

# ACTIVE TRIM FOR MULTIFUNCTION DISPLAY (MFD)

**IMPORTANT:** This document guides our dealers, boatbuilders, and company service personnel in the proper installation or service of our products. If you have not been trained in the recommended servicing or installation procedures for these or similar Mercury Marine products, have the work performed by an authorized Mercury Marine dealer technician. Improper installation or servicing of the Mercury product could result in damage to the product or personal injury to those installing or operating the product. Always refer to the appropriate Mercury Marine service manual for component removal and installation instructions.

**NOTE:** After completing installation, place these instructions with the product for the owner's future use.

**NOTE:** Follow the instructions provided in the digital trim sender kit to install this component on outboard models that are not equipped with digital trim.

**NOTE:** Outboard models equipped with analog gauges must have a digital to analog converter installed when using a digital trim sender on the engine.

## Electrical Safety Requirements

### WARNING

This unit has not been assessed as a safety component and is not to be relied upon as a safety device.

## Specifications

**IMPORTANT:** Always refer to the Operation and Maintenance manual included with each engine for fuse holder location, fuse rating, and electrical system overload protection.

This equipment is only intended for connection to 9–16 VDC, low voltage, electrical systems of boats or similar marine vessels. Do not connect this equipment to any circuit rated in excess of 16 VAC (RMS), 22.6 VPK, or 35 VDC, and only connect to boat electrical systems powered by batteries or alternators or otherwise only to circuits separated from main voltages by at least double or reinforced insulation.

This product must not be installed in a manner inconsistent with the recommended procedures set forth in the installation instructions included herein. Improper removal or installation of the product can cause injury or damage to the vessel or engine components.

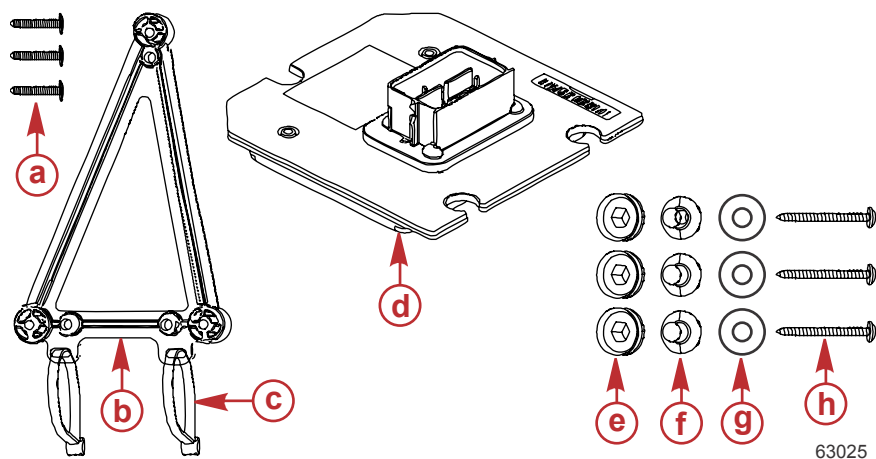
## Battery Installation

Always refer to the installation manual included with each engine for battery specifications and battery installation procedures.

Electrical rating	9–16 VDC	
Maximum fuse size	Mechanical: 15 A	DTS: 5 A
Maximum rate input current	300 mA	
IP rating	IP4X	

Environmental conditions	Altitude	< 3000 m (9842 ft)
	Operating temperature	–20–60 °C (–4–140 °F)
	Overvoltage	Category 1
	For use in pollution degree 4 (outdoor use)	
IP rating	IP4X	

## Components Contained in Kit



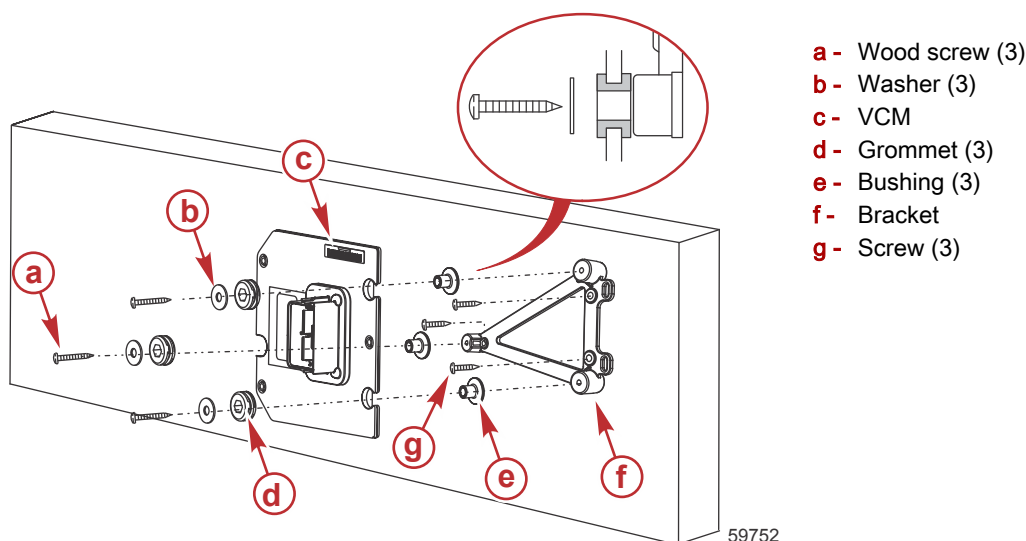
Ref.	Qty.	Description
a	3	Screw
b	1	Bracket
c	2	Cable tie
d	1	Vessel control module (VCM)
e	3	Grommet
f	3	Bushing
g	3	Washer
h	3	Wood screw, #10-16 x 1.750
–	1	Active Trim harness (see <b>IMPORTANT</b> statement, following) – or – DTS Active Trim harness
–	1 or 2	Digital trim sender kit (75/90/115 FourStroke engines, only)
–	1 or 2	Digital to analog converter and instruction sheet (75/90/115 FourStroke engines, only)

**IMPORTANT:** The Active Trim harness for non-DTS applications is different between Outboard and MerCruiser applications, and between single and dual-engine applications. Confirm that you have the correct harness for your application prior to beginning the installation.

