



HUGH CRANE

Cleaning Equipment Limited



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OPERATOR INSTRUCTION MANUAL

COMMANDO® 1000 Range

(1000U, 1022U and 1030U versions)



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1. DESIGN & MANUFACTURE

COMMANDO® high pressure equipment is manufactured to rigorous quality standards. The basic design concept is to use quality materials and proven designs to attain reliability and safe functional operation. This instruction manual is provided to assist the operator to obtain the best from the equipment, together with basic safety points. Should you require information or technical assistance regarding the unit or any aspect of jetting or pressure cleaning, do not hesitate to contact **Hugh Crane (Cleaning Equipment) Ltd** or their approved distributor.

IMPORTANT

This handbook should be read and understood by the operator before using this equipment. It should be kept with the equipment and made available to anybody who is intending to use the equipment.

2. MACHINERY DESIGNATION

The **COMMANDO®** 1000 range are portable, diesel powered high pressure cleaning and jetting units, with electric start, mounted within a 4 wheeled barrow.

There are three versions depending on pump capacity: **1000U**; **1022U** and **1030U**.

3. GENERAL DESCRIPTION OF THE 1000 RANGE

The 1000 range brings together a proven Udor high pressure pump, coupled via a Lancereal gearbox to a twin cylinder electrically started Hatz diesel engine for heavy duty washing and cleaning tasks.

The range provides a cost effective, quality, compact and versatile solution for wide range of industrial and commercial high pressure water cleaning tasks.

GUARANTEE

COMMANDO® products are guaranteed for one year for parts and labour from the date of purchase (guarantees are not transferable) subject to good use and adherence to recommended service procedures. Major components are subject to individual manufacturer's warranty conditions. Wearing parts, including tyres, pump seals, valves, hoses, filters, jets and tooling are excluded from warranty cover unless subject to faulty materials or manufacture.

4. EC DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY

We: Hugh Crane (Cleaning Equipment) Ltd,
South Walsham Road,
Acle,
Norwich,
NR13 3ES.

Certify that the:

COMMANDO®

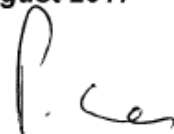
Range of High Pressure Cleaning and Jetting Equipment

Has been designed and manufactured in accordance with the essential requirements of the following European Directives and any subsequent amendments to them:

Directive	Standards Applied
Machinery Directive 2006/42/EC	EN ISO 12100: 2010
	BS EN 1829 – 1: 2010 as applicable.
Low Voltage Directive 2006/95/EC	BS EN 60204 -1: 2006 as applicable.
Noise Directive 2000/14/EC	BS EN ISO 3744: 1995 as applicable

Date: 29th August 2017

Signed by:



Philip Crane
Managing Director
On behalf of Hugh Crane (Cleaning Equipment) Ltd

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5. SPECIFICATION

MODEL	COMMANDO® 1000U	COMMANDO® 1022U	COMMANDO® 1030U
SERIAL NUMBER			

ENGINE			
MODEL	Hatz 2G40	Hatz 2G40	Hatz 2G40
SERIAL NUMBER			
NET POWER	13.1 kW @ 2600 rev/min	13.1 kW @ 2600 rev/min	13.1 kW @ 2600 rev/min
FUEL	Diesel	Diesel	Diesel

GEARBOX			
MODEL	Lancereal 901	Lancereal 901	Lancereal 901
SERIAL NUMBER			
RATIO	2.5 : 1	2.5 : 1	2.5 : 1
ROTATION	Reverse	Reverse	Reverse

PUMP			
MODEL	UDOR GB21/20S	UDOR GKC 50/150S	UDOR GB30/20S
SERIAL NUMBER			
TYPE	Triplex Ceramic Plunger	Triplex Ceramic Plunger	Triplex Ceramic Plunger
PUMP	205 bar / 3000psi	150 bar / 2175 psi	200 bar / 2900 psi
FLOW	22.7 l/min, 5 gal/min	38 l/min, 8.4 gal/min	28.2 l/min, 6.2 gal/min

UNLOADER			
TYPE	Speck UL262	Speck UL262	Speck UL262
PRESSURE SETTING	205 bar / 3000 psi	150 bar / 2175 psi	205 bar / 3000 psi

6. HEALTH & SAFETY – COMMANDO® RANGE

General and operational safety

- **COMMANDO®** equipment/machinery is designed and constructed for industrial / commercial use only for high pressure water cleaning and jetting activities and similar in controlled environments with third parties exclude from the work area.
- It should only be used by persons trained and competent in its operation in accordance with the instructions within this manual, and should only be maintained / repaired by persons trained and competent to do so, following the isolation and making safe of the equipment as detailed within this manual.
- The machine must not be misused in any way, nor any hazardous areas accessed, for example by directing the water jet at other person or animals. Nor should the equipment/jet be directed by the operator at himself, for example used for cleaning the operator or his clothing.
- The machine should only be used in a safe location away from other persons not involved in the activity and a safe working area should be established with other persons kept away and clear of the hazard area.
- The machine should not be left unattended where there is the possibility of access or operation by unauthorised persons.
- The machine should only be located in well-ventilated areas where exhaust fumes are able to safely disperse.
- The machine should only be used with clean water, NEVER any other liquid.

Mechanical hazards (rotating parts etc.)

