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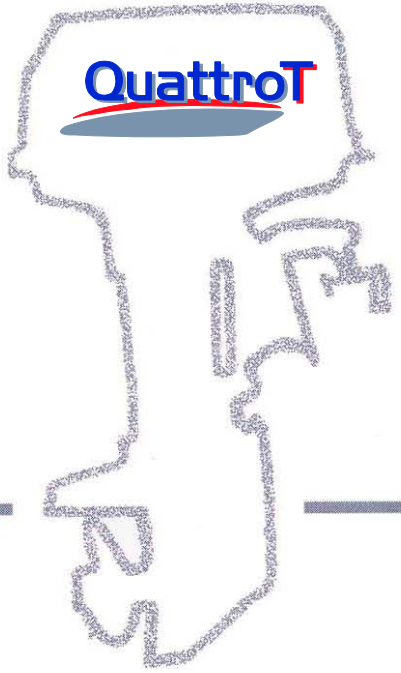
OWNER'S MANUAL

Sea Bass 4

Sea Bass 5



SELVA Marine

Vers. 01-2012

This manual must be considered as an integral part of your outboard motor and has to be kept with it, also if the motor is resold.
Selva joint-stock CO. reserve the right to change its product at any moment, except for the essential specifications, which will be kept as they are.
Any reference to products or details of a third party has only an informative purpose and it doesn't represent an obligation.
Selva joint-stock CO. doesn't take on any responsibility concerning the performance or the employment of these products.

We are glad that you have chosen a **SELVA MARINE** product, which means quality, technology and careful research. Your choice will give you many advantages, which you will soon learn to appreciate. Our dealers, our after-sales service and the guarantee, which you have signed, together with the observance of the information contained in this owner's manual are the essential conditions to give your recent purchase a long life.
Your holiday, your favorite sport, your job, which has from today the name **SELVA MARINE,** will be a further moment of satisfaction.

INTRODUCTION

Before operating this outboard motor, read this Owner's Manual carefully and completely, pay attention especially to the safety measures and rules.

Your safety and other people's safety do not depend only on your ability at using the motor, but they depend also on your knowledge and on the efficiency of the motor as well as on the respect of the laws and regulations relating to the use of outboard motors.

We suggest you improve your knowledge of the motor so that you can sail with mastery and confidence.

If any kind of repair on the motor should not have been clearly described in this manual or if you want to order spare parts or accessories, or if you have any question about the operation or maintenance of your outboard motor, please consult an authorized **SELVA MARINE** service station or **SELVA MARINE** dealer

ATTENTION

Pay attention to all the particularly important information that in this manual are distinguished in the following ways:

Safety measures and rules, which protect the machine operator and other people from serious accidents or risks.

Directions or special precautions that must be taken to avoid damage to the outboard motor or personal accidents.

Directions that make procedures easier or clearer. Technical information.

OUTBOARD MOTOR IDENTIFICATION DATA

This data is stamped on the label attached on the clamp bracket, as shown on the picture 1.

When you receive your new SELVA outboard motor write down the serial number, it will be useful to you in case you will have to order spare parts or for reference if your outboard motor would be stolen.

Make sure that the data on the label is the same as the data written in your registration book.
Picture No.1

Do not install an outboard motor with higher horsepower than shown in the certification of your boat.

SERIAL NUMBER RECORD

Write down the identification number and the model of your outboardmotor in the spaces below.

MOTOR MODEL

SERIAL NUMBER

CONTENTS

DIRECTIONS FOR USE

BASIC SAFETY MEASURES

To use the outboard motor you must have all requisites provided by law (physical suitability, insurance, government duties, registration, and so on). We suggest you become familiar with your boat equipped with SELVA motor in places, which are not too crowded.

Taking some medicines, alcoholic drinks or drugs increase considerably the risk of accidents.
Make sure that you are in a physical condition suitable for driving. Pay attention to tiredness and sleepiness.

The engine operator should not let his mind wander, or be distracted or influenced by other people, things or actions,(do not smoke, eat, read, and so on.) while steering the boat.

Use fuels and oils suitable for the engine, which are listed in the "greasing chart ".
Check every so often the oil level and the fuel level.

Stop the motor before every kind of maintenance or cleaning procedures, and in case of complicated maintenance take the spark-plug cap out.

Picture No. 2.

When the motor is running it may reach high temperatures.
Before opening the top cowling, wait till the engine has cooled down.
Do not open the top cowling, when the engine is running.

Picture No. 3.

PAY ATTENTION TO THE PROPELLER

The propeller is certainly the less protected part of your motor. It is therefore forbidden to get near the propeller when this is in rotating. You must leave bathers, skiers and other boat users enough space to move, in order to avoid any contact with the propeller.

Picture No. 4.

The engine operator must attach the engine stop switch lanyard to his wrist when the motor is on.

Picture No. 5.

Never sit on the motor **Picture No. 6.**

Never change the trim/tilt angle of your motor pushing on the steering handle.

Picture No. 7.

The motor must always have its top cowling on, when it is operating

Picture No. 8.

When you connect the fuel joint, check the proper connection.

Picture No. 9.

When starting there must be nobody within the engine operator's action radius. **Picture No. 10.**

There must be nobody within the motor steering radius.

Picture No. 11.

The free lock lever must always be engaged while the motor is in motion.
Never tilt-up the motor out of the water, while it is in motion.

Picture No. 12

Never pull the recoil starter handle, while the motor is running.

Picture No. 13.

To transport the motor use only the proper handle.
Before transporting the motor you have to tilt-up the steering rod properly.
The fuel tank is also provided with a handle to use for the transport. **Picture No. 14.**

When starting or operating the engine, do not touch electrical parts and particularly the ignition-coil, the high voltage wire, the spark-plug cap and the spark-plug itself.

When opening the safety valve of the fuel tank, highly flammable vapours come out. Do not smoke, inhale or use open flames close to it.

If the motor has had an accident, you should have it fully checked, before you use it again. If necessary let the **SELVA MARINE** authorised skilled staff have a look at it.
Do not use the motor, as the damage could have compromised the sailing safety.

Any alteration attempted on your motor or the removal of any of its basic elements, can compromise its safety and besides it is against the law. It also means the immediate loss of your guarantee.

Observe the laws in force.

Pay utmost attention to the weather conditions. Listen to the weather forecast and take the warnings to the sailors into consideration.

Keep your boat and equipment on board in a perfect state of efficiency.
Keep enough spare parts on board.
Inform somebody of your route, before sailing.

Prevent fires and explosions..

Before operating an outboard motor, you must know the laws and regulations relating to navigation.

Avoid sudden and dangerous manoeuvres

SELVA motors are only meant as propulsion for pleasure craft. **SELVA joint-stock CO.** declines all responsibility for any damage to items or harm done to any person, which is due to an improper use of the motor.

SPECIFICATIONS

MODEL	Sea Bass 4 – F118A	Sea Bass 5 – F118A
POWER	4 HP/2,9 Kw	5 HP/3,7 Kw
FULL THROTTLE OPERATING RANGE	5000/6000	5500/6000
PISTON DISPLACEMENT	118	118
BORE X STROKE	56x48	56x48
NUMBER OF CYLINDER	1	
ENGINE TYPE	cycle eight - 4 stroke	
FUEL PUMP	N° 1 Mechanical pump	
AVERAGE CONSUMPTION	1,1 litres/hour	1,3 litres/hour
FUEL	Petrol min 95 octans RON	
FUEL TANK	Separatated lt 12 (Incorporated lt. 1,6)	
OIL TANK	Incorporated cc. 700	
RECOMMENDED ENGINE-OIL	NMMA TC-W3 – SAE J 1536 GRADE 3 (OIL FOR MIXTURE 2 STROKES SYNTHETIC)	
IGNITION	Digital CDI	
SPARK LEAD	electronic automatic programmed with the engine revolutions	
STARTING	manual with rope, which returns automatically on the pulley	
SPARK PLUGS	NGK DCPR6E	
EXHAUST	submarine depression-working through the propeller-hub	
COOLING	water cooling with forced circulation caused by a pump	
PROPELLER REDUCTION RATIO	13/30	
GEAR SHIFT LEVER	forward gear - neutral gear - reverse gear(shaft rotation of 360°)	
RECOMMENDED GEARBOX-OIL	OUTBOARD MOTOR GEARBOX OIL API GL-5 SAE 80W/90	
GEARBOX-OIL QUANTITY	220cc / 200 gr	
PROPELLER TYPE	anti-weed with three blades with silent-block incorporated	
TRIM ANGLE ADJUSTING	4 positions, which you can select through pin	
SUSPENSIONS	anti vibrations annular shock-absorbers	
RECOMMENDED HEIGHT OF THE TRANSOMS(mm.)	Normal shaft 380 – Long shaft 510	
WEIGHT (Kg.)	Normal shaft 23 – Long shaft 23,5	

Selva joint-stock CO reserve the right to change weight, construction, materials and characteristics without warning and without therefore having to change the motors, which were built previously. **See Picture No. 15 for the dimensions of your motor.**

LOCATION OF MAIN COMPONENTS

See picture No.16

N°	DESCRIPTION
1	Lubricating oil tank cap (2 stroke oil)
2	Security stop / stop switch
3	Accelerator clutch
4	Acceleration grip
5	Tilt-up handle and air intake
6	Transport handle
7	Steering wheel adjustment
8	Swivel bracket
9	Trim adjustment pin
10	Anode
11	Anti-cavitation plate
12	Engine cooling water inlets
13	Propeller nut
14	Propeller
15	Engine oil drain plug
16	Hole for the engine cleaning joint plug
17	Oil-level plug hole
18	Clamp-screws
19	Security stop rope
20	Front cowling lock lever
21	Choke knob
22	Fuel connector
23	Tilt-up lever
24	Fuel grip (Models with incorporated tank)
25	Gear-shift lever (R = reverse gear ; N = neutral gear ; F = forward gear)
26	Water circulation warning lamp
27	Starter handle
28	Fuel tank cap (Model with built-in fuel tank only)

CONTROL FUNCTIONS

Gear-shift lever .

Starting out from the position of neutral gear (N), turn the lever in boat direction (F) and you engage the clutch with the forward gear. Turning it in the opposite direction, you engage the reverse gear (R).**Fig. 17.**

Push-button to stop the motor.
Pressing the stop button (red) the ignition circuit is broken and the engine stops immediately. **Fig. 18.**

Choke knob.
Pulling out this knob provides a richer mixture which is required to start a cold engine.
Fig. 19.

Fuel cock. (Integrated tank)
Ruotando il rubinetto si apre o si chiude il passaggio della benzina verso il carburatore.
Fig. 20.

Fuel joint. (Separated tank)
Turning the cock you open or close the fuel connection to the carburator.
Fig. 21.

Recoil starter handle. (Model with manual start)
Pulling this handle starts the engine.
Fig. 22.

Emergency engine stop switch.
Switch to stop the engine in an emergency.
Fig. 23.

Throttle-control adjustment.
A device that allows the throttle to be fixed to give a constant speed.
Fig. 24.

Accelerator-grip/steering-handle.
Turn the grip to operate the accelerator, and move it sideways to adjust the steering angle.
Fig. 25.

