

ACCESSORIES & EQUIPMENT

Audio, Navigation and Anti-Theft - Repair Instructions - X6

MONO RADIO

65 11 072 REMOVING AND INSTALLING/REPLACING CD CHANGER

Operation is identical to:

Removing and installing/replacing **DVD changer** , see 65 11 075 Removing and installing/replacing DVD changer.

65 11 075 REMOVING AND INSTALLING/REPLACING DVD CHANGER

NOTE: Follow instructions for handling optical fibres , see 61 00 ... NOTES ON HANDLING OPTICAL FIBERS .

Open glovebox.

Release trim (1) at clips (2).

Installation:

Replace damaged clips (2):

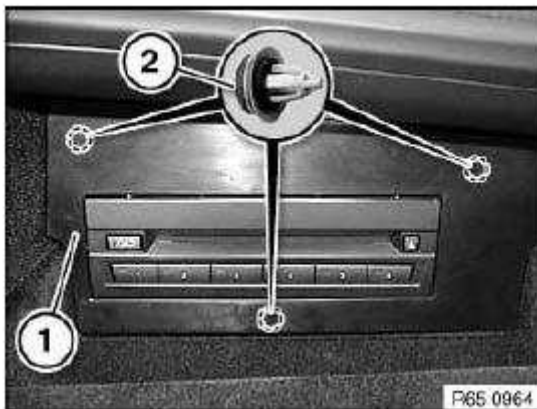


Fig. 1: Identifying Trim And Clips

Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Pull out DVD changer (2) and disconnect associated plug connection.

Tightening torque **65 52 5AZ** , see 65 52 CD/DVD DRIVES AND SPECIAL DEVICES .

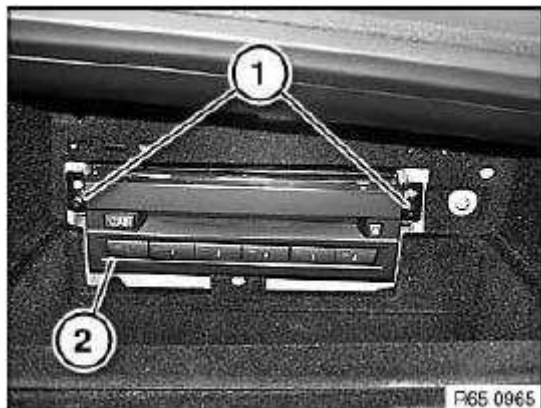


Fig. 2: Identifying DVD Changer And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Release screws (1) on both sides and remove bracket (2).

Tightening torque **65 52 1AZ** , see **65 52 CD/DVD DRIVES AND SPECIAL DEVICES** .

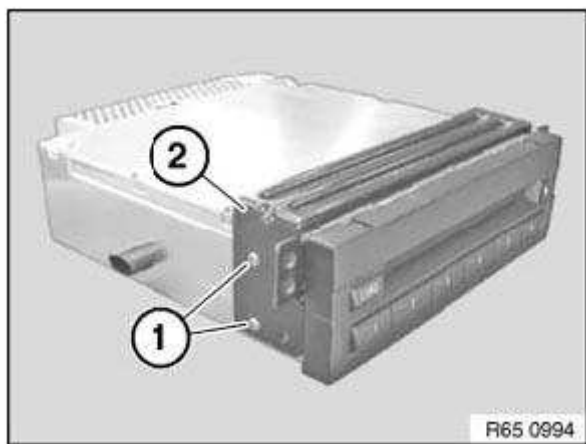


Fig. 3: Identifying Bracket And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

65 12 ... REMOVING AND INSTALLING/REPLACING AERIAL/ANTENNA SPLITTER (IBOC) (US VERSION ONLY)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

Necessary preliminary tasks:

- Remove **digital radio** , see 65 12 240 Removing and installing/replacing digital radio (IBOC) (US version only).

Release screws (1).

Disconnect plug connections (2) and remove aerial/antenna splitter (3).

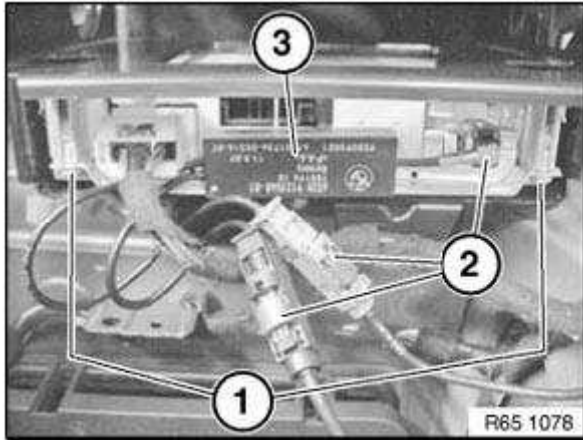


Fig. 4: Identifying Plug Connections And Antenna Splitter
Courtesy of BMW OF NORTH AMERICA, INC.

65 12 220 REMOVING AND INSTALLING/REPLACING SATELLITE RADIO (US VERSION ONLY)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

NOTE: Follow instructions for handling optical fibres, see 61 00 ... NOTES ON HANDLING OPTICAL FIBERS .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .
- Remove **luggage compartment panel** on side panel on left, see 51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT .

Release screws (1).

Disconnect plug connections (2) and remove satellite tuner (3) from holder (4).

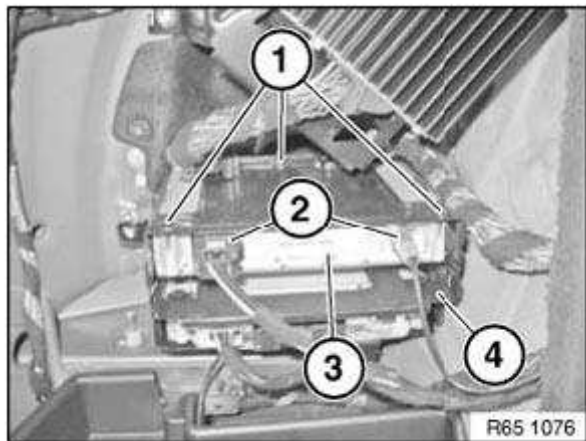


Fig. 5: Identifying Plug Connections And Satellite Tuner
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **vehicle programming/coding**.

65 12 230 REMOVING AND INSTALLING (REPLACING) DAB TUNER

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

NOTE: Follow instructions for handling optical fibres, see **61 00 ... NOTES ON HANDLING OPTICAL FIBERS** .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD** .
- Remove **luggage compartment panel** on side panel on left, see **51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT** .

Release screws (1).

Disconnect plug connections (2) and remove DAB tuner (3) from holder (4).

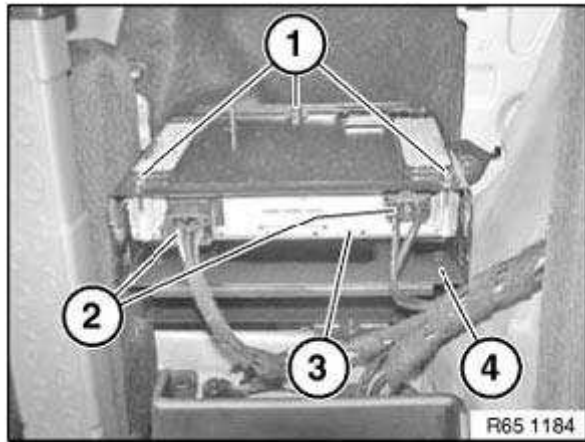


Fig. 6: Identifying Plug Connections And DAB Tuner
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **vehicle programming/coding**.

65 12 240 REMOVING AND INSTALLING/REPLACING DIGITAL RADIO (IBOC) (US VERSION ONLY)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

NOTE: Follow instructions for handling optical fibres, see **61 00 ... NOTES ON HANDLING OPTICAL FIBERS** .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD** .
- Remove **luggage compartment panel** on side panel on left, see **51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT** .
- If necessary, remove **satellite radio** , see **65 12 220 Removing and installing/replacing satellite radio (US version only)**.

Release screws (1).

Disconnect plug connections (2) and remove digital radio (3) from holder (4).

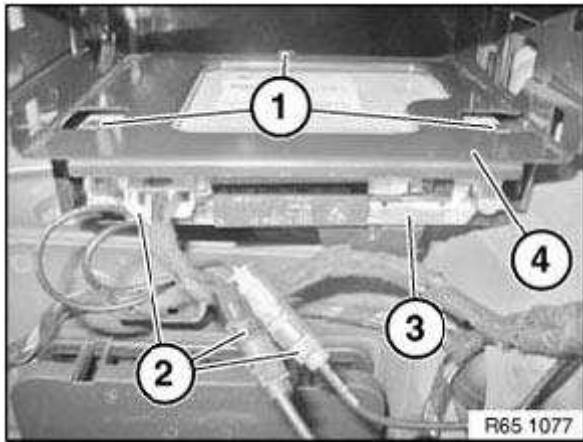


Fig. 7: Identifying Plug Connections, Digital Radio And Holder
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Remove aerial/antenna splitter. , see **65 12 ... Removing and installing/replacing aerial/antenna splitter (IBOC) (US version only).**

Replacement:

Carry out **vehicle programming/coding**.

65 12 265 REMOVING AND INSTALLING/REPLACING DVD PLAYER IN REAR CONSOLE

Necessary preliminary tasks:

- Remove **rear centre console trim** , see **51 16 163 REMOVING AND INSTALLING/REPLACING REAR CENTRE CONSOLE TRIM** .

Release screws (1) on both sides.

Lift out mounting (2) on both sides over catch (3) and feed out DVD player (4).

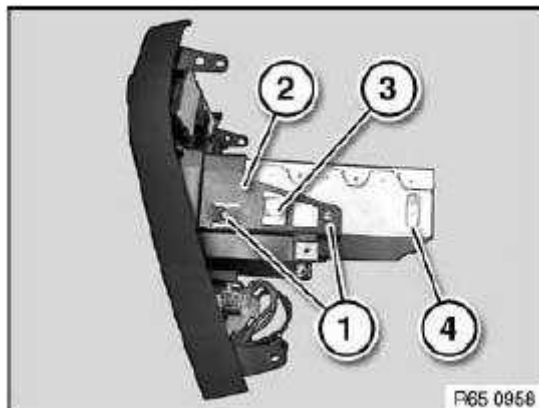


Fig. 8: Identifying Mounting, Catch And DVD Player
 Courtesy of BMW OF NORTH AMERICA, INC.

STEREO RADIO, AMPLIFIER

65 12 ... REMOVING AND INSTALLING/REPLACING AERIAL/ANTENNA SPLITTER (IBOC) (US VERSION ONLY)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

Necessary preliminary tasks:

- Remove **digital radio** , see 65 12 240 Removing and installing/replacing digital radio (IBOC) (US version only).

Release screws (1).

Disconnect plug connections (2) and remove aerial/antenna splitter (3).

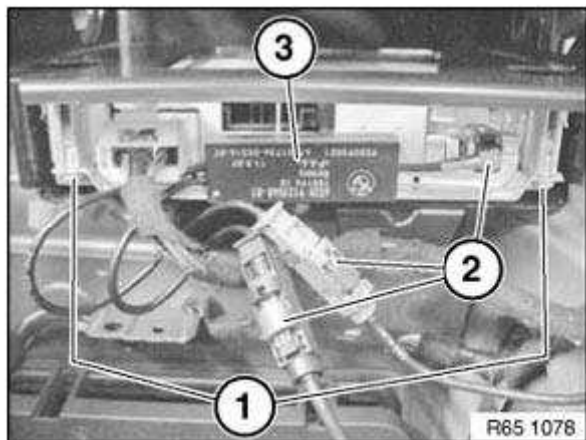


Fig. 9: Identifying Plug Connections And Antenna Splitter
Courtesy of BMW OF NORTH AMERICA, INC.

65 12 050 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT CENTRAL BASS SPEAKER

Necessary preliminary tasks:

- Remove **front seat** , see **52 13 000 REMOVING AND INSTALLING LEFT OR RIGHT FRONT SEAT (NORMAL/SEMI-ELECTRIC)** or **52 14 000 REMOVING AND INSTALLING LEFT OR RIGHT FRONT SEAT** .
- Lay floor carpet in working area to one side

Release screws (1) and remove trim (2).

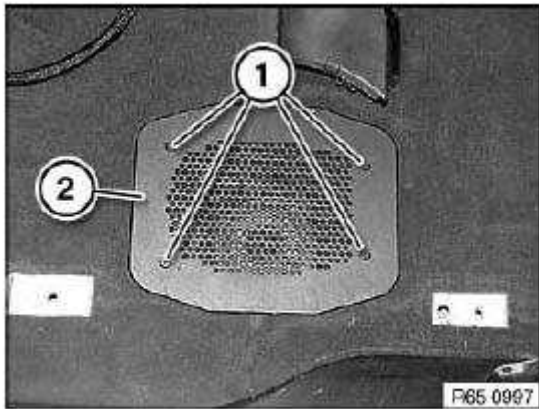


Fig. 10: Identifying Trim And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release screws (2) and feed out central bass speaker.

Tightening torque **65 13 2AZ** , see **65 13 SPEAKERS** .

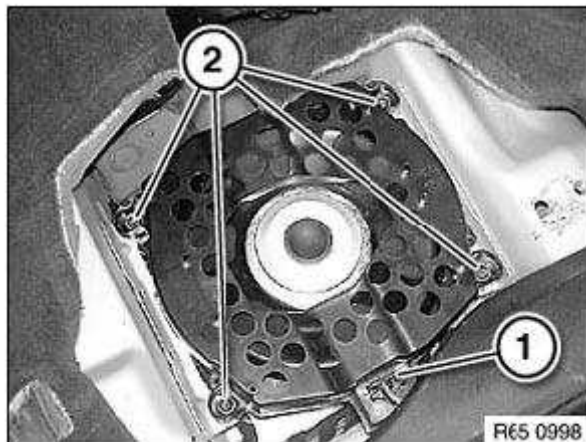


Fig. 11: Identifying Plug Connection And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

65 12 071 REMOVING AND INSTALLING OR REPLACING AMPLIFIER

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

NOTE: Comply with notes and instructions on handling optical waveguides. , see 61 00 ... NOTES ON HANDLING OPTICAL FIBERS .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .
- Remove **flap in luggage compartment panel on left** , see 51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT .

NOTE: For purposes of clarity, graphic shows luggage compartment side panel removed.

Release screw (1).

Disconnect plug connection (2) and slide amplifier (3) in direction of arrow out of mounting.

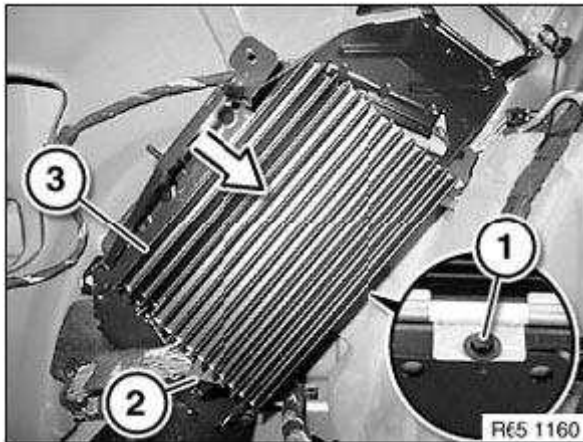


Fig. 12: Identifying Plug Connection And Slide Amplifier
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Lugs on amplifier must be correctly pushed into guides (1) on bracket.

Check that amplifier is firmly seated.

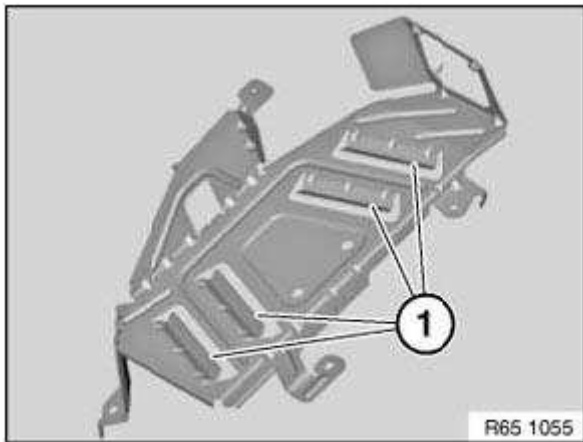


Fig. 13: Identifying Guides On Bracket
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **vehicle programming/coding**.

65 12 200 REMOVING AND INSTALLING (REPLACING) AUDIO SYSTEM CONTROLLER

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC**

DISCHARGE) .

Comply with notes and instructions on handling optical waveguides , see **61 00 ... NOTES ON HANDLING OPTICAL FIBERS** .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD** .
- Remove **middle trim for instrument panel** , see **51 45 310 REMOVING AND INSTALLING (REPLACING) CENTRE TRIM FOR INSTRUMENT PANEL** .

NOTE: Work is shown on the E60 by way of example. There may be differences in detail in the case of other car models.

IMPORTANT: Do not scratch centre console trim, cover if necessary.

Release screws (1).

Pull back audio system controller (2) slightly.

Disconnect associated plug connections.

Remove audio system controller (2).

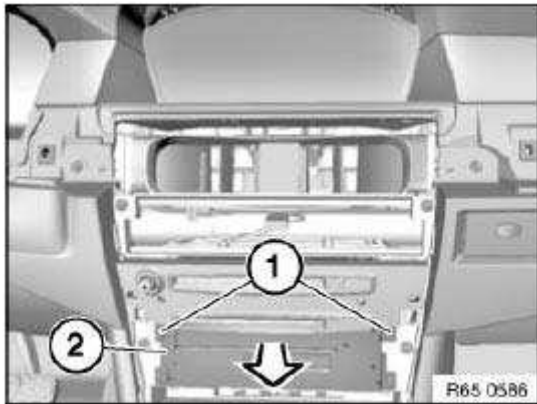


Fig. 14: Identifying Audio System Controller
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **vehicle programming/coding**.

65 12 220 REMOVING AND INSTALLING/REPLACING SATELLITE RADIO (US VERSION ONLY)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

NOTE: Follow instructions for handling optical fibres, see 61 00 ... NOTES ON HANDLING OPTICAL FIBERS .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .
- Remove **luggage compartment panel** on side panel on left, see 51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT .

Release screws (1).

Disconnect plug connections (2) and remove satellite tuner (3) from holder (4).

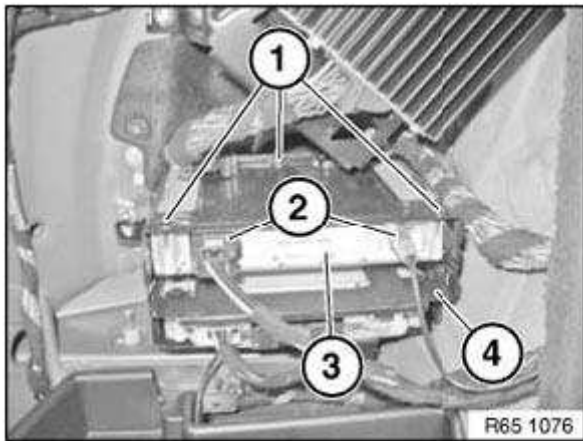


Fig. 15: Identifying Plug Connections, Satellite Tuner And Holder
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **vehicle programming/coding**.

65 12 230 REMOVING AND INSTALLING (REPLACING) DAB TUNER

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

NOTE: Follow instructions for handling optical fibres, see 61 00 ... NOTES ON

HANDLING OPTICAL FIBERS .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .
- Remove **luggage compartment panel** on side panel on left, see 51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT .

Release screws (1).

Disconnect plug connections (2) and remove DAB tuner (3) from holder (4).

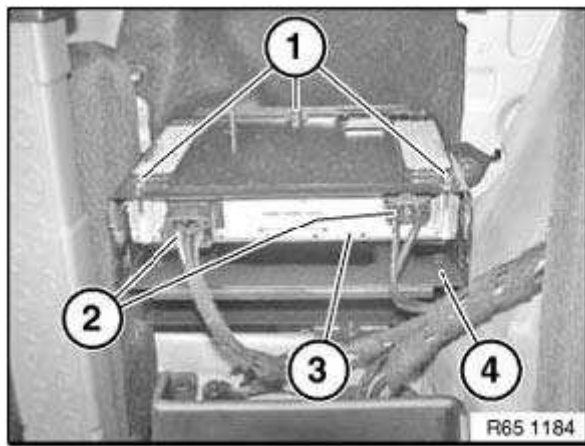


Fig. 16: Identifying Plug Connections, DAB Tuner And Holder
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **vehicle programming/coding**.

65 12 240 REMOVING AND INSTALLING/REPLACING DIGITAL RADIO (IBOC) (US VERSION ONLY)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

NOTE: Follow instructions for handling optical fibres, see 61 00 ... NOTES ON HANDLING OPTICAL FIBERS .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see 61 20 900 DISCONNECTING AND CONNECTING

BATTERY NEGATIVE LEAD .

- Remove **luggage compartment panel** on side panel on left, see **51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT .**
- If necessary, remove **satellite radio** , see **65 12 220 Removing and installing/replacing satellite radio (US version only).**

Release screws (1).

Disconnect plug connections (2) and remove digital radio (3) from holder (4).

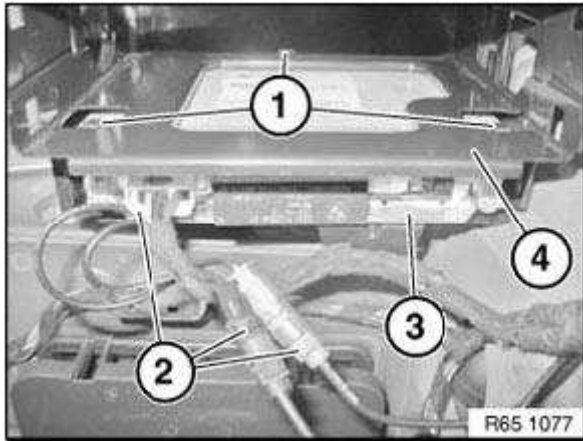


Fig. 17: Identifying Plug Connections And Digital Radio
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Remove **aerial/antenna splitter** , see **65 12 ... Removing and installing/replacing aerial/antenna splitter (IBOC) (US version only).**

Replacement:

Carry out **vehicle programming/coding**.

65 12 250 REMOVING AND INSTALLING/REPLACING HEADPHONES MODULE

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .**

NOTE: Follow instructions for handling optical fibres, see **61 00 ... NOTES ON HANDLING OPTICAL FIBERS .**

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD** .
- Remove **video module** , see **65 50 011 Removing and installing (replacing) video module for on-board monitor**.

Disconnect plug connection (1).

Release nuts (2) and remove headphones module.

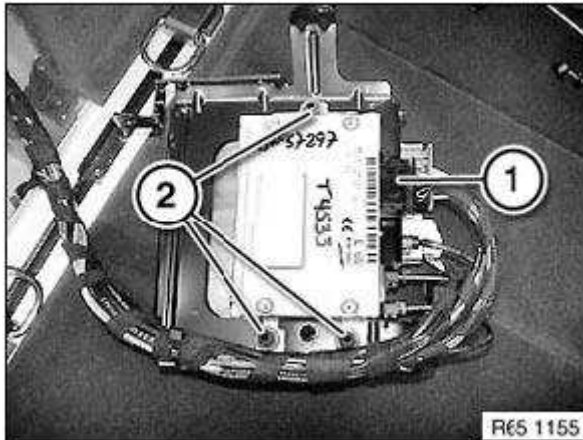


Fig. 18: Identifying Plug Connection And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

65 12 265 REMOVING AND INSTALLING/REPLACING DVD PLAYER IN REAR CONSOLE

Necessary preliminary tasks:

- Remove **rear centre console trim** , see **51 16 163 REMOVING AND INSTALLING/REPLACING REAR CENTRE CONSOLE TRIM** .

Release screws (1) on both sides.

Lift out mounting (2) on both sides over catch (3) and feed out DVD player (4).

