vft vallfirest
the wildfire company

User manual

BP4 Motor Pump

Vers. 07.15.2021

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SAFETY SYMBOLS

This manual identifies potential hazards and includes safety messages identified by a safety warning symbol indicating a hazard that may cause serious injury or death if you don't follow the recommended precautions.
This manual uses two more words to highlight information:

IMPORTANT: brings attention to special mechanical information.
NOTE: highlights general information worth special attention.

1. INTRODUCTION

Please read the manual before operating the VFT BH1-4H Motor Pump to be aware of the necessary instructions for use, service and maintenance. If you need technical assistance, parts or additional information, please contact our customer service.

customer.service@vallfirest.com | Tel. (+34) 93 867 87 79.

This equipment is designed to work in any external conditions of temperature, wind or rain. However, it must be operated by qualified personnel with experience extinguishing wildland fires.

2. SAFETY INFORMATION

2.1. SAFETY PRECAUTIONS ⚠

1. READ THIS MANUAL BEFORE OPERATING YOUR MOTOR PUMP

Improper use of the VFT BP4 pump may cause serious injury and damage to the pump. All operators must be familiar with the device and its capabilities before trying to operate the equipment in an emergency situation. Read this manual completely before using your VFT BP4 motor pump and abide by all personal safety warnings.

2.2. WARNINGS ⚠

1. Always use protection for your eyes and ears as well as gloves to protect your hands when operating the motor pump.

2. Do not operate if you are mentally or physically fatigued.

3. Always inspect the hoses and pipes to prevent injury due to an explosion.

4. Use only pipes, hoses and accessories of the same or higher maximum pressure classification as the pump, as shown below, or in accordance with the maximum pressure for which the system was designed, whichever is lower.

5. Do not make any changes and/or modifications to the pump. Any modification of this kind not only voids the pump warranty but may make the unit hazardous for anyone operating the pump.

6. Do not operate the pump above the maximum nominal pressure.

7. Always operate the unit at a lower pressure than required for enhanced operator and equipment safety.

8. Slowly close the valves and use slow-close valves whenever possible to avoid any danger for other line operators and prevent water hammer which could damage the pump and pipe components.

9. Bleed all pressure from the system before doing any service work on the pump.

10. Never operate the pump in a closed or confined area. The exhaust fumes contain carbon monoxide which is toxic for humans. Avoid inhaling exhaust fumes.

11. Carefully reload the motor. Gas and diesel are inflammable and the fumes from the gas may explode. Refuel in a well-ventilated area with the motor off.

12. Stay alert and never touch any part of the exhaust system on the motor (muffler, shield, header pipes, etc.) while the motor is on. Always wait long enough after stopping the unit to adequately cool the muffler and surrounding parts.

13. For safety reasons, do not pump corrosive or inflammable liquids such as gasoline or acids. Avoid corrosion in the pump. Do not pump seawater, chemical solutions or caustic liquids such as used oil, wine or milk.

14. This motor pump is specifically intended for firefighting. A safety distance must be kept between the person operating the motor pump and everyone nearby. Do not use the motor pump for any purpose other than as specified in this manual.

15. Do not shoot water at any person with the motor pump as this could cause serious injury. It is not intended for recreation. It is only intended for professional use.

16. To operate the motor pump, make sure you have enough light either from the natural environment or artificial light outside the motor pump (minimum 5 Lux).

17. In the event of an accident, contact the official medical emergency service in your area.

2.3. PREVENTING DAMAGE TO THE EQUIPMENT

The following recommendations will help prevent damage to your equipment:

1. Rinse the pump with clean water if the pump has been used to pump salt or dirty water or water with a high mineral content or which contains residue or foam-injected water. Check to make sure all residue is removed for using the pump again.

2. Always vacuum water with a suction hose filter.

3. Drain all the water from the pump, collectors and lines in freezing weather. You can also pour a little anti-freeze into the pump and have it circulate through the pump and pipe system.

4. Let the motor heat up before using the unit at maximum performance.

5. Always use lead-free gas or gas at the octane recommended by the manufacturer.

6. Always make sure the correct quantity of oil has been blended with the gasoline. Read the manual for the exact percentage of oil to be blended.

7. Pumps must not be operated without water or without releasing the water. Operate the pump so it does not overheat and cause damage to the seals or inside of the pump.

8. Make sure to correctly fill the pump before starting it and avoid closing the water release when the pump is on.

9. Use replacement parts supplied by Vallfirest to avoid damage and/or lose the warranty covering this product.

3. GENERAL DESCRIPTION

3.1. VFT BP4 MOTOR PUMP

The BP4 is a motor pump that combines maximum performance with a small size and low weight. This performance is provided by the revolutionary Thor 130 motor from the famous competition motorcycle manufacturer POLINI. It's a very compact and light low-consumption motor with immense power and optimal features with all regimes which gives the pump maximum performance at all times.
The motor couples to the pump via a quick anchoring system and stays in place with a bracing system for quick pump changes.
The BP4 is mounted on the 4-phase VFT4SP pump. This pump performs the best of all the pumps of the same type and is capable of propelling water long distances. This motor pump may be used when long hoses, high pressure and high performance are required.

1. It's very simple to use and features an easy-start system.

2. The built-in electronics stop the motor when the pump has no water, among other features.

3. A special muffler significantly reduces the noise level.

4. It has different standard fuel connection systems such as "Mercury" and "Chrystler".

5. The compact, robust base protects the pump and motor at all times in addition to providing an easy hold for mobility and starting. It is also designed to be used with a VFT hose pack.

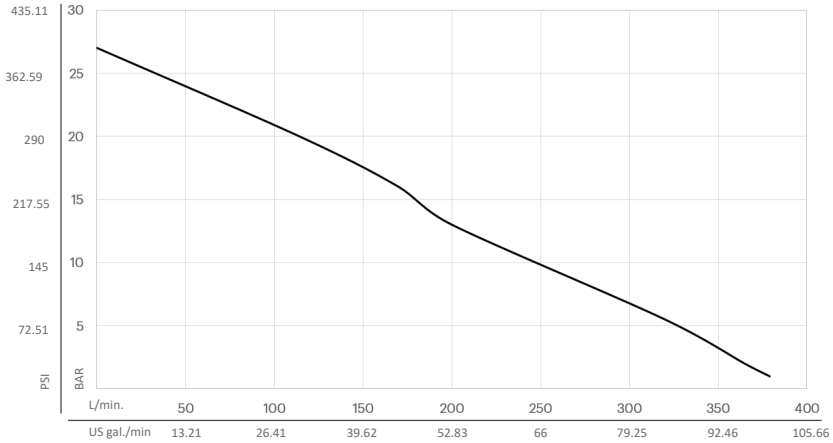
This motor pump is designed to meet the requirements of wildland, industrial and household firefighting.

· Noise level: 104 db

This product is compliant with Directive **2006/42/EC** as well as standard **UNE-EN-14466:2006+A1 2009**. For further details, please see the Declaration of Conformity for the product.

If you need technical assistance, parts or additional information, please contact our VALLFIREST Customer Service (customer.service@vallfirest.com // Tel.: +34 938678779). Have the model and serial number for your product with you.

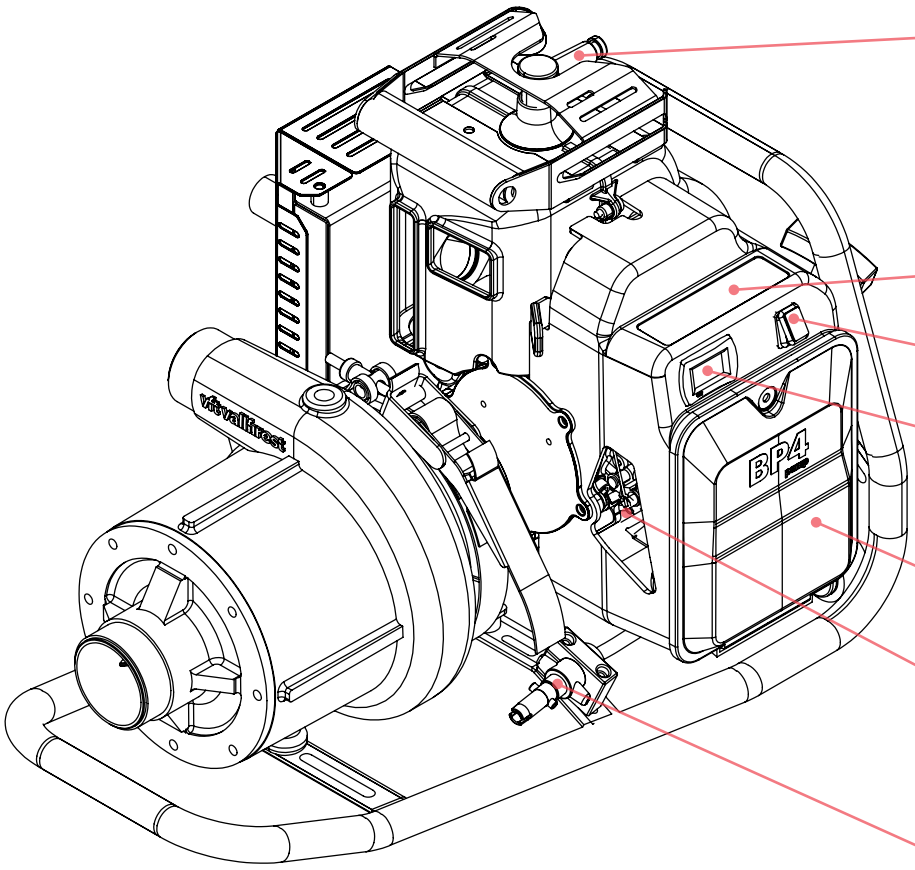
The following image shows the location of the model and serial number on the product.

