INSTRUCTIONS FOR INITIAL ENGINE & FUEL SYSTEM SETUP
MODELS – F18SE-EPA & H24SE-EPA

ESP SETUP:

Connect to the ESP computer to the ECU and open the service tool

Verify the workspace opens and screens are navigable

View fault list and record any faults on ESM. If any faults are present correct the faults before going forward.

Set the following values in ESP

From any screen, start editing.

On the F3 Start Stop Screen:

Pre lube time to 60 seconds (if equipped)

Purge time to 5 seconds

Post lube time to 60 seconds (if equipped)

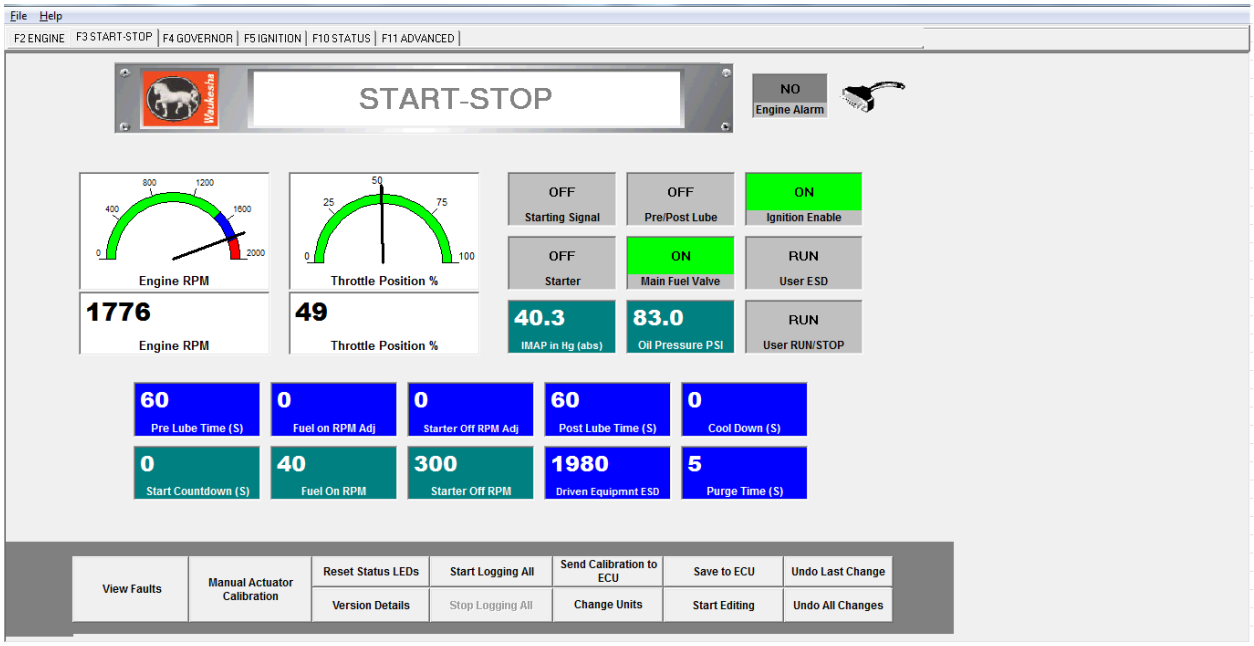

Figure 1-F3 Start-Stop Screen

On the F4 Governor Screen:
Input the driven equipment, including coupling, rotating moment of inertia in (kg-M^2) or (lb-in-s^2).

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Note: If using the high/low idle RPM functionality make sure the high idle is set to desired full speed operation.

