Technical manual

THE HOVERCRAFT

UNIK 1737.11.16 "Tornado – F50"

Nikolaev – 2012

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ATTENTION!

Dear owner The hovercraft "Tornado F50"!
Before using the product, carefully review
the manual of the engine and the passport product
where You will find information about design and operation.

Introduction

The hovercraft "Tornado F50" (HOVERCRAFTs "Tornado F50") is amphibious vehicle designed for travel on relatively smooth surfaces (water, snow, ice, grass). Can be used for extreme sports, entertainment, corporate and family vacations, fishing, hunting, rescue operations on water during floods and ice drifts, as well as in wetlands and on mountain rivers. A hovercraft can move over water of any depth with the wave height up to 0.4 m, and over land or ice with a relatively smooth surface. When driving, it separates from the surface, touching its roughness flexible fencing.
Before operating the vessel you must read with a real passport.
The passport contains the necessary information about the design, device and
the principle of a hovercraft, as well as its maintenance and operation.
During operation of the HOVERCRAFT passport must be with the product.
In section I of the passport General information on the design of HOVERCRAFT, its system Mach and units, their placement, operation principles.
Section II of this guidance for the management of the HOVERCRAFT, the peculiarities of its operation-
using and maintenance, as well as the order of execution of inspections and periodic inspections.
The passport also contains information on acceptance of the HOVERCRAFT by the Department of technical control (section III).
In section IV, the warranty obligations of the manufacturer.
All the necessary information on the engine provided in the guide
operation applied to each HOVERCRAFT.

I. Technical description.

1. Main characteristics.

Engine brand	Simonini Viktor1 Super .
Engine power	54 l/s
Type of transmission	Belt
The thrust of the boat	90 kg
The length of the boat	3 m
The width of the boat	1.8 m
The height of the boat	1.5 m
The diameter of the turbine propeller	0,85 m
The diameter of the propeller	0.88 m
Case material	fiberglass
The material of the propeller	ABS plastic
The material is flexible skirts (skirts)	PVC fabric
Height of overcome obstacles	0,15 m
The weight of the boat	150 ±7%kg
Maximum load weight	200 kg
The maximum allowable operating the wind speed	up to 4 m/s
Maximum wave height	to 0.4 m
Performance	
• maximum speed:	
- on the water	up to 80 km/h
- on the ice	to 100 km/h
- on the ground	up to 60 km/h
• reserve	60 km (at a speed of 60km/h)
• period of use	year-round
• ambient temperature	-20°C to 40°C
• side wind, not more	12 m/s
Filling capacity:	
- main fuel tank	12 l
- cooling system	2,5 l
Fuel consumption 1 motechs	8-15 L.
Color (RAL)	

2. The purpose of the vessel and General information about it.

HOVERCRAFT "Tornado F50" can be used as:
is a pleasure ship designed for river trips, recreation, tourism, and other recreational purposes (recreational fishing, hunting, sightseeing, boat travel, etc.);
A hovercraft is a vehicle, which lifting force balances the weight of the vessel occurs due to excess air pressure under the bottom. Increased pressure generated by the fan.
HOVERCRAFT, having a flexible enclosure, has amphibious properties, i.e. are able to move not only over water but also over a relatively flat land surface, ice, wetland surface.
Small contact resistance with the surface gives the opportunity to consider the motion of a hovercraft in hovercraft like movement in the air that can significantly increase the speed, which is limited only by safety requirements engine power and parameters of propulsion complex.
Propulsion system includes the engine systems, auxiliary machinery, fan drive and fan.
The specific feature of this complex is that the creation of the air cushion and thrust by a single propulsion pressure fan placed in the nozzle in the rear of the hull.

3. A flexible enclosure.

Schematic diagram of the flexible protection (TH) is shown in figure 1. The flexible protection i.e. "Skirt" consists of segments of nylon-covered neoprene. Each segment is centered over a respective air path in the housing. Due to the design maximizes the flexibility while overcoming obstacles. The lower part of the segments attached to the body with plastic ties, which in turn are fastened to the bales. the proposed on the bottom of the case. The upper part of the segments attached to the hull by means of two plastic screws. Pressure for lifting is formed by directing about one-third of air drawn by the propeller under the bottom of the vessel. This air circulating in the air channel of the housing of the HOVERCRAFT and is fed through openings on each segment of the skirt.
The main material of GO is nylon covered neoprene. The permissible temperature range fabric +40°C÷-40°C.

