

13 02 96 (084)

Leaded fuel in vehicles with catalytic converters

All models since MY 86

Situation:

Due to the nature of unrestricted global trade, vehicles with catalytic converters fitted can find their way into markets in which the BMW Group only sells vehicles without catalytic converters/"catalytic converter ready" vehicles due to the local exhaust gas legislation or limited availability of unleaded petrol.

The following measures are required in order for a BMW vehicle with a catalytic converter to run on leaded petrol (depending on engine type).

Affected vehicles:

All vehicles since model year 86 manufactured as a catalytic converter version (not "catalytic converter ready" optional equipment) - excluding compressed natural gas vehicles

Measure:

Conversion of vehicle from "catalytic converter version" to "catalytic converter ready" version or "Gulf States/Tropics" version.

Caution, two restrictions must be observed:

1. Natural-gas powered vehicles (compressed natural gas vehicles) cannot be converted

Natural-gas powered vehicles cannot be converted as no "catalytic converter ready" variant is available. If used without prior conversion, the DME adapts the substitute values that trigger a fault message for CNG components, which then causes the compressed natural gas system to switch off. The vehicle can then no longer be driven in CNG mode.

2. US models only partially convertible

- a) US models with M50 or M52 engine and automatic transmission cannot be converted.
- b) For other US models, tyres with the same speed rating as the respective ECE model must be fitted as per the list below.

Reason: When recoding US models to run on leaded fuel, either the ECE or Gulf States version of the "catalytic converter ready" variant must be used due to the lack of a US "catalytic converter ready" variant. **This will delete any top speed limitation stored in the DME**, which means that the vehicle runs faster after conversion without being type-approved or technically set up for this function.

Since model year 90, all versions of the following US models have been subject to maximum speed restrictions:

187 km/h limit: From 01/94: E36 318i, E36 318is, E36 318ti, E36 Z3 1.9

196 km/h limit: E30 325i, E30 325ix

206 km/h limit: E34 525i, E34 530i, E34 540i, E36 320i, E36 325i, E36 325is, E36 328i, E36 328is, E38 740i, E38 750i, E39 528i, E39 540i; until 12/93: E36 318i, E36 318is

220 km/h limit: E36 M3

These US models have also been designed to operate with the maximum speed restriction in place:- All-season tyres, H tyres, T tyres, depending on the model- Transmission ratio (4-speed automatic), whose propeller shaft speed reaches its maximum at 206 km/h. On account of the restrictions outlined above, proceed as follows.

Procedure:

a) General measures:

1. The catalytic converter system must always be replaced by a suitable front silencer without a catalytic converter. This will prevent a foul odour caused by the hydrogen sulphide that is generated as a result of the higher sulphur content in leaded fuel ("smell of rotten eggs").

Note: The method practised up to now (for cost reasons), in which the catalytic converter and oxygen sensor are left fitted in the vehicle, must no longer be used. This is due to vehicle performance problems that arise either straight after conversion or at a later date due to adaptive engine control.

2. Remove the unleaded reduction sleeve from the tank filler neck. If the reduction sleeve is permanently fitted, contact the Parts Department and order the

PN 16 12 1 150 748

reduction funnel:

PN 16 12 1 150 747

with holder:

From the E36 onwards, the entire tank filler pipe can be replaced with the "catalytic converter ready" version.

3. Disconnect the electrical plug connection for the oxygen sensor and tie back the sensor connector on the engine wiring harness. Apply waterproof insulation to the connector.
4. Remove the oxygen sensor heating relay (if fitted as standard).
5. Set idle CO according to repair instructions.
6. For environmental reasons, the tank ventilation function fitted in all BMW vehicles since 09/88 (using the active carbon canister) should be left fitted in all vehicles - including "non-catalytic converter vehicles".

B. Engine-specific measures:

The respective encoding/programming measures must be carried out using the latest "Programming" software (on CD-ROM and loaded using DIS or on floppy disk and

loaded using the MoDiC station onto the MoDiC). The correct path to be used is specified for each engine-specific measure.

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|--|---|
| 1. M20 B20/B25/B27 (since 09/85)
M30 B30/B35M70 | Leaded fuel, min. RON 91 / min.
MON 82.5 |
|--|---|
- Recode DME control unit M 1.x to "catalytic converter ready" or "Gulf States/Tropics" (path: "DME version code", menu item "Recode") to ensure continued tank ventilation using the carbon canister (AKF).