## Vessel Control Module (VCM) Installation

1. Insert a rubber grommet into the three spaces provided on the VCM.
2. Insert a bushing into each rubber grommet.
3. Mount the VCM bracket in a dry and accessible location using three screws.
4. Use wood screws to mount the VCM to the bracket at the selected location. (At the helm, near the junction box is recommended.)

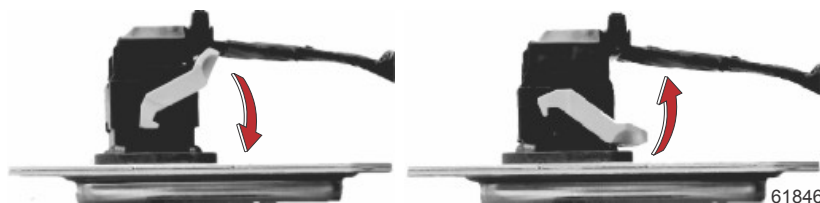
5. Predrilling pilot holes for the screws is recommended.



## Harness Connections

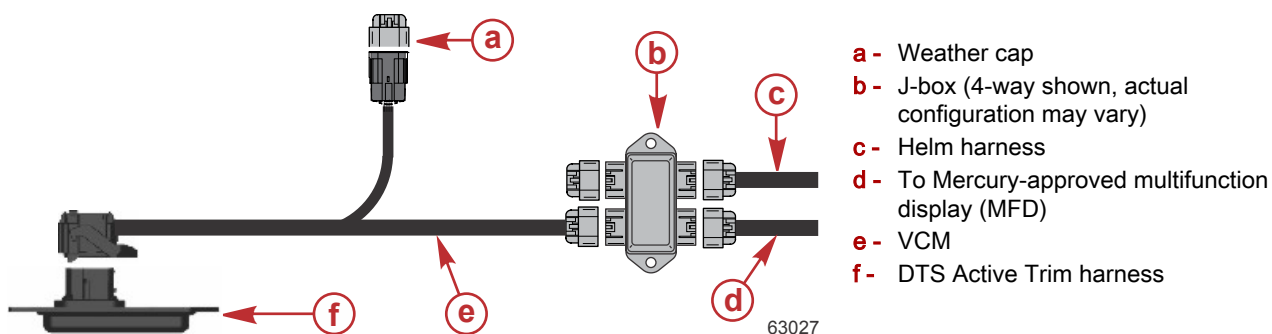
### VCM Connection (All Models)

Exercise care when connecting the vessel control module (VCM) to the Active Trim harness. Carefully insert the harness connector into the module socket, and push down on the connector lock to fully engage the connector.



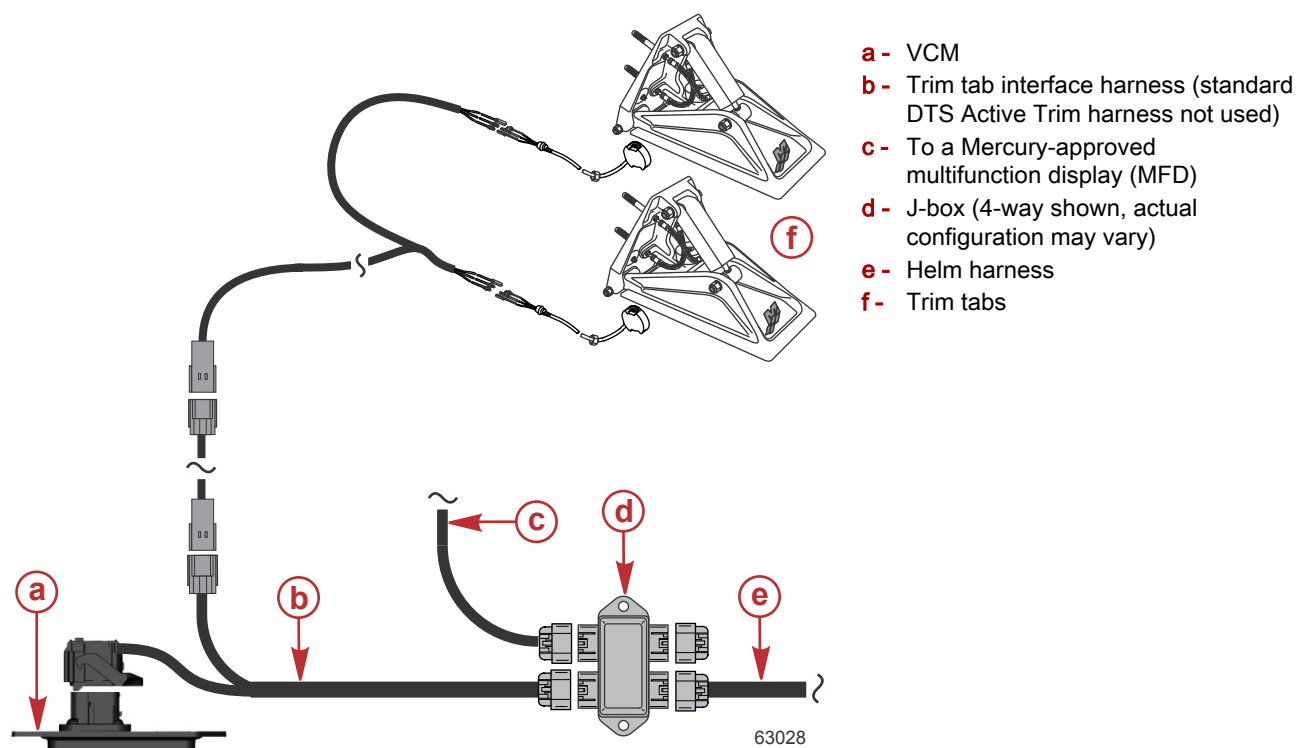
VCM connector; press down to lock, pull up to unlock

### All Digital Throttle and Shift (DTS) Applications (Except Tabs)



1. Verify the command control module (CCM) software is compatible with the Active Trim system.
  - a. For DTS, the CCM software must be version 80 or higher.
  - b. For joystick piloting systems, the CCM software must be CCM13 or newer.
2. Verify that a Mercury-approved multifunction display is properly connected to the DTS control system.
3. Ensure that the VCM has been installed as previously outlined.
4. Connect the DTS Active Trim harness to the VCM. Refer to **VCM Connection (All Models)**.
5. Remove the weather cap from an unused connector on the helm harness J-box, and connect the DTS Active Trim harness 10-pin connector.