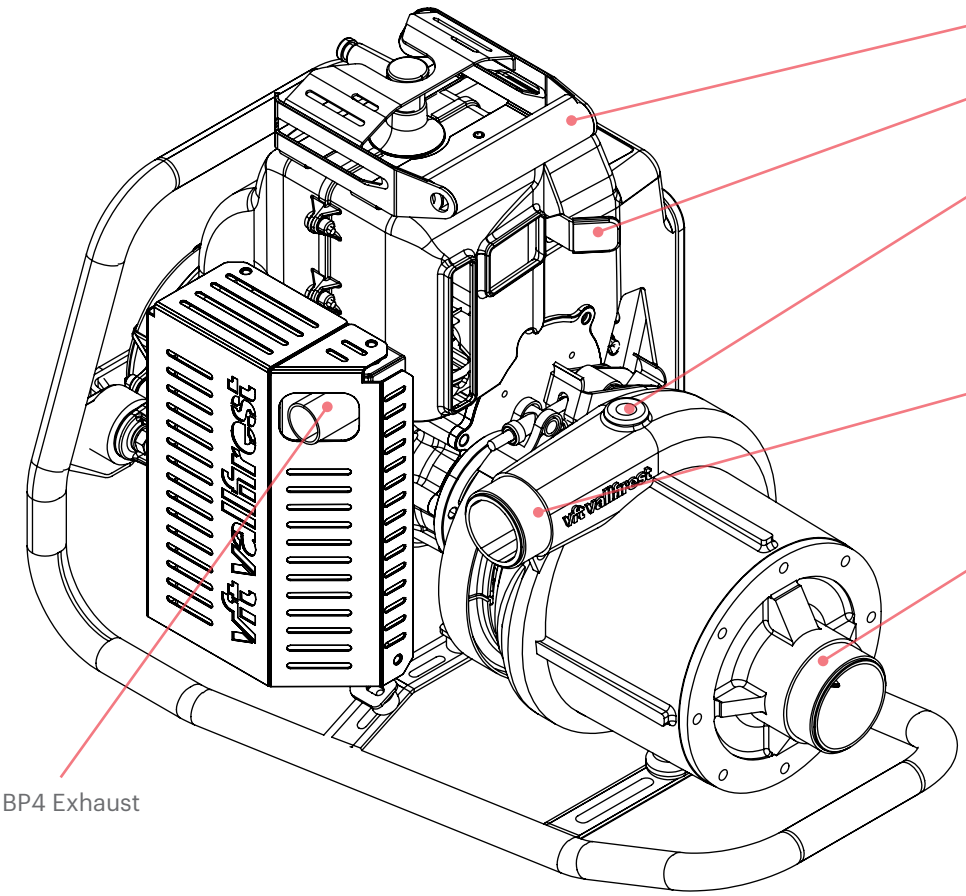


BP4 Performance Data

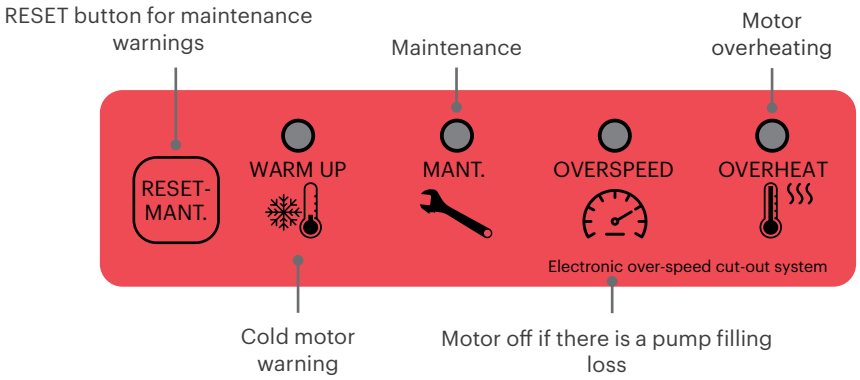
Maximum flow rate	370 l/m
Maximum pressure	26.2 bar
Max. Water meters	267 mH2O

Pressure		Flow	
[Bar]	[PSI]	[L/m]	[U.S. GPM]
15	217.55	180	47.5
10	145	245	65
5	72.51	325	85.9


Spark plug tube
Control panel
On/Off switch
Tachometer (Hours/Rpm)
Air filter cap
Motor carburation access
Fuel inlet
BP4


Grip Handle
Gas lever
1/4” BSPT thread connection
1/2” NPSH thread connection
2” NPSH thread connection
BP4 Exhaust

CONTROL PANEL



1.**RESET - MANT.**: Hold down for 5 seconds to reset the maintenance warning indicator.

2.**WARM UP**: This indicator turns on when the motor is too cold to operate.

3.**MANT.**: This indicator turns on after 20 hours of operation. Do all maintenance operations indicated in this instructions manual on pg. 15. Reset after completing maintenance.

4.**OVERSPEED**: This indicator turns on when the motor pump is working too hard; it lowers the accelerator speed.
The motor stops automatically if the unit may be damaged.
If the motor turns off, pull on the pull cord again with the button in the ON position to re-start.

5.**OVERHEAT**: This indicator turns on when the motor overheats. It lowers the motor speed to 1/4 to lower the operating temperature range and the fan continues to operate. If the problem persists, stop the motor completely and refer to troubleshooting pg. 29.

4. OPERATING INSTRUCTIONS

4.1. INITIAL CHECKS

Before using the pump, follow this procedure:

1. When you receive and unbox your BP4 motor pump, visually inspect the product and make sure there is no damage. Contact your Vallfirest representative or customer service if you see any imperfections:
customer.service@vallfirest.com | Tel. (+34) 93 867 87 79.

2. Before the first use, prepare the motor which comes dry. Before each subsequent use, check the levels and refill as necessary.

- Motor/mechanism fuel level.

3. Check that all suction and release hoses are structurally firm and show no leakage.

4. Inspect all safety characteristics and make sure they are in good conditions before using the pump.

5. Each time you plan on using the pump, check that it was not damaged during prior use. Notify your superior if the equipment requires repairs. Remember that damaged equipment may expose you to safety risks.

4.2. WATER FILLING AND SUCTION

1. Insert the foot valve with the filter into the suction oversleeve.

2. Fill the suction oversleeve with water.

3. Connect the suction oversleeve to the pump and check that it is well-adjusted.

4. Connect the filling pump to the pump outlet and bellows until water comes out of the hole on the white tube.

5. Disconnect the filling pump.

6. Check that the foot valve does not touch the bottom of the tank and is not too close to the surface. This will prevent obstruction in the valve and air suction.

7. Connect the discharge hose.

CAUTION: DO NOT OPERATE THE PUMP WITHOUT WATER, FILL THE PUMP BEFORE STARTING THE MOTOR.

4.3. FILLING WITH FUEL

1. Insert the motor pump fuel line “quick coupling” and pump the fuel bulb until fuel mixture is just touching bottom of carburetor

2. When preparing the blend, pour a small quantity of gasoline/ Naphtha inside the tank. Add all the oil necessary and blend. Then add the rest of the fuel and blend again.

The 2-stroke motor requires an oil/gasoline blend. Only use 98-octane unleaded gasoline from a gas station. Add good quality 2% synthetic oil to the gasoline. A 1.5% blend can be used with the following oils:
MOTUL 800-VALVOLINE RACING 2T FULL SYNTHETIC SAE 50 - BARDAL KXT - ELF 976 – ELF 909

Never leave gasoline in containers for too long as the quality will be affected. Blend the gasoline with oil ONLY when it is going to be used.

WARNING: The nature of the carbon deposits in the cylinder heads, spark plugs and exhaust provide important information on the fuel blend used in the motor. Remember that blends with too much oil do not increase the motor lifetime.

ATTENTION: Gasoline is extremely inflammable and explosive. Carry out these operations in a well-ventilated location with the motor off. Do not smoke and do not provoke flames or sparks where gasoline is stored or when refueling.

ATTENTION!
Only for US customers. The European octane range is different from the US one.
For example: EU 95 octanes = US 91 octanes / EU 98 octanes = UE 93 octanes
THOR motors need high-octane gasoline (no less than US 91)

CAUTION: THE ENGINE OIL IS ADDED TO THE GASOLINE!

4.4. START-UP (STARTING)

4.4.1. COLD START

See instructions on FILLING WITH FUEL above:

1. Place the button in the starting “ON” position.

2. Place the Starter in the open position
(only if version have starter)

3. Pull on the starter lever slowly until you “feel” resistance. Then quickly pull upwards.

4. Do not release the starter lever too abruptly. Hold and guide the lever until it returns to the rest position.

5. Move the gas lever to a position that’s not too forward. Now continue pulling on the starter pull cord until the motor starts.

6. Keep the motor at idling speed until the “warm up” LED turns off.

7. Place the Starter lever in the closed position.

4.4.2. HOT START

Follow the cold start instructions yet with the gas lever in the rest position.

4.4.3. OTHER STARTING CONDITIONS

1. When a new VFT BP4 motor pump must be started or if it has run out of gas, the hose primer bulb must be pressed until the fuel can be seen inside the transparent tube below the carburetor. Follow the normal starting procedure.

2. If all the procedures mentioned above fail, keep the accelerator open and pull the starter repeatedly to clean the fuel vapors and start the motor.

4.5. TURNING THE MOTOR OFF

1. Move the accelerator to the idling position (below).

2. Maintain this speed for 30 seconds to a minute.

3. Cut off the ignition by positioning the key in “OFF”.

4. Then, remove the suction oversleeve and release hose, drain the pump by lifting the motor pump and rotate it in all positions. (The pump may need to be washed with anti-freeze under extreme cold conditions to prevent breakage due to freezing). Water will have to be released from the manual primer and all the pipes or pressure gauge line).

4.6. MOTOR PERFORMANCE AND USEFUL LIFE

Although this pump unit is capable of high performance for long periods of time when required, operating at a low speed when possible is recommended as this will greatly extend the useful life of the motor. For a longer life, use the accelerator at “3/4 - 7/8” full speed.

4.6.1. FUEL CONSUMPTION AND TANK

The BP4 motor pump consumes 3.6 L/h.

