

Aquila Trucks Centres

SECTION 16

Electric/Electronic system

	Page
GENERAL WARNINGS FOR ELECTRICAL/ ELECTRONIC COMPONENTS	3
COMPONENT CODE	6
MAIN CHANGES	11
CAN LINES	12
CAN LINE ASSEMBLY DRAWING	17
POWER NETWORK	18
GROUND POINTS	19
ELECTRICAL EQUIPOTENTIAL BRAID	20
ALTERNATOR	23
STARTER MOTOR	25
JUNCTION CONNECTORS	27
DIAGNOSIS CONNECTOR	77
BULKHEAD	79
CENTRAL INTERCONNECTING UNIT	84
FUSE	85
REMOTE SWITCHES	87
FUSE ASSEMBLY BODY CONTROLLER (IBC3)	89
SUPPLEMENTARY FUSES (70000)	90
INSTRUMENT BOARD	92
CENTRAL DASHBOARD CONTROLS	93
CONTROLS ON THE STEERING WHEEL	94
REARVIEW MIRRORS AND WINDOW REGULATOR CONTROL ADJUSTMENT	95
LEFT LIGHT CONTROL 54033	96
ENGINE BRAKE CONTROL AND INTARDER	99
GEAR SELECTION FUNCTION	100
FUNCTION ENGAGING EMERGENCY MODE (LIMP HOME)	102

Aquila Trucks Centres

Page

Page

CLUSTER	104	ECAS SUSPENSIONS	178
CLUSTER (PIN-OUT)	107	EUROTRONIC AUTOMATIC TRANSMISSION ..	184
BODY CONTROLLER (IBC3)	113	LIMP - HOME	189
BODY CONTROLLER	115	ELECTRONIC CONTROL UNIT	192
- Linking connectors	115	TRANSMISSION ACTUATOR	194
CHASSIS ELECTRONIC MODULE (M.E.T.)	119	CLUTCH ACTUATOR	196
S.W.I. (STEERING WHEEL / STEERVATOR INTERFACE)	122	INTARDER	200
SPIRALED CONTACT	125	EM (EXPANSION MODULE) ELECTRONIC CONTROL UNIT (PTO)	206
STEERING COLUMN (COMPONENT LOCATION)	126	AUTOMATIC AIR CONDITIONER	209
B.M. (BED MODULE)	130	MANUAL AIR CONDITIONER	224
E.B.M. (BED MODULE EASY)	131	HYDRONIC D 10 WATER HEATER	228
TACHOGRAPH	133	SCR (SELECTIVE CATALYTIC REDUCTION) SYSTEM - DENOX 2	235
EDC (ECM) SYSTEMS	135	CENTRAL LOCKING WITH REMOTE CONTROL	238
SYSTEM COMPONENTS	139	DIAGNOSTIC	240
VCM (VEHICLE CONTROL MODULE) ELECTRONIC CONTROL UNIT	163	CIRCUIT CHARTS	245
IMMOBILIZER	166		
ABS-EBL	168		
COMMON COMPONENTS	171		

Aquila Trucks Centres

GENERAL WARNINGS FOR ELECTRICAL/ELECTRONIC COMPONENTS

Do not ever disconnect the batteries from the system with the engine running.
Do not start the engine without first having connected the batteries in a permanent manner.

- Before working on the vehicle, immobilise the wheels with chocks.
- Do not use fast chargers to start the engine. Engine starting can be performed either by means of separate batteries or by means of a special truck.
- Incorrect polarisation of the power supply voltage for the electronic control units (e.g. erroneous battery polarisation) may damage the components irreversibly.
- If you have to disconnect the batteries from the system, always disconnect the frame ground cable from the negative terminal of the batteries first.
- Before connecting the batteries to the system, make sure that the system is suitably insulated.
- Disconnect the batteries from the system before recharging them by means of an external unit.
- Disconnect the external recharging unit from the power mains before removing the unit's pliers from the battery terminals.
- At temperatures of over 80 °C (drier ovens), take down the ECU's.
- At the connection stage, tighten the flanged nuts of the connectors (temperature and pressure sensors, etc.) to the required torque. Check the exact polarity of the battery terminals when starting the engine by means of the auxiliary truck.
- Before working on the vehicle's electrical/electronic system disconnect the positive pole of the battery.
- Before disconnecting the connector from an electronic control unit, isolate the system.
- Do not cause sparks to check whether a circuit is live.
- Do not use a test bulb to check the continuity of a circuit. Only use the appropriate testing devices.
- Do not directly power the components associated with electronic control units with the nominal power rating of the vehicle.
- Make sure that the wirings of electronic devices (length, type of cable, location, grouping, connection of screen braiding, earthing, etc.) conform with the IVECO system and that they are carefully restored after repair or maintenance work. To avoid the possible malfunctioning of the electronic systems on board, the wirings of additional devices must follow a different path than that of the above-mentioned systems.
- Do not connect the negative terminals of additional systems to the negative terminals of electronic systems.
- In the event of electric welding on the vehicle, disconnect all the electronic control units and/or disconnect the power cable from the battery positive terminal and connect it to the frame earth.
- Connectors are viewed from the cable side.



Key storage procedures are affected by electromagnetic disturbances such as cell phones and the like.
Therefore, during key memorization:

1. Ensure there are no sources of disturbance in the cab or close to the keys.
2. Keys not inserted in the panel must be at a distance of at least 1 meter.



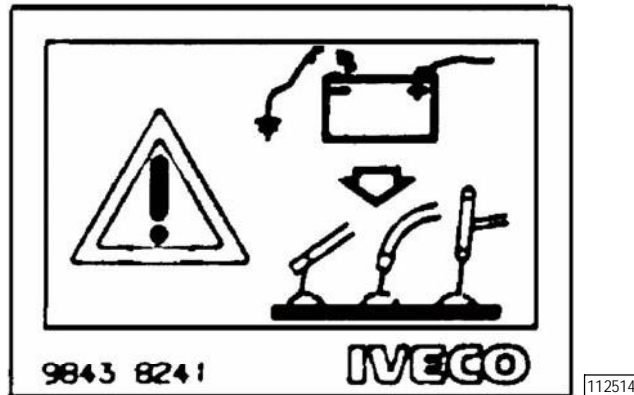
When working on electronic control units, plug connections and electrical connections to the components, measurements can be made only on suitable testing lines, by means of special plugs and plug-type bushes. Do not under any circumstances make use of improper devices such as metal wires, screwdrivers, clips and the like. In addition to the risk of causing a short circuit, this might damage plug-type connections and this would then give rise to contact problems.

