

NEPTUNE 1 NEPTUNE 2 NEPTUNE 2 SPECIAL



**Nilfisk
ALTO**

Why Compromise

Service Manual

This service manual contains detailed description of the main repair work on the hot HPW NEPTUNE 1, NEPTUNE 2 & NEPTUNE 2 Special.

Repair work requires a suitable testing workplace with the necessary water and power supply.

If operating errors are evident, refer the customer to the operating instructions.

A fault in the cleaner can have several causes as described in the section on troubleshooting.

Refer to the illustrated spare parts lists during repairs. They show the assembly position and the sequence in which the individual components should be assembled.

See "Service Technical Information" (STI) sheets. They include information on technical modifications that have been made after this repair manual was printed.

"Service Technical Information" sheets are also valid as a supplement to the spare parts list until publication of a new edition.

Repair manuals and "Service Technical Information" sheets should be available at the site where repairs are carried out.

It is not permitted to give them to third parties.

Use original [Nilfisk-ALTO](#) spare parts only.

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For your own safety



Repair work should be carried out by persons instructed in electrical installations or by trained electricians only.

Observe valid safety regulations for electrical equipment. In particular, observe the following regulations:

IEC 60335-2-79

EN 60335-2-79

Additionally:

Also see national regulations

Before using the cleaner, always read the operating instructions and keep them readily available.

Only allow the high pressure cleaner to be used by persons who have been trained in its use and who have been explicitly authorized to use it.

ESD measures
(electrostatic discharge)

Take the following ESD precautions before carrying out any repairs to the electronics:

- Touch the earth conductor before repairing the cleaner (to discharge electrostatic charge from your body).
- Wear wrist band if necessary.
- Use a conductive floor covering or a conductive table cover.
- Never touch the printed circuit board or electronic components (always hold on to plastic).
- Transport electronic components in conductive packaging (e.g. ESD bag).

Parent item no: 107145000		Description: NEPTUNE 1-22 EU 230/50/16A	
Service data	Unit	Value	
Model		NEPTUNE 1-22	
Item no.		107145000	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	106	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	83	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	8,3	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,1	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	230V/1ph/50HZ/12A/2.8KW	
Control voltage	V	230	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	2800	
Electrical diagram no.		106421562	

Parent item no: 107145000		Description: NEPTUNE 1-22 EU 230/50/16A	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.4	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0400	
Max. Inlet temp. (primed)		40	
Max. Inlet temp. (suction)		40	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		FLEXOPOWER PLUS LANCE 990 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°	
Guaranteed sound power		90	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		94	
Size - Machine alone L x W x H		607x688x1000	

Parent item no:		Description:
107145001		NEPTUNE 1-22 GB 230/50/13A
Service data	Unit	Value
Model		NEPTUNE 1-22
Item no.		107145001
TECHNICAL DATA		
PUMP:		
Pump pressure water	bar	106
Pressure pump outlet @ Qiec	bar	
Pressure gun outlet @ Qiec	bar	83
Retaining pressure*	bar	-
Flow. Qiec	l/min	8,3
Suction height dry	m	-
Suction height primed	m	-
Pump type		NA2
Number of pistons		3
Piston type		Full Ceramic
Stroke	mm	1
Pump oil type		Agip Rotra
Pump oil amount	l	0,1
ELECTRIC:		
Electric data	V/ph/Hz/A/kW	230/1ph/50Hz/12A/2.8KW
Control voltage	V	230
Highvoltage (HV) test voltage	kV	1,5
HV Insulation resistance	MΩ	1
Earth circuit resistance	Ω	0,2
Pump revolutions	rpm	2800
Electrical diagram no.		106421562

Parent item no: 107145001		Description: NEPTUNE 1-22 GB 230/50/13A	
Service data		Unit	Value
BOILER:			
Boiler power input		kW	35
CO		ppm	75
Exhaust temp		°C	0
Ambient temp. @ Burner values		°C	20±10
Fuel tank (Boiler)		l	17
Boiler fuel consump.@ΔT=45C			2.4
Burner efficiency		%	92
Oil nozzle			0,75 60H
Oil nozzle size			0,75
Oil pressure		bar	10,5
Fuel type			Diesel
UNIT DATA:			
Nozzle size, water			NT 0400
Max. Inlet temp. (primed)			40
Max. Inlet temp. (suction)			40
Max. Inlet temp. (pressure fed)			40
Gun Type			ERGO 2000 STANDARD GUN W/O HOSE SWIVEL
Primary Lance Type			FLEXOPOWER PLUS LANCE 990 BEND
Secondary Lance Type			None
Hose			HP Hose DN6x10 w/swivel, Quick 3/8", 155°
Guaranteed sound power			90
Impactfactor calculated			0
Vibration ISO 5349, lance 1 / lance 2			0 / -
Protection Class			IPX5
Machine incl. standard acc.			94
Size - Machine alone L x W x H			607x688x1000

Parent item no: 107145002		Description: GERNI NEPTUNE 2-16 240/1/50/10	
Service data		Unit	Value
Model			GERNI NEPTUNE 2-16
Item no.			107145002
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar		93
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar		84
Retaining pressure*	bar		-
Flow. Qiec	l/min		6,1
Suction height dry	m		-
Suction height primed	m		-
Pump type			NA2
Number of pistons			3
Piston type			Full Ceramic
Stroke	mm		1
Pump oil type			Agip Rotra
Pump oil amount	l		0,2
ELECTRIC:			
Electric data	V/ph/Hz/A/kW		240V/1ph/50Hz/9,6A/2,2kW
Control voltage	V		240
Highvoltage (HV) test voltage	kV		1,5
HV Insulation resistance	MΩ		1
Earth circuit resistance	Ω		0,2
Pump revolutions	rpm		2800
Electrical diagram no.			106421566

Parent item no: 107145002		Description: GERNI NEPTUNE 2-16 240/1/50/10	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		1,8	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		25030	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type	ERGO 2000 ST GUN - GERNI W/O HOSE SWIVEL		
Primary Lance Type	UNIVERSAL PLUS LANCE 1080 BEND - GERNI		
Secondary Lance Type	None		
Hose	HP-Hose DN6X10M for swivel quick 3/8"		
Guaranteed sound power		91	
Impactfactor calculated		1,4	
Vibration ISO 5349, lance 1 / lance 2		13,3 / -	
Protection Class		IPX5	
Machine incl. standard acc.		110	
Size - Machine alone L x W x H		607x688x1000	

Parent item no:		Description:	
107145003		NEPTUNE 2-26 EU 230/1/50/16	
Service data	Unit	Value	
Model		NEPTUNE 2-26	
Item no.		107145003	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	134	
Pressure pump outlet @ Qiec	bar	124	
Pressure gun outlet @ Qiec	bar	120	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	8,17	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	230V/1ph/50HZ/14.5A/3.4KW	
Control voltage	V	230	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	2800	
Electrical diagram no.		106421566	

Parent item no: 107145003		Description: NEPTUNE 2-26 EU 230/1/50/16	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.4	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0340	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8",155°	
Guaranteed sound power		91	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		110	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145004		Description: NEPTUNE 2-26X EU 230/1/50/16	
Service data	Unit	Value	
Model		NEPTUNE 2-26 X	
Item no.		107145004	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	135	
Pressure pump outlet @ Qiec	bar	122	
Pressure gun outlet @ Qiec	bar	118	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	8,17	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	230V/1ph/50HZ/14.5A/3.4KW	
Control voltage	V	230	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	2800	
Electrical diagram no.		106421566	

Parent item no:		Description:	
107145004		NEPTUNE 2-26X EU 230/1/50/16	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.4	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0340	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP hose DN6 15 for HW and w/swivel, 155°	
Guaranteed sound power		91	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		112	
Size - Machine alone L x W x H		607x688x1071	

Parent item no:		Description:	
107145005		NEPTUNE 2-25 GB 230/1/50/13	
Service data	Unit	Value	
Model		NEPTUNE 2-25	
Item no.		107145005	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	85	
Pressure pump outlet @ Qiec	bar	71	
Pressure gun outlet @ Qiec	bar	67	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	10	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	230V/1ph/50HZ/12.4A/2.9KW	
Control voltage	V	230	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	2800	
Electrical diagram no.		106421566	

Parent item no: 107145005		Description: NEPTUNE 2-25 GB 230/1/50/13	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.9	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0530	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8",155°	
Guaranteed sound power		90	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		110	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145006		Description: NEPTUNE 2-25X GB 230/1/50/13
Service data	Unit	Value
Model		NEPTUNE 2-25 X
Item no.		107145006
TECHNICAL DATA		
PUMP:		
Pump pressure water	bar	89
Pressure pump outlet @ Qiec	bar	69
Pressure gun outlet @ Qiec	bar	65
Retaining pressure*	bar	-
Flow. Qiec	l/min	10,72
Suction height dry	m	-
Suction height primed	m	-
Pump type		NA2
Number of pistons		3
Piston type		Full Ceramic
Stroke	mm	1
Pump oil type		Agip Rotra
Pump oil amount	l	0,2
ELECTRIC:		
Electric data	V/ph/Hz/A/kW	230V71ph/50Hz/12.5A/2.9KW
Control voltage	V	230
Highvoltage (HV) test voltage	kV	1,5
HV Insulation resistance	MΩ	1
Earth circuit resistance	Ω	0,2
Pump revolutions	rpm	2800
Electrical diagram no.		106421566

Parent item no: 107145006		Description: NEPTUNE 2-25X GB 230/1/50/13	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		3.1	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0530	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP hose DN6 15 for HW and w/swivel, 155°	
Guaranteed sound power		90	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		112	
Size - Machine alone L x W x H		607x688x1071	

Parent item no: 107145007	Description: NEPTUNE 2-25 KR 220/1/60/15	
Service data	Unit	Value
Model		NEPTUNE 2-25
Item no.		107145007
TECHNICAL DATA		
PUMP:		
Pump pressure water	bar	117
Pressure pump outlet @ Qiec	bar	109
Pressure gun outlet @ Qiec	bar	105
Retaining pressure*	bar	-
Flow. Qiec	l/min	8,25
Suction height dry	m	-
Suction height primed	m	-
Pump type		NA2
Number of pistons		3
Piston type		Full Ceramic
Stroke	mm	1
Pump oil type		Agip Rotra
Pump oil amount	l	0,2
ELECTRIC:		
Electric data	V/ph/Hz/A/kW	220V/1ph/60Hz/14.3A/3.2KW
Control voltage	V	220
Highvoltage (HV) test voltage	kV	1,5
HV Insulation resistance	MΩ	1
Earth circuit resistance	Ω	0,2
Pump revolutions	rpm	3360
Electrical diagram no.		106421565

Parent item no: 107145007		Description: NEPTUNE 2-25 KR 220/1/60/15	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	40	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.4	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0350	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°	
Guaranteed sound power		91	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		110	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145008		Description: GERNI NEPTUNE 2-26 240/1/50/15	
Service data		Unit	Value
Model			GERNI NEPTUNE 2-26
Item no.			107145008
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar		134
Pressure pump outlet @ Qiec	bar		124
Pressure gun outlet @ Qiec	bar		120
Retaining pressure*	bar		-
Flow. Qiec	l/min		8,17
Suction height dry	m		-
Suction height primed	m		-
Pump type			NA2
Number of pistons			3
Piston type			Full Ceramic
Stroke	mm		1
Pump oil type			Agip Rotra
Pump oil amount	l		0,2
ELECTRIC:			
Electric data	V/ph/Hz/A/kW		240V/1ph/50Hz/14,5A/3,4kW
Control voltage	V		240
Highvoltage (HV) test voltage	kV		1,5
HV Insulation resistance	MΩ		1
Earth circuit resistance	Ω		0,2
Pump revolutions	rpm		2800
Electrical diagram no.			106421566

Parent item no: 107145008		Description: GERNI NEPTUNE 2-26 240/1/50/15	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2,4	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0340	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 ST GUN - GERNI W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 1080 BEND - GERNI	
Secondary Lance Type		None	
Hose		HP-Hose DN6X10M for swivel quick 3/8"	
Guaranteed sound power		91	
Impactfactor calculated		2,3	
Vibration ISO 5349, lance 1 / lance 2		21,3 / -	
Protection Class		IPX5	
Machine incl. standard acc.		110	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145009		Description: NEPTUNE 2-33 EU 400/3/50	
Service data		Unit	Value
Model			NEPTUNE 2-33
Item no.			107145009
TECHNICAL DATA			
PUMP:			
Pump pressure water		bar	160
Pressure pump outlet @ Qiec		bar	
Pressure gun outlet @ Qiec		bar	142
Retaining pressure*		bar	-
Flow. Qiec		l/min	9,8
Suction height dry		m	-
Suction height primed		m	-
Pump type			NA2
Number of pistons			3
Piston type			Full Ceramic
Stroke		mm	1
Pump oil type			Agip Rotra
Pump oil amount		l	0,2
ELECTRIC:			
Electric data		V/ph/Hz/A/kW	400V/3ph/50Hz/8A/4.1KW
Control voltage		V	400
Highvoltage (HV) test voltage		kV	1,5
HV Insulation resistance		MΩ	1
Earth circuit resistance		Ω	0,2
Pump revolutions		rpm	2800
Electrical diagram no.			106421563

Parent item no: 107145009		Description: NEPTUNE 2-33 EU 400/3/50	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	40	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.8	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0370	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°	
Guaranteed sound power		94	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		110	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145010		Description: NEPTUNE 2-33X EU 400/3/50
Service data	Unit	Value
Model		NEPTUNE 2-33 X
Item no.		107145010
TECHNICAL DATA		
PUMP:		
Pump pressure water	bar	163
Pressure pump outlet @ Qiec	bar	
Pressure gun outlet @ Qiec	bar	139
Retaining pressure*	bar	-
Flow. Qiec	l/min	9,6
Suction height dry	m	-
Suction height primed	m	-
Pump type		NA2
Number of pistons		3
Piston type		Full Ceramic
Stroke	mm	1
Pump oil type		Agip Rotra
Pump oil amount	l	0,2
ELECTRIC:		
Electric data	V/ph/Hz/A/kW	400V/3ph/50Hz/8A/4.1KW
Control voltage	V	400
Highvoltage (HV) test voltage	kV	1,5
HV Insulation resistance	MΩ	1
Earth circuit resistance	Ω	0,2
Pump revolutions	rpm	2800
Electrical diagram no.		106421563

Parent item no:		Description:	
107145010		NEPTUNE 2-33X EU 400/3/50	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	40	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.8	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0370	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP hose DN6 15 for HW and w/swivel, 155°	
Guaranteed sound power		94	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		112	
Size - Machine alone L x W x H		607x688x1000	

Parent item no:		Description:
107145012		NEPTUNE 2-33X NO 230-400/3/50
Service data	Unit	Value
Model		NEPTUNE 2-33 X
Item no.		107145012
TECHNICAL DATA		
PUMP:		
Pump pressure water	bar	163
Pressure pump outlet @ Qiec	bar	
Pressure gun outlet @ Qiec	bar	139
Retaining pressure*	bar	-
Flow. Qiec	l/min	9,6
Suction height dry	m	-
Suction height primed	m	-
Pump type		NA2
Number of pistons		3
Piston type		Full Ceramic
Stroke	mm	1
Pump oil type		Agip Rotra
Pump oil amount	l	0,2
ELECTRIC:		
Electric data	V/ph/Hz/A/kW	230-400V/3ph/50Hz/14.3-8A/4.1KW
Control voltage	V	230
Highvoltage (HV) test voltage	kV	1,5
HV Insulation resistance	MΩ	1
Earth circuit resistance	Ω	0,2
Pump revolutions	rpm	2800
Electrical diagram no.		106421564

Parent item no:		Description:	
107145012		NEPTUNE 2-33X NO 230-400/3/50	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	40	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.8	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0370	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP hose DN6 15 for HW and w/swivel, 155°	
Guaranteed sound power		94	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		112	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145013		Description: NEPTUNE 2-41 EU 400/3/50	
Service data	Unit	Value	
Model		NEPTUNE 2-41	
Item no.		107145013	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	176	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	157	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	11,3	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	400V73ph/50HZ/9A/5.1KW	
Control voltage	V	400	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	2800	
Electrical diagram no.		106421563	

Parent item no: 107145013		Description: NEPTUNE 2-41 EU 400/3/50	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	53	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		3.3	
Burner efficiency	%	92	
Oil nozzle		1,0 60H	
Oil nozzle size		1	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0400	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°	
Guaranteed sound power		95	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		110	
Size - Machine alone L x W x H		607x688x1000	

Parent item no:		Description:	
107145014		NEPTUNE 2-41X EU 400/3/50	
Service data	Unit	Value	
Model		NEPTUNE 2-41 X	
Item no.		107145014	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	181	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	154	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	11,1	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	400V/3ph/50Hz/9A/5.1KW	
Control voltage	V	400	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	2800	
Electrical diagram no.		106421563	

Parent item no:		Description:	
107145014		NEPTUNE 2-41X EU 400/3/50	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	53	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		3.2	
Burner efficiency	%	92	
Oil nozzle		1,0 60H	
Oil nozzle size		1	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0400	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP hose DN6 15 for HW and w/swivel, 155°	
Guaranteed sound power		95	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		112	
Size - Machine alone L x W x H		607x688x1000	

Parent item no:		Description:	
107145015		NEPTUNE 2-40 EXPT 220,440/3/60	
Service data	Unit	Value	
Model		NEPTUNE 2-40	
Item no.		107145015	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	172	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	153	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	11,4	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	220,440V/3ph/60Hz/17-9A/5.7KW	
Control voltage	V	220	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	3360	
Electrical diagram no.		106421564	

Parent item no:		Description:	
107145015		NEPTUNE 2-40 EXPT 220,440/3/60	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	53	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		3.3	
Burner efficiency	%	92	
Oil nozzle		1,0 60H	
Oil nozzle size		1	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0400	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°	
Guaranteed sound power		95	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		110	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145016		Description: NEPTUNE 2-40X EXPT 220,440/3/60	
Service data	Unit	Value	
Model		NEPTUNE 2-40 X	
Item no.		107145016	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	177	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	150	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	11,2	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	220,440V/3ph/60Hz/17-9A/5.7KW	
Control voltage	V	220	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	3360	
Electrical diagram no.		106421564	

Parent item no: 107145016		Description: NEPTUNE 2-40X EXPT 220,440/3/60	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	53	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		3.2	
Burner efficiency	%	92	
Oil nozzle		1,0 60H	
Oil nozzle size		1	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0400	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP hose DN6 15 for HW and w/swivel, 155°	
Guaranteed sound power		95	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		112	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145018		Description: NEPTUNE 2-30 US 220-240/1/60/20	
Service data	Unit	Value	
Model		NEPTUNE 2-30	
Item no.		107145018	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	136	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	110	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	10,5	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	220-240V/1ph/60Hz/20A/2.15KW	
Control voltage	V	230	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	3360	
Electrical diagram no.		106421565	

Parent item no:		Description:	
107145018		NEPTUNE 2-30 US 220-240/1/60/20	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	53	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		3	
Burner efficiency	%	92	
Oil nozzle		1,0 60H	
Oil nozzle size		1	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0435	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		FLEXOPOWER PLUS LANCE 990 BEND	
Secondary Lance Type		None	
Hose		DN8 x 15 m	
Guaranteed sound power		91	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		120	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145019		Description: NEPTUNE 2-20 US 115/1/60/20
Service data	Unit	Value
Model		NEPTUNE 2-20
Item no.		107145019
TECHNICAL DATA		
PUMP:		
Pump pressure water	bar	57
Pressure pump outlet @ Qiec	bar	
Pressure gun outlet @ Qiec	bar	48
Retaining pressure*	bar	-
Flow. Qiec	l/min	8
Suction height dry	m	-
Suction height primed	m	-
Pump type		NA2
Number of pistons		3
Piston type		Full Ceramic
Stroke	mm	1
Pump oil type		Agip Rotra
Pump oil amount	l	0,2
ELECTRIC:		
Electric data	V/ph/Hz/A/kW	115V/1ph/60Hz/20A/2.1KW
Control voltage	V	115
Highvoltage (HV) test voltage	kV	1,5
HV Insulation resistance	MΩ	1
Earth circuit resistance	Ω	0,2
Pump revolutions	rpm	3360
Electrical diagram no.		106421565

Parent item no:		Description:	
107145019		NEPTUNE 2-20 US 115/1/60/20	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.3	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0500	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		FLEXOPOWER PLUS LANCE 990 BEND	
Secondary Lance Type		None	
Hose		DN8 x 15 m	
Guaranteed sound power		91	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		120	
Size - Machine alone L x W x H		607x688x1000	

Parent item no:		Description:	
107145022		NEPTUNE 2-40 JP 200/3/50/20	
Service data	Unit	Value	
Model		NEPTUNE 2-40	
Item no.		107145022	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	172	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	148	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	11,1	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	200V/3ph/20Hz/18A/5KW	
Control voltage	V	200	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	2800	
Electrical diagram no.		106421561	

Parent item no: 107145022		Description: NEPTUNE 2-40 JP 200/3/50/20	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	53	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		3.2	
Burner efficiency	%	92	
Oil nozzle		1,0 60H	
Oil nozzle size		1	
Oil pressure	bar	13,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0400	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°	
Guaranteed sound power		95	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		120	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145023		Description: NEPTUNE 2-40 JP 200/3/60/20	
Service data	Unit	Value	
Model		NEPTUNE 2-40	
Item no.		107145023	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	172	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	148	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	11,1	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,2	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	200V/3ph/60HZ/20A/5.8KW	
Control voltage	V	200	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	3360	
Electrical diagram no.		106421561	

Parent item no:		Description:
107145023		NEPTUNE 2-40 JP 200/3/60/20
Service data	Unit	Value
BOILER:		
Boiler power input	kW	53
CO	ppm	75
Exhaust temp	°C	145
Ambient temp. @ Burner values	°C	20±10
Fuel tank (Boiler)	l	17
Boiler fuel consump.@ΔT=45C		3.2
Burner efficiency	%	92
Oil nozzle		1,0 60H
Oil nozzle size		1
Oil pressure	bar	13,5
Fuel type		Diesel
UNIT DATA:		
Nozzle size, water		NT 0400
Max. Inlet temp. (primed)		-
Max. Inlet temp. (suction)		-
Max. Inlet temp. (pressure fed)		40
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND
Secondary Lance Type		None
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°
Guaranteed sound power		95
Impactfactor calculated		0
Vibration ISO 5349, lance 1 / lance 2		0 / -
Protection Class		IPX5
Machine incl. standard acc.		120
Size - Machine alone L x W x H		607x688x1000

Parent item no: 107145024		Description: NEPTUNE 2-26 SPECIAL EU 230/1/50/16	
Service data	Unit	Value	
Model		NEPTUNE 2-26 SPECIAL	
Item no.		107145024	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	130	
Pressure pump outlet @ Qiec	bar	120	
Pressure gun outlet @ Qiec	bar	116	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	8,6	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,23	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	230V/1ph/50HZ/14.5A/3.4KW	
Control voltage	V	230	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	1450	
Electrical diagram no.		106421566	

Parent item no: 107145024		Description: NEPTUNE 2-26 SPECIAL EU 230/1/50/16	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.5	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0350	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°	
Guaranteed sound power		90	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		97	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145025		Description: NEPTUNE 2-26X SPECIAL EU 230/1/50/16	
Service data		Unit	Value
Model			NEPTUNE 2-26X SPECIAL
Item no.			107145025
TECHNICAL DATA			
PUMP:			
Pump pressure water		bar	132
Pressure pump outlet @ Qiec		bar	119
Pressure gun outlet @ Qiec		bar	115
Retaining pressure*		bar	-
Flow. Qiec		l/min	8,6
Suction height dry		m	-
Suction height primed		m	-
Pump type			NA2
Number of pistons			3
Piston type			Full Ceramic
Stroke		mm	1
Pump oil type			Agip Rotra
Pump oil amount		l	0,23
ELECTRIC:			
Electric data		V/ph/Hz/A/kW	230V/1ph/50HZ/14.5A/3.4KW
Control voltage		V	230
Highvoltage (HV) test voltage		kV	1,5
HV Insulation resistance		MΩ	1
Earth circuit resistance		Ω	0,2
Pump revolutions		rpm	1450
Electrical diagram no.			106421566

Parent item no:		Description:	
107145025		NEPTUNE 2-26X SPECIAL EU 230/1/50/16	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	35	
CO	ppm	75	
Exhaust temp	°C	0	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.5	
Burner efficiency	%	92	
Oil nozzle		0,75 60H	
Oil nozzle size		0,75	
Oil pressure	bar	10,5	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0350	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP hose DN6 15 for HW and w/swivel, 155°	
Guaranteed sound power		90	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		99	
Size - Machine alone L x W x H		607x688x1000	

Parent item no: 107145026		Description: NEPTUNE 2-30 SPECIAL EU 400/3/50	
Service data	Unit	Value	
Model		NEPTUNE 2-30 SPECIAL	
Item no.		107145026	
TECHNICAL DATA			
PUMP:			
Pump pressure water	bar	144	
Pressure pump outlet @ Qiec	bar		
Pressure gun outlet @ Qiec	bar	130	
Retaining pressure*	bar	-	
Flow. Qiec	l/min	9,2	
Suction height dry	m	-	
Suction height primed	m	-	
Pump type		NA2	
Number of pistons		3	
Piston type		Full Ceramic	
Stroke	mm	1	
Pump oil type		Agip Rotra	
Pump oil amount	l	0,23	
ELECTRIC:			
Electric data	V/ph/Hz/A/kW	400V73ph/50HZ/8A/3.8KW	
Control voltage	V	400	
Highvoltage (HV) test voltage	kV	1,5	
HV Insulation resistance	MΩ	1	
Earth circuit resistance	Ω	0,2	
Pump revolutions	rpm	1450	
Electrical diagram no.		106421563	

Parent item no:		Description:
107145026		NEPTUNE 2-30 SPECIAL EU 400/3/50
Service data	Unit	Value
BOILER:		
Boiler power input	kW	50
CO	ppm	75
Exhaust temp	°C	145
Ambient temp. @ Burner values	°C	20±10
Fuel tank (Boiler)	l	17
Boiler fuel consump.@ΔT=45C		2.7
Burner efficiency	%	92
Oil nozzle		1,0 60H
Oil nozzle size		1
Oil pressure	bar	12
Fuel type		Diesel
UNIT DATA:		
Nozzle size, water		NT 0350
Max. Inlet temp. (primed)		-
Max. Inlet temp. (suction)		-
Max. Inlet temp. (pressure fed)		40
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND
Secondary Lance Type		None
Hose		HP Hose DN6x10 w/swivel, Quick 3/8", 155°
Guaranteed sound power		90
Impactfactor calculated		0
Vibration ISO 5349, lance 1 / lance 2		0 / -
Protection Class		IPX5
Machine incl. standard acc.		97
Size - Machine alone L x W x H		607x688x1000

Parent item no:		Description:
107145027		NEPTUNE 2-30X SPECIAL EU 400/3/50
Service data	Unit	Value
Model		NEPTUNE 2-30X SPECIAL
Item no.		107145027
TECHNICAL DATA		
PUMP:		
Pump pressure water	bar	146
Pressure pump outlet @ Qiec	bar	
Pressure gun outlet @ Qiec	bar	126
Retaining pressure*	bar	-
Flow. Qiec	l/min	9,2
Suction height dry	m	-
Suction height primed	m	-
Pump type		NA2
Number of pistons		3
Piston type		Full Ceramic
Stroke	mm	1
Pump oil type		Agip Rotra
Pump oil amount	l	0,23
ELECTRIC:		
Electric data	V/ph/Hz/A/kW	400V/50HZ/8A/3.8KW
Control voltage	V	400
Highvoltage (HV) test voltage	kV	1,5
HV Insulation resistance	MΩ	1
Earth circuit resistance	Ω	0,2
Pump revolutions	rpm	1450
Electrical diagram no.		106421563

Parent item no: 107145027		Description: NEPTUNE 2-30X SPECIAL EU 400/3/50	
Service data	Unit	Value	
BOILER:			
Boiler power input	kW	50	
CO	ppm	75	
Exhaust temp	°C	145	
Ambient temp. @ Burner values	°C	20±10	
Fuel tank (Boiler)	l	17	
Boiler fuel consump.@ΔT=45C		2.7	
Burner efficiency	%	92	
Oil nozzle		1,0 60H	
Oil nozzle size		1	
Oil pressure	bar	12	
Fuel type		Diesel	
UNIT DATA:			
Nozzle size, water		NT 0350	
Max. Inlet temp. (primed)		-	
Max. Inlet temp. (suction)		-	
Max. Inlet temp. (pressure fed)		40	
Gun Type		ERGO 2000 STANDARD GUN W/O HOSE SWIVEL	
Primary Lance Type		UNIVERSAL PLUS LANCE 940 BEND	
Secondary Lance Type		None	
Hose		HP hose DN6 15 for HW and w/swivel, 155°	
Guaranteed sound power		90	
Impactfactor calculated		0	
Vibration ISO 5349, lance 1 / lance 2		0 / -	
Protection Class		IPX5	
Machine incl. standard acc.		99	
Size - Machine alone L x W x H		607x688x1000	

VARIANTS:

Neptune 1

Single phase: 1-22 EU

Neptune 2

Single phase: 1-22 EU, 2-25 GB, 2-26X GB, 2-26 EU, 2-26X EU, 2-26 SPECIAL EU, 2-26X SPECIAL EU.

