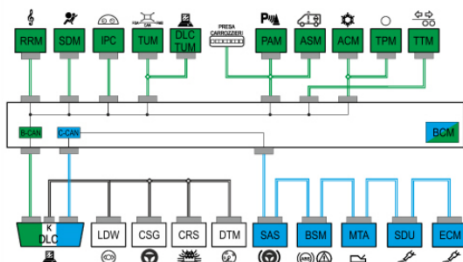


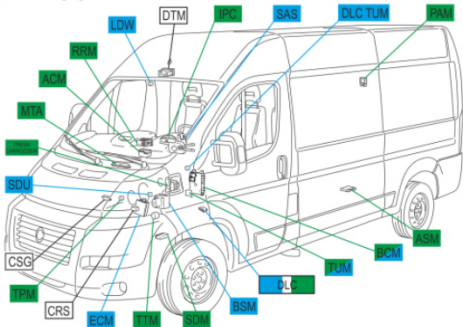
ARCHITECTURE OF THE ELECTRIC/ELECTRONIC SYSTEM

Network architecture

The main electronic components managed by the electronic architecture are described in the following diagram:



The nodes belonging to the architecture described are located in the vehicle as illustrated in the following figure.



Identification code	Electronic component	Wiring Diagram Code
BCM	Body Computer node	M001
ECM	Engine management node	M010
IPC	Instrument panel node	E050
RRM	Radio receiver node	P020
PAM	Parking sensor node	M084
SDM	Airbag node	M060
ACM	Climate control node	M070
BSM	Braking System Node	M051
CRS	Additional Heater Control Unit	M075
TPM	Tyre pressure monitoring node	M047
TUM	TUM control unit	M209
SDU	Methane Injection management node	M019
LDW	Lane Departure Warning	M2012
TTM	Trailer Module	M181
SAS	Steering Angle Node	M092
MTA	Robotised Gearbox Node	M054
ASM	Air Suspension Node	M046
Bodywork Socket	Module for Transformers	P125
CSG	Power Steering Control Unit	M088
DTM	Tachograph Control Unit	E005
DLC	Diagnosis Socket	R010
DLC TUM	TUM Diagnosis Socket	R058

**B-CAN**  
The B-CAN (highlighted in green in the previous diagram) is the low-speed (50 Kbit/s) serial network responsible for the onboard/body-related functions. It uses two cables (dia. 0.35 mm<sup>2</sup>), one White/Orange (CAN-B A) and one Black/Orange (CAN-B B). The B-CAN is resistant to network malfunction and adopts the 29-bit standard.

**C-CAN**  
The C-CAN (highlighted in blue in the previous diagram) is the high-speed (500 Kbit/s) serial communication network designed to allow communication among components responsible for the dynamic control of the vehicle. It consists of 2 twisted electric cables (dia. 0.35 mm<sup>2</sup>), one Blue/Green (CAN-C H), and one Blue/Brown (CAN-C L).

**LIN serial line**  
The vehicle's architecture also includes a low-speed serial interface connection between different vehicle components and the Body Computer Node.

The ISO 5 serial A-BUS line manages the following components:

Identification code	Electronic component	Wiring Diagram Code
RLS	Rain and dusk sensor	K125
ASV	Alarm Siren Control Unit	P090
IBS	Battery Charge Sensor	K059

For further details,  
See **E1060 A-BUS SERIAL LINE**

**K lines**  
In the vehicle's architecture, the K lines that converge directly on the diagnosis connector (EOBD connector) permit diagnosis, using the diagnosis equipment, of the following Nodes / Control Units:

Identification code	Electronic component	Wiring Diagram Code
CSG	Power Steering Control Unit	M088
CRS	Additional Heater (Webasto) Control Unit	M075

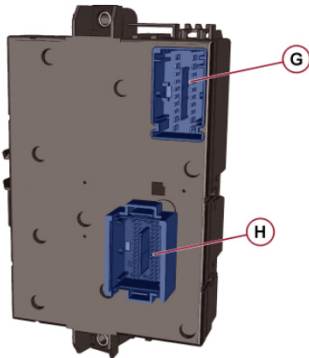
CCT	Tachograph Control Unit	E005
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For further details,  
[See E0010 DIAGNOSTIC MULTIPLE CONNECTOR](#)

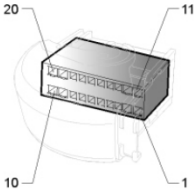
**BODY COMPUTER NODE**

**Body computer connections**

The following image shows the location of the rear connectors of the Body Computer Node.

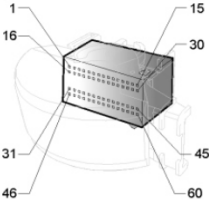


**M001G connector PIN-OUT (Grey, 20 pin, dashboard wiring)**



Pin	Function
1	Body Computer Node earth
2	Active digital signal to Vbatt INT from ignition switch
3	INT power supply (F50) for Airbag Node (NAB)
4	+30 power supply (F53) for Instrument Panel Node (NQS)
5	Setup for power supply +30 (F53)
6	SBMT supply setup from contact output Relay T44 (F32)
7	INT supply (F51) for tachograph
8	INT supply (F51) for infotelematic accessory junction setup
9	Active digital signal to Vbatt INT/A from ignition switch
10	+30 power supply (F36) for Radio Receiver Node (NRR) / Convergence Node (NCV) / Voltage stabiliser
11	Body Computer Node earth
12	INT power supply (F49) for driver side control panel
13	Setup for power supply INT (F51)
14	INT power supply (F49) for radio receiver setup
15	INT power supply (F49) for voltage stabiliser
16	INT power supply (F49) for coil spring on steering column stalk unit
17	INT supply (F37) for Instrument Panel Node (NQS)
18	+30 supply (F36) for diagnosis connector (EOBD)
19	+30 supply (F36) for tachograph
20	Setup for power supply +30 (F36)

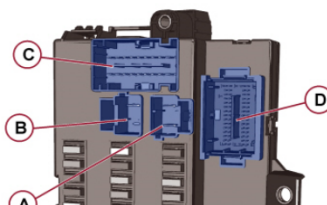
**M001H connector PIN-OUT (Grey, 60 pin, dashboard wiring)**

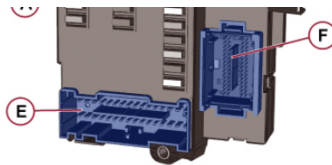


Pin	Function
1	Active analogue input to earth. Negative signal for heated rear window defrosting activation
2	Active analogue input to earth (5 V reference). Negative Resume/Up/Down signal from steering column stalk
3	Low Side Relay Driver. Driver for Side Marker relay; negative relay coil control
4	Low Side Relay Driver. Repetition of D+ alternator negative recharging signal for transformer socket
5	Free
6	Low Side Driver. Negative Dynamic LED control