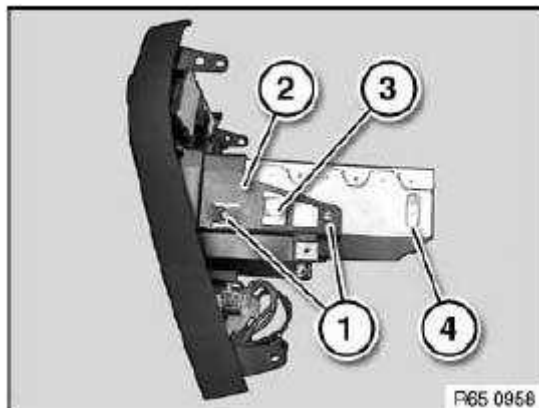
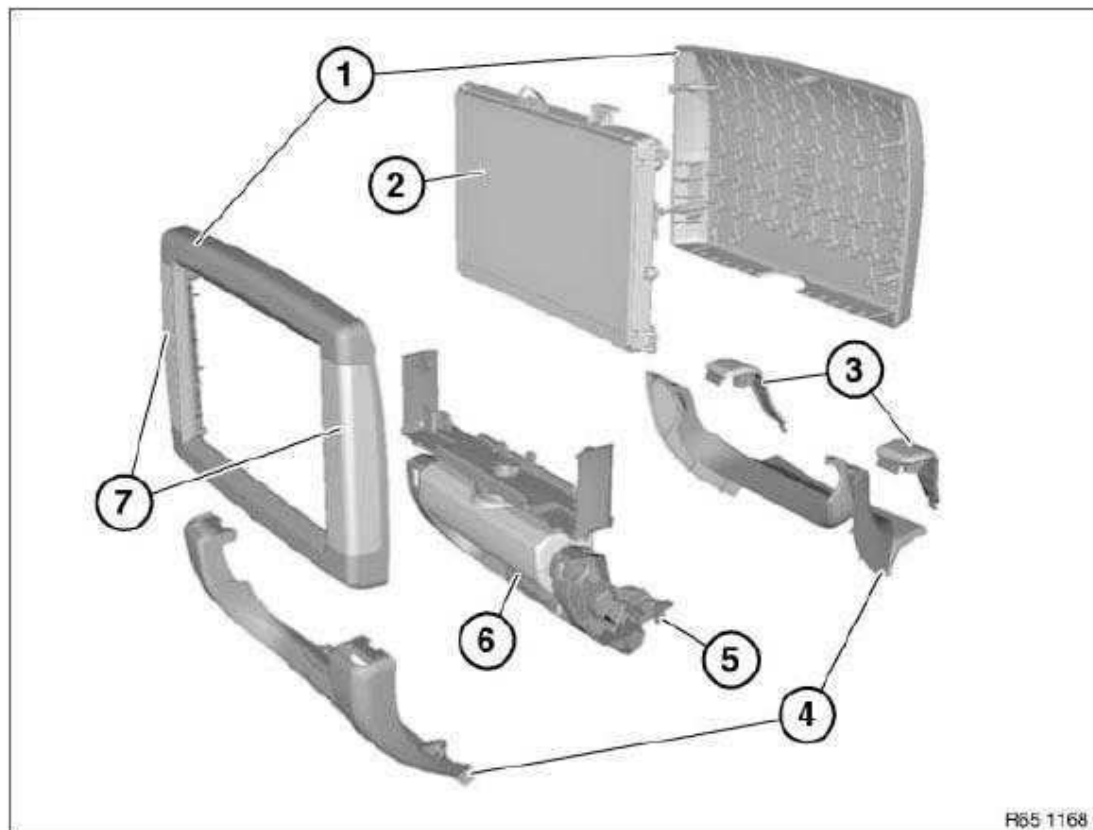


Fig. 19: Identifying Mounting, Catch And DVD Player
Courtesy of BMW OF NORTH AMERICA, INC.

65 50 ... OVERVIEW OF INDIVIDUAL REAR CABIN MONITOR PARTS



- | | | | |
|---|---|---|---|
| 1 | Trim, display, front and rear | 5 | Bracket, rear cabin monitor |
| 2 | Display, rear cabin monitor | 6 | Trims, base, middle |
| 3 | Trims, base, rear | 7 | Trim, display, side |
| 4 | Trims, base, front and rear | | |

Fig. 20: Identifying Individual Rear Cabin Monitor Parts

Courtesy of BMW OF NORTH AMERICA, INC.

SPEAKER AND COVER

65 13 050 REMOVING AND INSTALLING/REPLACING SPEAKER (TWEETER, FRONT DOOR)

Necessary preliminary tasks:

- Remove **front door trim** , see **51 41 000 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT DOOR TRIM PANEL** .
- Detach cover on door window frame in front area.

NOTE: For purposes of clarity, illustration shows cover removed on door window frame.

Remove foam wedge (1) from cover on door window frame (2).

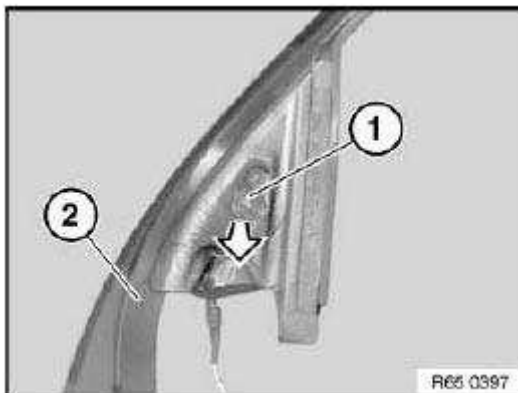


Fig. 21: Identifying Foam Wedge And Door Window Frame
Courtesy of BMW OF NORTH AMERICA, INC.

Unlock catches (1) and remove speaker (2) from cover on door window frame (3).

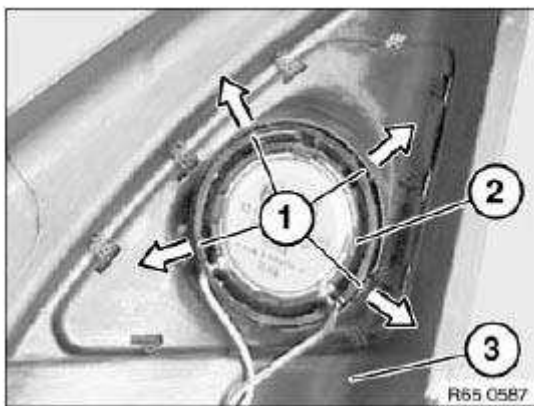


Fig. 22: Identifying Catches, Speaker And Door Window Frame
Courtesy of BMW OF NORTH AMERICA, INC.

65 13 060 REMOVING AND INSTALLING/REPLACING FRONT SPEAKER (MID-RANGE SPEAKER IN INSTRUMENT PANEL TRIM)

The following operation is described in:

Removing and installing/replacing front speaker carrier , see **65 13 065 Removing and installing/replacing front speaker carrier (instrument panel)**

65 13 065 REMOVING AND INSTALLING/REPLACING FRONT SPEAKER CARRIER (INSTRUMENT PANEL)

Special tools required:

- 00 9 317 , see **00 9 317 TRIM PANEL WEDGE** .

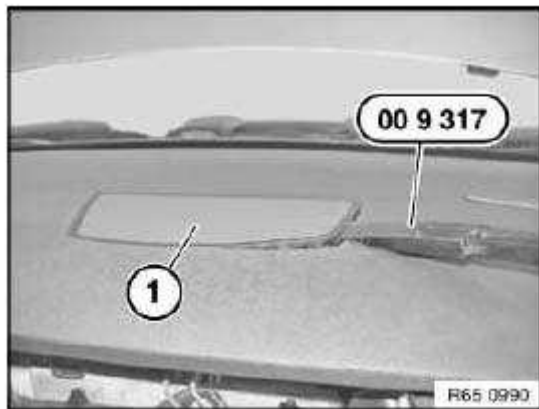


Fig. 23: Identifying Trim With Special Tool (00 9 317)
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove speaker carrier and disconnect associated plug connection.

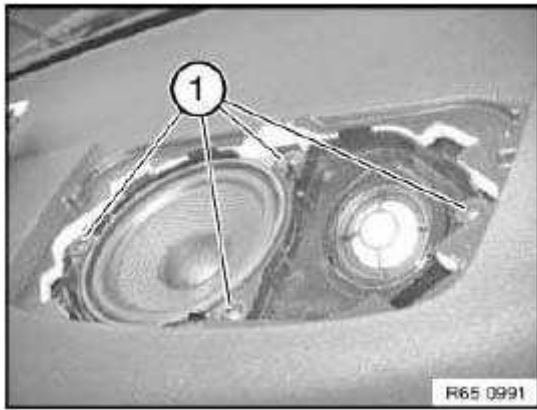


Fig. 24: Identifying Speaker Carrier And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Retaining lugs (1) must not be damaged

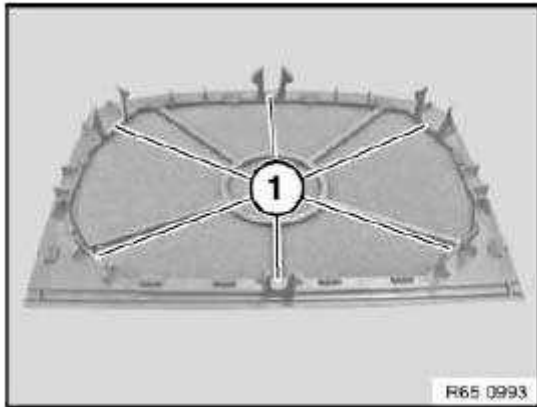


Fig. 25: Identifying Retaining Lugs
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Disconnect plug connection (1) and feed out speaker (2).

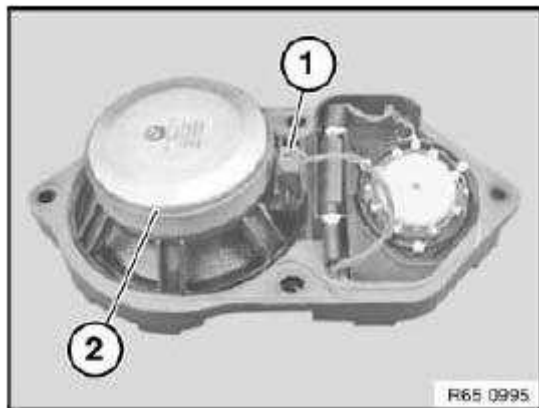


Fig. 26: Identifying Plug Connection And Speaker
Courtesy of BMW OF NORTH AMERICA, INC.

65 13 070 REMOVING AND INSTALLING/REPLACING SPEAKER (FRONT MID-RANGE SPEAKER IN DOOR TRIM PANEL)

Necessary preliminary tasks:

- Remove **front door trim** , see **51 41 000 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT DOOR TRIM PANEL** .

Release screws (1) and mid-range speaker.

Tightening torque **65 13 1AZ** , see **65 13 SPEAKERS** .

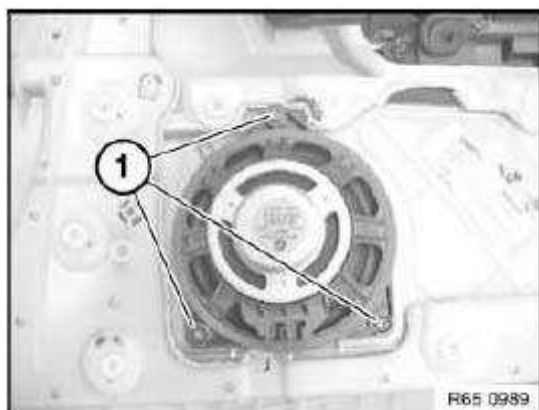


Fig. 27: Identifying Mid-Range Speaker And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

65 13 080 REMOVING AND INSTALLING/REPLACING REAR TWEETER (IN DOOR TRIM PANEL)

Necessary preliminary tasks:

- Remove **rear door trim panel** , see **51 42 000 REMOVING AND INSTALLING (REPLACING) REAR LEFT OR RIGHT DOOR TRIM PANEL** .

Unclip speaker (1) from retaining lugs (2) and remove.

Disconnect associated plug connection.

Installation:

Retaining lugs (2) must not be damaged

Make sure speaker (1) is securely seated.

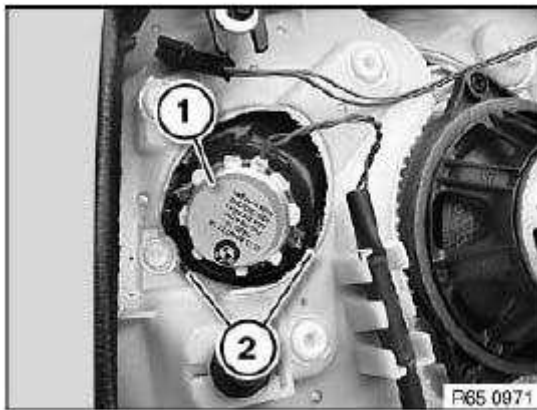


Fig. 28: Identifying Speaker And Lugs
Courtesy of BMW OF NORTH AMERICA, INC.

65 13 090 REMOVING AND INSTALLING/REPLACING SPEAKER (MID-RANGE SPEAKER, DOOR AT REAR)

Necessary preliminary tasks:

- Remove **rear door trim** , see **51 42 000 REMOVING AND INSTALLING (REPLACING) REAR LEFT OR RIGHT DOOR TRIM PANEL** .

Disconnect plug connection (1) and release screws (2).

Tightening torque **65 13 1AZ** , see **65 13 SPEAKERS** .

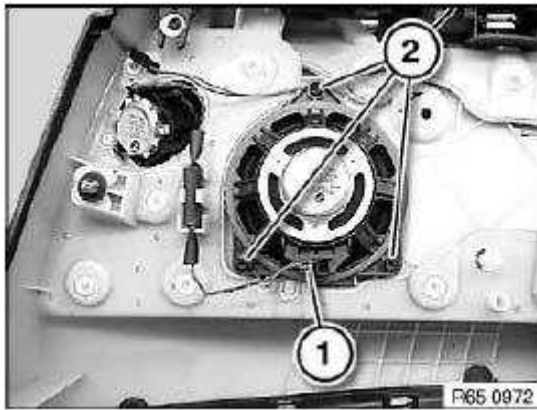


Fig. 29: Identifying Plug Connection And Release Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

65 13 110 REMOVING AND INSTALLING/REPLACING SPEAKER (MID-RANGE SPEAKER IN D-PILLAR)

Necessary preliminary tasks:

- Remove **rear speaker carrier** , see **65 13 160 Removing and installing/replacing rear left or right speaker carrier (D-pillar)**.

Release screws (1) and open speaker box (2).

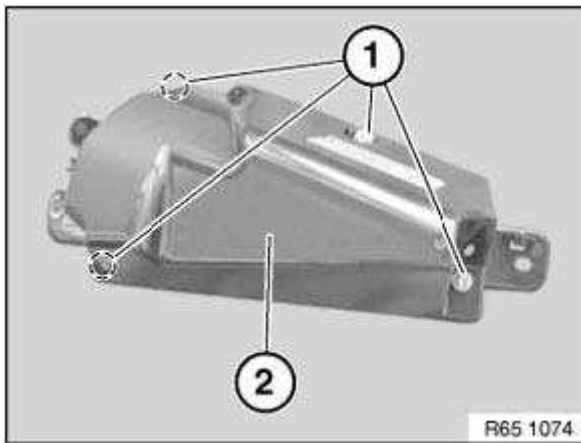


Fig. 30: Identifying Open Speaker Box And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release nuts (2) and remove mid-range speaker (3) from speaker carrier (4).

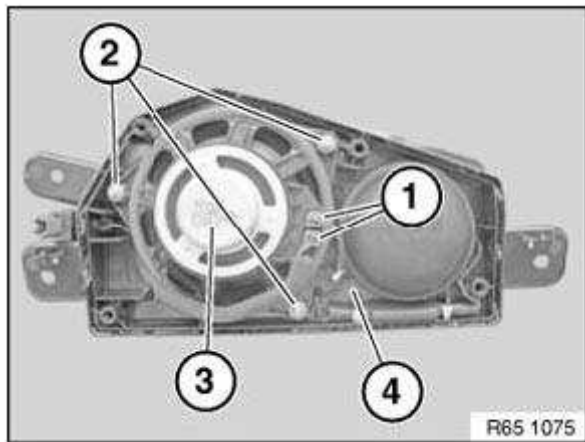


Fig. 31: Identifying Mid-Range Speaker And Speaker Carrier
 Courtesy of BMW OF NORTH AMERICA, INC.

65 13 160 REMOVING AND INSTALLING/REPLACING REAR LEFT OR RIGHT SPEAKER CARRIER (D-PILLAR)

Necessary preliminary tasks:

- Remove **trim panel for roof pillar at rear** , see **51 43 259 REMOVING AND INSTALLING/REPLACING TRIM FOR REAR ROOF PILLAR (D-PILLAR), LEFT OR RIGHT** .

Release screws (1).

Remove speaker carrier and disconnect associated plug connection.

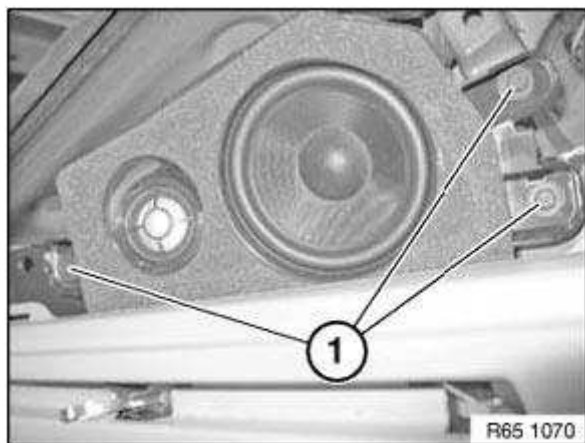


Fig. 32: Identifying Associated Plug Connection And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Remove **mid-range speaker** , see **65 13 110 Removing and installing/replacing speaker (mid-range speaker in D-pillar)**.

AERIAL ANTENNA

65 20 030 REMOVING AND INSTALLING/REPLACING EMPTY HOUSING FOR ROOF-MOUNTED AERIAL

Special tools required:

- **65 2 010**

WARNING: Risk of injury!

Special tool has sharp edges!

Adapt working height to vehicle height with non-tilting and non-slip platform.

Handle special tool correctly and make sure it is positioned without tilting or slipping on the vehicle.

Special tool 65 2 010 is only permitted in conjunction with a suitable stepladder, see

Risk of damage!

In order to prevent dents in the roof, do not exert any pressure on the roof.

IMPORTANT: Note to customer:

In order to guarantee a permanent connection and adhesive curing:

After bonding the empty housing for the roof-mounted aerial, wait 24 hours before driving the vehicle through a car wash.

NOTE: Clean roof.

Mask roof (2) around empty housing for roof-mounted aerial (3) with yellow plastic adhesive tape (1). To do so, slide plastic adhesive tape under empty housing (3) slightly.

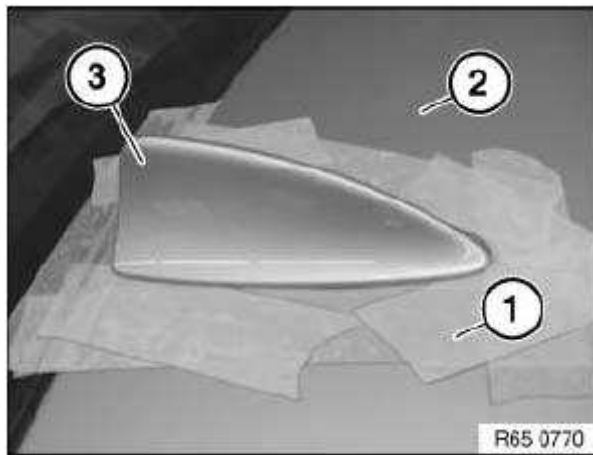


Fig. 33: Identifying Roof-Mounted Aerial And Roof
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

Make sure your arms do not cross over (1) when holding special tool 65 2 010.

Pull handle must always be ahead of the guiding hand (2).

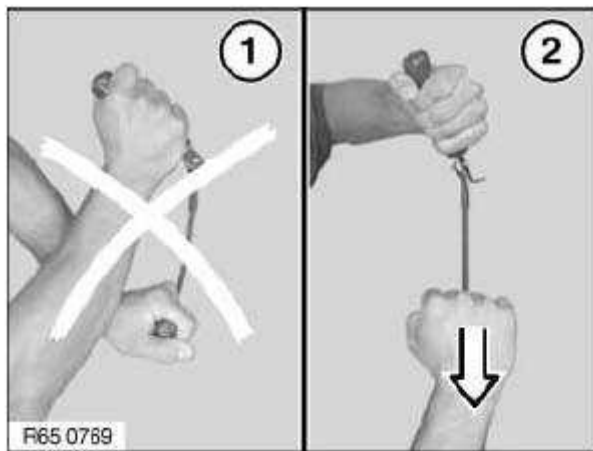


Fig. 34: Precaution For Special Tool
 Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

To avoid damaging the paintwork on the roof and empty housing (3), do not fit special tool 65 2 010 askew.

Cut through adhesive bead all round with special tool 65 2 010.

Pull on handle (1) and align blade on handle (2).

NOTE: Use sharp blades only. Replace blade if necessary.

Remove empty housing (3).

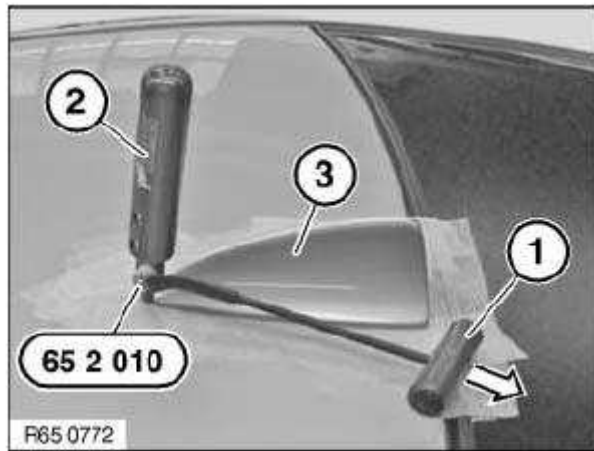


Fig. 35: Removing Empty Housing

Courtesy of BMW OF NORTH AMERICA, INC.

Installation

Empty housing for roof-mounted aerial is secured with window glass adhesive. All preparatory operations correspond to the **Window cementing instructions**, see 51 31 ... INSTRUCTIONS ON GLUING WINDSCREEN.

NOTE: Replace empty housing for roof-mounted aerial is centering pins (1) on empty housing are damaged.

Bonding surface (2) must be clean and free from grease.

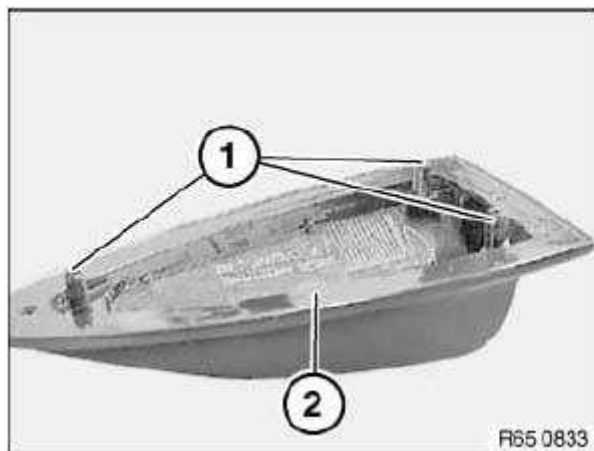


Fig. 36: Identifying Centering Pins And Bonding Surface

Courtesy of BMW OF NORTH AMERICA, INC.

Position two spacers (1) on cleaned empty housing.

Dimensions:

- A. 10 mm
- B. 14 mm

Position spacer (2) centrally and flush with shoulder of adhesive flange.

IMPORTANT: Use spacers without fail!

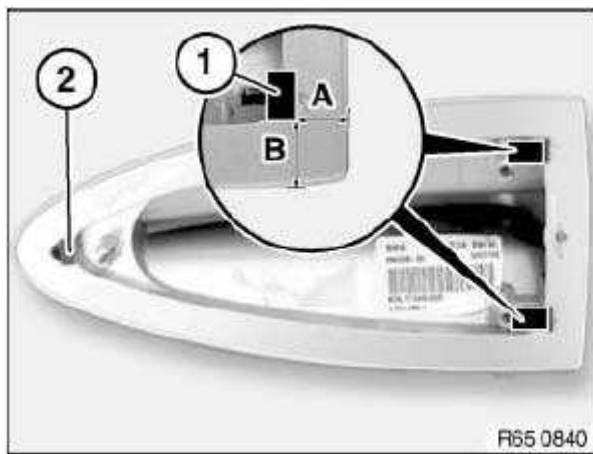


Fig. 37: Positioning Spacer Of Adhesive Flange
Courtesy of BMW OF NORTH AMERICA, INC.

