4T sprayer truck

P101

anova®

Instructions and user manual

EN

Millasur SL
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CE

Anova wishes to congratulate you for choosing one of our products and guarantees the assistance and cooperation that has always distinguished our brand over time.

This machine is designed to last for many years and to be of great use if used in accordance with the instructions contained in the user manual. We therefore recommend that you read this instruction manual carefully and follow all our recommendations.

For more information or doubts, you can contact us through our web supports such as www.anova.es

INFORMATION ABOUT THIS MANUAL

Please pay attention to the information provided in this manual and on the appliance for your safety and that of others.

- This manual contains instructions for use and maintenance.
- Take this manual with you when you go to work with the machine.
- The contents are correct at the time of printing.
- The rights to make changes at any time are reserved without affecting our legal responsibilities.
- This manual is considered an integral part of the product and must remain with it in case of loan or resale.
- Ask your dealer for a new manual in case of loss or damage.

READ THIS MANUAL CAREFULLY BEFORE USING THE MACHINE

To ensure that your machine provides the best results, please read the usage and safety regulations carefully before using it.

OTHER WARNINGS:

Incorrect use could cause damage to the machine or other objects.

The adaptation of the machine to new technical requirements could cause differences between the content of this manual and the purchased product.

Read and follow all instructions in this manual. Failure to follow these instructions could result in serious personal injury.

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1. USER WARNINGS

⚠Warning
Read carefully the recommendations included in this instruction manual that comes with your equipment.

During the entire spraying process (product mixing, application, cleaning, etc.) protect yourself with the following personal protective equipment: gloves, helmet, respirator, safety glasses and adequate clothing that prevents contact with the product.


vision protection


respiratory protection


face protection


hand protection


Body protection with adequate PPE


Danger due to inhalation of toxic vapors


Danger of burns (indication of hot parts)


corrosive materials


General danger, read instructions


Danger of projection of pressurized fluid, keep a safe distance.

1.1. Operation safety warnings

- Always make sure, before using the machine, that there are no people or animals in the work area.
- Keep hands and feet at a safe distance from moving and/or rotating parts.
- Especially in areas with low temperatures, to prevent the pump from being damaged when trying to start it with the pipes blocked by ice, let the pump work until no water comes out to empty it completely.
- Never touch any part of the pump if it has not cooled down, there is a risk of burns.
- Wash and change your clothes after every job.
- Wash used tools susceptible to contamination.
- Do not eat, drink or smoke during spray work.
- Do not work in rain or wind.
- When filling tanks with chemical products, have clean water nearby for later washing of the face and hands. In any case, avoid direct skin contact with these devices.
- In case of poisoning go to the doctor, provide the label of the product that caused it.
- Carefully read the information on the product to be applied and its consequences in case of poisoning or contact with the body.
- Control possible unwanted reactions between different pesticides stored, next to each other or mixed.
- Keep the products in their original packaging with their labels, in a dry and ventilated place, away from the manipulation of children or inexperienced people. After use, destroy the containers according to the manufacturer's instructions.
- If a product spill accidentally occurs, apply the safety measures on the spilled product according to the manufacturer's instructions.
- It should not enter the treated field until a reasonable time has elapsed since its application.

1.2. Additional security warnings

- Be sure to cover the spray tank well once it is full.
- The tank will always be filled in ventilated places, leaving part of the tank capacity unfilled.
- Never use the tank of the equipment to transport drinking water or fuel.
- After using the equipment, you must wash it with plenty of clean water and run the pump with the keys open in order to keep it clean of products that may be corrosive. These types of operations must be carried out in places prepared for this purpose, where there is no risk of contamination for people, animals or plants.
- Do not clean the nozzles by blowing.
- Before your overhaul, take the pressure off the machine.
- Never check the machine when it is running.
- After your review, install the security covers again.
- Before carrying out any revision, maintenance or action that is not completely safe, contact your official distributor.

2. TECHNICAL SPECIFICATIONS

	P101/P102
Engine	Anova 4 stroke – MA81
Displacement	79cc
Deposit	100L
Bomb	Anova P100-187
Flow	23L/min
Pressure	25 bar
Long hose	10m

3. INSTRUCTIONS FOR USE OF THE ENGINE

3.1. Security warnings

3.1.1. User Responsibility

Please read and follow the instructions carefully before using the motor, otherwise it will result in personal injury or damage to the motor.

Learn how to quickly stop the engine and familiarize yourself with all control operations. Never work with the engine unattended. Keep children and pets away from the area of use.

3.1.2. Carefully refuel

Gasoline is flammable. Carry out the operation in an outside, well-ventilated area, stop the engine completely and refuel.

Do not smoke during refueling, keep away from fire and other sources of sparks.

It is forbidden to start the engine when there are gasoline splashes in the work area and they are not completely dry.

3.1.3. Hot exhaust gas

The exhaust will be very hot during engine operation, even after a period of inactivity.

Be careful not to touch the hot exhaust so as not to cause burns. Shut off the engine and let it cool down.

To prevent fire, keep the motor at least 1 meter away from walls and other equipment while the motor is running.

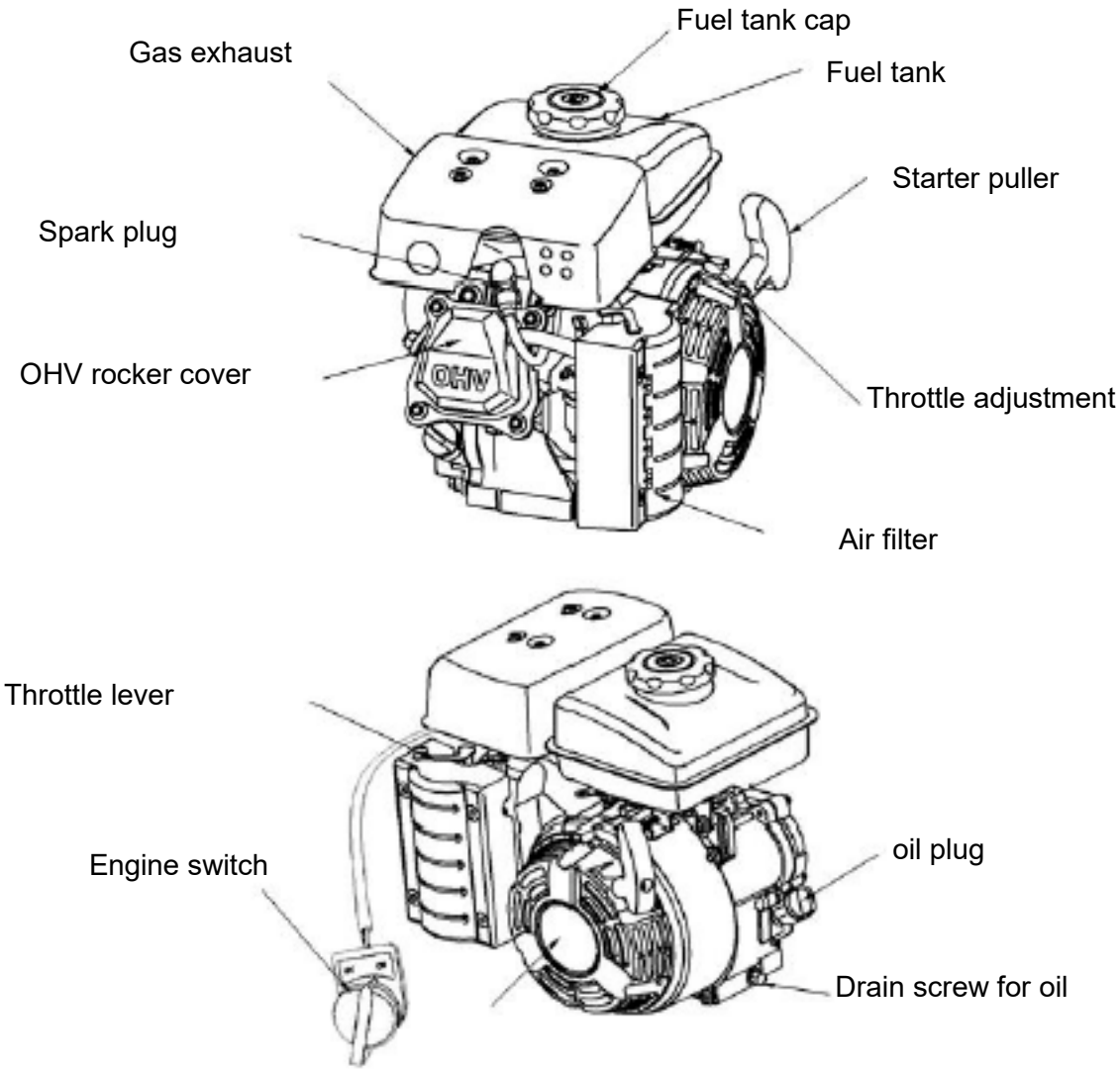
Flammable products must be kept away from the engine.

