

EMS689 Diagnostic Centres

Installation Notes: Throttle Control

yi6220
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catalogue section 30



Please read the following information before installing. A visual inspection of this product for damage during shipping is recommended before installation. It is your responsibility to ensure that qualified mechanical and electrical technicians install this product. If in doubt, please contact your local Murphy representative.

This document provides additional information about the throttle set up of EMS689 diagnostic centres. The instructions below should be read in conjunction with the EMS447/448 Controller Operating Manual (for use with program #A97002).

Initial Set-up

Before attempting to start the engine, ensure that the throttle controller mechanical arrangements are set correctly. For example, ensure that the throttle controller stops operating before the maximum / minimum throttle stop, also that the throttle controller will provide the necessary travel required.

Next, set the EMS447 controller with following values. (Note: these values are for the purposes of throttle set up only. Some settings may need to be reset later for the application in hand):-

- Warmup Delay (S31) = 10 seconds
- Cooldown Delay (S32) = 300 seconds
- Warmup Speed (S42) = 800 RPM
- Cooldown Speed (S43) = 800 RPM
- Minimum Engine Speed (S40) = 1200 RPM
- Target Pressure (S11) = 0.1 BAR
- Slope (S54) = 0.

The speed calibration must also be set correctly for each engine: set S13 with the number of pulses per revolution received from the magnetic pickup or alternator.

Once the above settings have been made, the controller may be tested as detailed overleaf.



EMS689 diagnostic centre (model B5010)



IMPORTANT: When making adjustments detailed below, it is good practice to record the existing program settings, change only ONE setting at a time, and note the results. If the desired effect is not achieved, the original setting may then be reset before adjusting another setting.



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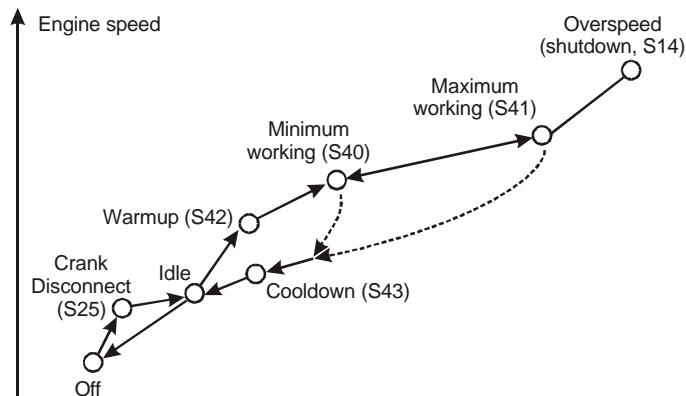
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Throttle Control Speed setup (Not Throttling To Demand Pressure)

Engine speed settings and typical operation may be represented as follows:-



To test the throttle speed set up:-

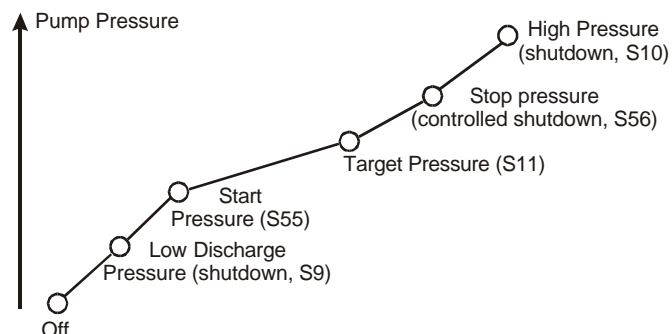
- A. Press the start push-button and allow the engine to crank and start.
- B. The engine speed should increase to the warmup speed, and run for the warmup delay. Ensure that the engine throttle stop allows the engine RPM to run at or lower than the warmup speed. (Note: if actual speed remains *higher* than the set warmup speed, the EMS assumes a throttle linkage fault. It then inhibits ANY throttle activity and attempts to keep the engine at idle speed.)
- C. After the warmup delay has expired, the throttle controller should increase the engine speed to the minimum engine speed, quickly and accurately.
- D. Press the stop pushbutton. The engine speed should decrease to the cooldown speed, quickly and accurately.
- E. Do not allow the engine to stop (by letting the cooldown timer expire). Increase engine speed again by pressing the start button.
- F. Repeat D and E above to ensure accurate and speedy throttle control. If operation is not satisfactory, allow the engine to stop, then make adjustments **ONLY** to the following parameters:-
 - **Rate Of Increase (S44)**
If the throttle controller does not increase the engine speed quickly enough, increase the value of S44.
 - **Rate Of Decrease (S45)**
If the throttle controller does not decrease the engine speed quickly enough, increase the value of S45.
- G. If new settings have been made, restart the engine and retest the speed control. If necessary, stop the engine again and re-adjust settings.

Throttle Control Set up (Throttling To Demand Pressure)



WARNING: before carrying out the following tests, the EMS 'slope' setting (S54) **MUST** be reset to a value of 51.

Pump pressure settings and typical operation may be represented as follows:-



To test the throttle set up *with* demand pressure:-

- a. Set Target Pressure (S11) to the desired pressure
- b. Set Adjust Delay (S52) to value 5
- c. Press the start pushbutton. The engine will start and increase the engine speed to the warmup speed for the warmup delay.
- d. After the warmup delay, the engine will increase the engine speed, operating between the minimum and maximum engine speeds defined, to maintain the pressure required.
- e. If adjustments need to be made, adjust **ONLY** the following parameters:-
 - **Adjust Delay (S52)**
If changes in pump pressure significantly lag any changes in speed, the Adjust Delay (S52) may need increasing. This delay allows pump pressure to settle (i.e. catch up with speed changes), and temporarily holds off the controller from attempting any further (unnecessary) speed compensation.
 - **Deadband (S50)**
If the pump pressure either exceeds or does not quite reach the desired pressure, decrease the Deadband setting. The controller will then try to give more accurate control of pump pressure.

Final checks

Once the throttle control has been correctly set, re-check the other programmable settings (e.g. speed levels and timers), as detailed in the EMS447/448 Controller Operating Manual (for use with program #A97002). Reprogram the settings if necessary to suit the application in hand.