

SID- POWER

The original Norwegian bow thruster

6 HP

Service manual



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IMPORTANT !

This manual contains the majority of possible faults, but we can not guarantee that all possibilities is included. All dealers should be sure that they have the necessary technical and electrical competence to make a safe and reliable service for the customer before taking on such a job. This manual is only a help, and Sleipner Motor takes no responsibility for the work or repair being done.

How to use this manual:



When using this manual for servicing and repairing a SIDEPOWER bow thruster, please note the following points:

- The customer can normally say what he believes the problem to be, and also how and when it started. This is useful information as it can save work in finding the problem, and also it can help us determine the reason for the problem to happen.
- Unless you are quite sure about the fault already, it is important that you follow the points in this manual by starting at the top and following the test points as they are mentioned.
- We have included most of the possible faults in this manual, but if you are not sure, or you have not found the fault after going through it, please consult with your distributor or Sleipner Motor directly.
- You must always use this manual together with the owners manual / mounting description that was supplied with the bow thruster.
- The references and drawings in this must be used, and also the installation measures from this.
- This service manual does not include drawings and spareparts references for all models that have been delivered during the years, but the drawings that are included can be seen as general drawings showing the construction of the different models in general.
- The electrical connection diagrams in this service manual is also general for all models, but you must always confer with the owners manual / mounting description that followed the bow thruster.

ALWAYS GO THROUGH THE INSTALLATION TIPS BEFORE RE-INSTALLING A RE-PAIRED UNIT OR BEFORE INSTALLING A NEW UNIT.

Finding the problem:

We divide the possible problems with a bow thruster to two different areas, **electrical or mechanical**.

To find if there is an electrical or mechanical problem, you must see if the motor is running. If the motor is running in only one direction, or not at all, it will be an electrical malfunction, and you should look in the part of the manual describing these.

If the motor is running in both directions, it will be a mechanical malfunction, and you should look in the section describing these.

Always start at the top of the list to look for the fault, unless you believe that you already now the reason, and wants to move directly to check if you are correct.

4 Hp / 6 Hp without flex. coupl. / 6 Hp with flex.coupl / 10 Hp TWIN

All check points does not apply for all models. The points for each type is marked with:

4 Hp and 6 Hp without flex.coupl:



6 Hp with flexible coupl and 10 Hp TWIN:



Electrical faults



Problem / Check	Possible reason	Action
<p>THE MOTOR DOES NOT WORK</p>		
<p>▲● Check voltage on control panel</p>	<p>Wrong voltage on panel</p>	<p>Change the panel to the right Voltage.</p>
<p>▲● Check voltage on solenoids</p>	<p>If there is a 24V solenoid in a 12V boat, the solenoids will not engage. If there is 12V solenoids in a 24V boat, they can be burned out.</p>	<p>Change the solenoid to the right voltage. You will get a new from the distributor when returning the wrong one.</p>
<p>▲● Check the power cables from the battery (ies).</p>	<p>The cables could have fallen off, the main switch can be "off", the fuse could have gone.</p>	<p>Make sure there is power for the motor and that all connections are good.</p>
<p>▲● See if the solenoids are "clicking" at all when you try to run the unit. YES -</p>	<p>It can be dust on the contact surface in the solenoids. The solenoids can be for the wrong voltage.</p>	<p>Clean the contact surface. Change the solenoids to the right voltage.</p>
<p>NO -</p>	<p>Check the solenoids to see if they are OK. If the solenoids are OK, check the wiring according to the wiring diagram. Check that the panel is OK by engaging the solenoids directly on the wires to the control panel.</p>	<p>If not OK, change the solenoids. Make sure all contacts and wires to the panel is OK. If the bow thruster then works, change the control panel.</p>
<p>The motor only works in one direction</p>		
<p>▲● See if the solenoids are "clicking" when you try to run the unit in the direction it does not work.. YES -</p>	<p>If the solenoids are clicking, it can be dust on the contact surface in the solenoids.</p>	<p>Clean the contact surface.</p>
<p>NO -</p>	<p>Check the solenoids to see if they are OK. Check that the wiring according to the wiring diagram is OK. Check that the panel is OK by trying to engage the solenoids directly on the wires, without the panel.</p>	<p>If not OK, change the solenoids. Make sure all contacts and wires to the panel is OK. Change the control panel.</p>



Technical faults

Problem / Check

Possible reason

Action

THE MOTOR RUNS, BUT NO THRUST

- ▲● Check shear pin or flexible coupling inside the boat (between motor-shaft and driveshaft).
- ▲● Check that the shearpin or flexible coupling is properly engaged.
- Check that the top-end of the drive shaft is OK.
- ▲● Check if there is any resistance when turning the drive-shaft from the inside of the boat.
- ▲● Check that the propeller is turning when you turn the driveshaft inside the boat.
- ▲● Check that the propeller is OK*
* the shearpins or flexible couplings should break before the propeller, but in some situations the propeller can also break without damaging the shearpin or flexible coupling

The shearpin can be broken.
The flexible coupling can be broken or loose.

The shearpin can have fallen out, or the motor can be mounted too high for the shearpin to be correctly engaged in the driveshaft. The flexible coupling can be loose so that the rubber part is not correctly engaged in one of the parts.

The top end of the driveshaft can be broken or badly damaged.

If there is no resistance at all, it is probably a problem inside the gearhouse. Or if the drive shaft is completely jammed, there is probably also a problem inside the gearhouse.

If it is not turning, there can be a problem inside the gearhouse or with the propeller.

If all propeller blades are gone, or the inside hub of the propeller are damaged, there will be no thrust.

Change the shearpin. There is a spare shearpin fastened to the solenoid cover. Make sure to remove all parts of the old shearpin. Also check the top end of the driveshaft to see if it is damaged. If it is damaged, send the gear house to your distributor to get an exchange gear house with a new driveshaft, so that it will not break shearpins when it is not necessary. Also check the height of the installation with the measure gauge to be sure that the shearpin is correctly engaged in the driveshaft.

Change the flexible coupling and make sure that all parts are correctly fastened and that the measures are correct.

Send the gear house to your distributor to get an exchange gear house.

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Change the propeller. Remember to see if you can find the reason for the propeller to break. You should also look if there are marks on the propeller. If not, consider see the point later in this manual about deflector s/ recesses.