Operating hours:

- 12 L tank: 3 h 15 min (75% performance).
- 25 L tank: 6 h 55 min (75% performance).

*The operating hours are provided for guidance only; the actual consumption may vary based on external conditions.

Always use ISO 13591 certified tanks and also for the fuel line.

Check the status each time the portable motor pump is to be connected.

4.7. FUEL BLENDING ADJUSTMENT SCREWS (CARBURETOR ADJUSTMENT)

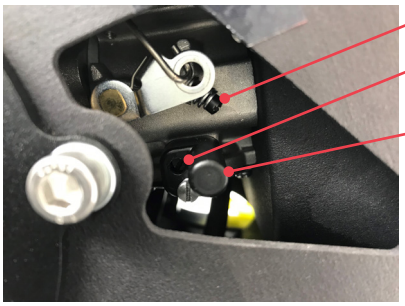
The carburation must be adjusted only by specialized personnel.

A quick carburation analysis may be done by checking the spark plug color. To do so, turn off the motor after having been on and loaded for a few minutes.

Remove the spark plug by unscrewing it with the right wrench and check the color of the porcelain, which should be light brown.

CAUTION: Take the greatest of care when adjusting the high-speed blending screw (needle). If it is adjusted incorrectly, the motor may be damaged due to overheating.

If the spark plug electrode is a light color, the carburation is poor; if the motor is used in these conditions, it could be damaged. Do not use the motor in these conditions and check with an authorized distributor for adjustment.



4.8. OPERATING CONDITIONS WITHOUT RELEASING WATER

Operating the pump without releasing the water for long periods (no waterflow pressure - for example, due to a twisted hose because of nozzle changes or additional hoses) will cause overheating and possible damage to the seal and components. That's why the BP4 motor pump is equipped with an electronic cut-off to prevent damage due to a fuel loss.

NOTE 1: There is no manual reset to re-start the motor and no need for adjustment.

NOTE 2: Only use original spare parts when servicing the motor. Do not replace components as this could affect the operation and automatic cut-off system criteria.

4.9. OPERATING IN A COLD CLIMATE

The pump may operate at below-zero temperatures if certain precautions are taken to prevent the formation of ice in the pump.

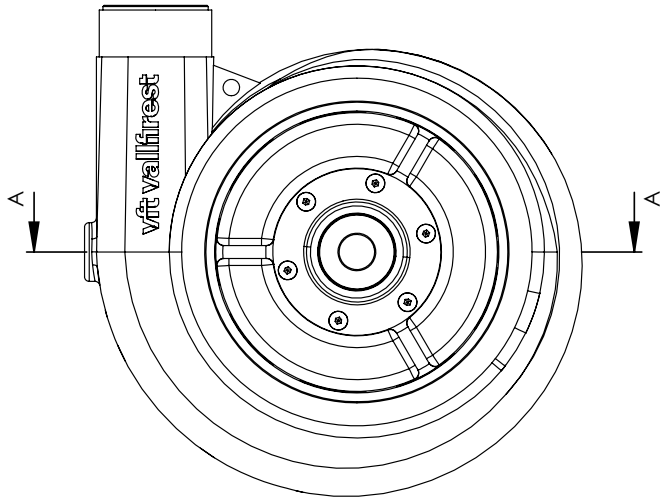
1. After filling the pump, the unit must operate at low-speed for a short period of time to allow all components to heat up before continuing with the remaining operational procedures.

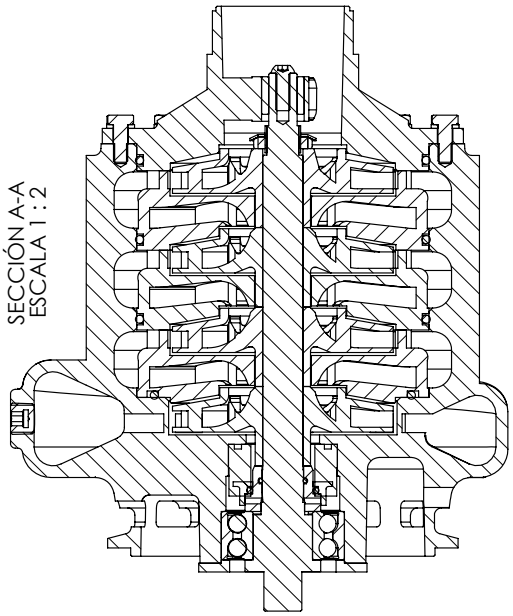
2. Unless a heater is available, drain the pump of all water if not used for a prolonged period. The motor unit / starter must rotate a few times to ensure all water has been drained from the pump. Drain the pump filling line if a filler was used.

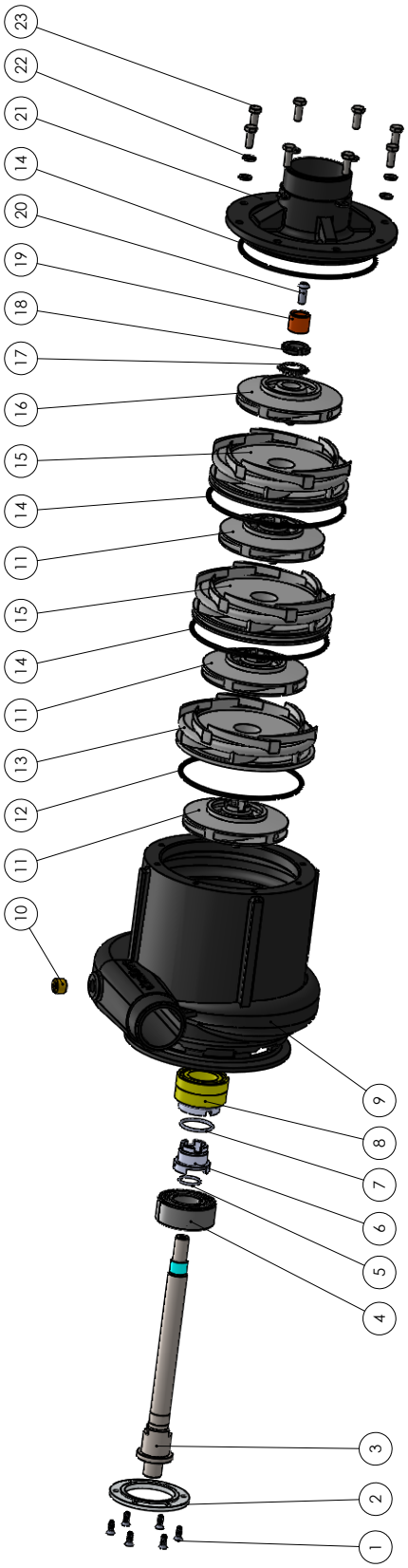
3. After using, drain all the water from the pump, collectors and lines. You can also pour a little anti-freeze into the pump and have it circulate through the pump and pipe system.