Three phase: 2-33 EU, 2-33X EU, 2-33 NO, 2-33X NO, 2-41 EU, 2-41X EU, 2-30 SPECIAL EU, 2-30X SPECIAL EU

X vs. Standard : Hose Reel and Hose length 15m.

SPECIAL: 1400RPM motor/pump unit & without steam device

_ : These numbers refer to the theoretical total impact of spraying water calculated by the formula:

$$\text{Impact} = Q1 \times \sqrt{P1} \times 0.24 \text{ [N]}$$

$$P1 = \text{bar. } Q1 = \text{l/min.v } P1.$$



Fig.C.1: NEPTUNE 2 - 26

1. Handle.
2. Lance holder, Top.
3. Cabinet lock.
4. Exhaust.
5. Ergo 1000.
6. Water outlet.
7. EI-box lid with operation display.
8. Main switch.
9. Temperature Regulation.
10. Detergent Regulation.
11. Lance holder button.

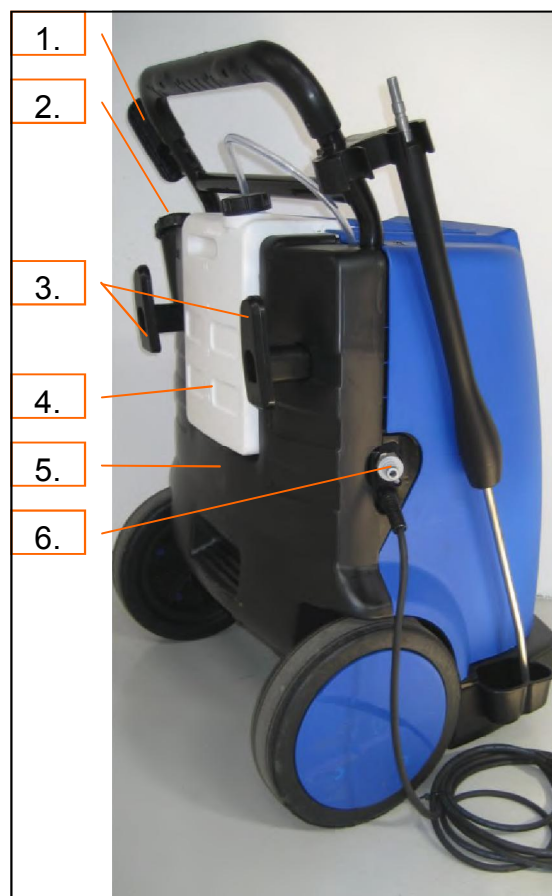


Fig.C2: NEPTUNE 2—26

1. Hose holder.
2. Fuel filler.
3. Power cord holder.
4. Detergent tank.
5. Fuel tank.
6. Water inlet.



Fig.C.3: NEPTUNE 2—X model = Hose reel



Fig.C.4: NEPTUNE 2 E-Box, Operation display

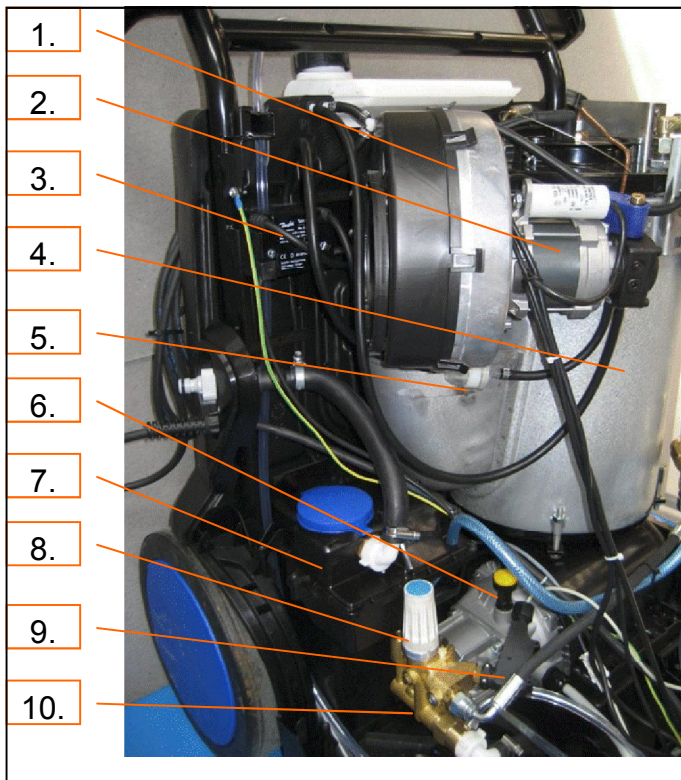


Fig.C.5: NEPTUNE 2 - 26

1. Burner fan housing.
2. Burner motor.
3. Ignition transformer.
4. Boiler.
5. Fuel filter.
6. Venting tube for pump oil.
7. Water break tank. (Only Neptune 2)
8. Water regulation. (Only Neptune 2)
9. Microswitch.
10. Unloader.

NOTE: Neptune 1 is not equipped with water break tank and water regulation (steam device).
Neptune 2 Special is not equipped with water regulation (steam device).

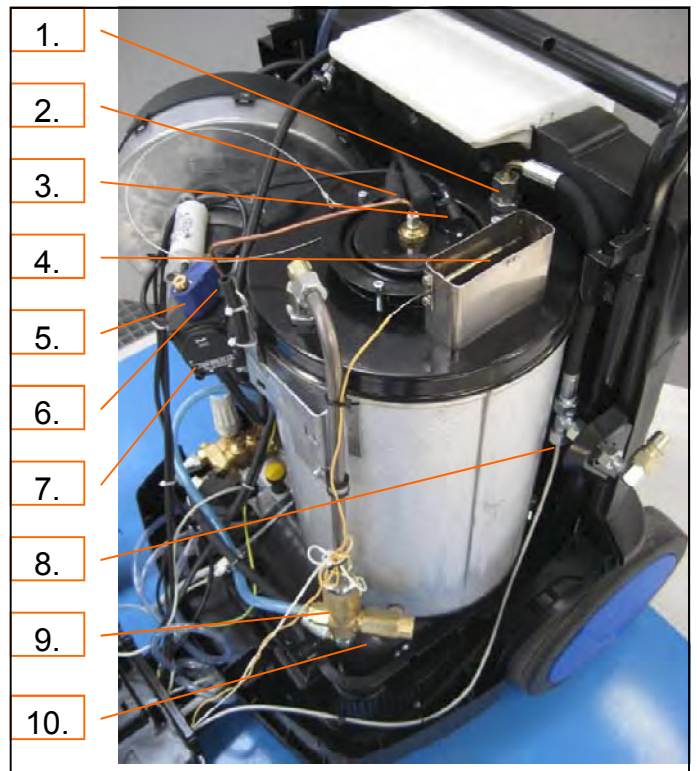


Fig.C.6: NEPTUNE 2 - 26

1. Boiler outlet.
2. Ignition cords.
3. Flame sensor.
4. Temperature sensor.
5. Fuel solenoid.
6. Venting tube for fuel.
7. Fuel pump.
8. Outlet temperature sensor.
9. Flow control.
10. Safety valve.

Functional - Flow diagram

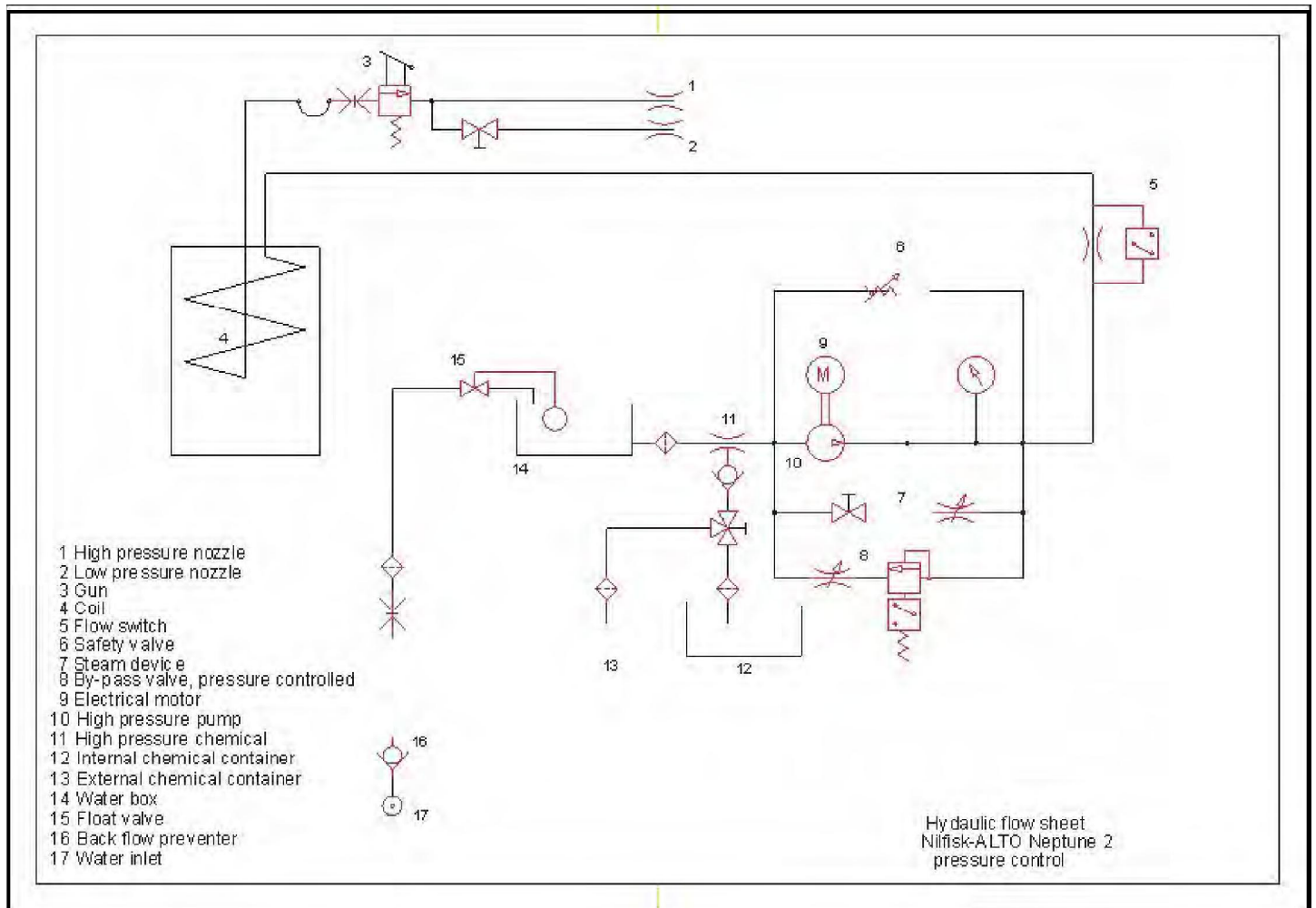


Fig.D.1. Flow

The picture shows the hydraulik function for the Neptune 1 & 2.

NOTE: Neptune 1 is not equipped with:

- Pos. 7: Steam device,
- Pos. 11: High pressure chemical
- Pos. 14: Water break tank.

Instead of high pressure chemical a low pressure chemical injector is placed in the pump outlet.

Instead of the water break tank a back flow preventer must be connected between the water supply and the machine.

Delayed stop of the motor pump unit is not possible for the Neptune 1 due to increased by-pass pressure.

Neptune 2 Special is not equipped with:

- Pos. 7: Steam device.

Heat system - Principal drawing

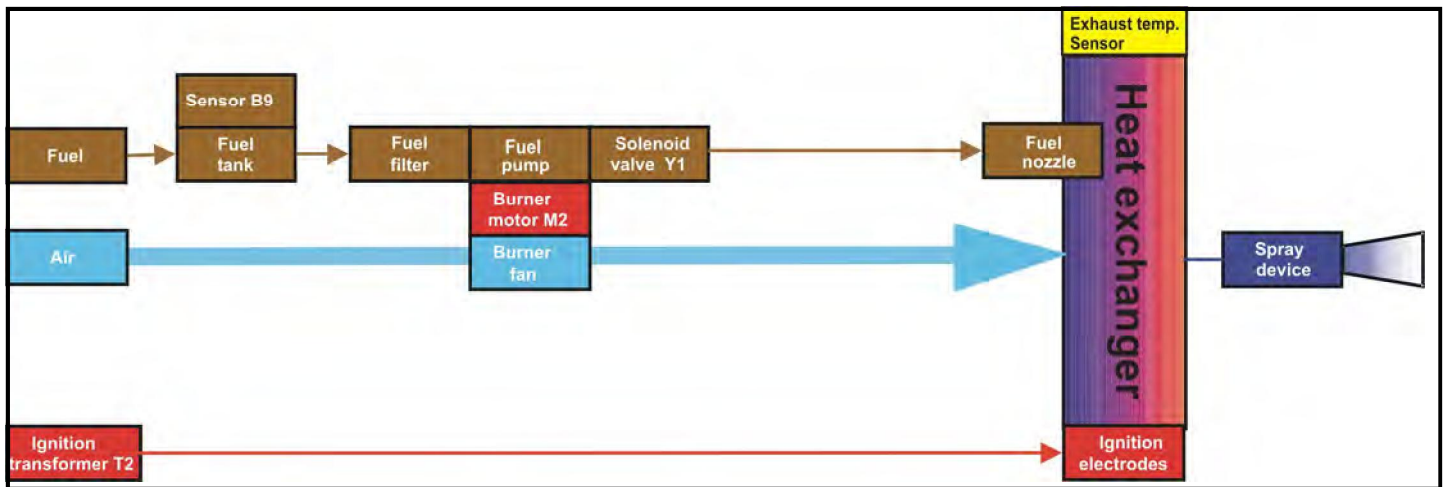


Fig.D.2. Heat system.

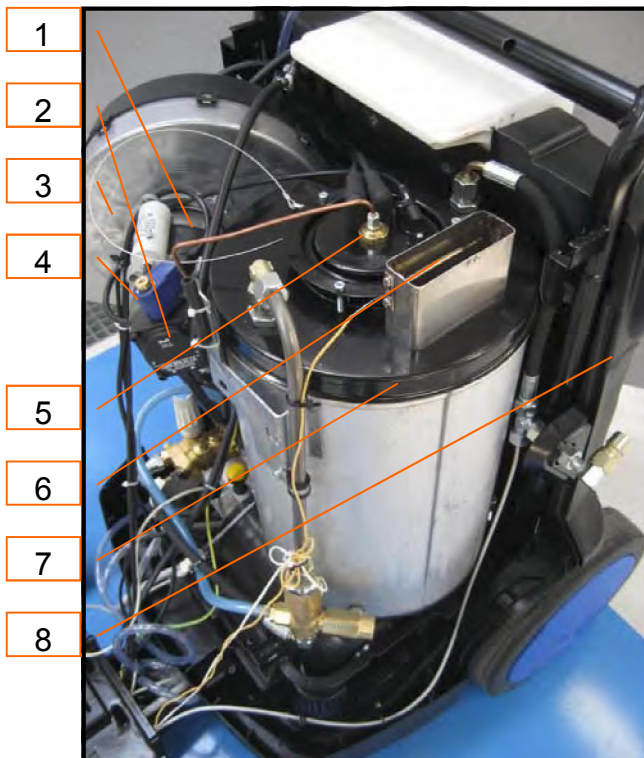


Fig.D.3. Heat system

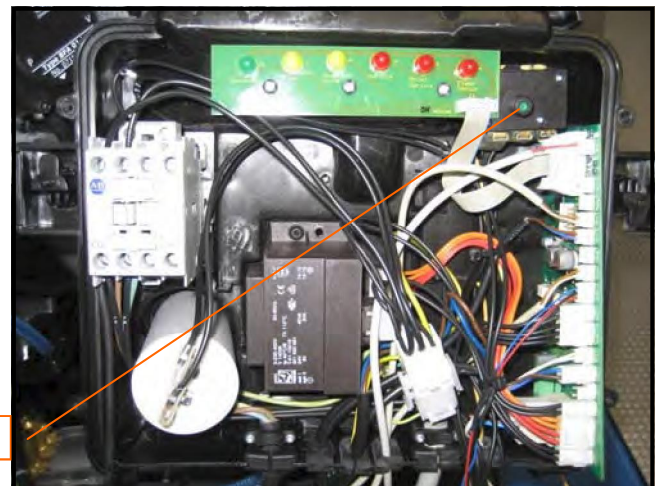


Fig.D.4. Heat system

The single phase electrical burner moter (1) drives the fuel pump (2) and the burner fan (3). The fuel pump (2) intakes fuel from the tank (8) through the fuel filter and conveys it, with the solenoid (4) activated, through the fuel nozzle (5) into the heatexchanger (7). The burner fan (3) simultaneously adds the necessary air. The ignition transformer generates the 12 kV high voltage for the electrodes. A spark is produced across the electrodes to ignite the fuel/air mixture. The exhaust sensor (6) controls the exhaust temperature and cuts of the machine when the temperature reaches 270 C. The switch (9) for exhaust sensor is placed in the E-box.

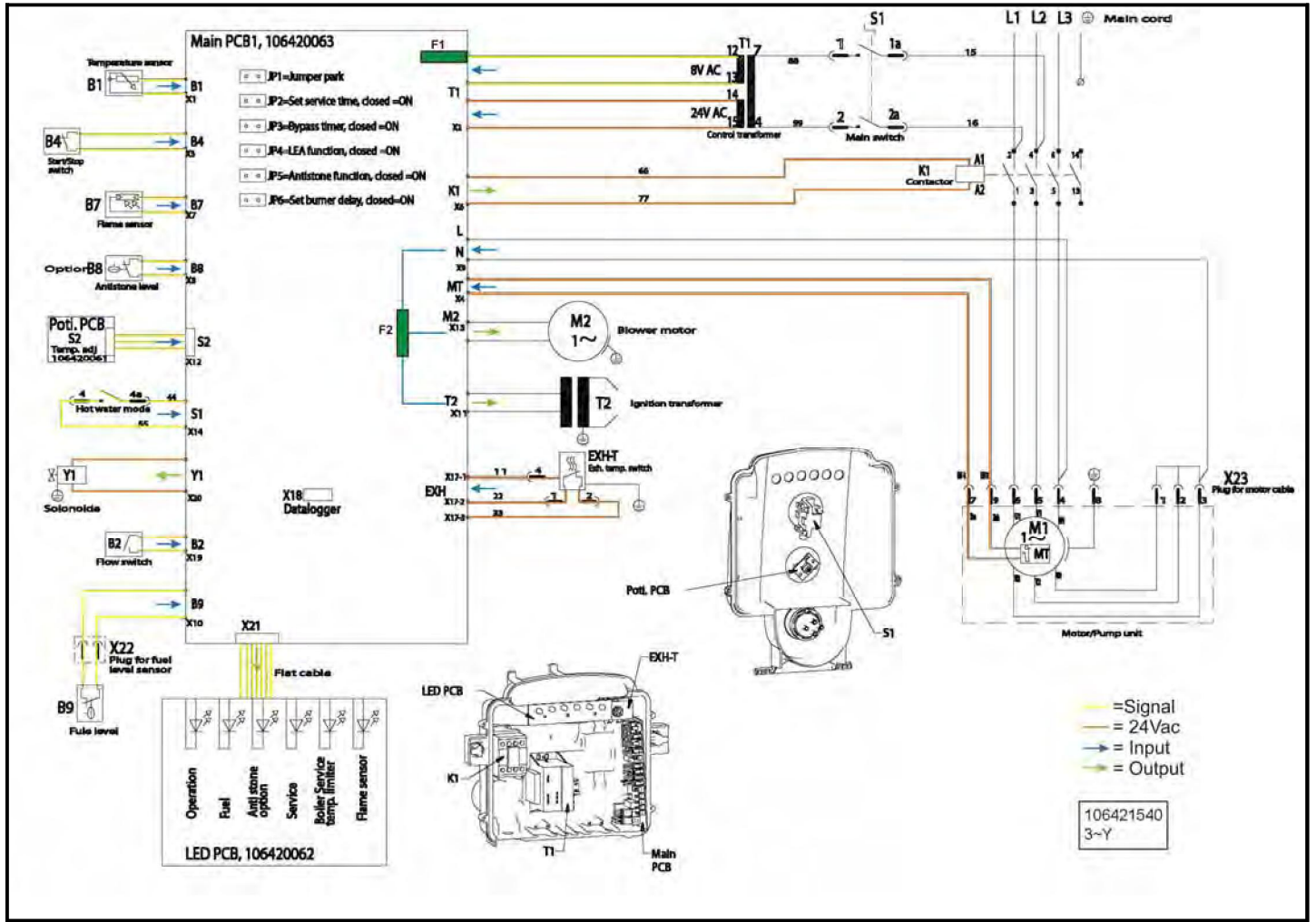
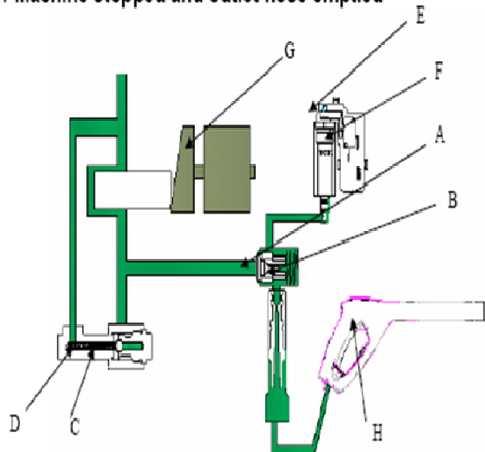


Fig.D.5. Electric box

Schematic function Neptune 1.

2.0 Operation

2.1 Machine stopped and outlet hose emptied

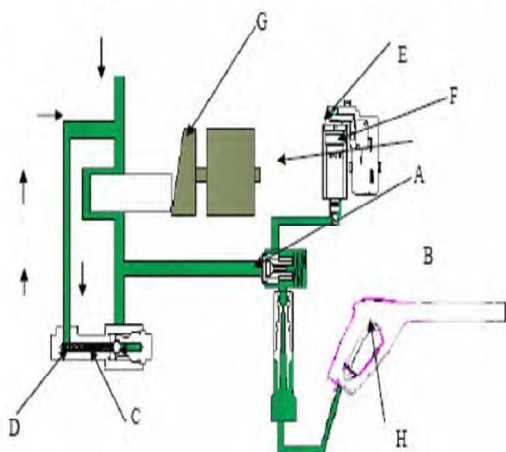


In this situation the position of the parts are The following:
The none return valve(A) is closed by the spring (B) as there is no pressure on either of the sides.

The easy start ball valve (C) is pressed against the upper seat by the easy start spring (D). The s/s spring presses the s/s piston, and the Activation arm (E) is taken to the front position, the micro switch (F) at the “switch on” position, the motor (G) will start.

The handle (H) is released, No water flow from the nozzle.
Water flow: None

2.2 Starting up when connecting the maching(soft start)



1. The none return valve (A) is closed by the spring (B) as the pressure on the front side is still not high enough to open it.

2. The easy start ball valve (C) moves a little from the upper seat as the easy start spring (D) is pressed a little.

3. The s/s spring pressed the s/s piston, and the Activation arm (E) is taken to the front position, the micro switch (F) at the “switch on” position, the motor (G) is running.

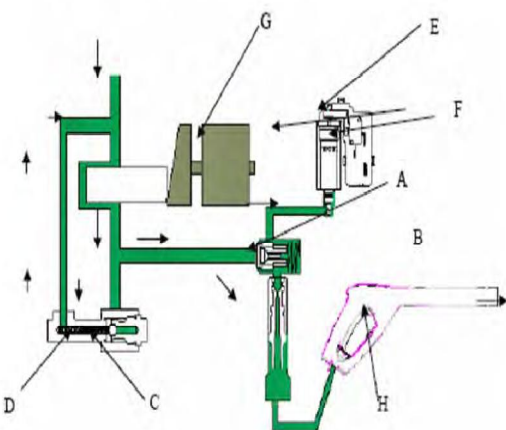
4. the handle (H) is released, and no water flow from the nozzle.

Water flows:

1. From the water inlet to the pump.

2. From the pump through the ball valve to the water inlet.

2.3 Building-up of pressure in hose



During building-up of pressure, the position of the parts are following:

1. The none return valve (A) open a little because of the high pressure from pump.

2. The easy start ball valve (C) moves to the lower seat as the easy start spring (D) impresses more.

3. The s/s spring pressed the s/s piston, and the Activation arm (E) is taken to the front position, the micro switch (F) at the “switch on” position, the motor (G) is running.

4. The handle (H) is released, and no water flow from the nozzle

Water flows:

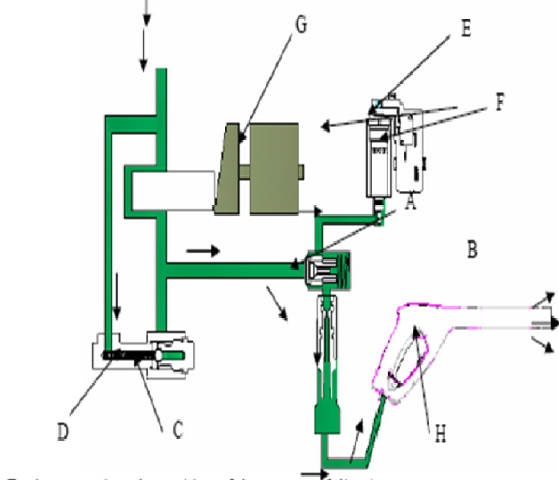
1. From the water inlet to the pump

2. (Decreases during the process). From the pump through the ball valve to the water inlet

3. From the pump through the none-return valve to the high pressure hose.

Schematic function Neptune 1.

2.4 Operation

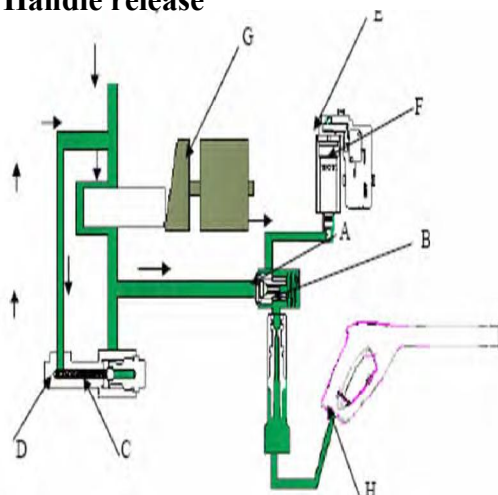


1. The non return valve (A) is fully open because of full working pressure and flow.
2. The easy start ball valve (C) is pressed against the lower seat by the pressure from the pump.
3. The s/s spring is pressed a little, but the Activation arm (E) is still on the front position, The micro switch (F) at "switch on" position. The motor (G) is running.
4. The handle (H) is activated, and water flow from the nozzle.

