

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

THESE INSTRUCTIONS DESCRIBE HOW TO INSTALL CH2200 AND 2300 SERIES SIDE MOUNT CONTROLS. (THE CH2300 SERIES CONTROLS HAVE LIMITED-TRAVEL THROTTLE WARM-UP MOVEMENT TO PREVENT BOAT TRAVEL WHILE IN NEUTRAL FOR JET BOAT APPLICATIONS).

#### ADDITIONAL EQUIPMENT REQUIRED:

- (2) Cables - P/N's CC172XX, CC199XX, or CC419XX (CC172 and CC199 are 3300 type cables used for shift or throttle in all applications; CC419XX is a HD cable used for Shift only in Jet Boat Applications)
- (1) Neutral Safety Switch Kit (P/N CA27090 for CH2200 Series or P/N CA27100 for CH2300 Series). Required if "Start in Gear" protection is not provided by the Engine Manufacturer.

#### WARNING

READ THESE INSTRUCTIONS THOROUGHLY BEFORE STARTING INSTALLATION. FAILURE TO FOLLOW THESE INSTRUCTIONS AND ENGINE MAKERS INSTRUCTIONS MAY RESULT IN LOSS OF ENGINE CONTROL WITH SUBSEQUENT PROPERTY DAMAGE AND PERSONAL INJURY. DO NOT SUBSTITUTE PARTS FROM OTHER CONTROLS MAKERS, THEY MAY CAUSE A SAFETY HAZARD FOR WHICH TELEFLEX, INC. CANNOT ACCEPT RESPONSIBILITY.

#### PREPARATION FOR MOUNTING CONTROL

1. Select a location for the control ensuring that the handle does not interfere with dashboard, steering wheel, seat, switches, or other equipment at any point in its travel. NOTE: THICKNESS OF MOUNTING SURFACE MUST NOT BE GREATER THAN 1/2". Also ensure that the cables will have at least 36" of unrestricted space for movement (see INSTALLATION OF CABLES). Refer to figure 1 for dimensions and clearances. NOTE: CONTROL CAN BE MOUNTED HORIZONTALLY OR VERTICALLY TO FACILITATE CABLE CLEARANCE.

2. Cut mounting holes in selected location, using template provided.

3. Route the cables (if not routed already) from the engine to the cutout, allowing the cables to protrude from the cutout enough to allow connection to the control mechanism.

#### INSTALLATION OF CABLES

##### A. BEND RADIUS

Minimum bend radius is 8". If it is installed with sharper bends, cable wear will increase rapidly.

##### B. SUPPORTING THE CABLE

DO NOT TIE OR CLAMP THE CABLES WITHIN 36" OF THE CONTROL. This especially applies to the throttle cable, as it moves side to side during operation. Securing the throttle cable too close to the control mechanism would restrict its motion. WHEN SUPPORTING THE CABLES BEYOND 36" OF THE CONTROL, DO NOT TIE OR CLAMP TIGHTLY.

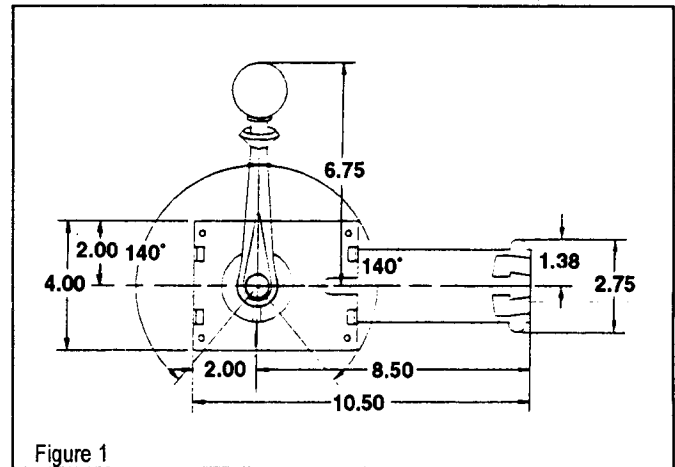


Figure 1

#### CONNECTION OF CABLES

NOTE: ALWAYS CONNECT THE CABLES TO THE MECHANISM BEFORE CONNECTING THEM TO THE ENGINE AND GEAR. ENGINE CONNECTION SHOULD NOT BE MADE UNTIL THE CONTROL HAS BEEN COMPLETELY INSTALLED.

