HE351VE Turbo Actuator Guide

Note: Every situation is unique. While a malfunctioning actuator is a common cause of turbo issues, a sticking turbocharger can also lead to actuator failure. A sticking turbo may not always trigger a fault code since the only sensor on the turbocharger is the Turbo Speed Sensor. Even low-mileage trucks can have turbos clogged with soot, whether they are driven gently or under heavy load.

Key Points to Consider:

1. Actuator and Turbo Relationship: The actuator's health is closely tied to the condition of the turbocharger. A sticking turbo can damage the actuator over time, even if no fault codes are present. Replacing just the actuator without addressing the turbo can lead to recurring failures.
2. Arm Test Limitations: The "Arm Test," which involves manually moving the small arm on the turbo to check for resistance, may not accurately diagnose issues. This test is often performed when the turbo is cold, but since metal expands when hot, a turbo that passes the test cold might still stick when operating at normal temperatures.
3. Turbocharger Impact: Even without specific warning codes, a sticking turbo can lead to actuator damage. Over time, the extra strain on the actuator due to a sticking turbo can cause the circuit board to overheat or the gears to wear down, leading to failure.
4. Long-Term Solutions: While replacing only the actuator may temporarily fix the issue, it is not a permanent solution if the turbocharger itself is sticking. To ensure a long-term fix, it's advisable to replace both the turbo and the actuator simultaneously. This approach helps prevent repeated failures and costly repairs.
5. Potential Consequences of Actuator-Only Replacement: Replacing just the actuator might seem like a quick fix, but it often does not address underlying issues with the turbocharger. If the turbo is sticking, a new actuator may fail again within a few months. Warranty claims may not be honored in such cases if a sticking turbo is the underlying cause of failure.

Common Diagnostic Codes and Troubleshooting:

- Code **U010C** or **P0046**: These codes typically point to issues with the actuator or its wiring, not the turbocharger itself. Check for corrosion or damage in the connector terminals and ensure solid power and ground connections.
- Code **P003A**: Indicates that the actuator couldn't locate its end stops, usually due to actuator malfunction or a failure to recalibrate after actuator removal.
- Code **P00AF**: Points to either an actuator fault or wiring issues, similar to Code P0046.
- Code **P226C**: Suggests a discrepancy between the desired and actual vane positions, often caused by sticking vanes in the turbocharger. This issue may not be persistent, but it can still lead to actuator failure. If this code appears alongside P00AF or P003A, both the actuator and the turbo may need to be addressed.

Turbo Actuator Installation Instructions:

1. Start with the engine and key in the off position.
2. Drain the engine coolant system.
3. Disconnect the actuator by unplugging the cable.
4. Remove the four bolts securing the actuator and take the actuator out.
5. Rotate the sector gear clockwise until it stops.
6. Check that the gaskets are correctly seated on the new actuator and ensure the turbo mounting surface is clean.
7. Install the new actuator and perform calibration.
8. Refill the coolant system with fresh coolant.