Water flows:

1. From the water inlet to the pump.
2. From the pump through the non-return valve to the high pressure hose.

2.5 Handle release



1. The non return valve (A) is closed by the pressure in the hose system.
2. The s/s spring is pressed at max position, the Activation arm (E) moves back, presses the Micro switch (F) at "switch off" position (means that the motor (G) is stopped).
3. The pressure in pump drop over a leak in the easy start valve, The easy start spring presses the ball valve (C) up against the upper seat, pressure in the cylinder head close to the inlet pressure.
4. the handle (H) is released, and no water flow from the nozzle

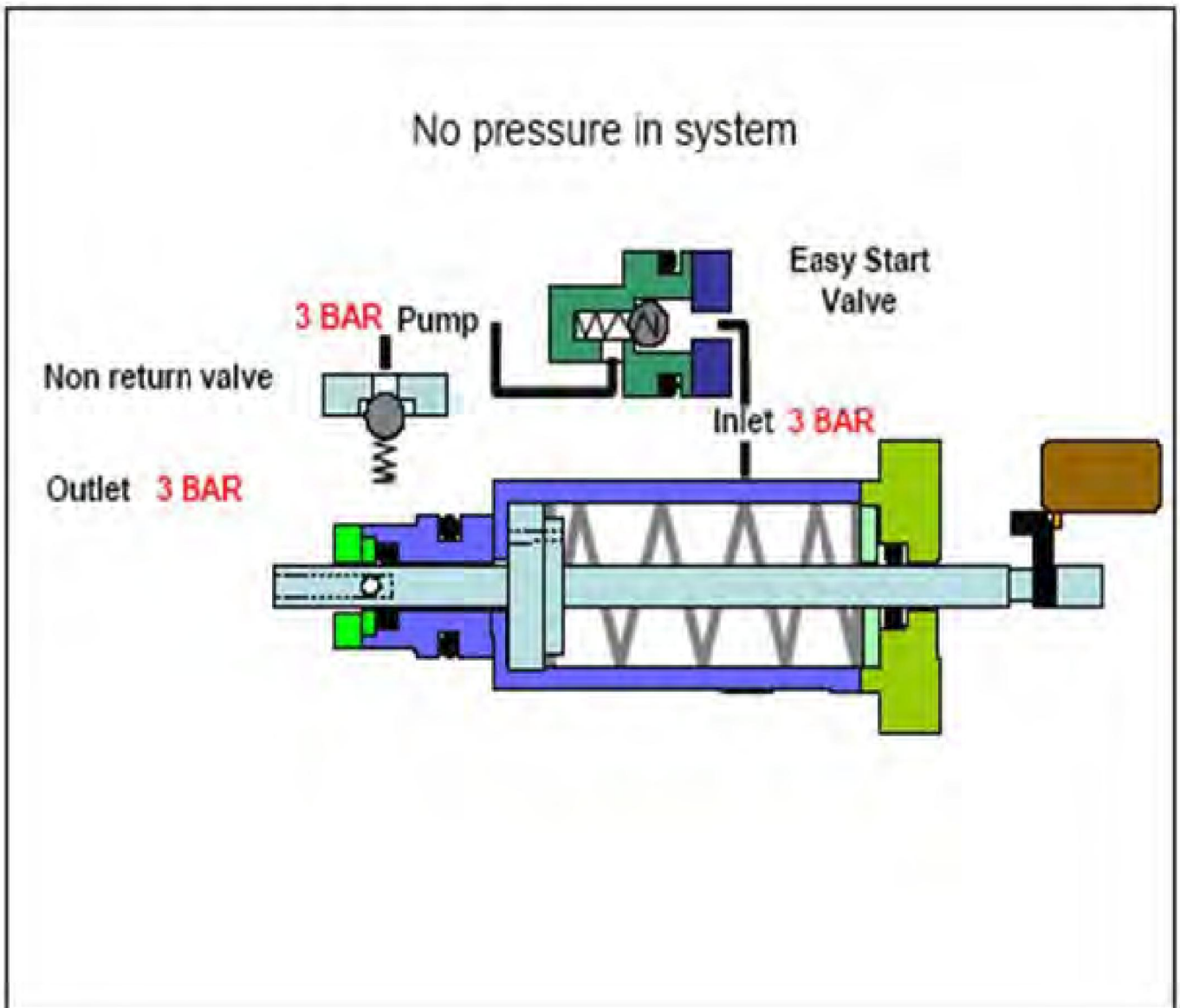
Water flows:

None.

Neptune 1

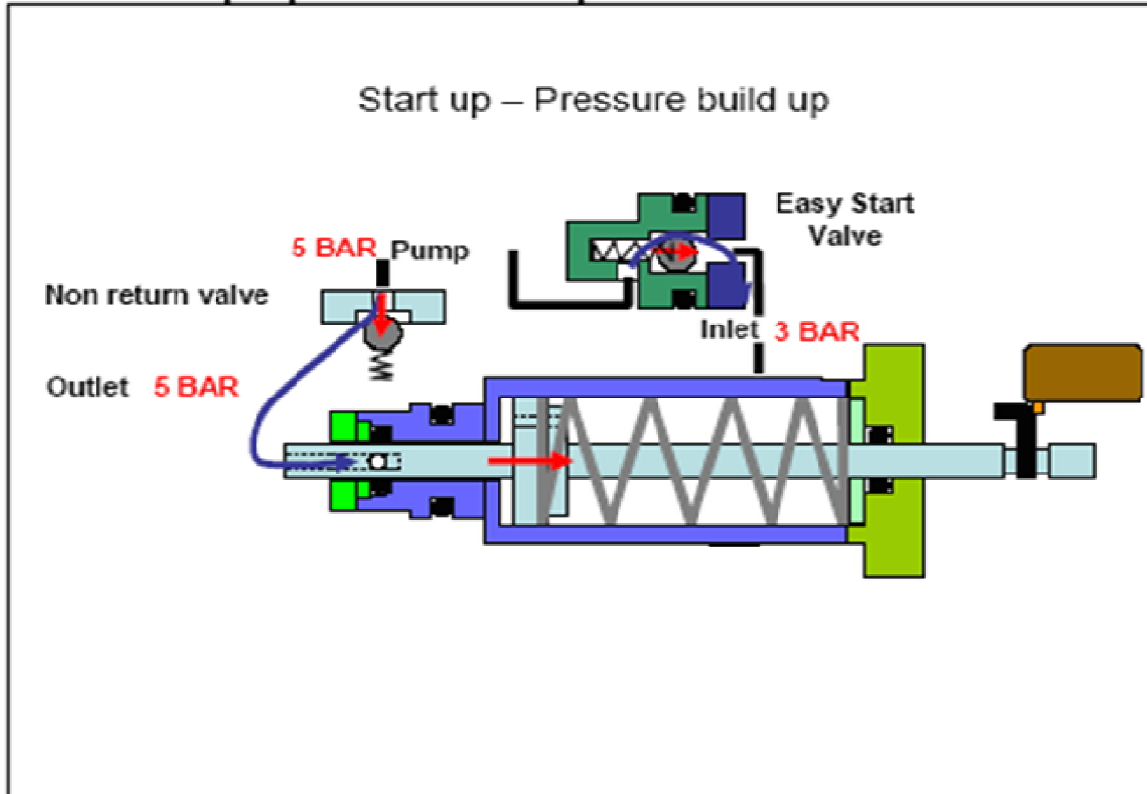
3.0 Start stop system guide

3.1 No pressure in system

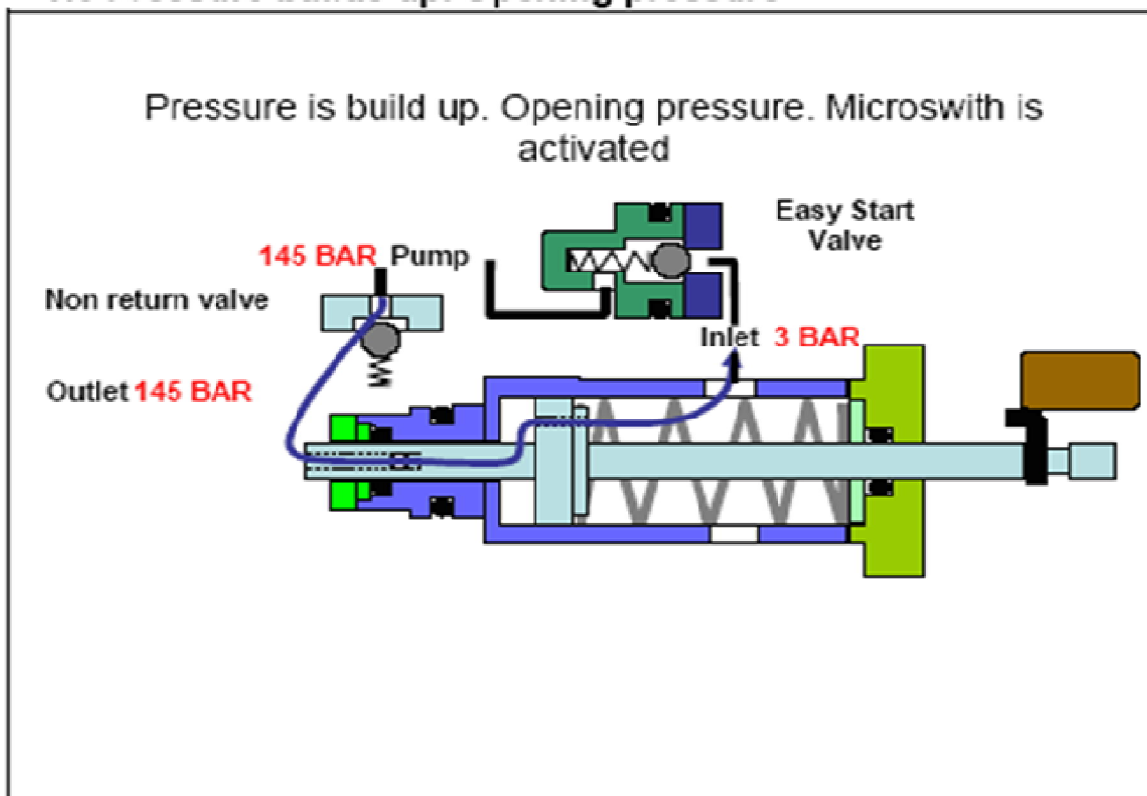


Neptune 1

3.2 Start up – pressure build up

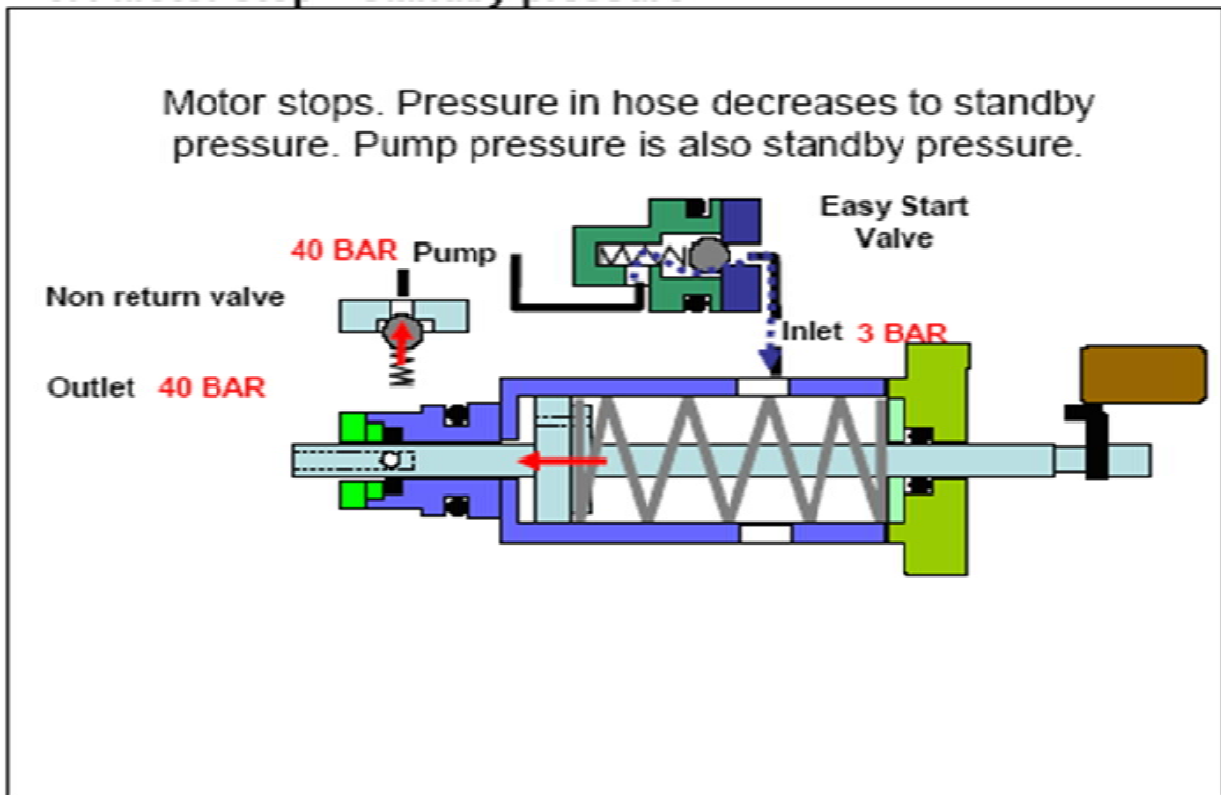


3.3 Pressure builds up. Opening pressure

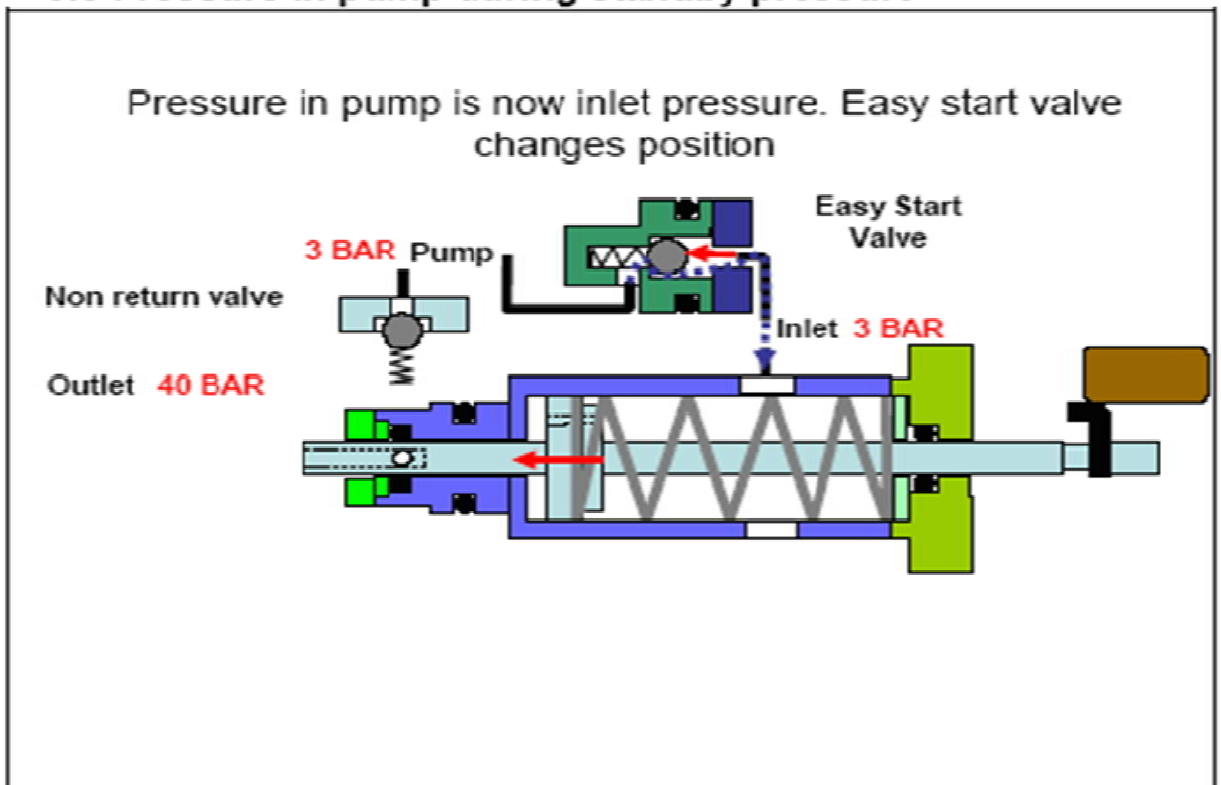


Neptune 1

3.4 Motor stop – standby pressure

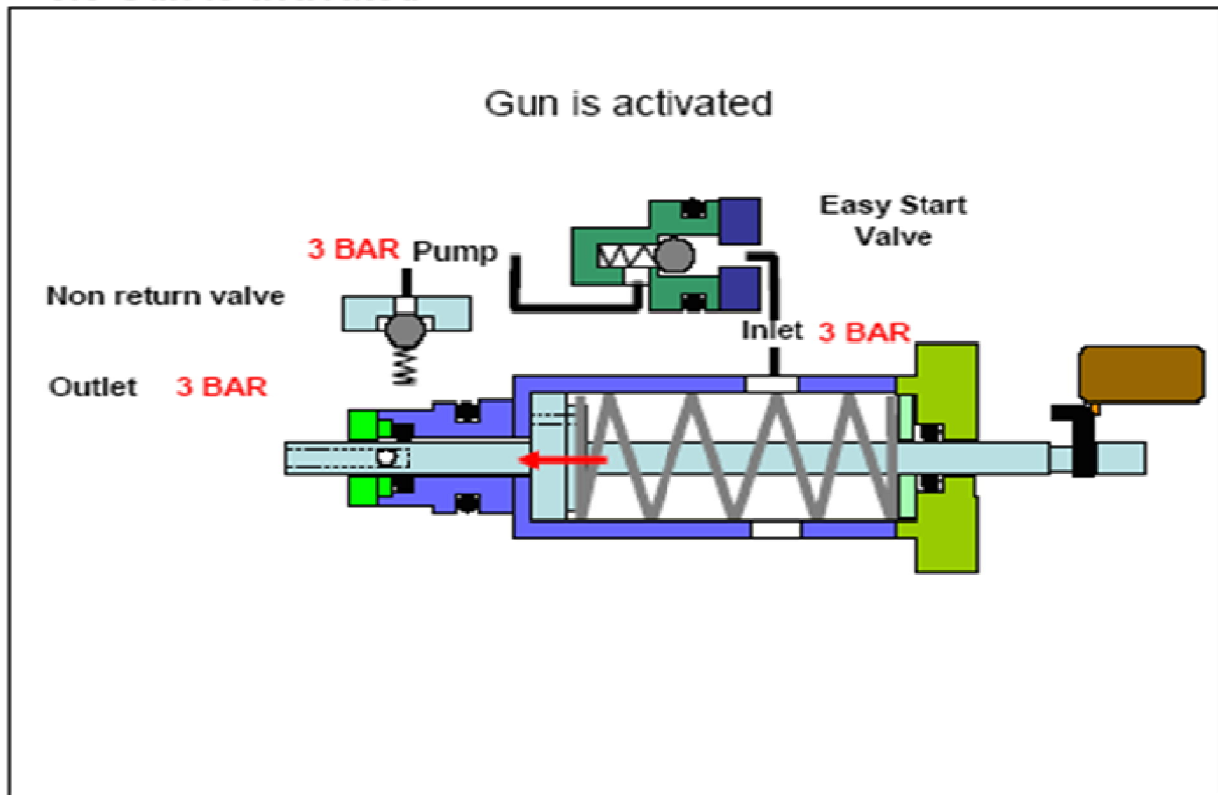


3.5 Pressure in pump during standby pressure

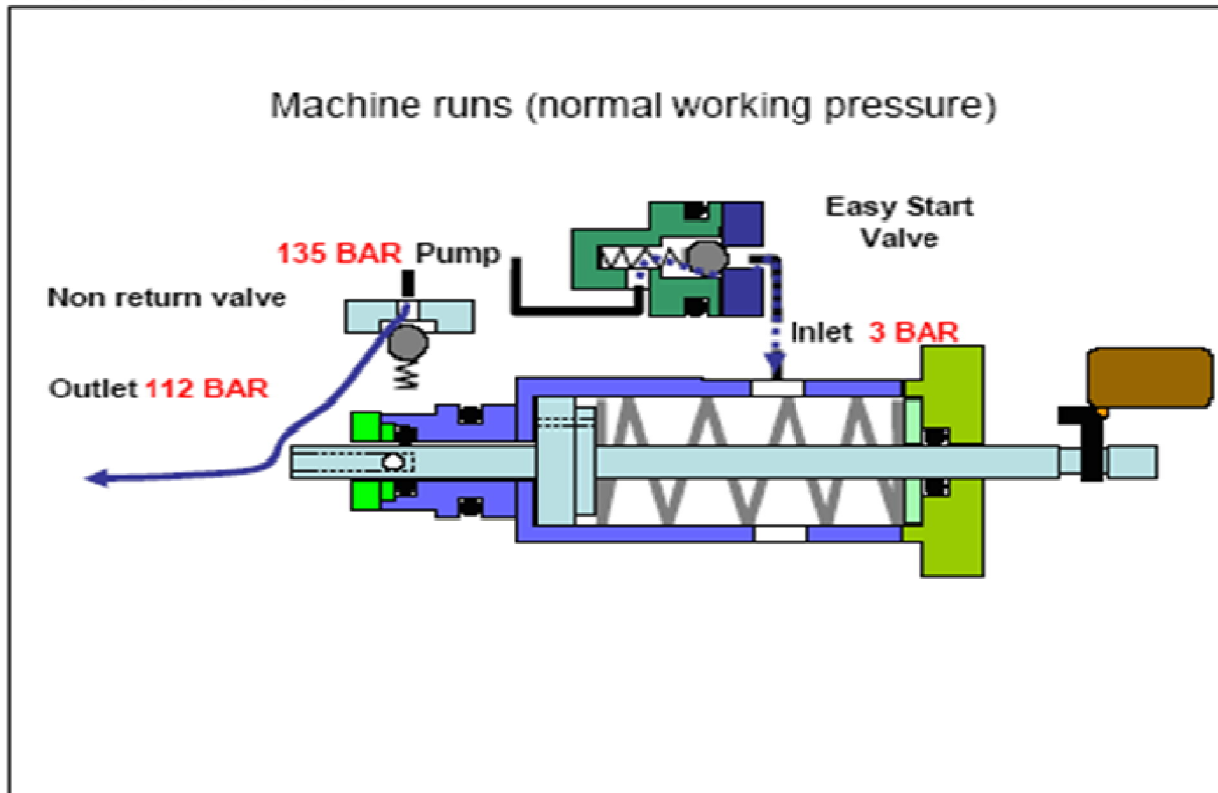


Neptune 1

3.6 Gun is activated

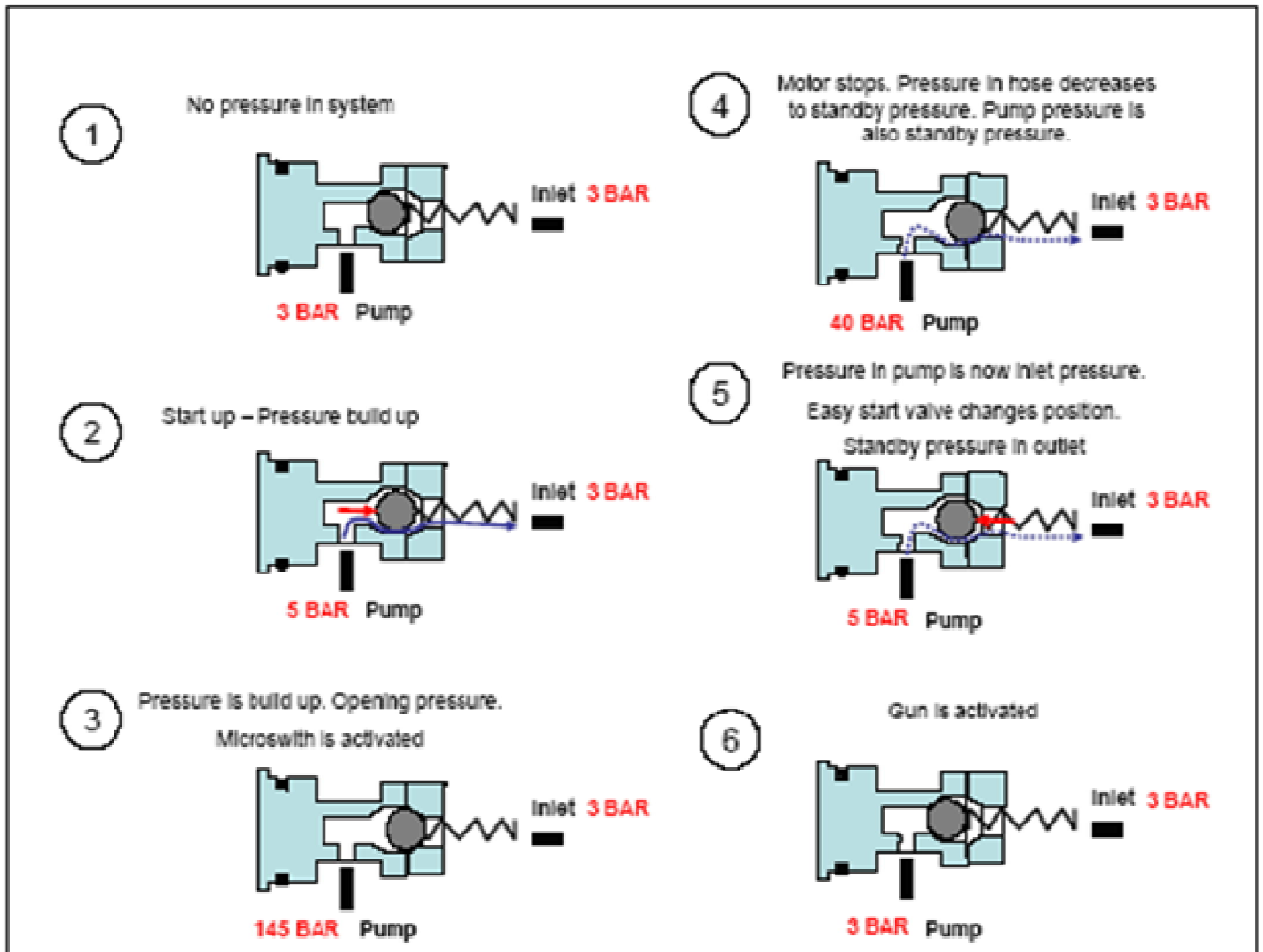


3.7 Machine run



Neptune 1

4.0 Easy start guide



Valve block Principal drawing Neptune 2 1~

The valve blocks for Poseidon 3 and Neptune 2 are identical due to the function. The schematic drawing of the Valve Block 1~ in (Fig.D.6) is made to get a better understanding of the function.