Aquila Trucks Centres



In order to prevent damage or short-circuiting of the on-board electronic control units, the following operations must be always carried out before starting any welding operation on the chassis.

- If electric welding has to be done on the vehicle,



isolate the electric system as follows:

- a) disconnect the power lead from the battery positive terminal and connect it to the chassis earth;
 - b) disconnect the power lead from the battery negative terminal;
 - c) disconnect the electronic control unit connectors, taking care to avoid touching the control unit connector pins.
- Moreover:
 - a) should it be necessary to carry out welding operations close to the control unit, remove it from its location.
 - b) whenever possible, earth the welding machine directly to the piece that has to be welded.



In the case of vehicles equipped with a DTCO digital tachograph, do not disconnect the battery leads and then connect them by jumpers to reset the electronic systems.

This operation should be avoided, as it could cause permanent damage to the DTCO tachograph CARD or other on-board electronic systems.

To reset the electronic system without running risks, disconnect the vehicle battery and wait for 10 minutes.



It is strictly forbidden to carry out any modifications or connections to the electronic control unit wiring; in particular, the line interconnecting data between the control units (CAN line) must be considered as untouchable.

Diagnostic and maintenance operations can only be carried out by authorised personnel with IVECO approved equipment.

Aquila Trucks Centres

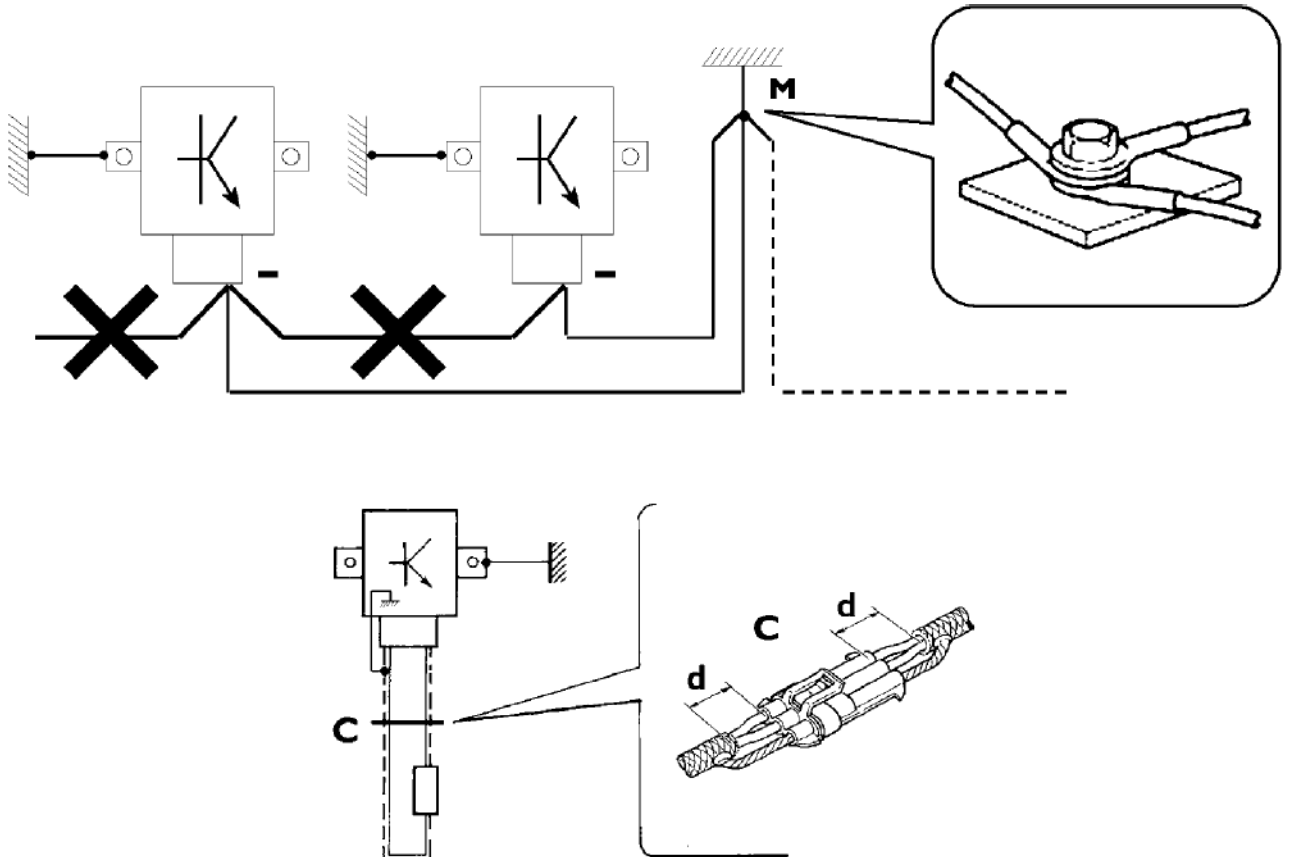
Practical tips

The negative leads connected to a system grounding point must be as short as possible and connected to one another in "star" configuration; make sure that they are tightened in an orderly and adequate manner (Figure 1, ref. M).

Furthermore, for electronic components, the instructions to be followed very carefully are:

- ECU's must be connected to the system ground if they are provided with a case.
- ECU negative cables must be connected both to a system grounding point, such as for instance the dash compartment ground (with no "serial" or "chain" connections) and to the negative terminal(s) of the battery/batteries.
- Even though they are not connected to the system ground/battery negative terminals, analogue ground elements (sensors) must have excellent insulation. As a result, special care must be devoted to the eddy resistances of the cable terminals: oxidation, seam-folding defects, etc.
- The metal braid of shielded circuits must be in electrical contact at either end with system components.
- Only one end of the shielding braid must be connected to the system ground.
- In the presence of jointing connectors, the non-shielded portion, d, must be as short as possible in the proximity of the connectors (Figure 1).
- The cables must be arranged so as to run parallel to the reference plane, i.e., as close as possible to the frame/body structure.
- Additional electromechanical systems must be connected with the greatest care to the system ground and must not be placed alongside the cables of electronic components.

Figure 1



88039

SHIELDING BY MEANS OF A METAL BRAID OF A CABLE LEADING TO AN ELECTRONIC COMPONENT -
C. CONNECTOR - d. DISTANCE ! 0.

