



ULTIMATE WATER JETTING SOLUTION

C-150-200D

**DIESEL POWERED
HEAVY DUTY COLD WATER
HIGH PRESSURE CLEANER**

USER GUIDE & SPARE PARTS MANUAL



www.densin.com

Introductions

Congratulations on your purchase of the **DEN-SIN** High Pressure Cleaner.

Model: C-150D & C-200D

Read this user manual before you start up your High Pressure Cleaner the first time.

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This machine is a High Pressure Cleaner producing water jet under high-pressure, which is why severe injuries can occur if the safety precautions are not observed. Therefore a full understanding of the contents of this instruction manual is required, in order to prevent injuries to you, objects and persons near by.

Safety

The following symbols are used in this manual to indicate procedures that if not followed, may results in personal injuries or damage to equipment.



WARNING is used to alert the reader of procedures or practice which if not followed correctly could result in personal injuries.



CAUTION is used to alert the reader of procedures or practice which if not followed correctly could result in damage to machine or other equipment.



NOTE is used to highlight important information that may assist the reader carrying out the procedure or understanding the text.

Version 16: March 2015

Revision History

Date	Revision	Rev No.
June 2013	Amend error to Gearbox part number	13
Aug 2014	Added C-200D Unloader	14
Oct 2014	Manual Updating / Repair Kit Updating	15
Mar 2015	Updating of Manual with new configuration components	16

Table of Contents

Table of contents	
Introductions	1
Table of contents	2
1. Getting acquainted with your High Pressure Cleaner	3
Fast and efficient cleaning.....	3
Specifications	3
Applications	3
Unpacking	4
Installation.....	4
Operations	5
2. Safety and protection information	6
General safety & application guidelines	6
Safety devices.....	6
Important medical information.....	7
WARNING	7
Safety precautions	8
3. Maintenance and troubleshooting	9
Maintenance	9
Troubleshooting	10
Service instructions	12
4. Available accessories	15
ID-plate.....	15
Chassis assembly.....	16
Chassis assembly spare-parts list	17
Gear box assembly	18
Gear-box assembly spare-parts list	18
Pump assembly.....	19
Pump assembly spare-parts list	20
Pump spare-parts kit.....	21
Un-loader valve assembly C-150D	22
Unloader valve assembly spare-parts list.....	22
Repair kit Unloader valve C-150D.....	24
Un-loader valve assembly C-200D	25
Un-loader valve assembly C-200D spare-parts list.....	25
Repair kit Unloader valve	27
Safety valve assembly C-200D	27
Safety valve assembly spare-parts list C-200D.....	27
Lance assembly	28
Lance assembly spare-parts list.....	28
Trigger gun assembly	29
Trigger gun assembly spare-parts list.....	29
Recommended spare-parts	31
5. Declaration and Warranty	32
EU declaration of conformity.....	32
Warranty.....	32
6. Spare Parts Request Form	33
7. Maintenance Log Book	34



The information contained in this user guide is subject to change without notice.

1. Getting acquainted with your High Pressure Cleaner

1. Getting acquainted with your High Pressure Cleaner

Fast and efficient cleaning

The **DEN-SIN** series of High Pressure Cleaners C-150D & C-200D enables you to get more cleaning done in less time, fully independent of power supply.

This **DEN-SIN** High Pressure Cleaner offers you high performance yet a compact design. The compact design enables the machines to be agile within inconvenient places even at staircases, and the high performance gives you the opportunity to solve an array of cleaning tasks. This High Pressure Cleaner is designed for heavy industrial use as well as for cleaning contractors. All pump parts, fittings and pipes in contact with water are made of non-corrosive materials. Together with the ceramic pistons, long life seals and stainless steel valves, it ensures long life and high durability.

Specifications

Model	Motor		Motor Speed	Working Pressure		Flow Capacity		Power Supply	Dimensions LxWxH	Weight
	Hp	kW	rpm	psi	Bar	gpm	l/min		mm	kg
C-150D	6.0	4.4	3600	2175	150	4.0	15.2	Diesel	850x600x900	60
C-200D	10	7.5	3600	2900	200	4.9	18.5	Diesel	850x600x900	95

Applications

These heavy-duty High Pressure Cleaners are capable of removing any kind of dirt:

- Algae off concrete constructions
- Paint and graffiti off walls
- Dust, dirt, soil & mud off floors
- Oil & grease off engines and other mechanical parts
- Dirt and salt deposits off ship decks

And with the option for use of accessories even many more jobs can be dealt with:

- Sand-blasting
- Drain-cleaning
- Dispensing of soaps and chemicals
- Sludge pumping
- Extra long lances for hard to reach places
- Floor cleaning equipment
- Rotary brushes



This machine is only to be used for the purposes it is designed for. Any other use shall be considered improper and therefore potentially dangerous. The manufacturer is not to be held responsible for any damages caused by improper use.

1. Getting acquainted with your High Pressure Cleaner

Unpacking

Remove the High Pressure Cleaner and its accessories from the packing material. For transport and packing reasons some accessories may be supplied disassembled.

Make sure all components are present:

- High-pressure machine itself
- Handle bar (partly attached)
- Wing nuts for the handle bar
- Electrical cord (attached)
- High pressure hose with Spray-gun trigger
- Double barrel lance (disassembled)
- Water inlet male hose coupling

Installation

- Attach the handle bar (pos 23, page11) to the machine using the wing nuts and bolts supplied; align the handle bar according to the cabinet molding.
- Mount the high-pressure hose on to the High Pressure Cleaner (pos. 30 page 18) by pulling back the retainer (pos. 24) on the high-pressure hose coupling, while sliding it on the male part (pos. 30 page 18) positioned on the front of the High Pressure Cleaner.
- Assemble the double barrel spray-lance (pos. 1 page 22). To mount the assembled spray-lance on to the Spray-gun trigger, pull forward the front of the Spray-gun trigger while sliding in the male swivel coupling part (pos. 13 page 22) of the spray-lance.
- Prepare the water supply for the High Pressure Cleaner, by attaching a hose to the supplied low pressure inlet male-coupling. Connect the other end of the water supply hose to a potable water tap. Open the tap.

Notice: Connection to the public mains water supply according to regulations.

- Before starting the machine, bleed out air by pulling the trigger-gun handle until any air has escaped the inlet hose.
- Turn on the power of the engine.
- The high pressure cleaner is now ready for operation. The spray-gun lance is affected by a recoil force during operation – therefore keep a firm grip with both hands on the Spray-gun handle and the lance. Press the trigger and start cleaning.
- The pressure can be regulated by turning the high-pressure cock on the spray-gun lance. When using chemical injector, pressure must be adjusted to low.



Do Not run the High Pressure Cleaner without sufficient potable water supply it can cause cavitations and serious damage to internal pump parts. Do not let the machine recycle the water (running with Spray-gun trigger not activated) for more than a few minutes; this can cause serious damage to the seals.

1. Getting acquainted with your High Pressure Cleaner

Operations



To prevent accidents from happening, ensure the safety of the person(s) who uses the equipment and to protect bystanders and nearby placed inventory or machinery, a few safety precautions needs attention.

- 1) Treat the machine as a high-speed cutting tool.
- 2) Anyone under the age of 18 is NOT allowed to use the machine.
- 3) Always keep the High Pressure Cleaner and its accessories in good working condition. Check the machine for defects. Do NOT start up the machine if there is any defect. Have the machine serviced.
- 4) When using the High Pressure Cleaner and its accessories, eye protection must be worn to protect against repelling or ricocheting matters causing eye damage.
- 5) Suitable clothing and footwear must be worn while using the equipment to protect the operator. Do not try to clean clothes or footwear with the machine.
- 6) Precautions must be made to keep bystanders away from the working range.
- 7) **Do NOT** spray-clean on yourself, others or live animals. The high-pressure beams are capable of making severe injuries.
- 8) **Do NOT** spray at electrical equipment OR the machine itself.
- 9) While repairing or servicing the equipment and its accessories always make sure the machine is turned off and disconnected from the main power supply.
- 10) Only allow instructed personnel to operate the machine.
- 11) Activating the trigger/gun can cause backward force therefore always hold spray lance with both hands.
- 12) When pausing during operation turned off the main switch of the machine and ensures that the trigger/gun is locked.
- 13) Only use high-pressure hoses, connections and nozzles specified by DEN-SIN.
- 14) **IMPORTANT** – Do not use the machine in a possible explosive environment in accordance with EN-50014.