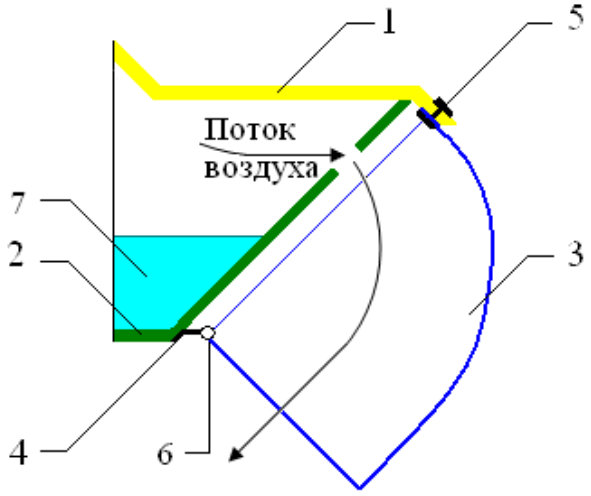

Fig.1. The cross section of the flexible fence (cross).
Legend:
1 - housing; 5-plastikowy screw, washer, nut;
2 - bottom plate; 6 - plastic clamp;
3 - flexible protection; 7, the buoyancy module
4 - Kip;

ATTENTION!
In winter time, before the subsequent operation of a hovercraft to maintain its driving characteristics, it is necessary to check the presence of snow and ice in the segments of flexible fencing. Such inspection and cleaning is preferably carried out after operation of a hovercraft on different surfaces, for example: from water to snow-covered ground, or Vice versa.

4. Hull.

The main material of the hull – GRP based on polyester resin. Application of fiberglass reduces the weight of the hull and the complexity of building and operating costs, since the surface of the vessel to operate no need to paint, and it is not subject to corrosion. The housing consists of the following elements (Fig.2.):

1.Engine
2.Aerodynamic steering wheel
3.Turbine
4.Tank buoyancy
5.Mooring duck
6. Button engine stop with th
coy security
7.Seat, driver and passenger
8.The wheel
9.Control knob throttle for-
the valve
10.Silencer
11.Fuel tank
12.Motor frame
13.Airbag segment type
14.Mesh fencing propeller
15.The hub of the propeller
16.Propeller
17. The stator of the propeller
18. Reducer
19.Air channel
20.Steering column
21.The starter button
22.Handle a richer mixture
23.Towing eye

