Intelligent Shift and Throttle (iST)

Owner's Manual

© 2017 American Honda Motor Co., Inc.—All rights reserved
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

**Gear Operating Range**
handle controls gear position

FORWARD OPERATING RANGE
REVERSE OPERATING RANGE
NEUTRAL POSITION

ENGINE SPEED IS CONTROLLED FROM IDLE TO FULL THROTTLE

The NEUTRAL transmission position is indicated by a spring detent. With the handle in this orientation, the transmission is positioned in NEUTRAL gear.
Keypad Operation

Single Engine

- **NEUTRAL gear position LED indicator**
- **Select station LED indicator**
- **WARM LED indicator**

- **Station SELECT button**: used to transfer station control from one station to another (page 11).
- **(-) Troll Control Down**
- **(+): Troll Control Up**

Multi-Engine

- **SELECT Button and LED Indicator**
- **Engine Trim (Up/Down) buttons**: provide independent trim of Port or Starboard engines.
- **NEUTRAL LED Indicators**
- **WARM Button and LED Indicator**: locks gear in NEUTRAL; throttle only (page 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.
- **SYNC Button and LED Indicator**: allows all engines to be controlled from one control handle (page 11).
- **(-) 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

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Action</th>
<th>Each use</th>
<th>After use</th>
<th>First month or 20 hours</th>
<th>Every 6 months or 100 hours</th>
<th>Every year or 200 hours</th>
<th>Every 2 years or 400 hours</th>
<th>Every 6 years or 1,200 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cowling protective tape (1)</td>
<td>Check</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(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.

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**
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.
**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.

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.

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

Used for single engine boats

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

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.

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.

IST system will automatically control the slave engine speed to exactly match the lead engine speed.
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).

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.)

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.

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.

<table>
<thead>
<tr>
<th>ACTIVE STATION</th>
<th>DESIRED STATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>- In NEUTRAL</td>
<td>- In NEUTRAL / idle</td>
</tr>
<tr>
<td>- In gear / idle</td>
<td>- In same gear</td>
</tr>
<tr>
<td>- In gear / with speed</td>
<td>- Same or slower speed setting</td>
</tr>
</tbody>
</table>

The following positions are acceptable for transferring station control:
Configuration Mode

Enter Configuration Mode

1. Turn System Power OFF
2. Move control station handles to full throttle position
3. Turn System Power ON
4. Press and release SLOW (2-button keypads) or WARM button (8-button keypads) three times
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).

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.
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.

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

<table>
<thead>
<tr>
<th>Option Number</th>
<th>Speed Increment Step Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>2 (default)</td>
<td>1.0%</td>
</tr>
<tr>
<td>3</td>
<td>1.5%</td>
</tr>
<tr>
<td>4</td>
<td>2.0%</td>
</tr>
<tr>
<td>5</td>
<td>2.5%</td>
</tr>
<tr>
<td>6</td>
<td>3.0%</td>
</tr>
<tr>
<td>7</td>
<td>3.5%</td>
</tr>
<tr>
<td>8</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

### Startup Mode Configuration — Menu 5

<table>
<thead>
<tr>
<th>Option Number</th>
<th>Startup Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (default)</td>
<td>Normal Run Mode</td>
</tr>
<tr>
<td>2</td>
<td>Start in Warm Mode</td>
</tr>
</tbody>
</table>

### Reset Factory Defaults — Menu 7

<table>
<thead>
<tr>
<th>Option Number</th>
<th>Startup Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (default)</td>
<td>Selection resets to factory default settings</td>
</tr>
</tbody>
</table>
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
2. All engines must be turned OFF
3. Move control station handles to full throttle position
4. Turn the ignition switch of one engine to the ON position.
5. 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
6. After alarm codes have been retrieved, turn the ignition switch OFF and then ON again to restart the control system.

**Display Alarm Code Statistics**

- CODE CATEGORY press to cycle through alarm codes
- CODE DETAIL

**Retrieve Alarm Codes**

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

1. ‘Code category’ is indicated by the number of blinks on the left LED. This will indicate the type of alarm code that has occurred.
2. ‘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.
3. Single engine keypad – ‘Code Category’ is blinking on the SEL LED while ‘Code Detail’ is blinking on the WARM LED.
4. Multi-engine keypad – ‘Code Category’ is blinking on the SYNC LED while ‘Code Detail’ is blinking on the SLOW LED.
5. Press and release the SEL (2-button keypads) or SYNC button (8-button keypads) to advance through other alarm codes in memory.
6. The most recent 16 alarm codes are stored in system memory.
7. After alarm codes have been retrieved, turn the ignition switch OFF and then ON again to restart the control system.
## Alarm Codes

<table>
<thead>
<tr>
<th>Code Category 1 — Actuator Communication Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Head lost communication with the ECU on engine indicated in Code Detail</td>
</tr>
</tbody>
</table>

**Possible faults**
- Engine control unit failure, communication 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 |

<table>
<thead>
<tr>
<th>Code Category 2 / 3 / 4 / 5 / 6 — Control Head handle sensor fault</th>
</tr>
</thead>
</table>

**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 |

<table>
<thead>
<tr>
<th>Code Category 9 — Low Battery Warning</th>
</tr>
</thead>
</table>

**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 |

<table>
<thead>
<tr>
<th>Code Category 11 — Throttle actuator position alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttle actuator is not responding correctly to ECU command</td>
</tr>
</tbody>
</table>

**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 |

<table>
<thead>
<tr>
<th>Code Category 12 — Gear actuator position alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear actuator is not responding correctly to ECU command</td>
</tr>
</tbody>
</table>

**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 |

<table>
<thead>
<tr>
<th>Code Category 13 — Throttle actuator feedback alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttle actuator feedback sensor is out of range</td>
</tr>
</tbody>
</table>

**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 |

<table>
<thead>
<tr>
<th>Code Category 14 — Gear actuator feedback alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear actuator feedback sensor is out of range</td>
</tr>
</tbody>
</table>

**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 |

<table>
<thead>
<tr>
<th>Code Category 15 — Loss of tach signal</th>
</tr>
</thead>
</table>

**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).

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 (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.

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

**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.

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