- Never attempt to adjust, clean or disconnect any part of the machine with the engine/motor running. Always either stop the engine or disconnect the unit from the electrical supply before carrying out any such tasks.
- All rotating and moving parts are enclosed either within the item itself (engine/motor/pump) or by a solid bolted guard/enclosure which prevents operator contact during normal operation.
- The machine should never be operated without these protective features in place.
- Removal of such features should only take place for the purposes of fault finding, maintenance and repair, carried out by trained and competent persons only, following the unit and any accessories being stopped, isolated and depressurised as follows:
 - Ensure the **COMMANDO®** unit is stopped and take precautions to prevent it from being started.
 - Ensure that the HP water is depressurised
 - Ensure that no hazardous chemicals are present which could cause harm.

Electricity and electrical hazards – shock, fire, burns etc.

- The equipment is designed and constructed for use in industrial / commercial environments in accordance with relevant electrical safety standards, with all hazardous/potentially live electrical parts totally enclosed.
- Only suitably trained and competent persons, as authorised by the user, are permitted to access electrical panels or equipment or carry out electrical work.
- Electrical panels and equipment must always be secured closed and only accessible/ openable using a tool or key which is not available to untrained personnel.
- Electrically powered units should be selected, operated & maintained in accordance with Health & Safety Executive publications PM29 and INDG68. **In particular user's attention is drawn to the need for provision of Residual Current Devices (RCDs) of 30mA/30mS sensitivity on electrical circuits feeding water pressure cleaners.**
- Electrically operated equipment should be periodically inspected and tested to help maintain electrical safety.
- Users should carry out daily/pre-use visual checks on electrical items including the condition of power leads and connectors (sockets and plugs)
- The electrical supply must be isolated by disconnection of the electrical supply or battery before carrying out any work on the panel or equipment, and "proven dead" before contacting any potentially live parts. Live working should be avoided.
- The electrics and electrical installation must be periodically inspected and tested to maintain safety.
- During cleaning or jetting activities the spray should not be directed at electrical equipment, including overhead lines, (unless such equipment has been specifically designed for cleaning by pressure jet)

Hot surfaces and cleaning fluid – scalds and burns

- The engine exhaust gets hot in operation, but is thermally insulated within the engine enclosure.
- Hot water/steam machines generate hot water at 100°C+ using an internal boiler
- Avoid all unlagged hot parts, and hot water/steam, and allow to cool before making contact.

Noise

- The equipment is engine powered and can generate noise levels of between 106dB and 116dB. The water jet itself can also generate high noise levels.
- Where possible, when in operation the machine should be located away from the cleaning/jetting activity and any other persons who might be affected by the noise
- Hearing protection should be worn
- When in operation a noise survey should be carried out to determine any areas which may exceed the relevant hearing action limits of 80/85dB with appropriate precautions being put in place by the user.

Hand/Arm Vibration (HAV)

- Hand held lances can transfer vibration generated by pulsation of the high pressure pump, to the operator's hands.
- The most appropriate lance/nozzle combination, with minimum vibration levels, should be selected.
- If necessary, users need to carry out HAV assessment/measurement and put in place appropriate precautions to minimise/manage any identified risks.

Water-borne diseases (notably Legionellosis & Weil's Disease)

- Legionella bacteria can be present and breed in water at temperatures between 20° and 45°C, and can thrive in the presence of nutrients such as rust, sludge, scale, algae, organic material or other bacteria. This becomes hazardous when in aerosol form, for example as generated by cleaning and jetting nozzles.
- The equipment should therefore be operated using water sources outside these temperatures and regularly cleaned, flushed and maintained to prevent the development and existence of conditions where nutrients can exist.
- Preferably only water from a known clean source should be used (e.g. mains water supply)
- The system should be flushed through prior to each use by running the equipment for a few minutes to remove all stagnant water, minimising production of and avoiding breathing of any aerosol.
- The attention of UK users is drawn to Health and Safety Executive "Approved Code of Practice" L8 which details the precautions that employers are required to take in respect of Legionnaires disease, including the need to carry out a risk assessment; have an appointed competent person; have in place a legionella control scheme: and review of control measures.
- The system/equipment should be included by the user within his overall legionella assessment and management programme which will determine any further actions/precautions/monitoring which may be necessary.
- Weils disease can exist in stagnant water, therefore only water from known clean sources should be used.
- Operators should wear waterproof gloves and skin protection, and wash hands regularly at the end of work, before eating, and before using the toilet.

Fuels and Lubricants

- Fuelling and maintenance should take place with the machine shut down (and isolated if required) and in a cold state.
- PPE should be worn to avoid skin/eye contact
- Used lubricant/engine oil should be collected and disposed of in accordance with local requirements.

Chemicals/hazardous substances (used to aid the cleaning operation)

- All chemicals used should be approved by the machine manufacturer, be suitable for the task in hand, and subject to a detailed COSHH assessment which will identify the hazards and necessary precautions.
- Chemical injectors (where used) draw chemicals direct from their containers which can be located at ground level adjacent to the machine. No pouring or dispensing of chemical is thus required.
- Following use of any chemical the machine should be flushed through with clean water to remove any residues, directed to a safe location where no environmental harm will be caused.