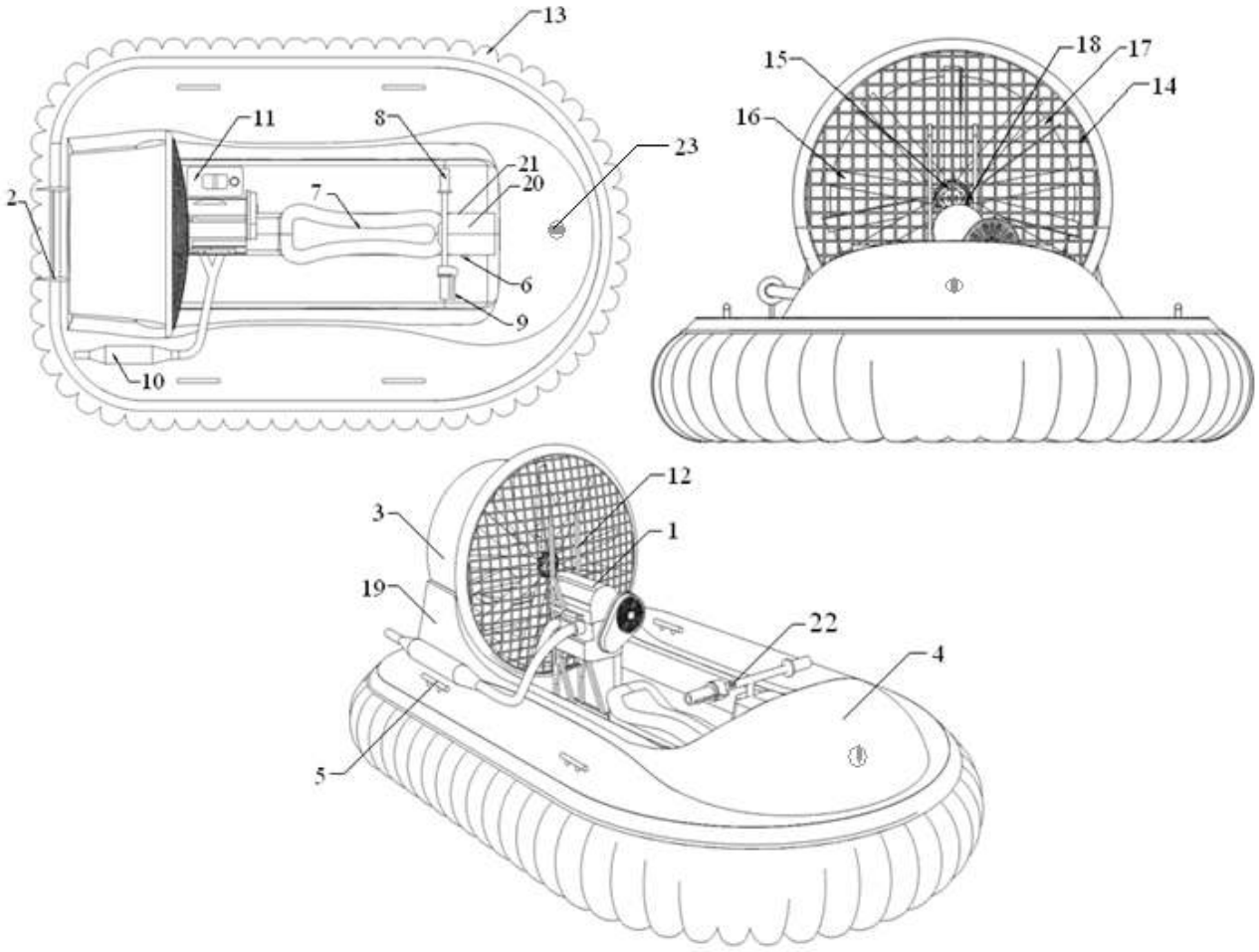

Fig.2. The types of HOVERCRAFT and the location of the constituent lements.

Position 2. AERODYNAMIC STEERING WHEEL

Aerodynamic wheel consists of two separate elements placed at the exit of the turbine, they direct the flow of air to the side, depending on the desired angle of turn of the vessel. Control dual aerodynamic feathers occurs with the steering wheel in the bow of the vessel.

ATTENTION! Before beginning, ensure the health and integrity of the steering system.

Position 3. TURBINE

The turbine is part of the hull, which houses items such as mesh fencing, air screw, air screw, starter, hub of the propeller and gearbox. In the turbine, with located in it elements creates the flow of air is required for lifting and movement of the vessel.

ATTENTION! Do not forget to check the integrity of the design, as this part of the case contains a rotating with high speed elements, the failure of which may result in accident or injury of the passenger and the driver.

Position 4. TANK BUOYANCY

This part of the body HOVERCRAFT located in the bow. Is to ensure the flooding of the ship

ATTENTION! Before driving make sure the integrity of the buoyancy tank and the tightness of technological hatches.

Position 5. MOORING DUCK

Convenient location on both sides of the ship two pairs of mooring ducks allows mooring in a convenient on the choice of the driver.

ATTENTION! Check reliability of fastening of a duck to the body. When a fault is detected the use of this site is prohibited. Mooring the duck is not designed for lifting. Permissible loading force of 50 kg.

Position 6. STOP BUTTON WITH THE KEY SECURITY

Button engine stop located on the steering column, below the steering, on right hand.

ATTENTION! Before driving, check the no dirt and foreign objects on the button and serviceability checks of safety.

Position 7. THE SEAT OF VOLITILE AND PASSENGERS

Steering column smoothly into the driver's seat and the passenger. It conveniently located two.

ATTENTION! For your own safety, do not break the maximum the allowable carrying capacity of the vessel (200 kg).

Position 8. The WHEEL

The wheel is located at the top of the steering column, behind the tank buoyancy. Near the right arm is the handle the throttle control and the handle control of the dressing mixture.

ATTENTION! Before beginning, ensure the health and integrity of the rudder and its elements.

Position 9. CONTROL KNOB BROSELEY VALVE

Handle throttle control located on right side of handlebar grips.

ATTENTION! Before beginning, ensure the health and integrity of the system throttle.

Position 10. SILENCER

Depending on the type of engine location of the exhaust silencer is changed.

ATTENTION! Before beginning, ensure the health and integrity of the system.

Position 11. FUEL TANK

The fuel tank is at the rear of the hull. The attachment by means of belt to the frame or to the body, which allows in case of refueling to be carried out immediately disconnect.

ATTENTION! Do not mix gasoline and oil at an arbitrary ratio. Use oil and fuel only what is recommended by the manufacturer of the motor used.

Position 12. MOTOR FRAME

Motor frame located in the rear of the case. On it are mounted. - the engine and its systems.

ATTENTION! Before beginning, verify the integrity of the engine
the frame and also check the fastening of all the elements on it.

Position 13. AIRBAG SEGMENT TYPE

The air cushion consists of individual air sacs (segments) that can be raised and lowered from the muppet show. In case of damage of one of the segments, adjacent compensates for the breakdown or lack of it.

ATTENTION! In case of detection of an impulse of one or more segments, repair them, or refer to a specialist. Since no segments will lead to the deterioration of the seaworthiness of the vessel.

Position 14. MESH FENCING PROPELLER

Mesh fencing propeller located between the motor and the propeller. Fastening mesh fencing is made to the turbine housing. Its presence prevents the ingress of foreign objects into the turbine, also protects the driver and passenger in case of destruction of the propeller.

ATTENTION! Mesh fencing propeller does not pass through only the large items, so try not to have on a
accessories which motion can disrupt the air flow. Don't let the ship loose items that can get to the turbine. In case of contact via the net foreign objects
first stop the engine and remove the pin for emergency stop, make sure the full stop of the propeller, and only after that learn-
the subject.

Position 15. THE HUB OF THE PROPELLER

The hub of the propeller located between the propeller and the engine.

