HONDA MARINE

Intelligent Shift and Throttle (iST)

Owner's Manual

Table of Contents

This iST owner's manual is a supplement to the BF200A, BF225A, and BF250A marine outboard owner's manuals. Please refer to your outboard owner's manual for information specific to the maintenance and operation of your outboard.

A Few Words About Safety

Your safety and the safety of others are very important. And, using this outboard motor safely is an important responsibility.

To help you make informed decisions about safety, we have provided operating procedures and other information on labels and in this manual. This information alerts you to potential hazards that could hurt you or others.

Of course, it is not practical or possible to warn you about all the hazards associated with operating or maintaining an outboard motor. You must use your own good judgment.

You will find important safety information in a variety of forms, including:

Safety labels — on the outboard motor

Safety Messages — preceded by a safety alert symbol ⚠ and one of three signal words, DANGER, WARNING, or CAUTION.

These signal words mean

⚠ DANGER You WILL be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠ WARNING You CAN be KILLED or SERIOUSLY HURT if you don't follow instructions.

⚠ CAUTION You CAN be HURT if you don't follow instructions.

Safety Headings — such as IMPORTANT SAFETY INFORMATION.

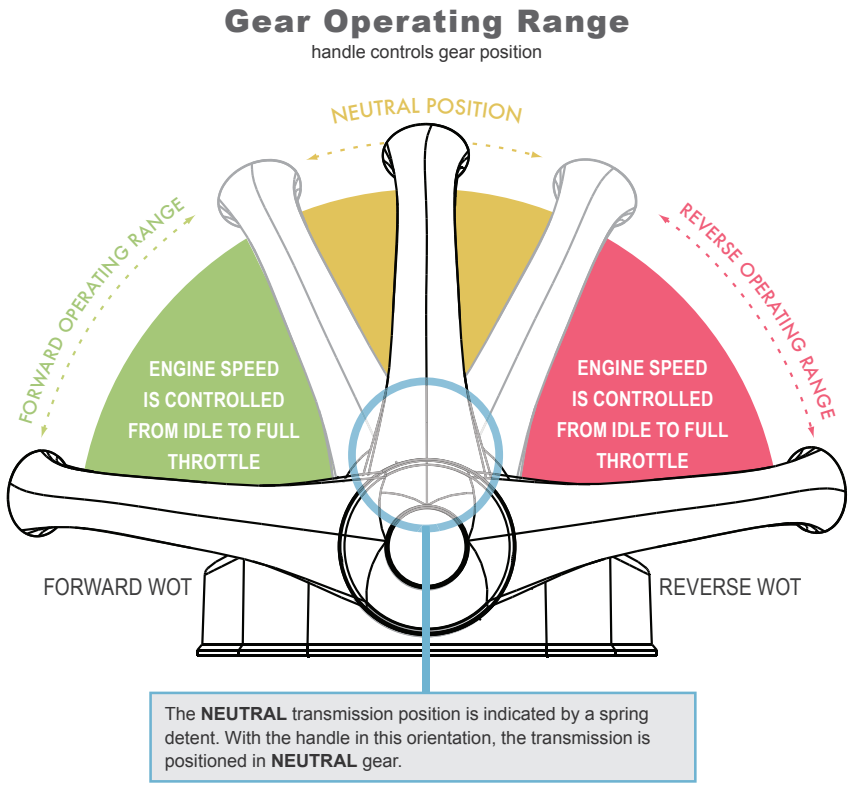
Safety Section — such as OUTBOARD MOTOR SAFETY.

Instruction — how to use this outboard motor correctly and safely.

This entire book is filled with important safety information—please read it carefully.

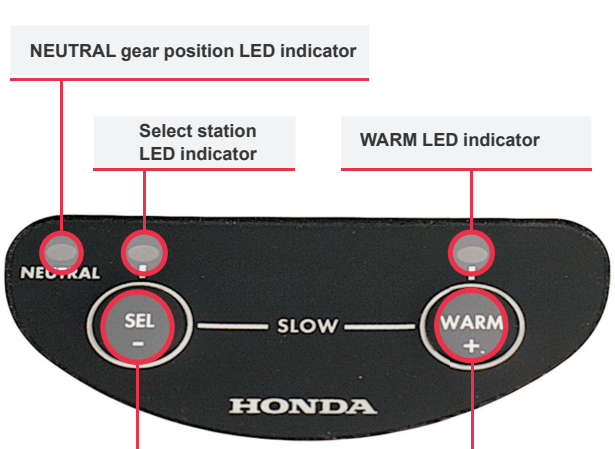
NOTICE: Your outboard motor or other property can be damaged if you don't follow instructions

Control Head Operation



Keypad Operation

Single Engine



Station SELECT button: used to transfer station control from one station to another (page 11).