Cowling lock lever.
Cowling locking device. To remove the top cowling pull the lever upwards. When replacing the cowl, ensure that it is correctly fitted over the tray and that the front hook is inserted correctly, locate the rear locking lever over the cowl's hook and push down to lock in place.
Fig. 26.

Free-lock lever to control the tilting arrangement.
This lever controls/locks the engine's tilting hook assembly to prevent the engine tilting when in reverse gear due to the propeller thrust.
Fig. 27.

Clamp-screws.
Use them to clamp the outboard motor on the transom.
Fig. 28.

Steering adjustment grip.
With it you can adjust the resistance to steering movement. Screw it to increase resistance.
Fig. 29.

Shallow water lever.

It's used to release the tilt support bar.
Fig. 30.

Trim angle adjusting-rod.
It can be positioned in different holes in order to obtain the appropriate trim angle.
Fig. 31.

Wiring diagram **Fig. 32.**

Legenda
1. Flywheel
2. Ignition-coil
3. Sparking plug.
4. Emergency engine stop switch / Stop button

Wiring colour scheme

Red = Re
Black = Ba
Blue = Bu
Brown = Br
Black / Light blue = Ba / Az
Light blue = Az
Grey = Gr
Orange = Or
White = Wh

SYMBOLS **Fig. 33.**

1 - A serious risk is present. The machine operator must read and follow the instructions in the manual.
2 - Pull the choke knob.
3 - Position of the gear-shift lever.
4 - Outboard motor free lock.
5 - Opening level of the throttle.
6 - Warning against fire hazard.
7 - Button to stop the motor.
8 - Indication fuel cock positionning.

USE OF OUTBOARD MOTOR

PRELIMINARY CONTROLS CHART

DETAIL	CHECK DESCRIPTION	PAGE
Complete supply	Check that the motor supply includes all the components, that are in the detailed list.	14
Proper installation	Check the proper installation of your motor (the centre of the transom).	14
	Check the proper mounting height of your motor.	14
	Check the tightness of the clamp screws.	14
Fuel hose connection	Check the proper connection of the fuel hose.	16
Oil filling	Check the conformity of the fuel and of the oil to the detailed list.	16-17
Fuel tank	Check the position of the fuel tank from detailed list.	16
Check of the equipment on board	Check that you have on board everything necessary to face a possible emergency.	

Before leaving always check your motor to make sure that it is in a perfect state of efficiency, check its proper and safe functionality. Failure to check as shown in the chart could result in severe injury to people or damage to the boat.

If you ever have a question about the operation of your outboard motor, or if you should find any kind of anomaly, please consult a SELVA MARINE dealer. The time which is needed to check your motor is very modest, but the safety, that you obtain from it is enormous

CHECK OF THE SUPPLY

When you receive your motor, check that:

- the packing is integral
- the supply corresponds to the detailed list:

1. The entire motor.
2. Fuel tank supplied complete with the fuel hose and fast fuel joint (for the motors with separate fuel tank).
3. Tool-bag.
4. Use and maintenance manual.
5. Certificate of warranty.
6. Declaration of conformity E.E.C.

- Check that there is no evidence of damage. If there is any damage or if parts are missing , you must inform immediately and in detail the forwarding- agent, SELVA joint-stock CO. or its area agents.
Fig. 34.

OUTBOARD MOTOR INSTALLATION

A good position of the motor on the transom is very important to have an appropriate trim angle and therefore to obtain a good performance from your boat.
To have the optimum mounting height of the outboard motor, you must mount it so that the anticavitation plate is between the bottom of the boat and a level of 2 cm below it and it is parallel to it.

If the mounting-height is too high, cavitation tends to occur and consequently there will be a falling-off in the performance and a probable overheating of the motor.
If the mounting-height is too low, the waterresistance will increase and thereby reduce engine efficiency.
Fig. 35.

The motor must be vertical to the water surface and the bracket mounted on a flat even surface and should be fully supported by the top edge of the transom.
If the bracket is not fully supported or, if the transom height is too low, a hard wood block should be securely fitted between the bracket and the transom. **Fig. 36.**

BATTERY MOUNTING (if installed)
Connecting the battery

Before connecting or disconnecting the battery leads remove the emergency cut-off, to avoid risks of electric shock, fire or explosion.

Together with the battery it is important to install with the battery disconnect switch. (not included)
Mount the battery in a dry, well-ventilated, vibrationfree location in the boat.

Recommended battery type: 12V 40 AH (144 kC)

Connect the red lead to the **positive terminal (+)** first**;** then connect the black lead to the **negative terminal (-).**

1. Red lead
2. Black lead
3. Battery
4. Battery disconnect switch **Fig. 37.**

To disconnect the battery, disconnect the black lead first.

Battery electrolytic fluid is dangerous; it contains dilute sulphuric acid and therefore is poisonous and highly caustic
Always follow these preventive measures: caustico. Always follow these preventive measures:

- Avoid bodily contact with electrolytic fluid as it can cause severe burns or permanent eye injury.
- Use protective eyewear when handling or working near batteries.
- If any battery electrolytic fluid spills onto your skin, flush with water.
- If you should get battery electrolytic fluid in your eyes flush with water for 15 minutes and get immediate medical attention.
- If you should swallow battery electrolytic fluid, drink large quantities of water or milk followed by milk of magnesia, beaten eggs or vegetable milk. Get immediate medical attention.

Batteries also generate explosive hydrogen gas. Therefore avoid operating in areas which are not well-ventilated or near fire, spark, or open flames. **DO NOT SMOKE** when charging or handling batteries.

KEEP BATTERIES AND ELECTROLYTIC FLUID OUT OF REACH OF CHILDREN.

TRIM ANGLE ADJUSTING

The trim angle is the inclination angle, that should be given to the motor in order to obtain an optimal performance from your boat.

An improper trim angle does not only affect the performance of your boat, but can also cause loss of control, which means danger for the people on board.

While sailing the motor should be perpendicular to the water surface, but the trim angle can be 3 degrees to 5 degrees.
If the trim angle is made too great, the buoyancy centre of the boat will shift towards the stern. In this condition, and if the stability moment at the bow is large, the boat will tend to "porpoise". If the trim angle is insufficient, the bow may "plough", making the boat unstable.
When the boat is in stable trim it remains parallel to the water.

To adjust the trim angle proceed as follows:

- close the fuel grip (for motors with built in fuel tank);
- disconnect the free-lock lever and tilt up the motor
- remove the adjusting-rod and reposition the rod in the desired hole, which allows the appropriate trim angle;
- unlock the tilt support bar and bring again the motor in the vertical position, so that it leans on the adjustment pin;
- set the free-lock lever to the lock position.

Improperly distributed load on boat or in different positions, can alter the ideal trim conditions.

You must adjust the trim angle when the engine is switched off. **Fig. 38.**

Ensure the transom clamp screws are tightened securely

Fig. 39.

FUEL

Fuel

The fuel used for the propulsion of internal combustion engines is highly flammable and, in certain cases can become explosive.
Refuelling and maintenance operations must be done in a well-ventilated area and with the engine stopped.
Do not smoke while refuelling, keep away from sparks, flames, or other sources of ignition, which could cause fire or explosion.
Do not spill gasoline. If gasoline spills, wipe it immediately with dry rags, before starting the motor .
Do not overfill the fuel tank, because gasoline expands with the heat and the sun radiation.
Tighten the filler cap securely after refuelling.
Do not let gasoline get into your eyes or onto your skin. Avoid swallowing gasoline or inhaling its vapour.
Do not pour fuel off using a pipe.

KEEP OUT OF CHILDREN REACH

Gasoline type

Use only petrol with a octane number of 95 N.O. Research or higher and which does not contain alcohol. (see the detailed list)

Fuel tank clamping and pipes connection

Put the fuel tank horizontally in the hull, anchored to the bottom, in a place where it does not hinder your movements and so that the piping is long enough to reach the motor. Then connect the piping to the fuel joint. **Fig. 40.**

For this operation you have to insert the female fast fuel joint. **Fig. 41.**

Now you have to check the connection, pulling lightly the joint (do not pull grasping the hose). **Fig. 42.**

To release it is enough to pull the ring nut of the fast joint.

Oil mixture

Even if a 4 stroke, the motor is lubricated with oil for 2 strokes that is mixed automatically to the gasoline and consumed when it is used.

Even if the oil autonomy is remarkable, be always sure of having in the tank a sufficient oil quantity.

For the oil mixture refuelling see the following steps. All refuelling and maintenance operations must be carried out when engine is switched off.

• Remove the top cowling from the motor.

• Open the oil filler cap (the smaller tank) and use 2 stroke oil as per below mentioned specifications.

Fig. 43

Use synthetic oil mixture for 2 stroke motors Type NMMA TC-W3 – SAE J 1536 GRADE 3

IF MOTOR IS RUNNING WITHOUT OIL, IT MAY UNDERGO TO SEVERE DAMAGE.

Check that the oil used has the requested specifications

STARTING

Verifications before starting the motor

Check that the top cowling is locked, that the freelock mechanism is in the lock position and that the gear-shift lever is in the neutral position (N). **Fig. 44.**

Make sure that the lanyard's lock plate is installed on the engine stop switch**.** **Fig. 45.**

Start-in-gear protection device

All versions are equipped with mechanical or electrical devices that prevent the engine starting in gear.

Starting procedures for motors with built in fuel tank:

1. Open the fuel cock. If the engine is cold, pull out the choke knob. **Fig. 46.**
2. Place the throttle-grip in the "start" position. **Fig. 49.**
3. Pull the starter-handle slowly so that the starter pinion engages with the flywheel. **Fig. 50.**
4. Pull the starter-handle powerfully until the engine starts. If necessary, repeat the procedure. **Fig. 51.**
5. Let the engine run for a few seconds, then press the choke control rod. **Fig. 52.**

Starting procedures for motors with separatated fuel tank

1. Loosen the air vent valve on the fuel tank filler cap. **Fig. 47.**
2. Fill up the carburettor with fuel using the priming bulb in the fuel line. Keep pressing the priming bulb until it becomes firm. If the engine is cold, pull out the choke knob. **Fig. 48.**
3. Place the throttle-grip in the "start" position. **Fig. 49.**
4. Pull the starter-handle slowly so that the starter pinion engages with the flywheel. **Fig. 50.**
5. Pull the starter-handle powerfully until the engine starts. If necessary, repeat the procedure. **Fig. 51.**
6. Let the engine run for a few seconds, then press the choke control rod. **Fig. 52.**

ATTENTION

You don't need to use the choke-knob, if the engine is warm.

If the motor doesn't start after several attempts, you should refer to the troubleshooting section.

When restarting an integrated tank model, when motor has stopped because it has run out of fuel, after refuelling, even with a warm motor, we suggest the choke knob is pulled out, as this will ease refilling of the carburettor.

Verifications when the motor is on

Just after starting the motor, you should make sure that :

- after 5/10 seconds, water runs out from the coolingwater pilot-holes. **Fig. 53.**

The indicator at the entrance of the circuit, provides only for the proper operation of the pump and not for the circulation of water in the head and in the cylinder.

That means that possible shortages will not be reported.