Problem / Check	Possible reason	Action
<p>THE BOW THRUSTER BREAKS A LOT OF SHEARPINS.</p> <p><i>PS ! HERE THERE CAN BE SEVERAL REASONS TOGETHER, AND ALL POINTS SHOULD BE CONSIDERED.</i></p> <ul style="list-style-type: none">● Check that the installation measures is right (see pages 11 - 12)● Check that the top-end of the drive shaft have not been damaged by an earlier breaking of a pin.● Check that the installation is in-line, that there are no "bumps" on the tunnel, causing either the gear house or the motor bracket to be out of the centre line in the installation.● Check that there are no parts of an old shearpin left in the driveshaft.● Check that the driveshaft can be turned. It is not easy to turn, but it should turn.	<p>It is very important that the pin has the correct depth in the driveshaft There is a template that makes it easy to test this. <i>This is without the distance plate on the bracket.</i></p> <p>When breaking shearpins, the parts of the old shearpin can damage the "track" in the shaft, and allowing the pin to move a little before it hits the shaft. This will make it a lot easier to break shearpins as they will be "clipped".</p> <p>If there are "bumps" on the tunnel, either inside or outside, the bracket or the gear house can be sitting on such a bump, causing the whole installation to be out of line. There will then be side pressure on the driveshaft, and this can cause breaking of shearpins, and damage to the higher bearing in the gear-house.</p> <p>When a shearpin is broken, a part of it can be lying in the bottom of the track in the driveshaft. When putting in a new shearpin, it will be pressing against the old one. This will give a pressure both on the new pin, and also damage the gear house because of the pressure forcing the driveshaft down.</p> <p>There can be a problem inside the gear house, making the unit hard to move. This can cause breaking of shearpins. One of the other points in this section can be real reason for this.</p>	<p>If it is wrong it must be corrected. Remember to also check that the gear house is OK, and that the top of the driveshaft is not damaged.</p> <p>If the shaft is damaged, send the gear house to your distributor to get a replacement gear house back with a new driveshaft.</p> <p>Make the installation right, and send the gear house to your distributor for control / replacement with an exchange gear house. If the unit is quit new, and you find the gear house to be 100% OK, it is not absolutely necessary to send in the gear house.</p> <p>Make the installation right, and send the gear house to your distributor for control / replacement with an exchange gear house. If the unit is quit new, and you find the gear house to be 100% OK, it is not absolutely necessary to send in the gear house.</p> <p>Send the gear house to your distributor for control / replacement with an exchange gear house.</p>



Problem / Check	Possible reason	Action
<ul style="list-style-type: none">● Check that the propeller turns freely in the tunnel.● If this is on a fast boat, or a boat that travels a lot in heavy seas, you must also check the tunnel installation in the boat to see that it is not too easy for water to be pushed through the tunnel when driving the boat.	<p>If the propeller is hitting against the tunnel walls, the shearpins will break. The propeller must turn freely.</p> <p>It is important that these types of boats have deflectors in front of and under the tunnel opening, so that water is not pushed through the tunnel when driving the boat. This will cause the bow thruster to be moving hours and hours, and that will result in abnormal wear of the unit. Further the strains on the unit if the water going through the tunnel is at high speed, can be many times more than when using the bow thruster, and this will of course break the pin.</p>	<p>Reinstall the bow thruster so that the propeller moves freely in the tunnel. Make sure that the gear house and drive shaft is OK.</p> <p>If you believe that the water-flow through the tunnel is causing the problems, you should make deflectors in front of and under the tunnel as shown in fig. 5. It will not be as easy to do this after the tunnel has been moulded in. But an experienced "moulder" can do it. The point of this is to make the water pass by the tunnel, and this is also important on sailboats as it will prevent "drag" from the tunnel, slowing the sailboat down when sailing.</p>
<p>THE BOW THRUSTER VIBRATES OR MAKES ABNORMAL NOISE.</p>	<p>If the unit is loose on the tunnel, it will vibrate and make noise. It can also leak, and cause further damage if it is loose.</p> <p>If the propeller is touching the tunnel walls, it will make noise.</p> <p>If the gear house sits on a bump on the tunnel, it can move while driving the unit, causing vibrations and noise between the bow thruster and the tunnel.</p> <p>If the tunnel is very long, the fastening at both ends will be far apart, and the tunnel can vibrate a little.</p>	<p>Fasten the unit properly, and make sure that the installation is correct. Also make sure that the gearhouse is OK.</p> <p>Reinstall the bow thruster correctly, and make everything is OK.</p> <p>Grind off the bump and reinstall the bow thruster correctly. Make sure the gearhouse is OK.</p> <p>Fasten the centre of the tunnel also to the hull. Make sure not to mould where the unit sits. Also check the old moulding for cracks.</p>



Problem / Check	Possible reason	Action
LOW POWER ON A NEW UNIT.		
▲● Check that the motor has the right voltage.	If it is a 24V motor in a 12V boat, the power will be very low.	Call your distributor to get the right voltage motor (or to buy a 12V conversion kit if you have tried to install a 10 Hp Twin in a 12V boat).
▲● Make sure that the main cables are big enough according to the owners manual / mounting description.	If the main cables from the battery (ies) are too thin, the voltage fall when running the unit will be very high, and the voltage the motor gets too low to get full power. See also "tips for installation" later in this service manual.	Change the main cables to the required size, or put in another cable along the other (both "+" and "-") to get the total size big enough. But remember that you can only have one fuse. You can not use 2x100A fuses to get 200A.
▲● Make sure the battery (ies) capacity is enough according to the owners manual / mounting description.	If the battery (ies) are too small for the amperage draw when running the unit, the voltage drop will be very high, and the motor will not be able to give full power.	Change to a bigger or install one more battery for the bow thruster.
▲● Make sure the battery is in a good condition.	If the battery (ies) are old and in a bad condition, the voltage drop when running the unit will get very high, and the motor will not be able to give full power.	Change the battery to a new one. Remember, bigger and better batteries gives less voltage drop when running the SIDEPOWER and thereby more power.
▲● Check that the propeller turns freely in the tunnel.	If the propeller is hitting the tunnel walls, this will give a lot of resistance in the drive system and give less thrust from the bow thruster.	Reinstall the unit correctly. Make sure that the unit has not been damaged by this.
▲● Check that you can turn the driveshaft from the inside.	If you are unable to turn the driveshaft from the inside or it is very heavy, there can be a lot of resistance in the gear house.	Check the installation so that there are no side or down pressure on the drive system. If it still not OK, contact your distributor to check the gear house.
▲● Check that the unit is deep enough in the water and does not suck air.	If the unit sucks air in to the tunnel, the thrust will fall dramatically, as the propeller will spin.	As the tunnel is already in place, the only thing to do is to fill some of the top of the tunnel-opening. This will make it more difficult to suck air in to the tunnel.



