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2024 bmw i3 owners manual

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Access a wide range of BMW i3 manuals, including: * Troubleshooting Manuals * Transmission Repair Manuals * Shop Manuals * Service Manuals * Sales Brochures * Restoration Manuals * Restoration Guides * Repair Manuals * Parts Manuals * Parts Catalogs * Paint Chips * Owner's Manuals * Owner's Handbooks * Operator's Manuals * Maintenance Manuals * Interchange Manuals * Engine Repair Manuals * Electrical Wiring Diagrams * Electrical Troubleshooting Manual For pricing and availability information, please call us at (206) 721-3077 or email us at books@books4cars.com. BMW Service Training Document General Vehicle Electronics I01 Technical Information Symbols Used: This document uses the following symbol to facilitate better comprehension or draw attention to very important information: Important Safety Information and Information That Needs to Be Observed Strictly in Order to Guarantee the Smooth Operation of the System. Information Status and National-Market Versions: BMW Group vehicles meet the requirements of the highest safety and quality standards. Changes in requirements for environmental protection, customer benefits, and design render necessary continuous development of systems and components. Consequently, there may be discrepancies between the contents of this document and the vehicles available in the training course. This document basically relates to the European version of left-hand drive vehicles. Some operating elements or components are arranged differently in right-hand drive vehicles than shown in the graphics in this document. Further differences may arise as a result of equipment specification in specific markets or countries. Additional Sources of Information: Further information on individual topics can be found in the following: • Owner's Handbook • Integrated Service Technical Application Contact: conceptinfo@bmw.de ©2013 BMW AG, Munich Reprints of this publication or its parts require the written approval of BMW AG, Munich The information contained in this document forms an integral part of the technical training of the • Vehicle electrical system overview • Bus systems: K-CAN, PT-CAN, FlexRay, D-CAN, Ethernet • Sub-bus systems: LIN-Bus, Local CAN • Diagnosis and access: OBD2, Installation locations of control units • Electronic power steering (EPS), Dynamic Stability Control (DSC), Optional equipment system (SAS) • Voltage supply overview • System wiring diagram • Components: + Battery + Intelligent battery sensor (IBS) + Safety battery terminal (SBK) + Integrated supply module + Power distribution box, front + Body Domain Controller (BDC) **Vehicle Electrical System Overview** The I01 vehicle electrical system consists of various bus systems, including K-CAN and PT-CAN. The K-CAN system uses three different buses (K-CAN2, K-CAN3, and K-CAN4) with a data transfer rate of 500 kBit/s each. In contrast to other F-series vehicles, the I01 does not use MOST. **Bus System Architecture** The bus systems are connected using terminating resistors, which prevent reflections on the data lines. The CAN terminator is equipped with two 60 Ohm resistances in series, as well as a measuring tap and ferrite beads to suppress high-frequency faults. All other control units are connected at the CAN terminator without terminating resistors. **Specific Bus Systems** The I01 uses K-CAN buses for various systems, including: * Frontal Light Electronics Left (FLEL) and Right (FLER) * Body Domain Controller (BDC) * Top Rear Side View Camera (TRSVC) Additionally, the vehicle employs PT-CAN buses with a data transfer rate of 500 kBit/s each. The PT-CAN2 gateway is located in the Electrical Digital Motor Electronics (EDME). **Other Systems** The I01 also features other systems, including: * Electronic Power Steering (EPS) * Dynamic Stability Control (DSC) * Body Domain Controller (BDC) These systems are connected to the bus systems using various interfaces and gateways. FlexRay System Overview The FlexRay system's wiring diagram shows its physical layout (topology). It has a data transfer rate of 10 MBit/s. The control units at the FlexRay are connected using an additional line at terminal 15WUP or terminal 15N. Bus Termination Resistors are used for termination in most bus systems, including FlexRay, to avoid reflections on the data lines. Terminating resistors are located in the control units. Synchronization To achieve a synchronous design of individual functions in networked control units, a common time base is required. This synchronization must be done via the data bus. Control units measure the period of certain synchronization bits, calculate the mean value, and adapt their bus cycle to this value. Synchronization starts in FlexRay after system start between two control units authorized to perform wake-up functions. 