Apply trace of adhesive bead all round outer contour as follows.

Distance between adhesive bead and edge of aerial cover:

- A. $6.5 \text{ mm} \pm 1 \text{ mm}$

Start and end of bead trace must have an overlap length of max. 10 mm.



Fig. 38: Identifying Bead Trace Length

Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: To prevent the adhesive from escaping, the adhesive bead diameter must not exceed max. 1.5 mm to 2.5 mm.

NOTE: Attach the empty housing coated with adhesive by hand. To spread the adhesive better, move the housing back and forth horizontally slightly when pressing down.
Secure empty housing if necessary with adhesive tape and press down uniformly.
After bonding, leave vehicle to stand for at least 3 hours at room temperature.

65 20 035 REMOVING AND INSTALLING/REPLACING ROOF-MOUNTED AERIAL

Necessary preliminary tasks:

- Detach **empty housing** for roof-mounted aerial, see **65 20 030 Removing and installing/replacing empty housing for roof-mounted aerial.**

Release screw (1) and feed out roof aerial (2) towards top.

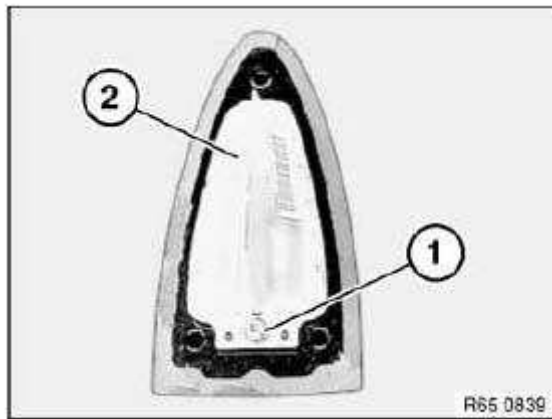


Fig. 39: Identifying Feed Out Roof Aerial And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connections (1) and remove aerial (2).

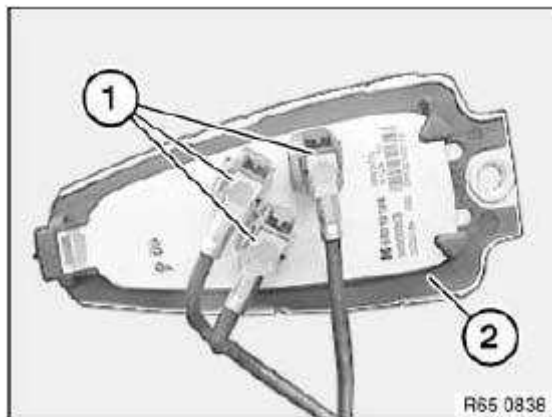


Fig. 40: Identifying Plug Connections And Aerial
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- Stick on **empty housing** for roof-mounted aerial, see **65 20 030 Removing and installing/replacing empty housing for roof-mounted aerial.**

65 20 090 REMOVING AND INSTALLING/REPLACING AERIAL AMPLIFIER (DIVERSITY)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

Necessary preliminary tasks:

- Remove **rear window frame trim panel** , see **51 49 002 REMOVING AND**

INSTALLING/REPLACING (UPPER) PANEL FOR REAR WINDOW FRAME .

Release screws (1).

Disconnect plug connections (2, 3) and remove aerial amplifier.

Installation:

Ensure correct line routing (4).

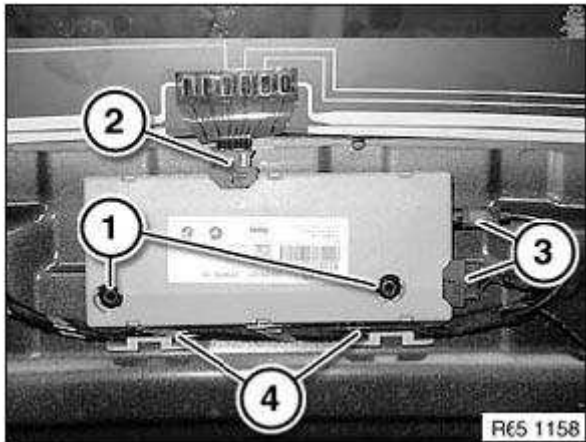


Fig. 41: Identifying Line Routing And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

65 20 150 REMOVING AND INSTALLING/REPLACING BACKUP AERIAL

Necessary preliminary tasks:

- Remove **rear centre console** , see **51 16 270 REMOVING AND INSTALLING COMPLETE REAR SECTION OF REAR CONSOLE .**

Release screws (1) and associated nuts.

Remove back-up aerial and disconnect associated plug connection (2).

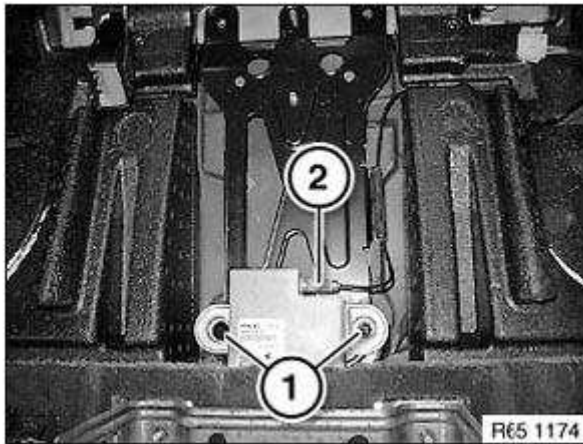


Fig. 42: Identifying Plug Connection And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

65 20 252 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SUPPRESSION FILTER

Necessary preliminary tasks:

- Partially remove **roofliner**, see **51 44 001 REMOVING AND INSTALLING/REPLACING ROOFLINER (VERSION WITHOUT SLIDE/TILT SUNROOF)** or **51 44 011 REMOVING AND INSTALLING/REPLACING ROOFLINER (VERSION WITH SLIDE/TILT SUNROOF)** in working area.

Roofliner shown completely removed for purposes of clarity.

Disconnect plug connection (1).

Release screw (2) and remove suppression filter (3).

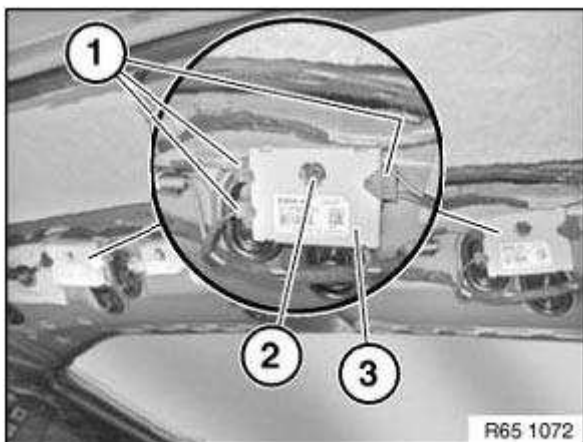


Fig. 43: Identifying Suppression Filter, Screw And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

REAR WINDOW AERIAL ANTENNA

65 20 252 REMOVING AND INSTALLING/REPLACING LEFT OR RIGHT SUPPRESSION FILTER

Necessary preliminary tasks:

- Partially remove **roofliner** , see **51 44 001 REMOVING AND INSTALLING/REPLACING ROOFLINER (VERSION WITHOUT SLIDE/TILT SUNROOF)** or **51 44 011 REMOVING AND INSTALLING/REPLACING ROOFLINER (VERSION WITH SLIDE/TILT SUNROOF)** in working area.

Roofliner shown completely removed for purposes of clarity.

Disconnect plug connection (1).

Release screw (2) and remove suppression filter (3).

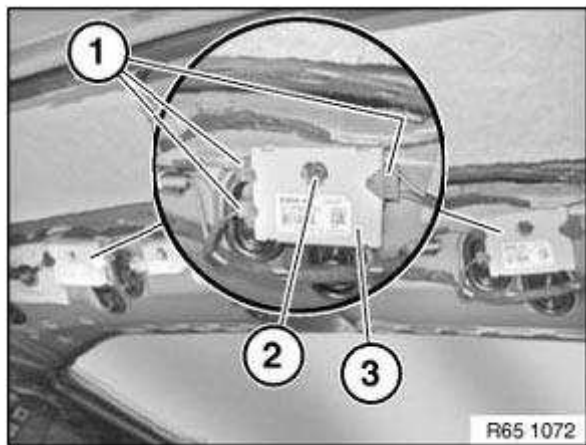


Fig. 44: Identifying Suppression Filter And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

65 24 020 REMOVING AND INSTALLING/REPLACING BLOCKING CIRCUIT (LEFT OR RIGHT)

Necessary preliminary tasks:

- Partially remove **roofliner** , see **51 44 001 REMOVING AND INSTALLING/REPLACING ROOFLINER (VERSION WITHOUT SLIDE/TILT SUNROOF)** or **51 44 011 REMOVING AND INSTALLING/REPLACING ROOFLINER (VERSION WITH SLIDE/TILT SUNROOF)** in working area.

Roofliner shown completely removed for purposes of clarity.

Disconnect plug connections (2).

Release screw (1) and remove blocking circuit (3).

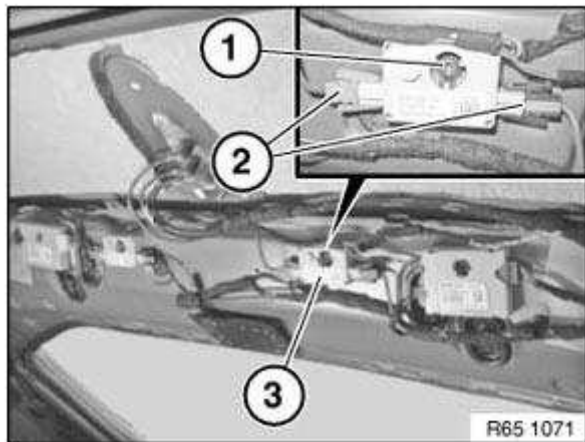


Fig. 45: Identifying Blocking Circuit, Plug Connection And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Fit blocking circuit (1) so that screw (2) engages thread (3) and locating pin (4) engages bore (5).

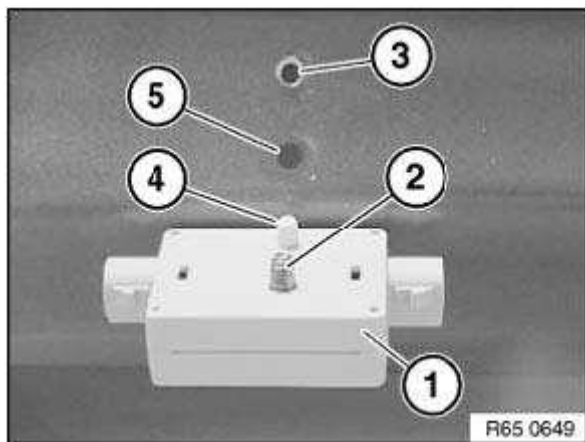


Fig. 46: Identifying Locating Pin, Engages Bore And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

65 24 030 REMOVING AND INSTALLING/REPLACING TV AMPLIFIER

Necessary preliminary tasks:

- Remove **rear bumper trim** , see **51 12 156 REMOVING AND INSTALLING REAR BUMPER TRIM** .

Feed aerial/antenna (1) out of guides (3) and through opening (2).

Installation:

Make sure aerial/antenna is laid correctly.

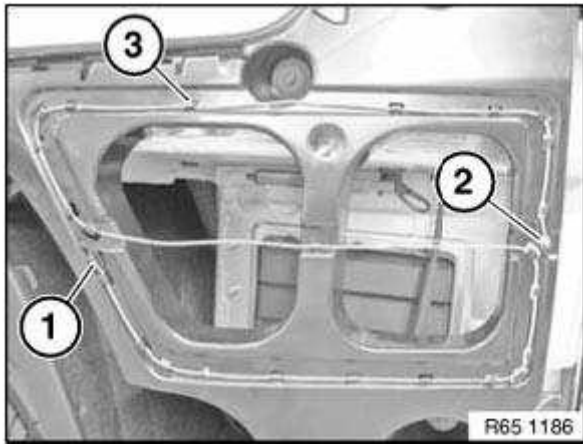


Fig. 47: Identifying Antenna And Guides
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1).

Release screw (2) and remove TV amplifier (3).

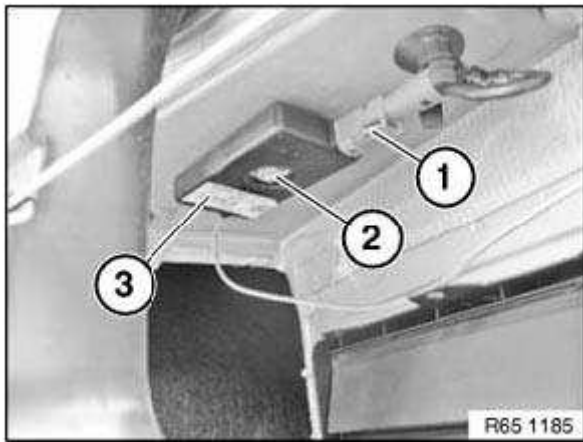
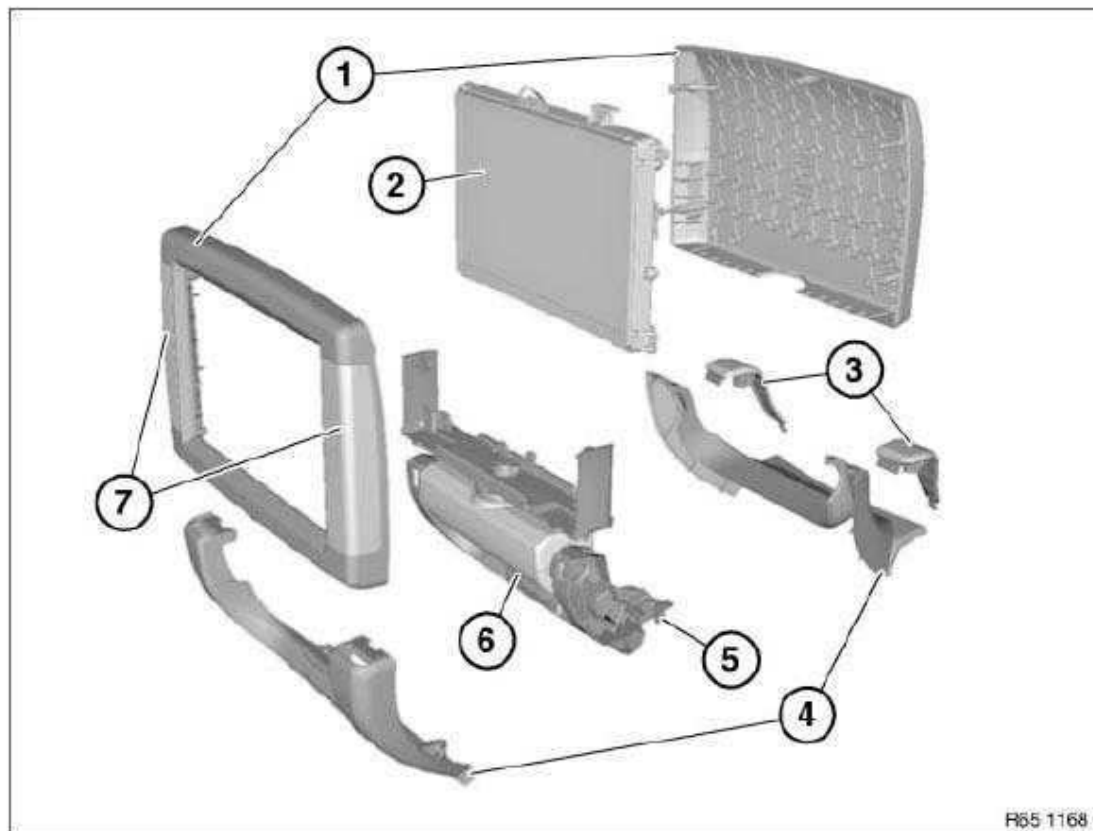


Fig. 48: Identifying TV Amplifier, Plug Connection And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

VIDEO AND TV EQUIPMENT

65 50 ... OVERVIEW OF INDIVIDUAL REAR CABIN MONITOR PARTS



- | | | | |
|---|---|---|---|
| 1 | Trim, display, front and rear | 5 | Bracket, rear cabin monitor |
| 2 | Display, rear cabin monitor | 6 | Trims, base, middle |
| 3 | Trims, base, rear | 7 | Trim, display, side |
| 4 | Trims, base, front and rear | | |

Fig. 49: Identifying Individual Rear Cabin Monitor Parts
 Courtesy of BMW OF NORTH AMERICA, INC.

65 50 ... REMOVING AND INSTALLING/REPLACING IR BOARD FOR REAR CABIN MONITOR

Necessary preliminary tasks:

- Remove trim for rear cabin at front and rear base , see **65 50 150 Removing and installing/replacing trim for rear cabin monitor base at front and rear.**

Release electric cable (1) from guides.

Installation:

Ensure correct cable routing.

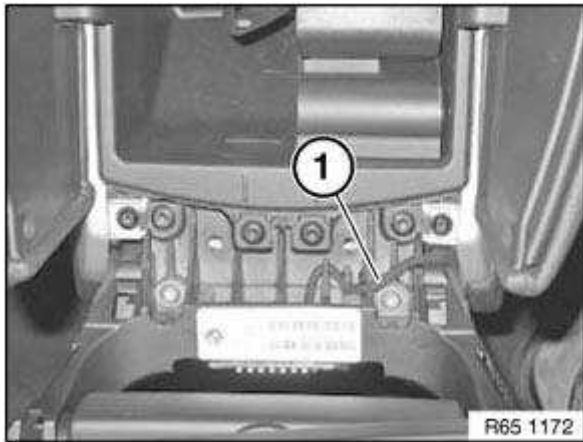


Fig. 50: Releasing Electric Cable From Guides
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove IR board and disconnect associated plug connection.

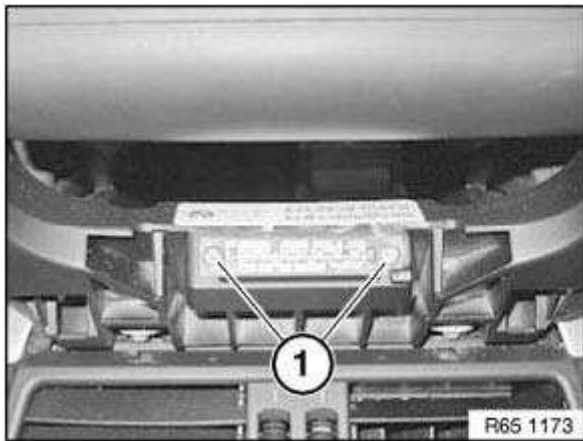


Fig. 51: Identifying Associated Plug Connection And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

65 50 ... REMOVING AND INSTALLING/REPLACING TRIM FOR REAR CABIN MONITOR BASE IN MIDDLE

Special tools required:

- 00 9 317 , see 00 9 317 TRIM PANEL WEDGE .

IMPORTANT: Trims may only be replaced in pairs so as to avoid differences in color.

Move rear cabin monitor (1) into position illustrated.

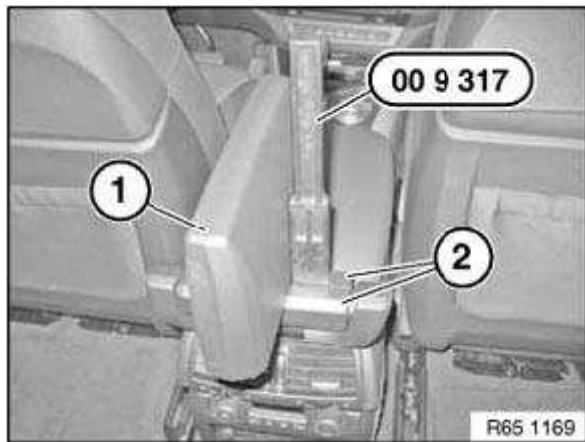


Fig. 52: Identifying Rear Cabin Monitor And Trims
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1) and remove trim (2) in downward direction.

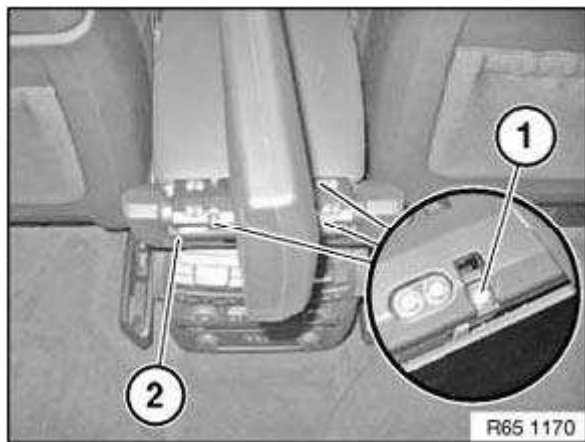


Fig. 53: Identifying Trim And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Retaining lugs (1) must not be damaged

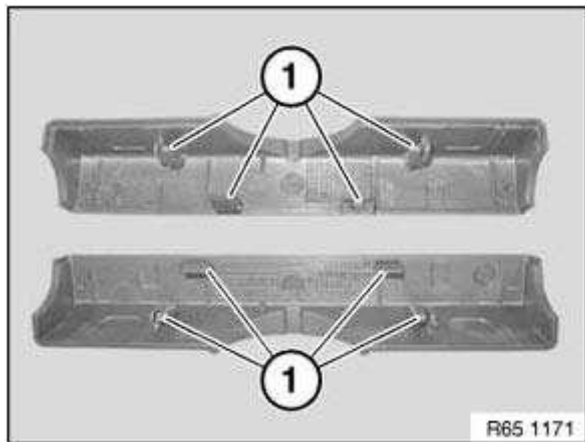


Fig. 54: Identifying Lugs Location

Courtesy of BMW OF NORTH AMERICA, INC.

65 50 ... REMOVING AND INSTALLING/REPLACING TRIMS FOR REAR CABIN MONITOR BASE AT REAR

Special tools required:

- 00 9 340 , see 00 9 340 DISASSEMBLY AID (2 PIECES) .

IMPORTANT: Trims may only be replaced in pairs so as to avoid differences in color.

Unclip trim (1) on both sides with special tool 00 9 340.

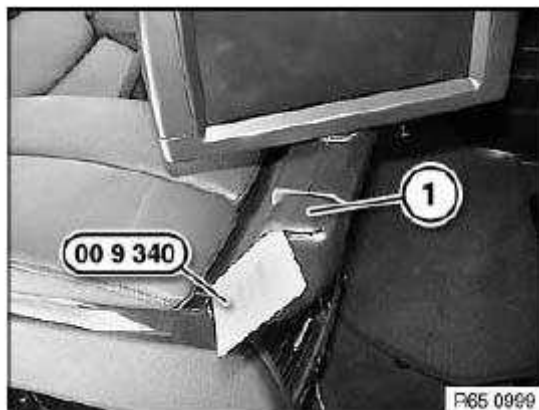


Fig. 55: Identifying Rear Cabin Monitor Base And Trim

Courtesy of BMW OF NORTH AMERICA, INC.

65 50 ... REMOVING AND INSTALLING/REPLACING TRIMS FOR REAR CABIN MONITOR DISPLAY AT SIDE

Special tools required:

- **00 9 340** , see **00 9 340 DISASSEMBLY AID (2 PIECES)** .

IMPORTANT: Trims may only be replaced in pairs so as to avoid differences in color.

Unclip trims (1) on both sides with special tool **00 9 340**.

Installation:

Make sure trims (1) are correctly seated in rear cabin monitor trim (2).



Fig. 56: Identifying Rear Cabin Monitor Trim
Courtesy of BMW OF NORTH AMERICA, INC.