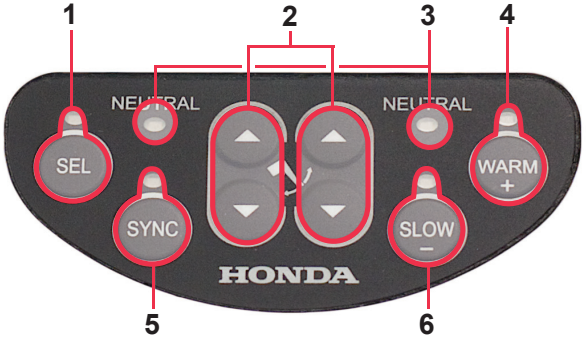
(-) Troll Control Down

WARM button: will activate **WARM** mode (page 6) when control handle is in **NEUTRAL**.

(+) Troll Control Up

Button light key: OFF ON BLINKING

Multi-Engine



1. **SELECT** Button and LED Indicator
2. **Engine Trim (Up/Down)**: buttons provide independent trim of Port or Starboard engines.
3. **NEUTRAL LED** Indicators
4. **WARM Button and LED Indicator:** locks gear in **NEUTRAL**; throttle only (page 6).

   (+) Troll Control Up
5. **SYNC Button and LED Indicator:** allows all engines to be controlled from one control handle (page 11).
6. **SLOW Button and LED Indicator** : used to transfer station control (page 11) and in conjunction with the **SLOW** button to change engine throttle response to approx. ½ normal range.

   (-) Troll Control Down

Oil Filter and Scheduled Maintenance

NOTE:

Only use required oil filter.

- iST-equipped engines require use of an oil filter with a maximum body diameter of 65 mm.
- Use oil filter part number **15400-PLM-A01** or equivalent.
- Use of a filter other than specified can lead to loss of oil and damage to the engine.

iST-related Scheduled Maintenance for BF200A and BF225A Marine Engines Only

Perform at every indicated month or operating hour interval, whichever comes first. ITEM	Action	Each use	After use	First month or 20 hours	Every 6 months or 100 hours	Every year or 200 hours	Every 2 years or 400 hours	Every 6 years or 1,200 hours
Cowling protective tape (1)	Check					O (2)		

(1) An abrasion resistant tape has been applied to the inside of the engine cowling. Check this tape for excessive wear every year or 200 hours.

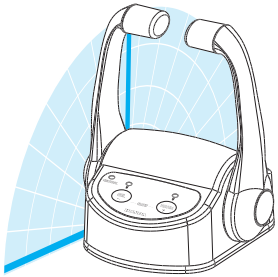
(2) This item should be serviced by your servicing dealer, unless you have the proper tools and are mechanically proficient.

System Startup

Explains the process of starting up the iST system

1 NEUTRAL Position

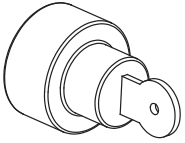
Control handles must be in the **NEUTRAL** position prior to starting the control system.



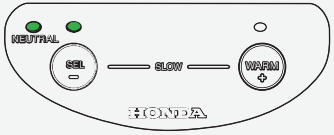
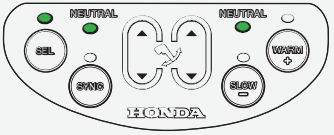
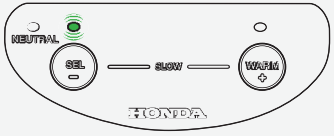
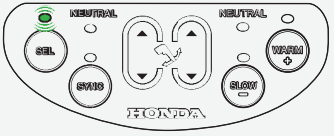
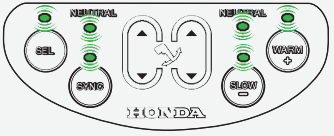
NEUTRAL control handle position; handles at vertical.

2 Turn System ON

Turn **ON** the system with the ignition keyswitch or enable switch. Do not move the handles for five seconds while the system runs diagnostics during start-up.



3 Check System Lights

	SINGLE ENGINE CONTROL	MULTI-ENGINE CONTROL
The system is on when the **NEUTRAL** indicator LED and **SEL** LED are fully illuminated.		
If the **SEL** LED blinks slowly, the control handles are ***not*** in **NEUTRAL**. Move the handles to **NEUTRAL** and the system will start.		
If all keypad LEDs blink simultaneously, system is in alarm mode. Shutdown system and proceed to Alarm Code Retrieval (page 15) before restarting.		