3.1.4. Carbon monoxide poisoning

Exhaust gases produce toxic carbon monoxide. Inhalation of exhaust fumes should be avoided.

Do not use in closed places without proper ventilation. Do not run the engine in a closed garage or enclosed area.

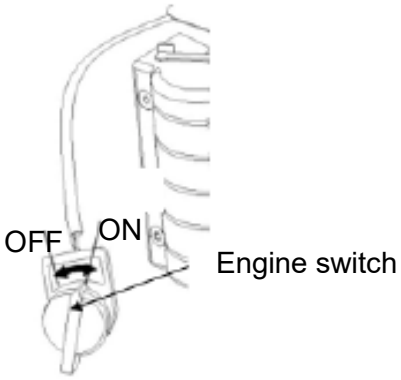
3.2. Identification of engine parts



3.3. Engine use

3.3.1. Engine switch

The engine switch is for turning the ignition circuit on and off: The engine can only be operated when the engine switch is in the "open" (ON) position; it can be moved to the "OFF" position to stop the motor.

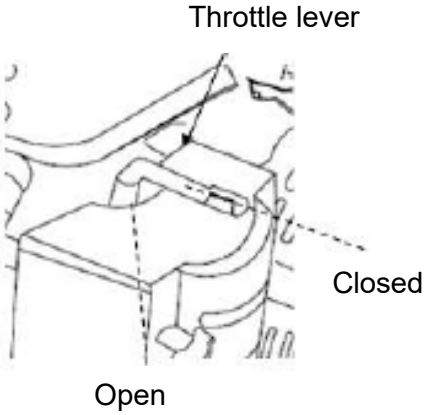


3.3.2. Throttle control (choke)

The purpose of the choke lever is to open the throttle control and close the choke.

The choke handle must be placed in the "closed" position when the engine is started.

After starting the engine, the choke must be placed in the "open" position.

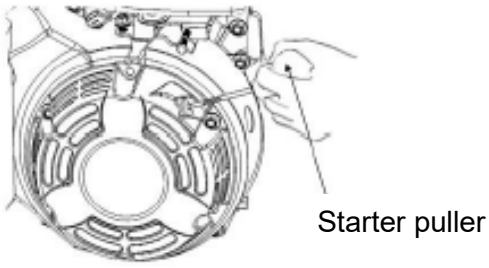


3.3.3. Starter handle

Pulling the starter handle causes the system to drive the engine crankshaft to start the engine.

⚠Warning

Do not let the starter handle jump back after starting, gently return the pull handle to its original position.



3.3.4. Speed control handle

Adjust the position of the speed control lever to achieve the desired engine speed.

3.4. Pre-Operation Checks

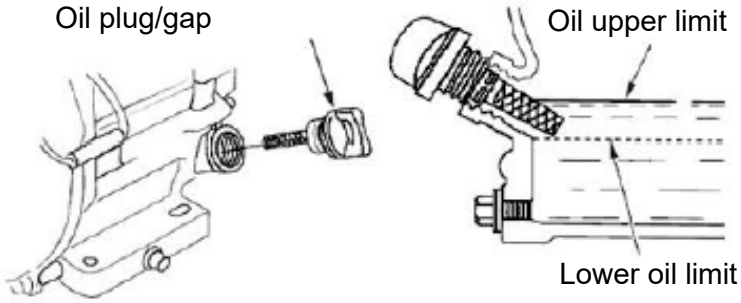
3.4.1. Routine inspection

- Check for possible oil and gasoline leaks.
- Check for signs of damage or deterioration in any of the engine parts.
- Check all parts of the covers, tighten the screws, nuts and cables.

3.4.2. Oil level

After stopping the engine, place it in a horizontal position and check the oil:

1. Remove the oil gauge from the oil plug and clean it.
2. Reinsert the oil gauge and check the oil level without tightening the plug or gauge.
3. If the oil level is too low, add the recommended oil to the upper limit.
4. After adding the oil, remember to install and tighten the oil plug properly.

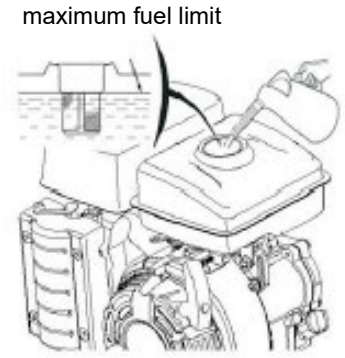


When the oil level is lower than the safety line, the oil protection system will automatically stop it. To avoid unexpected downtime, check the oil level before every start.

3.4.3. Fuel level

First turn off the engine completely, then unscrew the fuel tank cap and check the fuel level. If the fuel level is too low, fill the fuel tank. After adding fuel, tighten the fuel tank cap.

Warning



When filling the fuel, the level must not exceed the top of the fuel filter (highest fuel).