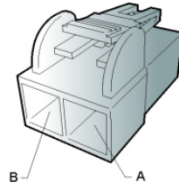
7	High Side Driver, Positive control for heated rear screen LED
8	Free
9	CAN-B A for diagnosis connector (EOBD)
10	CAN-B A for Radio Receiver Node (NRR)
11	CAN-B A for Instrument Panel Node (NQS)
12	CAN-B A for Airbag Node (NAB)
13	CAN-C H for Convergence Node (NCV) - Setup
14	CAN-C L for Convergence Node (NCV) - Setup
15	Specific signal input from aerial for Code device (immobilizer signal)
16	Active analogue input to earth. Negative luggage compartment opening button signal - Setup
17	Active analogue input to Vbatt/earth. Active signal from economy button to earth - Setup
18	Active analogue input to Vbatt/earth. Driver side electric window lowering control - Setup
19	Active analogue input to earth. Negative "Teg Reader" Locked / Unlocked signal - Setup
20	Active analogue input to earth (5 V reference). Windscreen wiper intermittent operation negative signal from steering column stalk
21	Active analogue input to earth of the LDW control negative signal
22	Active analogue input to earth. Negative "Teg Reader" on signal - Setup
23	High Side Driver, Positive door status / deterrent LED control
24	CAN-B B for diagnosis connector (EOBD)
25	CAN-B B for Radio Receiver Node (NRR)
26	CAN-B B for Instrument Panel Node (NQS)
27	CAN-B B for Airbag Node (NAB)
28	CAN-C H for diagnosis connector (EOBD)
29	CAN-C L for diagnosis connector (EOBD)
30	Specific signal input from aerial for Code device (immobilizer signal)
31	Active analogue input to Vbatt/earth. Driver side electric window raising control - Setup
32	Low Side Relay Driver, Negative control for interior light relay (T25) of the optional wiring control unit (CCO)
33	Speed signal input from tachograph
34	Active analogue input to Stop/Start system earth
35	Free
36	Earth reference for driver side control panel
37	Earth reference for driver side control unit
38	Active analogue input to earth (5 V reference). Negative signal for LH side steering wheel controls
39	Active analogue input to earth. Negative rear fog light / fog light signal from switch control unit
40	Active analogue input to earth (5 V reference). Negative rear window wiper signal from steering column stalk - Setup
41	Active analogue input to earth (5 V reference). Negative signal from vehicle dynamic selector - Setup
42	Active analogue input to earth (5 V reference). Negative lights selector signal from steering column stalk
43	Active analogue input to earth (5 V reference). Negative main beam / flasher signal from steering column stalk
44	A-bus serial line setup
45	Reference earth for steering column switch unit
46	Positive signal for Instrument Panel Node (NQS) and left headlight alignment control
47	Active analogue input to Vbatt/earth. DCDC converter diagnosis signal
48	Active analogue input to Vbatt/earth. Driver side electric window lowering control - Setup
49	Positive position control for headlight alignment control from Instrument Panel Node (NQS)
50	High Side Driver, Positive fixed lighting control interlocked with side lights
51	Active analogue input to earth (5 V reference). Negative signal for RH side steering wheel controls
52	High Side Driver, Positive control for Start&Stop system activation LED
53	Earth reference for steering wheel controls
54	Active analogue input to earth (5 V reference). Negative windscreen washer signal from steering column stalk
55	Active analogue input to earth. Negative signal from hazard warning lights switch
56	Active analogue input to earth (5 V reference). Negative signal for Cruise Control/Speed Limiter/Off from steering column stalk
57	Active analogue input to earth (5 V reference). Negative direction indicator signal from steering column stalk
58	Active analogue earth input (5 V reference). Negative windscreen wiper selector signal from steering column stalk
59	LIN4 serial line setup
60	High Side Driver, Positive control for LED on HDC button

The following image shows the location of the front connectors of the Body Computer Node.



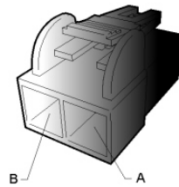


**M001A connector PIN-OUT (Grey, 2 pin, cab wiring)**



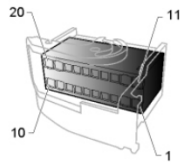
Pin	Function
A	+30 supply from F71 from the Battery Control Unit (CBA)
B	+30 supply from F72 from the Battery Control Unit (CBA)

**M001B connector PIN-OUT (Black, 2 pin, cab wiring)**



Pin	Function
A	+30 supply for Optional Wiring Control (CCO)
B	Free

**M001C connector PIN-OUT (Black, 20 pin, front)**



Pin	Function
1	Relay contact output (T01b). Supply from F12 for right dipped headlight
2	Relay contact output (T23a). Supply from F43 for windscreen washer
3	Relay contact output (T11a). Supply from F90 for left main beam headlight
4	INT supply from F51 for clutch pedal switch (normally open) / brake servo pressure sensor
5	Relay contact output (T11b). Supply from F91 for right main beam headlight
6	Relay contact output (T12a). Supply from F92 for left fog light
7	Power supply from F51 for reversing switch and water in diesel filter sensor
8	Relay contact output (T12b). Supply from F93 for right fog light
9	Not connected
10	Not connected
11	Not connected
12	Relay contact output (T01a). Supply from F13 for left dipped headlight / Headlight alignment control
13	+30 supply from F36 for Climate Control Node (NCL) / Additional Heater Control Unit Timer (CRS) / TUM control unit
14	+30 supply from F36 for Alarm Siren Control Unit (CSA) / Tyre pressure monitoring control unit
15	INT supply from F37 for brake pedal switch (normally closed)
16	INT power supply from F37 for TUM Control Unit
17	INT power supply from F51 for SERVOTRONIK control unit
18	INT supply from F51 for air conditioning controls / passenger compartment air fan relay switch
19	Not connected
20	INT/A power supply from F31 for T21 (headlight washer relay)

**M001D connector PIN-OUT (Black, 60 pin, front)**

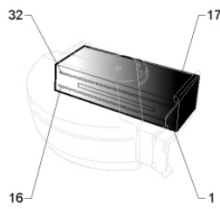




Pin	Function
1	High Side Driver. Positive control for front right side light (COM1 for LED control unit) - Setup
2	Active analogue input to earth - Free.
3	T20 positive control for diesel filter heating
4	Low Side Relay Driver. Windscreen wiper 2nd speed relay coil negative control
5	Free
6	Free
7	Not connected
8	Active analogue input to earth. Negative signal from bonnet open indication switch (normally closed)
9	Not connected
10	Low Side Relay Driver. Windscreen wiper 1st speed relay coil negative control
11	Active digital input to Vbatt. Positive brake pedal switch signal (normally closed)
12	INT supply from F42 for Braking System Node (NFR)
13	INT supply from F42 for Steering Angle Node (NAS)
14	Supply for right headlight alignment control
15	Free
16	Free
17	Not connected
18	Active analogue input to earth. Negative signal from brake fluid level switch
19	Low Side Relay Driver. Rear view mirror defrosting relay coil negative control
20	Not connected
21	Not connected
22	Low Side Relay Driver. Headlamp washer relay coil negative control
23	Active analogue input to earth. Negative signal from brake pad wear sensor
24	Not connected
25	Active digital input to Vbatt/earth (uncoupling diode). Negative signal from FIS inertia switch (normally open)
26	A-bus serial line setup
27	LIN 3 serial line setup
28	INT supply from F42 for brake pedal switch (normally closed)
29	Supply for left headlight alignment control
30	High Side Driver. Supply for left headlight (LED) day light (DRL)
31	High Side Driver. Front left positive direction indicator control
32	Free
33	High Side Driver. Positive control for front left side light (COM2 for LED control unit) - Setup
34	Active analogue input to earth - Free.
35	Active digital input to earth. Diagnosis feedback from right active headlight to earth (LED)
36	Active digital input to earth. Diagnosis feedback from left active headlight to earth (LED)
37	C-CAN L for Steering Angle Node (NAS) / TUM control unit
38	C-CAN H for Steering Angle Node (NAS) / TUM control unit
39	Earth for TUM control unit
40	B-CAN B for Climate Control Node (NCL) and tyre pressure control unit
41	B-CAN A for Climate Control Node (NCL) and tyre pressure control unit
42	Active analogue input to Vbatt/earth. Positive signal for compressor engagement (A/C)
43	Free
44	Free
45	Active analogue input to Vbatt. Positive D+ signal from alternator - Setup
46	High Side Driver. Front right positive direction indicator control
47	Free
48	High Side Driver. Positive fixed lighting control interlocked with side lights for Climate Control Node (NCL)
49	Low Side Relay Driver. Negative starting relay enablement control
50	A-bus serial line for Alarm Siren Control Unit (CSA)
51	Free
52	CAN-C L - Setup
53	CAN-C H - Setup
54	Free
55	High Side Driver. Positive right headlight side light control / DRLs
56	Free

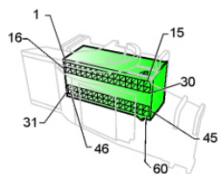
57	Active digital input to Vbatt. Positive brake pedal switch signal (normally open)
58	Negative signal from windscreen wiper cam
59	Positive position control for left headlight alignment control from Instrument Panel Node (NQS)
60	Positive position control for right headlight alignment control from Instrument Panel Node (NQS)