## Active Trim with Trim Tab Interface Kit



**IMPORTANT:** The Active Trim system will not control the trim tabs. The VCM reads the tab sensor position and transmits it on CAN P for use with SmartCraft gauges.

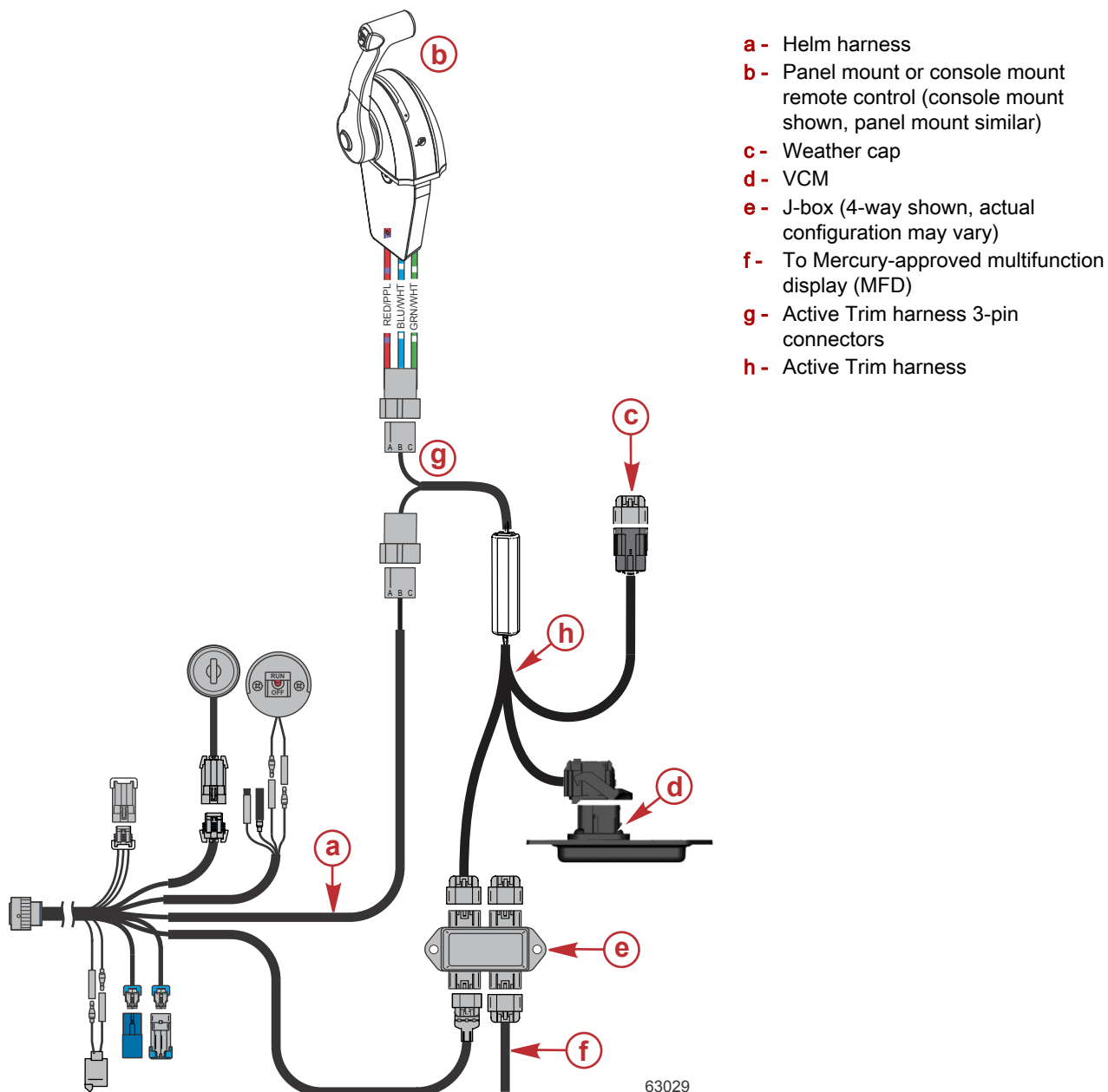
1. Verify that a Mercury-approved MFD has been properly connected to the DTS control system.
2. Ensure that the VCM has been installed as previously outlined.
3. Connect the trim tab interface harness to the VCM.
4. Ensure that the trim tab interface harness is connected to the J-box.