If water does not flow from the pilot-holes check to see :

- the water-inlets are not blocked
- that you do not hear any strange noise;
- that the throttle-grip operates in a proper way;
- that the gear shift lever operates properly and with the reverse gear selected the motor does not rise;
- that the engine stop switch operates properly.

Emergency starting procedures

If the starter does not operate, the engine may be started with an emergency starter rope.
Carry out the following operations:
Remove the cowling; place the gear-shift lever in the neutral position “N ", and the throttle-grip in the start position and check the installation of the lock-plate on the engine stop switch. Remove the screws blocking the starter and removing it (it is also necessary to detach the block start system with inserted gear).
Insert the knotted end of the emergency starter rope into the notch in the flywheel rotor, wind the rope two turns clockwise, and then pull strongly to start. Repeat if necessary.

When starting the engine with the emergency starter rope, it is very important to make sure that nothing can get entangled in the engine. A rotating flywheel is very dangerous. never try to replace the top cowling when the engine is running. Proceed at once to the nearest port to get the engine repaired. Take care to prevent water splashing onto the flywheel.

While the emergency start, the starter block with inserted gear is disabled. Before to start the engine, make sure that the invester is in postition “N”.

RUNNING-IN PROCEDURE

A SELVA outboard motor is tested completely in our workshop and it is partially run in a tank. A second test is done by the dealer. It is always advisable to complete the running-in procedure in the following way:

During the first hour let the motor run at 2000 rpm maximum (or at half acceleration).
During the second hour maintain it at 3000 rpm and accellerate at max speed for 1 minute max each 10 min.
After this operation use the motor in a normal way.
After 10 hours change the motor oil. After 20 hours change the gear oil (see the lubrification paragraph).

A good running-in will allow you to obtain a good performance from your motor and a longer endurance of it.

CRUISING

Responsibility during the navigation.

The operator is responsible for the proper running of the boat and for the safety of the people on board.
Everybody must read this manual before cruising. Show all the passengers the location of the safety equipment and the way to use it. Teach one of your passengers , how to pilot the boating an emergency. Familiarise yourself with the laws and regulations in force where you want to sail.

Navigation in shallow water

Fig. 54.

A SELVA motor is equipped with device, which adjusts the trim angle so that you can sail in shallow water.

This operation must be carried out with the engine not in motion and paying very much attention.
Cruising in shallows, run the boat at the lowest possible speed.

- Release the free-lock lever;
- Close the safety valve of the fuel tank (for motors with built in fuel tank);
- Tilt up the engine till the first automatic stop using only the tilt up handle.

To bring the engine to the home position:
- Tilt up slightly the engine (using always the proper handle);
- Release the tilt support bar, operating the shallow water levers and take the motor again to its vertical position;
- Then set the free lock lever to the lock position.

Reserve fuel (version with built-in tank)

Fig. 55.

The version with the built-in tank is specially designed to keep a small amount of fuel available as a reserve fuel.
If the engine had stopped by lack of gasoline, raise the engine on a tilt and traverse it counterclockwise. Then reposition the motor in the position of use. With this procedure the fuel reserve is sent to the draft area and allows a further autonomy for few minutes.

This activation operation of the reserve must be done very carefully. Autonomy for use with gasoline reserve is limited to a few minutes. Always check before departure to have enough fuel on board so that planned navigation is carried out safely.

STOPPING PROCEDURE

Emergency stopping procedures

In case of emergency you must stop your motor pulling the engine stop switch lanyard.

To start the motor again you have to install again the lock plate on the engine stop switch.**Fig. 56.**

Stopping in normal conditions

- Place the gear-shift lever in the neutral position " N " (neutral gear); accelerate light in order to avoid floodings, run the engine again at idling speed;
- Close the fuel cock; (Vers. with built-in tank)
- Push the stop button.. **Fig. 57.**

Stopping for a long period of storage

If you don't use the motor for many days, it is preferable to stop the engine by adding to the procedures in normal condition the following operations :

- When engine is cold, take out the spark plugs and spray some c.c. of motor oil in the cylinder.;
- Engaging the starter, perform few runs to the piston;
- Re-install the spark plugs.

Removal of the motor from the boat

To remove the motor from the boat proceed according to the following instructions:

- Close the fuel cock; (Vers. with built-in tank);
- Disconnect the fast fuel joint; (Vers. with external tank);
- Let the motor run for few minutes, in neutral, to allow complete fuel consumption in the carburetor bowl and avoid leakage during the transport;
- let the motor cool down;
- Release the clamp screws;;
- Lift up the motor vertically and keep it in this position till all the water has run out from the cooling-water passages (about 1 minute)
- Tilt up the steering rod;;
- Transport the motor by using the proper handle only;

Fig. 58.

Each time you remove the motor from your boat, you must let it cool down.

CLEANING

Outside cleaning

SELVA motors do not need much cleaning, to clean the painted parts use a cloth soaked with water.

Do not use flammable solvents.

Cleaning cooling-water passages

Every now and then after using, clean the cooling-water passages, in order to remove mud and salt, so that they do not affect the performance of your motor.

You can carry out this cleaning operation in two different ways:

1 - Immerse the outboard motor without the propeller in a vessel filled up with fresh-water, make sure that the water level is over the height of the water inlets, so that no irreparable damage could be caused to the motor. Shift the gear-shift lever into neutral " N ". Start the engine and run at low speed for a few minutes.

2- Connect a pipe of fresh-water to the hole for the engine cleaning joint plug (use the proper joint available in the fittings series). Stop the water inlets. Shift the gear-shift lever into neutral. Start the engine and run at low speed for a few minutes.

While cleaning the cooling water passages make sure that water always circulates in the passages, checking its running out of the pilot hole.

Fig. 59.

MAINTENANCE

Before doing any kind of maintenance or check operation, switch off the engine and wait till it has cooled down, then remove the spark plug cap, in order to avoid an accidental staring.
Pay attention to the motor parts, which are still hot, so that you do not burn yourself.
Some maintenance operations must be carried out by qualified staff.
Contact **SELVA MARINE** after-sale service.

The following chart lists the periodic maintenance operations to do on your motor.

The pointed out operations must be done by qualified staff.

PERIODIC INSPECTIONS AND ADJUSTMENTS (Running hours)					
OPERATIONS TO PERFORM	INITIAL			THEREAFTER EVERY	
	10	50	100	100	Out of season
Inspection of the conditions of the fuel hoses.If necessary replace them.	■		■	■	■
Check the fuel hose joints for leaks If necessary replace them.	■		■	■	■
Inspection of the conditions of the lubrication system. If necessary replace them.	■		■	■	■
Check the proper working of the carburetor. If necessary adjust it.	■		■	■	■
Check, clean and adjust the spark-plug. If necessary replace them.	■		■	■	■
Check the ignition.	■	■	■	■	■
Check the head screws and the adjustment to the correct torque.	■	■	■	■	■
Check the valve clearence	■	■	■	■	■
Check the trasmission belt. If necessary replace it	■				■
Check the efficiency of the water pump and of the cooling system	■	■	■	■	■
Check the gearbox-oil level	■	■		■	
Check the wear of the anode. If necessary replace it.	■	■	■	■	■
Check the condition of the propeller. If necessary replace it.	■	■	■	■	■

GREASING CHART			
GREASE POINTS	LUBRICANT TO BE USED	GREASING FREQUENCY	
		FRESH WATER	SALT WATER
Gearbox	API GL-5 SAE 80 W 90 MIL -L 2105 C	Check the level after the first 10 running hours. Afterwards every 50 hours. If necessary add till the marked point. Change the gearbox-oil after the first 20 running hours and afterwards every 100 running hours; and anyway once every season.	
Bushes of the screw bracket swivel	SPRAY LUBRICANT	60 days	30 days
Cowling lock levers pins	SPRAY LUBRICANT	60 days	30 days
Tie rod carburettor levers	WATER-REPELLENT MARINE GREASE	60 days	30 days
Propeller shaft	WATER-REPELLENT MARINE GREASE	60 days	30 days
Transom clamp screws	WATER-REPELLENT MARINE GREASE	60 days	30 days
Gear-shift lever	SPRAY LUBRICANT	60 days	30 days

GREASING AND ADDITIONS

The only part, which must be filled with oil, is the gearbox.
Selva supply the motor already with the oil, which the user will have to change completely after the first 20 cruising hours
After this change you must check its level every 50 hours and change it every 100 hours, and anyway once every season.

Gearbox-oil change

To change the oil proceed as follows:
- Keep the motor in vertical position.
- Place a container to collect the used oil under the gearbox.
- Take out the oil-level plug and the oil drain-plug.

They have a different size and after the oil change they must be replaced in their proper seat.

- Wait until the oil has drained completely, (during this operation you must check, if water or other foreign bodies are to be found in the drained oil. These are signs of anomalies which must be identified and repaired by qualified staff, before using the motor again).
- Protecting the leaning parts, put the motor horizontally, with the oil-level plug and the oil drain-plug holes upwards.
- Inject the oil into the oil drain-plug hole.

The oil must agree with the characteristics listed in the greasing chart, and must comply with the quantity pointed out in the technical detailed list.

Insert and tighten the oil-level plug and the oil drain plug. **Fig. 60.**

Spark-plug

The spark-plug must be often inspected because heat and deposits affect its efficiency so that the performance of the motor will be affected too.

The inspection of the spark-plug must be done when the engine is not running and it has cooled down.
It is very important to check, that the part made of porcelain is not damaged because this could allow external sparks, which could lead to explosion or fire.

To remove the spark-plug use the supplied spanner; using an abrasive brush, remove any deposits, then check the wear condition and the spark-plug gap (the gap must be 0,6 mm, to measure it use a thickness gauge) .
If the spark-plug is too badly worn you must replace it with a new one which must agree with the characteristics listed in the specifications chart.

The spark-plug torque is 20 Nm (~ 2. kgm). If a torque-wrench is not available, you can obtain a good estimate of the correct torque turning the spark plug completely by hand and then turning it with the spanner, a new spark-plug must be turned ~ 90° and the old one 15° ÷ 20°.
Replace the spark-plug cap, checking that it is correctly fitted and then replace the top cowling. **Fig. 61.**

Sacrificial anode.
To protect the motor against electrochemical corrosion, due to the presence in its structure of many different materials, a sacrificial anode has been applied.
The anode will be subject to a strong corrosion, so you have to remove the scales from the surfaces of the anode periodically.

Failure to clean it, will affect its effectiveness.

Do not paint the anode, for this would render it ineffective.
When the corrosion compromise its functionality, you have to replace it.

Fig. 62.

Replacement of the propeller.
The propeller is one of the components, which have a great influence upon the performance of the motor. An unsuitable or damaged propeller can cause serious damages to the motor besides reducing the performance.

For a careful choice of the propeller contact a SELVA MARINE service point.
To replace the propeller do as follows:
- Wait until the motor has cooled down and remove the top cowling ;
- Remove the spark-plug cap, to avoid an accidental start during the operations of replacement of the propeller ;
- Place the gear-shift lever in the neutral position "N" ;
- Protect your hands using strong gloves and insert a wooden lump between the propeller blades and the anticavitation plate, to keep the propeller still ;
- Remove the self stopping nut, the washer and the propeller
- Spread the propeller shaft with water-repellent grease ;
- Make sure, that the drive propeller pin is centred on the shaft;
- By hand insert the propeller making sure that it gets correctly into the drive pin ;
- Insert the washer and by hand screw the self-locking nut ;
- Insert a wooden lump between the propeller blades and the anti-cavitation plate ;
- Keep the propeller pressed against the pin and screw tight the nut.