M001E connector PIN-OUT (Black, 32 pin, Cab)



Pin	Function
1	Relay contact output (T25a). Supply from F47 for driver side electric window raising control
2	Relay contact output (T25b). Supply from F47 for driver side electric window lowering control
3	Relay contact output (T37c). Supply from F38 for central door locking control (Dead Lock)
4	+30 supply from F36 for Battery Disconnecting Control Unit (BDS)
5	INT supply from F49
6	INT supply from F49 for transformer socket
7	INT supply from F49 for rain and dusk sensor
8	Relay contact output (T38a). Supply from F89 for folding mirrors - Setup
9	Relay contact output (T38b). Supply from F89 for opening rear window release - Setup
10	INT supply from F49 for Battery Disconnecting Control Unit (BDS)
11	INT power supply from F51 for DRIVING ADVISOR control unit
12	INT power supply from F-51 for rear camera
13	INT supply from F51 - Setup
14	Relay contact output (T37d). Supply from F38 for load compartment/rear sliding side door locking
15	Relay contact output (T26b). Supply from F48 for passenger side electric window lowering control
16	Free
17	+30 power supply from F34 for interior hazard warning lights (Minibus) - setup
18	Relay contact output (T37a). Supply from F38 for front door locking
19	+30 supply from F33 for battery monitoring system
20	Positive command for cab roof light
21	Power supply from F36 for Optional Wiring Control Unit (CCO) and Optional Wiring Module (MCO) - setup
22	Relay contact output (T44). SBMT supply from F32 for front roof light
23	Relay contact output (T44). SBMT supply from F32 for luggage compartment roof light
24	Relay contact output (T44). SBMT supply from F32 for access board light
25	Free
26	Earth reference for rear bulbs - Setup
27	INT/A supply from F31 for Multifunction screen node / Battery Disconnecting Control Unit (BDS) / Relay (T66) for Optional Wiring Control Unit CCO
28	Free
29	Free
30	Relay contact output (T26a). Supply from F48 for passenger side electric window raising control
31	Free
32	Relay contact output (T37b). Supply from F38, for front door unlocking / Shared with central door locking (deadlock)

M001F connector PIN-OUT (green, 60 pin, Cab)

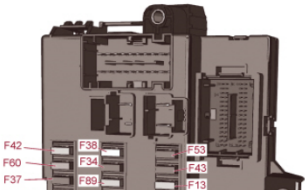


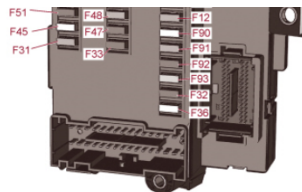
Pin	Function
1	High Side Driver. Right reversing light positive control
2	High Side Driver. Positive left brake light control
3	High Side Driver. Positive rear left fog light control
4	High Side Driver. Positive left reversing light control
5	High Side Driver. Positive electric window enablement control
6	High Side Driver. Positive left and right number plate light control
7	High Side Driver. Positive control for fixed lighting interlocked with side lights for rear current socket

8	Low Side Driver. Front roof light timer/dimmer negative command
9	Active analogue input to Vbatt. Rear left roof light positive signal - Setup
10	Low Side Driver. Rear second row roof light dimmed/timed negative control
11	Active analogue input to Vbatt/earth. Negative trailer presence signal (normally open) - Setup
12	Active analogue input to earth. Signal from trailer control unit - Setup
13	Low Side Driver. Rear first row roof light dimmed/timed negative control
14	A-bus serial line for rain and dusk sensor and battery charge status
15	RF aerial coaxial cable input signal
16	Battery disconnecter not engaged positive control
17	High Side Driver. Positive right front and rear side light control
18	High Side Driver. Positive rear right direction indicator control
19	High Side Driver. Positive rear left direction indicator control
20	Active analogue input to Vbatt/earth. Positive driver side electric window lowering control - Setup
21	Low Side Relay Driver. Second external heated rear window relay driver
22	Active analogue input to Vbatt. Rear right roof light positive signal - Setup
23	Active analogue input to Vbatt. Positive front roof light signal - Setup
24	Negative fuel level signal from tank
25	Positive fuel level signal from tank
26	Active digital input to earth. Negative digital rear window wiper cam signal - Setup
27	Active analogue input to earth. Negative load compartment locking/unlocking signal from Control Panel on door
28	A-bus serial line setup
29	Low Side Driver. Negative electric window/Sun Roof enablement signal (comfort closing) - Setup
30	Earth reference for RF aerial
31	High Side Driver. Positive rear left fog light control
32	High Side Driver. Positive right brake light control
33	Active analogue input to earth. Negative signal from switch on rear right sliding side door (normally open)
34	Active analogue input to earth. Negative signal from opening switch on tailgate handle - Setup
35	Active analogue input to earth. Negative signal from switch on tailgate (normally open)
36	Free
37	Specfic input for outside temperature signal
38	Active analogue input to earth. Negative signal from switch on rear window - Setup
39	LIN 3 serial line setup
40	Active analogue input to Vbatt/earth. Positive signal for passenger side electric window raising/lowering control
41	High Side Driver. Positive load compartment door status LED control
42	Active analogue input to earth. Diagnosis feedback from left active headlight to earth (LED) - Setup
43	Active analogue input to earth. Negative emergency button input for minibus
44	Active analogue input to earth. Negative signal from handbrake engaged indication switch (normally open)
45	CAN-B A for Parking Sensor Node (NSP)
46	Battery disconnecter engaged positive control
47	Free
48	High Side Driver. Positive third brake light control
49	Low Side Driver. Speed signal generation VSO / B7
50	Active analogue input to earth. Negative signal from switch on driver side front door
51	Active analogue input to earth. Negative signal from switch on passenger side front door
52	Earth reference for outside temperature sensor
53	Active analogue input to Vbatt/earth. Analogue driver side front door geared motor pawl signal
54	Active analogue input to Vbatt/earth. Positive passenger side electric window raising/lowering control signal from driver side dashboard
55	Active analogue input to Vbatt/earth. Positive driver side electric window raising/lowering control signal from driver side dashboard
56	Active analogue input to Vbatt/earth. Negative passenger side front door geared motor pawl signal / Mirror folding signal - Setup
57	Low Side Driver. Negative and timed step light control
58	Low Side Driver. Negative and timed load compartment roof light control / removable roof light
59	Active digital input to Vbatt/earth. Negative signal from aftermarket anti-theft device with remote control - Setup
60	B-CAN B for Parking Sensor Node (NSP), transformer socket and suspension control unit

**Fuses**

The following figure illustrates the position of the fuses in the Body Computer Node.





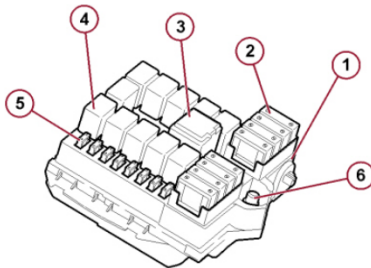
The following table describes the Body Computer Node fuses.