65 50 ... REPLACING TRIM FOR CENTRAL INFORMATION DISPLAY (CID) (UP TO 10/2009)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

Necessary preliminary tasks:

- Remove **Central Information Display** , see **65 50 057 Removing and installing replacing central information display (CID)**.

Carefully release catches (1).

Installation:

Catches (1) must not be damaged.

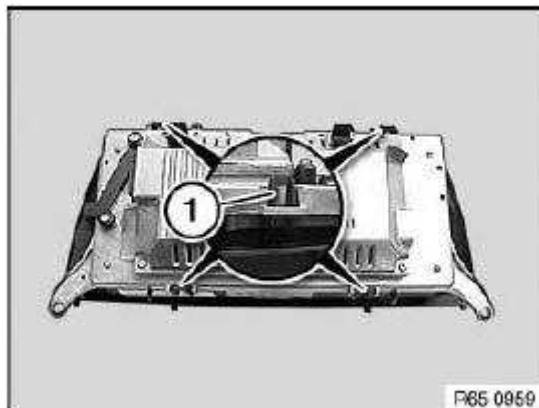


Fig. 57: Identifying Catches Location
 Courtesy of BMW OF NORTH AMERICA, INC.

Carefully raise trim (2).

Disconnect plug connection (1) and remove trim (2) from CID.

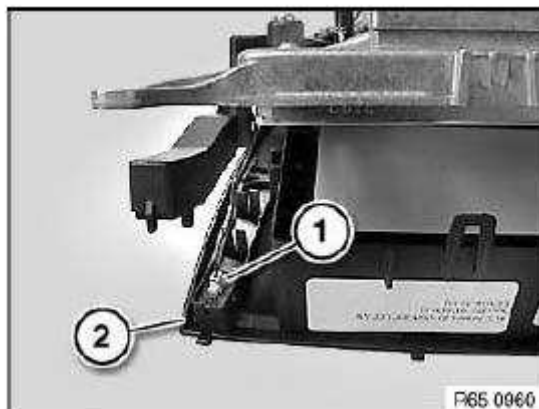


Fig. 58: Identifying Plug Connection, Trim And CID
 Courtesy of BMW OF NORTH AMERICA, INC.

65 50 011 REMOVING AND INSTALLING (REPLACING) VIDEO MODULE FOR ON-BOARD MONITOR

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

NOTE: Follow instructions for handling optical fibres, see 61 00 ... NOTES ON HANDLING OPTICAL FIBERS .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD** .
- Remove **luggage compartment trim on left**, see **51 47 172 REMOVING AND INSTALLING/REPLACING FLAP IN LUGGAGE COMPARTMENT TRIM, LEFT OR RIGHT** ..
- Remove **left storage compartment** , see **51 47 ... REMOVING AND INSTALLING/REPLACING STORAGE COMPARTMENT IN LUGGAGE COMPARTMENT ON LEFT OR RIGHT** .

Release bolts (1).

Feed out video module (2) complete with holder towards top.

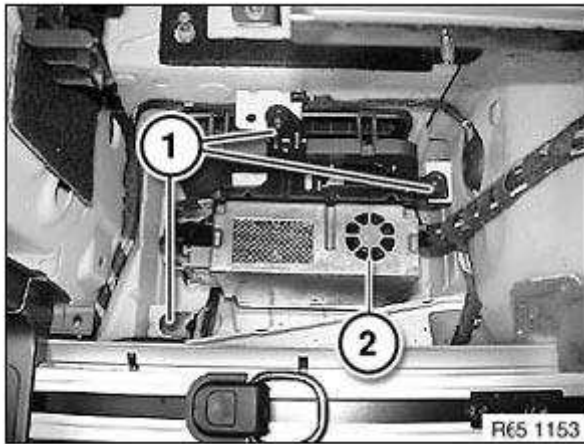


Fig. 59: Identifying Video Module And Bolts
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: The number of plug connections (1) and screws (2) can vary, depending on the video module version.

Disconnect plug connection (1).

Release screws (2) and remove holder from video module for on-board monitor.

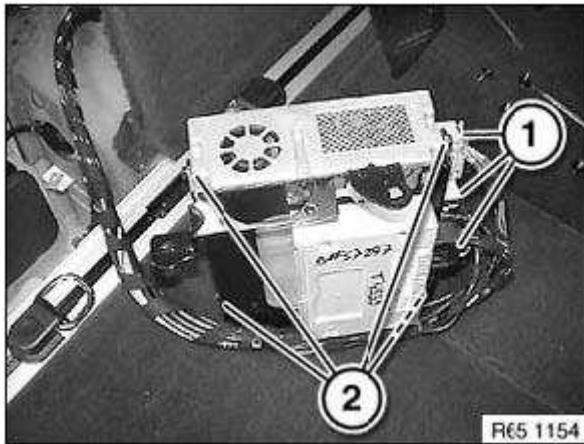


Fig. 60: Identifying Plug Connection And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **vehicle programming and coding**.

After replacing the video module and programming, it is absolutely essential to reset the TV standard of the country in question.

65 50 057 REMOVING AND INSTALLING REPLACING CENTRAL INFORMATION DISPLAY (CID)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

Necessary preliminary tasks:

- Remove **centre fresh air grill** , see **64 22 164 REMOVING AND INSTALLING OR REPLACING MIDDLE FRESH-AIR GRILLE** .

Release screws (1) and feed out CID (2) towards bottom.

Tightening torque **65 50 1AZ** , see **65 50 CENTRAL INFORMATION DISPLAY (CID)** .

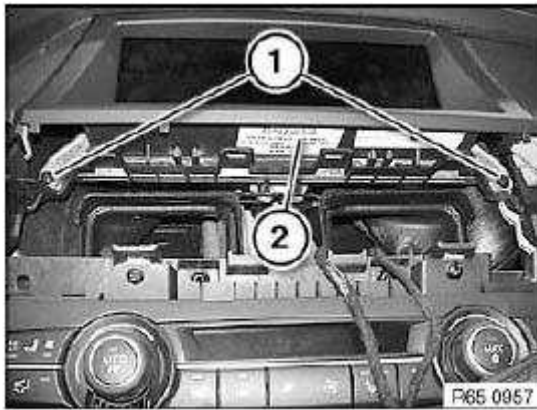


Fig. 61: Identifying CID And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connections (1) and unclip cable from holders (2).

Remove CID (3).

Installation:

Holders (2) must not be damaged!

Make sure cable is correctly routed through holders (2).

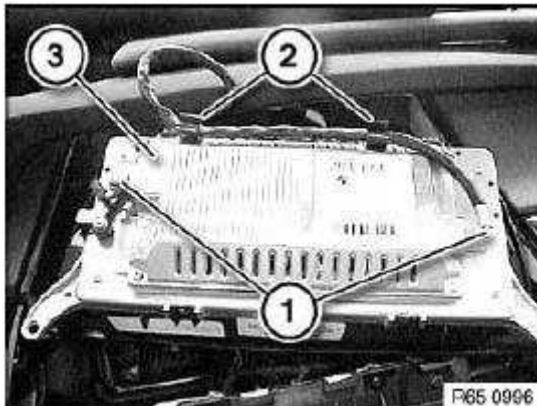


Fig. 62: Identifying Holder, CID And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

65 50 121 REMOVING AND INSTALLING REAR CABIN MONITOR (COMPLETE)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

Necessary preliminary tasks:

- Remove **fresh-air grille in rear cabin** , see **64 22 191 REMOVING AND INSTALLING/REPLACING REAR CABIN FRESH-AIR GRILLE** .
- Remove **trim for rear cabin monitor base at front and rear** , see **65 50 150 Removing and installing/replacing trim for rear cabin monitor base at front and rear**.

Release screws (1) and remove rear cabin monitor with holder (2).

Disconnect associated plug connections and feed out leads.

Tightening torque **65 52 1AZ** , see **65 52 CD/DVD DRIVES AND SPECIAL DEVICES** .

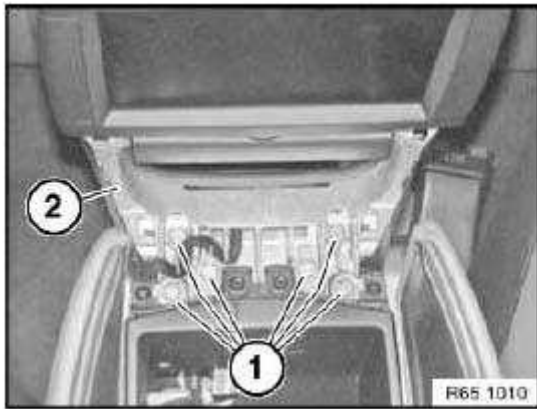


Fig. 63: Identifying Rear Cabin Monitor Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Ensure correct cable routing (1) on both sides.

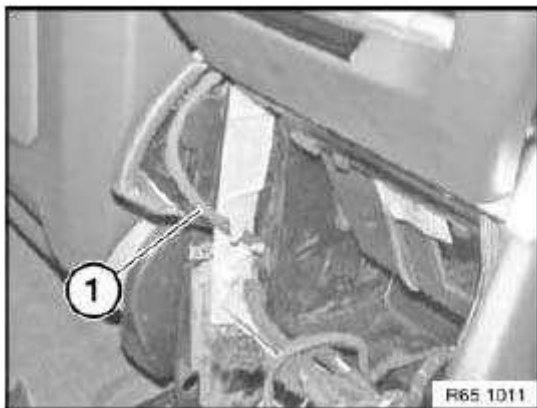


Fig. 64: Identifying Correct Cable Routing
Courtesy of BMW OF NORTH AMERICA, INC.

65 50 150 REMOVING AND INSTALLING/REPLACING TRIM FOR REAR CABIN MONITOR BASE AT FRONT AND REAR

Special tools required:

- 00 9 340 , see 00 9 340 DISASSEMBLY AID (2 PIECES) .

IMPORTANT: Trims may only be replaced in pairs so as to avoid differences in color.

Using special tool **00 9 340** , unclip trim (1) on both sides.

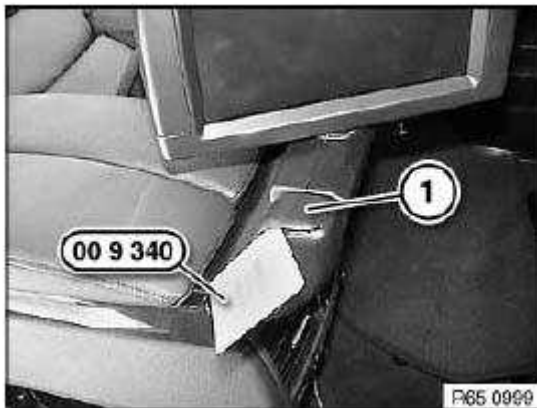


Fig. 65: Identifying Rear Cabin Monitor Base And Trim
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip trim (1) for base at front with special tool **00 9 340** and remove.



Fig. 66: Identifying Rear Cabin Monitor Base Trim Location
Courtesy of BMW OF NORTH AMERICA, INC.

Open armrest (1).

Unclip trim (2) for base at rear with special tool **00 9 340** and feed out.



Fig. 67: Identifying Armrest And Trim Location
 Courtesy of BMW OF NORTH AMERICA, INC.

65 50 160 REMOVING AND INSTALLING/REPLACING TRIM FOR REAR CABIN MONITOR DISPLAY AT FRONT AND REAR

Special tools required:

- **00 9 340** , see **00 9 340 DISASSEMBLY AID (2 PIECES)** .

IMPORTANT: Trims may only be replaced in pairs so as to avoid differences in color.

Unclip trims (1) on both sides with special tool **00 9 340**.

Installation:

Make sure trims (1) are securely seated in rear cabin monitor trim at front.



Fig. 68: Identifying Rear Cabin Monitor Trim
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Tightening torque 65 52 2AZ , see 65 52 CD/DVD DRIVES AND SPECIAL DEVICES .

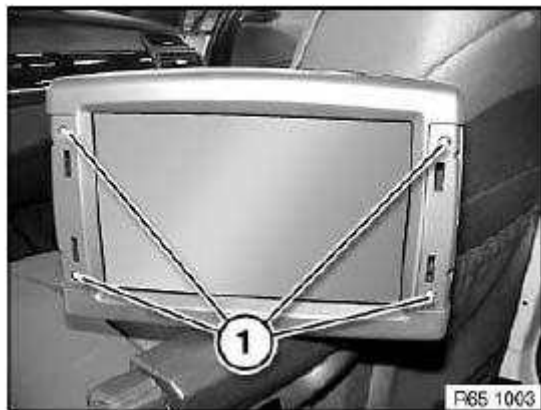


Fig. 69: Identifying Rear Cabin Monitor Screws Location
Courtesy of BMW OF NORTH AMERICA, INC.

Unclip trim for display at rear (1) with special tool **00 9 340** and remove.



Fig. 70: Identifying Trim For Display (Rear)
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Carefully remove trim for display at front (2) and disconnect plug connection (3).

Installation:

Make sure ribbon cable is securely seated.

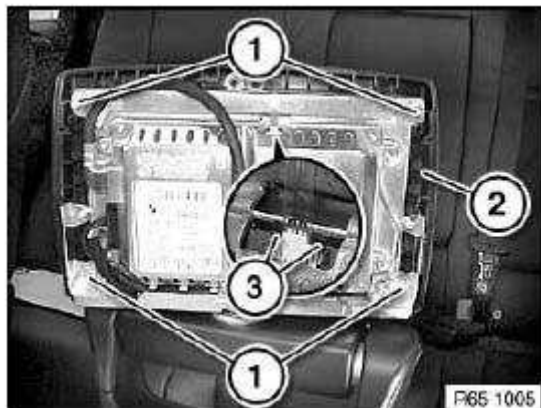


Fig. 71: Identifying Trim For Display (Front)
Courtesy of BMW OF NORTH AMERICA, INC.

65 50 170 REPLACING THE COVER FOR THE CENTRAL INFORMATION DISPLAY (CID) (AS OF 10/2009)

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection).

Necessary preliminary work:

Remove Central Information Display

Release screws (1). Tightening torque 5.5 INCH lbs. (63 N.m). Note: To tighten screws, use special tool 00 9 460.

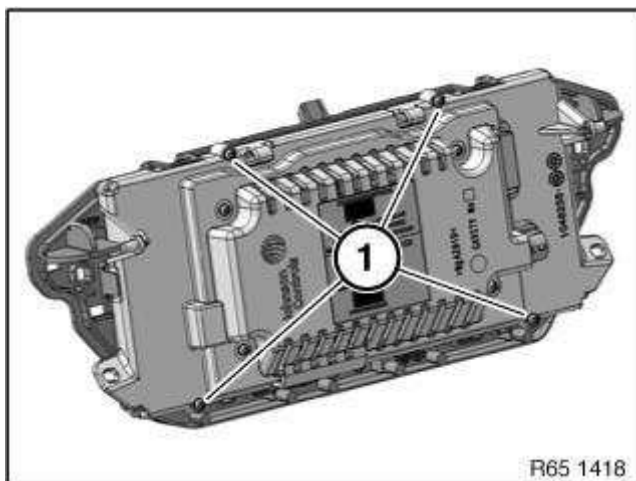


Fig. 72: Release Screws (1)
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage !

Carefully unlock latch mechanisms (1) with a suitable tool. Remove cover (2) from Central Information Display (3).

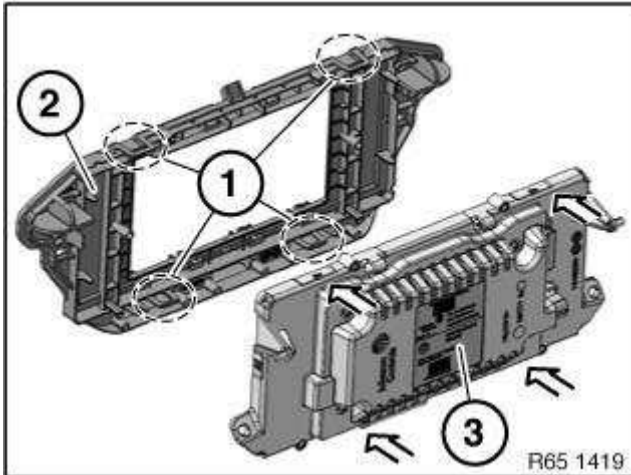


Fig. 73: Carefully Unlock Latch Mechanisms (1) With A Suitable Tool
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Before/after assembly, cover is bolted to the Central Information Display, correct installation position must first be checked!

Installation note: Before connecting the screw connection, check whether latch mechanisms marked with an arrow are correctly seated.

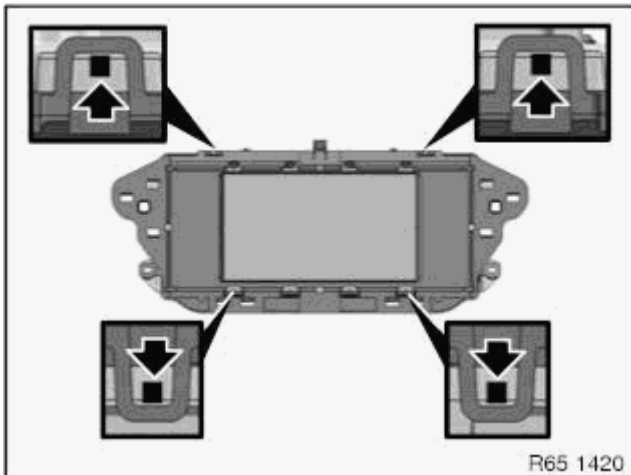


Fig. 74: Check Whether Latch Mechanisms Marked With An Arrow Are Correctly Seated
Courtesy of BMW OF NORTH AMERICA, INC.

Installation note: Before connecting the screw connection, check all-round rim at the places marked with an arrow.

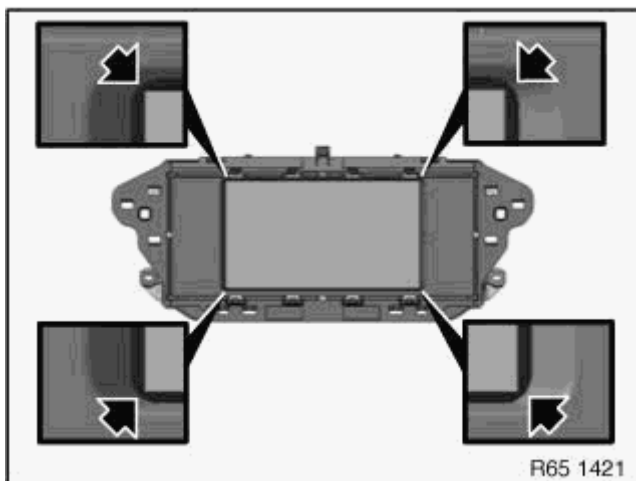


Fig. 75: Check All-Round Rim At The Places Marked With An Arrow
 Courtesy of BMW OF NORTH AMERICA, INC.

65 50 570 REPLACING REAR CABIN MONITOR DISPLAY

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

Necessary preliminary tasks:

- Remove **trim for rear cabin monitor display at front and rear** , see 65 50 160 Removing and installing/replacing trim for rear cabin monitor display at front and rear.

Disconnect plug connection (1).

Release screws (2).

Tightening torque **64 52 3AZ** , see 64 52 A/C COMPRESSOR .

Release screw (3) and remove display (4) towards top.

Tightening torque **65 52 4AZ** , see 65 52 CD/DVD DRIVES AND SPECIAL DEVICES .

Installation:

Remove protective film from replacement display.

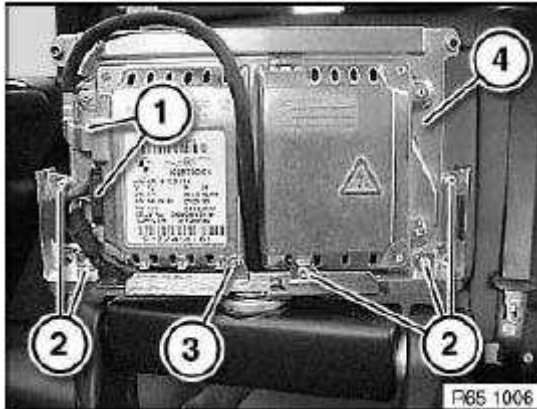


Fig. 76: Identifying Plug Connection And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

ANTI-THEFT ALARM SYSTEM

65 75 055 REMOVING AND INSTALLING/REPLACING EMERGENCY POWER SIREN WITH TILT SENSOR

Necessary preliminary tasks:

- Remove **front left wheel arch trim** , see **51 71 039 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (REAR SECTION)** .

Release screws (1) and remove cover (2).

Installation:

Make sure rubber grommet (3) is correctly seated.

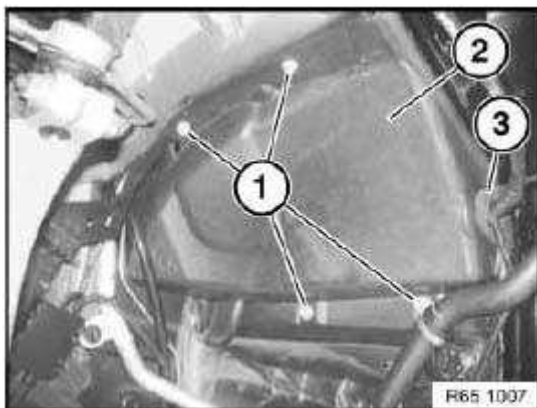


Fig. 77: Identifying Rubber Grommet And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove housing (2) and disconnect associated plug connection.

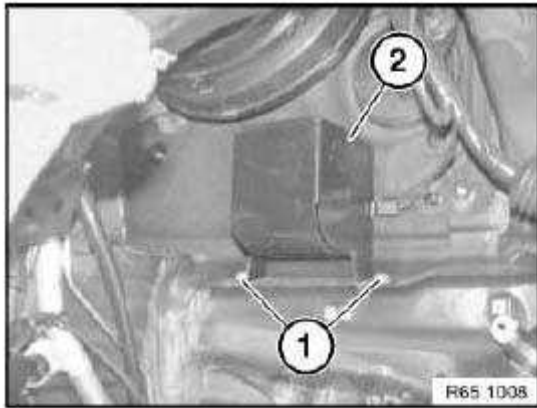


Fig. 78: Identifying Housing And Plug Connection
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Release nut (1) and remove emergency power siren with tilt sensor (2).

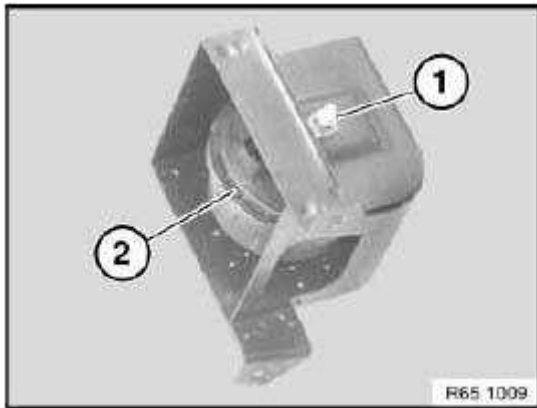


Fig. 79: Identifying Tilt Sensor And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

Guides (1) of emergency power siren (2) must be correctly seated in area (3) of holder (4)!

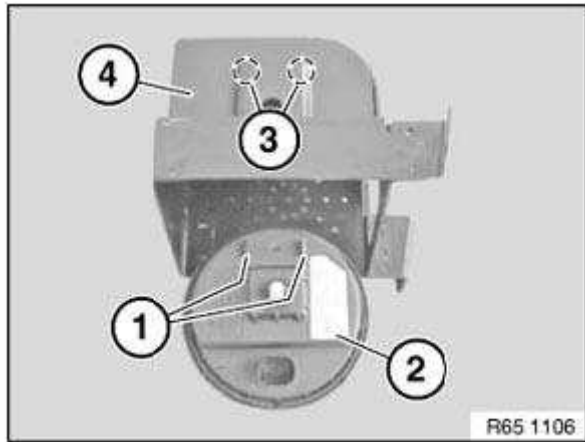


Fig. 80: Identifying Emergency Power Siren, Holder And Guides
Courtesy of BMW OF NORTH AMERICA, INC.

