372: Signal description, central electronic module (CEM)

S60 (-09), 2004, B5254T4, AW50/51 AWD, L.H.D

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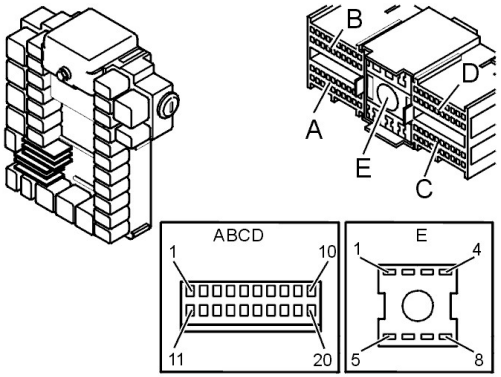
Signal specification



Note! It is important to connect the breakout box and check the ground terminals before taking readings.

Other information

- To connect the breakout box, see Connecting the breakout box
- To check ground terminals, see Checking the ground terminal .

U=	DC voltage in volts (V)	U_{AC} =	AC voltage in volts (V)
U_{bat} =	Battery voltage (V)	f =	Frequency in Hertz (Hz)
U_{low} =	Voltage approximately 0 V	% duty =	Duty cycle (pulse ratio) as a percentage (%)
t =	Time in milliseconds (ms)		

Connector A, terminals #A1-#A20
The following values are measured between the relevant terminal in column 1 and terminal #E1 (power ground) unless otherwise stated.
Note! Check the ground terminals before starting to take readings with the breakout box.
U = DC in volts (V)
Ubat = battery voltage in volts (V)
Ulow = Voltage close to 0 V

Breakout box terminal	Terminal in connector	Signal type	Ignition off		Ignition on		Other
			Activated	Not activated	Activated	Not activated	
#A1	#A1	Signal (-) back-up (reversing) lamp	Ulow	Ubat	Ulow	Ubat	

#A2	#A2	Signal, for fault-tracing the actuator motor for the left-hand xenon lamp	Ulow	Ulow	Ulow-Ubat if active, Ulow otherwise in pulse ratio (%duty)=0-100%		A fault is detected at 65%>pulse ratio (%duty) >90%
#A3	#A3	Control signal, starter motor relay			0V	0V	Activated with key in position III
#A4	#A4	Signal, Hood switch	Ulow with the hood closed Ulow-Ubat with the hood open				Pulsed signal, f=100Hz
#A5	#A5	Signal (-) L-signal	Ulow	Ulow	Ubat	U~0.3-0.7*Ubat	
#A6	#A6	Stepper motor speed related power steering (channel B)	Ulow		Ulow-Ubat	Ulow	signal for 12 ms
#A7	#A7	Stepper motor speed related power steering (channel A)	Ulow		Ulow-Ubat	Ulow	signal for 12 ms
#A8	#A8	Reference voltage, beam adjustment unit	Ulow		Ubat		Model years prior to 2000
#A9	#A9	Pulse width modulated signal (+) to beam adjustment unit	Ulow		Ulow-Ubat if active, Ulow otherwise Pulse ratio (% duty) > 0%		Pulse ratio increases with increased beam width
#A10	#A10	Reference ground, beam adjustment unit	Ulow				Model years prior to 2000
#A11	#A11	Stepper motor speed related power steering (channel B)	Ulow		Ulow-Ubat	Ulow	signal for 12 ms
#A12	#A12	Stepper motor speed related power steering (channel A)	Ulow		Ulow-Ubat	Ulow	signal for 12 ms
#A13	#A13	Control signal, windshield wiper relay off/on	Ubat		Ulow	Ubat	
#A14	#A14	Control signal, windshield wiper high speed relay	Ubat		Ulow	Ubat	
#A15	#A15	Glass breakage loop, pulsed signal	0-12 V		Ulow	Ulow	0-12 V periodically when the car is alarmed

#A16	#A16	Control signal, front washer motor relay	Ubat		Ulow	Ubat	
#A17	#A17	Control signal, rear washer motor relay	Ubat		Ulow	Ubat	(5 DRS)
#A18	#A18	Volcano Lite	The voltage is 0 V - Ubat during communication				Serial communication
#A19	#A19	Control signal, horn relay	Ulow	Ubat	Ulow	Ubat	
#A20	#A20	Signal (-), starter motor relay	Ulow		Ubat	Ulow	

