DETROIT DIESEL
DEMAND PERFORMANCE℠

No.: 09 TS-15
April 29, 2009

TO: Service Locations

FROM: Technical Support Development

SUBJECT: **EPA04 Series 60® Engines DDEC® V Actuator Adjustment**

NOTE: This document supersedes 08 TS-29Rev.

ISSUE

EPA04 turbocharger actuators that are leaking or out of adjustment have required turbocharger assembly replacement. With this new procedure the actuator can now be replaced and/or adjusted.

Turbocharger Actuator Adjustment

NOTE: This procedure can be used on all EPA04 Series 60 DDEC V engines regardless of displacement.

To be able to perform the turbocharger actuator adjustment, engine serial Number 06R1999999 needs to be programmed in the ECM running the engine. This can be done by having your test ECM (23533662) programmed with this engine serial number or by re-flashing the original ECM. If the original ECM is going to be re-flashed, it is important to write down or print the accumulators, injector codes and parameters so they can be re-entered when original calibration is re-flashed.

When using the test calibration there will be fault code(s) present. Disregard them as they will not affect the outcome of the test. Once the original calibration is installed back into the ECM, the codes should be cleared.

1. Warm the engine up to operation temperature.

2. If testing or adjusting turbocharger actuator, perform step A or B:
    a. Install test ECM 23533662 with service routine calibration 06R1999999. Continue with step 3.
    b. Re-flash ECM on the truck with service routine calibration tool 06R1999999. NOTE: When reflashing the original ECM, select “No Charge,” then from the drop-down box select “Description” and for the reason ---“Turbocharger actuator adjustment.” If the original ECM was reflashed, all the customer passwords will be reset to default and will need to be reset using Diagnostic Link. Continue with step 3.

3. Remove air filter-to-turbocharger inlet tube going to the turbocharger and install protective shield J-26554-A (essential tool required at service locations). Verify that the charge air inlet temperature sensor is connected.

4. Start the engine.

5. Connect Diagnostic Link. Verify version of Diagnostic Link is 6.45 or newer version.

6. Close Welcome window and Engine configuration window.

7. Open Diagnostics pull-down menu.

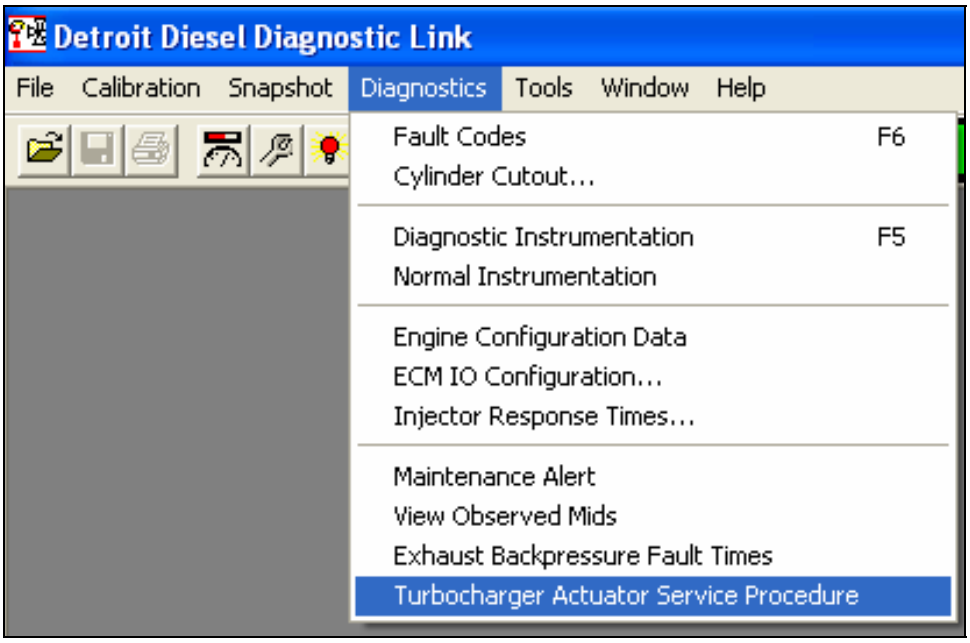


Figure 1. Diagnostics Pull-Down Menu

8. From the drop-down menu, open **Turbocharger Actuator Service Procedure**.

9. Acknowledge caution, check to agree. Click 

.