Trolling Control (Bump Mode)

Change engine speed in small increments while cruising

1 Increase or Decrease Throttle Settings

During normal cruise mode you can ‘bump’ engine throttle settings in small increments while handles are in gear above idle.

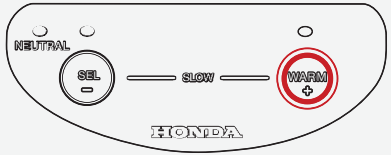
Increase Engine Speed

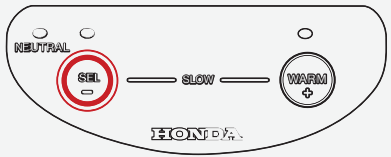
Press and release **WARM** (**+**) to increase engine speed.
There will be no LED indication when the **WARM** (**+**) button is pressed.

Decrease Engine Speed

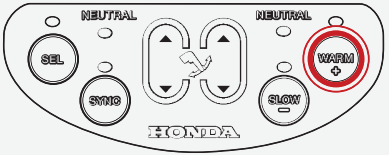
Press and release **SEL** (-) (2-button keypads) or **SLOW** (-) (8-button keypads) to decrease engine speed.
There will be no LED indication when the **SEL** (-) (2-button keypads) or **SLOW** (-) button (8-button keypads) is pressed.

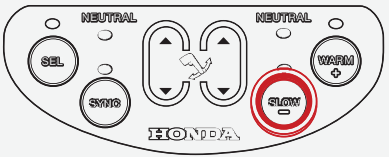
SINGLE ENGINE CONTROL





MULTI-ENGINE CONTROL





WARM Mode

Locks gearshift in neutral while allowing throttle operation

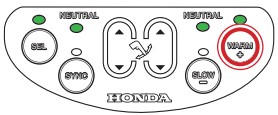
1 Enter WARM Mode

To enter warm mode, the control handles must be in **NEUTRAL**. Press and release the **WARM** button one time.

NOTE:

It is strongly recommended that the system be placed in **WARM** mode at all times when the boat is docked.

When control handles are in the **NEUTRAL** position, press **WARM** once.

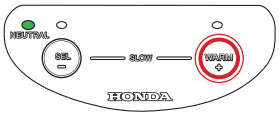


The **NEUTRAL** gear indicators should be illuminated before pressing the **WARM** button.

2 Exit WARM Mode

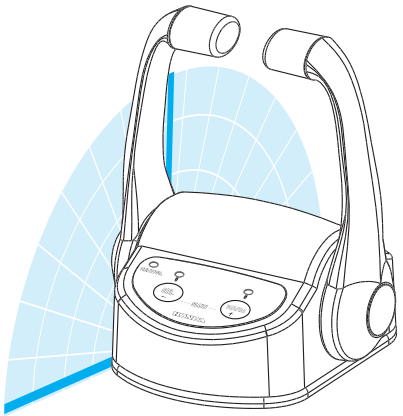
To exit **WARM** mode and regain gear operation, bring handles back to **NEUTRAL** and press and release the **WARM** button one time.

When control handles are in the **NEUTRAL** position and you press the **WARM** button once, the **WARM** indicator should not be illuminated.



NOTE:

Control handles must be in the **NEUTRAL** position before entering or exiting **WARM** mode.



throttle only, no shift

SLOW Mode

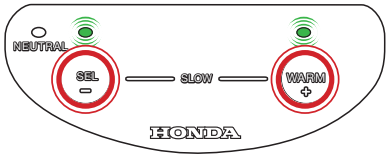
Throttle operation will result in approximately half of normal throttle output

1 Enter SLOW Mode

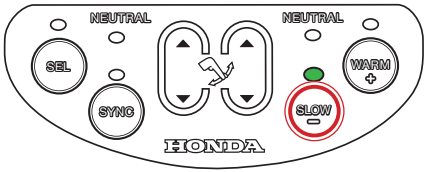
To engage control handles, you must be in **NEUTRAL**.

SLOW mode can only be engaged or disengaged when the control handles are in **NEUTRAL**.

On single-engine boats, press the **SEL** and **WARM** buttons simultaneously to enter **SLOW** mode. **SEL** and **WARM** LEDs will blink when the iST system is in **SLOW** mode.