Ergonomic hazards

- All **COMMANDO®** equipment is manufactured either with wheels to ease handling or for direct (skid) mounting on to a vehicle or tractor linkage.
- Larger and heavier versions are trailer mounted to enable direct towing/positioning by a tow vehicle.
- Long lengths of hose can be heavy, therefore the minimum length to allow the task to be carried out safely and effectively should be used. Hose reels are provided on larger machines or by specific user request.
- The need to lift drums containing cleaning chemicals is minimised by the provision of chemical injector systems which allow chemical containers to be located at ground level directly adjacent to the machine.
- Users should assess each work situation to ensure that all ergonomic hazards have been identified with appropriate precautions put in place, including the need for suitably trained persons.

Other hazards associated with the work area or task

- Units are mobile and can thus be used and located in many different environments for a wide range of tasks.
- Users are therefore reminded of the need to ensure that all tasks and locations are risk assessed before activity commences to ensure that all significant hazards are identified with appropriate precautions put in place.
- Such hazards/considerations may include for example (but not exhaustively):
 - Any chemicals use to improve the effectiveness of cleaning (COSHH assessment required)
 - Wet/slippery surfaces
 - Trip hazards from hoses, cables or rough surfaces
 - Moving vehicles
 - Working at height – which requires specific assessment and safe provision as per the Working at Height Regulations 2005.
 - Inadequate lighting
 - Open manholes (if drain jetting)
 - Inclement weather

- Confined space working which requires specific assessment and safe provision as per the Confined Spaces Regulations 1997.
- Exhaust fumes - the machine should only be located in well-ventilated areas where exhaust fumes are able to safely disperse.
- Members of the public or other persons working nearby or above.

Mechanical Lifting of **COMMANDO® units.**

- Provision may have been made for the attachment of lifting equipment to ease the movement of some **COMMANDO®** units, for example lifting eyes or a lifting frame bolted to the machine.
- Such lifting should only be carried out by suitably trained and competent persons using the correct equipment.
- The adequacy and condition of lifting points and frames should be periodically checked and verified as required by the “LOLER”/“PUWER” Regulations as applicable.

Explosive atmospheres

- Commando units are not designed nor intended for use in explosive atmospheres created by either dust or vapours (unless by specific customer request)
- The use, maintenance or repair of **COMMANDO®** units in explosive, or potentially explosive, atmospheres must thus be avoided.

Equipment condition and maintenance.

- The operator should carry out the specified daily checks to maintain equipment condition as detailed elsewhere in this manual
- The operator should carry out the specified periodic maintenance tasks as detailed elsewhere in this manual to help minimise the potential for failure of any critical parts.
- Safety features are provided for the protection of all and their settings must be verified periodically (typically 3 monthly) to be as detailed within the O&M manual, and recorded as follows (where fitted):
 - Unloader unit
 - Pressure regulator
 - Safety valve
 - Bursting disc.
- Operators must maintain awareness of and periodically check for obvious leaks.
- Work on the unit should only take place following it and any accessories being stopped, isolated and depressurised as follows:
 - Ensure the **COMMANDO®** unit is stopped and take precautions to prevent it from being started.
 - Ensure that the HP water is depressurised
 - Ensure that no hazardous chemicals are present which could cause harm.

- No modifications should be carried out to any item of **COMMANDO®** equipment without the prior written approval of HCCE Ltd
- Any components replaced must be to equal standards as the original equipment. As such it is recommended that any such components are sourced directly from HCCE Ltd.

Cleaning and Jetting Activities – High Pressure Water Jets.

- High pressure jetting and cleaning are by nature tasks involving significant hazards, specifically due to the pressure and flow of water generated by **COMMANDO®** units. High Pressure Jets can be highly dangerous if subject to mis-use.
- It is critical therefore that such activities are only carried out by suitably trained and competent operators in controlled environments.
- It is essential that a full risk assessment, and method statement if required, are in place to cover all tasks. Specifics to consider within these include:
 - The machine must not be misused in any way, nor any hazardous areas accessed, for example by directing the water jet at other person or animals.
 - Nor should the equipment/jet be directed by the operator at himself, for example used for cleaning the operator or his clothing.
 - The machine should only be used in a safe location away from other persons not involved in the activity and a safe working area should be established with other persons kept away and clear of the hazard area.
 - The machine should only be located in well ventilated areas where exhaust fumes can safely disperse.
 - The machine should not be left unattended where there is the possibility of access or operation by unauthorised persons.
 - “Hold to Run” controls, notably the lance trigger or foot pedal, must never be wedged or tied in their open/ operating positions.
 - Only use hand-held lances of the correct type, design and length – normally a minimum length of 75cm, below which particular requirements apply (refer to BS EN 1829 – 1, Section 5.3.2.2).
- The need for personal protective equipment (PPE) should always be considered as part of the assessment. As a minimum it is suggested that this should include the requirement for eye/face protection and the wearing of waterproof clothing. Plus potentially hearing protection, safety/waterproof footwear, hard hat, hi - visibility garment and gloves depending on the task and the actual equipment used.

Hoses, hose lines, connectors

- Only high pressure hoses, spraying devices and accessories rated at or above the capacity of the machine should be used. In the case of higher pressures of > 350 bar, hoses, hose lines, connectors and their use should comply with BS EN 1829 -2.
- The use of connector safety devices (restraints) across connections to restrain the hose ends should the connector, swage or hose end fail is recommended (and is mandatory for machines with a drive input exceeding 40kW or a working pressure exceeding 500 bar where significant presence of persons is foreseeable) .

