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1. COMPONENTS

1.1 GENERAL

Bulbs

Headlight (main beam)		halogen	70 W
Headlight (dipped beam)		halogen	70 W
Parking light		spherical bulb	5 W
Rear light		spherical bulb	2 x 5 W
Rear fog lamp		spherical bulb	21 W
Reversing light		spherical bulb	21 W
Stop light		spherical bulb	21 W
Direction indicator lamp		spherical bulb	21 W
Marker light		spherical bulb	5 W
Side marker light		special type	3 W
Combilamp:	fog lamp	halogen	70 W
	spotlight	halogen	70 W
Interior lighting		spherical bulb	10 and 21 W
Bunk light		spherical bulb	10 W
Stepwell lighting		spherical bulb	5 W
Marker light		spherical bulb	5 W
Work lamp:	white	halogen lamp	70 W
	yellow	spherical bulb	35 W

Max. current and wire diameter (mm^2)				
Wire diameter	**< 2 m**	**2 - 4 m**	**4 - 8 m**	**> 8 m**
1	9	5	4	
1.5	22.5	13.5	7.5	6
2.5	37.5	22.5	12.5	10
4	60	36	20	16
6	90	54	30	24
10	150	90	50	40
16	240	144	80	64
25	375	225	125	100
35	525	315	175	140
50	750	450	250	200
70	1050	630	350	280
95	1425	855	475	380
120	1800	1080	600	480

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Alternator

NCB1

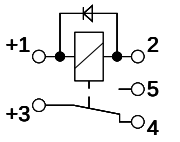
Max. current	80 A
Rated voltage	28 V

NCB2

Max. current	100 A
Rated voltage	28 V

Micro relay

Maximum cut in current making connection between points 3 and 5:	10 A
Maximum cut out current breaking connection between points 3 and 4:	5 A



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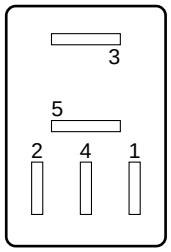

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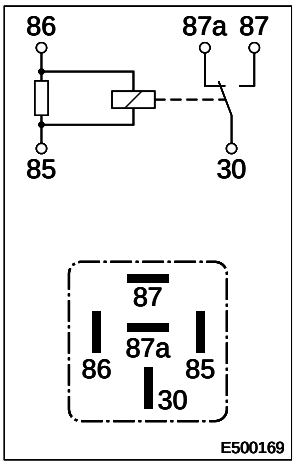
Mini relay

Maximum cut in current making connection between points 30 and 87:	20 A
Maximum cut out current breaking connection between points 30 and 87a:	10 A



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Handheld transmitter CDS

Battery type (2x)	CR1620, 3 V

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1.2 TIGHTENING TORQUES

Tightening torques

Drive pulley	80 Nm ± 5 Nm
B+ connection	15 Nm
Chassis earth connection	65 Nm

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1. BATTERIES

1.1 FAULT-FINDING TABLE

SYMPTOM: NEW BATTERY HEATS UP CONSIDERABLY DURING FILLING	
Possible cause	**Remedy**
Inadequate formation because of storage in unsuitable or damp conditions over a long period	Allow to cool Charge fully Check the relative density

SYMPTOM: BATTERY ACID LEAKING FROM THE PLUG HOLES	
Possible cause	**Remedy**
Battery overfilled	Siphon off some of the fluid
Overcharging	Check the charger and repair if necessary

SYMPTOM: ELECTROLYTE LEVEL TOO LOW	
Possible cause	**Remedy**
Leaking battery	Replace the battery
Excessive gas development due to charging current being set too high	Check/repair the charger

SYMPTOM: RELATIVE DENSITY TOO LOW (< 1.240) STARTING TROUBLE	
Possible cause	**Remedy**
Power consumer left on by mistake	Charge the battery
Insufficient charging	Check/repair the charger
Short circuit in the charging circuit	Check the charging circuit

SYMPTOM: RELATIVE DENSITY TOO HIGH (> 1.290)	
Possible cause	**Remedy**
Topped up with acid instead of distilled water	Siphon off some of the fluid and top up with distilled water If necessary, repeat this after mixing (charging)

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SYMPTOM: STARTING TROUBLE POOR STARTING TEST RESULT POWER FAILS UNDER LOAD	
Possible cause	**Remedy**
Discharged battery	Charge the battery
Worn battery (plates corroded and worn away)	Replace the battery
Defective battery (‘dead cell’)	Replace the battery
Battery too small	Replace with battery of a higher capacity
Battery sulphated (plates have hardened)	Replace the battery

SYMPTOM: BURNT IN BATTERY POLES	
Possible cause	**Remedy**
Terminals not securely fitted, or poor contact	Have the battery poles repaired, fit the terminals properly and replace the terminals if necessary

SYMPTOM: 1 OR 2 CELLS BUBBLE EXCESSIVELY UNDER HIGH LOADS (STARTING OR STARTING TEST)	
Possible cause	**Remedy**
Defective cells	Replace the battery
Leaking cell partition	Replace the battery

SYMPTOM: BATTERY DISCHARGES VERY FAST (DOES NOT RETAIN POWER)	
Possible cause	**Remedy**
Insufficient charging	Check the charging. Is the charging time (driving time) sufficient?
Short circuit in charging circuit	Check the charging circuit
Major self discharging, for example due to contamination	Clean the battery
Battery sulphated (on examining the plates, they are found to be hard and, in some cases, whitened)	Replace the battery

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SYMPTOM: SHORT BATTERY LIFE	
Possible cause	**Remedy**
Wrong type of battery chosen (for example, in the case of tail lifts)	Install Super Heavy Duty or semi-traction battery
Often too deeply discharged	Intermediate charging with rectifier
No recharging after deep discharge (white deposits)	Always charge the battery after deep discharge

SYMPTOM: BATTERY HOT DURING OPERATION WITH EXCESSIVE WATER CONSUMPTION	
Possible cause	**Remedy**
Overloading, or charging voltage too high	Check the charger (voltage regulator)

SYMPTOM: BATTERY HAS EXPLODED	
Possible cause	**Remedy**
Fire or sparks during or just after charging	Ensure good ventilation and exercise due caution as regards fire and sparks
Short-circuiting by tools	Be careful where tools are put down
Internal defect (loose connection)	Replace the battery

SYMPTOM: DEFECTIVE ALTERNATOR AND/OR DIODES (RADIO AND OTHER POLARITY SENSITIVE EQUIPMENT NOT WORKING)	
Possible cause	**Remedy**
Reversed battery polarity, or incorrect charging	Discharge the battery and charge in the correct direction If necessary, replace the battery

SYMPTOM: BATTERY IS INACTIVE (NO VOLTAGE)	
Possible cause	**Remedy**
Internal open circuit	Replace the battery
Battery very deeply discharged	Charge the battery and test it; replace if necessary

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1.2 SERVICE LIFE

The service life of a battery is significantly shortened if it is used 'cyclically'.
This means that the batteries are used a lot without their being charged.
For example when using a tail lift, cab heater, microwave oven and a cooler box.
This is why batteries in commercial vehicles and vehicles used for international transport often fail prematurely (within 1.5 years).

The battery must be charged whenever the voltage measured across the battery falls below 12.5 V. If the battery is not charged, the 'sulphating' process will begin.
This is a chemical reaction in the battery that produces lead sulphate. Lead sulphate adheres to the battery plates and can cause short circuiting between the plates, reducing the capacity of the battery.
However, most lead sulphate breaks down when the battery is recharged.
If a battery is used (discharged) while it is not being charged by the alternator, short circuiting between the battery plates will occur sooner.
This reduces the capacity and consequently the service life of the battery.

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2. ALTERNATOR

2.1 FAULT-FINDING TABLE

SYMPTOM: ALTERNATOR NOT PRODUCING POWER WHEN IDLING	
Possible cause	**Remedy**
Open circuit in connection 15 on alternator	Repair connection 15
Connection 15 on alternator short circuited to earth	Repair connection 15
Internal defect	Replace regulator

SYMPTOM: ALTERNATOR WARNING (YELLOW)	
Possible cause	**Remedy**
Open circuit in 'S' connection	Measure the regulated alternator voltage with as many consumers as possible switched on and with the engine turning above idling speed
Open circuit in 'L' connection	Check/repair wiring
Open circuit in connection 15	Increase the engine speed to approx. 1500 rpm. If voltage is still present, check connection 15 on the alternator
Voltage difference between 'B+' and 'S' connections is greater than 2.5 V	Check all contacts between alternator and batteries (contact resistances). Internal battery resistance too high.
Voltage too low <16 V	Check alternator drive. Check wiring on contact resistances Check regulated voltage
Open circuit in voltage regulator	Replace voltage regulator

SYMPTOM: ALTERNATOR VOLTAGE HIGH (RED)	
Possible cause	**Remedy**
Voltage too high >31 V	Measure voltage
Internal defect	Replace regulator/alternator

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3. FAULT FINDING

The following test equipment and tools can be used to trace faults.

1. The best instrument for this is a digital multimeter. This instrument can be used to measure voltages, currents and resistances avoiding reading errors, and it can be used to trace virtually any faults.
2. Many, but not all, faults are easily traced by means of warning lamps. Failures caused by poor earthing cannot normally be detected by a warning lamp or buzzer.

The most frequently occurring faults are:

a. short circuit
b. open circuits
c. earthing problems (poor earthing due to corrosion).

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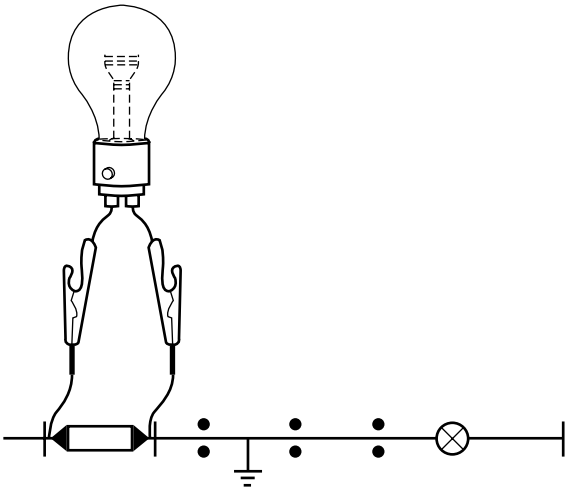
3.1 SHORT CIRCUITS

A short circuit is caused by a positive wire shorting to earth somewhere. In most cases this will cause a fuse to blow.
To remedy this failure, use a test lamp of approximately 70 W. First check the diagram to see which consumers are connected to the fuse in question, and then switch them all off.
Remove the fuse and connect the test lamp in its place. Now switch each of the consumers on and off one by one. If the lamp comes on very brightly when a consumer is switched on, the fault is almost certainly in the wiring of that consumer. Now check the diagram to see via which connectors the consumer is connected.
Now disconnect the first wiring connection (as seen from the fuse).
If the lamp is still bright, the fault is between the fuse and this wiring connection.



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If, however, the lamp goes out, the fault is somewhere further on in the wiring.
Now reconnect the connectors and disconnect the next wiring connection. If the lamp is still bright, the failure is between these two wiring connections.
However, if the lamp goes out again, the fault-finding procedure must be continued.
The faulty wiring section can be found in this way.

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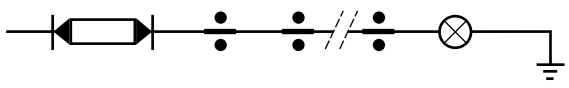
3.2 OPEN CIRCUIT

Suppose a consumer is not functioning. The fault may be in the consumer itself, or there may be an open circuit in the wiring.
First switch on the consumer. Then check the consumer for voltage using a test lamp. If no voltage is found, first check whether the fuse is still intact.
If there is voltage at the fuse, check the wiring from the fuse to the consumer. This means every wiring connection must be checked.
Stop at the first wiring connection that has no voltage. The open circuit will be between this connection and the previous one.
However, if there was a voltage at the consumer, there may still be an open circuit in the negative (earth) wiring. Check this using a test lamp.
Ensure that the relevant circuit is switched on.
Connect one end of the test lamp to earth and the other end to the earth connection of the component to be checked.
If the test lamp starts burning, the earth connection of the component is interrupted. If the test lamp does **not**light up, the earth connection will in many cases be in good condition.
If both the positive and negative connections are in good order, the consumer in question must be replaced.



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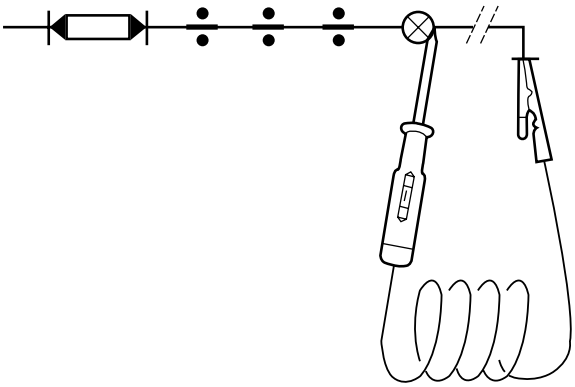

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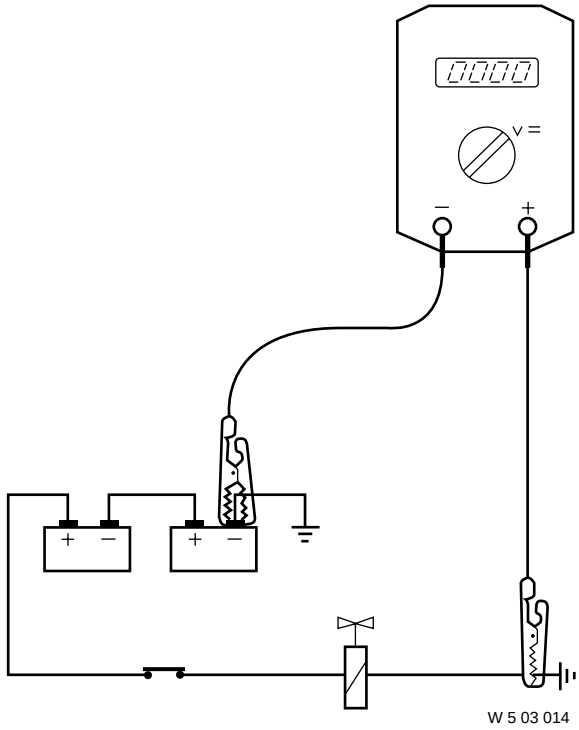
3.3 EARTHING PROBLEMS

Earthing problems are mainly caused by corrosion between the contact surfaces of electrical connections.
Earthing problems can only be detected using a multimeter (preferably digital). A digital tester is preferable because usually only a few volts will be measured and an analogue meter is generally not precise enough for this purpose.
To find out whether a specific earthing point has a good earth connection, use a voltmeter to measure the voltage between the negative battery pole and this earthing point.
Switch on as many consumers as possible.
If there is a correct earth connection, **no** voltage should be found.
In practice, however, a loss of approx. 0.5 volts will often be measured.
If the reading is higher, the earth connection must be checked carefully.
In this way, the earth connections of all consumers can be checked and measured.



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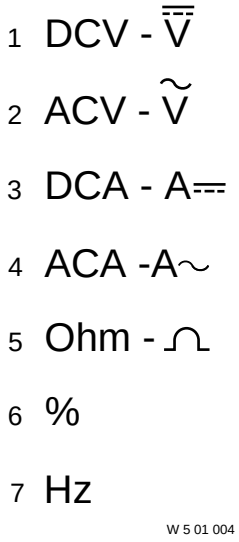
1. GENERAL

1.1 MULTIMETER

Various measurement options can be selected on the Fluke 87 multimeter.

Units of measurement
The multimeter should be set to the range for the unit of measurement required.
For example, voltage range, current range, or resistance range.
The units of measurement are indicated by symbols on the meter. The following symbols are used:

1. DC voltage
2. AC voltage
3. DC current
4. AC current
5. Resistance
6. Duty cycle
7. Frequency



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1.2 SCOPEMETER

Diagnostics in modern electronic systems is becoming steadily more complex.
Using a multimeter on its own is not always sufficient to diagnose a fault.

The scopemeter allows complex signals to be measured.

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Practical examples of complex signals are:

- PWM signals
- signal deformation
- CAN-bus-signals

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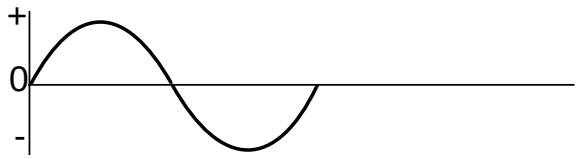
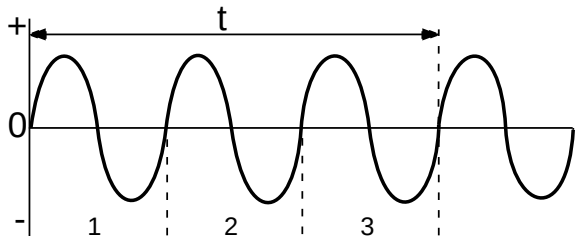
1.3 SIGNAL MEASUREMENTS

Sine-wave signal (AC voltage)
This signal changes polarity regularly in relation to the “0” line.

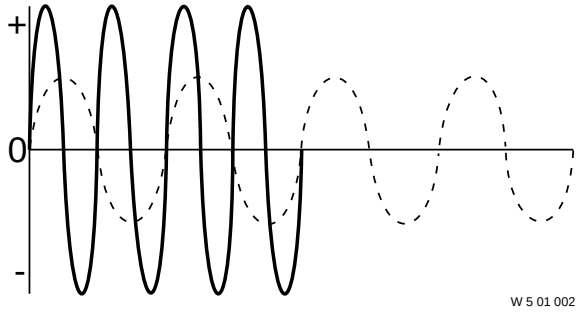
Frequency
The frequency is shown in Hertz (Hz).
The number of complete sines per second is the frequency of the signal (3 Hz in the diagram).



Voltage
If the number of sines per second increases, not just the frequency increases but also the voltage.



Measuring a sine wave signal
The sine wave signal can be measured in the following ways using a multimeter:
- Multimeter in the frequency position (Hz). This measures the number of complete sines per second.
- Multimeter in the AC voltage position. This measures the average value of the supplied voltage.



Sine wave signals in the vehicle
- Wheel speed sensor output signal.
- Engine speed sensor output signal.

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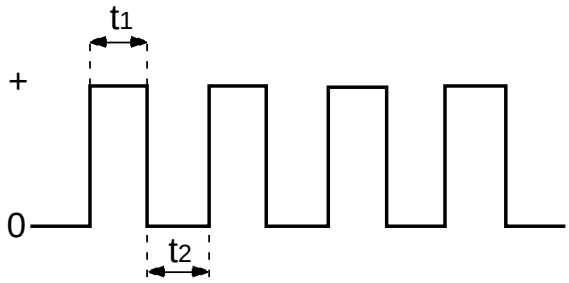
Square wave signals
Square wave signals are signals with only two voltage levels, both of which have the same duration in principle (t1 is equal to t2).



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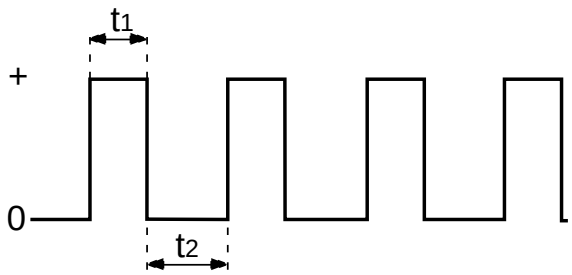
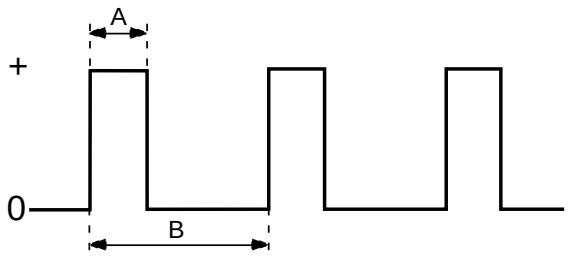
If there is a difference between the duration for the two levels (t1 is not equal to t2), the signal is also called a ”pulse train“.



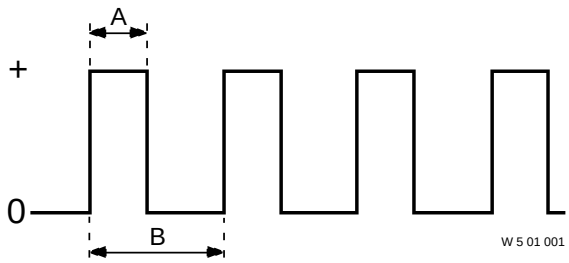
Duty cycle
The duty cycle is the ratio between the two voltage levels, expressed as a percentage.

$$\frac{A}{B} \times 100\%$$



The voltage level ratio of a “pulse train” may change (for example, when the vehicle speed increases).
If the number of pulses per unit of time increases, the duty cycle reading will rise.

Voltage
An increase in the number of pulses per unit of time will not only lead to a higher duty cycle ratio but also to a higher mean voltage.



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Measuring a square wave signal
The square wave signal can be measured in the following ways using a multimeter:
- Multimeter in the duty cycle position (%). This measures the voltage level ratio.

- Multimeter in the DC voltage position. This measures the average value of the supplied voltage.

Square wave signals in the vehicle
- Speed sensor output signal
- Vehicle speed signal to electronic units

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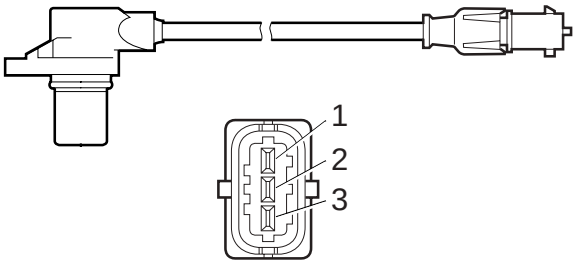
2. DESCRIPTION OF COMPONENTS

2.1 INDUCTIVE SENSOR

The vehicle has a number of inductive sensors, such as:

- wheel speed sensor
- engine speed sensor
- camshaft sensor



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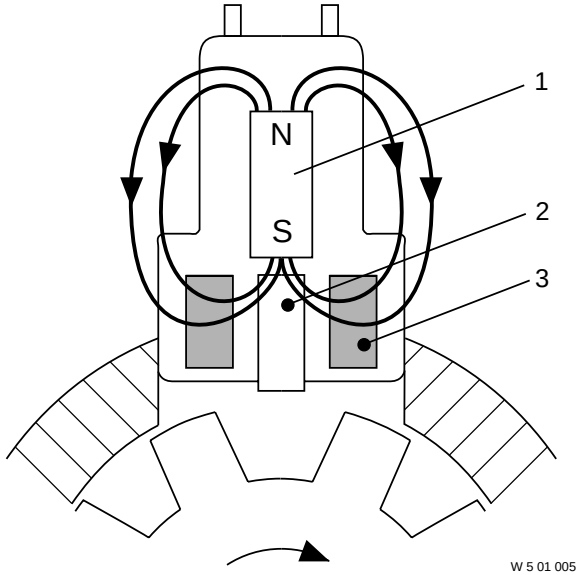
Recording engine speed
The engine speed is recorded via the crankshaft position sensor. The crankshaft position sensor output signal is a sine wave signal with a frequency corresponding to the number of holes in the pulse disc and the crankshaft rotation frequency.
The signal is converted in the electronic unit into a message that is sent via the CAN network. The VIC sends this message to the DIP, which then activates the rev counter.

Engine speed sensor operating principles
The inductive sensor consists of a permanent magnet (1), a core (2) and a coil (3).
When the inductive sensor is situated between two teeth, the lines of force of the magnetic field will run directly from the north pole to the south pole via the housing.

The moment a tooth approaches the inductive sensor, the lines of force of the magnetic field will run from the north pole to the south pole via the housing, the teeth of the toothed wheel and the core.
As more lines of force are now running through the core, a more powerful magnetic field is obtained.
As a result of this change in the magnetic field, an AC voltage is generated in the coil.

The value of the AC voltage generated depends on the speed of +rotation of the toothed wheel and the air gap between sensor (core) and tooth.



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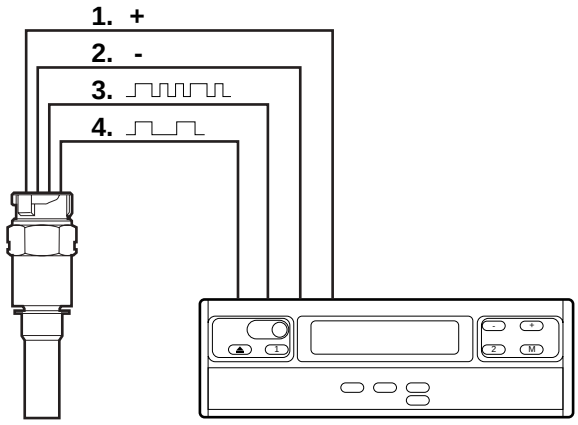
2.2 VEHICLE SPEED SENSOR

The vehicle speed sensor has two connections for output signals. The “real-time” speed signal, generated by a Hall IC, is sent via the first connection,
A data signal (bi-directional signal) is sent via the other connection, data being exchanged between the MTCO and the speed sensor.
The MTCO requests data from the sensor.
The sensor sends the coded data to the MTCO in sequence, and the MTCO checks the accuracy of this data.
The coded signal consists of the following data:

- Serial number of the sensor
- “Master key” (the same as that of the MTCO)
- Coded speed signal



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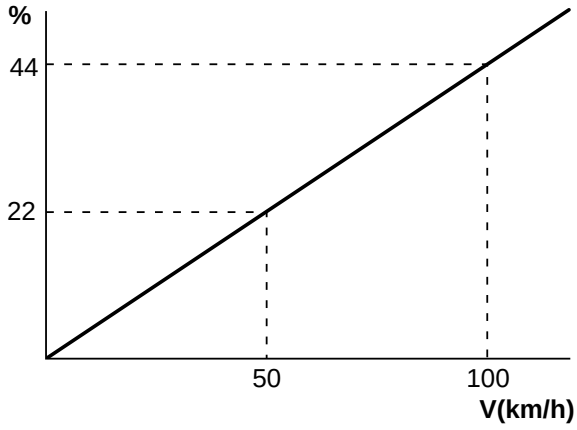
The MTCO compares the coded speed signal to the “real-time” speed signal.
The MTCO sends commands and data to the sensor at 10 second intervals.

Speed data for the CAN-system is sent via MTCO-outputs A6 and A7.

Speed data for the UPEC-system and ECAS-system is sent for UPEC via output B7 and for ECAS via output B6; these are duty-cycle signals.

Duty cycle speed signal
The speed signal sent via the vehicle speed sensor to the MTCO is processed by the MTCO and sent as a message via the CAN network.
The speed signal is also converted into a duty cycle signal. This signal is used by electronic units that do not receive/read the vehicle speed signal message via the CAN network.
This diagram shows the linear characteristic of the duty cycle (%) in relation to the vehicle speed (V).
This graph applies to all vehicle models.



E501057

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Inspection
The duty cycle signal (square wave voltage) can be checked using a multimeter that is set to the DC voltage or duty cycle range or using a scopemeter.

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2.3 TEMPERATURE SENSORS

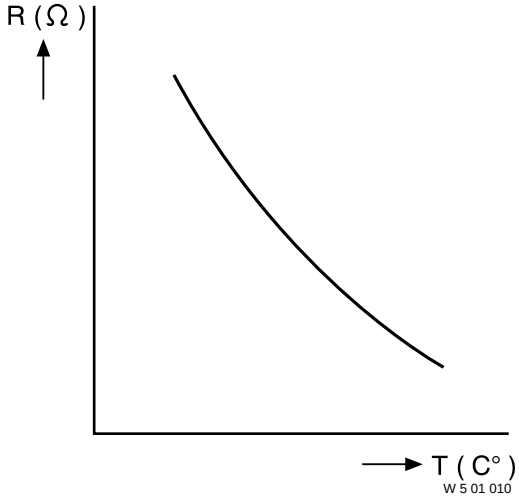
The vehicle has a number of temperature sensors, such as:
- coolant temperature sensor
- inlet air temperature sensor
- fuel temperature sensor
- ambient air temperature sensor

These sensors are temperature-sensitive resistors.
Large changes in the resistance of these sensors are perceptible when the temperature rises or drops.

There are two types of temperature sensor:
- NTC resistor (Negative Temperature Coefficient).
- PTC resistor (Positive Temperature Coefficient).

NTC resistor
In an NTC resistor, the resistance value reduces when the temperature rises.

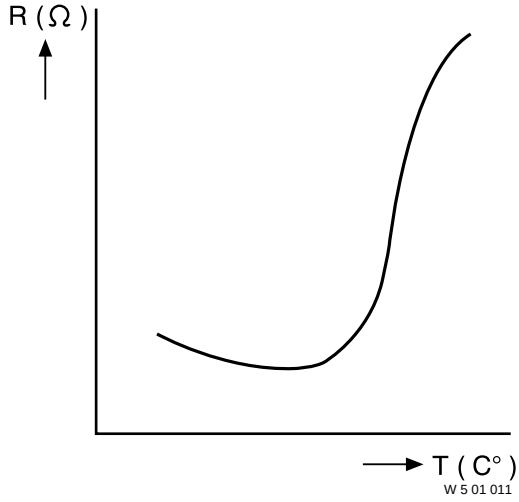
Application:
- measuring coolant temperature.



PTC resistor
In a PTC resistor, the resistance value increases when the temperature rises.

In contrast to the NTC resistor, there will be a large change in resistance within a small temperature range in the PTC resistor.

Application:
- measuring air temperature when cab heater is on



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Inspection
The temperature sensors can be checked using a multimeter that is set to the resistance range.

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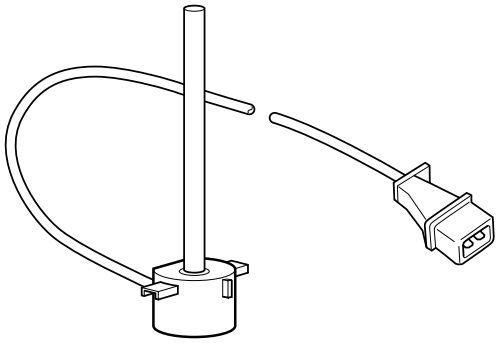
2.4 FLUID LEVEL SENSORS

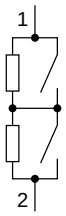
The vehicle has a number of fluid level sensors, such as:
- cooling system fluid level sensor
- engine oil level sensor

Coolant level sensor
The coolant level sensor consists of two microswitches (reed switches), connected in parallel with two resistors.
These microswitches are influenced by a magnetic field positioned outside the sensor.
If the coolant level drops, the microswitches will be closed by a float fitted with a fixed magnet.



E501433

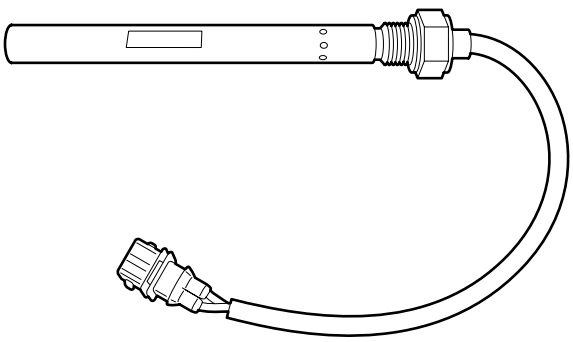
The “alarm switch” detects that the coolant level is too low and short circuits the parallel switched resistor.
The “daily inspection” switch detects that the coolant needs to be topped up and short circuits the parallel switched resistor.
The VIC uses the resistance value to detect the status of the microswitches.
As a result the instrument display is activated by the VIC.



E501434

Note:
The VIC will only send a message to the instruments display during the startup phase if the “daily inspection” switch is closed during the startup phase.

Engine oil level sensor
The operation of the engine oil level sensor is based on a resistance measurement.
When the contact is switched on, a current is sent through the sensor from the VIC control unit for a specific period of time.
Applying this current briefly in this way ensures that the sensor is properly warmed up.
When the level is being measured the resistance value is influenced by the quantity of oil in the sump.



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Inspection
The engine oil level sensor can be checked with a multimeter set to the resistance range.
The resistance value is between 20.5 and 23.5 Ohms, measured at 20°C.
The maximum current strength of 200mA may not be exceeded when the resistance value is measured.

2.5 PRESSURE SENSORS

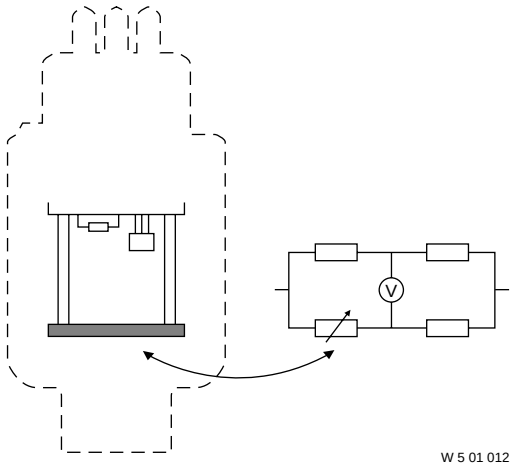
The vehicle has a number of pressure sensors, such as:

- Pressure sensor to record bellows pressure for ECAS.
- Pressure sensor on the air supply unit.

There is a diaphragm made of semi-conducting material (silicon) in the pressure sensor.
When pressure is applied to the diaphragm, it will be deflected.
Deflection of the diaphragm leads to a change in the resistance of the semi-conducting material.

The diaphragm is part of a what is known as a bridge circuit.
Deflection of the diaphragm unbalances the bridge circuit, which changes the output signal.
The output voltage is in direct proportion to the pressure applied (deflection of the diaphragm).

Inspection
The output voltage can be checked using a multimeter set to the DC voltage range.



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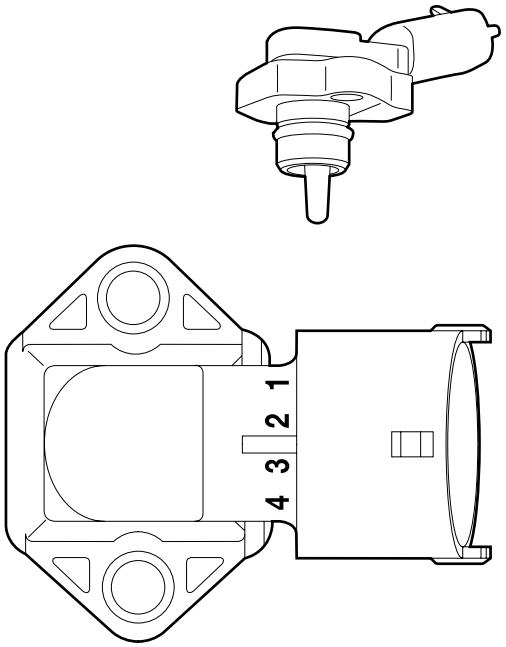
Pressure sensor for monitoring boost pressure.
A piëzo pressure sensor is used to check the boost pressure. This sensor consists of an electronic circuit and a pressure recording element.
The pressure recording element records changes in pressure; these changes in pressure are converted into an electrical voltage. The electronic circuit amplifies this voltage to create a usable output signal.

Inspection
The output voltage can be checked using a multimeter set to the DC voltage range.



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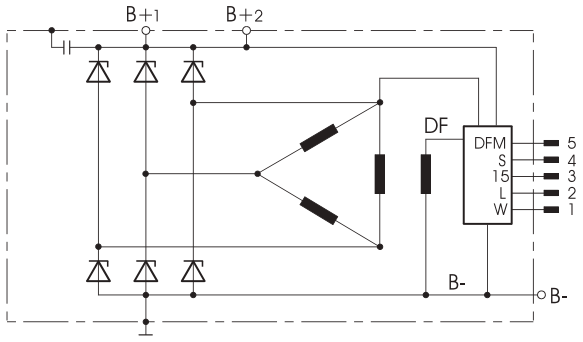
2.6 ALTERNATOR

The compact alternator is a lightweight alternator with two internal cooling fans. The electronic controller also controls pre-excitation of the alternator. The function of the exciter diodes has also been taken over by the controller. The alternator generates high currents in the lower speed range.

B connection to terminal 30 on the starter motor
18 voltage after ignition
S sens connection on the controller
L connection to VIC

B connection
The alternator has two B+ connections that are connected to each other internally. B+1 is connected to terminal 30 on the starter motor. B+2 is **NOT** connected. B- (earth) is connected to the alternator housing.



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Connection 15
When the ignition has been turned on (contact made), power is supplied to the alternator via connection 15 (1010). The controller uses this power to activate pre-excitation (self-energising). If there is an open circuit in this connection, the alternator will not produce any power until it reaches a speed of about 5000 rpm. This corresponds to an engine speed of around 1500 rpm. The alternator will energise itself when it reaches this speed.

Sens connection
The sens connection can be used to compensate for voltage losses in B+. There are voltage differences between the alternator and the battery. Voltage regulation can be improved if these voltage variations can be controlled. The sens connection is connected to terminal 30 on the starter motor.

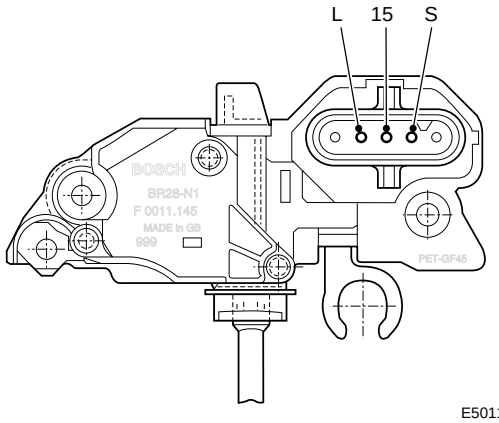
L connection
The L connection is connected to the VIC electronic unit.
This connection is used to activate a fault message in the master display via the VIC, if necessary.