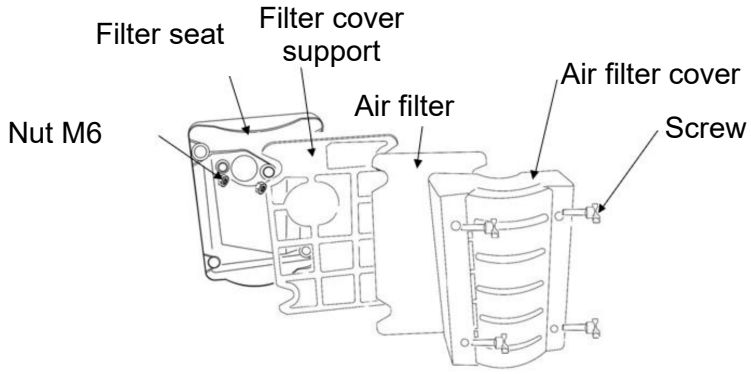
Fuel Tank Capacity: 1.6L

It is recommended to use unleaded gasoline with an octane number greater than or equal to 92#. Unleaded gasoline can reduce carbon deposits and extend the life of the exhaust system.

It is strictly forbidden to use rancid or contaminated or mixed organic oil. Prevent dust or water from entering the fuel tank.

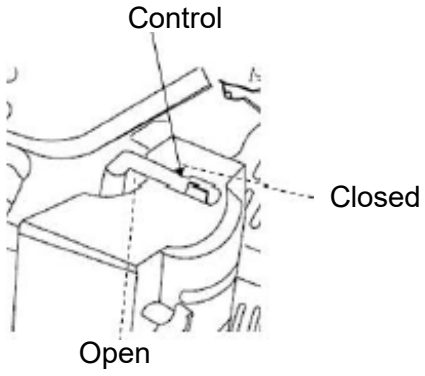
3.4.4. Air Filter Check

Remove the air filter housing and check the filter element. Clean the filter element when it is dirty. If it is damaged, replace it with a new one.



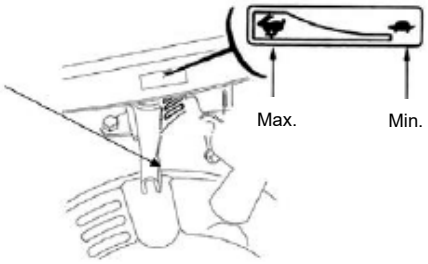
3.5. Engine start

1) When starting the cold starter, put the choke lever in the "off" position. When the heat engine is started, the choke handle must be placed in the "open" position.

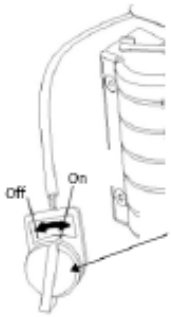


2) Move the speed control lever from "low speed" to "high speed", about 1/3 of "high speed".

Throttle lever



3) Place the engine switch in the "on" position.

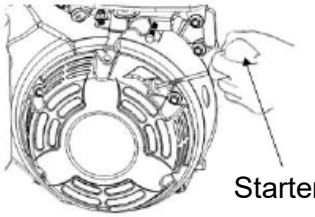


engine switch

4) Gently pull the starter lever until you feel resistance, then pull quickly and firmly until the rope is fully extended.

⚠ Warning

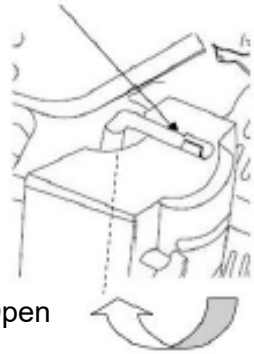
Do not allow the starter handle to back up after starting, gently reinsert it without letting go of it suddenly.



Starter puller

5) If the engine is started with the choke lever in the "off" position, the choke lever should be moved slowly to the "open" position when the engine warms up. If a warm engine starts, place the choke lever in the "open" position.

Joystick

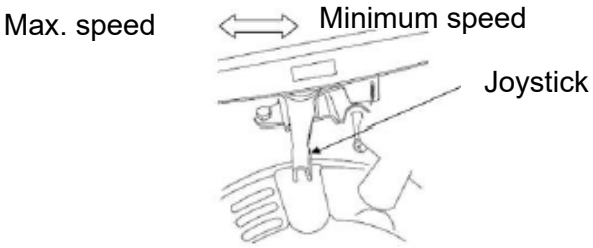


Open

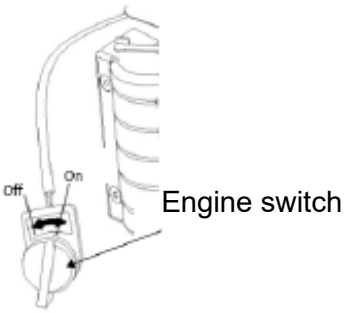
3.6. Engine stop

In an emergency, an easy way to stop the engine is to turn the engine switch to the "off" position. Under normal circumstances, the shutdown steps are as follows:

1) Move the speed control lever to the "low speed" position.



2) Turn off the engine switch.



3.7. Engine maintenance

3.7.1. Maintenance program

Maintenance Period (whichever comes first)		Regularly	Every 20h / first month of first use	Every 50h / 3 months	Every 100h /6 months	Every 300h / 1 year
Oil	Check level	x				
	Replace		x		x	
Air filter	check status	x				
	Cleaning			x(1)		
	Replace					
fuel remains	clean sediment				x	
Spark plug	Clean up				x	Replace
Valve adjustment	adjust/check					x(2)
rocker cover	Cleaning	Every 300 hours (2)				
Fuel tank and fuel filter	Cleaning	Every 2 years (2)				
fuel tubes	Replace	Every 2 years (2)				

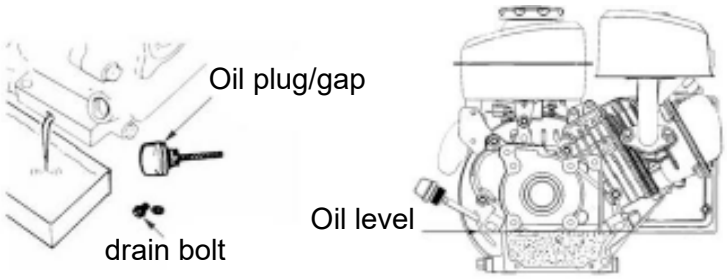
(1): Use in dusty areas means more frequent maintenance will be required.

(2): Must be performed by your after-sales service provider. Unless you have the right tools and experience.

3.7.2. Replace crankcase oil

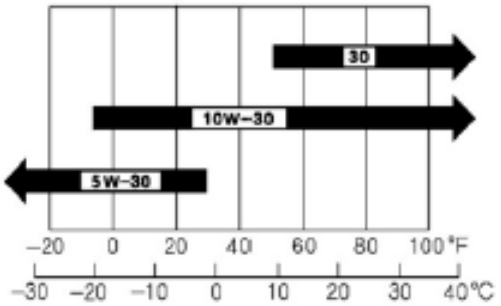
Let the engine warm up and then drain the oil, this will ensure that the oil drains quickly and cleanly.