5. PARTS LIST

5.1. VFT4SP PUMP PARTS



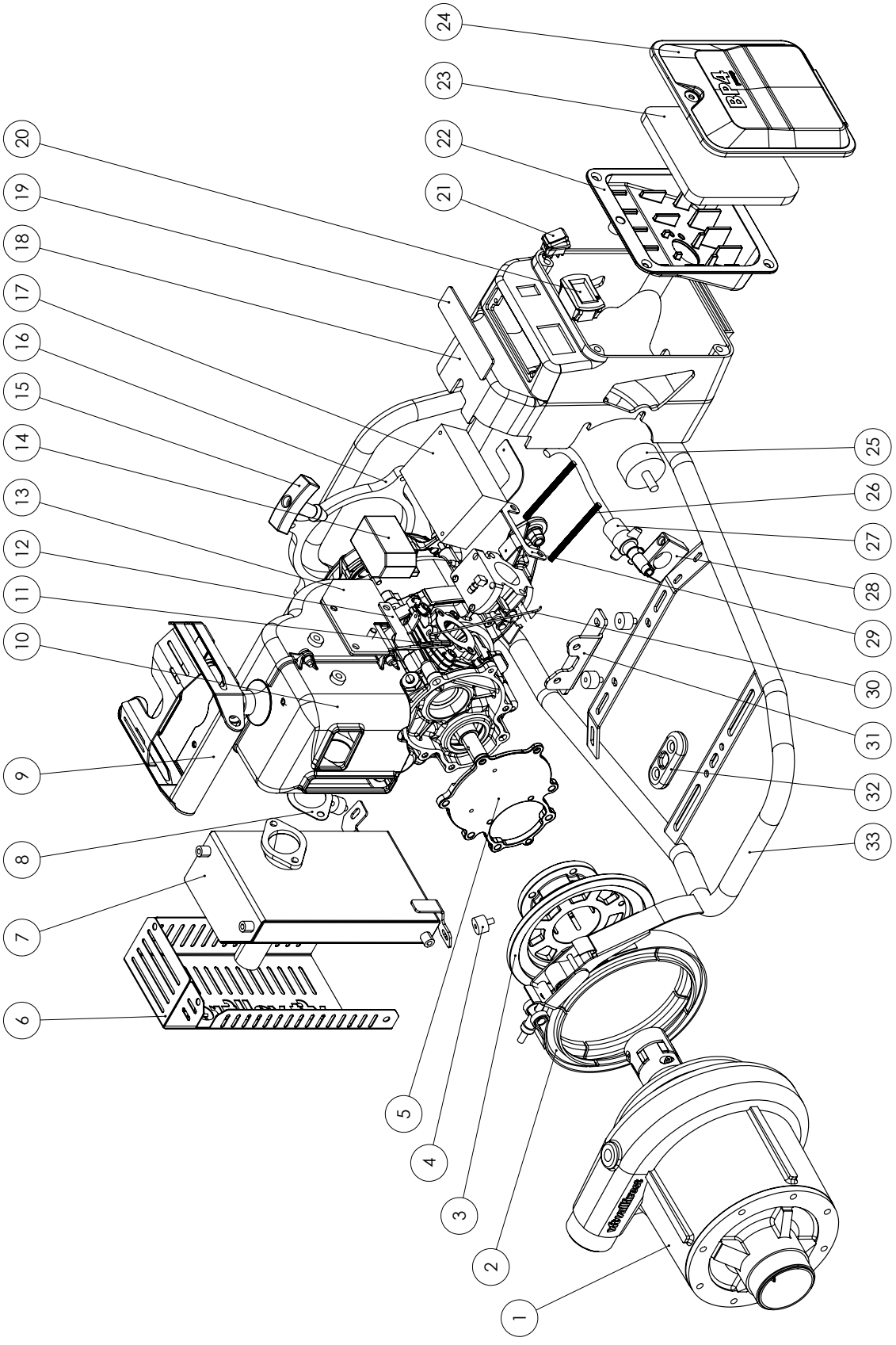




VFT4SP PUMP PARTS

No.	REFERENCE	DESCRIPTION	QUANTITY
1	ZEZ0203-00018	DIN7991 (A2) - M4x16 Countersunk Allen Screw	6
2	DVD3040-P070A	vft 4-phase pump bearing cover	1
3	DVD3040-P040A	vft 4-phase pump axle	1
4	ZEZ3301-00002	3205 A-2ZTN9_MT33 double-row bearing	1
5	ZEZ0601-00005	17x2 O-ring	1
6	DVD3040-P080A	vft 4-phase pump axle transmission bushing	1
7	ZEZ0601-00006	25x2.50 O-ring	1
8	ZEZ3302-00002	4SP mechanical seal	1
9	DVD3040-P010A	vft 4-phase pump body	1
10	ZEZ1328-00001	1/4" BSPT Brass Stopper	1
11	DVD3040-P025A	vft 3-4-phase rear pump impeller	3
12	ZEZ0601-00007	105x3.5 O-ring	1
13	DVD3040-P035A	vft 3-4-phase rear pump distributor	1
14	ZEZ0601-00008	110x3.5 O-ring	3
15	DVD3040-P030A	vft 3-4-phase front pump distributor	2
16	DVD3040-P020A	vft 3-4-phase front pump impeller	1
17	ZEZ3309-00002	MB2 washer	1
18	ZEZ3309-00001	KM2 right-threaded nut	1
19	ZEZ3303-00002	Selfoil bearing A 12x18x18	1
20	ZEZ0215-00035	ISO7380 (A2) - M6x10 round Allen screw	1
21	DVD3040-P060A	vft 3-4-phase pump cover	1
22	ZEZ0209-00004	DIN127-B (A2) - M6 Grower Washer	8
23	ZEZ0201-00088	DIN933 (A2) M6x16 Hexagonal Bolt	8

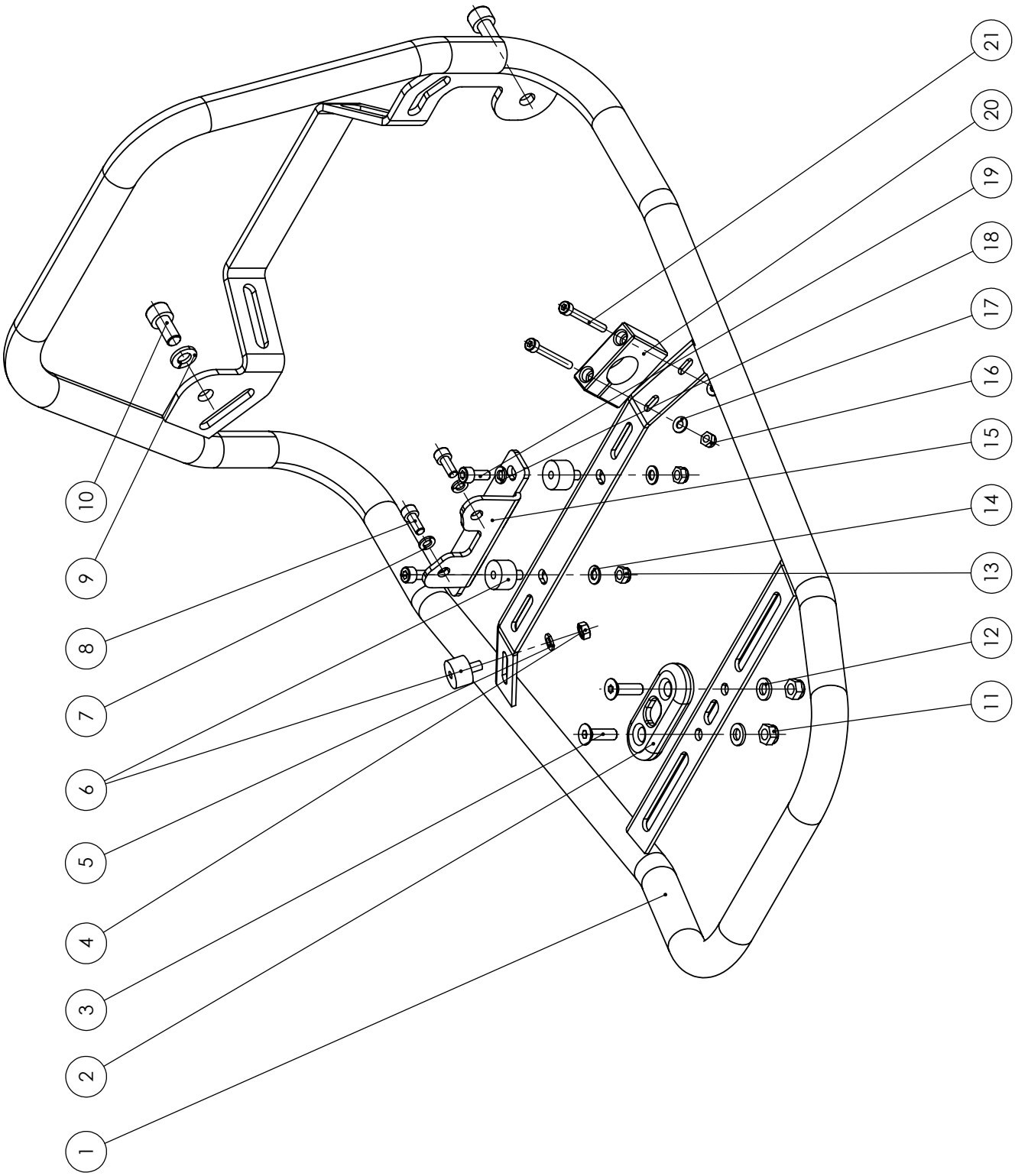
5.2. GENERAL EXPLODED VIEW



GENERAL EXPLODED VIEW

No.	REFERENCE	DESCRIPTION	QUANTITY
1	DVD3040-AAA0A	vft 4-phase pump (VFT_4SP)	1
2	ZEZ3306-00003	vft pump brace	1
3	DVD3240-P071A	BP4 motor pump end bell	1
4	ZEZ1501-00003	M5 H10 M-F Silent Block Bush	3
5	DVD3240-P060A	BP4 motor pump connector plate	1
6	DVD3240-P160A	BP4 exhaust protector	1
7	DVD3240-P030A	BP4 exhaust	1
8	ZEZ3330-00001	BP4 exhaust gasket	1
9	DVD3240-P020A	BP4 carrying handle	1
10	ZEZ2005-00001	Polini THOR 130 Evo motor	1
11	ZEZ3305-00003	BP4 plastic accelerator cover	1
12	DVD3240-P050A	BP4 accelerator control lever	1
13	DVD3240-P040A	BP4 accelerator-coil plate	1
14	ZEZ2005-00001	Polini THOR 130 Evo Motor Coil	1
15	ZEZ3306-00005	BP4 starter pull cord	1
16	DVD3240-P080A	BP4 rotor protector	1
17	DVD3240-P100A	BP4 electronic board	1
18	DVD3240-P150A	BP4 electronic housing	1
19	DVD3240-P110A	BP4 LED plate	1
20	ZEZ3331-00001	BP4 counter	1
21	ZEZ3331-00003	BP4 ON/OFF switch	1
22	DVD3240-P120A	BP4 air filter box	1
23	ZEZ3330-00002	BP4 air filter foam	1
24	DVD3240-P130A	BP4 air filter cap	1
25	ZEZ1501-00004	M8 D30 H20 M-F Silent Block Bush	2
26	ZEZ3309-00009	BP4 M5 stainless steel threaded carburetor rod	2
27	DED6002-00005	Mercury male fuel line connector	1
28	DVD3240-P170A	BP4 Mercury connector support	1
29	DVD3240-P140A	BP4 electronic support	1
30	DVD3240-P200A	BP4 gas rod	1
31	DVD3240-P090A	BP4 motor pump union support	1
32	ZEZ2005-00101	Polini motor anti-vibration support	1
33	DVD3240-P010A	BP4 tubular base	1

