SI M12 02 10
Engine Electrical Systems

November 2010
Technical Service

This Service Information bulletin supersedes M12 02 10 **dated October 2010.**

NEW designates changes to this revision

SUBJECT
Cooper S with N14 – Diagnosis for Misfire Faults

MODEL
R55, R56, and R57 with the N14 engine

SITUATION
The Service Engine Soon (MIL) lamp is illuminated; customer complains that the engine runs rough (engine cold or warm) with any of the following misfire faults stored in the DME:

- 2771, 2772, 2773, 2775, 2776, 2777, 2779, 277A, 277B, 277D, 277E, 277F – "Combustion misfire, cylinder 1..4", sometimes together with
- 2781, 2782, 2783 – "Combustion misfire, multiple cylinders"

Complaint may be intermittent and difficult to reproduce.

NEW CAUSE
Multiple causes related to electrical and mechanical engine components, or;

Possible clogging of the injector tips causing a disturbance of the fuel spaying pattern or excessive carbon deposits on the intake valves/ports, which result in reduced air flow into the combustion chambers.

NEW CORRECTION
IMPORTANT:

The ISTA/D test plan "B1214_M_Misfire detection" has been significantly improved and modified in the version 2.22, with more corrections and changes planned for the next ISTA/D releases.

The following steps should be used as guidance and a supplement to the ISTA misfire diagnostic test plan:

1. If other fault codes for VANOS, High-pressure Fuel Systems (e.g. HPP FC 2880), injectors, ignition, turbo boost control, etc. are stored in the DME as well as the misfire faults, **it is mandatory to perform the appropriate ISTA/D test plans for the affected component prior to executing the misfire test plan (B1214 M Misfiring detection)**.

   Perform necessary repairs as needed.

2. Conduct basic mechanical engine checks:

- Check the intake track for leaks or restrictions (air filter, collapsed hoses, etc.).
- Check that the crankcase pressure = 38.0 mbar +/-10%, but not more than 4 mbar.
- Check the inlet oil feed pipe to the turbo for possible blockage.
- For the repeat visits for misfire faults (especially when the fault 2B64 "Intake manifold, unmetered air" is stored together with misfire faults) also check the timing chain stretch as per procedure from SI M11 02 07.

Perform necessary repairs as needed.

3. **Check each misfire faults' environmental condition for indication of fuel pressure loss. If the fuel pressure recorded in any of the environmental conditions shows a value less than 4.00 MPa, replace the High-pressure Fuel Pump (HPP).**

   Verify the effectiveness of the repair with a cold start (mandatory for complaints of rough running/misfire faults when cold) after overnight parking.

   Important:

   The N14 High-pressure Fuel Pump replacement requires TeileClearing authorization (N14/N18 Drivability and Fuel System action) via TC PuMA case "N14 HPP".

4. If the fuel pressure recorded in misfire faults under environmental conditions is **equal to or higher than 4 MPa,** perform ISTA/D test plan "B1214_M¬_Misfiring detection".

   In the first step of the Misfire Test Plan, when answering the question: **"If this procedure was interrupted in order to carry out the testing procedures for VANOS, Fuel High-pressure System, should this testing procedure be resumed following a fault tree check?"** select **"NO".**.

5. Follow all the diagnostic steps (e.g., check/swap the ignitions coils and spark plugs) of the test plan. When instructed to perform a compression test, also follow-up with the **leak-down test.**

   Note:

   Certain vehicles, usually with higher mileage (above 30,000 miles), when driven mostly in a city stop & go condition may develop an excessive carbon build-up on the intake valves which may affect engine compression and leak-down. If the leak-down test shows results exceeding substantially standard of 8% (e.g.15-25%), then cylinder head has to be removed, valves/seats checked and valves lapped. In case the leak-down test is below 8%, proceed to the next step. **Perform necessary repairs as needed.**

6. In the next step, answer **"YES"** to question "Is the emission warning light on?"

7. **When instructed by the test plan to "clean tips of fuel injectors"**, perform the in-rail injection cleaning using the approved **"BMW Group Fuel Injection and Induction System Cleaner"**, following the attached procedure. The injection cleaning Application Kit (P/N 82 14 0 429 692) has been shipped via the Automatic Tool Shipment Program to every MINI dealer. Refer to SI

M04 07 07 for complete details. Advise the customer that it is necessary to add one bottle of the BMW Group Fuel System Cleaner Plus, P/N 82 14 0 413 341 (provided free of charge at the time of releasing the vehicle), with either TOP TIER Detergent Gasoline or premium fuel with a minimum octane rating of AKI 91, the next time the vehicle is refueled.