NOTE ! Fig.D.6 shows the single phase version with enabled easy start valve. With disabled easy start valve, the function will be the same as the three phase version fig.D.8

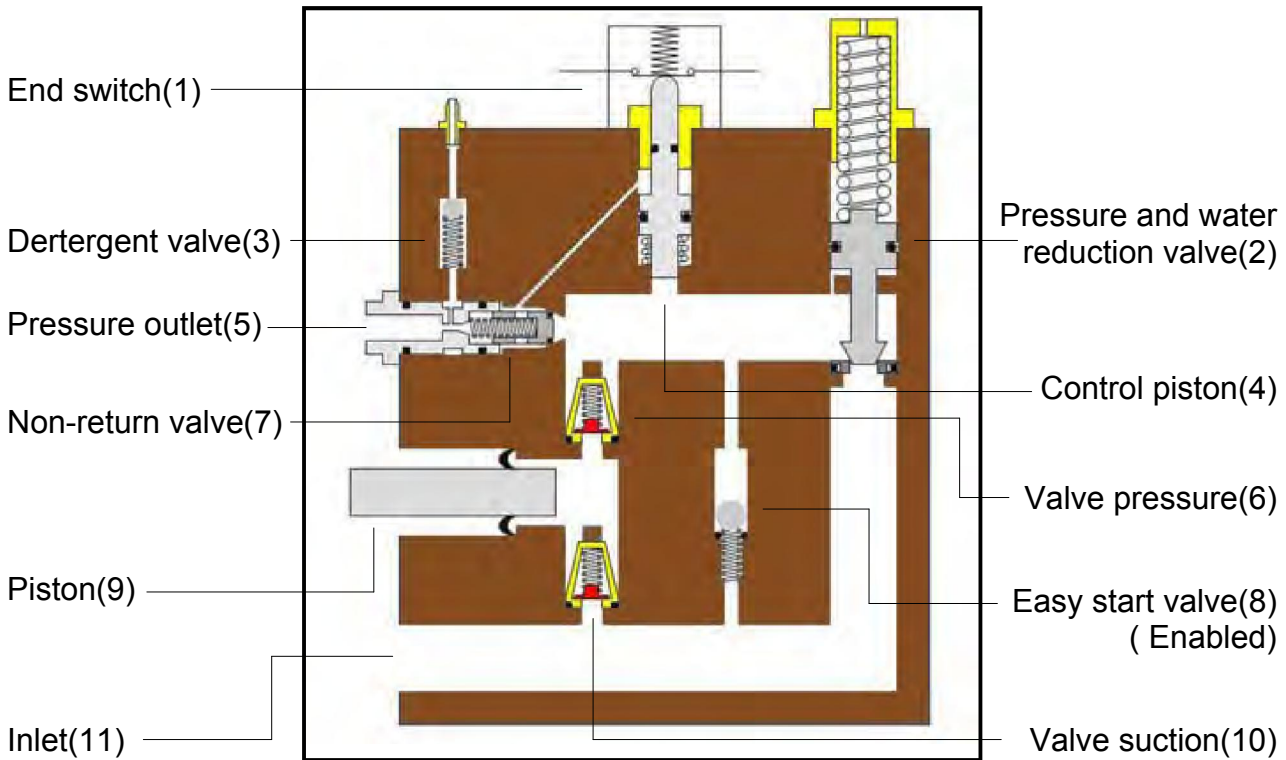


Fig.D.6: Schematic drawing valve block 1 ~

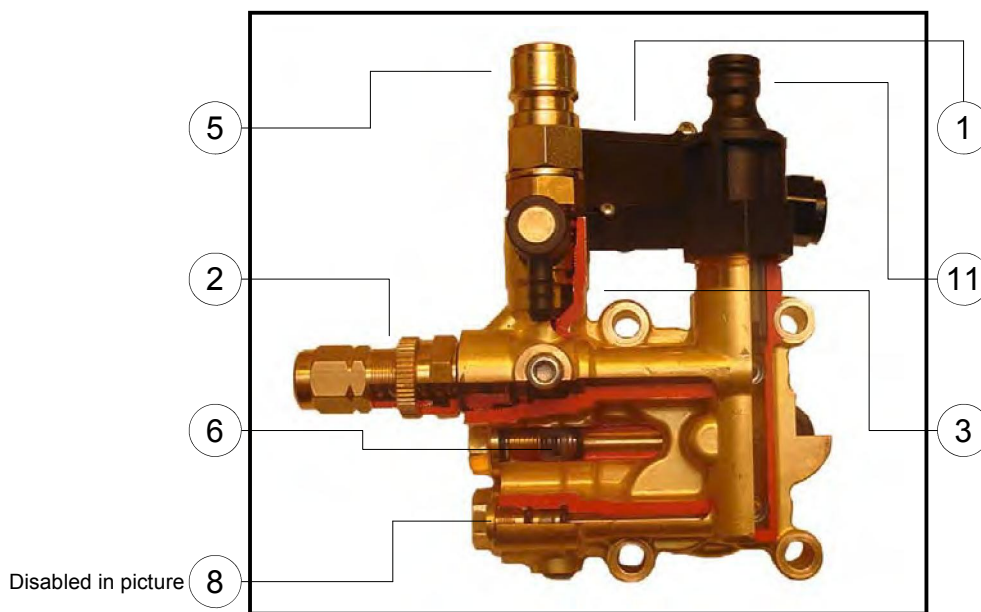


Fig.D.7: Valve block 1 ~ - Cut Away View

Valve block principal drawing Neptune 2 3~

The schematic drawing of the Valve Block 3~ in (Fig.D.8) is made to get a better understanding of the function.

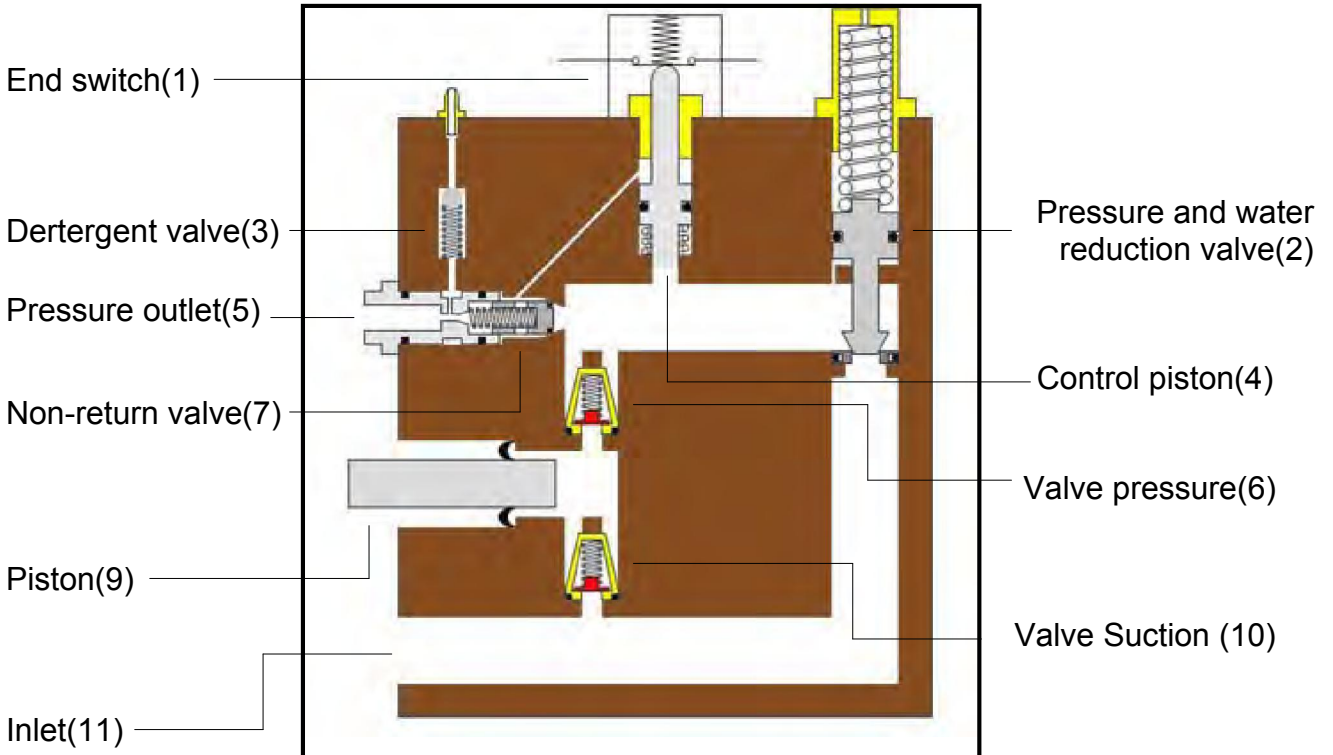


Fig.D.8: Schematic drawing valve block 3 ~

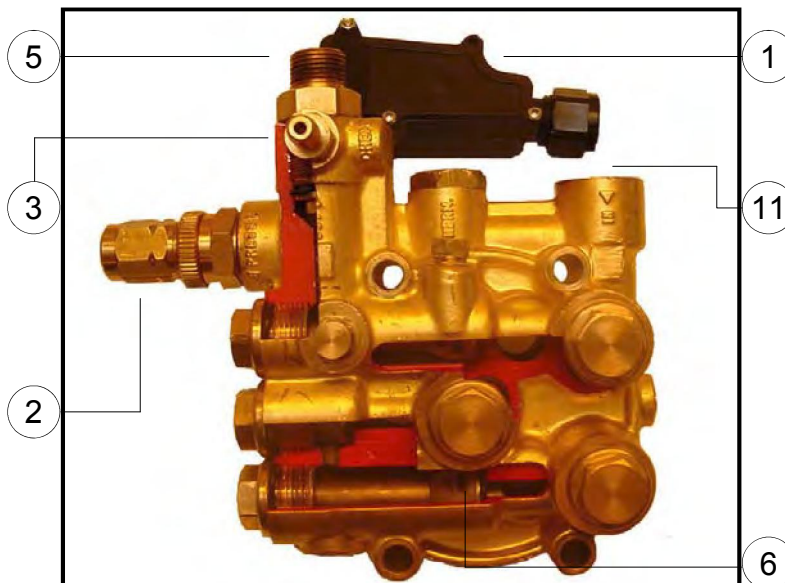


Fig.D.9: Valve block 3 ~ Cut Away View

Schematic function Neptune 2 1~ and 3~

The difference between the 1 ~ and the 3 ~ function is the easy start valve in the single phase valve block.

In the majority of the single phase versions the easy start valve will be enabled.

With disabled easy start valve the function will be as the three phase version.

In the following figures (1 - 5) the schematic function is shown.

10.1 Precondition: Water circulating through the valve block. Power has just been switched ON.

10.2 Precondition: Power ON - Open gun.

10.3 Precondition: Gun is just about being closed.

10.4 Precondition: Power ON - Closed gun = Standby mode.

10.5 Precondition: Power ON - Open gun - FlexoPower turned to low pressure - Open detergent valve.

In the three phase version, fig.D.10.1 just has to be skipped.

Colour code :
 Light blue - Vacuum
 Blue - Supply pressure
 Purple - Reduced pressure
 Red - High pressure

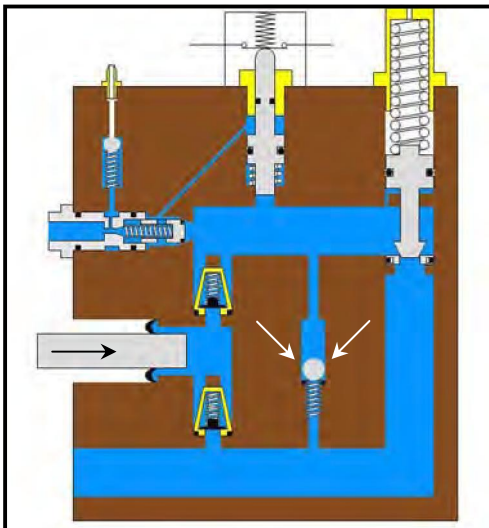


Fig.D.10.1: Schematic function valve block

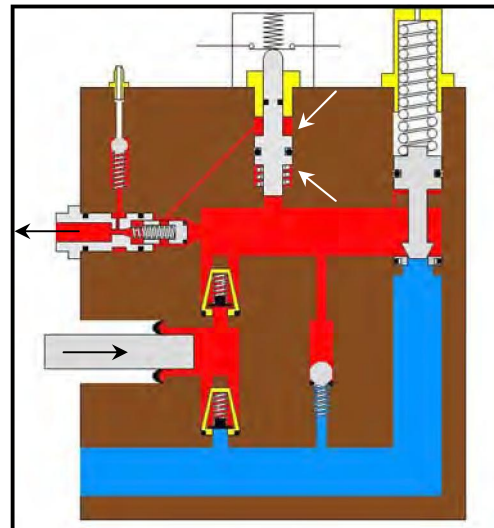


Fig.D.10.2: Schematic function valve block

Schematic function Neptune 2. 1~ and 3 ~

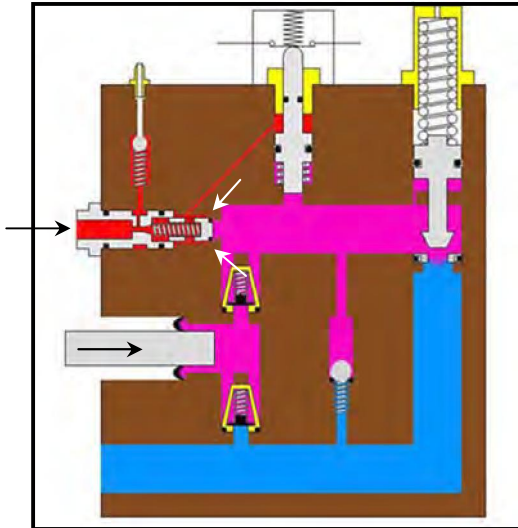


Fig.D.10.3: Schematic function valve block

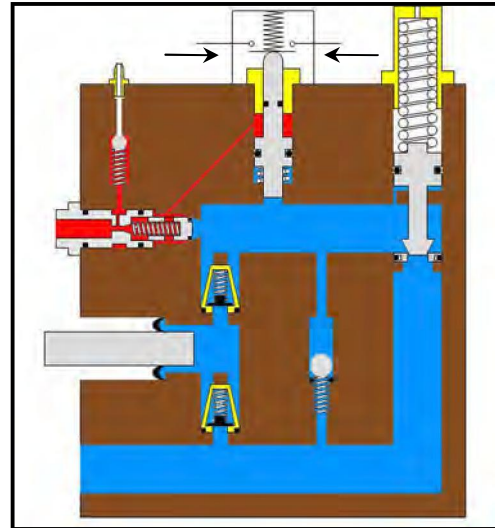


Fig.D.10.4: Schematic function valve block

3. Gun closes. Pressure rises to cut-off pressure and pressure valve opens and releases pressure in valve block. Non return valve moves to its seat.

4. Pressure in valve block released. Non-return valve holds pressure in gun and on top of control piston. Control piston moves down and end-switch cuts off motor power supply.

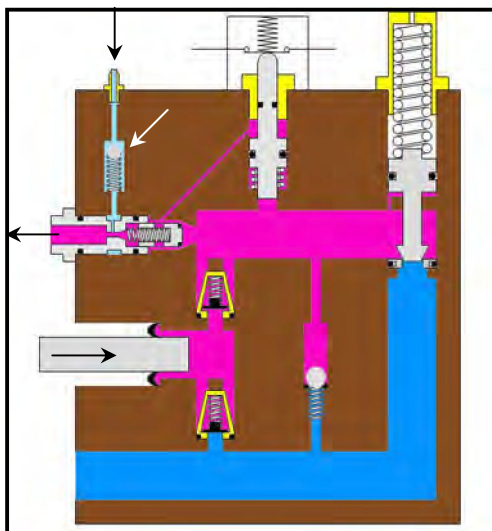




























Fig.D.10.5: Schematic function valve block

Neptune 1&2. Trouble Shooting

Indication lights						Cause	Remedy
Operation	Fuel	Scale	Service	Boiler	Flame		
							
						>	Constant light Appliance ready for operation.
						>	Flashing light Flow sensor fault. Water tap closed or water shortage Detergent tank empty Pressure regulation on the safety control block or VarioPress-lance set to low water volume Machine scaled Spray gun leaking High pressure hose, coupling or line system leaking
						>	Refuel detergent or set SDR valve to "0"
						>	Constant light Low fuel level
						>	Top up fuel Cold water operation possible
						>	Flashing light Low ALTO antiStone level
						>	Top up Alto AntiStone
						>	Constant light Service interval expired
						>	Flashing light Service interval due in 20 hours
						>	Microprocessor Error.
						>	Repair end reset Customer: contact Alto Service Replace PLC

Neptune 1&2. Trouble Shooting

					>	<p>Constant light</p> <p>Boiler overheated. Exhaust sensor (EXT-H) has cut off fuel supply.</p> <p>Insufficient water flow</p> <p>Machine scaled</p> <p>Boiler not serviced</p>	>	<p>Machine shuts down, Cold water operation possible</p> <p>Check water supply</p> <p>Clean boiler</p>	
						>	<p>Constant light</p> <p>Flame sensor(B7) sooted</p> <p>Ignition or fuel system failure</p>	>	<p>Clean flame sensor(B7)</p> <p>Cold water operation possible</p>
					>	<p>Flashing light</p> <p>Motor overheated</p> <p>Water leakage in high pressure line. (Happens when pump has been in by-pass 3 times without flow)</p>	>	<p>Turn main switch in position „OFF“, let machine cool down</p> <p>Remove/disconnect extension cable</p> <p>Possible phase failure; have electrical connection checked</p> <p>Find Internal or External water leakage in high pressure line.</p>	
						>	<p>Flashing light</p> <p>Faulty temperature sensor(B1).</p>	>	<p>Cold water operation possible</p> <p>Check wire to temperature sensor (B1).</p>
						>	<p>Flashing light</p> <p>Illegal temperature setpoint</p>	>	<p>Cold water operation possible</p>
					>	<p>Flashing light</p> <p>Pressure switch is turned off - flow switch is not turned off within a time of 1 second</p>	>	<p>Check flow sensor.</p>	
						>	<p>Visual test of lamps</p> <p>When switching on, all the LEDs light up approximately 1 sec.</p>		

Indification



Fig.F.1: Data Plate

- Prior to any maintenance, identify the machine version at the data plate.
- The data plate is situated in two places at the machine.
- External. Back left-hand side
- Internal. Inside the Electrical Box.

Filter and Oil Maintenance

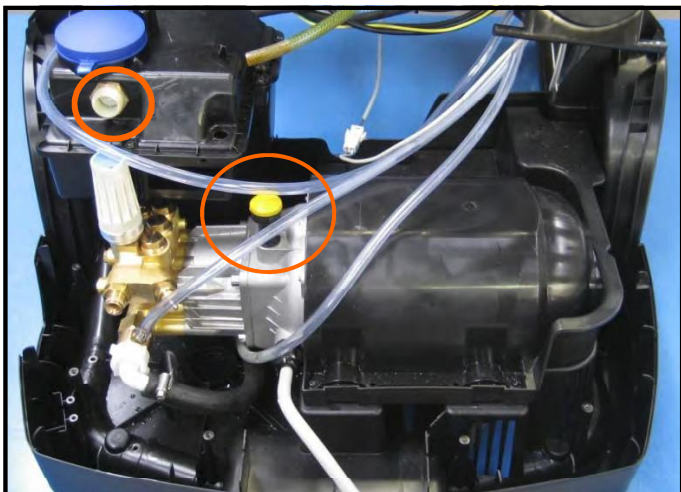


Fig.F.3: Oil plug extension.

- The pump is lubricated for life, therefore regular oil change isn't necessary.
- However, change the oil at major repairs.
- Type of oil, refer to part "B".

Inlet filter

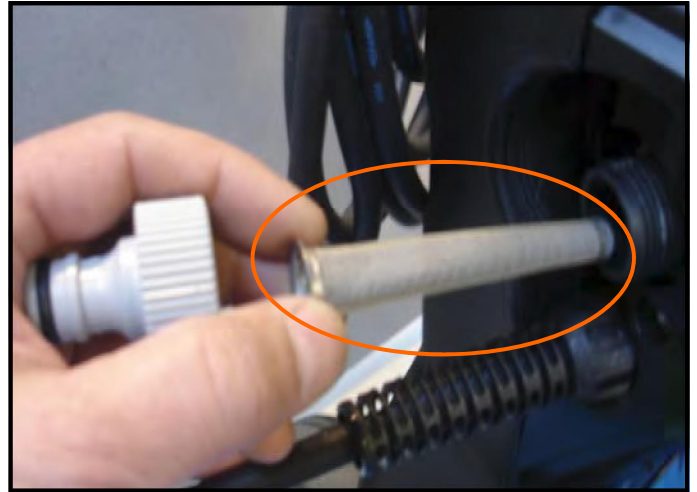


Fig.F.2: Water filter—Cleaning

- As required clean the water filter.
- Unscrew quick coupling.
- Pull out the filter by use of a nose pliers.
- Clean the filter and inspect for damages.
- Clean the filter in water break tank. Fig.F.3
- Replace if necessary.

Fuel filter.



Fig.F.4: Fuel filter.

- Check the fuel filter and replace if necessary.

Chassis

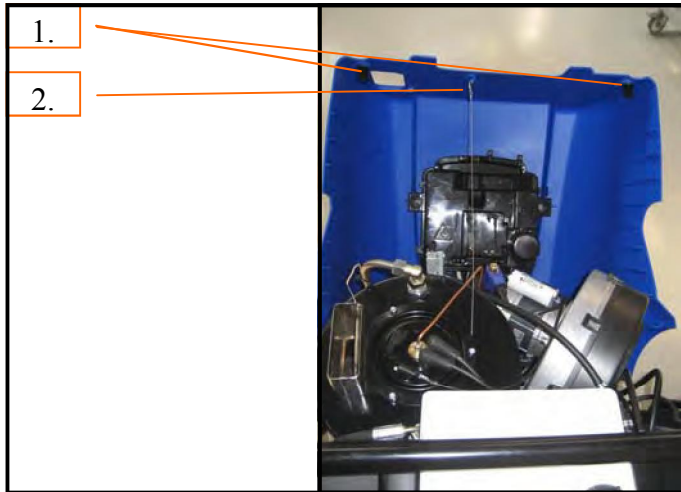


Fig.F.5: Cover - Removal

1. Turn locks a quarter turn.
2. Remove hook.
The cabinet can then be lifted of the top bumper.

Electrical box

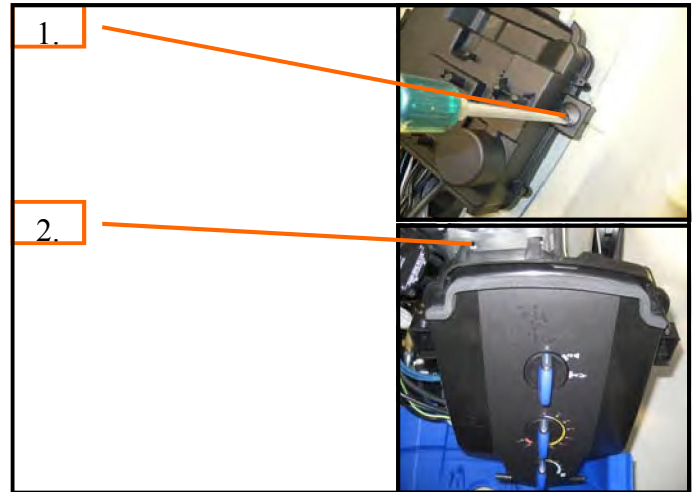


Fig.F.6: Electrical box - Removal

1. Turn locks on the back side of the E-box a quarter turn and remove the box from the cover.
2. Place the e-box on the service bracket fixed on the boiler.

Bumper

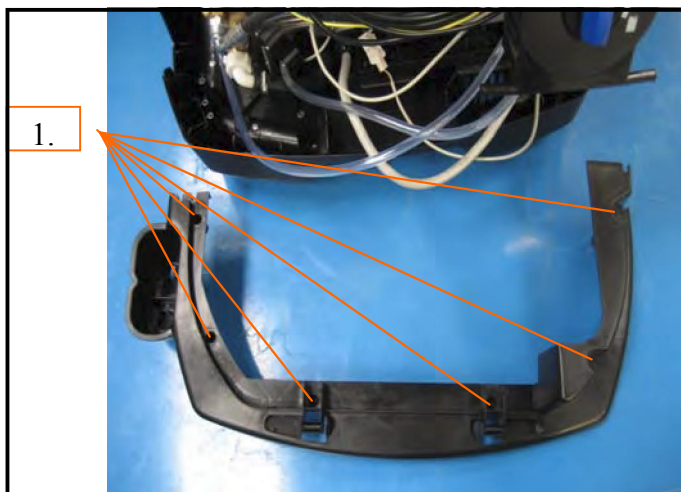


Fig.F.7: Top bumper - Removal

1. Loosen the 6 screws on the top bumper And remove the top bumper from the bottom bumper.

Motor cover

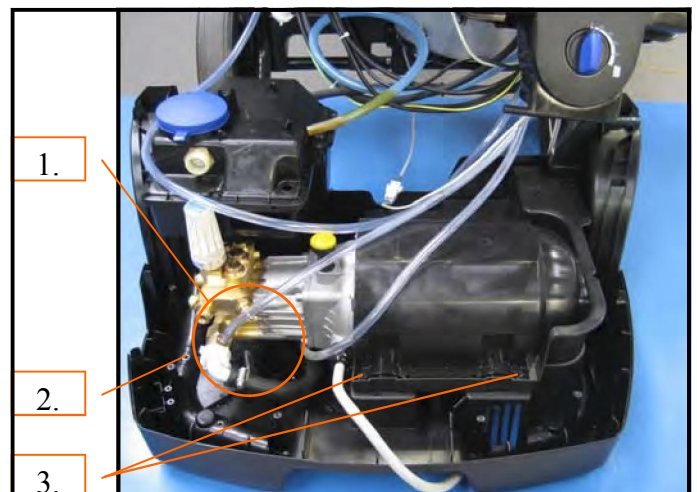


Fig.F.8: Bottom bumper and motor cover - Removal

1. Dismount micro switch, hoses and wires from the motor/pump unit.
2. Loosen the screws fixing the bottom bumper to the frame and pull the bumper out of the frame.
3. Loosen the 4 screws fixing the motor cover to the bottom bumper.

Neptune 2

Motor/pump removal



Fig.F.9: Motor Pump Unit - Removal

- To repair plungers/seals the MP-unit has to be lifted out of the frame.
- Remove the motor cover.
- Lift MP-unit out of the frame.

Valve Block



Fig.F.11: Valve Block 1~. Plug removal

- Suction valves - Plug kept in place between valve block and piston housing.
- Pull out the valves by means of a puller or a nose pliers.
- Pressure valves - screw plug (17 mm wrench).

Valve Maintenance

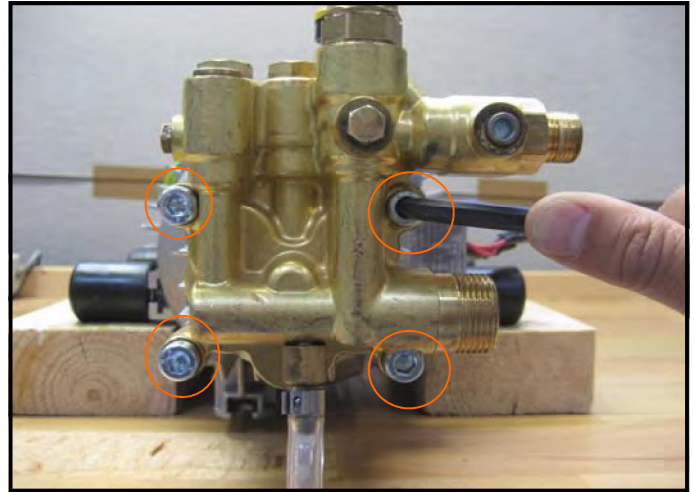


Fig.F.10: Valve Block 1~ Removal

- On the 1~ machine the valve block must be dismantled from the pump unit to get access to the suction valves.
- Dismount the four Hexagon bolts M8x55 in front of the valve block.
- Torque for the four bolts is 24Nm (18ft.lbs)

Valves

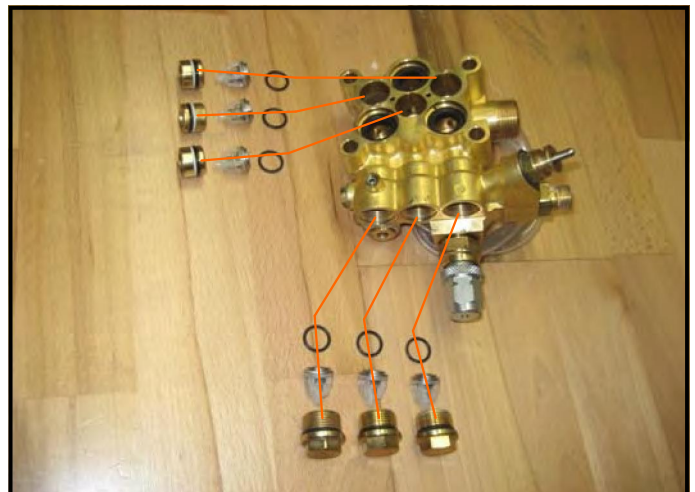


Fig.F.12: Valve Block 1~ Valves

- Inspect valves/seats and replace if necessary.