AIRBAG TRIGGERING UNIT, DIAGNOSTICS

65 75 055 REMOVING AND INSTALLING/REPLACING EMERGENCY POWER SIREN WITH TILT SENSOR

Necessary preliminary tasks:

- Remove **front left wheel arch trim** , see **51 71 039 REMOVING AND INSTALLING/REPLACING FRONT LEFT OR RIGHT WHEEL ARCH COVER (REAR SECTION)** .

Release screws (1) and remove cover (2).

Installation:

Make sure rubber grommet (3) is correctly seated.

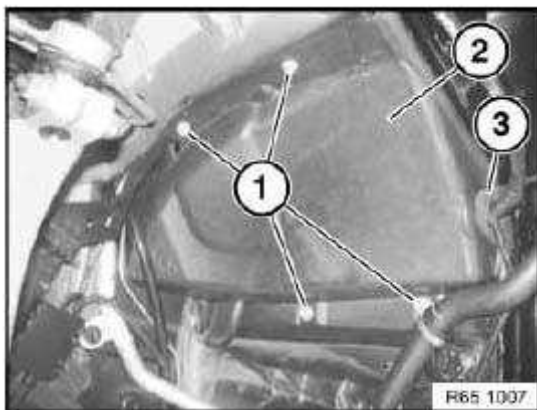


Fig. 81: Identifying Rubber Grommet, Screws And Cover
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

Remove housing (2) and disconnect associated plug connection.

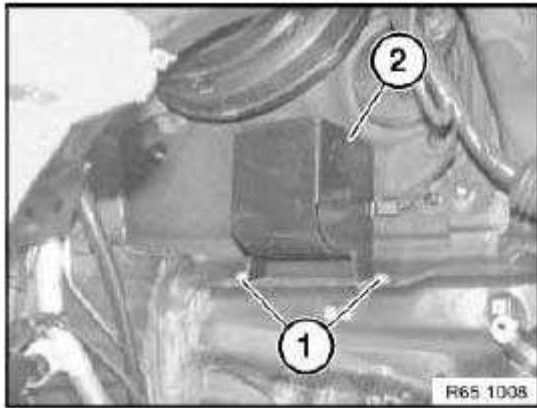


Fig. 82: Identifying Associated Plug Connection, Housing And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Release nut (1) and remove emergency power siren with tilt sensor (2).

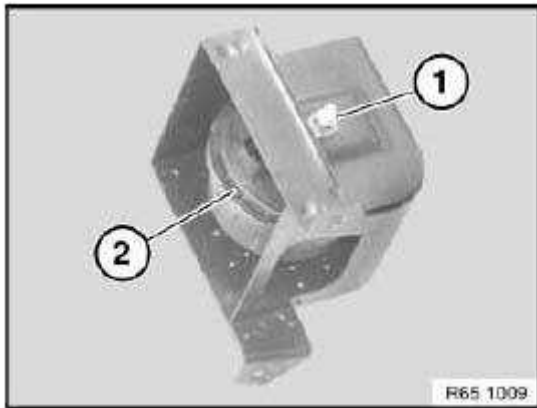


Fig. 83: Identifying Emergency Power Siren, Tilt Sensor And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

IMPORTANT: Risk of damage!

Guides (1) of emergency power siren (2) must be correctly seated in area (3) of holder (4)!

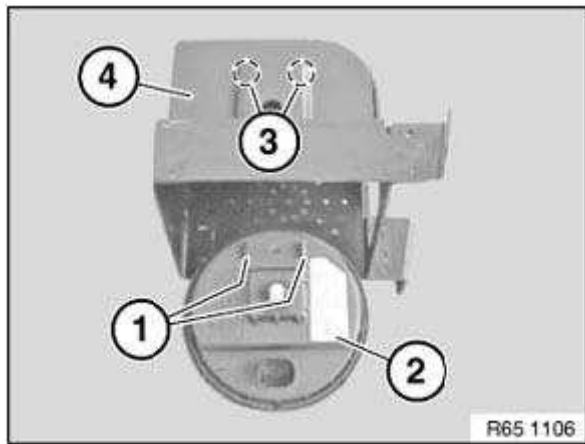
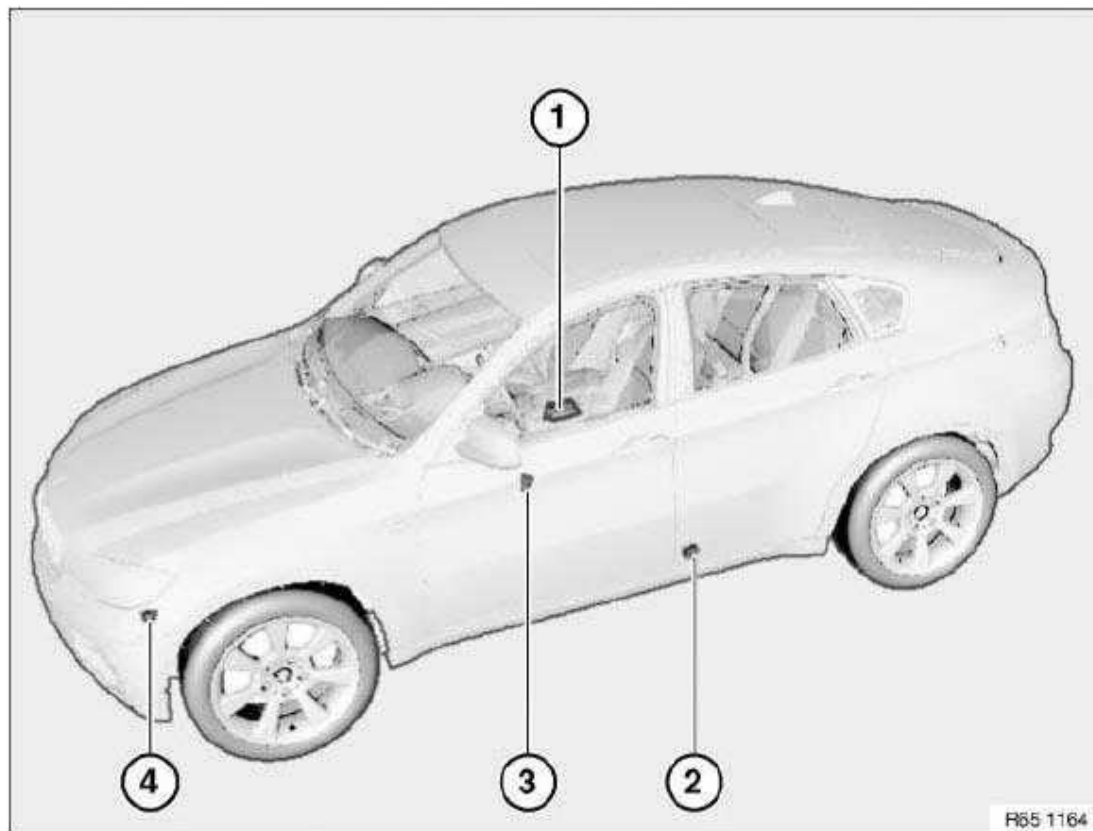


Fig. 84: Identifying Guides, Emergency Power Siren And Holder
Courtesy of BMW OF NORTH AMERICA, INC.

65 77 ... OVERVIEW OF SENSORS FOR AIRBAG SYSTEM



1. Airbag control unit (under centre console)
2. Sensor, B-pillar (left/right)
3. Sensor, front door (left/right)
4. Acceleration sensors, front (left/right)

Fig. 85: Identifying Airbag System Part Location
 Courtesy of BMW OF NORTH AMERICA, INC.

65 77 016 REMOVING AND INSTALLING/REPLACING AIRBAG CONTROL UNIT

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

WARNING: Note airbag safety instructions! , see 72 00 ... SAFETY REGULATIONS FOR HANDLING COMPONENTS WITH GAS GENERATORS .
 Incorrect handling can activate airbag and cause injury.

Necessary preliminary tasks:

- Disconnect **battery negative lead** and cover, see 61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .

- Remove **complete centre console** , see 51 16 165 REMOVING AND INSTALLING/REPLACING COMPLETE CENTRE CONSOLE .
- Remove rear cabin ventilation duct

Unscrew nuts (1).

Tightening torque **65 77 1AZ** , see 65 77 AIRBAG TRIGGERING CONTROL .

Disconnect plug connections (2).

Installation:

Make sure ground cable (2) is correctly laid.

If necessary, replace damaged cable shoe on ground cable (2).

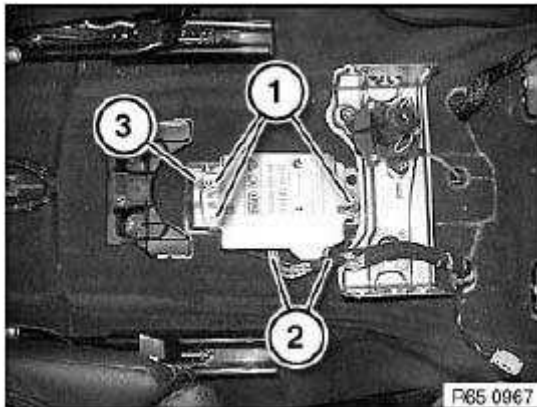


Fig. 86: Identifying Ground Cable, Plug Connection And Nuts
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **programming/coding**.

65 77 532 REMOVING AND INSTALLING/REPLACING FRONT LEFT SENSOR (ACCELERATION SENSOR)

Necessary preliminary tasks:

- Remove **grille in bumper trim** on left, see 51 11 185 REMOVING AND INSTALLING/REPLACING GRILLE (SIDE) IN BUMPER TRIM .

Release bolts (1).

Disconnect plug connection (2) and remove sensor.

Tightening torque **65 77 6AZ** , see **65 77 AIRBAG TRIGGERING CONTROL** .

Installation:

Replace screws (1).

Sensor surface of front left acceleration sensor must point downwards.

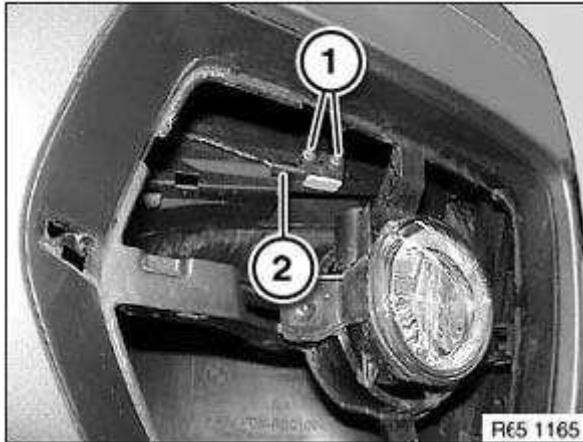


Fig. 87: Identifying Plug Connection, Sensor And Nut
Courtesy of BMW OF NORTH AMERICA, INC.

**65 77 534 REMOVING AND INSTALLING/REPLACING FRONT RIGHT SENSOR
(ACCELERATION SENSOR)**

Necessary preliminary tasks:

- **N54, N63:** Partially remove **bracket for auxiliary cooler** (do not open coolant circuit), see **17 11 150 REMOVING AND INSTALLING/REPLACING BRACKET FOR ENGINE OIL COOLER** , **17 11 150 REMOVING AND INSTALLING/REPLACING HOLDER FOR ENGINE OIL COOLER (N63)** , **17 11 150 REMOVING AND INSTALLING/REPLACING BRACKET FOR ENGINE OIL COOLER (N54)** .
- **M57 (T2):** Remove **grille in bumper trim** at front left, see **51 11 185 REMOVING AND INSTALLING/REPLACING GRILLE (SIDE) IN BUMPER TRIM** .

NOTE: Subsequent work is described in:
Removing front left sensor , see 65 77 532 Removing and installing/replacing front left sensor (acceleration sensor).

Installation:

Sensor surface of front right sensor must point upwards.

65 77 598 REPLACING SENSOR MAT FOR DRIVER'S SEAT OCCUPANCY DETECTOR

Operation is described in: Replacing sensor mat for passenger seat occupancy detector , see 65 77 605 Replacing sensor mat for passenger seat occupancy detector.

65 77 604 REPLACING SENSOR MAT (OC3 MAT) FOR PASSENGER SEAT OCCUPANCY DETECTOR

WARNING: Note airbag safety instructions! Incorrect handling can activate airbag and cause injury.

WARNING: US/CDN front passenger seat (with OC3 mat) only: A defective OC3 mat can only be replaced together with the padding and the seat cover. New OC3 mat is supplied with padding, seat cover and if necessary seat heating. After fitting, the OC3 mat must be enabled with the diagnosis system. Individual parts not available.

Operation for replacing the OC3 mat in conjunction with padding and seat cover is described in:

52 17 415 REPLACING PADDING FOR LEFT OR RIGHT FRONT SEAT (COMFORT)

52 16 415 REPLACING PADDING FOR LEFT OR RIGHT FRONT SEAT

52 13 415 REPLACING PADDING FOR LEFT OR RIGHT FRONT SEAT (NORMAL/SEMI-ELECTRIC)

65 77 605 REPLACING SENSOR MAT FOR PASSENGER SEAT OCCUPANCY DETECTOR

WARNING: US/CDN front passenger seat (with OC3 mat) only:

If seat cover is defective, seat cover, padding and OC3 mat must be replaced together.

The same applies to a faulty OC3 mat or padding. Both parts can only be replaced together with the seat cover.

New seat cover is supplied with padding, OC3 mat and if necessary seat heating.

After fitting, the OC3 mat must be enabled with the diagnosis system. Individual parts not available.

Necessary preliminary tasks:

- Remove seat cover for passenger seat , see 52 13 400 REPLACING SEAT COVER FOR LEFT OR RIGHT FRONT SEAT (NORMAL/SEMI-ELECTRIC) or 52 14 400 REPLACING COVER FOR LEFT OR RIGHT FRONT SEAT , or 52 16 400 REMOVING AND INSTALLING/REPLACING SEAT COVER FOR LEFT OR RIGHT FRONT SEAT (SPORT/ELECTRIC) or 52 17 400 REMOVING AND INSTALLING/REPLACING SEAT COVER FOR LEFT OR RIGHT FRONT SEAT (COMFORT) .

Pull sensor mat (1) off passenger seat padding (2) and feed out plug housing (3).

Installation:

- To avoid malfunctions, make sure sensor mat (1) is cleanly laid:
 - Lay plug housing (3) in designated recess
 - Secure sensor mat (1) to bonding surface
 - Lay sensor mat (1) straight and without kinks

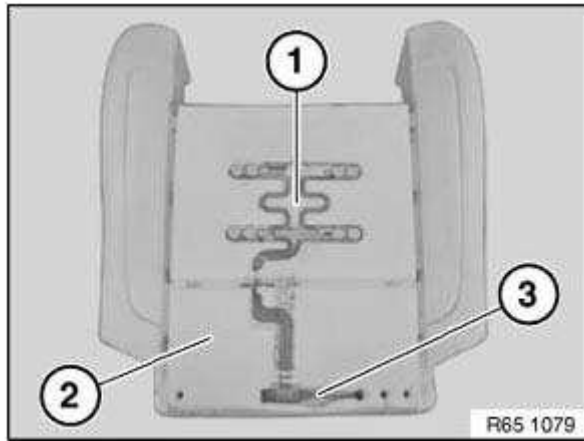


Fig. 88: Identifying Plug Housing And Sensor Mat
Courtesy of BMW OF NORTH AMERICA, INC.

65 77 720 REMOVING AND INSTALLING (REPLACING) LEFT B-PILLAR SENSOR

WARNING: Note airbag safety instructions! , see 72 00 ... SAFETY REGULATIONS FOR HANDLING COMPONENTS WITH GAS GENERATORS .
Incorrect handling can activate airbag and cause injury.

Necessary preliminary tasks:

- Disconnect **battery negative lead** and cover, see **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD .**
- Remove **front entrance cover strip** , see **51 47 000 REMOVING AND INSTALLING/REPLACING FRONT (INSIDE) LEFT OR RIGHT ENTRANCE COVER STRIP .**

Release screw (1).

Installation:

Replace screw (1).

Tightening torque 72 11 01AZ, see .

Unlock inertia reel unit (2) and remove from B-pillar.

Installation:

Inertia reel unit (2) is coded against incorrect installation (3).

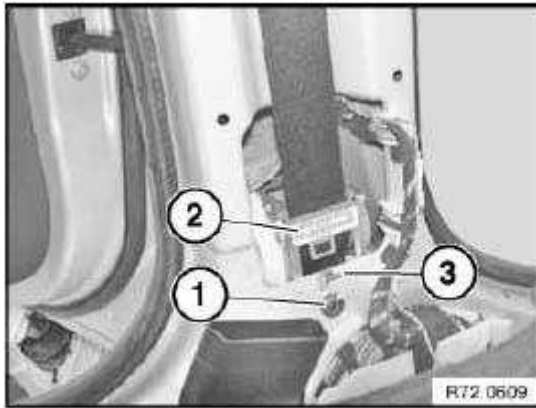


Fig. 89: Identifying Reel Unit And Screw
Courtesy of BMW OF NORTH AMERICA, INC.

Release bolts (1).

Slacken screw (2) and feed out sensor.

Tightening torque 65 77 3AZ , see **65 77 AIRBAG TRIGGERING CONTROL** .

Disconnect plug connection (3).

Installation:

Replace microencapsulated screws (1, 2).

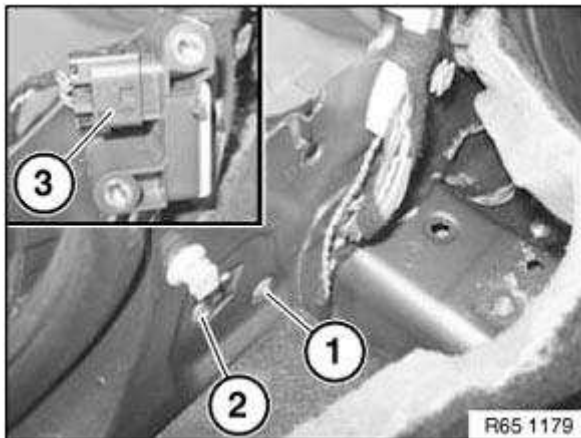


Fig. 90: Identifying Plug Connection, Bolt And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Establish correct positioning of B-pillar sensor (1) by means of guide pin (2) and screw (3).

Replace microencapsulated screws (3).

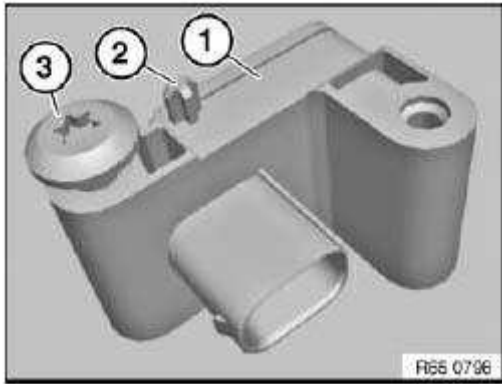


Fig. 91: Identifying Microencapsulated Screws And Guide Pin
Courtesy of BMW OF NORTH AMERICA, INC.

65 77 740 REMOVING AND INSTALLING (REPLACING) LEFT FRONT DOOR SENSOR

WARNING: Note airbag safety instructions! , see 72 00 ... SAFETY REGULATIONS FOR HANDLING COMPONENTS WITH GAS GENERATORS .
Incorrect handling can activate airbag and cause injury.

Necessary preliminary tasks:

- Partially detach **sound insulation** , see **51 48 060 REMOVING AND INSTALLING/REPLACING SOUND INSULATION IN LEFT OR RIGHT FRONT DOOR .**

Release screw (1).

Tightening torque **65 77 4AZ** , see **65 77 AIRBAG TRIGGERING CONTROL .**

Remove sensor with pin (2) from door panel fit (3) towards rear and disconnect associated plug connection.

Installation:

Make sure fit (2) is correctly seated.

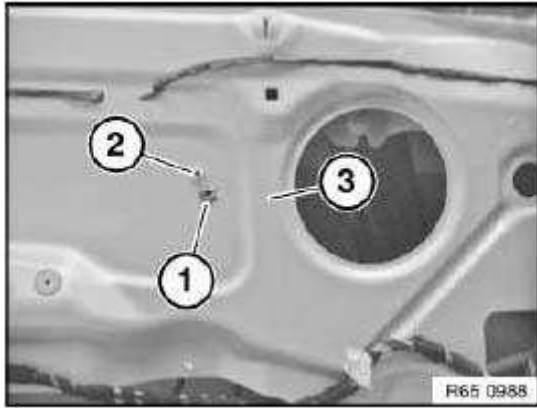


Fig. 92: Identifying Door Panel Fit And Pin
 Courtesy of BMW OF NORTH AMERICA, INC.

65 77 745 REMOVING AND INSTALLING/REPLACING RIGHT FRONT DOOR SENSOR

This operation is described in:

Removing and installing (replacing) left front door sensor , see 65 77 740 Removing and installing (replacing) left front door sensor.

ON-BOARD COMPUTER

65 81 060 REMOVING AND INSTALLING/REPLACING OUTSIDE TEMPERATURE SENSOR

Necessary preliminary tasks:

- Remove **front bumper trim** , see **51 11 156 REMOVING AND INSTALLING FRONT BUMPER TRIM** .

Disconnect plug connection (1).

Press out outside temperature sensor (2) in direction of arrow and remove.

Installation:

Outside temperature sensor must audibly snap into place.

Check for secure seating after fitting.

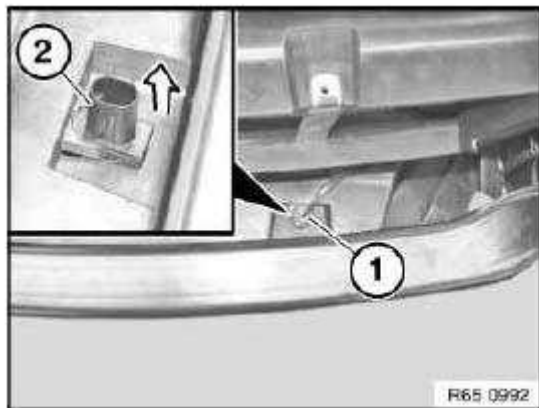


Fig. 93: Identifying Outside Temperature Sensor And Plug Connection
 Courtesy of BMW OF NORTH AMERICA, INC.

CAR COMMUNICATION COMPONENTS

65 83 010 REMOVING AND INSTALLING/REPLACING CAR COMMUNICATION COMPUTER

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

NOTE: Comply with notes and instructions on handling optical waveguides , see **61 00 ... NOTES ON HANDLING OPTICAL FIBERS** .

Necessary preliminary tasks:

- Disconnect **battery negative lead** , see **61 20 900 DISCONNECTING AND CONNECTING BATTERY NEGATIVE LEAD** .
- Remove **middle trim for instrument panel** , see **51 45 310 REMOVING AND INSTALLING (REPLACING) CENTRE TRIM FOR INSTRUMENT PANEL** .

Release screws (1).

Pull back Car Communication Computer (2) slightly.

Disconnect associated plug connections and remove Car Communication Computer (2).

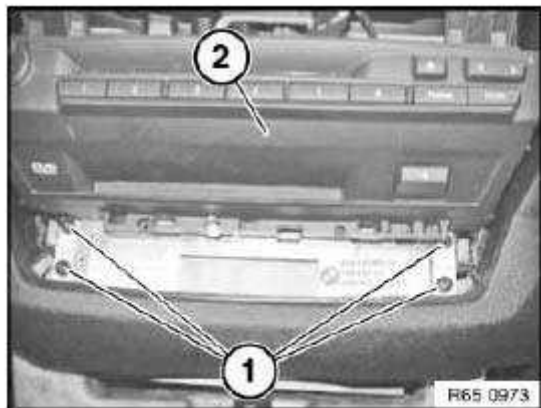


Fig. 94: Identifying Car Communication Computer And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Carry out **programming/coding**.

65 83 550 REMOVING AND INSTALLING/REPLACING FAN FOR CAR COMMUNICATION COMPUTER

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

Necessary preliminary tasks:

- Remove **CAR COMMUNICATION COMPUTER**, see **65 83 010 Removing and installing/replacing Car Communication Computer**.

Raise retaining hook (1) and turn fan for Car Communication Computer (2) in direction of arrow.

Remove fan for Car Communication Computer (2) from Car Communication Computer (3).

