SB-10034867-5414

SI M12 02 10
Engine Electrical Systems

June 2011
Technical Service

This Service Information bulletin supersedes SI M12 02 10 **dated May 2011.**

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 and/or the 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"

On rare occasions, the Service Engine Soon lamp may not be illuminated (with misfire faults still stored in the DME) when the vehicle is brought to the workshop.

CAUSE
Multiple causes related to electrical and mechanical engine components, or poor fuel quality in combination with unfavorable driving behavior (low loads and short driving distances). This condition may lead to possible clogging of the injector tips, causing a disturbance of the fuel spaying pattern or excessive carbon deposits on the intake valves/ports, resulting in reduced air flow into the combustion chambers.

CORRECTION
IMPORTANT:

The ISTA/D test plan "B1214_M_Misfire detection" has been modified in version 2.23.6, with more corrections and improvements planned for the future 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.

   IMPORTANT NOTE:

It was brought to BMW's attention via the Diagnostic Feedback entries that the VANOS test plan B1214_M_VME_G_VANOS is not working correctly in ISTA/D 2.23/2.24. Specifically, the actual and the target values of VANOS position are incorrect. The results of the test plan may be misleading and should be ignored. This situation will to be addressed in version 2.26, planned for release in July 2011.

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 (follow SI M11 03 08).
   - When the fault code 2B64 "Intake manifold, unmetered air" is stored together with misfire faults, and/or excessive engine rattle noise may be detected during cold startup), also check the timing chain stretch as per the procedure from SI M11 02 07.

     Perform necessary repairs as needed.

3. **IMPORTANT HINT: For vehicles with combustion misfire faults stored in Multiple Cylinders:**

   Check the cylinder-specific misfire fault's environmental conditions for indication of fuel pressure loss. A cylinder-specific misfire fault states in the description of the fault the cylinder in which the fault occurred. Disregard the environmental conditions stated on FC 2778 "Misfiring, several cylinders", since these environmental conditions are incorrectly stated.

   If the fuel pressure recorded in cylinder-specific misfire fault environmental conditions shows a value less than 4.00 MPa, replace the High-pressure Fuel Pump (HPP) and clear the DME adaptation values. Verify the effectiveness of the repair with a cold start (mandatory for complaints of rough running/misfire faults when cold) after overnight parking.

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 ignition coils and spark plugs) of the test plan.

   Note:

   It is generally **not recommended to perform a compression test at this early stage of diagnosis**, as it is currently stated in the misfire test plan.

The compression and leak-down test should be performed when diagnosing repeat drivability-related visits which were not corrected by previous repairs. Certain vehicles, usually with higher mileage (above 35,000 miles), when driven mostly in city stop-and-go conditions, may develop an excessive carbon build-up on the intake valves. This may affect engine compression and leak-down. If the leak-down test shows results substantially exceeding the standard of 8% (e.g.,15-25%), the cylinder head has to be removed, the valves/seats checked and the valves lapped.

Perform necessary repairs as needed.

6. IMPORTANT: Rough running complaint where NO “Service Engine Soon” lamp is illuminated and no misfire fault codes are stored in DME.

   In a situation where the customer may complaint about a rough running condition, but the “Service Engine Soon” lamp is **NOT** illuminated, and there are **NO** misfire fault codes stored in the DME, the cause of this complaint may not be related to the condition described in this bulletin.

   If no defect is found, recommend that the customer purchase and add one bottle of BMW Group Fuel System Plus (P/N 82 14 0 413 341) to the vehicle’s fuel tank (during the next refueling) for cleaning of the injection system.

   NEW If no defect is found, recommend that the customer purchase and add one bottle of MINI CRUD-B-GONE Fuel System Plus (P/N 82 14 2 186 158) to the vehicle’s fuel tank (during the next refueling) for cleaning of the injection system.

   NEW Explain to the customer that in order to help maintain optimum engine cleaning performance, MINI USA recommends routinely adding one bottle of the MINI CRUD-B-GONE Fuel System Cleaner Plus every 3,000 miles when refueling, preferably with TOP TIER Detergent Gasoline that provides a premium level of detergent concentration and qualities. Adding the MINI CRUD-B-GONE Fuel System Cleaner Plus, as recommended, is not a warranty matter.