Connector B, terminals #B1 - #B20
The following values are measured between the relevant terminal in column 1 and terminal #E1 (power ground) unless otherwise stated.
Note! Check the ground terminals before starting to take readings with the breakout box.
U = DC in volts (V)
Ubat = battery voltage in volts (V)
Ulow = Voltage close to 0 V

Breakout box terminal	**Terminal in connector**	**Signal type**	**Ignition off**		**Ignition on**		**Other**
			Activated	**Not activated**	**Activated**	**Not activated**	
#A21	#B1	S-supply (Power supply from ignition switch)	Ulow (Key out), Ubat (key in)				
#A22	#B2	X-supply (Power supply from the ignition switch)	Ubat (Key in positions I and II); Ulow otherwise				
#A23	#B3	15-supply (Power supply from ignition switch)	Ubat (Key in positions II and III); Ulow otherwise				
#A24	#B4	Stop lamp switch signal	Ubat	Ulow	Ubat	Ulow	
#A25	#B5	Supply upper stop lamp (4 door)	Ubat	6V	Ubat	6V	
#A26	#B6	Supply to stop lamp relay in the rear electronic module (REM)	Ulow	Ubat	Ulow	Ubat	
#A27	#B7	Diagnostic communication (CAN H) for the high speed network	The voltage is 2.0-3.5 V during communication				
#A28	#B8	Diagnostic communication	The voltage is 1.5-2.5 V during communication				

		(CAN_L) for the high speed network				
#A29	#B9	Signal (-) sensor for the front left seat belt buckle	Ulow		0-5V	0-5V
#A30	#B10	Reference voltage (+) for X-supply to the left seat belt buckle	Ulow		Ubat	
#A31	#B11	Serial communication the left heated seat	Ulow		During communication voltage is ~Ubat	
#A32	#B12	Signal (-) contact breaker (left rear door open)	Ulow-Ubat if the door is open, Ulow otherwise			Pulsed signal, f=100Hz.
#A33	#B13	Signal (-) contact breaker (left rear door locked)	Ulow if the door is locked, Ubat otherwise			
#A34	#B14	Frequency signal (-) from the engine control module (ECM) for the fuel pump (FP) relay	Ulow		Frequency signal U=Ulow-Ubat	f=50HZ
#A35	#B15	Signal (-) from the windshield washer reservoir level sensor	Ubat if the tank is not empty, Ulow if under 1 liter.			
#A36	#B16	Signal (-) from the windshield wiper motor	Ulow	Ubat	Ulow	Ubat	Ulow if the engine is running
#A37	#B17	Communication CAN_H high speed network	The voltage is 2.0-3.5 V during communication			
#A38	#B18	Communication CAN_L high speed network	The voltage is 1.5-2.5 V during communication			
#A39	#B19	Diagnostic communication (CAN_H) for the low speed network	The voltage is 2.0-3.5 V during communication			
#A40	#B20	Diagnostic communication (CAN_L) for the low speed network	The voltage is 1.5-2.5 V during communication			

Connector C, terminals #C1-#C20
The following values are measured between the relevant terminal in column 1 and terminal #E1 (power ground) unless otherwise stated.
Note! Check the ground terminals before starting to take

readings with the breakout box.
U = DC in volts (V)
Ubat = battery voltage in volts (V)
Ulow = Voltage close to 0 V

Breakout box terminal	Terminal in connector	Signal type	Ignition off		Ignition on		Other
			Activated	Not activated	Activated	Not activated	
#A41	#C1	Reference voltage (+) for X-supply to the right seat belt buckle	Ulow		Ubat		
#A42	#C2	Signal (-) sensor for the front right seat belt buckle	Ulow		0-5V	0-5V	---
#A43	#C3	Signal (-) contact breaker (right rear door locked)	Ulow if the door is locked, Ubat otherwise				
#A44	#C4	Serial communication right heated seat	Ulow		During communication voltage is ~Ubat		
#A45	#C5	Signal (-) Lock unit trunk lid	Ulow-Ubat if the tailgate is open, Ulow otherwise				Pulsed signal, f=100Hz.
#A46	#C6	Control signal, auxiliary lamp relay	-	Ubat	Ulow	Ubat	
#A47	#C7	-					
#A48	#C8	-					
#A49	#C9	-					
#A50	#C10	-					
#A51	#C11	-					
#A52	#C12	-					
#A53	#C13	-					
#A54	#C14	Signal (-) fuel pump (FP) relay switch	-	Ulow	Ubat	Ulow	
#A55	#C15	-					
#A56	#C16	-					
#A57	#C17	-					
#A58	#C18	Signal (-) contact breaker (right rear door open)	Ulow-Ubat if the door is open, Ulow otherwise				Pulsed signal,

							f=100 Hz.
#A59	#C19	-					
#A60	#C20	Reserve (-)					