2. Safety and Protection information

2. Safety and protection information


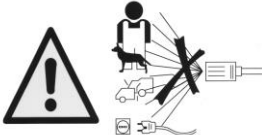
General safety & application guidelines

- 1) It is not allowed to clean asbestos containing surfaces with high-pressure, unless using special equipment.
- 2) Persons under the influence of alcohol, drugs or medicine should not operate the machine.
- 3) This machine has been constructed for use with Nilfisk-ALTO detergents. The use of other detergents or chemicals may cause problems as to the operation and the safety.
- 4) When using detergents the instructions should always be strictly observed.
- 5) Always flush the machine with clean water after use of chemical/detergents.
- 6) Do not operate the machine if important parts are damaged – i.e. safety devices, high-pressure hoses, spray handle.
- 7) The user is obliged to observe all national working environment and working safety regulations concerning “operation of high-pressure washers”.
- 8) It is not allowed to connect this machine directly to a potable water supply.
- 9) If the machine is to be connected to potable water supply it is strictly necessary to fit the machine with a water break tank, in accordance with EN1717.

Safety devices

The machine is equipped with the following safety devices:


- 1) Stop button. Please refer to the separately supplied manual covering the proper use of the engine.
- 2) Un-loader (page 20) and safety valve (page 22) protect against overpressure.
- 3) Locking device on spray-gun handle. The locking device prevents the trigger from being activated when pulled out.

DO	DON' T
	

2. Safety and Protection information

Important medical information

Immediate hospital attention should be given personnel who sustain equipment related injuries while operating the system. In such cases, it is vital that medical personnel be apprised of all facts relevant to such injuries. Therefore, all operating personnel should be provided with waterproof emergency medical alert tags or cards, describing the nature of their work and the possibility of injury inherent in the use of water jetting equipment. The below example of a standard card can be photo copied, laminated and used as medical alert tag.



**IMPORTANT
MEDICAL INFORMATION**

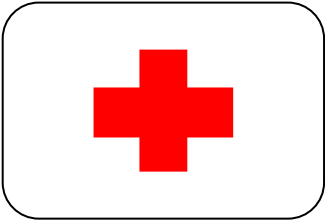
WARNING

Obtain medical treatment immediately for ANY high-pressure water-jet injuries.

Inform the doctor of the cause of the injury.

Show this card to the doctor.

This card is to be carried by personnel working with high-pressure water jetting equipment.



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**MEDICAL ALERT
NOTE TO PHYSICIAN**

This patient may be suffering from a water jet injury. Evaluation and management should parallel that of a gunshot injury. The external manifestations of the injury cannot be used to predict the extent of internal damage. Initial management should include stabilization and a thorough neurovascular examination. X-rays can be used to access subcutaneous air and foreign bodies distant from the site of injury. Injuries to the extremities can involve extensive nerve, muscle, vessel damage, as well as cause a distal compartment syndrome. Injuries to the torso can involve internal organ damage. Surgical consultation should be obtained. Aggressive irrigation and debridement is recommended.

Surgical decompression and exploration may also be necessary. Angiographic irrigation studies are recommended pre-operatively if arterial injury is suspected. Bandages with a hygroscopic solution (MgSO₄) and hyperbaric oxygen treatment have been used as adjunctive therapy to decrease pain, edema and subcutaneous emphysema. Unusual infections with uncommon organisms in immune competent patients have been seen; the source of the water is important in deciding on initial, empiric antibiotic treatment, and broad spectrum intravenous antibiotics should be administered. Cultures should be obtained

2. Safety and Protection information

Safety precautions



The following protective clothing and devices should be worn both by personnel operating the water blaster system and equipment and by those working nearby:

<p>Eye protection- Operators must wear visors and goggles to guard against spray and flying debris. A combination of both goggles and visor is advisable. And will protect the eyes and the face during both water-blasting as well as abrasive water-blasting</p>	<p style="text-align: center;">EYE PROTECTION</p>
<p>Head protection- Helmets must be worn at all time by personnel within the work area. Helmet material must be able to withstand mechanical shock exceeding 10G in 8ms without fracturing.</p>	<p style="text-align: center;">HEAD PROTECTION</p>
<p>Hand protection- Shear proof gloves must be worn by the operator at all times. A glove combination of a cloth inner lining and a water tight outer layer is preferred.</p>	<p style="text-align: center;">HAND PROTECTION</p>
<p>Foot protection- Safety footwear with steel toecaps minimum 0.5mm (0.02”) thick must be worn. The toecap must cover at least 30% of the footwear length. Basic safety footwear must also be equipped with metatarsal guards to protect the instep. Safety boots are available in other designs than the illustration.</p>	<p style="text-align: center;">FOOT PROTECTION</p>
<p>Hearing protection- Operators and other personnel exposed to noise levels of more than 90-dBa for more than 1 hour must wear suitable ear protection. Ear plugs or ear muffs are usually sufficient.</p>	<p style="text-align: center;">HEARING PROTECTION</p>
<p>Body protection- Waterproof garments protect the operator only from spray and flying debris. They do NOT deflect direct jet impact. Therefore, an operator must take care never to point a water-jet either at them selves or other personnel.</p>	<p style="text-align: center;">PROTECTIVE CLOTHING</p>

3. Maintenance and Troubleshooting

3. Maintenance and troubleshooting

Maintenance

Subject	Matter / Procedure
Lubrication	<p><i>Oil renewal of the pump, gearbox and engine crankcase is to be completed the first time after no more than 50 hours of use. Oil renewal is hereafter to be completed in every 500 hours of use.</i></p> <p>Renewal of oil in pump: Turn off the High Pressure Cleaner. Dismount the hexagon screw at the bottom of the pump housing (pos. 28 pg. 19) Allow the oil to drain into a waste oil-tray. Remount the hexagon screw and add oil through the oil inlet on top of the pump (pos. 14 pg. 19) until the red point of the oil control glass has been reached. Approx. 0.4kg of oil, type SAE 15W40, is to be used.</p> <p>Renewal of oil in gearbox: Turn off the High Pressure Cleaner. Dismount the screw (pos. 16 pg. 18) Allow the oil to drain into a waste oil-tray Remount the hexagon screw and add oil through the oil inlet on top of the gearbox (pos. 2 pg. 18) until the red point of the oil control glass has been reached Approx. 3/4 liter of oil, type Omala 220, is to be used.</p> <p>Please refer to the separate engine manual for engine maintenance. Check oil level in pump, gearbox and engine regularly.</p> <p>Notice: Do not dispose of used oil in drain.</p>
Refueling	<p>Before refueling, allow the engine to cool down. Do not spill fuel.</p>
Cleaning	<p><i>Use a damp cloth to wipe the cabinet and handlebar. Do not use detergent cleaning chemicals.</i></p> <p>Notice: To prevent electrical shock. DO NOT SPRAY DIRECTLY UPON THE MACHINE WITH HIGH PRESSURE.</p> <p><i>Occasionally clean the fan cover positioned at the back of the engine to ensure sufficient airflow.</i></p> <p><i>Do NOT operate the machine with damaged or removed fan cover.</i></p>
Inspection	<p><i>To prevent spills of leaking water. Check high pressure hose for wear and cracks. Keep coupling parts free of dirt to ensure long life of O-ring seals preventing water leaks.</i></p> <p>Notice: To prevent damage on hoses, be careful not to have them run over by heavy vehicles or squeezed in door openings etc. Replace if necessary.</p>
Storage	<p>Be sure the cleaner is kept frost-free, if not possible flush the pump of the cleaner with antifreeze fluids.</p>

3. Maintenance and Troubleshooting

Troubleshooting

Symptom	Cause and Rectification
---------	-------------------------

The engine will not start / run.

No fuel.

Refuel the engine
(For any further, refer to the separately supplied engine manual.

The pressure drops and the High Pressure Cleaner works irregularly.

The strain filter is clogged or the water supply from the tap is insufficient.

Clean the strain water filter.
If there isn't enough water-flow through the tap, the machine should suck from a filled water vat or tank.

The pump continuously stops and starts, when the spray-gun trigger is activated.

The high pressure nozzle is partly clogged.

Turn off the High Pressure Cleaner, dismantle the high-pressure nozzle and remove the extraneous matter. Replace if damaged.

The high pressure cleaner does not reach the proper working pressure when the spray-gun handle is activated.

The high-pressure nozzle is clogged or there is dirt in the by-pass valve. The pump sucks air.

Turn off the High Pressure Cleaner. Clean the nozzle. Inspect the low pressure supply, or while the spray-gun trigger is activated turn the machine on again. Repeat the procedure again; now with the trigger released. If the problem still occurs, the by-pass valve should be dismantled and the extraneous matter removed.

The High Pressure Cleaner only works with approximately 2/3 of the maximum pressure, and the high-pressure hose is vibrating

There is dirt in the valves.

Turn off the High Pressure Cleaner. Dismantle the valve bolts and the valves, remove the dirt and check to ensure the valve flaps are movable and fits tightly.

(Continues)

3. Maintenance and Troubleshooting

(Continued)

Symptom

Cause and Rectification

Noisiness

The pump sucks air. One or more valve springs are broken or down. Extraneous matter in the valves. Crankcase or motor bearings worn out.

Inspect the low-pressure supply. Replace springs. Clean the valves. Replace the bearings.

Water in the oil

The O-ring casing is worn out. High moisture in the air (condensing inside the crankcase) The seals are completely worn out.

Check or replace the O-ring.
Renewal of the crankcase oil more often.
Replace the seals.