Fig. 63.

Storage

 To help the endurance of your motor, you must carry out properly the following storage operations:

- Clean the motor and the water-cooling passages ;
- Switch off the engine as shown in the section "stopping for a long period of storage " ;
- Remove the fuel-line connections from the motor ;
- Empty the float chamber ;
- Change the gearbox-oil ;
- Verify the valve clearence ;
- Verify the correct timing ;
- Check the screws torque ;
- Grease all the components as shown in the greasing chart ;
- Inspect the anode ;
- Empty the fuel tank ;
- Empty the oil tank ;
- Store the motor in the vertical position and in a dry, not to cold place .

 The storage operations must be carried out by qualified staff.

TROUBLESHOOTING

 A regular maintenance can help you prevent many problems with your outboard motor.

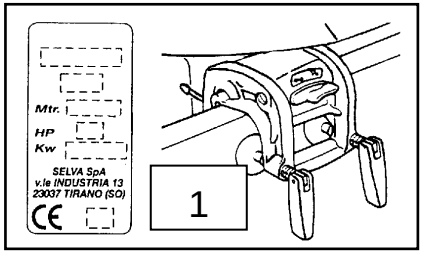
The following chart lists some common difficulties and their possible causes.

 If you still have difficulties, after investigating these, please contact your **SELVA MARINE** dealer**.**

A. The engine is not starting.
B. The engine runs irregularly or stalls.
C. The engine idles unevenly.
D. Engine speed does not increase.
E. The engine is overheating.
F. Engine speed is higher than normal.
G. Engine speed is lower than normal.
H. Boat speed lower than normal.
I. The boat is suddenly slowing down.

A	B	C	D	E	F	G	H	I	Possible cause
■	■							■	Fuel tank is empty
■	■		■						Fuel hose is incorrectly connected
■	■	■	■			■			Fuel hose is flattened or kinked
■	■	■	■					■	Fuel pump is malfunctioning
	■	■	■	■		■			Improper fuel
	■	■	■			■			Improper motor oil
■	■	■							Carburettor has a wrong adjustment
■	■	■	■			■			Wrong timing
■									Incorrect starting procedure
■	■	■	■			■		■	Sparks -plugs are fouled.
■	■	■		■		■			Improper spark-plugs
	■	■				■			Incorrect spark-plug gap.
■									Spark-plug cap incorrectly fitted

A	B	C	D	E	F	G	H	I	Possible cause
■									Electric circuit is defective
■	■	■	■			■		■	Ignition-coil is defective
				■		■		■	Clogged water passages
				■		■		■	Faulty water-pump
	■			■		■		■	Thermostat faulty
					■		■	■	Cavitation is occurring
					■		■	■	Propeller is damaged
			■	■	■	■	■		Propeller has not the proper dimensions
			■	■	■		■		Incorrect trim-angle
			■	■			■		Load on boat is improperly distributed
					■				Transom is too high
			■						Transom is too low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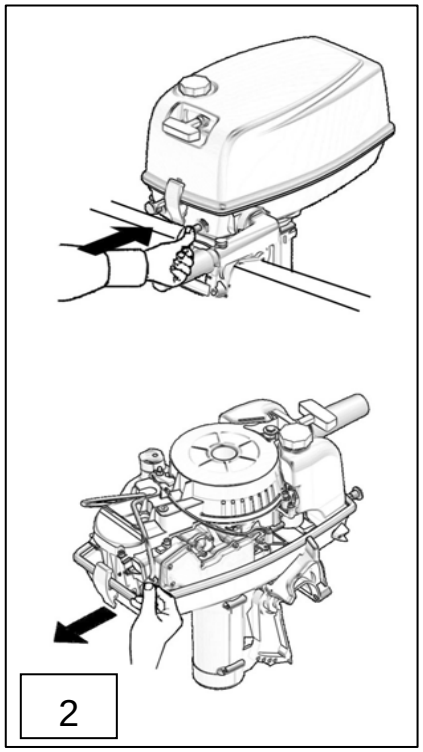
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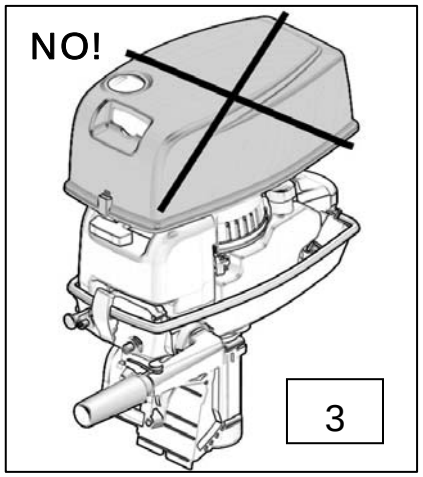
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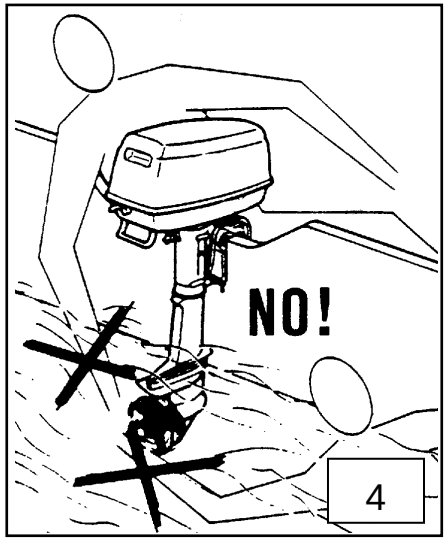
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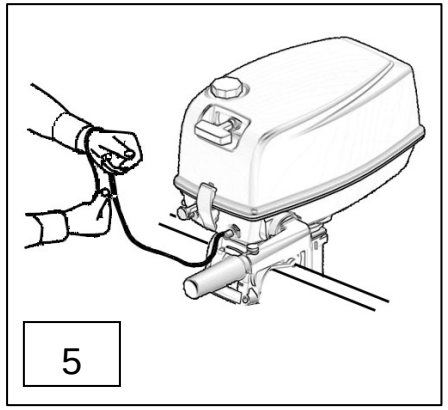
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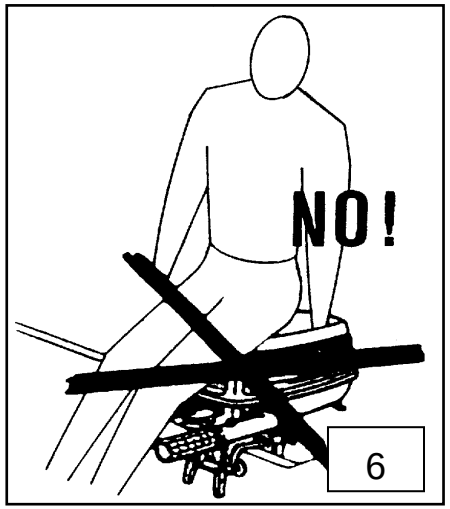
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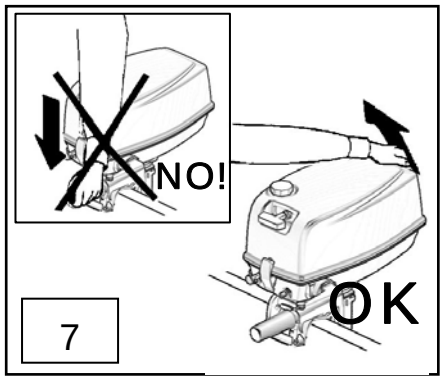
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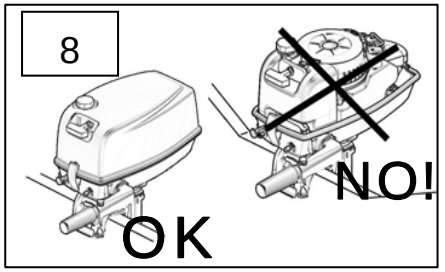
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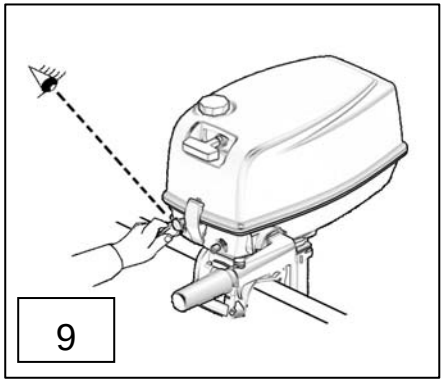
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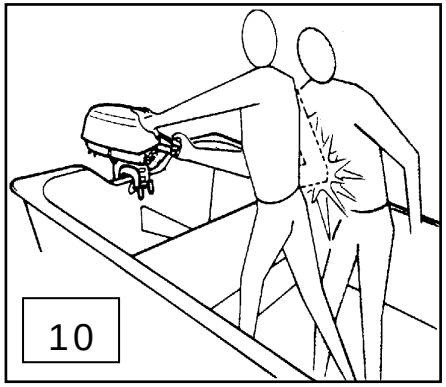
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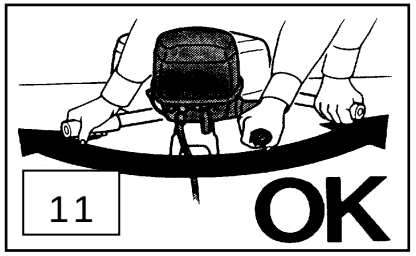
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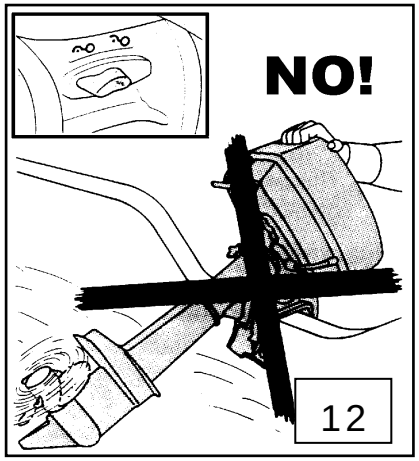
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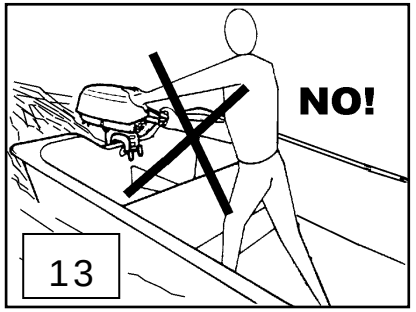
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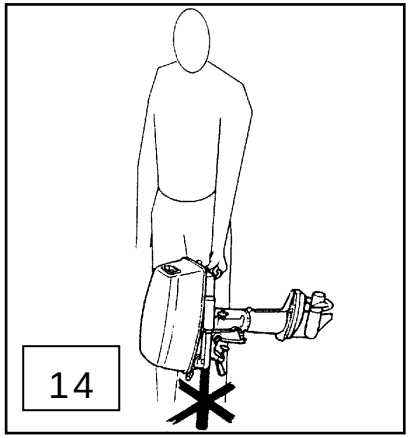
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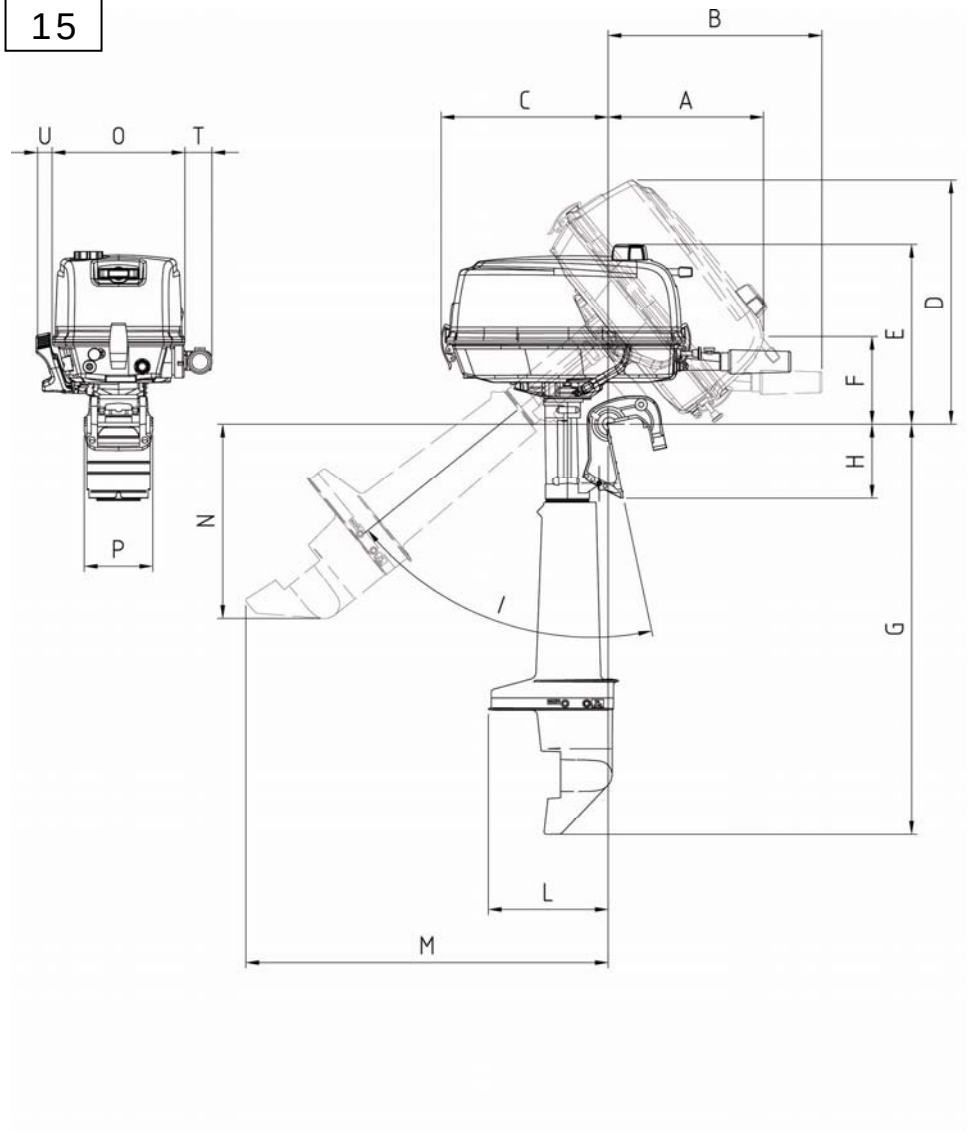