Aquila Trucks Centres

COMPONENT CODE

03000	Self-rectifying alternator with built in voltage regulator
08000	Starter Motor
12015	Motor for outside air intake door
12023	Window shade motor
12032	Cab hydraulic release pump motor
20000	Starter battery
22000	Horn
25200	Relay for starter
25201	Relay, preheating
25202	Relay, G.C.R. energizing
25203	Relay, G.C.R. opening
25204	Relay, remote starting enablement, cab unlatched
25205	Relay, engine stopping
25206	Relay, rich mixture control
25207	Relay, alternator D+ earthing
25208	Relay, remote start enablement, gear engaged
25209	Relay for cutting off various components during starting stage
25210	Relay, starting enablement with transmission in neutral
25211	Relay with delayed opening contact for keeping G.C.R. energized
25212	Relay with delayed closing contact for keeping RTE energized
25213	Relay for supply of users connected to ignition switch through battery positive
25222	Relay for allowing connection of thermal starter
25310	Relay for allowing connection of internal heating with power load inhibiting relay
25322	Relay for connection of auxiliary heater (1st speed)
25327	Relay for connection of air-conditioning system
25332	Relay for connection of air-conditioning system
25544	Topflap engine polarity reverse contactor for LD
25545	Topflap open/close comand contactor for LD
25722	Cab hydraulic release pump switch (lowering)
25723	Cab hydraulic release pump switch (raising)
25866	Relay for terminal 58
25874	Relay for connection of power loads with engine running
25897	Relay for connection of side transmission power takeoff
25898	Relay for connection of rear transmission power takeoff
25900	General current relay
25924	EDC connecting relay "Main Relay"
30001	Dipped and main beam headlamp with side light
30011	Fog light
32002	Front direction indicator
33001	Side direction indicator
34000	Multifunctional rear light
34011	Trailer light
35000	Number plate light
37000	Front/rear dimensions light
37001	Front dimensions light
39003	Courtesy light for steps
39009	Courtesy light for reading lights
39017	Courtesy light for adjustable cabin interior light
39030	Cab side opening lighting lamp
39034	White and red internal light unit
40011	Electronic Tachograph

Aquila Trucks Centres

40032	Sender unit for tachometer and tachograph
40046	Inductive type chassis height sensor (rear axle)
40047	Inductive type chassis height sensor (front axle)
42030	Sender unit for engine oil pressure gauge
42045	Sender unit for outdoor temperature gauge
42102	Switch signalling handbrake applied
42108	Switch for trailer retarder signal
42111	Switch signalling trailer braking system failure
42116	Switch for low air pressure indicator in EBS system
42200	Switch signalling pneumatic suspension system failure
42351	Switch signalling air filter blocked
42374	EDC clutch switch
42381/A	Drive axle RH pressure sensor (ECAS)
42382/a	Lift axle RH pressure sensor (ECAS)
42389	Air pressure sensor on third axle pneumatic lifting system
42551	Switch signalling oil filter blocked
42608	Coolant pressure signalling 3-switch assembly
42700	Fuel filter clogged indicator switch
44031	Fuel level gauge sender unit with reserver warning light contact
44035	Insufficient windscreen washer fluid level gauge control
44036	Insufficient radiator coolant level gauge control
44037	Insufficient power assisted steering fluid level gauge control
44043	Engine oil level gauge sender unit
47032	Sender unit for engine oil temperature thermometer
47041	Water temperature sender for retarder control unit
47042	Fuel temperature sensor
47043	Engine fan temperature sensor
48035	Engine rpm sensor
48042	Engine rpm sensor (on timing gear)
48043	Turbocharger speed sensor
50005	Multiplex instruments unit module
52005	Switch with built in w/l for heated rear view mirrors
52009	Switch with built in w/l for trailer light
52024	Switch with built in w/l for additional headlamps
52056	Switch with built-in w/lamp for ASR cutout
52059	Automatic transmission speed selector
52070	Switch for engaging side power takeoff
52071	Switch for engaging rear power takeoff
52090	Suspension levelling switch (ECAS)
52092	Switch for engine or cab heater
52093	Switch for tail hatch locking safety
52093	Switch for tail hatch locking safety
52094	Switch for spot light
52200	Switch for electric or pneumatic horns
52302	Switch with built in w/l for hazard warning lights
52304	Switch for fog lights and rear fog lights inhibitor
52307	Switch for exterior lights
52312	Switch controlling headlamp alignment adjustment
52324	Engine brake connecting switch
52326	White and red internal lights switch
52502	Ignition switch for services with starting
53006	Switch for starting from engine compartment
53007	Switch for stopping engine from engine compartment

Aquila Trucks Centres

53030	Switch for controlling starting assistance
53061	Cab hydraulic release consensus switch
53062	Cab hydraulic release pump switch (lowering)
53063	Cab hydraulic release pump switch (raising)
53300	Switch for driver's side electric window
53302	Switch for passenger side electric window
53053	Test pushbutton coupling, automatic transmission
53054	Limit switch button on side doors
53055	Unstable switch for interior lights
53306	Switch controlling sun roof motor
53309	Switch for 3rd axle raising system
53311	Switch for controlling window blind
53315	Switch with built in telltale to turn on foglights
53316	Current general contactor switch
53501	Switch signalling vehicle stopped
53503	Switch signalling reversing lights
53507	Switch signalling reduced gears engaged
53508	Switch for antistarting with reduced gears
53509	Switch for switching on interior lights
53510	Switch for switching on step lights
53511	Switch signalling cabin unlatched
53512	Switch for antistarting engine device with handbrake off
53521	Switch for signalling longitudinal differential lock
53547	Switch for secondary signal from brake pedal to EDC control unit
53567	Switch for signalling side power takeoff engaged
53568	Switch for signalling rear power takeoff engaged
53591	Switch for signalling failure of the hydraulic circuit with auxiliary steering third axle
53593	Switch to light cab side opening lamp
53593	Tool compartment light switch
53602	Switch indicating incomplete sunshade closing
53801	Switch signalling Rockwell axle differential lock engaged
53802	Switch signalling Rockwell axle differential lock engaged (3rd axle)
54030	4 function steering column switch unit
54033	6 function steering column switch unit
61011	3A 1-diode holder container
61104	Air braking system drier resistor
61121	Resistance for engine preheating
61126	Termination resistor for CAN bus
64000	Electric windscreen washer pump
68000	Radio equipment
68001	Speaker
68003	Preamplifier
68005	Feeder 24 V 12 V
68007	City Band (C.B.)
70000	6 fuse carrier
70058	1-way 20A fuse carrier
70601	6-fuse holder
70602	6-fuse holder
70603	6-fuse holder
70604	6-fuse holder
70605	6-fuse holder
72006	Coupling with 7 poles for electrical connection of trailer ABS
72010	15-pole coupling for electrical connection to trailer
72021	30-pole connector for the electrical connection to the diagnostic equipment located outside the vehicle
72025	2-pole 12 V connection for general power supply