NOTE:

For optimum cleaning, advise the customer to add one bottle every 3,000 miles when refueling. Refer to SI M13 05 06, "BMW Fuel System Cleaner Plus", for a full explanation of the product benefits.

8. Additionally, for the complaints of "lack of power and rough idle", the Misfire Test plan may recommend inspecting the intake valves/ports (with the intake manifold removed) and cleaning excessive carbon deposits, if needed.

   Submit a PuMA case titled **"N14 Intake Valves Carbon Cleaning"** for authorization and the appropriate cleaning procedure.

9. Make sure to complete the "B1214_M_misfire detection" test plan, and to include all diagnostic codes provided by the test module into the warranty claim.

10. After the repairs are completed, perform a function check and clear the fault memory entries and DME adaptation values. Verify the effectiveness of the repair with a cold start after overnight parking.

11. **Important:**

    On vehicles equipped with **manual 6-speed transmissions ONLY**, after completion of the repairs, check the vehicle's integration level. If the integration level is R056-09-12-520 or lower, reprogram the complete vehicle using the current ISTA/P version (target integration level R056-10-03-500 or higher). The new DME calibration software includes optimized injection timing strategy, as well as an increased operating pressure, improving the injector's operation.

    NOTE:

    Currently, **do not conduct the reprogramming step on Cooper S/Clubman S vehicles equipped with the ASIN F21 automatic transmissions**. The updated DME software with drivability improvements will be released in the near future (planned 12/10 with ISTA/P 2.40).

IMPORTANT NOTE:

The in-rail injection cleaning is covered under warranty only in the case of existing drivability problems (misfires with rough running and the SES light illuminated).

Additionally, MINI USA recommends that this service be performed yearly (on a customer-pay basis) on N14 vehicles which currently do not exhibit the negative harmful effects of carbon build-up, to maintain MINI's dynamic performance and maximize fuel economy.

Note: The fluids and tools described in this Service Information bulletin are the only MINI approved items that can used to clean the fuel injection system and combustion chamber. Using

non-approved fluids or tools can lead to premature component failure and will not be covered under Warranty.

NEW **PARTS INFORMATION**

Part Number	Description	Quantity
82 14 0 428 376*	Fuel injection and induction system cleaner concentrate	1
82 14 0 413 341*	BMW Group Fuel System Cleaner Plus	1

NEW **WARRANTY INFORMATION**

Covered under the terms of the MINI New Passenger Car Limited Warranty.

Defect Code:	**13 53 22 48 00**

Labor Operation:	Labor Allowance:	Description:
13 99 000	10 FRU	Cleaning the injectors and the combustion chambers

For Cooper S/Clubman S vehicles with manual 6-speed transmissions ONLY, if reprogramming is required:

Labor Operation:	Labor Allowance:	Description:
00 00 006**	Refer to KSD2	Performing vehicle test
61 00 710	Refer to KSD2	Programming and encoding control units w/o CAS
61 00 720	Refer to KSD2	Programming and encoding control units with CAS

In cases where ISTA requires the replacement of control modules or additional programming because certain control modules failed to program correctly, or just an initialization is required, print out the Measures Plan and/or Final Report and attach these reports to the RO in the vehicle file. This additional work should be claimed under the defect code listed in this bulletin, using the labor operation and labor allowance from the KSD2.

* Reimbursement may be charged to sublet code 4 for 300 ml of the concentrated cleaner (P/N 82 14 0 428 376) and one bottle of Fuel System Cleaner PLUS (P/N 82 14 0 413 341) required to perform this repair. Claiming for more than the amount listed above or claiming outside of sublet code 4 will result in a delayed or denied claim payment.

**Main Work - use this labor operation number when this is the only repair being performed, or if this is the main repair when performed along with other repairs at the same time. If this is not the main repair, refer to KSD for the associated (+) labor operation code.

ATTACHMENTS

view PDF attachment

M120210_N14_Direct_Injection_&_Combustion_Chamber_Cleaning_Procedure.