##### A. CONNECTION OF THE THROTTLE CABLE

1. Remove the nut (figure 2 item A) and both rubber seals (figure 2 item B). Push the throttle cable through the retainer (figure 2 item C). Apply a light, even coating of a marine-grade grease to the terminal. Refit both rubber seals and nut.

2. Secure the cable with the hitch pin (figure 2 item D). Note that the hitch pin must be fitted with the flat side upwards.

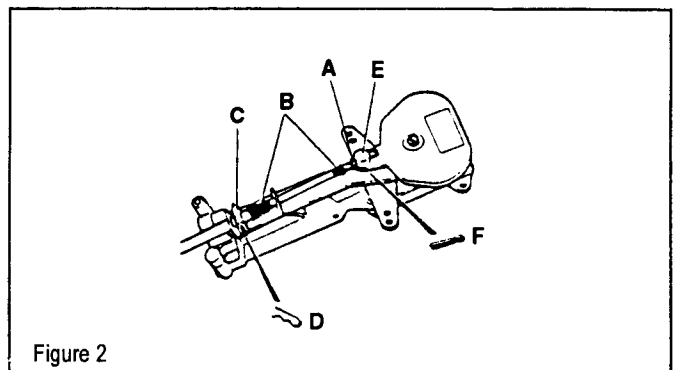


Figure 2

3. Thread the pivot (figure 3, item A) onto the cable terminal until the threaded portion of the terminal protrudes 5/32" (5 threads). Use the large thread diameter pivot with cables having a 1/4" diameter terminal only (CC419XX) and the small thread diameter pivot(s) with cables having a 3/16" diameter only (CC172XX or CC199XX). Secure the pivot by tightening the nut (figure 3 item B). Connect the pivot to the throttle lever (figure 2 item E) and secure it with a cotter pin (figure 2 item F).

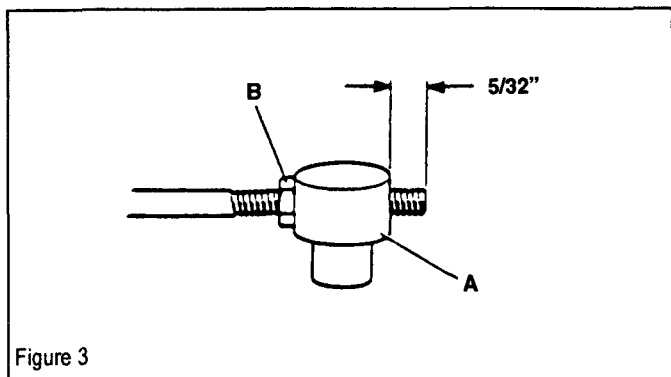


Figure 3

## B. CONNECTION OF THE SHIFT CABLE

1. Push the shift cable through the appropriate retainer, making sure the cable seats securely into the retainer (figure 4 item A).
2. Thread the pivot (figure 3 item A) onto the cable terminal until the threaded portion of the terminal protrudes 5/32" (5 threads). Secure the pivot by tightening the nut (figure 3 item B).
3. Connect the pivot to the shifting lever (figure 4 item B) and secure with a cotter pin (figure 7 item C).