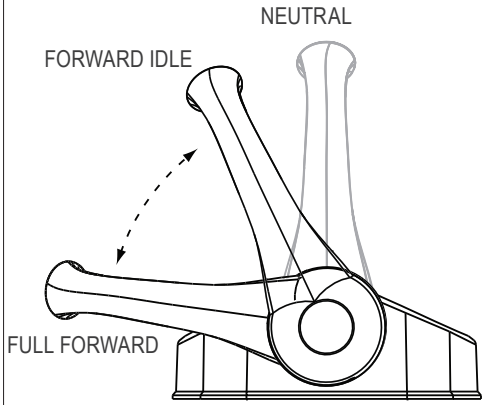
On multi-engine boats, press the **SLOW** button to enter **SLOW** mode. The **SLOW** LED will illuminate to indicate the system is in **SLOW** mode.



2 Using SLOW Mode

Once engaged, advancing the control lever into engine throttle operating range will only result in approximately half of normal throttle output.

Engine throttle operating range



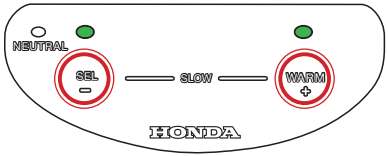
When **SEL** and **WARM** LEDs are blinking, response to control handle movement will result in half of normal output.

SLOW Mode (cont.)

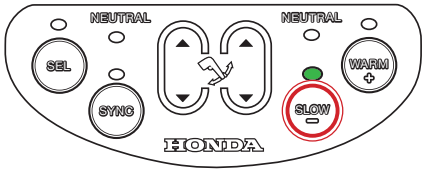
3 Exit SLOW Mode

To disengage **SLOW** mode, you must be in **NEUTRAL**. Proceed as follows:

On single-engine boats, press **SEL** and **WARM** to exit **SLOW** mode.



On multi-engine boats, press the **SLOW** button to exit **SLOW** mode.



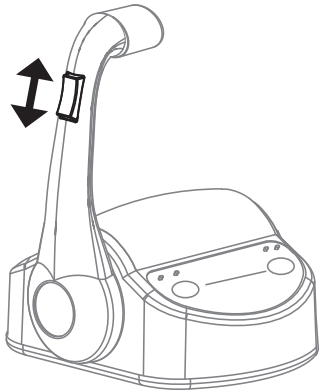
Trim Control

Allows the boat operator to control the trim/tilt of the engine drive unit from the control handle or keypad

1 Control All Engines Simultaneously

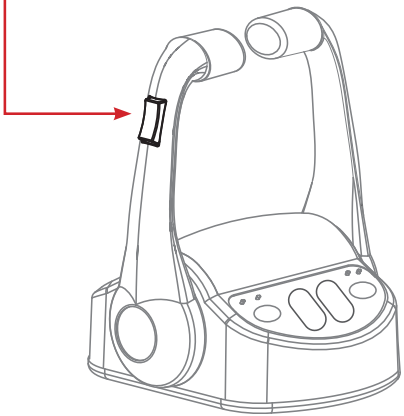
NOTE:
System must be **ON** for trim on control handle to work.

Control handles may be in any position to operate trim control.
Toggle **UP** to trim outboard in an upward position.
Toggle **DOWN** to trim outboard in a downward position.



Used for single engine boats

To control all engine trim simultaneously, press and release trim toggle switch located on the port control handle.

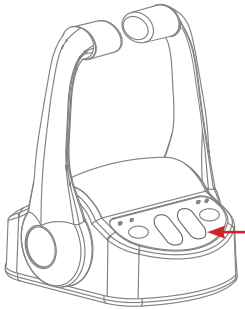


Used for multi-engine boats

2 Control Port and Starboard Separately

Individual trim for three or four engines is done on an auxiliary panel.

With each press and release of the trim buttons, the engine drive units will respond incrementally. For large movements of the engine drive unit, buttons will need to be pressed and held until desired position is reached.



To control port and starboard trim/tilt separately, press and release port or starboard trim button located on the center of the keypad.

SYNC Mode

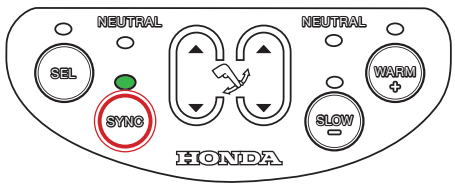
iST system will automatically control the slave engine speed to exactly match the lead engine speed

1 Enter SYNC Mode

To engage, handles should be in or above idle — press and release the sync button one time (**SYNC** LED will illuminate).

SYNC mode can only be used when both engines are in the forward gear and handles are approximately the same position — within 10% of total travel.

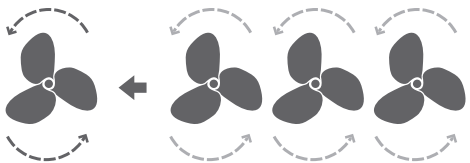
SYNC LED will be **ON** when in **SYNC** mode.