Fuse	Capacity (A)	Protected circuit
F12	7,5	Right dipped headlight
F13	7,5	Left dipped headlight
F31	5	(INT/A supply) - Engine compartment junction unit relay, dashboard junction unit relay
F32	7,5	Passenger compartment interior roof light activation
F33	20	(+ 30 supply) - Battery monitoring sensor for Start & Stop versions
F34	20	Minibus interior lights (emergency) - Setup
F36	10	(+30 supply) - Radio, Compressor for climate control, Alarm, Tachograph, Battery disconnection control unit, Webasto additional heater timer, TUM control unit, voltage stabiliser
F37	7,5	(INT supply) - Brake light control (main), Third brake light, Instrument panel, TUM control unit
F38	20	(+ 30 supply) - Central locking Door locking
F42	5	(INT supply) - ABS, ASR, ESP, Brake light control (secondary)
F43	20	(INT supply) - Windscreen wiper
F47	20	Driver side electric windows
F48	20	Passenger side electric windows
F49	5	(INT supply) - Parking sensor control unit, radio, steering wheel controls, central control panel, driver side control panel, auxiliary panel, battery disconnecting control unit
F50	7,5	(INT supply) - Airbag node
F51	5	(INT power supply) - Climate control node, power steering control unit, reversing lights, diesel filter water sensor, flow meter, tachograph, SERVOTRONIK control unit, DRIVING ADVISOR control unit, rear camera
F53	7,5	(+ 30 supply) - Instrument panel
F89	-	Not used
F90	7,5	Left main beam headlight
F91	7,5	Right main beam headlight
F92	7,5	Left fog light
F93	7,5	Right fog light

#### ENGINE COMPARTMENT CONTROL UNIT (CVM)

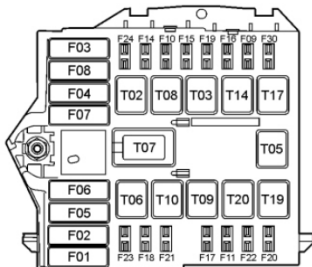
##### Characteristics

The Engine Compartment Junction Unit (CVM) is a junction unit with sheared circuits, installed in the engine compartment, which contains fuses and relays and performs an interconnection function between the front wiring, radiator and battery positive. These wirings are connected to the control unit through fixed couplings. These couplings can be easily reached as they are positioned to facilitate fitting or removal operations. There is a fastening on the lower cover for sealed fuse holder connectors (maxi and auto type).



1. Engine Compartment Junction Unit Mounting (CVM);
2. System protective maxifuse;
3. Maxi type relay switch;
4. Micro type relay switch;
5. System protective mini fuses;
6. Connector for connection between Battery Control Unit (CBA) and Engine Compartment Junction Unit (CVM).

The following figure illustrates the fuses and relay switches in the engine compartment junction unit (CVM).



#### Fuses

Fuse	Capacity (A)	Protected circuit
F01	40	Braking System Node (NFR) electric pump



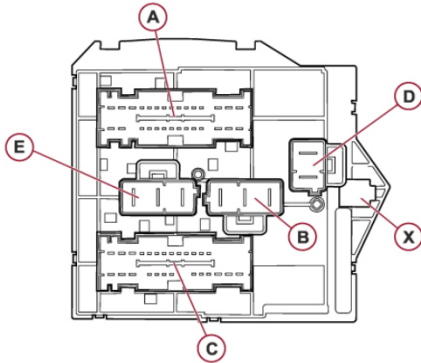
F02	50	Glow plug preheating control unit (diesel engines)
F03	30	Ignition switch
F04	30	Heated filter
F05	20	(+30 power supply) Optional Wiring Module (MCO) for the protection of the following circuits: Additional Webasto Heater, Minibus (setup), Ambulance, starting management relay switch with Stop/Start system
F05	50	(+ 30 supply) Optional Wiring Module (MCO) for the protection of the following circuits: Robotised Gearbox, Additional Webasto Heater (Versions with robotised gearbox)
F06	40	(+ 30 supply) Dual-speed engine cooling fan - High speed
F06	60	(+ 30 supply) Dual-speed engine cooling fan - High speed (Versions with air conditioning / climate control)
F07	40	(+ 30 supply) Dual-speed engine cooling fan - Low speed
F07	50	(+ 30 supply) Dual-speed engine cooling fan - Low speed (Versions with air conditioner/climate control system)
F08	40	Climate control system
F09	15	Rear power socket
F10	15	Acoustic warnings
F11	15	Engine management system (secondary loads)
F14	15	Cigar lighter/power socket
F15	10	Cigar lighter
F16	7,5	(15/54 supply) Engine Management Node / starting management relay switch for versions with Start&Stop system / starting management relay switch for robotised gearbox versions
F17	10	Engine management system (main loads)
F18	7,5	+ 30 supply Engine Management Node / Robotised gearbox control unit (Euro 5, Euro 5+)
F19	7,5	Climate control system compressor
F20	30	Windscreen wiper
F21	15	Fuel pump
F22	20	Engine management system (main loads)
F23	30	+ 30 supply Braking System Node (solenoid valve unit)
F24	15	(15/54 supply) Auxiliary panel (ambulance version) / Electric window and mirror movement controls
F30	15	Mirror demisting

Relay switches

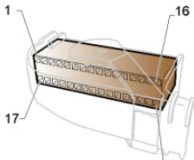
Relay switch	Capacity (A) / Type	Circuits controlled
T02	30 / micro	Current socket/cigar lighter
T03	20 / micro	Acoustic warnings
T05	20 / micro	Climate control system compressor
T06	30 / micro	Engine cooling fan (high speed)
T07	50 / Maxi	Engine cooling fan (low speed)
T08	30 / micro	Climate control system
T09	30 / micro	Injection system main relay
T10	20 / micro	Fuel pump
T14	20 / micro	Mirror demisting
T17	30 / micro	Rear power socket
T19	30 / micro	Windscreen wiper
T20	30 / micro	Diesel filter heating (Diesel engines)

Engine compartment junction unit pin out

The rear view of the engine compartment junction unit is illustrated below (CVM), with the various connectors highlighted.

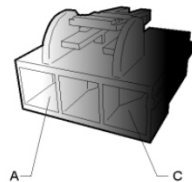


B001A connector pin out (brown 32 pin, Front)



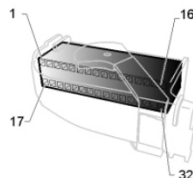
Pin	Function
1	Supply from F09 / T17 for rear power socket
2	Not connected (CNG) / + 30 supply from F18 for robotised gearbox control unit (Euro 5, Euro 5+)
3	Input for contact 30 of the diesel filter heating relay
4	Supply from F30 / T14 for left mirror defrosting
5	Supply from F30 / T14 for right mirror defrosting
6	Contact input 85 rear power socket relay T17. Negative control for relay coil from Body Computer Node (NBC)
7	15/54 supply from F24 for electric window and mirror movement controls
8	15/54 supply from F24 for auxiliary panel (ambulance version)
9	INT/A supply from F31 of Body Computer Node (NBC) for ambulance setup
10	INT/A supply from F31 of Body Computer Node (NBC) for windscreen wiper relay T19 (output)
11	INT/A supply from F31 of Body Computer Node (NBC) for: windscreen wiper relay T19 (input) and climate control unit relay T08
12	Contact input 85 cigar lighter/power socket relay T02. Negative control for relay coil from Body Computer Node (NBC)
13	Not available
14	Not available
15	Not available
16	Supply from F21 / T10 for fuel pump
17	Earth for contact 86 of the diesel filter heating relay (Diesel engines)
18	Power supply from F22 for Powertrain Control Module
19	Not available
20	+15/54 supply from F16 - Setup
21	Contact input 85 horn relay T03. Negative control for relay coil from steering wheel switch (clock spring)
22	Supply from F14 / T02 for cigar lighter
23	Contact input 85 mirror defrosting relay T14. Negative control for relay coil from Body Computer Node (NBC)
24	Supply from F15 / T02 - Setup
25	Supply from F15 / T02 for front power socket
26	Contact input 85 climate control unit relay T08. Earth for relay coil
27	Supply from F10 / T03 for single-tone horn
28	Supply from F10 / T03 - Setup
29	Input for contact 86 of relay T10 - Setup
30	+15/54 supply input from ignition switch for fuses F16, F24, cigar lighter/power socket relay coil T02 and mirror defrosting relay coil T14
31	+30 power supply from F03 for ignition switch
32	+30 power supply from F23 for Braking System Node (solenoid valve unit)

B001B connector pin out (grey 3 pin, Front)



Pin	Function
A	+30 power supply from F01 for Braking System Node (NFR) electric pump
B	+30 supply from F02 for Plug preheating control unit (Diesel engines)
C	INT/A supply from F08 / T08 for climate control unit

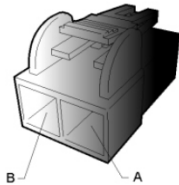
B001C connector pin out (black 32 pin, Front)