- The machine/high pressure system must always be depressurised before the connection or disconnection of any hose, spraying device, or other accessory.
- Never repair a high pressure hose using screw type couplings or other temporary measures such as jubilee clips etc.
 - Hoses can only be repaired safely using swaged/crimped fittings of the correct type by competent persons using the correct crimping tool.
- Above 350 bar (BS EN 1829-2 2008, BS EN ISO 4413 and WJA Code of Practice)
 - Hose lines whose outer layer has been damaged down to the outer wire layer shall be withdrawn from service
 - “Re-ending” of damaged hoses is not allowed.
 - Inspect daily by a competent person as WJA guidelines
 - Examine/inspect at least 3 times per year by a suitably qualified person & keep records
 - Pressure test and record every 12 months - < 350bar @ 1.5 x MWP; > 350 bar @ 1.2 x MWP
- Quick release couplings – all 8 balls and “O” rings in place.
- Guns and lances should also be checked for leakage or damage
- **Take out of use if defects are found!**

Product contamination/food safety

- **COMMANDO®** equipment is not designed to satisfy any particular food safety standard, therefore users should carry out their own assessment of this, if relevant.
- Where product safety is a factor, only use cleaning water from a potable source.
- Only use cleaning chemicals which are “food safe” and ensure all residues are rinsed and removed prior to putting the equipment back into use.
- Flush/purge machine with clean/ potable water prior to each use.
- Carry out the specified daily checks and periodic maintenance to keep the machine in safe working order.

Freezing

- Ensure that the machine is protected from freezing which can cause catastrophic damage, as detailed in section 7 of this manual.
- Should a pump become frozen, do not attempt to start it.
- Allow to thaw over time in a warm environment and inspect for damage before use.
- Never attempt to thaw using heat sources which themselves could cause damage or fire.

Safety features and regular checking

Safety features are provided for the protection of all and their settings must be verified periodically (typically 3 monthly) to be as detailed within the O&M manual, and recorded as follows (where fitted):

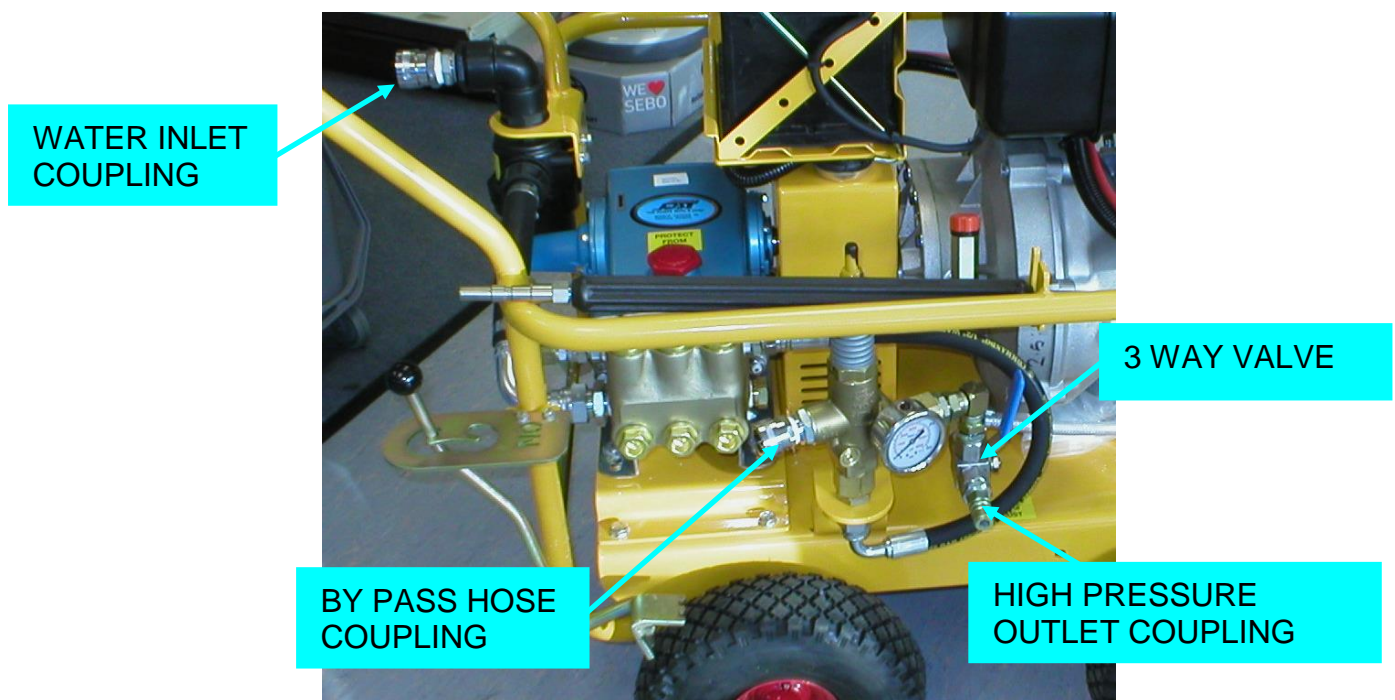
- Unloader unit
- Pressure regulator

- Safety valve
- Bursting disc.