2 Using SYNC Mode

When **SYNC** function is activated, the boat operator controls all engines from the port engine control lever. The system will automatically control the other engines to match the speed of the port engine.

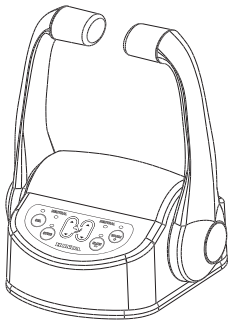
Starboard handle is inactive.



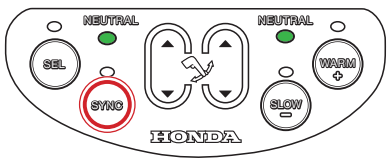
PORT ENGINE

3 Exiting SYNC Mode

To disengage, match the position of both engine control handles and press and release the **SYNC** button one time.



The **SYNC** mode will be automatically disengaged.



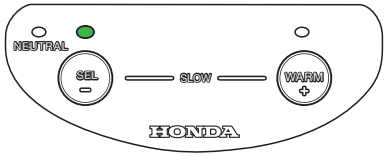
The **SYNC** LED is **OFF** when **SYNC** mode is disengaged. The system is now in cruise mode.

Station Transfer

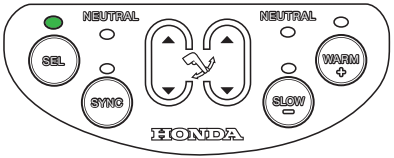
Allows the propulsion system to be transferred from one helm control station to the other

1 Determine Active Station

If the **SEL** LED is fully illuminated (not blinking), station is ‘active’ and in control of the engine’s gear and throttle (**NEUTRAL** lights will only be **ON** if gear is in **NEUTRAL** position).



SINGLE ENGINE

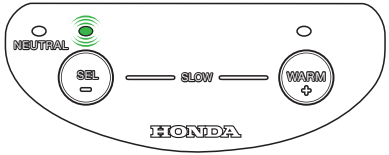


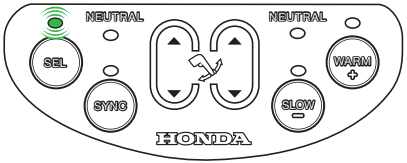
MULTI-ENGINE

2 Determine Inactive Station

Prior to pressing the **SEL** button at the station where you wish to take control, the **SEL** LED and appropriate gear light will blink once every two seconds (inactive station heartbeat).

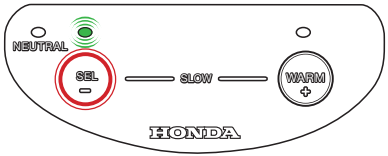
SEL LED and appropriate gear lights will blink one time every two seconds.



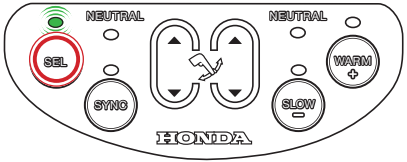


3 Begin station transfer at the helm station where you wish to take control

Press and release the **SEL** button one time at the helm station where you want to take control (the **SEL** LED will begin to blink).



The **SEL** LED and appropriate gear lights will blink when the **SEL** button is pressed at the inactive station.



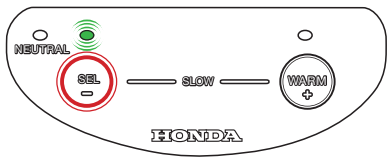
Station Transfer (cont.)

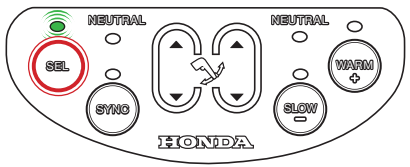
Allows the propulsion system to be transferred from one helm control station to the other

4 Determine Appropriate Handle Position

After you press and release the **SEL** button once, the **SEL** LED and appropriate gear lights will blink—blink rate will depend on control handle setting at the station taking control.

- **Slow blink**: handles not in appropriate position.
- **Quick blink**: handles are in the appropriate position; proceed to step six.



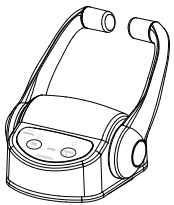


5 Prepare the Station Handles

Control handles must be in the appropriate handle position at the station taking control in order for transfer to be completed (see chart below). When handles are in appropriate handle position for transfer, the **SEL** LED will begin to blink quickly.