Pin	Function
1	Not available
2	Supply from F20 / T19 for windscreen wiper
3	INT power supply for relay T20 for diesel filter heating (Diesel engines)
4	Supply from F19 / T05 for air conditioning compressor
5	Contact input 85 air conditioning compressor relay T05. Negative control for relay coil from Body Computer Node (NBC)

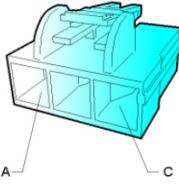
6	Contact input 86 windscreen wiper relay T19. INT/A supply for windscreen wiper relay coil from F31 of Body Computer Node (NBC)
7	Power supply from F11 / T09 for engine management system (secondary loads)
8	15/54 supply from F16 - Setup
9	15/54 supply from F16 for Engine Management Node (NCM) - Key-sense
10	Contact input 85 main injection system relay T09. Negative control for relay coil from engine Management Node (NCM)
11	Contact input 85 fuel pump relay T10. Earth for relay coil
12	Contact input 86 main injection system relay T09. Supply for relay coil from F18
13	15/54 supply from F16 - Setup
14	Not available
15	Not available
16	Not available
17	Not available
18	Power supply from F22 / T09 for engine management system (primary loads)
19	Not available
20	Not available
21	Contact input 85 engine cooling fan relay (low speed) T07. Negative control for relay coil from engine Management Node (NCM)
22	Contact input 85 windscreen wiper relay T19. Reference earth for relay coil from Body Computer Node (NBC)
23	+30 supply from F18 for Engine Management Node (NCM) (2.3 JTD version)
24	+30 supply from F18 for injection system relay coil T09
25	Not available
26	Not available
27	Supply from F17/ T09 primary load supply
28	Contact input 85 engine cooling solenoid valve relay (high speed) T06. Negative control for relay coil from engine Management Node (NCM)
29	Contact input 86 of fuel pump relay T10. Positive control for relay coil from engine Management Node (NCM)
30	Supply from F21/ T10 - Setup
31	Primary injection system load supply from F17
32	Primary injection system load supply from F17 - Setup

B001D connector pin out (black 2 pin, Front)



Pin	Function
A	+30 supply from F05 for Optional Wiring Module (MCO)
B	+30 power supply from F04 for contact 30 of relay T20 for diesel filter heating (Diesel engines)

B001E connector pin out (blue 3 pin, Radiator)



Pin	Function
A	Supply from F7/ T07 for engine cooling fan (low speed)
B	+30 supply from F6 for relay on radiator unit
C	Supply from F6 / T06 for engine cooling fan (high speed)

B001X Connector pin out (battery positive)



Pin	Function
1	Connection to battery positive from fuse F70 of Battery Control Unit CBA

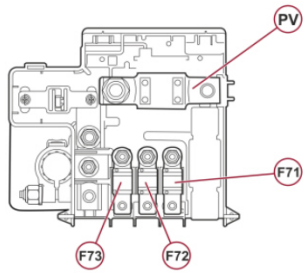
**BATTERY CONTROL UNIT (CBA)**

**Characteristics**

The Battery Control Unit (CBA) in the wiring diagrams is a power distribution control unit located directly on the battery. It has a plastic protection that prevents accidental contact with the positive battery terminal.

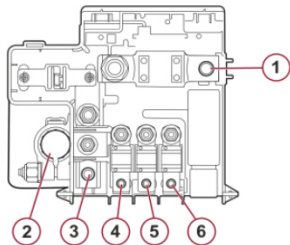
The CBA is connected to the cab wiring, the OPT cab wiring, the Engine Compartment Junction Unit (CVM) supply connector and the positive battery lead for the starting/recharging circuit.  
The Battery Control Unit fuses are illustrated below.

Diesel engines



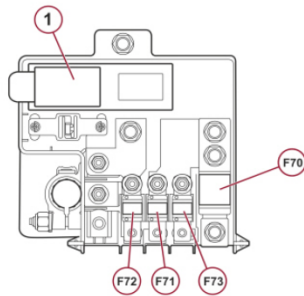
Fuse	Capacity (A)	Protected circuit
F71	70	+30 supply Body Computer Node (NBC) - BCM1 -
F72	50	+30 supply Body Computer Node (NBC) - BCM2 -
F73	50	+30 supply Transformer socket - TRASF -
PV	CAL5	+30 starter supply - Engine compartment junction unit

The following figure shows the Battery Control Unit connections (Diesel engines).



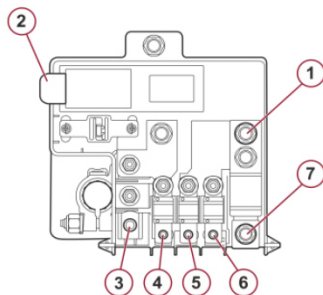
Re.	Connector	Wiring	Function
1	B099B	Battery positive	Starter supply / Engine compartment junction unit
2	-	-	Battery positive pole
3	B099F	Left longitudinal wiring	Self-levelling suspension fuse supply
4	B099E	OPT cab wiring	Transformer socket supply
5	B099C	Cab wiring	Supply for Body Computer Node (NBC) - BCM2 -
6	B099D	Cab wiring	Supply for Body Computer Node (NBC) - BCM1 -

CNG - Minibus versions



Protection	Capacity	Protected circuit
1	-	Battery disconnecter
F70	150	+30 supply terminal board positives
F71	70	+30 supply Body Computer Node (NBC) - BCM1 -
F72	50	+30 supply Body Computer Node (NBC) - BCM2 -
F73	50	+30 supply Transformer socket - TRASF -

The following figure shows the Battery Control Unit connections (CNG - Minibus Versions).



Re.	Connector	Wiring	Function
1	B099 A	Battery positive	Starter supply
2	B099 G	Cab wiring	Battery disconnecter control from Body Computer
3	B099 F	-	Not connected
4	B099 C	Cab wiring	Supply for Body Computer Node (NBC) - BCM2 -
5	B099 D	Cab wiring	Supply for Body Computer Node (NBC) - BCM1 -
6	B099 E	OPT cab wiring	Transformer socket supply
7	B099 B	Battery positive	Engine Compartment Junction Unit supply

To prevent damage to the vehicle when changing fuses, it is very important to tighten the nuts fixing the fuses and the electrical connections correctly to torque.

For further details,  
**Op. 5530B40 SUPPLY BOX ON BATTERY (LINK BATTERY AND FUSE BOX) - R R**

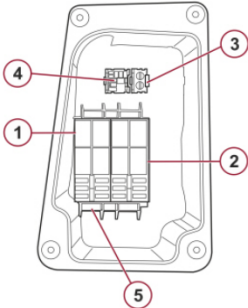
**OPTIONAL WIRING CONTROL UNIT (CCO) AND TRANSFORMER SOCKET**

**Characteristics**

The optional wiring control unit CCO is located on the right side of the cab, on the rear post of the front passenger side door.

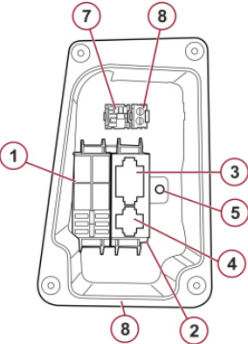
Depending on the version and the structure of the vehicle for the installer versions, this control unit may feature one or two modules and an additional socket known as a "transformer socket" (or "bodywork socket") - P125 in the wiring diagrams. In addition, in the compartment where it is housed, there may be additional components (fuses and relays) for specific functions relating to particular versions (people carrier).

**BASIC and People Carrier variants CCO view**



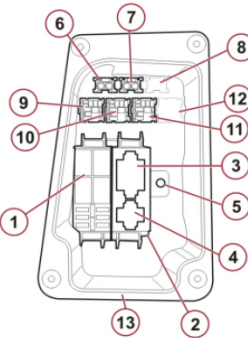
- 1. Module 1 for Optional Wiring Control Unit (CCO)
- 2. Module 2 for Optional Wiring Control Unit (CCO)
- 3. Exterior side marker light fuse
- 4. External relay switch (T69) side marker lights
- 5. Cable input side.

