SI M12 02 10
Engine Electrical Systems

December 2012
Technical Service

This Service Information bulletin supersedes SI M12 02 10 **dated November 2012.**

NEW designates changes to this revision

SUBJECT
Cooper S with N14: Diagnosis for Misfire Faults

MODEL
R55, R56, R57, R58 and R59 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 spraying pattern or excessive carbon deposits on the intake valves/ports, resulting in reduced air flow into the combustion chambers.

CORRECTION
Teile Clearing Authorization is no longer required for this repair as of November 6th 2012.

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 MISFIRE2 Misfiring detection)**.

   Perform necessary repairs as needed.

2. Conduct basic engine diagnostic checks:

   - Check coils, plugs, relevant electrical connections, etc.

   - 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).

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 in FC 2778, "Misfiring, several cylinders," since these environmental conditions are incorrectly stated.

   If the fuel pressure recorded in any cylinder-specific misfire fault's environmental conditions show 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_MISFIRE2_Misfiring detection.**"

   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 buildup 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.

5. **IMPORTANT:** Rough running complaint where NO "Service Engine Soon" lamp is illuminated and no misfire fault codes are stored in the DME:

   In a situation where the customer may complain 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 MINI Fuel System Cleaner Plus (P/N 82 14 2 186 158) to the vehicle's fuel tank (during the next refueling) for cleaning of the injection system.

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

   Also, the MINI 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.

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

7. Follow the test plan using ISTA/D test plan “B1214_M_Misfire2 - Misfire detection,” supplied in version 2.33.0 or higher, after reviewing the troubleshooting hints described above in steps 1-5.

8. Only clean the excessive carbon deposits if instructed by the test plan. 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 SI M04 03 11) for a detailed description of the cleaning procedure.

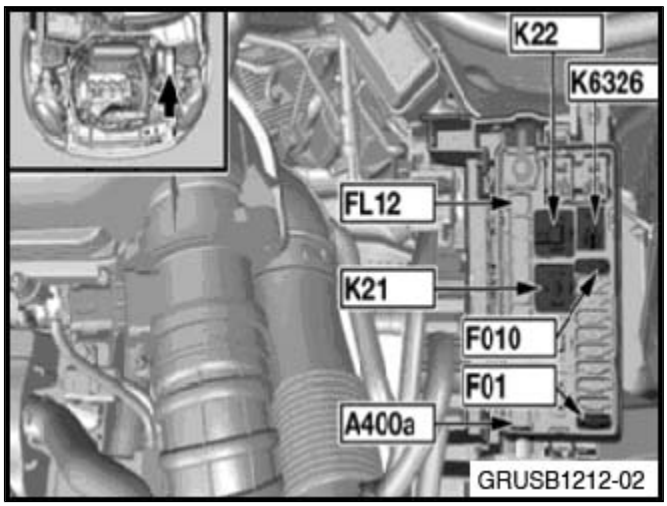
9. NEW When the following question is encountered in the test plan:

NEW “Was the procedure called up for the first time, or were one or both of the following measures performed immediately (up to approx. 5000 km) beforehand? Intake ports cleaned or timing adjusted,” select **“Procedure is called up for the first time”** if this is the initial diagnosis of the customer’s complaint.

NEW or

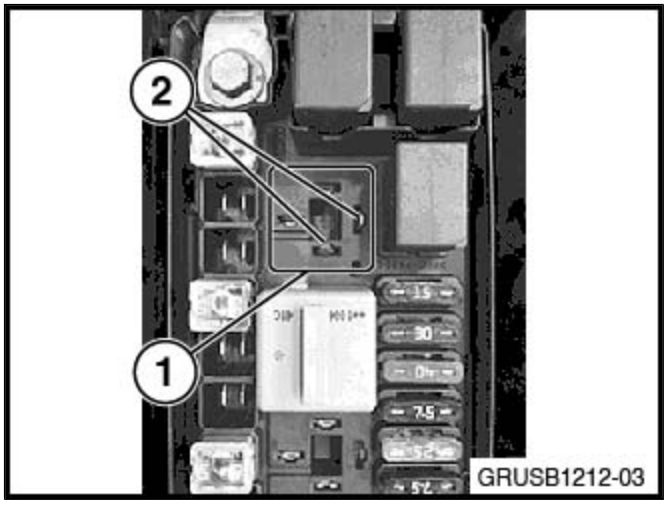
NEW Select **“Procedure is called up after performing one of these measures”** if this is a verification test after repairs have been conducted, i.e., setting the timing or cleaning the valves.

After the cleaning procedure has been completed, the test plan will need to be conducted once more before releasing the vehicle. It may be necessary to cool the engine before continuing in the test plan, refer to the illustrations below to properly cool the engine.



Locate the front power distribution box (A400a)

Connect battery charger
Remove electric fan relay K22 (1)
Insert Special Tool P/N 61 31 1 379 817 to activate the cooling fan. Make sure that the contacts bridge the two



terminals shown in the illustration (2). The tool will activate the fan by connecting terminal 87 and 30 of the relay connector.
For addtional information refer to SI M04 14 12.
The cooling of the engine requires aproximatly 2 hours.

NEW After the engine is cooled, resume the test plan. When the following question is encountered in the test plan:

NEW "Was the procedure called up for the first time, or were one or both of the following measures performed immediately (up to approx. 5000 km) beforehand? Intake ports cleaned or timing adjusted," select **"Procedure is called up after performing one of these measures"** if this is a verification test after repairs have been conducted, i.e., setting the timing or cleaning the valves.

After the carbon cleaning procedure is completed, add one bottle of MINI 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:

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 Fuel System Cleaner Plus," for a full explanation of the product benefits.