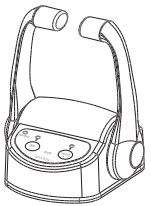
Control handles at the active station can be in any position prior to transferring control to another station.	Control handles at 'station taking control' ***must*** be in the appropriate position to accept the transfer of control.

The following positions are acceptable for transferring station control:



ACTIVE STATION

- In **NEUTRAL**
- In gear / idle
- In gear / with speed



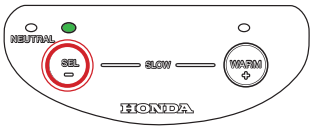
DESIRED STATION

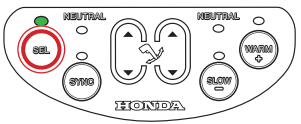
- In **NEUTRAL** / idle
- In same gear
- Same or slower speed setting

6 Use the Desired Station

Press and release the **SEL** button a second time at the station where you want to take control. The new control station is now the active station and has control of the engine and transmission.

The **SEL** LED and appropriate gear lights will be fully on (not blinking) after **SEL** button is pressed for the second time to indicate this station is in control.





NOTE:

You can always take control when the inactive handle is at the **NEUTRAL** position, no matter where the active handle is located.

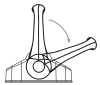
Configuration Mode

Allows you to set speed increments, define the startup mode, and reset to factory settings

Enter Configuration Mode

1
- Turn System Power **OFF**
- All engines must be turned **OFF**

2
- Move control station handles to full throttle position



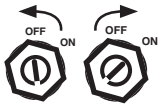
3
- Turn System Power **ON**
- Only turn the ignition switch of one engine to the **ON** position

4
- Press and release **SLOW** (2-button keypads) or **WARM** button (8-button keypads) three times

- All LEDs begin blinking
- This is the Configuration Mode Main Menu

5
- Make desired changes following the menu and selection instructions to the right

6
- After configuration changes are made, turn the ignition switch **OFF** and then **ON** again to restart the control system.



Choose Menu and Select

1 Cycle through menu options

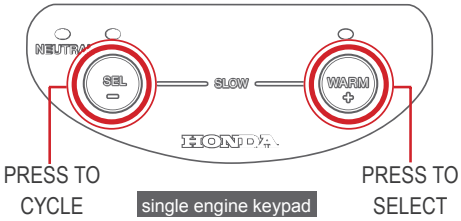
Press and release the **SEL** (2-button keypads) or **SYNC** button (8-button keypads) to cycle through menus.

Menu options will be shown by the number of times the **SEL** (2-button keypads) or **SYNC** LED (8-button keypads) blinks. Refer to the chart on page 14 to see which menu each LED combination indicates.

2 Select desired menu

Press and release the **WARM** (2-button keypads) or **SLOW** button (8-button keypads) to enter into the selected menu.

The menu selection will remain blinking on the **SEL** (2-button keypads) or **SYNC** LED (8-button keypads) followed by the current configuration setting, indicated by the **WARM** (2-button keypads) or **SLOW** LED (8-button keypads).



single engine keypad

Choose Option and Select

1 Cycle through available settings for selected menu

Press and release the **SEL** (2-button keypads) or **SYNC** button (8-button keypads) to cycle through menus.

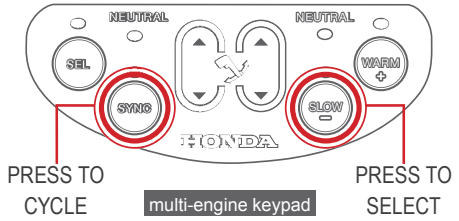
The **WARM** (2-button keypads) or **SLOW** LED (8-button keypads) will blink the appropriate number of times to indicate the new selection for that menu item. Refer to page 14 for the list of menu settings.

2 Store the desired setting for the selected menu item

Press and release the **WARM** (2-button keypads) or **SLOW** button (8-button keypads) to store the selected setting.

The system will automatically return to the Main Configuration Menu with all the LEDs blinking.

3 After configuration changes are made, turn the ignition switch **OFF** and then **ON** again to restart the control system.



multi-engine keypad

Configuration Mode (cont.)

Speed Increment ('Throttle Bump') Size Configuration — Menu 4

Option Number	Speed Increment Step Size
1	0.5%
2 (default)	1.0%
3	1.5%
4	2.0%
5	2.5%
6	3.0%
7	3.5%
8	4.0%

Startup Mode Configuration — Menu 5

Option Number	Startup Mode
1 (default)	Normal Run Mode
2	Start in Warm Mode

Reset Factory Defaults — Menu 7

Option Number	Startup Mode
1 (default)	Selection resets to factory default settings

These are the only Configuration Menus that are available for end user adjustment.