Connector D, terminals #D1-#D20
The following values are measured between the relevant terminal in column 1 and terminal #E1 (power ground) unless otherwise stated.
Note! Check the ground terminals before starting to take readings with the breakout box.
U = DC in volts (V)
Ubat = battery voltage in volts (V)
Ulow = Voltage close to 0 V

Breakout box terminal	**Terminal in connector**	**Signal type**	**Ignition off**		**Ignition on**		**Other**
			Activated	**Not activated**	**Activated**	**Not activated**	
#B1	#D1	Control signal automatic Gear selector module (GSM), switch to ground	-		Ubat	Ulow	
#B2	#D2	Communication CAN L low speed network	The voltage is 1.5-2.5 V during communication				
#B3	#D3	Communication CAN_H low speed network	The voltage is 2-3.5 V during communication				
#B4	#D4	Signal (-) from control stalks (Limp Home)	Ubat	Ulow	Ubat	Ulow	
#B5	#D5	Signal (-) from the SRS-control module (airbag OK)	Ubat for 200 ms if the airbag is triggered, Ulow if the airbag is not triggered.				
#B6	#D6	Serial communication (K-line), diagnostic	The voltage is 0 V - Ubat during communication				
#B7	#D7	Signal (-) contact breaker (left front door open)	Ulow-Ubat if the door is open, Ulow otherwise.				Pulsed signal, f=100 Hz.
#B8	#D8	Signal (-) contact breaker (right front door open)	Ulow-Ubat if the door is open, Ulow otherwise.				Pulsed signal, f=100Hz.
#B9	#D9	Signal (-) from the gear-shift position sensor (locked in P/N)	Ulow	Ulow	Ulow	Ubat	Ulow in P and N position

#B10	#D10	Signal (+), speed (frequency signal)	Ulow		Ulow-Ubat		Frequency signal increases with speed
#B11	#D11	Signal, for fault-tracing the actuator motor for the right-hand xenon lamp	Ulow	Ulow	Ulow-Ubat if active, Ulow otherwise in pulse ratio (%duty)=0-100%		A fault is detected at 65% >pulse ratio (% duty) >90%
#B12	#D12	Signal (-) from horn switch	Ulow	Ubat	Ulow	Ubat	
#B13	#D13	Signal (+) data Immobilizer	Ulow		Ubat		
#B14	#D14	Signal (+) Immobilizer	Ulow		Ubat		
#B15	#D15	-					
#B16	#D16	Signal (-) switch for the hazard warning signal flasher	Ulow if the button is held in, Ubat otherwise				
#B17	#D17	Pulse width modulated signal (+) lamp in button for hazard warning signal flasher	Ulow-Ubat if active, Ulow otherwise Pulse ratio (% duty) > 0 %				
#B18	#D18	Signal (+) glove compartment lighting	Ubat				30 minutes after ignition off, Ulow
#B19	#D19	Signal (+) ignition switch illumination	Ubat	Ulow	Ubat	Ulow	
#B20	#D20	Signal (+) Alarm indicator LED	Ulow or 0.7 V		Ulow		0.7 V if the LED is active

Connector E, terminals #E1-#E8
The following values are measured between the relevant terminal in column 1 and terminal #E1 (power ground) unless otherwise stated.
Note! Check the ground terminals before starting to take readings with the breakout box.
U = DC in volts (V)
Ubat = battery voltage in volts (V)

Ulow = Voltage close to 0 V

Breakout box terminal	Terminal in connector	Signal type	Ignition off		Ignition on		Other
			Activated	Not activated	Activated	Not activated	
#B21	#E1	Power ground	Ulow				
#B22	#E2	Pulse width modulated signal (+) courtesy lighting	Ulow-Ubat if active, Ulow otherwise				
#B23	#E3	30-supply to turn signal lamps and hazard warning signal flasher	Ubat				
#B24	#E4	-					
#B25	#E5	-					
#B26	#E6	30-supply to the central electronic module (CEM)	Ubat				
#B27	#E7	-					
#B28	#E8	Pulse width modulated signal (+) to rheostat	Ulow-Ubat if active, Ulow otherwise				

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