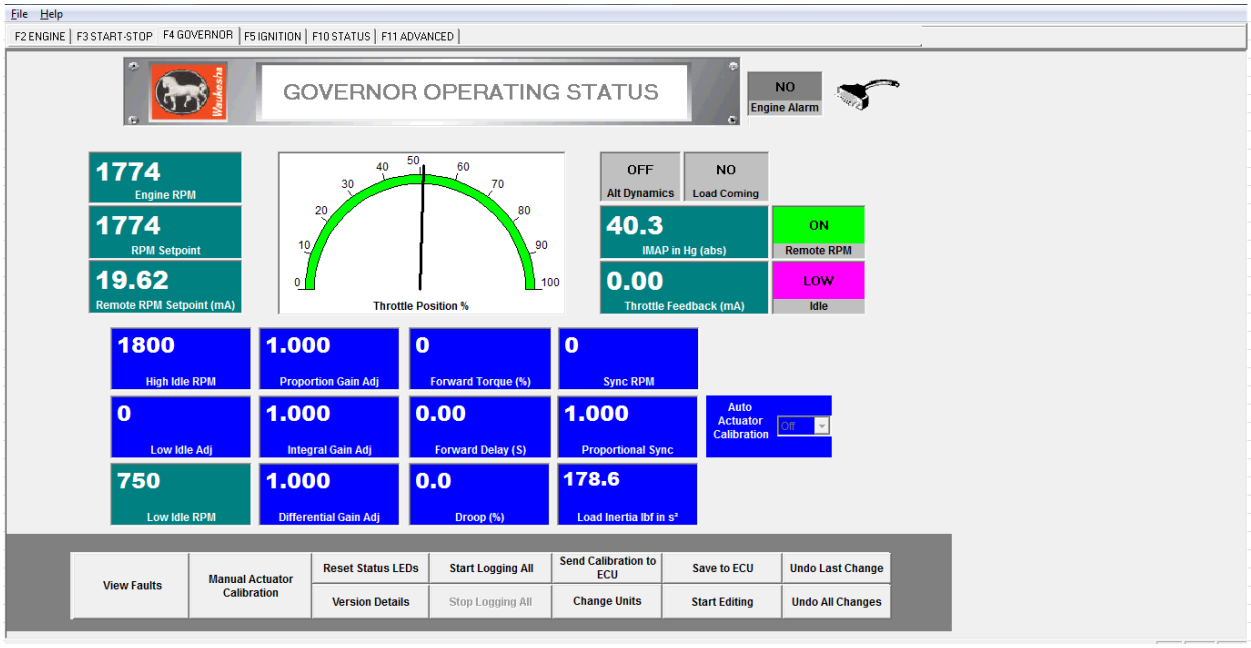

Figure 2-F4 Governor Screen

On the F5 Ignition Screen:

Input the site WKI value**. Note: This step is required for proper fuel system setup using the HMI.**

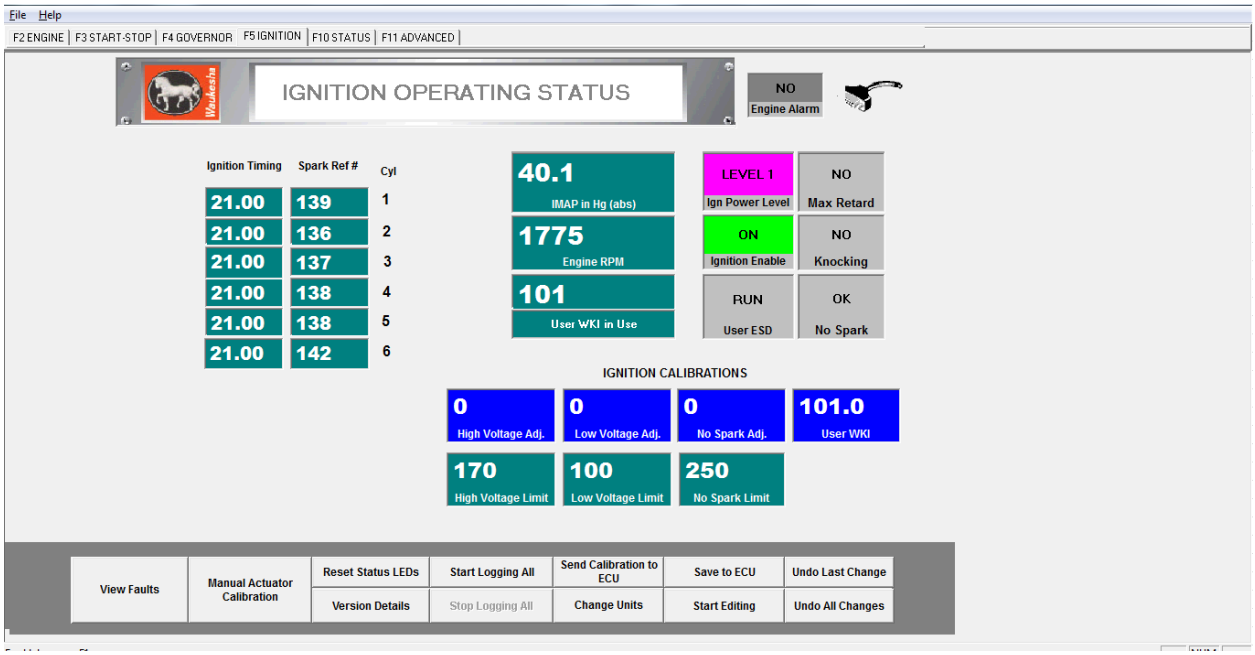

Figure 3-F5 Ignition Screen

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On the F11 Advanced Screen:

Set the modbus baud rate to 19200 and the ID to 1. (These should already be set.)
From any panel save all changes to the ECU