Problem / Check	Possible reason	Action
POWER BEING LOWER THAN BEFORE		
▲● Make sure the battery is in a good condition.	If the battery (ies) are too small for the amperage draw when running the unit, the voltage drop will be very high, and the motor will not be able to give full power.	Change the battery to a new one. Remember, bigger and better batteries give less voltage drop when running the SIDEPOWER and thereby more power.
▲● Check that the connections on the main cables are OK.	If there is bad contact, this could give a voltage drop.	Connect the cables so that they give full contact.
▲● Check that there are no dust or burns on the contact surface on the solenoids.	If the contact surface on the solenoids are not OK, they can give less contact and a voltage drop.	If possible, clean the contactor surfaces. If this is not possible or the result is not good, change to new solenoids.
▲● Check that you can turn the driveshaft from the inside.	If you are unable to turn the driveshaft from the inside or it is very heavy, there can be a lot of resistance in the gear house.	Check the installation so that there are no side or down pressure on the drive system. Contact your distributor to get an exchange gear house.
▲● Check that there are no growth on the propeller or the gearhouse.	If there is growth on the propeller the performance of the propeller will be very low. If there is growth on the lower unit, it will be more resistance for the water going through the tunnel.	Clean the propeller and the gear house. If the propeller is not 100% clean, you should install a new. Remember to paint these parts with anti-growth paint. PS ! Not the zincanode.(s)
▲● Check that all propeller blades are intact.	If a propeller blade is missing or damaged, the performance from the propeller will be very low.	Install a new propeller. Try to find the reason for it to have broken.

Checklist before, during and after installation.

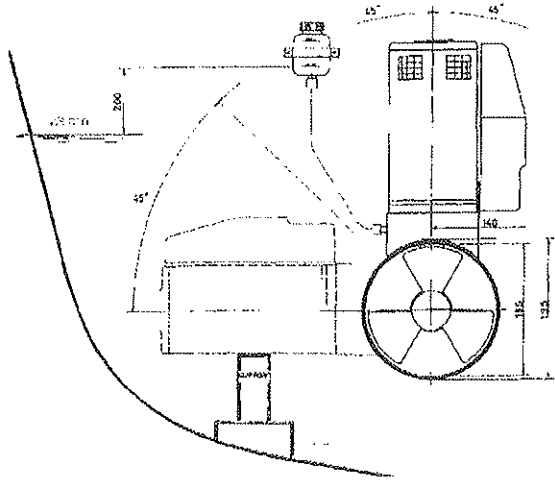


Check !	Explanation	Illustrated	Checked
All measurements is correct.	All installation measurements must be correct according to the installation manual following the SIDEPOWER	Pages 11 - 12	<input type="checkbox"/> <input type="checkbox"/>
Tunnel is plain.	No bumps on the tunnel. Make sure not to mould where the SIDEPOWER sits on the tunnel when moulding the tunnel to the hull.	NO	<input type="checkbox"/> <input type="checkbox"/>
That the miotor has the right voltage for the boat.	Always check the sign on the motor to make sure that it is the right voltage for the boat.	NO	<input type="checkbox"/> <input type="checkbox"/>
All connections are correct according to the diagram in the mounting description.	Make all electrical connections safe and thorough. make sure to isolate the ends and connections. We advice that this is done by somebody with experience from electrical boat installations and that can ready a connection diagram.	Pages 14 - 15	<input type="checkbox"/> <input type="checkbox"/>
Battery capacity and cable sizes are sufficient.	Make sure that there is enough battery capacity and that the cables are thick enough to avoid unnecesarry voltage drops.	Page 15	<input type="checkbox"/> <input type="checkbox"/>
That there are oil in the gear-house.	The gear house must always be filled with gear oil EP 90, and we advice you to prefill it, as that is normally the most easy way of making sure it is full.	NO	<input type="checkbox"/> <input type="checkbox"/>
That the oil tank is installed above the waterline as described in the mounting description.	The oil tank must always be placed above the waterline so that the oilpressure is higher than the water pressure outside the gearhouse.	Pages 11 - 12	<input type="checkbox"/> <input type="checkbox"/>
That the parts in the water have been painted with anti fouling, except for the zinc anode(s).	The gearhouse and the propeller should be painted with anti fouling to avoid growth. Growth on the propeller and gear house will dramatically lower the effect from the bow thruster.	NO	<input type="checkbox"/> <input type="checkbox"/>
That there is a deflector and/or a recess on the tunnel installation on boats that require this.	High speed and / or big boats and boats used much in heavy seas, must have such to prevent water driving the SIDEPOWER. This will cause unreasonable wear and strain on the unit. In sailboats this will also give less drag when sailing.	Page 13	<input type="checkbox"/> <input type="checkbox"/>

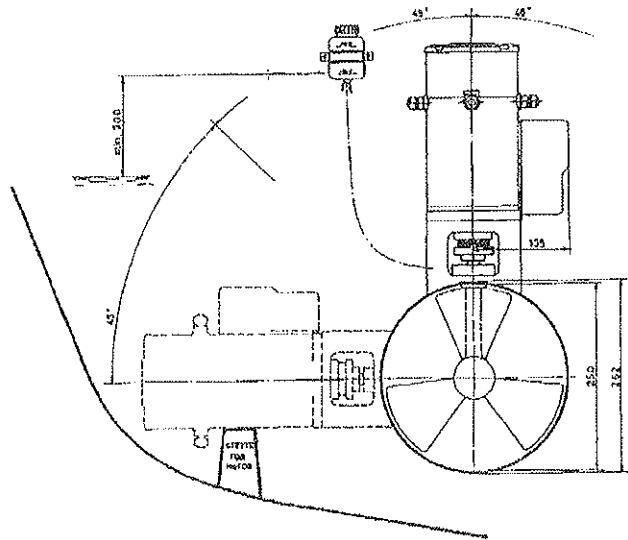
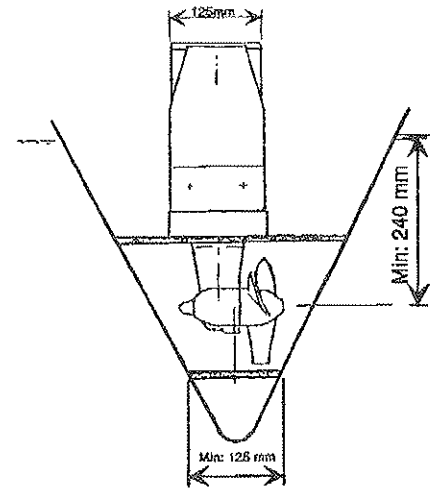
Installation measurements.