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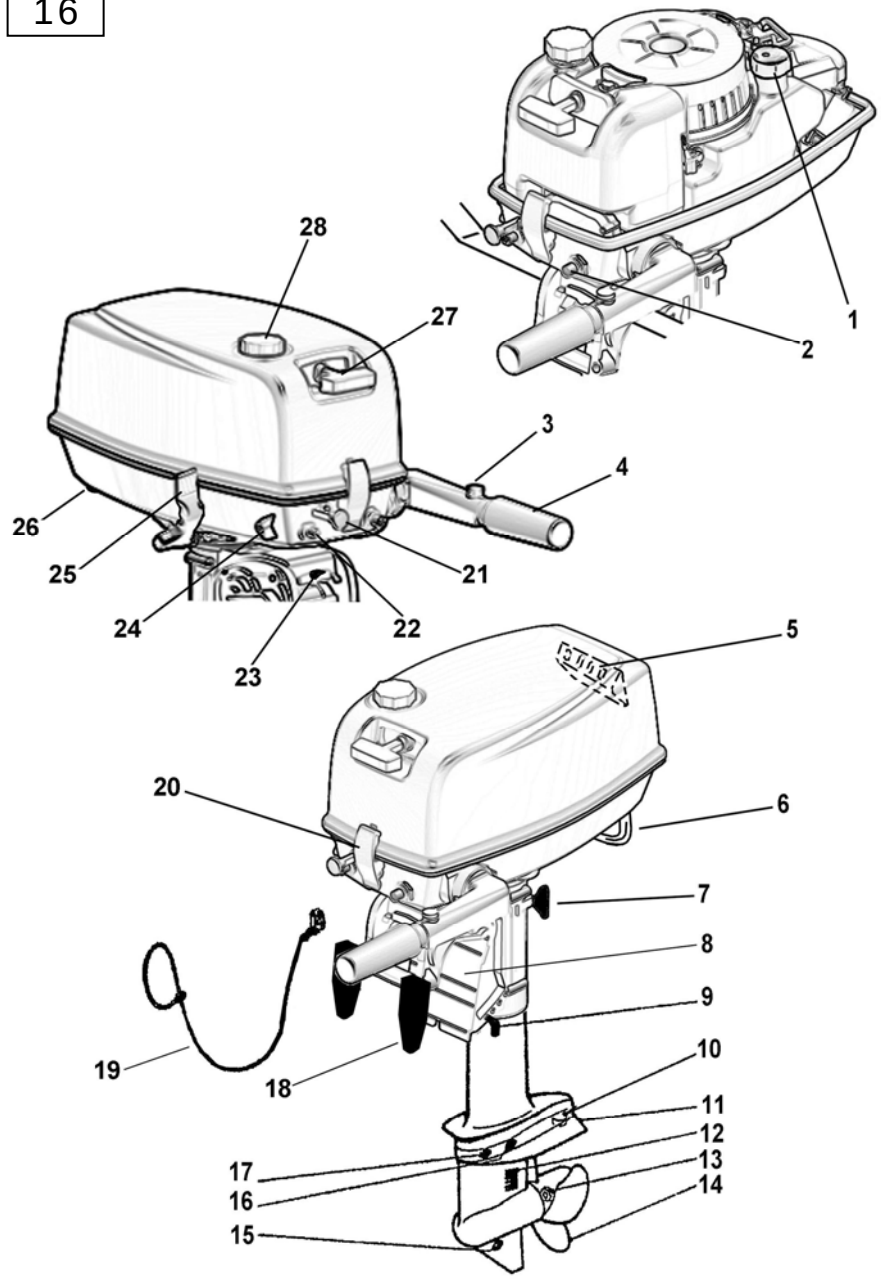