L voltage high: no fault
L voltage low: fault

The following faults can be detected via the “L” connection:
- Voltage too low (< 16V)
- Open circuit in connection 15 (1010)
- Open circuit in “S” connection
- Open circuit in “L” connection

These faults are indicated by the yellow “Alternator fault” warning.

Too high a voltage (red warning) can be recognised by too high a voltage (>31 V) on the VIC electronic unit.



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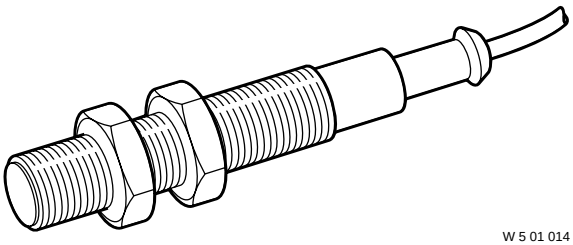
2.7 PROXIMITY SENSORS

The vehicle has a number of proximity sensors, such as:
- sensor under the clutch pedal for engine management
- cab lock sensor
- mechanical rear axle lifting-gear



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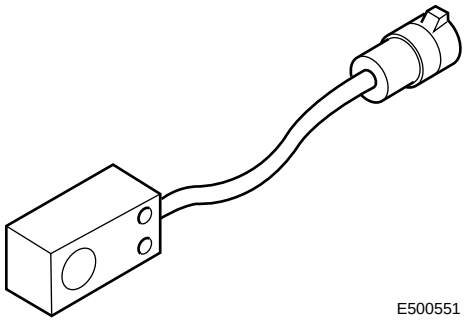
Inductive proximity sensor
An alternating electromagnetic field is generated by a pulsating current in a coil (oscillation).
If a metal object is introduced into the electromagnetic field, eddy currents will occur in that metal object.
These eddy currents will “damp” the magnetic field in the coil, so that the current in the coil changes.
This change results in an output voltage.



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Inspection
Placing a metal object in front of the sensor (inductive sensor) makes it possible to check the output voltage using a multimeter set to the direct voltage range.

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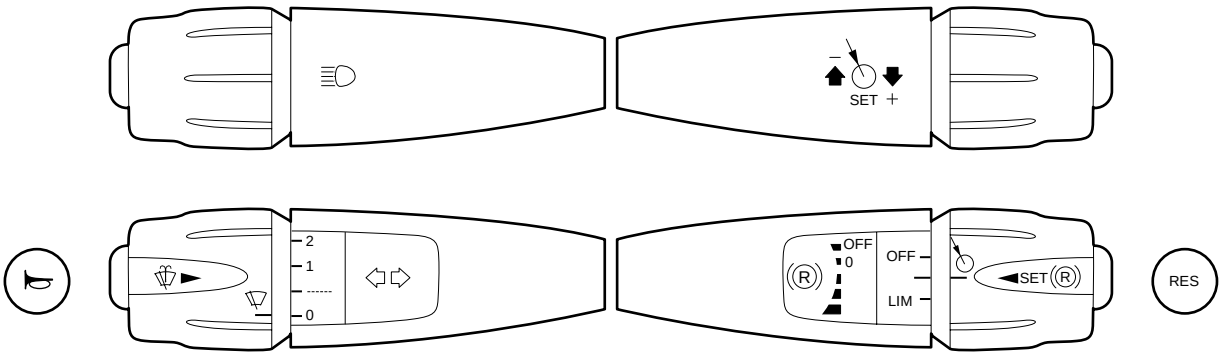
2.8 STEERING COLUMN SWITCH

The steering column switches in the CF vehicle series have been re-designed.
Both the design and the functionality have changed.
The advantages of the new switches are:

- They are short-circuit proof
- Use of reed switches ensures a longer service life
- The intarder function has been integrated into the right hand switch; consequently there are two switches on the steering column
- All cruise-control and engine speed control functions have been integrated into the right hand steering column switch



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There are always two stalks on the steering column.

The left hand stalk has one model. Its functions are:
- Left/right direction indicator
- Main/dipped beam
- Horn
- Windscreen wiper speed/intermittent/wash

The right hand stalk has two models:
- With intarder function
- Without intarder function

The functions of the right hand stalk are as follows:

Model 1:
Cruise control function (speed up/slow down/memory)
Engine speed control (speed up/slow down/fixed speed PTO)

Model 2:
Same functions as version 1
Intarder intarder/V-constant function

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3. DIAGNOSTICS

3.1 DIAGNOSTICS IN ELECTRICAL SYSTEMS

DAVIE XD is used to carry out diagnostics. This tool has a two-channel scope and a multimeter function.
DAVIE XD is also used to read data from electronic systems. When a fault arises, it offers the option of selecting a ”guided” diagnosis that goes through a series of measurement steps to help locate the cause of the problem.

Refer to the user manual for a full description of the operation and capabilities of DAVIE XD.

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3

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1. GENERAL

The increasing application of electronics in vehicles means a much broader range of connectors, contacts and wiring is being used. Be sure to pay special attention to this during repairs, so as to avoid unnecessary faults.

1.1 CONNECTOR

A connector is a removable connection between two or more electrical wires or components. The female contacts are on one side and the male contacts on the other side. This way they can be connected and disconnected.
The connector should protect the contacts against unwanted electrical connections and external influences. It also ensures the proper connection of the applicable contacts.

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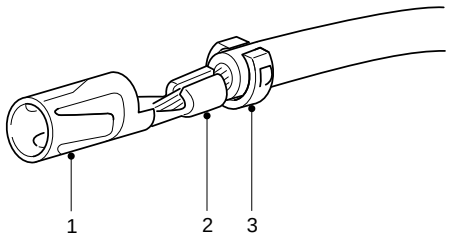
1.2 CONTACT

A connector has one or more contacts. These contacts are available in various sizes and models.
However, they all have the same design:

The mating part (1) enables the electrical connection between the contacts.
The contact press part (2) is the electrical connection between the stripped part of the wire and the contact.
The relief part (or pull relief) (3) relieves the contact press part from mechanical wear. The insulation relief is placed over the insulating sheath and/or the SCAT.



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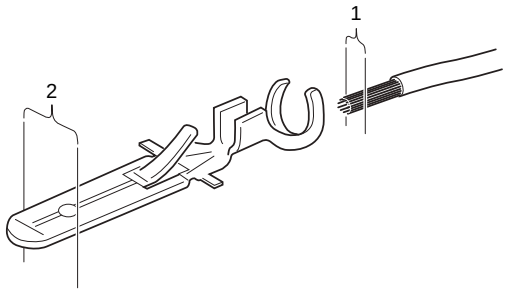
With contacts, three dimensions are important: the diameter (1) of the wire to be connected, the size of the contact press part (2), which is linked to the wire diameter, and the size of the mating part (3).



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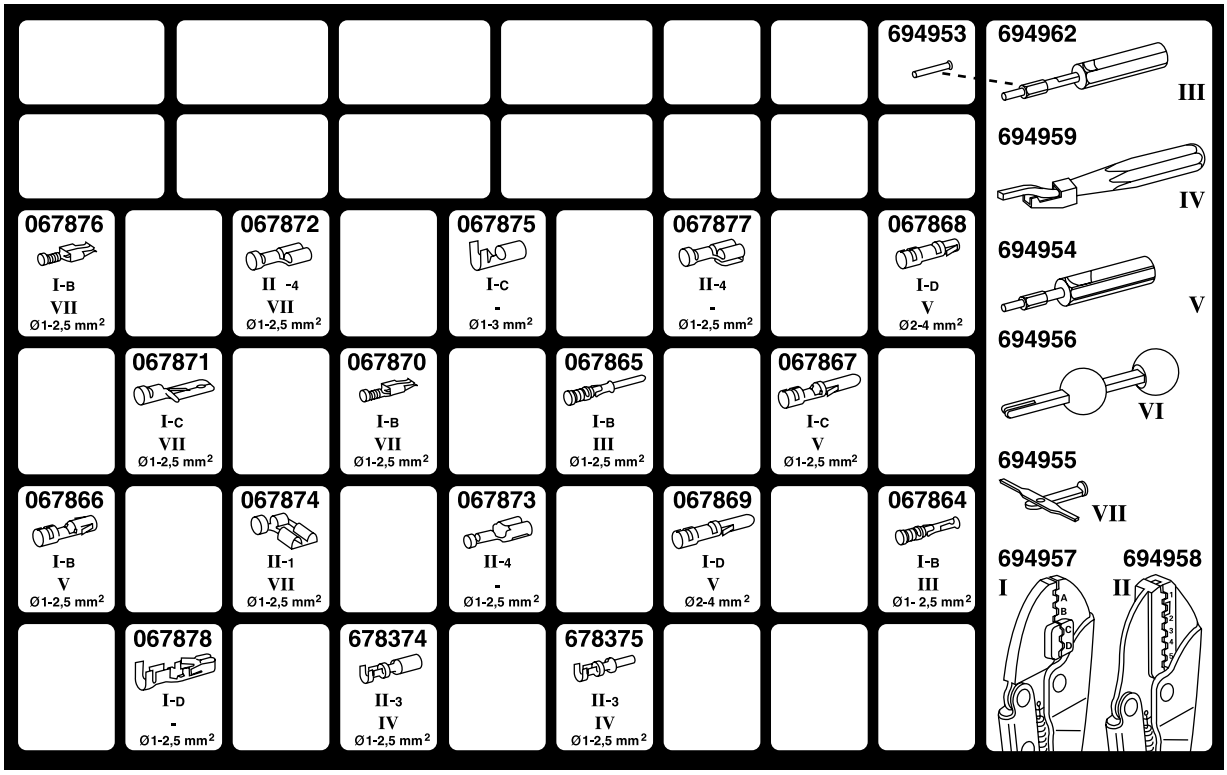
1.3 CONTACT KITS

Contact kit A
Contact kit A (DAF No. 0694960) is available for the contacts, except SCAT contacts and micro-timer contacts.

There is a sticker on the inside of the kit to facilitate selection of the contact, contact crimping tool and ejector tool.



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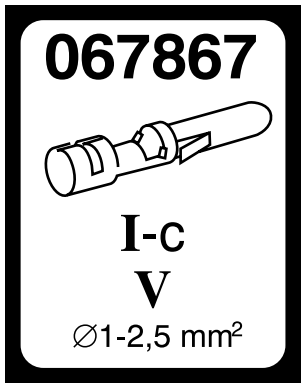
At the top the DAF no. of the contact is shown.
Roman numerals I and II, shown below the illustrations, refer to the contact crimping tool to be used.
The numeral or letter added to Roman numeral I or II indicates the hole in the contact crimping tool in which the contact is to be placed.
Roman numerals III to VII refer to the type of ejector tool to be used for removing the contact from the connector.
The information at the bottom refers to the core section suitable for the contact.



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Contact kit B
Additional contact crimping and ejector tools are required for SCAT contacts and for micro-timer contacts. Contact kit B (DAF No. 1240065) is available for this purpose.
There is a sticker on the inside of the kit to facilitate selection of the contact, contact crimping tool and ejector tool (to be used in the same way as for contact kit A).

Note:
The proper ejector and the proper contact crimping tool for each contact can also be found through 'Parts Rapido'.

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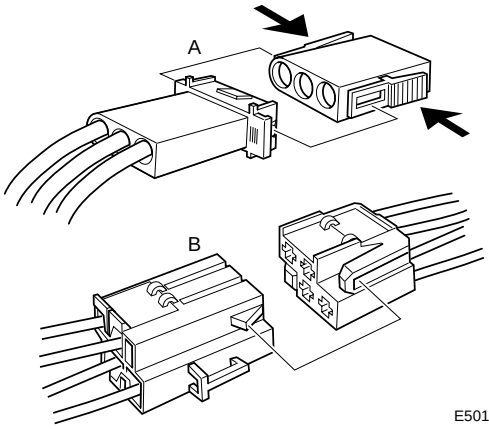
2. REMOVAL AND INSTALLATION

2.1 REMOVAL AND INSTALLATION, CONNECTORS

Unlocking the connectors
The connectors can often be locked with one another or with a component. They can be divided into:

A. Active locking.
This means that the lock must be activated. With this type a lock must often be pressed.
B. Passive locking.
Opens when the parts are pulled apart with a certain force.



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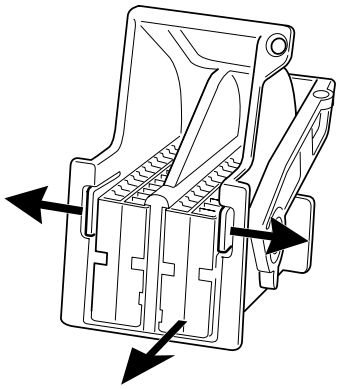
Two connectors in one housing
These connectors consist of two separate connectors. To remove the contacts first remove the connectors from the connector housing. Push the locking lip aside before removal. The connector can then be slid out of the connector housing.

Examples:
- Connector for VIC electronic unit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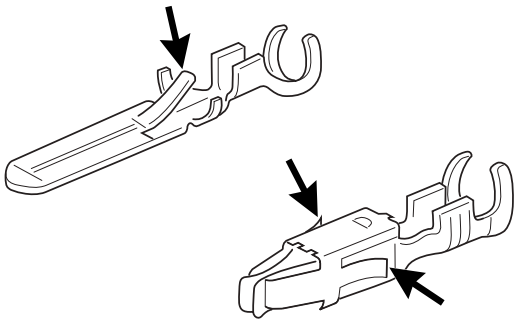
2.2 REMOVAL AND INSTALLATION, CONTACTS

Contact lock
There are various types of contact locks. A few examples are given below. When a lock is applied, individually for each contact, this is called a primary lock. An extra general lock for several contacts in a connector is a secondary lock.

Primary contact lock
To keep an individual contact in the connector in place, a contact is often furnished with one or more locking bolts. This is a primary lock. These locking bolts should never be damaged, with a view to pressing and ejecting the contacts.



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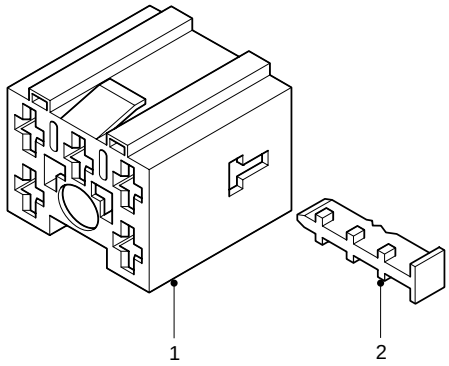
Secondary contact lock
This type of lock is normally used on 2 and 3-row connectors.
For connectors (1) with a locking lip (2) first remove the lip before removing the contacts. This is a secondary lock. The locking lip is on the side of the connector and can usually be recognised from a colour that is different from the colour of the connector.
The lip is removed entirely. Now the contacts can be removed using the proper ejector tool by unlocking the primary lock.



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Examples:
- Cab connectors
- Electronic unit connectors

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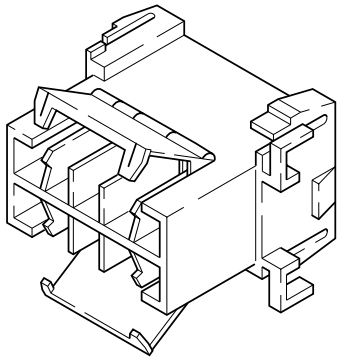
The contacts may also be locked secondarily by the lower part of the connector. After tilting this lower part, the contacts can be removed by unlocking the primary lock using the proper ejector tool.
This type of lock is used only on 2-row connectors.

Examples:
- MTCO connector



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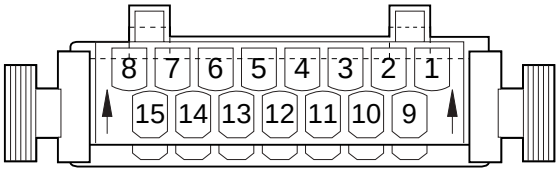
A different type of secondary lock is formed by two sliding parts of the connector.
The upper half (on the wire insert side) and the lower half form the extra contact lock.

To unlock this secondary contact lock the upper half of the connector must be pushed away slightly in the direction of the arrows on the connector housing.
The contacts can then be removed from the connector using the proper ejector tool.



E500475

After any installation of wires with contacts, the connector must be pressed into the lock again. If this is not done it will not fit into the counterpart.

Application examples:
- Connector, CDS electronic unit
- Connector, ECAS-2/3 electronic unit
- Connector for UPEC electronic unit

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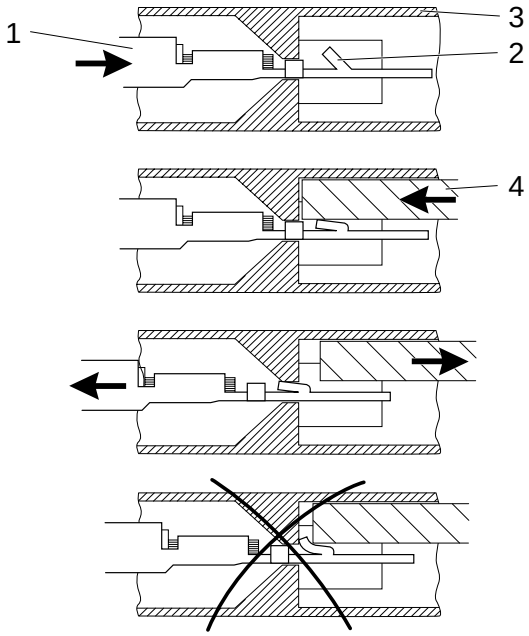
Ejecting contacts
For repair or extension of the wiring a contact may have to be replaced or added. Using special ejector tools a contact can be removed from the connector without being damaged.
For the proper ejector tools, see 'Parts Rapido'.

1. Push the wire with contact forwards (1). The locking bolt (2) is now free from the connector (3).
2. Push the proper ejector tool (4) into the front of the connector. This will push the locking bolt (2) down.
3. The contact can now be removed by gently pulling the wire.

Note:
If the wire is pulled before the ejector tool pushes the locking bolt down, the contact will only be fixed in the connector even more.



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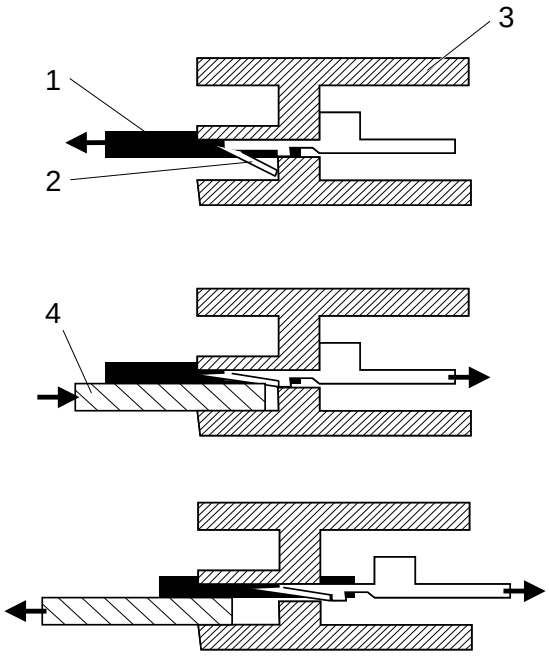
Contacts are also used in which the locking bolt (2) is on the rear of the connector (3).

1. Pull the wire and contact backwards (1). The locking bolt (2) is now free from the connector (3).
2. Push the proper ejector tool (4) into the back of the connector. This will push the locking bolt (2) up.
3. The contact can now be removed by gently pushing the wire forwards.

Note:
Here the locking bolt works exactly the opposite to the usual connectors.

Application examples:
- EMAS pressure sensor connector
- Accelerator sensor connector, CF series / XF series

For each contact a specific ejector tool is required.
The proper ejector tool for each contact can be found through 'Parts Rapido'.



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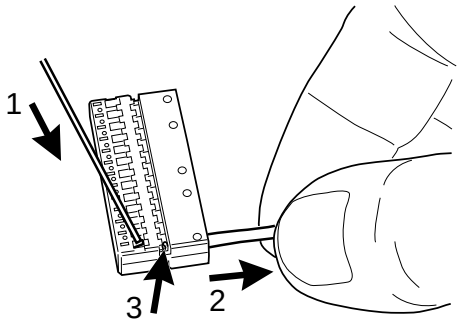
An MQS (Micro Quadlock System) contact lock
Before the contact can be removed, the lock must be unlocked with a needle-shaped object.

1. First press the lock at the end of the connector (1). At the same time gently pull the wire (2) until resistance is felt.
2. Then press the second lock (3) and again gently pull the wire (2).
3. The contact can now be removed from the connector.



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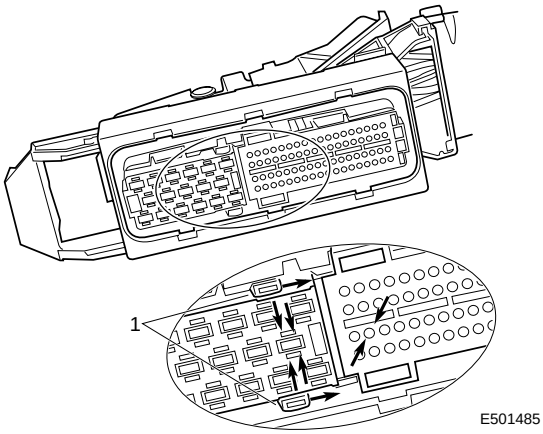
Note:
This type of contact is locked twice and must therefore be unlocked twice.

Application examples:
- Connector for VIC electronic unit

Removing contacts from the Bosch 89-pin connector
To remove a contact from this connector proceed as follows:

1. Fold the protective cover around the wiring harness down by pushing the lock outwards.
2. Now push the two outer halves of the protective cover outwards and then upwards. The protective cover can now be removed.
3. The pink secondary contact lock (1) must be slid to the centre of the connector to enable the contacts to be removed.
4. The contacts can now be removed using the proper ejection tool.



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Note:
The larger contacts are locked with four locking bolts. The smaller contacts are locked with two locking bolts.
Always unlock the locks when adding contacts!

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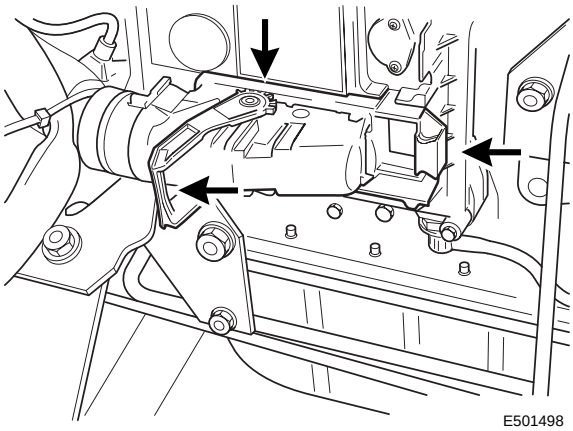
Fitting the Bosch 89-pin connector
When refitting the protective cover, ensure that the siphon and slide are both in the 'unlocked' position.
If they are not, the connector, when fitted, will not be locked correctly on the electronic unit. As a result, the contact between the connector and the electronic unit may be bad.

Application examples:
- Connector, ECS-DC3 electronic unit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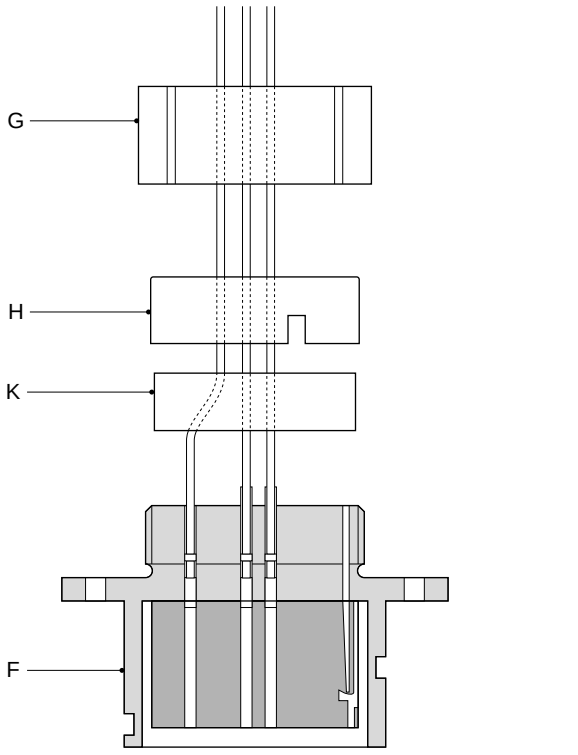
3

Removing 39-pin connector contacts
1. Loosen union G.
2. Push pressure ring H and seal K back slightly over the wiring.
3. Then eject the contacts from connector housing F using a special ejector tool from contact kit A or B.

Fitting 39-pin connector contacts
1. Fit union G, pressure ring H over the wiring.
2. Fit new contacts to the wires using the correct tool.
3. Insert the wires and contacts through seal K.
4. Press the contacts to their definitive positions in connector housing F.
5. Press seal K against connector housing F.
6. Position pressure ring H so that the two ridges on the side of connector housing F fall into the pressure ring recesses.
7. Tighten union G by hand.



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Note:
- Pressure ring H has contact numbers (their purpose is to enable the contacts to be positioned correctly). These contact numbers must be in the same position as the contact numbers on the connector housing.
- When an incorrectly positioned wire is removed the seal will leak. If a new wire is not inserted a sealing plug should be fitted.

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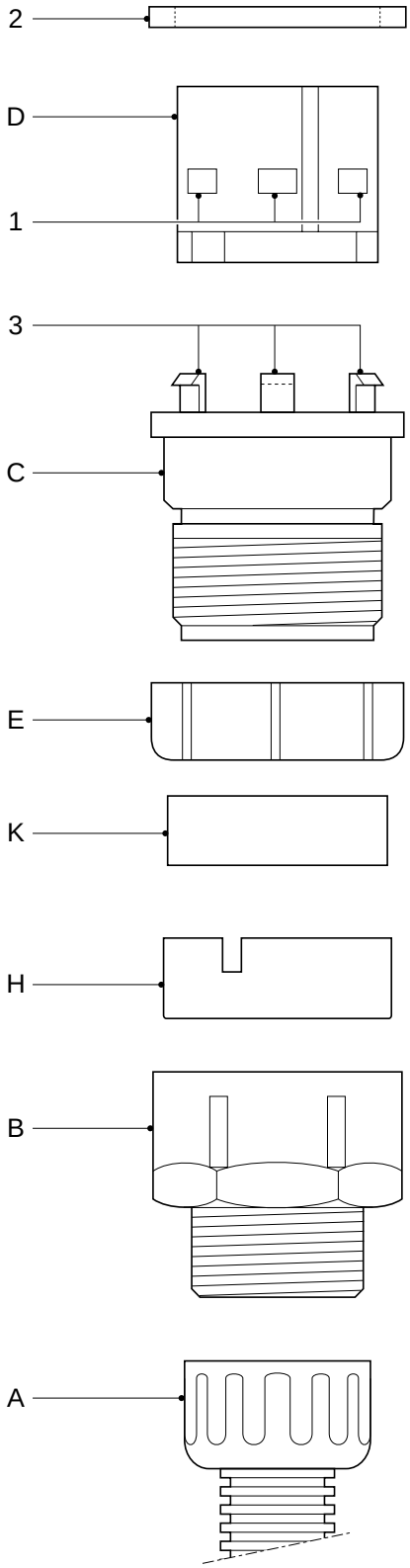
Removing contacts from 39-pin connector counterpart

1. Loosen end union nut A and tapered coupling nut B and push these as far as possible back over the insulation pipe.
2. Push pressure ring H and seal K as far as possible back over the wiring harness.
3. Push union E back over the wiring harness.
4. Carefully remove the sealing ring (2).
5. Carefully loosen the locking lugs (3) in connector housing F.
6. Remove centring sleeve D from connector housing C.
7. Then eject the contacts from connector housing C using a special ejector tool from contact kit A or B.

Fitting contacts in 39-pin connector counterpart

1. Push end union nut A and tapered coupling nut B as far as possible back over the insulation pipe.
2. Fit the centring sleeve D in connector housing C so that all openings are positioned opposite each another.
3. Check that all locking lugs (3) are positioned in the lock openings (1).
4. Insert the wires without contacts through pressure ring H and seal K.
5. Fit new contacts to the wires using the correct tool.
6. Feed the cable harness through tapered coupling nut B.
7. Press seal K against connector housing C.
8. Position pressure ring H so that the two ridges on the side of connector housing C fall into the pressure ring recesses.
9. Press the connector pins into their correct positions in connector housing C.
10. Fit sealing ring (2) around centring sleeve D and press it until the stop of connector housing C.



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Note:
- When carrying out the last two steps it is important not to twist the cable harness as this can lead to serious damage (wire breakage).
- Tighten the respective union nuts by hand. Do not use tools (pliers) to do this.

11. Screw tapered coupling nut B onto connector housing C.

12. Screw end union nut A (with insulation pipe) onto tapered coupling nut B.

2.3 FITTING CONTACTS TO ELECTRICAL WIRES

The increasing application of electronics in vehicles means a much broader range of connectors, contacts and wiring is being used. The result of this is that more attention has to be paid to making and repairing connections. The following criteria should be taken into account:

1. Wires with a reduced insulation thickness, with retention of the mechanical properties, for use with core sections from 0.5 to 2.5 mm^2.

2. Wires with a normal insulation thickness, for use with core sections from 4 to 120 mm^2.

3. Wires for various temperature ranges:
   T1: from -40°C to +70°C
   (in cab and chassis) and
   T2: from -40°C to +100°C
   (in engine compartment and gearbox)

Note:
In view of the mechanical strength required, the minimum permissible core section is 1 mm^2, with the exception of cab wiring. At certain points this may be 0.5 mm^2.

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To ensure the reliability of systems and connections, the following points should be observed when repairs or extensions are made to the wiring:

A. Always choose the following:
   - the correct type of contact
   - the correct wire diameter for the contact used
   - the correct type of contact material (tin-plated, silver-plated or gold-plated)

B. Use the right tool for the job. Wire ends are always clamped to a contact. Special crimping tools have been developed for this purpose.

Note:
Connections will only be reliable if these crimping tools are used and the contact is fitted in the correct hole.

C. Strip the correct length of wire. Always use stripping pliers.
   The rule of thumb is:
   stripped length = length of shrink-sleeve + 1 mm.

   Make sure that the core is not damaged during stripping or problems may occur after some time.

Note:
A good connection will only be obtained if points A, B and C are complied with. This implies that both the copper core and the insulation are firmly clamped in place.

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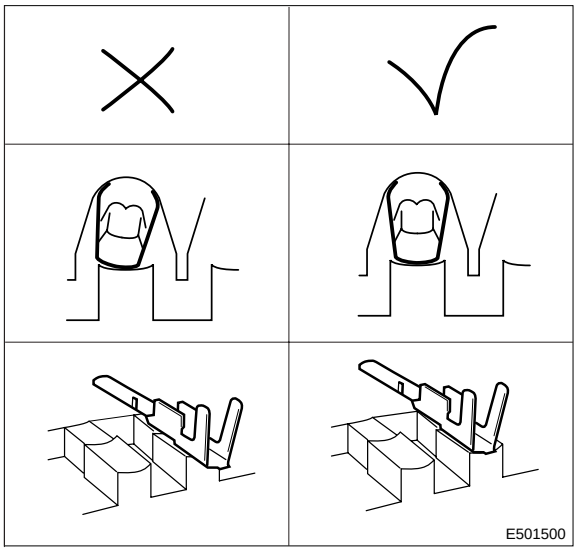
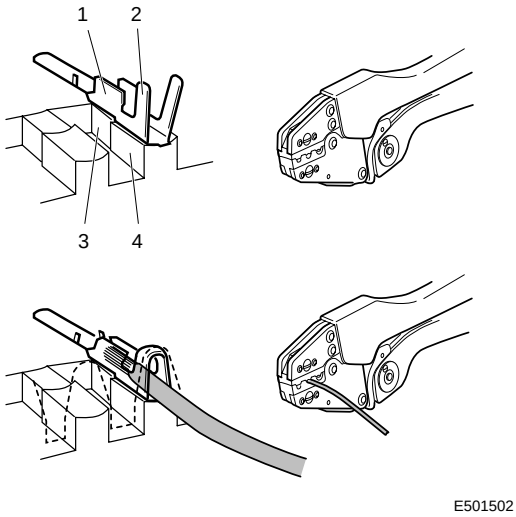
Crimping wire to a contact
Choose the right crimping tool and place the contact in the correct hole.

Note:
The proper crimping tool for each contact can be found through 'Parts Rapido'.

The contact may never be in a twisted, slanting or slid position (X) in the press clamp opening.



1. Place the wire in the contact.
2. The stripped wire part, the copper conductor must be in the contact press part (1).
   The wire insulation must be in the relief part (2).
3. Check again whether the wire is in the correct position in the contact (1 and 2) and press the contact press part (3 and 4) together.
4. Do not interrupt the contact pressing before the tool is completely compressed in the end position. Only then is full contact pressure reached and the tool can be opened.



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Copper connection

1A. Wire diameter too large
1B. Wire diameter too small
2A. Crimp height too great (hole in crimping tool too large)
2B. Crimp height too small (hole in crimping tool too small)
3A. Asymmetric crimping
3B. Asymmetric crimping
4. Proper contact crimping

S = material thickness
x = cracking

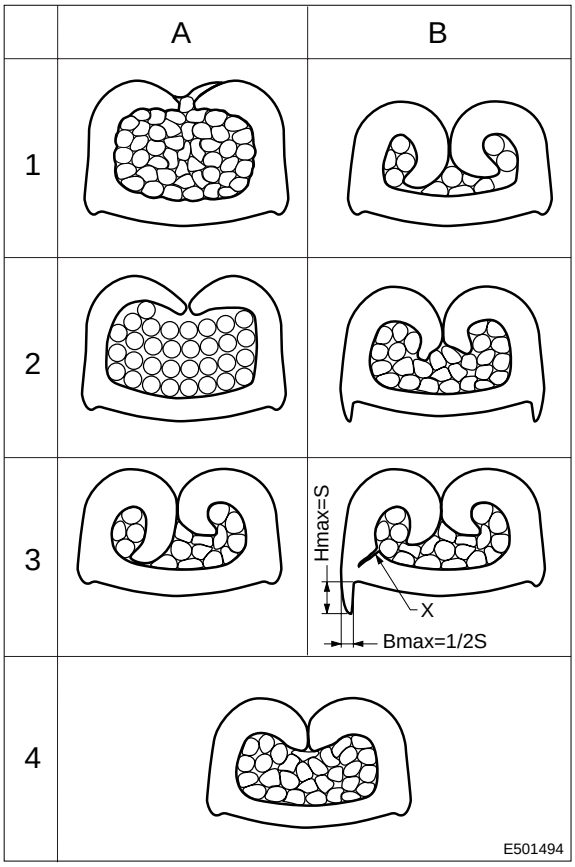
1A. There is a risk that copper conductors could stick out, which would adversely affect the fixed position of the other copper conductors.
This may result in a short circuit and loose contact.

1B. The contact may crack and the copper conductors may not be sufficiently fixed in the contact.

2A. Copper conductors are not sufficiently fixed in the contact. The wire will come loose of the contact.

2B. The contact will be damaged. The contact may crack after some time and the wire will then come loose from the contact.

3A and B The contact will be damaged and the copper conductors are not fully fixed in the contact. The wire may come loose. The height of any bulge on the contact may not exceed the material thickness of the contact. The width of this bulge may not exceed half the material thickness.



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Insulation connection
Different types of crimping are allowed:
1. Normal crimping; the two sides of the relief part fully engage the insulation.
2. Double crimping; two wires are clamped in one contact.
3. Overlap crimping; the two sides of the relief part engage one another slightly.
4. Double overlap crimping; two wires are clamped in one contact, the two sides of the relief part engaging one another slightly.

A. If the insulation connection is correct, the wire is clamped in the relief part with the correct pressure and the insulation is not broken.

B. If the contact pressure is too high the insulation could break, possibly causing a short circuit.
This may for instance be caused by:
- using the wrong crimping tool
- using an improper hole in the crimping tool (too small)
- a defect in the crimping tool delaying the interruption of the contact pressing.

C. If the contact pressure is not sufficient the insulation may not be clamped and the wire may come loose. This will interrupt the electrical connection but may also result in a short circuit.
This may for instance be caused by:
- using the wrong crimping tool
- using an improper hole in the crimping tool (too big)
- interrupting the contact pressing prematurely.

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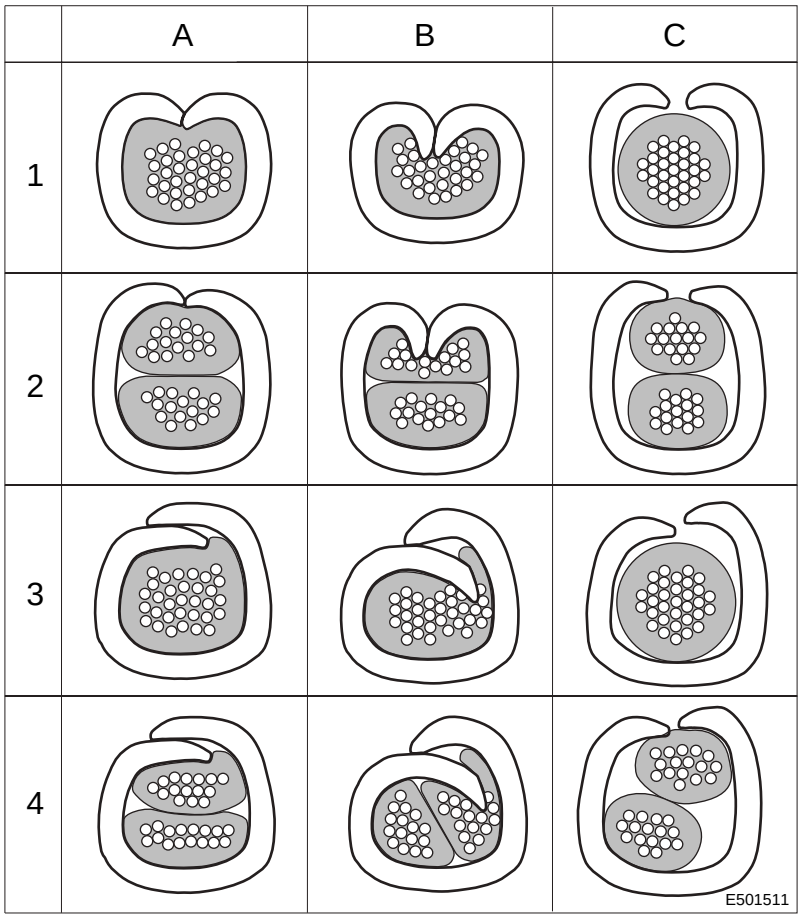
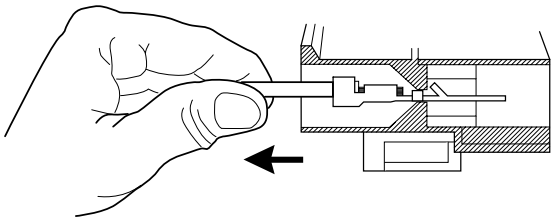


1. Normal crimping
2. Double crimping
3. Overlap crimping
4. Double overlap crimping

A. Good insulation connection
B. The insulation is broken
C. The insulation is not secured

With double crimping the thinnest wire is always at the bottom.

