Multi-functional steering wheel (MFL) / Cruise control (GRA) retrofit kit
Retrofit kit identical to standard equipment for BMW 3 Series Coupé, touring, Saloon from 6/00 and Convertible, compact from start of series (E46/2/3/4/5/C)

The installation time is approx. 1 hour, but this may vary depending on the condition of the car and the equipment in it.

Retrofit/Installation kit No. 65 71 0 021 159
65 71 0 026 223
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**Important information**

The retrofit kit is for use within the BMW dealership organisation only.

**Installation information**

All work is shown using a left-hand drive vehicle. On RHD cars some work must be completed the opposite way round.

**Target group**

The target group for these installation instructions is specialist personnel trained on BMW cars with specialist knowledge of vehicle electrical systems.

**Work:**

All servicing, repair and installation work on BMW cars is completed at your own risk.

All work must be completed using the latest BMW repair manuals and circuit diagrams in a rational order using the prescribed tools (special tools) and observing current health and safety regulations.

**Special tools required**

Torque wrench  
Folding leg (00 9 321)  
Crimping pliers (61 9 040)
## 1. Preparations

<table>
<thead>
<tr>
<th>TIS instruction No.</th>
<th>Refer to the safety instructions for handling components of the airbag system.</th>
</tr>
</thead>
<tbody>
<tr>
<td>32 34 ...</td>
<td></td>
</tr>
</tbody>
</table>

Conduct a brief test

Disconnect the battery 12 00 ...

### The following components must be removed first of all:

<table>
<thead>
<tr>
<th>Component</th>
<th>TIS instruction No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airbag unit</td>
<td>32 34 020</td>
</tr>
<tr>
<td>Steering wheel</td>
<td>32 33 000</td>
</tr>
<tr>
<td>Top steering column trim</td>
<td>32 31 020</td>
</tr>
<tr>
<td>Release the bottom steering wheel trim</td>
<td>32 31 003</td>
</tr>
<tr>
<td>Glove compartment</td>
<td>51 16 350</td>
</tr>
<tr>
<td>Pedal trim</td>
<td>51 45 185</td>
</tr>
<tr>
<td>Light switch unit</td>
<td>61 31 033</td>
</tr>
<tr>
<td>Electrics box cover</td>
<td></td>
</tr>
</tbody>
</table>
2. **MFL/GRA wiring harness connection diagram**

<table>
<thead>
<tr>
<th>Branch</th>
<th>Description</th>
<th>Signal</th>
<th>Cable colour / Cross-section</th>
<th>Connection location in the car</th>
<th>Abbreviation / Slot</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Socket contact</td>
<td>DME/DDE</td>
<td>BL/SW 0.35 mm²</td>
<td>On the steering column switch mounting 10-pin plug GN</td>
<td>X10170 PIN 8</td>
</tr>
<tr>
<td>A2</td>
<td>Socket contact</td>
<td>K bus</td>
<td>WS/RT/GE 0.35 mm²</td>
<td>On the steering column switch mounting 10-pin plug GN</td>
<td>X10170 PIN 9</td>
</tr>
<tr>
<td>A3</td>
<td>Socket contact</td>
<td>Terminal R</td>
<td>VI/GE 0.5 mm²</td>
<td>On the steering column switch mounting 10-pin plug GN</td>
<td>X10170 PIN 10</td>
</tr>
<tr>
<td>A4</td>
<td>Twin-lead terminal</td>
<td>Terminal R</td>
<td>VI/GE 0.5 mm²</td>
<td>On the light switch unit SW 54-pin plug</td>
<td>X12 PIN 27</td>
</tr>
<tr>
<td>A5</td>
<td>Twin-lead terminal</td>
<td>K bus</td>
<td>WS/RT/GE 0.35 mm²</td>
<td>On the light switch unit SW 54-pin plug</td>
<td>X12 PIN 21</td>
</tr>
<tr>
<td>A6</td>
<td>Socket contact</td>
<td>DME/DDE</td>
<td>BL/SW 0.35 mm²</td>
<td><strong>M47 engine before 9/01 only and all N42, M54 and M57 engines</strong>&lt;br&gt;On the DME/DDE control module SW 40-pin plug</td>
<td>X60004 PIN 27</td>
</tr>
<tr>
<td>A7</td>
<td>Socket contact</td>
<td>DDE</td>
<td>WS 0.35 mm²</td>
<td><strong>M47TÜ engine after 9/01 only</strong>&lt;br&gt;To DDE control module SW 58-pin plug</td>
<td>X60002 PIN 37</td>
</tr>
<tr>
<td>A8</td>
<td>Cable branch</td>
<td>DDE</td>
<td>WS 0.35 mm²</td>
<td><strong>M47TÜ engine after 9/01 only</strong>&lt;br&gt;With butt-joint connector to branch A6</td>
<td>---</td>
</tr>
</tbody>
</table>
3. Installation and cabling diagram