**Transformer - Leisure time variants CCO view**



- 1. Module 1 for Optional Wiring Control Unit (CCO)
- 2. Transformer socket bracket
- 3. Connector P125A for transformer socket
- 4. Connector P125B for transformer socket
- 5. Connector P125C for transformer socket
- 6. Exterior side marker light fuse
- 7. External relay switch (T69) side marker lights
- 8. Cable input side

**Transformer - People Carrier variants CCO view**



- 1. Module 1 for Optional Wiring Control Unit (CCO)
- 2. Transformer socket bracket
- 3. Connector P125A for transformer socket
- 4. Connector P125B for transformer socket
- 5. Connector P125C for transformer socket
- 6. External fuse A side marker lights
- 7. External fuse B additional passenger compartment air fan
- 8. External fuse C additional air conditioning control panel
- 9. External relay switch (T69) side marker lights
- 10. External relay switch (T23) additional passenger compartment air fan
- 11. Relay switch (T24) for low speed fan engagement (additional air conditioning)
- 12. Relay switch (T29) for additional air conditioning enablement
- 13. Cable input side

**Module 1 fuses**

Fuse	Capacity	Circuits protected
F54	15	INT/A supply for internal ventilation / intake (Minibus version) - setup
F55	15	INT/A supply for heated seats
F56	15	INT/A supply for 12 V socket (people carrier transformer version)
F57	10	Additional heater enablement
F58	15	+30 supply for right heated rear window
F59	15	+30 supply for left heated rear window

Module 2 fuses

Fuse	Capacity	Circuits protected
F60	-	Available
F61	-	Available
F62	-	Available
F63	10	+30 supply for additional air conditioning temperature controls
F64	-	Available
F65	30	Additional passenger compartment air fan motor supply (additional air conditioning)

External fuses

Fuse	Capacity	Circuits protected
A	10	+30 supply for side marker lights
B	30	+30 supply for additional passenger compartment air fan (people carrier transformer version)
C	10	+ 30 supply for Additional air conditioning temperature controls (people carrier transformer version)

Module 1 relay switches

Relay switch	Capacity (A) / Type	Circuits controlled
T25	10 - 20 / Micro	Interior lights (Minibus version) - setup
T30	20 / Micro	Heated rear window
T31	30 / Micro	Additional heater enablement
T66	30 / Micro	Heated seats / 12 V socket (people carrier coach work fitter version)

Module 2 relay switches

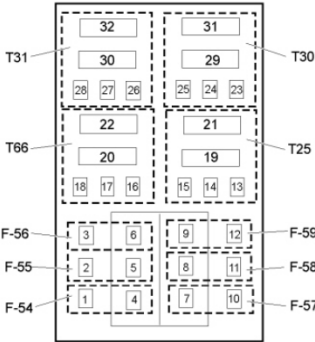
Relay switch	Capacity (A) / Type	Circuits controlled
T23	30 / Micro	Additional passenger compartment air fan (additional heater)
T24	30 / Micro	First speed activation for additional air conditioning
T29	30 / Micro	Additional air conditioning enablement
T32	30 / Micro	Available

External relay switches

Relay switch	Capacity (A) / Type	Circuits controlled
T23	30 / Micro	Additional air fan for additional passenger compartment heater (people carrier transformer variant)
T24	30 / Micro	First speed activation for additional air conditioning (people carrier transformer variant)
T67	10 - 20 / Micro	Internal intake (Minibus version) - setup
T68	10 - 20 / Micro	Internal ventilation (Minibus version) - setup
T69	30 / Micro	Side marker lights

Optional wiring control unit cco pin-out

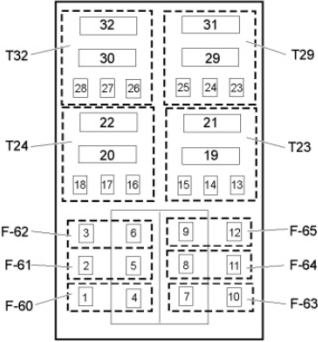
B098A Module 1 connector PIN-OUT (32 pin, OPT cab)



Pin	Function
1	F54 fuse output. Aspirator/fan motor supply for interiors (Minibus version) - setup
2	Heated seat supply from fuse F55
3	Supply for 12 V socket from F56 (people carrier / transformer versions)
4	F54 fuse Input - Setup
5	Fuse input F54, F55 and F56. INT/A supply from relay T66
6	F56 fuse input - Setup
7	F57 fuse input. +30 supply from Body Computer Node (NBC)

8	Fuse input F58 and F59. +30 supply for left and right heated rear window
9	F59 fuse input - Setup
10	F57 fuse output. Supply for additional heater enablement relay (T31)
11	F58 fuse output. +30 supply for right heated rear window
12	F59 fuse output. +30 supply for left heated rear window
13	Contact 86 interior light relay coil (T25). +30 power supply from F36 of Body Computer Node (NBC) - (Minibus version) - setup
14	Not connected
15	Contact 85 interior light relay coil (T25). Negative control for coil of relay T25 from Body Computer Node (NBC) - (Minibus version) - setup
16	Contact 86 relay coil (T66). INT/A supply from F31 of Body Computer Node (NBC)
17	Not connected
18	Contact 85 relay coil (T66). Earth for relay coil
19	Contact 87 interior light relay coil (T25). +30 power supply for Auxiliary panel - (Minibus version) - setup
20	Contact 87 relay (T66). INT/A supply for fuses F54, F55 and F56
21	Contact 30 interior light relay (T25). +30 power supply from F36 of Body Computer Node (NBC) - (Minibus version) - setup
22	Contact 30 relay (T66). Supply from maxifuse F72 from Body Computer Node (NBC)
23	Contact 86 heated rear window relay coil (T30). INT/A supply from F31 of Body Computer Node (NBC)
24	Not connected
25	Contact 85 heated rear window relay coil (T30). Negative control for relay coil from Body Computer Node (NBC)
26	Contact 86 relay coil (T31). INT/A supply from F31 of Body Computer Node (NBC)
27	Not connected
28	Contact 85 relay coil (T31). Negative signal for coil of relay T31 from driver side control panel
29	Contact 87 heated rear window relay (T30). +30 supply for fuses F58 and F59 protecting left and right heated rear window
30	Contact 87 relay (T31). +30 supply for additional heater solenoid valve, additional air conditioning enablement, +30 supply for additional front heater (Minibus versions)
31	Contact 30 heated rear window relay (T30). +30 supply from F72 of Battery Control Unit (CBA)
32	Contact 30 relay (T31). +30 power supply from F57

Modulo 2 pin out (B098B connector)



Pin	Function
1	Not connected
2	Not connected
3	Not connected
4	Not connected
5	Not connected
6	Not connected
7	Not connected
8	Fuse input F63 and F65. +30 supply from Body Computer Node (NBC)
9	Not connected
10	F63 fuse output. +30 supply for additional air conditioning temperature controls
11	Not connected
12	F65 fuse output. +30 supply for additional passenger compartment air fan relay (T23)
13	Contact 86 additional passenger compartment air fan relay coil (T23). INT/A supply from F31 of Body Computer Node (NBC)
14	Contact 87a additional passenger compartment air fan relay coil (T23). Not connected
15	Contact 85 additional passenger compartment air fan relay coil (T23). Earth for relay coil T23
16	Contact 86 relay coil (T24). INT/A supply from F31 of Body Computer Node (NBC)
17	Contact 87a relay coil (T24). Not connected
18	Contact 85 relay coil (T24). Negative signal for coil of relay T24 from additional air conditioning temperature controls (CMD RELAY 1)
19	Contact 87 additional passenger compartment air fan relay coil (T23). +30 supply for additional passenger compartment air fan
20	Contact 87 relay (T24). Power earth
21	Contact 30 additional passenger compartment air fan relay (T23). +30 power supply from F65
22	Not connected
23	Contact 86 additional passenger compartment air fan relay coil (T23). INT/A supply from F31 of Body Computer Node (NBC)
24	Contact 87a additional passenger compartment air fan relay coil (T23). Not connected
25	Contact 85 additional passenger compartment air fan relay coil (T23). Earth for relay coil T23
26	Contact 86 relay coil (T24). INT/A supply from F31 of Body Computer Node (NBC)
27	Contact 87a relay coil (T24). Not connected
28	Contact 85 relay coil (T24). Negative signal for coil of relay T24 from additional air conditioning temperature controls (CMD RELAY 1)
29	Contact 87 additional passenger compartment air fan relay coil (T23). +30 supply for additional passenger compartment air fan
30	Contact 87 relay (T24). Power earth
31	Contact 30 additional passenger compartment air fan relay (T23). +30 power supply from F65
32	Not connected