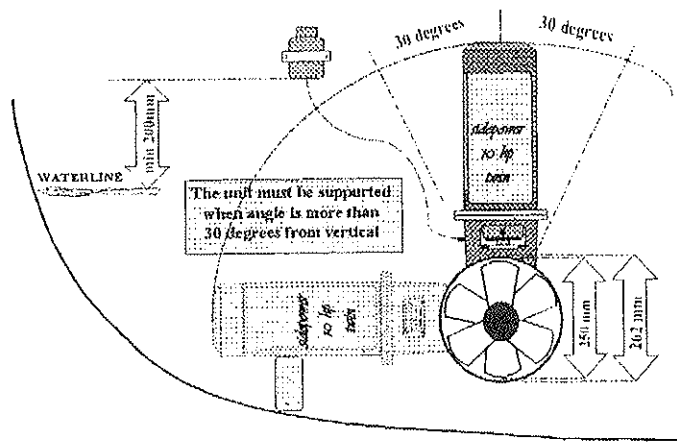
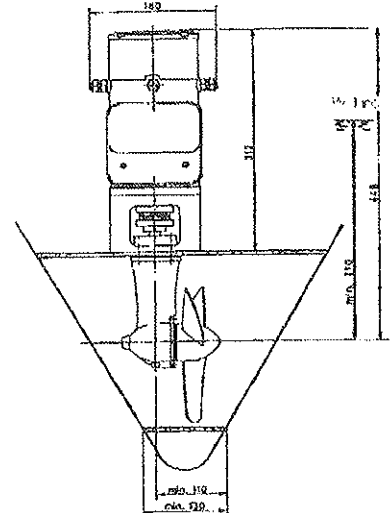
PS! These are for 1993 models, always use the measurements in the mounting description following the bow thruster.



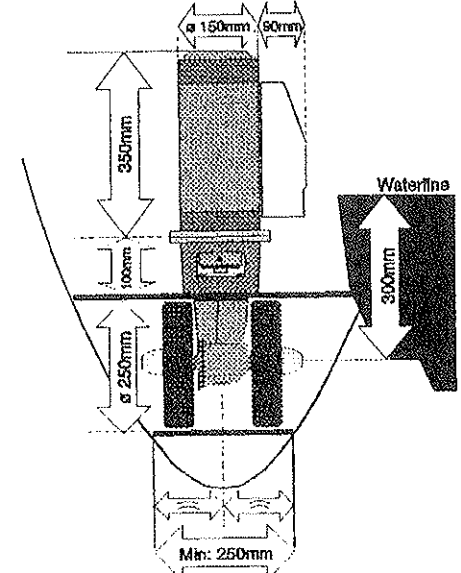
4 Hp



6 Hp



10 Hp

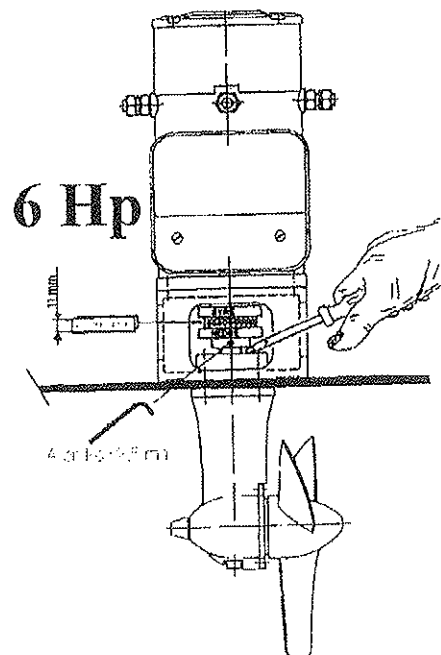
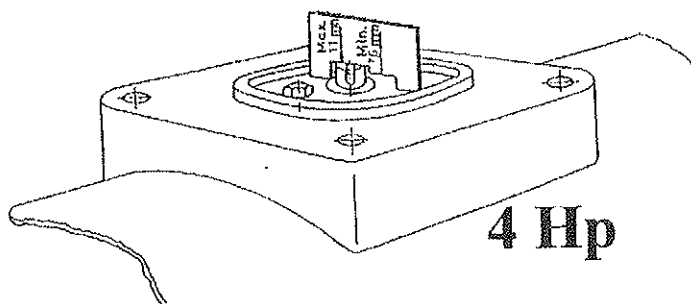


NOTE ! To get maximum effect, the tunnel should be as short as possible, as far forward in the boat as possible and as deep as possible. But you must never make the lower part of the tunnel shorter than what is stated as the minimum in the installation manual. Also remember deflec-



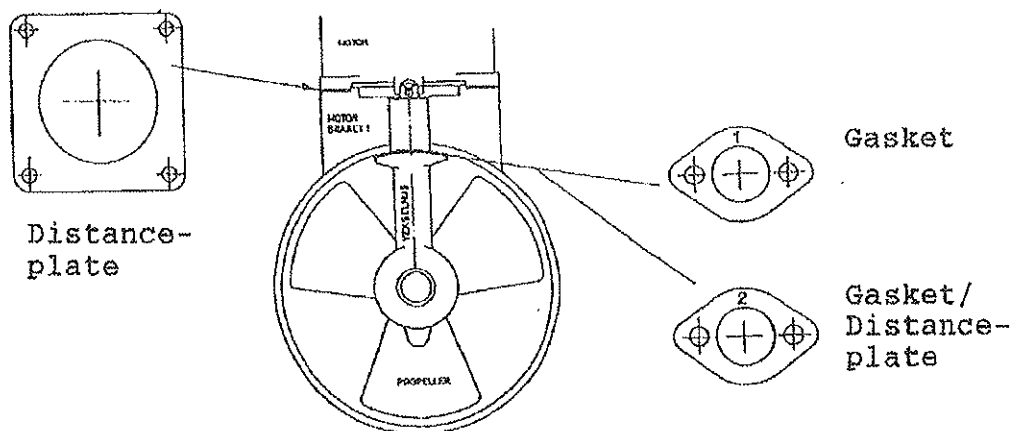
Measurements and important adjustments

Always use the templates that follow the **SIDEPower** to make sure that the high of the shaft on the 4 Hp is correct, and that the flexible coupling on the 6 Hp have the right tension.