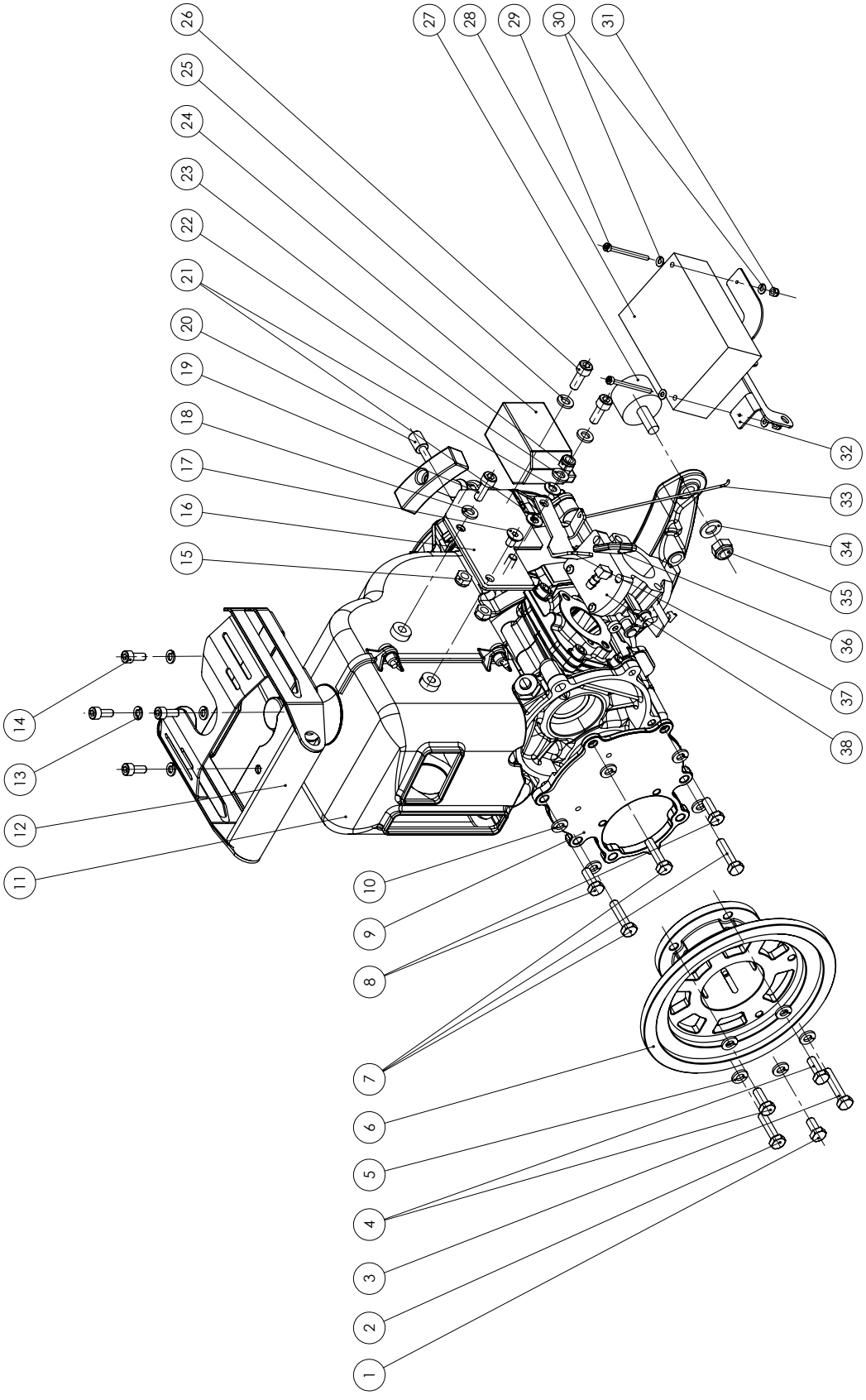
5.3. EXPLODED VIEW OF TUBULAR BASE COMPONENTS



EXPLODED VIEW OF TUBULAR BASE COMPONENTS

No.	REFERENCE	DESCRIPTION	QUANTITY
1	DVD3240-P010A	BP4 tubular base	1
2	ZEZ2005-00101	Polini motor anti-vibration support	1
3	ZEZ0203-00057	DIN7991 (A2) - M6x25 Countersunk Allen Screw	2
4	ZEZ0206-00006	DIN934 (A2) - M5 Hexagonal Bolt	1
5	ZEZ0209-00003	DIN127-B (A2) - M5 Grower Washer	1
6	ZEZ1501-00003	M5 D16 H10 M-F Silent Block Bush	3
7	ZEZ0209-00003	DIN127-B (A2) - M5 Grower Washer	2
8	ZEZ0202-00074	DIN912 (A2) - M5x12 Allen Screw	2
9	ZEZ0209-00005	DIN127-B (A2) - M8 Grower Washer	2
10	ZEZ0202-00131	DIN 912 (A2) M8x10 Allen Screw	2
11	ZEZ0207-00005	DIN985 (A2) - M6 Hexagonal Self-Locking Nut	2
12	ZEZ0204-00007	DIN125 (A2) - M6 Flat Washer	2
13	ZEZ0207-00004	DIN985 (A2) - M5 Hexagonal Self-Locking Nut	2
14	ZEZ0204-00006	DIN125 (A2) - M5 Flat Washer	2
15	DVD3240-P090A	BP4 motor pump union support	1
16	ZEZ0207-00003	DIN985 (A2) - M4 Hexagonal Self-Locking Nut	2
17	ZEZ0204-00005	DIN125 (A2) - M4 Flat Washer	2
18	ZEZ0209-00003	DIN127-B (A2) - M5 Grower Washer	2
19	ZEZ0202-00074	DIN912 (A2) - M5x12 Allen Screw	2
20	DVD3240-P170A	BP4 Mercury connector support	1
21	ZEZ0202-00063	DIN912 (A2) - M4x35 Allen Screw	2

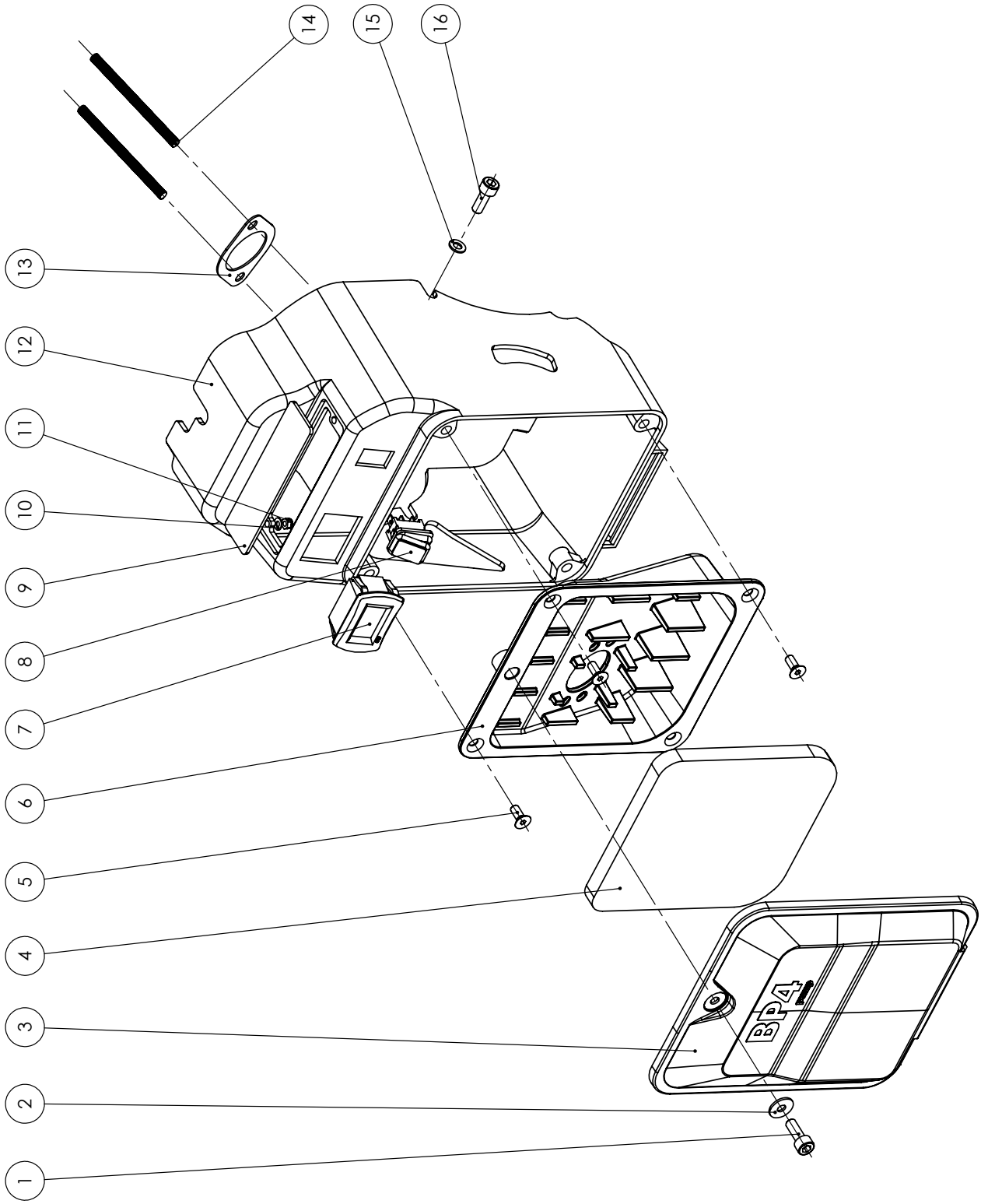
5.4. EXPLODED VIEW OF MOTOR UNIT COMPONENTS



