



Manufactured by
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CH 4400 SERIES TWO LEVER TOP MOUNT CONTROLS INSTRUCTIONS

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INSTALLER: THESE INSTRUCTIONS CONTAIN IMPORTANT SAFETY INFORMATION AND MUST BE FORWARDED TO BOAT OWNER.

These instructions show how to install CH4400 SERIES top mount controls, for throttle and shift in single or twin engine boats. These controls are available with either straight or raked (curved) handles.

Optional Equipment:

Neutral start switch	CA68075
Two station kit (one kit for each engine)	CA68065
4300 Cable kit (one kit for each control handle)	CA68055
Engine Connection Kit.	See Catalog

In addition the following cables, SAE Type 3300 (Teleflex CC172XX, CC633XX, or equivalent) are required.

Single engine, Single station	2 required
Single engine, Two station	4 required
Twin engine, Single station.	4 required
Twin engine, two station	8 required

WARNING

*** BEFORE STARTING INSTALLATION, READ THESE INSTRUCTIONS AND THE ENGINE MAKERS INSTRUCTIONS THOROUGHLY. FAILURE TO FOLLOW BOTH INSTRUCTIONS OR INCORRECT ASSEMBLY CAN RESULT IN LOSS OF CONTROL AND CAUSE PROPERTY DAMAGE OR INJURY.**

***DO NOT SUBSTITUTE PARTS FROM OTHER MANUFACTURERS, THEY MAY CAUSE A SAFETY HAZARD FOR WHICH TELEFLEX INC. (USA) CANNOT ACCEPT RESPONSIBILITY.**

*** CABLE INSTALLATION AND CONNECTIONS MUST BE MADE IN ACCORDANCE WITH THE MOTOR MANUFACTURERS INSTRUCTIONS.**

*** TO ENSURE BEST PERFORMANCE, FREE OPERATION OF ALL LINKAGES AND THE REMOTE CONTROL IS ESSENTIAL. FOLLOW THE MANUFACTURERS RECOMMENDED PROCEDURES FOR ADJUSTMENT AND LUBRICATION.**

PREPARATION FOR INSTALLATION

1. Select a location which allows convenience of operation and full travel of control handles in both directions. Ensure that handles clear windshield, steering wheel and other equipment on the dashboard. Make sure that there is sufficient clearance under the mounting surface for the control body and cable routing. See figure 1.

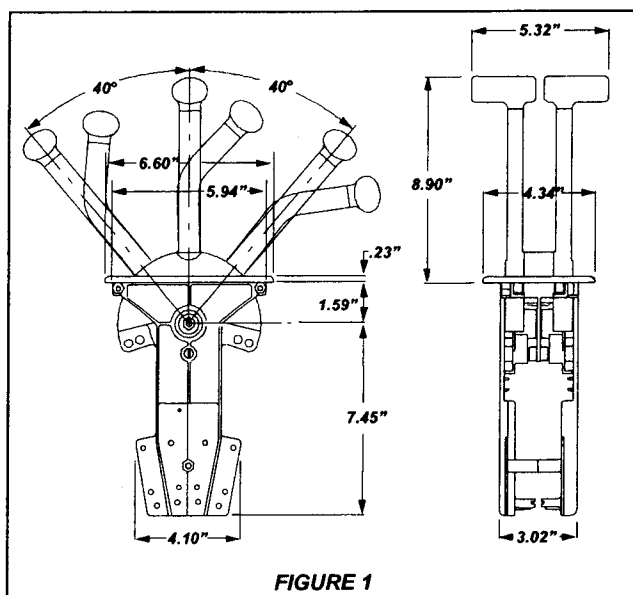


FIGURE 1

2. Detent kits are provided with each control for use on the shift lever. (See figure 3.) For single engine use, install as shown. For twin engine use install detent kits from both controls into the control which will have both shift levers. In two station systems, detents are used in the lower station controls only. **DO NOT INSTALL DETENTS IN UPPER STATION OF TWO STATION SYSTEMS.**

3. If neutral start switches are to be installed, they should be installed at this time. Follow the instructions packed with the Neutral Start Switch Kit.

4. Carefully lift the top bezel (A) from the control. If the bezel is black it will snap off, if the bezel is chrome it will lift off. The control is now ready for installation.

5. At each control location position the template (Fig.5) and carefully mark the holes and cutout. **RECHECK** the location and clearances, if they are correct, drill the holes and make the cutout.

6. You should now route the cables through the boat from the control station to the engine. **DO NOT** connect the cables to the engine at this time. Select a path as straight as possible and with as few bends as possible. Cable bends must not be less than 8" (203mm) radius.

7. With the control prepared for installation, the dashboard prepared to receive it and the cables installed in the boat, you are now ready to install the control.