You adjust the high of the 4 Hp lower unit with gaskets that sits inside the tunnel. There are two gaskets that is included with the **SIDEPower** (1x1mm and 1x2mm) and it is important that the shaft has the right high up through the motor bracket. The big gasket that fits between the bracket and the motor, is only for adjusting the motor higher, if you the shaft comes to high in the bracket. This adjustment gasket should not be used if the measurement is OK when testing it with the template.

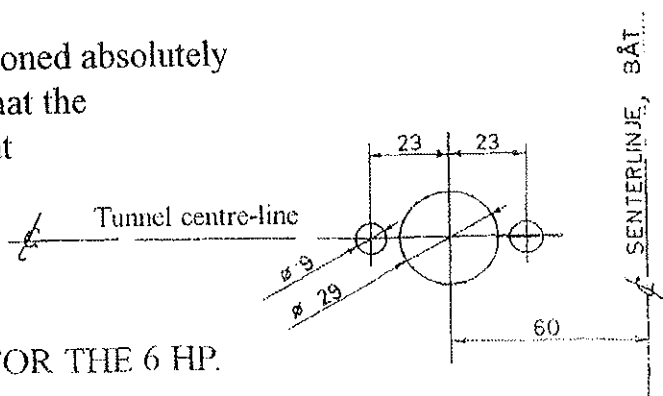
You also use these to make sure that the propeller moves freely in the tunnel.



It is also very important that the gear house is positioned absolutely straight on the tunnel. It must also be installed so that the propeller sits in middle of the tunnel, that means that the motor sits a bit off the centre-line of the boat.

The measurement that it should sit off, is mentioned in the mounting description following the **SIDEPower**.

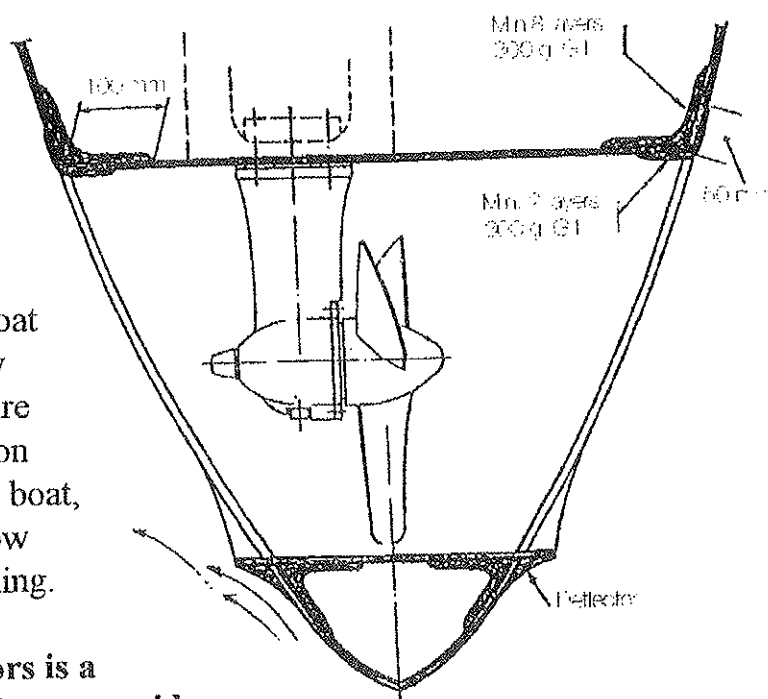
THE MEASUREMENT IN THIS DRAWING IS FOR THE 6 HP.





Tunnel installation / deflector & recess

When installing the tunnel in the boat, we advice you to also include a atleast a deflector in front of and under the tunnel opening. The reason for this is that the tunnel is always shorter in the forward and the lower part. Therefor you get a "wall" in the back and top of the tunnel, that will force water through the tunnel, and it can also slow the boat down. This can cause dammage on the bow thruster because of the high speed and pressure the water will have going through the tunnel on some boats. The water can actually on a fast boat, push the bow thruster twice as hard as the bow thruster are able to push the water when running.



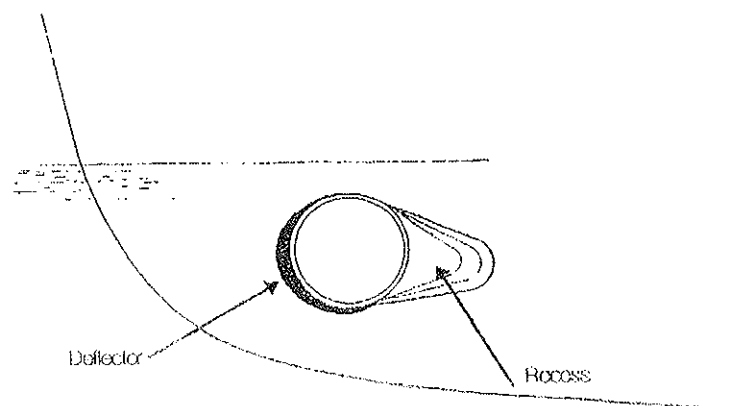
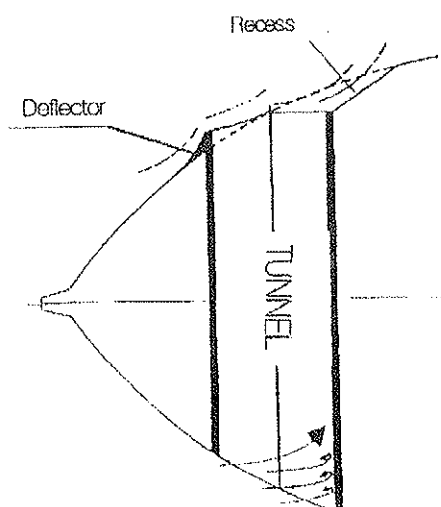
On fast and big, heavy boats, only deflectors is a minimum, and not an option for the installer to consider.