Neptune 2

Valve Maintenance 3~

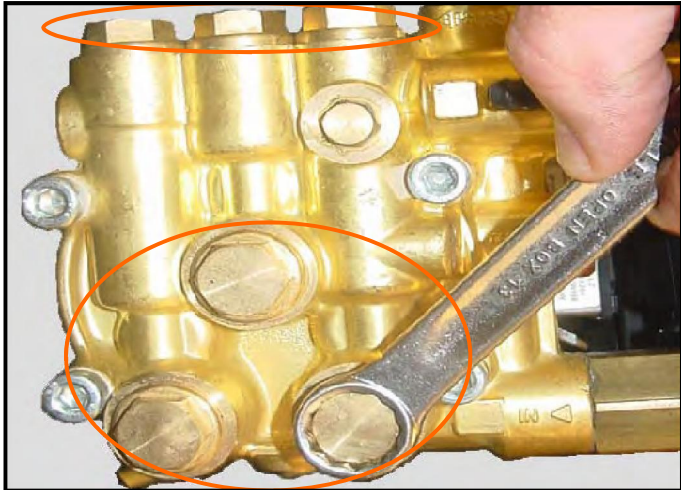


Fig.F.13: Valve Block 3 ~ - Plug removal

- To take out the valves remove the six screw plugs (17 mm wrench).
- Pull out the valves by means of a nose pliers.
- Bear in mind the o-ring.
- Inspect valves/seats and replace if necessary.
- Grease o-ring lightly.

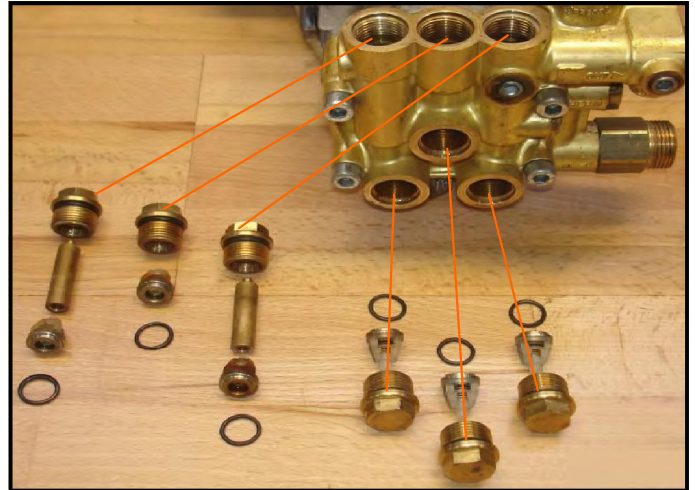


Fig.F.14: Valve Block 3 ~ - Valve replacement

- Inspect valves/seats and replace if Necessary as described in Fig.F.12.

Valve Maintenance

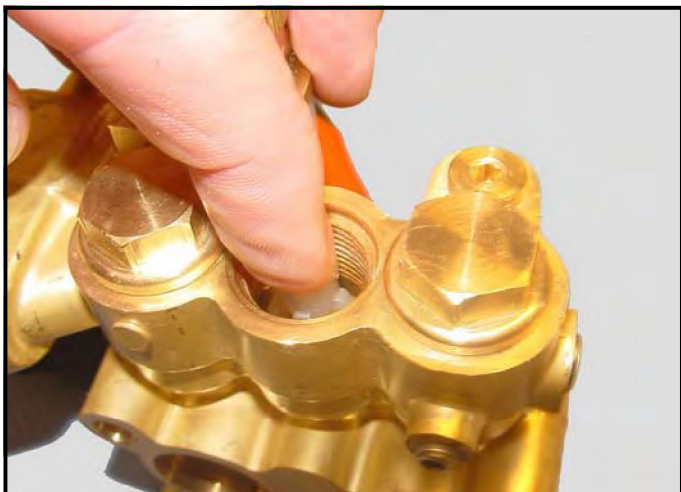


Fig.F.15: Valve Block – Valve replacement -

- Grease O-rings lightly.
- Place the valve in the valve chamber.
- Press down firmly on top of the valve.
- Fit screw plug applying Loctite 243.
- Torque 44Nm (33ft.lbs).

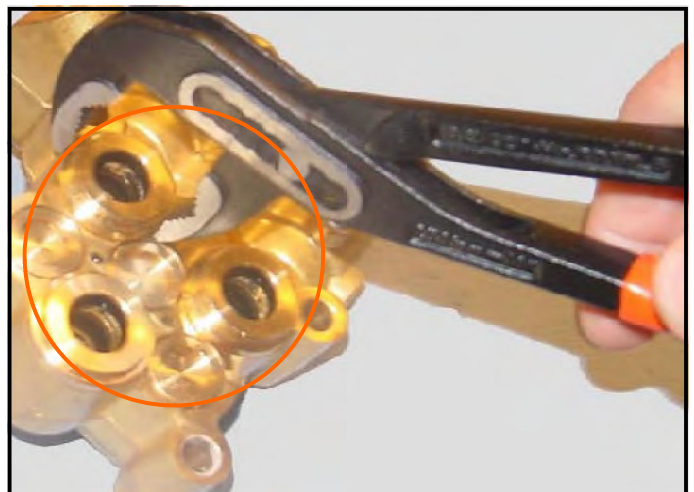


Fig.F.16: Valve Block - Thrust Collar Removal

- The seals and V - packings are identical for the 1 ~ and 3 ~.
- By use of a combination pliers remove the thrust collar.
- Beware not to damage the packing ring.
- Inspect the seals and packings for wear and replace them if necessary.

Neptune 2

Seal and V - Packing Maintenance



Fig.F.17: Packing Ring - LP Seal Removal

- Always replace as a kit.
- Remove the low pressure seal from packing ring, using a nose pliers.
- Don't use a screwdriver, as it might damage the inner surfaces of the packing ring.
- Grease seals lightly before assembling.



Fig.F.18: Packing Ring - O ring removal

- Working with o-rings, always use the proper tool to avoid damages on the metal parts.



Fig.F.19: Valve Block

- Use compressed air to clean relief bores.

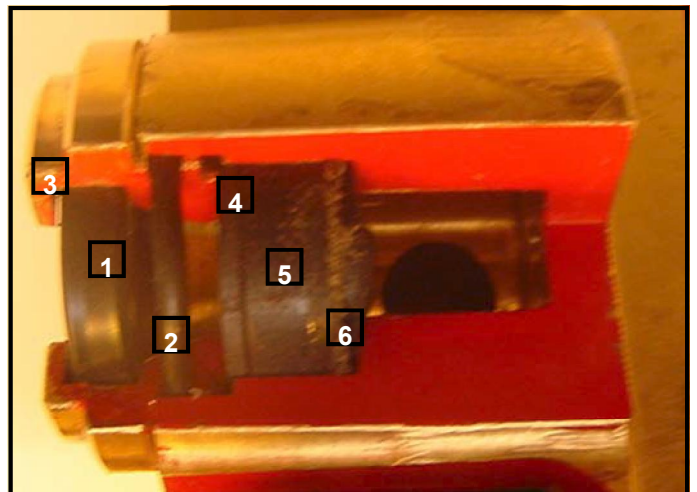


Fig.F.20: Thrust Collar Mounted - Cut Away View

- The cut-away view shows the right order for the V-packing assembly.
- Refer to numbers on fig.F.26.

Neptune 2

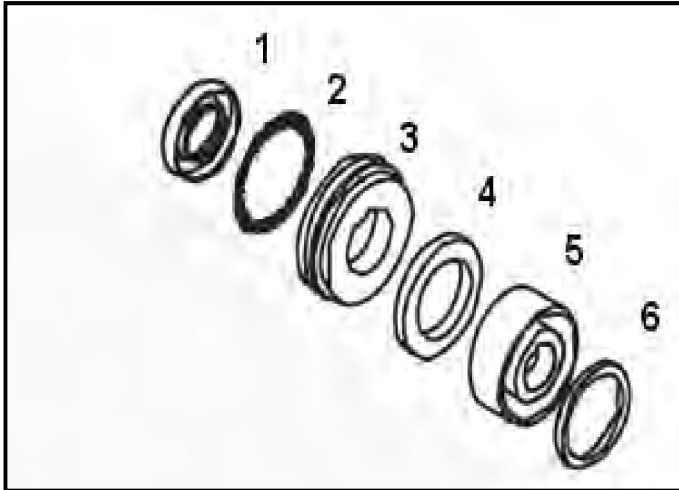


Fig.F.21: Thrust Collar Kit - Exploded View

- Numbers refer to spare parts catalogue 1~.
- No 1—2—4—5—6 are the single parts in the Thrust Collar Kit.
- No 4 - Packing Ring

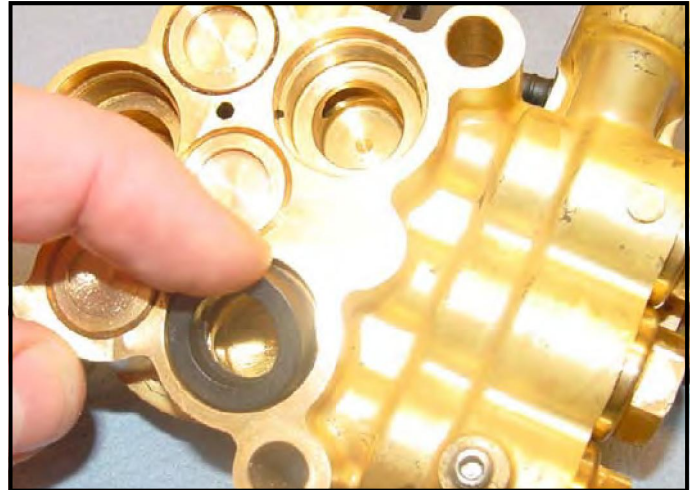


Fig.F.22: Valve Block - V-packing assembling

- Prior to assembly, grease the parts lightly with silicon grease.
- Stack the V-packing in correct order and firmly press assembly into the valve block.
- Use a proper tool to avoid damages on the valve block and V-packing.

Easy start valve



Fig.F.23: easy start valve - Dismount

- Dismount the plug with a 6mm hexagon key.
- By assembly apply Loctite 243



Fig.F.24: Easy start valve - Check

- Check the parts for wear and damages.
- Be aware of the order of the parts.

Neptune 2

Pressure regulation - Maintenance

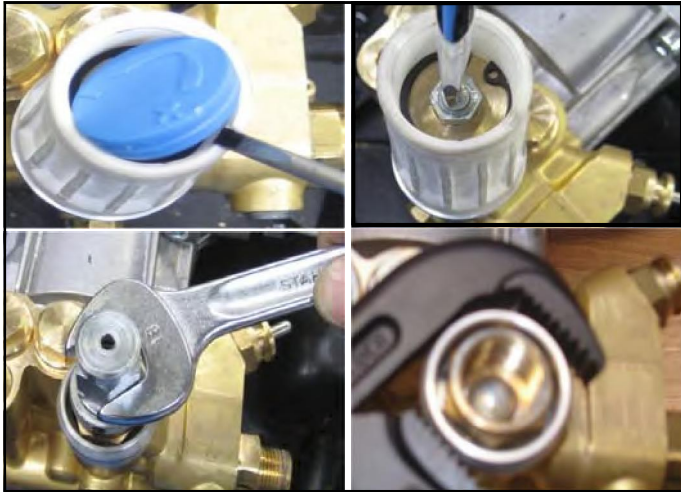


Fig.F.25: Pressure regulation - Dismount.

- Lift up the lid for pressure regulation.
- Loosen the screw inside.
- Demount the regulation valve.
- Demount the connector.

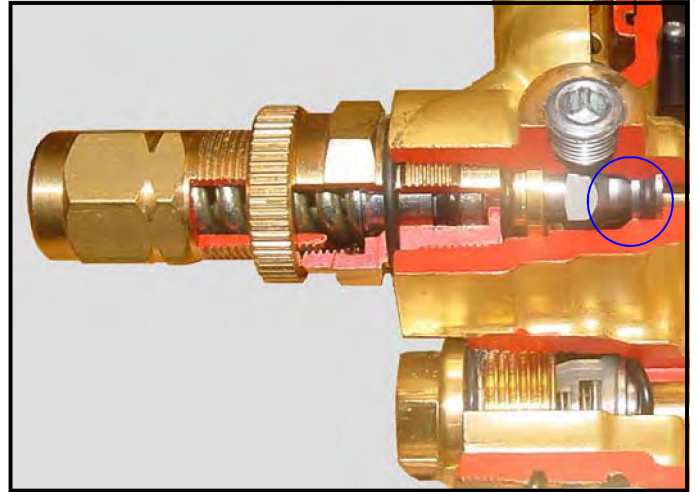


Fig.F.26: Pressure regulation - Cut away

- The pressure valves on 1 ~ and 3 ~ versions are identical.
- Using a 22 mm wrench unscrew the pressure valve as a whole.
- Take out the valve seat by means of e.g. an impact piercer (Fig.F.46).

Control piston – Maintenance

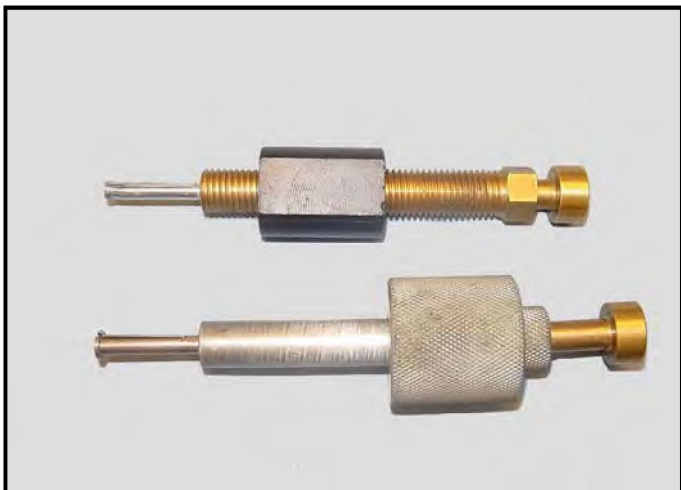


Fig.F.27: Puller—Impact piercer.

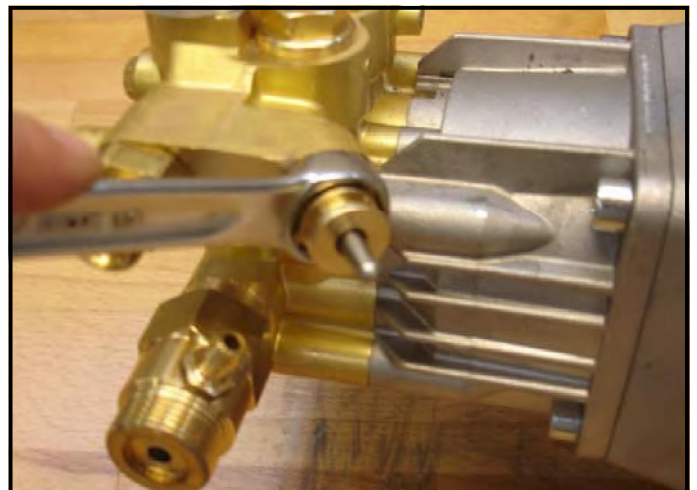


Fig.F.28: Control piston– Dismount

- Remove the Start/Stop switch from the connector.
- Unscrew the union nut using a 17 mm socket.

Neptune 2

Control piston.



Fig.F.29: Control piston– inspection

- Inspect the parts for wear and damages.
- If needed replace the control piston kit.
- Grease the parts and assemble.



Fig.F.30: Control piston

- Control piston repair kit.

Plunger and Oil Seal - Maintenance

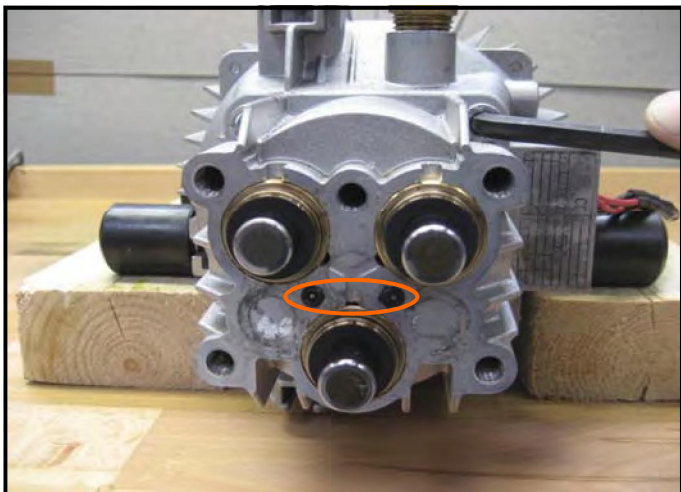


Fig.F.31: Motor Pump Unit - Repair

- Place the unit on e.g. two pieces of wood.
- Remove valve block. Refer to page 25.
- Loosen the 4 hexagon bolts, securing the wobble disc housing, synchronously.
- Let the oil drain out into a tray.
- Note housing position and the 2 O-rings!
- **Beware** of the springs being relieved.

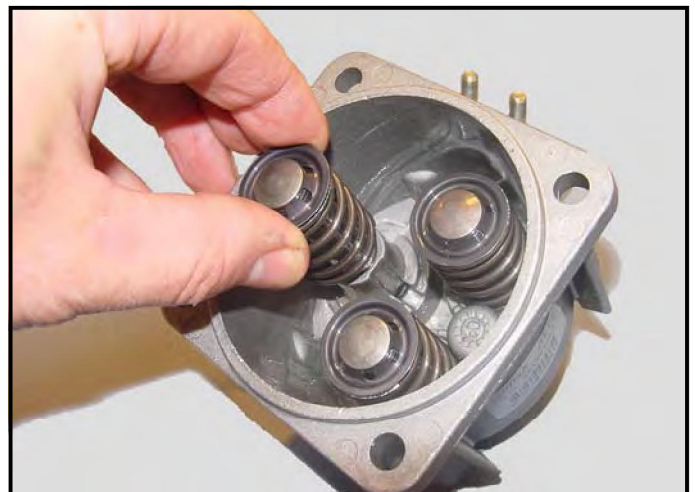


Fig.F.32: Pistons - Removal

- Remove the pistons from the inside of the wobble disc housing.
- Inspect the surfaces on the pistons for wear.
- Inspect springs for fractures.
- Clean the wobble disc housing properly before assembly.
- Use paper - not cotton waste

Neptune 2

Plunger and Oil Seal - Maintenance



Fig.F.33: Piston - Assembling

- Prior to assembly, lubricate the pistons and holes with pump oil.
- Slide the pistons through the housing piston holes.
- Beware not to damage the new oil seals.



Fig.F.34: Oil Seal - Removal

- To take out the oil seal, take a small flat head screwdriver and apply pressure through the slots (see picture).



Fig.F.35: Oil Seal - Replacement

- Using the proper tool, fig.F36 carefully tap the new oil seal in place.



Fig.F.36: Oil Seal Mounting Tool

- In lack of this tool, use a socket from a socket wrench set.

Neptune 2

Wobble Disc - Maintenance



Fig.F.37: Wobble Disc - Removal

- Loosen the center screw by means of an air tool or a hexagon key.
- Use a two legged puller to withdraw the wobble disc from the motor shaft.



Fig.F.38: Wobble Disc—Inspection

- Inspect the wobble disc and the bearing for wear.
- Replace if needed.
- Are main bearings, rotor or stator housing damaged, it is recommended to replace the motor as a whole.

Housing wobble disc - Assembling



Fig.F.39: Wobble disc — Assembling.

- Use Loctite 243 on the center screw and tighten it with a torque setting at 24 Nm (18 ft.lbs.).
- When tightening up the center screw, hold the motor shaft with a 16mm spanner.

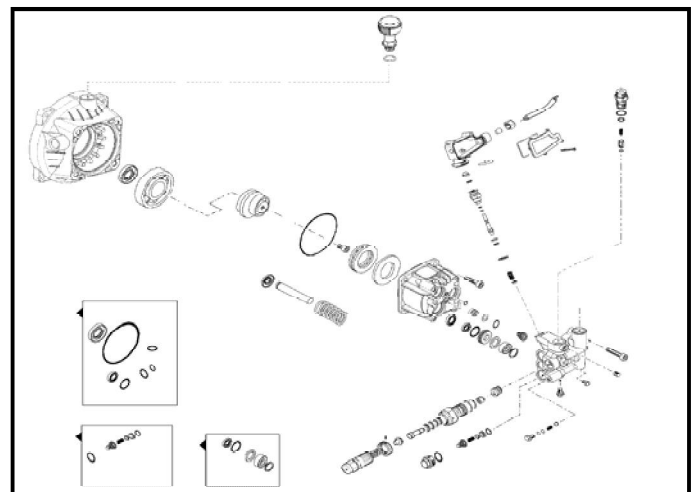


Fig.F.40: Pump— Blow through.

Neptune 2

Housing wobble disc - Assembling

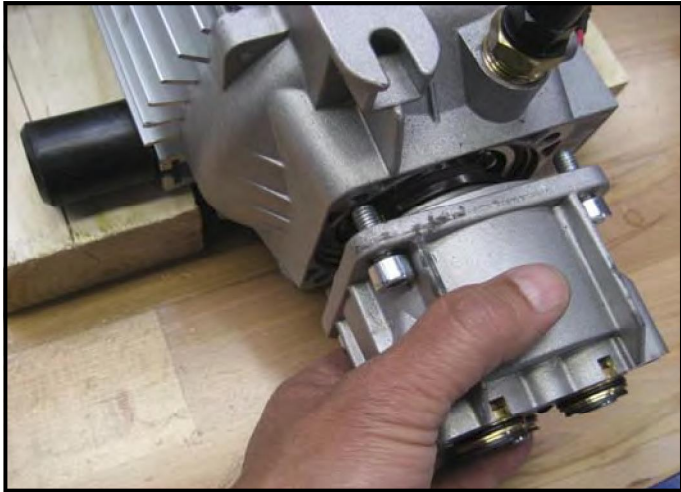


Fig.F.41: Housing Wobble Disc - Assembling

- Grease o-ring (housing) to keep it in place.
- Align motor and housing
- Note the housing position and the 2 O-rings outside the front of the housing !
- Press to insert bolts and tighten synchronously.

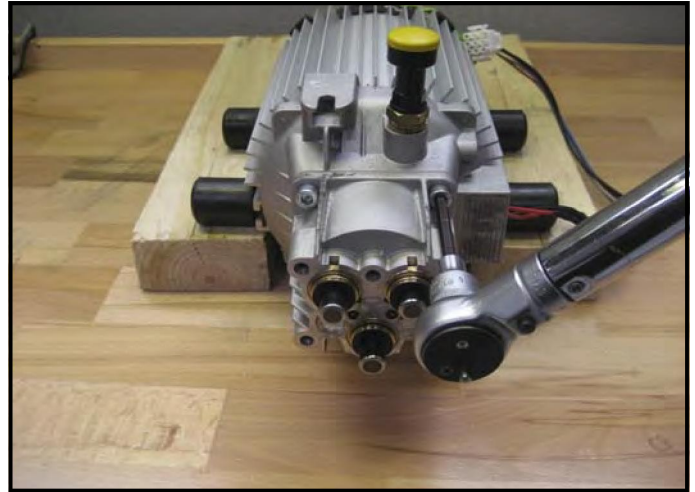


Fig.F.42: Housing Wobble Disc - Assembling

- Use a torque wrench to tighten the four hexagon bolts.
- Tightening torque 24 Nm (18 ft.lbs.).

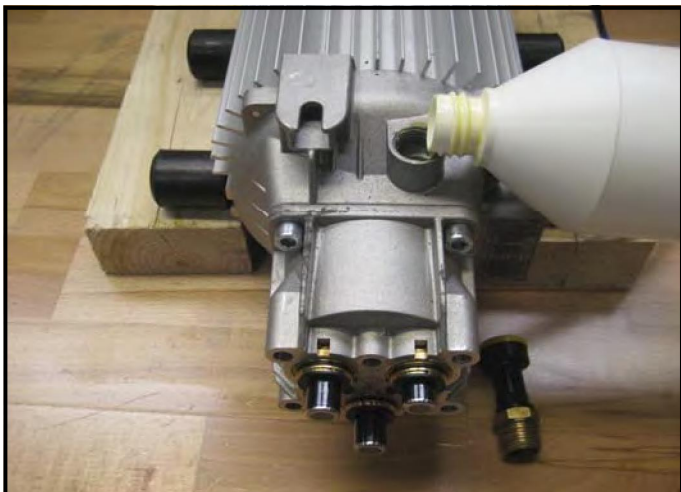


Fig.F.43: Housing Wobble Disc - Assembling

- Demount the oil plug extension and fill with oil.
- Refer to part "B" and refill with correct measured amount of oil.
- Mount the oil plug extension.
- Now the motor and the valve block can be assembled.



Fig.F.44: Oil plug

- If the oil plug extension has been taken apart note the correct order at assembly.

Neptune 2 Special

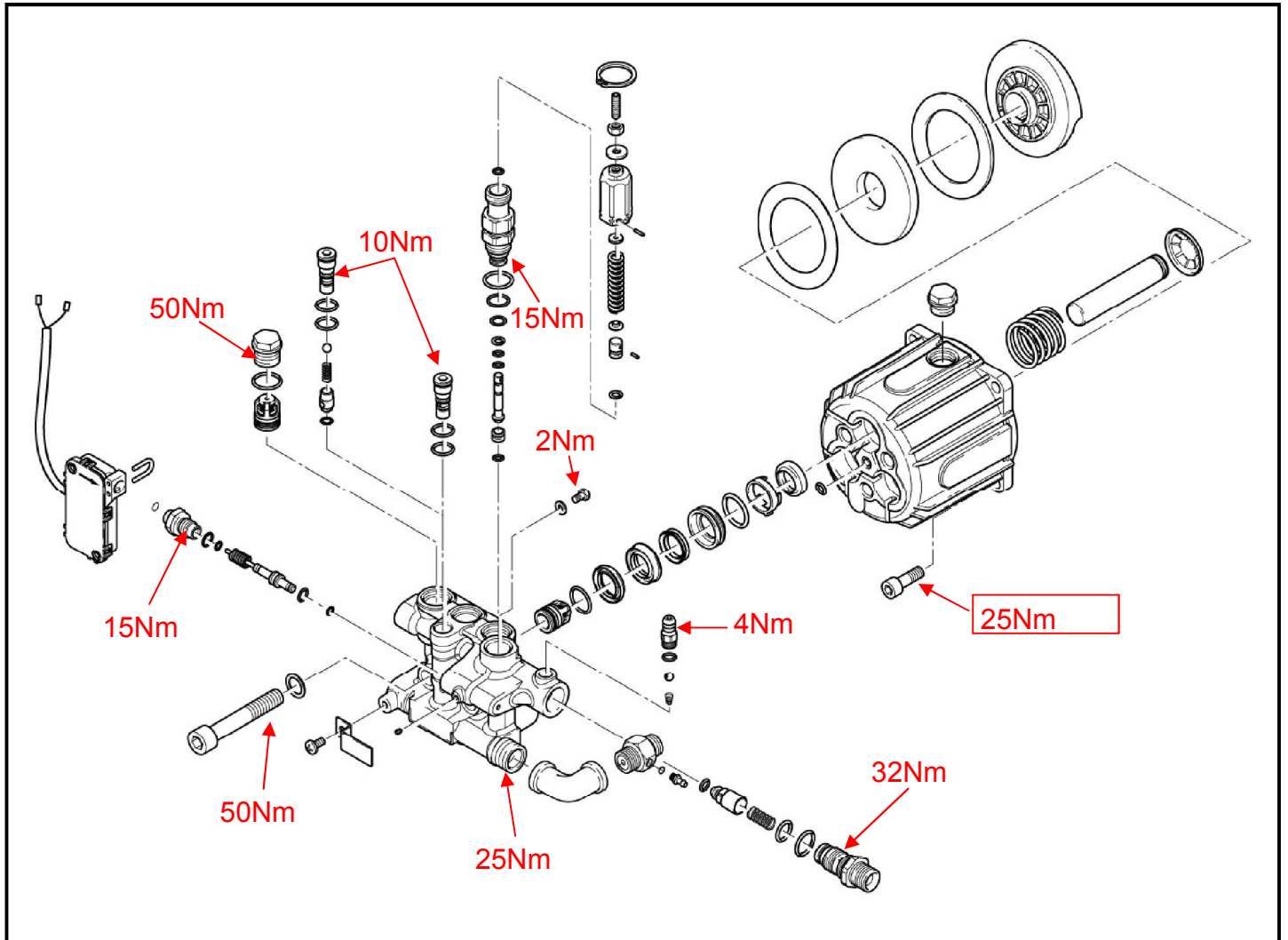


Fig.F.45: Pump unit complete

The function of the Neptune 2 Special pump is similar to the Neptune 2 pump. The assembling and disassembling of the pump parts must be made after the same principles. Follow the torque specifications by assembling.

