



01-16-13 - Engine, Misfire Diagnostic Aid

Release date: 6/15/2022

Condition

Applicable Vehicles					
Model(s)	Year	Eng. Code	Trans. Code	VIN Range From	VIN Range To
All (Except Routan, ID.4)	2008-2023	All Gasoline Engines	All	All	All

Revision Table			
Instance Number	Published Date	Version Number	Reason For Update
2033805/6	6/15/2022	01-16-13	Include model year 2023 applicability.
2033805/5	6/22/2021	01-16-13	Include additional models and model year 2018-2022 applicability.
2033805/4	7/28/16	V011613	Include additional models and model year 2017 applicability.
2033805/1	5/9/13	V011314	Original publication.

The MIL is flashing or illuminated.

One or more of the following DTCs are stored in the ECM fault memory:

DTC	Description
P0300	Random/Multiple Cylinder Misfire Detected
P0301-P0308	Cyl.1 Misfire Detected – Cyl.8 Misfire Detected
P130A	Hide Cylinder

Engine may also exhibit reduced performance without significant loss of power.



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**Note:**

Multiple components **SHOULD NOT** be replaced for 1 misfiring cylinder.

Technical Background

Misfire faults have commonly been related to conditions such as:

- Loose or damaged electrical connections
- Circuit grounds
- Poor fuel quality

Production Solution

Not applicable.

Service

- There can be multiple causes for engine misfire, ensure all campaigns and applicable technical service bulletins (TSBs) have been performed.
- Repeat repairs must be carefully addressed to identify the root cause of the concern. Utilize proper diagnosis steps to ensure that the concern has been identified, vehicle is repaired properly, and that the repair is verified.
- To repair the vehicle correctly, obtain as much information as possible from the customer about the symptoms of the condition and when it occurred.
- In what situation (turning, acceleration, rolling stop, etc.) does the condition occur?
- Under what environmental conditions (road conditions, weather, temperature, start conditions, etc.) does the condition occur?
- What is the operating situation of the vehicle (activated electrical equipment, gear selection, etc.) when the condition occurs?
- Can the complaint be reproduced?

Workshop procedure

1. Read out the data memory of engine/motor control module -**J623**-, and note the environmental conditions on the DTC log.

1a. If there are other entries in addition to combustion misfires, address the other entries before addressing the cylinder misfires.

1b. If DTC P0301 – P0308 (Cyl.1 Misfire Detected - Cyl.8 Misfire Detected) is accompanied by P1250 (Fuel level too low), it is likely the faults occurred due to low fuel level, and not a component malfunction.

1c. Review all applicable TSBs related to cylinder misfires and ECM software improvements before diagnosing the misfire condition.



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2. Try to duplicate customer complaint based on the environmental conditions at the time the DTC was set. The freeze-frame data gives important indicators for the traceability of the complaint, in particular, if it occurs sporadically or at cold start.

**Note:**

If cylinder misfire faults are sporadic and a P130A Hide Cylinder fault is not present, it is likely that the misfires may be caused by poor fuel quality, and are not related to a faulty component.

The fault memory should be cleared and the vehicle test driven to verify that the misfire faults do not return.

3. Review the vehicle repair history for previous misfire or maintenance service that could be related to the current complaint.

4. Observe the requirements of Guided Fault Finding. Perform Guided Fault Finding in full, according to the proposed sequence (test plan). **DO NOT** skip any steps.

5. Complete Guided Fault Finding correctly and set the readiness code.

- A Proper GFF misfire diagnosis **must** be followed before replacing any components.

**Tip:**

This is important to ensure that no subsequent faults occur due to the misfire.

6. In the case of **single** cylinder misfires:

6a. **Before replacing components**, determine whether the misfire migrates to other cylinders after swapping components between cylinders (spark plugs, ignition coils and fuel injectors if practical). If necessary, perform a test drive to ascertain this.

6b. If the misfire migrates and follows a specific component:

- Interrupt and resume GFF during component swap, re-read the DTC memory indicating that the fault changed cylinders.
- Replace the defective part.

6c. If the misfire does not migrate:

- Interrupt and resume GFF during component swap, re-read the DTC memory indicating that the fault did not change cylinders.
- If fuel injectors were not previously swapped between cylinders, a fuel injector internal leakage test should be performed to verify if an internally leaking fuel injector is causing the misfire fault.
- If the fuel injectors pass the internal leakage test, or if the fuel injectors were swapped and the misfire remains steady, a cylinder compression test should be performed and repairs diagnosed as necessary.



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7. In the case of **multiple** cylinder misfires:

7a. **Before replacing multiple components**, determine whether misfire faults are attributed to other possible issues. For example, if data shows that the DTCs were sporadic, search Elsa for TSBs related to cylinder misfires or ECM software improvements before diagnosing the misfire condition.

7b. Check to verify if one component may be influencing multiple cylinders. Use misfire monitor in GFF to determine if misfires are continuous (which may indicate a faulty component), or sporadic (which may indicate other possible issues).

7c. Determine whether the misfires migrate to the other cylinders after exchanging components. If necessary, perform a test drive to ascertain this.

7d. If the misfire migrates and follows a specific component:

- Interrupt and resume GFF during component swap, re-read the DTC memory indicating that the fault changed cylinders.
- Replace the defective part.

7e. If the misfire does not migrate:

- Interrupt and resume GFF during component swap, re-read the DTC memory indicating that the fault did not change cylinders.
- If fuel injectors were not previously swapped between cylinders, a fuel injector internal leakage test should be performed to verify if an internally leaking fuel injector is causing the misfire fault.
- If the fuel injectors pass the internal leakage test, or if the fuel injectors were swapped and the misfire remains steady, a cylinder compression test should be performed and repairs diagnosed as necessary.

8. Interrupt and resume GFF during any component swap, and then re-read DTC memory indicating that the fault either changed cylinders or did not return.

8a. If misfires are determined to be related to a specific component(s) (fuel injector, spark plug, ignition coil), replace only one defective component at a time and re-evaluate the concern.

**Note:**

If it is determined through Guided Fault Finding that a component has caused a misfire, the repair should only include the component causing the misfire.

All fuel injector, spark plug, or ignition coil replacements must accompany a corresponding misfiring cylinder to avoid unnecessary part replacement.

Misfire code P0300 – random/multiple cylinder misfire is not a probable cause to replace all fuel injectors, spark plugs, or ignition coils. A cylinder specific P030X fault (P0301-P0308) should always accompany a misfiring cylinder.

9. Verify repair under the same environmental conditions (e.g.: engine speed, engine load value, vehicle speed, coolant temperature, intake air temperature, ambient air pressure, voltage at terminal 30, etc.) as noted on the DTC log.



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Warranty

Information only.

**Note:**

If a fuel injector, spark plug, or ignition coil is replaced for a misfire concern, the failed component **must have** a misfire code (P0301-P0308) related to the misfiring cylinder.

Misfire code P0300 – random/multiple cylinder misfire must have the affected cylinder identified for reimbursement.

**Tip:**

For warranty reimbursement, the Guided Fault Finding log identifying that the issue either changed cylinders during the test, or shows a failed fuel injector internal leakage test, must be available upon request.

Each part replaced must have a corresponding misfire fault on the documented Guided Fault Finding log for reimbursement.

Required Parts and Tools

No special parts required.

No special tools required.

Additional Information

All part and service references provided in this Technical Bulletin are subject to change and/or removal. Always check with your Parts Dept. and Repair Manuals for the latest information.