Aquila Trucks Centres

72026	2-pole 12 V connection for telephone
78016	Engine fan solenoid valve
78050	Engine brake solenoid valve
78052	ABS/EBS solenoid valve
78053	ASR solenoid valve
78054	Solenoid valve for engaging retarder
78055	Solenoid valve for retarder oil accumulator
78057	EBS front axle air pressure control proportional valve
78058	EBS trailer air pressure control proportional valve
78059	Duplex valve for EBS
78060	Solenoid valve to exclude third-axle braking with ASR
78061	Redundant solenoid valve for rear-axle braking in the event of EBS control unit failure
78203	Solenoid valve for pneumatic horns
78227	Solenoid valve for radiator water recirculation
78238	Rear axle solenoid valve assembly for chassis alignment
78239	Front axle solenoid valve assembly for chassis alignment
78243	Rear axle electropneumatic distributor
78247	Solenoid valve for electronic injection
78248	Solenoid valve for variable geometry turbine order
72049	3-pole coupling for rear-view mirror motor
72050	Unipolar current outlet
78251	Solenoid valve for engaging transmission side power takeoff
78252	Solenoid valve for engaging transmission rear power takeoff
80000	Motor for right electric window
80001	Motor for left electric window
82000	Windscreen defrosting control unit
82005	Auxiliary air heater
82010	Air-conditioning system electronic control unit
84000	Water boiler
84009	Internal temperature sensor
84010	Metering device
84019	Electromagnetic pulley
85000	Cigar lighter
85001	Cigar lighter outlet
85003	Heated rearview mirror (trailer)
85004	Heated rearview mirror (wheel)
85005	Heated rearview mirror
85006	Electrically adjustable heated rear view mirror
85007	Wheel electrically adjustable heated rear view mirror
85008	Trailer electrically adjustable heated rear view mirror
85010	Rear view mirror control
85023	Electric latch
85065	Remote control for aligning suspensions and raising 3rd axle
85150	EDC MS6 control unit
85152	Accelerator load sensor (EDC)
85153	Coolant temperature sensor (EDC)
85154	Turbofan air temperature sensor (EDC)
85155	Turbofan air temperature sensor (EDC)
85158	Turbofan air temperature sensor (EDC)
85159	Temperature and ambient air pressure sensor for E.D.C.
86002	Sensors for front brake shoe wear
86003	Sensors for rear brake shoe wear
86004	Automatic transmission electronic control unit
86013	Sensor for signalling water in fuel filter
86015	Retarder electronic control unit
86023	Vehicle raising/lowering control unit Ecas
86030	Sensor detecting heat irradiation

Aquila Trucks Centres

86053	Multiplex control and signal unit from bed positions
86116	Multiplex body computer control unit
86117	Multiplex front frame computer control unit
86118	Multiplex rear frame computer control unit
86119	Multiplex Driver Door Module Control Unit
86120	Multiplex Passenger Door Module Control Unit
86123	Multiplex control unit for interface with steering control shaft
86124	Cab with multiplex function electronic control unit
86125	Electronic control unit for VDI (Vehicle Data interface)
86126	Electronic control unit for EM (Expansion module)
86127	Electronic control unit for DMI (Data Management Interface)
86128	Electronic control unit for M.E.T. chassis (chassis electronic module)
86129	Electronic control unit for MC-NET (Mobile Communication Network)
86130	Electronic control unit for navigator
86131	Electronic control unit for telematic
86132	VCM control unit (Vehicle Control Module)
88000	ABS system electronic control unit
88001	ABS system sensor
88005	Electronic control unit for EBS system
88006	EBS rear axle air pressure control modulator
88007	Potentiometric sensor for front wheel shoe position indicator
88008	Potentiometric sensor for rear wheel shoe position indicator
88010	Rear axle brake application pressure sensor
88011	Potentiometric sensor for third axle skid wear signalling
88012	SAS sensor (= Steering Angle Sensor) for EBS
88013	ESC module (= Electronic Stability Control) for EBS
89000	Fridge
89010	Food warmer

Aquila Trucks Centres

MAIN CHANGES

For vehicles with Euro 4 engine the electric/electronic system is subject to important variations.

In order to handle the increased complexity of Euro 4 operations demanded to the engine control system extra hardware and software resources, the VCM (Vehicle Computer Module) has been added so that vehicle functions can be reallocated on it, which up to Euro 3 had been carried out by the EDC engine control unit, therefore more development flexibility is available for vehicle functions. The immobilizer function has been also integrated on this unit.

The New Body Controller (IBC3) unlike the Body Computer (BC) distributes direct positives and key-locked, protected by external fuses (replaceable) or internal (resettable). In the chassis there is the MET control unit (chassis electronic module) which controls the chassis power devices, thus replacing the FFC and RFC control units.

For the automated transmission on the new Euro 4 vehicle range the gear selector has been removed. Its functions are carried out from the control pushbuttons located on the dashboard center panel combined with the power steering lever.

The EM control unit (Expansion Module) replaces the DMI (Data Management Interface). It controls the power takeoffs and makes it possible to implement complex applications and connections to different devices through the CAN-open line. It communicates with the other control units through the CAN DVB line.

The SCR (Selective Catalytic Reduction) - Denox 2 is on the entire Average/Heavy Euro 4 Range with the Urea Dosing System (UDS) positioned on the lower side of the frame.