1) Place a suitable container under the engine to collect the used oil. Then remove the oil plug/gap, remove the oil drain bolts and gaskets.
2) After completely draining the oil, reinstall the oil bolts and washers and tighten them.
   From the perspective of environmental protection, please properly dispose of used motor oil after use. We strongly recommend that you pour your used oil into a sealed container and send it to your local service station or used oil recycling center. Remember not to throw it in the dumpster or throw it on the ground or in a ditch in an uncontrolled way.
3) Place the engine in a horizontal position and add the recommended oil to the upper limit.
   Engine oil quantity: 0.35L



4) Install the oil plug/gap and tighten it.

Recommended oil: Four-stroke gasoline engine oil. API classification of SE, SF or equivalent to grade SG SAE 10W -30.



Use this motor oil grading chart if the temperature change in your region/work area is within the temperature range listed for each oil grade in the chart.

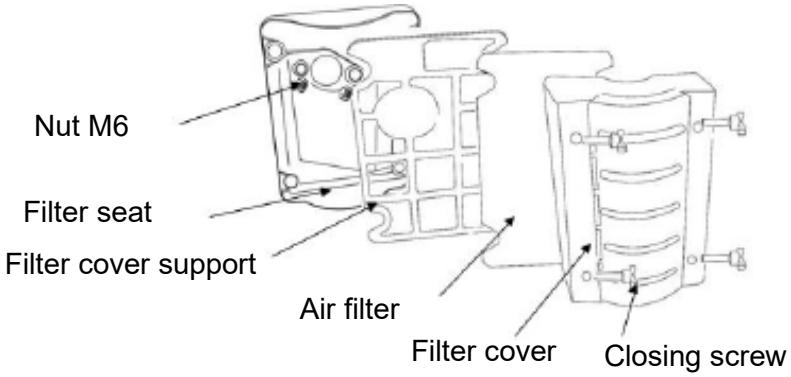
3.7.3. Air Filter Maintenance

When the air filter element gets dirty, it will affect the quality of the intake air and the power of the engine. If the work area is dusty, maintenance should be performed more frequently than the basic maintenance schedule.

The absence of a filter element or the use of a damaged filter element can cause dust to enter the engine, resulting in rapid engine wear.

Air filter

1) Unscrew the air filter fixing bolt and remove the outer casing.

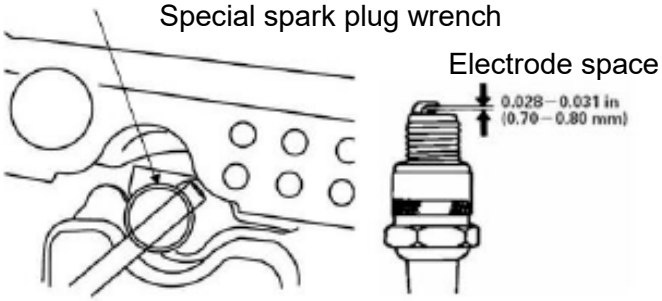


2) Remove the foam filter.
   Check the filter element and replace it if it is damaged. Foam filter cleaning:
   - Rinse in hot water with detergent, or in a non-flammable solvent;
   - After drying, dip in clean oil and squeeze out excess oil.
3) Clean the lower body of the air filter, the outer cover and the rubber pad. Dust must be prevented from entering the carburetor inlet.
4) Reassemble the foam filter and note that the pad is placed under the filter.
5) Install the outer casing and tighten the air cleaner mounting bolts.

Spark plug

Recommended spark plug: NGK BP5HS or equivalent spark plug. The wrong type of spark plug can damage the engine.

1) Remove the spark plug cap and remove the dust from the spark plug.
2) Unscrew the spark plug with a spark plug socket wrench.



3) Check the spark plug. Replace the spark plug if the electrode is damaged or the insulator is broken. The gap between the spark electrodes is 0.70mm to 0.80mm.
   Adjust the side electrodes if necessary.
4) Carefully screw in the spark plug by hand to avoid stripping the cylinder head threads.
5) When the spark plug is seated, tighten and compress the washer with a spark plug socket wrench.
   If reinstalling old plug, when plug is seated, tighten 1/8 to 1/4 turn.
   If installing a new spark plug, tighten 1/2 turn when plug is seated.
6) Install the spark plug cap.

Idle speed adjustment

1) Start the engine in the open air and allow it to warm up.
2) Set the speed control lever to the lowest speed position.
3) Use the tool to adjust the idle adjusting screw so that the speed is within the standard idle speed range.

Standard idle speed: 1800 rpm ± 150 rpm.

3.8. Engine storage

After turning off the engine, let it cool down for at least half an hour.

Clean all exterior surfaces, repair damaged paint, and apply a light coat of rust preventative oil to other areas that may rust.

⚠ Warning

Pressurized water can enter the air filter and muffler and even enter the cylinder along the air passage, causing rust damage.

Splashing water can damage a hot engine. Therefore, cleaning should be done after the engine has cooled down completely.

Steps for proper long-term engine storage:

1) Change the oil.
2) Remove the spark plug.
3) Fill a tablespoon (5-10 ml) of clean oil into the cylinder head.
4) Pull the actuator to rotate for several weeks to spread the oil in the cylinder head.
5) Replace spark plug.
6) Pull the starter handle slowly until you feel resistance. At this point, the intake and exhaust valves are closed, preventing moisture from entering the cylinder head. Then gently replace the starter handle.
7) Put a dust-proof cover on the motor cover and store it in a dry and ventilated area.

3.9. Problem solving

3.9.1. Difficulty starting

Situation				probable cause	Required action
If the normal pressure in the cylinder	Spark plug normal	Faulty fuel system	There is no fuel flow	There is no fuel in the tank	refuel
				Hole in fuel cap vent blocked	Clean up
				Fuel tap blocked	clean key
				Carburetor needle or float blocked	Repair or replace
			there is fuel circulation to the engine	Fuel too dirty or with impurities	Replace fuel
				Presence of water in the fuel	Replace fuel
				Excessive fuel in cylinder	Drain and dry the spark plug
				Fuel grade is wrong	Add the correct fuel
	normal fuel system	Spark plug normal	Weak spark plug	Carbon deposits or dirty electrode	Remove carbon deposits and clean spark plug
				Spark plug insulator damage	Replace spark plug
				Spark plug electrode breakage	Replace spark plug
				Wrong electrode gap	Set the correct electrode gap
		regular spark plug	There is no spark in the ignition system	Power cord damage	Replace the cables
				damaged coil	Replace the coil
				Insufficient magnetic field strength	Repair or replace flywheel magneto
If the pressure in the cylinder is abnormal	normal fuel system	system on normal	regular spark plug	The piston ring is worn and broken	Replace
				Dirt deposits on the piston rings	Clean carbon deposits
				Spark plug without cap or loose	Install the cap or tighten the spark plug
				Rocker cover leaks	Replace the rocker cover gasket
				Valve sealing leaks	Repair gasket or seal