Neptune 1

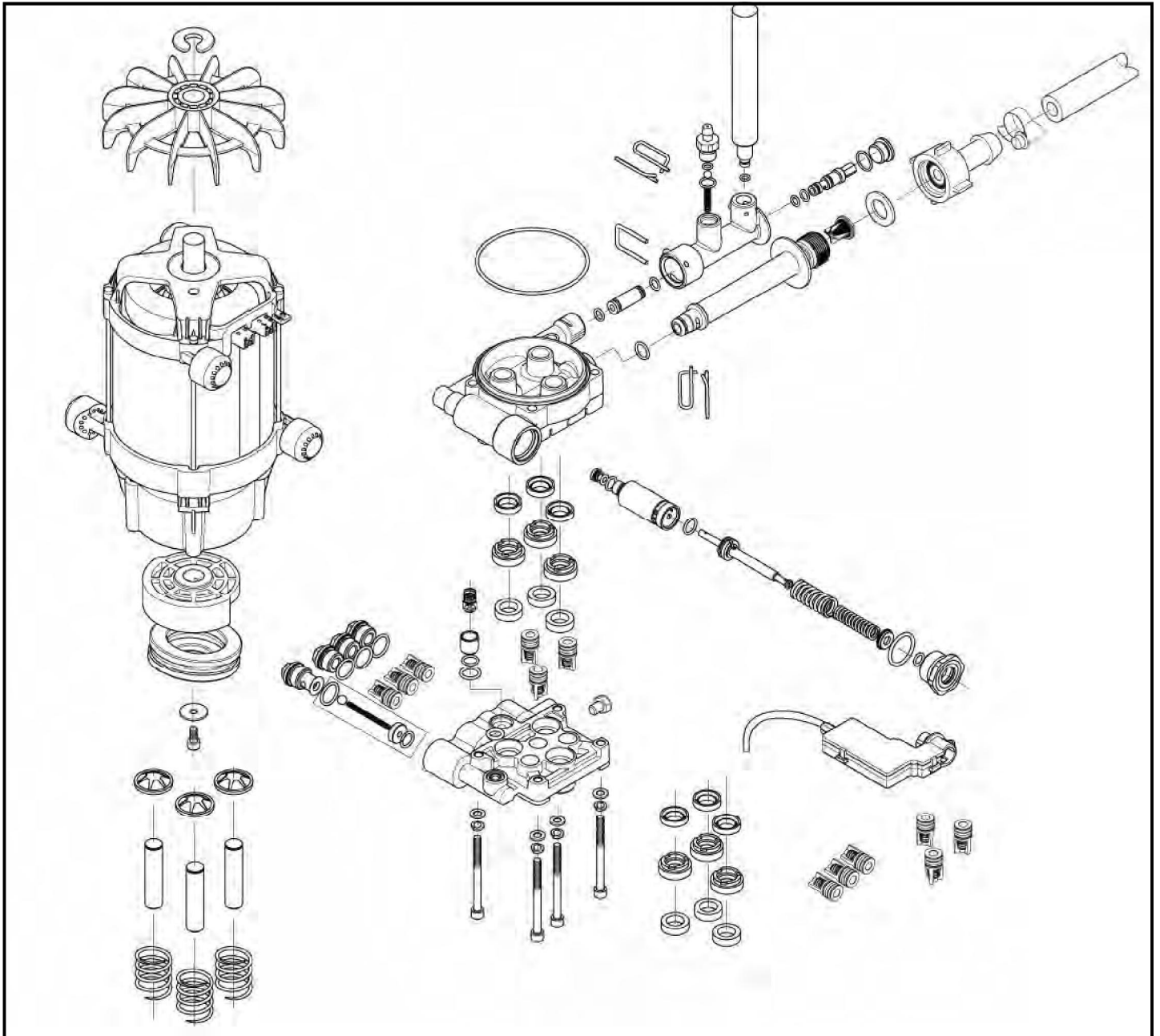


Fig.F.46: Motor/pump unit complete

Neptune 1

Motor cover



Fig.F.47: Neptune 1 pump

Neptune 1 pump is placed in the bottom cabinet part.

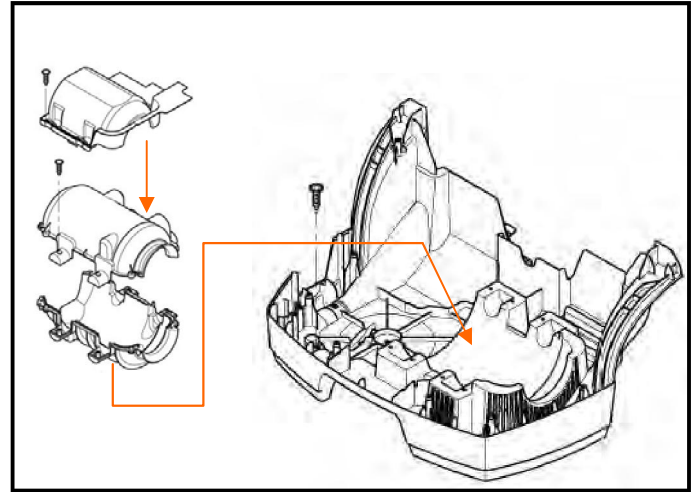


Fig.F.48:

- To repair plungers/seals the MP-unit has to be lifted out of the frame.
- Remove the motor cover.
- Lift MP-unit out of the frame.

Micro switch

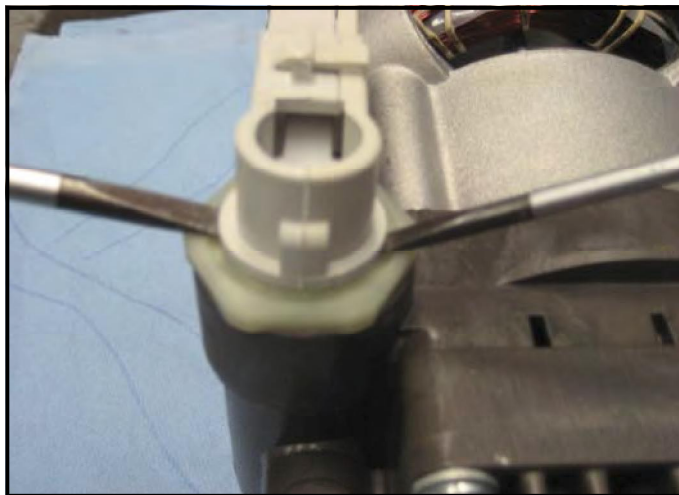


Fig.F.49: micro switch box

Remove micro switch box carefully with 2 screw drivers

Start/Stop valve



Fig.F.50: Start/stop valve

Before reassembling check the parts for damages

Neptune 1

Micro switch



Fig.F.51: Micro switch box

Remount the micro switch box.



Fig.F.52: Micro switch arm

Press down the micro switch arm with a screwdriver.

Valves

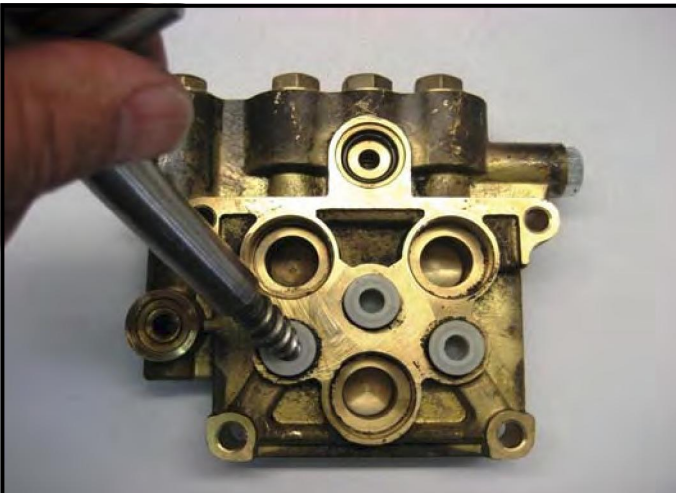


Fig.F.53: Seat for pressure valve

Remove the valve seats using a threaded pin or similar tool. Discard the valve seats.

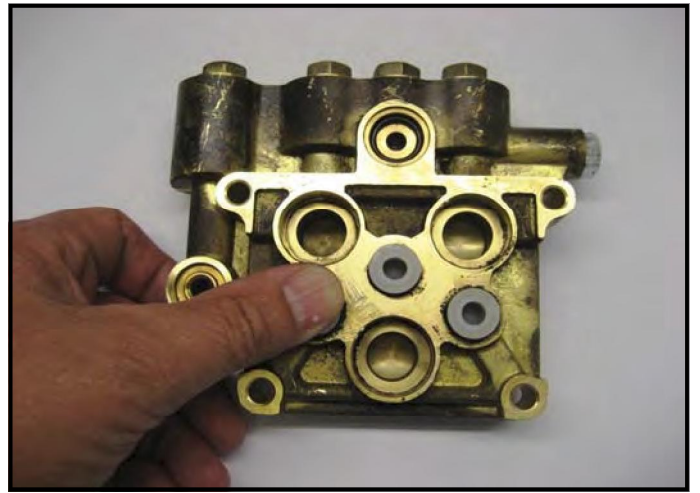


Fig.F.54: Seat for pressure valve

Insert new valve seats by pressing them into the cylinder head. Clean and lubricate before mounting.

Neptune 1



Fig.F.55: Suction valves

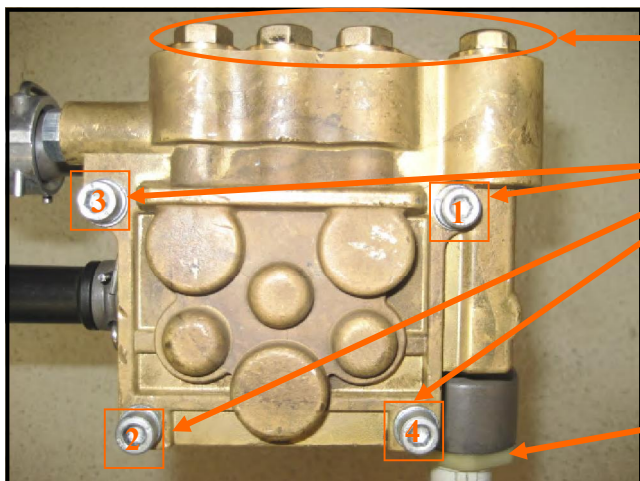
Remove the valve seats using a threaded pin or similar tool. Discard the valve seats.



Fig.F.56: Suction valves

Mount new valves with a slight finger pressure and special tool no.1220103

Torque



Use loctite 271— torque 20 Nm

Torque 16 Nm

Torque 10 Nm

Fig.F.57: Cylinder head

When mounting the cylinder head always tighten the bolts in the order 1-2-3-4 shown on Fig.F.55

Neptune 1

Easy start valve

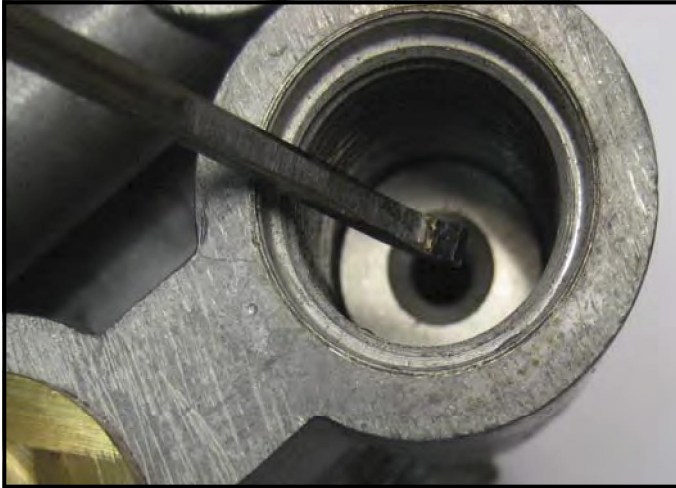


Fig.F.58: Easy start valve

Remove the seat for easy start valve with a small hook. Then remove the o-ring underneath the seat with a small screwdriver.



Fig.F.59: Seat for easy start valve

The slit in the easy start seat ensure the pressure drop from pump outlet to pump inlet, when the spray handle is released.

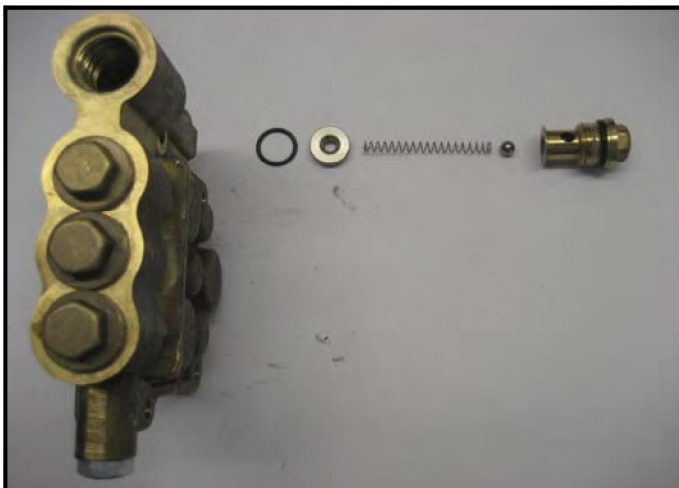


Fig.F.60: Easy start valve complete

Before reassembling of the easy start valve make sure that all parts are undamaged.



Fig.F.61: Easy start valve reassembling

By assembling place the ball on the end of the spring. Be sure the ball is in the right position when mounting the plug.

Neptune 1

Cylinder head

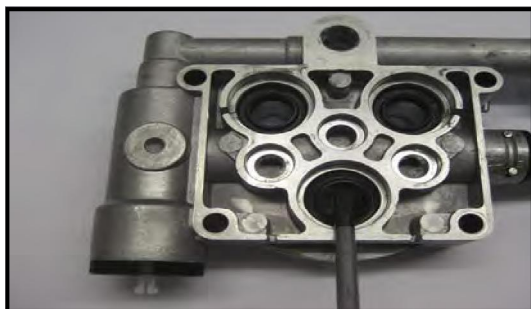


Fig.F.62: Cylinder head

Tip up the oil seal with a screwdriver and discard.
Clean up and lubricate before mounting.

Wobble disc & Bearing



Fig.F.63: Wobble disc

Inspect the wobble disc and pistons for damages and replace if necessary.



Fig.F.64: Wobble disc and bearing

By replacement of wobble disc, bearings and bearing tracks be aware of the two different bearing tracks.

Fig. F.62. Pos 1: The inner diameter of the bearing track fits around the wobble disc.

Fig.F.63. Pos 2: Place the bearing in right position in the bearing track.

Fig.F.64. Pos 3: Place the bearing track upon the bearing.



Fig.F.65: Wobble disc and bearing track

Oil fill



Fig.F.66: D-bearing cover comp.

When refilling pump oil, place the motor on the fan end.

Oil quantity: 100ml.

Electrical System - Maintenance

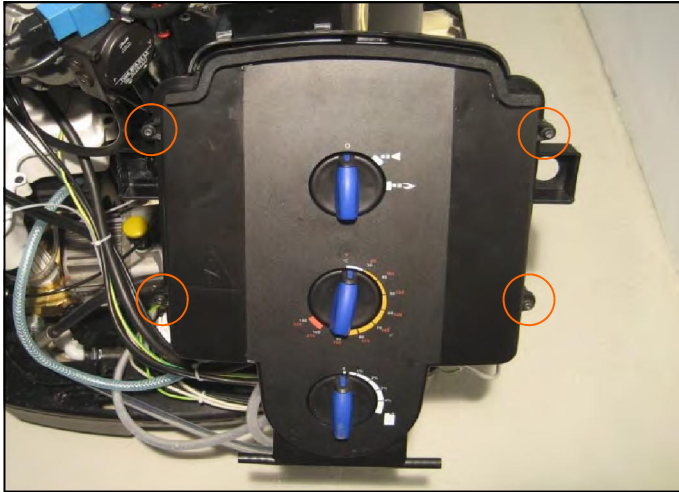


Fig.F.67: Electrical box

- **Caution !** Before any repair on the electrical system - **Pull out the power plug !**
- Remove the cover by loosening the 4 screws shown in the red circles.
- **Caution !** On 1 ~ machines capacitor might still be charged !



Fig.F.68: E box knob disassembly

- Loosen the screw in the bottom of the knob.
- Drag the knob out from the shaft.
-
- **Note !** When closing the electrical box, leave the wiring diagram inside.

The components in the E-box are shown by numbers in the wiring diagrams chapter H.

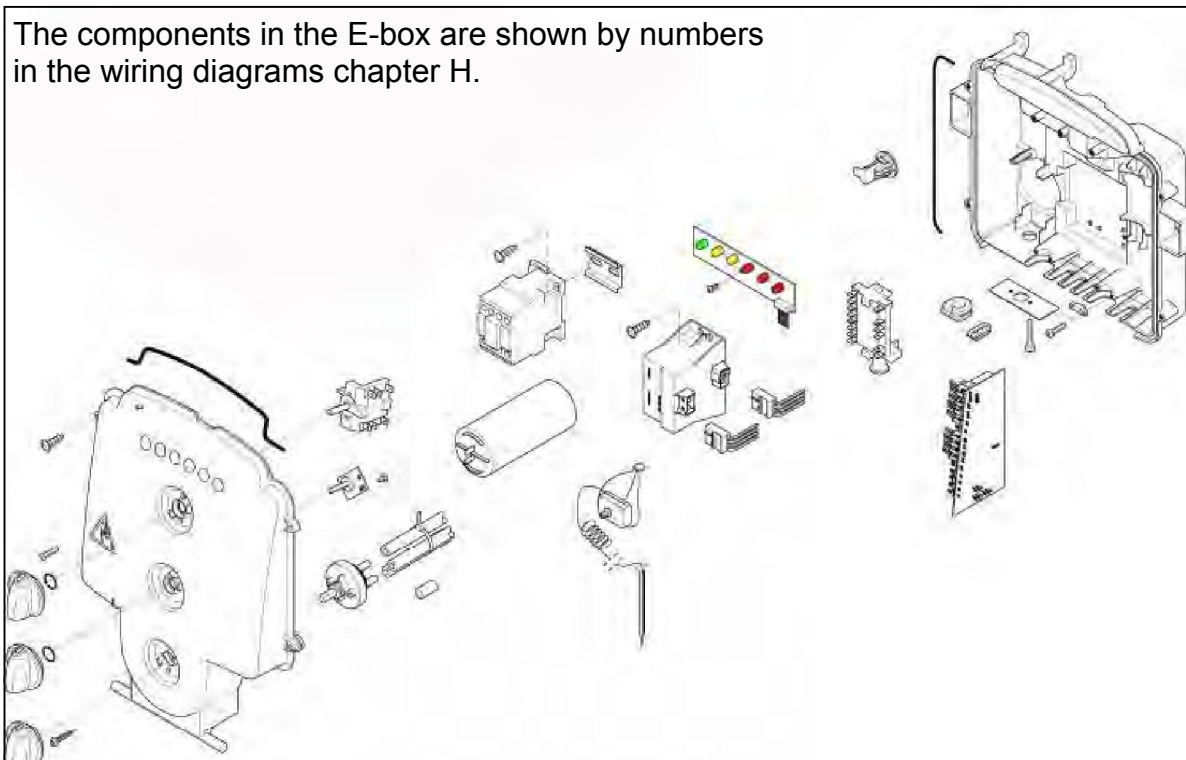


Fig.F.69: Electrical box - Exploded view.

Fuel tank.

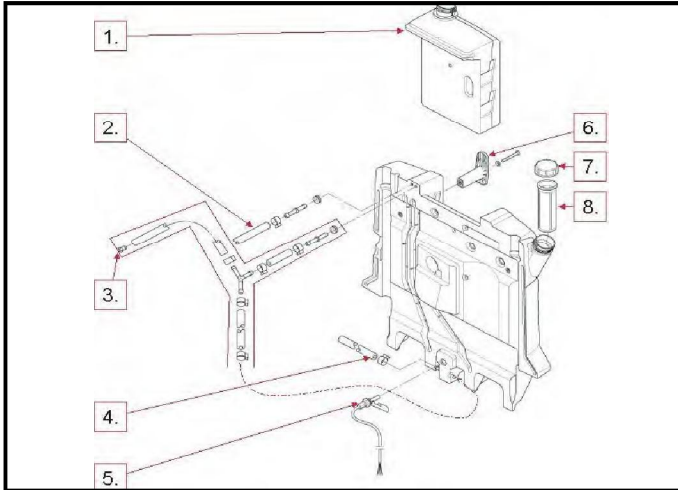


Fig.F.70: Fuel tank - Overview.

- | | |
|--------------------|------------------|
| 1. Detergent tank. | 5. Level sensor. |
| 2. Return hose. | 6. Cord hook. |
| 3. Venting system. | 7. Fuel lid. |
| 4. Outlet hose. | 8. Strainer. |



Fig.F.71: Fuel tank

- Dismount the 2 cord hooks on the back of the fuel tank.
- Dismount the detergent tank and the fuel hoses in the top of the fuel tank.
- Lift the tank of the wheel shaft.
- Empty the fuel of the tank.

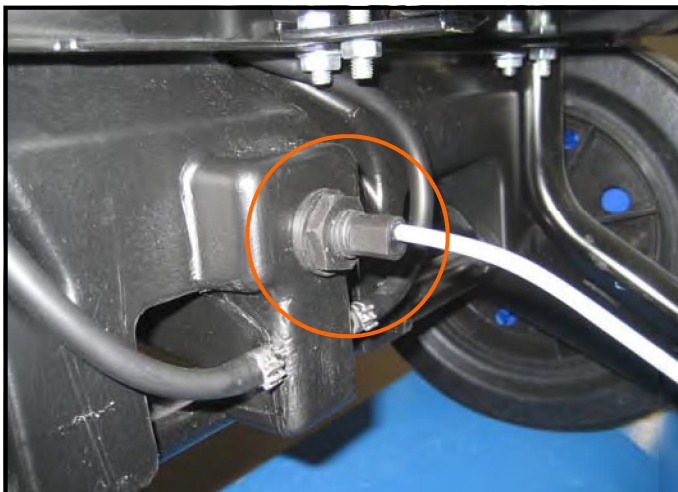


FIG.F. 72: Fuel level sensor

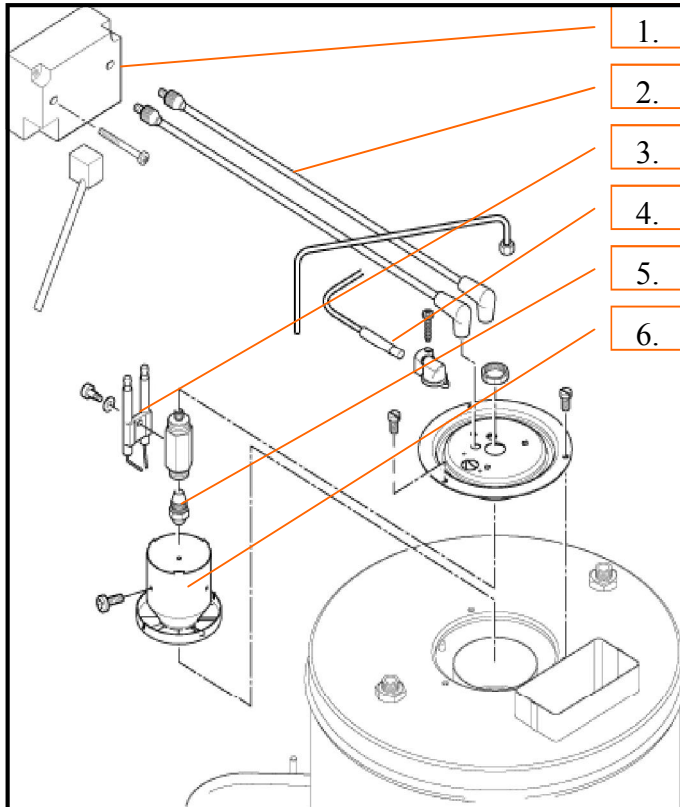
- Loosen the nut and drag out the sensor.
- Disconnect the plug on the cord and replace the sensor if necessary.



FIG.F.73: Fuel level sensor

- Check resistance.
- Empty tank - open.
- Full tank - closed.

Heating system.



There are no differences between the function of the Neptune 2 and the Neptune 3 ignition systems.

However there are used variants of the fuel nozzles and air distributors.

1. Ignition Transformer.
2. Ignition cords.
3. Ignition electrodes
4. Flame sensor.
5. Fuel nozzle.
6. Air distributor.

Fig.F.74: Distributer

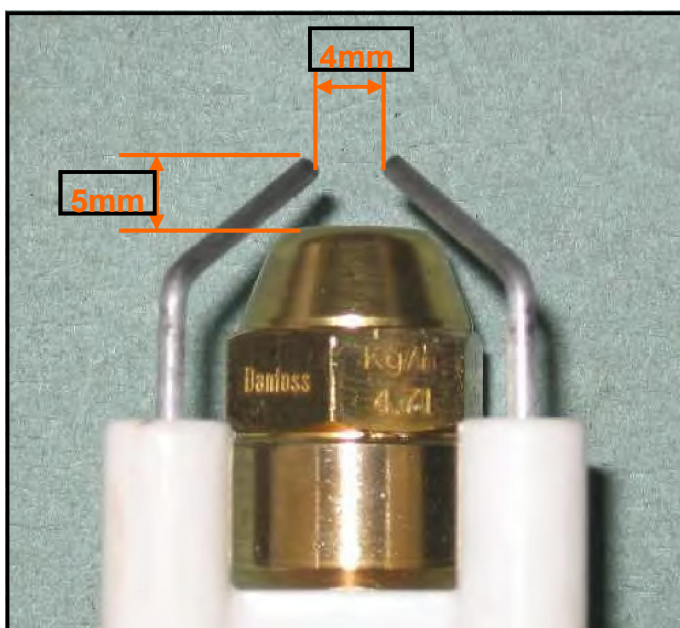


Fig.F.75: Fuel nozzle.

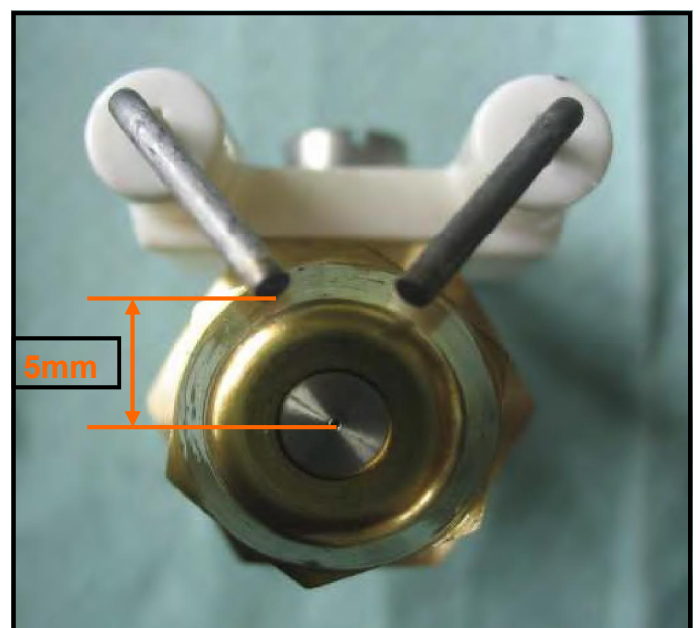


Fig.F.76: Fuel nozzle.

Burner Unit.