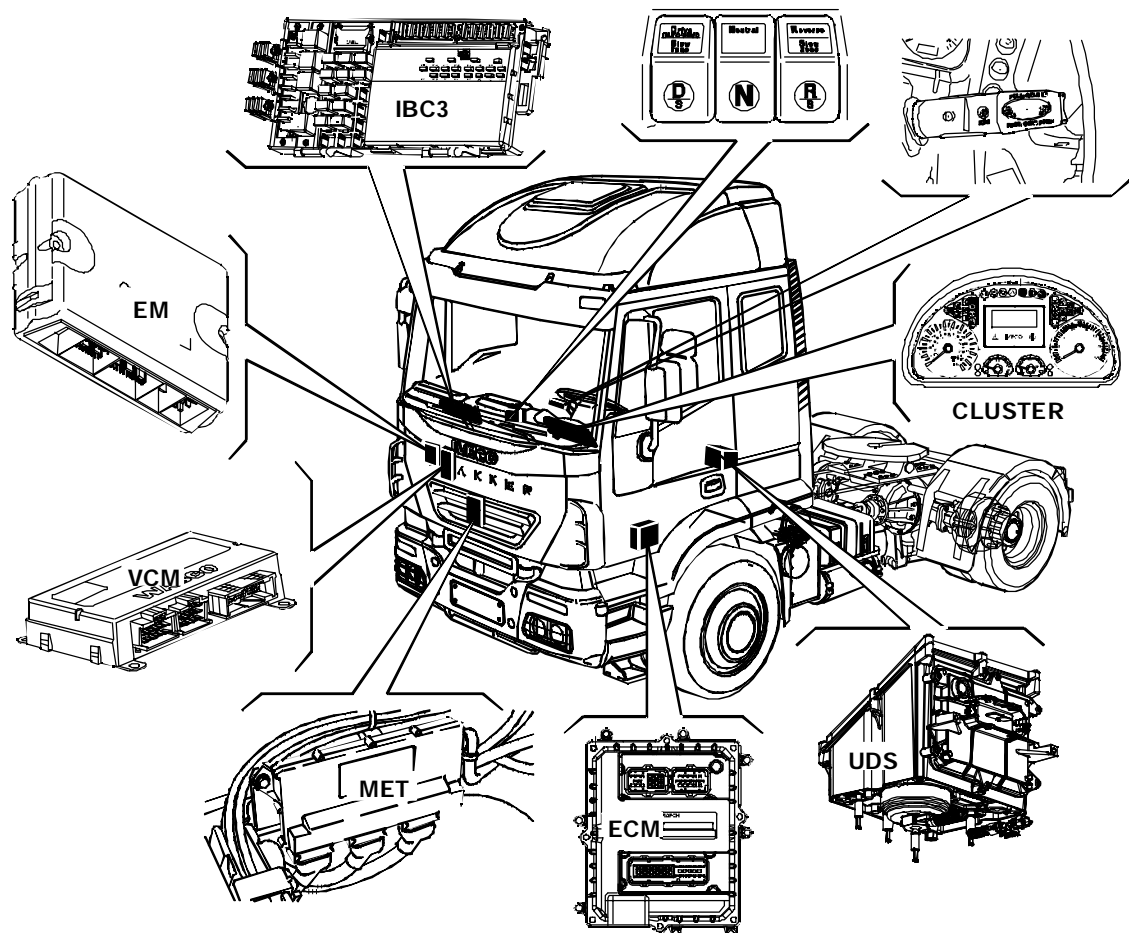
The ENGINE ECM (Engine Control Module) replaces EDC MS 6.2.

The new Cluster is monochrome with more functions compared to the previous one.

The introduction of the new units and the change of the previous ones require changes of the vehicle system structure. The following CAN lines are on the VCM unit:

- VDB - Vehicle Data Bus
- ECB - Engine Control Bus
- FMB - Fuhrpark Management Bus

Figure 2



112584

Aquila Trucks Centres

CAN LINES

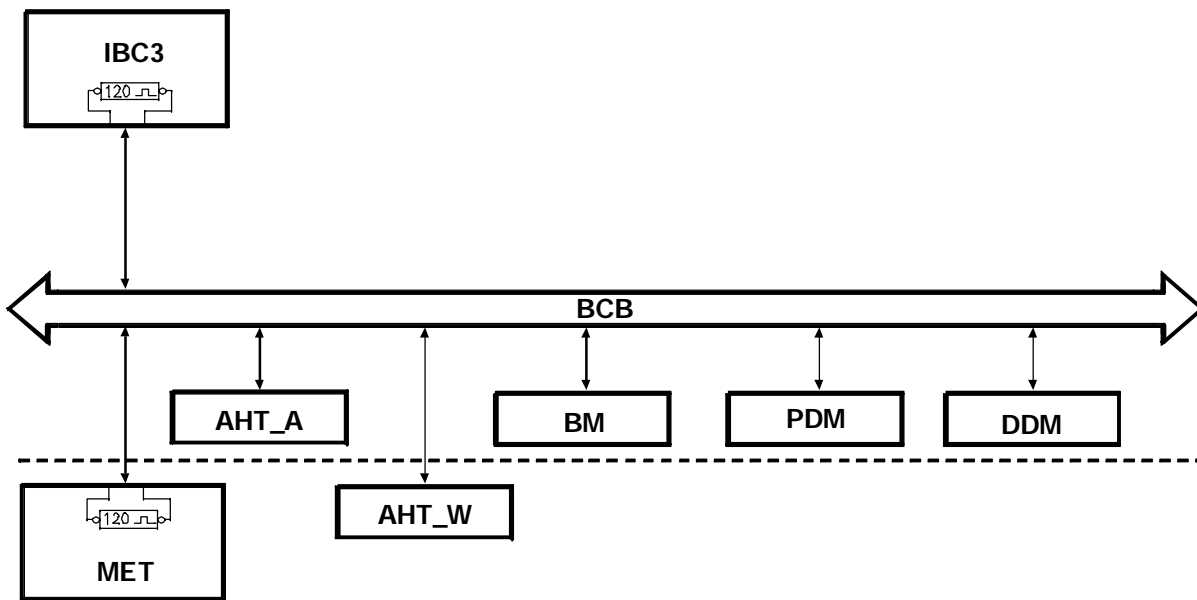
Dialogue between the Easy Mux system, vehicle systems, engine control unit, SCR system, radio and various setters is carried out by means of the CAN lines:

- BCB - Body Control Bus
- VDB - Vehicle Data Bus
- ECB - Engine Control Bus
- IDB - Infotainment Data Bus
- FMB - Fuhrpark Management Bus

BCB (Body Control Bus) communication line

It enables the communication between the IBC3 and MET control units of the Easy Mux system and the other control units of the different services onboard.