To reset Factory Defaults, select Configuration Menu 7. There are no options with this Menu—when it is selected, all options are set to their default settings.

Troubleshooting and Alarm Codes

If at any time the system is unresponsive, return all handles to the **NEUTRAL** position and restart the system. Additionally, if it is necessary to restart an engine, for any reason, all handles need to be in the **NEUTRAL** position.

Activate Alarm Code Retrieval

1

- Turn System Power **OFF**
- All engines must be turned **OFF**

2

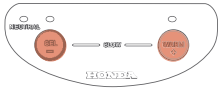
- Move control station handles to full throttle position

3

- Turn the ignition switch of one engine to the **ON** position.

4

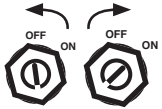
- Press and release code buttons three times
- Single engine keypad – press and release **SEL** and **WARM** buttons together, 3 times



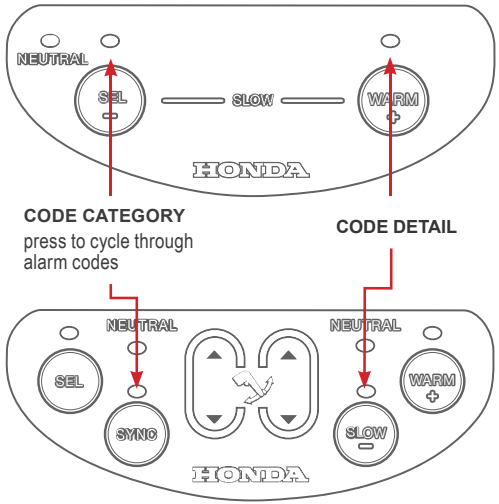
- Multi-engine keypad – press and release **SYNC** and **SLOW** buttons together, 3 times

5

- After alarm codes have been retrieved, turn the ignition switch **OFF** and then **ON** again to restart the control system.



Display Alarm Code Statistics



Retrieve Alarm Codes

1

After activating Alarm Code retrieval, the most recent alarm code will be blinking on the control head LEDs:

- '**Code category**' is indicated by the number of blinks on the left LED. This will indicate the type of alarm code that has occurred.
- '**Code detail**' is indicated by the number of blinks on the right LED. This will indicate the specific component which is causing the alarm code.

2

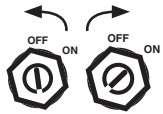
- Single engine keypad – 'Code Category' is blinking on the **SEL** LED while 'Code Detail' is blinking on the **WARM** LED.
- Multi-engine keypad – 'Code Category' is blinking on the **SYNC** LED while 'Code Detail' is blinking on the **SLOW** LED.

3

- Press and release the **SEL** (2-button keypads) or **SYNC** button (8-button keypads) to advance through other alarm codes in memory.
- The most recent 16 alarm codes are stored in system memory.

4

- After alarm codes have been retrieved, turn the ignition switch **OFF** and then **ON** again to restart the control system.



Alarm Codes

Code Category 1 — Actuator Communication Alarm Control Head lost communication with the ECU on engine indicated in Code Detail	
Possible faults	Engine control unit failure, communi-cation cable failure, control head failure
Code Detail 1	Port Engine
Code Detail 2	Stbd Engine
Code Detail 3	Port (Inboard) engine
Code Detail 4	Stbd (Inboard) engine

Code Category 2 / 3 / 4 / 5 / 6 — Control Head handle sensor fault	
Possible faults	Internal failure in control head – control head replacement required
Code Detail 1	Port Engine control handle
Code Detail 2	Stbd Engine control handle
Code Detail 3	Port Engine control handle
Code Detail 4	Stbd Engine control handle

Code Category 9 – Low Battery Warning	
Possible faults	Battery voltage too low – alternator failure, battery connections are poor
Code Detail 1	Port Engine
Code Detail 2	Stbd Engine
Code Detail 3	Port (Inboard) engine
Code Detail 4	Stbd (Inboard) engine

Code Category 11 – Throttle actuator position alarm Throttle actuator is not responding correctly to ECU command	
Possible faults	Throttle Actuator failure, throttle cable adjustment error
Code Detail 1	Port Engine
Code Detail 2	Stbd Engine
Code Detail 3	Port (Inboard) engine
Code Detail 4	Stbd (Inboard) engine

Code Category 12 – Gear actuator position alarm Gear actuator is not responding correctly to ECU command	
Possible faults	Gear Actuator failure, 'dry shifting' (shifting without engine running)
Code Detail 1	Port Engine
Code Detail 2	Stbd Engine
Code Detail 3	Port (Inboard) engine
Code Detail 4	Stbd (Inboard) engine