1.2.4 D-CAN The vehicle diagnosis system uses a data transfer rate of 500 kBit/s for D-CAN. I01 General Vehicle Electronics 1. Vehicle Electrical System 1.3 Sub-bus Systems 1.3.1 LIN-Bus Overview Page 16 I01 General Vehicle Electronics 1. Vehicle Electrical System The vehicle's electrical system consists of various control units and electronic systems. These include: * A Hybrid Pressure Refueling Electronic Control Unit * A Crash Safety Module * An Integrated Automatic Heating/Air-Conditioning System * A Driver's Seat Module * An Intelligent Safety Button * A Body Domain Controller designed for different data rates * Local CAN networks with a 500 kBit/s data transfer rate, used in various vehicle systems such as camera-based driver support and charging interfaces * USB connections for equipment like headunits, telematic communication boxes, and telephone base plates The vehicle's diagnosis is performed using the OBD2 interface and D-CAN bus. Various control units are installed at different locations within the vehicle, including: * A Vehicle Sound Generator (not available in the US market) * Frontal Light Electronics Rights * Dynamic Stability Control * An Integrated Automatic Heating/Air-Conditioning System (not available in the US market) * Instrument cluster and gear selector switch * Roof function center * Touchbox and parking maneuvering assistant or park distance control headunit * Optional equipment system, charging interface module, range extender electrical machine electronics, and range extender digital engine electronics. Electronics modules in vehicles include an Amplifier (AMP), Telematic Communication Box (TCB), and a Battery Management Electronics module. The Crash Safety Module (ACSM) and Controller (CON) are also important components. The Hybrid Pressure Refueling Electronic Control Unit (TFE) is responsible for controlling various systems, including the Electrical Digital Motor Electronics (EDME). Camera-based driver support systems (KAFAS) rely on electronic power steering (EPS), frontal light electronics, and other components. In modern vehicles, a Body Domain Controller (BDC) replaces control units used in older models. The BDC has multiple functions, such as serving as a gateway, immobilizer, terminal controller, comfort access system, central locking system, and power window regulator. Fuses within the BDC protect various components, including the steering column switch cluster, headlight driver module, OBD2 socket, outside door handle electronics, power window regulators, central locking system, and heated rear window. Relays in the BDC switch on/off the power window regulators, central locking system, headlight cleaning system, and rear wiper. The gateway module (ZGM) integrated into the BDC connects all data bus systems to each other, allowing information from individual bus systems to be shared at a generalized level. The ZGM can implement different protocols and speeds on various bus systems, receiving programming data for control units via Ethernet transmission to the vehicle. The vehicle's remote control receiver, steering column switch cluster, light switches, intelligent safety button, and seat-heating electronics are connected at the BDC. However, only specific components from these systems are looped through to the Local Interconnect Network. Local Interconnect Network components include: * Electric heating * Electric A/C compressor * Integrated automatic heating/air conditioning system or integrated heating/air conditioning regulation Frontal Light Electronics (FLEL/FLER) control units are installed in the left and right headlight for LED headlights. FLEL includes activating the LED in the corresponding headlight, activating the stepper motor for headlight beam throw adjustment. The Top Rear Side View Camera (TRSVC) control unit is integrated with the reversing camera in one housing, connected at the K-CAN3. No side view cameras are offered in this system. Roof function center (FZD) includes components for alarm systems and controlling slide/tilt sunroofs. FZD is connected at the K-CAN2 and LIN, but not responsible for interior light control. Car Sharing Module (CSM) is used in rental cars for access and use of the vehicle. CSM is connected at the K-CAN2 via USB at the headunit. Park Distance Control (PDC) assists drivers when maneuvering in and out of parking spaces by indicating current distance from obstructions through acoustic signals and visual display. Sensors are evaluated by Parking Maneuvering Assistant control unit in vehicles with PMA. Parking Maneuvering Assistant (PMA) facilitates parking in gaps between cars parallel to the roadway, using all sensors of Park Distance Control when available. **General Vehicle Electronics** * The PDC (Power Door Control) functions are integrated into the vehicle's electronics system, with no separate control unit installed. * The PMA (Parking Management System) is connected to the K-CAN2 bus. **Integrated Automatic Heating/Air-Conditioning (IHKA)** * IHKA is an optional equipment for vehicles with I01 electrical system. It controls electric heating, blower output stage, and flap motors through a Local Interconnect Network master unit. * Information from the audio control panel is transmitted to the IHKA control unit via Local Interconnect Network. **Touchbox (TBX)** * The Touchbox is required for interpreting contact sensors on the touch controller for the Headunit High. It's connected to the K-CAN4 bus. **Controller with Touchpad (CON)** * For vehicles with Professional navigation, a touch controller replaces the regular rotary adjuster/knob. * The touch controller allows customers to input location information or phone numbers and contact details. **Head Unit (HEADUNIT)** * The Headunit High does not have