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|----------------|---|
| 2. M40 B16/B18 | Leaded fuel, min. RON 91 / min.
MON 82.5 |
| M42 B18 | Leaded fuel, min. RON 95 / min.
MON 85 |

- Recode DME control unit M 1.x to "catalytic converter ready" or "Gulf States/Tropics" (path: "DME version code", menu item "Recode") to ensure continued tank ventilation using the carbon canister (AKF).
- Pull off the electrical plug connection from the tank vent valve (TE valve) and apply waterproof insulation to the connector at the engine wiring harness end (TE valve is open and de-energised).
- M40/M42 in the E30: Plug together the single-pin plug connection on the engine wiring harness in the cable channel on the engine compartment bulkhead to make a connection with the CO potentiometer in the air-flow sensor (LMM).
- M40 in the E36, until production date 06/91: Plug together the single-pin plug connection at the DME connector output in the electronics box (LMM as standard with CO potentiometer in both catalytic converter and catalytic converter ready versions).
- M40/M42 in the E36, production date 07/91 to 09/92: Plug together the single-pin plug connection at the DME connector output in the electronics box. Exchange LMM for LMM with CO potentiometer.

Refer to SI 13 02 94 (796)

- M40/M42 in the E34 (M40 only) and E36 from production date 10/92: Exchange LMM for LMM with CO potentiometer.

Refer to SI 13 02 94 (796)

3. M43 B16/B18 until 03/96 **Leaded fuel, min. RON 91 / min. MON 82.5 (knock control)**

- Recode DME control unit M1.x to "catalytic converter ready" or "Gulf States/Tropics" (path: "DME version code", menu item "Recode") to ensure continued tank ventilation using the carbon canister (AKF).
- Exchange LMM for LMM with CO potentiometer.

Refer to SI 13 02 94 (796)

4. M50 until 08/92 (without variable camshaft timing control) **Leaded fuel, min. RON 95 / min. MON 85**

- Replace control unit with an automatic transmission basic control unit
 - Use MoDiC to program to "catalytic converter ready" version or "Gulf States/Tropics", path "DME programming" **Caution:** Carry out programming in "Manual entry" mode only, i.e. when the query "Is the faulty control unit still installed in the vehicle? Y/N" appears under the "Identify basic control unit" path, answer with "No". Afterwards the relevant "Basic control unit part number", vehicle identification number and the "Programmed control unit for catalytic converter ready part number" or "Gulf States/Tropics" can be entered.
- The basic control unit part number and programmed control unit part number are listed in the Electronic Parts Catalogue.
- Alternative for leaded fuel, RON 91 / MON 82.5: Program automatic transmission basic control unit using MoDiC to MNV version (low-compression engine), as well as "catalytic converter ready" or "Gulf States/Tropics").

5. M50 since 09/92 (with variable camshaft timing control) M60M73 **Leaded fuel, min. RON 91 / min. MON 82.5 (knock control)**

- Replace control unit with an automatic transmission basic control unit
- Use MoDiC to program to "catalytic converter ready" version or "Gulf States/Tropics", path "DME programming" **Caution:** Carry out programming in "Manual entry" mode only, i.e. when the query "Is the faulty control unit still installed in the vehicle? Y/N" appears under the "Identify basic control unit" path, answer with "No". Afterwards the relevant "Basic control unit part number", vehicle identification number and the "Programmed control unit for catalytic converter ready part number" or "Gulf States/Tropics" can be entered.

The basic control unit part number and programmed control unit part number are listed in the Electronic Parts Catalogue.

**Leaded fuel,min. RON 91 / min. MON
82.5 (knock control)**

6. M43 with ASC since
03/96M44M52M62S50
B32/USS50 B32

- No new control unit required due to flash technology
 - Use MoDiC to program to "catalytic converter ready" version or "Gulf States/Tropics", path "DME programming"**Caution:**Carry out programming in "Manual entry" mode only, i.e. when the query "Is the faulty control unit still installed in the vehicle? Y/N" appears under the "Identify basic control unit" path, answer with "No". Afterwards the relevant "Basic control unit part number", vehicle identification number and the "Programmed control unit for catalytic converter ready part number" or "Gulf States/Tropics" can be entered.
- "Basic control unit part number" and "Programmed control unit part number" are listed in the Electronic Parts Catalogue.

**Leaded fuel, min. RON 95 / min.
MON 85 (knock control)**

7. S38 B36S70 B56S70/2

- Recode DME control unit M 1.x to "catalytic converter ready" or "Gulf States/Tropics" (path: "DME version code", menu item "Recode") to ensure continued tank ventilation using the carbon canister (AKF).

**Leaded fuel, min. RON 95 / min.
MON 85 (knock control)**

8. S38 B38

Leaded fuel, min. RON 91 / min.
MON 82.5 (knock control)

S50 B30

- Replace control unit with an automatic transmission basic control unit
- Use MoDiC to program to "catalytic converter ready" version or "Gulf States/Tropics", path "DME programming"**Caution:**Carry out programming in "Manual entry" mode only, i.e. when the query "Is the faulty control unit still installed in the vehicle? Y/N" appears under the "Identify basic control unit" path, answer with "No". Afterwards the relevant "Basic control unit part number", vehicle identification number and the "Programmed control unit for catalytic converter ready part number" or "Gulf States/Tropics" can be entered.

The basic control unit part number and programmed control unit part number are listed in the Electronic Parts Catalogue.

In accordance with the warranty conditions currently valid, reimbursement for this subsequent conversion cannot be claimed from BMW AG under warranty/goodwill.