7. OPERATING INSTRUCTIONS

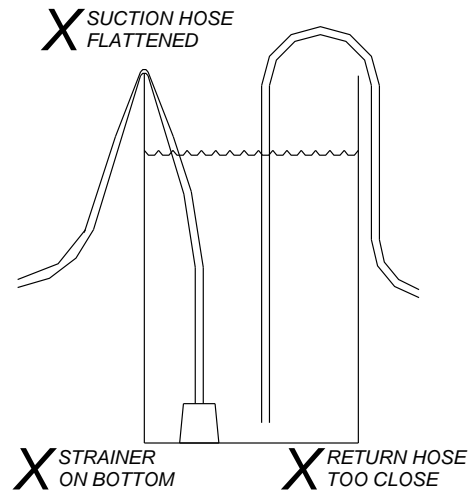
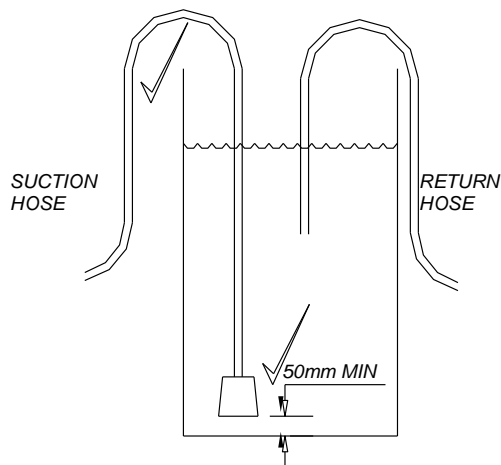
7.1 BEFORE STARTING WORK: PREPARING THE MACHINE FOR USE:

- a) Check engine, gearbox and pump oil level and top up if required. Check fan belt tension and condition.
- b) Fill fuel tank with clean diesel fuel.
- c) Ensure unit is standing on level ground with the handbrake applied.
- d) Connect the mains supply hose to the water inlet coupling. Confirm that the water supply has sufficient capacity to keep the **COMMANDO** 1000 unit supplied continuously with 40 litres/min at a positive pressure.
- e) Connect the by-pass return hose to its connection point and place the end of it in a suitable receiving vessel.

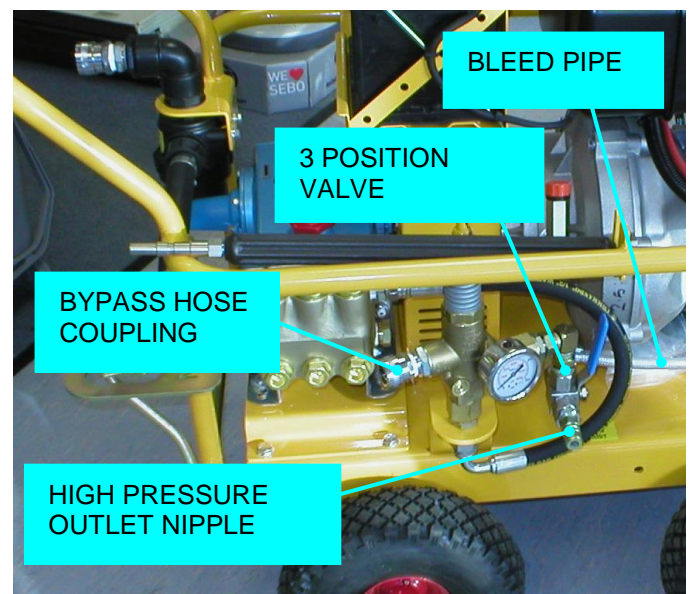
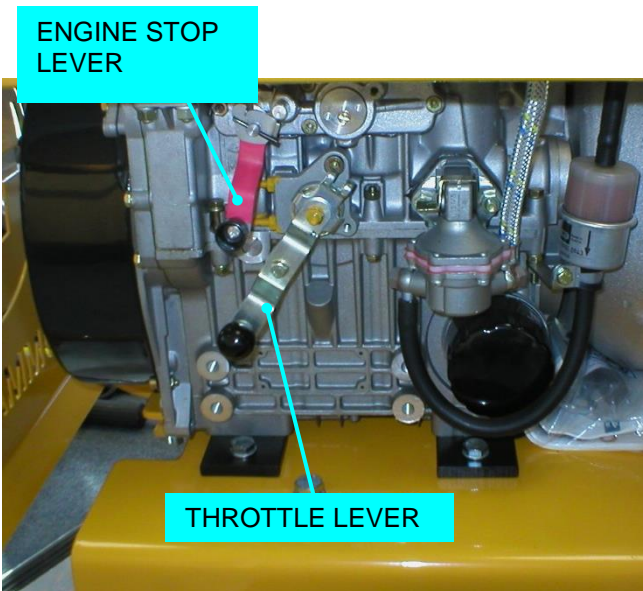


- f) Connect the high pressure hose to the outlet coupling and ensure that it is fitted with a spray gun and lance before turning on the mains water and starting the machine.
- g) When the machine is to be operated on suction mode, connect the inlet suction hose and foot strainer to the inlet quick coupling and line strainer on the machine and connect the return hose to the female quick release coupling provided on the unloader valve. Place both hoses in a clean tank of water and secure in place. Ensure that the suction hose is not flattened or crimped and that the foot strainer is at least 50mm

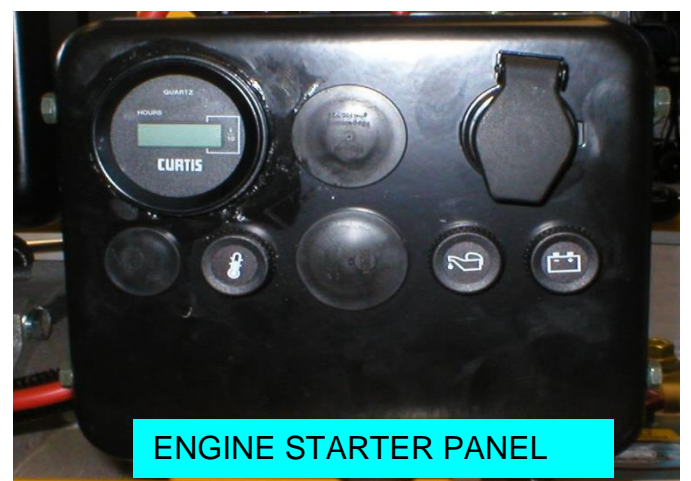
from the bottom of the tank and not placed too close to the return hose as illustrated below.