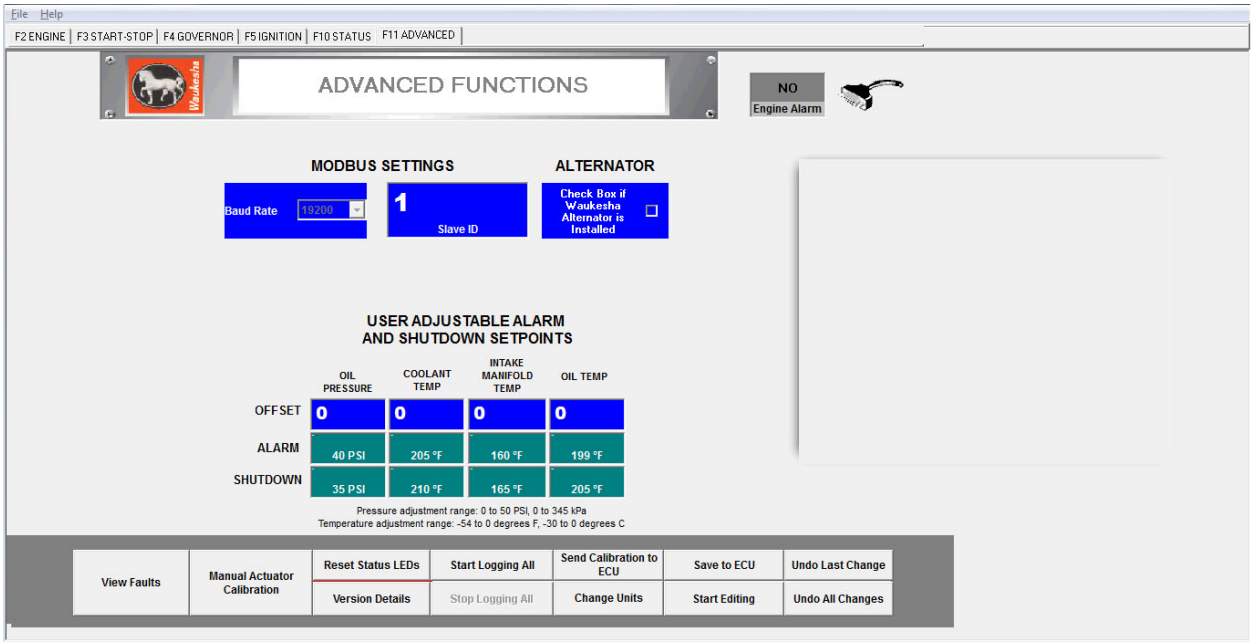

Figure 4-F11 Advanced Screen

Fuel System Instructions

A. SYSTEM DESCRIPTION & PHYSICAL REQUIREMENTS

1. Opening and closing of all engine mounted fuel valves is controlled by the ESM™.

2. A “Customer supplied” manual shutoff valve, placed upstream of the engine main shutoff valve is recommended. This valve will assist initial engine start-up and will act as a visual gas shutoff when engine is not in operation.

3. The main gas regulator controls the gas/air and is adjusted at 1400-1800RPM, low load.

4. The carburetor adjusting screw is located on the carburetor above the air cleaner. The carburetor adjusting screw is used to adjust fuel flow at rated speed and load, with the AFR2 functioning in automatic, until the fuel control valve (FCV) is open the proper percentage.

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B. FUEL SYSTEM ADJUSTMENT PRIOR TO ENGINE START-UP

1. Set main fuel supply pressure to 1.5-5 psig, at the customer inlet connection.
   (**NOTE: Make sure this pressure is also maintained during engine operation**).
   Set LP (HD-5) supply pressure to 30 – 300 psig.
   For Dual Fuel, refer to S-07546-40; Propane Secondary Fuel System Instructions for fuel temperature vs. pressure requirements.

2. HMI (Human Machine Interface) was provided shipped loose for customer installation. See the latest version of the O & M for installation and wiring of the HMI. Power up the HMI and navigate to the Main Menu using the lower left button “Utilities”. See Figure 5.

Figure 5-HMI Main Menu Screen

3. Select “**AFR Control**” on the utilities menu.

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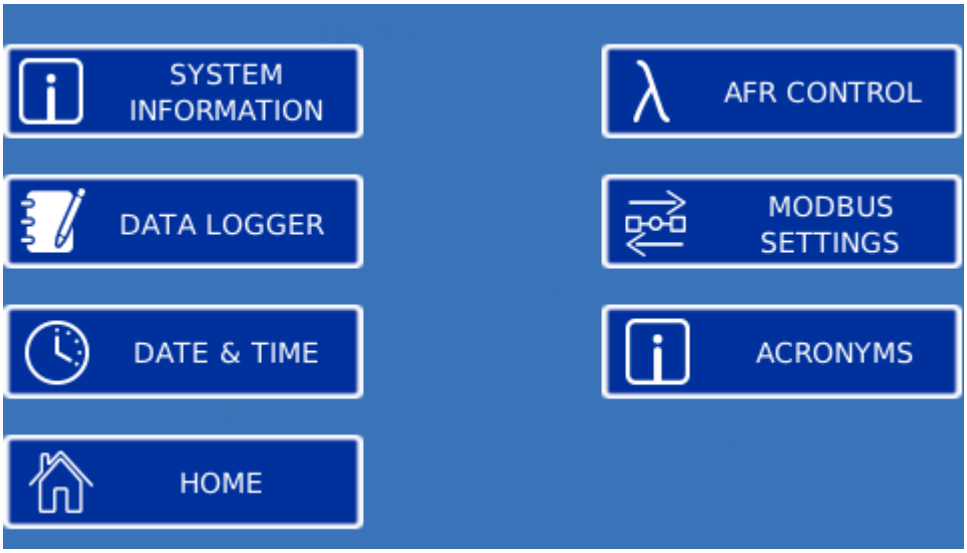