When using chemical injector

The High Pressure Cleaner does not suck chemicals

The chemical container is empty. The High Pressure Cleaner has not been set to low-pressure (on the double barrel lance cock). The low-pressure nozzle is clogged, or partly clogged. The non-return valve of the chemical injector is stuck.

Ensure the chemical container contains sufficient fluid for proper suction.

Set the spray-lance to low pressure by turning the cock on the lance counterclockwise.

Clean or replace the low-pressure nozzle.

Clean, correct or replace the non-return valve of the chemical injector.



NOTE

For any further inconveniences, not mentioned in this user guide or any damages of the machine, we strongly suggest you to make contact with your dealer for the repair or possible replacement of any original spare-parts.

3. Maintenance and Troubleshooting

Service instructions

Detach the high pressure hose, dump back hose, inlet hose, safety valve, and parts on the pump head before servicing the pump.

(Please refer to Pump assembly (Page 17) unless otherwise stated.)

Servicing the valves:

1. Remove the valve cap (Pos: 2).
2. Inspect the valve cap O-Ring (Pos: 1) for any damage, replace if necessary.
3. Use the needle nose pliers to remove the valve (Pos: 3).
4. Use a small probe to move the poppet up and down to assure that the valve is functioning properly and that no debris is stuck in the valve (Pos: 3).
5. To reassemble the valves proceed the other way round and tighten the cover screws with a torque wrench. (Referring to torque specification)

Servicing the Packings/Seals:

1. Remove the bolts (Pos: 38) on the head (Pos: 36) of the pump.
2. Place the screwdrivers between the head (Pos: 36) and crankcase (Pos: 9) of the pump, lifting one up and the other down. The head should start to lift off of the plungers (Pos: 23).



3. When you remove the head, some of the water seals have stayed on the plungers (Pos: 23) and some in the head (Pos: 36). To remove the seals from the plungers (Pos: 23), simple turn the assemblies and pull off.



3. Maintenance and Troubleshooting

4. If the seal assemblies (Pos: 30~33) are in the head (Pos: 36) use the reversible pliers to grab the seal retainer on the outside ring, twist the retainer in either direction and lift out.



5. Pull out the guide ring (Pos: 31) with your finger.
6. Pull the high-pressure seal (Pos: 30) and support ring (Pos: 7) out of the head with your finger.
7. The low-pressure seal (Pos: 33) is located in the brass seal retainer. Using the mechanics pick, go in between the seal and retainer and pull the seal straight out.
8. Remove the seal retainer O-Ring (Pos: 32) with mechanics pick.
9. To reassemble the packing and seals proceed the other way round and tighten the cover screws with a torque wrench. (Referring to torque specification)

Servicing the Plungers (Pos: 23):

Recommend to replace Piston kits, Support Rings kits, and Water Seals kits whenever servicing the plungers.

1. Remove the plunger retainer nut (Pos: 25).
2. Insert the gasket scraper between the copper washer (Pos: 24) and plunger (pos: 23) to remove the washer (Pos: 22).
3. Twist and pull the plunger off the plunger rod.



4. Remove the plunger rod O-Ring (Pos: 21) with the mechanics pick.
5. Remove the washer (Pos: 22). And clean any thread locker that is left on the plunger rod and retaining nut threads.
6. To reassemble the plungers, proceed the other way round and tighten the cover screws with a torque wrench. (Referring to torque specification)

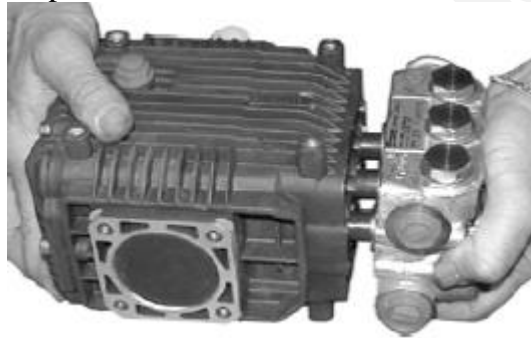
3. Maintenance and Troubleshooting

Pump head (Pos: 36) to drive end (Pos: 9) Installation:

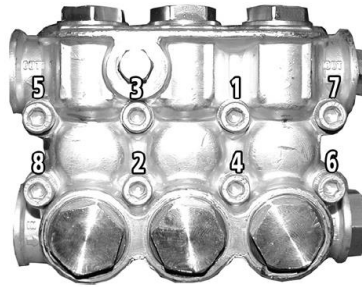
1. Turn the crankshaft to align the plungers as shown.



2. Place the head evenly onto the plungers and push it until it makes contact with the drive end of the pump.



3. Torque the head bolts (Pos: 38) as shown in the tightening sequence diagram.



Torque Specification:

Descriptions	Head (Pos: 38)	Piston Nut (Pos: 25)	Valve Cap (Pos: 2)
In .lbs	133	106	442
Kg.m/N.m	15	12	50

4. Spare Part List

4. Available accessories

Accessories	part no.:
Chemical injector.	700550021
Rotary brush.	700550462
Foam injector	700550156
Foam lance.	700550464
Foam sprayer.	700550463
Extension hose with quick couplings. from 10 - 50 m	Please inquire
Industrial drain cleaner (1 front, 3 rear jets).	700550508
Container for sandblasting grid, including regulator.	Please inquire
Floor cleaner	700550465
Filter for suction from vat or tank with 3/4" hose nipple	700520049
Retractable hose reel.	700550208

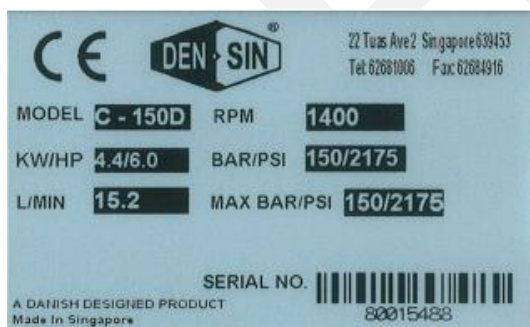
Accessories	C150D	C200D
**Double Barrel Lance	700551473	700551474
*Single Barrel Lance	700550449	700550450
**Short Double Barrel Lance	700551502	700550490
Single Barrel Lance with Rotating Nozzle	700550171	700551287
**Double Barrel Contractor Lance with side Regulator Handle	700550192	700550193
Single Barrel Lance with Multi-speed Nozzle	700550566	700551289
Industrial Sandblaster Kit with boron Carbide Nozzle	700550479	700550480

* With Straight Jet Nozzle **With Fan Jet Nozzle

Notice: Always state type of High Pressure Cleaner along with the part no.: when ordering accessories or spare-parts.