ATTENTION! Before each use HOVERCRAFT verify the structural integrity of the hub of the propeller, loose
all of the items.

Position 16. PROPELLER

The propeller is attached to the hub in the turbine.

ATTENTION! Do not operate the propeller, making sure of its integrity.

Position 17. THE STATOR OF THE PROPELLER

The stator is located in the turbine for the propeller. This design by the ability to significantly reduce air turbulence at the turbine outlet and the to reduce power loss.

ATTENTION! Before driving, ensure the health and integrity of all parts of a stator of the propeller.

Position 18. REDUCER

Reducer mounted between the engine and propeller. Reducer is to lower the engine rpm.
ATTENTION! Before driving, ensure the health and integrity of the gearbox.

Position 19. AIR CHANNEL

The channel of discharge of air in the pillow is a peripheral part of the body system. Channel discharge air is closed with the turbine.
ATTENTION! Before driving, ensure the health and integrity of the air channel.

Position 20. STEERING COLUMN

Steering column located in front of the cockpit. It is located the main controls of the ship.
ATTENTION! Before beginning, verify the integrity of steering column and positioned on this items.

Position 21. THE STARTER BUTTON

The starter button located on the steering column below the steering, on the left hand.
ATTENTION! Before driving, check the no dirt and
foreign objects on the button.

Position 22. HANDLE A RICHER MIXTURE (FOR NEMATOVICH

EMBODIMENTS OF A VESSEL)

Handle a richer mixture are located on the right side of the arm. Is only performed for certain versions of the ship.
ATTENTION! Before start make sure the integrity of the handle enrichment

Position 23. TOWING EYE

The towing eye is located on the buoyancy tank. It is used for towing and ship, as well as for mounting TAS during transport
ATTENTION! Verify structural strength and reliability of fastening the tow ring to the housing.

5. Controls.

Access controls include:
• Steering Wheel (Fig.2., POS.8);
• Handle throttle control (Fig.2., POS.9);
• Security button (Fig.2., POS.6);
• Starter button (Fig.2., POS.21);
• Handle a richer mixture (Fig.2., POS.22)

6. Ship devices.

6.1. Mooring device

As a mooring device on the ship used ducks, two of which are located in the bow and two aft. Their location is shown in the diagram of the General form (Fig.2, POS.5). Also required mooring ropes, which serve to secure the vessel to the jetty port, pier, or the adjacent vessel berthing facilities
receiving and unloading of passengers. Mooring ropes are purchased by the customer or optional equipment.

6.2. The towing device.

The towing device provides the possibility of towing a ship in case of need. To do this, in the bow of the ship is checked eye (Figure 2, POS.23). Towing is performed using a mooring rope.

7. Shipping systems.

7.1. Electrical system.

Electrical system - DC nominal
voltage of 12 V.
The system is powered from primary and secondary alternator and battery.
The main generator excitation from the permanent magnet.
Nominal power 170 W rated voltage: 13.5 V, Mak-
maximum current is 20 A.
The engine has run only from the electric starter. The starter is powered by a rechargeable battery with a capacity of 12 A·h, which is located
under the seat.
To the consumers of electricity include electrical systems:
− lighting and light-signalling.
− the control devices of the engine;
− start the engine;
− ignition engine.

7.2. Fire-fighting equipment.

The main cause of fires on small vessels is the fire of fuel when it leaks. To prevent fire and combat on a ship should be manual fire extinguisher (not supplied and must be purchased by the buyer).

7.3. Emergency funds.

The ship, adrift (controllability) on the way traffic signals day – in a circular motion over the head of any noticeable of the subject, a circular movement of the white fire.
The ship in distress (needing help), delivers the set signals of distress:
− continuous sound (beep), as well as frequent continuous
strikes for example in a metal object;
a frequent flashing of fire;
− rocket disasters (red, 2 PCs., are not supplied and PUR-
recauda by the buyer);
the flare of red light (not supplied and the acquisition
it is the responsibility of a consumer);
− slow, repetitive lowering of hands, outstretched to the sides.

7.4. Fuel system.

The fuel tank is at the rear of the hull (Fig.2., POS. 11.). The attachment by means of belt to the motor frame or to the body, the option of refueling to be carried out immediately disconnect.

ATTENTION! Do not mix gasoline and oil at an arbitrary ratio. Use oil and fuel only what is recommended by the manufacturer of the motor used.

7.5. Rescue vehicle.

Rescue tool designed to save people in the accident
the ship on the water. Kit rescue equipment is regulated by GIMS
should include:
rescue Lin (yellow);
- first-aid kit;
- a personal flotation device (vests).
Individual rescue equipment should be colored orange, and their number is to match the number of people on the ship.

7.6. Control system.

Management of HOVERCRAFT for the course is carried out two air rudders behind the fan.
Top and bottom of the aircraft rudders are fixed to the support hinge, to the attachment of the propeller and the hull.
Control air rudders is carried out by the steering wheel through the steering
cable.