- h) Turn the three position valve to the 'bleed' position before starting the engine.



- i) With stop control in the start position, turn the ignition key to start the unit. In cold weather conditions hold the ignition key in the heater position marked, for 15 to 20 seconds prior to turning to start the machine. (Refer to the Hatz engine instruction manual). Run the engine at approximately $\frac{1}{3}$ rd of full speed up to bleed any air out of the system.



- j) When air free water is issuing from the bleed hose turn the three-way valve to the high-pressure position.
- k) Now operate the wash gun to bleed air out of the hose until air free water is issuing from the lance.
- l) Increase the engine speed to the desired working level, using the hand throttle lever at the side of unit. Use of the throttle will directly affect output water volume and pressure.

7.2 DURING WORK:

- a) **Do not leave the COMMANDO unit idling for periods in excess of 15 minutes, as re-circulating water heats up rapidly and will eventually boil causing severe damage to the pump.**
- b) Should any vibration, fluctuation of pressure or any other abnormal symptoms occur during operation, this should be investigated immediately.

Likely causes include:-

- i) A lack of water entering the unit causing air to be drawn into the pump.
- ii) A blockage of the main inlet filter causing water starvation at the pump.
- iii) The inlet water valve between tanks and pump not fully open.
- iv) Leaking seals or damaged valves etc.

7.3 DETERGENT/CHEMICAL ADDITION.

- a) The unit can be equipped for chemical addition by adding an in-line chemical or foam injector.
- b) The suction pipe and filter of this injector should be inserted into the detergent drum, which can be located immediately adjacent to the **COMMANDO®** unit. The amount of detergent can be regulated to suit the task by rotating the black knob on top of the detergent injector. Rotate anticlockwise to increase the dose, clockwise to reduce and fully shut off.
- c) Any chemical used must be suitable for the task and used in a manner so as not to endanger the operator or others, or cause damage to the machine. To this end:
 - Only detergents/chemicals approved by Hugh Crane Cleaning Equipment should be used
 - The task and detergent/chemical must be subject to a full COSHH assessment prior to commencement, with all necessary precautions put in place.
- d) Following use of any chemical the machine should be flushed through with clean water to remove any residues, with flushings directed to a safe location where no environmental harm will be caused.

- e) The injector control should be left in the closed (fully clockwise) position when not using detergent, otherwise air will be sucked in and impair the effectiveness of the water jet.

7.4 AFTER WORK

- a) To stop the **COMMANDO** unit, decrease engine revs to idle speed, turn the starter key to the OFF position. Move the engine stop lever to the STOP position and hold it there till the engine ceases to run.
- b) Safely release any residual water pressure trapped in the system by operating the gun trigger (if required).

7.5 FROST PROTECTION

It is essential to protect the unit from damage by frost. The following instructions will be adequate to protect the unit to temperatures down to - 5°C. During winter months it is strongly recommended to store the unit inside whenever possible.

- a) Run unit for **one minute** with open ended hoses or gun open to expel all water and stop the motor.
- b) Remove bowl from inlet strainer and store safely together with its filter screen.
- c) During severe weather, the unit should be stored inside if possible. Where this is not possible, a 25% anti-freeze/water mixture should be introduced into the pump, hose and gun. The antifreeze mixture can be reclaimed after use for recycling when next required. (Do not use antifreeze in concentrations >50% which can cause pump damage.
- d) Before starting work again the antifreeze must be emptied out of the system by running the pump and directing the using the solution back into the container. Always ensure that all anti-freeze solutions are flushed out of the system before using the unit for cleaning tasks, as anti-freeze solution can be highly detrimental to certain surfaces and materials.

8. MAINTENANCE & ADJUSTMENT.

8.1 REGULAR MAINTENANCE SCHEDULE

Note that the machine should be shut down before carrying out the following:

		Daily	Weekly	250 hrs.	500 hrs.	1000 hrs.
ENGINE:						
	Oil level	*				
	Air Cleaner oil bath	*		*		
	Fan belt	*				
	Oil Change			*		
	Oil filter change			*		
	Check & adjust valve clearances			*		
	Battery level		*			
	Clean Air Duct			*		
	Check Battery Terminals			*		
	Check tightness of all screws			*		
	Renew fuel filter				*	
	Clean & Check mountings					*

GEARBOX						
	Check Level		*			
	Change oil				*	

PUMP						
	Inlet filter	*				
	Oil level	*				
	Change oil				*	
	Hose Reel security			*		
	Hoses for security/chafing				*	

UNLOADER VALVE						
	Check break off pressure			*		

HOSES						
	Hoses of the correct rating and undamaged	*				

	Hose connectors of the correct rating and undamaged	*				
	Hose restraints in place and in good order (where required)	*				

8.2 OTHER MAINTENANCE INFORMATION

ENGINE: Refer to Hatz Handbook.