EXPLODED VIEW OF MOTOR UNIT COMPONENTS

No.	REFERENCE	DESCRIPTION	QUANTITY
1	ZEZ0201-00086	DIN933 (A2) - M6x12 Hexagonal Bolt	1
2	ZEZ0201-00092	DIN933 (A2) M6x25 Hexagonal Bolt	1
3	XXXXXXXXXXX	DIN933 (A2) - M6x30 Hexagonal Bolt	1
4	ZEZ0201-00088	DIN933 A2 M6x16 Hexagonal Bolt	2
5	ZEZ0209-00004	DIN127-B (A2) - M6 Grower Washer	5
6	DVD3240-P071A	BP4 motor pump end bell	1
7	ZEZ0201-00092	DIN933 (A2) M6x25 Hexagonal Bolt	3
8	ZEZ0201-00088	DIN933 (A2) M6x16 Hexagonal Bolt	2
9	DVD3240-P060A	BP4 motor pump connector plate	1
10	ZEZ0209-00004	DIN127-B (A2) - M6 Grower Washer	5
11	ZEZ2005-00001	Polini THOR 130 Evo motor	1
12	DVD3240-P020A	BP4 carrying handle	1
13	ZEZ0209-00003	DIN127-B (A2) - M5 Grower Washer	4
14	ZEZ0202-00074	DIN912 (A2) - M5x12 Allen Screw	4
15	ZEZ0207-00005	DIN985 (A2) - M6 Hexagonal Self-Locking Nut	2
16	DVD3240-P040A	BP4 accelerator-coil plate	1
17	ZEZ0203-00051	DIN7991 (A2) - M6x10 Countersunk Allen Screw	1
18	ZEZ0209-00004	DIN127-B (A2) - M6 Grower Washer	1
19	ZEZ0202-00103	DIN912 (A2) - M6x16 Allen Screw	1
20	DVD3240-P180A	BP4 M5 threaded spacer	1
21	ZEZ3309-00011	M6 Gas accelerator washer	2
22	ZEZ0204-00007	DIN125 (A2) - M6 Flat Washer	1
23	ZEZ0207-00005	DIN985 (A2) - M6 Hexagonal Self-Locking Nut	1
24	ZEZ2005-00001	Polini THOR 130 Evo Motor Coil	1
25	ZEZ0204-00007	DIN125 (A2) - M6 Flat Washer	2
26	ZEZ0201-00088	DIN933 (A2) M6x16 Hexagonal Bolt	2
27	ZEZ1501-00004	M8 D30 H20 M-F Silent Block Bush	2
28	DVD3240-P100A	BP4 electronic board	1
29	ZEZ0202-00048	DIN912 (A2) - M3X40 Allen Screw	2
30	ZEZ0204-00004	DIN125 (A2) - M3 Flat Washer	4
31	ZEZ0207-00002	DIN985 (A2) - M3 Hexagonal Self-Locking Nut	2
32	DVD3240-P140A	BP4 electronic support	1
33	DVD3240-P200A	BP4 gas rod	1
34	ZEZ0204-00008	DIN125 (A2) - M8 Flat Washer	2
35	ZEZ0207-00006	DIN985 (A2) - M8 Hexagonal Self-Locking Nut	2
36	ZEZ3305-00003	BP4 plastic accelerator cover	1
37	DVD3240-P050A	BP4 accelerator control lever	1
38	Pending	Polini THOR 130 Evo Motor Carburetor	1

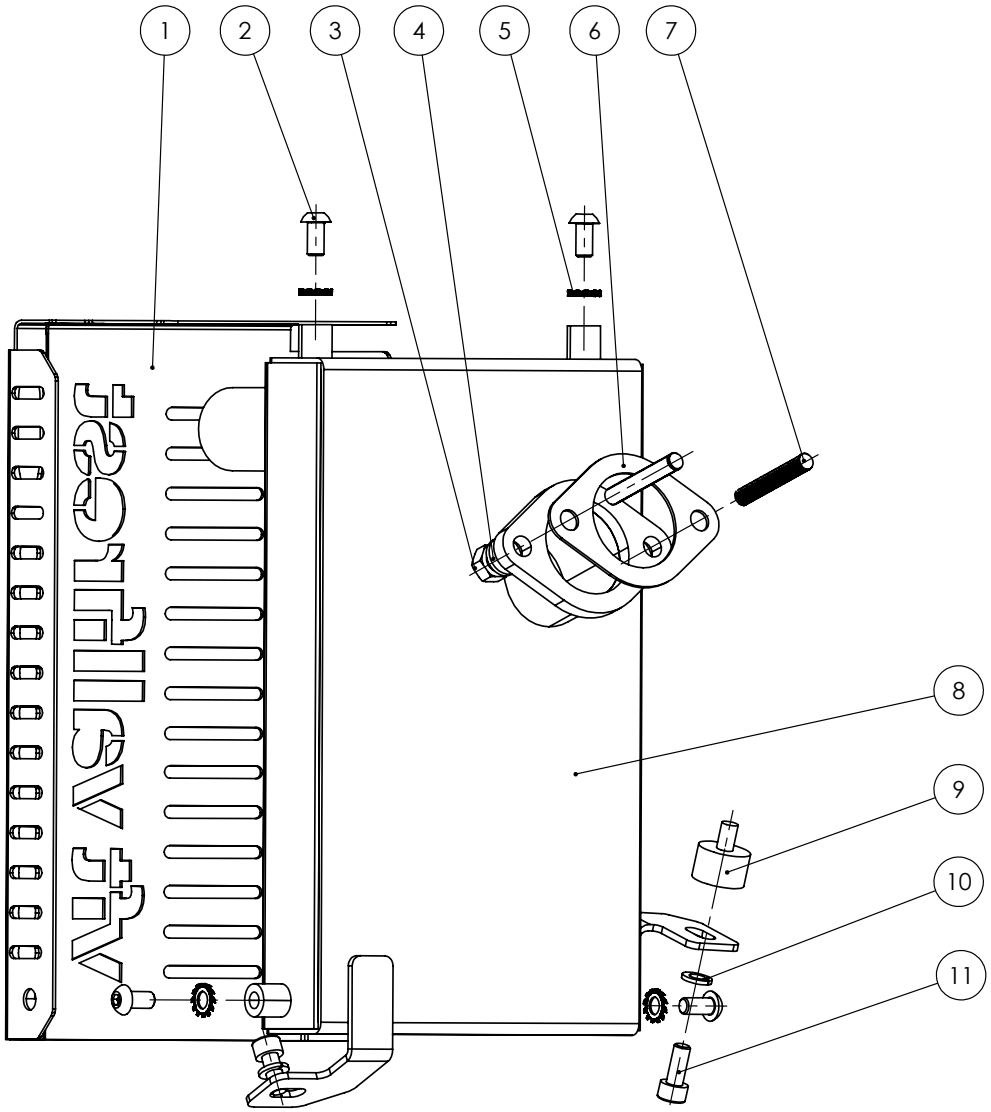
5.5. EXPLODED VIEW OF ELECTRONIC HOUSING COMPONENTS



EXPLODED VIEW OF ELECTRONIC HOUSING COMPONENTS

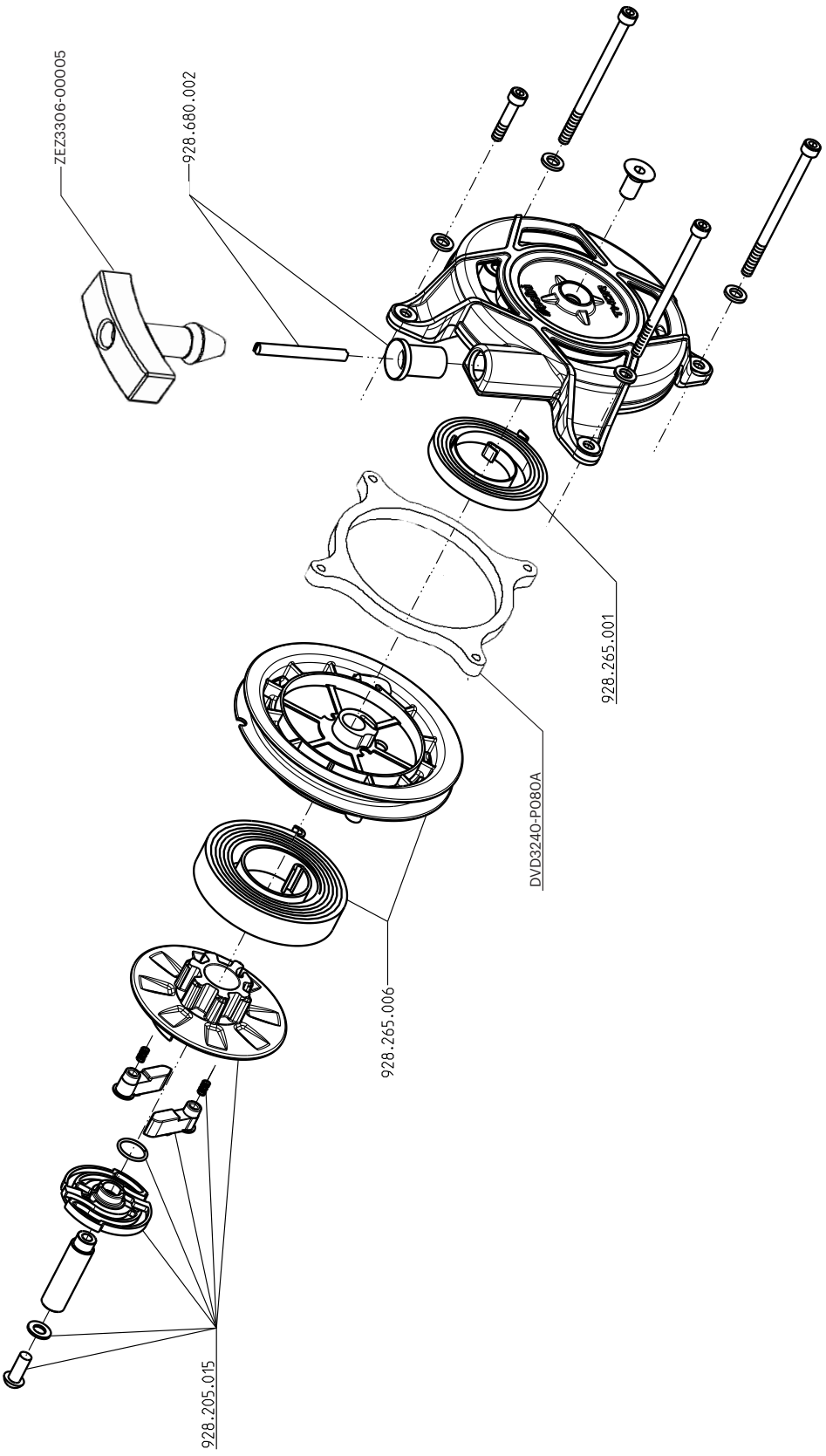
No.	REFERENCE	DESCRIPTION	QUANTITY
1	ZEZ0202-00103	DIN912 (A2) - M6x16 Allen Screw	1
2	ZEZ0205-00007	DIN9021 (A2) - M6 Flat Washer	1
3	DVD3240-P130A	BP4 air filter cap	1
4	ZEZ3330-00002	BP4 air filter foam	1
5	ZEZ0203-00033	DIN7991 (A2) - M5x12 Countersunk Allen Screw	4
6	DVD3240-P120A	BP4 air filter box	1
7	ZEZ3331-00001	BP4 counter	1
8	ZEZ3331-00003	BP4 ON/OFF switch	1
9	DVD3240-P110A	BP4 LED plate	1
10	ZEZ0204-00004	DIN125 (A2) - M3 Flat Washer	2
11	ZEZ0207-00002	DIN985 (A2) - M3 Hexagonal Self-Locking Nut	2
12	DVD3240-P150A	BP4 electronic housing	1
13	ZEZ3309-00007	BP4 carburetor gasket	1
14	ZEZ3309-00009	BP4 M5 stainless steel threaded carburetor rod	2
15	ZEZ0204-00006	DIN125 (A2) - M5 Flat Washer	1
16	ZEZ0220-00024	DIN912 (A2) - M5X16 Allen Screw	1