8. Powerplant.

8.1. Engine Simonini VICTOR 1 Super

As the power plant used engine Simonini VICTOR 1
Super. It is attached to the motor frame by four bolts via four
of the shock absorber.
ATTENTION!
The use of other engines as well as self-repair, will lead to reduced efficiency or failure of the vessel.
The use of synthetic oils is PROHIBITED.
Mixing oils of different brands is FORBIDDEN.

1. Carb
2. Air filter
3. Spark plugs
4. Electric starter

Fig. 3. Engine Simonini VICTOR 1 plus

The Simonini motors are equipped with a poly-V belt drive reducer. Reduction ratio 1:270. Two-stroke, single-cylinder engines Simonini, water system cooled, piston controlled inlet reed valve, with electronic duplicate ignition system, a carburetor mixing. Engines equipped with exhaust system of resonant type. Starting system the engine has an electric starter. Integrated 12-pole generator ensures operation of the system ignition engines and electrical hovercraft.

8.2. Fuel

Please read the manual to know all the proportions, engine model, installed on Your HOVERCRAFT.

ATTENTION!

If You do not add oil to the fuel, this will lead to the exit of your movement the gates down. For a long time in the fuel tank can trap moisture. Water in the fuel supply system could cause failure or a complicated start engine. When a large amount of water in the fuel tank or the filter may need to replace the fuel and clean fuel system. Do not use gasohol, fuel with an octane rating of 95 or below any impurities, this can lead to breakage. Tornado F50 recommended sulking high-octane fuel (95 or higher) for greater efficiency control. It is vital that oil and fuel are correctly mixed before using HOVERCRAFT, otherwise the oil will settle to the bottom of the tank and will bring the system down. For best results, you must fill out the top Livny tank as follows:

• Remove the tank from the ship
• Add oil to the tank
• Add three liters of fuel in the tank
• Close the lid of the tank and trotted a few seconds it
• Fill the tank almost completely, so left about-
tional 1-2cm from the edge of the fuel filler cap
• Reinstall the tank

As the oil and fuel mixed properly, the butter will not be him to separate.

ATTENTION!

Do not fill the tank completely with fuel. In warm weather, when the extension fuel, it may cause leakage. Don't forget to open the valve-operating the valve on the lid of the tank.

9. Propulsion.

As a mover and blower air cushion for a hovercraft "Tornado F50" uses an air screw (Fig. 2., POS. 16) mounted in the turbine. The turbine is made of fiberglass and in cross section has a wing profile
for additional traction. The propeller consists of nine blades and hub. The base blades are mounted in sockets of the hub. The hub consists of two halves which are after the blades in the socket tightened bolts. A stern fan hub is closed by a fairing, which is attached by screws to the guide disk.

10. Transport and storage of the vessel.

Transportation of the vessel are provided with modified trailer.
The trailer must be equipped with a winch appropriate. - in particular, the front support wheel and drawbar for attachment to the towbar using a car.
The process of loading a hovercraft on the trailer is made the following way:
1. The trailer detaches from the vehicle.
2. The front of the trailer rises until it stops at the ground the back of his part.
3. Weakened rope with the winch.
4. The hook is attached to the nose-eye a hovercraft, start the engine and mode bench is filled with air cushion is pulling up apparatus with means of a winch.
5. The engine is switched off, and a hovercraft pulled up to the stop in the winch.
The process of unloading the hovercraft from the trailer is made the following way:
1. The trailer detaches from the vehicle.
2. The front of the trailer rises until it stops at the ground the back of his part.
3. Weakened rope with the winch.
4. If HOVERCRAFT does not begin to slide down on the inclined plane of the trailer, you need to run the engine and filled with air cushion must be slipping HOVERCRAFT.

Transportation HOVERCRAFT.

For transportation of HOVERCRAFT is required to emancipate his mooring cleats and bow eye to the side brackets of the trailer with a special safety belts. Storage vessel to perform one of the following ways:

- •Set the ship on keel blocks and store under cover in a covered state;
- •To keep the ship dry and well ventilated room on a trailer or keel blocks.

Before lifting the vessel must be transferred to the shore all the gear,
removable equipment and wash the hull inside.
Immediately after waking you should wash the ship, starting with the underwater part until it has time to dry. If the dirt is difficult to wash off, then it is removed with a stiff brush with non-metallic bristles. Traces of oil and fuel oil is removed by solvent or kerosene. The deck and the freeboard is enough to wash soap solution using brushes. Washed the Board should be wiped dry with a cloth. Clean all deck equipment and apply a layer of non-abrasive polishing wax.

II. Instruction manual.

Operation of the new HOVERCRAFT is allowed to produce after studying of this Manual and the operation Manual of the engine.

1.Security measures.

