details

- Max. operating pressure: 720 bars
- Battery: 36V 10Ah
- Battery charging period: 1 hour apx.
- Electric motor: 940 W
- Noise output: 67dB(A) at 2 metres, 75dB(A) at 1metre
- Complete unit weight: 17.7 kg
- Battery weight: 4.8 kg
- Dimensions (LxWxH): 530x252x388 mm

2.2 Holmatro hydraulic hose

- (a) The Holmatro hydraulic hose incorporates CORE™ technology.
- (b) A CORE™ technology system consists of a high-pressure inner hose inside a low-pressure outer hose.
- (c) The hydraulic principle and tool performance of CORE™ technology is a safer way of using a high-pressure hydraulic system as the user is not exposed to the potential of coming into contact with fluid at 720 bar pressure. The inner core of the hose contains the hydraulic fluid at 720 bar pressure and the outer core pressure will not exceed 25 bar.



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- (d) CORE™ technology hose is a single hose connection on the SPU16 power unit and the tool, and a single 5 metre length of CORE™ technology hose which doesn't kink and doesn't need to be laid out in a straight line before use as there is a 360-degree rotation on the hose collars.
- (e) Supplied with quick fit couplings and locking rings at both ends.
- (f) Single hose connection to both power unit and tool.
- (g) The FRU carries two lengths of CORE™ hose. One orange and one blue.

2.3 Holmatro pressure relief tool

- (a) Temperature differences can cause pressure in unconnected CORE hoses and tools. This pressure can make it impossible to connect the two parts together and it will be necessary to remove the built-up pressure by using the pressure relief tool.



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3 Safety precautions

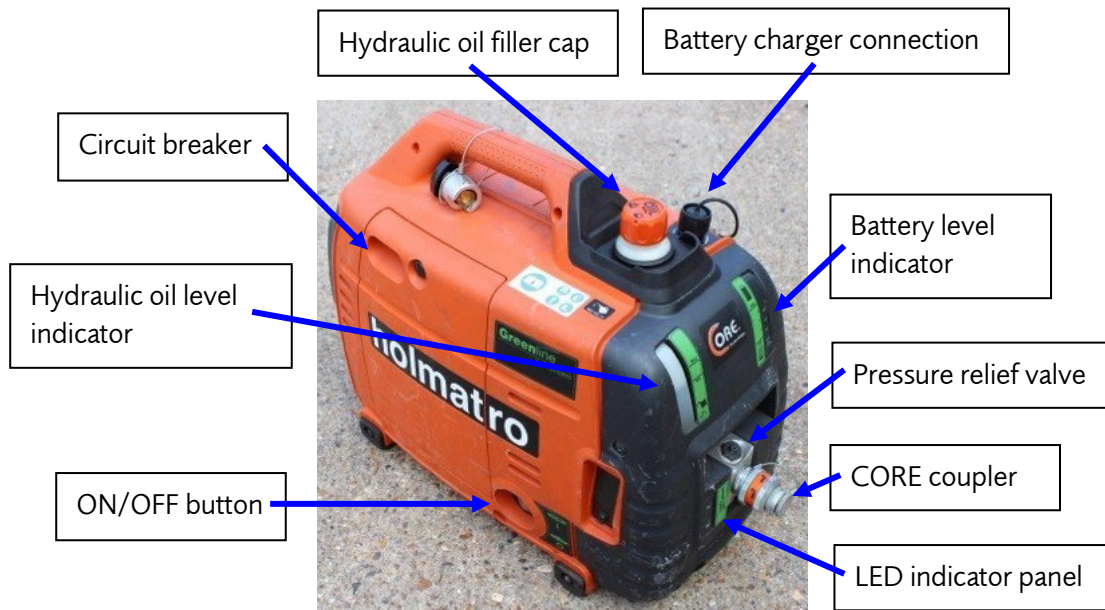
- 3.1 Appropriate PPE including eye protection and gloves must be worn at all times, when operating this equipment.
- 3.2 This equipment should only be operated by individuals who have received specific training in its use.
- 3.3 Always check the equipment before use.
- 3.4 Hold the equipment only by the carrying handle. Never use any part of the hose as a carrying handle.
- 3.5 Never use damaged hydraulic couplers.
- 3.6 Prevent dirt in and on the couplers.
- 3.7 Never connect or disconnect the hydraulic couplers if the equipment is being used or if the system is under pressure.
- 3.8 Never use pliers or similar tools to connect the hydraulic couplers.
- 3.9 Stop immediately if the equipment makes strange noises.
- 3.10 Stop immediately if the equipment leaks oil.
- 3.11 Keep unit away from fire/naked flames and sparks from welding etc.
- 3.12 Nitrile gloves (POMS-V2481/2/3) are to be worn when topping up the oil on the SPU.
- 3.13 When topping up oil levels, ensure appropriate spill equipment is readily available nearby, in accordance with Policy number 747 – polluting material storage and spillage procedure.

