Preface

Thank you very much for purchasing a Craftsman Marine Bow and/or Stern Thruster (hereinafter simply called: Thruster). You have made an excellent choice and our Craftsman Marine Service Team will gladly be of the best possible assistance, if and when you will need us.

The Thrusters made by Craftsman Marine are designed and developed by engineers who are fully aware of the many requirements of the marine environment; professionals who know of the ultimate quality demands, whilst making the best use of their many years of experience.

Enjoy boating with your Craftsman Marine products on board.

Safety

Below you will find a survey of caution pictograms pertaining to this manual. Remarks that are related to safety bear this symbol:

![DANGER](image)

**DANGER**

Carefully adhere to these instructions and inform all people who are involved in the operation or the maintenance of the Thruster about these safety precautions.

- When the Thruster is in operation: do not touch any of the moving parts.
- When the Thruster is in operation several components will become very hot. Never touch these parts.
- In the case of adjustment or inspection of parts of the Thruster always stop the Thruster.
- All maintenance jobs should be executed by qualified mechanics, using properly fitting tools.

**STRONG ADVICE**

It is highly recommended to entrust an experienced installation engineer with the complete mechanical, electrical and hydraulic installation, so as to ensure a flawless operating equipment. Here after a survey of the basics, for your information (only!).

If at all possible, only entrust these jobs to an authorized Craftsman Marine dealer.

Symbols related to the text below:

![Pay attention to the symbols and read the instructions in the text.](image)

Pay attention to the symbols and read the instructions in the text.

![Attention](image)

Attention

(especially with a view to a safety risk for man or material)
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A Bow Thruster (especially in combination with a Stern Thruster) is a most effective manoeuvring aid, designed to handle the boat with utmost ease, when mooring or leaving the quay or in the cramped space of a marina box, while having to cope with bad currents or adverse winds.

For trouble-free operation of the Thruster, it is necessary to read and adhere to the following:

1. The technical specifications of the Thruster
2. Knowing the Thruster itself
3. Correct mechanical installation
4. Correct hydraulic installation
5. Tips for proper use
6. Maintenance and trouble shooting

The thrust force given in the specification is nominal and the result of standard test conditions. The actual thrust force developed is bound to vary from one boat to another, depending on various parameters, such as hull design, type of tunnel, protective grids at the ends of the tunnel or not, the attachment mode of the tunnel to the hull, etc.

Most important is the correct flow rate and pressure achieved by the hydraulic power source. This can vary by other hydraulic devices operating at the same time, engine rpm, etc. Naturally, the performance is also dependant on external conditions like the water current, wind conditions, etc.

The hydraulic thruster does not have the same limited running time the electric thruster has. Running time is dependant on the hydraulic power source, tank size, etc. Continuous rating can be achieved with the use of an oilcoolers, a larger tanks, etc.
The Thruster consists of the following components:

1. Hydraulic motor
2. Mounting flange for hydraulic motor
3. Screws M8x25 no washers
4. Screws M8x25 with washers
5. Flexible coupling
6. Connecting flange
7. Tail piece with gasket
8. Key for propeller
9. Propeller
10. Nut for mounting propeller
11. Zinc anode
12. Screw for mounting the zinc anode
13. Screws for mounting the tail piece
3 Tips for safe use

The safety of the crew members on board (and of other people) is of prime importance and the following instructions must therefore be kept in mind and strictly adhered to.

1. Carefully read and follow the installation instructions.
2. The hydraulic motor is a heat generating source and must therefore be positioned in a dry and well ventilated area.
3. Look out for swimmers close to the Thruster tunnel before using the Thruster.
4. Always use Craftsman Marine spare parts and accessories, so that the compatibility of the whole system is ensured.
5. Use always a CM Thruster control panel.
6. Maintain the equipment in line with the specified periodical maintenance plan.
7. Never touch any moving parts.
8. Never touch the hydraulic motor when in operation.
9. Never store flamable products in the area of the hydraulic motor.
10. Make sure the main engine driving the hydraulic pump is not running in the case of maintenance to the thruster.
11. In the case of installation of more than one panel, make sure to operate the Thruster from only one panel at the time.
1. Installation of the tunnel

The Bow Thruster, when positioned at the most forward point in the bow, provides, by law of leverage, its optimum performance.