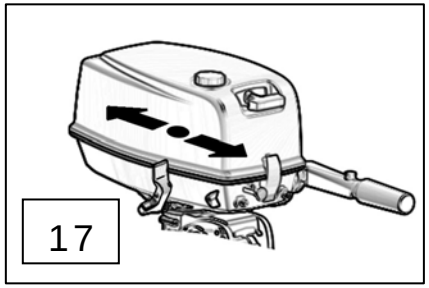
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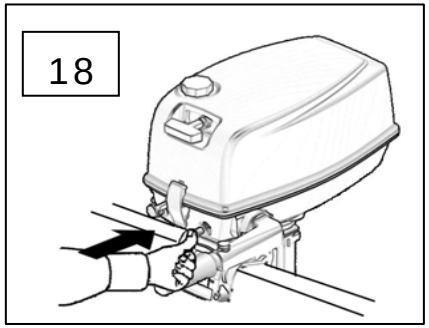
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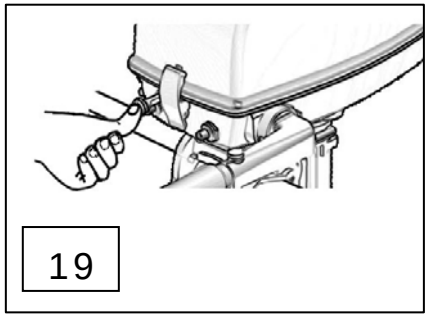
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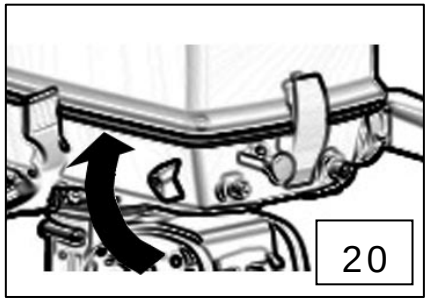
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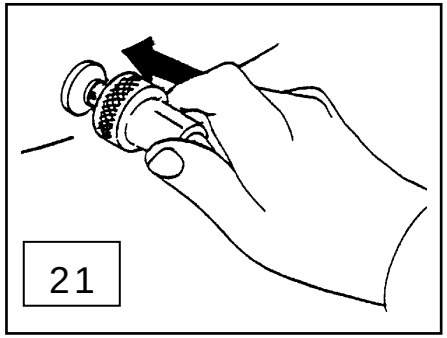
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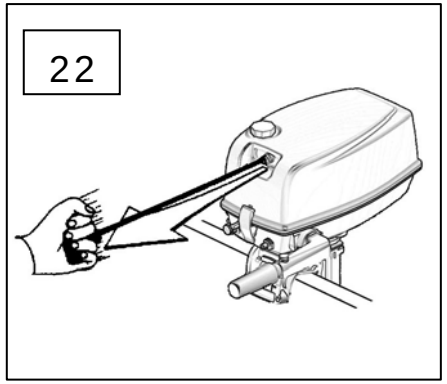
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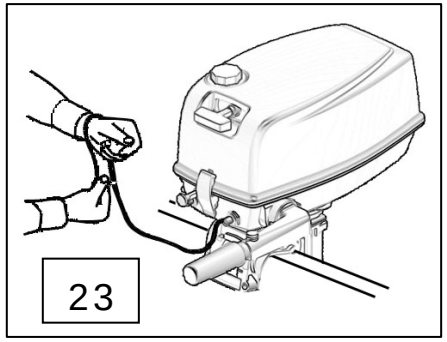
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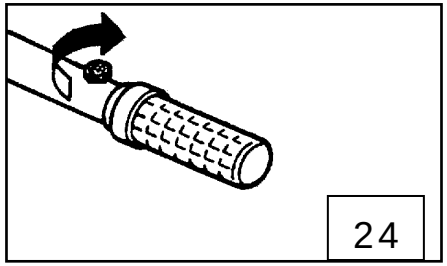
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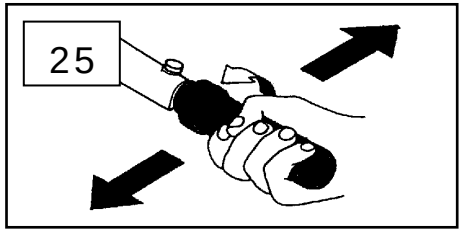
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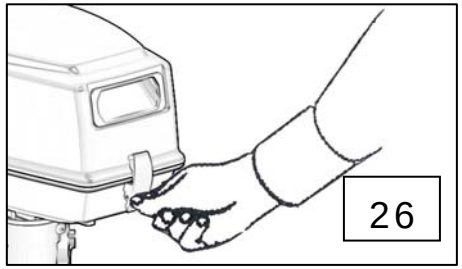
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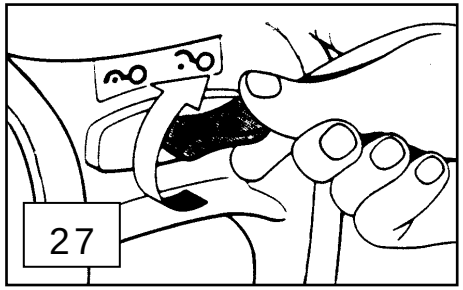
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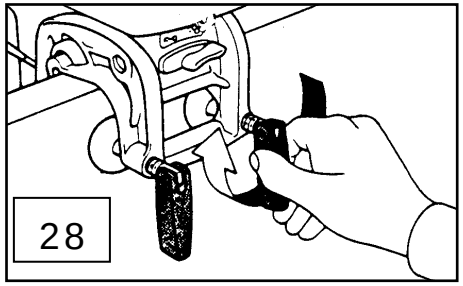
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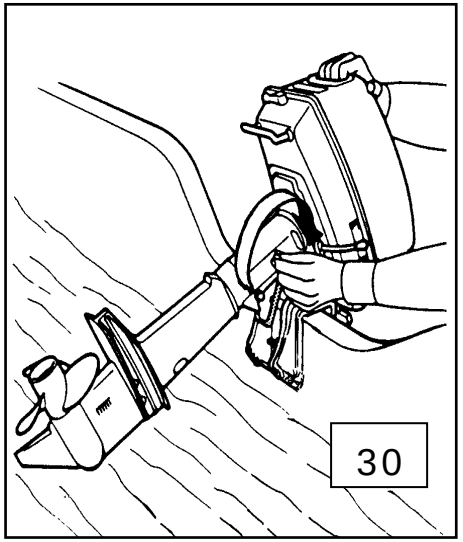
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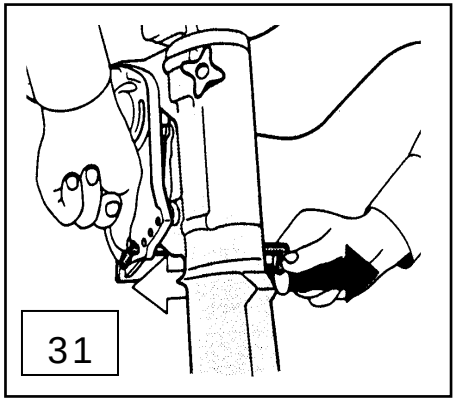
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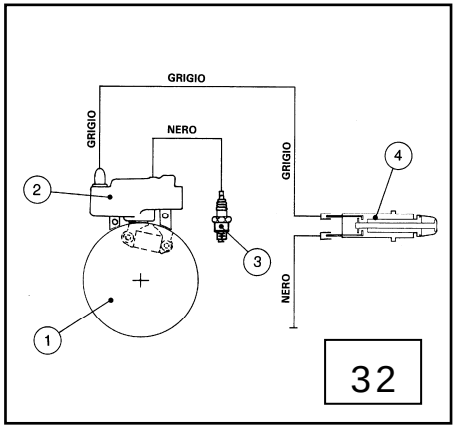
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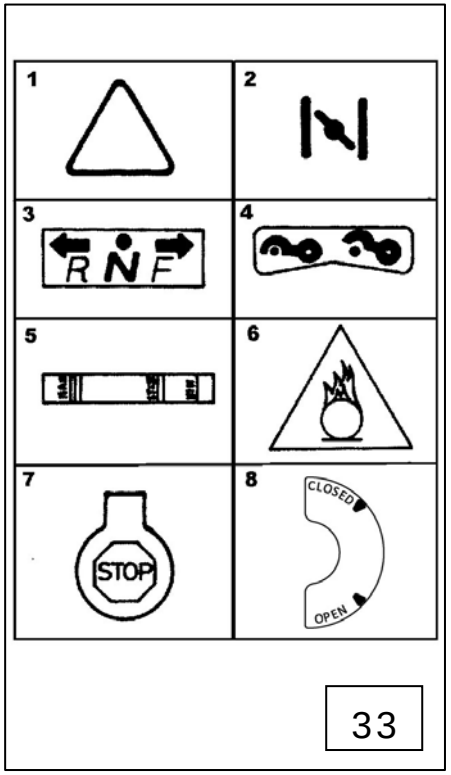
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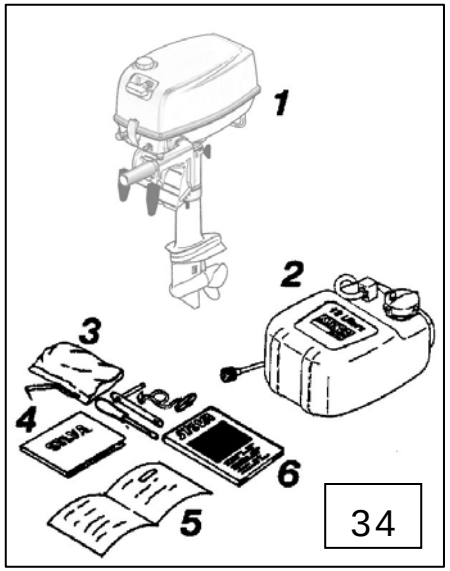
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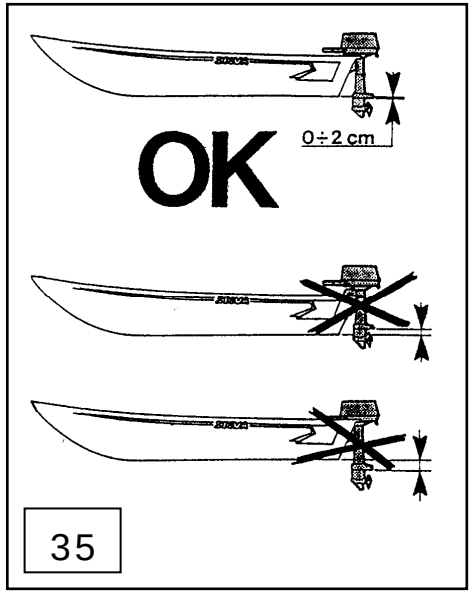
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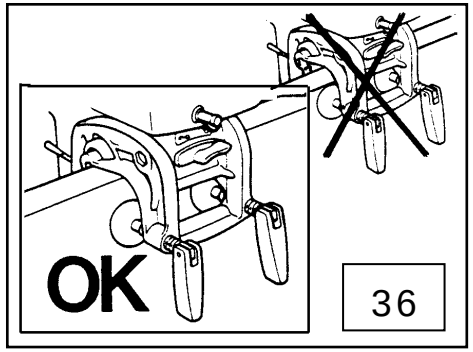
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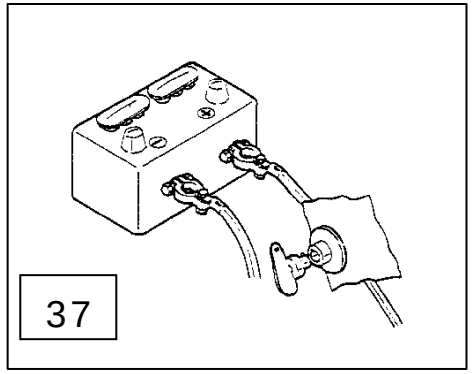
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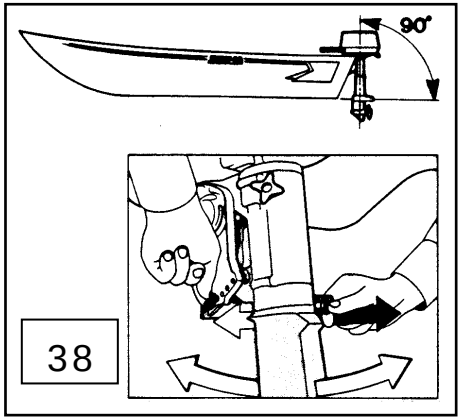
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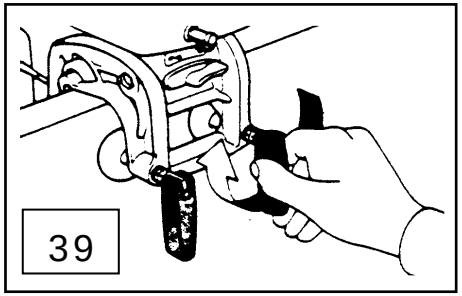