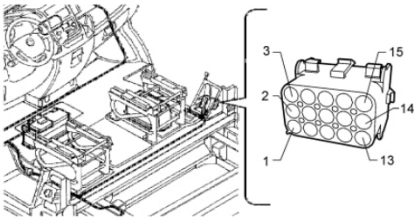
22	Contact 30 relay (124). Earth for additional passenger compartment air fan first speed.
23	Contact 86 additional air conditioning enablement relay coil (T29). +30 supply from relay (T31)
24	Not connected
25	Contact 85 additional air conditioning enablement relay coil (T29). Earth for relay coil T29
26	Not connected
27	Not connected
28	Not connected
29	Contact 87 additional air conditioning enablement relay (T29). Power earth
30	Not connected
31	Contact 30 additional air conditioning enablement relay (T29). Negative enablement signal for additional air conditioning
32	Not connected

TRANSFORMER SOCKET

The transformer socket (or "bodywork socket") is available as an optional component and has the function of facilitating the conversion of the vehicle by installers for multiple requirements, providing the repetition of various signals, including the two CAN-B cables.

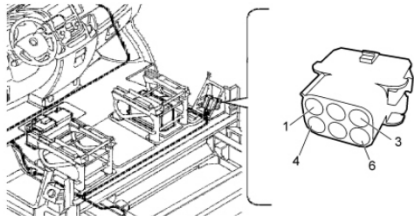
**Transformer socket connector pin-out**

**P125A connector PIN-OUT (white 15 pin, OPT cab)**



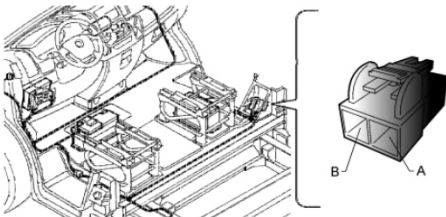
Pin	Function
1	Additional brake light
2	D+ (active to earth)
3	Vehicle speed repetition (VSO)
4	Lock locking control
5	Lock unlocking control
6	Side and rear door status signal
7	Roof light timed SBMT supply 20 W driver
8	Negative roof lights control (dimmed)
9	B-CAN A
10	B-CAN B
11	Negative relay control unit for side lights (side markers)
12	Additional air conditioning activation request (A/C request)
13	INT supply from F49 of Body Computer Node (NBC)
14	Additional heater control (A/C rear)
15	Not connected

P125B connector PIN-OUT (white 6 pin, OPT cab)



Pin	Function
1	Permanent 12 V supply (+30) for radio
2	Rear LH speaker +
3	Rear LH speaker -
4	Rear RH speaker +
5	Rear RH speaker -
6	Not connected

P125C connector PIN-OUT (black 2 pin, OPT cab)

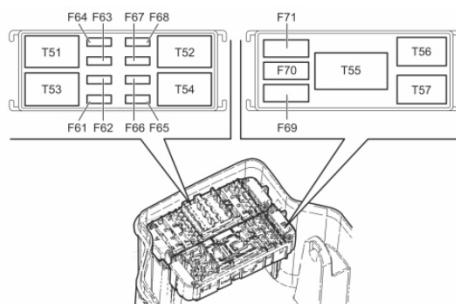


Pin	Function
A	+30 power supply from F73 of the Battery control unit



**OPTIONAL WIRING MODULE (MCO)**

The Optional Wiring Module (MCO) or additional system fuse box (B046) is used in vehicle versions with robotised gearbox. It incorporates the protective fuses for the additional Webasto heater

**Fuses (connector a)**

Fuse	Capacity (A)	Circuits protected
F61	30	Available (CNG) / Additional heater control unit supply (Euro 5, Euro 5+)
F62	30	Available (CNG) / Headlight washer (Euro 5, Euro 5+)
F63	20	Tow hook socket (CNG) / Supply for passenger compartment air fan with additional heater (Euro 5, Euro 5+)
F64	30 (CNG) - 20 (Euro 5, Euro 5+)	Headlight washer (CNG) / Tow hook socket (Euro 5, Euro 5+)
F65	15	Trailer control unit power supply
F65	7,5	Ambulance control panel - setup
F66	20	Ambulance siren - setup
F66	15 (CNG) - 30 (Euro 5, Euro 5+)	Trailer control unit supply (CNG) / Stop/Start (Euro 5, Euro 5+)
F67	20	Siren flashers - setup
F67	20 (CNG) - 15 (Euro 5, Euro 5+)	Tow hook socket (CNG) / Trailer control unit supply (Euro 5, Euro 5+)
F68	10 (CNG) - 20 (Euro 5, Euro 5+)	Cylinder solenoid valves (CNG) / Tow hook socket (Euro 5, Euro 5+)

**Relay switches (connector a)**

Relay switch	Capacity (A) / Type	Circuits controlled
T51	30 - Microswitch	Cylinder solenoid valves (CNG) / Oil vapour heating (Diesel engines)
T52	10/20 - Microswitch	Minibus - setup
T53	30 - Microswitch	Tow hook socket (CNG) / Available (Euro 5, Euro 5+)
T54	30 - Microswitch	Headlight washers

**Fuses (connector b)**

Fuse	Capacity (A)	Circuits protected
F69	30 - Maxi Compact	Robotised gearbox - setup
F70	-	Available
F71	30	Robotised gearbox oil electric pump power supply

**Relay switches (connector b)**

Relay switch	Capacity (A) / Type	Circuits controlled
T55	50 - MAXI	Robotised gearbox
T56	30 - Microswitch	Robotised gearbox
T57	30 - Microswitch	Tow hook socket.

**Optional wiring control unit cco pin-out****Connector a pin-out (front pin 36)**

Pin	Function
1	+30 power supply from F65 for trailer control unit
2	Supply from F66 for relay switch J005A Stop/Start system (Euro 5, Euro 5+) / for Trailer control unit (CNG)
3	+30 supply F67 for trailer control unit (Euro 5, Euro 5+) / for tow hook socket (CNG)
4	+30 supply from F68 for trailer setup junction (Euro 5, Euro 5+) / for cylinder solenoid valves (CNG)
5	Not connected
6	+30 power supply
7	Not connected
8	+30 power supply
9	Not connected
10	Not connected
11	Not connected
12	+30 power supply
13	+30 supply from F61 for additional heater control unit (Euro 5, Euro 5+) / Not connected (CNG)
14	Supply from F62 for electric headlight washer pump motor relay switch T54 (Euro 5, Euro 5+) / Not connected (CNG)
15	Supply from F63 for additional heater relay switch (Euro 5, Euro 5+) / for tow hook socket (CNG)
16	+30 supply from F64 for trailer setup junction relay switch T57 (Euro 5, Euro 5+) / for headlight washer (CNG)
17	Oil vapour heating relay switch T51 coil control from control unit M010 (Diesel engines) / for cylinder solenoid valves (CNG)