a DVD drive. It's connected to the K-CAN4 bus and Body Domain Controller via Ethernet. **Telematic Communication Box (TCB)** * The Telematic Communication Box is connected to the Headunit High and provides functions such as BMW Assist with eCall, BMW Online, and Remote functions. * It uses a SIM card integrated in the vehicle for internet connectivity and is connected to the K-CAN4 bus and headunit via USB. **Audio Amplifier (AMP)** * The audio amplifier receives audio analog signals from the headunit and amplifies them for speakers. It's connected to the K-CAN4 bus. **Instrument Cluster (KOMBI)** * The instrument cluster displays are shown by a thin-film transistor display, with indicators and gauges controlled through a Local Interconnect Network master unit. * It's connected to the K-CAN2 bus. The electrical and digital motor electronics (EDME) system plays a crucial role in controlling the electric motor in the I01 vehicle. The EDME is modeled after vehicles with gasoline engines, but with specific functions tailored to its hybrid-electric powertrain. It includes features such as: * Evaluating driver inputs (accelerator pedal) * Coordinating torque demands * Activating the electrical machine and fan * Monitoring and controlling high-voltage electrical systems The EDME is connected to the PT-CAN, PT-CAN2, and FlexRay networks. Another key component is the charging interface module (LIM), which coordinates the charging procedure, activates LEDs for displaying charging status, and locks the charging socket cover. The LIM is connected to the PT-CAN and Local-CAN at the charging socket. The gear selector switch (GWS) allows drivers to select drive positions and display them on an LED screen. It's also connected to the PT-CAN and PT-CAN2 networks. Convenience charging electronics (KLE) are standard equipment in US market vehicles, enabling AC-charged high-voltage battery charging with 3.7 kW power. This provides a maximum charging power of 7.4 kW. The KLE can handle direct current voltage charging and has a maximum power rating of up to 50 kW. The charging power depends on the station's power output. Finally, the hybrid pressure refueling electronic control unit (TFE) is only installed in vehicles with range extenders and is required for depressurizing the fuel tank before filling. The hybrid pressure refueling electronic control unit (ECU) is responsible for filling up the vehicle's fuel tank. This ECU is connected to the powertrain CAN bus (I01 General Vehicle Electronics 1.6.20). The control unit, known as RDME (Range Extender Digital Engine Electronics), is installed in vehicles equipped with a range extender and serves as the DME (Digital Motor Electronics) for this system. The RDME controls the range extender electrical machine electronics (REME), which is only installed in vehicles with a range extender. REME starts the range extender, generates voltage when the combustion engine is running, and charges the high-voltage battery via its operation. Additionally, the vehicle's camera-based driver support systems (KAFAS) control unit is connected to the PT-CAN bus (I01 General Vehicle Electronics 1.6.22). This system provides features like camera-based cruise control, traffic jam assistant, road sign recognition, collision warning, and person recognition with city braking functionality. The electrical machine electronics (EME) function activates and controls the permanently excited electrical machine in the high-voltage electrical system. To achieve this, a bidirectional inverter converts the high-direct current voltage of the high-voltage battery into three-phase alternating current for the electrical machine. The EME also incorporates a DC/DC converter responsible for supplying 12 V to the vehicle's electrical system. Lastly, the battery management electronics (SME) is integrated within the high-voltage battery and executes functions such as monitoring the state of the lithium-ion battery, detecting insulation faults in the high-voltage electrical system, and controlling switch contactors for activating the high-voltage system. The SME is connected to the PT-CAN2 bus (I01 General Vehicle Electronics 1.6.24). **Vehicle Electrical System** The vehicle's electrical system is comprised of several components that work together to provide power and control for various functions. * **Crash Safety Module (ACSM)**: This module permanently evaluates sensor signals to identify potential crash situations. It sends information on yaw rate to the FlexRay data bus, allowing dynamic stability control and navigation systems to operate selectively. * **Dynamic Stability Control (DSC)**: This system has been updated for electric vehicles, featuring new functions such as motor tow-away control and tire pressure monitoring. The DSC is connected to the FlexRay and receives information from other control units via the data bus. **Electronic Power Steering (EPS)**: The EPS provides steering angle information by calculating it based on input voltage from the 12V vehicle electrical system. This information is made available to other control units via the FlexRay data bus. **Optional Equipment System (SAS)**: This system offers various driver assistance functions, including collision warning with city braking, cruise control with braking, and parking maneuvering assistant. The image information