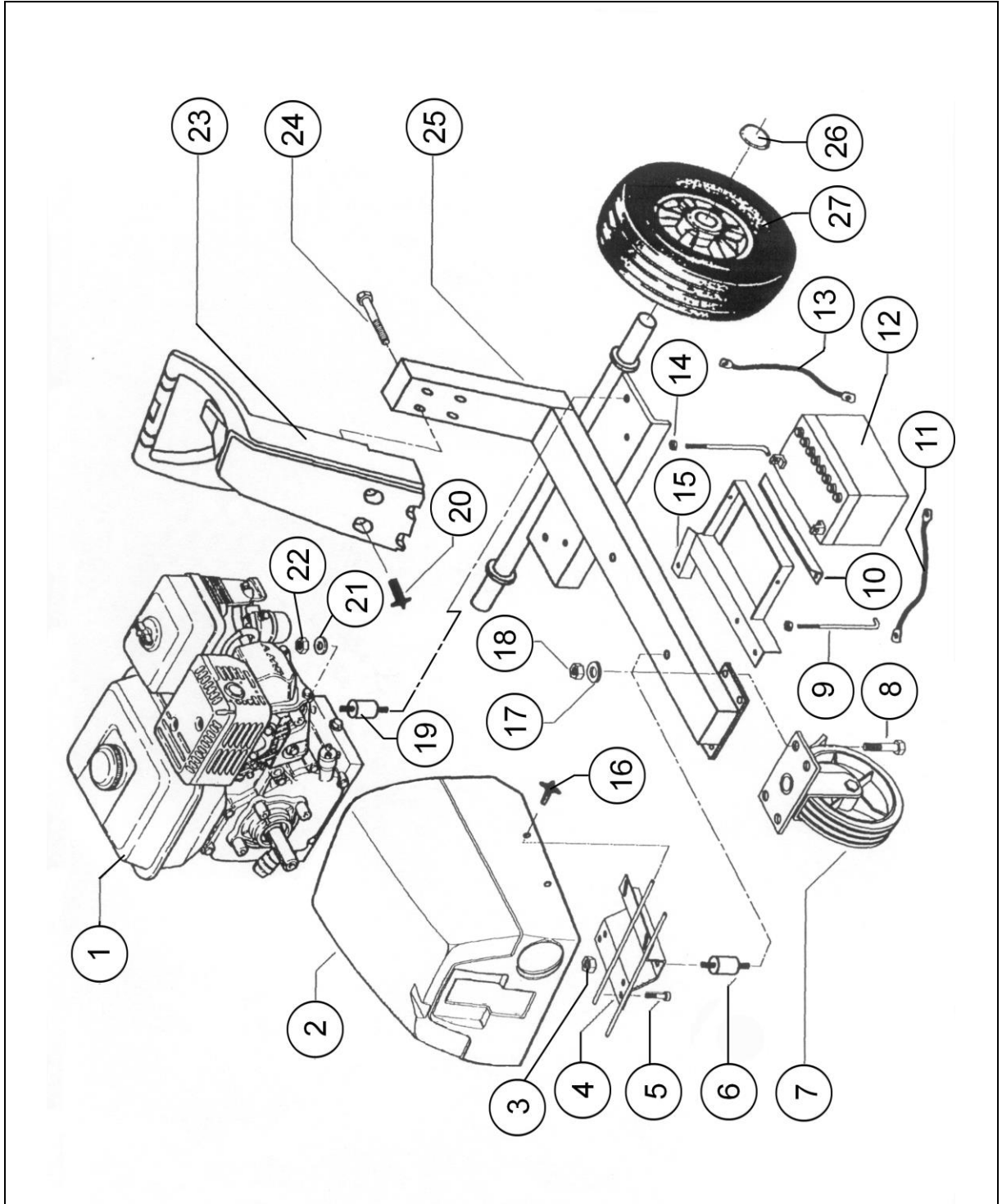
ID-plate

Refer to the identification plate on the machine:



4. Spare Part List

Chassis assembly



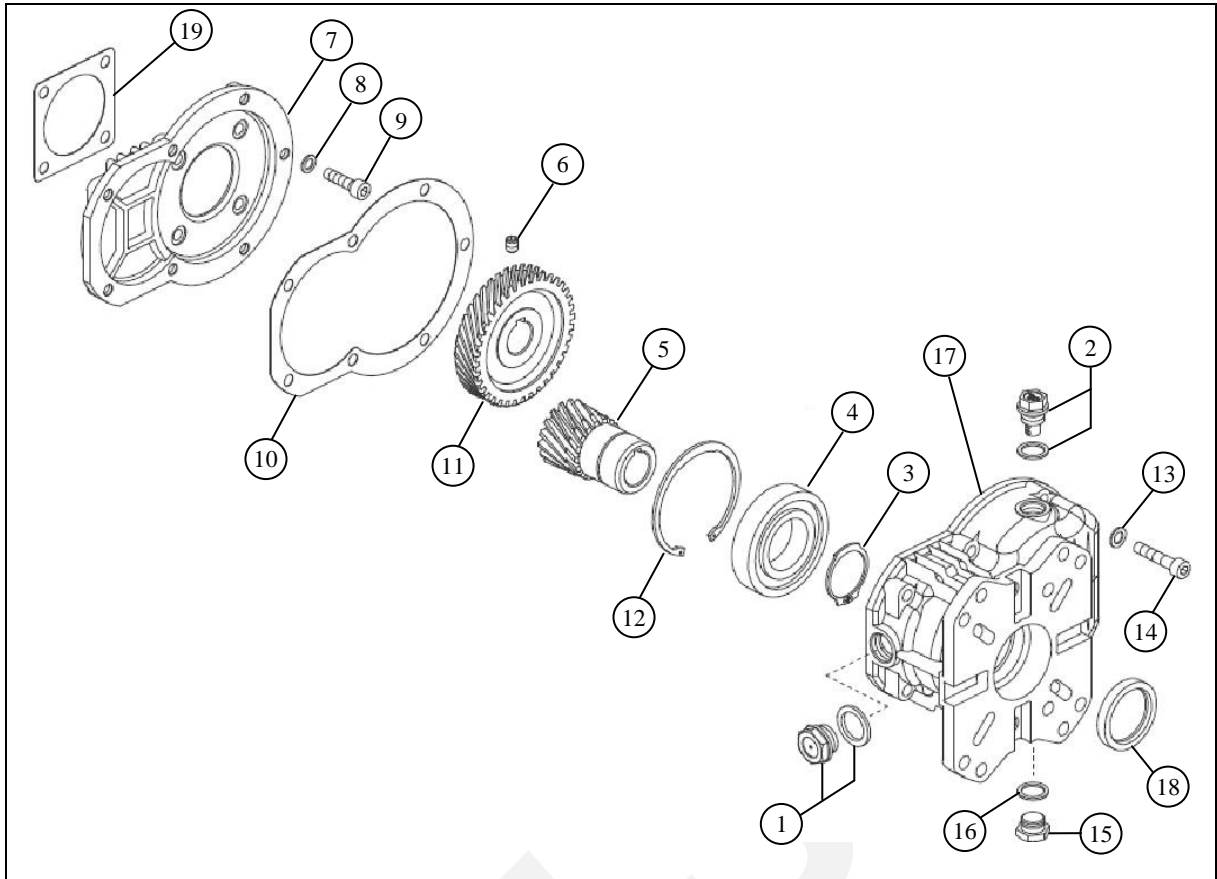
4. Spare Part List

Chassis assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:	
1	700530283	1	Engine 6Hp recoil start	C-150D
	700530087	1	Engine 10Hp electric start	C-200D
2	700520128	1	Cabinet	
3	700510008	1	Lock nut	
4	700520521	1	Castor wheel bracket	
5	700510041	4	Screw	
6	700510053	1	Rubber mount	
7	700520466	1	Castor wheel w/ brake	C-150D
	700520037	1	Castor wheel w/o brake	C-200D
8	700510030	4	Screw	
9	700520234	1	Stud for battery	C-200D
10	700520235	1	Holder for battery	C-200D
11	700530140	1	Battery cable	C-200D
12	700530141	1	Battery	C-200D
13	700530140	1	Battery cable	C-200D
14	700510007	2	Lock nut	C-200D
15	700520091	1	Battery bracket	C-200D
16	700510010	4	Finger screw	
17	700510005	4	Washer	
18	700510004	4	Lock nut	
19	700510052	2	Rubber mount	
20	700510050	4	Finger screw	
21	700510006	4	Washer	
22	700510008	4	Lock nut	
23	700520057	1	Handle	
24	700510066	4	Screw	
25	700520090	1	Chassis frame	
26	700520092	2	Hub cap with star-lock	
27	700520012	2	Pneumatic wheel	