## Wire Color Code Abbreviations

Wire Color Abbreviations				
BLK	Black		BLU	Blue
BRN	Brown		GRY or GRA	Gray
GRN	Green		ORN or ORG	Orange
PNK	Pink		PPL or PUR	Purple
RED	Red		TAN	Tan
WHT	White		YEL	Yellow
LT or LIT	Light		DK or DRK	Dark

## Outboard Non-DTS Applications

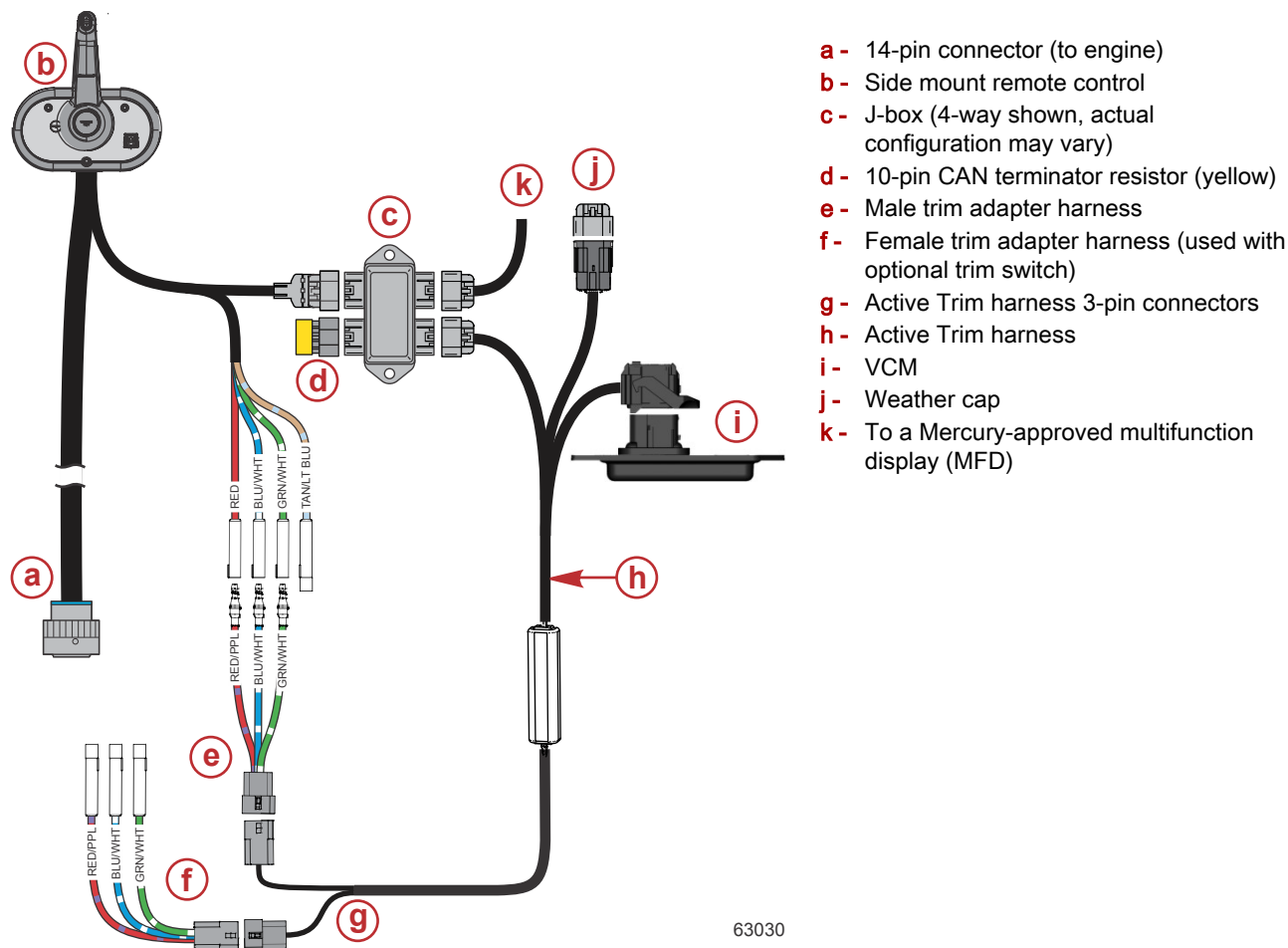
### Outboard Single Engine Non-DTS Applications, Panel or Console Control



**IMPORTANT:** The Active Trim harness for non-DTS applications is different between Outboard and MerCruiser applications, and between single and dual-engine applications. Confirm that you have the correct harness for single-engine outboard applications prior to beginning the installation.

1. Verify that a Mercury-approved MFD has been properly installed.
2. For 75/90/115 engines, install the digital to analog (D/A) converter and digital trim sender kit. Instructions are supplied with the D/A converter.
3. Ensure that the VCM has been installed as previously outlined.
4. Connect the Active Trim harness to the VCM. Refer to **VCM Connection (All Models)**.
5. Remove the weather cap from an unused connector on the helm harness J-box, and connect the Active Trim harness 10-pin connector.
6. For existing installations, disconnect the helm harness trim connector or connectors from the remote control.
7. Connect the Active Trim harness to the 3-pin trim connector on the helm harness.
8. Connect the Active Trim harness to the remote control 3-pin trim harness connector.