This must be done ! When the installation is so that you can barely see the "back wall" fo the tunnel, it is Ok. Tests have shown that with a good tunnel installation, sailboats are not slowing down so that it is measureable.

To make a deflector is very easy. You just leave a part of the tunnel in the front and the lower part of the tunnel. This "edge" sticking out of the hull, will be the support for the deflector that you make smooth and curved while moulding the tunnel to the hull.

Remember that this must not be done at the back and top of the tunnel.

To make a recess behind the tunnel is not as easy as making the deflector. This requires a lot of handy work and good "moulder" to do it. It is a lot easier for boatbuilders, as they can include this in the mould. But for installers who have problems doing this on older boats, we advice them to atleast "cut" the back edge of the tunnel as soft as possible, everything helps.



Touch panel and main cable connections.

This diagram is for units that are controlled by touch button panels. These panels have a built in delay function that prevents misuse by changing the drive direction immediately. With the electronic delay, it is not possible to change directions immediately and cause damage to breakpins, and the rest of the drive system.

As you can see from this diagram, all connections to the panels are done with connectors that are on the cables. If you need long cables, we advise you to purchase our extension cables that are also ready with connectors. Just plug them in, no danger of wrong connections.

The only connections on the motor is the main cables directly from the battery. The minus lead goes on A1 on the motor, and the positive lead goes on the solenoids, under the cover.

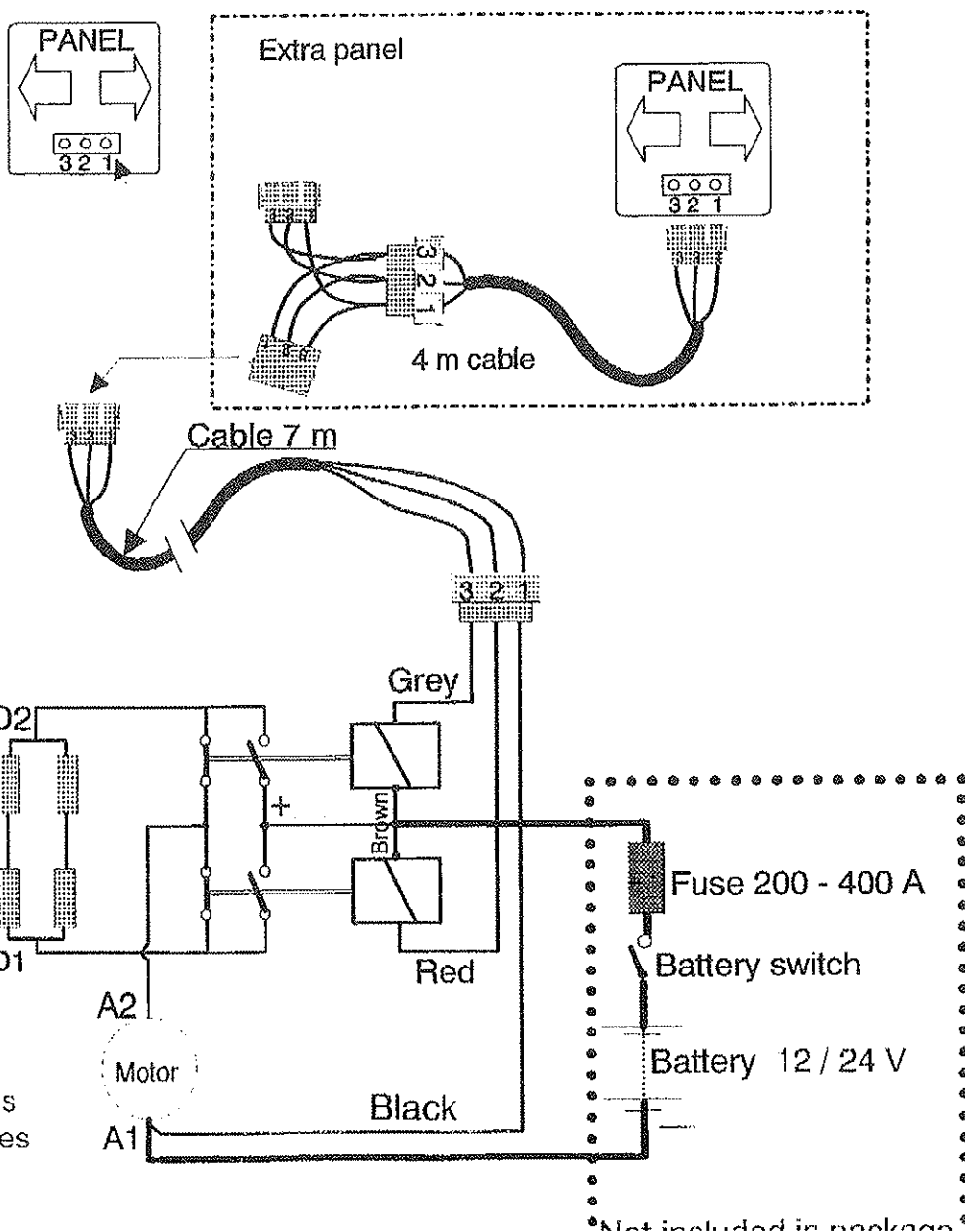
We advise you to put a main switch on the positive lead from the battery, so that the power can be turned off when the boat is not in use.

A fuse can also be an extra safety, but it is not absolutely necessary.

A very important point is to use the necessary size of battery cables. In general you can say that the bigger the cables are, the more power you will get out of the bow thruster.

This also goes for the battery that you are connecting the bow thruster to. The bigger, the more thrust you get.