4 Operating instructions

4.1 Before use

- (a) Check condition of the unit. Do not use if damaged.
- (b) Check pressure relief tool is present.
- (c) Position the pump on a solid level base.
- (d) Check battery level by pressing the level indicator button on the back of the battery for a few seconds. Change battery if necessary (see below).

- (e) Check the level of the hydraulic oil through the gauge glass. Add hydraulic oil if necessary (see below).



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4.2 Operation

- Remove the dust caps from the couplers. Put the dust caps into each other to avoid dirt entering the cap.
- Check the couplers for dirt and damage and clean them if necessary.
- Connect the couplers by holding them against each other and pushing the male coupler with one action into the female coupler. The external ring of the female coupler must move in the opposite direction to the arrows.
- Pull both couplers to check whether the couplers cannot be pulled apart with a normal manual effort.
- If the hose is difficult to connect, the pressure relief tool may need to be used (see below).
- Start the pump by pushing the ON/OFF button to the ON position (The motor is designed to run at the required speed).
- The system is now ready to use. Operate the hydraulic tool as required.
- Eco whisper mode:** The motor speed increases automatically when a tool is used. When the tool is no longer being used, the motor speed reverts to the standby speed. This restricts noise emission and battery consumption to a minimum.

4.3 To close down

- Set the hydraulic tool to its appropriate closed down position (see appropriate tech note for specific tools)
- Stop the pump by pushing the ON/OFF button to the OFF position.
- Disconnect the couplers by turning the external ring on the female coupler and then sliding it in the direction of the arrows. The male coupler will slip out.
- Remove dirt and oil from the couplers and dust caps.

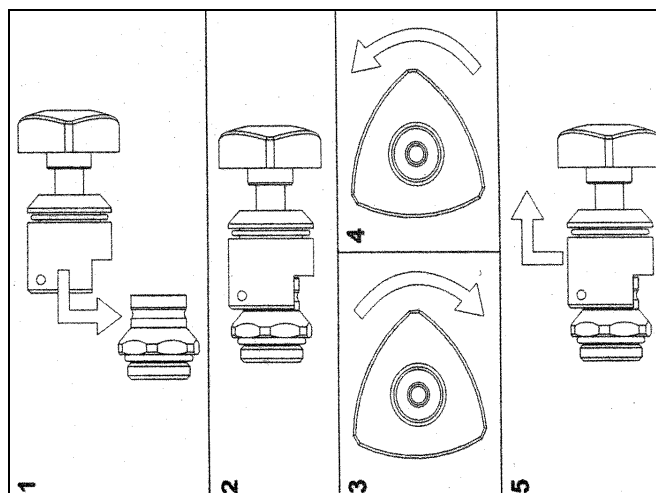
- (e) Disconnect the dust caps from each other and replace dust caps on all couplers.
- (f) If required wipe/clean equipment with a dry cloth.
- (g) Re-stow equipment on vehicle as necessary.

4.4 Relief of pressure in unconnected hoses and tools

- (a) Temperature differences can cause overpressure in unconnected hoses and tools. This overpressure can make it impossible to connect the system.
- (b) Use the pressure relief tool to remove this overpressure.

4.5 Use of pressure relief tool (refer to diagram below)

- (a) Ensure that you are wearing full structural firefighting PPE with visor down and gloves.
- (b) Hook the pressure relief tool over the male coupling (1).
- (c) Once the tool is in the correct position (2) turn the knob to the clockwise (3) to release the pressure. Some oil will be released during this process.
- (d) Turn the knob anti-clockwise (4) and remove the pressure relief tool from the male coupler (5).
- (e) Wipe the released oil from the hose and surrounding area as necessary.
- (f) Ensure that the hydraulic oil level on the SPU16 is checked and topped up as necessary.



4.6 Relief of pressure in connected hoses

- (a) If it is not possible to disconnect the hose because the system is still under pressure, the pressure can be released with the pressure relief valve.