The tunnel must be positioned perpendicular to the axis of the boat, in all the directions. The propeller must not protrude out of the tunnel.

It is also possible to fit a Stern Thruster in combination with the Bow Thruster.
4 Mechanical installation

The tunnel can be made of steel, aluminium or fiberglass. There are three options of fitting the tunnel:

1. Blind Connection
2. Connection with a Radius
   \( R = 0.1 \times D \) \( D = \) tunnel diameter
3. Connection with a Chamfer. The chamfer to be between 20 and 30mm

Grid bars at the ends of the tunnel reduce the thrust force and the performance of the Thruster. However, if there is a need to fit these, on account of much debris in the water, it is necessary that the number of bars is kept to a minimum (maximum 3). The shape of the bars must be trapezoidal with no sharp edges on the bars. It is also advised to position the bars in a perpendicular direction to the wave of the bow.
## 1. Installation of the tunnel

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>Mark the centre line of the tunnel. This must be perpendicular to the axis of the boat. Drill a small hole in the center at both sides of the bow.</td>
<td><img src="image1.png" alt="Diagram of tunnel installation" /></td>
</tr>
<tr>
<td>2</td>
<td>Use a simple tool to pass through the drilled centers and mark the cutout at both sides of the bow.</td>
<td><img src="image2.png" alt="Diagram of tool usage" /></td>
</tr>
<tr>
<td>3</td>
<td>Cutout the hull using the mark as a knife guide by appropriate method.</td>
<td><img src="image3.png" alt="Diagram of hull cutout" /></td>
</tr>
<tr>
<td>4</td>
<td>The Tunnel may now be inserted. Based on the material of the tunnel the tunnel may be fixed with resin or welded. The sides are to be finished with 2 pack epoxy paint.</td>
<td><img src="image4.png" alt="Diagram of tunnel insertion" /></td>
</tr>
</tbody>
</table>
2. Installation of the tail piece

A. Mark the installation position of the unit with the intermediate flange so that the propeller will be in the middle of the tunnel

B. Every Thruster is supplied with 2 gaskets of 1mm and 2mm thickness. Check which gasket thickness must be used to center the propeller in the tunnel. It is also possible to use both gaskets to have a distance altogether of 3mm.

Apply (Sikaflex - 292) sealant on both sides of the gasket and stick the gasket in position on the tail piece. Then position the tail piece in the correct position in the hole, drilled earlier in the tunnel.

Position the intermediate flange on top of the tunnel. The application of grease (Molykote br2plus) on all threaded joints is advisable, then firmly tighten the bolts.

Next apply grease on the propeller shaft and fit the propeller. Make sure that there is a gap between the propeller blades and the tunnel wall of at least 1.5mm at all sides. Fix the propeller using the Nylock nut and then fit the zinc anode at the end of the propeller shaft and tighten it.

Stop the propeller from rotating by mounting the flexible coupling on the tailpiece and block rotation by inserting an Allen key in the locking screw of the coupling. After tightening the zinc anode, remove the flexible coupling.
3. Installation of the hydraulic motor

Apply a little grease to the shaft of the hydraulic motor and tailpiece. With the key in position in the shaft of the hydraulic motor, slide over the flexible coupling and tighten the lock screw with the aid of a well-fitting Allen key.

Insert the hydraulic motor assembly onto the intermediate flange.

Turn the propeller by hand and make sure it rotates freely.

Then grease the screws lightly with Lanolin or Duralac and fasten the aluminum flange onto the intermediate flange. Lanolin and Duralac prevent electrolytic reactions between the stainless steel bolts and the aluminium.