To operate SAP is allowed to the persons knowledgeable of the information contained in the present passport, the last course in driver training and have a permit to drive a hovercraft.
Persons operating a hovercraft, must be able to swim and give first medical care.
When operating hovercraft on Board has to have the following tools:
paddle and life jackets – when operating on water;

- fire extinguisher;
- first aid kit (automotive).

ATTENTION!
The boarding and disembarkation of people to produce only with the engine off and full stop of the propeller.
FORBIDDEN:

- to transfer the management of HOVERCRAFT individuals who do not have permission to drive;
- manage HOVERCRAFT in a state of intoxication or in a state of exhaustion;
- to transfer control to children under the age of 18 years;
- write HOVERCRAFT for a long time without mooring;
- to operate a hovercraft in the vicinity of people and animals (not closer than 20 m).

ATTENTION!
The propeller is very dangerous. Constantly monitor the serviceability of the blades and hub of the propeller
over vibration when the engine is running. Avoid contact with objects in the zone of rotation of the propeller! Don't let people when starting and engine operation to be fully behind of the propeller!

2. The principle of operation

ATTENTION!
Before you can control Your Tornado F50 for the first time, make sure that You read and understand Your user manual and have undergone complete training from an authorized reseller in the manufacture and sale Tornado F50. In addition, you must operate the vessel with the help of an experienced pilot the first 20 hours of driving.

The ship only has one screw and one motor. During the launch, the screw is injected, the air in the airbag. Formed there the air pressure lifts the device, as the only way out for the air to raise the entire machine as a whole and to pass under the edge of the skirt. The ship rises on a cushion of compressed air. The construction of the hull of the boat parts air flow from the rotor into two separate, single flow of air enough to lift goes to the "education" of air cushion, and the second is the motion of the ship. Design of flexible barriers, with individual segments allows up and down, skirting the obstacle.

ATTENTION!
In the case of damage to one of the adjacent segments compensates for the breakdown but a replacement is needed! It is fast enough. The ship is controlled by multiple aerodynamic control surfaces at the output
turbine, changing the center of gravity and adjustable throttle. Using these three methods control hovercraft easy maneuvering on land, water or snow. The ship reacts well on the twists and turns of tail feathers that allows the pilot clearly on the right track, both on water and on land. Approximately 50% open throttle, you can reach speeds of 50 km/h in a straight line. When fully open the valve, it is possible to reach speeds up to 100 km/h.

ATTENTION!
One should not fully open the throttle with the aim of achieving maximum speed, only to increase maneuverability. At low speed easier to stick to a given course and easier to stay in the dream GU, water, or land. With the same level of open, high speed can be achieved on land than on water, and on ice/snow more
than on land, so be extremely careful when moving from one surface to another.

The best position to manage is to sit on your lap, legs wide apart. The hovercraft is sensitive to the displacement of the center of gravity, so leaning forward or backward, you can easily control the trim angle of the vessel. The ship weighs approximately 150 kg, and its relatively easy to raise. Your vessel is equipped with two-stroke engine, which requires care and prevention. The propeller creates both static pressure for lift and force for movement of the vessel. The angle of attack of the blades is chosen for the optimum balance between engine power and traction force. Any changes in the number or angle of attack of the blades will only affect the decrease in the efficiency of propulsion and lift kit hovercraft. Managing feather helm is based on the principle standard for ships of the cable pull. Access to the front coupling is carried out through special technological holes in the steering column. Require regular lubrication with light oil on hinge assemblies steering.
The frame of the engine of Your Tornado F50 is designed to reduce vibration from motor and propeller. It is firmly attached to the hull of eight points. It is extremely important to avoid external mechanical stress on the frame, it may lead to a change in the geometry of the frame and breakage of the propulsion system.
For long-term operations, the ship can be easily transported by conventional road trailers. Don't forget to dock the ship on your trailer straps.
Examine Your manual on the subject of correct procedures of commissioning. If it isn't followed, it can lead to engine damage and voiding the warranty.

ATTENTION!
Need to remember 7 basic rules before the first time control of HOVERCRAFT:
1. The first and most important rule – do NOT RUSH. Constantly watch the speed, as it can grow very quickly.
2. Nose HOVERCRAFT will not always be directed in the direction of motion.
3. The tail rudder will not work until the air flow starts to pass through it. Thus, management is a ombination of tilts of feathers and control chokes.
4. The pull of Your F50 Tornado can generate wind speeds of over 140 km/h. Always be aware of what is behind Your hovercraft, as a small
pieces of dust and dirt can be picked up that great stream of wind. Never point the stern of Your vessel in the direction of people or cars when the engine was running.
5. Do not attempt to learn to operate a hovercraft in places crowded with boats or people. Their curiosity can lead them too close.
6. Avoid situations where the vessel will touch the ground when driving on uneven soil. This can lead to an abrupt stop of the vessel. While riding the nose of the ship should be visible a little mist of water spray, as an indicator of the correct position over the water. In other words, manage the HOVERCRAFT so that the nose was slightly raised.