4. Spare Part List

Gear box assembly

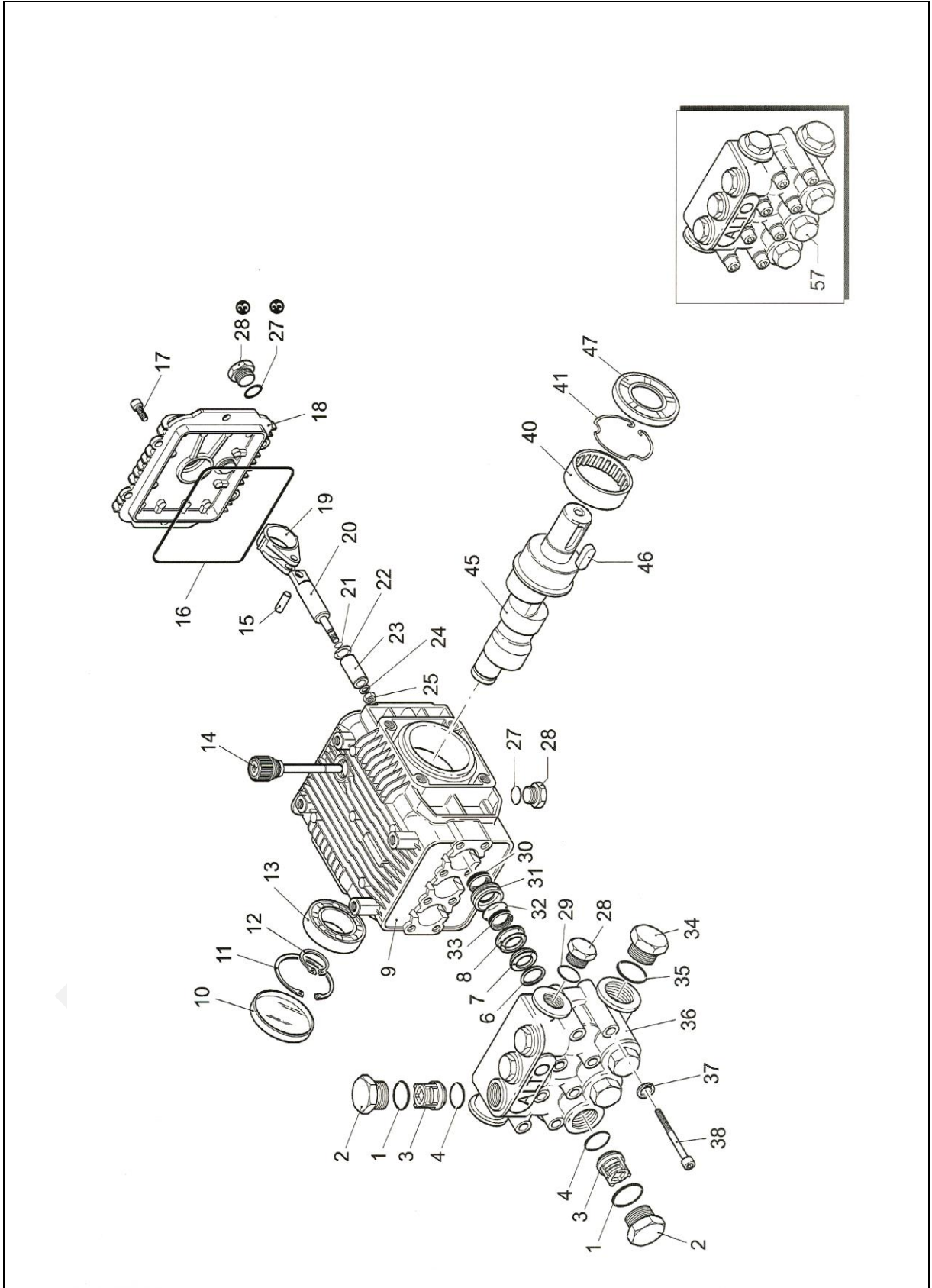


Gear-box assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	-	1	Oil sight glass
2	-	1	Filler plug 3/8"
3	-	1	Snap ring Ø40
4	700021414	1	Bearing
5	-	1	Gear wheel, engine side
6	-	1	Screw
7	-	1	Flange for pump
8	700540316	4	Dowty seal M8
9	-	4	Screw
10	-	1	Gasket
11	-	1	Gearwheel, pump side
12	700505214	1	Snap ring Ø80
13	700505253	7	Washer
14	-	7	Screw
15	700505256	1	Plug 3/8"
16	-	1	Aluminum washer
17	700022830	1	Gearbox housing
18	-	1	Oil seal
19	-	1	Gasket
1-19	700560064	1	Gearbox complete

4. Spare Part List

Pump assembly



4. Spare Part List

Pump assembly spare-parts list

Pos	Part no.:	Qty.:	Description:	
1	700560012	6	O-ring	
2	700560013	6	Plug	
3	Kit A	6	Complete valve	
4		6	O-ring	
6	Kit D	3	Support ring Ø18	
7		3	Gasket Ø18	
8		3	Piston guide Ø18	
9	700560022	1	Pump body	
10	Kit C	1	Cap	
11	700560024	1	Circlip Ø52	
12	700560025	1	Snap ring	
13	700560026	1	Bearing	
14	700560027	1	Oil Cap	
15	700560028	3	Piston pin	
16	Kit C	1	O-ring	
17	700560030	6	Screw M6x16	
18	700560031	1	Complete cover	
19	700560032	3	Connecting rod	
20	700560033	3	Guiding piston	
21	700560034	3	O-ring	
22	700560035	3	Spacer disc	
23	Kit B	3	Piston Ø18	
24	700560038	3	Piston washer	
25	700560039	3	Nut M8	
27	700560040	2	O-ring	
28	700560041	3	G plug 3/8"	
29	700560042	1	Washer	
30	Kit C	3	Oil Seal	
31	Kit D	3	Rear piston guide Ø18	
32		3	O-ring	
33		3	Gasket Ø18	
34	700560049	1	G plug 1/2"	
35	700560050	1	Washer	
36	700560051	1	Head	
37	700560052	8	Washer	
38	700560053	8	Screw M6x60	
40	700560054	1	Bearing	
41	700560055	1	Snap ring	
45	700560056	1	Crank shaft	C-150D
	700560058	1	Crank shaft	C-200D
46	700560066	1	Key for Ø24mm Shaft	
47	Kit C	1	Seal	
57	700560062	1	Pump head pre-assembly (Ø18)	
1-47	700560002	1	Pump complete for C-150D	
1-47	700560003	1	Pump complete for C-200D	

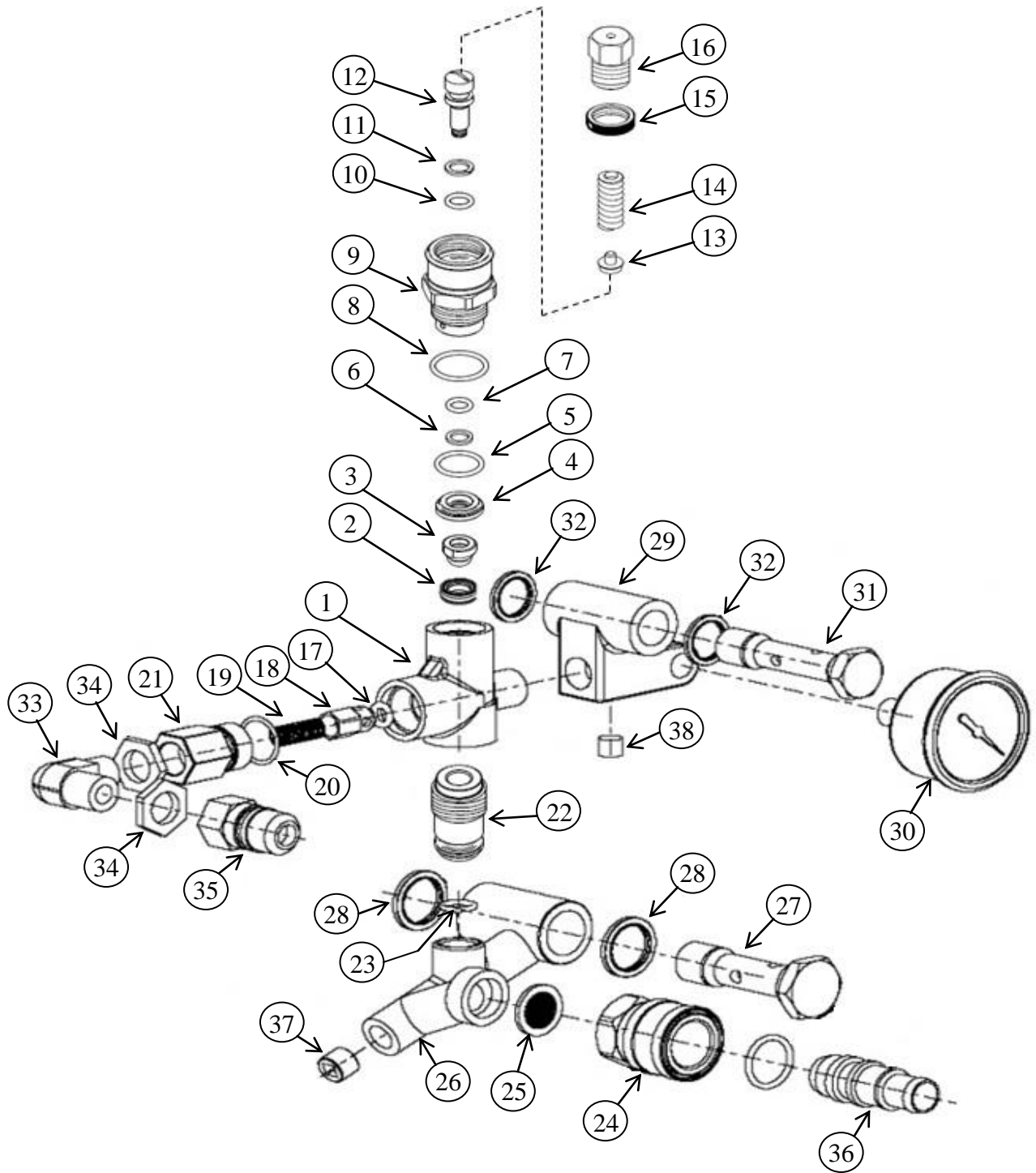
4. Spare Part List

Pump spare-parts kit

Part no.:/ Kit description	Pos:	Qty.:	Individual components Part no.:
Kit A – 700560004 Pump Valves Kit (1 SET)	-	-	-
	3	6	Complete valve
	4	6	O-ring
	-	-	-
Kit B – 700560008 Pistons (Ø18) (1 SET)	23	3	Piston Ø18
Kit C – 700560011 Oil seals (1 SET)	10	1	Cap
	16	1	O-ring
	30	3	Oil Seal
	47	1	Seal
Kit D – 700560139 Water seals (Ø18) (1 SET)	32	3	O-ring
	33	3	Gasket Ø18
	8	3	Piston guide Ø18
	6	3	Support ring Ø18
	7	3	Gasket Ø18
	31	3	Rear piston guide Ø18