PUMP: Refer to Udor Handbook

GEARBOX: Refer to Lancereal Handbook

UNLOADER AND SAFETY VALVE:

No user serviceable parts.

Under no circumstances should any adjustments be made to the unloader or safety valve as serious personal injury, or damage to engine, gearbox or pump could result.

9. SPARE PARTS

When ordering spares please quote:-

- a) Your company name and address
- b) Model type and serial number of unit
- c) Full description of parts required
- d) Your contact name and telephone number
- e) Your order number

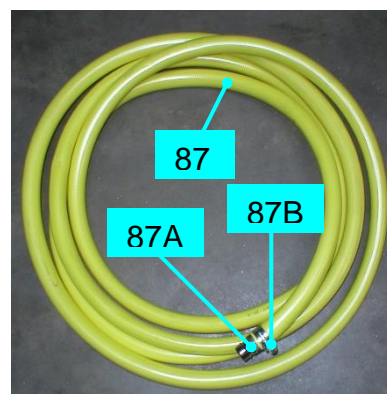
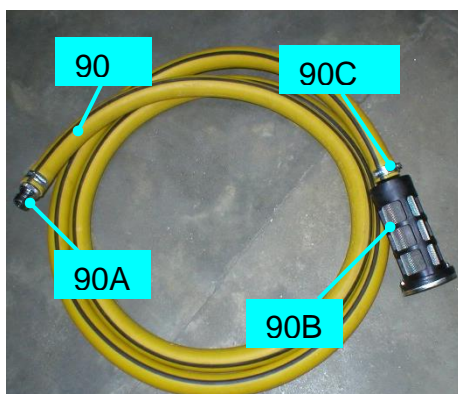
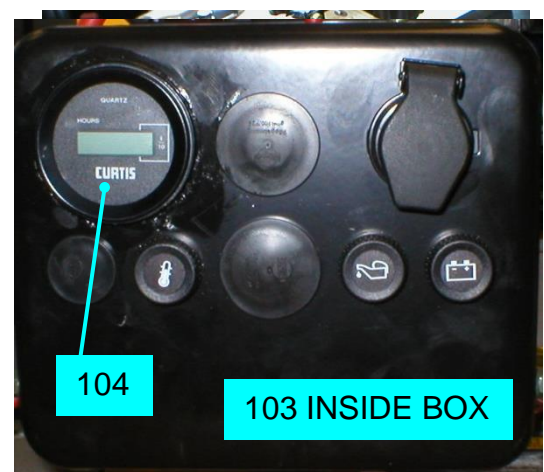
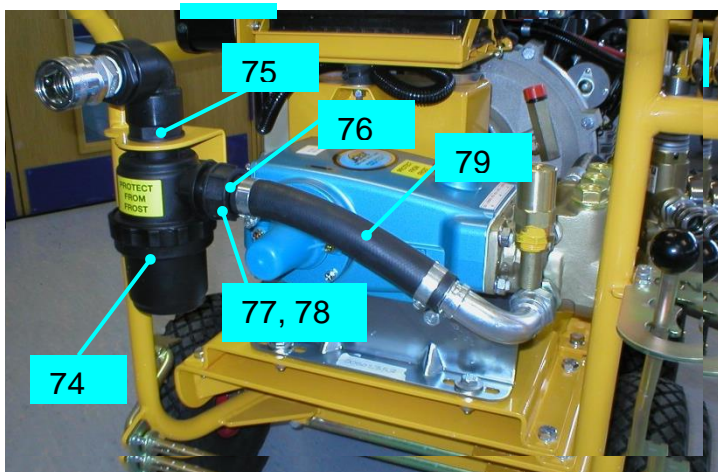
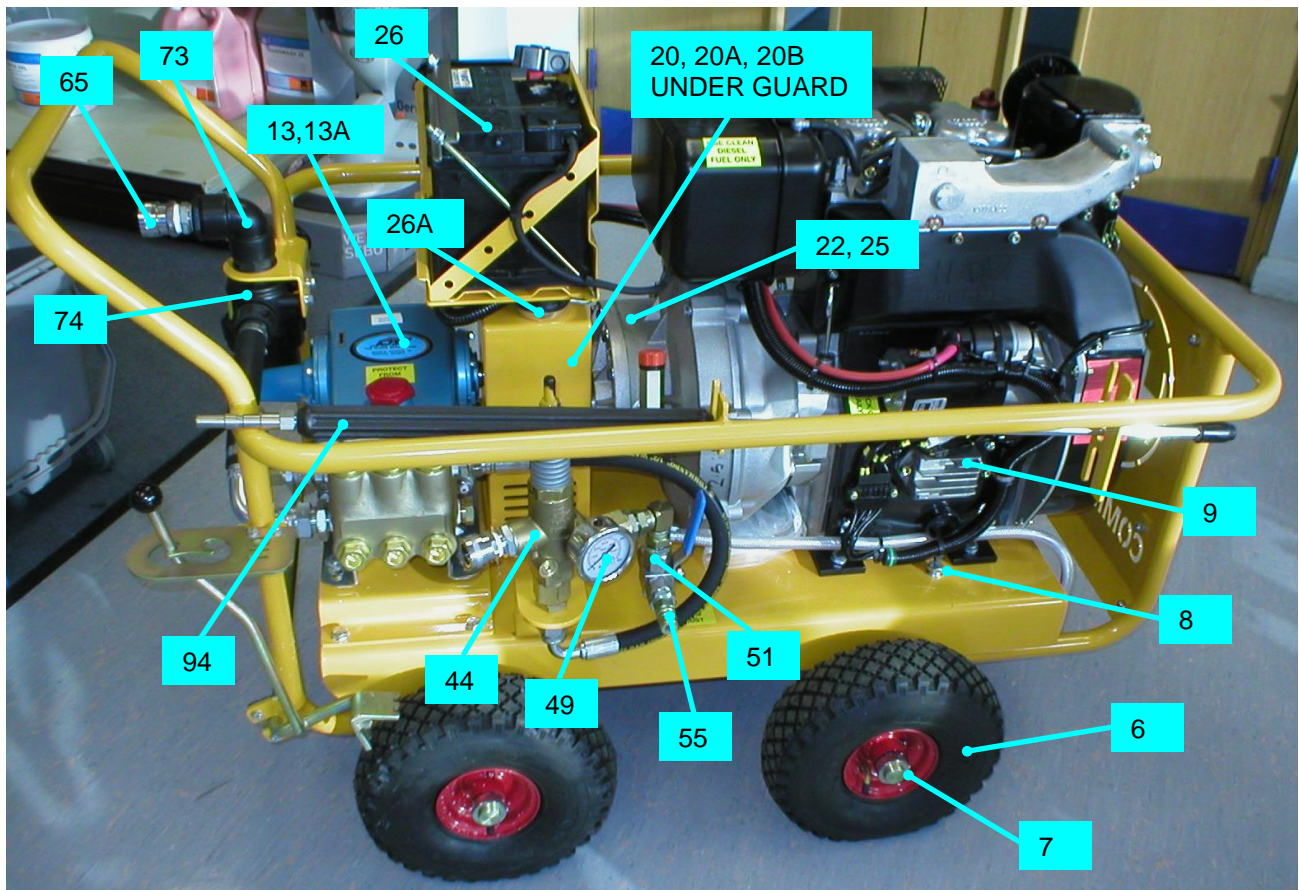
Note that spare parts should only be fitted by persons trained and competent to do so.