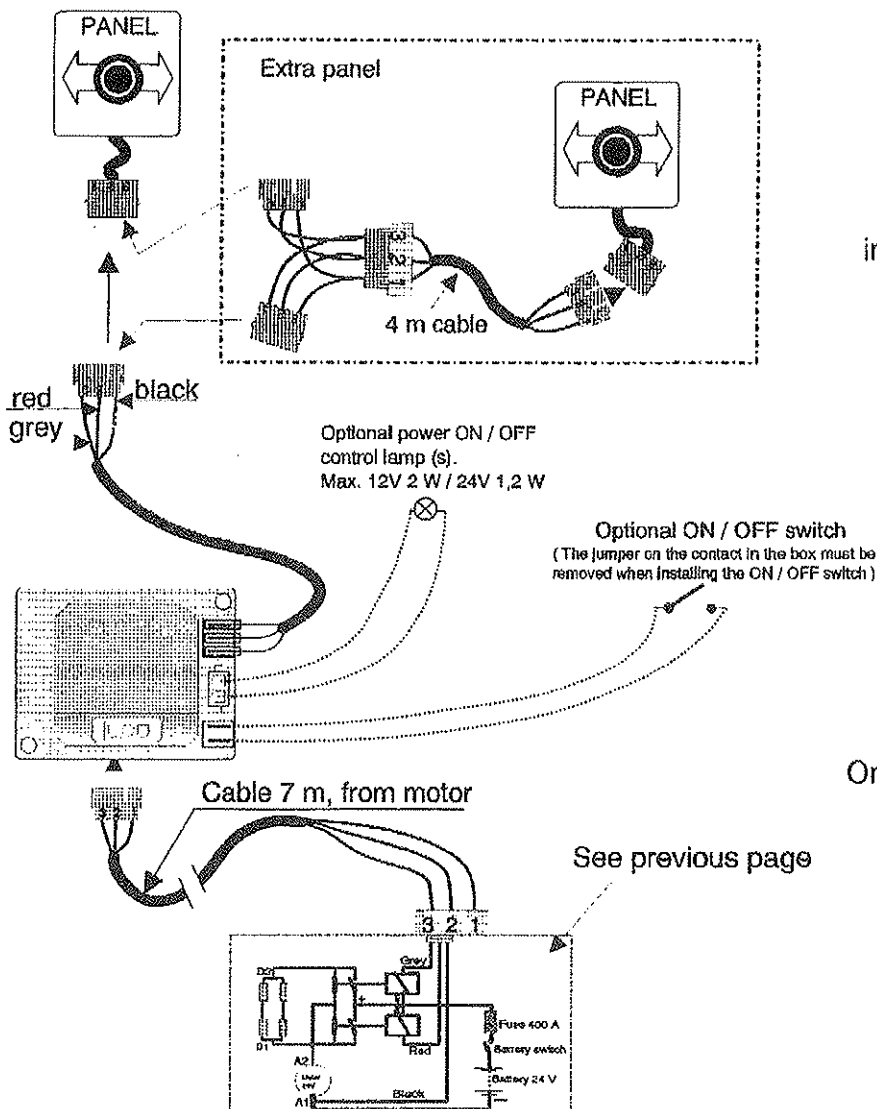
The reason for this is: when using this amount of power, there will always be a considerable voltage drop in the battery. But the voltage drop gets smaller if you have a big battery. Further there will also be a voltage drop in the cables, and we want this to be as small as possible. The distance between the bowthruster and the battery has a lot to do with the size of cables you need. See next page.



Not included in package



Joystick panel and control box connections



This diagram shows how to connect the joystick panels and the control box for joysticks. This control box contains a delay function, making it impossible to misuse the bow thruster by sudden change of drive direction. If you are installing a unit with joystick control, but without the control box, you should connect it as shown for the touch panel on the previous page.

The control box is not included when buying a 4 hp or a 6 hp with joystick control, but for unexperienced users, or in boats used by a lot of different people (for example rental boats), we strongly advise you to install it. So that the users do not put themselves in trouble because of misuse.

On the 10 Hp Twin, it is always included.

How to calculate cable size between battery and motor:

Length = total of positive and negative lead.

Amp = the amperage drawn by the motor. (3100 W / 12 V = 260 A)

Formula: $(0,0175 \times \text{Length} \times \text{Amp}) / \text{Voltage drop} = \text{Diameter of cable in mm}^2$

Use for 12 V boats: $(0,0175 \times \text{Length} \times \text{Amp}) / 0,8 = \text{Diameter of cable in mm}^2$

Use for 24 V boats: $(0,0175 \times \text{Length} \times \text{Amp}) / 1,3 = \text{Diameter of cable in mm}^2$

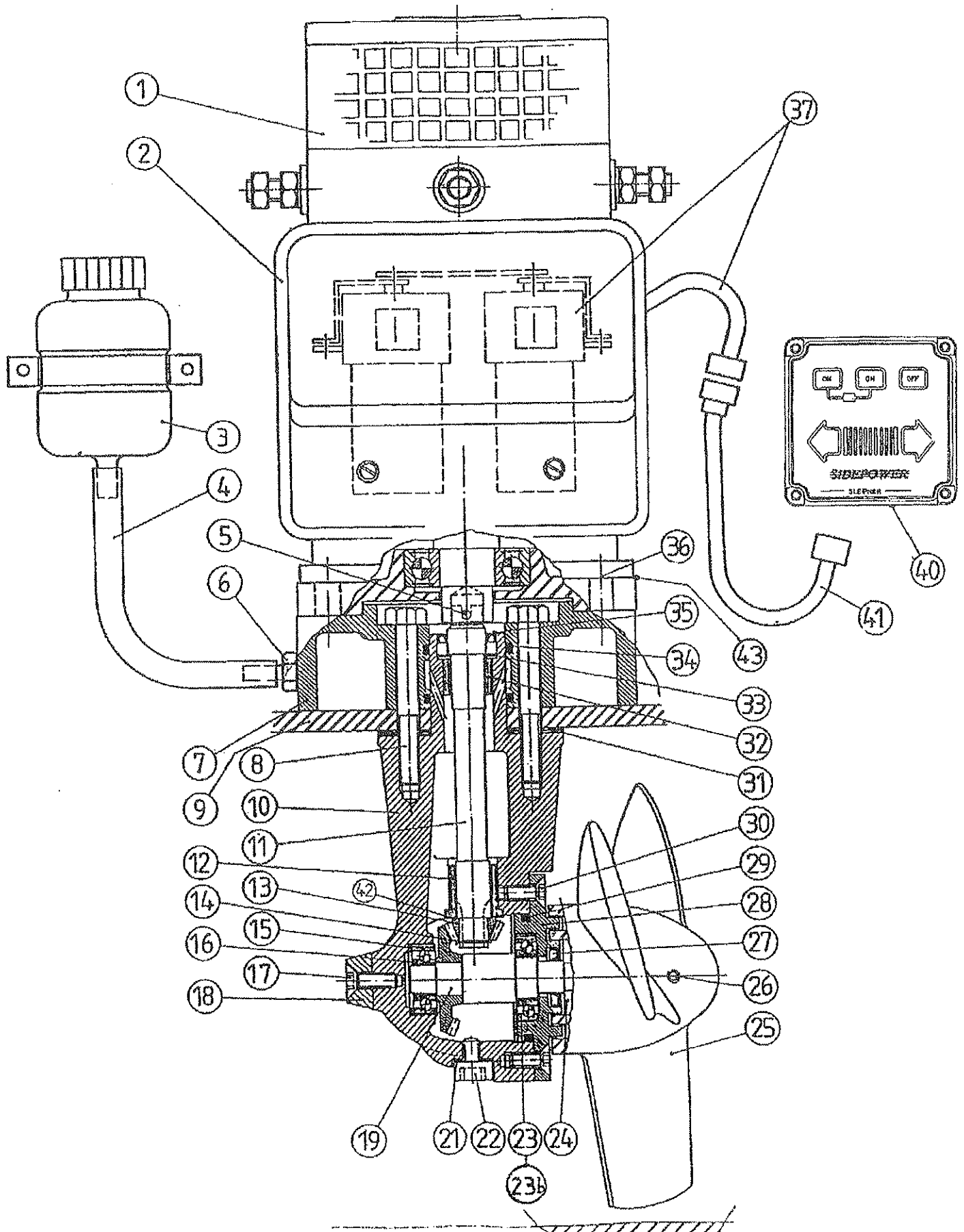
We do not want the cables to cause much more than 1 V voltage drop for 12 V boats and 1,5 V in 24 V boats.