Figure 6-Utilities Menu

4. Press the upper left button on the HMI with the “AFR Control” menu screen displayed as shown. An “**EDIT**” button will appear.

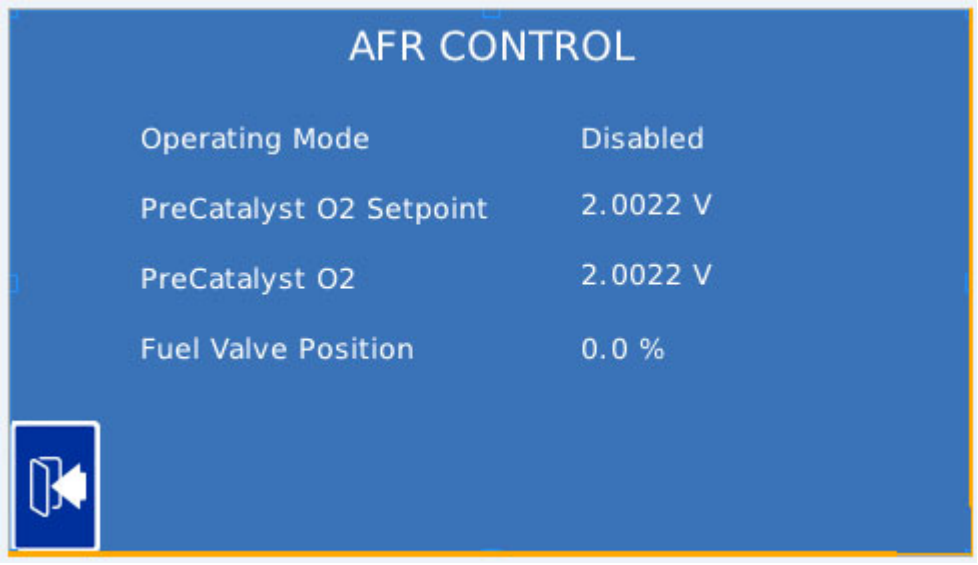

Figure 7-AFR Control Menu

5. Press and hold the “**EDIT**” button until the screen changes to that shown in Figure 8.

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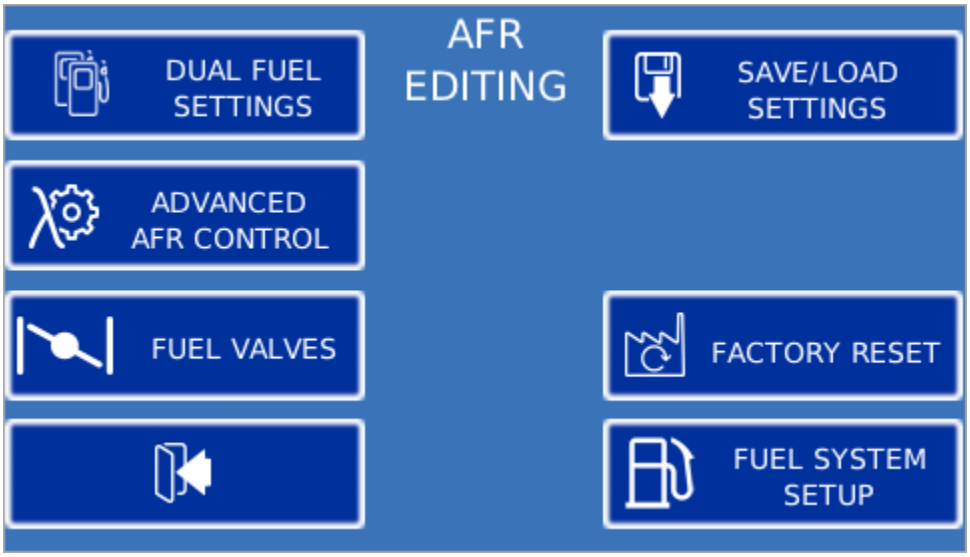

Figure 8-AFR Edit Menu

6. Press the “Fuel System Setup” button. The screen in Figure 9 will appear. **Note:** It’s important that the proper WKI of the engine fuel be entered in ESP and saved before proceeding.