Code Category 13 – Throttle actuator feedback alarm Throttle actuator feedback sensor is out of range	
Possible faults	Throttle actuator feedback sensor failure, ECU failure, wire harness between ECU and throttle actuator error
Code Detail 1	Port Engine
Code Detail 2	Stbd Engine
Code Detail 3	Port (Inboard) engine
Code Detail 4	Stbd (Inboard) engine

Code Category 14 — Gear actuator feedback alarm Gear actuator feedback sensor is out of range	
Possible faults	Gear actuator feedback sensor failure, ECU failure, wire harness between ECU and throttle actuator error
Code Detail 1	Port Engine
Code Detail 2	Stbd Engine
Code Detail 3	Port (Inboard) engine
Code Detail 4	Stbd (Inboard) engine

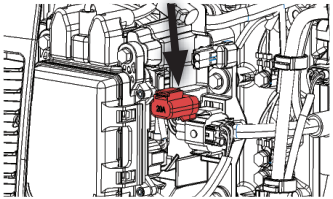
Code Category 15 — Loss of tach signal	
Possible faults	ECU failure, tach connector failure, sensor failure on engine
Code Detail 1	Port Engine
Code Detail 2	Stbd Engine
Code Detail 3	Port (Inboard) engine
Code Detail 4	Stbd (Inboard) engine

Emergency Return to Port Capability

In the event of complete iST system malfunction, the engine can be manually shifted and the throttle manually operated to provide emergency 'Return to Port' capability. This procedure should only be used when no other options for safe return are available. Great care should be taken to ensure operator and passenger safety when performing this operation.

To access the shift and throttle actuators, it is necessary to remove the engine upper cowling. The iST system must be completely disabled prior to performing any of the following steps. **To disable the iST system, turn the engine OFF and remove the fuse from the iST power harness located to the port side of the engine fuse box (see diagram below).**

REMOVE FUSE



Operate the shift actuator manually using the following procedure.

Use a flat-head screwdriver (supplied in engine tool kit) to turn the screw located in the starboard side end cap of the shift actuator (see diagram to the right).

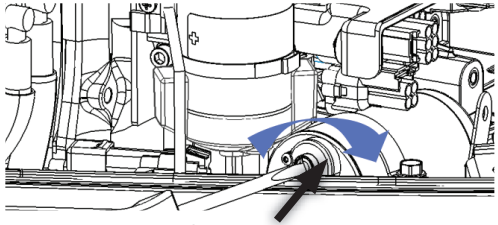
To shift into **NEUTRAL**: Turn the shift actuator clockwise until it stops and then approximately 7 turns counterclockwise.

The engine must be started while in **NEUTRAL** before proceeding to the following steps.

To shift into **FORWARD** from **NEUTRAL**: Turn the shift actuator clockwise until it stops (approximately 7 turns).

To shift into **REVERSE** from **NEUTRAL**: Turn the shift actuator counterclockwise until it stops (approximately 7 turns).

With the engine running and in gear, the throttle can be controlled by manually moving the cam on the throttle body located on the top port side of the engine (see diagram to the right). Care should be taken not to use excessive throttle when performing this emergency procedure. When in this operating mode, maneuvering, transmission, and throttle response will be adversely affected; great care should be taken to ensure sufficient maneuvering room to avoid injuring yourself or others, your vessel, or other vessels nearby when performing this operation.



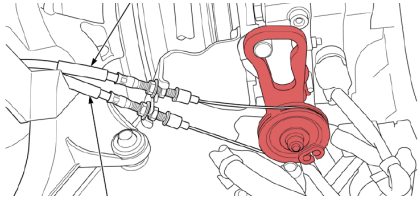
SHIFT ACTUATOR

⚠ WARNING

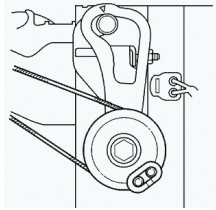
Sudden throttle application could result in a person falling overboard. A person falling overboard could be injured by the propeller or vessel hull.

Warn all occupants before manually engaging the shift actuator or throttle, and then gently apply throttle.

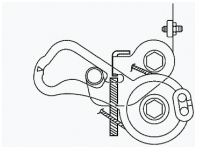
The boat should be taken to an authorized Honda Marine dealer to have the reason for the failure diagnosed and the engine repaired.



to increase speed



IDLE POSITION



FULL-THROTTLE POSITION

NOTE:

This procedure should only be used when no other means of safe return are available!

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