Use an Allen key to fasten the 4 bolts of the flange, maximum torque is 22Nm.
4 Mechanical installation

For Thruster of 120kgf and higher
Install the supplied oil reservoir and fill it with oil, type EP90.

Install the reservoir ± 50 cm above waterline!
Make sure the oil-line has a constant downward slope.
**Caution**

The most frequent cause of malfunction or failure of hydraulic equipment is contamination of the hydraulic fluid. Depending on the amount of contamination this can lead to loss of efficiency and reduced life of equipment. This contamination can consist of dirt, sand, paint, etc.

⚠️ Ensure that fittings and pipes are absolutely clean and free from sand, dirt, scale and other contaminants. All ports in the components and hoses must be plugged and these plugs should only be removed just before the hoses are installed.

**Preparation**

Inspect threads for burrs. We discourage the use of Teflon, putty, etc for sealing threads. Make sure the working environment is clean and free from dust and debris. The space where the Thruster is installed should be dry and well ventilated.

The hydraulic motor can be installed in various positions, but make sure it is always clear from the maximum bilge water level.

**Power Supply**

**Engine**

The thruster can only perform well when the engine or powerpack can supply sufficient flow and pressure to the hydraulic motor. Please check the performance curves in the back of this manual to check the necessary oil flow and pressure at given thrust forces.

⚠️ Never exceed the maximum flow and pressure given in the performance curves. This will damage the thruster and no warranty can be claimed in such a case.

When using the main propulsion engine to drive the hydraulic pump that powers the thruster, remember that when using the Bow Thruster it is likely that the engine is idling. Depending on the engine size and type of hydraulic pump, this low rpm can dramatically decrease the performance of the thruster. It is stressed again that the thruster will only reach the given thrust force when there is sufficient oil flow and pressure (see performance curves page 26 and following).

**Hoses**

Make sure the hoses are of the correct pressure rating and that the correct bending radii for the hoses are observed.
5 Hydraulic installation

Connection

The hydraulic motor is fitted with European flanges with G1/2 inner thread. Remove the plugs only just before the hoses are fitted to prevent contamination of the inner parts of the motor.

The hoses must be properly supported, at least every 60cm, to avoid abrasion, kinking or excessive flexing. Excessive flexing may cause weakening of the hose or loosening at the fittings. Hoses that pass through bulkheads must be provided with additional shielding to reduce the risk of chaffing.

Connect the drain port to the hydraulic tank. Not connecting the drain line can result in seal failure and mechanical damage.
Control panel connection

At moment of print, Craftsman Marine supplies her standard switch control panels. This means that only full thrust in either direction can be selected.

The Craftsman Marine control panels can be connected to any 4/3 valve with a normally closed centre position and solenoids of 12/24VDC with a maximum control current of 5A. Connect the supplied cable to the valve solenoids according to the schematic below.

⚠️ Make sure the valve plug connector is the type with an integrated suppression diode to protect the control panel against voltage transients. The suppression diode is required to ensure proper operation of the control panel.

Connection cables between this cable and the control panel are available in lengths of 7m, 10m, 15m or 20m.

Use splitter cables when connecting two or more panels in parallel. By using Craftsman Marine control panels, any number of panels can be connected in parallel.

Please verify the correct direction of the thruster once the installation is completed. Should change of direction be required, simply swap the electrical connectors on the solenoids to achieve the correct direction in combination with the panel(s).
6 Control panel connection

Figure 3

Figure 4

Connection of the Thruster panel for bow OR stern.
Figure 5  
Connection of the Thruster panel for bow AND stern.
7  Thruster panels

Specifications of Thruster panel

1. Time lapse device
   Integrated time lapse device when changing directions (port to starboard and vice versa).

   Setting options:
   1. Time lapse device as from 1 second (factory setting)
   2. No time lapse delay when changing over directions.

2. Switching off the panel
   Dependent on the settings, the panel can switch off automatically, when it has not been activated during a certain period of time.