A connection can be checked by gently pulling the wire after the contact is placed in the connector. The lock of the locking bolt in the connector should then be felt.



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Examples of wire-contact connections

A. Wire not sufficiently slid forwards.
The wire is not sufficiently slid forwards to ensure a proper current transfer and pull relief.

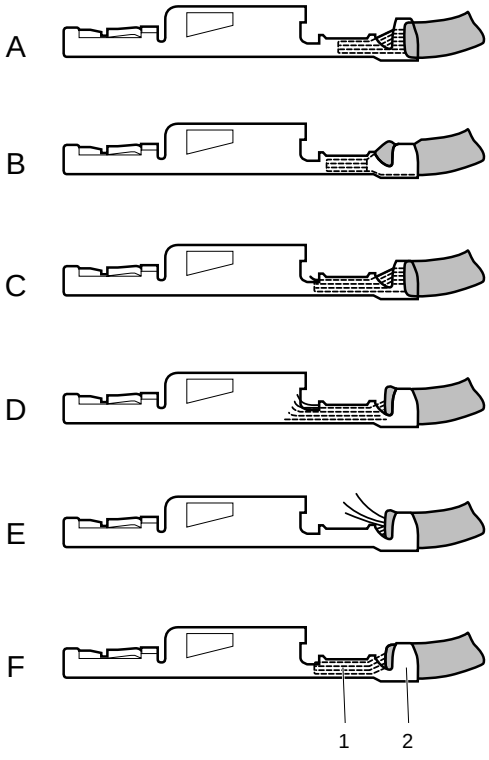
B. Stripped part of the wire too short.
The stripped part of the wire is too short to ensure a proper current transfer whereas a part of the insulation is clamped underneath the contact press part.

C. Wire too far backwards.
If the stripped part of the wire is too long and the wire is placed correctly relative to the contact press part, the pull relief will cover too little of the wire.

D. Wire too far forwards.
If the stripped part of the wire is too long and the wire is placed correctly relative to the pull relief, the copper conductors at the front will stick out too far past the contact press part.

E. Copper conductors not clamped.
Copper conductors not clamped may cause a short circuit to other wires nearby.

F. This is a correct connection.



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2.4 FITTING A SCAT SEAL

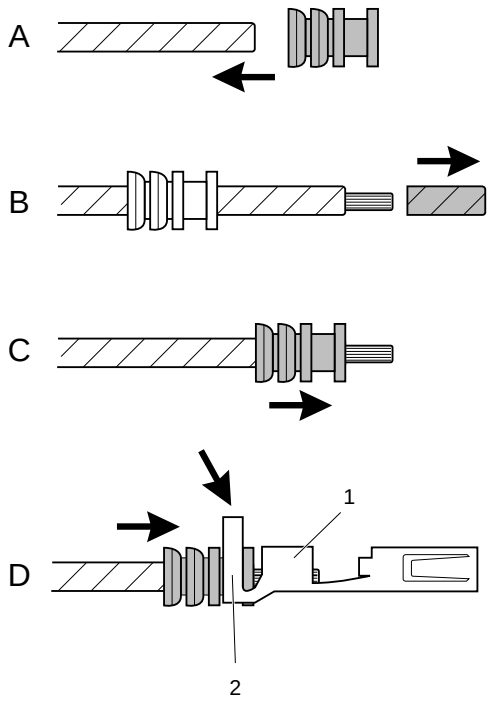
SCATs are used in places where wires are exposed to heavy conditions (environment or application of the vehicle), with the risk of water entering the connector.

The SCAT seal, which is made of silicone, prevents corrosion inside the connector and keeps the seal properties intact in the event of temperature changes.

The SCAT seal is pressed around the wire with the relief part of the contact.

The SCATs are available in various colours and sizes.

1. Select the right SCAT for the wire, contact and connector.
2. Slide the SCAT onto an unstripped wire (A).
3. Slide the SCAT far enough onto the wire and strip the wire to the proper length (B).
4. Slide the SCAT back to the tip of the stripped wire so that the copper just sticks out of the SCAT (C).
5. Place the contact in the proper manner (D) around the SCAT (2) and the stripped wire (1).
6. Now crimp the contact around the SCAT and the wire using the proper crimping tool.



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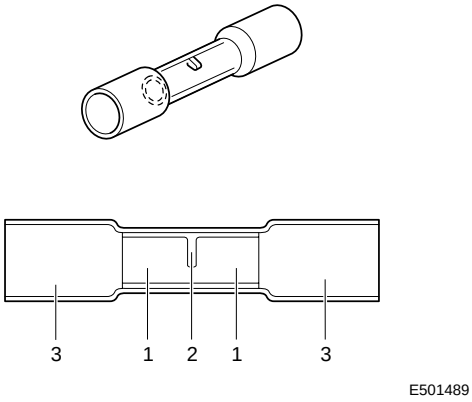
2.5 FITTING AN ELECTRICAL BUFFER CONNECTION

A buffer connection is made when at least two wire ends must be connected to one another. This may be required because of a wire repair or if a wire is to be added to a connection.

Note:
When adding a new wire to an existing wire, both wires must be of the same thickness.
If part of the existing wire is to be removed, try to make sure that the wire number can still easily be found on the wire.

The contact crimping part (1) is the electrical connection to the stripped wire part. The central stop (2) is a limiter, preventing the wire to be connected from being inserted too far. The insulation is a crimp insulating sleeve with glue layer (3), which, after heating by a blow drier, will offer protection against unwanted electrical contact and corrosion.



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There are three different buffer connectors available: red, blue and yellow. Depending on the wire thicknesses to be connected (and possibly the number of wires to be connected) a specific colour must be used.

- red diameter 0.25 - 0.75 mm^2
- blue diameter 1.0 - 2.5 mm^2
- yellow diameter 4.0 - 6.0 mm^2

Connecting more than two wires to one another is not recommended. The glue layer of the crimping insulation is not sufficient to seal all resulting gaps. So this is certainly not permitted outside the cab.

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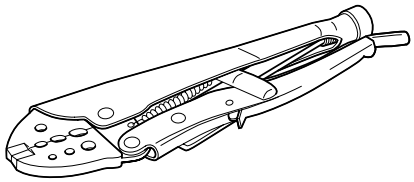
It is very important to carry out contact crimping in the correct way to prevent electrical faults. For cold fusion a contact crimping tool is required. This tool creates a cold fusion between wire and buffer connector.



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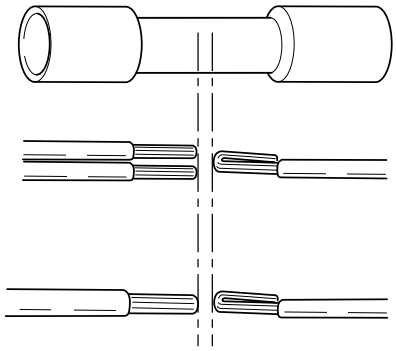
Fitting the contact crimp connector

1. Select the right buffer connector for the wires to be connected.

Note:
If three wires of the same diameter have to be connected after all, choose a buffer connector that is the same diameter as two of the wires. The single wire on the other side must be stripped to double length and folded double. The same applies when a wire is used on one side that is twice the diameter of the other.

2. Strip the wire to a length of 4 to 5 mm.

Note:
The stripped wire end may **not** be twisted.



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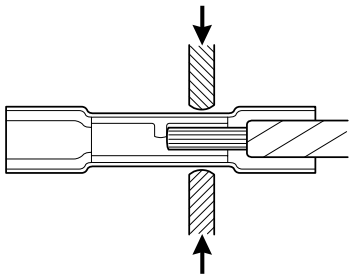
3. Choose the proper contact crimping tool on the basis of the buffer connector and wire diameter, and check the holes to be used.
4. Place the buffer connector in the hole of the tool and clamp it gently so the buffer connector will remain in the hole.
5. Slide the stripped wire ends into the side of the buffer connector that is engaged by the contact crimping tool.

Note:
The wire insulation may not be slid into the contact part of the buffer connector.



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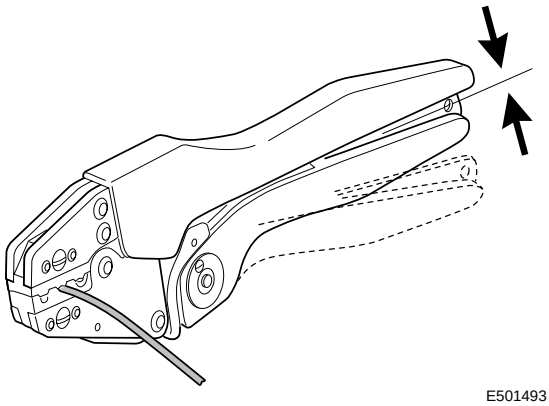
6. Compress the contact crimping tool: Do not interrupt the contact crimping before the tool is completely compressed to the end position. Only then is full contact crimping completed and the tool can be opened.
7. Repeat this for the other ends of the buffer connector.
8. Check the contact crimping for damage and pull the wires to ensure they are properly fixed.

Note:
Improper contact crimping means a bad connection, which may cause failures.

Avoid breathing in the vapours produced when heating the crimping insulation.

9. Heat the crimping insulation to fix it properly to the wire insulation. Ensure that the insulation does not get burnt. If the insulation gets burnt it will become brittle and easily break or crack.



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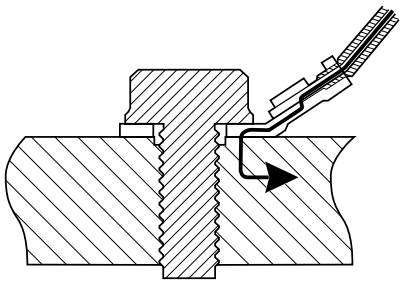
2.6 REMOVAL AND INSTALLATION, EARTH WIRE

When a failure occurs in an electrical system, one of the first things to be checked is the earth connection, with particular attention being paid to earth connections on the chassis.

Points for special attention when checking earth connection on chassis
If an earth connection has been removed and is being re-installed, pay attention to the following:

- The bolt, nut, earth strip and washers must be cleaned (e.g. using a steel brush or sand paper). If a component is corroded, it must be replaced by a new one.
- Clean all dirt and paint from the area around the engine/chassis earth connection on both sides of the chassis member so that the bare metal is visible.
- Clean all dirt and paint from the area around the battery/chassis earth connection on the inside of the chassis member so that the bare metal is visible.
- On the earth strip side, the cleaned area must be larger than the contact area of the earth strip.
- On the nut side, the cleaned area must be larger than the contact surface of the nut.
- After fitting the earth connection, a protective zinc primer should be applied to both sides of it and it should be painted.



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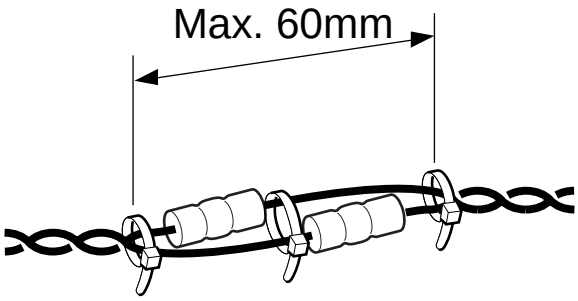
2.7 REPAIRING CAN NETWORK WIRING

When repairing or replacing the CAN wiring, the original twisted lengths and diameters of the wiring must be taken into consideration. A 10% tolerance in the twisted length of the wiring is permitted. Winding density 40-50 turns/m.

When repairing the wiring, the winding density must be maintained, with the provision that it is permissible for the wiring at the point of repair to have no twists over a maximum length of 60 mm. When the wiring is being repaired, it must be secured in a wire tie at the end and in the middle.



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Replacing CAN wire

1. Measure the length of the original wire when untwisted.
2. Measure the diameter of the original wire. Always take a wire of the same diameter or, if this is not available, of the next size.
3. Preferably choose a wire of the same colour as the original wire.
4. Follow the routing of the original wire and install the wire in the original way.

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1. SAFETY INSTRUCTIONS

1.1 BATTERIES

- The sulphuric acid in the batteries is an aggressive and poisonous liquid. While working on batteries, wear protective clothing, gloves and safety goggles.
  In case of contact with clothes, skin or eyes, wash immediately with copious amounts of water. Consult a doctor in case of contact with the eyes or skin.
- Always remove the earth lead first before working on batteries.
  When connecting battery leads, always connect the earth lead last.
- Always handle batteries carefully and hold them upright.
- When topping up batteries, never allow the electrolyte level to rise more than 10 mm above the plates or above the level indicator.
- Never put tools or other materials, which could accidentally short circuit the battery poles, down on the batteries or in the vicinity of batteries. Short-circuited battery poles may cause the battery to explode.
- Secure the batteries well after completing the work, but not too tightly.

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1.2 BATTERY CHARGING

- An explosive gas mixture may be released during battery charging. Only charge batteries in a well-ventilated area.
- Never smoke or allow naked flames or sparks in the vicinity of the battery.
- Allow frozen batteries to thaw before charging.
- Switch the charger off before the leads to the battery are disconnected.

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2. CHARGING BATTERIES

2.1 GENERAL

- A battery may only be charged using DC current. Connect the positive pole of the battery to the positive terminal (+) of the charger, and the negative pole of the battery to the negative terminal (–) of the charger. The cell sealing plugs may remain on the battery during charging (with the exception of fast charging).
  The cell voltage will rise during charging. This increase in voltage depends on the charging current applied and the temperature. During normal charging, the cell voltage will rise from about 2 volts/cell to about 2.65 volts/cell. If a charging voltage of about 2.35 to 2.4 volts/cell (about 14.2 volts in a 12V battery) is exceeded, this will initiate active gas development.
  As a consequence of the rise in voltage during charging, the charging current will gradually fall, as a rule.
  Overcharging will reduce the service life of a battery.

- If the charging of the battery is continued after it has been fully charged (even with a low current), this will lead to corrosion (corrosive attack) of the grids of the positive battery plates. This type of wear leads to premature redundancy of the battery.
  Depending on the capacity of the charger, the normal charging time is between 8 and 15 hours.
  If during charging, the temperature of the battery acid exceeds 55°C, charging should be stopped. High temperatures reduce the service life of the battery.

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- A battery should be considered to be charged when the charge voltage stops rising for a period 2 hours and the acid density (relative density) has reached the nominal value (for example 1.28 kg/dm^3) and it rises no further.
- A charged battery must be used immediately. If this is not possible, maintain the battery as described in the “Storage of batteries” section.
- A discharged battery must be charged as soon as possible. If a discharged battery is not recharged, the battery plates may become sulphated (i.e. they may become hard), which will lead to permanent loss of capacity.

- Never disconnect the battery terminals when the engine is running to prevent damage to electronic components.
- Connect the positive lead (+) of the battery charger to the positive terminal (+) of the battery first and then the negative lead (–) to the negative terminal (–).
- Switch off the battery charger before disconnecting the battery charger leads, to avoid sparking and to eliminate the risk of explosion.
- To disconnect, release the negative terminal (–) first and then the positive terminal (+).

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2.2 METHODS OF CHARGING

Always disconnect the battery terminals before charging.

Normal charging
- Normal charging is done to partially or fully restore discharged batteries to full capacity. In most cases, a charging current of $^1/_{20}$ to $^1/_{10}$ of the capacity is selected.

- It is important to reduce the charging current during gas development and to switch the charger off when the battery is charged.

Fast charging
- With this method, multiples of the normal charge current (approx. 3 to 5 times) are used to achieve an acceptable charge condition in the shortest possible time.

- Before fast charging, remove the battery leads to prevent damage to the electronic components.

- Remove the cell sealing plugs so that the released gases can easily escape.

- To prevent overcharging, switch to a lower charging current when the cell voltage is reached (2.35 to 2.4 volts/cell).

  Note:
  If possible, avoid fast charging. Only use it in exceptional cases. Fast charging causes battery overloading, which reduces the service life of the battery.

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Buffer charging

- With this method, the consumer and the charger are both connected to the battery. The charger delivers sufficient current to ensure that the battery remains virtually fully charged. The battery will deliver peak currents to the consumer.

- Buffer charging is best done at a constant (stabilised) voltage.

Trickle charging

- A fully charged battery that is not used for some time, will start to discharge of its own accord. It may discharge at a rate of 0.1% to 1% per day. Trickle charging compensates for such discharges.

- The charging current for trickle charging should be around 0.1 A per 100 Ah.

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3. STORAGE OF BATTERIES

3.1 GENERAL

Before storing batteries, take the following steps:

1. Remove the battery terminals.
2. Clean the battery terminals and top of the batteries.
3. Grease the battery terminals with petroleum jelly.
4. Check the charging condition of the batteries, and charge them if necessary. See section “Checking batteries”.
5. Check the electrolyte level; this should be approx. 10 mm above the plates or up to the level indicator, if present.
   If necessary, top the batteries up with distilled water.

3.2 STORAGE UP TO FOUR WEEKS.

If batteries (whether as separate units or fitted in a vehicle) are not going to be used for an extended period of time not exceeding four weeks, the following measures should be taken:

1. Do **not** connect the battery leads to the batteries.
2. Check the charging condition of the batteries regularly, particularly if the batteries are stored in low temperature conditions. See section “Checking batteries”.
   If the voltage falls below 12.4 volts, or if the relative density of the electrolyte in one or more of the cells is less than 1.23 kg/dm^3, the battery must be charged.

   Note:
   The lower the relative density of the electrolyte, the higher the risk of the battery freezing.

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3.3 STORAGE FOR MORE THAN FOUR WEEKS

If the batteries will not be used for more than four weeks, the following measures should be taken:

1. Remove the batteries from the vehicle and store them in a frost-free, dry, cool and well-ventilated room.
2. Check the charging of the batteries regularly, at least once every four weeks. See section “Checking batteries”.
   If the voltage falls below 12.4 volts, or if the relative density of the electrolyte in one or more of the cells is less than 1.23 kg/dm^3, the battery must be charged.
3. Limit the storage period to a maximum of three months. The longer the period of storage, the greater the permanent loss of capacity.

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4. CHECKING BATTERIES

4.1 VISUAL INSPECTION

- A white dividing line at $^1/_3$ of the plate height (this can be seen through transparent battery boxes) indicates that the battery has been left in a deeply discharged condition.
- If the electrolyte is brown and the battery consumes a lot of fluid, this indicates that the battery is overcharged.
- If the electrolyte is turbid and milky and the cells have a white deposit, the battery has become damaged due to insufficient charging (deep discharge).

4.2 CHECKING THE CHARGING CONDITION

Relative density

- The charging and discharging of the battery leads to a chemical reaction in the battery, which involves sulphuric acid. The sulphuric acid concentration drops as the battery discharges.
  The concentration, measured as relative density (kg/dm^3) is a useful indicator in determining the charging condition of the battery.
- An acidimeter can be used to check the charging condition.

Relative density at 27°C in kg/dm^3		
Charged battery	:	1.28
Half-charged battery	:	1.20
Discharged battery	:	1.10

- Measurement corrections are necessary if temperatures are significantly lower or higher. For every 10°C lower temperature, subtract 0.007 points from the measured value. For every 10°C higher temperature, add 0.007 points.
  In batteries that are in good condition, the relative density should be the same in all the cells. The difference between the highest and lowest relative density must not exceed 0.03 kg/dm^3.

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Note:
If the relative density in one of the cells is much lower than in the other cells it may be caused by cell closure. If the relative relative density of two adjacent cells is much lower than in the other cells, this indicates a leakage in the cell partition. In both cases, the battery must be replaced.

Voltage

- The charging condition of the batteries can be measured using a sensitive, preferably digital voltmeter. This method can only be used 1 to 2 hours after full completion of charging or discharging. Measure the absolute rest voltage (the positive and negative terminals of the battery must be removed).
  The charging condition of the battery can be calculated using the formula: Voltage per cell = relative density (kg/dm^3)+0.84.

  For example:
  For a fully charged battery, the relative density per cell is 1.28 kg/dm^3. The voltage per cell is therefore 1.28 + 0.84 = 2.12 V.
  A 12V battery has 6 cells. The total voltage for a charged battery is 6 x 2.12 = 12.72 V.
  The voltage of a half-charged battery is approx. 12.24 V.
  The voltage of a discharged battery is approx. 11.75 V.

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4.3 CHECKING USING A BATTERY TESTER

- The general condition of the battery can be checked quickly using a battery tester. For this check, a load is applied to the battery, and then the discharge voltage at the battery terminals is measured. The load applied to the battery must be at least 3 times the capacity of the battery.

- As a rule, the test can be carried out when the battery is sufficiently charged (relative density 1.25 - 1.28 kg/dm^3).
  At normal temperatures (10-20°C), the charging voltage for a properly charged battery must be 10 volts after 10 seconds.
  In the case of a partially discharged battery (relative density 1.25 kg/dm^3), the reading should be at least 9 volts.
  It is important that the voltage is measured directly at the battery poles.

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1. CONNECTION OF ACCESSORIES

1.1 SPARE WIRES

Additional wiring
In the roof console on the driver's side is a 12-pin, black connector (connector no. 597) with two spare wires (spare 1 and spare 2) that are connected to connector 581.

The following signals are available there:

Pin pattern of connector no. 597:

Pin no.	Wire no.	Description
1		
2	1154	Power supply before contact
3	1258	Power supply after contact
4	2102	Left rear light signal
5	2103	Right rear light signal
6	2122	Main beam signal
7	2630	Instrument lighting
8		
9		
10	spare 1	Spare 1
11	spare 2	Spare 2
12	M	Earth

NOTE: The power supply **before** contact is fuse-protected via fuse E142. The power supply **after** contact is fuse-protected via fuse E163. Both 25 A. The power supply to the cooler box and connector 656 (if present) is also via fuse E142.

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A black 6-pin connector (connector 581) that is connected to connector no. 597 is fitted at the height of the top connector attachment partition on the driver's side.

Pin pattern of connector no. 581:

Pin no.	Wire no.	Description
1	3649	Ultrasonic/radar unit earth
2	3650	Ultrasonic/radar input signal
3	3651	Ultrasonic/radar power supply
4	3654	Ultrasonic/radar input signal
5	spare 1	Spare 1
6	spare 2	Spare 2

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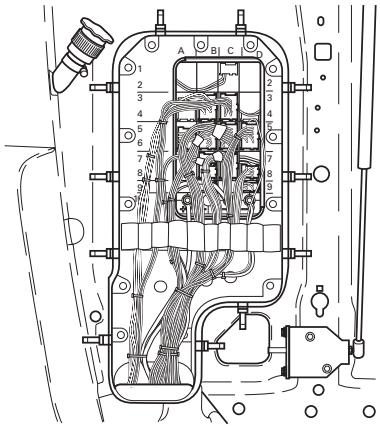
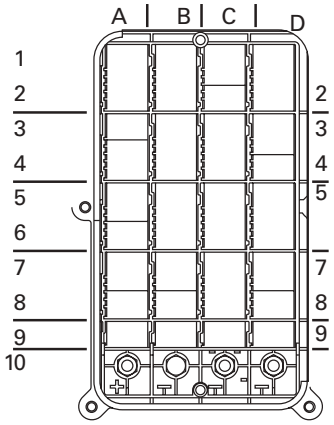
1.2 DASHBOARD LEAD-THROUGH CONNECTORS, GENERAL

A number of connectors are fitted in the dashboard connector lead-through at the front of the cab. A number of earth wires and the main power supply wire are also led through at this point.



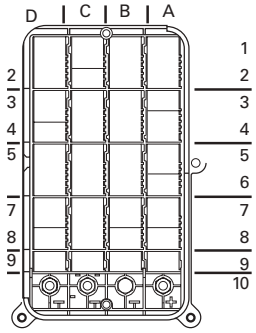
E501059

Seen from the outside looking inwards, the dashboard connector lead-through appears as follows.



E501060

Seen from the inside looking outwards, the dashboard connector lead-through appears as follows.



E501093

In the descriptions of the various connectors in the dashboard connector lead-through, the view is always from the cab.

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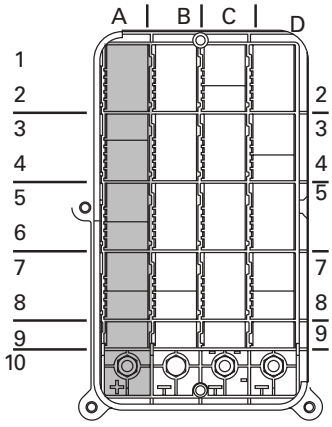
1.3 OVERVIEW OF THE DASHBOARD LEAD-THROUGH CONNECTOR FUNCTIONS

The panel with the dashboard lead-through connectors is divided into four columns. Connectors of the same colour are in the same column.

Pattern for dashboard lead-through connectors:
< 0E581142

Column A: **Colour: yellow**

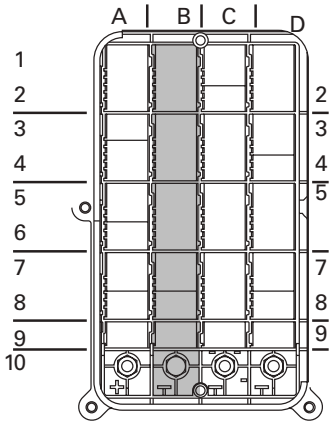
Row number	Function	Number of pins
1 - 2	Not in use	21
3	Not in use	6
4	Application connector, engine speed control	12
5	Fuel filter	6
6	Cab heater	12
7	Not in use	6
8	Not in use	12
9	Thermoline	2
10	Power supply before contact (1000)	1



E501435

Column B: **Colour: grey**

Row number	Function	Number of pins
1 - 2	Allison gearbox	21
3 - 4	Engine wiring	21
5 - 6	ABS or EBS, rear axle	21
7	ECAS, front axle	6
8	ECAS, rear axle	12
9	ABS, drawn vehicle	2
10	Earth	1



E501436

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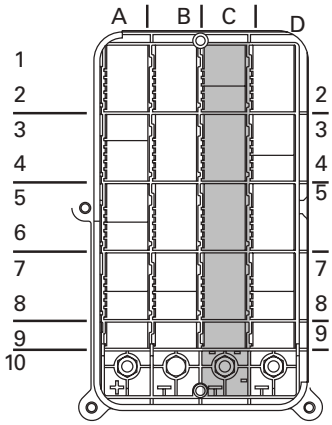
Column C: **Colour: green**

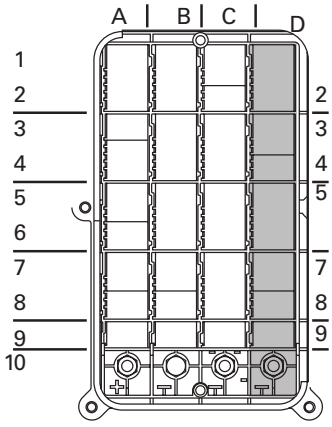
Row number	Function	Number of pins
1 - 2	Allison gearbox	21
1	AGS wiring	6
2	Allison gearbox	12
3 - 4	Engine wiring	21
5 - 6	Chassis wiring	21
7 - 8	ABS or EBS, front axle	21
9	Mechanical lifting axle, FAS/FAG	6
10	Earth	1



E501437

Column D: **Colour: blue**

Row number	Function	Number of pins
1 - 2	Superstructure connector	21
3	Not in use	12
4	Main switch	6
5 - 6	Chassis/Gearbox	21
7	Not in use	6
8	Intarder	12
9	MTCO tachograph	6
10	Earth	1



E501438

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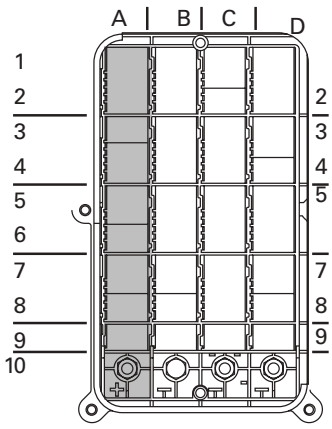
Pattern for dashboard lead-through connectors:
≥ **0E581142**

Column A: **Colour: yellow**

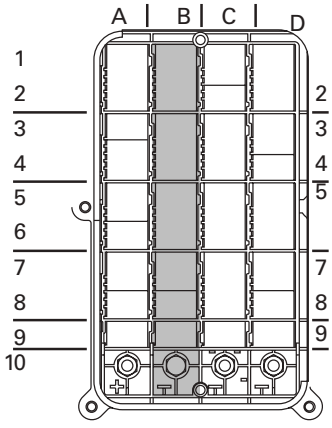
Row number	Function	Number of pins
1 - 2	EMAS	21
3	Not in use	
4	Application connector, engine speed control	12
5	Fuel filter	6
6	Cab heater	12
7	Chassis wiring	6
8	Second PTO operation	12
9	Thermoline	6
10	Power supply before contact (1000)	1



E501435

Column B: **Colour: grey**

Row number	Function	Number of pins
1 - 2	Allison or AS Tronic gearbox	21
3 - 4	Engine wiring	21
5 - 6	ABS or EBS, rear axle	21
7	ECAS, front axle	6
8	ECAS, rear axle	12
9	ABS, drawn vehicle	6
10	Earth	1



E501436

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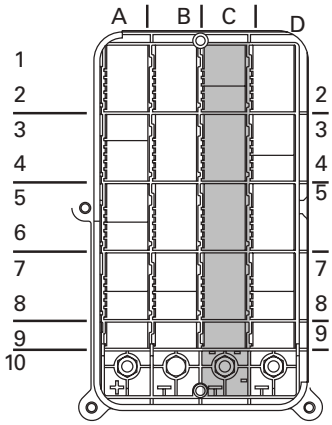
Column C: **Colour: green**

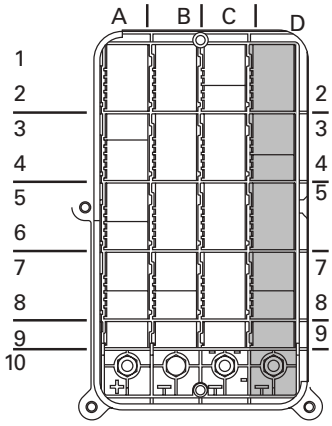
Row number	Function	Number of pins
1	AGS wiring	6
2	Allison-gearbox or tilt protection	12
3 - 4	Engine wiring	21
5 - 6	Chassis wiring	21
7 - 8	ABS or EBS, front axle	21
9	Mechanical lifting axle, FAS/FAG	6
10	Earth	1



E501437

Column D: **Colour: blue**

Row number	Function	Number of pins
1 - 2	Superstructure connector	21
3	Not in use	12
4	Main switch	6
5 - 6	Chassis/MTCO wiring	21
7	Not in use	
8	Intarder	12
9	Cab lock	6
10	Earth	1



E501438

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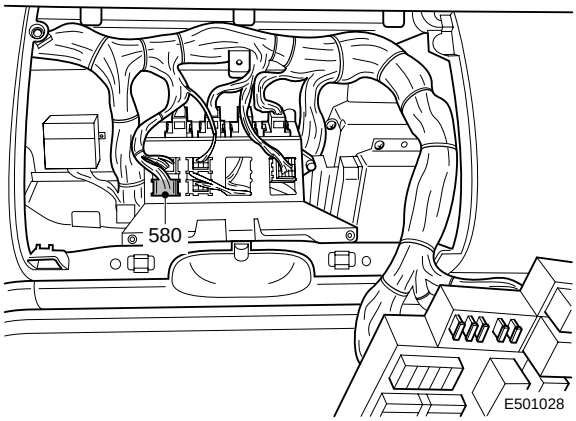
1.4 CONNECTION OF ACCESSORIES VIA THE ACCESSORIES CONNECTOR

A 6-pin green accessories connector (connector no. 580 = A027) that is connected to the dashboard wiring harness has been fitted below the central PCB.



The following signals are available there:
Pin pattern for wiring harness connector 580:

Pin no.	Wire no.	Description
1	1154	Power supply before contact
2	1258	Power supply after contact
3	3412	Cab locking signal
4	3157	Engine running signal
5	M	Earth
6	M	Earth

NOTE: The power supply **before** contact is fuse-protected via fuse E142. The power supply **after** contact is fuse-protected via fuse E163. Both 25 A. The power supply to the spotlights, rotating beam and cooler box (among others) is also via fuse E142.

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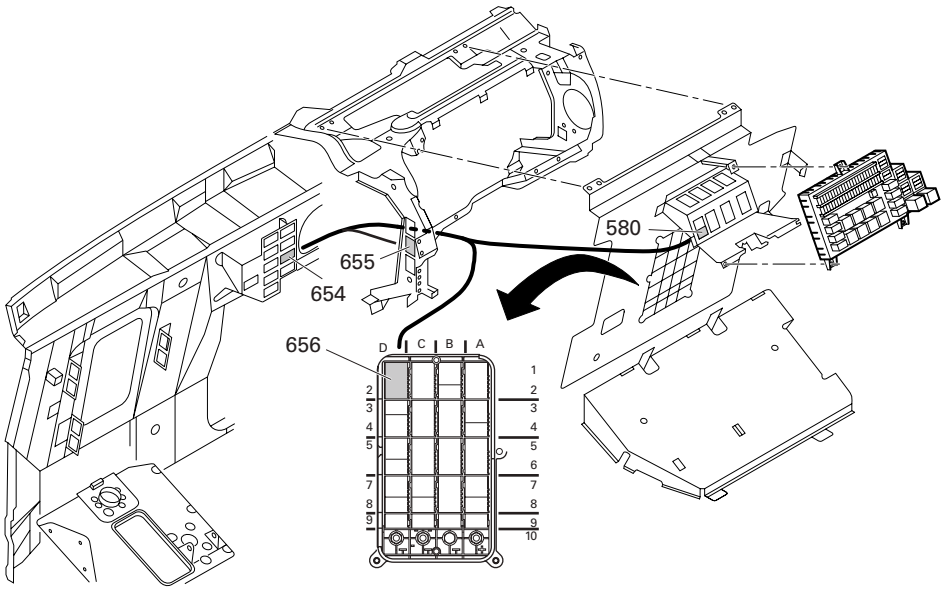
Application connector 656 for superstructure functions (with 12 spare wires) is optional. Only if this option is selected is a wiring harness fitted from the connector under the PCB (connector no. 580) to the connector lead-through (connector no. 656) and to the connector behind the cover of the radio panel (connector no. 654) and the connector behind the heater panel cover (connector no. 655).



E501029

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Pin pattern for wiring harness connector 656:

Pin no.	Wire no.	Description
1	M	Earth
2	M	Earth
3		
4	3412	Cab locking signal
5	spare 1	Spare 1
6	spare 2	Spare 2
7	spare 3	Spare 3
8	spare 4	Spare 4
9	spare 5	Spare 5
10	spare 6	Spare 6
11	spare 7	Spare 7
12	spare 8	Spare 8
13	spare 9	Spare 9
14	spare 10	Spare 10
15	spare 11	Spare 11
16	spare 12	Spare 12
17		
18		
19	3157	Engine running signal
20	1154	Power supply before contact
21	1258	Power supply after contact

NOTE: The power supply **before** contact is fuse-protected via fuse E142. The power supply **after** contact is fuse-protected via fuse E163. Both 25 A. The power supply to the cooler box and connector 597 (if present) is also via fuse E142. The power supply to connector 597 is also via fuse E163.

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Pin pattern for wiring harness connector 654:

Pin no.	Wire no.	Description
1	spare 1	Spare 1
2	spare 2	Spare 2
3	spare 3	Spare 3
4	spare 4	Spare 4
5	spare 5	Spare 5
6	spare 6	Spare 6
7		
8		
9		

Pin pattern for wiring harness connector 655:

Pin no.	Wire no.	Description
1	spare 7	Spare 7
2	spare 8	Spare 8
3	spare 9	Spare 9
4	spare 10	Spare 10
5	spare 11	Spare 11
6	spare 12	Spare 12

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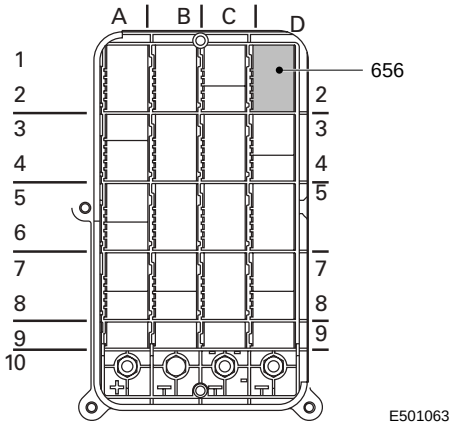
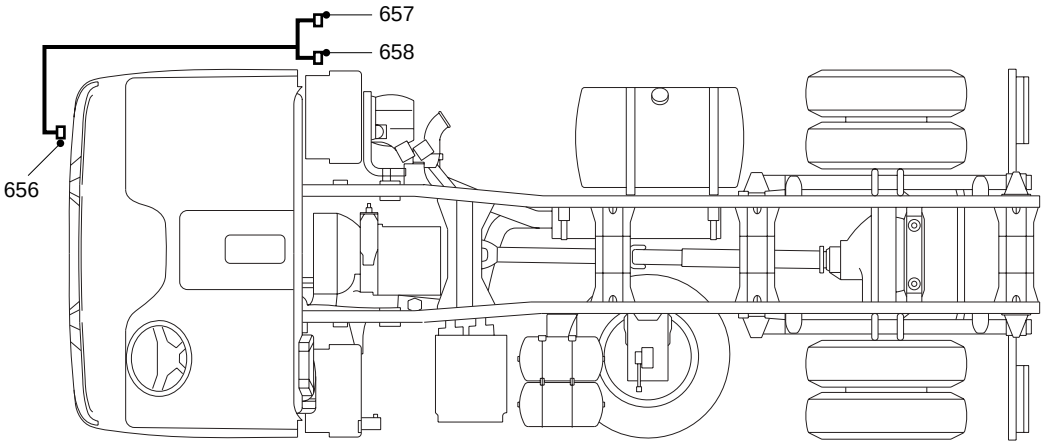
1.5 DASHBOARD LEAD-THROUGH CONNECTOR FOR SUPERSTRUCTURE FUNCTIONS APPLICATION CONNECTOR

Application connectors for superstructure functions are optional. Dashboard lead-through connector 656 is present only if this option has been selected.