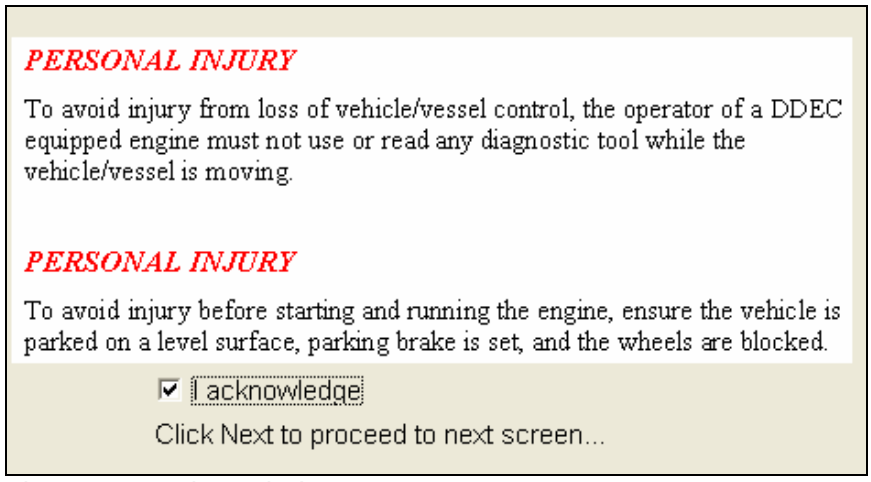


Figure 2. Caution Window

10. Verify that the air inlet tube is removed from the turbocharger and the protective shield (J-26554-A) is installed on the turbocharger inlet. Verify that the Turbocharger Performance Diagnostic Checklist has been completed. Check all boxes to agree.

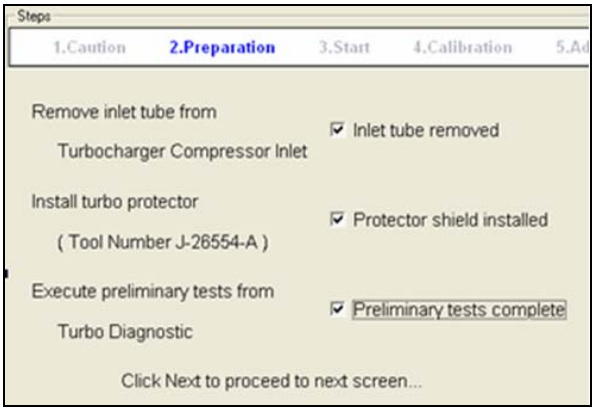


Figure 3. Performance Diagnostic Checklist

11. If the truck is running, the box will be checked for engine started. If not, start the engine. Verify that the climate control (Defroster and Air conditioning) is off. Click to agree.

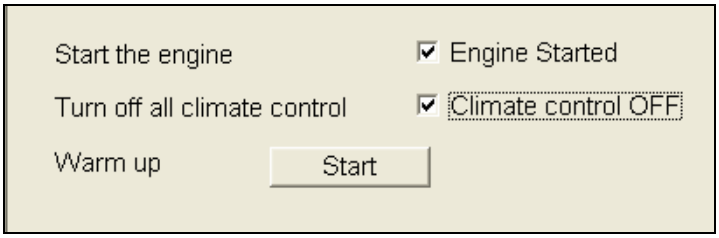


Figure 4. Start Checklist

12. Click 

to begin the routine.

Note: If the engine is not at the required operating temperature for the test to run, a progress window will appear. Once the engine reaches the required temperature the progress window will close and the test will begin.

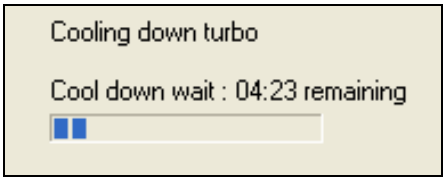


Figure 5. Progress Window

Note: Anytime engine RPM is raised above idle a five minute cool down period is required before the test will begin. If the RPM's are raised during the cool down period the timer will reset and an additional five minutes will be required before the test can begin. If the 

button is clicked during the cool down period the test will begin automatically (engine RPM will increase) when the cool down period has successfully completed.

13. Once the test (measuring) is over (engine back to idle), click the Next> button.

    Note: If the turbo reaches a speed of 75,000 RPM, the test will abort and a window will appear stating “Aborted due to turbo overspeed” (Figure 6). If an overspeed occurs, check turbo RPM and pressure ratio displayed during the (measuring) step.

    With turbo speed greater than 75,000 RPM and the pressure ratio over 2.0 (Figure 6), shorten the actuator rod by six turns and retest.

    With turbo speed greater than 75,000 RPM and the pressure ratio under 2.0 (Figure 6), verify air induction system has no leaks per Turbocharger Performance Diagnostic Checklist. If no leaks are found, contact the CSC.