   Setting options:
   1. Panel does not switch off automatically (factory setting)
   2. Panel switches off after 30 minutes
   3. Panel switches off after 60 minutes
   4. Panel switches off after 120 minutes

3. Protection against continuous use
   If the thruster is operated during more than 2 minutes continuously, this equipment can be switched off automatically, dependent on the settings.

   The hydraulic thrusters do not have the same limited operation time of two minutes the electric thrusters have. However, since a thruster is rarely used for such a prolonged period, the warning signal is maintained in the control panel. For the hydraulic thruster it is advised to set option 2.

   Setting options:
   1. The thruster switches off after 2 minutes of use. The LED indicator and the buzzer are activated.
   2. The thrusters does NOT switch off after 2 minutes of use. The LED indicator and the buzzer are activated.

4. Detection by the relay
   If an interruption occurs in the wiring of the control current circuit of the relay, the LED on the panel will blink intermittently with a red colour.

5. Protection against erroneous switching (childrenproof setting)

6. Supply voltage is 12VDC or 24VDC

7. The front section of the panel is watertight in accordance with IP65

8. Dimensions
   ALFA10T: 81 x 85mm
   ALFA20T: 81 x 85mm
   ALFA30T: 81 x 136mm
In order to be able to modify the settings, the backside of the panel must be removed. By changing the positions 1 - 4 of the dip switch from OFF to ON, the settings are altered.

When dip switch settings are changed, the panel must be switched OFF and ON.

<table>
<thead>
<tr>
<th>Dip switch</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Setting for time lapse device when switching over (portside &lt;-&gt; starboard)</td>
</tr>
<tr>
<td>2</td>
<td>Setting for 2 minutes’ continuous use of the joy stick/push buttons</td>
</tr>
<tr>
<td>3</td>
<td>Setting for automatic switching off of the panel</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Factory setting:
8 Settings of Thruster panel

DIP SWITCH

Dip switch 1

On

Off

1 2 3 4

No time lapse.

The time lapse amounts to 1 second.

Dip switch 2

On

Off

1 2 3 4

If the joystick (or push buttons) are operated for more than 2 minutes continuously, the bow thruster will be switched off.

The LED indicator and the buzzer are activated.

If the joystick (or push buttons) are operated for more than 2 minutes continuously, the bow thruster will NOT be switched off.

The LED indicator and the buzzer are activated.
DIP SWITCHES 3 and 4:

The panel will not be switched off automatically.

If the panel is not engaged during more than 30 minutes, it will switch off automatically.

If the panel is not engaged during more than 60 minutes, it will switch off automatically.

If the panel is not engaged during more than 120 minutes, it will switch off automatically.
Switching the panel ON and OFF:

Switching the panel ON:
Push the ON/OFF key.

The LED will blink intermittently with a green colour and the buzzer will sound. In order to activate the panel, the ON/OFF button must be pushed again within a time lapse of 6 seconds. The green LED will be on continuously and the buzzer will stop. If the ON/OFF switch is not pushed (again) within 6 seconds’ time, the panel will not be switched on.

Switching off the panel by hand:
Push the ON/OFF switch so as to disengage the panel.

Automatic switch off of the panel:
If the settings of the dip switches 3 and 4 have been modified, as described under the heading “Settings”, the panel will switch off automatically after 30 min, 60 min or 120 min respectively.
Operation of the directional switch:

If the directional switch (push button or joystick) is operated, the Thruster will be engaged.

In the case of more than one steering position:
1. Never operate the Thruster from more than one position simultaneously.
2. Whenever the Thruster is engaged, the LED on the other steering positions will blink intermittently with a green colour.

If the directional switch is operated during more than 2 minutes continuously, the Thruster will, dependent on the setting in use:

1. be switched off; the LED indicator and the buzzer are activated.
   If the joystick/push button is released, the bow thruster can be operated again thereafter.
2. not be switched off; the LED indicator and the buzzer are activated.