Also remember that most of the voltage drop comes from the battery. So if there is a big battery bank, you can allow more drop in the cables, and if there is a small battery bank, use bigger cables to compensate.

Construction and parts drawing, SIDEPOWER 4 Hp.

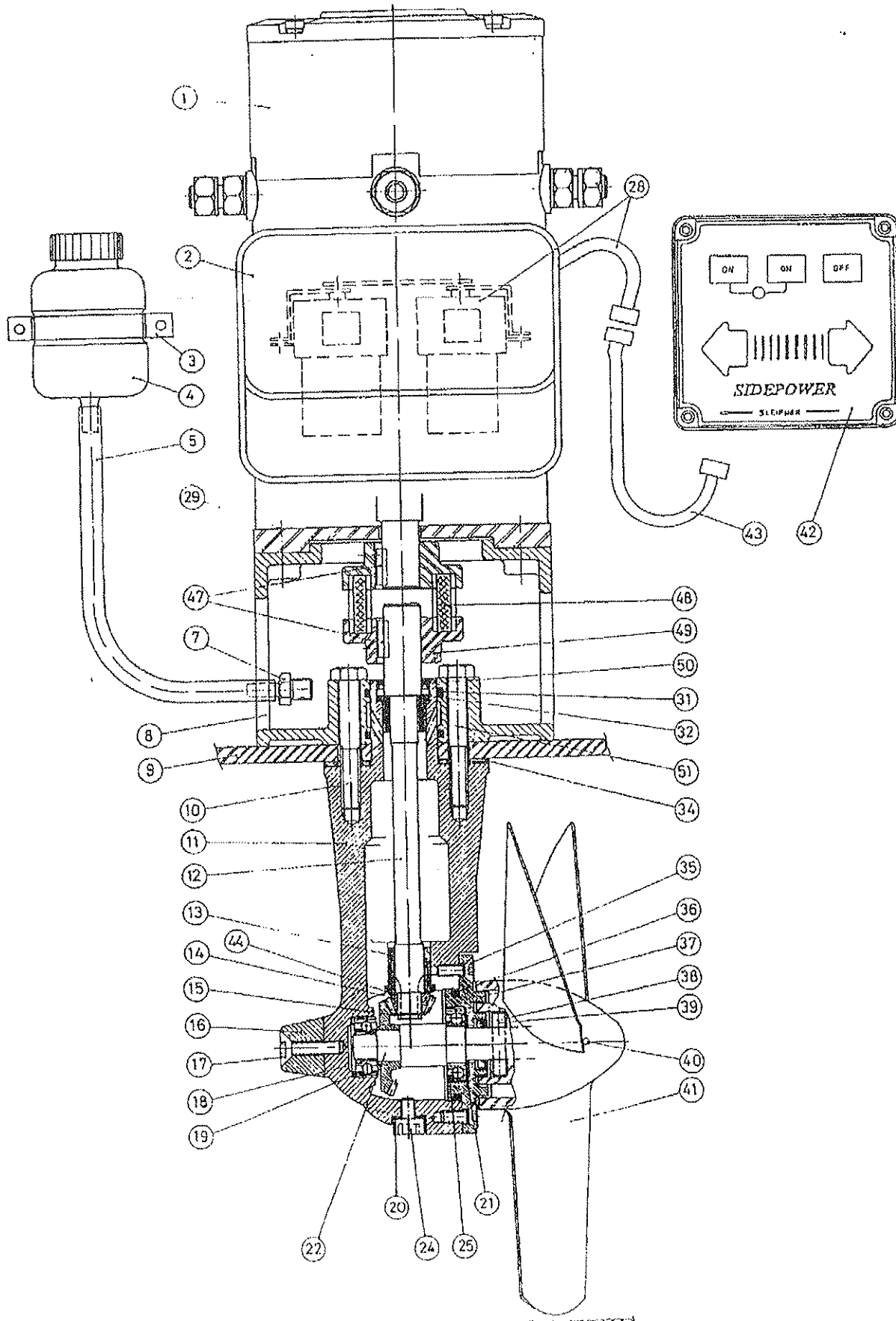


1993 model, always look in the mounting description / owners manual belonging to the unit.



Construction and parts drawing, SIDEPOWER 6 Hp. page 17

1993 model, always look in the mounting description / owners manual belonging to the unit.



1993 model, always look in the mounting description / owners manual belonging to the unit.