   NEW Also, the MINI CRUD-B-GONE Fuel System Cleaner Plus is the only MINI approved fuel system cleaner for cleaning the fuel injection system and combustion chambers. Using non-approved fluid or tools can lead to premature component failure, and will not be covered under warranty.

7. If the “Service Engine Soon” lamp is illuminated or the misfire fault(s) is stored in the DME, proceed to the next step.

8. On vehicles with mileage **below 35,000 miles,** OR if the “Service Engine Soon” (MIL) lamp is NOT currently illuminated with misfire faults stored (regardless of mileage), and if the root cause of misfire/rough running has NOT been identified up to this point:

   - At this point, do **NOT** follow the ISTA test plan instructions to remove the intake manifold and inspect the intake valves/ports.
   - Instead, **terminate the current ISTA/D diagnostic session.**
   - Start a new diagnostic session. This time, perform the vehicle test **with the engine running**. Make sure that the FASTA data is transmitted.

- **Submit a TeileClearing case to N14 DrivabilityTC Action titled "N14 Rough running /misfire".**

9. For vehicles with mileage **above 35,000 miles**, follow the steps below:

10. In the next step of the misfire test plan, answer "**YES**" to the question, "Is the emission warning light on?" in order not to terminate the test plan

11. Continue with the next diagnostic steps. If the root cause was not identified after performing all recommended procedures, follow the instruction:

    "Restart this testing procedure (Misfire Test Plan) and skip the previous steps in the process".

12. Start test plan "B1214_M_Misfire 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 "**YES**". Checks that have already been carried out should be skipped.

    The following step provides you with a visual evaluation of the intake carbon build-up (intake valve deposits from level 1 to 9). To view the comparison table, answer "**NO**" to the question: "The following value was measured for the additive fuel mixture adaptation: xx%. Is the value greater that 2%?" As an alternative, use the "N14_Deposits Chart" attached to this service bulletin.

13. Remove the intake manifold and visually inspect the intake valves and ports for carbon deposits.

    If the amount of carbon **resembles or exceeds** that from example picture **5** (example illustrations are included in the test plan and are also attached to this bulletin), clean the excessive carbon deposits. To clean intake carbon deposits, use BMW Group Carbon Blaster P/N 81 29 2 208 034, shipped to your dealership via the Automatic Tool Shipment Program (SI M04 03 11). Follow the Operating Manual (attached to the SI M04 03 11) for a detailed description of the cleaning procedure

    NEW After the carbon cleaning procedure is completed, add one bottle of MINI CRUD-B-GONE Fuel System Cleaner Plus, P/N 82 14 2 186 158, to the vehicle's fuel tank for additional cleaning of the injection system.

    NOTE:

    NEW For prolonged and continuous fuel system cleaning effects, advise the customer to add one bottle every 3,000 miles when refueling. Refer to SI M13 05 06, "MINI CRUD-B-GONE Fuel System Cleaner Plus", for a full explanation of the product benefits.

14. NEW If the amount of carbon **resembles or is below** that from example picture 4 (example illustrations are included in the test plan and are attached to this bulletin), 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 MINI CRUD-B-GONE Fuel System Cleaner Plus, P/N 82 14 2 186 158 (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:

NEW For prolonged and continuous fuel system cleaning effects, advise the customer to add one bottle every 3,000 miles when refueling. Refer to SI M13 05 06, “MINI CRUD-B-GONE Fuel System Cleaner Plus”, for a full explanation of the product benefits.

15. 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.**

    Important:

    After completion of the repairs, check the vehicle’s integration level. If the integration level is:

    R056-09-12-520 or lower for 6-speed manual transmission-equipped vehicles, or

    R056-10-11-510 or lower for F21 ASIN automatic transmission-equipped vehicles,

    reprogram the complete vehicle using the current ISTA/P version (ISTA/P 2.40 or higher; target integration level R056-10-11-511 or higher). The new DME calibration software includes optimized injection timing strategy, as well as an increased operating pressure, improving the injector’s operation.