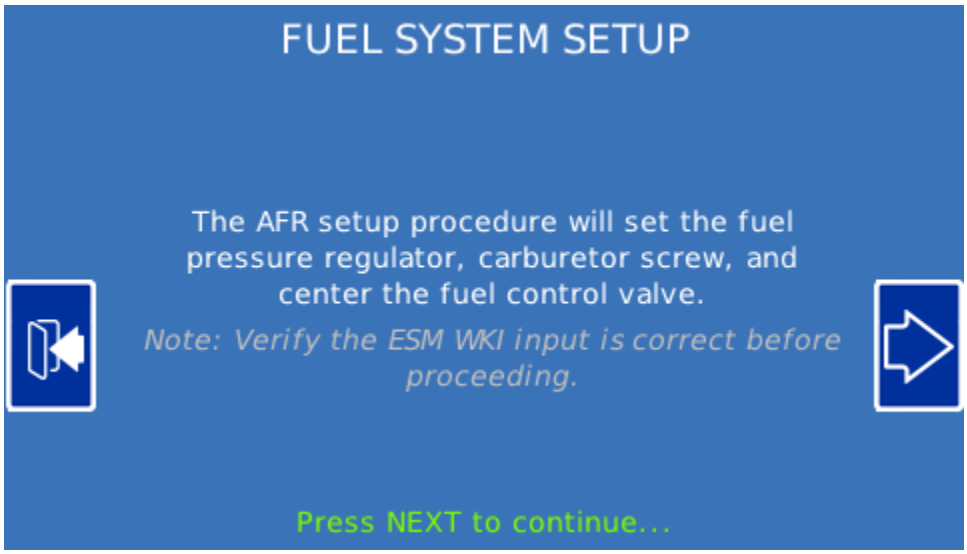

Figure 9-Fuel System Setup

7. Press the right arrow button for Next

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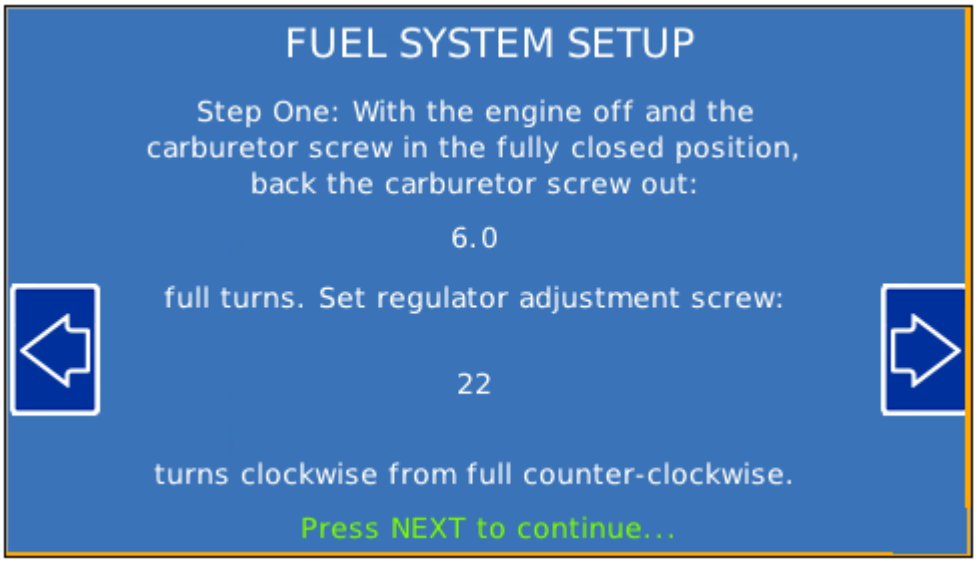

Figure 10 Step one: Fuel Setup Screen

8. Based on the fuel WKI that was input in ESP, initial settings for the regulator and carburetor are shown. Turn the carburetor screw fully clockwise (**CW**) then back out the number of turns indicated. See Figure 11.

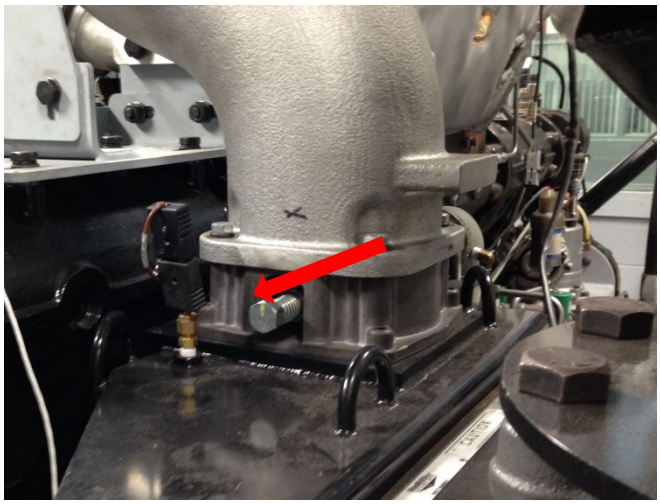

Figure 11-Carburetor Screw

9. Remove the cap from the regulator tower and turn the regulator adjuster fully counter clockwise (**CCW**). Turn the regulator adjuster clockwise (**CW**) the number of turns shown on HMI "Fuel Setup Screen" in Figure 10. See Figure 12 for regulator adjustment. Proceed to next screen.