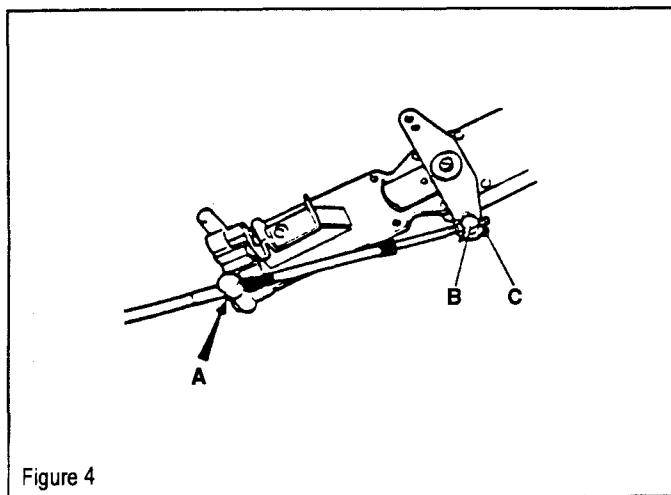


Figure 4

## THROTTLE BRAKE ADJUSTMENT

The control mechanism is equipped with an adjustable friction device (brake) for the throttle cable to prevent throttle creep. If needed, the friction device can be adjusted by turning the adjustment screw (figure 5 item A) clockwise to increase braking and counterclockwise to decrease or remove braking. Any adjustments should be made with the control set at 1/2 throttle and the gear engaged. Gear shifting is not influenced by the brake.

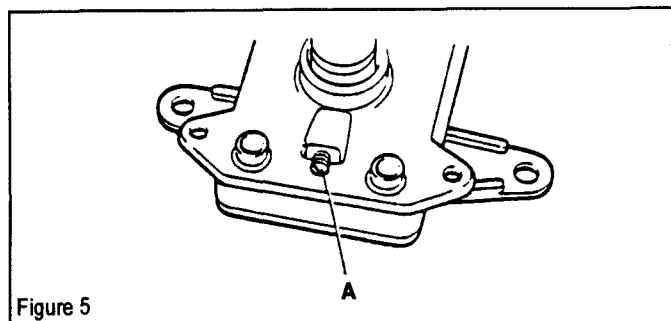


Figure 5

## NEUTRAL SAFETY SWITCH INSTALLATION

A neutral safety switch prevents the boat's engine from starting in gear and is required if "Start in Gear" protection is not provided by the engine manufacturer. Follow instructions packed with the neutral safety switch kit for installation and wiring.

### A. CH2300 CONTROL

1. Route the wires so they will not in any way come in contact with the cable or moving parts of the control. If necessary, the switch can be relocated to the right side.
2. Connect one wire of the switch to the "Start" terminal on the ignition switch and the other to the positive terminal of the starter solenoid (see figure A and warning).

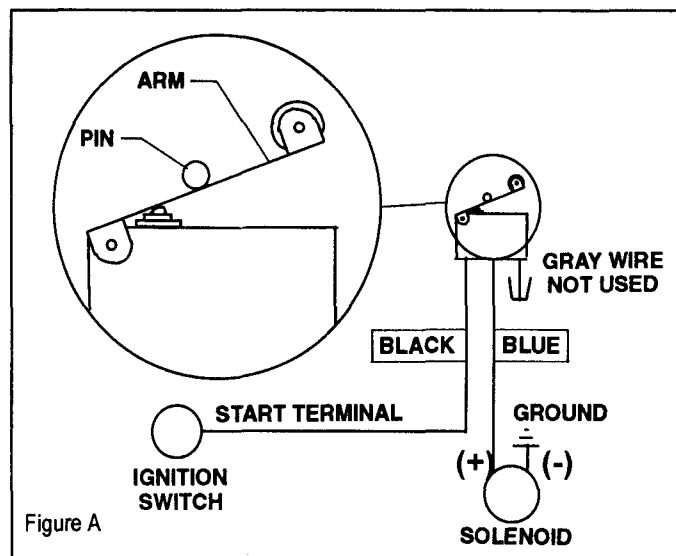


Figure A

### WARNING

CONNECTION TO THE GROUND TERMINAL OF THE SOLENOID WILL SHORT CIRCUIT AND DESTROY THIS SWITCH.

NOTE: CHECK FOR CORRECT OPERATION BY TRYING TO START THE ENGINE AT ALL GEAR LEVER POSITIONS. IF THE ENGINE STARTS IN EITHER FORWARD OR REVERSE POSITIONS, CHECK CONNECTION AT IGNITION SWITCH.

### B. ALL OTHER CONTROLS

Follow instructions provided with the neutral safety switch kit.

## INSTALLATION OF CONTROL

### A. INSTALLING THE MECHANISM

1. Make sure that the control is in gear and at half throttle position. This will allow the control to fit in the cutout shown in the template. If not already in half throttle position, use the handle to move in gear and at half throttle position by temporarily placing the handle on the splined shaft of the control. Push the mechanism until it seats flush against the mounting surface of the boat.
2. Secure the control mechanism to the boat with the four screws provided.