5.6. EXPLODED VIEW OF EXHAUST UNIT COMPONENTS



No.	REFERENCE	DESCRIPTION	QUANTITY
1	DVD3240-P160A	BP4 exhaust protector	1
2	ZEZ0220-00024	ISO7380 (A2) - M5x10 round Allen screw	4
3	ZEZ0206-00007	DIN934 (A2) - M6 Hexagonal Bolt	2
4	ZEZ0209-00004	DIN127-B (A2) - M6 Grower Washer	2
5	ZEZ0222-00006	M5 DIN-6798 A toothed washer	4
6	ZEZ3330-00001	BP4 exhaust gasket	1
7	ZEZ3309-00010	M5 x 35 exhaust threaded rod	2
8	DVD3240-P030A	BP4 exhaust	1
9	ZEZ1501-00003	M5 D16 H10 M-F Silent Block Bush	1
10	ZEZ0209-00003	DIN127-B (A2) - M5 Grower Washer	2
11	ZEZ0209-00003	DIN912 (A2) - M5x12 Allen Screw	2

5.7. EXPLODED VIEW OF THE PULL CORD COMPONENTS



6. MAINTENANCE

HOURS	TASKS TO BE DONE
Every **20 h** (**MANT.** Indicator)	Check and tighten screws
	Check the status of the silent block bushes and replace as necessary
	Check and adjust carburation
	Replace spark plug
	Clean the air filter
Every **100 h**	Replace the air filter
	Replace the pull cord
	Replace the gasoline filter
	Check the piston rings and piston
	Replace the piston bolt and camshaft bearing
	Clean the cylinder gas outlet and exhaust
	Replace the reed box
Every **200 h**	Replace the entire piston set
Every **400 h**	Replace all bearings and motor seals
	Replace the crankshaft

6.1. AIR FILTER CLEANING

Under normal operating conditions, the air filter must be cleaned daily. However, more frequent cleaning is recommended in extremely dirty conditions. To clean the air filter, remove the central screw from the cover, incline it towards you and pull out. Once the cover is removed, remove the foam filter. Brush with a large brush. Wash with mineral spirits until clean. Squeeze to get all the remaining liquid out and re-install.

IMPORTANT
Dirt entering the motor through the carburetor is one of the biggest causes of motor wear; therefore, it is very important to regularly check the air filter.

6.2. COOLING THE MOTOR

This screen prevents grass, leaves, etc. from entering the cooling system flaps. As this motor is cooled by air, this screen must always be clean to allow fresh water into the fan.

6.3. SPARK PLUG

Monitor and clean the spark plugs regularly (every 10 hours of operation). A dirty, carbonized or misadjusted spark plug will make it difficult to start and harm motor performance.

To check the distance from the electrode, remove the spark plug and check with a gauge that the distance is 0.9 mm. Re-install and check that it works.

6.4. MUFFLER SCREWS

Re-adjust the muffler screws securing it to the cylinder after the first 4 hours and check every 15 hours after that. Check the silent block bushes are adjusted after the first 4 hours and every 20 hours after that.

6.5. FUEL FILTER

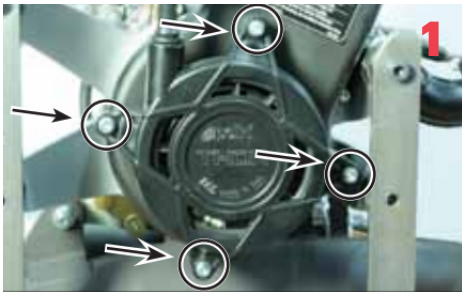
The fuel filter must be checked every 50 hours or if the motor shows signs of overheating. When the motor is on at maximum speed, unscrew the high-speed screw (needle) (c.c.w.) 1/4 to 1/2 a turn. The motor should immediately reduce rotation. If this does not occur, dirt could be blocking the fuel passage.

Change the fuel filter first and check again. If it continues to operate the same, the problem could be in the carburetor. Take it to a mechanic to be checked.

6.6. REPLACING THE STARTER CORD (Flash Starter)

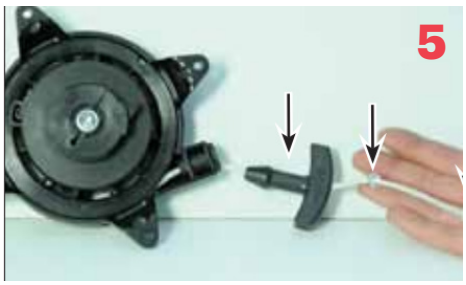
Remove the motor starter by loosening the 4 screws (Photo 1). Remove the cord. Be careful. The central wheel will turn until the spring is completely unloaded: hold it and unload slowly to prevent damage and/or injury. Remove the central screw and cover (Photo 2).

Attention! There are two teeth below the cover for the starter (check the conditions and replace if worn); there are two small clamps below. Be very careful not to lose these small clamps. Prepare the cord again and make a knot on one end. Remove the plastic wheel and old cord.



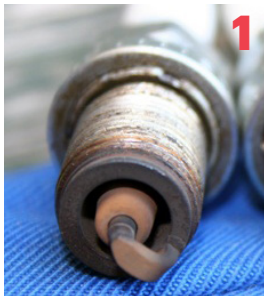
Insert the new cord into the hole (Photo 3), roll the cord around the wheel (in the direction the cord enters the wheel) (Photo 4). Now insert the plastic wheel in place again and check through the hole whether the inner spring is perfect inserted. Position the springs, teeth for the starter and screw the cover back on using a threaded seal.
All moving parts, including the springs, must be well-lubricated.
Now continue and load the return spring: secure the end of the cord leaving 10-20 cm outside the hole in a “u” shape next to the wheel. Turn the wheel three times clockwise until it stops in front of the aluminum cover outlet hole. Keep the plastic wheel stable and place the cord through the cover hole. Insert the handle and washer and make a knot as shown in photo 5.

ATTENTION: check that the return spring does not go all the way to the end of the run. Completely pull the cord and rotate the wheel again to check that it can turn at least once before stopping.
This test is very important because the spring is not designed to reach the end of the run and it will break if it does.
Put the starter back on the motor and tighten the 4 screws (M5) firmly (see the torque table).



6.7. CHECKING THE CARBURATION

To check whether the motor carburation is correct, let it work for a few minutes with the gas open and stop the motor. Once cooled down, remove the spark plug and check the color of the porcelain inside the spark plug. The correct color is a coffee brown (Photo 1).



If it is not this color, check with a mechanic for correct carburation adjustment.

Warning: Combustion motors may lose performance if operated at very high heights. Ask the manufacturer for more information if necessary.

6.8. DISMANTLING THE PUMP

VFT4SP PUMP DISMANTLING AND ASSEMBLY KIT

PUMP REPAIR KIT

DVD3115-P010A - Tool for KM nut (1)

DVD3115-P020A - Shaft protector (2)

DVD3115-P030A - Tool for assembling the mechanical seal (3)

DVD3115-P040A - Too for dismantling the impellers and distributors (4)

DVD3115-P050A - Shaft base (5)

DVD3115-P060A - Pump body support (6)

DVD3115-P070A - Tool for dismantling the shaft (7)

DVD3115-P080A - Tool for assembling distributors (8)

DVD3115-P100A - Tool for dismantling the seal (9)

DVD3115-P110A - Tool for dismantling the bearing (10)

1. Remove the 6 screws from the bearing cover.

2. Remove the screw from the end of the shaft suction.

3. Remove the 8 screws. The suction cap can now be removed.

4. Using a small screw driver (or extractor), remove the safety washer tongue from the shaft nut.

5. Remove the shaft nut (use the “tool for nut” (1)) and remove the lock washer.

6. Remove the first turbine.

7. Now, press the shaft through the pump:

a. Support the pump (use the “Pump body support” (6)).

b. Protect the small end of the shaft (use the “Shaft protector” (2)).

c. Press the shaft completely down (use the “Tool for dismantling the shaft” (7)).

8. The internal components can now be pressed down from the end of the bearing:

a. Reverse the pump (use the “Pump body support” (6)).
Please remember that inner parts must be guided during this task (use the “Tool for dismantling impellers and distributors” (4)).

A manual press is preferred as the mechanic can feel the components through the inner edge of the body.

9. Remove the seal by inverting the pump (use the “Pump body support” (6)).
By pressing from the inside of the pump body (use the “Tool for assembling the mechanical seal” (3)).

IMPORTANT: DAMAGE to internal components may be the result of incorrect procedures.

NOTE 1: If the seal is going to be re-used, protect the seal as it leaves the body. If it falls down on a hard surface, it can be damaged.

NOTE 2: When requesting spare parts, please indicate the model and serial number.

6.9. ASSEMBLING THE PUMP

NOTE: Inspect all components for wear, damage or corrosion. Replace any components as necessary. Always use new O-rings.