4. Spare Part List

Un-loader valve assembly C-150D



4. Spare Part List

Unloader valve assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:	
1	-	1	Valve Housing	
2	Kit E	1	Seat	
3		1	Shutter Unloader	
4	-	1	Spacer	
5	Kit E	1	O-Ring	
6		1	Anti-Extrusion Ring	
7		1	O-Ring	
8		1	O-Ring	
9	-	1	Piston Coupling	
10	Kit E	1	O-Ring	
11		1	Anti-Extrusion Ring	
12	-	1	Adjustable Piston	
13	-	1	Spring Holder Plate	
14	-	1	Spring	
15	-	1	Locking Nut	
16	-	1	Regulation Nut	
17	Kit E	1	O-Ring	
18	-	1	Shutter VRT3	
19	-	1	Shutter Spring	
20	Kit E	1	O-Ring	
21	700540992	1	Retention Coupling	
22	-	1	VR Coupling Bypass	
23	700540993	1	O-Ring	
1-23	700540989	1	Unloader Valve Complete	
24	700540034	1	Quick Coupling Female Inlet	
25	700540033	1	Strainer	
26	700540738	1	Water Inlet	
27	700540736	1	Banjo Bolt 1/2" (High flow)	
28	700540056	2	Dowty Seal 1/2"	
29	700540737	1	Holder For Un-Loader Valve	
30	700540193	1	Pressure Gauge	
31	700540734	1	Banjo Bolt 3/8"	
32	700550004	2	Dowty Seal 3/8"	
33	700540025	1	Elbow	
34	700510136	2	Contra Nut 3/8"	
35	700540026	1	Quick Coupling Male Outlet	
36	700540036	1	Hose Nipple	
37	700540194	1	Plug 1/4"	
38	700540195	1	Plug 1/8"	
1-38	700540994	1	Unloader System Complete	
*	700540186	1	Elbow 3/8" M-F (Safety Valve Installation)	C-200E 50/60Hz
*	700510136	2	Contra Nut 3/8" (Safety Valve Installation)	C-200E 50/60Hz

* Not shown

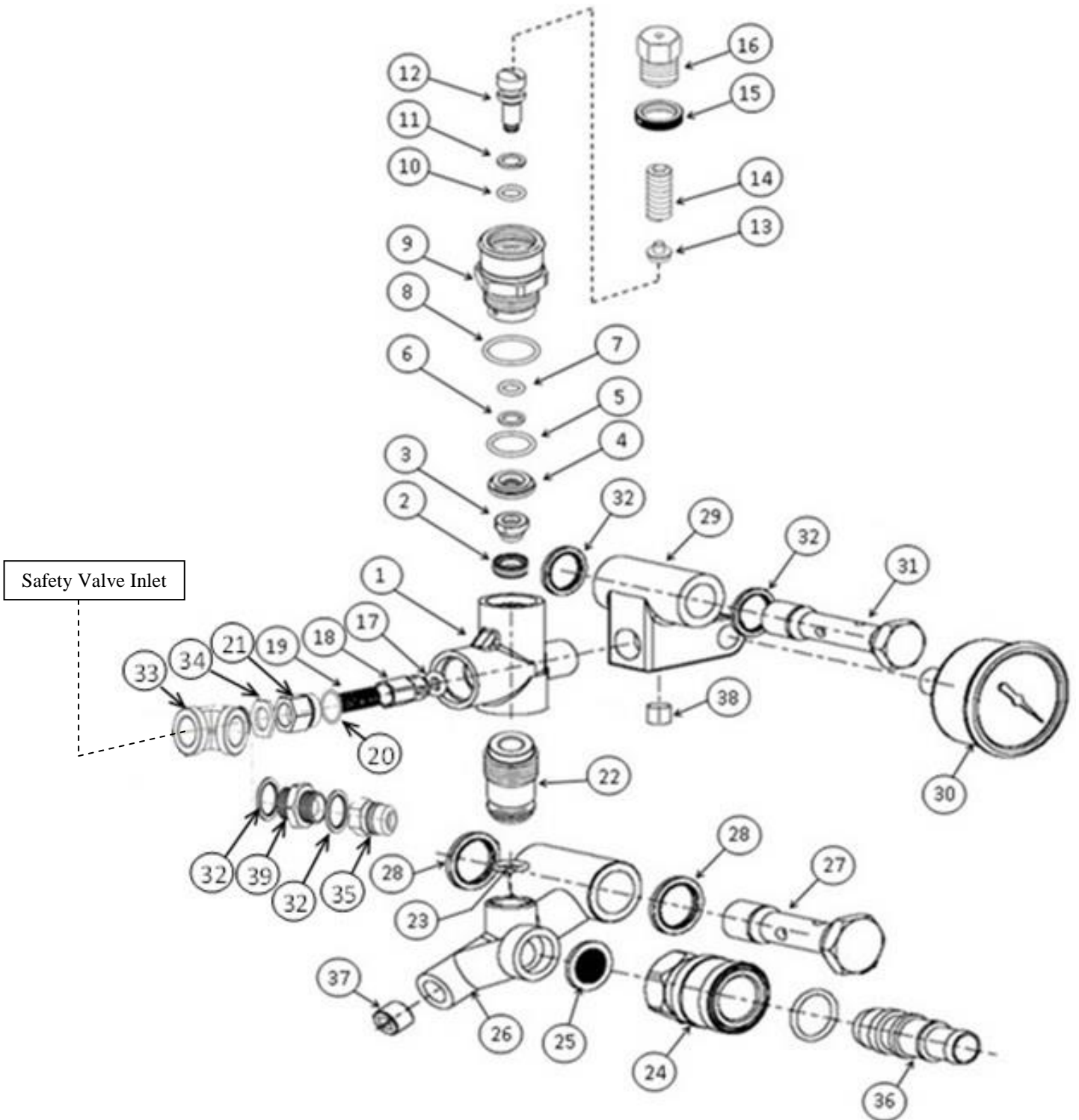
4. Spare Part List

Repair kit Unloader valve C-150D

Part no./ Kit description	Pos:	Qty.:	Description
Kit E - 700540991 (Unloader Valve Seal Kit)	2	1	Seat
	3	1	Shutter Unloader
	5	1	O-Ring
	6	1	Anti-Extrusion Ring
	7	1	O-Ring
	8	1	O-Ring
	10	1	O-Ring
	11	1	Anti-Extrusion Ring
	17	1	O-Ring
	20	1	O-Ring