Dashboard lead-through connector 656 is connected to a wiring harness outside the cab for application connectors 657 and 658.





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Pin pattern for wiring harness connector 656:

Pin no.	Wire no.	Description
1	M1	Earth
2	M2	Earth
3		
4	3412	Cab locking signal
5	spare 1	Radio compartment spare wire 1
6	spare 2	Radio compartment spare wire 2
7	spare 3	Radio compartment spare wire 3
8	spare 4	Radio compartment spare wire 4
9	spare 5	Radio compartment spare wire 5
10	spare 6	Radio compartment spare wire 6
11	spare 7	Heater panel spare wire 7
12	spare 8	Heater panel spare wire 8
13	spare 9	Heater panel spare wire 9
14	spare 10	Heater panel spare wire 10
15	spare 11	Heater panel spare wire 11
16	spare 12	Heater panel spare wire 12
17	3700	CAN-L (leads to dashboard lead through)
18	3701	CAN-H (leads to dashboard lead through)
19	3157	Engine running signal
20	1154	Power supply before contact
21	1258	Power supply after contact

NOTE: The power supply **before** contact is fuse-protected via fuse E142. The power supply **after** contact is fuse-protected via fuse E163. Both 25 A. The power supply to the cooler box and connector 597 (if present) is also via fuse E142. The power supply to connector 597 is also via fuse E163.

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Connectors 657 and 658 are under the cab on the co-driver's side in SL and SH cabs or behind the cab on the co-driver's side in D cabs.

Pin pattern for wiring harness connector 657:

Pin no.	Wire no.	Description
1	spare 1	Spare wire 1
2	spare 2	Spare wire 2
3	spare 3	Spare wire 3
4	spare 4	Spare wire 4
5	spare 5	Spare wire 5
6	spare 6	Spare wire 6
7	spare 7	Spare wire 7
8	spare 8	Spare wire 8
9	spare 9	Spare wire 9
10	spare 10	Spare wire 10
11	spare 11	Spare wire 11
12	spare 12	Spare wire 12

Pin pattern for wiring harness connector 658:

Pin no.	Wire no.	Description
1	1154	Power supply before contact
2	1258	Power supply after contact
3	3157	Engine running signal
4	3412	Cab locking signal
5	3700	CAN - L
6	3701	CAN - H
7	M	Earth
8	M	Earth

NOTE: The power supply **before** contact is fuse-protected via fuse E142. The power supply **after** contact is fuse-protected via fuse E163. Both 25 A. The power supply to the cooler box and to connector 597 is also via fuse E142. The power supply to connector 597 is also via fuse E163.

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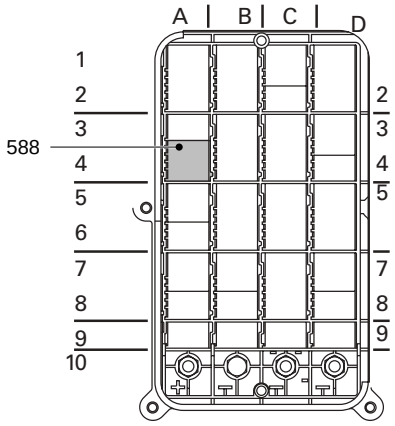
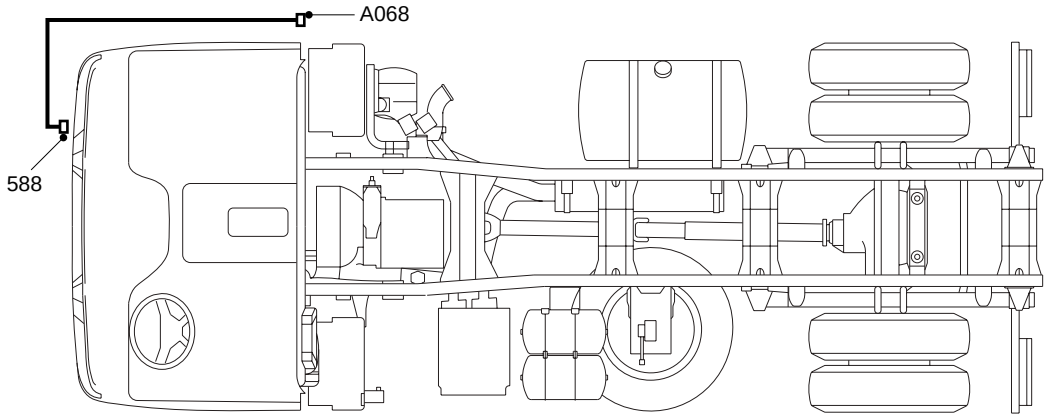
1.6 DASHBOARD LEAD-THROUGH CONNECTOR FOR ENGINE SPEED CONTROL APPLICATION CONNECTOR

The application connector for engine speed control is optional: (connector A068).

Dashboard lead-through connector 588 is connected to a wiring harness outside the cab for application connector A068.



E501032



E501031

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Connector A068 is under the cab on the co-driver's side in SL and SH cabs or behind the cab on the co-driver's side in D cabs.

Pin pattern for wiring harness connector A068:

Pin no.	Wire no.	Description
1	M	Earth
2	9029	Earth
3	3003	Engine speed signal
4	3039	Vmax signal
5	3141	Signal 'SET –' (NOT for ECS-DC3)
6	3142	Signal 'SET +' (NOT for ECS-DC3)
7	3143	'Engine speed control permitted' signal
8	3144	Signal 'SET +' (NOT for ECS-DC3)
9	3145	N2 signal
10	3146	N3 signal
11	4594	PTO remote control
12	1240	Power supply after contact

In the dashboard lead-through, the wiring harness coming from connector A068 is connected to the dashboard wiring harness via connector no. 588 at location A4.

Pin pattern for wiring harness connector 588:

Pin no.	Wire no.	Description
1	M	Earth
2	9029	Earth
3	3003	Engine speed signal
4	3039	Vmax signal
5	3141	Signal 'SET –' (NOT for ECS-DC3)
6	3142	Signal 'SET +' (NOT for ECS-DC3)
7	3143	'Engine speed control permitted' signal
8	3144	Signal 'N1 variable' (NOT for ECS-DC3)
9	3145	N2 signal
10	3146	N3 signal
11	4594	PTO remote control
12	1240	Power supply after contact

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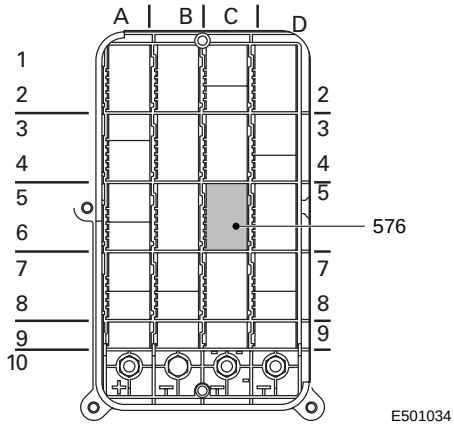
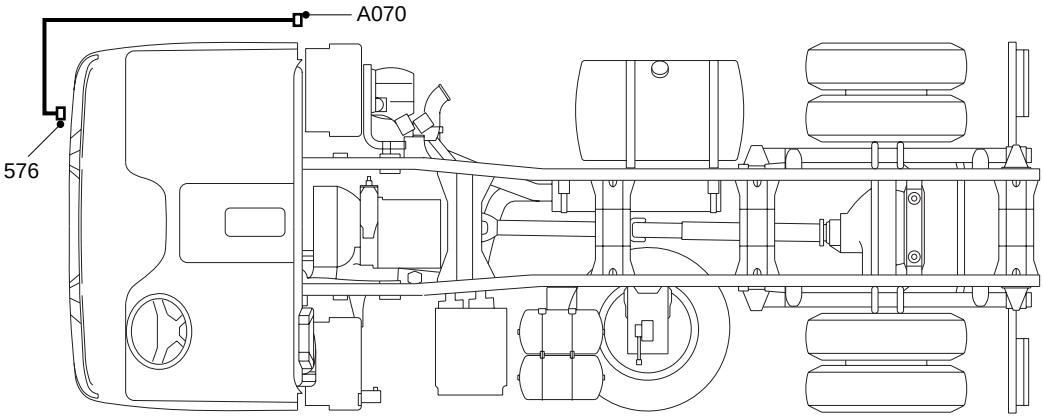
1.7 DASHBOARD LEAD-THROUGH CONNECTOR FOR CHASSIS WIRING APPLICATION CONNECTOR

Application connector: A070. This is only fitted on FA vehicles.

Dashboard lead-through connector 576 is connected to a wiring harness outside the cab for chassis wiring application connector A070.





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Connector A070 is under the cab on the co-driver's side in SL and SH cabs or behind the cab on the co-driver's side in D cabs.

Pin pattern for wiring harness connector A070:

Pin no.	Wire no.	Description
1	1113	Power supply before contact
2	2102 2155	Superstructure lighting
3	4601	Stop light signal
4	4591	Reversing light signal
5	1264 3651	Alarm, power supply
6	3659	Alarm, superstructure/drawn vehicle
7	3660	Alarm, superstructure/drawn vehicle
8	M	Earth

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In the dashboard lead-through, the wiring harness coming from connector A070 is connected to the dashboard wiring harness via connector no. 576 at location C5/6.

Pin pattern for wiring harness connector 576:

Pin no.	Wire no.	Description
1	9005	Earth
2	3651	Superstructure/drawn vehicle alarm power supply
3	4591	Reversing light signal
4	2036	Left direction signal
5	2037	Right direction signal
6	2008	Left direction signal (semi-trailer)
7	2009	Right direction signal (semi-trailer)
8	2102	Left town light
9	2103	Right town light
10	2152	Rear fog lamp signal
11	2155	Work lamp
12	4601	Stop light signal
13	3408	Differential blocking signal
14	4517	Differential blocking signal
15	4518	Differential lock (inter-axle)
16	3503	Fuel level signal
17	4935	Cab heater signal
18	4936	Cab heater signal
19	1113	Power supply before contact
20	3659	Alarm, superstructure/drawn vehicle
21	3660	Alarm, superstructure/drawn vehicle

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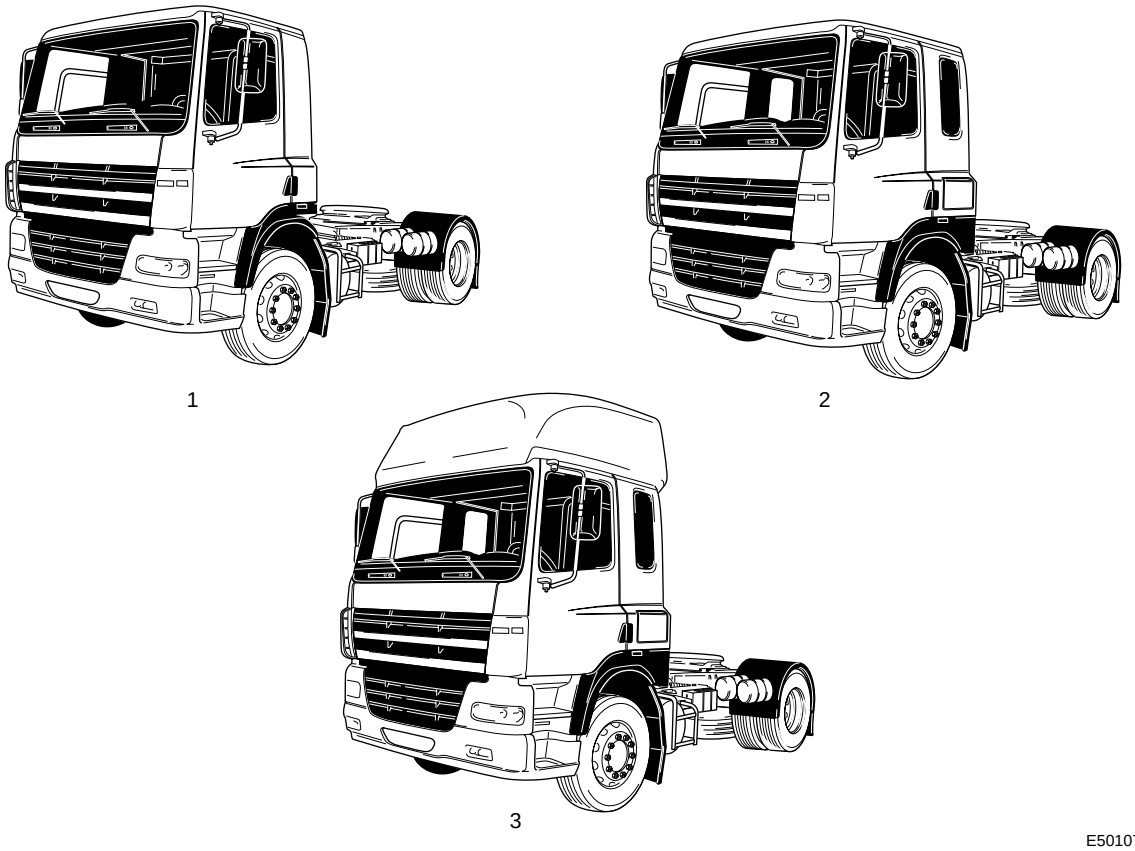
1.8 OVERVIEW OF CONNECTION POINTS IN ROOF CONSOLE

Cab versions



1. D cab
2. SL cab
3. SH cab

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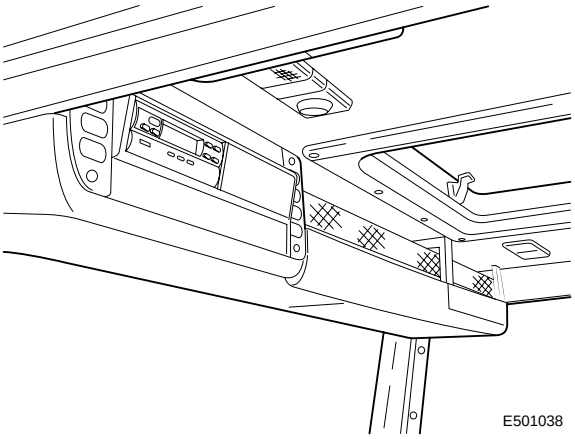
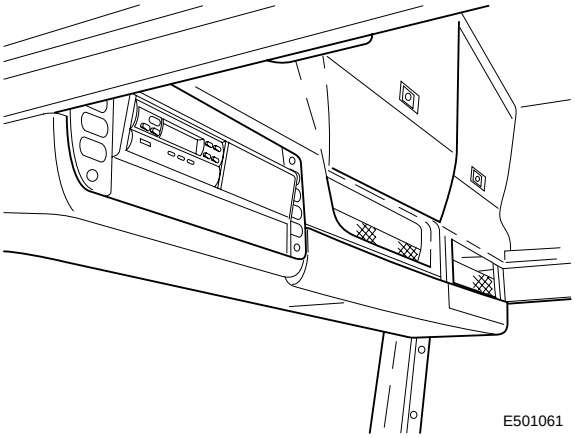
Roof console, D and SL cabs



Roof console, SH cab



The following connectors are standard in all three cab types:
1. Black connector with wires 1264 and 3482 for alarm/immobiliser LED (if NO alarm system is fitted).
2. Connector B026 (1108 and M) for the 12V connector for audio equipment (for example CB transmitter).
3. Connector no. 597 for 12-pin connector with various signals.

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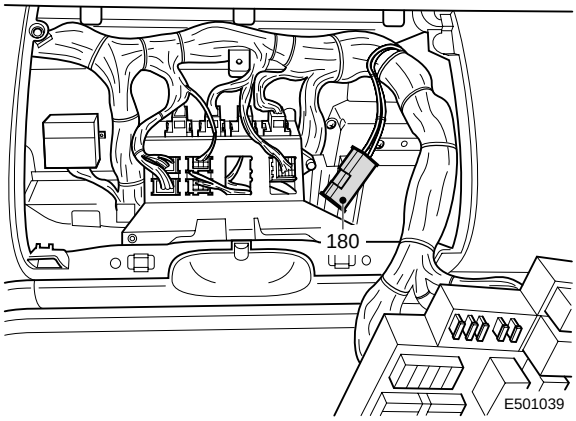
1.9 40 A CONNECTOR

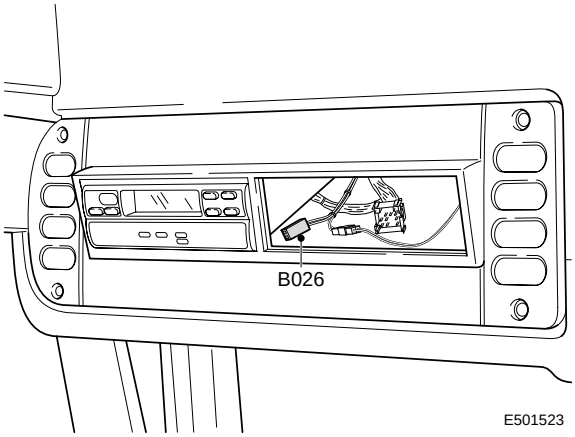
If current strengths of up to 40A are required, a wiring harness should be made according to the accompanying diagram. The necessary relay and fuses must also be added that may **not** be fitted to the printed circuit board. Wires must have a diameter of at least 6 mm^2.

The wiring harness should be connected to the 40A connector. This connector (A) is a 2-pin connector. The supply voltage for this connector is branched from the power supply before contact via fuse E168. This fuse is fitted as standard in a fuse holder on the edge of the central PCB.



1.10 CONNECTOR FOR 12V CONNECTION IN ROOF CONSOLE

In the roof console is a white 2-pin connector (B026). This is intended for connecting a CB set. This connector has the following wires: 1108 and earth.



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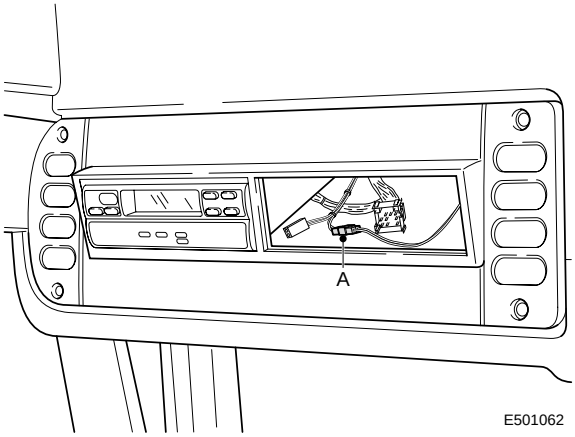
1.11 CONNECTOR FOR ALARM/IMMOBILISER LED IN ROOF CONSOLE

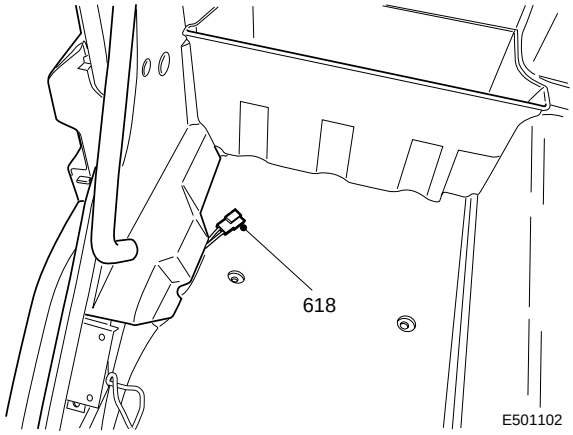
In the roof console is a black 2-pin connector (A). This is for connecting an LED alarm. This LED alarm is fitted as standard if the vehicle does **not** have an alarm system. This connector has the following wires: 1264 and 3482.



1.12 CONNECTOR FOR COOLER BOX

The wiring for the cooler box has been fitted as standard ready for use behind the door pillar trim (connector no. 618) on the co-driver's side. This connector consists of the following wires: 1154 and M.
The cooler box (if present) is connected here to the connector on the co-driver's side.
The lighting for the tool compartment is connected here to the connector on the co-driver's side.

NOTE: The power supply before contact is fuse-protected via fuse E142 (25 A). The power supply for the superstructure functions dashboard lead-through connector (if present) is also via these fuses.



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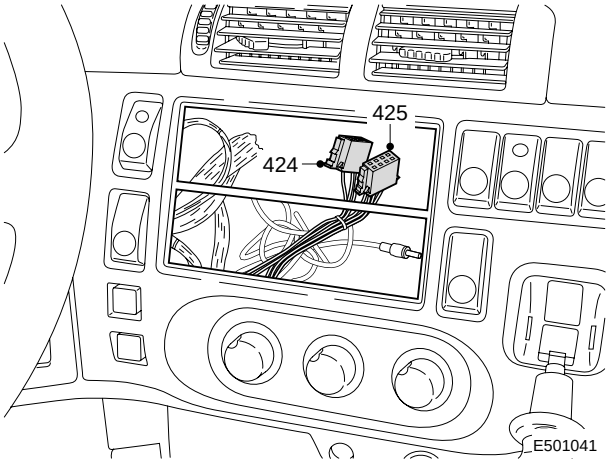
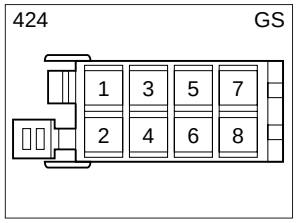
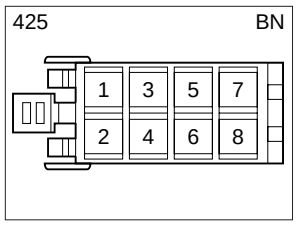
1.13 CONNECTORS FOR CONNECTING THE RADIO

Radio connection
Behind the radio panel there is a connector (connector no. 424) (to ISO-standard) for the radio connection; this connector is provided with a power supply before contact of 12 V/10 A (20 A) (1108) and earth. The wiring to the door, A pillar and rear wall for the loudspeakers (connector 425) has also been fitted as standard ready for use. If tweeters are fitted, a separating filter should be fitted.

Connectors for connecting the radio.





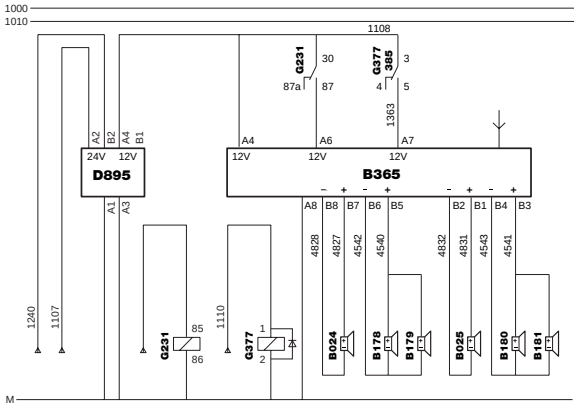


424 Power supply to radio
425 Loudspeakers for radio

DISPLAY LIGHTING DIMMING

Philips and Grundig radios
If the radio has display lighting (search lighting), it can switch on at the same time as the vehicle lights are switched on. The display lighting can be dimmed by connecting relay G231 in accordance with the diagram.

Relay G231 should be connected to search lighting wire 2630.



E501008

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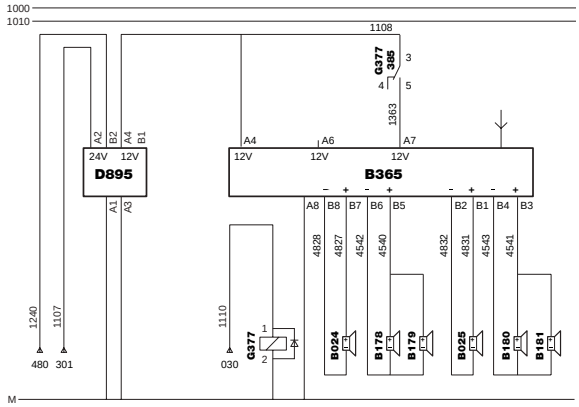
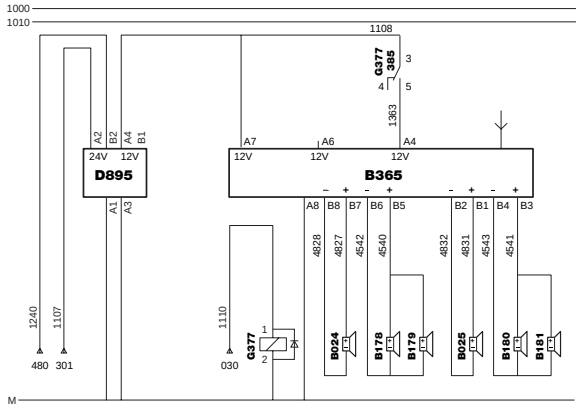
Philips radio station memory
Wire 1110 is switched by relay G178 in the 'accessories' ignition/starter switch position. This relay (G178) then switches relay G377 and, as a result, the radio is connected to the 12V power supply through wire 1108.



E501009

Grundig radio station memory
Wire 1110 is switched by relay G178 in the 'accessories' ignition/starter switch position. This relay (G178) then switches relay G377 and, as a result, the radio is connected to the 12V power supply through wire 1108.

Wires 1108 and 1363 in connector no. 424 (the 'iso connector') must be reversed. (see illustration)



E501010

The wiring for the speakers in the rear wall of the SL and SH cabs has been fitted in the speaker positions ready for use.
The wiring for tweeters has been fitted ready for use in the A pillar under the dashboard.

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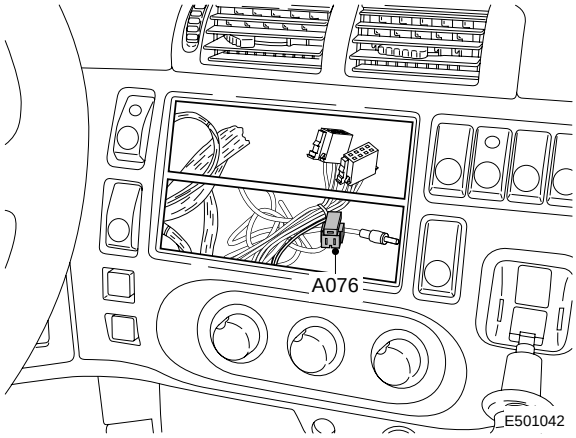
1.14 CONNECTOR FOR CONNECTING THE TELEPHONE

Telephone connection
There is space for a telephone connection on the right side of the radio panel.
A white 3-pin connector (A076) is fitted behind the radio panel as standard.



Pin no.	Wire no.	Description
1	1108	Power supply before contact (12 V)
2	1353	Power supply before contact (12 V/25 mA)
3	M	Earth

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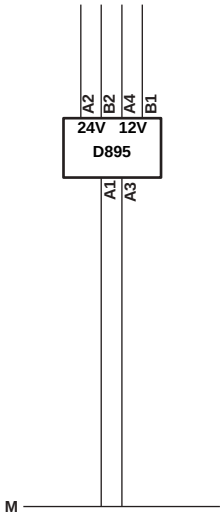
TELEPHONE STATION MEMORY IN COMBINATION WITH 24V/12V 10A OR 20A CONVERTER

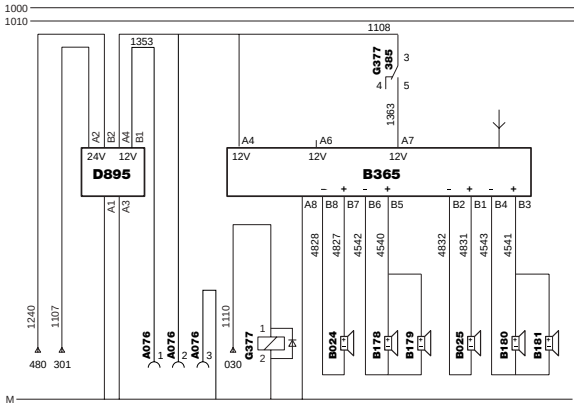
This converter is available in two versions:
24 V/12 V (10 A + 25 mA) or:
24 V/12 V (20 A + 25 mA)
They are connected in the same way.

The converter has two separate inputs and outputs:

24V input	12V output	Max. current strength
A2	A4	10 or 20 A
B2	B1	25 mA



E500726



E501011

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1. GENERAL

1.1 LIST OF ABBREVIATIONS

Abbreviation	Explanation	Translation/description
ABS/ASR-D	Anti Blocking System/Anti Slip Control - version D	Antiblokkeersysteem/Antislipregeling, versie D
ACH-E	Additional Cab Heater - Eberspächer	Standverwarming - Eberspächer
ACH-W	Additional Cab Heater - Webasto	Standverwarming - Webasto
AGC-A	Automatic Gearbox Control - Allison	Besturing automatische versnellingsbak - Allison
AGS	Automatic Greasing System	Automatisch smeersysteem
AIRCO	Air conditioning	Airconditioning
ALS-S	Alarm system Scorpion	Alarmsysteem Scorpion
ASR	Anti Slip Control	Antislipregeling
CAN	Controller Area Network	Controller Area Network
CCU	CAN Connection Unit	CAN-verbindingsunit
CDB	Central Distribution Board	Centraalkast CF-serie
CDS	Central door locking	Centrale portiervergrendeling
CXB	CAN extension box	CAN-extensiebox
ECS-DC3	Engine Control System - DAF/Cummins	Motormanagementsysteem DAF/Cummins
DAVIE XD	DAF Vehicle Investigation Equipment version XD	DAF-voertuigdiagnose-apparaat versie XD
DEB	DAF Engine Brake	DAF-motorrem
DIP-4	DAF Instrument Pack	DAF-instrumentenpaneel
DVB	Connection	Doorverbinding

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Abbreviation	Explanation	Translation/description
EBS	Electronic Brake System	Elektronisch remsysteem
ECAS-2	Electronically Controlled Air Suspension - version 2	Elektronisch geregeld luchtveersysteem - versie 2
ECAS3	Electronically Controlled Air Suspension system - version 3	Elektronisch geregeld luchtveersysteem - versie 3
ECS-DC3	Engine Control System - DAF/Cummins	Motormanagementsysteem DAF/Cummins
EMAS	Electronically controlled multi axle steering	Elektronisch geregelde naloop assturing
EVS	Electronic Vehicle Steering system	Elektronisch voertuigstuursysteem
NMV	Engine specific power take off	Motor-PTO
NRM	Noise reduction module	Geluidsreducerende module
PTO	Power Take Off	Krachtafnemer
RAS-EC	Rear Axle Steering - Electronically Controlled	Electronisch geregelde naloop assturing
Tacho MTCO	Modular Tachograph	Modulaire tachograaf
UPEC	Unit Pump Electronically Controlled	Elektronisch gestuurde pompunit
VIC	Vehicle Intelligence Centre	Voertuig intelligente centrale
VLG/ ADR/ GGVS/ PETREG/ RTMDR	Overland transport of hazardous substances	Vervoer gevaarlijke stoffen

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2. MARKING OF ELECTRICAL WIRING

INTRODUCTION

This standard sets out specifications for the uniform use of markings on electrical wiring.

The marking system consists of a numerical system and a colour coding system, which ensure a clear wiring layout and prevents faulty connections and manufacturing errors.

The marking system does not apply to vehicles subject to special conditions, such as military vehicles.

Numerical and colour coding
Each numerical code consists of four digits, the first of which refers to the main group and to the colour.

Main groups

Power supply (red)	
1000 to 1099	Voltage generation
1100 to 1199	Power supplies before ignition
1200 to 1499	Power supplies after ignition
Lighting (yellow)	
2000 to 2099	Direction indicator lights and alarm light
2100 to 2599	Vehicle external lights
2600 to 2999	Vehicle interior lighting
Warning and inspection functions (blue)	
3000 to 3399	Engine functions
3400 to 3999	Vehicle functions
Consumers (black)	
4000 to 4499	Starting, stopping, engine, glow functions
4500 to 5499	Vehicle functions
5500 to 5999	Automatic transmission
Special applications (colour as desired)	
6000 to 6999	
Earth connections (white)	
Not marked	
9000 to 9499	Test and signal earth

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I-CAN wiring (twisted)

3565	CAN-L (yellow)
3566	CAN-H (grey)

V-CAN wiring (twisted)

3700	CAN-L (yellow)
3701	CAN-H (blue)

Notes:
- The “M” with serial number coding on earth wiring is used for production-related reasons.
- In the case of straight splicing of the wiring (cascading), the numerical codes are shown on each separate wire followed by a serial letter.

Earth connections
The application of electronic systems has made it necessary to divide the earth connections into groups. There is a distinction to be made between two different types of earth connection:
- switching earth
- test and signal earth.

The switching earth is the conventional type of earth.
The test and signal earth is used exclusively for electronic systems.
The wiring colour for both types of earth is white, but the test and signal earth wiring is marked with numerical codes (from 9000 to 9500).

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NEVER USE THE TEST AND SIGNAL EARTH WHEN FITTING AN ELECTRICAL COMPONENT

If you do this, electronic components may not work correctly.
If an electronic component needs to be connected, the earth for this system must be connected to the central earth connection in the cab.
The connection point is located in the dashboard connector lead-through.

Abbreviations used in colour coding

Colour	Abbre-viation	Colour	Abbre-viation
red	rd	yellow	gl
brown	bn	white	wt
green	gn	grey	gs
blue	bw	black	zt
orange	oe		

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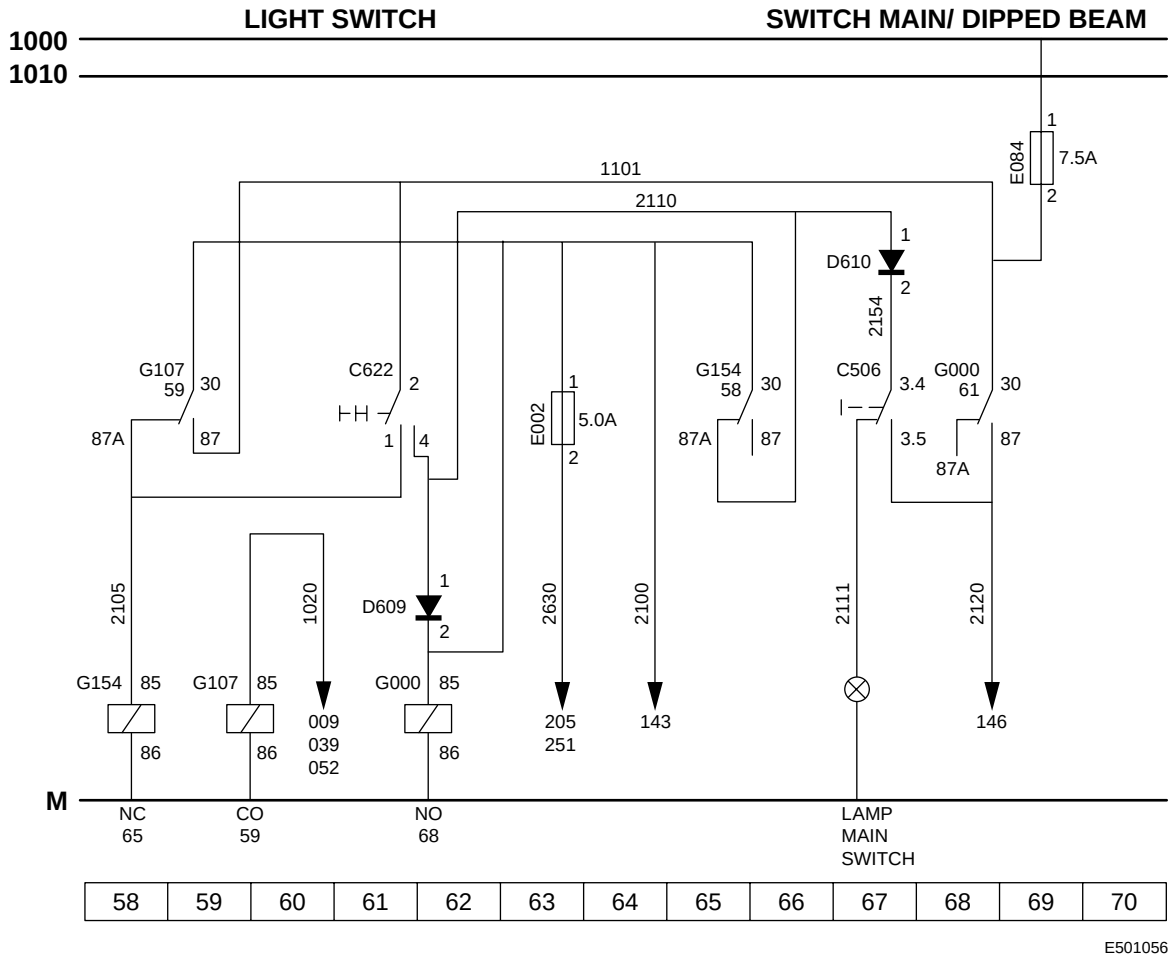
3. READING CIRCUIT DIAGRAMS

The circuit diagram is intended to show the various circuits in the simplest way possible. Symbols are used to do this.