10. If the test plan advises that the carbon on the valves is not excessive but does recommend performing an injection cleaning, only use the approved in-rail injection cleaning kit. This kit utilizes the approved **"BMW Group Fuel Injection and Induction System Cleaner."** Refer to 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 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:

    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 Fuel System Cleaner Plus," for a full explanation of the product benefits.

    Important:

    After completion of the repairs, reprogram the complete vehicle using the current ISTA/P version (ISTA/P 2.47.1 or higher; target integration level R056-12-07-503 or higher). The new DME calibration software

includes an optimized injection timing strategy, as well as an increased operating pressure, improving the injector's operation.

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 buildup, 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.

WARRANTY INFORMATION

Covered under the terms of the MINI New Passenger Car Limited Warranty or the MINI NEXT Certified Pre-Owned Limited Warranty.

Specific eligible repairs **may** also be covered by the terms of the Federal, State or MINI Emissions Warranty.

To determine if any **applicable** Federal, State or MINI Emissions Warranty coverage applies prior to performing repairs, please see SI M01 03 11 for "Emissions Warranty Coverage" and refer to the "Glossary of Emission Coverage" attachment for more information.

The MINI NEXT Certified Pre-Owned Limited Warranty applies to MINI NEXT vehicles that are still within the MINI NEXT coverage period, but beyond Emissions Warranty coverage that applies.

Correction "Step 5" is excluded from all coverage options listed above.

Defect Code:	**11 34 00 76 00**	
Labor Operation:	**Labor Allowance:**	Description:
00 00 006	Refer to KSD2	Performing vehicle test (Main Work)
and if necessary, also		
61 21 528	Refer to KSD2	Charging battery
and		
11 12 670	NEW Refer to KSD2	Remove and install intake manifold and clean carbon from intake valves/ports only when the test plan advises cleaning. (Plus work)
Sublet Code 4:	See sublet reimbursement calculation item # 1, below	Reimbursement must be charged to sublet code #4 for the cleaning media (Bulk quantity of 20/30 SAE or 0.45-0.80 mm walnut shells, sourced locally) and one bottle of MINI Fuel System Cleaner PLUS (P/N 82 14 2 186 158) required to perform this repair. Do not use this part number for claim submission. Claiming for more than the applicable amount 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 (Main work)
and if necessary, also		
61 21 528	Refer to KSD2	Charging battery
and		
13 31 573	Refer to KSD2	Clean the injectors and the combustion chambers only when the test plan advises cleaning. (Plus work)
Sublet Code 4:	See sublet reimbursement calculation item # 2, below	Reimbursement must be charged to sublet code #4 for 300 ml of the concentrated cleaner (Bulk quantity reference P/N 82 14 0 428 376) and one bottle of MINI Fuel System Cleaner PLUS (P/N 82 14 2 186 158) required to perform this repair. Do not use this part numbers for claim submission. Claiming for more than the applicable sublet amount or claiming outside of sublet code 4 will result in a delayed or denied claim payment.

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.

Refer to KSD2 for the corresponding flat rate unit (FRU) allowance. Enter the Chassis Number, which consists of the last 7 digits of the Vehicle Identification Number (VIN). Click on the “Search” button, and then enter the applicable flat rate labor operation in the FR code field.

Note: When the ISTA system message displays: Battery voltage only “XX.XX” V. Please connect charger. Please note the displayed battery voltage reading in the repair order comments section.

FR Descriptions

Labor operation code 11 12 670 is a Plus labor operation that includes the following:

- Disconnecting and connecting battery negative cable
- Remove air filter housing
- Remove intake manifold
- Turn engine to close appropriate valves for cleaning

- Cover any open ports
- Prepare the Carbon Blaster
- Clean the intake ports
- Fit a new intake manifold gasket
- Install the intake manifold
- Install the air filter housing

Labor operation code 13 31 573 is a Plus labor operation that includes the following:

- This labor operation is for the repair described in the attachment “N14 Direct Injection and Combustion Chamber Cleaning Procedure.

Additionally, for Cooper S/Clubman S vehicles, reprogramming control units, if required, may be claimed in conjunction with one of the repair scenarios 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

Materials - Sublet Reimbursement Calculation (Sublet Code 4)

1. Walnut shells (Bulk quantity, sourced locally) at $20.00 and PN 82 14 2 186 158 (quantity one) at dealer net plus handling. Enter these materials as one sublet total and itemized the amount in the claim comment section. Do not use this part number for claim submission.

2. PN 82 14 0 428 376 (partial container quantity of 300 ml) and PN 82 14 2 186 158 (quantity one), both at dealer net plus handling. Enter these materials as one sublet total and itemized the amount in the claim comment section. Do not use this part numbers for claim submission.

   Note: PN 82 14 0 428 376 (Bulk quantity) full container size is 16 fluid ounces or 473 ml

Cooper S/Clubman S Vehicles Requiring Reprogramming

If a control module fails to program correctly or initializations are required, the additional work must be claimed with separate labor operations under the defect code listed above, refer to KSD2.

Other Repairs

When applicable, if performing other mandatory ISTA diagnostics and their related test plans results with **eligible and covered work,** claim this work with the applicable defect code and labor operations listed in KSD2.

Note: Please follow any TeileClearing (TC) or Diagcode (DC) requirements that may apply to this additional work.

ATTACHMENTS

view PDF attachment **M120210_N14_Direct_Injection_and_Combustion_Chamber_Cleaning_Procedure**.
view PDF attachment **M120210_BMW_Group_Carbon_Blaster_N14**.
view PDF attachment **M120210_Service_Instruction**.