**B. INSTALLING THE COVER (IF SUPPLIED)**

1. Place the cover over the shaft and spline and snap into place on the control mechanism.

**C. INSTALLING THE HANDLE**

Once the mechanism has been securely mounted, the handle assembly may be attached to the control. The handle assembly contains two (2) sets of internal splines; one (1) on the chrome locking ring, and one (1) on the black handle. There are two (2) sets of mating external splines on the mechanism; one (1) on the cast housing and one (1) on the steel shaft. Each set of splines contains forty-eight (48) teeth and both sets of the 1 3/8" splines and 3/4" splines are consistently oriented to the other (See figure 6).

1. Make sure the pinned rocker in the handle is situated in the slot in the locking ring; this is referred to as the locked position.

2. Firmly install the handle assembly onto the control so that both sets of splines are fully engaged and the steel shaft "bottoms-out" against the internal shoulder of the handle. Since the splines on the shaft and handle will engage before the splines on the locking plate and diecast housing, make sure the locking ring rests securely on the 1 3/8" splines and cannot rotate.

3. While applying pressure firmly against the assembly and leaving the handle in the locked position, install the set screw into the bottom of the handle and tighten.

4. Once the handle has been attached with the set screw, insert the black button onto the push pin in the shaft and press firmly. Insert the #6-32 x 7/8" long machine screw through the center of the button and tighten until the screw is flush with the button. Overtightening can result in damaging the button and/or screw.

**IMPORTANT:** ONCE THE ASSEMBLY HAS BEEN FULLY ATTACHED AND THE ENGINE TURNED OFF, LIFT THE "UMBRELLA" OF THE HANDLE AND CYCLE THE HANDLE THROUGH FULL FORWARD AND FULL REVERSE TO ENSURE THAT BOTH SETS OF SPLINES ARE FULLY ENGAGED. IF THE LOCKING PLATE IS CAPABLE OF ROTATING WITH THE HANDLE, REMOVE THE HANDLE ASSEMBLY AND REPEAT THE HANDLE INSTALLATION PROCEDURE. ALSO, CYCLE THE CONTROL USING THE PUSH BUTTON/NEUTRAL WARM-UP TO ENSURE THAT THE BLACK BUTTON HAS BEEN PROPERLY INSTALLED.

**NOTE:** SINCE THE SETS OF SPLINES ARE ORIENTED AND HAVE THE SAME NUMBER OF TEETH, THE CONTROL ALLOWS FOR THE HANDLE ASSEMBLY TO BE INDEXED EVERY 7.5°. THE CENTERLINE OF THE HANDLE IS ALIGNED WITH THE CENTERLINE OF THE CONTROL, SO IF THE CONTROL IS MOUNTED HORIZONTALLY, THE HANDLE CAN BE ATTACHED PERPENDICULARLY TO THE CONTROL..

**CONNECTION OF CABLES TO ENGINE**

Read engine makers manual and connect control cables to engine following those instructions, using attachment kits recommended by the engine manufacturer.

**MAINTENANCE**

Very little maintenance is required for this control system, but the following should be checked periodically:

- Ensure that the control is firmly mounted
- If the handle develops lost motion, check that it is firmly attached to the control body, that the control body is firmly attached to the boat, and that the cables are firmly attached to the control and engine.
- If stiffness of operation develops, disconnect cables from the engine and check operation. If stiffness is due to cable it must be replaced.