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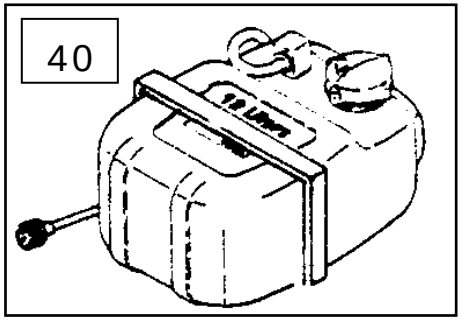
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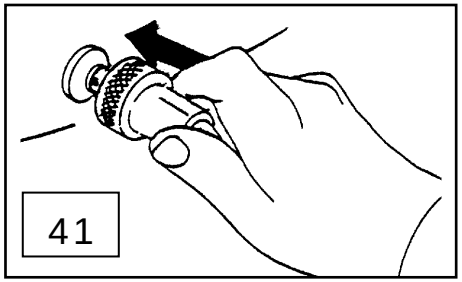
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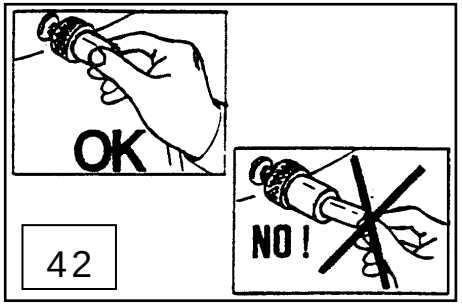
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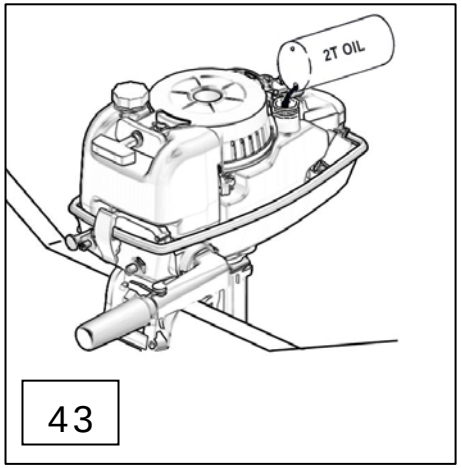
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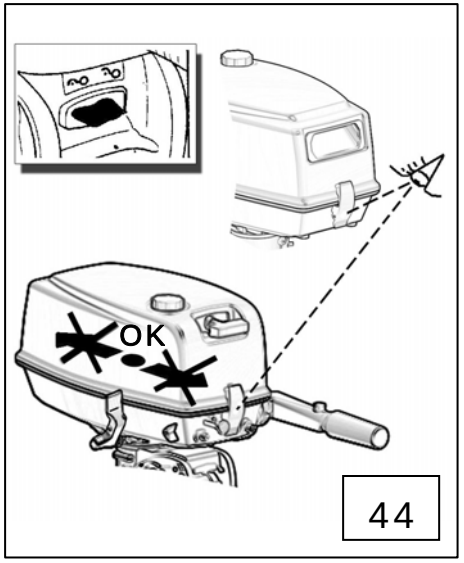
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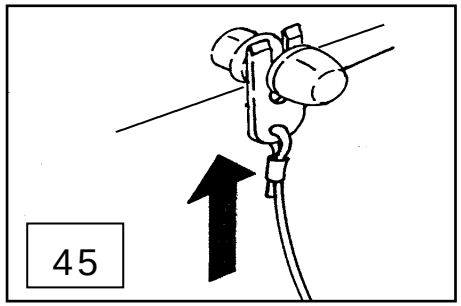
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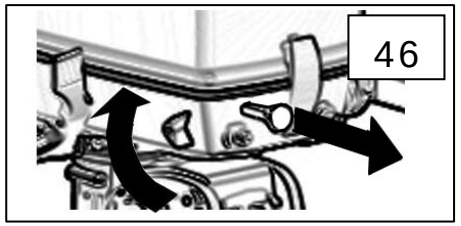
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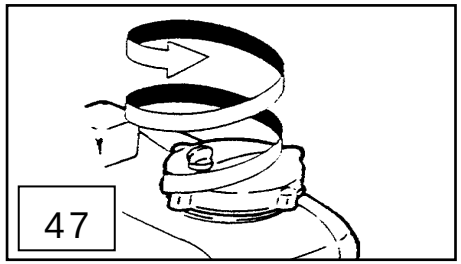
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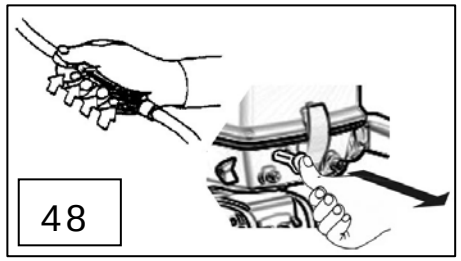
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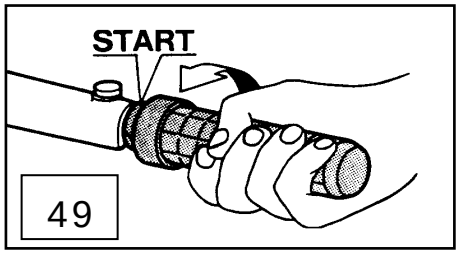
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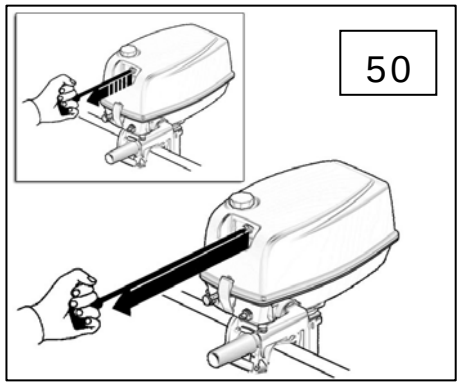
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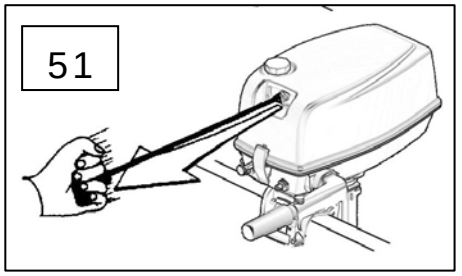
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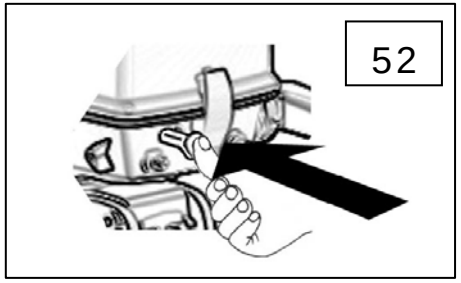
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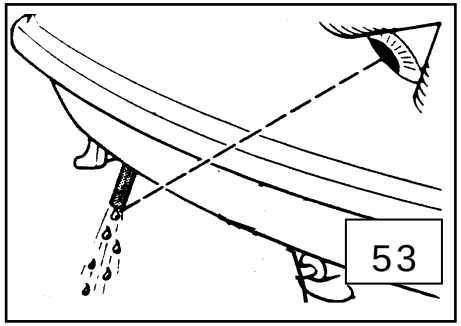
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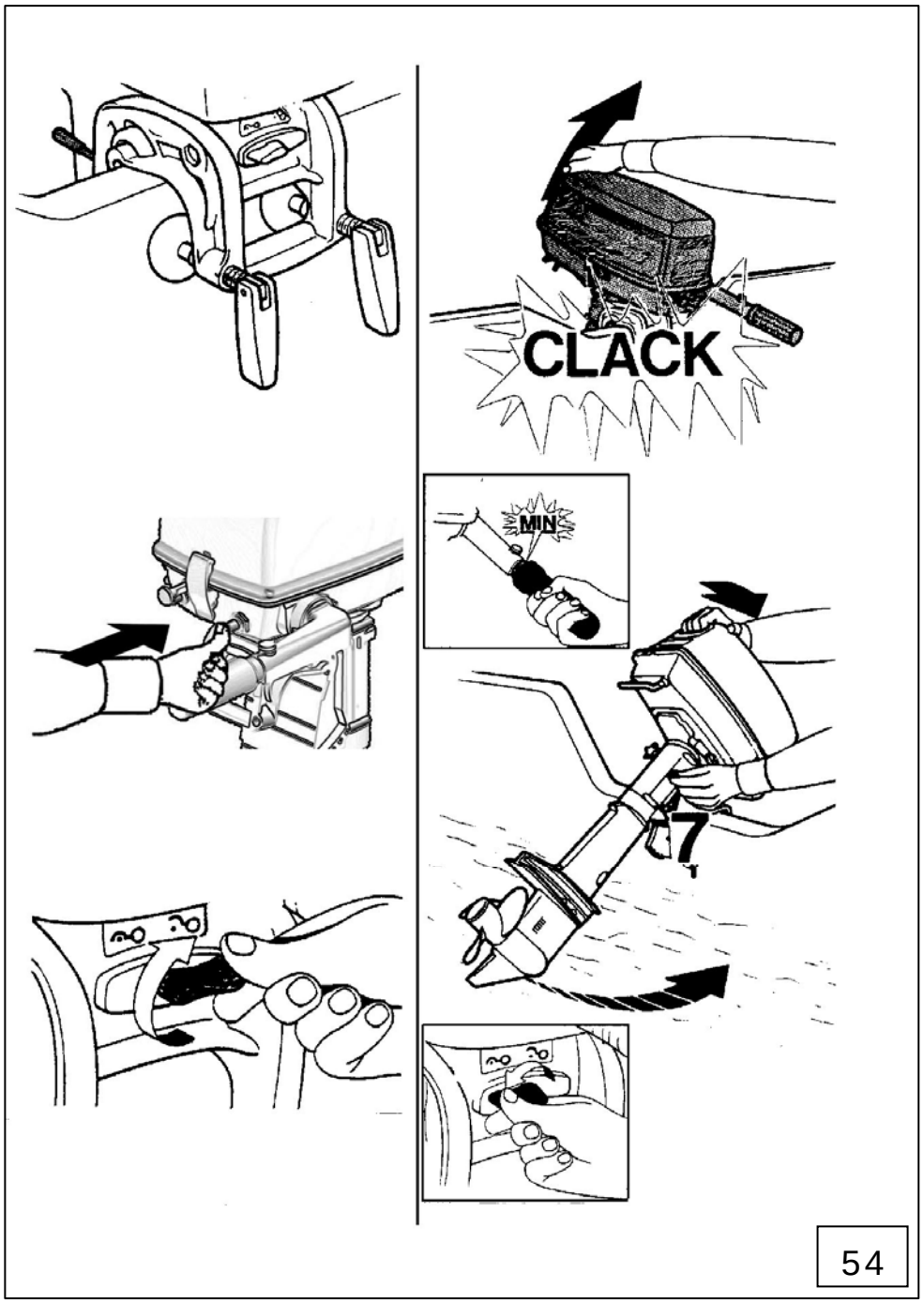
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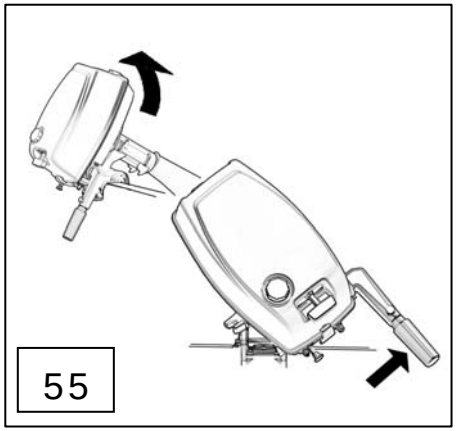
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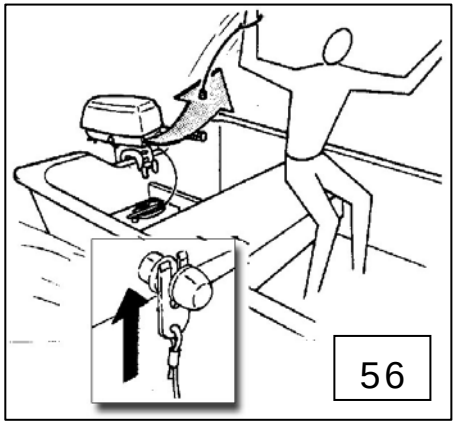
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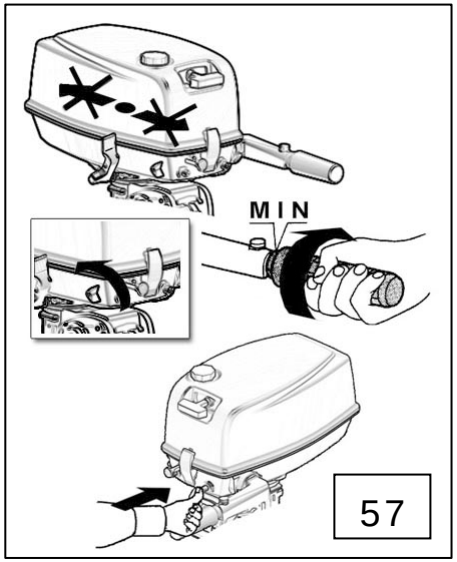
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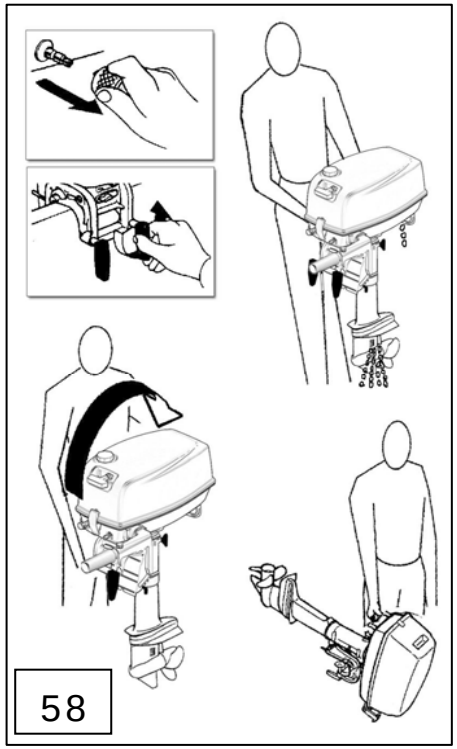
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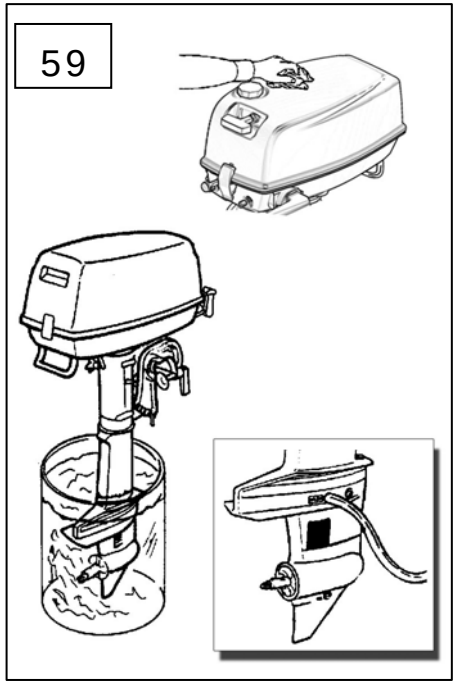
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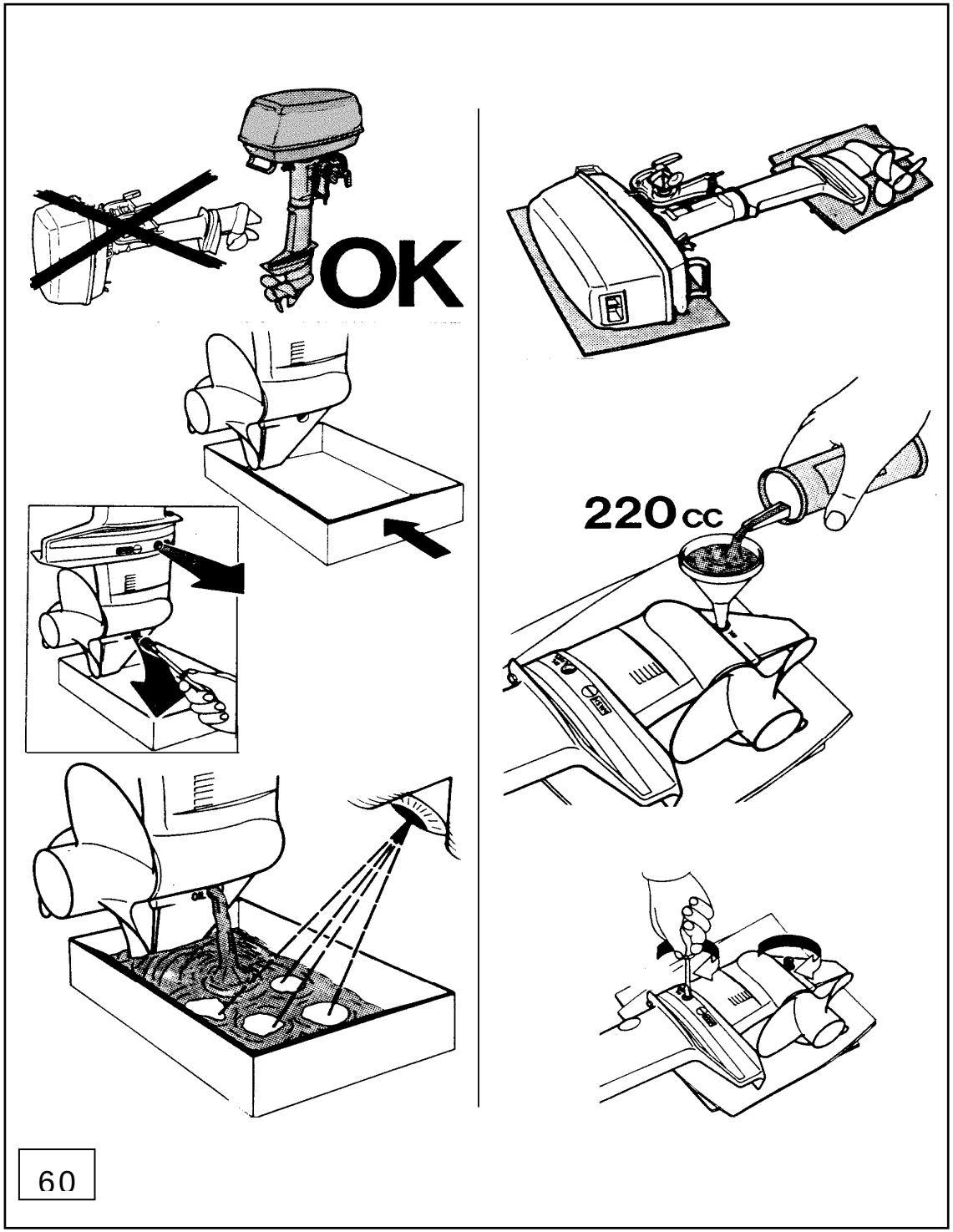
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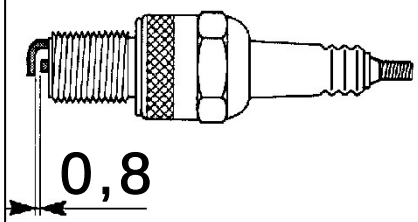