3.9.2. Insufficient power

Situation		probable cause	Required action
When throttle speed is increased, engine speed increases very slowly or even decreases or engine shuts off	Switched on	The coil calibration is incorrect	Replace coil
	fuel system	Presence of air in the ducts	purge the air
		Incorrect fuel outlet setting	fit correctly
		Hole in the carburetor needle blocked	Clean up
		Fuel tap blocked	Clean or replace the defective part
		Dirt deposits in the system	Clean dirt in the fuel system
	Air intake in the engine	Blocked air inlet	Clean or replace the filter
		Leaks in engine air intake system	repair or replace
	Weak engine compression	Loss or wear in piston, cylinder or piston rings	replace components
		Rocker cover leaks	Replace valve cover gasket
		Incorrect valve adjustment	reset correctly
		Incorrect valve sealing	repair or replace

3.9.3. Sudden stop

Situation		probable cause	Required action
Sudden shutdown during engine use	Fuel system	fuel exhausted	refuel
		Carburetor lock	Check fuel circuit; clean up
		Leaks in the carburettor	Repair
		blocked needle	Repair the carburetor needle
	Ignition system	spark plug failure	Replace spark plug
		Spark plug electrode failure	Replace spark plug
		Wiring damage	Replace or repair
		Ignition coil failure	Replace ignition coil
	Others	Valve failure or cylinder collapse	Repair or replace damaged parts

3.9.4. Engine overheating

Situation	probable cause	Required action
The motor overheats during use	Wrong coil setting	Replace the coil
	fuel exhausted	refuel
	blocked exhaust pipe	Clean fuel lines
	Leaks in the ventilation system	Repair the faulty component
	Dirt in the air system	Clean up
	Damaged starter fan	Replace the damaged part
	Piston ring failures causing cylinder wear	Replace worn parts
	Engine speed too high	Reset engine speed
	Damaged crankshaft bearings	Replace or repair

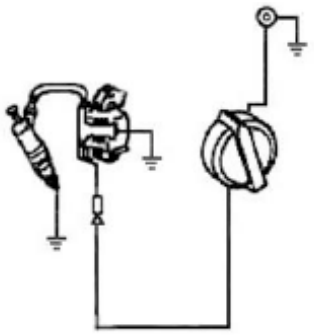
3.9.5. Abnormal sound

Situation	probable cause	Required action
bumps or rattles	Piston, worn piston rings	Replace worn parts
	Worn connecting rod, piston pin and pin hole	Replace worn parts
	wear on crankshaft bearings	Replace worn parts
	Piston ring breakage	Replace damaged parts
metallic noises and explosions	Excessive carbon deposits	Clean carbon deposits
	Spark plug electrode gap too small	Adjust electrode spacing
	Fuel mixture too rich	Check carb adjustment
	Wrong fuel grade	Replace fuel
	engine overheating	See point 4 of this section
Other abnormal sounds	Incorrect valve adjustment	reset valves
	The flywheel magneto is loose or poorly connected to the crankshaft	Adjust correctly

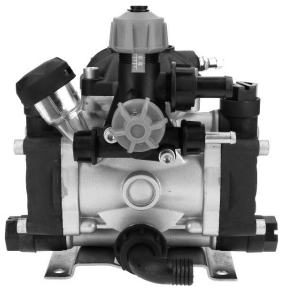
3.10. Engine technical data

		MA80/MA81/MA82
Engine type		Single-cylinder, four-stroke, air-ventilated, overhead valve (OHV)
Average power (kW/3600rpm)		1.2
Maximum power (kW/3600prm		1.4
Max Torque (Nm/rpm)		3.8Nm/3800rpm
Fuel tank capacity (L)		1.4
Oil tank capacity (L)		0.35
Piston dimensions (stroke) mm		52x37
Displacement		79
Lubrication system		Splash lubrication
System on		Manual
Direction of rotation of the motor		Clockwise (according to transmission axis)
Valve adjustment (mm)		Input 0.10~0.15 // Output 0.15~0.20
Spark plug electrode gap (mm)		0.7~0.8
Ignition system		Magnetic with coil
Measurements (mm)	**Length**	335
	Width	290
	Tall	350
Net weight / kg)		10

3.11. Wiring diagram



4. INSTRUCTIONS FOR USE OF THE P100-187 PUMP



Membrane Pumps, with radial piston kinematic mechanism, are designed and manufactured to pump or transfer water or antiparasitic liquids and herbicides in aqueous solution to be used according to the indicated specifications. They are generally driven by: electric motors, endothermic gasoline or diesel engines, hydraulic motors, tractor power take-offs. The couplings can be made by means of a transmission shaft, direct flanged, reducer or multiplier, joints, sleeves, pulleys and belts.

4.1. Security warnings

Read this manual carefully before using the pump, in particular the safety warnings. Keep it in a suitable place and keep it unaltered.

Situations and/or problems related to the correct operation of the Pump.

The "DANGER" symbol shown to the side draws attention to situations and/or problems that may endanger people's safety.

- Never start the pump under pressure.
- Constantly check the state of wear of the pipes and the corresponding joints, especially those that are under pressure. The tubes that present abrasions and that do not guarantee a perfect tightness must be replaced.

⚠ - Protect the rotating parts with a protection in order to prevent their contact.

- The Pump is intended to be part of a machine or installation, with different power systems, which can even substantially vary the noise emitted. It is the task of the manufacturer of said machine or installation to assess the level of noise emitted by the assembly and communicate it to the user in a timely manner, including in relation to the use of adequate Personal Protection Equipment.

4.2. Expected use

⚠

Membrane Pumps are intended to be used inside machines or installations for the pressurized transfer of water or antiparasitic and herbicide liquids, such as: Atomizers, Nebulizers, Herbicide Bars, Gardening, Civil and industrial cleaning, Drainage, Firefighting, Antifreeze.

The working environment temperature must be between: Min. 0°C (32°F) - Max. 45°C (113°F).

The Pump cannot be used submerged in a liquid.

4.3. Unintended uses

The characteristics of the liquid to be used are described in detail below: do not use for other liquids; in particular, it is not possible to use the Pumps in the following conditions:

- In the presence of water with a high salt concentration, such as, for example, sea water.

- In environments with corrosive or explosive atmosphere.
- In the presence of any liquid not compatible with the manufacturing materials of the Pump.
- To pump paints, solvents, fuels and any flammable liquid (not suitable for ATEX environments).
- For food use.
- To wash people, animals, electrical or electronic devices with live electrical current.
- To wash the Pump itself.

4.4. Preliminary checks

4.4.1. Usable liquids

The pump has been designed and manufactured for the transfer of clean water, non-aggressive aqueous solutions or antiparasitic liquids and herbicides in aqueous solution, to be used in accordance with the instructions of the corresponding manufacturers.

- The aspirated liquid must not contain sand or other solid particles in suspension.
- The aspirated liquid must have viscosity and density characteristics similar to those of water.
- The temperature of the liquid to be pumped must be between 5°C (41°F) and 38°C (100°F).
- Any other use is prohibited, except in writing from the Technical Service.

4.4.2. Pump inlet and outlet

The inlet mouth of the liquid to be pumped, also called suction or supply, is generally larger in diameter than the outlet mouth, also called impulsion.

⚠ Warning

The Pump Inlet and Outlet can NOT be reversed with each other.