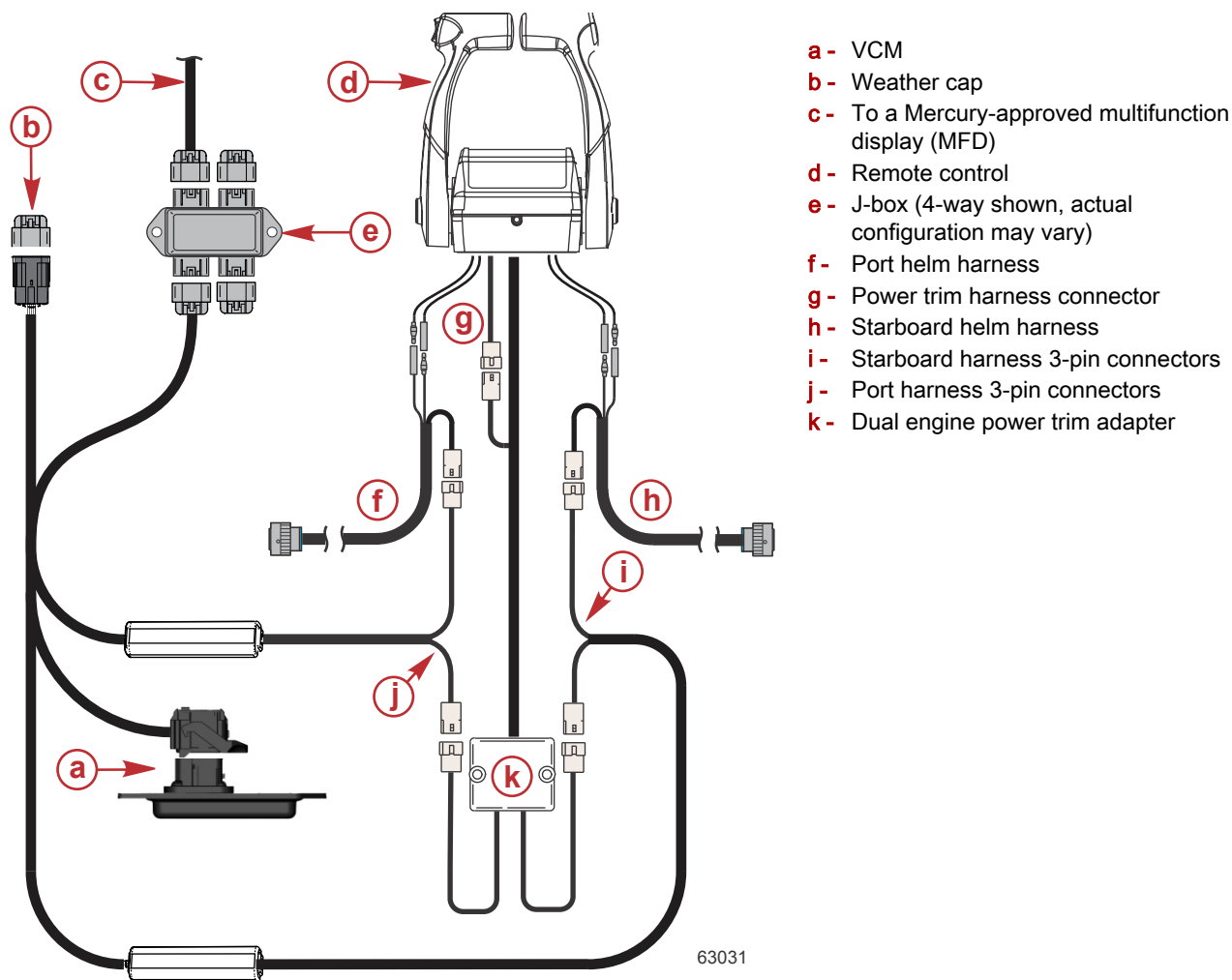
## Outboard Single Engine Non-DTS Applications, Side Mount Control



- a - 14-pin connector (to engine)
- b - Side mount remote control
- c - J-box (4-way shown, actual configuration may vary)
- d - 10-pin CAN terminator resistor (yellow)
- e - Male trim adapter harness
- f - Female trim adapter harness (used with optional trim switch)
- g - Active Trim harness 3-pin connectors
- h - Active Trim harness
- i - VCM
- j - Weather cap
- k - To a Mercury-approved multifunction display (MFD)

1. Verify that a Mercury-approved MFD has been properly installed.
2. For 75/90/115 engines, install the digital to analog (D/A) converter and digital trim sender kit. Instructions are supplied with the D/A converter.
3. Ensure that the VCM has been installed as previously outlined.
4. Connect the Active Trim harness to the VCM. Refer to **VCM Connection (All Models)**.
5. Remove the weather cap from an unused connector on the helm harness J-box, and connect the Active Trim harness 10-pin connector.
6. Connect the Active Trim harness 3-pin connectors to the two trim adapter harnesses, purchased separately.
7. Connect the male trim adapter harness to the remote control harness. Red connects to red/purple, blue/white to blue/white, and green/white to green/white.
8. Ensure that the four unused bullet connectors have weather plugs. This includes the bullet connector for the tan/light blue wire on the remote control harness.