1. "1000" and "1010" is shown at the top left of the diagram.
   These stand for:
   1000 = supply before ignition.
   1010 = supply after ignition.

2. "M" is shown at the bottom left of the diagram.
   This stands for:
   M = earth connection.

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3. To make it easier to find your way around the circuit diagram, a “search bar” is included at the bottom, which contains numbers.
   These numbers are called location numbers.

   In the legend to the circuit diagram, the description of the basic code (ECN) is followed by the relevant location number. This means that a specific component can immediately be located in the diagram.

4. There is an arrow above location numbers 60, 63, 64, and 68 in the diagram example. Below this arrow is a number. This number refers to the location number on the search bar where you can find the relevant wire number.

5. Beneath the “M” (earth connection) line are found the “NC” codes relating to relay G154, the “CO” codes relating to relay G107, and “NO” codes relating to relay G000.
   These codes stand for:
   NC = **n**ormally **c**losed (= break contact)
   CO = **c**hange **o**ver (= changeover contact)
   NO = **n**ormally **o**pen (= make contact)

   These contacts can be found at the location numbers shown beneath the codes “NC”, “CO” and “NO”.

   At the relay contacts shown in the diagram, you will also find the location numbers indicating the relay coil locations.

6. In the circuit diagram, you will find the basic codes (for example, E002). What these codes stand for can be found in the legend to the relevant circuit diagram.

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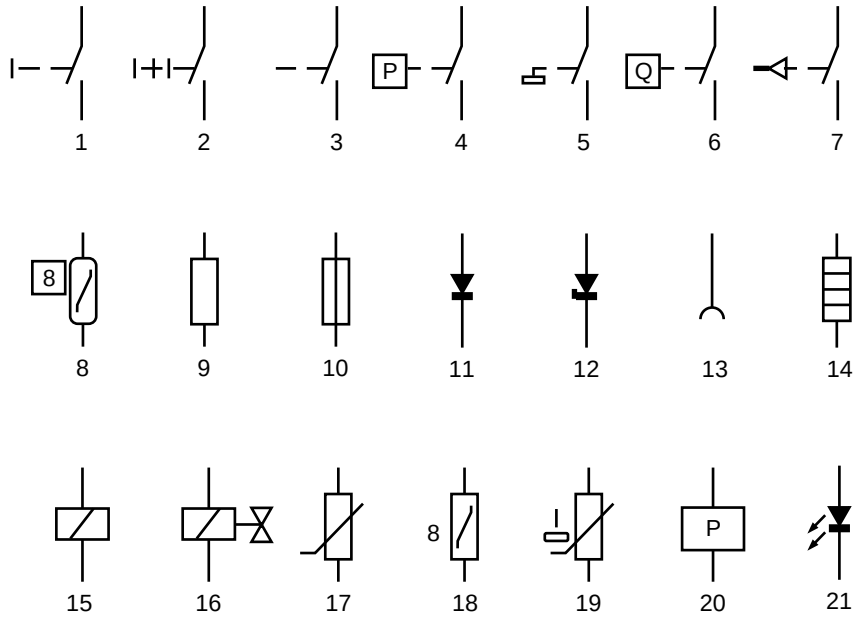
7. If the wire numbers remain unchanged, these will not be repeated in the circuit diagram.
   For example, in the sample diagram, wire 1101 is connected to connection point 87 of relay contact G107, but also to connection point 2 of component C622.
   Wire 2100 (at location number 64) is connected to connection point 30 of relay G154, but also to connection point 85 of relay G000 etc.

Symbols used



E500135

1. Switch, manually operated
2. Switch, manually operated (multi-position)
3. Switch, manually operated (spring-loaded)
4. Switch, pressure-controlled (pneumatic or hydraulic)
5. Switch, float position
6. Switch, liquid flow
7. Pressure switch
8. Switch, temperature-dependent
9. Resistor
10. Fuse
11. Diode
12. Zener diode
13. Contact socket (for example, for trailer connection)
14. Heating element
15. Relay
16. Electropneumatic valve
17. Resistor, voltage-dependent
18. Resistor, temperature-dependent
19. Resistor, fluid level-dependent
20. Microprocessor
21. LED

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4. READING SECTION DIAGRAMS

EXPLANATION OF THE ITEM NUMBERS IN THE SECTION DIAGRAMS

In the section diagram only information functional in this section diagram is shown in detail.

1. The wiring is shown in the same colours as the wiring in the vehicle.
2. The wire numbers are as they are printed on the wiring in the vehicle.
   Suffixes to wire numbers, such as A, B, C etc., have been omitted.
3. Basic code of a component. For component descriptions, see the legend to the diagram. For more information, see the relevant section diagram.
4. Number of the wire connection point or the PCB track on the component.
5. The basic code of the connector and the connection point on this connector.
6. The symbols indicate which system or component is being referred to (in most cases, the symbol is also shown on the lens of the warning lamp or the switch).
7. PCB tracks.
8. The central box and the instrument panel PCBs are grey.
9. Removable components are shown in white.

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10. Reference to the component with connection point and to the section (section diagram) which gives further information about this component.

G178 85
7

G178	=	Basic code number of the component
85	=	Connection point on the component
7	=	Reference to section diagram 7

11. **ATTENTION!** The vehicle may differ here, because of different specifications. Always consult the legend to the diagram.
12. The housing of this component is connected to earth. The line shown is not a wire, therefore.
13. Search bar numbers.
14. Section diagram number as well as section number.
15. Relation to the circuit diagram.

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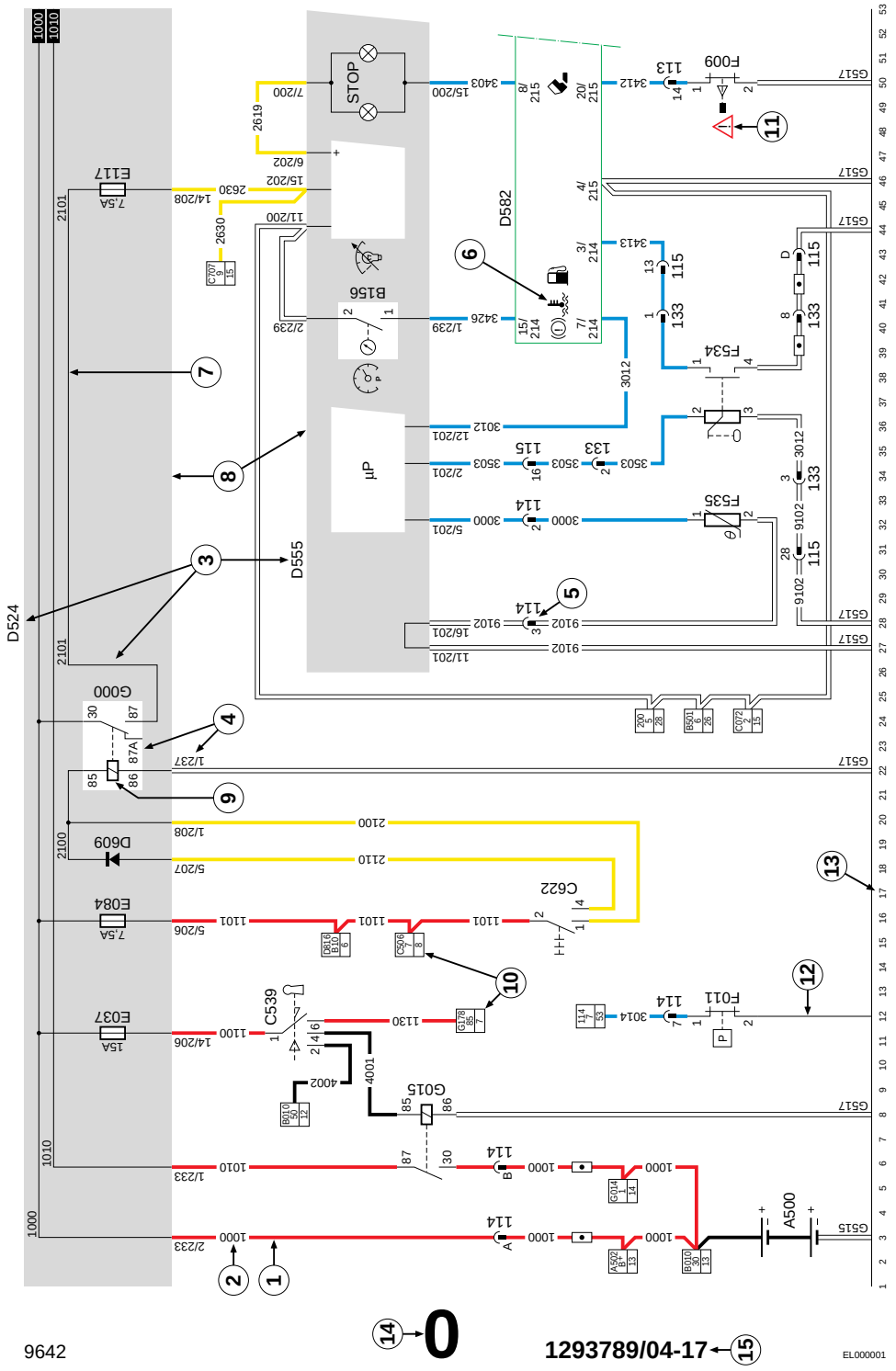

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1. GENERAL LOCATION OF COMPONENTS

1.1 INTRODUCTION

This main group contains an overview of components that do **not** occur in a system manual.
The location of system components is shown in the appropriate system manual.

There is a sticker in the central box indicating what relays, diodes and fuses can be found on the PCB.

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1.2 LOCATION OF COMPONENTS IN RELATION TO CIRCUIT DIAGRAM: 1358030/15

Column 1 = Basic codes of component
Column 2 = Description
Column 3 = Location
Column 4 = page number reference

1	2	3	4
A000	FA drawn vehicle socket (7-pin)	Chassis rear end	5
A001	Socket, rear fog lamp, reversing light, FT trailer (7-pin)	Behind cab	5
A002	FT drawn vehicle socket (7-pin)	Behind cab	5
A003	Socket, rear fog lamp, reversing light, FT trailer central power supply (7-pin)	Behind cab	5
A004	Socket, ABS/EBS, FA drawn vehicle (7-pin)	Chassis rear end	5
A005	Socket, ABS/EBS, FT drawn vehicle (7-pin)	Behind cab	5
A007	24V socket, 2-pin	Under radio panel, driver's side	8
A021	Diagnostics socket (16-pin)	Under step-up bracket, co-driver's side	1
A076	Telephone socket	Behind radio panel cover	4
A510	Alarm system battery	Under foot rest, co-driver's side	2
B015	Heater unit with resistor	Middle of dashboard	6
B026	CB set connector	In roof console, driver's side	4
B042	Air dryer heating element	On APU unit, under cab, co-driver's side	6
B176	Reversing buzzer	In rearmost chassis cross member	3
B182	Thermoline heating element	Along side member, co-driver's side next to battery pack	5
B241	Fuel filter/water separator heating element sensor	Rear of cab, driver's side	5
B243	Cross-axle differential lock operation valve	In chassis side member, above rear axle, driver's side	3
B251	Neutral position buzzer, cab tilting	Co-driver's side, front of stepwell	3

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1	2	3	4
C854	Chassis main switch	In housing, chassis side member, driver's side	5
D529	Electronic unit, ECAS remote control	Left of seat console, driver's side	6
D609	Light switch diode	On PCB print track, central box	1
D610	Diode, main beam/dipped beam	On PCB print track, central box	1
D710	Interior lighting diode to prevent feedback to driver's side switch	On PCB print track, central box	1
D715	Alarm system LED	Underside of roof console	2
D782	Diode to prevent door locking feedback, driver's side	On PCB print track, central box	1
D783	Interior lighting diode, driver's side	On PCB print track, central box	1
D802	ECAS-2 (6x2) electronic unit	Front of attachment plate, central box	1
D814	UPEC electronic unit	On engine block, driver's side	7
D850	Electronic unit for ABS/ASC, D model	Front of attachment plate, central box	1
D851	Electronic unit, ECAS-3 (4x2)	Front of attachment plate, central box	1
D855	Electronic unit for water separator	Under dashboard radio panel, driver's side	6
D866	Electronic unit, automatic gearbox control (AGC-A)	On attachment plate under PCB, central box	1
D871	Electronic unit for Airtronic D2 cab heater	In front of storage compartment, behind driver's seat	6
D880	EBS electronic unit	Front of attachment plate, central box	1
D895	Electronic unit for (10 A) converter with power supply for radio memory	On attachment plate under PCB, central box	1
D900	Electronic unit, VIC-1	On attachment plate under PCB, central box	1

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1	2	3	4
D901	Electronic unit for Hydronic 10 cab heater	Behind cab, co-driver's side	5
D902	Electronic unit, ZF intarder with CAN	On attachment plate under PCB, central box	1
D903	Electronic unit, ECS-DC3	On engine block, driver's side	7
D905	Electronic unit for central door locking	Under tachograph in roof console, driver's side	4
D909	Electronic unit, ultrasonic alarm system	In roof console, driver's side	2
D910	Electronic unit, battery charger	Under foot rest, co-driver's side	2
D911	Electronic unit, alarm system (ALS-S)	On attachment plate under PCB, central box	1
D912	Electronic unit, immobiliser	Against steering column near ignition/starter switch	2
D924	Electronic unit for main switch	Chassis side member, driver's side	3
D929	Central PCB	Central box, co-driver's side	1
D931	Electronic unit, LED	On attachment plate under PCB, central box	1
D977	EBS electronic unit	On attachment plate under PCB, central box	1
E112	Fuse, glow warning lamp	Above glow plug relay	7
E153	Fuse, main switch for timer/engine stop/main switch power supply	In main switch electronic unit (D924)	5
E279	Fuse, generator voltage control ('S' connection)	Above starter motor relay (if there is **NO** main switch)	5
E279	Fuse, generator voltage control ('S' connection)	Next to main switch (if there is a main switch)	5
E286	Fuse, storage capacity (large capacity) (125 A)	On engine block bracket, driver's side	7
E501*	Operating switch, reversing light (no PTO)	Gearbox, driver's side	3

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1	2	3	4
E501**	Operating switch, reversing light (with N10 PTO)	Gearbox, driver's side	3
E509	Operating switch, air conditioning, low pressure	In evaporator pipe, on outside of cab, co-driver's side	8
E511	Stop light operating switch	Behind radio panel cover	4
E561	Gearbox gate protection operating switch	Gearbox, driver's side	3
E564	Operating switch, engine brake	On floor plate, driver's side	6
E566	Operating switch, Eberspächer Airtronic cab heater thermostat	In rear wall, driver's side	2
E569*	Neutral position switch for RHD	Gearbox, driver's side	3
E569**	Neutral position switch for LHD	Gearbox, driver's side	3
E570	Pneumatic switch, clutch PTO N10	Above clutch pedal	4
E575	Proximity switch, clutch	To left of clutch pedal	4
E579	Thermostat control switch for Eberspächer Hydronic cab heater	In rear wall, driver's side	2
E580	Control switch, Eberspächer Hydronic cab heater timer	In rear wall, driver's side	2
E581	Control switch, Eberspächer Airtronic cab heater timer	In rear wall, driver's side	2
F000	Control switch for parking brake	Behind radio panel cover	4
F006	Differential lock control switch, 1st differential	In chassis side member, above rear axle, co-driver's side	3
F087	Control switch, gearbox PTO	Gearbox, driver's side	3
F533	Speed sensor (4-pin, 1st)	Gearbox, driver's side	3
F603	Transmitter, ultrasonic	Under roof console, driver's side	2

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1	2	3	4
F604	Receiver, ultrasonic	Under roof console, co-driver's side	2
F651	Ambient temperature sensor	Behind bumper, driver's side	3
F652	Air pressure sensor	On air supply unit	6
F656	Coolant level sensor	Rear of expansion tank	3
F673	Sensor, engine oil level and temperature	In engine oil sump, driver's side	8
F676	Cab tilting cylinder sensor	Next to cab tilting cylinder in side member, co-driver's side	8
F686	Alarm system radar sensor	In roof console, driver's side	2
G014	Relay, glow element	On engine block, driver's side	7
G257	Recirculation valve micro-relay	Right-hand side of heater unit	6
G258	Recirculation valve micro-relay	Right-hand side of heater unit	6
G267	Air conditioning micro relay	Right-hand side of heater unit	6
G279	Air conditioning micro relay	Right-hand side of heater unit	6
G299	Relay, roof spotlights	In roof console, driver's side	8
G367	Relay, main switch power supply	In main switch electronic unit (D924)	5
G368	Relay, main switch earth	In main switch electronic unit (D924)	5
G535	CAN distribution block	On attachment plate under PCB, central box	1

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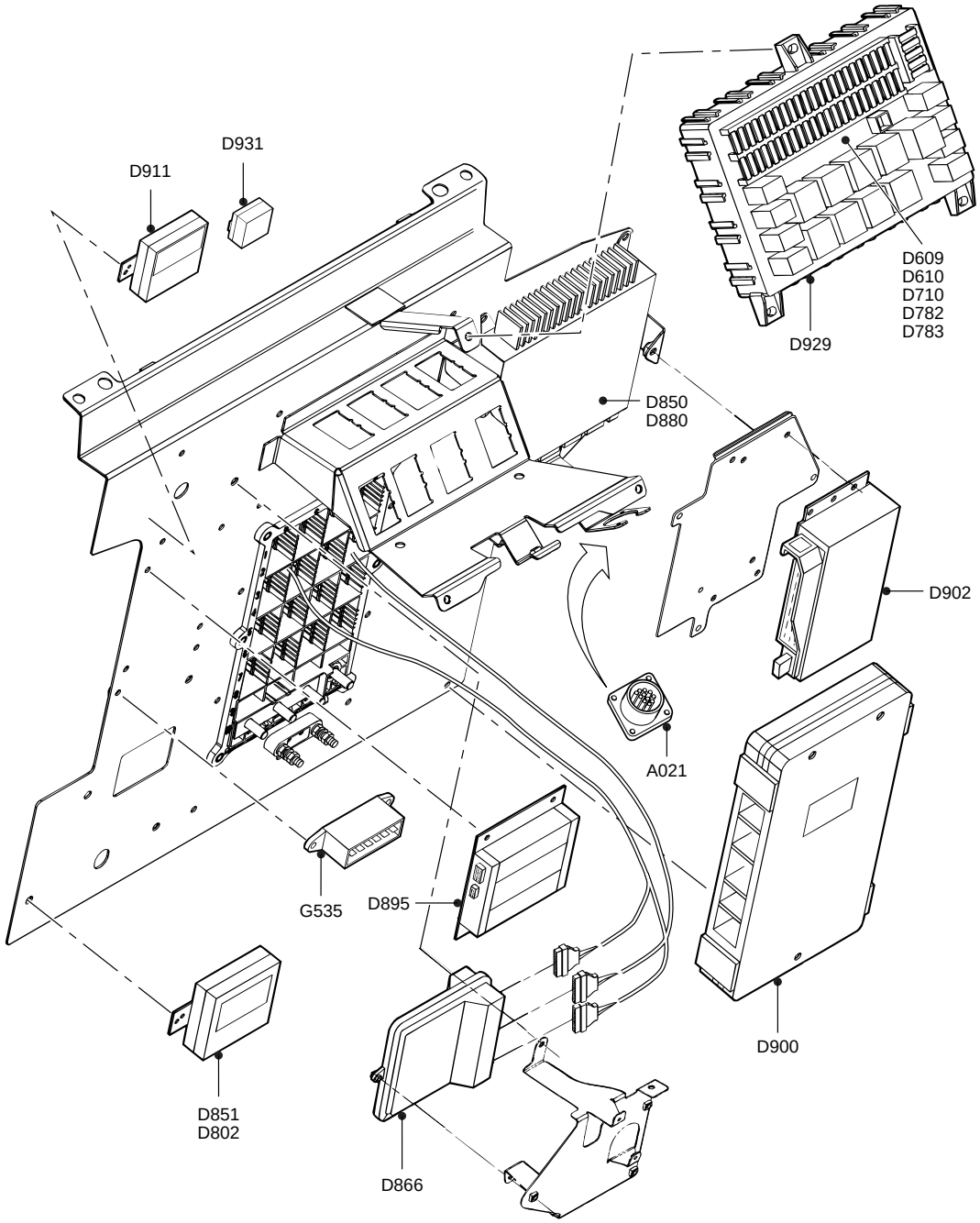

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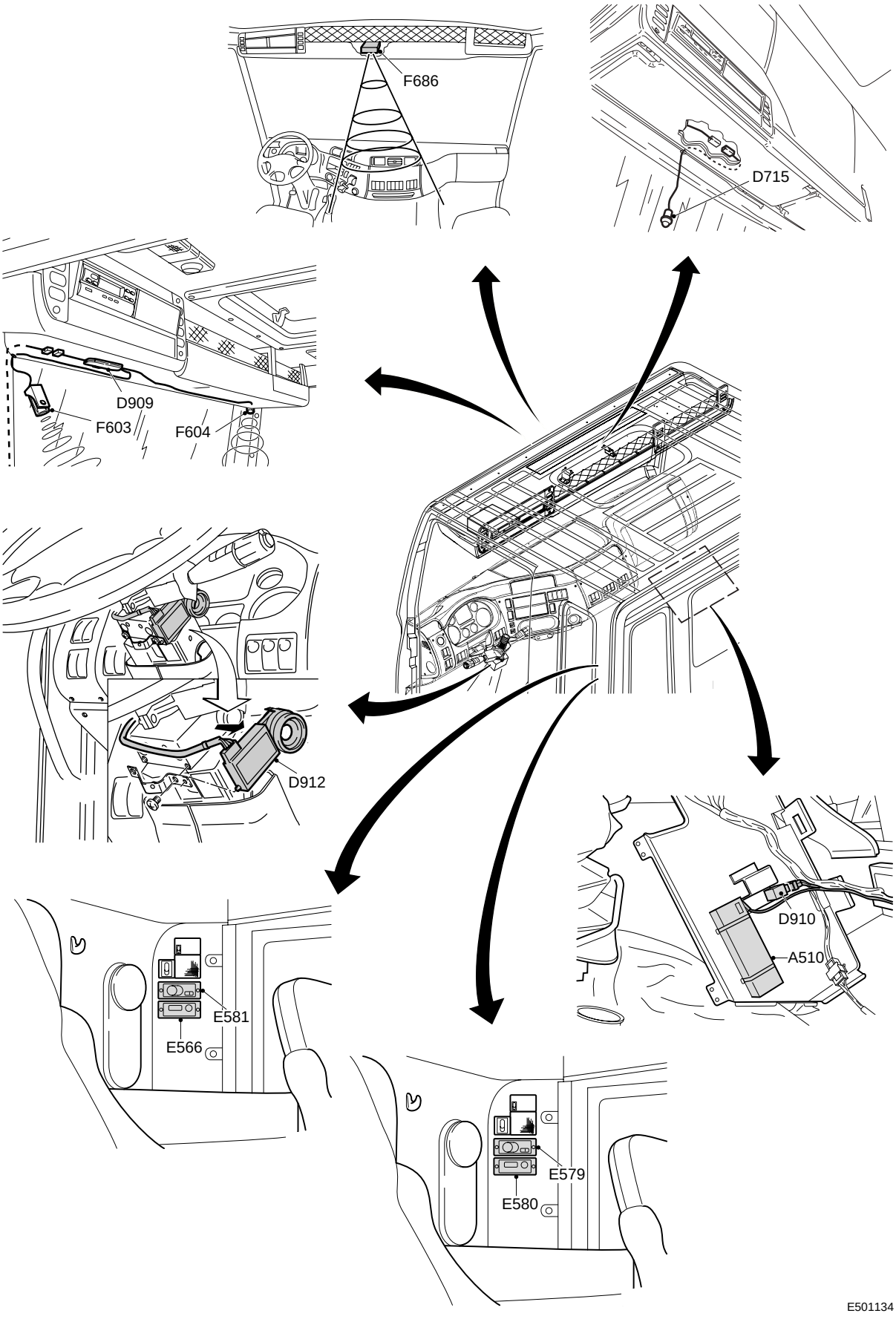
Location of components in relation to circuit diagram: 1358030/15

*CF*65/75/85 series



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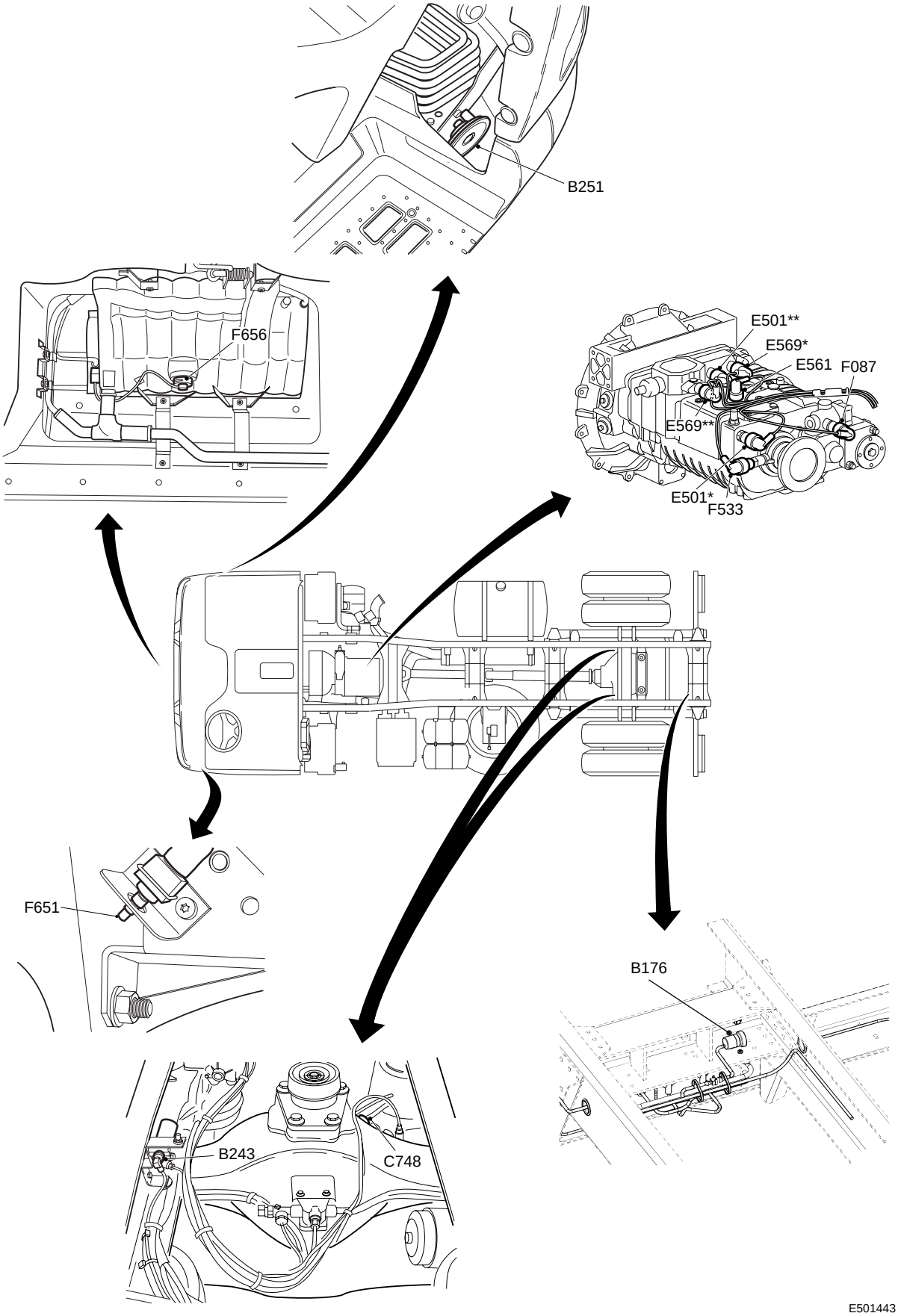

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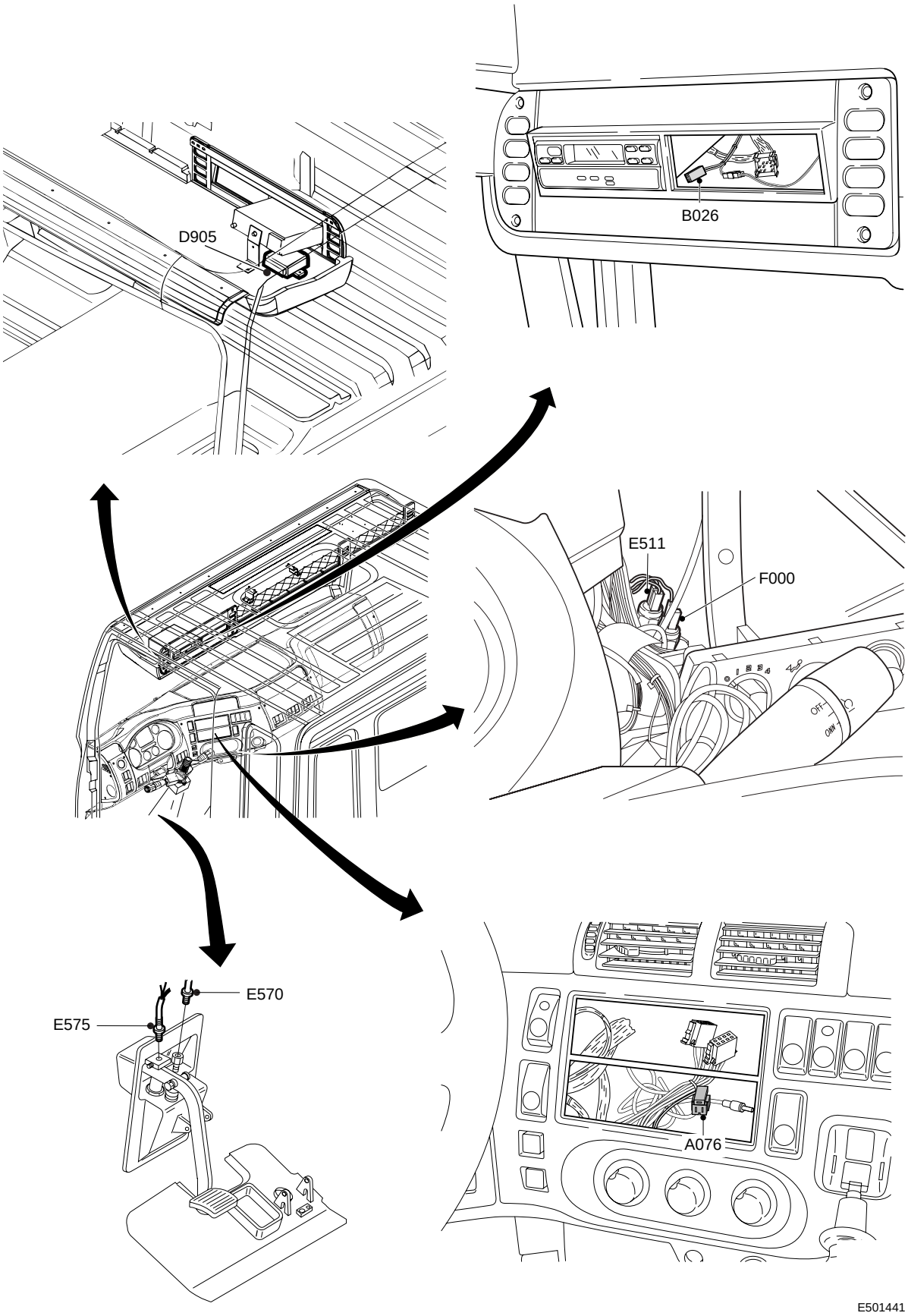
Location of components in relation to circuit diagram: 1358030/15



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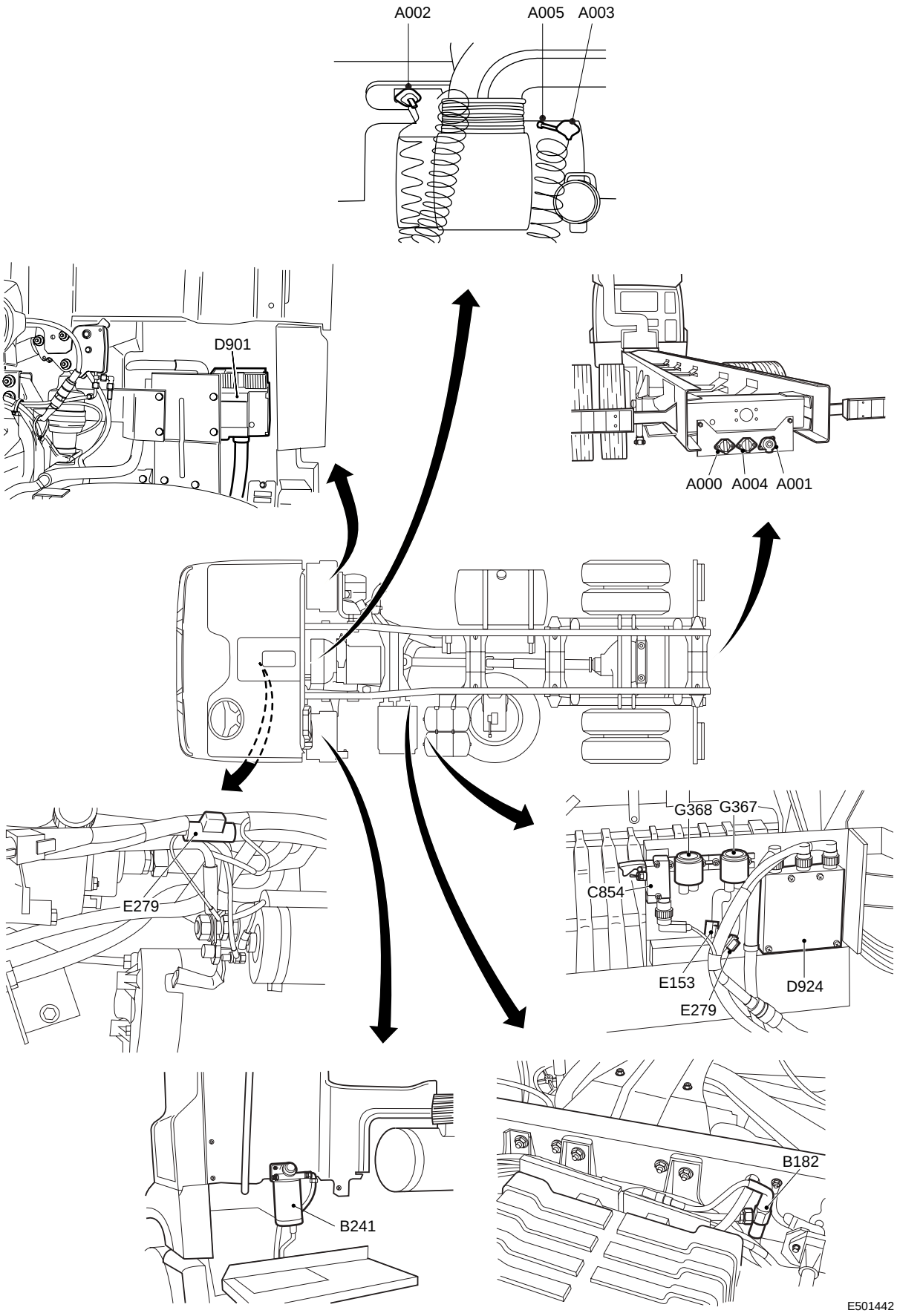

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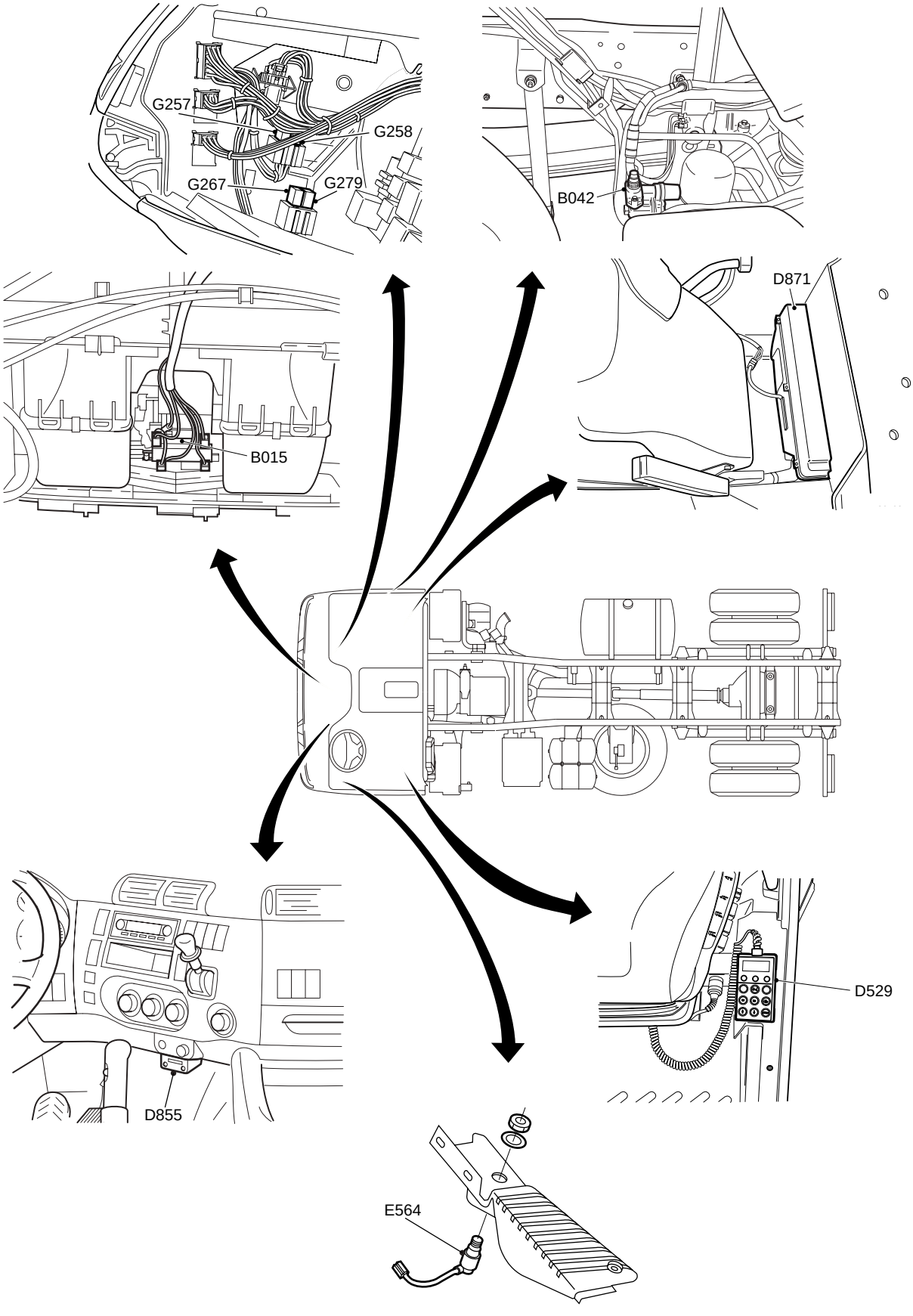
Location of components in relation to circuit diagram: 1358030/15

