

785CE-SB**CruiseCommand with Speed Boost**

785CE-SB is a basic CruiseCommand Processor with Speed Boost as an additional feature. The following is the information required to utilize Speed Boost. All other functions and features of CruiseCommand are described in the standard MM14330-I manual, attached.

**SPEED BOOST****SPEED BOOST FEATURE**

**CAUTION:** Misapplication of Speed Boost can damage the transmission or other equipment. Before using Speed Boost, the transmission representative must be consulted about its use and any limitations on clutch engagement as a function of engine speed. The person(s) implementing Speed Boost have the responsibility for ensuring it is implemented properly and for any damage that might occur.

**CAUTION:** With a properly set and timed Speed Boost signal, the engine speed should not increase significantly (if at all) during clutch engagement. Engine speed should remain at or slightly above idle as the clutch begins to engage, droop below idle as the clutch pressure rises, and not rise above idle until after the clutch is fully engaged. A Transmission or other damage may occur if this is not followed. Adjust the Function Codes as needed to meet this requirement.

Speed Boost is a temporary increase in the Speed Command output signal from the Processor. Its purpose is to decrease the possibility of stalling the engine upon clutch engagement or a reversal in direction (e.g., Ahead to Astern). The use of Speed Boost is often not required and its necessity should be assessed during sea trials.

- NOTES:**
1. SPEED BOOST IS NOT REQUIRED FOR MOST APPLICATIONS. ITS PRIMARY USE IS WITH ENGINES THAT HAVE MECHANICAL GOVERNORS AND WHERE THE ENGINE STALLS UPON CLUTCH ENGAGEMENT OR CLUTCH REVERSAL (GOING FROM AHEAD TO ASTERN OR VICE VERSA) TYPICALLY DUE TO A HIGH GEAR REDUCTION RATIO (4:1 OR HIGHER).
  2. SPEED BOOST HAS BEEN USED WITH SOME ELECTRONIC ENGINES WHERE THERE IS A STALLING PROBLEM DUE TO THE ENGINE BEING UNABLE TO RESPOND QUICKLY ENOUGH TO A SUDDEN LOAD (CLUTCH ENGAGEMENT) ESPECIALLY WITH BOATS THAT HAVE A HIGH GEAR REDUCTION (TYPICALLY 4:1 OR HIGHER) OR TO REDUCE THE DROOP IN ENGINE SPEED (RPM) AS CLUTCHES ENGAGE.
  3. USE OF SPEED BOOST DOES NOT GUARANTEE THAT AN ENGINE WILL NOT STALL. ULTIMATELY THE ENGINE MUST BE CAPABLE OF PRODUCING THE POWER REQUIRED IN THE TIME FRAME NECESSARY TO HANDLE THE SUDDEN LOAD OF CLUTCH ENGAGEMENT.

**SPEED BOOST FUNCTIONS**

There are four Function Codes associated with Speed Boost (**F0**, **F1**, **F2**, and **F3**) which are described below (also See Figure SPEED BOOST-1:). Not all Functions need to be adjusted and determining the best values for these Functions requires a trial and error approach during seatrials. See Figure SPEED BOOST-1: for the desired engine response when using Speed Boost. Typically the

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timing of Speed Boost is the most critical Function to set, not the amount of Speed Boost.

