

## Diagnosing Injector Balance Rate Issues



Your customers rely on your expertise to make sense out of all the electronics under the hood. Diagnosing the root cause of a rough running truck can be a case of eliminating possibilities. A great place to start: the Balance Rate.

Below is a quick listing of what types of injector balance rate tests or cylinder contribution tests are supported by the engines D Tech provides products for. Remember, the tests are usually measuring cylinder performance which comprises many different variables and engine components, not just the injector.

### **DODGE**

**5.9L:** Does not have a supported balance rate test. Some scan tools will provide for a percentage of cylinder contribution test.

**6.7L:** Supports a cylinder contribution percentage test with appropriate scan tools.

### **FORD**

**6.0L:** Supports a Power Balance test that shows the contribution of each cylinder. This test may falsely identify adjacent cylinders in the firing order or companion cylinders as weak. It is recommended to replace only the injector on the most deficient cylinder and then reevaluate engine operation. For more information refer to Ford bulletin 04-15-13.

**6.4L:** Supports a power balance test with balance rates when using an appropriate scan tool.

**7.3L:** Supports a cylinder contribution test. Grey cam position sensors, dual mass flywheels and an incorrect PCM program can cause false cylinder contribution diagnostic trouble codes (DTC).

### **GM / DURAMAX**

**6.5L:** Supports an injector balance test that provides the ability to cutout individual cylinders and monitor RPM drop. This can be used for evaluation of misfires, smoking, or knocking conditions.

**6.6L:** All Duramax 6.6L engines use the balance rate test and have viewable balance rates using an appropriate scan tool. Balance rates should be carefully reviewed to determine if one injector is skewing the other injectors rates. Please contact DIPACO / D Tech Customer Experience before complete sets are unnecessarily removed.

### **SPRINTER 2.7L**

**Early:** Does not support a balance rate test.

**Late:** Supports an injector quantity test displaying the fuel delivery of each injector.

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## **PRODUCT INFORMATION**

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### **BALANCE RATE STARTING TIPS**

When your customer's truck supports balance rate, we suggest these 6 starting places to diagnose the problem:

1. If there is an engine performance issue, check if the balance rates are within the recommended range.
2. Check if diagnostic codes are present and troubleshoot before proceeding.
3. Check the low and high side fuel supply pressures. On common rail systems the actual high side pressure must match the desired pressure.
4. On a Ford 6.0L and 7.3L Power Stroke, check for compression blow-by into the fuel supply.
5. If one cylinder repeats a high balance rate with multiple replaced injectors, swap injectors from cylinder to cylinder to test if the issue is the cylinder or the injector.
6. Perform an engine compression test. Relative compression tests may incorrectly lead one to believe the engine compression is okay.
7. Incorrect engine valve clearance will affect balance rates. On engines with an adjustable valve clearance, always check and adjust the valve clearance when installing injectors.

To avoid or minimize injector issues in the future, advise your customer to:

1. Perform regular maintenance intervals per manufacture recommendations.
2. Purchase good quality fuel, and
3. Regularly use DieselMAX or DieselBOOST to remove water and contaminates from the fuel system.

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