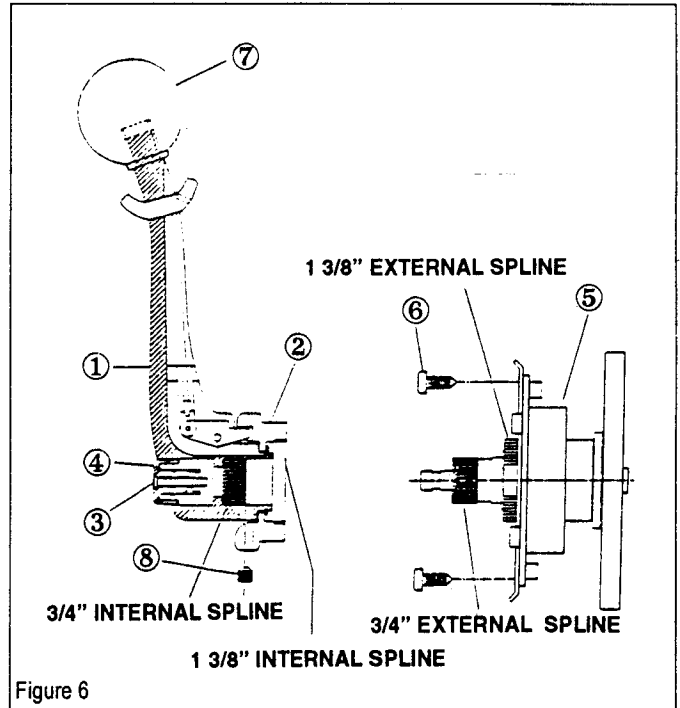


Figure 6

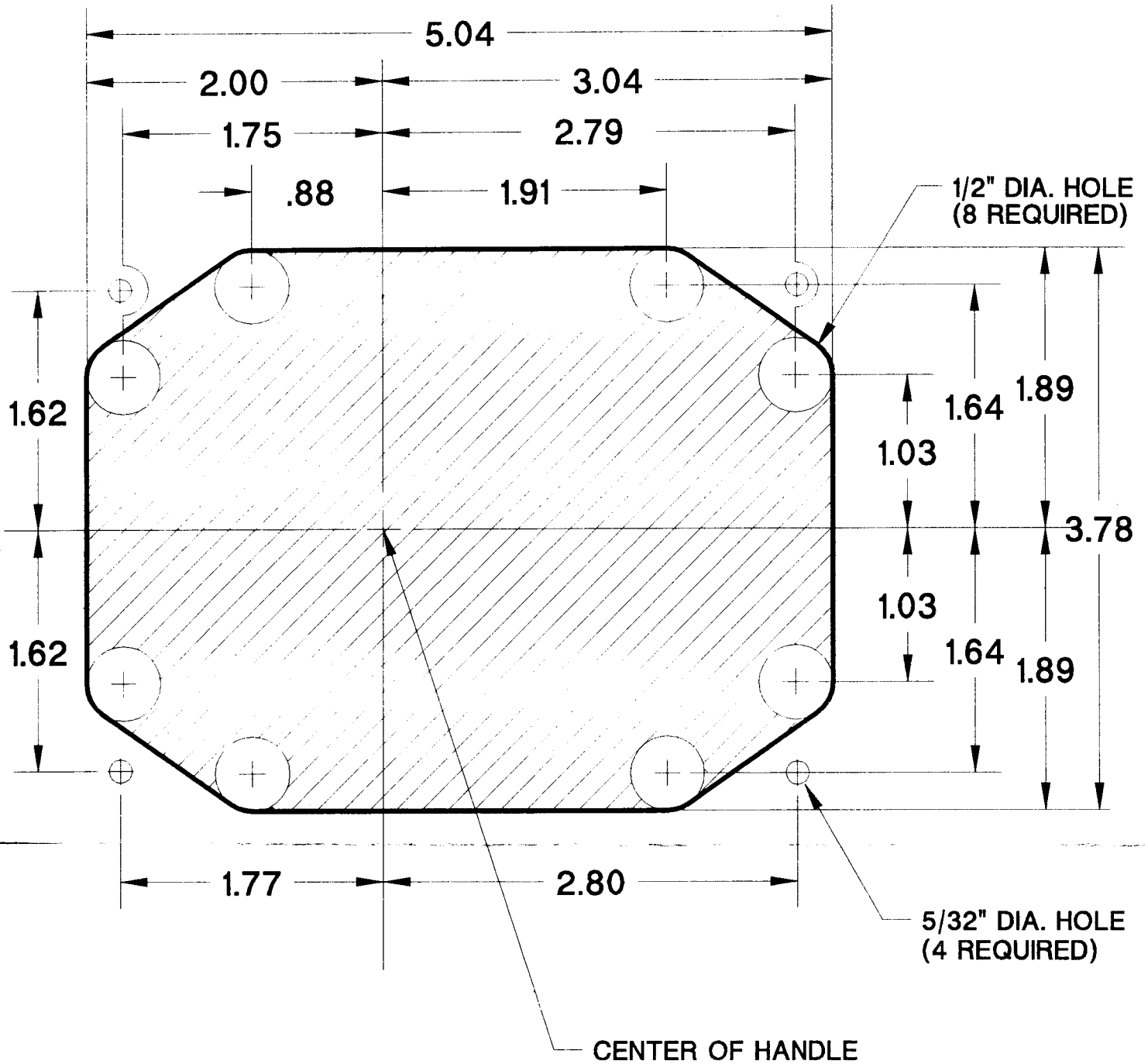
**PARTS LIST**

ITEM	DESCRIPTION	QUANTITY
1	Handle	1
2	Locking Ring	1
3	Neutral Detent Warm-up Button	1
4	Button Mounting Screw	1
5	Control Mechanism	1
6	Control Mounting Screw	4
7	Knob	1
8	Handle Mounting Set Screw	1
9*	Pivot, Large (1/4") Dia. Thread	1
10*	Pivot, Small (3/16") Dia. Thread	2
11	Hitch Pin (Figure 2 Item D)	1
12	Cotter Pin (Figure 2 Item F)	2

\*See Figure 3 Item A

**KEEP THESE INSTRUCTIONS WITH YOUR BOAT FOR FUTURE REFERENCE.**

# TEMPLATE

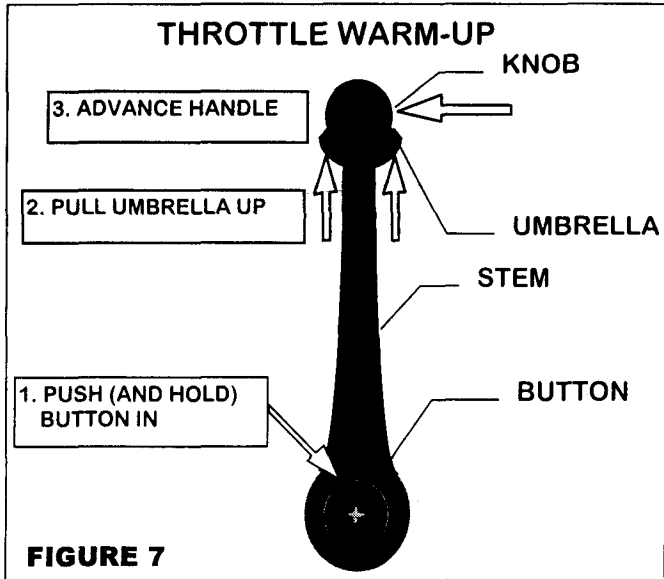


DRILL (8) 1/2" DIA. HOLES AS SHOWN AND DRAW LINES FROM THE OUTSIDE OF ONE DRILLED HOLE TO THE NEXT TO CREATE THE ABOVE PATTERN. THEN USE A JIGSAW TO CUT ALONG THE LINES.

## OPERATION OF CONTROL

### THROTTLE WARM-UP IN NEUTRAL POSITION

To start the boat's engine and to activate the throttle for engine warm-up, the handle must be in the neutral position. Neutral can be found by rotating the handle (by grasping the knob or stem) until the handle locks in position and can not be rotated in either direction. Usually the handle is vertical as shown in Figure 7 when in the neutral position.



Push in the button with your left hand while grasping the umbrella and knob with your right hand and pull the umbrella up towards the knob (see figure 7). While still holding the button and umbrella, advance the handle forward or rearward to put the control in warm-up throttle mode. Once in this mode, the button and umbrella can be released and throttle can be adjusted by simply moving the control handle away from the neutral position to increase throttle and towards the neutral position to decrease throttle. Returning the handle to the neutral position will disengage throttle warm-up.

### SHIFTING THE CONTROL

To shift the control into forward or reverse, pull the umbrella up towards the knob and advance the handle forward (for forward travel) or rearward (for reverse travel) until the handle settles into a detent at approximately 30° of travel (see figure 8). At this point, the control has engaged the gear and automatically entered the throttle mode where further advancement of the handle will increase the throttle. Once in the throttle mode, it is no longer necessary to pull on the umbrella. Increase or decrease throttle by simply moving the handle.