4.4.3. Feed conditions (suction)

Check that the power line is correctly connected and that it meets the following requirements:

- Have, at each of its points, a minimum internal diameter equal to the internal diameter of the inlet of the Pump.
- Be perfectly hermetic in order to avoid harmful air infiltrations.
- Not present, throughout its length, any strangulation or narrowing of the ducts.
- Avoid all kinds of turbulence near the pump inlet and the feed tank.
- Any filter must have a minimum capacity of at least 2 times the flow rate of the Pump and must not cause bottlenecks or pressure drops. The recommended filtration degree is 32 ÷ 50 and its efficiency must be maintained by cleaning the filter every time it is necessary.
- Maximum allowable suction pressure: 0.5 bar (7 PSI).
- Maximum allowed negative pressure in suction: -0.2 bar (-3 PSI) [-6 inch. Hg].
- Maximum allowable height difference between the Pump and the power source located below: 2 m (6.5 ft.).

4.4.4. Output conditions (discharge)

Check that the impulse line and all the accessories are correctly connected, securely fastened and leak-tight and that the pipes have the correct dimensions.

All pipes with pressure must be permanently marked with the maximum value of admissible pressure, which must never be less than the maximum operating pressure of the Pump indicated on the Nameplate.

4.4.5. Speed and direction of rotation

⚠ Warning
The speed of rotation of the pump shaft must never exceed the value of revolutions per minute (RPM) indicated on its nameplate.

The minimum number of revolutions per minute (RPM) allowed is: Maximum RPM x 0.6.

The pump shaft can rotate both clockwise and counterclockwise.

4.5. Controls in the installation

4.5.1. Pressure regulation valve
A pressure regulation valve must be installed to avoid overpressure that exceeds the maximum limit indicated on the Pump Plate.

⚠ Warning
Use, even for a short time, with a pressure higher than this limit will cause damage to the Pump. The choice of regulation valve must be made based on the maximum pressure and flow data indicated on the plate.

Warning
An incorrect installation of the pressure regulation valve can cause serious damage to people and things, in addition to seriously damaging the pump itself.

The circuit must have an additional safety valve to prevent the maximum pressure from being exceeded in the event of failure of the pressure regulation valve.

4.5.2. Nozzle
A damaged nozzle produces a drop in pressure; In this case, do not intervene on the pressure regulation valve to try to increase the pressure of the installation, since, when closing the impulsion, a pressure surge would be caused that could damage the Pump.

⚠ In the event of a drop in pressure, it is advisable to replace the nozzle and re-regulate the system pressure. The pump flow rate must be at least 10% higher than the flow rate required by the equipment; the excess flow must be sent to discharge.

4.5.3. Pulsation damper (accumulator)
Before starting the Pump, check the value of the air pressure in the accumulator, if any. Said operation can be carried out, with the pump stopped, by operating on the inflation valve with a common rubber pressure gauge. It is advisable to periodically check the inflation pressure.

⚠ Warning
The use of the Pump with the accumulator discharged or incorrectly inflated, in addition to causing the installation to malfunction, can damage the accumulator membrane.

The value of the accumulator inflation pressure varies according to the operating pressure of the pump:

pump working pressure	bar *PSI*	2 *29*	5 *72*	10 *145*	20 *290*	30 *435*	40 *580*	50 *725*
		⇩	⇩	⇩	⇩	⇩	⇩	⇩
accumulator pressure	bar *PSI*	1 *15*	2 *29*	4 *58*	5 *72*	6 *87*	7 *102*	8 *116*

It normally inflates the pumps accumulator with approximately 5 bar (72 PSI).

4.5.4. Pressure gauge

Install a pressure gauge as close as possible to the outlet of the Pump, since the maximum pressure indicated on the Pump Plate refers to the pressure measured at that point and not at the nozzle or other accessories.

All the components of the machine or of the circuit must have technical characteristics compatible with the data indicated on the Pump Plate.

4.6. Installation, commissioning and shutdown

4.6.1. Location

The smaller and lighter pumps can be handled by hand, in accordance with current legislation. For those of greater weight, an appropriate lifting device must be used; If it is necessary to use this device, use one or more suitable slings, paying attention not to damage the product. The weight of the pumps is indicated in the Table on pg. 17.

For a longer life of the components subject to wear, such as valves or diaphragms, it is recommended to install the pump under load or at the same level as the supply tank. In any case, the Membrane Pumps are self-priming, that is, they can be installed above the power supply; in this case the maximum difference in level allowed is 2 m. (6.5 ft.). If the Pump is used in a particularly dirty environment or exposed to atmospheric agents, it is recommended to protect it by respecting the ventilation conditions.

4.6.2. Mounting

Mount the Pump on a rigid surface, keeping the PTO and support feet horizontal, in order to allow proper drainage in the event of water or oil leaks. The pump must be firmly fixed on a suitable base and be perfectly aligned with the transmission components. In case of belt drive, carefully check the alignment of the pulleys and the tension of the belts.

Use flexible pipes of adequate dimensions for both the inlet and the outlet of the Pump, according to the technical characteristics indicated on the Plate.

4.6.3. Start up

Before starting up the pump, the following preliminary checks must be carried out:

- Check the oil level from the glass or sight glass plug and, if necessary, add oil.
- Check the value of the accumulator pressure, if any. Inflate or deflate, as needed.
- The pressure regulation valve must be calibrated at "0" pressure to favor suction.

Start the Pump for approximately 10 seconds until the complete discharge of the delivery liquid. Once the suction cycle is complete, the pump can be brought to the desired pressure value,

operating with the pressure regulation valve, without exceeding the maximum pressure value indicated on the pump plate.

4.6.4. Power off and standby

After use or in case of storage, it is recommended to wash the internal part of the Pump. This operation can be carried out by making the Pump work for a few minutes with clean water.

Then, disconnect the supply line and let the pump turn for 15 seconds until all the water contained inside comes out.

A few minutes dedicated to the internal cleaning of the Pump means a notable benefit in terms of its useful life.

⚠ Warning

Never leave the Pump at rest with the liquid used inside it. Generally, the membranes are damaged by their permanent contact with the liquid, rather than by using the liquid itself for many hours of work.

Do not wash the outside of the Pump: water could enter the inside of its casing, for example, through the eccentric shaft seals.

♻ Do not dispose of the liquid used for washing in the environment; comply with current legislation.

4.6.5. Freezing Precautions

In winter times or in areas and periods of the year with risk of freezing, at the end of the work, turn the pump for the time necessary to circulate an emulsion made up of 50% clean water and 50% antifreeze liquid. , to prevent freezing and damage to it.

⚠ Warning

The Pump must not be used to pump antifreeze liquid not mixed with water.

The Pump must never be started in the presence of ice or very low ambient temperatures. Otherwise, the Pump could suffer very serious damage. In order to put the installation into operation, it is essential that the entire circuit is completely defrosted.