required by SAS comes from camera-based driver support systems. The optional equipment system is not part of the standard equipment and is only installed if the customer orders it. **Voltage Supply** * **Overview of 12V Voltage Supply**: The 12V voltage supply provides power to various components in the vehicle, including the EPS. * **Power Distribution Box**: This component controls the distribution of power from the battery pack to the rest of the electrical system. * **Front Body Domain Controller**: This controller regulates the distribution of power and data within the front body domain. The Integrated Supply Module (ISM) is a specialized module designed for vehicles with range extenders. It includes electrical machine electronics, safety battery terminals, and intelligent battery sensors. The ISM consists of the following components: * 12V battery * Intelligent Battery Sensor (IBS) * Safety Battery Terminal (SBK) * Integrated Supply Module (ISM) specifically designed for vehicles with range extenders * Power distribution boxes in front and passenger compartment * DC/DC converter in the electrical machine electronics to supply power to the vehicle's electrical system The 12V battery used is a 20Ah AGM battery, which has different requirements compared to conventional automotive batteries. The ISM's role is limited to powering up the high-voltage system, rather than ensuring engine starting. The Intelligent Battery Sensor (IBS) records and calculates data on the 12V battery's voltage, current, and temperature. It then sends this information to the superior control units via a local interconnect network bus (EDME and BDC). The Safety Battery Terminal (SBK) is activated in case of an accident of corresponding severity, featuring separate wires for the electrical machine electronics (EME), integrated supply module (in vehicles with range extenders), and terminal 30C (crash message) for battery management electronics (SME). The voltage system in a vehicle consists of several components, including the high-voltage safety connector and the integrated supply module. The integrated supply module is only installed in vehicles with range extenders and supplies the digital engine electronics and 12V components of the range extender with voltage. The power distribution box at the front of the vehicle is powered by the 12V battery and supplies various components, including electronic power steering, dynamic stability control (valves), and electric fans. The Body Domain Controller (BDC) is responsible for terminal control and activates relays for terminals 30F, 30B, and 15N. The following components are controlled by the BDC: Steering column switch cluster, driver assistance system operating facility, operating unit for light, OBD2 connection, automatic integrated heating/air conditioning, and outside door handle electronics. Additionally, power window regulators, central locking system, horn, and heated rear window are switched on and off according to their settings. The power distribution box in the passenger compartment contains relays for terminals 30B and 15N, as well as a relay for terminal 30F, which is soldered into the power distribution box. All relays are activated by the BDC. The DC/DC converter for the voltage supply and charging of the 12V battery is located in the Electronic Motor Control Unit (EMC). **Electrical Grounding in Vehicles** The electrical system in vehicles relies on a stable grounding system to function properly. In the case of a vehicle with a carbon fiber passenger compartment, the ground connections are critical for ensuring safe and reliable operation. **Ground Connection Locations** Ground connections can be found at various points in the vehicle's electrical system, including: * At the rear cross-member (for the Drive module) * At the front cross-member (for the Drive module) * In the Life module via a ground cable at a ground distribution block In some cases, consumer ground cables may not be connected to the body due to the use of carbon for the Life module. Instead, they are connected to ground support points. **Electrical Characteristics of Carbon** Carbon fiber has excellent electrical and thermal conductivity properties on its own. However, when introduced into a resin, the resulting material (carbon fiber-reinforced plastic or CFRP) has very low electrical and thermal conductivity. This means that the carbon fibers in a vehicle's passenger compartment may not provide adequate grounding if they are not connected to a metal component. **Safety Considerations** If an electrical conductor becomes damaged due to an incident, such as an accident or improper repair, and touches the carbon fiber passenger compartment, a current may flow through the fiber. With a 12V vehicle voltage, this can result in a relatively high current level (a few amperes), which could lead to safety issues if not properly addressed. **Fuse Protection** To mitigate these risks, vehicles with carbon fiber passenger compartments often have fuse protection in place to prevent excessive current flow through the carbon fibers. Working on electrical lines requires extreme caution due to the risk of thermal events caused by current flow through carbon fibers. These events can spread to other parts of the system and produce harmful gases with an unpleasant odor. When