4.7 Use of pressure relief valve

- (a) Stop the pump.
- (b) Turn the screw of the pressure relief valve clockwise a number of turns inwards, until it is blocked, to release the overpressure.
- (c) Turn the screw of the pressure relief anti-clockwise a number of turns outwards, until it is blocked, to get ready for using the tool.

4.8 Changing the battery

- (a) Stop the pump.

- (b) Lift the handle.
- (c) Slide the battery lock down.
- (d) Pull the battery out of the pump.
- (e) Slide a new battery into the back of the pump until the battery lock snaps tight.
- (f) Lower the handle.
- (g) Try to pull the battery lock up to ensure that the lock mechanism works correctly.

4.9 Charging the battery

- (a) **Note:** It is not possible to use the pump whilst charging the battery inside the pump. When the battery charger is connected to a running pump, the pump will shut down.
- (b) The battery should be charged when the red light on the battery level indicator lights up.
- (c) The maximum capacity of the battery is only achieved once it has been charged and discharged several times.
- (d) Always charge the battery, even if it has only been used for a short time.
- (e) The battery can remain connected to the charger for an indefinite period because it is protected against overcharging.
- (f) When not in use the battery should be kept connected to the charger either by being connected in the pump or the docking station.

4.10 Charging the battery inside the pump

- (a) Make sure the pump is turned off.
- (b) Make sure the battery is placed inside the pump.
- (c) Place the pump in its stowage position on the vehicle.
- (d) Connect the charging cable to the battery charger connection on the pump.

4.11 Charging the battery in the docking station

- (a) Place the battery in the docking station. Make sure the battery snaps into the correct position.
- (b) **Note:** The battery will fully charge in approximately one hour.
- (c) **Note:** The batteries will only charge on the vehicle when the vehicle is plugged into the station power shoreline.

4.12 LED battery level indicator

- (a) The pump has an LED indicator that indicates the approximate battery level (State of Charge). The battery should be charged before the red light on the battery level indicator starts blinking.

State of Charge (SOC)	Indication on pump
75% to 100%	3 green lights on
50% to 75%	2 green lights on
25% to 50%	1 green light on
1% to 25%	1 red light on
0%	1 red light blinks; buzzer sounds; pump turns off

4.13 LED indicator panel

- (a) **Overheating:** The LED will light up when critical temperature limits are exceeded. Let the pump cool down for several minutes before continuing operation. Idle running will speed up the cooling of the electric motor.
- (b) **Service indicator/error:** In case of errors (for example internal hardware or software issues) the pump will stop running and the LED will start blinking. To reset the error: Turn off the pump and then turn the pump back on. If the error remains take off the run.
- (c) **Note:** After 100 hours of operation, the service LED will be continuously lit. The pump should be sent back to the service provider for servicing.

4.14 Circuit breaker

- (a) In case of a short circuit, the circuit breaker will shut off the power.
- (b) Solve the problem that caused the short circuit.
- (c) Press the circuit breaker to reset and restore the power.
- (d) If the circuit breaker shuts off the power again, take unit off the run.

5 Maintenance and testing

5.1 Inspection frequency:

- Daily (visual)
- Before use

5.2 Test frequency:

- On acceptance
- After use
- Weekly
- Annually (by the vehicle and equipment (V&E) contractor)

Visual inspection

5.3 SPU:

- (a) Place the SPU on a level surface.
- (b) Check general condition of unit, checking for any leaks or damage.
- (c) Check the battery for damage and function. Charge as necessary.
- (d) Check pressure relief tool is present.
- (e) Check the hydraulic oil level.
- (f) Add oil if necessary: Remove the hydraulic oil tank filler cap. Add oil to the maximum level mark via the filler opening. Install the filler cap.
- (g) The SPU has been supplied with a small funnel (POMS-S9251) for topping up oil levels. This funnel must be kept clean.
- (h) Hydraulic oil is a consumable item available on POMS (S9272).
- (i) Remove the dust cap, checking that the retaining wire is intact. Inspect the hose coupler, checking for any damage or dirt. Wipe away any dirt with a clean dry cloth.

- (j) Inspect the SPU for any signs of damage.
- (k) Check all safety symbols, pictograms and information labels are present and in good condition.
- (l) Clean, if necessary, with a damp cloth.
- (m) Where contamination of any equipment occurs, the procedures laid down in Policy number 707 - The control of infection and infectious diseases policy should be followed.

5.4 **Hydraulic hose:**

- (a) Lay the hose out and inspect the full length and check for any defects.
- (b) Remove the dust caps and examine their condition.
- (c) Check that the retaining wires are intact.
- (d) Inspect the hose couplers checking for any damage or dirt. It is normal for a small amount of oil to weep from the coupler.
- (e) Wipe away any dirt with a clean dry cloth.