REPLACEABLE ITEMS LIST

See the following illustrations for component reference numbers.

Ref.	Description	Qty.	Part Number
6	PNEUMATIC TYRED WHEEL	4	HCOB/154
7	LOCKING COLLAR	4	HCD070139
8	ANTI VIBRATION MOUNTS	6	HCOB/023
9	ENGINE HATZ 2G40	1	HC01400
13	PUMP UDOR GB 21/20S (COMMANDO 1000)	1	
13	PUMP UDOR GCK 50/150S (COMMANDO 1022U)	1	HC52007
13	PUMP UDOR GB 30/20S (COMMANDO 1030U)	1	HC52002
13A	PUMP MOUNTING RAILS	1	CP030613
20	FLANGE F70H	2	HC22002
20A	TAPERLOCK BUSH 1610/30 - GEARBOX	1	HC22003
20B	TAPERLOCK BUSH 1610/30 – PUMP	1	HC22003
22	GEARBOX LANCEREAL 2.5:1	1	HC06055
25	ENGINE FLYWHEEL ADAPTOR PLATE	1	HC01420
26	BATTERY	1	HCOB/060
26A	FLEXIBLE MOUNT	1	LP32920890
37	ST230 - SAFETY RELIEF VALVE	1	GS53040
44	UNLOADER - SPECK UL262	1	SP00817
49	PRESSURE GAUGE 0-400 BAR	1	GS54840
51	BALL VALVE 1/2" BSP 3 WAY 06000PSI	1	HC02303
55	COUPLING MALE H.P.	1	KW1600493
65	3/4" FEMALE COUPLING - INLET	1	KW1602945
73	1 1/4" BSP ELBOW	1	DP9901EL12590
74	SUCTION FILTER 1 1/4"	1	DP8074005
75	1 1/4" BACK NUT	1	DP8042301
76	25mm BARB – 1 1/4" FLY NUT, HOSE TAIL	1	DP8002301
77	1 1/4" FLY NUT	1	DP8040301
78	1 1/4" FLY NUT GASKET	1	DPG00001022

79	1" HOSE – NOVOLINE	0.3M	2302009
87	RETURN HOSE ¾" TRICOFLEX	3M	2302002
87A	¾" HOSE NIPPLE WITH HOSE TAIL	1	KW1600659
87B	22mm CLIP	1	HC81204
87C	INLET COUPLING	1	HCQC050
87D	NIPPLE HOSETAIL	1	HCQC053
90	1" NOVOLINE	4.5M	2302009
90A	1" HOSE NIPPLE WITH HOSE TAIL	1	02ST/NT7360
90B	¾" – 1" ST35 FOOT FILTER	1	GSST35A
90C	35mm HOSE CLIP	2	HC81207
94	LANCE DOUBLE	1	GSST54
95	SPRAY GUN Q/R SWIVEL ST1500	1	GSST1500SQR
96	JET 1506 1/4MEG	1	02XX1506/MEG
103	AUDIBLE BUZZER	1	HC21738
104	HOUR METER 12v	1	HCOB/010



10. MANUFACTURER'S LITERATURE

10.1 UDOR PUMP

10.2 SPECK UL262 UNLOADER

[Data sheet](#)

10.3 HATZ 2G40 ENGINE

[Operator manual](#)