operating electrical lines, it is crucial to avoid touching non-insulated lines or connectors that may come into contact with carbon body components. Always follow general and special information on the electrical characteristics of the carbon body in repair instructions. Regarding terminal control, pressing the START-STOP button simultaneously with the brake pedal activates driving readiness by switching to either terminal 15 (car wash mode) or terminal R (ready to drive). Pressing the START-STOP button also triggers wake-up events for certain vehicles, such as when the vehicle is stationary. However, some functions like seat heating and heated rear windows require significant energy consumption and may be partially or completely deactivated based on driving programs. In general, it's essential to exercise caution when working with electrical lines and follow specific guidelines to avoid accidents and ensure safe operation of the vehicle. **High-Voltage Battery and 12V Battery** To operate the vehicle, both the high-voltage battery and 12V battery must be fully charged. If either battery is not charged, the charging cable for the high-voltage battery must be connected, and manual unlocking may be necessary. The 12V battery is partially charged after a few minutes, but the high-voltage system can only start once the high-voltage battery has been charged. The charging status of both batteries can be displayed again once the desired level of charge is reached. **Diagnosis and Programming** For diagnosis and programming purposes, it's essential to charge the 12V battery using an external charger, as it's not possible to charge the high-voltage battery through the 12V vehicle electrical system. During programming, the high-voltage system must be switched off if necessary. **Exterior Lights** The vehicle is equipped with LED headlights and daytime running lights, as standard equipment (for the US market). Incandescent bulbs are used for the front turn indicators. A wiring diagram is provided for the exterior lights, including the LED headlight system. Fuse in power distribution box in passenger compartment Body Domain Controller Fuse in Body Domain Controller Additional turn indicator, exterior mirror, front passenger side Ride height sensor, rear Additional turn indicator, exterior mirror, driver's side Hazard warning switch Rain-light-solar-condensation sensor Steering column switch cluster (SZL) Light switch Ride height sensor, front I01 General Vehicle Electronics 3. Exterior Lights System wiring diagram for rear exterior lights with LED rear lights... Fuse in power distribution box at front Body Domain Controller Fuse in Body Domain Controller Tailgate contact Rear light, top right Rear light, bottom right Number plate light, right Number plate light, left Rear light, bottom left Rear light, top left Additional brake light Interference suppression filter Brake light switch Steering column switch cluster (SZL) Light switch Hazard warning switch 3.2. Lighting, front LED headlight Index Explanation Side lights and daytime driving lights Low-beam headlight LEDs are used for the low-beam headlight, side lights and daytime driving lights... Control units for LED headlights, Frontal Light Electronics Left (FLEL) and Frontal Light Electronics Right (FLER), are installed in the left and right headlight. The Frontal Light Electronics includes: • Activation of LEDs in the corresponding headlight • Activation of stepper motor for the headlight beam throw adjustment. 3.2.2. High-beam headlight and turn indicator High-beam headlight/Turn indicator Index Explanation High-beam headlight Turn indicator Bulbs are used for high-beam headlight and turn indicator. The bulbs have the following power: • High-beam headlight 55 W H7 • Turn indicator 21 W. 3.3. Lighting, rear I01 has a two-part rear light, so that the vehicle can also be identified when the tailgate is opened. One part is located in the tailgate, the other in the bumper panel. The following lights in the bumper panel are only active when the tailgate is open: • Tail light • Brake light • Turn indicator. Tail light/Brake light Turn indicator Index Explanation Tail light/Brake light Turn indicator Reverse light Rear fog light The tail light and brake light in the bumper panel are only active when the tailgate is open. The tail light of the tailgate is switched off when the tailgate is open. The turn indicator in the bumper panel is active when the tailgate is open. LEDs are used for all lights for the rear lighting. 4. Interior Lighting Depending on the optional equipment selected, the I01 has different light elements for the interior light. The customer has ambient lighting in the passenger compartment, including LED elements at various locations. The brightness of the ambient lighting can be adjusted via the CID. Depending on the selection in the central information display, white or orange LEDs are activated for accent lighting. Without local interconnect network bus connection (standard equipment), or with local interconnect network bus connection (optional equipment). The interior lighting system is controlled by the Body Domain Controller (BDC). The output stage for the interior lighting is located in the BDC. The interior lighting includes various elements, such as: * Glove box switch and light * Luggage compartment light * Tailgate contact with tailgate lock * Interference suppression filter * Rear and front interior lights The interior lighting system is designed to provide optimal visibility for the driver and passengers while maintaining a visually appealing ambiance. The availability of various lighting options depends on the vehicle's equipment, including options such as Mega World, Giga World, or Tera World. The interior lights for the front and rear are located in the interior light unit, and all other LEDs on the interior light are controlled by the Body Domain Controller (BDC). The I01 vehicle has a wash/wipe system with two windshield wipers and a rear wiper. The system offers various wiping functions, including intermittent wipes, continuous wipes in different stages, and flicking motions. The system uses a unique windshield wiper design that works in the opposite direction, taking up less space than traditional systems. The system components include: * Windshield wiper motors * Right and left washer jets with heaters * Power distribution box in the passenger compartment * Body Domain Controller (BDC) * Rain-light-solar-condensation sensor (RLSBS) * Instrument cluster (KOMBI) * Steering column switch at steering column switch cluster (SZL) The system wiring diagram is included, showing connections between various components. The BDC establishes a local interconnect network bus connection for the driver's side wiper motor control unit, which receives wiping requests and driving speed data from the BDC via Local Interconnect Network. Note that I've tried to summarize the main points of the text in simpler language, while still conveying the essential information about the wash/wipe system on the I01 vehicle. The I01 vehicle features a wiper motor unit that can be replaced as a single component. This unit consists of a permanently excited direct current motor, reduction gear, control unit electronics with an eccentric shaft sensor and suppressor components, and a plug connection. The control unit is responsible for identifying faults in the system, including control unit electronics errors, short circuits at the motor and sensor systems, and open lines at the motor and sensor systems. However, it does not have fault memory. The vehicle's locking and security functions are integrated into the Body Domain Controller (BDC). These functions include a basic access system, comfort access (an optional feature), and various locking and unlocking mechanisms such as the mechanical key for emergency operation, the 4th button for unlocking the tailgate, and an electronic immobilizer. The BDC also controls power window regulators, sliding/tilting sunroofs, terminal control, and other functions. The vehicle's locking and security functions are based on the CAS (Central Access System) functions in the F01 model and are described in separate training material. An ID transmitter with a new design has been developed for the I01, which uses the same data transfer protocol as current BMW models to store and transmit vehicle data. The vehicle can be started without a key using the "Passive Go" function, but it is still necessary to activate the ID transmitter to gain access to the vehicle. Overall, the I01's locking and security functions are designed to provide convenience and security features for drivers and passengers. The FlexRay system already provides redundancy in data transfer between the BDC and EDME, as well as additional features such as the transmission release unit GWS and Electronic Power Steering (EPS). The emergency-start function, which stops the ID transmitter at the ring aerial, is also available. The central locking system of the I01 vehicle is based on BMW models. With the introduction of the BDC, all relevant functions for the central locking system are handled by one control unit. Here's how it works: the radio signal from the ID transmitter is received by the remote control receiver, which causes the BDC to activate the central locking system and interior lighting. The BDC evaluates the status of all door contacts, preventing the vehicle from being locked while the driver's door is open. The BDC also activates the central locking system button and records its status in the tailgate. Additionally, the BDC handles the activation of the unlocking function for the engine compartment lid and fuel filler flap (except for vehicles with a range extender). **Central Locking and Security Functions** The I01 system features advanced locking and security functions, including a remote control receiver and power distribution box in the passenger compartment. **Components** * A button for central locking in the front passenger's side door (exclusive to US vehicles) * Door contacts for the central locking system on both the front and rear passenger sides * An interference suppression filter * A tailgate contact with tailgate lock * A tailgate push-button on the outside of the tailgate * Door contacts for the central locking system on the driver's side **Engine Compartment Locking** The engine compartment lid can be unlocked using a button at the A-pillar and an ID transmitter. In the event of a fault, the emergency release can be used to unlock the lid. A microswitch in the engine compartment lid catch detects when the lid is fully closed. During the journey, the unlocking of the engine