4.7. Pump maintenance

4.7.1. Daily maintenance

If the pump is used for less demanding applications, it is recommended to carry out the following routine maintenance interventions:

- After the first 50 hours: Oil change (see section 9.2 - Lubrication)
- Every 500 hours: Oil Change
- Replacement of Membranes (Go to an Official Distributor)
- Every 1000 hours: Valve replacement

4.7.2. Lubrication

- The pump is delivered without lubricating oil. Periodically check the level of the oil inside the pump using the appropriate level indicator.
  Use SAE 15W-40 / SAE 30 OIL or equivalent characteristics.

- The oil change operation must be carried out by making the oil flow from the appropriate lower drain plug and necessarily with the pump stopped.
- During the priming phases, the oil level may vary; instead, it must stabilize when the installation is under constant pressure.
  A decrease in the oil level during the first hours of operation of the Pump could be normal; it is enough to fill in timely.
  If, on the other hand, there are significant variations in the oil level after many hours of operation, the pump membranes could be damaged or there could be strangulation in the suction line.

⚠ Warning
Do not start the pump if there is no oil in the crankcase.

During the maintenance phase it is recommended:

- Adopt suitable protective equipment (eg gloves).
- Wait until the machine has cooled down sufficiently and is in standby.
- During the maintenance phases, do not dispose of any residues in the surrounding environment; comply with the provisions of current regulations.

In case of pump replacement:

1. Separate components according to type (eg plastic, hazardous liquids, metal, etc.).

2. For disposal, the public or private collection systems provided for by local legislation must be used.

3. This device may contain hazardous substances: improper use or incorrect disposal could have negative effects on human health and the environment.

4.8. Troubleshooting the pump

drawbacks	possible causes	Solutions
The pump has no pressure. The pump does not reach the required pressure. The pump loses pressure when the valves are opened. devices.	Improper filter, dirty or partially clogged.	Fit a filter with the correct capacity or clean the filter cartridge.
	Clogged suction tube.	Remove the obstruction.
	Breakage of the suction tube inside or outside the tank	Replace the damaged tube.
	The pump draws air from the suction line.	Check that pipes and joints are tight.
	Damaged or worn pressure regulation valve.	Repair or replace the pressure regulation valve (*).
	Excessive foam in the water tank or level too low.	Restore ideal conditions in the water tank.
	The flow of the nozzles is greater than that of the pump.	a. Check the valve regulation. b. Check the wear, size and number of nozzles.
	One or more valves on the Pump are worn or damaged.	Clean or replace the valves (*).
The pressure gauge oscillates noticeably. Excessive pulsations in the drive line.	Accumulator pressure is too high or too low.	Inflate the accumulator with the correct pressure (*)
	The pump draws air from the suction line.	Check that pipes and joints are tight.
	Inadequate, dirty or partially clogged filter.	Fit a filter with the correct capacity or clean the filter cartridge.
	Presence of air in the cavities of the pump.	Rotate the pump with the outlet open in order to completely eliminate the air.
The pump does not load water	The pump draws air from the suction line.	Check that pipes and joints are tight.
	Inadequate, dirty or partially clogged filter.	Fit a filter with the correct capacity or clean the filter cartridge.
	One or more valves on the Pump are worn or damaged.	Clean or replace the valves (*).
Pump oil turns white. Pump oil comes out of discharge; The oil level drops noticeably. The oil cap pops off.	One or more damaged membranes. ⚠ **Warning** stop pump immediately	Replace the membranes (*). Instructions for the replacement of the membranes.
(*) These operations must be carried out by specialized personnel		

5. MAINTENANCE AND STORAGE

5.1. Maintenance

- All maintenance and repair operations must be carried out with adequate protections.
- At the end of each working day, empty the content, recovering the remaining liquid in a suitable container or continue the treatment until it is completely emptied.
- Dilute the remainder of the product from the tank with at least 10 parts of water and spray it on the trees that have already been treated.
- The machine should be washed with detergent on the outside.
- Rinse the tank and spray circuits with plenty of clean water to remove any traces of liquid.
- Clean clogged nozzles with a soft brush (never metal).
- Check the fastening of the wheels after several hours of work.
- In case of possible frost, empty the liquid pump. To do this, start the equipment without liquid suction for a few minutes.
- At the end of each treatment or if the pump is out of service for a long time, it is necessary to wash the internal parts that are in contact with the liquids used.
  These operations can be carried out by making the pump work under pressure with clean water for a few minutes (4-5), after this period, disconnect the suction line from the pump and let it turn for a few seconds (15-20) so that all the water comes out. the water inside the pump.

5.1.1. Tank emptying

- To empty the equipment, remove the screw cap located under the tank, wait for the tank to empty completely and put the cap back in its place.
- When removing the cap, the product will come out freely, so it must be protected, with suitable clothing, against possible splashes. In addition, you must place a container for the correct disposal of the liquid.
- Periodically check the drain rubber gaskets to avoid possible leaks.
- The elimination of phytosanitary products must be carried out in places prepared for this purpose, where there is no risk of contamination for people, animals or plants.

Note: Remember that they are toxic products that are harmful to health. In case of doubt about how to eliminate these products, contact the Regional Health or Environment Offices.

⚠ Warning

The product diluted in the cleaning water must be distributed on the same treated land or, better still, on land that has not yet been treated but is compatible with the diluted chemical products.

All maintenance and repair operations must be carried out with adequate protections.

5.2. Maintenance and long-term storage

Carry out the following instructions to keep your equipment in good condition when it will be idle for long periods of time:

- Completely empty the machine tank through the lower drain plug.
- Wash the tank internally and externally with clean water and check that there are no residues inside.
- Check the hoses and prevent them from knotting or getting caught on sharp edges, to avoid breakage and premature wear.
- When the equipment is stored in places where there is a risk of frost, fill the tank with antifreeze, run the equipment until the pipes and the inside of the pump are filled. In this way it can be preserved without causing damage.
- Loosen the pressure valve on the distributor as much as possible to relieve the pressure exerted on the spring.
- Disassemble and clean all nozzles before storing the equipment.
- Clean and grease the transmission at the end of the season of use.
- Carry out the operation described in the previous section for pump maintenance.

6. WARRANTY

Millasur guarantees that if your product suffers from a manufacturing defect during the established guarantee period, contact or go to your point of sale.

Your purchase invoice should be kept as proof of the purchase date. Your tool must be returned to your dealer in an acceptable clean condition, in its original molded case, if applicable to the unit, accompanied by your appropriate proof of purchase.

6.1. Warranty period

The legal guarantee period of the product begins on the original date of purchase by the first initial buyer and its duration will be that established by the Royal Decree-law of protection of consumers and users against situations of social and economic vulnerability of the year corresponding to the moment of purchase of the product.

Some countries do not allow limitations on how long an implied warranty lasts or do not allow the exclusion or limitation of consequential or incidental damages, in which case the above limitation and exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or country to country.

6.2. Exclusions

This warranty does not cover product damage or performance problems caused by:

- Natural wear and tear.
- Misuse, negligence, careless operation or lack of maintenance.