Figure 3



Technical features

- Data transmission speed
- Color of the wire

112585

62.500 (BIT/SEC)

Grey

List of Units

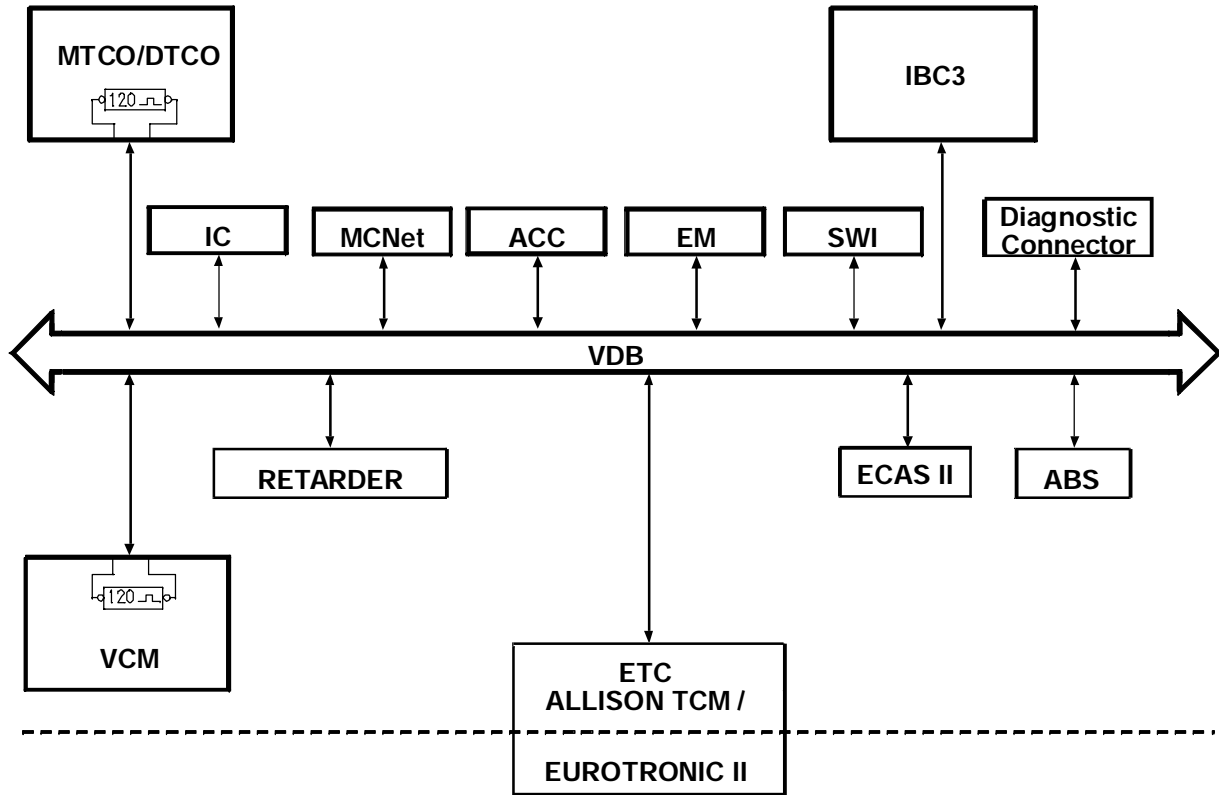
Ref.	Description
IBC3	Body Controller
DDM	Driver Door Module control unit
PDM	Passenger Door Module control unit
BM	Bed Module
MET	MET chassis control unit
AHT-A	Air heater
AHT-W	Water heater

Aquila Trucks Centres

VDB (Vehicle Data Bus) Communication Line

Allows the electronic systems on the vehicle to dialogue. The units connected to it are: Eurotronic Transmission, Retarder, ABS, Ecas, Diagnosis connector, VCM, Tachograph, ACC, SWI, EM, (Mc Net). This line also dialogues with the Cluster and the Body Computer.

Figure 4



112597

Features

- Data transmission speed 250.000 (BIT/SEC)
- Color of the wire Black

List of Units

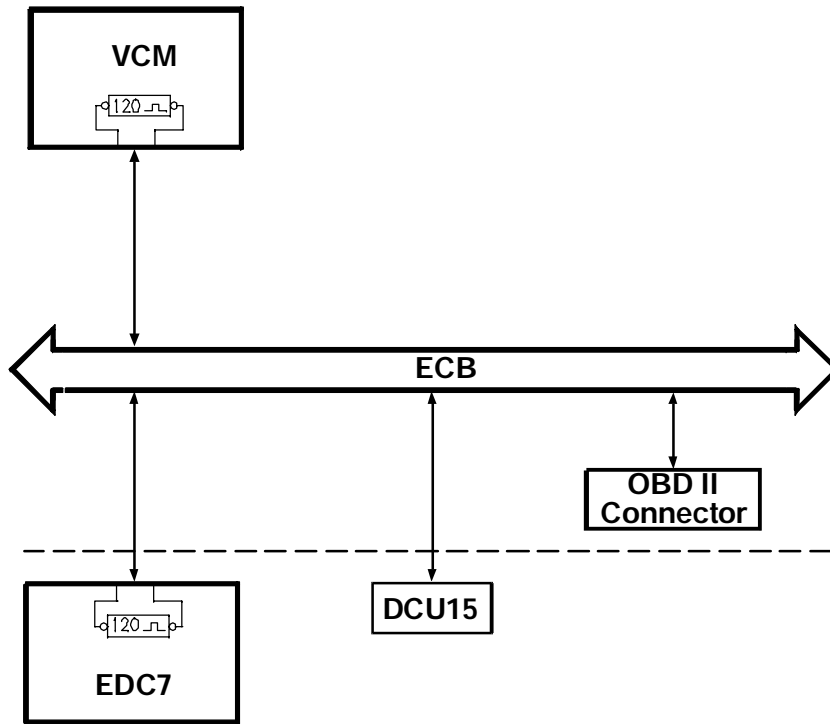
Ref.	Description
MTCO	Tachograph
DTCO	Digital tachograph
VCM	Vehicle Control Module control unit
IC	Cluster
IBC3	Body Controller
SWI	Steering Wheel Interface control unit
Diagnostic Connector	30-pole diagnosis connector
ABS	ABS control unit
McNet	Electronic control unit for Mobile Communication Network
RETARDER	Intarder control unit
ECAS II	Air suspension contrl unit
EUROTRONIC II	Eurotronic II automatic gearbox control unit
ALLISON TCM	Allison automatic gearbox control unit
ACC	Radar ACC (Adaptive Cruise Control) control unit

Aquila Trucks Centres

ECB (Engine Control Bus) communication line

Allows the units and the engine control sensors to dialogue together. The units connected to it are: EDC, VCM, DCU15 and the OBD connector.

Figure 5



112280

Features

- Data transmission speed 250.000 (BIT/SEC)
- Color of the wire Yellow

List of Units

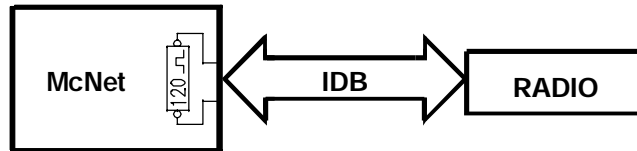
Ref.	Description
VCM	Vehicle Control Module Unit
EDC7	Engine control unit
DCU15	SCR pumping module unit
OBD II Connector	16 pole connector for OBD (onbord diagnose)

Aquila Trucks Centres

I.D.B. (Infotainment Data Bus) communication line

Allows communication between the Cluster and the Radio. The messages sent are shown on the CLUSTER.