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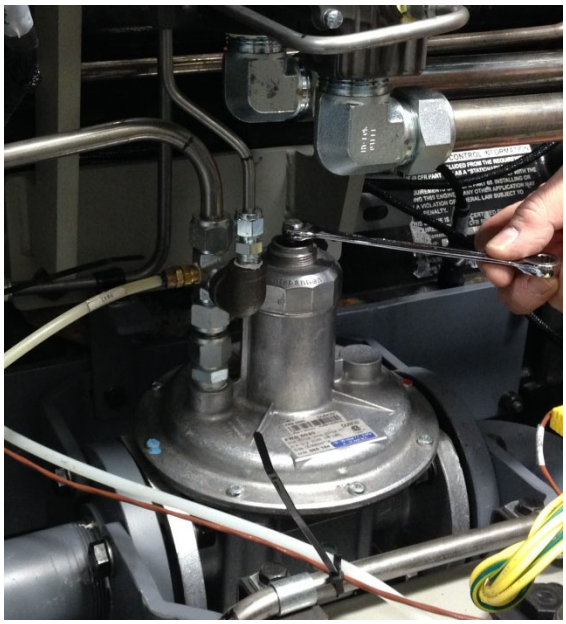

Figure 12-Regulator Adjustment Device

C. ENGINE START-UP AND PRELIMINARY SETTINGS

1. Complete all pre-start activities and checks including checking oil and coolant levels, adjusting valves (if needed), alignment and crankshaft deflection, rocker arm oiling, piping tests, etc…
2. Confirm engine coolant and lube oil are at least 50°F for reliable starting.
3. Open manual gas shut-off valve.
4. Pre lube engine (if equipped).
5. Set operating speed to 750 RPM. (See latest VGF SE O & M for information on how to set).
6. Start engine.
7. **If engine fails to start:**
    a. Confirm fuel is reaching engine, ignition is firing, and cranking speed is at a minimum 80 RPM.
    b. Reduce regulator start position in 1 turn increments and re-try.
    c. Raise regulator start position in 1 turn increments and re-try.
    d. Repeated start attempt failures may cause moisture to build on spark plugs. Crank several times with fuel off to “dry” the spark plugs, and repeat start attempts.

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8. Once started verify there are no current alarms present. If alarms are active, they may interfere with air/fuel ratio control.

9. On the HMI, once the engine is started, press the right arrow. *(See Figure 13)*.

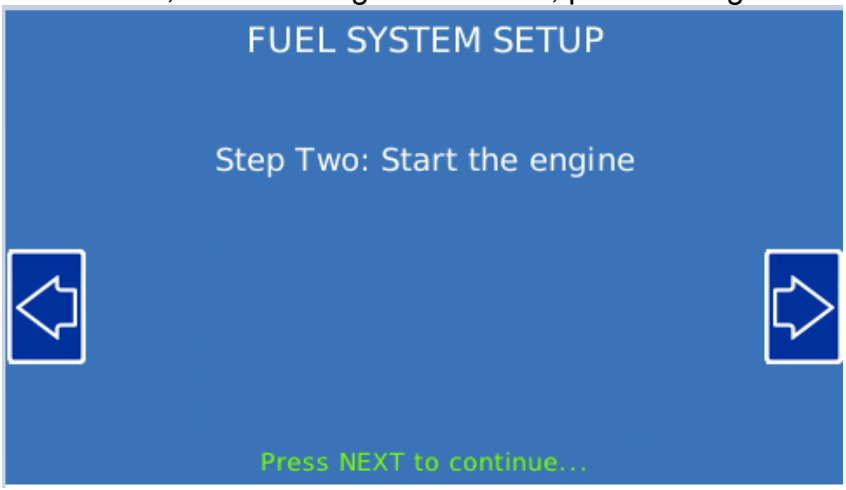

Figure 13-Step two: Starting the Engine

10. Run the engine unloaded at 1400-1800 rpm. Allow the control to activate, activation will be seen when the fuel control valve starts moving on the screen. Adjust the regulator adjuster while watching the FCV position on the HMI until the "Current Fuel Valve Position" is within 2-3% of the desired setting. Turning the regulator adjustment clockwise (**CW)** will decrease the FCV position, counter clockwise (**CCW)** will increase the FCV position. *(See Figure 14)*. Note: It may take a few minutes for the control to go active.