## Outboard Dual Engine Non-DTS Applications

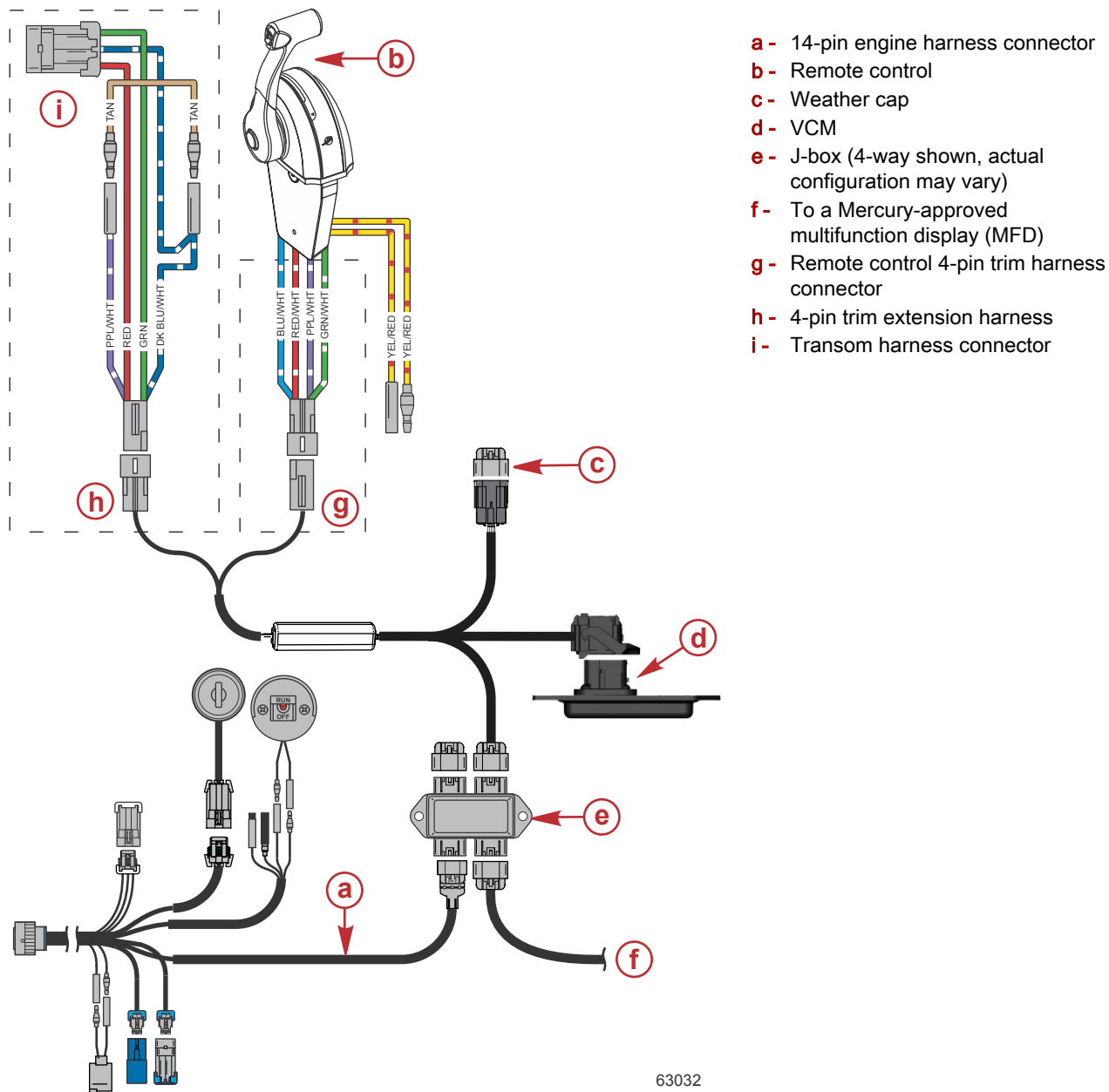


**IMPORTANT:** The Active Trim harness for non-DTS applications is different between Outboard and MerCruiser applications, and between single and dual-engine applications. Confirm that you have the correct harness for dual-engine outboard applications prior to beginning the installation.

1. Verify that a Mercury-approved MFD has been properly installed.
2. For 75/90/115 engines, install the digital to analog (D/A) converters and digital trim sender kits. Instructions are supplied with the D/A converters.
3. Ensure that the VCM has been installed as previously outlined.
4. Connect the Active Trim harness to the VCM. Refer to **VCM Connection (All Models)**.
5. Remove the weather cap from an unused connector on the helm harness J-box, and connect the Active Trim harness 10-pin connector.
6. For existing installations, disconnect the dual engine power trim adapter from the port and starboard helm harnesses.
7. Connect one Active Trim harness port connector to the port helm harness 3-pin connector.
8. Connect the other Active Trim harness port connector to the dual engine power trim adapter 3-pin port connector.
9. Connect one Active Trim harness starboard connector to the starboard helm harness 3-pin connector.
10. Connect the other Active Trim harness starboard connector to the dual engine power trim adapter 3-pin starboard connector.

## MerCruiser Non-DTS Applications

## MerCruiser Single Engine Non-DTS Applications



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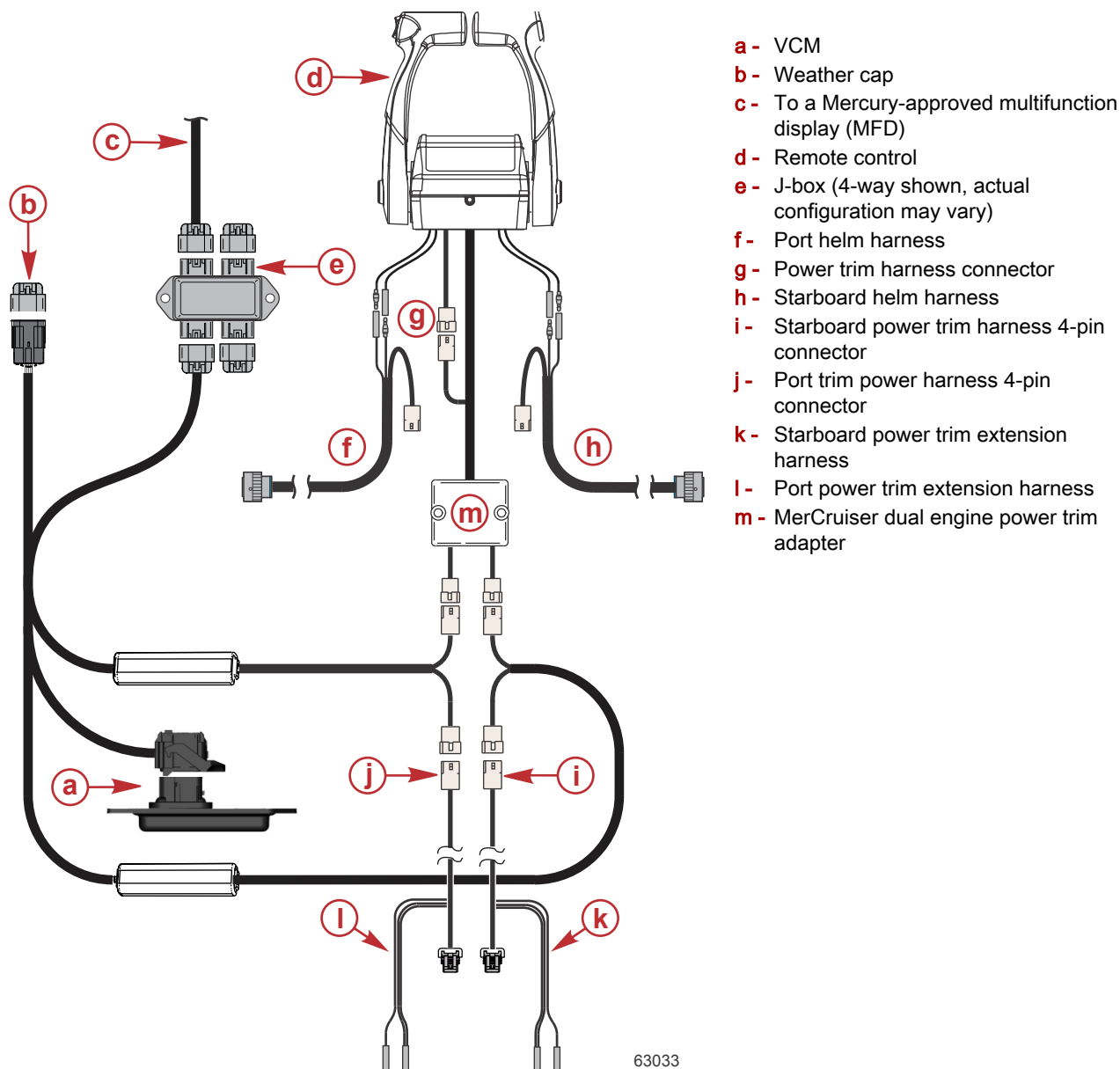
**NOTE:** Refer to **Outboard Single Engine Non-DTS Applications** for MerCruiser applications equipped with outboard remote controls.