SINGLE ENGINE SINGLE STATION INSTALLATION

1. Feed the cables up through the dashboard until about two feet protrudes through the dashboard.

2. Screw pivots (12) onto the threaded ends of the cables.

CAUTION; DO NOT LEAVE MORE THAN 3/8IN. OF THREAD PROTRUDING THROUGH THE PIVOT.

3. Determine if the cables should be push or pull to open the throttle and whether push or pull to select forward gear. Cables attach to the front of the control arms for push operation, to the rear of the control arms for pull operation.

4. Place the cables in the correct slots in the control, put the cable clamp lock plate (9) in position, turn the screw(10) fully home to lock the plate in position. **CHECK** that the plate is locked. See figure 2.

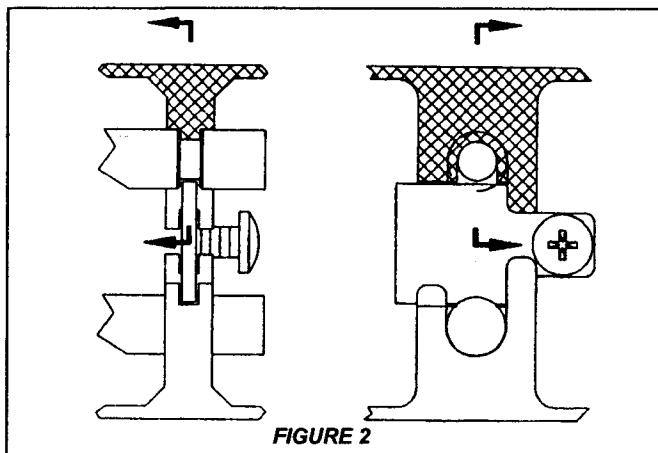


FIGURE 2

5. Place the bushings (13) in the outermost holes in the control arms, insert the pivots in the bushings, and retain the pivots in place with cotter pins (14). See figure 3.

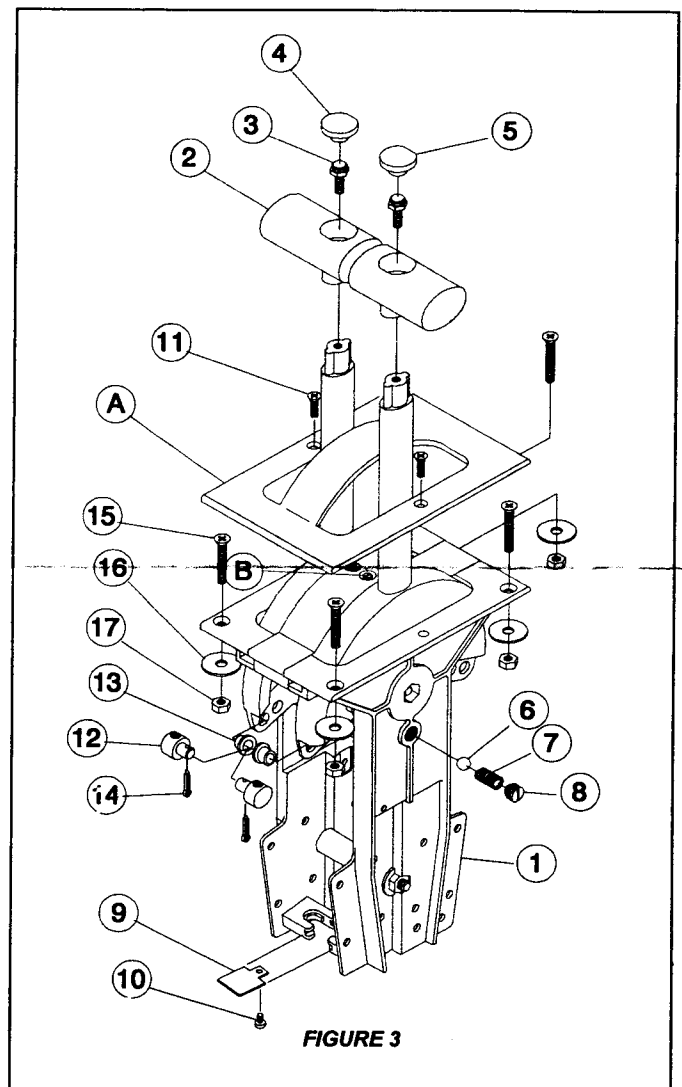


FIGURE 3

6. Place the control in position in the cutout and secure in place using screws (15) washers (16) and locknuts (17).

7. Check that the control moves freely from full forward to full reverse position. The handle friction can be adjusted by means of turning the screw (B) in the top of the control body. See figure 3. Increase friction by turning screw clockwise, decrease friction by turning the screw counterclockwise. **CAUTION: FRICTION MUST BE REMOVED FROM SHIFT LEVER IN ORDER TO FEEL DETENTS.**

8. Replace the top bezel and attach it to the control body using screws (11) for chrome bezels or by snapping it on for black bezels. Install knobs (2) to the handles using knob screws (3). Snap caps (4 & 5) into handles, the red cap with a raised "T" is for the throttle. Make sure that the cap is aligned with the contour of the knob. If it is necessary to remove the caps, insert a small screwdriver into the hole under the knob and push gently.