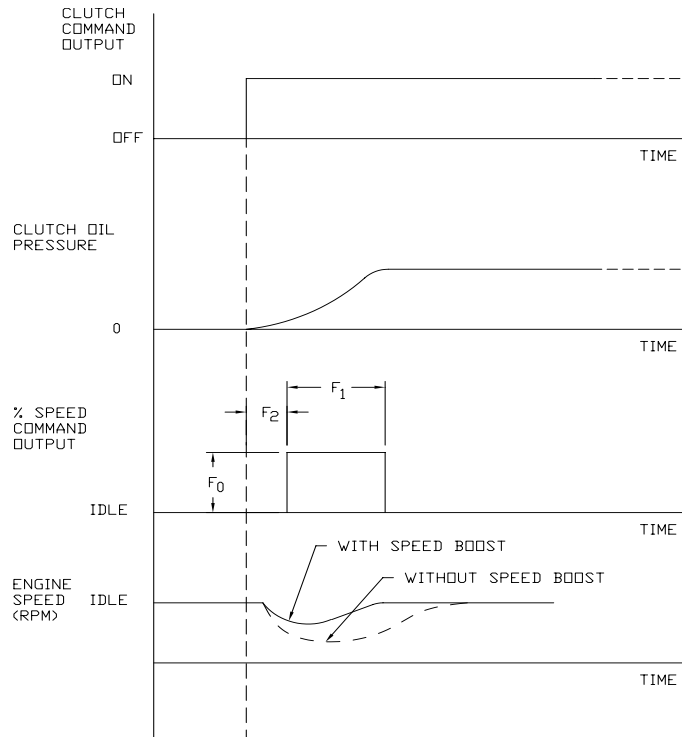


Figure SPEED BOOST-1: Graphical Display of the Use of Speed Boost

Slow speed reversals should be attempted initially without Speed Boost and the amount of engine droop recorded (how far the engine speed drops below idle). If it is determined that Speed Boost is needed, then the Function Codes should be adjusted based on observations of engine response during slow speed reversals. A high speed reversal should be attempted only after adequate testing at slow speeds.

Start applying **Boost\_Percent** and **Boost\_Duration** in small increments and record the result and work upward from there. For example, for an 1800 rpm engine with Idle set at 600 rpm, try a starting point of 3% or 4% for **Boost\_Percent** and a **Boost\_Duration** of 1 second. If this is unsatisfactory, increase **Boost\_Duration** to 2 seconds and evaluate the results.

Typically the timing of Speed Boost is the most critical Function to set, not the amount of Speed Boost. **BOOST\_START\_DELAY** may need to be adjusted in order to get Speed Boost just before the clutches start to transmit significant load to the engine. Again start with a small value initially (for example, 200 milliseconds which is **F2** set to **0.2** seconds).

The engine response when engaging the clutch at slow speed should also be observed. If the engine speed increases too much during slow speed maneuvering/clutch engagements, the **F3** Function Code may be used to link the use of Speed Boost to the Proportional Pause Time (Reversal Pause Time) function.

## SPEED BOOST

### F0 - BOOST\_PERCENT

This Function is the percent of throttle to be applied during speed boost. See Figure SPEED BOOST-1:

**NOTE:** 0% Boost\_Percent MEANS IDLE SPEED.

**CAUTION:**The range for this Function is 0.0 to 20.0%. Using a value of 20% will likely damage the transmission. This range is provided to allow as much leeway as possible when using this Function but is not intended to mean you should use 20%.

Units: % (Percent of throttle)

Default Value: **0.0**

Range: **0.0** to **20.0**

Examples:

A value of **0** means no Speed Boost is used and the Speed Command remains at Idle Speed (0%) as the clutch is engaged.

A value of **3.5** means a 3.5% increase in Speed Command Output during clutch engagement.

### F1 - BOOST\_DURATION

This Function controls how long the boost is applied for. This time starts when the **BOOST\_START\_DELAY** has expired. See Figure SPEED BOOST-1:

Units: seconds

Default: **0.0**

Range: **0.0** to **20.0**

Examples:

A value of **0.0** is 0.0 seconds.

A value of **2.5** is 2.5 seconds.

A value of **5.0** is 5.0 seconds.

### F2 - BOOST\_START\_DELAY

This Function controls how long after the ahead (or astern) clutch engagement has been commanded until speed boost is applied. This is an open loop method of applying speed boost just before the load hits the engine. See Figure SPEED BOOST-1:

**NOTE:** MASTERCOMMAND USES PRESSURE TRANSDUCER TO APPLY THE SPEED BOOST AS A FUNCTION OF CLUTCH PRESSURE, A CLOSED LOOP METHOD.

The open loop method is the only one we offer with CruiseCommand. It lacks the ability to determine temperature so it is best set to a warm gear so that the fill times are normal.

Units: seconds

Default: **0.0**

Range: **0.0** to **10.0**

Examples:

A value of **0.0** means 0.0 seconds.

A value of **0.1** means 0.1 seconds or 100 milliseconds.

A value of **0.3** means 0.3 seconds or 300 milliseconds.

A value of **10.0** is 10.0 seconds.

## SPEED BOOST

### **F3 - BOOST\_BYPASS\_CLUTCH\_DELAY**

This Function controls if speed boost is applied as a function of the reversal pause time instead of every time the clutch is engaged.

For example, if **F3** is set to **1** (1 second), then speed boost would be applied only if the reversal pause time is greater than 1 second. This Function might be useful for boats that only need speed boost during a crash reversal.

Units: seconds

Default: **0.0**

Range: **0.0** to **99.0**

Examples:

A value of **0.0** means 0.0 seconds.

A value of **1.0** means 1 second.

A value of **99.0** means 99.0 seconds.