1. Place the body on a smooth surface or (use the "Shaft assembly base" (5)) to protect the body from damage. Then, press the mechanical seal into the body (use the "Tool for assembling the mechanical seal" (3)).

2a. Place the bearing in the position over the shaft using the press. (use the "Tool for dismantling the bearing" (10)) .

NOTE: Pressing on the outer bearing track (ring) can damage the bearing.

2b. Install the transmission bushing in the shaft and press in place over the flat areas in the pump shaft. The sides of the transmission bushing must touch the inner bearing track.

3. Press the shaft sub-ensemble, making sure the disc plugs in the transmission bearing fit in the seal grooves to align the shaft (use the "Shaft assembly base" (5)). Secure the bearing cover with the 6 retention screws.

4. Insert the Impeller into the Shaft, making sure it fits into the transmission bushing grooves.

5. Use grease to hold the O-ring in the groove in the distributor and carefully install it on the impeller.

6. Place the impeller in the shaft, making sure it is coupled to another impeller.

7. Install the O-rings in the distributors and lubricate with grease.

8. Place the distributor in the pump body hole (use the "tool for assembling distributors" (8)), and manually press to apply short pressure until the distributor is pressed through the first section. (This can be felt when the free distributor falls to the next level).

Repeat with the rest of the distributors and impellers.

9. Place the safety washer over the shaft hook tongue in the groove in the shaft thread.

10. Screw the locknut onto the shaft and tighten securely until the groove in the nut lines up with a tongue on the safety washer (use the "tool for nuts" (1)). Push the tongue into the nut groove to fix it in place.

11. Install the O-ring on the pump cover. Use the press to press the suction cover until it rests on the distributor. A small space between the body and cover is normal.

12. Install 8 safety washers and screws and tighten evenly by hand.

13. Install the self-locking screw.

14. Tighten the 8 screws on the cover until it's even with the pump body.

6.10. STORING THE MOTOR PUMP

Do the following to prepare the motor pump for storage:

1. Disconnect the fuel line.

2. Start the motor and let it run until it stops to use up all the fuel in the carburetor and prevent the formation of deposits due to fuel evaporation.

3. Drain all fuel from the tank.

4. Remove the spark plug and pour approximately 1/4 cup of motor oil into the cylinder. Replace the spark plug.

5. Pull the motor starter cord a couple of times to distribute the oil throughout the cylinder. This will cover the entire cylinder wall with oil and won't allow oxide formation during the storage period.

7. TROUBLESHOOTING

CAUSE	RECOMMENDATION
MOTOR START FAILURE	
Starter button in “OFF”.	Place in the “ON/RUN” position.
No fuel in the tank.	Fill the tank.
Closed fuel stopcock.	Open the stopcock.
Fuel tank filter or hose obstructed.	Clean the filter and the fuel line.
Flooding.	Close the main carburetor needle and try to start the motor until the first explosions, then turn the needle one turn (open). (if necessary)
Short-circuited, worn or dirty spark plug.	Install a new spark plug.
Broken spark plug (broken or cracked porcelain, broken electrodes).	Install a new spark plug.
Cable from the magneto short-circuited or disconnected from the spark plug.	Replace the cable or connect it to the spark plug.
Inoperative magneto (no spark).	Contact the nearest authorized representative.
MOTOR DIFFICULT TO START	
Water in the fuel or incorrect blend.	Drain the fuel and replace.
Too much oil in the fuel blend.	Drain and replace the fuel with the correct blend.
Flooded motor or not enough fuel.	If flooded after several attempts to start, follow the instructions indicated in the previous section. If there’s not enough fuel, position the primer closer to the closed position and try to start two or three times.
Leakage through gaskets (carburetor or red gasket).	Replace the gaskets.
Weak spark.	Contact the nearest authorized representative.
Dirt in the fuel line/carburetor.	Dismantle and clean.
Carburetor not properly adjusted.	See the adjustment screws.
Losses through seals.	Replace the seals.
Weak spark.	Contact the manufacturer or nearest authorized representative.
FAILURES IN THE MOTOR	
Dirt in the fuel line/carburetor.	Dismantle and clean.
Carburetor not properly adjusted.	See adjustment screws, section.
Dirty, broken or distant spark plug electrode.	Clean or replace the spark plug by adjusting the distance as per the specifications.
Weak or intermittent spark.	Contact the nearest authorized representative.
THE MOTOR LOSES POWER	
Obstructed air filter.	Clean the air filter.
Carburetor off center.	See fuel regulation screws.
Obstructed muffler.	Clean all carbon from the muffler.
Obstructed exhaust valves.	Remove the muffler, rotate the motor until the piston is in the lower position. Use a wooden spatula or wireless tool to remove all carbon from the exhaust outlet. Be careful not to damage the piston or cylinder walls. Clean any carbon remains with compressed air. Turn the motor on a bit to remove all carbon, then install the muffler with the seal.
Low compression.	Contact the nearest authorized representative.
Inner carburetor filter or line obstructed	Change the line filter or dismantle the carburetor to clean the filter.

IMPORTANT: Read the motor user manual for more information.

CAUSE	RECOMMENDATION
THE MOTOR OVERHEATS	
Not enough oil in the fuel blend.	Prepare the blend as per the instructions.
Obstructed air flow.	Clean the wheel protective screen and cylinder fins.
Inadequate high-speed screw (choke)	Adjust the speed of the fuel blend.
Inner carburetor or line filter obstructed.	Change the line filter or dismantle the carburetor to clean the filter.
NOISY OR KNOCKING MOTOR	
Loose flywheel.	Adjust the flywheel.
Incorrect spark plug temperature range.	Replace the spark plugs as specified for the motor.
Bushings, piston rings or cylinder walls worn.	Contact the nearest authorized representative.
Bent fan cover.	Remove the fan cover and harden the bent part.
PUMP FILLING PROBLEMS	
Air leakage.	Try to find the part with the problem by isolating each system component. - Visually check whether there is any leaking in the suction oversleeve. - Check whether the aspiration suction oversleeve is in good condition. - Check whether the suction oversleeve is properly tightened. - Check if all valves are closed.
PUMP PERFORMANCE PROBLEMS	
Locked.	Make sure the hoses and valves are not obstructed by any debris. Remove any obstructions.
Pump power problems.	- Visually check the motor and make sure everything is in good conditions. - Check the motor manual that came with the motor pump.
Air trapped in the suction line.	Make sure some part of the suction oversleeve is higher than the pump inlet.
Water restrictions in the pump inlet.	- Check the suction foot valve. If drainage is full, clean it. - Make sure the water suction is not blocked by debris. - If the suction hose is not made by Vallfirest, make sure the diameter is not too restrictive for the water pump requirements.
PUMP CAVITATION	
Difference in height between the pump and water source	- Check the length of the suction oversleeve. It must not be more than 5 m. - If the suction oversleeve is not made by Vallfirest, check the inside diameter. - Move the motor pump closer to the external water source.
Water temperature	- Make sure the temperature of the water source is no lower than 35ºC.
Restrictions and obstructions	Check the depth of the water source. The filter must not be in contact with the bottom of the water source. Correct if necessary.

IMPORTANT: Read the motor user manual for more information.

8. STORAGE IN WINTER

1. Verify that all pump ends, sprinklers and hoses are completely drained.

2. Dismantle the motor pump and rotate in all directions to remove all the water possible.

3. Add a cup (1/4 liter) of anti-freeze / glycol through the pump discharge outlet.

4. Disconnect the fuel line (if applicable) or empty the fuel tank. Run the motor until there is no fuel in the carburetor.

5. Dismantle the pump.

6. Store the hoses in a dry place free of rodents as they like to chew on hoses.

NOTE: The pump must be protected from freezing (see warranty).

9. WARRANTY

9.1. COVER

Subject to the conditions, limitations and exceptions indicated below and in this manual, this warranty covers all material and manufacturing defects under normal conditions of use and service for the period established in the following table from the date of purchase.

Product	Time	Cover
with 2-stroke engine	1 year or 100 hours	Limited
with 4-stroke engine	2 years	Limited

9.2. SCOPE

VFT Vallfirest will repair or replace any component at no cost deemed defective pursuant to the cover defined above by any VFT Vallfirest distributor or authorized representative. For repairs or replacements, the customer must pay the shipping costs to the VFT Vallfirest distributor or representative. The customer must provide the necessary information to analyze the causes of the non-conformity.

9.3. EXCEPTIONS

This warranty does not cover parts or accessories not supplied by VFT Vallfirest or damages from using such parts or accessories. This warranty will not be valid for the VFT BP4 motor pump when the pump has been used in a manner considered by VFT Vallfirest as unusual or unapproved.
Moreover, this warranty will not be valid on any VFT BP4 motor pump when:

1. The motor has been used without oil or with an inappropriate fuel blend.

2. The motor has been modified or altered for a higher revolution.

3. Damage is observed due to overheating because the cylinder heat dissipators are very dirty or because dirt enters the motor.

4. It simply needs a little fine tuning or an adjustment of the carburetor, spark plugs or minor repair.

5. It has been incorrectly repaired which affected the quality or reliability of the BP4 motor pump.

6. It has been subjected to abnormal uses. This is observed when the motor operates poorly because of abnormal use or under adverse conditions which shorten the useful life of the motor. The warranty cover is not applicable to the motors where normal use has ended the useful life of a part.

7. The result of the owner not following the operating instructions described in this manual.

8. The appropriate procedures for winter storage were not followed.

VFT Vallfirest will not be liable for any damages such as a loss of the use of the product, a loss of time, inconvenience, fuel costs, telephone, travel, transport or accommodation, losses or damages to personal items or loss of profit.

This is the only explicit or implicit warranty granted by VFT Vallfirest applicable to the VFT Bp4 motor pump and VFT Vallfirest does not authorize any person, firm, company or representative to grant any warranty or assume any other liability on behalf of VFT Vallfirest.

NOTE: All the specifications are subject to change without notice.

For more information **www.vallfirest.com**