Figure 6



112586

Technical features

- Data transmission speed 100.000 (BIT/SEC)
- Color of the wire Blue

List of Units

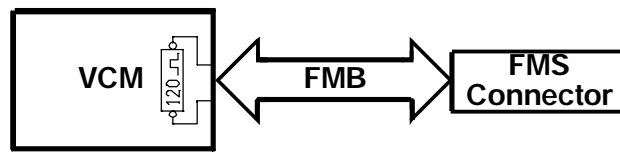
Ref.	Description
Radio	Radio
McNet	Electronic control unit for Mobile Communication Network

Aquila Trucks Centres

F.M.B. (Fuhrpark Managemant Bus) communication line

Allows communication between the different electronic systems (accessories) on the vehicle, , FMS (Telephone) connector and VCM unit.

Figure 7



112283

Technical features

- Data transmission speed 250.000 (BIT/SEC)
- Color of the wire White

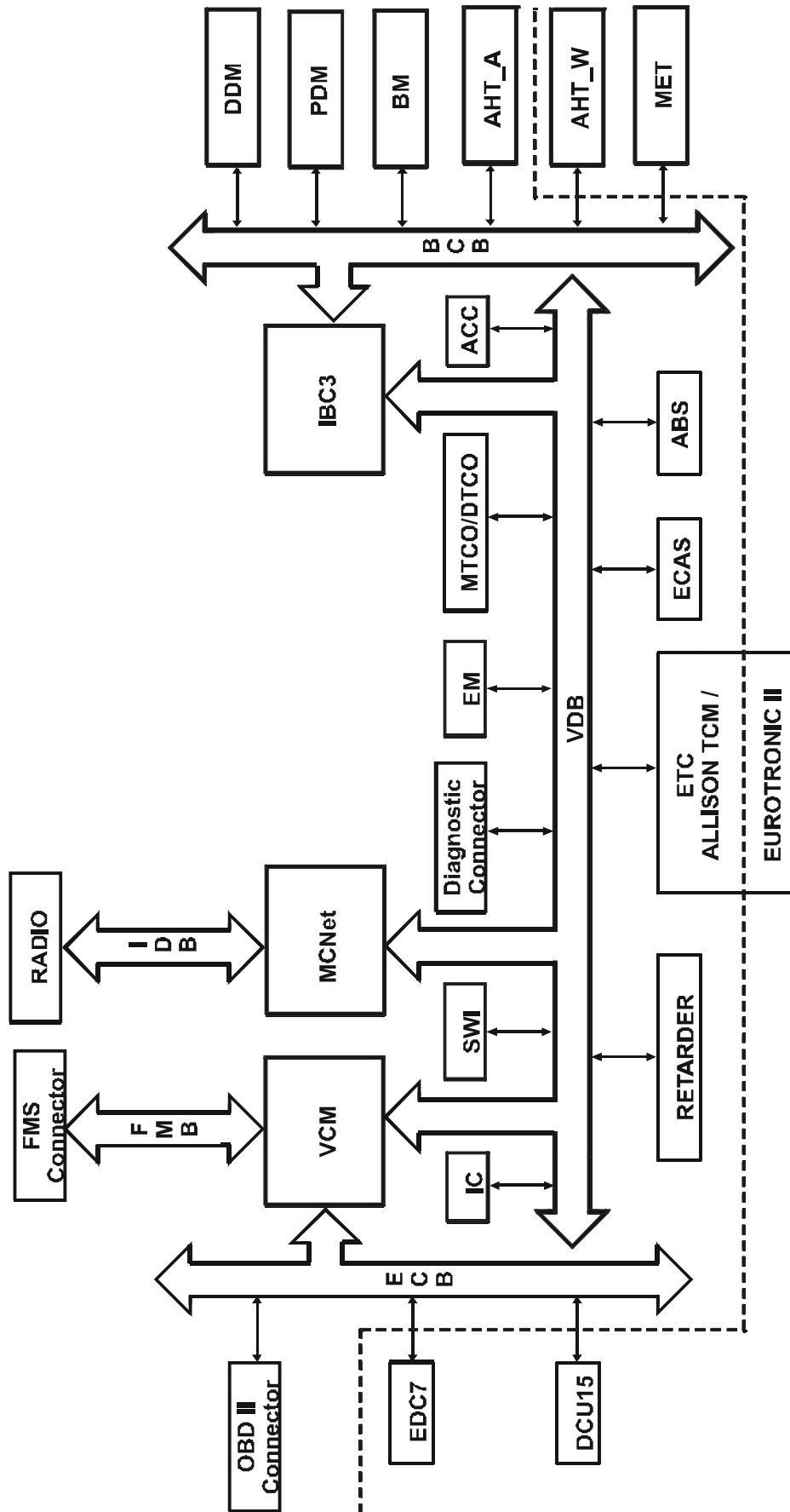
List of Units

Ref.	Description
VCM	Vehicle Control Module Unit
FMS	Connector FMS

Aquila Trucks Centres

CAN LINE ASSEMBLY DRAWING

Figure 8



112587

Aquila Trucks Centres

POWER NETWORK

Never disconnect the batteries from the system with the engine running.
Before connecting the batteries to the system, make sure that the system is well insulated.
Disconnect the batteries from the system when charging them.

The purpose of the electric system is to generate, regulate, store and distribute the energy needed to make the vehicle components work.

For this reason the supply of the base electric system is ensured by a generator (28V - 60A -90A alternator) and two batteries, each with 12 V 170 Ah (opt 220 Ah) connected in series.

A mobile fuse holder containing a 20 Amp fuse is located close to the batteries. This fuse supplies:

- Fuse holder 70605/1
- Body Controller (A07)
- Refrigerator
- ACC presetting

This fuse is not present on the ADR version.

Power cable section:

- battery direct cable = 16 mm²
- fuse cables = 4 mm²

Attain to what detected on the vehicle for the remaining sections.