*CF*65/75/85 series



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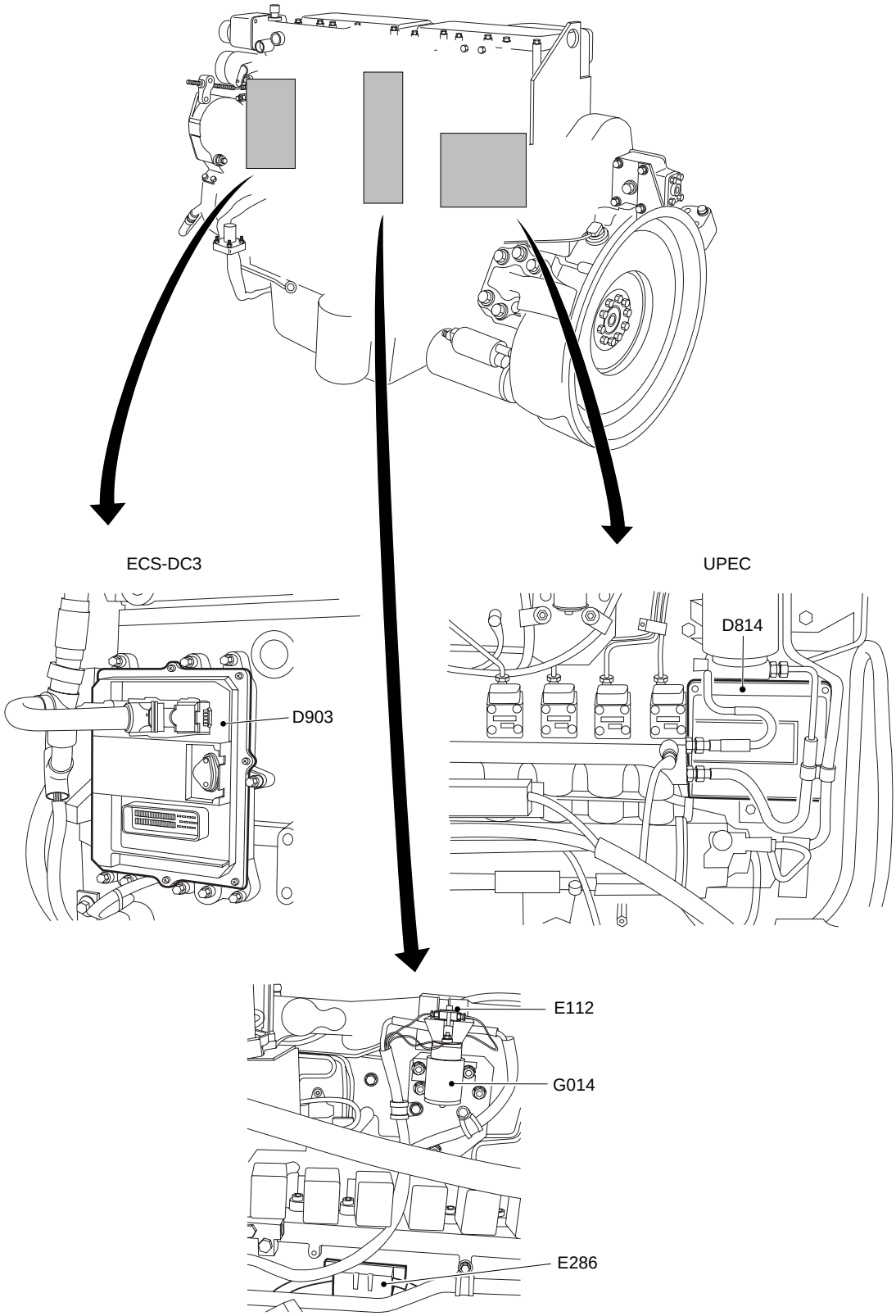

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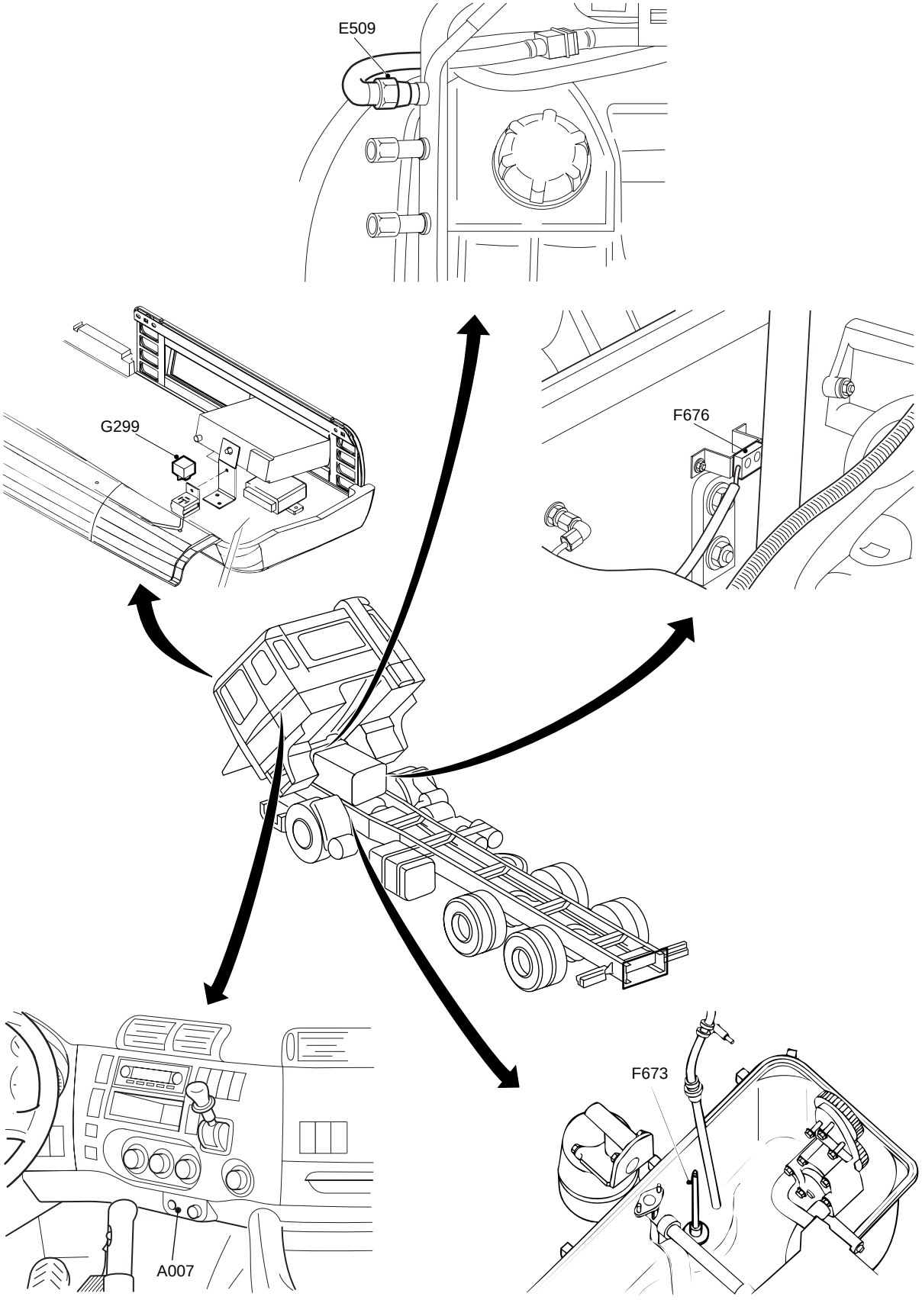
Location of components in relation to circuit diagram: 1358030/15



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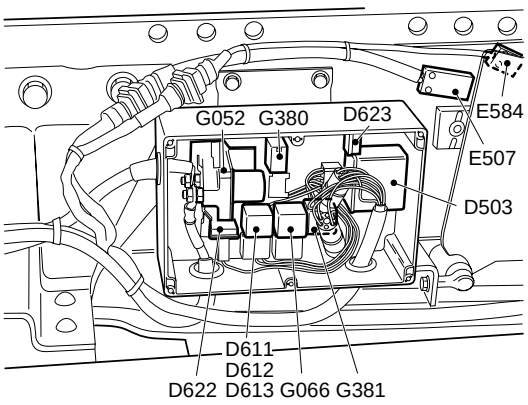

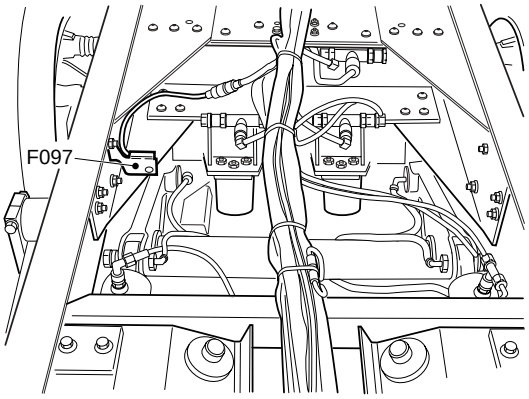

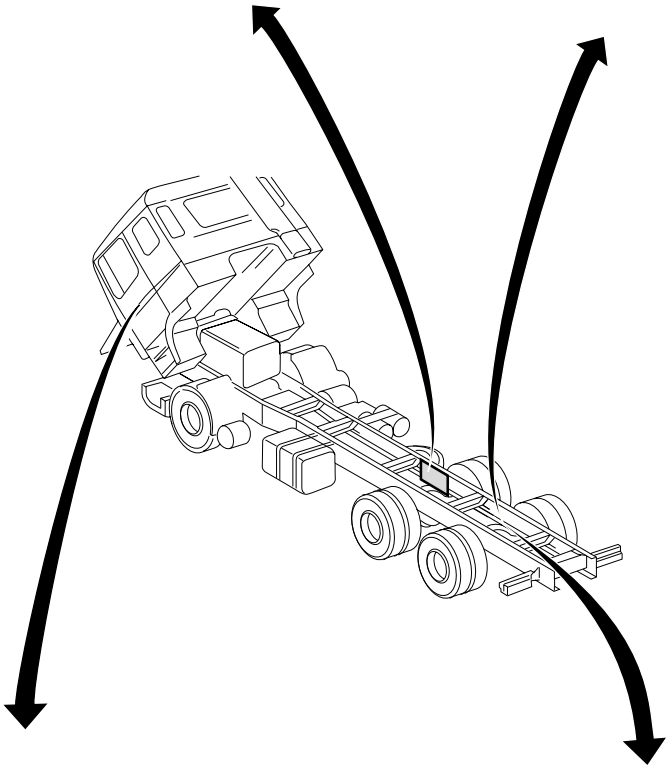

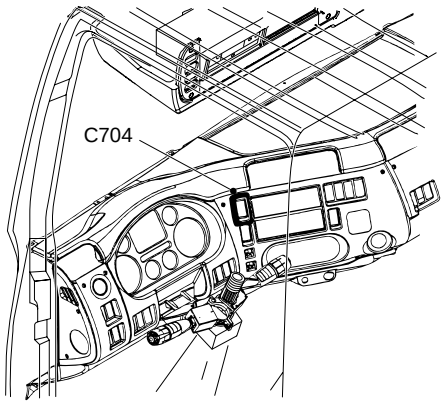

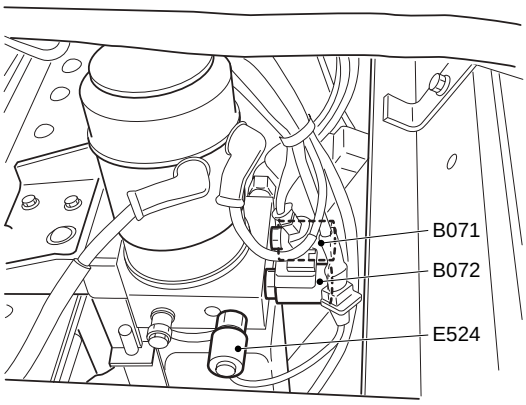

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Location of components in relation to circuit diagram: 1358030/15

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1.3 LOCATION OF COMPONENTS IN RELATION TO CIRCUIT DIAGRAM: 1358030/16-24

Column 1 = Basic codes of component
Column 2 = Description
Column 3 = Location
Column 4 = page number reference

1	2	3	4
A000	FA drawn vehicle socket (7-pin)	Chassis rear end	5
A001	Socket, rear fog lamp, reversing light, FT trailer (7-pin)	Behind cab	5
A004	Socket, ABS/EBS, FA drawn vehicle (7-pin)	Chassis rear end	5
A007	24V socket, 2-pin	Under radio panel, driver's side	8
A021	Diagnostics socket (16-pin)	Under step-up bracket, co-driver's side	1
A076	Telephone socket	Behind radio panel cover	4
A510	Alarm system battery	Under foot rest, co-driver's side	2
B015	Heater unit with resistor	Middle of dashboard	6
B026	CB set connector	In roof console, driver's side	4
B071	Mechanical lifting-gear lifting valve	On mechanical lifting-gear pump, between side members behind driven axle	9
B072	Mechanical lifting-gear lowering valve	On mechanical lifting-gear pump, between side members behind driven axle	9
B176	Reversing buzzer	In rearmost chassis cross member	3
B182	Thermoline heating element	Next to side member, co-driver's side next to battery pack	5
B241	Fuel filter/water separator heating element sensor	Rear of cab, driver's side	5
B243	Cross-axle differential lock operation valve	In chassis side member, above rear axle, driver's side	3

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1	2	3	4
B251	Neutral position buzzer, cab tilting	Against side member, front of stepwell, co-driver's side	3
B378	Heating element for fuel filter/water separator	Under cab rear, driver's side	5
C622	Switch, lighting	Dashboard, panel on driver's side	10
C704	Mechanical lifting-gear switch	Dashboard, radio panel	9
C716	Switch, rotating lights	Roof console, driver's side	10
C725	Switch, work lamp, loadspace lighting	Dashboard, instrument panel	10
C727	Front/rear fog lamp switch	Dashboard, instrument panel	10
C735	Switch, night lighting	Dashboard, central console	10
C736	Roof hatch switch	Dashboard, central console	10
C737	Switch, ASC	Dashboard, central console	10
C739	Switch, trailing axle lifting gear (leaf springs or air suspension)	Dashboard, radio panel	10
C740	Switch, normal driving height	Dashboard, radio panel	10
C742	Switch, traction assistance, air suspension or inter-axle lock differential	Dashboard, radio panel	10
C744	Switch, co-driver's door	Dashboard, central console	10
C748	Cross-axle differential lock operation switch	Dashboard, radio panel	10
C750	Switch, engine PTO	Dashboard, instrument panel	10
C751	Switch, gearbox PTO	Dashboard, instrument panel	10
C760	Air conditioning switch	Dashboard, radio panel	10
C763	Instrument lighting dimmer	Dashboard, instrument panel	10
C764	Headlamp height adjustment	Dashboard, instrument panel	10
C765	Switch, hazard warning lights	Dashboard, central console	10
C773	Rear fog lamp switch	Dashboard, instrument panel	10

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1	2	3	4
C774	Central door locking switch, co-driver's side	Dashboard, central console	10
C778	Cab heater switch	Dashboard, central console	10
C802	Switch, recirculation valve	Dashboard, radio panel	10
C813	Switches, roof spotlights	Roof console, driver's side	10
C814	Reversing buzzer on/off	Roof console, driver's side	10
C835	Switch to turn off interior detection	Dashboard, central console	10
C836	Switch to turn off superstructure/drawn vehicle loadspace detection	Dashboard, central console	10
C837	Interior lighting switch	Dashboard, central console	10
C840	Four-wheel drive switch	Dashboard, instrument panel	10
C844	Cab heater switch	Dashboard, central console	10
C853	Cab main switch	Dashboard, central console	10
C854	Chassis main switch	In side member housing, driver's side	5
C858	Reading spot, SH cab	Roof console, driver's side	10
C859	Interior lighting switch, driver's side roof console	Roof console, driver's side	10
C889	Tail lift switch	Dashboard, central console	10
D503	Electronic unit, mechanical lifting gear	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D529	Electronic unit, ECAS remote control	Left of seat console, driver's side	6
D609	Light switch diode	On PCB print track, central box	1
D610	Diode, main beam/dipped beam	On PCB print track, central box	1
D611	Diode, damping valve for lowering mechanical lifting gear	In distribution box, inside of chassis on co-driver's side, front of driven axle	9

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1	2	3	4
D612	Diode, damping valve for lifting mechanical lifting gear	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D613	Diode for pump damping relay, mechanical lifting gear	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D622	Diode for mechanical lifting gear, lifting lock	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D623	Diode for mechanical lifting gear, lowering lock	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D710	Interior lighting diode to prevent feedback to driver's side switch	On PCB print track, central box	1
D715	Alarm system LED	Underside of roof console	2
D782	Diode to prevent door locking feedback, driver's side	On PCB print track, central box	1
D783	Interior lighting diode, driver's side	On PCB print track, central box	1
D802	ECAS-2 (6x2) electronic unit	Front of attachment plate, central box	1
D814	UPEC electronic unit	On engine block, driver's side	7
D850	Electronic unit for ABS/ASC, D model	Front of attachment plate, central box	1
D851	Electronic unit, ECAS-3 (4x2)	Front of attachment plate, central box	1
D855	Electronic unit for water separator	Under dashboard radio panel, driver's side	6
D866	Electronic unit, automatic gearbox control (AGC-A)	On attachment plate under PCB, central box	1
D871	Electronic unit for Airtronic D2 cab heater	In front of storage compartment, behind driver's seat	6
D880	EBS electronic unit	Front of attachment plate, central box	1
D895	Electronic unit for (10 A) converter with power supply for radio memory	On attachment plate under PCB, central box	1

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1	2	3	4
D900	Electronic unit, VIC-1	On attachment plate under PCB, central box	1
D901	Electronic unit for Hydronic 10 cab heater	Behind cab, co-driver's side	5
D902	Electronic unit, ZF intarder with CAN	On attachment plate under PCB, central box	1
D903	Electronic unit, ECS-DC3	On engine block, driver's side	7
D904	Menu control switch, MCS	Dashboard, radio panel	10
D905	Electronic unit for central door locking	Under tachograph in roof console, driver's side	4
D909	Electronic unit, ultrasonic alarm system	In roof console, driver's side	2
D910	Electronic unit, battery charger	Under foot rest, co-driver's side	2
D911	Electronic unit, alarm system (ALS-S)	On attachment plate under PCB, central box	1
D912	Electronic unit, immobiliser	Against steering column near ignition/starter switch	2
D924	Electronic unit for main switch	Chassis side member, driver's side	5
D929	Central PCB	Central box, co-driver's side	1
D931	Electronic unit, LED	On attachment plate under PCB, central box	1
D969	CAN-data manager, CDM	Under foot rest, co-driver's side	6
D977	Electronic unit, EBS-2	On attachment plate under PCB, central box	1
E112	Fuse, glow warning lamp	Above glow plug relay	7
E153	Fuse, main switch for timer/engine stop/main switch power supply	In main switch electronic unit (D924)	5
E279	Fuse, airbag and seat belt tensioner/voltage regulation generator	Next to main switch (if there is a main switch) Above starter motor relay (if there is **NO** main switch)	5

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1	2	3	4
E286	Main fuse	On engine block bracket, driver's side or on bracket above front of gearbox (if Allison gearbox)	7
E501*	Operating switch, reversing light (no PTO)	Gearbox, driver's side	3
E501**	Operating switch, reversing light (with N10 PTO)	Gearbox, driver's side	3
E507	Proximity switch for axle-load protection lifting gear (10 tons)	Next to distributor box, inside of chassis on co-driver's side, front of driven axle	9
E509	Operating switch, air conditioning, low pressure	In evaporator pipe, on outside of cab, co-driver's side	8
E511	Stop light operating switch	Behind radio panel cover	4
E524	Mechanical lifting-gear operating switch, oil pressure limit switch	On mechanical lifting-gear pump, between side members behind driven axle	9
E561	Gearbox gate protection operating switch	Gearbox, driver's side	3
E564	Operating switch, engine brake	On floor plate, driver's side	6
E566	Operating switch, Eberspächer Airtronic cab heater thermostat	In rear wall, driver's side	2
E569*	Neutral position switch for RHD	Gearbox, driver's side	3
E569**	Neutral position switch for LHD	Gearbox, driver's side	3
E570	Pneumatic switch, clutch PTO N10	Above clutch pedal	4
E575	Proximity switch, clutch	To left of clutch pedal	4
E579	Thermostat control switch for Eberspächer Hydronic cab heater	In rear wall, driver's side	2
E580	Control switch, Eberspächer Hydronic cab heater timer	In rear wall, driver's side	2

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1	2	3	4
E581	Control switch, Eberspächer Airtronic cab heater timer	In rear wall, driver's side	2
E584	Proximity switch for axle-load protection lifting gear (7.5 tons)	Next to distributor box, inside of chassis on co-driver's side, front of driven axle	9
E592	Reversing light operating switch	Gearbox, driver's side	3
E593	Neutral position switch	Gearbox, driver's side	3
E595	Gearbox gate protection operating switch	Gearbox, driver's side	3
F000	Control switch for parking brake	Behind radio panel cover	4
F006	Differential lock control switch, 1st differential	In chassis side member, above rear axle, co-driver's side	3
F087	Control switch, gearbox PTO	Gearbox, driver's side	3
F097	Proximity switch for trailing axle mechanical lifting gear	Next to distributor box, inside of chassis on co-driver's side, front of driven axle	9
F120	Clutch protection switch	Gearbox, driver's side	3
F533	Speed sensor (4-pin, 1st)	Gearbox, driver's side	3
F603	Transmitter, ultrasonic	Under roof console, driver's side	2
F604	Receiver, ultrasonic	Under roof console, co-driver's side	2
F651	Ambient temperature sensor	Behind bumper, driver's side	3
F652	Air dryer heating element	On APU unit, under cab, co-driver's side	6
F656	Coolant level sensor	Rear of expansion tank	3
F673	Sensor, engine oil level and temperature	In engine oil sump, driver's side	8
F676	Cab tilting cylinder sensor	Next to cab tilting cylinder in side member, co-driver's side	8
F686	Alarm system radar sensor	In roof console, driver's side	2

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1	2	3	4
G014	Relay, glow element	On engine block, driver's side	7
G052	Relay, mechanical lifting gear motor	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
G066	Relay, mechanical lifting-gear takeover	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
G257	Recirculation valve micro-relay	Right-hand side of heater unit	6
G258	Recirculation valve micro-relay	Right-hand side of heater unit	6
G267	Air conditioning micro relay	Right-hand side of heater unit	6
G279	Air conditioning micro relay	Right-hand side of heater unit	6
G299	Relay, roof spotlights	In roof console, driver's side	8
G367	Relay, main switch power supply	In main switch electronic unit (D924)	5
G368	Relay, main switch earth	In main switch electronic unit (D924)	5
G380	Relay, mechanical lifting axle upwards	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
G381	Relay, mechanical lifting axle (7.5 tons)	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
G535	CAN distribution block	On attachment plate under PCB, central box	1

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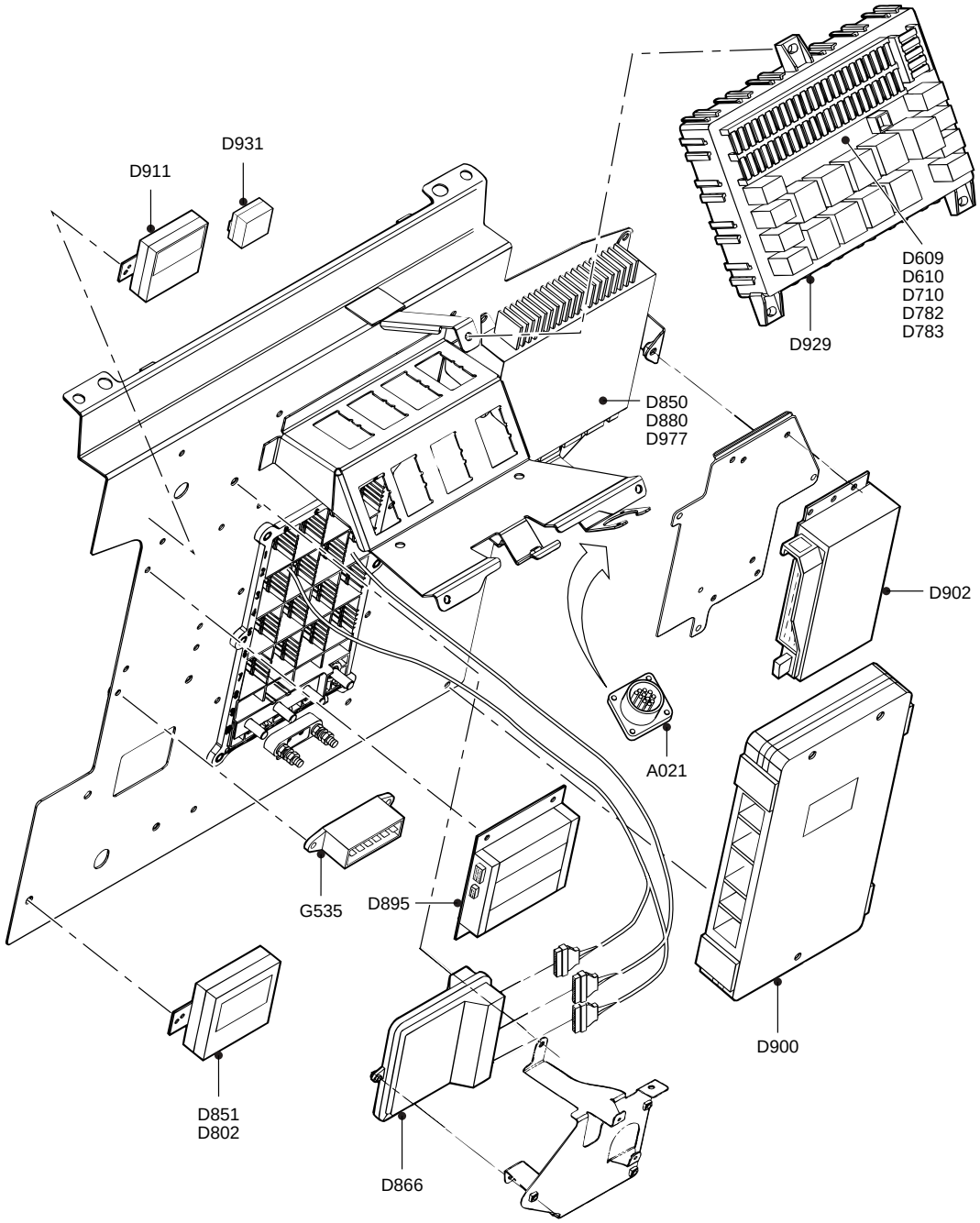

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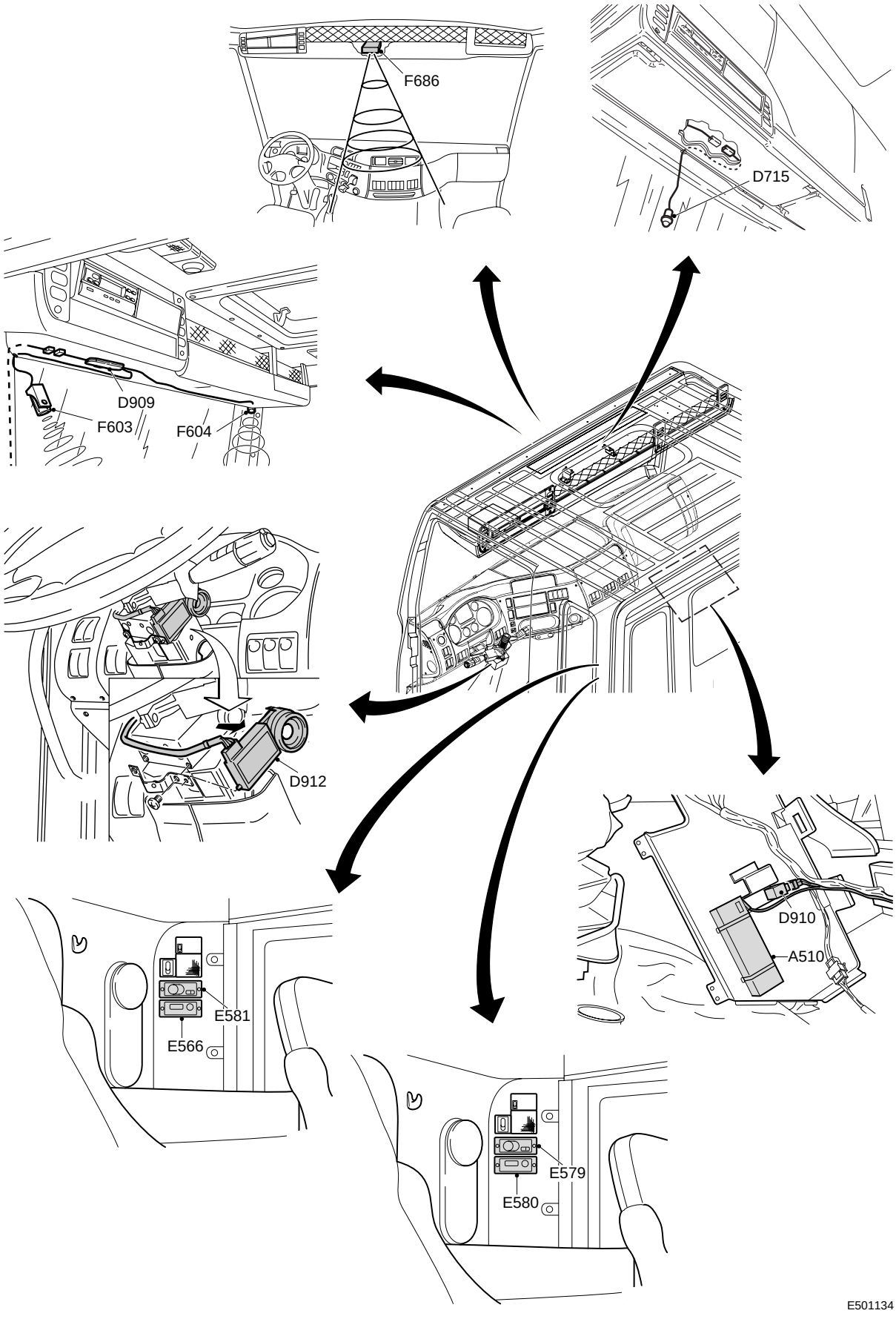
Location of components in relation to circuit diagram: 1358030/16-24



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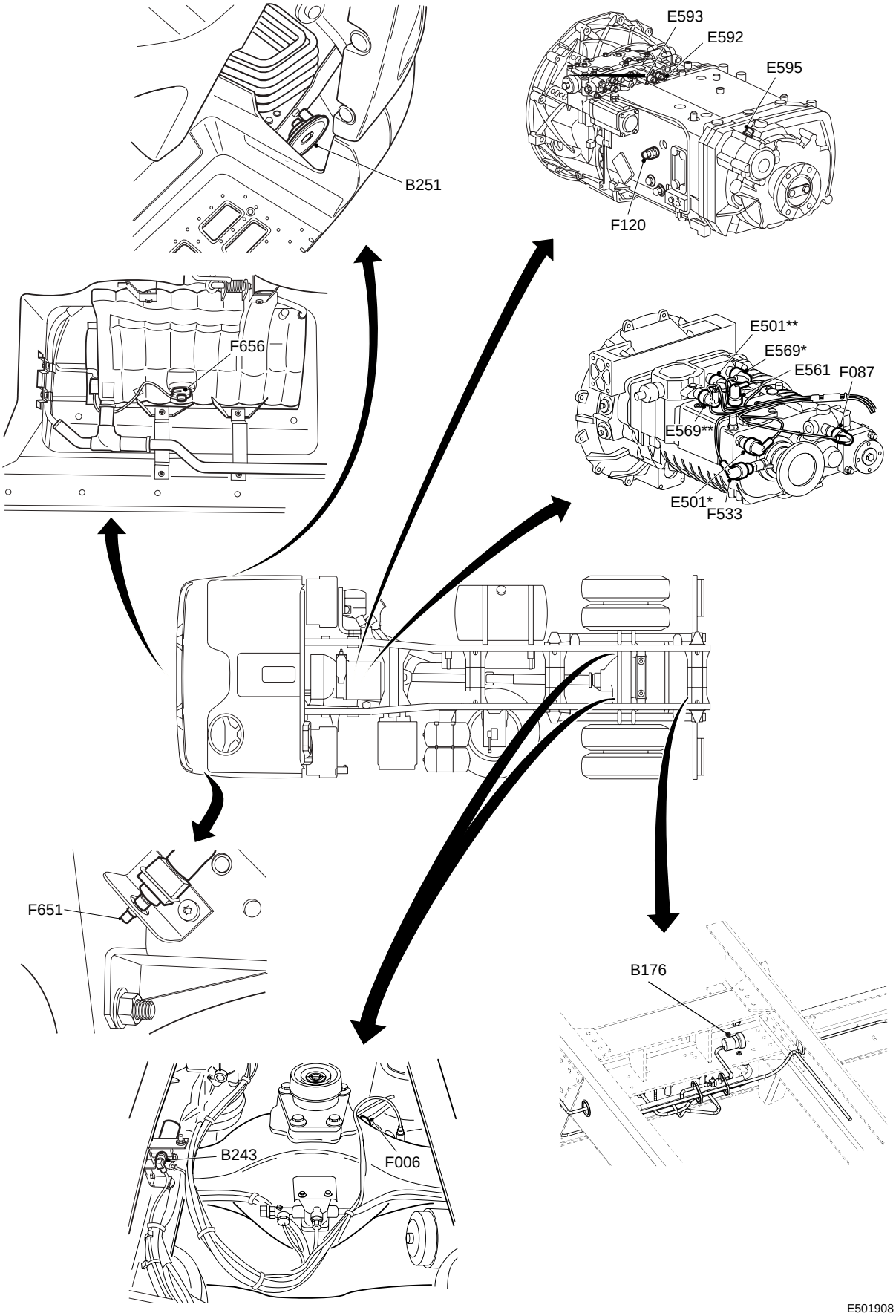

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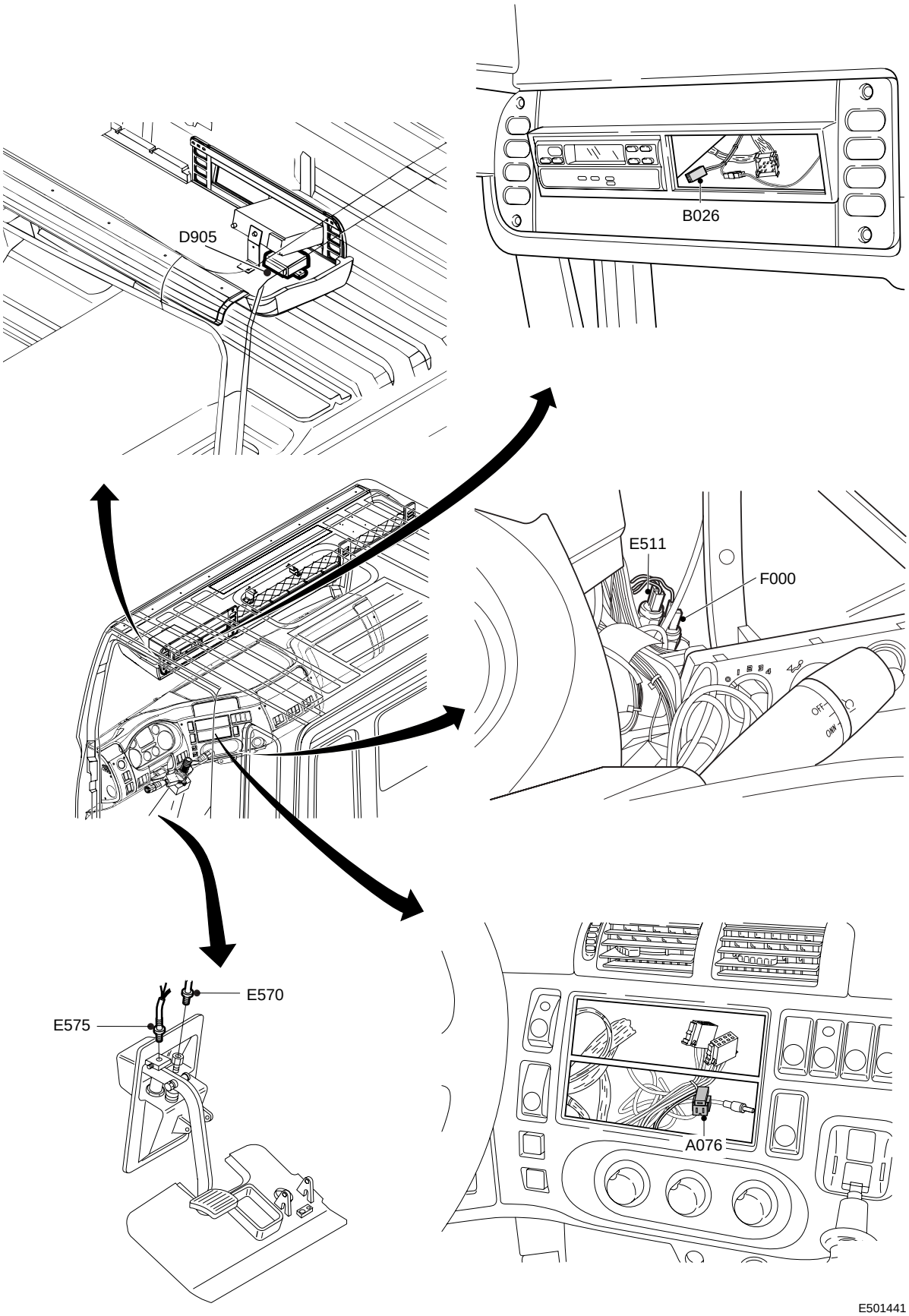