**IMPORTANT:** The Active Trim harness for non-DTS applications is different between Outboard and MerCruiser applications, and between single and dual-engine applications. Confirm that you have the correct harness for single-engine MerCruiser applications prior to beginning the installation.

1. Verify a Mercury-approved MFD has been properly installed.
2. Ensure that the VCM has been installed as previously outlined.
3. Connect the Active Trim harness to the VCM. Refer to **VCM Connection (All Models)**.
4. Remove the weather cap from an unused connector on the helm harness J-box, and connect the Active Trim harness 10-pin connector.
5. For existing installations, disconnect the 4-pin trim extension harness from the remote control 4-pin trim harness connector.
6. Connect the Active Trim harness to the remote control 4-pin trim harness connector.
7. Connect the Active Trim harness to the 4-pin trim extension harness.



## MerCruiser Dual Engine Non-DTS Applications



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**IMPORTANT:** The Active Trim harness for non-DTS applications is different between Outboard and MerCruiser applications, and between single and dual-engine applications. Confirm that you have the correct harness for dual-engine MerCruiser applications prior to beginning the installation.

1. Verify a Mercury-approved MFD has been properly installed.
2. Ensure that the VCM has been installed as previously outlined.
3. Connect the Active Trim harness to the VCM. Refer to **VCM Connection (All Models)**.
4. Remove the weather cap from an unused connector on the helm harness J-box, and connect the Active Trim harness 10-pin connector.
5. For existing installations, disconnect the dual engine power trim adapter from the port and starboard power trim extension harnesses.
6. Connect the Active Trim harness port connector to the dual engine power trim adapter 4-pin port connector.
7. Connect the Active Trim harness port connector to the port power trim extension harness 4-pin connector.
8. Connect the Active Trim harness starboard connector to the dual engine power trim adapter 4-pin starboard connector.
9. Connect the Active Trim harness starboard connector to the starboard power trim extension harness 4-pin connector.

## Setup and Configuration

### Configuration Notes

**IMPORTANT:** Always configure Active Trim with a major profile that will allow the operator to select an adjustable profile with additional trim in. That is, avoid selecting a major profile that results in normal operation in adjustable trim profile 1. This will ensure that the operator can always bring the bow down to correct porpoising without having to manually trim the engine or drive.

### Configuration Procedure

1. Turn the ignition key switch to the on position.
2. Use the remote control handle trim switch to establish the full trim and tilt range in the Active Trim module:
  - a. Trim the engine or sterndrive to the full down position and hold the switch for five seconds after the engine or sterndrive reaches the full down position.
  - b. Trim the engine or sterndrive to the full up (trailer) position and continue to hold the trim up switch for five seconds after the engine or sterndrive reaches the full up (trailer) position.
3. Return the engine or sterndrive to the down position before starting the engine.

### NOTICE

**Avoid damaging the engine and drive from overheating. Never start or run the power package without water circulating through the cooling system.**

4. Start the engine and navigate the multifunction display (MFD) to the Active Trim setup screen. Refer to the Owner's Manual for the MFD, for details.
5. Operate the vessel in open, navigable water.
6. Accelerate until the vessel is on plane and cruising at the approximate desired speed. A comfortable cruising speed for most applications is typically achieved between 48 and 64 km/h (30 and 40 mph).

**IMPORTANT:** RPM will increase as the sterndrive or engine is trimmed out.

7. Per the on-screen prompt, select the major trim profile that provides the most efficient running attitude.

**NOTE:** Setting 1 is the least aggressive trim profile, while 5 is the most aggressive. For an explanation of trim profiles, refer to **Trim Profiles Overview**.

8. Follow the instructions to retain the optimum trim profile in the Active Trim system's memory. The Active Trim feature is now ready to use.

**NOTE:** Depending on the model of MFD, these instructions may be on-screen or in the Owner's Manual.

## Introduction to Active Trim

Active Trim is Mercury Marine's patented GPS-based automatic trim system. This intuitive, hands-free system continually adjusts engine or drive trim for changes in operating conditions to improve performance, fuel economy, and ease of operation. It responds to boat maneuvers with precision and delivers a better overall driving experience. No knowledge of trimming an engine or drive is needed to take advantage of Active Trim.

- As the boat accelerates, the engine or drive will trim out.
- As the boat decelerates, for example, while making a turn, the engine or drive will trim in.
- Active Trim can be overridden at anytime by using the regular, manual trim buttons.
- Active Trim allows the boat operator to compensate for changes in boat load, driver preferences, and weather conditions while maintaining full automatic control.

## How It Works

The Active Trim system has four modes of operation:



### 1. Idle Speeds

Maintains the existing trim position.



### 2. Acceleration (hole shot)

Tucks the engine or drive under to minimize bow rise and improve time-to-plane.