5.5 A visual inspection should be carried out daily and before any pressure test.

5.6 The functional test should be carried out on acceptance, weekly and after use.

Functional test

- (a) Appropriate PPE should be worn, including eye protection and gloves.
- (b) Connect the SPU, hose and selected hydraulic tool. Ensure that a positive click is heard when connecting the couplings, check they can't be pulled apart.
- (c) Start up the SPU (as described above).
- (d) Position one firefighter on the SPU and one operating the hydraulic tool.
- (e) Operate the tool as described in the tools related policy (tech note) (see below).
- (f) Close the tool back to its shut down position as described in tools dedicated tech note (see Section 7)
- (g) Upon completion of the test, close down and disconnect all the equipment ensuring that all the dust caps are refitted.
- (h) If no defects are found, re-stow on the appliance.
- (i) The test should be recorded on appropriate standard test card.

6 Defects

- 6.1 When a SPU16 power unit on an FRU becomes defective it is classed as a Category B item and should be sent up as such via the POMS system, (part no. S8563) minus the battery.
- 6.2 The Holmatro SPU16 battery (S8588) is classed as a separate item. If it can't be determined if it is the SPU or battery that is defective, then a separate order for each item should be placed on POMS.
- 6.3 If, the total number of SPUs carried on the FRU fall below 50% then it becomes a Category A defect and should be sent up using the TLG3 process via the V&E contractor help desk. See Codes below.

Code 1

- Power unit fails to start.
- Power unit fails to produce pressure.
- Excessive hydraulic oil leak.
- Missing hydraulic cap.
- Any damage to the hydraulic hose.

Code 2

- Broken dust cap retaining wire.
- Missing dust cap.
- Defaced labelling.
- Minor hydraulic oil leak.

6.4 Other SPU related equipment is classed as category B and is available on POMS as follows:

- | | |
|--|-------|
| • Holmatro SPU16 battery (FRU only) | S8588 |
| • Holmatro core tech hydraulic hose 5m– Orange | S9899 |
| • Holmatro core tech hydraulic hose 5m– Blue | S9902 |
| • Holmatro pressure relief tool | S9708 |

7 Associated material

7.1 To be read in conjunction with the following material where necessary:

- Policy number 174 – Control of substances hazardous to health regulations 2002 policy.
- Policy number 206 – Environmental protection.
- Policy number 213 – Control of noise at work.
- Policy number 540 – Manual handling operations procedure.
- Policy number 598 – Provision and use of work equipment.
- Policy number 643 – Hazardous waste disposal procedure.
- Policy number 707 – The control of infection and infectious diseases policy.
- Policy number 724 – Appliance inventories and operational readiness.
- Policy number 747 – Polluting material storage and spillage procedure.
- Policy number 817 – Fuel cans – technical information.
- Policy number 854 – Holmatro hydraulic cutters CU3040 NCT – technical information
- Policy number 855 – Holmatro hydraulic cutters CU4050 NCT – technical information
- Policy number 909 – Holmatro hydraulic ram RA3331 – technical information
- Policy number 910 – Holmatro hydraulic spreaders SP3240 – technical information
- Policy number 911 – Holmatro hydraulic ram TR3340 – technical information
- Policy number 912 – Holmatro hydraulic spreaders SP3230 – technical information
- Policy number 979 – Rescue – NOG
- Policy number 985 – Operational safety management - knowledge skills and competence – NOG.

Document history

Assessments

An equality, sustainability or health, safety and welfare impact assessment and/or a risk assessment was last completed on:

EIA	05/10/2021	SDIA	04/11/2021	HSWIA	05/10/2021	RA	
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Audit trail

Listed below is a brief audit trail, detailing amendments made to this policy/procedure.

Page/para nos.	Brief description of change	Date
Para 2.2 (g)	Number of hoses changed from four to two, with black and green now removed.	15/11/2022
Para 5.3 (n)	Line removed referring to WD40.	09/02/2023
Section 6	Additional information added about the battery.	27/06/2023

Subject list

You can find this policy under the following subjects.

Accidents – motor vehicle	Equipment – operational
Equipment – rescue	Holmatro
Road traffic accidents (RTAs)	Road traffic collisions (RTCs)
Technical information	

Freedom of Information Act exemptions

This policy/procedure has been securely marked due to:

Considered by: (responsible work team)	FOIA exemption	Security marking classification