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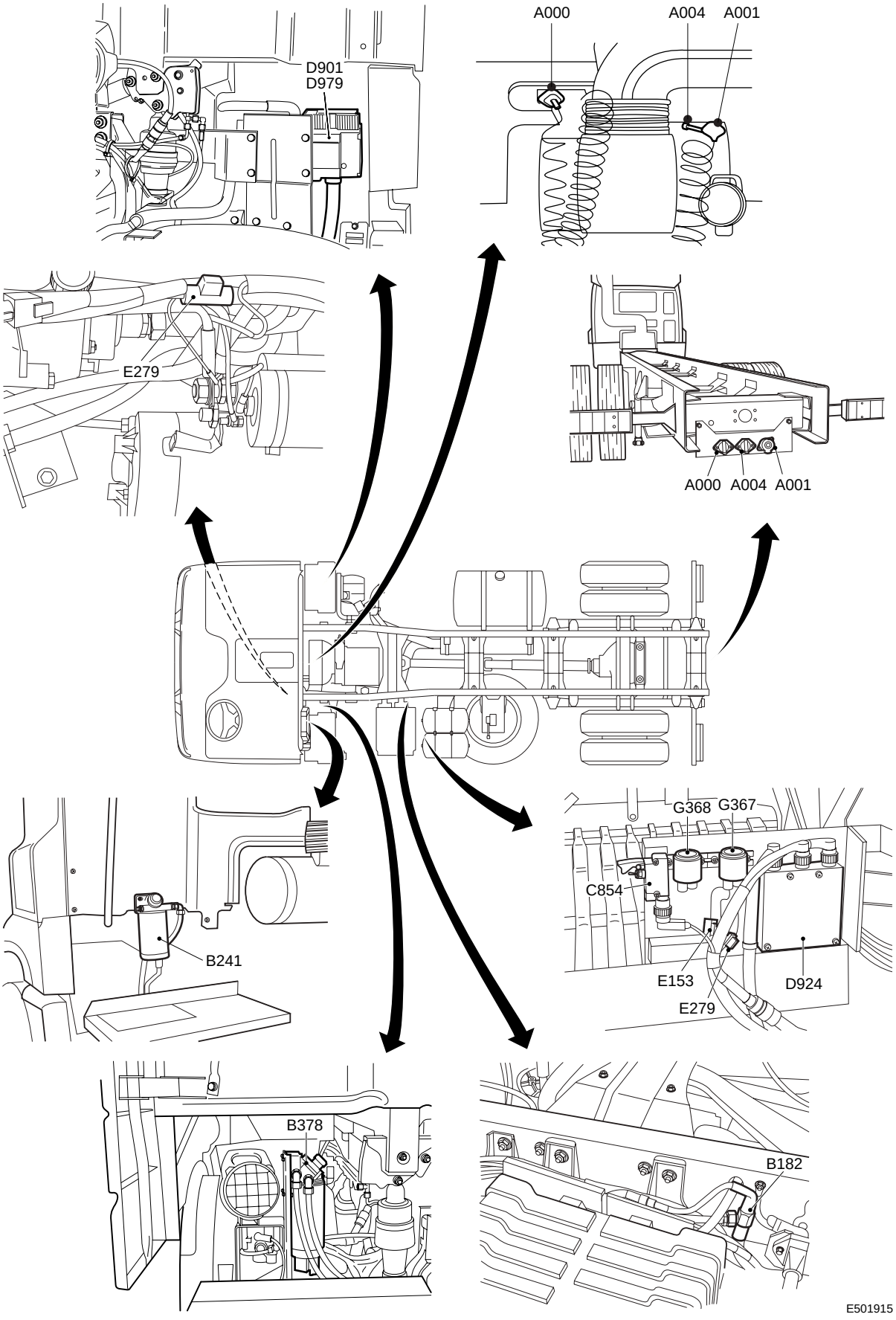

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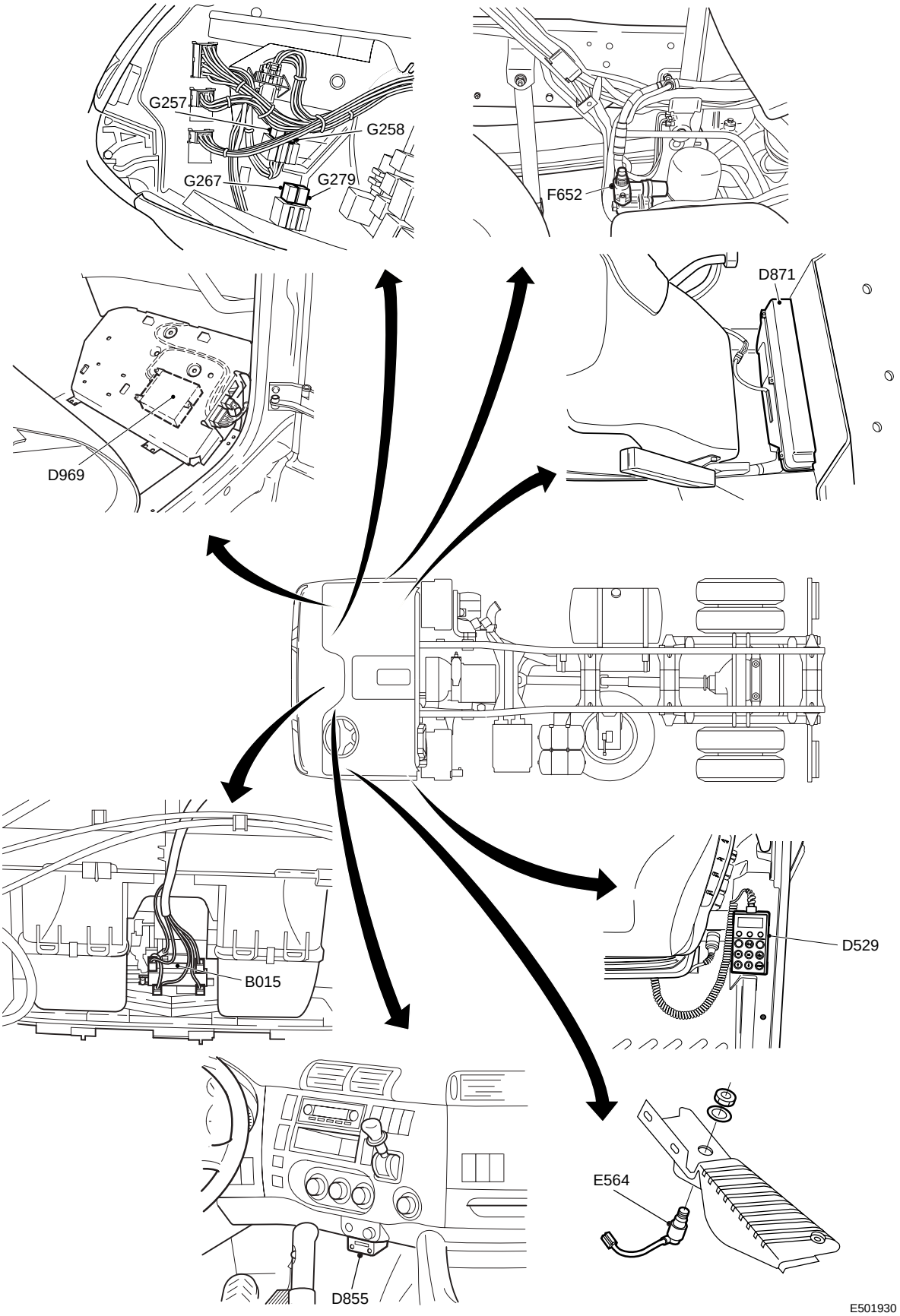

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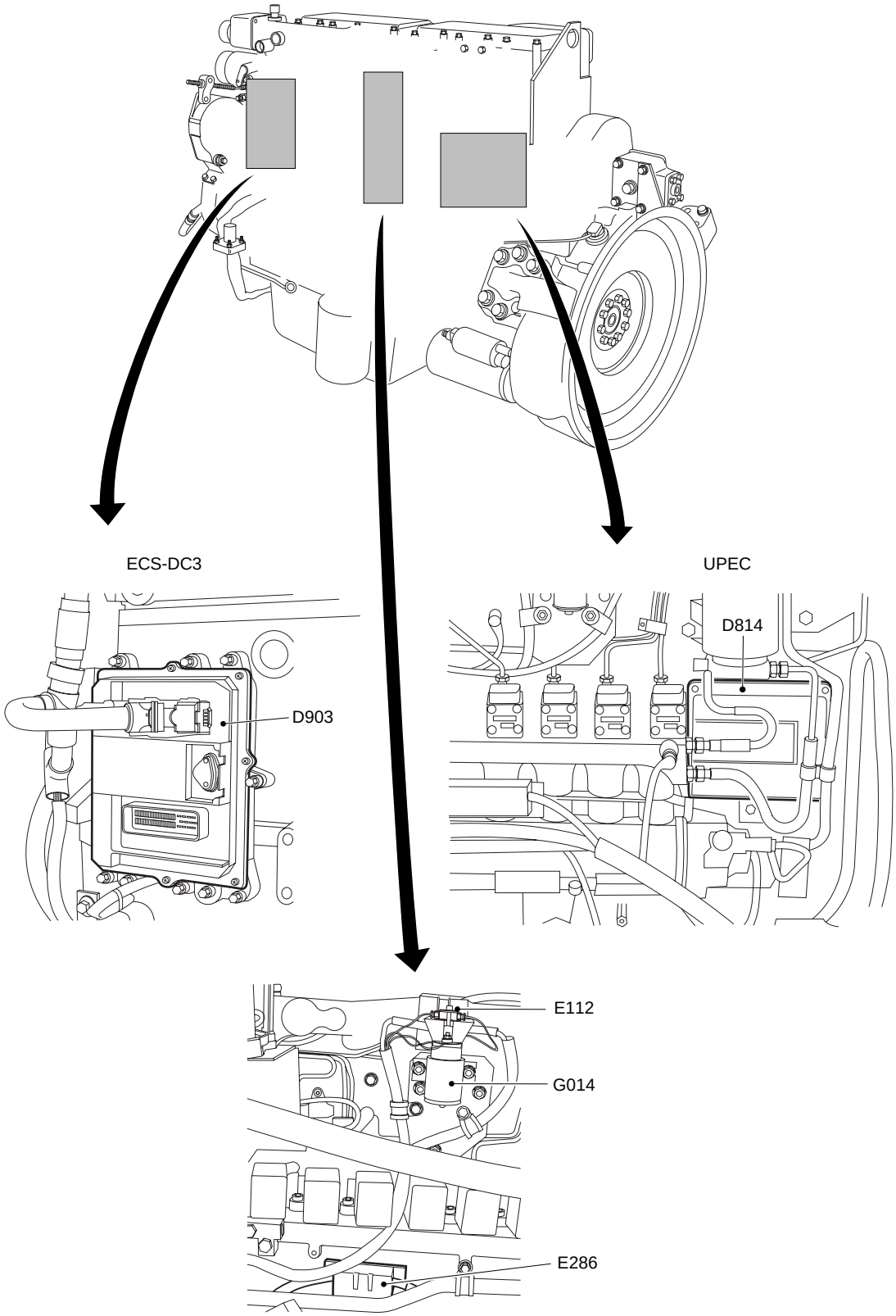

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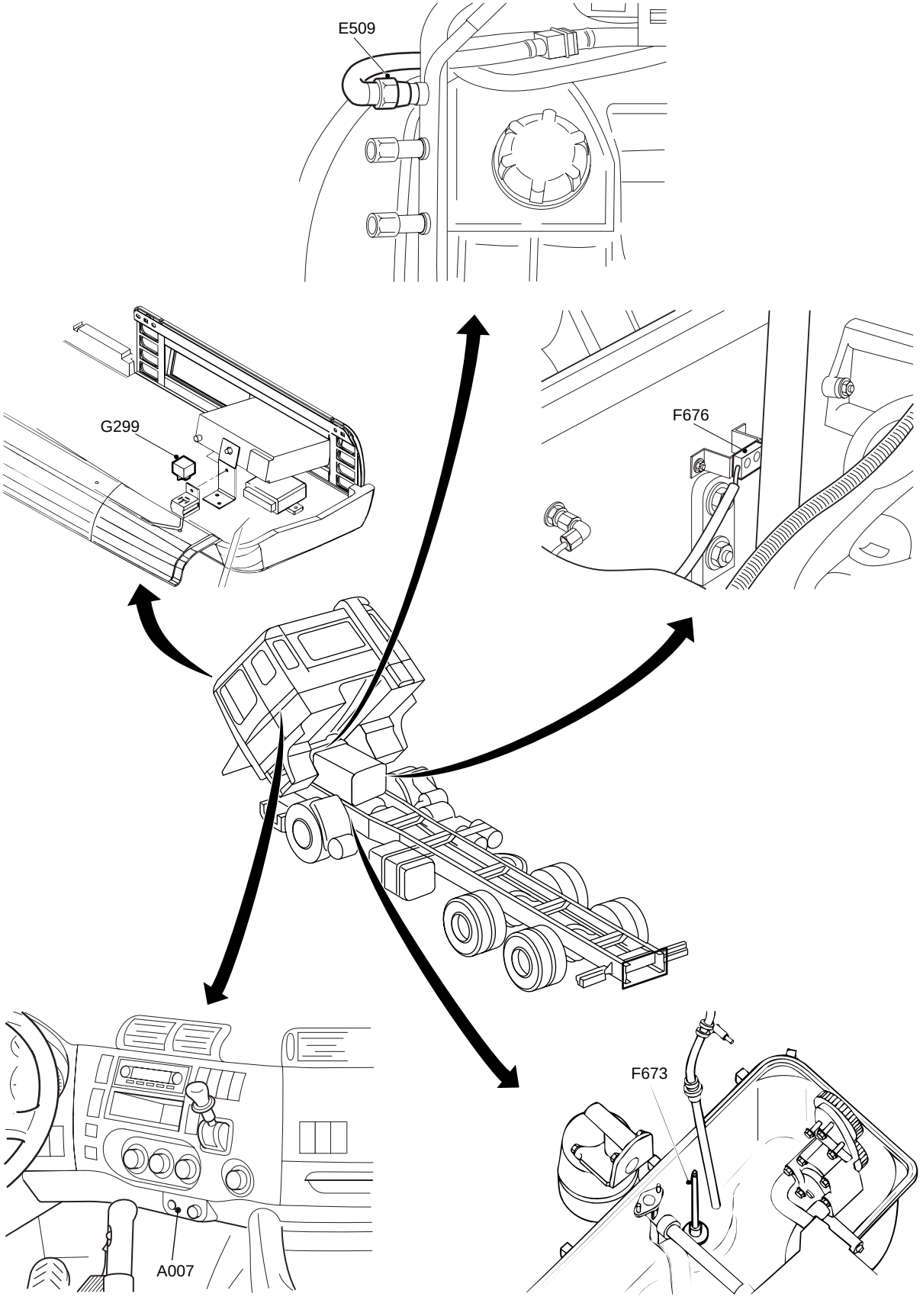
Location of components in relation to circuit diagram: 1358030/16-24



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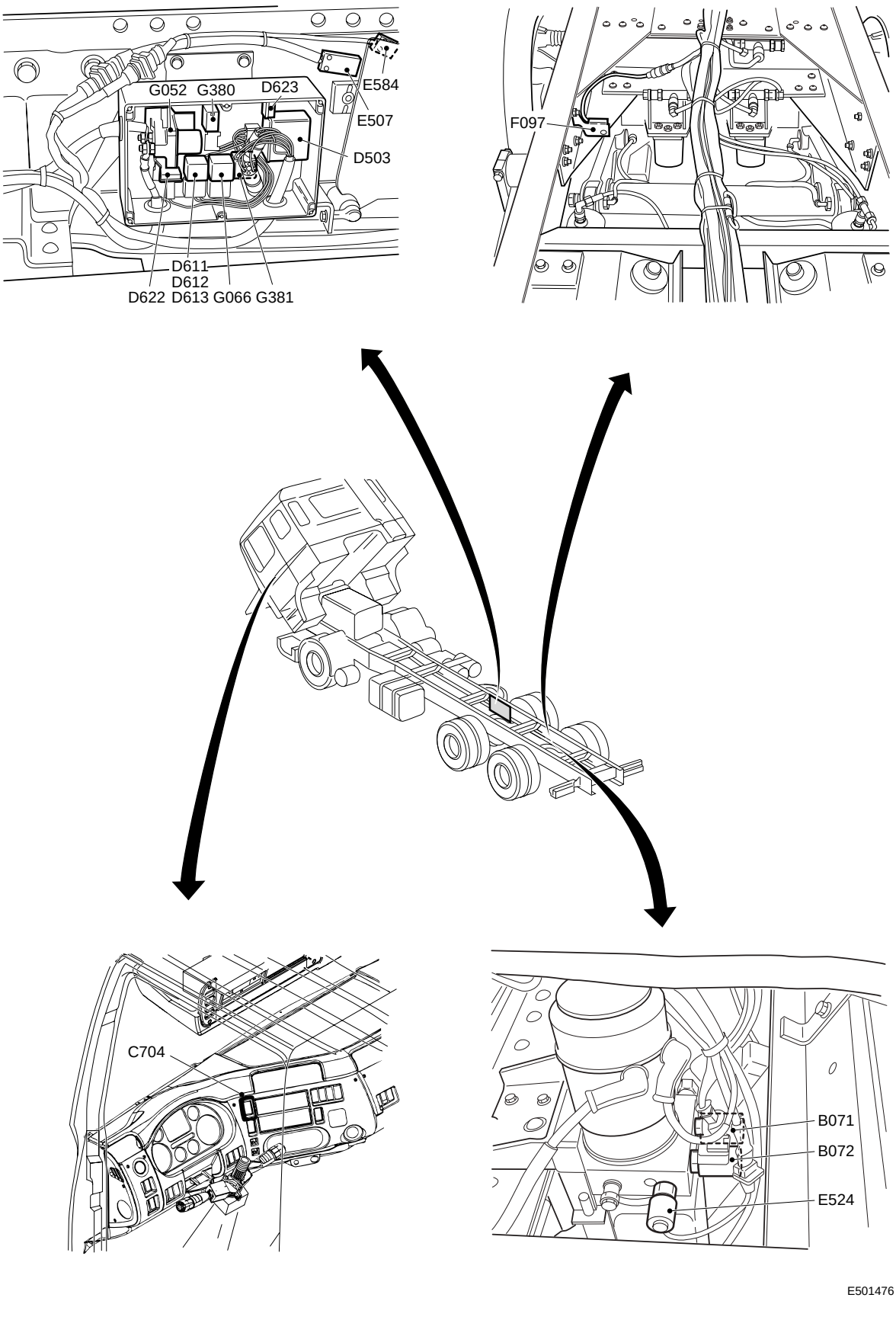

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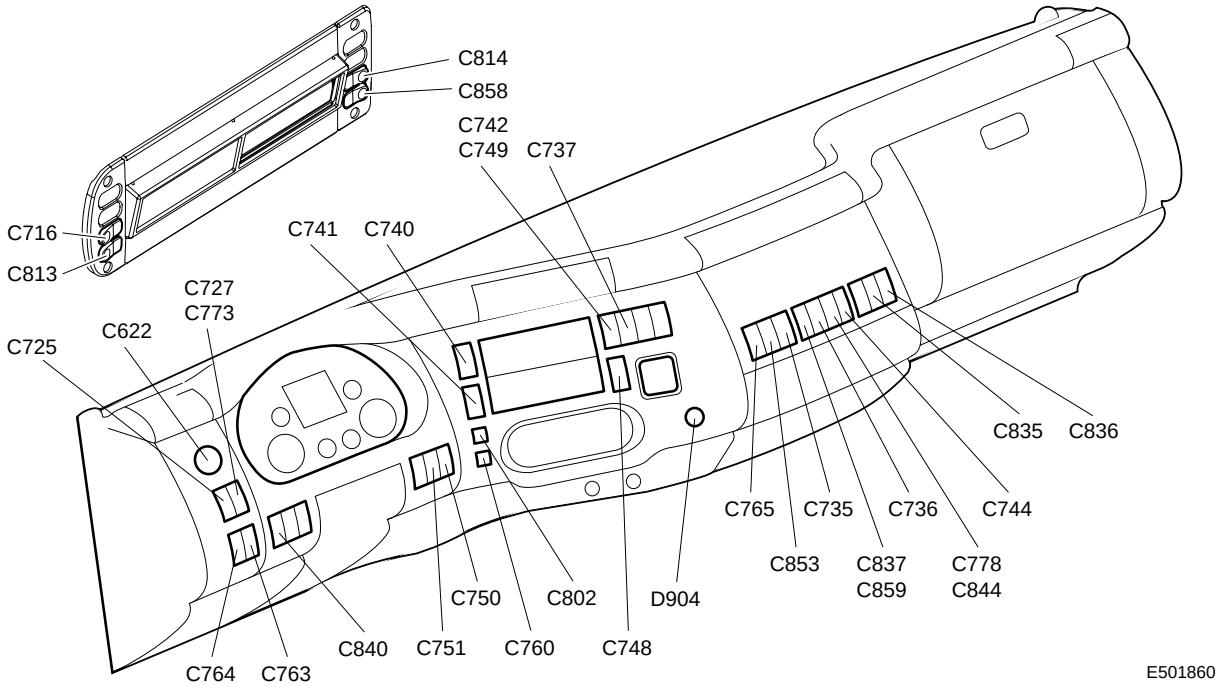
Location of components in relation to circuit diagram: 1358030/16-24

***CF*65/75/85 series**



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1.4 LOCATION OF COMPONENTS IN RELATION TO CIRCUIT DIAGRAM: 1358030/25

Column 1 = basic codes of component
Column 2 = description
Column 3 = location
Column 4 = page number reference

1	2	3	4
A000	FA drawn vehicle socket (7-pin)	Chassis rear end	5
A001	Socket, rear fog lamp, reversing light, FT trailer (7-pin)	Behind cab	5
A004	Socket, ABS/EBS, FA drawn vehicle (7-pin)	Chassis rear end	5
A007	24V socket, 2-pin	Under radio panel, driver's side	8
A021	Diagnostics socket (16-pin)	Under step-up bracket, co-driver's side	1
A076	Telephone socket	Behind radio panel cover	4
A510	Alarm system battery	Under foot rest, co-driver's side	2
B015	Heater unit with resistor	Middle of dashboard	6
B026	CB set connector	In roof console, driver's side	4
B071	Mechanical lifting-gear lifting valve	On mechanical lifting-gear pump, intermediate side member, behind driven axle	9
B072	Mechanical lifting-gear lowering valve	On mechanical lifting-gear pump, intermediate side member, behind driven axle	9
B176	Reversing buzzer	In rearmost chassis cross member	3
B182	Thermoline heating element	Next to side member, co-driver's side next to battery pack	5
B241	Fuel filter/water separator heating element sensor	Rear of cab, driver's side	5
B243	Cross-axle differential lock operation valve	In chassis side member, above rear axle, driver's side	3

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1	2	3	4
B251	Neutral position buzzer, cab tilting	Against side member, front of stepwell, co-driver's side	3
B378	Heating element for fuel filter/water separator	Under cab rear, driver's side	5
C622	Switch, lighting	Dashboard panel, driver's side	10
C704	Mechanical lifting-gear switch	Dashboard, radio panel	9
F006	Differential lock control switch, 1st differential	In chassis side member, above rear axle, co-driver's side	3
C716	Switch, rotating lights	Roof console, driver's side	10
C725	Switch, work lamp, loadspace lighting	Dashboard, instrument panel	10
C727	Front/rear fog lamp switch	Dashboard, instrument panel	10
C735	Switch, night lighting	Dashboard, middle of console	10
C736	Roof hatch switch	Dashboard, middle of console	10
C737	Switch, ASC	Dashboard, middle of console	10
C739	Switch, trailing axle lifting gear (leaf springs or air suspension)	Dashboard, radio panel	10
C740	Switch, normal driving height	Dashboard, radio panel	10
C742	Switch, traction assistance, air suspension or inter-axle lock differential	Dashboard, radio panel	10
C744	Switch, co-driver's door	Dashboard, middle of console	10
C748	Cross-axle differential lock operation switch	Dashboard, radio panel	10
C750	Switch, engine PTO	Dashboard, instrument panel	10
C751	Switch, gearbox PTO	Dashboard, instrument panel	10
C760	Air conditioning switch	Dashboard, radio panel	10
C763	Dimming instrument lights	Dashboard, instrument panel	10
C764	headlamp height adjustment	Dashboard, instrument panel	10
C765	Switch, hazard warning lights	Dashboard, middle of console	10

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1	2	3	4
C773	Rear fog lamp switch	Dashboard, instrument panel	10
C774	Central door locking switch, co-driver's side	Dashboard, middle of console	10
C778	Cab heater switch	Dashboard, middle of console	10
C802	Recirculation valve switch	Dashboard, radio panel	10
C813	Switches, roof spotlights	Roof console, driver's side	10
C814	Reversing buzzer on/off	Roof console, driver's side	10
C835	Switch to turn off interior detection	Dashboard, middle of console	10
C836	Switch to turn off superstructure/drawn vehicle loadspace detection	Dashboard, middle of console	10
C837	Interior lighting switch	Dashboard, middle of console	10
C840	Four-wheel drive switch	Dashboard, instrument panel	10
C844	Cab heater switch	Dashboard, middle of console	10
C853	Cab main switch	Dashboard, middle of console	10
C854	Chassis main switch	In side member housing, driver's side	5
C858	Reading spot, SH cab	Roof console, driver's side	10
C859	Interior lighting switch, driver's side roof console	Roof console, driver's side	10
C889	Tail lift switch	Dashboard, middle of console	10
C890	Third brake integration switch	Dashboard, radio panel	10
D503	Electronic unit, mechanical lifting gear	In distributor box, inside of chassis on co-driver's side, front of driven axle	9
D529	Electronic unit, ECAS remote control	Left of seat console, driver's side	6
D609	Light switch diode	On PCB print track, central box	1
D610	Diode, main beam/dipped beam	On PCB print track, central box	1

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1	2	3	4
D611	Diode, damping valve for lowering mechanical lifting gear	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D612	Diode, damping valve for lifting mechanical lifting gear	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D613	Diode for pump damping relay, mechanical lifting gear	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D622	Diode for mechanical lifting gear, lifting lock	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D623	Diode for mechanical lifting gear, lowering lock	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
D710	Interior lighting diode to prevent feedback to driver's side switch	On PCB print track, central box	1
D715	Alarm system LED	Underside of roof console	2
D782	Diode to prevent door locking feedback, driver's side	On PCB print track, central box	1
D783	Interior lighting diode, driver's side	On PCB print track, central box	1
D802	ECAS-2 (6x2) electronic unit	Front of attachment plate, central box	1
D814	UPEC electronic unit	On engine block, driver's side	7
D850	Electronic unit for ABS/ASC, D model	Front of attachment plate, central box	1
D851	Electronic unit, ECAS-3 (4x2)	Front of attachment plate, central box	1
D855	Electronic unit for water separator	Under dashboard radio panel, driver's side	6
D866	Electronic unit, automatic gearbox control (AGC-A)	On attachment plate under PCB, central box	1
D871	Electronic unit for Airtronic D2 cab heater	In front of storage compartment, behind driver's seat	6
D880	EBS electronic unit	Front of attachment plate, central box	1
D895	Electronic unit for (10A) converter with power supply for radio memory	On attachment plate under PCB, central box	1

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1	2	3	4
D900	Electronic unit, VIC-1	On attachment plate under PCB, central box	1
D901	Electronic unit for Hydronic 10 cab heater	Behind cab, co-driver's side	5
D902	Electronic unit, ZF intarder with CAN	On attachment plate under PCB, central box	1
D903	Electronic unit, ECS-DC3	On engine block, driver's side	7
D904	Menu control switch, MCS	Dashboard, radio panel	10
D905	Electronic unit for central door locking	Under tachograph in roof console, driver's side	4
D909	Electronic unit, ultrasonic alarm system	In roof console, driver's side	2
D910	Electronic unit, battery charger	Under foot rest, co-driver's side	2
D911	Electronic unit, alarm system (ALS-S)	On attachment plate under PCB, central box	1
D912	Electronic unit, immobiliser	Against steering column near ignition/starter switch	2
D924	Electronic unit for main switch	Chassis side member, driver's side	5
D929	Central PCB	Central box, co-driver's side	1
D931	Electronic unit, LED	On attachment plate under PCB, central box	1
D969	CAN-data manager, CDM	Under foot rest, co-driver's side	6
D977	Electronic unit, EBS-2	On attachment plate under PCB, central box	1
E112	Fuse, glow warning lamp	Above glow plug relay	7
E153	Fuse, main switch for timer/engine stop/main switch power supply	In main switch electronic unit (D924)	5
E279	Fuse, airbag and seat belt tensioner/voltage regulation generator	Next to main switch (if there is a main switch) Above starter motor relay (if there is **NO** main switch)	5

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1	2	3	4
E286	Main fuse	On engine block bracket, driver's side or: On bracket above front of gearbox (if Allison gearbox)	7
E501*	Operating switch, reversing light (no PTO)	Gearbox, driver's side	3
E501**	Operating switch, reversing light (with N10 PTO)	Gearbox, driver's side	3
E507	Proximity switch for axle load protection lifting gear (10 tons)	Next to distribution box, inside of chassis on co driver's side, front of driven axle	9
E509	Operating switch, air conditioning, low pressure	In evaporator pipe, on outside of cab, co-driver's side	8
E511	Brake light operating switch	Behind radio panel cover	4
E524	Mechanical lifting-gear operating switch, oil pressure limit switch	On mechanical lifting-gear pump, intermediate side member, behind driven axle	9
E561	Gearbox gate protection operating switch	Gearbox, driver's side	3
E564	Operating switch, engine brake	On floor plate, driver's side	6
E566	Operating switch, Eberspächer Airtronic cab heater thermostat	In rear wall, driver's side	2
E569*	Neutral position switch for RHD	Gearbox, driver's side	3
E569**	Neutral position switch for LHD	Gearbox, driver's side	3
E570	Pneumatic switch, clutch PTO N10	Above clutch pedal	4
E575	Proximity switch, clutch	Next to clutch pedal, left-hand side	4
E579	Thermostat control switch for Eberspächer Hydronic cab heater	In rear wall, driver's side	2
E580	Control switch, Eberspächer Hydronic cab heater timer	In rear wall, driver's side	2

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1	2	3	4
E581	Control switch, Eberspächer Airtronic cab heater timer	In rear wall, driver's side	2
E584	Proximity switch for axle-load protection lifting gear (7.5 tons)	Next to distribution box, inside of chassis on co driver's side, front of driven axle	9
E592	Reversing light operating switch	Gearbox, driver's side	3
E593	Neutral position switch	Gearbox, driver's side	3
E595	Gearbox gate protection operating switch	Gearbox, driver's side	3
F000	Control switch for parking brake	Behind radio panel cover	4
F087	Control switch, gearbox PTO	Gearbox, driver's side	3
F097	Proximity switch for trailing axle mechanical lifting gear	Next to distribution box, inside of chassis on co driver's side, front of driven axle	9
F120	Clutch protection switch	Gearbox, driver's side	3
F533	Speed sensor (4-pin, 1st)	Gearbox, driver's side	3
F603	Transmitter, ultrasonic	Under roof console, driver's side	2
F604	Receiver, ultrasonic	Under roof console, co-driver's side	2
F651	Ambient temperature sensor	Behind bumper, driver's side	3
F652	Air dryer heating element	On APU unit, under cab, co-driver's side	6
F656	Coolant level sensor	Rear of expansion tank	3
F673	Sensor, engine oil level and temperature	In engine oil sump, driver's side	8
F676	Cab tilting cylinder sensor	Next to cab tilting cylinder in side member, co-driver's side	8
F686	Alarm system radar sensor	In roof console, driver's side	2
G014	Relay, glow element	On engine block, driver's side	7
G052	Relay, mechanical lifting gear motor	In distribution box, inside of chassis on co-driver's side, front of driven axle	9

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1	2	3	4
G066	Relay, mechanical lifting-gear takeover	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
G257	Recirculation valve micro-relay	Right-hand side of heater unit	6
G258	Recirculation valve micro-relay	Right-hand side of heater unit	6
G267	Air conditioning micro relay	Right-hand side of heater unit	6
G279	Air conditioning micro relay	Right-hand side of heater unit	6
G299	Relay, roof spotlights	In roof console, driver's side	8
G367	Relay, main switch power supply	In main switch electronic unit (D924)	5
G368	Relay, main switch earth	In main switch electronic unit (D924)	5
G380	Relay, mechanical lifting axle upwards	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
G381	Relay, mechanical lifting axle (7.5 tons)	In distribution box, inside of chassis on co-driver's side, front of driven axle	9
G535	CAN distribution block	On attachment plate under PCB, central box	1

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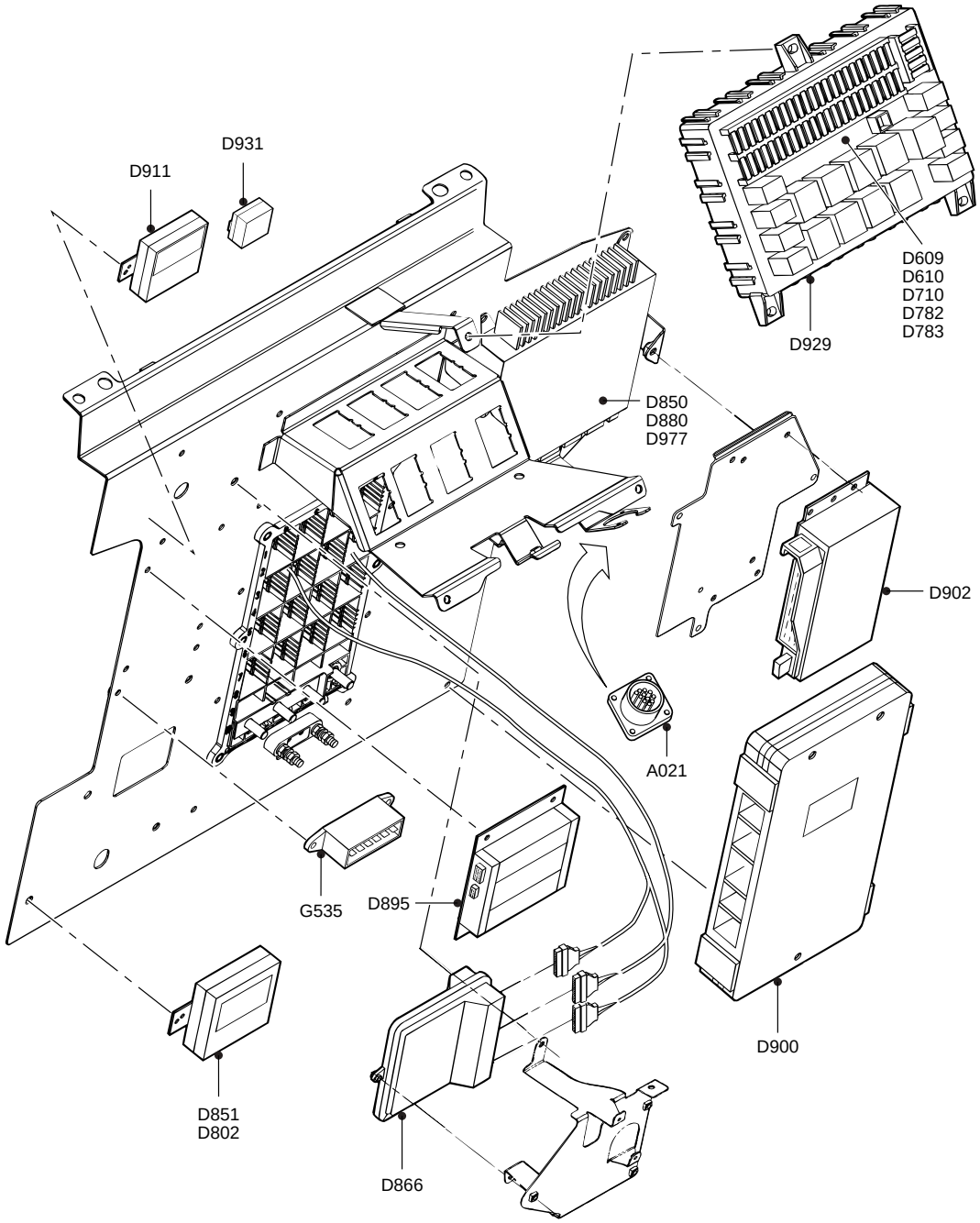