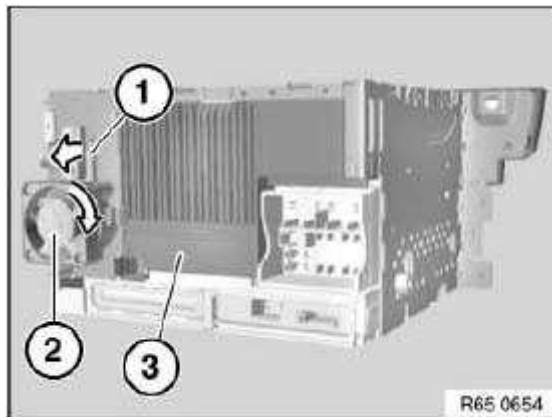


Fig. 95: Identifying Car Communication Computer And Retaining Hook
 Courtesy of BMW OF NORTH AMERICA, INC.

65 83 560 REMOVING AND INSTALLING/REPLACING FRONT TRIM FOR CAR COMMUNICATION COMPUTER

Special tools required:

- 12 7 192

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

Risk of damage!

Place Car Communication Computer on special tool 12 7 192 (antistatic mat) and earth/ground, see .

Necessary preliminary tasks:

- Remove CAR COMMUNICATION COMPUTER, see 65 83 010 Removing and installing/replacing Car Communication Computer.

Unlock retainer (1) and carefully raise front trim (2).

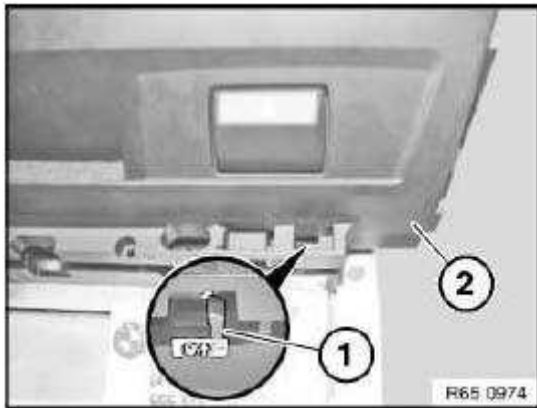


Fig. 96: Identifying Retainer And Front Trim
 Courtesy of BMW OF NORTH AMERICA, INC.

If necessary, unclip retaining lugs (2) and carefully remove front trim (1).

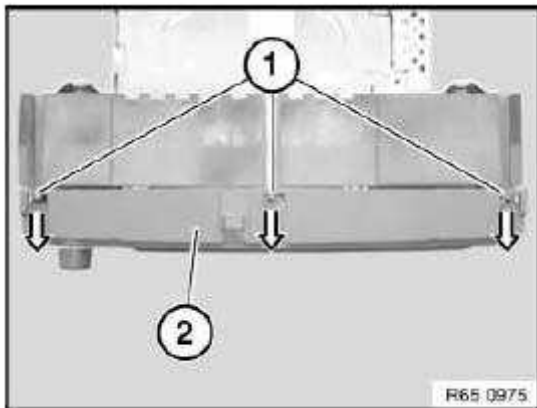


Fig. 97: Identifying Retaining Lugs And Front Trim
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: "LIF" stands for Low Insertion Force.

Open catch of LIF plug (1) in direction of arrow and feed out LIF cable (2).

Remove front trim (3).

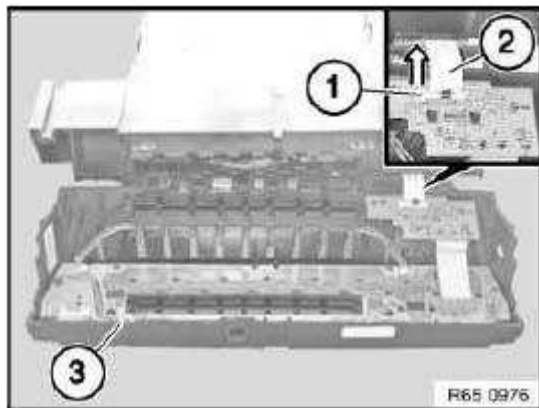


Fig. 98: Identifying Front Trim And LIF Plug
 Courtesy of BMW OF NORTH AMERICA, INC.

65 83 565 REMOVING AND INSTALLING/REPLACING FRONT TRIM FOR CAR COMMUNICATION COMPUTER (HOLDER)

Special tools required:

- 12 7 192

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

Risk of damage!

Place Car Communication Computer on special tool 12 7 192 (antistatic mat) and earth/ground.

Necessary preliminary tasks:

- Remove **front trim for Car Communication Computer** , see 65 83 560 Removing and installing/replacing front trim for Car Communication Computer.

Release screws (1) and remove holder (2).

Installation:

Retaining pin (1) must be adapted to fit in guide hole (2).

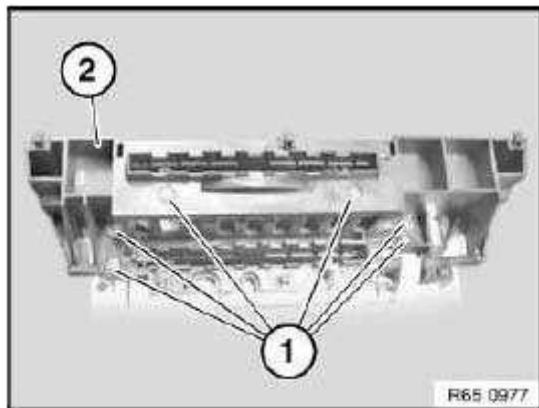


Fig. 99: Identifying Holder And Screws
 Courtesy of BMW OF NORTH AMERICA, INC.

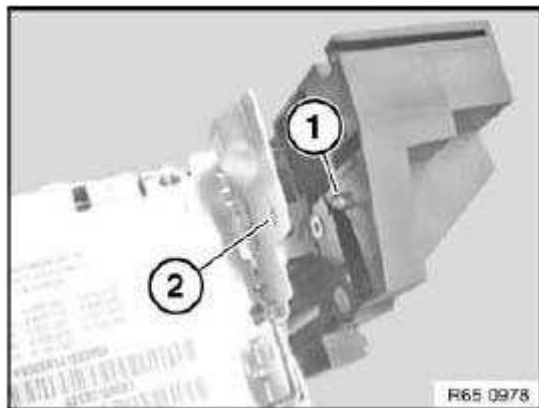


Fig. 100: Identifying Pin And Screw
 Courtesy of BMW OF NORTH AMERICA, INC.

Installation:

Guide tabs (1) must be correctly inserted in front trim holder.

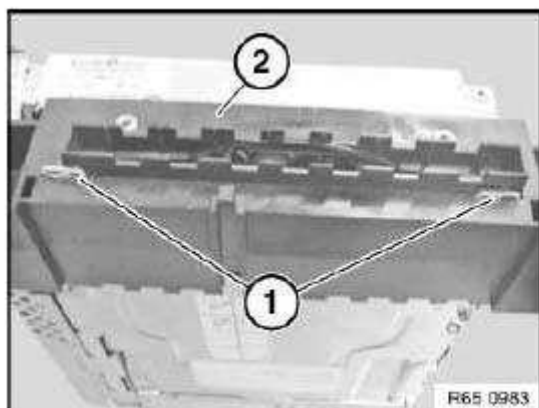


Fig. 101: Identifying Guide Tabs In Front Trim Holder
Courtesy of BMW OF NORTH AMERICA, INC.

65 83 570 REMOVING AND INSTALLING/REPLACING CD DRIVE FOR CAR COMMUNICATION COMPUTER

Special tools required:

- 12 7 192

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

Risk of damage!

Place Car Communication Computer on special tool 12 7 192 (antistatic mat) and earth/ground.

Necessary preliminary tasks:

- Remove front trim holder for Car Communication Computer , see 65 83 565 Removing and installing/replacing front trim for Car Communication Computer (holder).

Release screws (1), remove CD drive and place to one side.

Installation:

Ensure correct routing of cables.

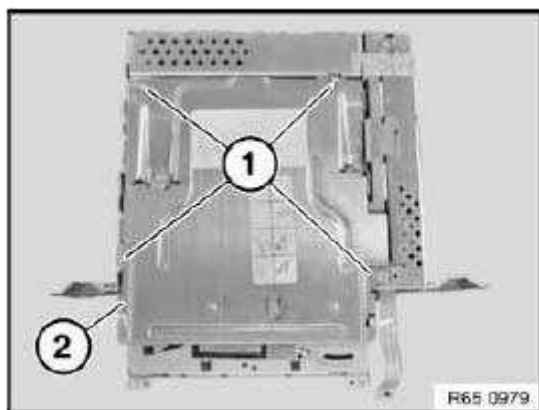


Fig. 102: Identifying CD Drive And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Replacement:

Release screws (1) and remove cover (2) from CD drive.

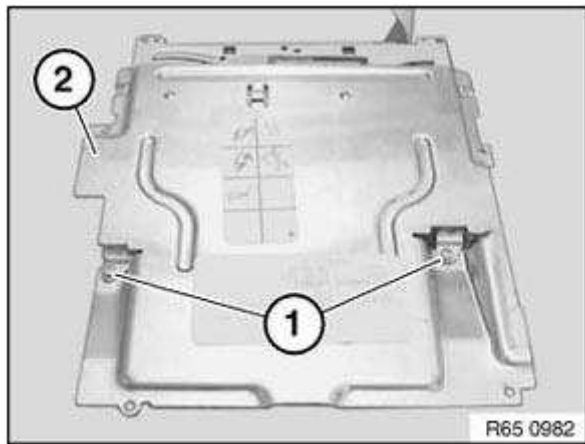


Fig. 103: Identifying CD Drive, Cover And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Cut through warranty seal (1) at marked point.

Release screw (2).

Lift side cover out of mounting (3) and carefully place to one side.

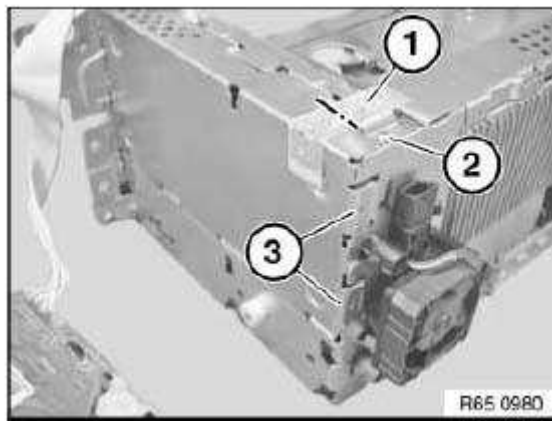


Fig. 104: Identifying Warranty Seal And Mounting
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1) and remove CD drive.

Installation:

Ensure correct routing of cables.

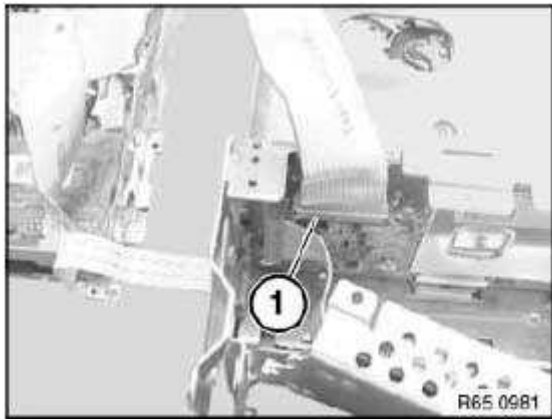


Fig. 105: Identifying Plug Connection And CD Drive
 Courtesy of BMW OF NORTH AMERICA, INC.

65 83 580 REMOVING AND INSTALLING/REPLACING DVD DRIVE FOR CAR COMMUNICATION COMPUTER (CCC)

Special tools required:

- 12 7 192

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .
Risk of damage!
 Place Car Communication Computer on special tool 12 7 192 (antistatic mat) and earth/ground.

Necessary preliminary tasks:

- Partially remove **CD drive for CCC** , see **65 83 570 Removing and installing/replacing CD drive for Car Communication Computer.**

Release screws (1) and remove cover (2) with CD drive.

Installation:

Make sure cables are correctly laid.

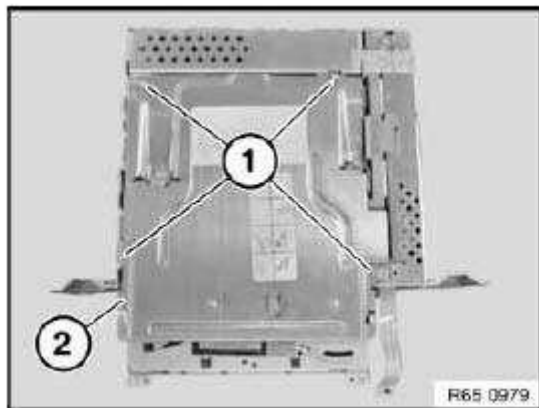


Fig. 106: Identifying CD Drive, Cover And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

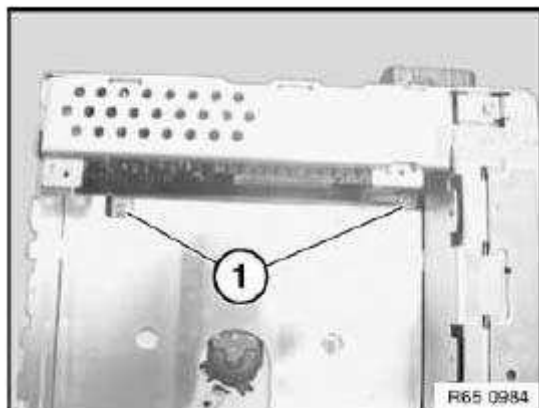


Fig. 107: Identifying CD Drive Cover And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Release screws (1).

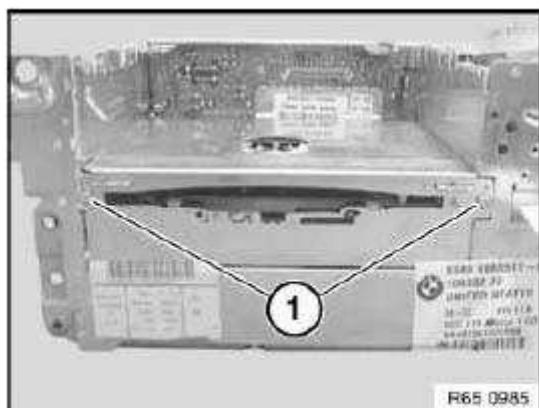


Fig. 108: Identifying CD Drive Cover And Screws Location
Courtesy of BMW OF NORTH AMERICA, INC.

Place Car Communication Computer (2) to one side.

Feed out DVD drive and disconnect plug connections (2).

Installation:

Make sure cables are correctly laid.

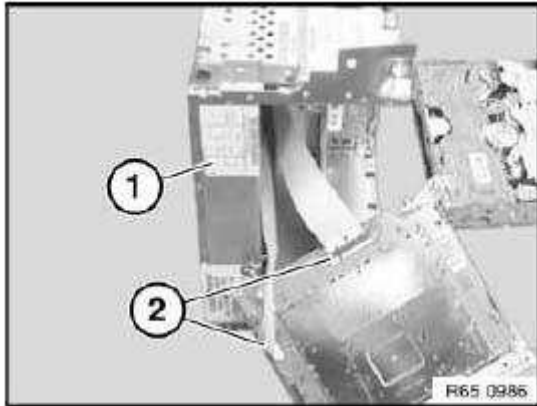


Fig. 109: Identifying Car Communication Computer And Plug Connections
Courtesy of BMW OF NORTH AMERICA, INC.

65 83 590 REMOVING AND INSTALLING/REPLACING GYRO SENSOR DRIVE FOR CAR COMMUNICATION COMPUTER

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see **61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE)** .

Necessary preliminary tasks:

- Remove **CAR COMMUNICATION COMPUTER**, see **65 83 010 Removing and installing/replacing Car Communication Computer**.

If necessary, cut through warranty seal.

Release bolts (1).

Remove floor pan (2) towards bottom and set down.

IMPORTANT: Contact spring strip (3) on floor pan (2) must not be bent: otherwise risk of short-circuiting!

When reinstalling floor pan (2), make sure individual springs of contact spring strip (3) are correctly seated.

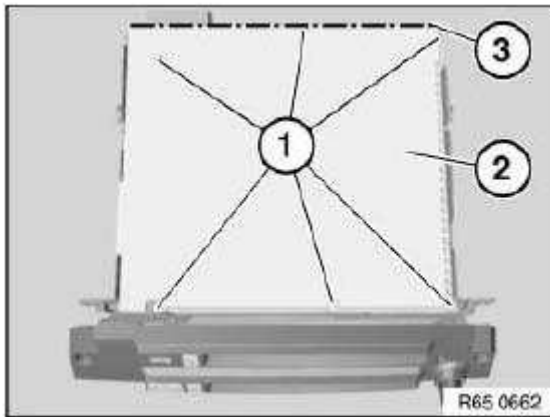


Fig. 110: Identifying Spring Strip And Floor Pan
Courtesy of BMW OF NORTH AMERICA, INC.

Release bolt (1).

Detach gyro sensor for Car Communication Computer (2) in direction of arrow from plug-in contact (3).

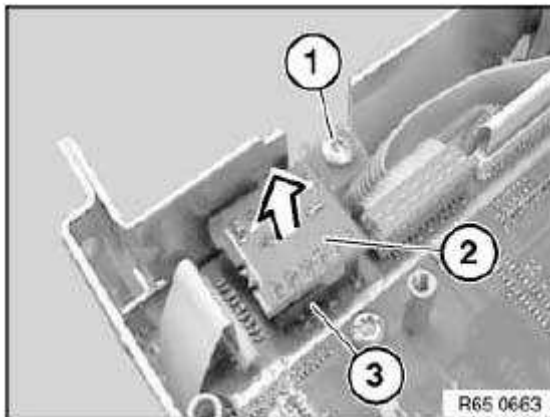


Fig. 111: Identifying Gyro Sensor And Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

65 83 600 REPLACING HIP MODULE FOR CAR COMMUNICATION COMPUTER

IMPORTANT: Read and comply with notes on protection against electrostatic damage (ESD protection) , see 61 35 ... NOTES ON ESD PROTECTION (ELECTRO STATIC DISCHARGE) .

Necessary preliminary tasks:

- Remove CAR COMMUNICATION COMPUTER, see 65 83 010 Removing and installing/replacing Car Communication Computer.

Release screws (1).

Remove cover (2) towards top.

IMPORTANT: Contact spring strip (3) on floor pan (2) must not be bent: otherwise risk of short-circuiting!
When reinstalling floor pan (2), make sure individual springs of contact spring strip (3) are correctly seated.

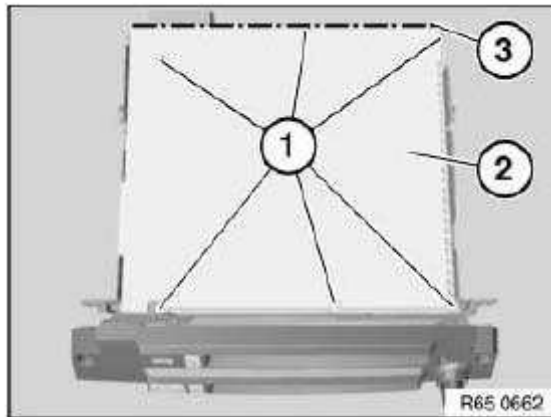


Fig. 112: Identifying Floor Pan, Spring Strip And Screws
Courtesy of BMW OF NORTH AMERICA, INC.

Press catches (1) and feed out HIP module (2) in direction of arrow.

Installation:

Make sure front guides (3) of HIP module (2) are correctly seated.

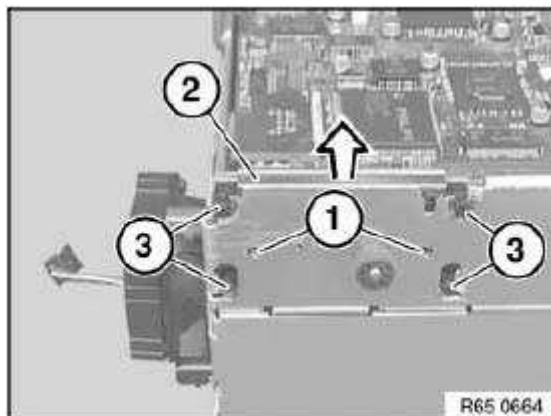


Fig. 113: Identifying Front Guides Of HIP Module
Courtesy of BMW OF NORTH AMERICA, INC.

Disconnect plug connection (1) in direction of arrow and remove HIP module (2).

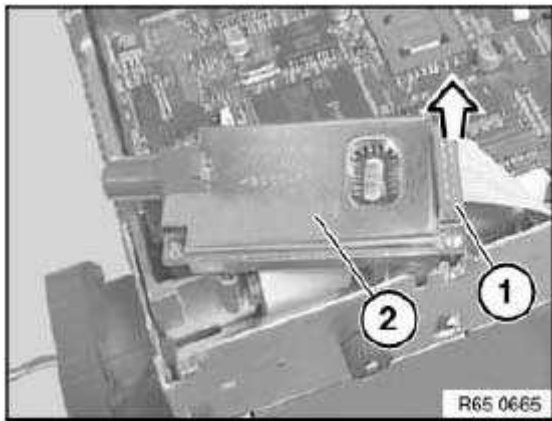


Fig. 114: Identifying Plug Connection And HIP Module
Courtesy of BMW OF NORTH AMERICA, INC.

After installation:

- **Cars with out-of-date software status at time of repair:**

After replacing the HIP module, **program** the Car Communication Computer. Then take the car for an initialization drive.

- **Cars with current software status at time of repair:**

After replacing the HIP module, take the car for an initialization drive.

Initialization drive:

Drive for 15-20 minutes at 50 km/h and with good GPS reception until correct vehicle position is achieved in the navigation display.

NOTE: During this time, the position pointer of the navigation system can be motionless or move across country.

ACCESSORIES & EQUIPMENT

Audio, Navigation and Anti-Theft - Service Techniques - X6

AUDIO, NAVIGATION AND ANTI-THEFT

AERIAL SYSTEM : E70, E71, E81, E82, E87, E88, E90, E91, E92, E93, R55, R56

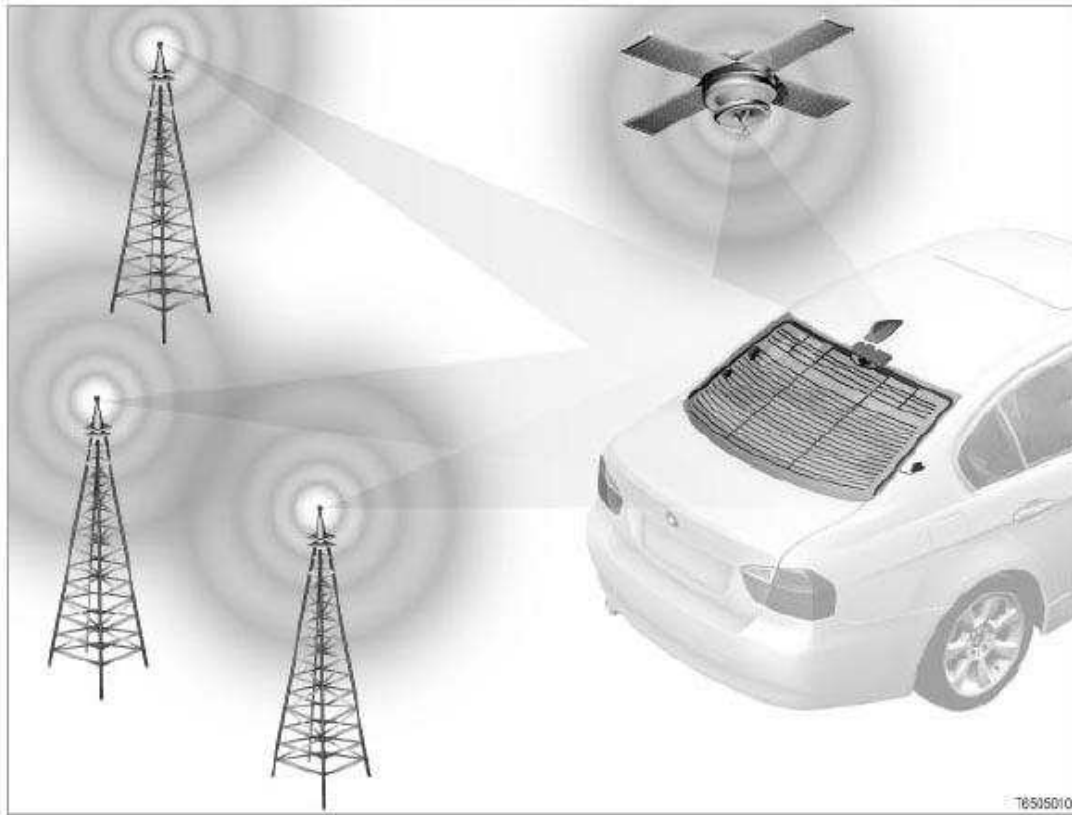


Fig. 1: Identifying Radio Services

Courtesy of BMW OF NORTH AMERICA, INC.