18	Not connected
19	Power supply from F17 of control unit B001 for relay switch T51 for oil vapour heating, contact 86 (Diesel engines) / for cylinder solenoid valves (CNG)
20	Not connected (Euro 5, Euro 5+) / Earth for tow hook socket relay switch T53 (CNG)
21	Not connected
22	Not connected (Euro 5, Euro 5+) / +15 supply for tow hook socket relay switch T53 (CNG)
23	Oil vapour heating coil supply from relay switch T51 (Diesel engines) / Cylinder solenoid valve supply from relay switch T51 (CNG)
24	Not connected (Euro 5, Euro 5+) / +30 supply for tow hook socket relay switch T53 (CNG)
25	Power supply from F17 of control unit B001 for relay switch T51 for oil vapour heating, contact 30 (Diesel engines) / for cylinder solenoid valves (CNG)
26	Not connected (Euro 5, Euro 5+) / +30 supply for tow hook socket relay switch T53 (CNG)
27	Not connected
28	Not connected
29	Not connected
30	Power supply from F31 for relay T54 coil
31	Not connected
32	Negative control for headlight washer electric pump motor
33	Not connected
34	Power supply from T54 and F62 of headlight washer electric pump motor
35	Not connected
36	Power supply from F62 for relay switch T54 of headlight washer electric pump motor

Connector b pin-out (front pin 20)

Pin	Function
1	Reference for the coil of relay switch T56 from control unit M054
2	Not connected
3	INT power supply from F18 of control unit B001 for the coil of relay switch T55
4	Earth for the coil of relay switch T57
5	Not connected
6	INT power supply from F24 of control unit B001 for the coil of relay switch T57
7	+50 power supply for the starter from relay switch T56
8	Power supply from contact 87 of relay switch T57 for trailer setup coupling
9	+50 power supply for relay switch T56 from ignition switch
10	+30 power supply from F64 for relay switch T57 of trailer setup coupling
11	+30 power supply from F71 for robotised gearbox oil pump relay switch T55
12	Control of coil of robotised gearbox oil pump relay switch T55 from control unit M054
13	Earth for coil of robotised gearbox oil pump relay switch T55
14	Power supply from contact 87 of robotised gearbox oil pump relay switch T55
15	Not connected
16	Not connected
17	+30 power supply for F71
18	Not connected
19	Not connected
20	+30 power supply from F71 for robotised gearbox oil pump relay switch T55

Connector c pin-out (front pin 1)

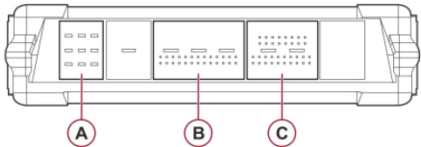
Pin	Function
1	+30 power supply from PV fuse of control unit B099

Connector d pin-out (front pin 1)

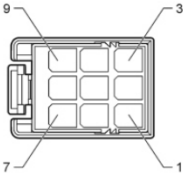
Pin	Function
1	+30 power supply

CAN (TUM) GATEWAY FOR FITTER/INSTALLER VERSIONS

Tum control unit pin out

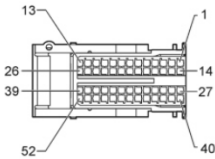


Connector A



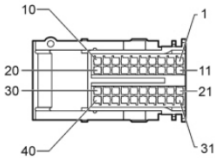
PIN	FUNCTION
2	+30 power supply from Body Computer F36
5	GND

Connector B



PIN	FUNCTION
1	CAN-C H (CAN-0, output)
2	CAN-C L (CAN-0, output)
5	Trailer presence signal - setup -
13	+15 (INT) power supply from Body Computer F37
14	CAN-C H (CAN-0, input)
15	CAN-C L (CAN-0, input)
22-24	Jumper between pins 22 and 24 for hardware identification
23-26	Jumper between pins 23 and 26 for hardware identification

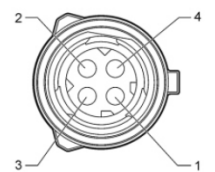
Connector C



PIN	FUNCTION
12	CAN-B B (CAN-1, input)
13	CAN-B A (CAN-1, input)
17	FMS-CAN L (CAN-2, to connector SAE J1939)
18	CAN-B A (CAN-1, output) - setup -
19	FMS-CAN H (CAN-2, to connector SAE J1939)
20	CAN-B B (CAN-1, output) - setup -

Should inter-CAN (FGA-FMS) communication not be available following installation of the TUM device, a jumper must be applied between pins 10 and 17 of connector C of the connection harness to activate the internal terminal resistor (120 ohm) in order to prevent connection problems between devices.

Fms-can connector pin out (sae j1939)



PIN	FUNCTION
1	FMS-CAN H (CAN-2, to TUM control unit)
2	FMS-CAN L (CAN-2, to TUM control unit)

For any further detail on electrical connection of the TUM, refer to the dedicated electrical diagrams.  
See E1050 CAN CONNECTION LINES

Tum device operation

The following table lists all the signals available on the FMS-CAN (depending on the version/trim level) which are useful for the control units that interface with the TUM device.

Message	Signal	Description
CCVS	Parking Brake Switch	Indicates parking brake engaged
	Wheel based speed	Indicates vehicle speed
	Clutch switch	Indicates clutch pedal pressed
	Brake switch	Indicates brake pedal pressed
	Cruise control active	Indicates Cruise Control active
EEC2	Accelerator pedal position 1	Indicates accelerator pedal position
	Engine Percent Load At Current Speed	Indicates percentage ratio between engine torque and maximum indicated torque at current engine speed
LFC	Engine total fuel used	Indicates total fuel used during vehicle operation
DD	Fuel Level	Indicates ratio of fuel volume to total tank volume
EEC1	Engine speed	Indicates engine speed
VDHR	High resolution total vehicle distance	Indicates total vehicle distance travelled
ET1	Engine coolant temperature	Indicates temperature of engine coolant

AMB	Ambient Air Temperature	Indicates temperature outside of vehicle
LFE	Fuel Rate	Indicates quantity of fuel used by engine per time unit
	Instantaneous Fuel Economy	Indicates ratio between quantity of fuel used and current vehicle speed
SERV	Service distance	Indicates distance that can be travelled by vehicle before scheduled servicing
HOURS	Total engine hours	Indicates total engine operating time
DC1	Position of doors	Indicates current door status
AS	Alternator Status 1	Indicates current alternator status
ETC2	Selected Gear	Indicates next awaited gear
	Current Gear	Indicates current gear
TD	Minutes	Indicates minutes
	Hours	Indicates hours
	Month	Indicates month
	Day	Indicates day
	Year	Indicates year
FMS1	High beam, main beam	Indicates active main beam headlight status
	Low beam	Indicates active dipped headlight status
	Turn signals	Indicates active direction indicator status
	Hazard warning	Indicates active hazard warning light status
	Parking Brake	Indicates parking brake engaged
	Brake failure/brake system malfunction	Indicates braking system fault
	Hatch open	Indicates rear door not shut
	Fuel level	Indicates fuel reserve warning light on
	Engine coolant temperature	Indicates engine coolant overheating warning light on
	Battery charging condition	Indicates insufficient battery charge warning light on
	Engine oil	Indicates insufficient engine oil pressure warning light on
	Position lights, side lights	Indicates active side light status
	Front fog light	Indicates active fog light status
	Rear fog light	Indicates active rear fog light status
	Engine / Mil indicator	Indicates EOBD/injection system failure warning light on
	Service, call for maintenance	Indicates that the scheduled servicing indicator is displayed on the instrument
	Transmission failure/malfunction	Indicates transmission system fault
	Anti-lock brake system failure	Indicates ABS failure warning light on
	Worn brake linings	Indicates brake pad wear warning light on
	Malfunction / general failure	Indicates general failure warning light on
	Height Control (Levelling)	Indicates active suspension indicator displayed
	Engine Emission system failure (Mil indicator)	Indicates particulate filter blocked warning light on
	ESC indication	Indicates stability control warning light on
TCO1	Tachogr. vehicle speed	Indicates vehicle speed stored by tachograph
DC2	Open Status Door 1	Indicates driver door status
	Open Status Door 2	Indicates passenger door status
	Open Status Door 3	Indicates rear door(s) status
	Open Status Door 4	Indicates sliding side door status
	Open Status Door 5	Indicates sliding side door status
FMS	Requests supported	Indicates whether the TUM can respond to requests from external FMS module
	Diagnostics supported	Indicates whether the TUM supports requests for sending diagnosis information
	FMS-standard SW - version supported	Indicates the version of the FMS Standard supported by the TUM