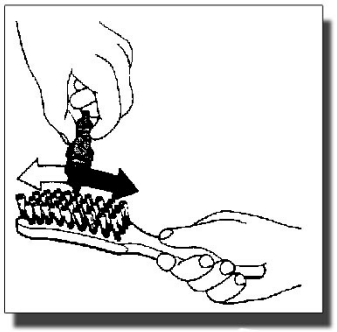

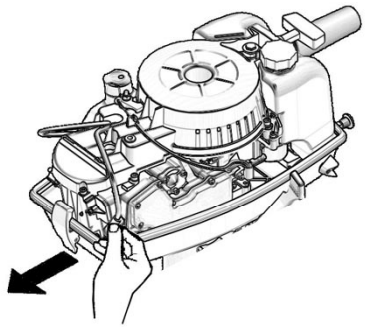

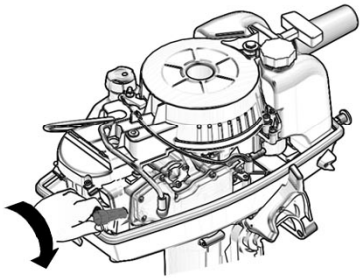

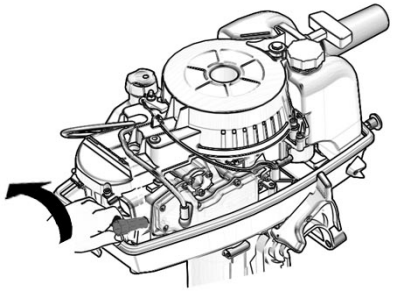

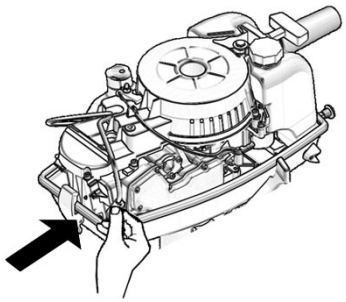

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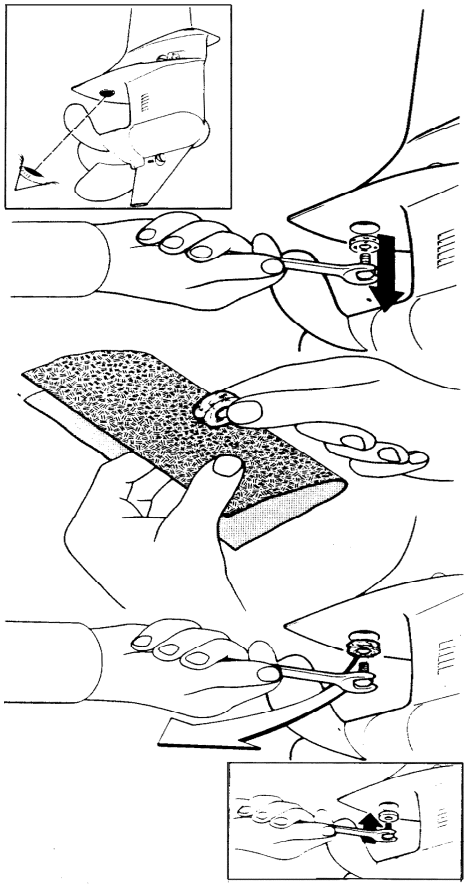

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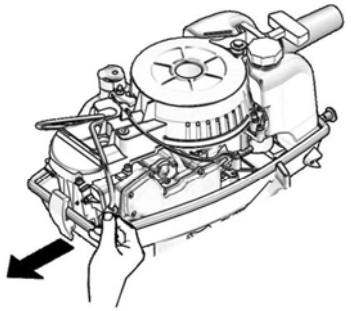

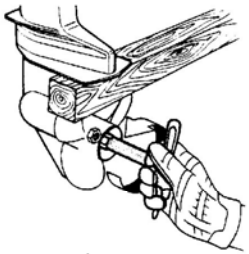

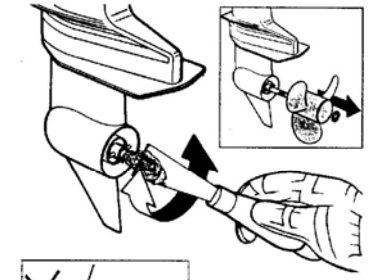

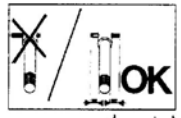

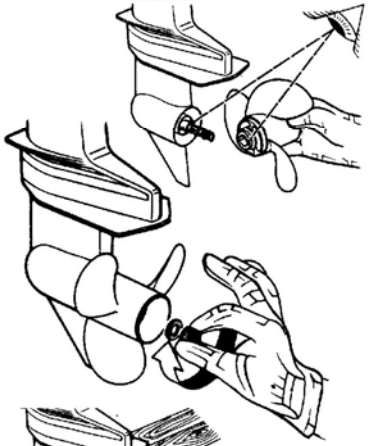

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