4. Spare Part List

Un-loader valve assembly C-200D



4. Spare Part List

Un-loader valve assembly C-200D spare-parts list

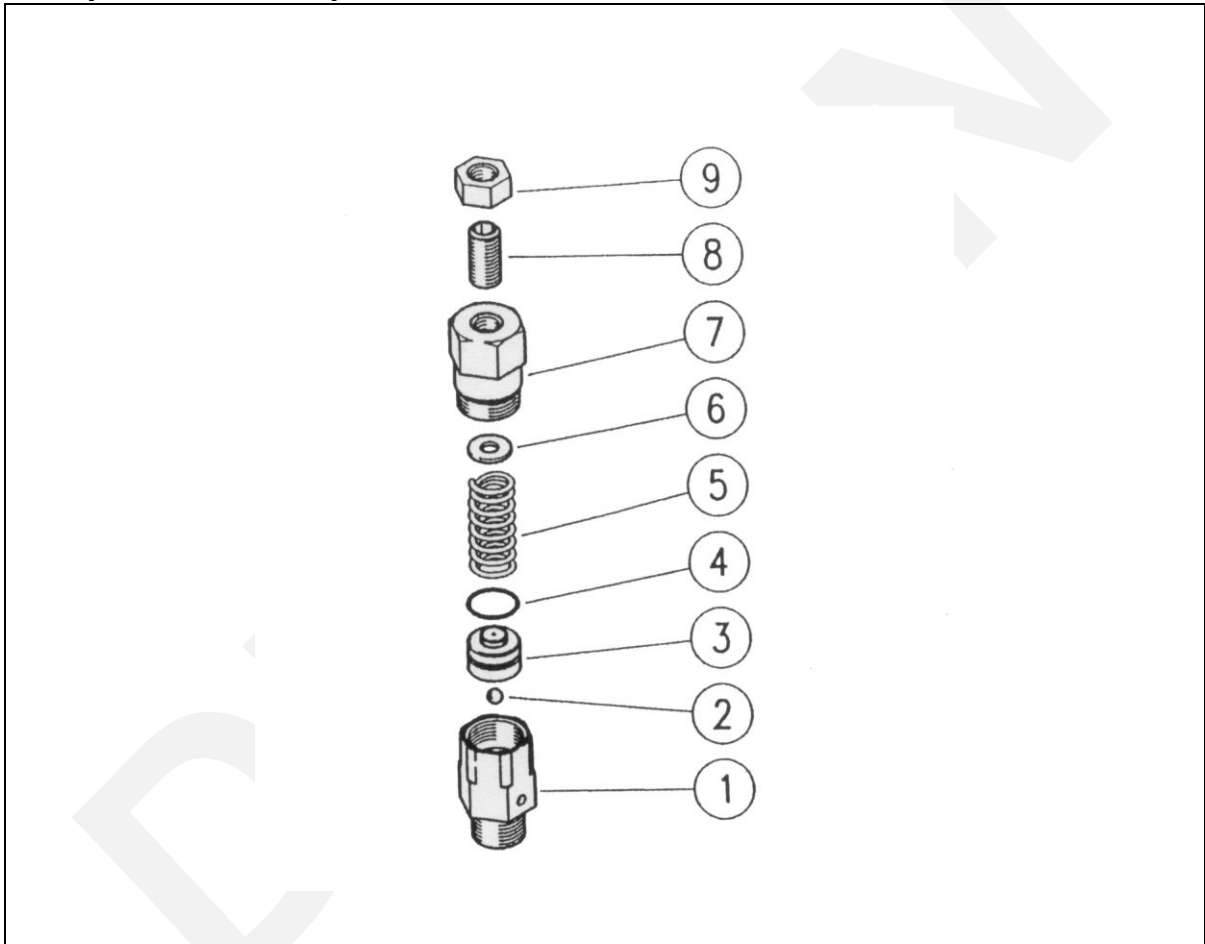
Pos:	Part no.:	Qty.:	Description:
1	-	1	Valve Housing
2	Kit E	1	Seat
3		1	Shutter Unloader
4	-	1	Spacer
5	Kit E	1	O-Ring
6		1	Anti-Extrusion Ring
7		1	O-Ring
8		1	O-Ring
9	-	1	Piston Coupling
10	Kit E	1	O-Ring
11		1	Anti-Extrusion Ring
12	-	1	Adjustable Piston
13	-	1	Spring Holder Plate
14	-	1	Spring
15	-	1	Locking Nut
16	-	1	Regulation Nut
17	Kit E	1	O-Ring
18	-	1	Shutter VRT3
19	-	1	Shutter Spring
20	Kit E	1	O-Ring
21	700540992	1	Retention Coupling
22	-	1	VR Coupling Bypass
23	700540993	1	O-Ring
1-23	700540989	1	Unloader Valve Complete
24	700540034	1	Quick Coupling Female Inlet
25	700540033	1	Strainer
26	700540738	1	Water Inlet
27	700540736	1	Banjo Bolt 1/2" (High flow)
28	700540056	2	Dowty Seal 1/2"
29	700540737	1	Holder For Un-Loader Valve
30	700540193	1	Pressure Gauge
31	700540734	1	Banjo Bolt 3/8"
32	700550004	4	Dowty Seal 3/8"
33	700540117	1	T Joint 3/8"
34	700510136	1	Contra Nut 3/8"
35	700540026	1	Quick Coupling Male Outlet
36	700540036	1	Hose Nipple
37	700540194	1	Plug 1/4"
38	700540195	1	Plug 1/8"
39	700540113	1	Nipple 3/8"

4. Spare Part List

Repair kit Unloader valve

Part no.:/ Kit description	Pos:	Qty.:	Description
Kit E - 700540991 (Unloader Valve Seal Kit)	2	1	Seat
	3	1	Shutter Unloader
	5	1	O-Ring
	6	1	Anti-Extrusion Ring
	7	1	O-Ring
	8	1	O-Ring
	10	1	O-Ring
	11	1	Anti-Extrusion Ring
	17	1	O-Ring
	20	1	O-Ring

Safety valve assembly C-200D

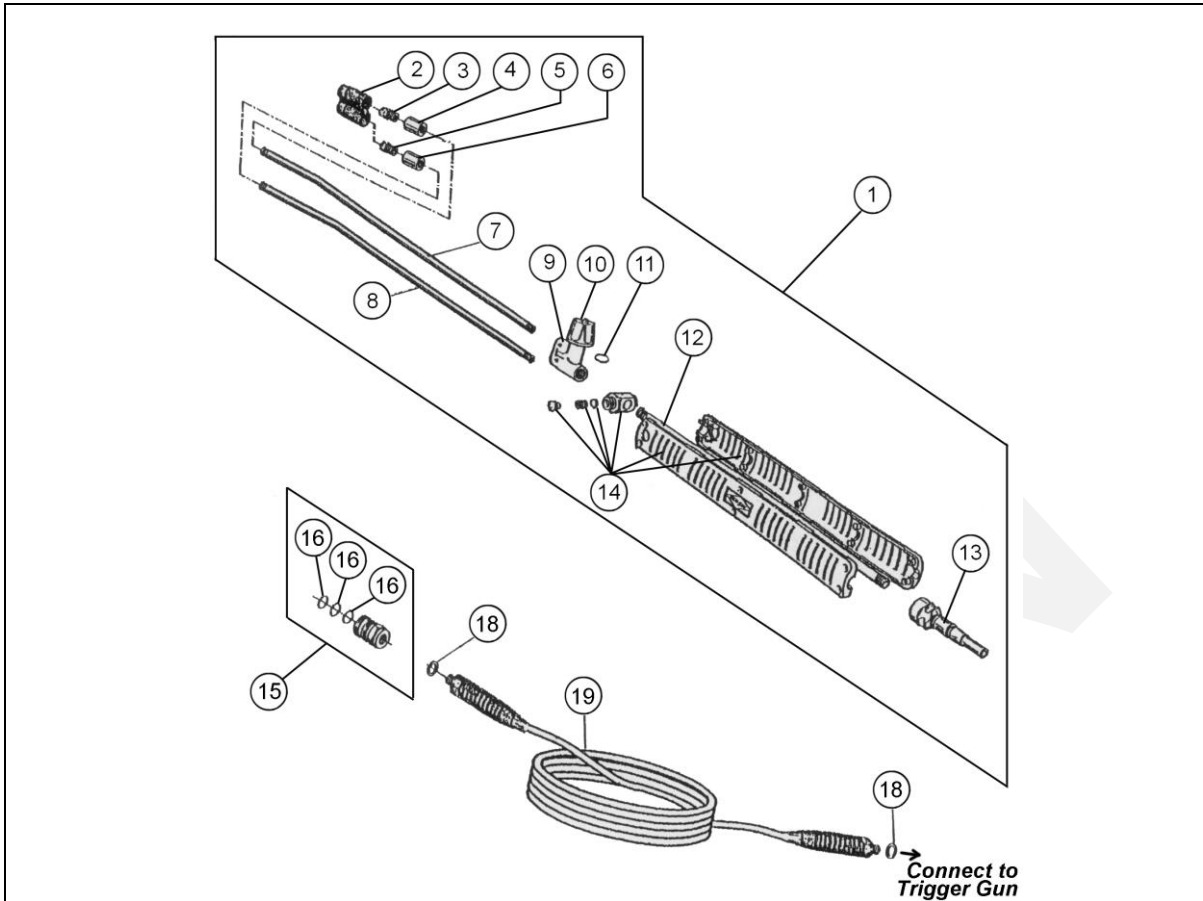


Safety valve assembly spare-parts list C-200D

Pos:	Part no.:	Qty.:	Description:
1	700540119	1	Body Safety Valve 3/8"
2	700540115	1	Rubber Ball
3	700540121	1	Piston
4	700540120	1	O-Ring
5	700540122	1	Spring
6	700540123	1	Washer
7	700540124	1	Fitting
8	700540125	1	Adjusting Screw
9	700510008	1	Nut
1-9	700540110	1	Safety Valve Complete