2.1. Recommended equipment for management.

For the protection and security we recommend the following equipment:
Helmet with protection for the mouth;
Glasses to protect the eyes;

- Life jacket;
- Ear protection;
- Knee pads;
- Clothes for cold weather.

2.2. Check before movement.

In default of clear instructions before you start driving, you put yourself at risk. Before you start, always make simple
validation:

- No unnecessary objects on the bottom;
- Do not carry things that can break wind while driving, or to tighten in a turbine (e.g. a scarf);
- Good oil and fuel filled;
- Open the valve for access of air to the fuel tank;
- Segments of the "skirt" in place and in good condition;
- Drain plug is securely closed;
- Steering is functioning correctly;
- Protection for the propeller is securely attached;
- All fasteners are securely fastened;
- The propeller blades for damage, cracks or deep cuts;
- The base of the HOVERCRAFT has no damage;
- Mounting of the motor is not worn and not damaged;
- At a distance of 30 meters from HOVERCRAFT there are no people, children in particular.

2.3. Start the engine.

- Connect the pin on the emergency stop of the engine; Upgrade the fuel into the carburetor;
- Open the dresser;
- Click on the START button (for engines with electric starter or pull handle manual starter (for motors with manual starter).

3. Features of management of HOVERCRAFT.

HOVERCRAFT – special kind of transport, combining the unique properties of aircraft, ship and car. Hence the need for special equipment management apparatus on the air cushion. When moving on the air cushion the friction between the flexible enclosure and the surface is minimal and almost never holds a hovercraft on the course. This means the following:
- during manoeuvres HOVERCRAFT for some time by inertia continues to move in the same direction;
- on the directional stability of a hovercraft is affected by the surface movement and particularly side wind. Thus, if the radius of rotation is not important (open area without obstructions for a few meters around), it is possible to maneuver as a simple turn of the wheel. If you want to rotate with absolutely certain radius, do the following:
- some distance before turning to throttle, to remove the airbag and get in contact with the traffic surface;
- turn the steering wheel until it stops in the desired direction (it is better that it was right before the turn) and immediately increase the engine speed to no less than 2/3 of the maximum. When this HOVERCRAFT will cease to move in the same direction and start to rotate;
- before the end of the turn, quickly turn the steering wheel in the opposite direction to the maturity of inertia (the rotation was not at a greater angle than necessary). When HOVERCRAFT will be on the desired course, return the steering wheel to the middle position. Side wind blows HOVERCRAFT out of course, and this should be ready. It is, if the machine suddenly starts to sidetrack, it is necessary to immediately adjust the direction of movement of the wheel.
You need to understand that management skills in any other form of transport for the hovercraft to be fully fit. Manage HOVERCRAFT need to learn from scratch.

4. Movement over different types of surfaces.

4.1 Movement over the water.

− in the presence of waves up to 0,3–0,4 m and the length less than 10 m of the apparatus movement should occur mainly along the wave in order to avoid
sahrastani inlet water to enter the fan;
− with wave height greater than 0.4 m, the exploitation is prohibited;
− to start with water is required to maximally move the center of gravity forward, and push the throttle to 100%. After the stern of the ship completely
out of the water, the driver and the passenger can take their former places.

4.2 Movement on snow and ice.

A feature of the movement over snow and ice is a long brake
the path of the device (on the ice with a speed of 70 km/h up to 300 m). The braking distance depends on the surface conditions, direction and strength of wind.
ATTENTION!
The operation of the apparatus on icy surfaces with sharp ridges and
frozen sharp objects leads to damage to the flexible protection and premature failure.

4.3 Motion on hard ground – sand, asphalt, concrete, gravel.

The device is not intended for long term motion on the above surfaces, as this may cause abrasive erosion of the bottom and accelerated wear of the flexible fence.

4.4 movement on a grassy cover, and wetland surfaces:

− height of herbaceous cover should be no more than 0.5 m;
− at the start of herbaceous cover to ensure a tight fit fore and aft curtain to the surface of the soil.

ATTENTION!
An important factor for optimal movement and achieving a maximum speed of HOVERCRAFT is the position of the vessel horizontal surface movement!