    IMPORTANT NOTE:

The in-rail injection cleaning and/or intake ports walnut shell blasting is covered under warranty only if authorized by TeileClearing for vehicles with mileage below 35,000 miles, or in the case of vehicles above 35,000 miles for existing drivability problems (misfires with rough running and the Service Engine Soon lamp illuminated).

Additionally, MINI USA recommends that the in-rail injection cleaning 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 be 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 WARRANTY INFORMATION

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

For vehicles below 35,000 miles

As stated in step # 8 in the **CORRECTION** section of this bulletin.

- On vehicles with mileage **below 35,000 miles**, or
- If the Service Engine Soon (MIL) lamp is NOT currently illuminated with misfire faults stored in the DME (regardless of mileage), and
- If the root cause of misfire/rough running has NOT been identified up to this point.

The repair procedure will be described by the TeileClearing Group. And since these repair procedures may vary depending upon the advice of the TeileClearing Group, you will need to refer directly to the KSD2 to code the repair as performed.

For vehicles above 35,000 miles

Depending on the repair procedure required, claim one of the appropriate repair packages listed below.

Defect Code:	**11 34 00 76 00**	
Labor Operation:	**Labor Allowance:**	**Description:**
00 00 006	Refer to KSD2	Performing vehicle test
11 61 550	Refer to KSD2	Remove and install intake manifold (main labor code)
11 99 000	7 FRU	Clean carbon from intake valves/ports **(Carbon deposits at Level 5 or higher)**
Sublet allowance:	$27.00	Reimbursement must be charged to sublet code #4 for the cleaning media (20/30 SAE or 0.45-0.80 mm walnut shells sourced locally) and one bottle of MINI CRUD-B-GONE System Cleaner PLUS (P/N 82 14 2 186 158) 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.

Or

Labor Operation:	**Labor Allowance:**	**Description:**
00 00 006	Refer to KSD2	Performing vehicle test
11 61 050	Refer to KSD2	Remove and install intake manifold (main labor code)
13 99 000	10 FRU	Cleaning the injectors and the combustion chambers **(Carbon deposits at Level 4 or lower)**

Sublet allowance:	$26.00	Reimbursement must be charged to sublet code #4 for 300 ml of the concentrated cleaner (P/N 82 14 0 428 376) and one bottle of MINI CRUD-B-GONE Fuel System Cleaner PLUS (P/N 82 14 2 186 158) 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.

Additionally, for Cooper S/Clubman S vehicles, reprogramming if required, may be claimed in conjunction with either repair scenario listed above:

Labor Operation:	**Labor Allowance:**	**Description:**
61 00 710	Refer to KSD2	Programming and encoding control units w/o CAS
or,		
61 00 720	Refer to KSD2	Programming and encoding control units with CAS
Refer to KSD2	Refer to KSD2	Concluding work (initializations) as described in the ISTA/P final report

Labor operation code 00 00 006 is a main labor operation, if you are using a main labor code for another repair; use the plus code labor operation 00 00 556 instead.

Even though labor operation code 11 99 000 ends in “000”; it has a designated FRU allowance, and as described above, it is not considered a main labor operation.

Even though labor operation code 13 99 000 ends in “000”; it has a designated FRU allowance, and as described above, it is not considered a main labor operation.

Only one main labor operation can be claimed per repair visit. All other labor operations on the same line or other lines must be claimed using plus code labor operations

If a control module fails to program correctly, or initialization is required, work through the Measures Plan and/or Final Report. Claim this additional work under the defect code listed in this bulletin, referring to the KSD2 for the labor operation code and labor allowance.

Please refer to the Warranty Policy and Procedures Manual regarding proper support, documentation and archiving required for claims, as applicable.

ATTACHMENTS

view PDF attachment **M120210_N14_Deposits**.
view PDF attachment **M120210_N14_Direct_Injection_and_Combustion_Chamber_Cleaning_Procedure**.
view PDF attachment **M120210_BMW_Group_Carbon_Blaster_Operating_Manual**.

view PDF attachment **M120210_BMW_Group_Carbon_Blaster_Operating_Manual_N14**.
view PDF attachment **M120210_Service_Instruction**.

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