4. Spare Part List

Lance assembly

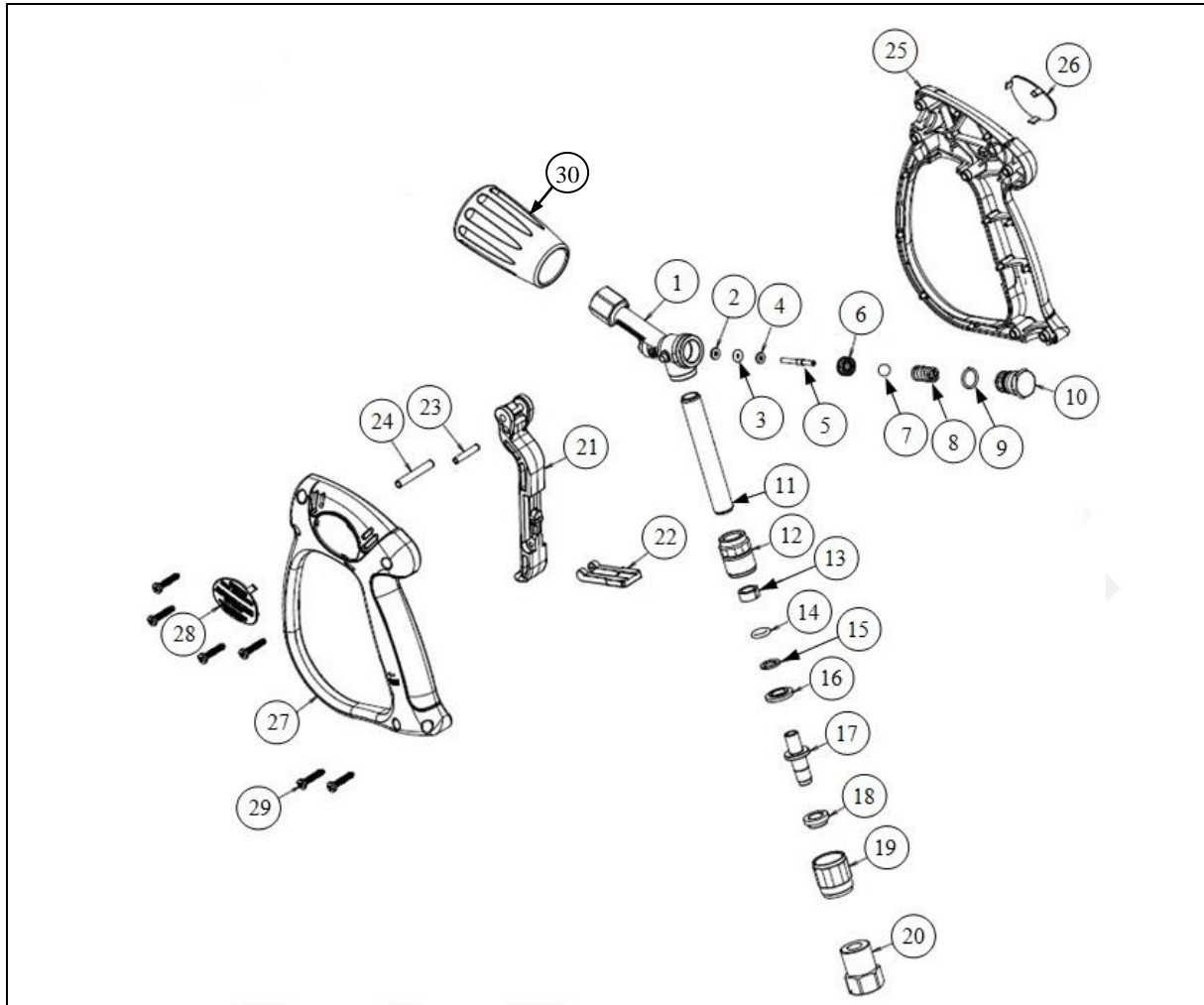


Lance assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:	
1	700551473	1	Double Barrel Lance Complete + Noz15045	C-150D
	700551474	1	Double Barrel Lance Complete + Noz1505	C-200D
2	700550077	1	Nozzle Guard Double	
3	700550015	1	Nozzle 15045	C-150D
	700550056	1	Nozzle 1505	C-200D
4	700550013	1	Bushing, High Pressure Nozzle Holder 1/4"	
5	700550782	1	Nozzle Low Pressure	
6	700550781	1	Bushing, Low Pressure Nozzle Holder 1/4" - 1/8"	
7	700550012	1	Lance Pipe Top	
8	700550572	1	Lance Pipe Bottom	
9	700550011	1	Needle Valve Complete	
10	700550575	1	Knob For Needle Valve	
11	700550574	1	O-Ring For Needle Valve	
12	700550591	1	Lance Pipe For Double Barrel Lance	
13	700550259	1	Nipple, Quick Coupling Male	
14	700550522	1	Lance Guard L+R Complete W. Screws And Holder	
15	700550003	1	Quick Coupling Female High Pressure	
16	700540491	3	O-Ring	
18	700550004	2	Dowty Seal 3/8"	
19	700550039	1	High Pressure Hose 3/8" R1T 10m Length	

4. Spare Part List

Trigger gun assembly



Trigger gun assembly spare-parts list

Pos:	Part no.:	Qty.:	Description:
1	-	1	Body
2	Kit F	1	Anti Extrusion Ring
3		1	O-Ring
4		1	Washer
5		1	Pin Press Sphere
6		1	Seat
7		1	Sphere 5/16
8	-	1	Spring S.S
9	Kit F	1	O-Ring
10	-	1	Plug
11	-	1	Pipe
12	-	1	Coupling G1/4F Outlet SW Top
13	Kit G	1	Bushing
14		1	O-Ring
15		1	Anti Extrusion Ring
16		1	Spacer
17		1	Rotating Joint Pin
18		1	Nut with Step
19	-	1	Nipple
20	700551521	1	Coupling G3/8F Inlet SW Top
21	-	1	Lever

4. Spare Part List

22	-	1	Trigger Safety Lock
23	-	1	Lever Pivot D4x22
24	-	1	Lever Pivot D5x33
25	-	1	Right Trigger Cover
26	-	1	Right Label
27	-	1	Left Trigger Cover
28	-	1	Left Label
29	-	1	Screw
30	700551522	1	Quick Coupling Female Complete
1-30	700551511	1	Trigger Gun Complete

Trigger Gun Repair Kits

Part no./ Kit description	Pos:	Qty.:	Individual components Part no.:
Kit F – 700551517 Seat Gasket Repair Kit	2	1	Anti Extrusion Ring
	3	1	O-Ring
	4	1	Washer
	5	1	Pin Press Sphere
	6	1	Seat
	7	1	Sphere 5/16
	9	1	O-Ring
Kit G - 700551520 Swivel Repair Kit	13	1	Bushing
	14	1	O-Ring
	15	1	Anti Extrusion Ring
	16	1	Spacer
	17	1	Rotating Joint Pin
	18	1	Nut with Step

4. Spare Part List

Recommended spare-parts

In events where uninterrupted use of the machine is of critical importance, or when operating at remote locations, like in weekends, holidays, in rural areas or onboard ships at sea, it is recommended to stock a few essential spare-parts for field maintenance and repair.

For Machine:	Valve Complete x1	Pistons Kit x1	Oil Seal x1	Water Seal x1
C-150D	700560004	700560008	700560011	700560009
C-200D	700560004	700560008	700560011	700560009


For Machine:	Trigger Rep. Kit Valve x1	Trigger Rep. Kit Release Gun x1	O-ring Quick Coupling x4	O-ring Quick Coupling x2
C-150D	101119486	101119482	700540035	700550002
C-200D	101119486	101119482	700540035	700550002

For Machine:	Inlet Strainer x2	High Pressure Nozzle x1	Un-loader Valve Rep. Kit x1
C-150D	700540033	700550015	700540321
C-200D	700540033	700550056	700540321

5. Declaration and Warranty

5. Declaration and Warranty

EU declaration of conformity

 EU Declaration of Conformity	
Product:	Diesel powered heavy duty cold water high-pressure cleaner
Type:	C-150D, 6.0Hp / C-200D, 10Hp
Description:	6.0Hp, 10Hp IP 54 – 150 , 200 [bar]
The design of the unit corresponds to the following pertinent regulations:	EC Machine Directive 98/37/ECC EN Gas Appliances 90/396/EEC
Applied harmonized standards:	EN 292, EN 60335-2-79
Applied national standards and technical specifications:	DIN EN 60335-2-79
Note:	
This equipment is not subordinated enhanced manufacturing or authority control according to directive 97/23/EEC §2, subsection 10, a+b, §4, subsection 1,3) b) 2) + subsection 3 and §7, subsection 2.	DEN-SIN – a division Nilfisk-Advance Pte Ltd. No 5 Tuas Ave 2 Singapore 639445 Tel: +65 62681006 Fax: +65 62684916
Singapore, October 2013	

Warranty

DEN-SIN warrants all equipments of its manufacture furnished under this agreement to be free from defect in workmanship and material for a period of one year from the date of invoice of the equipment. This warranty does not cover normal wear and tear, consumable items, or part failures caused by (i) accident, (ii) abuse, or (iii) failure to maintain the DEN-SIN system containing the affected parts in accordance with DEN-SIN technical specification. All labour is the responsibility, and the expense of the Buyer. The liability of Seller under this warranty is limited, at Seller's option, solely to repair or replacement with equivalent articles. This warranty is condition upon (a) Seller being notified in writing by Buyer within one week after discovery of defects;

(b) the return of defective articles to Seller, transportation charges prepaid by Buyer; and (c) Seller's examination of such article disclosing to its satisfaction that such defects were not caused by negligence, misuse, improper maintenance, improper installation, accident, or unauthorized repair or alteration.

Accessories or equipment furnished by DEN-SIN but manufactured by others, shall carry the warranty that its manufacturer has conveyed to DEN-SIN, and which may be passed on to the purchaser. The original warranty period of any article, which has been repaired or replaced by DEN-SIN, shall not thereby be extended.

6. Spare Parts Request Form

6. Spare Parts Request Form

Company Name: _____

Delivery Address: _____

Country: _____

Postal Code: _____

Contact Name: _____

Contact Number: _____

Fax Number: _____

Mobile Number: _____

Email: _____

S/N	Part Number	Description	QTY	Machine Model or Serial Number
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Special Instructions: _____

7. Maintenance Log Book

7. Maintenance Log Book

This maintenance logbook will assist you to keep track on the servicing of your equipment. Please record after service your machine.

Purchase date of the machine:

S/N	Service Description	Date	Remarks
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