### 3. Planing Speeds

Progressively trims the engine or drive based on GPS speed to maintain the most efficient running attitude.



### 4. Override

When the boat operator uses manual trim, the Active Trim system is immediately overridden, returning full control to the operator.

At boat startup, Active Trim resumes the on/off state from the previous shut down. For example, if Active Trim was on at the previous shut down, it will be on at the next startup.

## GPS

Active Trim uses a GPS antenna (not supplied in this kit) to determine vessel speed. The Active Trim system will not automatically control trim until the GPS unit has acquired a signal.

## Shallow Water Operation

Active Trim cannot detect water depth and will not trim up automatically in shallow water. The boat operator will need to override Active Trim by trimming the engine or drive manually or pressing the OFF button.

## Trailer Position and Active Trim

Placing the engine or drive in trailer position (over 50% of the adapted trim range) will prevent Active Trim from engaging. Any time the engine or drive is trimmed above its normal range—to navigate shallow water, launch the boat from a trailer, or load the boat onto a trailer, for example—you must manually trim down before Active Trim will function. This safety feature is meant to prevent the engine or drive from automatically trimming down and hitting something.

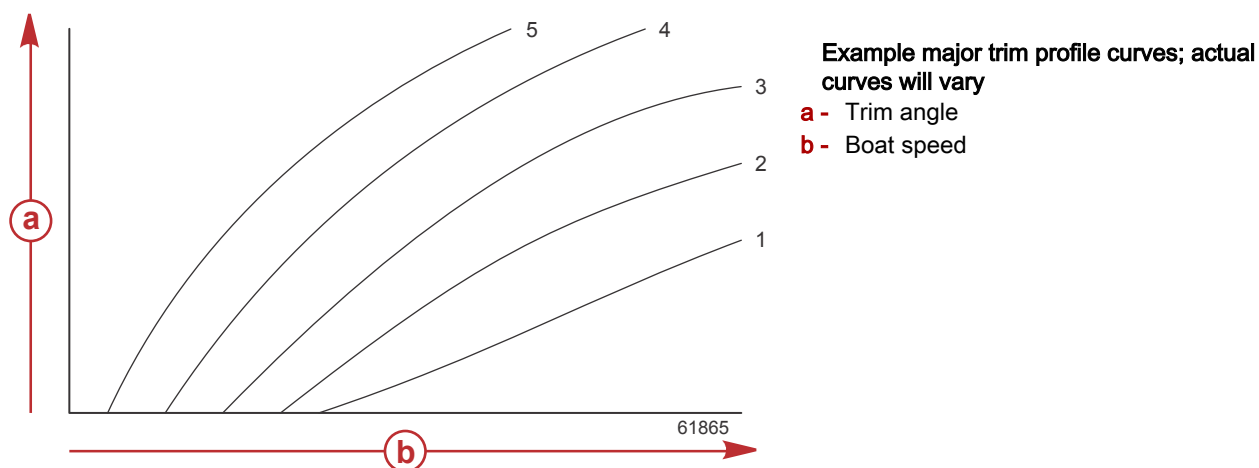
## Additional Information

For additional information on the Active Trim system, including how to change profiles, refer to the documentation that came with the multifunction display.

## Trim Profiles Overview

### Major Trim Profile Curves

The Active Trim system can be configured to any of five unique major trim profiles. The following illustration shows how the trim angle versus boat speed curves will differ for each of the five major profiles.



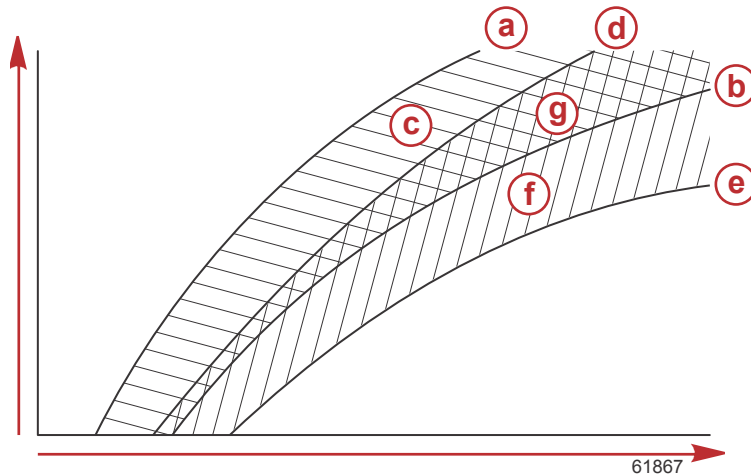
Configure the Active Trim system with the major trim profile that is most appropriate for an individual boat and power package combination under normal operating conditions.

Each major profile curve shown in the preceding example represents the default, middle setting (adjustable trim profile 3) of a broader range of adjustable trim profiles. Each major trim profile has a range of five user adjustable trim profiles, to allow the operator to fine tune the trim curve during boat operation, to compensate for differences in environmental conditions or boat loading.

The upper limit of a selected major trim profile equates to user adjustable trim profile 5. The lower limit equates to user adjustable trim profile 1. Refer to **Adjustable Profiles** for additional detail.

## Major Trim Profile Curve Overlap

The ranges of the five major trim profiles overlap one another. Placing the trim curve ranges for major profiles 4 and 3 (from the first graph) onto a single graph shows a substantial overlap. The upper limit for major profile 3 is higher than the lower limit for major profile 4, yielding a portion of the trim curve ranges that are shared by both profiles. In practice, this means that slight variations in the conditions at which the system is configured will not translate to large variations in system performance.



### Example major trim profile overlap; actual overlap will vary

- a** - Upper limit of major profile 4
- b** - Lower limit of major profile 4
- c** - This area (c) plus g equals the full range of major profile 4
- d** - Upper limit of major profile 3
- e** - Lower limit of major profile 3
- f** - This area (f) plus g equals the full range of major profile 3
- g** - Range overlap of major profiles 4 and 3

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