Bow + Stern Operation
Move both joysticks into the same direction to achieve the following:
10 Maintenance

Regular maintenance

There are no user serviceable parts inside your Thruster and therefore, in the case of a problem, please refer to the Dealer. Apply regular maintenance to your hydraulic system like changing filters, checking hose connections, etc. Replace the hydraulic oil every two years.

Recommended annual maintenance

1. Remove and clean the propeller and grease the propeller shaft with Molykote br2plus.
2. Replace the zinc anode if needed.
3. Inspect all hose connections; make sure that they are clean and tight.

However, the following parts are recommended for frequent inspection:

1. Propeller
2. Mounting bolts
3. Zinc anode
Trouble shooting

Hydraulic motor does not operate
- Is the battery main switch in “ON” position *
- Is the supply current circuit breaker of the control panel tripped *
- Check for damaged or disconnected cables from the control panel to the control valves *
- Is the engine driving the hydraulic pump running.
- Check if anything is blocking the propeller, piece of wood, rope, etc.
- Check operation of the thruster in both directions. Sometimes the hydraulic motor can be positioned in a dead spot. A short burst in the other direction will overcome this.
- Check if the pump drive clutch is engaged.

Hydraulic motor operates slowly/low thrust
- Check if anything is blocking the propeller, piece of wood, rope, etc.
- Speed of the hydraulic pump is (too) low. Rev up the engine driving the pump.
- Pump drive clutch slippage. Check clutch for physical damage or ingress of oil.
- Check hydraulic system pressure and adjust if too low.

Hydraulic system looses oil
- Check all hose connections for possible leakage.

* In all these cases the power LED of the panel will not be ON.
12 Hydraulic specifications

Use the following performance curves to check the necessary flow and pressure.

1. Carefully check if the correct thruster is selected with the correct hydraulic motor.
2. Choose the desired thrust in the bottom of the graph and draw a vertical line upwards.
3. Where the vertical line intersects the black line, draw a horizontal line to the right and find the necessary flow.
4. Where the vertical line intersects the grey line, draw a horizontal line to the left and find the necessary pressure.

![Performance curves diagram](image-url)
### Specifications of the Thruster

50-65kgf thruster with 6cc motor

<table>
<thead>
<tr>
<th>Article code</th>
<th>Thrust (kgf)</th>
<th>Inside diameter of tunnel (mm)</th>
<th>Weight (Kg)</th>
<th>Hydraulic motor (cc/rev)</th>
<th>Power (kW)</th>
<th>Pressure (bar)</th>
<th>Flowrate (l/min)</th>
<th>Hose connections</th>
<th>Drain</th>
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### Specifications of the Thruster

80-115kgf thruster with 6cc motor

<table>
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<th>Article code</th>
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<th>Inside diameter of tunnel (mm)</th>
<th>Weight (Kg)</th>
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<th>Power (kW)</th>
<th>Pressure (bar)</th>
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![Chart showing pressure and flowrate relation with thrust](image-url)
### Specifications of the Thruster

#### 80-115kgf thruster with 8cc motor

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### Specifications of the Thruster

120-180kgf thruster with 8cc motor

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<th>Inside diameter of tunnel (mm)</th>
<th>Weight (Kg)</th>
<th>Hydraulic motor (cc/rev)</th>
<th>Power (kW)</th>
<th>Pressure (bar)</th>
<th>Flowrate (l/min)</th>
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**Diagram:**
- Pressure (bar)
- Flow (l/min)

**Figure:**
- Height above tunnel = 211
- ID Tunnel ø 200
- 115
- 181
120-180 kgf thruster 11cc

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Pin configuration of 5 pole connector:
Pin1: RED = Positive voltage for control panel
Pin2: BLUE = Output 1 to solenoid
Pin3: WHITE = Output 2 to solenoid
Pin4: VIOLET = Thermal Overrun Switch (Connect to ground for hydraulic thruster)
Pin5: BLACK = Ground