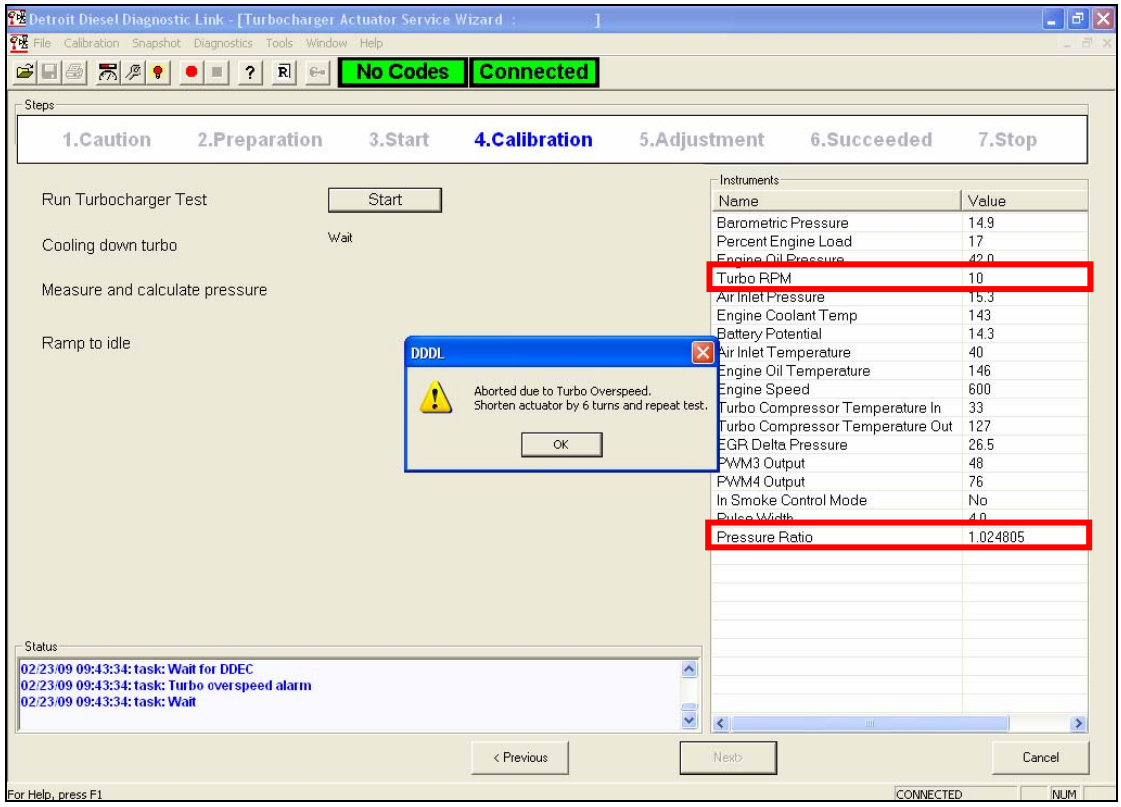


Figure 6. Instrument Window

14. Adjust the turbo actuator rod the estimated number of turns shown on the screen. (Note: both lock nuts are right-handed threads.) Clockwise will lengthen the rod and counter-clockwise will shorten the rod.

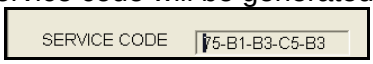
    Note: If there is not enough adjustment on the actuator, replace actuator and retest.

Figure 7. Turbo Actuator Rod

Note: To help see the number of turns on the actuator rod, mark the adjuster rod with a paint mark. **Verify that both lock nuts are loose and that the adjuster turns freely on both shafts**. If the adjuster is frozen, replace the actuator. If not replaced, you will have a difficult time adjusting the actuator.

15. To repeat measurement using Diagnostic Link, click the 

button. Verify that the adjustment is correct. If not, re-adjust the actuator rod and retest.

16. Once the adjustment is complete (test passed), a service code will be generated. Include this service code with the warranty repair narrative. 

    Note: If the turbo will not adjust and/or pass the test after five attempts, generate a service code by clicking on the 

button. Record the service code and replace the actuator assembly and retest.

17. Remove test ECM or re-flash the original ECM back to the original Engine Serial number.

18. If re-flashing the ECM, enter all the accumulators, injector calibration codes and customer preferences.

19. Verify the repair.

CONTACT INFORMATION

Please contact the Detroit Diesel Customer Support Center at 313-592-5800 or email csc@daimler.com if you have any questions.