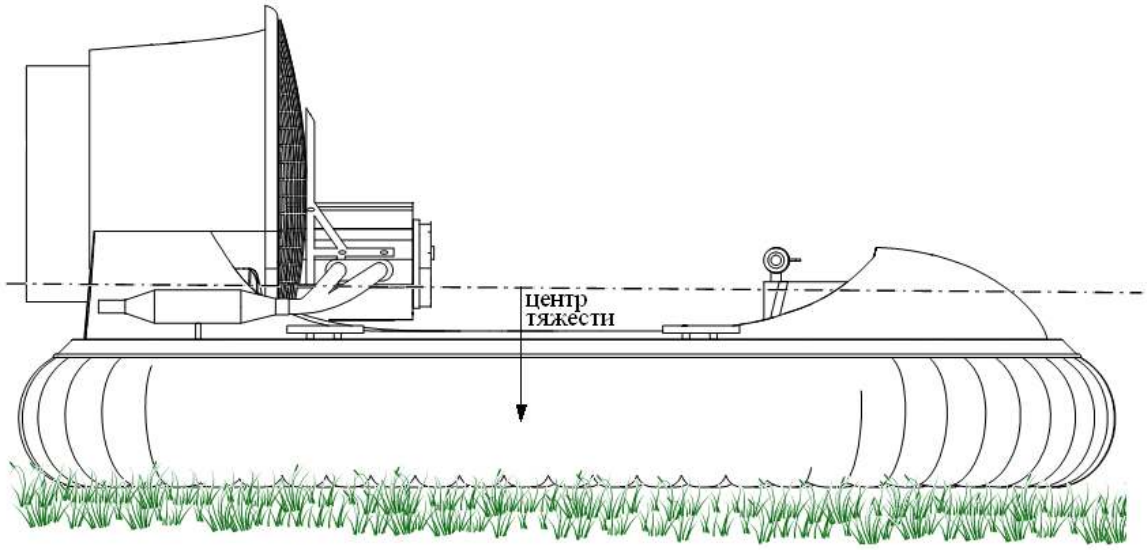

Fig.4. The correct location of the vessel relative to the surface.

REMEMBER! Depending on the load of passengers (total mass), of the total weight of the cargo and its location inside the body changes the center of gravity of the hovercraft, it is therefore important to monitor the uniformity of the location of the weight.

5. Stopping and Parking.

To stop the apparatus should:
− reduce traffic speed, reducing engine speed, this eliminates the hovercraft and hovercraft starts to slow down skirt and a bottom surface;
− stop the engine;
ATTENTION!
After stopping the HOVERCRAFT sharply **FORBIDDEN** to release the handle the throttle.
− make sure no foreign objects on the Parking place.
− perform mooring (if necessary);
− the controls set the rudders straight ahead;
− holster HOVERCRAFT when necessary.

6.Maintenance.

Technical service HOVERCRAFT provides normal operation, maintains the airworthiness of the HOVERCRAFT at the level of the established requirements-supports the technical condition of the device in conditions of long-term Parking (storage).
Airworthiness HOVERCRAFT is determined by the status of its design and systems.
HOVERCRAFT has assigned technical resources and operated by status, i.e. in the process of operation is periodic control of a condition of the body, flexible protection of all systems and performs the work needed to maintain them in working condition.
In the case of deviations of monitored parameters from technical requirements are necessary:
− repair, restoring the quality of the system;
adjustment, cleaning and other work, restoring the settings
systems;
− replacement of assemblies and devices on a healthy.
HOVERCRAFT is installed on the engine must be operated and maintained in strict accordance with the instruction manual.
The technical maintenance consists of:
− inspection and preparation of the HOVERCRAFT to the output;
− periodic maintenance;
− fixation.
First filling of oil and gasoline is provided by the manufacturer when filling out the card ready for mooring trials.
Brand of antifreeze Felix (Professional G11)
Mark of Agip TEC 2T oil API TC, JASO FC
When performing periodic maintenance special attention during the inspection pay for the power elements and components of HOVERCRAFT which have undergone repair. In all cases, the installation of HOVERCRAFT components, assemblies, finished products it is necessary to check their operability and compliance with technical parameters, and after the installation to test the functionality together with the system in which they are installed.

7. The care of the vessel

If You have any questions on the information contained in this
the passport or the manuals for other products installed on Your ship, contact the manufacturer or dealer.
NOTE!
Before you use any cleaner or a new way of repair, try them on an inconspicuous part of the hull to make sure the absence of a negative result.
Cleaning inside the housing
Cleaning the inner space of the case from dirt, sand and oil stain is made with a soft toothbrush, tissue and special cleaners.
NOTE!
Do not use to clean the interior of flammable solvents (e.g. kerosene).

Fiberglass and gelcoat

The hull is made of fiberglass. The surface of fiberglass covered with gelcoat including pigment, which gives the ship a bright stable color. The gelcoat is also resistant to scratches and mechanical damage.

Care gelcoat

NOTE!

When using household detergents, check whether they ammonia or chlorine. Ammonia and abrasive cleaners give darkening and discolor the gelcoat and are not recommended for routine care. The gelcoat should be regularly washed, dissolved in water a mild household detergent.

To maintain the Shine

gelcoat, it must be regularly rubbed with a special wax for fiberglass surfaces, which fills the tiny pores in the gelcoat in addition, the wax contains chemicals that protects the surface of the fiberglass from the harmful effects of UV rays that cause darkening and deterioration of the gelcoat.

ATTENTION!

Do not RUB the wax surface of the fiberglass in places intended for the passage of people. Dry, waxed gelcoat and wet (not wiped with a dry cloth) is extremely slippery and can cause falls and injuries.