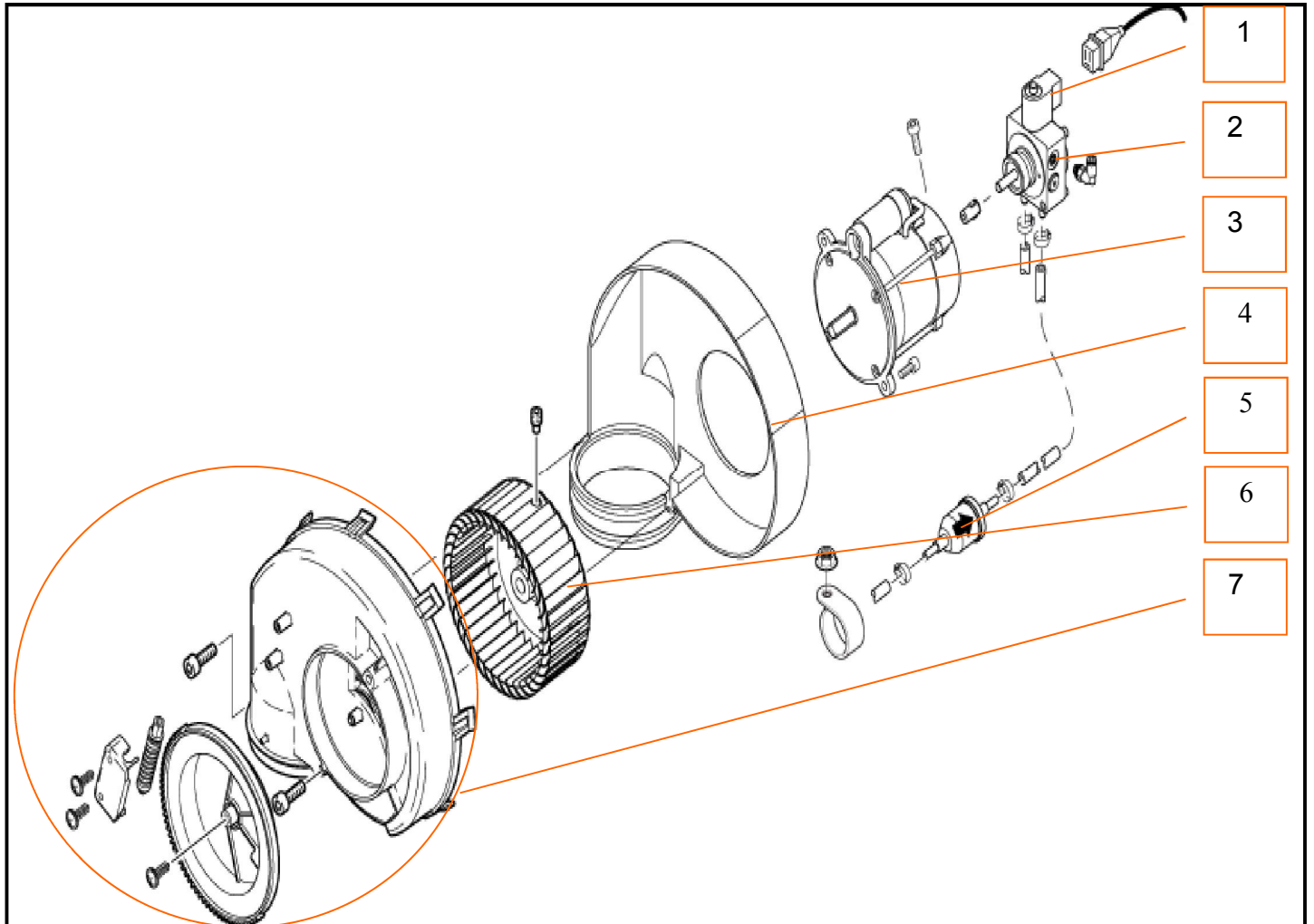
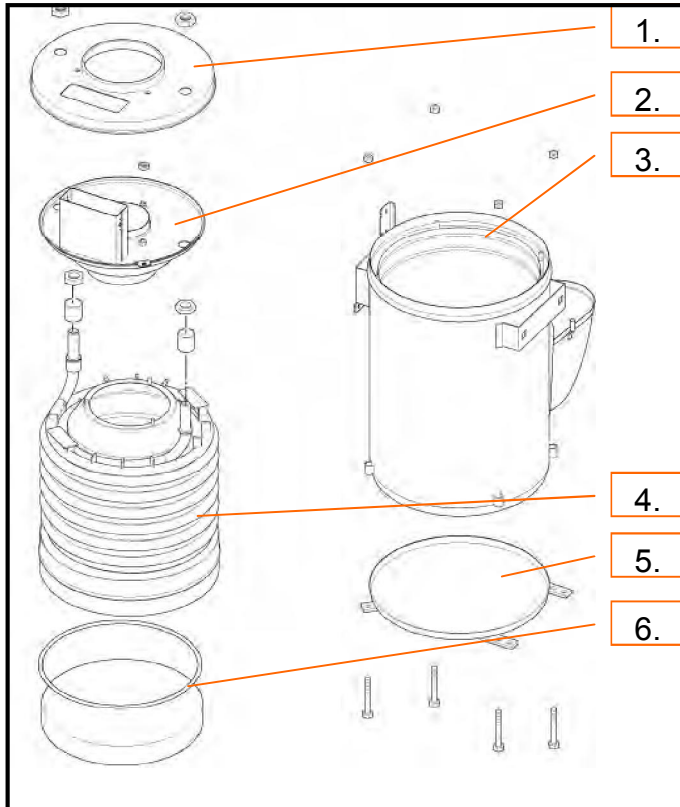


Fig.F.77: Burner unit.

1. Fuel solenoid
2. Fuel pump
3. Burner motor
4. Burner housing
5. Fuel filter
6. Fan
7. Fan cover



1. Boiler cover, outer.
2. Boiler cover/Flame tube.
3. Boiler shell.
4. Coil.
5. Boiler cover, bottom.
6. Insulation kit.

When the insulation needs to be replaced, please follow the guide line below:

Fig.F.78: Heat exchanger.



Fig.F.79: Heating coil.

Begin mounting the cord at the position shown on picture counter clock wise (straight arrow)



Fig.F.80: Heating coil.

Continue to mount the cord until tube crossing of inner and outer tube, see arrow on picture



Fig.F.81: Heating coil.

Turn round so the direction for mounting is now clock wise



Fig.F.82: Heating coil.

Continue mounting the cord clockwise

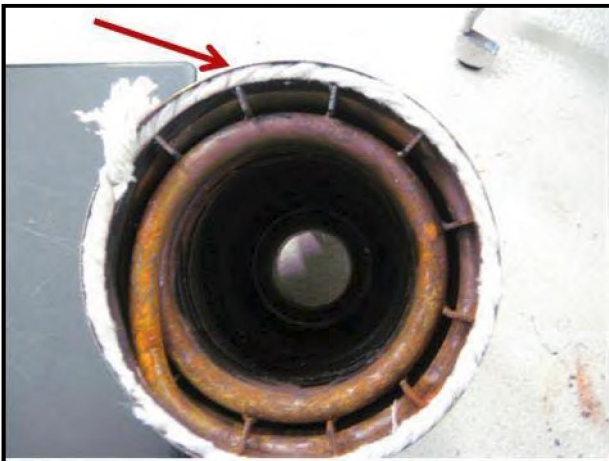


Fig.F.83: Heating coil.

Continue mounting the cord until the arrow on picture. App. Thread length is 160-170 cm.



Fig.F.84: Heating coil.

The final result

Safety valve—Flow valve.

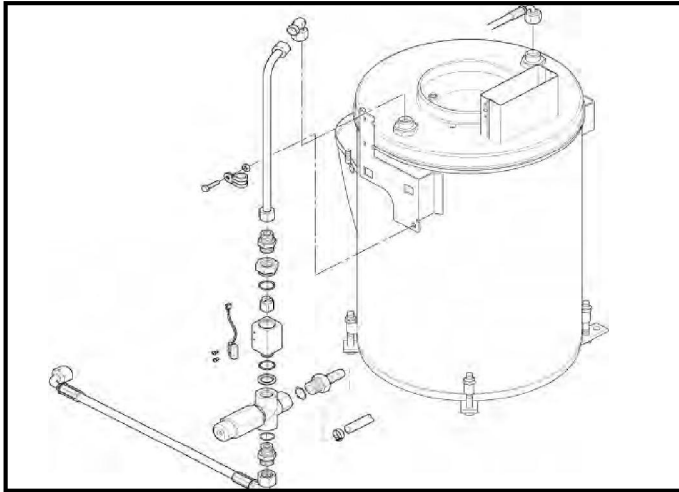


Fig.F.85: Safety valve and flow valve,

The flow valve and the safety valve is placed between the internal pressure hose and the bended pipe on the boiler inlet.

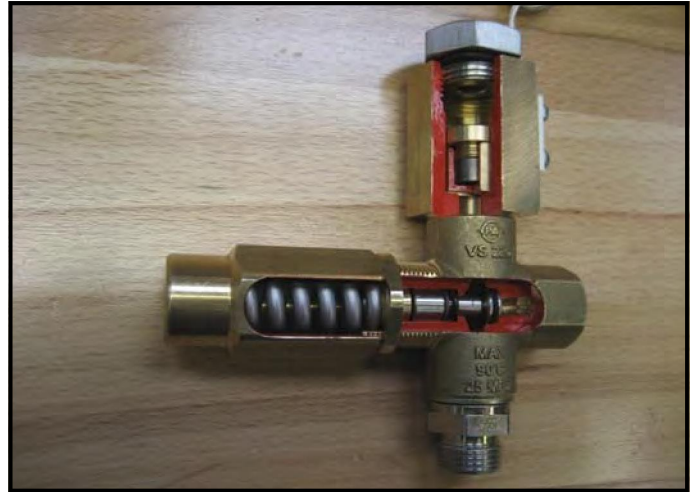


Fig.F.86: Safety valve and flow valve.

- Cut away of the safety valve and the flow valve.

Exhaust temperature sensor.

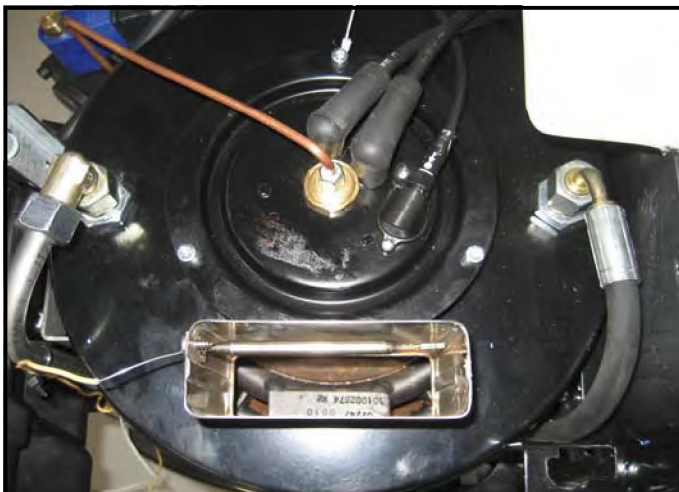


Fig.F.87: Temperatur sensor.

- The exhaust temperature sensor is fitted with 2 screws in the exhaust.

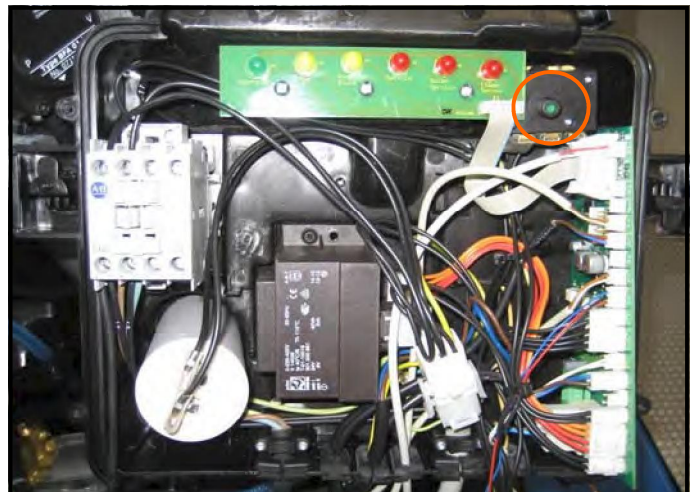


Fig.F.88: Temperatur relay.

If the exhaust temperature reaches 270C the machine cuts out. The relay placed in the E-box can be reset by pressing the green button.

Water break tank

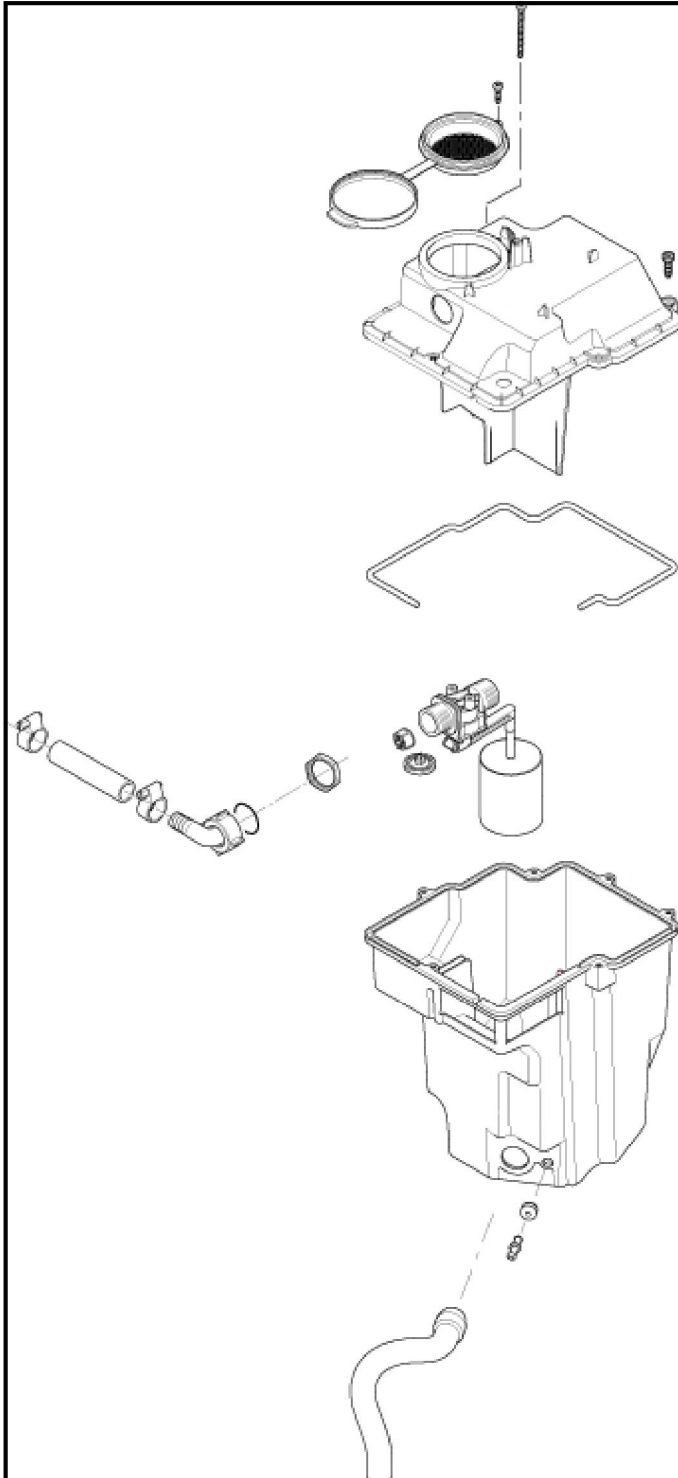


Fig.F.89: Water break tank.



Fig.F.90: Water break tank.

- Dismount the screws in the water tank lid.



Fig.F.91: Water break tank.

- Remove the water hose from the tank.
- Remove the water break tank from the machine.
- Remove the remaining hoses from the tank.
- Check float valve and replace if necessary.

Hose Reel - Maintenance



Fig.F.92: Hose Reel - Lock Bracket

- The crank/handle can be removed by the use of e.g. two screwdrivers.
- Beware not to damage the crank.



Fig.F.93: Hose Reel - Lock Bracket

- Pull lock bracket out to remove HP-hose.
- Connector/swivel and HP-hose can now be pulled apart.
- Note washer.
- Left-hand side is now free.



Fig.F.94: Hose Reel - Locks

- To release the right-hand side of the drum, press the two locks (arrow fig.F.64).
- The drum can now be lifted out from frame.



Fig.F.95: Hose Reel -

- To take the drum apart, the four screws, two on either side have to be removed.

Hose Reel - Maintenance



Fig.F.96: Connector and hose end-

- Inspect inner surface of connector.
- Inspect o-rings on the end-piece and replace if necessary.
- Grease the o-rings before assembly.

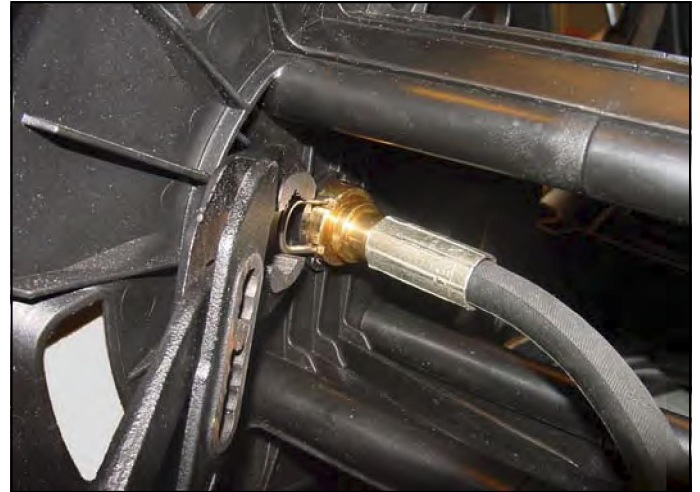


Fig.F.97: Hose reel assembling

- Beware not do damage o-rings at assembly.
- To ease assembly, use a combination pliers to hold the lock bracket.

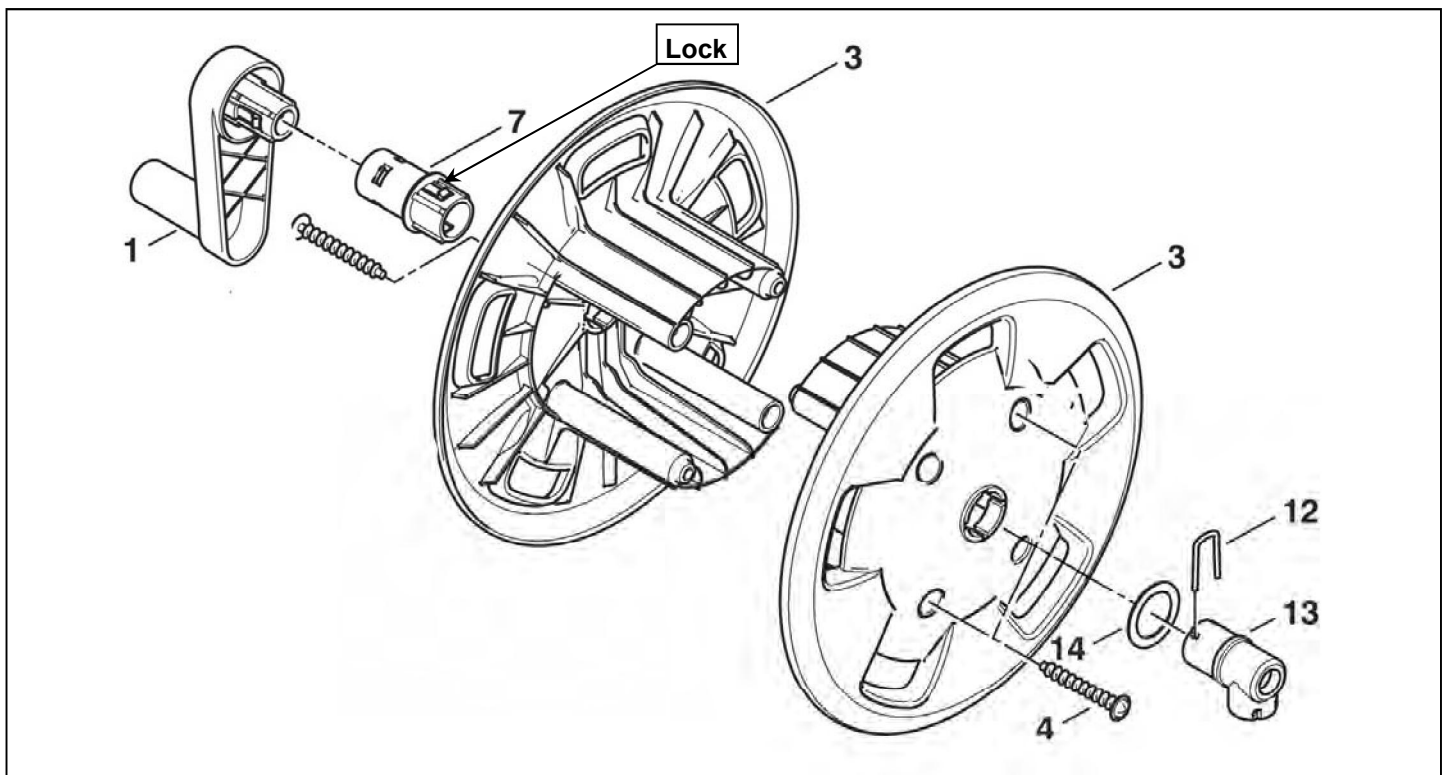


Fig.F.98: Hose Reel - Exploded View

Operating / Cut Off - Pressure Neptune 2



Fig.G.1: Pressure setting 1

- Mount test pressure gauge between HP-outlet and hose to get an accurate reading.
- Run the machine with the correct nozzle.
- Pressure should correspond with technical data chapter A.
- Close gun and note cut-off pressure.

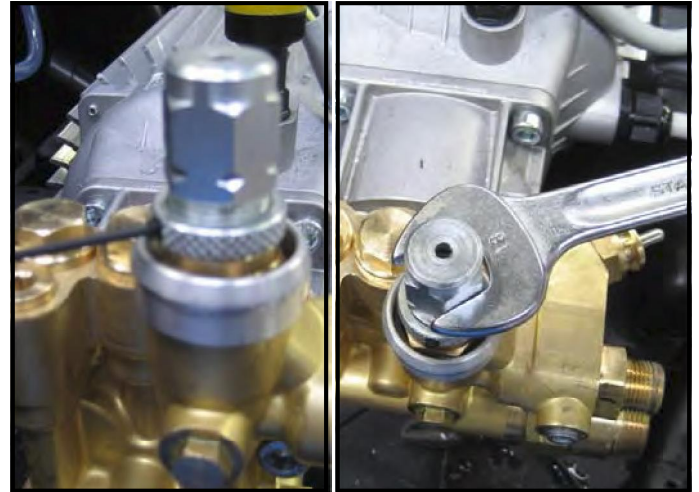


Fig.G.2: Pressure setting 2

- Use the gun to get a quick cut-off.
- Adjust if necessary by loosening crater screw, turn lock ring anticlockwise. Turn hexagon bolt.
- Adjust to maximum pressure minus X % according to technical data.
- Clockwise for higher cut-off pressure.
- Counter clockwise for lower cut-off pressure.

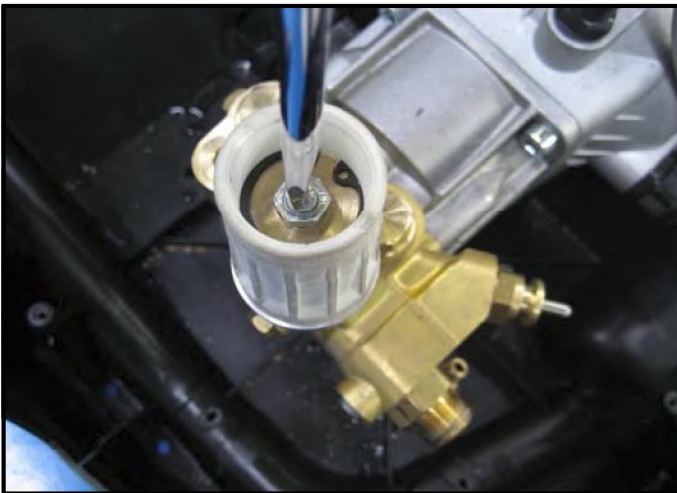


Fig.G.3: Pressure Testing 3

- Adjust the steam stage setting to 26-32 bar.
- Turn counter clockwise to reduce pressure and water volume.
- Run the machine to check correct adjustment.

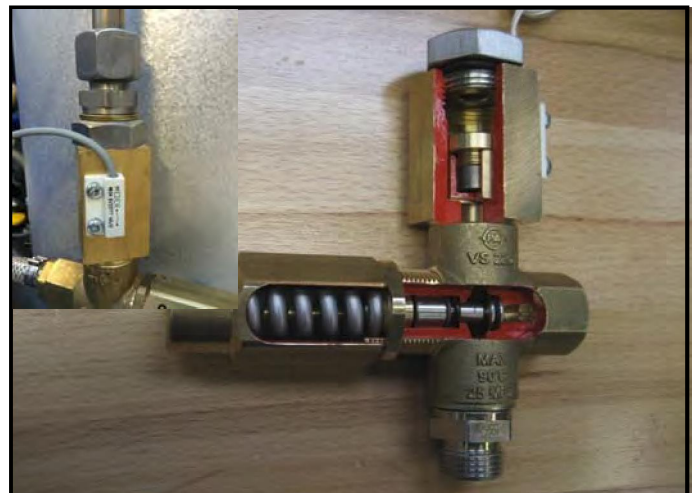


Fig.G.4: Safety valve and flow switch.

- The safety valve is preadjusted from factory.. To check the function, the spring must be released until the valve is leaking and then turned back to the starting point.
- The reed switch on the flow switch housing must be pushed ALL THE WAY UP, before the two screws are tightened.

Operating / Cut Off - Pressure Neptune 2 Special



Fig.G.5: Pressure setting 1

- Mount test pressure gauge between HP-outlet and hose to get an accurate reading.
- Run the machine with the correct nozzle.
- Pressure should correspond with technical data chapter A.
- Close gun and note cut-off pressure.

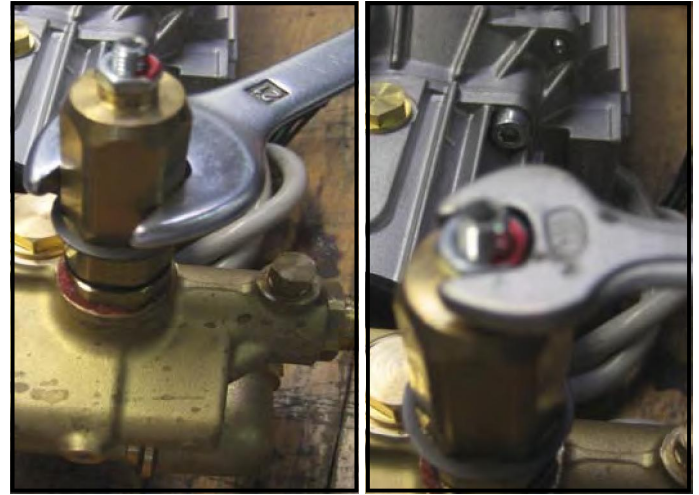


Fig.G.6: Pressure setting 1

- Make sure the end stop connector is tightened
- Loosening counter nut using a 10mm spanner.
- Use the gun to get a quick cut-off.

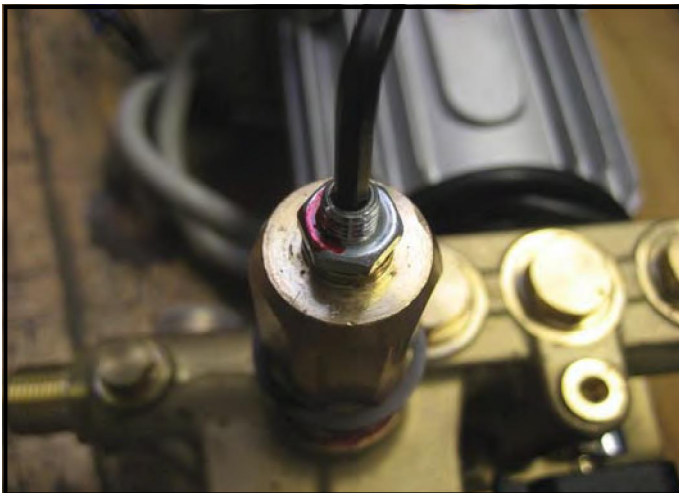


Fig.G.7: Pressure setting 1

- Open gun and read the pressure.
- Adjust to maximum pressure minus X % or as pressure @ Gun in technical data.
- Clockwise for higher cut-off pressure.
- Counter clockwise for lower cut-off pressure.
- Tighten the counter nut after adjustment.