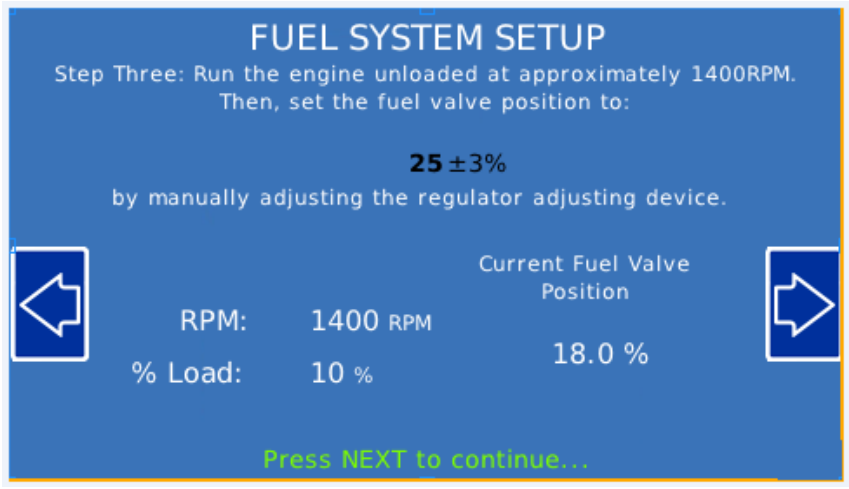

Figure 14-Step three: light load

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11. Run the engine at the application's highest speed and load possible. The display will now show a different desired position. (See figure 15) Adjust the carburetor fuel screw to move "Current Fuel Valve Position" to within 2-3% of the desired position. Turning the carburetor screw clockwise (**CW)** will increase the FCV opening; turning it counter clockwise (**CCW)** will decrease the FCV opening. Press right arrow when complete.

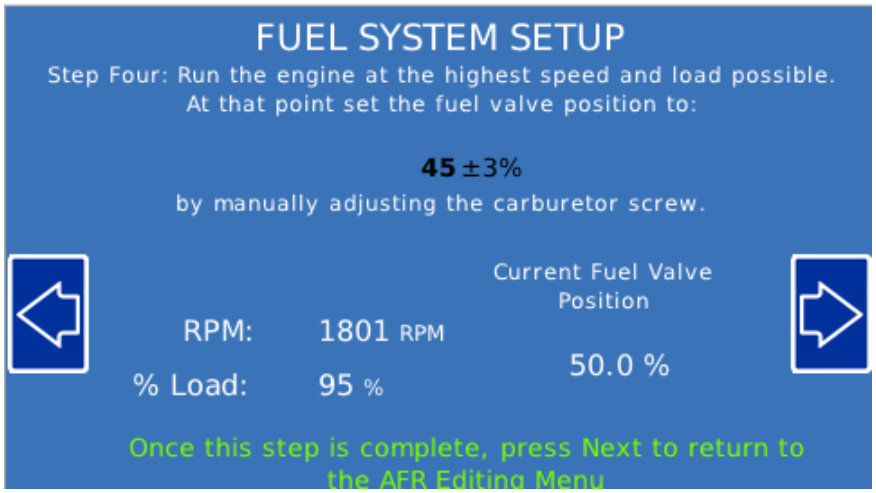

Figure 15-Step four: high load

12. If the engine is a dual fuel configuration the propane system can now be set. Pressing "**NEXT**" brings up the screen in Figure 16. Select "**YES**" to proceed to setup operation on the propane system. **Note:** If you do not have dual fuel this screen will not be shown and the fuel system setup is complete.

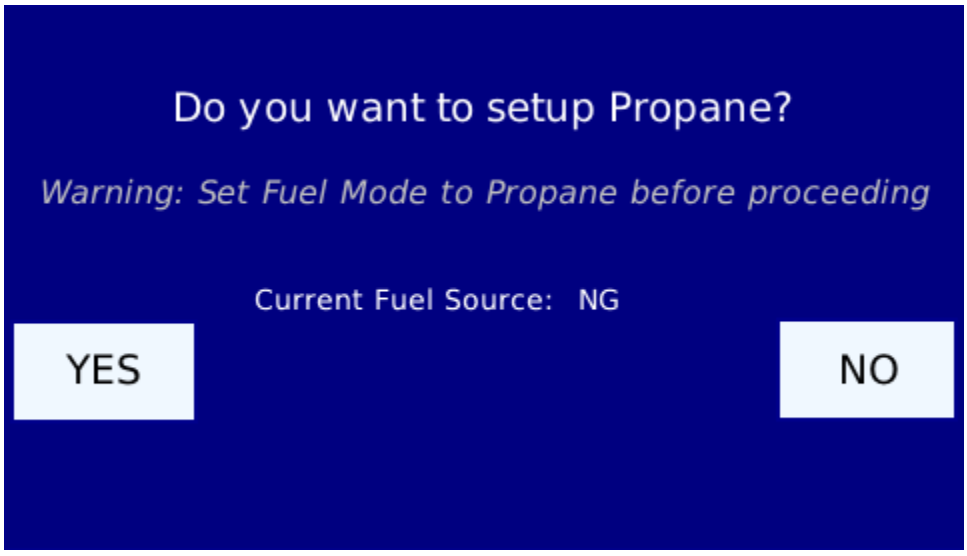

Figure 16 Setup for Propane Fuel

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13. The screen in Figure 17 will appear. Adjust the MAS valve (Figure 18) to cause the “Current Fuel Valve Position” to match the desired position.