Introduction

The number of radio services (transmission of messages by radio) in the vehicle is constantly growing: Services for communication, navigation, radio and sensor systems. The number of aerials has also increased in line with the additional radio services.

NOTE: **The description applies to vehicles with "High" equipment level.**

Depending on the vehicle's equipment specification, not all of the aerials described here may be fitted. Attention will be drawn to differences due to certain equipment combinations or national versions.

In principle, radio services can be separated into terrestrial services and satellite services. Terrestrial radio

services are broadcast via ground aerials (stationary aerials for terrestrial reception).

Terrestrial services include:

- AM-FM radio transmitters (analogue)
- DVB-T (Digital Video Broadcasting - Terrestrial)
- TV transmitters (analogue)
- DAB (Digital Audio Broadcasting). DAB makes digital radio reception possible.
- GSM dual band 900/1800 MHz (for mobile phones)

Satellite services include:

- GPS (signals for navigation)
- SDARS (Satellite Digital Audio Radio Service, US version only)

Aerials for vehicle systems (the aerials themselves are **not** dealt with in this SBT):

- Aerials for remote control or Comfort Access
- Bluetooth aerial for connecting mobile phones to the vehicle

Most aerials are integrated in the rod aerial, roof-mounted aerial, side window and in the rear window.

- E93

The E93 (Convertible) has no visible aerials apart from the SDARS aerial (US version) on the tailgate.

Different aerials are used for radio reception depending on the position of the convertible hardtop (closed or open).

Convertible hardtop closed:

- Radio reception using aerials (AM, FM 1, FM 3) in the rear window

Convertible hardtop open:

- Radio reception using aerials (AM, FM 1) in the rear left side trim and the aerial (FM 3) in the rear right side trim

Brief description of components

The aerials supply signals for the aerial system:

- **FM aerial**

The FM aerial receives radio stations and traffic information in the FM (VHF) range (FM stands for "Frequency modulation").

The number of FM aerials installed in the aerial system varies:

- E81, E87, E93

4 FM aerials (FM 1, FM 2, FM 3, FM 4)

- E70, E71, E82, E88, E90, E91, E92, plus R55, R56

3 FM aerials: (FM 1, FM 2, FM 3)

For space-saving reasons, the FM 4 aerial does not exist physically. The FM 4 aerial is formed from the HF signal of the FM 1 and FM 2 aerials by way of heterodyning. This improves FM reception.

○ **AM aerial**

The AM aerial receives radio stations in the SW, MW and LW ranges (SW stands for "short wave"; MW stands for "medium wave" and LW stands for "long wave").

○ **TV aerial**

The TV aerials receive analogue or digital television signals.

○ **DAB aerials (Europe version)**

The DAB aerial picks up high-frequency signals (digital signals) from the radio transmitters (DAB: Digital Audio Broadcasting).

Different DAB aerials are used for radio reception:

- DAB L aerial (frequency range: L-band)

The DAB aerial is used for reception in urban areas.

- DAB III aerial (frequency range: III-band)

The DAB aerial is used for regional reception.

○ **GPS aerial**

The GPS aerial picks up navigation signals transmitted by GPS satellites (GPS: Global Positioning System).

○ **Telephone aerial**

The telephone aerial is designed for the GSM mobile communication network and for other services, e.g. CDMA. (GSM stands for "Global Standard for Mobile Communication"; CDMA stands for "Code

Division Multiplex Access")

- **Emergency GSM aerial**

The emergency GSM aerial is installed in vehicles with TCU (TCU stands for "Telematics Control Unit")

An emergency call can be transmitted through the emergency GSM aerial if the external telephone aerial is not working, because of an accident, for example.

- **SDARS aerial (US version)**

- E70, E71, E82, E88, E90, E91, E92, E93 plus

R55, R56

High-frequency signals (digital signals) from satellites and stationary aerials for terrestrial reception are picked up by an SDARS aerial on the vehicle. (SDARS stands for "Satellite Digital Audio Radio Service")

An aerial cable routes the signals to the satellite tuner.

- **VICS aerial (Japan version)**

Information relating to the current road traffic situation is acquired from several locations and transferred to the VICS control centre. (VICS stands for "Vehicle Information and Communication System")

Information is provided by radio and infrared transmission for the current stretch of road. Information is provided both in text and graphic form.

- E70, E71

The E70, E71 has 2 aerials.

One aerial is integrated in the interior mirror, the other in the rear window.

- E81, E82, E87, E90, E91, E92

The aerial is integrated in the interior rear-view mirror.

- E88, E93

The aerial is installed in the mirror base of the inside mirror.

- R55

The R55 has 2 aerials.

One aerial is integrated in the interior mirror, the other in the rear left side window.

- R56

The R56 has 2 aerials.

One aerial is integrated in the interior mirror, the other in the rear window.

The individual aerials are integrated in the aerial system as follows:

- **Aerials in rod aerial**

- E81, E87

The rod aerial contains the aerials for AM, FM 1, telephone, GPS and DAB (frequency range: L-band).

- E88

The rod aerial contains the aerials for AM, FM 1 and telephone.

- R55, R56

Depending on the vehicle's equipment specification, up to 6 different equipment versions are possible.

- **Aerials in the roof-mounted aerial**

- E70, E71, E82, E90, E91, E92

The following roof-mounted aerials are fitted:

- Roof-mounted aerials with aerials for telephone, GPS and DAB (Europe version).
- Roof-mounted aerial with telephone, telephone 2, GPS and SDARS (US version)

The US version of the roof-mounted aerial is noticeably larger than the Europe version. Depending on the vehicle's equipment specification, up to 5 different equipment versions are possible.

- **Aerial in the rear window**

- E70, E71, E82, E87, E90, E91, E92, E93, R56

Conductors pressed onto the heated area of the rear window act as aerials. The heated area connections for the heated rear window are decoupled from the aerials by rejector circuits.

- **Aerials in side window**

- E70

The television aerial (TV 2) is integrated into the rear right side window.

The following aerials are integrated into the rear left side window:

- TV aerial (TV 1)
- DAB aerial (frequency range: III-band)
- E91

The television aerial (TV 2) is integrated into the rear right side window.

The television aerial (TV 1) is integrated into the rear left side window.

- R55

The television aerial (TV 2) is integrated into the rear right side window.

The following aerials are integrated into the rear left side window:

- TV aerial (TV 1)
- DAB aerial (frequency range: III-band)
- FM aerial (FM 2)
- FM aerial (FM 3)
- VICS aerial (VICS 2) for Japan navigation system
- R56 in Japan national version

One TV aerial is integrated in the rear left and rear right side window. The TV aerials (TV 3 on the left in the direction of travel; TV 4 on the right in the direction of travel) have their own TV aerial amplifier. The aerial amplifier sends the signals from the 2 TV aerials to the control unit for the Japan navigation system.

○ **Aerial on tailgate**

The aerial on the tailgate is of a similar design to the roof aerial, but it is much flatter.

- E88 Europe version

DAB aerial (frequency range: L-band)

- E88, E93 US version

SDARS aerial

○ **Aerials in the rear left and rear right side trims**

- E93

When the convertible hardtop is open, radio stations are received using the aerials in the rear right and rear left side trims.

The following aerials are fitted in the rear left and rear right side trims:

- AM and FM aerial (FM 1)
- FM aerial (FM 3)
- **Aerials under the rear bumper trim**

The following aerials are installed under the rear bumper trim:

- E71
 - TV aerial (TV 2):
under the rear left bumper trim
 - TV aerial (TV 3):
under the rear right bumper trim
- E81, E87
 - Telephone aerial (GSM 1):
under the rear left bumper trim
- E88
 - FM aerial (FM 2)
under the rear centre bumper trim
 - FM aerial (FM 3):
under the rear left bumper trim
 - Telephone aerial (GSM 2) for telematic services:
under the rear left bumper trim
 - DAB aerial (frequency range: III-band)
under the rear right bumper trim
- E93
 - FM aerial (FM 4):
under the rear left bumper trim
 - TV aerial (TV 1):
under the rear left bumper trim

- GSM aerial (GSM 2):
under the rear left bumper trim
- FM aerial (FM 2):
under the rear centre bumper trim
- DAB aerial (DAB III):
under the rear right bumper trim
- TV aerial (TV 2):
under the rear right bumper trim

○ **Aerial behind the front left wheel arch cover**

- E93

The telephone aerial is fitted behind the front left wheel arch cover. The telephone aerial (GSM 1) is directly connected to the eject box.

○ **Aerials in cowl panel**

- E93
- DAB aerial (frequency range: L-band)
- GPS aerial

○ **Aerials in the folding top compartment lid**

- E88

The GPS aerial is installed from below in the folding top compartment lid, left.

The following components are involved in operation of the aerial system:

○ **Aerial amplifier with aerial diversity for FM**

The aerial amplifier compensates for losses that occur in the aerial line. The aerial diversity function makes available the signal from the aerial with the best reception to the radio.

- E81, E87

The aerial amplifier for the FM aerial (FM 1) and for AM aerial is located in the base of the rod aerial.

The aerial amplifier with aerial diversity for the FM 2 to FM 4 aerials is installed on the inside of the boot lid above the rear window in the area of the auxiliary brake light.

NOTE: From 03/2008, aerial diversity is discontinued on the E81, E87 with BMW Audio radio (basic version).

From 03/2008, aerial diversity is discontinued on the E81, E87 with BMW Audio radio (basic version) The combination BMW Audio radio (basic version) and aerial diversity is only possible in conjunction with option 676 "HiFi loudspeaker system".

- E88

The aerial amplifier for the FM aerial (FM 1) and for AM aerial is located in the base of the rod aerial.

The aerial amplifiers for the FM aerials (FM 2, FM 3) are integrated in the aerial amplifier with aerial diversity.

The aerial amplifier with aerial diversity is at the rear left in the luggage compartment.

- E70, E71, E82, E90, E91, E92

The aerial amplifier with aerial diversity is installed above the rear window in the area of the auxiliary brake light.

Other aerial amplifiers are also housed in the AM/FM aerial amplifier housing:

- Aerial amplifier for television aerial
 - E82: TV function cannot be ordered as special equipment.
- Aerial amplifier for DAB (Digital Audio Broadcasting)

Moreover, the remote control receiver for unlocking the vehicle is also integrated into the module.

- E93

The aerial amplifier with aerial diversity is at the rear left in the luggage compartment.

The following aerial amplifiers are fitted in the aerial amplifier housing:

- Aerial amplifier for FM aerial (FM 2)
- Aerial amplifier for FM aerial (FM 4)

- R55

The aerial amplifier with aerial diversity is installed at the top of the left-hand C-pillar. Other aerial amplifiers are also housed in the AM/FM aerial amplifier housing:

- Aerial amplifier for TV aerial (TV 2)
- Aerial amplifier for DAB (Digital Audio Broadcasting)

- R56

The aerial amplifier with aerial diversity is located on the inside of the tailgate, under the rear window (between the rear window wiper and the C-pillar). Other aerial amplifiers are also housed in the AM/FM aerial amplifier housing:

- Aerial amplifier for TV aerials (TV 1 and TV 2)
- Aerial amplifier for DAB (Digital Audio Broadcasting)

○ **Compensator**

The compensator equalizes losses in the telephone aerial wire. The compensator can be retrofitted at the customer's express wish to improve reception.

○ **Suppressor filter**

The suppressor filter suppresses interference from the rear window aerials in the additional brake light wires. Filter circuits in the interference suppression filter are designed to suppress conducted interference. The interference suppression filter is located in the positive and earth cable of the auxiliary brake light.

- E81, E87

No interference suppressor fitted (suppression filter not needed).

- E91

The interference suppression filter is additionally installed in the positive and earth wires for the heated rear window.

○ **Rejector circuit for heated rear window**

The current to the conductors in the rear window is fed through 2 rejector circuits. The rejector circuits act as throttles to reduce the transmission of interference pulses in the aerials from the vehicle electrical system.

A rejector circuit is integrated into the earth wire on the left-hand side of the rear window. An identical rejector circuit is integrated into the positive (+) wire on the right-hand side of the rear window.

- E70

The rejector circuit is installed at the top of the left-hand C-pillar.

- E71

The rejector circuits are located in the tailgate above the rear window.

- E81, E87

The rejector circuits are located in the tailgate under the rear window.

- E82, E90, E92, E93

The rejector circuits are located on the left and right-hand sides under the C-pillar trim.

- E91

The rejector circuits are integrated in the interference suppression filter.

- R55

A rejector circuit is located in each split door, above the rear window.

- R56

The rejector circuits are located in the tailgate under the rear window.

○ **TV aerial amplifier**

Each television aerial is connected to a TV aerial amplifier. The TV aerial amplifier compensates for losses that occur in the aerial line. The TV aerial amplifiers are powered remotely by the video module.

- E70

3 TV aerial amplifiers are connected to the video module.

- E71

The TV aerial amplifier for TV 1 is integrated in the aerial amplifier for AM and FM. The TV aerial amplifier for TV 2 and TV 3 are connected directly to the video module.

- E81, E82, E87

No TV

- E90, E92

The TV aerial amplifiers are integrated in the AM and FM aerial amplifiers.

- E91

2 TV aerial amplifiers are connected to the video module.

The TV aerial amplifiers are installed in the left and right C-pillars at the level of the rear side windows.

- E93

2 TV aerial amplifiers are connected to the video module.

The TV aerial amplifiers are under the rear bumper trim.

- R55

The TV aerial amplifier for TV 2 is integrated in the aerial amplifier for AM and FM. The TV aerial amplifier for TV 1 is installed at the right-hand C-pillar. The TV aerial amplifiers are connected to the video module.

- R56

The TV aerial amplifiers are integrated in the AM and FM aerial amplifiers.

(In the Japan version, the R56 has a separate TV aerial amplifier for the aerials TV 3 and TV 4)

- **Coaxial cable**

The coaxial cables carry high-frequency signals, e.g. between the aerial amplifier and the radio.

- **RAD_ON wire**

The RAD_ON wire carries the "Radio on" signal. The RAD_ON wire switches on the aerial amplifier with aerial diversity and the AM/FM aerials.

- **aerial splitter**

- E87

Until 09/2007, only one telephone aerial was installed. An aerial splitter divided the aerial output between the TCU and the mobile phone.

From 09/2007, 2 telephone aerials are fitted. It is no longer necessary to divide the aerial output. The aerial splitter is thus discontinued.

The following control units are involved in the aerial system:

- **Radio, M-ASK, CHAMP or CCC**

- BMW "Audio" radio, BMW "Business CD" radio, BMW "Professional" radio

A MOST bus is fitted for the BMW "Professional" radio and higher.

- M-ASK or CHAMP: Multi-audio system controller or multimedia platform

The M-ASK is fitted with option "Business Navigation". The menus are displayed on the Central Information Display (CID).

In the US version, the Central Headset and Multimedia Platform (CHAMP) is operated as the BMW Professional radio instead of M-ASK. In contrast to M-ASK, CHAMP does not have a navigation system.

- CCC: Car Communication Computer

The CCC controls all information and communication systems. The menus are displayed on the Central Information Display (CID).

- **TCU: Telematics control unit**

A transmitter/receiver module (transceiver) with its own SIM card is installed in the TCU (SIM stands for "Subscriber Identity Module").

- **VM: Video module**

The video module is the central receiver unit for the picture signals from the TV aerials. In addition, the video module is a selector switch for the video sources. All TV aerial amplifiers are powered remotely by the video module.

[for more information, please refer to SI TECHNOLOGY (SBT) 65 07 04 105]

- **VM Hybrid: Hybrid video module (as from 03/2005 Europe version)**

The hybrid video module is a combination of the video module (for analogue TV reception) and the set-top box (for digital TV reception).

- **IBOC: Digital tuner US (US version only)**

- E90, E91 as from 09/2005
- E70, E71, E82, E88, E92, E93
- R55, R56

IBOC is an FM tuner that can receive additional digital information (IBOC stands for "In-Band On-Channel").

IBOC performs the task of the conventional tuner. This means the tuner function of the conventional tuner is coded inactive.

- **DAB: Digital tuner (not US version)**

DAB (Digital Audio Broadcasting) makes digital radio reception possible. The digital tuner converts the digital signals from the DAB aerials into optical signals (light signals). The digital tuner transmits these optical signals on the MOST bus.

- **SDARS: Satellite tuner (US version only)**

SDARS (Satellite Digital Audio Radio Service) facilitates digital radio reception via satellite and terrestrial reception via stationary aerials

The following aerial system functions are described:

- Aerial diversity for FM aerials
- Diagnosis function for aerial diversity

Aerial diversity for FM aerials

To ensure the best possible reception, aerial diversity works as follows:

- One of the aerials (FM 1) receives the required radio station.
- If the signal from this aerial deteriorates, the system switches to one of the other aerials (FM 2, FM 3, FM 4) with a stronger signal.
- E93

Depending on the position of the convertible hardtop (closed or open), aerial diversity will switch to either the aerials in the rear window or the aerials in the rear left and rear right side trim for radio reception.

The Convertible Top Module (CTM) records the position of the convertible hardtop. The CTM transmits a signal through a direct wire to aerial diversity.

Diagnosis function for aerial diversity

Aerial diversity self-diagnosis comprises a check of the aerial inputs based on DC current measurement. In diagnosis mode, the AM/FM tuner switches each FM aerial on individually in turn.

AM reception can be evaluated with the AM amplifier switched on and off. A comparison of the results will produce the diagnosis output.

Notes for service staff

The following information is available for service staff:

- Encoding/programming: -

National versions

The following details are available with regard to national versions:

- Japan version

Navigation system with VICS: Vehicle Information and Communication System

Current highway traffic data are displayed to the driver in the navigation system. Information is gathered from various sources and transmitted to the central VICS module:

- Highway management

- Police
- Highway traffic information centre

Information is provided by radio and infrared transmission for the current stretch of road. In urban areas, information is also displayed on display boards. In this way, delays are reduced and other information is displayed such as accident locations, construction sites and free parking spaces.

○ US version

Depending on the vehicle's equipment, an aerial splitter may be fitted. The aerial splitter divides the high-frequency (HF) signals received from the aerial amplifier with aerial diversity between the IBOC and the headset. This division allows the headset to receive Real Time Traffic Information (RTTI) data.

Subject to change.

DIGITAL AND ANALOGUE TELEVISION : E60, E61, E63, E64, E65, E66, E70, E71, E83, E85, E86, E90, E91, E92, E93

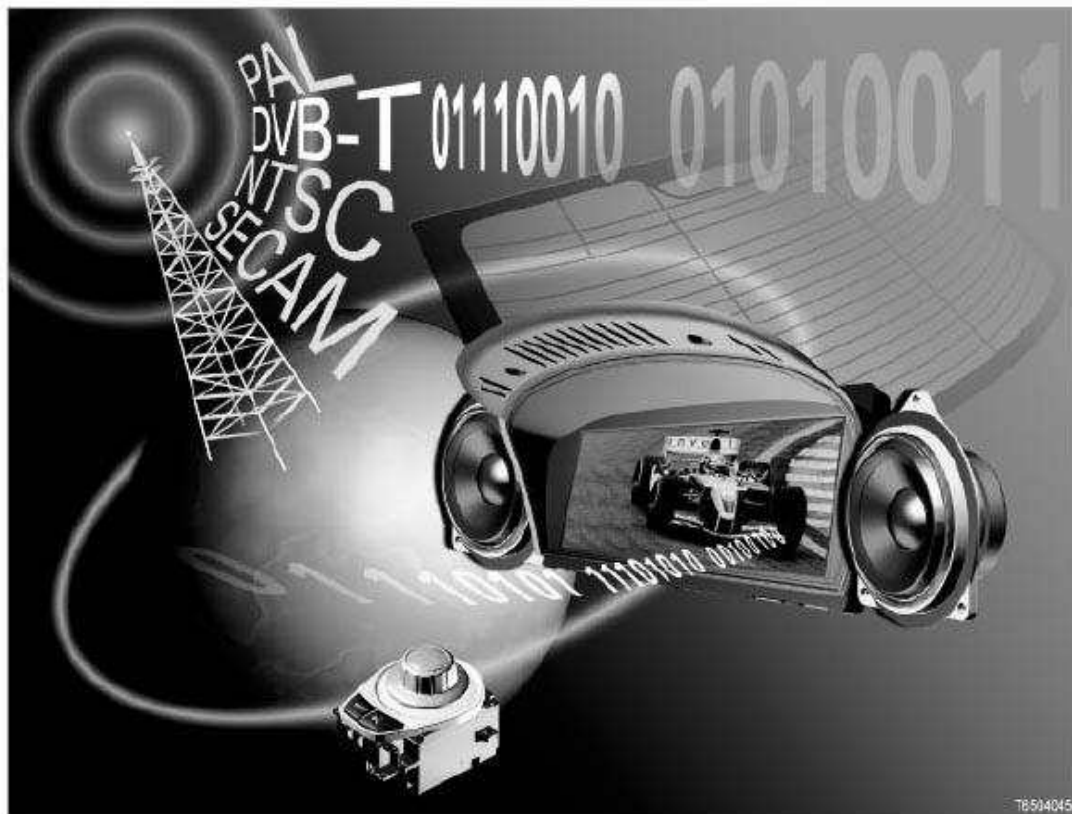


Fig. 2: Identifying Digital And Analogue Television
 Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: **Television picture in front is inactive while the vehicle is being driven.**

For safety reasons television is forbidden in the front when the vehicle is in motion. For this reason, the TV picture is faded out at road speeds greater than 3 km/h. However, TV sound remains audible.

Introduction

The television can be ordered as special equipment (option 601 or 602). Either the Control Display (only E65, E66) or the Central Information Display are used as the TV screen.

TV reception in the rear:

- E65, E66

With option 603, "Rear monitor", it is possible to use the television in the rear seat area too.

- E70, E71

From 09/2007, TV reception is also possible in the rear in conjunction with option 6FF "DVD system in rear" **and** option 601 "TV function" **or** option 602 "on-board monitor with TV". Here, a headphones module and a special RSE control unit are used.

New feature: The newly developed video modules receive both analogue and digital television in accordance with the international standard DVB-T. The abbreviation "DVB-T" stands for "Digital Video Broadcasting - Terrestrial".

Depending on the series there are the following equipment versions for analogue and digital television:

- Front television:

Viewing television in the front is only possible when the vehicle is stationary.

- Television in the front and rear is only available for model series E65, E66, E70, E71.

When the vehicle is in motion it is only possible to watch television in the rear seat area. It is only possible to watch television in the front when the vehicle is stationary.

NOTE: **The Japan national version has its own system overview.**

There is a separate television system overview for the Japan national version. Please refer to the "**NATIONAL VERSION**" section.

Brief description of components

The following components supply signals or data for the television:

- **TV aerial**

The TV aerial receive the signals for the television.

2 or 3 TV aerials are used as follows for the best possible TV reception under varying reception conditions:

- E60, E61, E63, E64 - Front television: 2 TV aerials
- E65, E66 without navigation system: Front television: 3 TV aerials
- E65, E66: Television in front and rear, analogue: 2 TV aerials
- E65, E66: Front and rear seat television: 3 TV aerials
- E70, E71: Front television: 2 TV aerials
- E70, E71: Front and rear seat television: 3 TV aerials
- E83, E85, E86: TV in front: 2 TV aerials
- E90, E91, E92, E93: TV in front: 2 TV aerials

○ **TV aerial amplifier**

There are always 2 TV aerial amplifiers (TV tuners) installed.