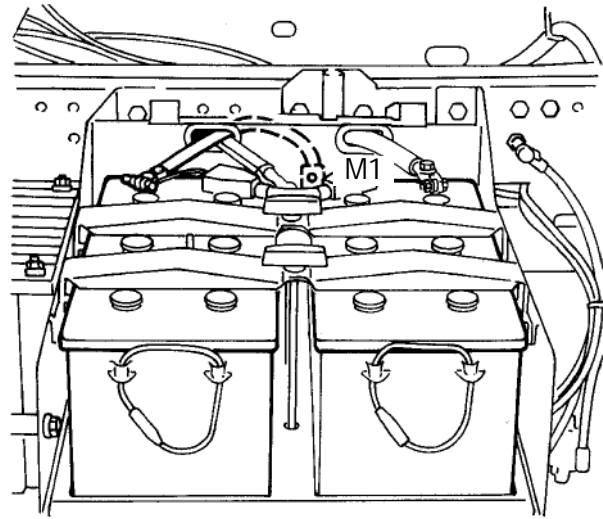
Negative network

The batteries are connected to the frame ground with a brown 70 mm² cable, at ground point M1 on the left sidemember (Figure 9).

The starter motor is connected to the frame ground (M2) through a 70 mm² cable, fastened on the right sidemember near the actual motor.

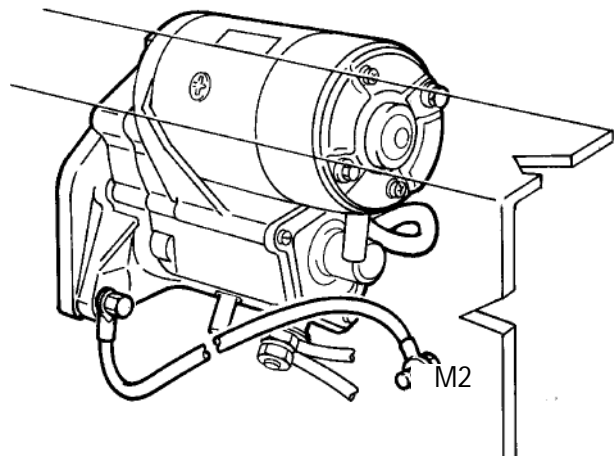
The same cable serves for connecting the whole engine unit to the frame ground.

Figure 9



GROUND POINT OF BATTERIES ON LEFT SIDEMEMBER

Figure 10



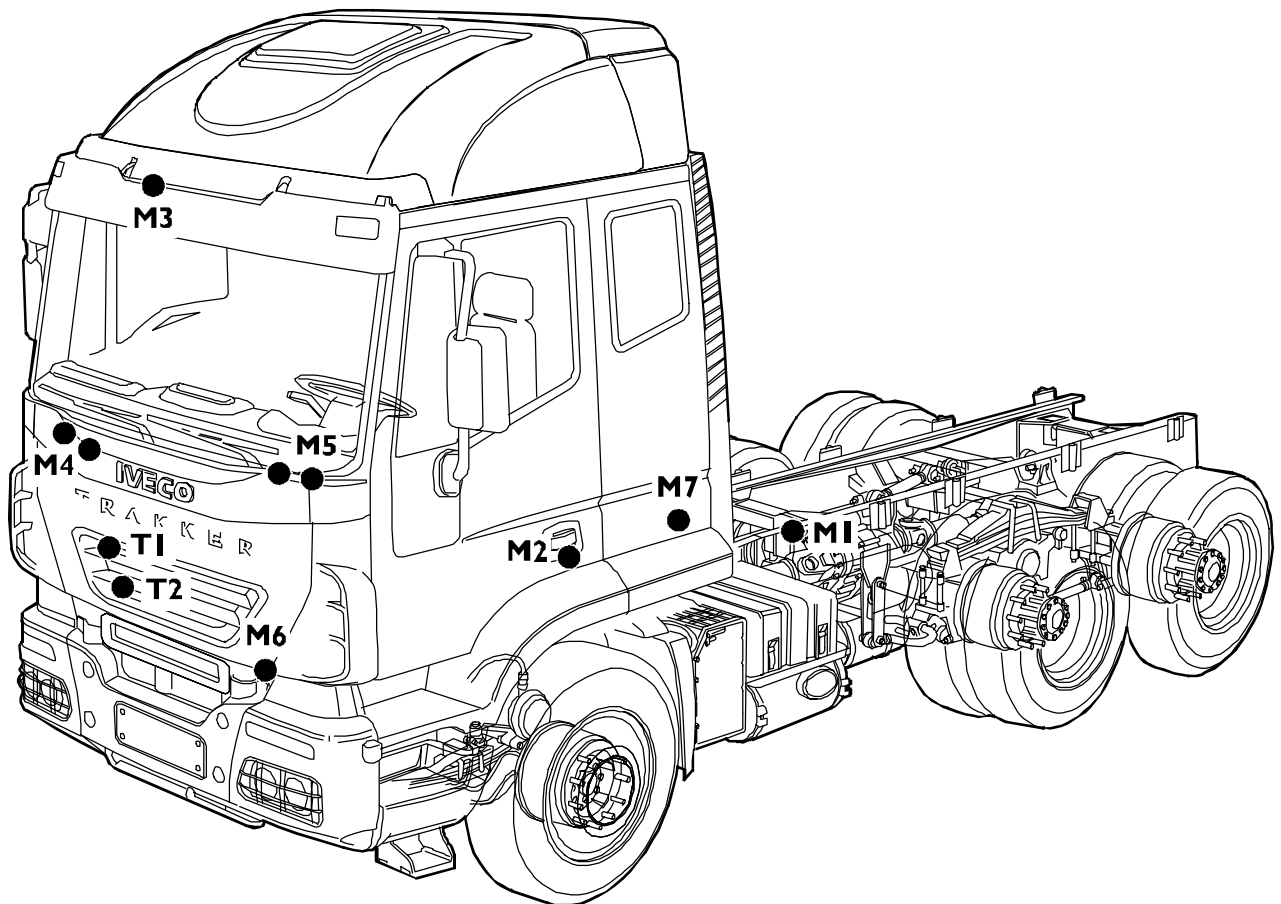
6632

STARTER MOTOR AND ENGINE GROUND POINT

Aquila Trucks Centres

GROUND POINTS

Figure 11



91664

M1. Battery ground - M2. Starter motor ground - M3. Upper cab ground - M4. Right inner cab ground - M5. Left inner cab ground - M6. Front right frame ground - M7. Engine ground - T1 - T2. Equipotential braid

Aquila Trucks Centres

ELECTRICAL EQUIPOTENTIAL BRAID

Though generally protected against the influence of on-board equipment voltage, electronic components nevertheless remain particularly sensitive electromagnetic compatibility issues, of different nature such as:

- generated by the vehicles
- external.

A suitable size flexible electrolytic copper braid has been provided on the vehicles to minimize these phenomena and return main cab and frame structures to the equipotential state.

Check that the braid is properly attached to the frame and the cab, in the event of defective cab grounding.

Figure 12