- Defects caused by incorrect use, damage caused due to manipulations carried out by personnel not authorized by Anova or use of non-original spare parts.
- Defects of normal wear parts, such as bearings, brushes, cables, plugs or accessories such as drills, bits, saw blades, etc.
- Damage or defects resulting from abuse, accidents or alterations.
- Improper use and storage (explicit reference that the rules described in the operating instructions have not been followed).
- Customer caused wear (for example, broken saw blades, worn carbon brushes, etc.).
- Wear and secondary damage due to lack of maintenance, repair, lubricants (e.g. overheating damage due to blocked cooling slots, bearing damage as a result of dirt, frost damage, etc.)
- Damage as an obvious result of excessive use / overload.
- Damage caused by improper supplies (eg incorrect fuel)
- Load-induced failure of housing components or accessories due to abnormal stress
- Load-induced deformation of housing components or accessories due to abnormal stress.
- Damage resulting from the operation of supplies that are overfilled or leak due to improper storage, inappropriate cleaning agents, or other damaging chemical components.
- Damage due to improper exposure to extreme temperatures (for example, freeze fractures, thermal deformation of components, etc.)
- Damage from permanent exposure to ultraviolet radiation.
- Damage caused by improper maintenance.
- Any damage caused by non-compliance with the instruction manual
- Any product that has attempted to be repaired by an unqualified professional.
- Any product connected to an improper power source (amps, voltage, frequency).
- Any damage caused by external influences (water, chemical, physical, shock) or foreign substances.
- Use of inappropriate accessories or parts.
- It does not include defects in normal wear parts, nor does it cover damages or defects resulting from abuse, accidents or alterations, nor does it cover transportation costs.

Also, the warranty is void if the product has been altered or modified, or if the trademark/serial number on the machine has been defaced or removed.

Routine maintenance, tune-ups, adjustments or normal wear and tear are not covered under this warranty.

This manual does not cover all possible situations regarding warranty exclusions, for more information contact your nearest Anova dealer.

6.3. In case of incident

The guarantee must be correctly completed with all the information requested, and accompanied by the purchase invoice.

Anova reserves the right to reject any claim where the purchase cannot be verified or where it is clear that the product was not properly maintained (maintenance, clean ventilation slots, lubrication, regularly maintained carbon brushes, cleaning, storage, etc.) .

Private use means personal domestic use by an end consumer. Instead, commercial use means all other uses, including uses for commercial, income-generating, or rental purposes.

Once the product has been used for commercial use, it will be considered a commercial use product for the purposes of this guarantee.

These are our standard warranty terms, but occasionally there may be additional warranty coverage not determined at the time of publication. For more information, contact your nearest Anova official distributor or by going to www.millasur.com.

Warranty service is only available through official Anova dealers. You can locate your nearest distributor on our distributor map at www.anova.es.

7. ENVIRONMENT

If your machine needs to be replaced after prolonged use, do not put it in the household waste, but dispose of it in an environmentally safe manner and in accordance with the legal provisions in this regard in your locality.

Protect the environment. Recycle the oil used by this machine by taking it to a recycling center. Do not pour used oil into drains, land, rivers, lakes or seas.

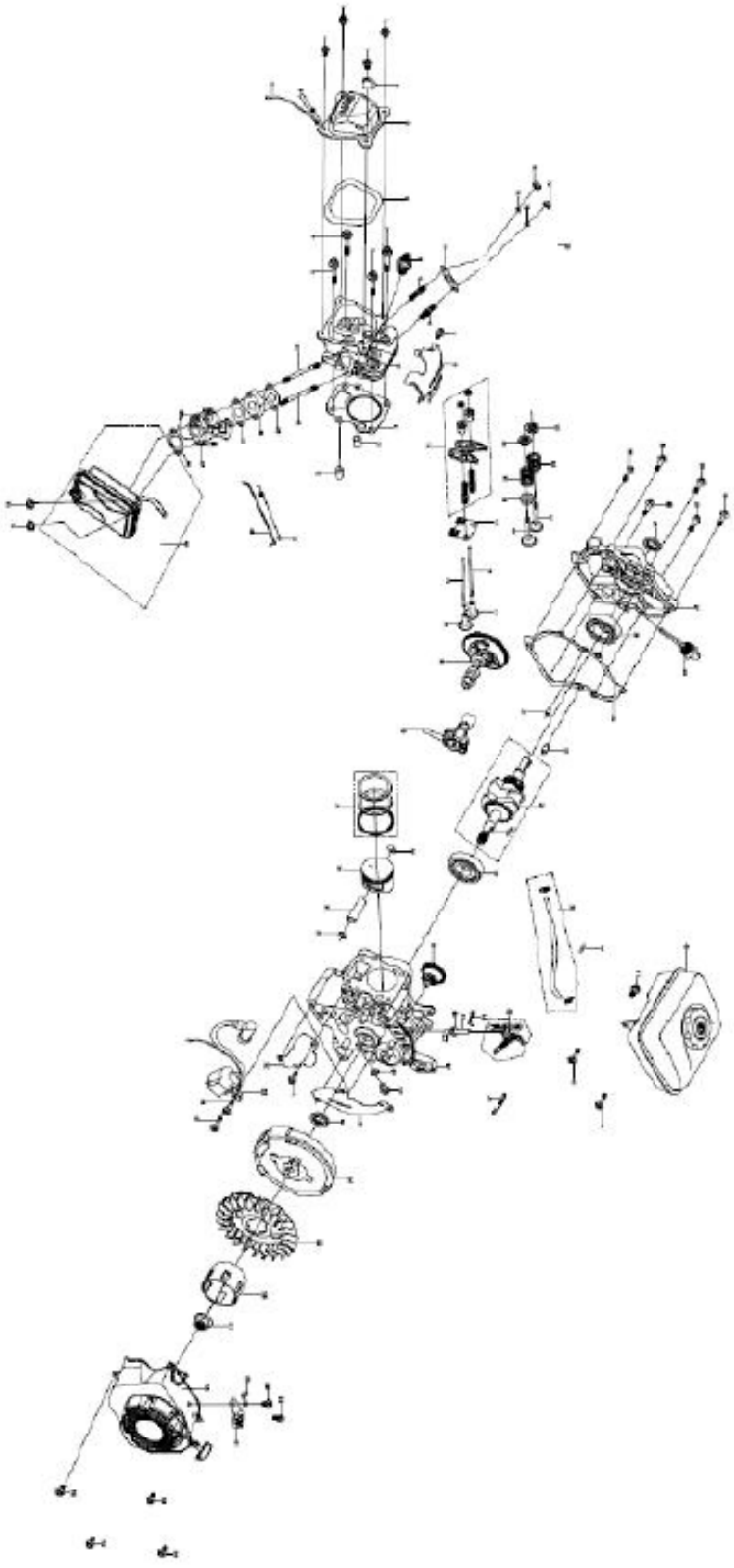
Please dispose of your machine in an ecological way. We must not dispose of machines together with household waste. Its plastic and metal components can be sorted according to their nature and recycled.

The materials used to pack this machine are recyclable. Please do not dispose of the packaging in household waste. Please dispose of these packages at an official waste collection point.

8. EXPLODED

Exploded view of the engine

MA80/MA81/MA82



Exploded view of the pump

P100-187