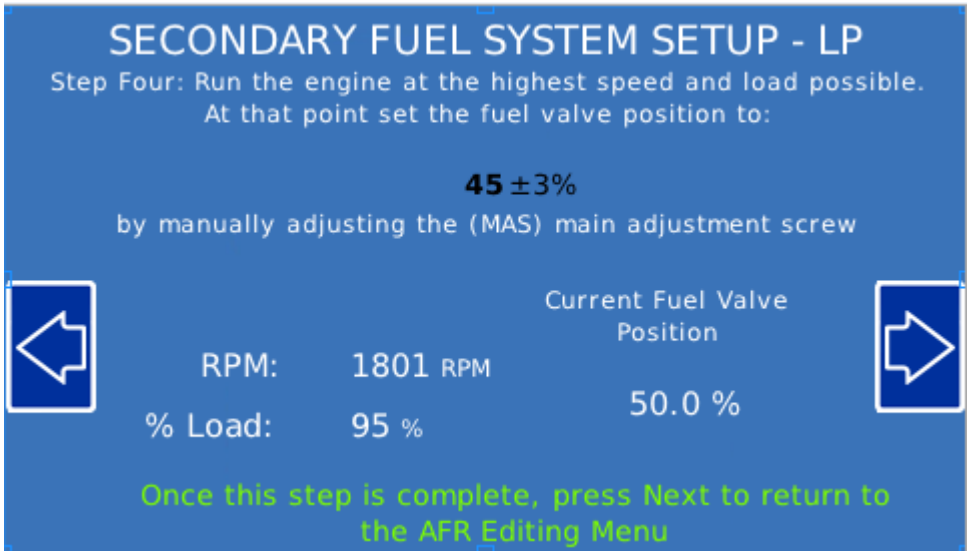

Figure 17-Propane Setup

Note:
To set Fuel Mode to LP (HD-5), connect wire 1818 Fuel Mode SEL from the Local Control Harness to ground. This puts the fuel system in ‘Manual Mode’. Also, connect wire 1024 Fuel SEL from Local Control Harness to ground switch. This sets the LP fuel system.

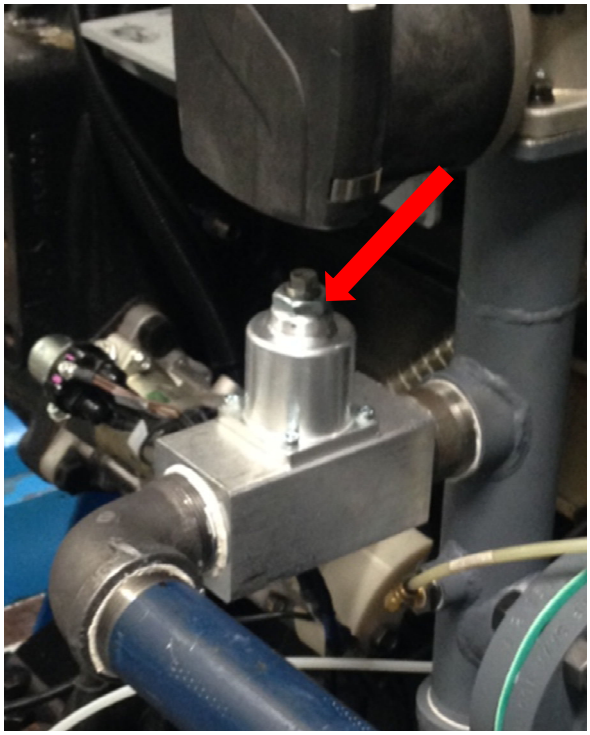

Figure 18-MAS valve for adjusting propane.

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14. Press the right arrow button to complete the fuel system setup.

D. ENGINE SHUTDOWN PROCEDURES - ROUTINE SHUTDOWN

1. Reduce engine load.

2. Operate engine at idle or as low as possible for 1-2 minutes to cool down engine temperatures.

3. Shut down engine.

4. Post lube engine for 60 seconds (if equipped).

5. Close manual shutoff valve (if equipped).

Note:
If this is the first time running the engine, the catalyst elements should not be installed until after a short runtime. This to ensure that internal engine preservative has been consumed, as well as confirm that the piping is clean.

Caution:
Running unloaded at reduced speed when hot can result in rich misfire causing thermal damage to the catalytic converter.

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