9. Connect the cables to the engine as instructed in the engine maker's installation instructions. The cables should now be clamped loosely or tied for support at regular intervals, but not closer than 36"(914)mm from the base of the control. CAUTION: CABLES MUST NOT BE BUNDLED TOGETHER WITH ELECTRICAL WIRING.

TWIN ENGINE SINGLE STATION INSTALLATION

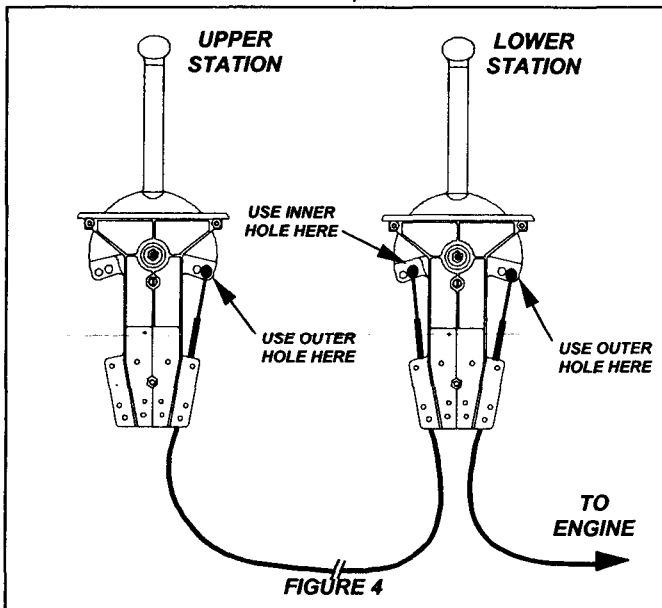
1. Repeat the instructions for single engine for both controls, but ensure that the control used for gearshift has both sets of detents installed, and the control used for throttle has both red knob caps.

SINGLE ENGINE TWO STATION INSTALLATION.

1. Prepare both locations for the controls, and position cables in the boat to run from UPPER control to LOWER control and LOWER control to engine. Do not attach the cables to controls,

2. Following the single station installation instructions, fully install the control nearest to the engine, but do not fasten the control in place. Connect cables to the engine and check that the operation is correct. REMOVE ALL FRICTION FROM THIS CONTROL.

3. Using the parts from a two station kit, attach the cables from the UPPER station to the LOWER station control. NOTE! these cables must be attached to the innermost hole on the control arms. See figure 4. Fasten the LOWER control in place.



4. At the UPPER control attach the cables to the control using the outermost holes in the control arms. Operate the control in both directions a number of times to check free operation. Place LOWER control throttle in idle and the shift handle in neutral. Adjust the pivots on the UPPER control to synchronize the handle position with the LOWER control.

DO NOT ADJUST THE LOWER CONTROL OR THE CABLES GOING BACK TO THE ENGINE. When adjustments are correct fasten both controls in place.

NOTE! You may find that the handles on the UPPER control do not travel as far as the handles on the LOWER control. This is normal and is necessary to ensure that LOWER control gives full travel at the engine.

TWIN ENGINE TWO STATION INSTALLATION

Repeat the instructions for single engine for both sets of controls, but ensure that the controls used for gearshift have both sets of detents installed and the controls used for throttle have both red knob caps installed. Take care that the cables are attached to the correct controls. It helps to mark them with tape for their function, i.e. port throttle, port shift etc.

FINAL SYSTEM CHECKOUT.

Final system check must be made with the boat in the water and engine running. Follow all boat and engine maker's requirements for operation. Operate the boat with extreme caution until the control installation is proven to be correct.