Legend

1. Steering column switch mounting
2. Multi-functional steering wheel
3. Light switch unit
4. Electrics box
4. To install and connect the MFL/GRA retrofit wiring harness

Connect branches A1 - A3 as follows to plug X10170:

- Branch A1, BL/SW cable, in PIN 8
- Branch A2, WS/RT/GE cable, in PIN 9
- Branch A3, VI/GE cable, in PIN 10

Assemble plug X10170 again and reconnect it to the switch mounting (1).

Remove the cable insulation (1) over a length of approx. 50 mm.

Cut the VI/GE (PIN 27) and WS/RT/GE (PIN 21) cables from plug X12 approx. 40 mm behind the plug X12.

Fit the ends of the cables with a socket/pin contact and insulation casing (1).

Lay branches A4 - A5 to plug X12 and connect to the same colours on the new connections.
4. To install and connect the MFL/GRA retrofit wiring harness

Secure the plug connectors to the wiring harness using cable ties (1).

- On RHD cars the tied back cable on branch A6 must be released. Branch A6 must be laid through the corrugated tube behind the heating/air conditioning unit to the left-hand side of the car and from there into the electrics box. Lay branch A6 through the cable passage into the electrics box.

Cars with M47 engines before 9/01 only and all N42, M54 and M57 engines

Disconnect the black 40-pin plug X60004 from the DME/DDE control module and release them.
Connect branch A6 BL/SW cable, to PIN 27 in plug X60004.
Reconnect plug X60004 to the DME/DDE control module.

Cars with M47TÜ engine after 9/01 only

Cut the socket contact off branch A6.
Connect branch A8 to the open cable end on branch A6 using a butt-joint connector (1) and shrink hose (2).
Disconnect the black 58-pin plug X60002 from the DDE control module and release it.
Connect branch A7 to PIN 37 in plug X60002.
Reconnect plug X60002 to the DDE control module.
5. To modify a 3-spoke sport steering wheel

Unscrew the Torx bolts (1) and remove the cover cap (2).

Unscrew the Torx bolts (1) and remove the top section (2).

Insert the switch unit (1) and secure it with Torx bolts (2).

Place the connection cable (1) from the installation kit into the cable tie (2).
5. To modify a 3-spoke sport steering wheel

Place the cover cap (1) and switch unit on to the steering wheel.
Connect the connection cable (2) to the switch unit.
Secure the cover cap (1) to the steering wheel using Torx bolts (3).
6. To install a 3-spoke sport steering wheel

Fit the sports steering wheel (1) and tighten the screws (2) with a torque of 63 Nm. Connect the plug (3) to the switch mounting.

Install the existing airbag unit (1).
7. To install a 4-spoke steering wheel

Fit the existing 4-spoke steering wheel (1) and tighten the screws (2) with a torque of 63 Nm.

Install the airbag unit with the multi-functional steering wheel buttons (1).
Tighten the securing screws for the airbag unit with a torque of 8 Nm.
8. **Concluding work**

- This MFL/GRA retrofit kit does not require coding.
- Assemble the car following the instructions to dismantle it in reverse order.
- Conduct a brief test.
- Conduct a function test (the operating instructions for the MFL/GRA retrofit kit are set out in the car or radio owner’s manual).
9. Circuit diagram

Cars with M47 engines before 9/01 only and all N42, M54 and M57 engines

Legend

A3 Light switch centre control module
A60004 DME/DDE control module
X12 SW 54-pin plug on the light switch centre
X10170 10-pin plug GN on the steering column switch
X60004 SW 40-pin plug on the DME/DDE control module

Cable colours

RT red
SW black
BL blue
GE yellow
VI violet
WS white
9. Circuit diagram

Cars with M47TÜ engine after 9/01 only

Legend

A3 Light switch centre control module
A60004 DME/DDE control module
X12 SW 54-pin plug on the light switch centre
X10170 10-pin plug GN on the steering column switch
X60002 SW 58-pin plug on the DDE control module
Y1 Butt joint connector

All the designations marked with an asterisk (*) apply only to these installation instructions or these circuit diagrams.

Cable colours

RT red
SW black
BL blue
GE yellow
VI violet
WS white