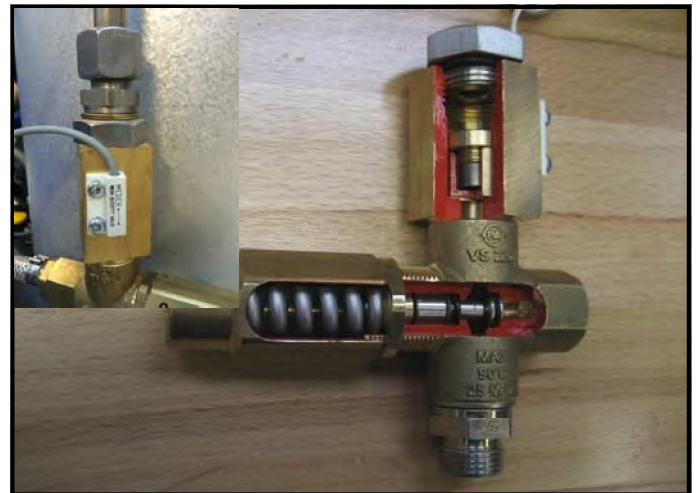


Fig.G.8: Safety valve and flow switch.

- The safety valve is preadjusted from factory.. To check the function, the spring must be released until the valve is leaking and then turned back to the starting point.
- The reed switch on the flow switch housing must be pushed ALL THE WAY UP, before the two screws are tightened.

Burner settings.

Note: Higher CO₂ concentrations at different barometric pressure, altitude or temperature and poor quality of the used fuel can lead to faster soot deposition on the heating coil of the heat exchanger.

Preparation

1. Set the fuel pressure.
2. Let the machine run in "Hot water" mode for at least two minutes so that it reaches operating temperature and meaningful results can be measured.

Note: Machines that are primarily used for a brief period should run continuously for about half an hour in "Hot water" mode before an exhaust measurement.

Measurement

3. Determine the soot rating with a soot pump and soot rating reference scale. The figure should not exceed "1". Otherwise, open the air flap a little and repeat the measurement. Repeat the procedure until the specified value is obtained.

4. Then the CO₂ content in the exhaust, the intake and exhaust temperature are determined. This can be done with conventional meters or with an electronic meter like the TESTO 325, which measures and displays all relevant data.

If the measured value is too low, close the air flap a little and check the soot rating and Co₂ content again.

Repeat all settings until all specified values are obtained.

5. Finally seal the set screw (arrow A) of the air flap with varnish.

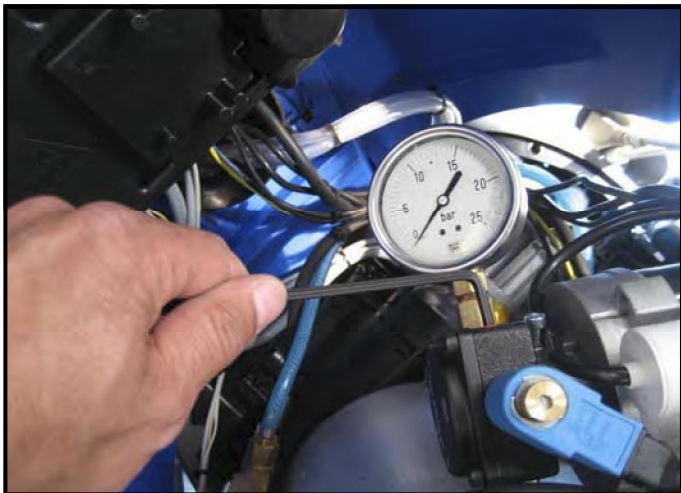


Fig.G.9: Fuel pressure setting.

- Mount pressure gauge on the fuel pump.
- Adjust the fuel pressure according to the values in Technical data chapter A.

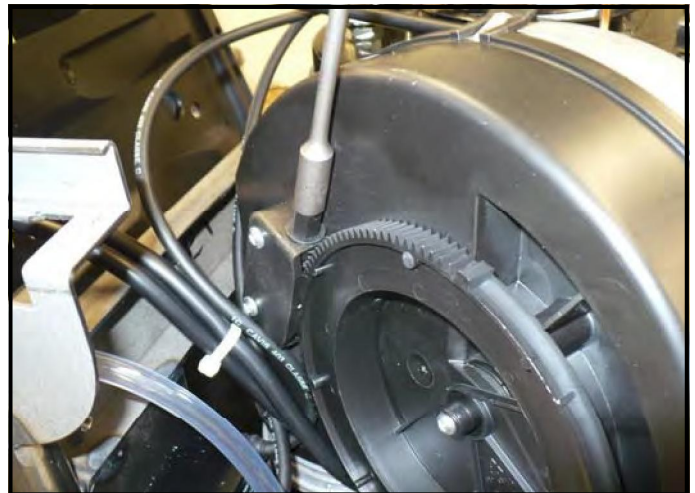


Fig.G.10: Air flap.

- The air flap on the side of the burner fan is adjusted by a self-locking spindle on a set screw. Turning clockwise increases the air intake, turning counterclockwise reduces it.

Service time setting.

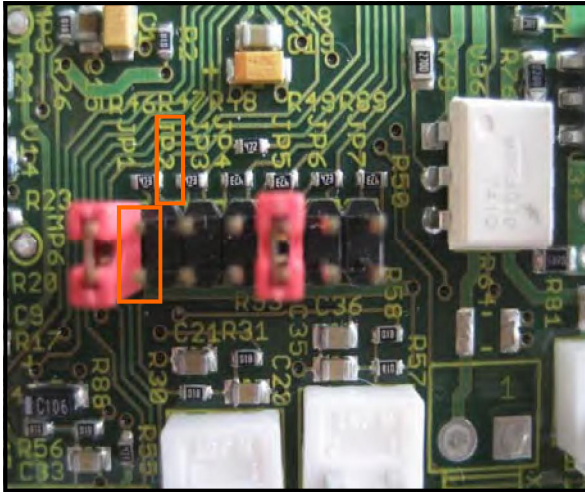


Fig.G.11: Jumper JP2.



Fig.G.12: S1 & S2 switches.

Step:

Switch the machine off with S1 (main switch).

Plug jumper on JP2.

Start the machine in cold water mode with S1 (main switch).

Old service time value is displayed for 5 seconds.

Choose with S2 (temp. Adjustment) the right service time : default value is 200hours.

Switch the machine to hot water mode with S1 (main Switch)

The new service time interval is now stored in the EEPROM..

The stored value is displayed at the led's and they are flashing.

Switch the machine off with S1 (main switch).

Remove the jumper from JP2.

Service Time	LED Operation	LED Fuel	LED Anti Stone	LED Service	LED Boiler Service	LED Flame Sensor
100h	OFF	OFF	OFF	OFF	regardless ON/OFF (EXH-T)	ON
200h	OFF	OFF	OFF	ON		ON
300h	OFF	OFF	ON	ON		ON
400h	OFF	ON	ON	ON		ON
500h	ON	ON	ON	ON		ON

Fig.G.13: LED lights.

Adjusting the K1 / K2 delay time in Neptune 2 Software Rev 0.3

Step

- :
- 1 Switch the machine off with S1(main sitch).
 - 2 Plug jumper on JP6.
 - 3 Start the machine in cold water mode with S1(main switch).
 - 4 The old K1 / K2 delay time value is displayed for 5 Seconds.
 - 5 Choose with S2 (temperatur adjust) the right delay time:

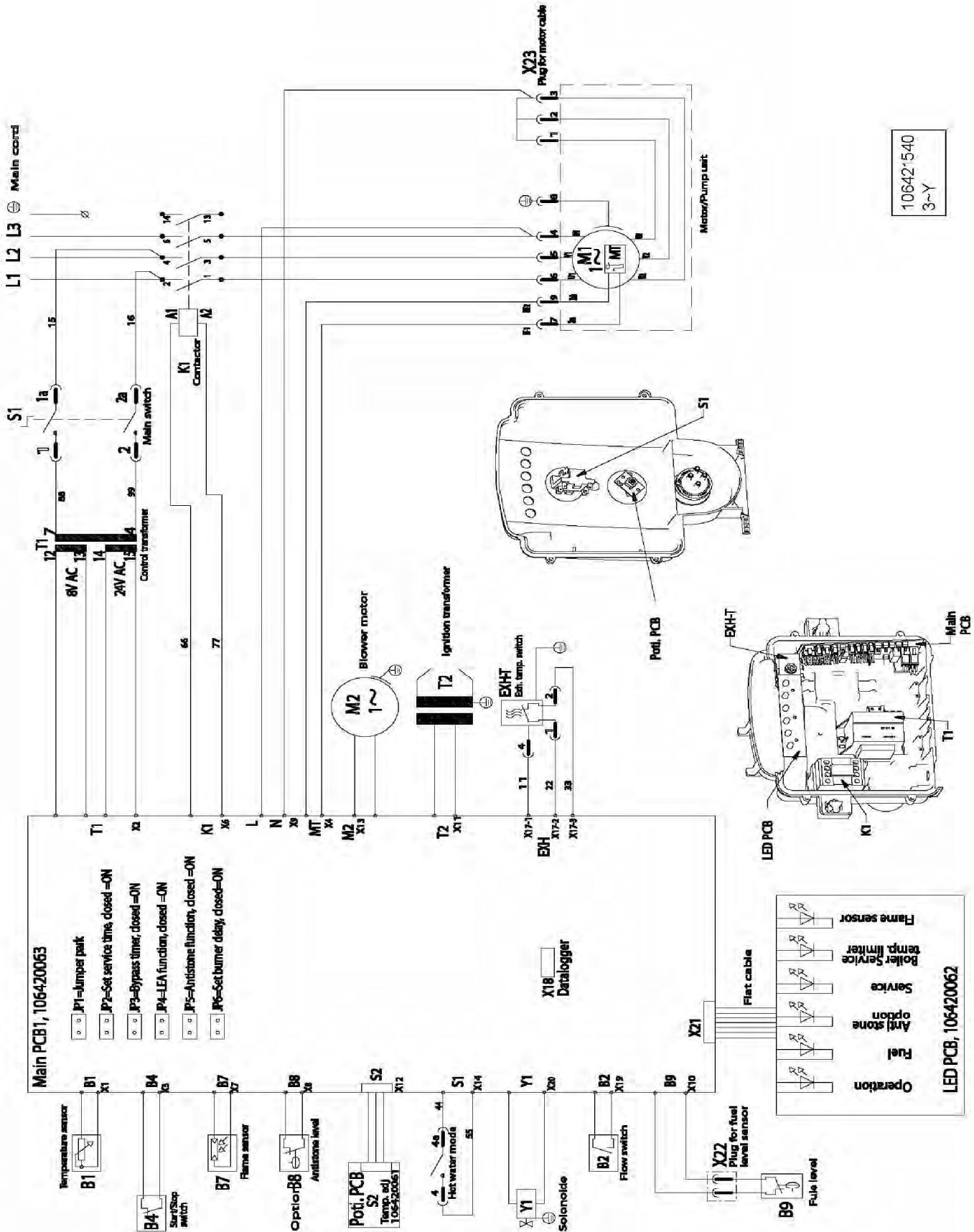
Delay Time	LED Operation	LED Fuel	LED Anti Stone	LED Service	LED Boiler Service	LED Flame Sensor
0,0 s	OFF	OFF	OFF	OFF	regardless ON/OFF (EXH-T)	ON
0,2 s	OFF	OFF	OFF	ON		ON
0,4 s	OFF	OFF	ON	ON		ON
0,6 s	OFF	ON	ON	ON		ON
1,0 s	ON	ON	ON	ON		ON

default
value: 0,4
s

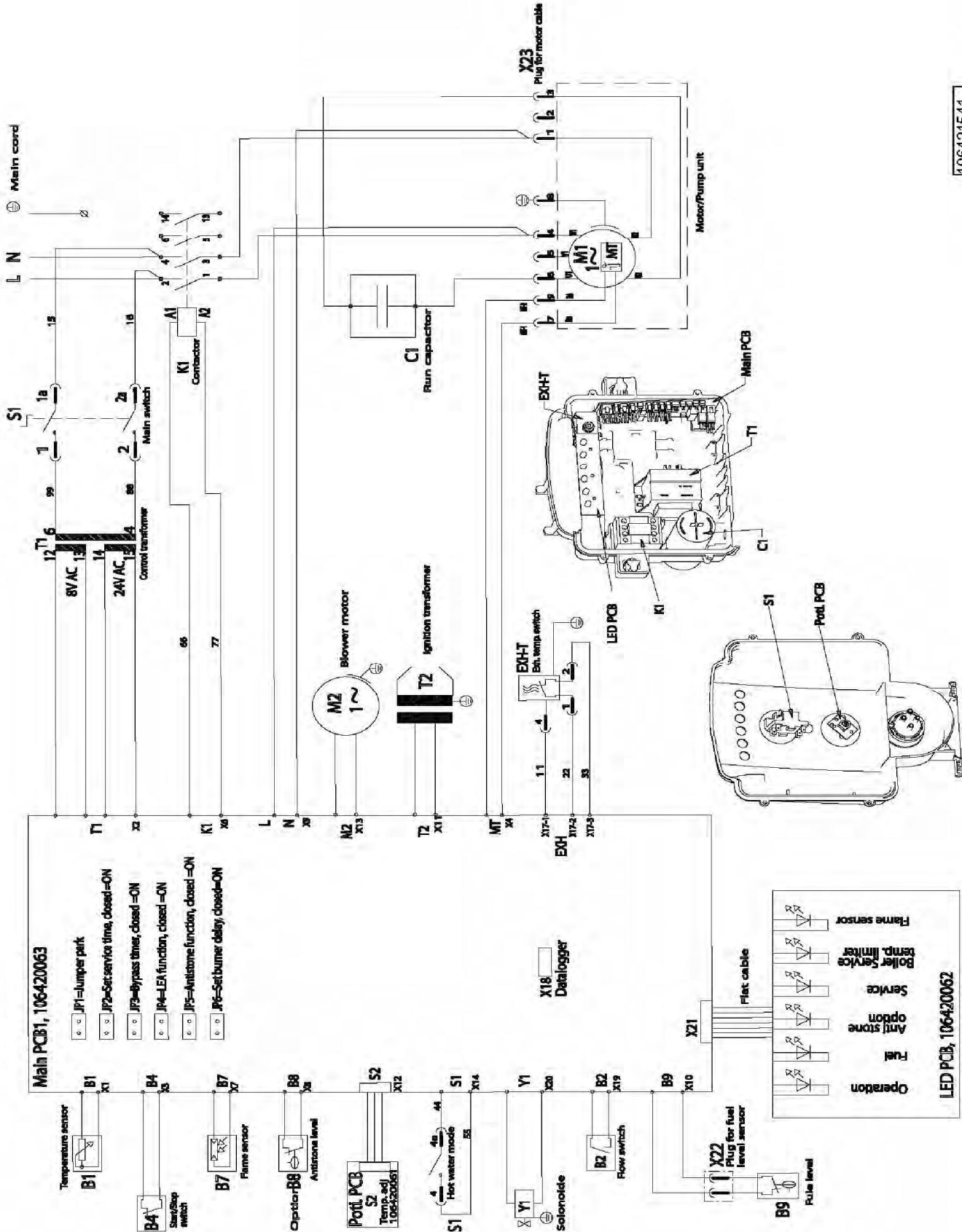
- 6 Switch the machine to hot water mode with S1(main switch).
- 7 The new K1 / K2 delay time is now stored in the EEPROM.
The stored value is displayed at the led's and they are flashing.
- 8 Switch the machine off with S1(main switch).
- 9 Remove the Jumper at JP6

Fig.G.14: K1 & K2 delay time.

Neptune 2

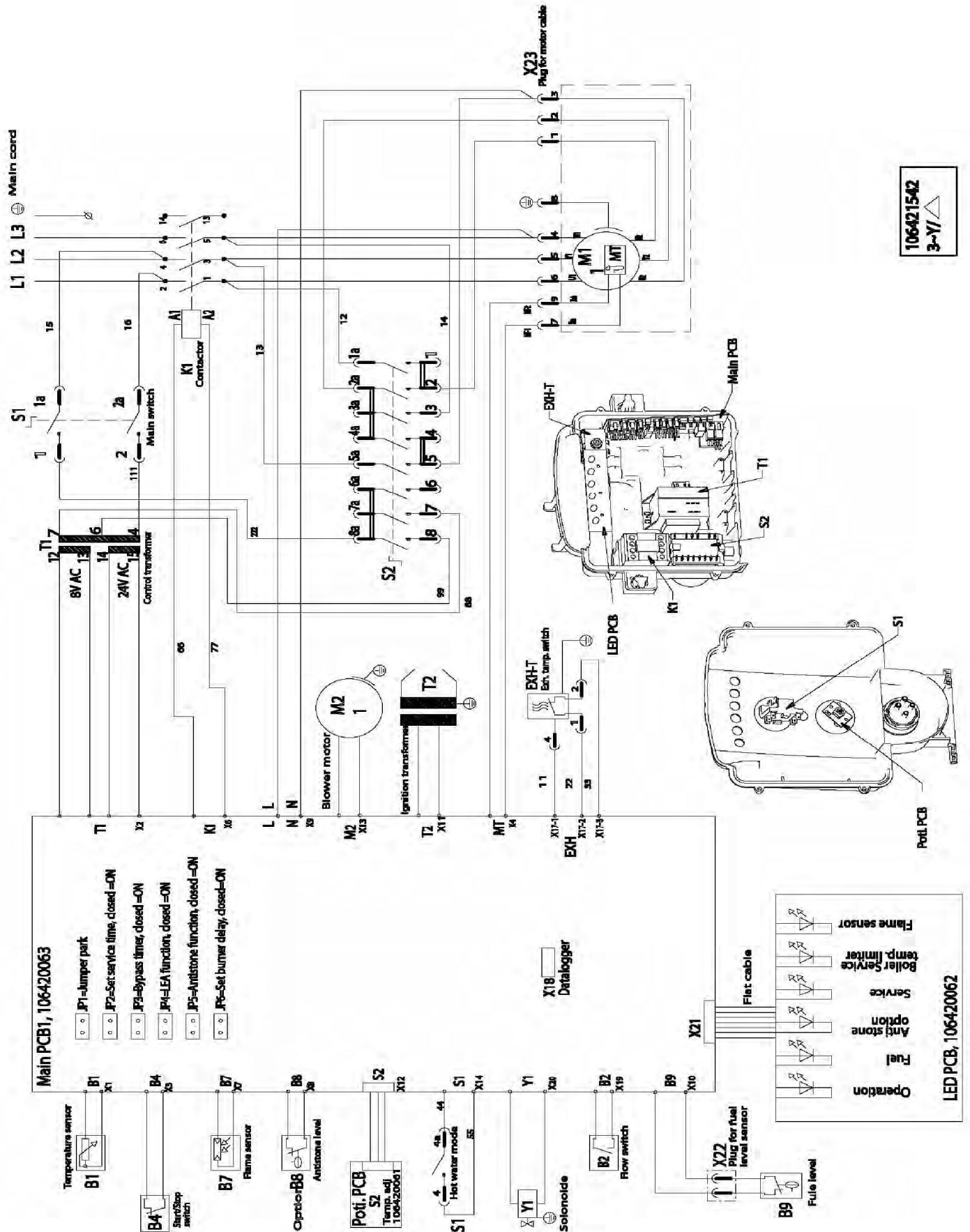


Neptune 2



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1~230V

Neptune 2



106421542
3-Y/△

<http://www.nilfisk-alto.com>

HEAD QUARTER

DENMARK

Nilfisk-Advance Group Sognevej 25
DK-2605 Brøndby Tel.: +45 4323
8100 Fax: +45 4343 7700 E-mail:
mail.com@nilfisk-advance.dk

SALES COMPANIES

AUSTRALIA

Nilfisk-ALTO
48 Egerton St.
P.O. Box 6046
Silverwater, N.S.W. 2128
Tel.: +61 2 8748 5966
Fax: +61 2 8748 5960

AUSTRIA

Nilfisk-Advance GmbH
Nilfisk-ALTO
Metzgerstrasse 68 5101
Bergheim/Salzburg Tel.:
+43 662 456 400-0 Fax:
+43 662 456 400-34
E-mail: info@nilfisk-alto.at
www.nilfisk-alto.at

BELGIUM

Nilfisk-ALTO Division of
Nilfisk-Advance n.v.s.a.
Internationalelaan 55 (Gebouw C3/C4)
1070 Brussel Tel.: +32 02 467 60 40
Fax: +32 02 466 61 50 E-mail:
info.be@nilfisk-alto.com

CANADA

Clarke Canada Part of the
Nilfisk-Advance Group
4080 B Sladeview Crescent, Unit 1
Mississauga, Ontario L5L 5Y5
Tel.: +1 905 569 0266
Fax: +1 905 569 8586

CHINA

Nilfisk-Advance (Shenzhen) Ltd. Blok
3, Unit 130 1001 Honghua Road Int.
Commercial & Trade Center Futian
Free Trade Zone 518038 Shenzhen
Tel.: +86 755 8359 7937 Fax:
+86 755 8359 1063

CZECH REPUBLIC

ALTO Česká Republika
s.r.o. Zateckých 9 14000
Praha 4 Tel.: +420 24 14 08
419 Fax: +420 24 14 08 439
E-mail: info@alto-cz.com

DENMARK

Nilfisk-Advance A/S Industrivej
1 9560 Hadsund Tel.: +45
7218 2100 Fax: +45 7218
2105 E-mail:
salg@nilfisk-alto.dk E-mail:
service@nilfisk-alto.dk
www.nilfisk-alto.dk

Nilfisk-ALTO Food division Division of
Nilfisk-Advance A/S Blytækkervej 2 9000
Aalborg Tel.: +45 7218 2100 Fax: +45
7218 2099 E-mail:
scania.technology@nilfisk-alto.dk

FINLAND

Nilfisk-Advance Oy Ab Piispantilankuja
4 02240 Espoo Tel.: +358 207 890 600
Fax: +358 207 890 601 E-mail:
jukka.lehtonen@nilfisk-alto.com
www.nilfisk-advance.fi

FRANCE

Nilfisk sk-ALTO
ALTO France
SAS
Aéroport 1 19 rue Icare
67960 Entzheim Tel.:
+33 3 88 28 84 00 Fax:
+33 3 88 30 05 00
E-mail:
info@nilfisk-alto.fr
www.nilfisk-alto.com

GERMANY

Nilfisk-ALTO Division of
Nilfisk-Advance AG
Guido-Oberdorfer-Strasse 10
89267 Bellenberg Tel.: +49
0180 5 37 37 37 Fax: +49 0180
5 37 37 38 E-mail:
info@nilfisk-alto.de www.nilfisk-
sk-alto.de

GREECE

Nilfisk-Advance SA 8,
Thoukiddou str. 164 52
Argiroupolis Tel.: +30 210 96
33443 Fax: +30 210 96 52187
E-mail: nilfisk-advance@clean.gr

HOLLAND

Nilfisk sk-ALTO Division of
Nilfisk-Advance BV
Camerstraet 9 3322 BB
Almere Tel.: +31 36 546 07 60
Fax: +31 36 546 07 61 E-mail:
info.nl@nilfisk-alto.nl www.nilfisk-
sk-alto.nl

HONG KONG

Nilfisk sk-Advance Ltd. 2001 HK
Worsted Mills Ind'l Bldg. 31-39
Wo Tong Tsui St. Kwai Chung
Tel.: +852 2427 5951 Fax: +852
2487 5828

HUNGARY

Nilfisk-Advance Kereskedelmi Kft.
II. Rákóczi Ferenc út 10 2310
Szigetzentmiklos-Lakihegy Tel.:
+36 2447 5550 Fax: +36 2447
5551 E-mail:
info@nilfisk-advance.hu www.nilfisk-
sk-advance.hu

ITALY

Nilfisk-ALTO Divisione di
Nilfisk-Advance A/S Località
Novella Terza 26852 Guardamiglio
(LO) E-mail:
d.puglia@nilfisk-advance.it

JAPAN

Nilfisk-Advance Inc. 1-6-6
Kita-shinyokohama, Kouhoku-ku
Yokohama, 223-0059 Tel.: +8145 548
2571 Fax: +8145 548 2541

MALAYSIA

Nilfisk-Advance Sdn Bhd
Sd 14, Jalan KIP 11
Taman Perindustrian KIP
Sri Damansara 52200
Kuala Lumpur Tel.: +60 3
603 6275 3120 Fax: +60 3
603 6274 6318

MEXICO

Nilfisk-Advance de Mexico, S. de R.L. de C.V.
Prol. Paseo de la Reforma 61, 6-A2 Col.
Paseo de las Lomas 01330 Mexico, D.F. Tel:
+52 55 2591 1002 (switchboard) Fax: +52 55
2591 1002 ext. 229 E-mail:
info@advance-mx.com www.nilfisk-
sk-advance.com.mx

NEW ZEALAND

Nilfisk-ALTO, Division of Nilfisk-Advance NZ
Private Bag 92829 6 Rockridge Avenue
Penrose, Auckland Tel: +64 9 525 0092 Fax:
+64 9 525 6440

NORWAY

Nilfisk sk-Advance AS
Bjørnerudveien 24 1266
Oslo Tel.: +47 22 75 17 70
Fax: +47 22 75 17 71
E-mail: info@nilfisk-alto.no
www.nilfisk-sk-alto.no

POLAND

Nilfisk-Advance Sp.
Z. O. O. 05-800 Pruszków
ul. 3-go MAJA 8
Tel.: +48 22 738 37 50
Fax: +48 22 738 37 51
E-mail:
info@nilfisk-alto.pl
www.nilfisk-alto.pl

PORTUGAL

Nilfisk sk-ALTO Division of
Nilfisk-Advance Lda. Sintra
Business Park Zona Industrial
Da Abrunheira Edificio 1, 1º A.
P2710-089 Sintra Tel.: +35 808
200 537 Fax: +35 121 911 2679
E-mail: mkt@nilfisk-advance.es

RUSSIA

Nilfisk-Advance LLC Vyatskaya
str. 27, bld. 7 127015 Moscow
Tel.: +7 495 783 96 02 Fax: +7
495 783 96 03 E-mail:
info@nilfisk-advance.ru

SINGAPORE

Nilfisk-Advance Pte. Ltd. Nilfisk sk-ALTO
Division 40 Loyang Drive Singapore
508961 Tel.: +65 6 759 9100 Fax: +65
6 759 9133 E-mail:
sales@nilfisk-advance.com.sg

SPAIN

Nilfisk-ALTO Division of
Nilfisk-Advance S.A. Torre
D'Ara Paseo del Rengle, 5 Pl.
10 08302 Mataró Tel.: +34 902
200 201 Fax: +34 93 757 8020
E-mail: mkt@nilfisk-advance.es

SWEDEN

ALTO Sverige AB Member of
Nilfisk-Advance Group
Aminogatan 18, Box 4029 431 04
Mölndal Tel.: +46 31 706 73 00
Fax: +46 31 706 73 40 E-mail:
info@nilfisk-alto.se www.nilfisk-
sk-alto.se

TAIWAN

Nilfisk-Advance Taiwan Branch
No. 5, Wen Fang Road Taipei
Tel.: +886 227 002 268 Fax:
+886 227 840 843

THAILAND

Nilfisk-Advance Co. Ltd. 89 Soi
Chokechai-Ruammit
Viphavadee-Rangsit Road Ladyao,
Jatuchak, Bangkok 10900 Tel.: +66
2 275 5630 Fax: +66 2 691 4079

TURKEY

Nilfisk-Advance Profesyonel
Temizlik Ekipmanları Tic. A/Ş. Necte
Cad. No: 48 Yenisahra / Kadıköy
İstanbul Tel.: +90 216 470 08 - 60
E-mail: info.tr@nilfisk-advance.com
www.nilfisk-advance.com.tr

UNITED KINGDOM

Nilfisk sk-ALTO Division of
Nilfisk-Advance Ltd. Bowerbank
Way Gilwilly Industrial Estate,
Penrith Cumbria CA11 9BQ Tel.:
+44 1 768 86 89 95 Fax: +44 1
768 86 47 13 E-mail:
sales@nilfisk-alto.co.uk
www.nilfisk-alto.co.uk

USA

Nilfisk sk-Advance Inc. 14600
21st Avenue North Plymouth,
MN 55447-3408 Tel.: +1 800
969 2235 Fax: +1 800 969
6566 E-mail:
info@advance-us.com
www.advance-us.com

VIETNAM

Nilfisk-Advance Representative Office
No. 46 Doc Ngu Str. Ba Dinh Dist.
Hanoi Tel.: +84 4 761 5642 Fax: +84 4
761 5643 E-mail: nilfisk@vnn.vn