compartment lid is blocked. **Comfort Access** The Comfort Access function is integrated into the Body Domain Controller (BDC). It includes: * Passive Entry: allows access to the vehicle without active use of the ID transmitter * Passive Go: enables the vehicle to be started when there is a valid ID transmitter in the passenger compartment * Passive Exit: enables the vehicle to be locked without active use of the ID transmitter The components and functionality of Comfort Access are familiar from current BMW models. **System Wiring Diagram** A system wiring diagram for Comfort Access can be found on page 84. **Alarm System** The alarm system in the I01 vehicle is equipped with an ultrasonic interior movement detector (USIS) to monitor the passenger compartment. The USIS is fully integrated into the roof function center (FZD). The door contacts, engine compartment lid contact switch, and opening of the tailgate are monitored by the Body Domain Controller. When a status change occurs, the USIS receives this information via the K-CAN2 network. In the event of an activated alarm system, a siren with tilt alarm sensor is triggered by the control unit in case of a break-in. The system wiring diagram for the alarm system is shown below: * Engine compartment lid contact switch * CAN terminator * Door contacts (front and rear) * Interference suppression filter * Tailgate contact with tailgate lock * Roof function center LED **Components** The following components are part of the Comfort Access system: * Antenna for Comfort Access under engine compartment lid * Remote control receiver * Body Domain Controller * Outside door handle electronics (TAGE) on front passenger's side * Interior antenna (front) * Antenna for Comfort Access in rear * Antenna for Comfort Access on rear left **BMW I01 Vehicle Electronics** The vehicle's electronics system includes various components that work together to provide comfort and convenience features. Here are some key aspects of the system: * **Slide/Tilt Sunroof**: The sunroof's wiring diagram can be found on page 90. The control unit for the sunroof is located in the body domain controller. * **Steering Column Switch Cluster**: This component includes various switches and buttons, including those for the cruise control and horn. The system uses LIN (Local Interconnect Network) to transmit signals between components, with two LIN lines connecting the steering column switch cluster to the body domain controller. * **Exterior Mirrors**: There are two types of exterior mirrors: basic and high-equipment versions. Both types use electric motors that are activated by a mirror adjustment switch. The instrument cluster receives temperature data from an outside temperature sensor and transmits it to the body domain controller, which controls the heating output for the mirror. Note that I've tried to preserve the original text's structure and content, while rephrasing it in a more concise and readable format. Let me know if you have any specific questions or need further clarification! The system for controlling temperature-related functions in the vehicle involves several components. The outside temperature sensor provides data to the Body Domain Controller, which then activates the mirror heating via the local interconnect network bus. The control of the heater's output depends on both the ambient temperature and the position of the driving experience switch. The mirror servomotors are activated by the mirror electronics. To adjust the exterior mirror, a request is sent to the mirror electronics via the local interconnect network bus. In vehicles equipped with an automatically dipping inside mirror, the inside mirror is connected to the Body Domain Controller via the local interconnect network bus. The LED for the alarm system is located at the inside mirror. For seat heating, the Body Domain Controller receives information from the control unit of the IHKA or integrated heating/air-conditioning regulation and transmits this information to the respective seat module via the local interconnect network bus. The seat module then activates the heating mats with corresponding power. The control of the heater's output depends on both the switch-on stage of the seat heating and the position of the driving experience switch. The system for the horn involves a fanfare relay and fuse, which are controlled by the Body Domain Controller. Looking for BMW owners manual to download: The relay for the horn is located above the power distribution box in the passenger compartment. The fuse for the horn is in the Body Domain Controller. Signal path of the horn: • Horn button read by steering column switch cluster SZL. • SZL sends information via local interconnect network bus to the Body Domain Controller. • Body Domain Controller evaluates information and activates the relay for the horn. BMW owners manual available: Search online forums or visit for a downloadable version. Alternatively, check sharing for a shared link. Material differences between UK and US versions: The 2014 BMW i3 Sustainability Owners Manual has material differences in standard and optional equipment, as well as driving positions, between the UK and US models. However, for BEV models, they are nearly identical. Control differences on the REx model exist between the two regions, causing some issues.