The aerial signals are transmitted to the video module via coaxial cables.

- E65, E66

On equipment versions with 3 TV aerials, 2 TV aerials are amplified by one TV aerial amplifier. One more TV aerial is amplified by the 2nd TV aerial amplifier.

- E70, E71

On the equipment version with 3 TV aerials, there are 3 TV aerial amplifiers installed.

○ **MOST port**

Control units for the television are programmed and encoded via the MOST port.

○ **Diagnosis lead**

Control units for the television are diagnosed via the diagnosis lead.

- Diagnosis-on CAN (D-CAN)

D-CAN supersedes the previous diagnosis interface in all countries. The background for the conversion is a new legal requirement in the USA that stipulates that all vehicles from Model Year 2008 must be equipped with D-CAN.

The following control units are involved in the television system (in alphabetical order):

○ **AMP: Amplifier**

The amplifier issues the audio signals to the loudspeakers.

The following amplifier is fitted, depending on equipment variant:

- HiFi amplifier without AMP control unit
- TOP-HiFi amplifier with AMP control unit:

This amplifier belongs to the "TOP-HiFi amplifier" option (Logic 7).

The TOP-HiFi amplifier is a control unit in the MOST network.

The audio signals are transmitted to the TOP-HiFi amplifier via the MOST bus.

○ **ASK: Audio system controller**

- E65, E66

The audio system controller controls the sound.

The audio system controller is a control unit in the MOST network.

○ **BZMF: Rear compartment centre armrest control centre**

- E65, E66

The rear compartment centre armrest control centre controls the headphones.

The centre armrest control panel in the rear is a control unit on the K-CAN SYSTEM

○ **CCC: Car Communication Computer**

- E60, E61, E63, E64, E70, E71, E90, E91, E92, E93

The Car Communication Computer controls the information and communication systems.

Depending on the equipment and national version, the Car Communication Computer processes RGB signals or FBAS signals (RGB: red-green-blue; FBAS: Composite Video Burst Synchronization).

The Car Communication Computer converts the analogue picture signals into digital LVDS signals (LVDS: Low Voltage Differential Signalling). The LVDS signals are transmitted to the screen via a special LVDS data wire (monitor is the CD or the CID).

The Car Communication Computer is a control unit in the MOST network.

○ **CD: Control display**

- E65, E66

The control display is the screen for the television and other information and communication systems (e.g. navigation system).

The Control Display is a control unit in the MOST network.

- **CID: Central Information Display**

- E60, E61, E63, E64, E70, E71, E83, E85, E86, E90, E91, E92, E93

The Central Information Display is the screen for the television and other information and communication systems (e.g. for the navigation system).

The Central Information Display is a control unit on the K-CAN.

- **CON: Controller**

- E60, E61, E63, E64, E65, E66, E70, E71, E90, E91, E92, E93

The controller is the operating unit and the control unit for operating the screen (control display or Central Information Display, see below).

The controller is a control unit on the K-CAN SYSTEM or K-CAN

(K-CAN-S on E65, E66; K-CAN on E60, E61, E63, E64, E70, E71, E90, E91, E92, E93).

- **DSC: Dynamic Stability Control**

Fading out the TV picture in the front while the vehicle is being driven requires the speed signal to be evaluated. The wheel-speed signals are transmitted by the DSC control unit on the powertrain CAN (PT-CAN). The instrument cluster (KOMBI) prepares the speed signal and makes it available as a message on the K-CAN or K-bus.

- **DVD-C: DVD changer**

The films on DVD use the components and software of the television.

- **FCON: Rear controller**

- E65, E66

The rear compartment controller is part of option 603 "Rear monitor".

The rear compartment controller is integrated into the rear compartment centre armrest control centre (BZMF).

The rear compartment controller is the operating unit and control unit for operating the rear display. The rear compartment controller is a control unit on the K-CAN system

- **KHI: Headphones interface**

- E65, E66

The headphones interface is part of option 603 "Rear monitor".

The headphones interface transmits audio data to the headphones connection module.

The headphones interface is a control unit in the MOST network.

- **KHM: Headphones module**

- E70, E71

The headphones module is the interface between the MOST bus and the control unit for the RSE (rear entertainment system).

While the image signals from the video module are directly transmitted to the RSE control units via an RGB wire, the video module transmits the TV sound as a message (optical signal) on the MOST bus.

The headphones module converts the optical signal into an analogue signal.

The headphones module transmits the TV sound to the RSE control unit as an analogue signal through the audio wires. The RSE control unit regulates the audio output of the TV sound for the rear entertainment system.

- **NAV: Navigation system**

- E65, E66

The navigation system is important for the equipment version "TV in front".

With the equipment variant "Television in front", the NAV control unit works as an RGB decoder:

The navigation system converts FBAS signals into RGB signals.

The navigation system is a control unit in the MOST network.

- E60, E61, E63, E64, E70, E71, E90, E91, E92, E93

The navigation system has been integrated in the Car Communication Computer (CCC). This means that there is only a separate navigation system for certain national versions.

- **SG-FD: Rear display control unit**

- E65, E66

The rear compartment controller control unit is only provided with option 603 "Rear monitor".

The SG-FD is installed beneath the rear display.

The SG-FD is a control unit on the K-CAN system

The SG-FD converts the image signal into the screen display on the rear display: e.g. RGB signals into LVDS signals.

The SG-FD is actuated by the video module.

Signal path: VM -> RGB wire -> SG-FD -> LVDS data wire -> FD

○ **SGM: Safety and gateway module**

- E65, E66

The safety and gateway module is the data interface between the K-CAN (K-CAN Periphery and K-CAN SYSTEM), the diagnosis wire, **byteflight** and PT-CAN.

The control units are diagnosed via the SGM.

- E60, E61, E63, E64
 - Until 09/2005: SGM
 - from 09/2005: Body gateway module (KGM)

○ **VM: Video module**

Depending on the national version concerned, either the hybrid video module or the video module 5 (VM5) is fitted.

The video module is the central receiver unit for the picture signals from the TV aerials. In addition, the video module is a selector switch for the video sources.

- The video module is the master control unit for the television.
- The video module edits the picture signals from the TV aerials and from the DVD drive or DVD changer.

The video module is a control unit in the MOST network.

- E83, E85, E86

The following components are controlled:

○ **Monitors: Central Information Display or Control Display**

- E60, E61, E63, E64, E70, E71, E83, E85, E86, E90, E91, E92, E93: Central Information Display (CID)
- E65, E66: Control display (CD)

○ **FD: Rear display**

- E65, E66, E70, E71

The rear display is the monitor for the television in the rear.

The rear display is mounted on the centre console between the driver's and front passenger's seats.

- E65, E66

The rear display is part of option 603 "Rear monitor".

The rear display is actuated via an LVDS data wire by the rear display control unit (SG-FD). The rear display is a control unit on the K-CAN system

- E70, E71

The rear display is part of option 6FF "Rear seat entertainment".

The rear display is actuated via an LVDS data wire by the RSE control unit (RSE = "Rear Seat Entertainment").

The rear display is a control unit on the K-CAN.

○ **Loudspeakers**

The following loudspeakers are actuated for audio output:

- Tweeters and medium-range loudspeakers: The loudspeakers are actuated by the CCC, the ASK or the radio.
 - E60, E61, E63, E64, E70, E71, E90, E91, E92, E93: Car Communication Computer (CCC)
 - E65, E66: Audio system controller (ASK)
 - E83, E85, E86: BMW CD radio or BMW Business CD radio
- Woofers: If an amplifier (AMP) is fitted (HiFi amplifier or TOP-HiFi amplifier), the woofers are actuated by the amplifier.

○ **Headphones connector module**

- E65, E66:

The headphones connector module is integrated into the rear compartment centre armrest control centre.

The headphones are connected to the headphones connector module.

The following wires are important:

○ **FBAS wire**

FBAS: Farbbild-Austast-Synchronsignal,

English CVBS: Composite Video Burst Synchronization

The FBAS wire consists of 2 wires:

- One wire is used to transmit all three RGB signals (red-green-blue) together.

The synchronization pulse (for a sharp TV picture) are also transmitted on the wire for RGB signals.

- The other wire is used for screening and earthing.

○ Coaxial cable

The coaxial cables transmit high-frequency signals, e.g. between the TV aerial amplifier and the video module (VM):

Construction of coaxial cable:

- Inner conductor ("core"), insulated
- The outer conductor forms a mantle around the inner conductor

○ LVDS data wire

LVDS stands for "Low Voltage Differential Signalling".

There is always an LVDS data wire between the control unit for the display and the screen (except E83, E85, E86):

LVDS is a special technology for fast and secure data transmission:

There are 2 wires for each signal. The signal is transmitted positively on one wire, negatively on the other (inverted). This means that each pair of wires is electrically neutral.

Interference from outside has no effect on the signal transmission: such interference affects both wires equally. The signal information is thus unaffected. This is because: The control unit processes the difference between the positive and negative signals. This difference remains unchanged even in the event of interference from outside.

The LVDS data wire for the television consists of the following wires:

- 2 wires for red
- 2 wires for green
- 2 wires for blue
- 2 earth wires
- Screening

The synchronized pulses are transmitted on the wire for image signals.

○ RGB wire

The RGB wire has 3 wires for image signals: red-green-blue. The synchronized pulse is transmitted on the wire for the green signal.

The RGB wire is screened. The screening carries no current.

In addition, the RGB wire has its own earth wire for improved electromagnetic compatibility. The earth wire conducts current.

- **MOST bus**

The MOST bus connects the control units for the vehicle's information and communication systems. These control units are programmed via the MOST port.

- E83, E85, E86: no MOST bus fitted.

- **K-bus: Body bus**

- E83, E85, E86

The K-bus links a series of control units whose functions are in the area of the body and in the information and communication systems of the vehicle.

- **K-CAN or K-CAN SYSTEM: Body CAN or body CAN SYSTEM:**

- E60, E61, E63, E64, E70, E71, E90, E91, E92, E93: K-CAN
- E65, E66: K CAN SYSTEM

System functions

The video module comprises the following functions:

- Digital and analogue television
- Television when the vehicle is stationary (front)
- Television when the vehicle is in motion (rear compartment only)
- Television reception
- Image build-up
- Sound reception
- Transmission of image signals in the vehicle
- Audio output
- Mute
- Station selection
- Aerial diversity (only with front and rear TV)

Aerial diversity for TV aerials is not a separate component, but rather a software component within the video module.

- Video switch

NOTE: **Digital television: Basic principles and introduction in various countries**

This SI Technology bulletin (SBT) describes digital television as used by BMW.

The enclosures also include the following information:

- Fundamental information about digital television

Digital and analogue television

Depending on the equipment variant, analogue and/or digital television can be received.

For digital television the DVB-T standard is supported. Only terrestrial reception is possible.

The abbreviation "DVB-T" stands for "Digital Video Broadcasting - Terrestrial". In other words "DVB-T" means: digital television transmitted via antenna ("terrestrial").

Television when the vehicle is stationary (front)

Viewing television in the front is only possible when the vehicle is stationary.

The television is deactivated when the vehicle reaches walking pace. The sound remains unaffected.

Television when the vehicle is in motion (rear compartment only)

- E65, E66, E70, E71

It is also possible to watch television in the rear when the vehicle is in motion.

Television reception

The analogue television supports the following television standards:

- NTSC: NTSC is most common in North and South America and in Japan. NTSC is an analogue television standard for color transmission.

NTSC stands for "National Television Standards Committee".

- PAL: PAL is most common in Europe.

PAL is also used in Australia and in most African and Asian countries (except for Japan). PAL is common in all countries that **do not have** NTSC and SECAM.

PAL is an analogue television standard for color transmission.

PAL is a further development of NTSC. As with NTSC, the TV pictures are transmitted in lines. PAL, however, evens out color faults.

PAL stands for "Phase Alternating Line".

- SECAM: SECAM is most common in France and Eastern Europe.

SECAM stands for "Sequentielle Couleur a Memoire", i.e. "sequential color memory".

Digital television supports data transmission via MPEG.

MPEG stands for "Motion Picture Experts Group". MPEG is the designation of a data compression standard for image signals.

Transmission of image signals in vehicle

Image signals are transmitted as follows, depending on equipment fitted:

- E60, E61, E63, E64, E90, E91, E92, E93

Television in front

The video module transmits the image data via the FBAS wire (Europe version) to the Car Communication Computer (CCC).

A LVDS data wire transmits the image signal between the CCC and the CID (Central Information Display).

- E65, E66

Television in front

Depending on the vehicle's equipment, the video module or the navigation system will transmit the RGB signals to the control unit for the monitor.

If a navigation system is fitted, the navigation system will transmit the RGB signals to the monitor (exception: Japan navigation system)

If there is **no** navigation system fitted, the video module will transmit the image signal to the monitor as follows: From the video module through the RGB wire to the control display.

Front and rear seat television

The navigation system transmits its image data to the video module.

The image signals are transmitted between the SG-FD and rear display through a LVDS data wire.

- E70, E71

Television in front

The video module transmits the image data via the FBAS wire (Europe version) to the Car Communication Computer (CCC).

A LVDS data wire transmits the image signal between the CCC and the CID (Central Information Display).

Front and rear seat television

The video module transmits the image data via the RGB wire (Europe version) to the Car Communication Computer (CCC) and to the RSE control unit.

An LVDS data wire transmits the image signal between the CCC and the CID (Central Information Display).

The image signals are transmitted between the RSE control unit and rear display through a LVDS data wire.

- E83, E85, E86

Television in front

The video module transmits the image data via the RGB wire to the Central Information Display (CID).

Image build-up

The TV picture is built up as follows:

- Colors are made up of individual red, green and blue pixels.
- The TV picture is built up line by line.
- Synchronization of image signals: For a sharp TV picture, the pixels must be precisely synchronized. The synchronization works as follows:
 - Horizontal synchronization defines when a line ends and a new line starts.
 - Vertical synchronization defines when a new image build-up is to start (in the top left corner).

A separate electrical pulse is provided for synchronization: The synchronization pulse. The synchronization pulse is transmitted with the green signal (all model series).

Sound reception

The sound signal is received together with the image signal in the TV signal.

Audio output

Audio output is in mono or stereo as follows:

- Analogue TV sound in mono:

The video module receives the analogue TV sound in mono.

The analogue TV sound is digitalized.

The video module lays the digitalized signal on both the left and right synchronous channel of the MOST bus.

The ASK or CCC emit the audio signals to the loudspeakers (via the amplifier, depending on equipment variant).

- Digital TV sound in stereo:

The digital TV sound is received and emitted in stereo.

Precondition: The TV program is transmitted in stereo.

- 2-channel sound:

2-channel sound is only available with digital television reception.

2-channel sound allows, for example, a foreign-language broadcast to be overdubbed in English. With 2-channel sound, the language of the country concerned will be output through the loudspeakers. The other language will be muted.

Mute

If necessary, audio output can be switched between navigation system and television.

The sound signals from the radio and television are muted under the following conditions:

- Telephone call
- Navigation system announcements
- Traffic reports

The CCC or the ASK controls the muting.

Station selection

The video module manages a list of all the television stations that can currently be received.

This list of stations is shown on the Control Display (CD) or Central Information Display (CID) as follows:

- Where station names for individual TV programs can be determined, the list starts with the station names arranged in alphanumeric order (e.g. ARD, BR3, SAT1 ...).
- After this, a list will appear showing the reception channels with unknown station names. This list is also alphanumerically ordered: e.g. CH3, CH7, CH12, ... for Channel 3, Channel 7, Channel 12.

Television in front: The list of stations is updated manually by selecting "Autostore".

Front and rear seat television: The list of stations is updated automatically.

The list of stations is also updated if another entertainment module is selected (e.g. if you change to the radio or DVD changer). When the television is called up again the current list of stations is offered automatically.

Aerial diversity

The aerial diversity function, which is integrated in the video module ensures that the stationary vehicle always has the best possible reception. The aerial diversity uses certain criteria to select the TV aerial that offers the best reception.

2 TV aerials are fitted for TV reception in the front (TV 1, TV 2).

3 TV aerials are fitted for TV reception in the front and rear.

To ensure optimum reception, these 3 TV aerials work as follows:

- 2 TV aerials (TV 1, TV 2) receive the desired TV channel.
- 1 TV aerial (TV 3) searches in the background for other transmission frequencies for this television station.

The required television station is received on the transmission frequencies with the highest signal strength.

Aerial diversity works as follows:

If more than one station have the same name when analogue TV is in use, then there are alternative frequencies. e.g. "Television station 1" is being received on 3 different analogue frequencies. In this case the television station is displayed just once.

Aerial diversity automatically selects the best frequency. "Television station 1" is shown in the display.

If, however, a television station is transmitting "Television station 1" analogue on several frequencies and "1st digital" digitally on another frequency, then the display shows the following:

- Aerial diversity combines all frequencies for analogue television.

The best frequency is selected and displayed. e.g.: "Television station 1".

- However, aerial diversity is **not** able to combine the following TV stations: Analogue reception for "Television station 1" and digital reception for the "1st digital".

This is because: The video module cannot assign the two different notations and meanings to one another.

This means "Television station 1" appears twice in the list of stations: Once analogue as "Television station 1" and once digitally as the "1st digital".

Video switch

The video module switchers between the various video sources, e.g. between television and video.

This function is called "video switch".

Operation

The following operations are described:

- Adjusting screen settings
- Selecting television stations
- Updating list of stations

NOTE: **Please comply with instructions in Owner's Handbook.**

Detailed instructions for the television can be found in the vehicle's Owner's Handbook.

Adjusting screen settings

Users can adjust the screen settings for color, contrast and brightness: Cal up the corresponding menu (with the controller on the CD or CID).

The controller controls the monitor settings.

Depending on the equipment specification, the screen setting is processed in the following control units:

- Vehicles with television in the front:
 - E60, E61, E63, E64, E70, E71, E90, E91, E92, E93: Car Communication Computer (CCC)
 - E65, E66, R83, E85, E86:

For vehicles **with** navigation system, the screen setting is processed in the control unit for the navigation system (NAV).

On vehicles **without** navigation system, the video module processes the monitor settings.

- Vehicles with rear display
 - E65, E66: The video module processes the monitor settings for the rear display.
 - E70, E71: The RSE control unit processes the monitor settings for the rear display.

Selecting television stations

- Select country (on Control Display or Central Information Display)

When a country is selected, the video module will set the correct television standard.

- Select the required television station from the list of stations.

The video module administers a list of stations with all receivable television stations. This list is shown on the Control Display or Central Information Display.

Updating list of stations

On vehicles with television in the front, the list of stations is manually updated as follows: Call up "Autostore".

Preconditions for activation

The television is available from terminal R ON.

Notes for service staff

The following information is available for service staff:

- Encoding/programming: -
- Car and Key Memory: The last settings made remain stored when the vehicle is shut down. The video module remembers the last TV station selected. The color settings are also stored (in either the video module or navigation system, depending on equipment variant).

National versions

Digital television is already available in many countries.

There are numerous analogue television standards worldwide. The video module supports these television standards and frequencies.

NOTE: Subscription TV is not supported.

Because special cards and decoders are needed for subscription TV (pay TV), pay TV is not supported.

Pay TV is available, for example in the Netherlands and in the UK.

Free TV stations in the UK are supported.

The following details are available with regard to national versions:

- US
- Japanese national version
- Different switch-off conditions when driving in different national versions

NOTE: The Japan national version is also valid for China and Korea.

The equipment specifications for the Japanese national version also support television reception in China and Korea.

US national version

In the US version, the television is deactivated by encoding.

Reason: watching television in cars is forbidden in the USA.

However, a video module is fitted, depending on the equipment. This video module serves as a video switch between the different entertainment sources (e.g. radio, CD changer).

Japanese national version

There is no DVB-T in Japan. For this reason, the Japan national version only has analogue television. The image signals are transmitted on an RGB wire (RGB: red-green-blue).

Vehicles with the Japan national version have the following equipment specifications for television:

- E60, E61, E63, E64 - Television in front with Japan navigation system
- E65, E66: Television in front with Japan navigation system
- E65, E66: Television in front and rear, with Japan navigation system
- E70, E71: Television in front and rear, with Japan navigation system
- E83, E85, E86: Television in front with Japan navigation system

The following components are also needed:

- **JNAV: Japan navigation system**

JNAV is the control unit for the Japan navigation system.

- E60, E61, E63, E64, E70, E71, E90, E91, E92, E93

The JNAV is a control unit in the MOST network.

- E65, E66

JNAV is connected to the following control unit:

FBI: Flexible bus interface

The FBI connects the JNAV control unit to the MOST bus.

- E83, E85, E86

The JNAV is a control unit on the body bus (K-bus).

The Japan navigation system is supported as follows by the video module (example E60):

- When the controller is operated, the CCC receives the prompt "switch on navigation system".
- The CCC sends the message "Navigation system requested" to the video module.
- The video module routes the signals from the Japan navigation system (JNAV) through to the CCC.

Different switch-off conditions when driving in different national versions

- Japan national version: The television in the front is switched off depending on the position of the gear lever or selector lever.
- Australia national version: it is only possible to watch television in the front when the selector lever position is "P" (with automatic transmission) or when the parking brake is applied.

ACCESSORIES & EQUIPMENT

Audio, Navigation and Anti-Theft - Tightening Torques

STEREO RADIO, AMPLIFIER

65 52 CD/DVD DRIVES AND SPECIAL DEVICES

CD/DVD DRIVES AND SPECIAL DEVICES-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Retaining screw, CD/DVD changer to bracket	E60, E61, E63, E64			0.7 Nm
	E65, E66, E67, E70			0.8 Nm
	E83			1.0 Nm
	E53, E85, E90, E91, E92, E93			1.2 Nm
2AZ Mounting bracket CD/DVD changer to body	E83			6.0 Nm
	E90, E91, E92, E93			3.3 Nm
	E53			4.9 Nm
	E60, E61, E63, E64			5 Nm
	E85, E86			4.4 Nm
3AZ CD/DVD drive to Car Communication Computer	E61, E60, E63, E64, E81, E82, E87, E88, E90, E91, E92, E93, R56			0.4 Nm
4AZ Rear cabin DVD player to centre console	E70			3 Nm
5AZ CD/DVD changer to glovebox	E70			6 Nm
6AZ Car Communication Computer (CCC)/Multi-Audio System Controller (MASK) to instrument panel	E70, E71			2.8 Nm

SPEAKER AND COVER

65 13 SPEAKERS

SPEAKERS-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Mid-range speaker to door trim panel	E81, E82, E87, E88, E90, E91, E92, E93			3 Nm

	E70, E71			1.5 Nm
2AZ Central bass to seat cross-member	E70, E71			4 Nm

VIDEO AND TV EQUIPMENT

65 50 CENTRAL INFORMATION DISPLAY (CID)

CENTRAL INFORMATION DISPLAY (CID)-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Central Information Display (CID) to instrument panel	E70, E71			2.5 Nm

VIDEO MONITOR

65 52 REAR CABIN MONITOR

REAR CABIN MONITOR-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Rear cabin monitor, mechanism, to centre console	E70, E71			2.8 Nm
2AZ Trim, display unit, to housing, display unit	E70, E71			1.35 Nm
3AZ Display, middle, to trim, display unit	E70, E71			1.35 Nm
4AZ Display unit to rear cabin monitor, mechanism	E70, E71			1.7 Nm
5AZ IR board to rear cabin monitor, mechanism	E70, E71			1.7 Nm

AIRBAG TRIGGERING UNIT, DIAGNOSTICS

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AIRBAG TRIGGERING CONTROL-TIGHTENING TORQUE SPECIFICATIONS

	Type	Thread	Tightening specification	Measure
1AZ Airbag control unit to tunnel middle	E70, E71, E82, E88			8 Nm
2AZ Sensor, A-pillar	E70			8 Nm
3AZ Sensor, B-pillar, to B-pillar	E70, E71, E82, E88			8 Nm

4AZ Sensor, front door, to inner door panel	E70, E71, E82, E88			8 Nm
5AZ Sensor, rear seat, to seat frame	E70			8 Nm
6AZ Acceleration sensor to front support carrier	E70, E71, E82, E88		Replace screws	8 Nm
7AZ Holder, rollover controller to rollover protection	E88			4.5 Nm
8AZ Rollover controller to holder	E88			5 Nm