WARNING

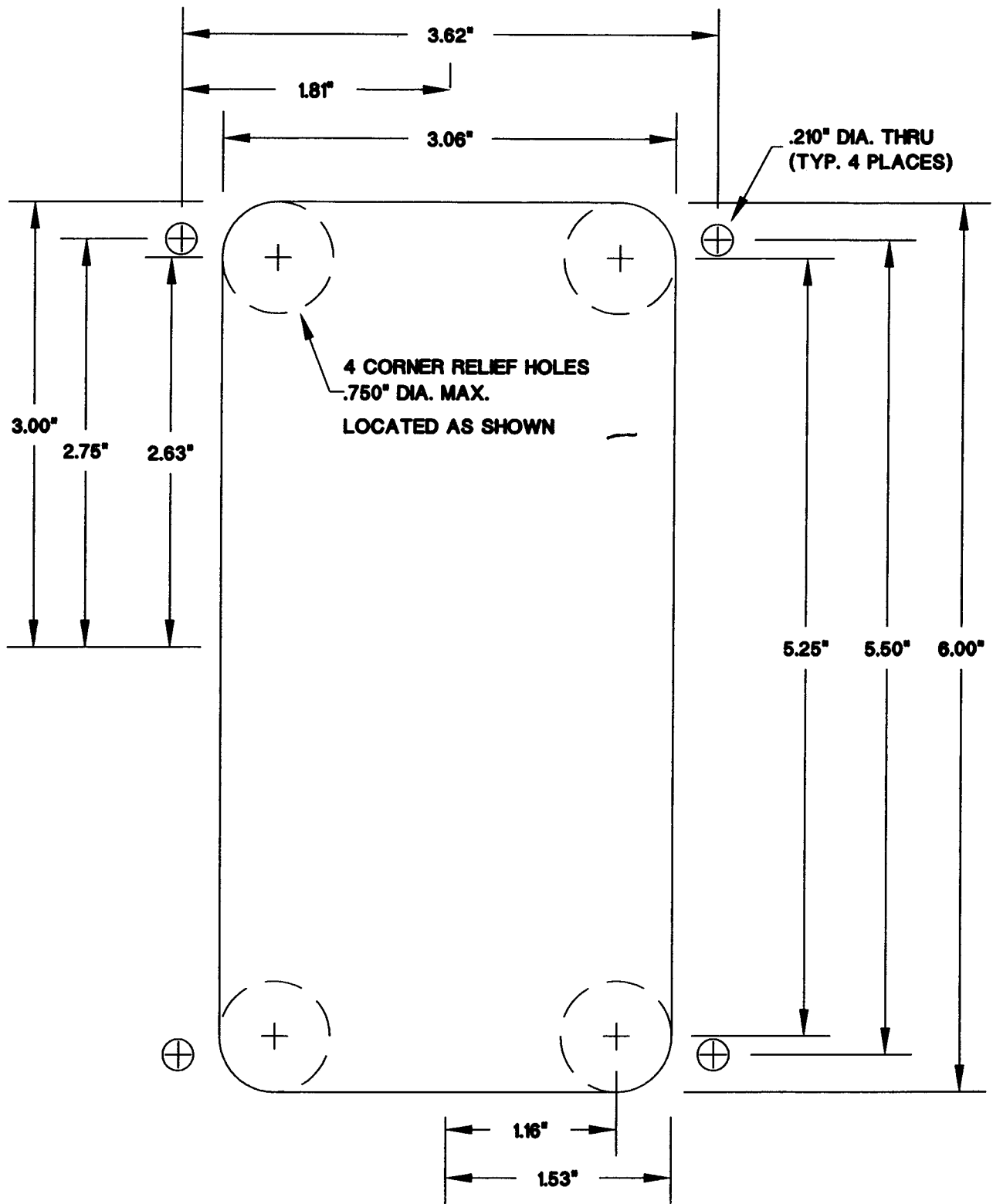
WHEN CHECKING SHIFTS MAKE SURE THAT THE THROTTLES ARE IN IDLE POSITION. WHEN CHECKING THROTTLES MAKE SURE THAT THE TRANSMISSIONS ARE IN NEUTRAL TO AVOID SUDDEN MOVEMENT OF THE BOAT.

When the control system is fully installed and tested, adjustments can be made to the friction and detents to give a comfortable feel to the handles. REMEMBER, DO NOT APPLY FRICTION TO THE LOWER STATION IN TWO STATION SYSTEMS.

After a few hours running, check all components and hardware to ensure it is secure. Recheck at regular intervals thereafter.

PARTS LIST		
ITEM	DESCRIPTION	QTY.
1	CONTROL BODY ASS'Y	1
2	KNOB	2
3	KNOB SCREW	2
4	RED CAP	1
5	BLACK CAP	1
6	DETENT BALL	1
7	DETENT SPRING	1
8	DETENT SCREW	1
9	CABLE BRACKET	2
10	CABLE CLAMP SCREW	2
11	BEZEL SCREW 6-32 x 1/4	2
12	PIVOT	2
13	BUSHING	2
14	COTTER PIN	2
15	FLAT HEAD SCREW 10-32 x 1-1/4	4
16	WASHER 10-32	4
17	LOCKNUT 10-32	4

KEEP THESE INSTRUCTIONS WITH YOUR BOAT FOR FUTURE REFERENCE.



**MOUNTING TEMPLATE
(TOP MOUNT CONTROL)**

FIGURE 5