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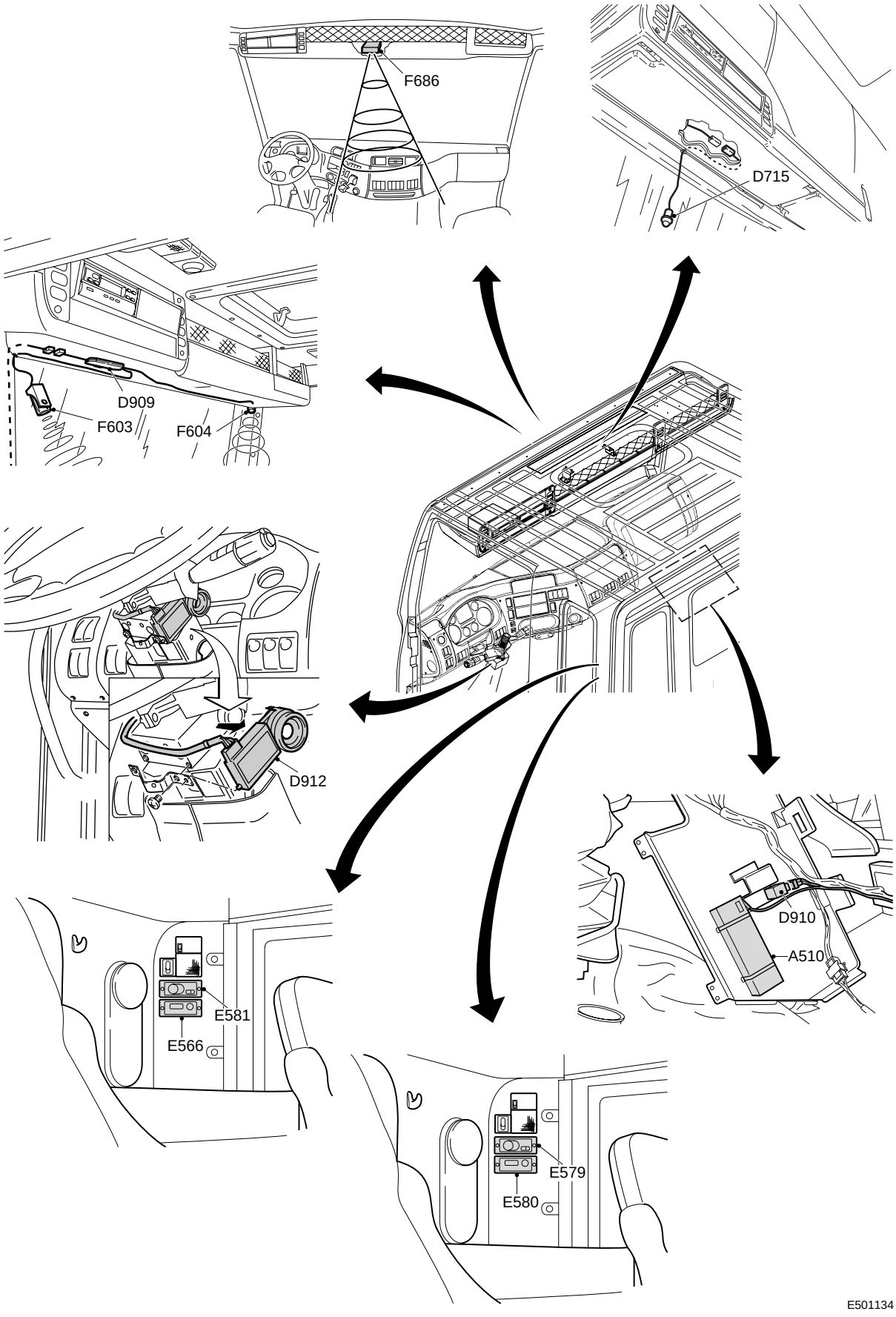
Location of components in relation to circuit diagram: 1358030/25



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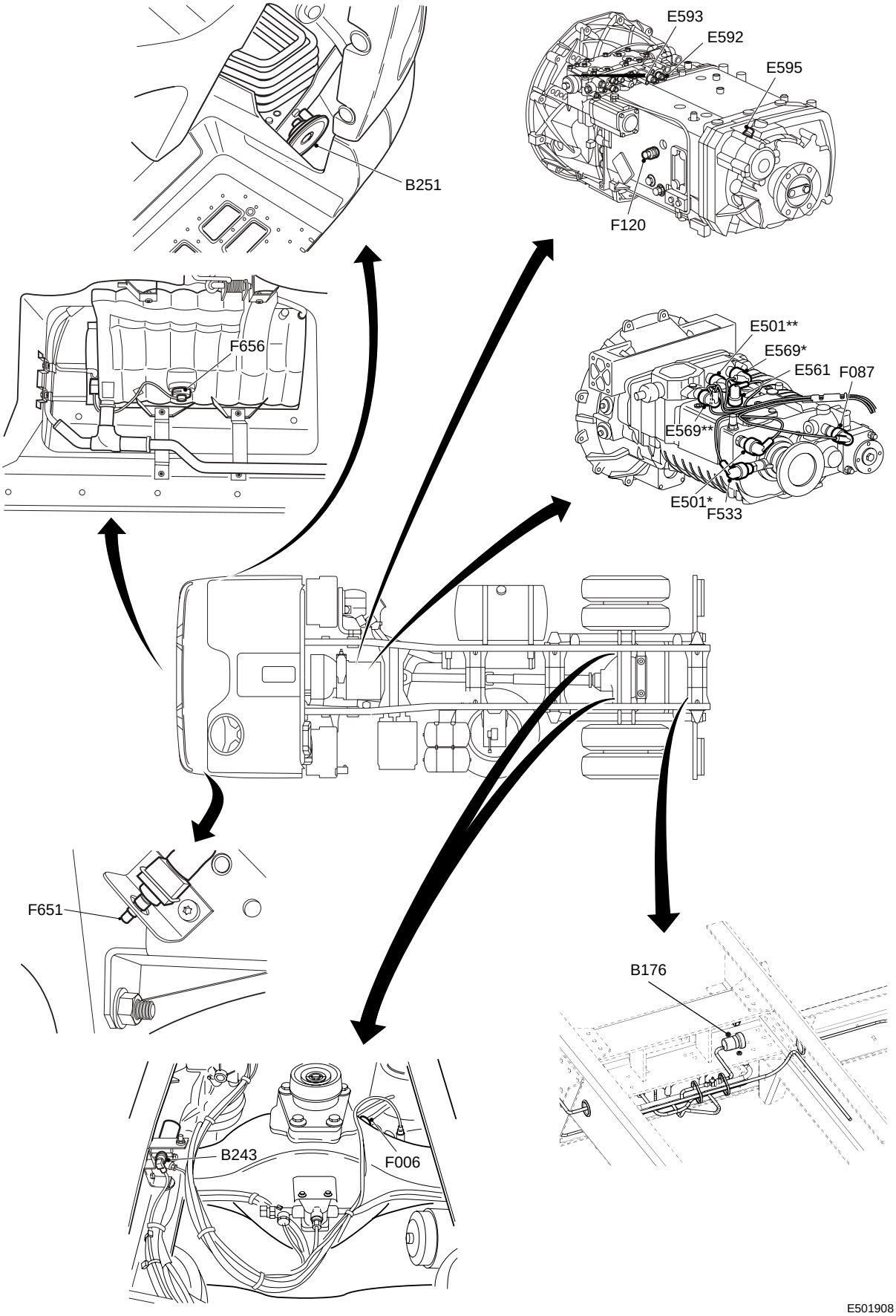

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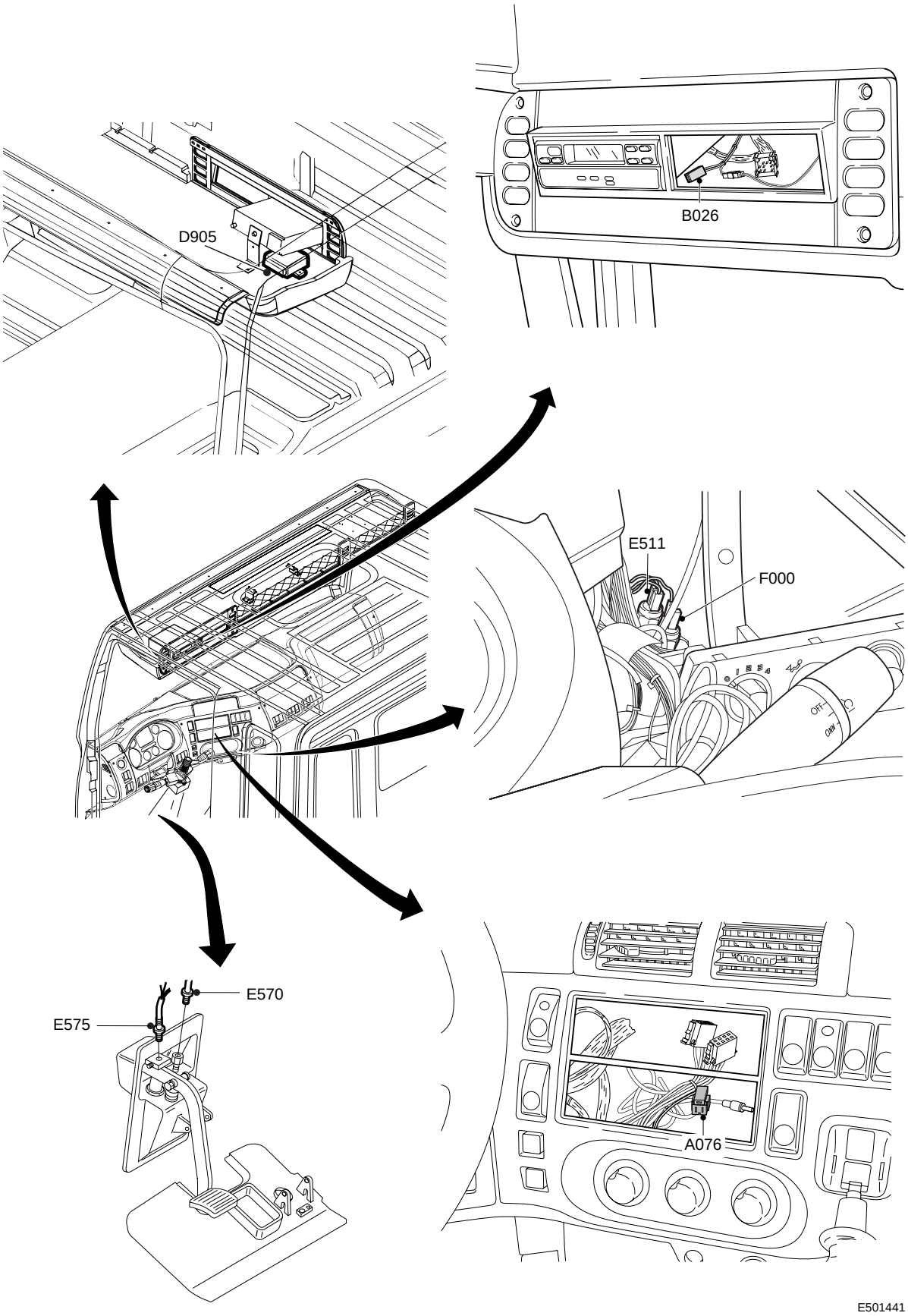

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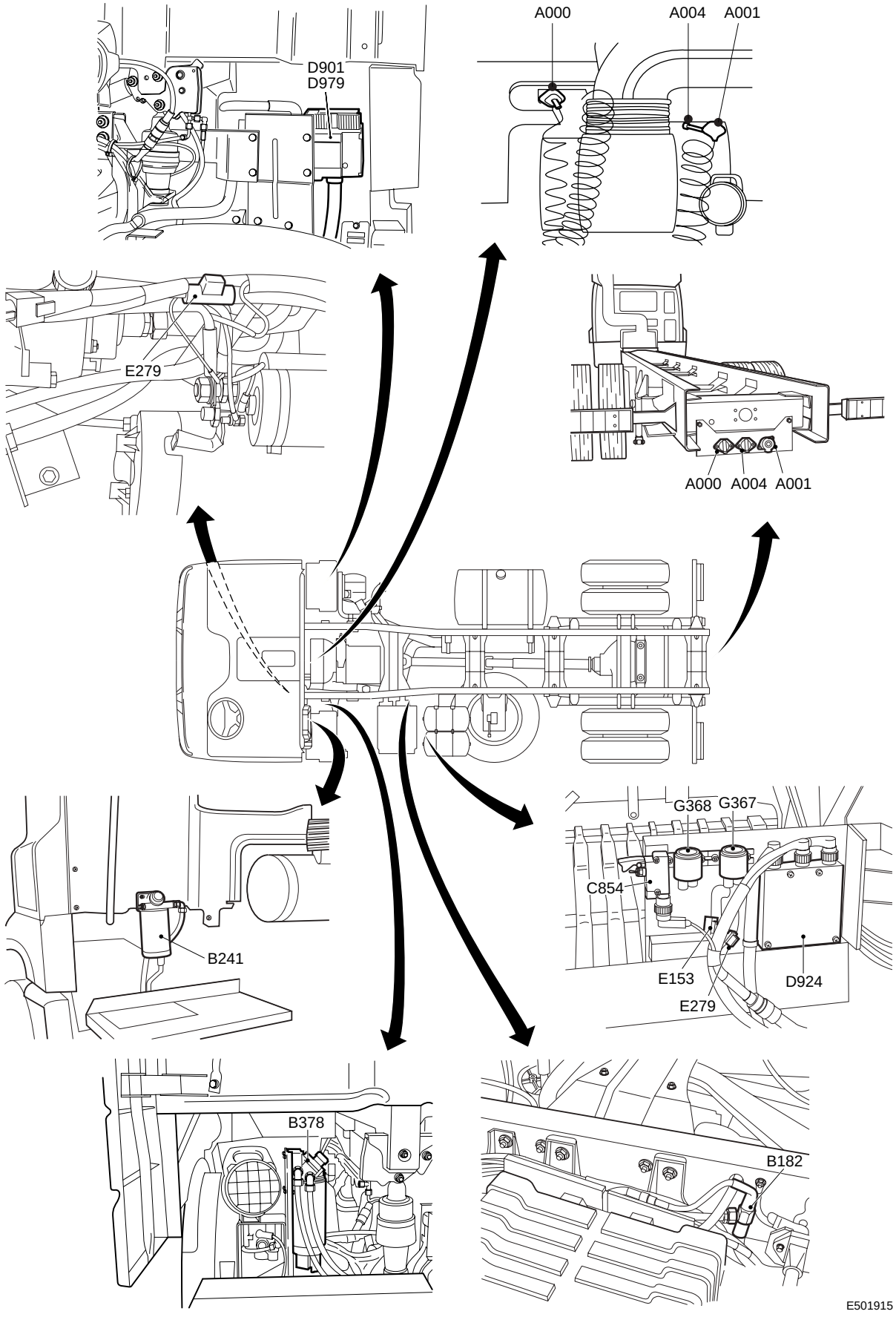

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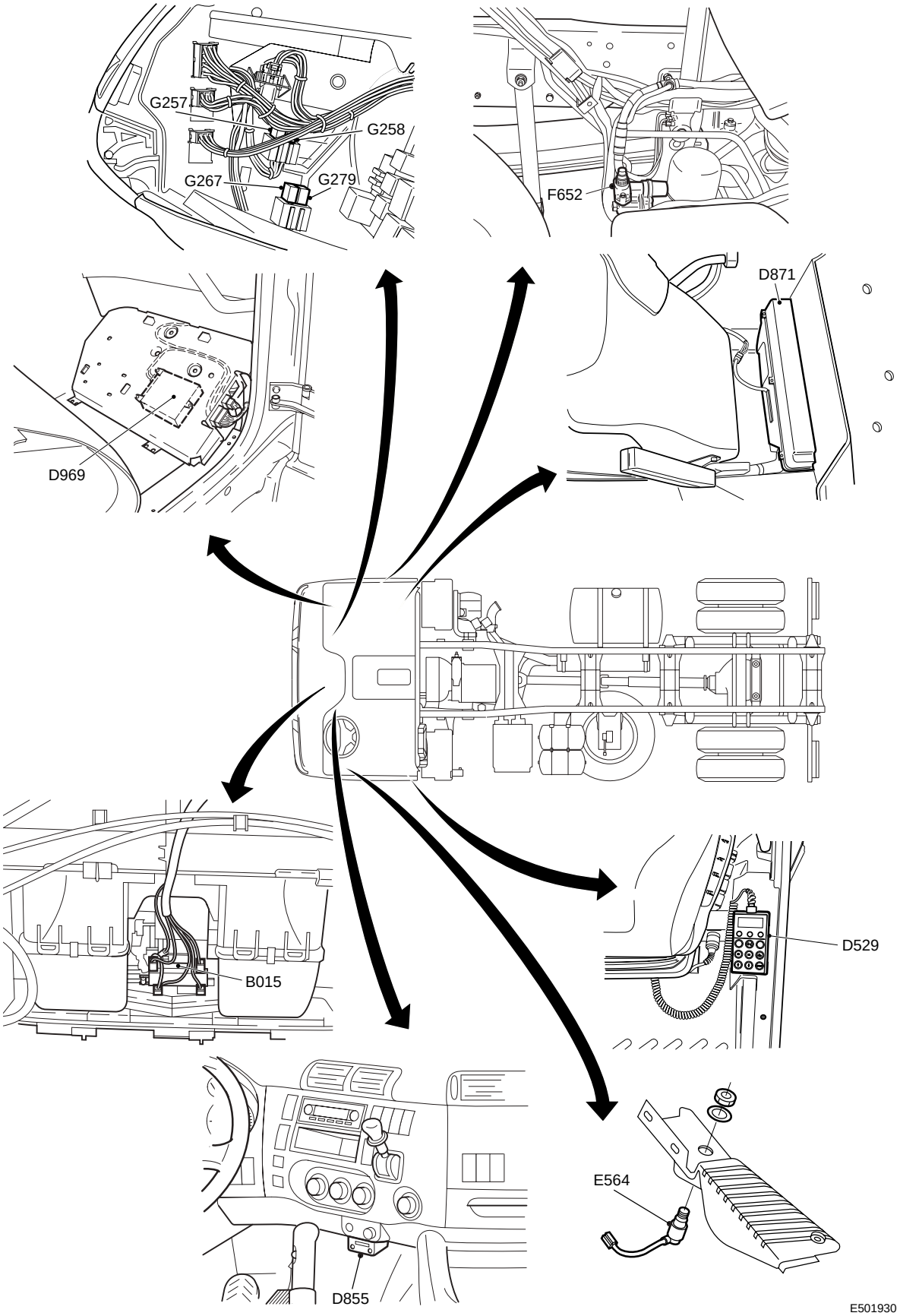

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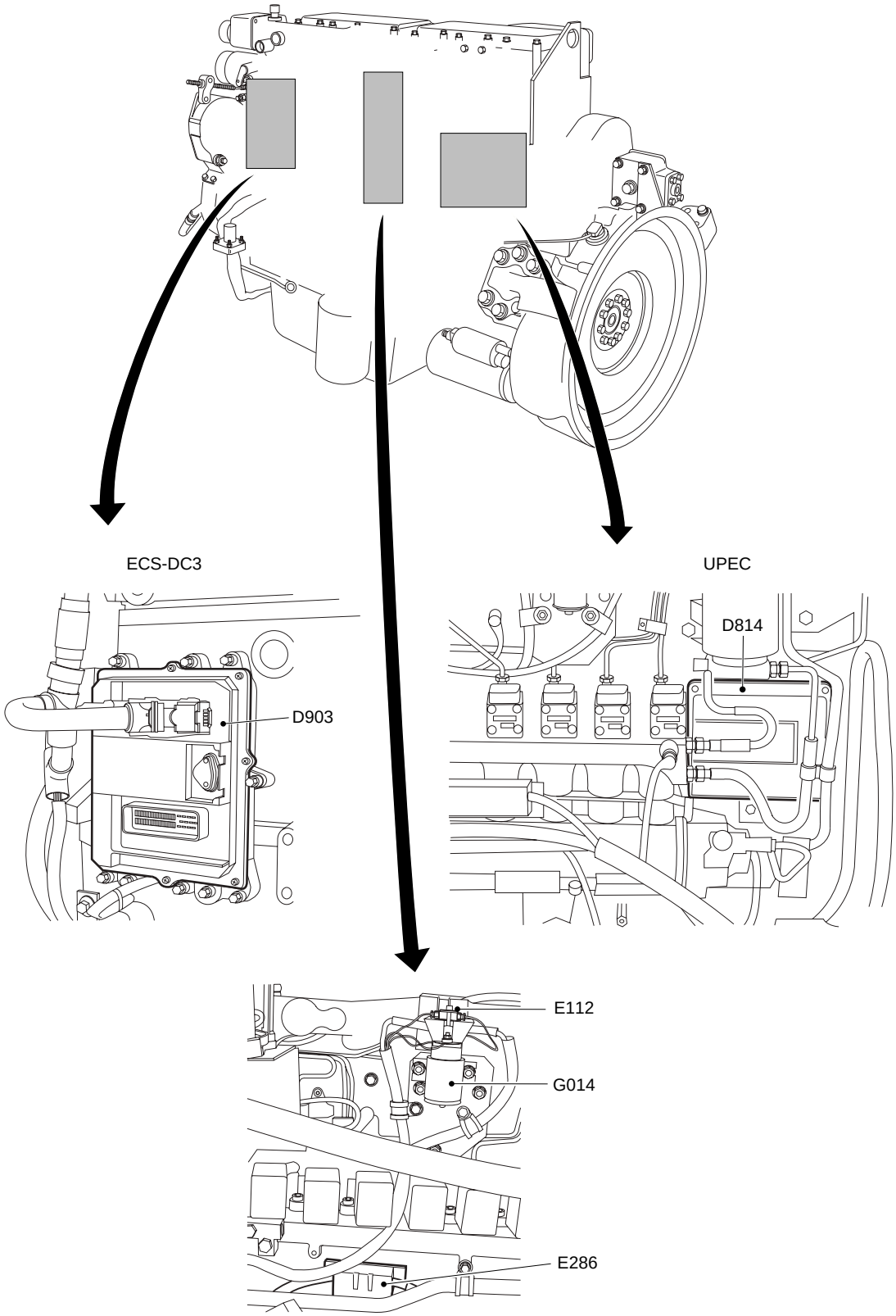

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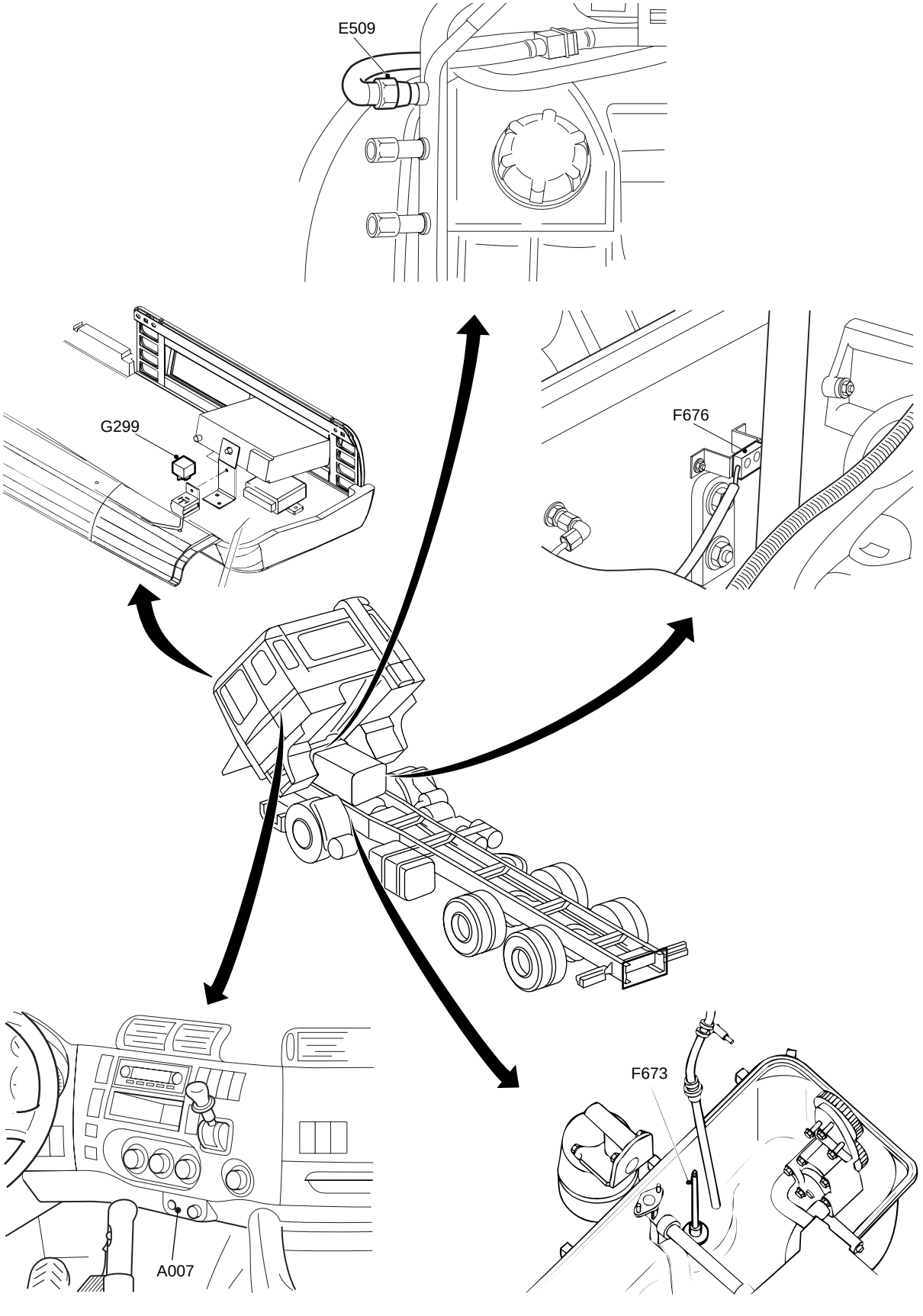

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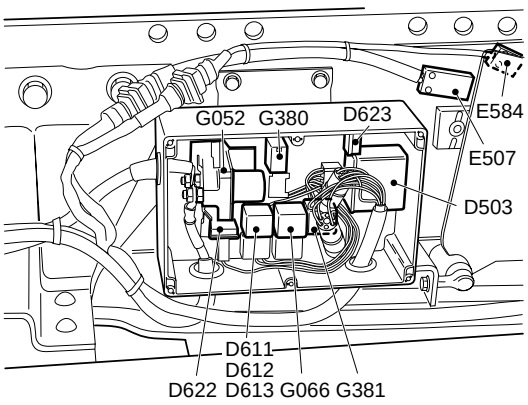

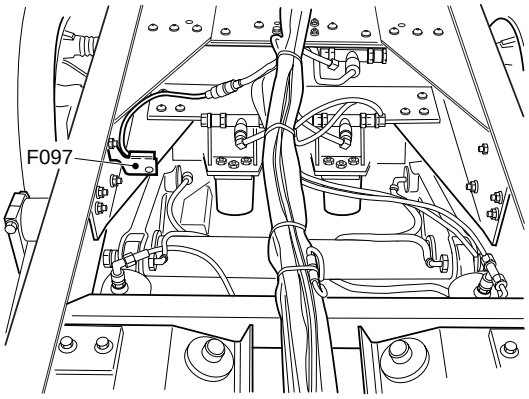

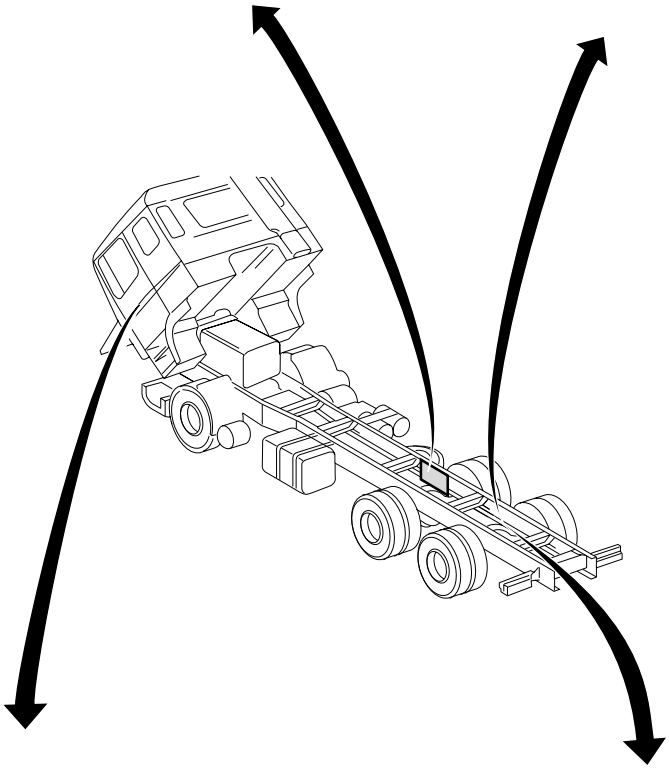

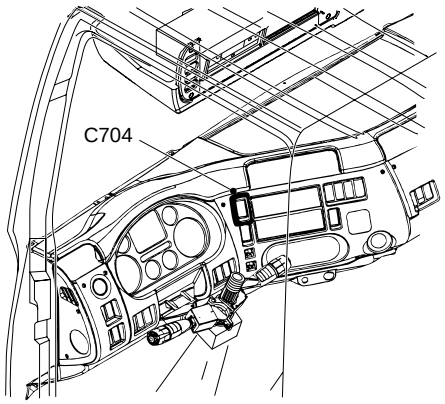

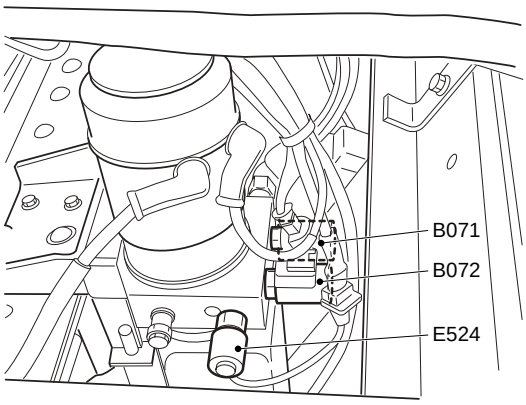

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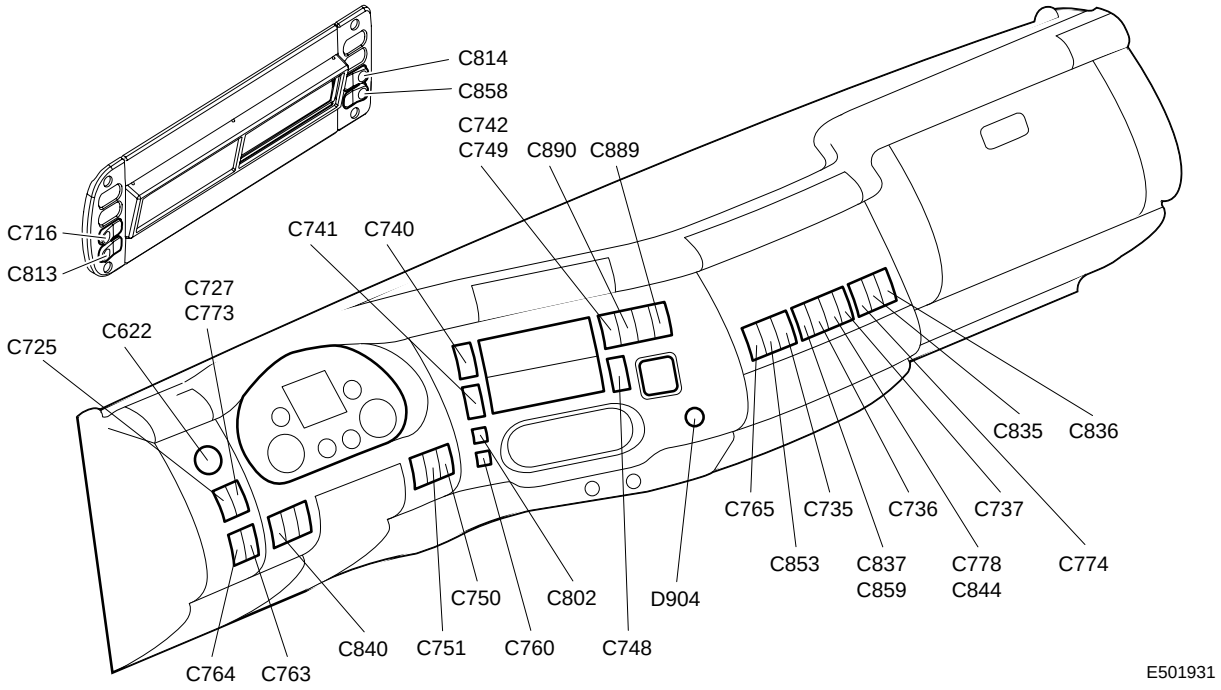
Location of components in relation to circuit diagram: 1358030/25

***CF*65/75/85 series**



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1.1	List of connectors	1-1	200332
1.2	Drawings showing location of connectors	1-14	200332

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1. LOCATION OF CONNECTORS

1.1 LIST OF CONNECTORS

Column 1 = Connector coding
Column 2 = Number of connection points on connector
Column 3 = Colour of connector
Column 4 = Description of connector, if applicable
Column 5 = Location of connector in the vehicle
Column 6 = Reference to page number (see “Drawings showing location of connectors”)

1	2	3	4	5	6
116	7	Black	Chassis wiring harness for mechanical lifting axle	In distribution box, inside of chassis on co-driver’s side, front of driven rear axle	33
122	6	White	Time relay, mechanical lifting gear	On electronic unit, mechanical lifting gear	36
143	4	Black	Stepwell lighting	Under cab, driver’s side	16
144	4	Black	Stepwell lighting	Under cab, co-driver’s side	16
180	2	Black	Accessories connection	Under central PCB, central box	8
216	16	Black	Diagnostics	Bottom right, central box	28
222	6	Blue	Steering column ignition switch	Behind radio panel cover	2
231	5	Black	Light switch	On light switch, left-hand side of steering column	34
251	3	White	Engine brake switch	On foot panel engine brake switch	35
269	14	Black	Eberspächer Airtronic cab heater thermostat unit	Rear wall corner, driver’s side	11
284	12	Black	Chassis substructure	Under cab, driver’s side	28
288	12	Black	Chassis substructure	Under cab, co-driver’s side	28

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1	2	3	4	5	6
294	35	Black	UPEC engine management (A connector)	On UPEC electronic unit against engine block, driver's side	15
295	35	Black	UPEC engine management (B connector)	On UPEC electronic unit against engine block, driver's side	15
307	9	Black	Remote control system, ECAS	Below seat, driver's side	34
340	35	Black	ECAS-2 (6x2) electronic unit connector	On ECAS-2 (6x2) electronic unit	17
373	18	Yellow	ECAS-3 (4x2) dashboard lead-through connector	Connector partition under PCB, central box	3
390	8	Black	AS Tronic gearbox	Right-hand side of gearbox	37
391	8	Black	AS Tronic gearbox	Right-hand side of gearbox	37
392	6	Yellow	Reversing buzzer wiring	Dashboard lead-through, location A7	6
393	21	Yellow	FAG dashboard wiring harness, ECAS 2 + front axle air suspension + EMAS + mechanical lifting gear	Connector partition under PCB, central box	38
397	12	Black	Heater wiring	Right-hand side of heater unit	13
400	35	Grey	PCB connector	Rear of PCB, central box - A-connector	1
401	35	Black	PCB connector	Rear of PCB, central box - B-connector	1
402	35	Grey	PCB connector	Rear of PCB, central box - C-connector	1
403	35	Black	PCB connector	Rear of PCB, central box - D-connector	1
407	6	Yellow	Clutch pedal sensor	Behind radio panel cover	2
416	1	White	PCB connector, power supply before contact	Rear of PCB, central box	1
417	1	Brown	PCB connector, power supply after contact	Rear of PCB, central box	1
424	8	Grey	Power supply to radio	Behind radio panel	9

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1	2	3	4	5	6
425	8	Brown	Loudspeakers	Behind radio panel	9
445	18	Yellow	ECAS-2 (6x2) dashboard lead-through connector	Connector partition under PCB, central box	3
446	25	Black	Electronic unit connector, ECAS-3 (4x2)	On electronic unit, ECAS-3 (4x2)	17
453	18	Black	A-connector, ABS/ASC-D electronic unit	On ABS/ASC-D electronic unit, central box	9
454	6	Black	B-connector, ABS/ASC-D electronic unit	On ABS/ASC-D electronic unit, central box	9
455	9	Black	C-connector, ABS/ASC-D electronic unit	On ABS/ASC-D electronic unit, central box	9
456	15	Black	D-connector, ABS/ASC-D electronic unit	On ABS/ASC-D electronic unit, central box	9
482	18	Black	Eberspächer Airtronic cab heater	On Airtronic cab heater unit	13
483	12	Black	Eberspächer Airtronic cab heater	Connector partition under PCB, central box	3
491	4	Black	PTO valve	On gearbox, right rear	23
499	12	Black	ABS chassis wiring harness	In front of driven rear axle	17
521	4	White	Electronic unit for RACOR water separator	Behind radio panel	9
527	14	Black	Eberspächer Hydronic 10 cab heater thermostat unit	On thermostat unit, driver's side rear wall corner	12
528	12	Black	Eberspächer Hydronic 10 cab heater unit	On Hydronic 10 cab heater unit	23
533	2	White	Eberspächer Hydronic 10 cab heater, temperature sensor	On cab rear wall	12
545	6	Blue	Cab lock	Dashboard lead-through, location D9	6
553	16	Grey	Door wiring, driver's side	Door pillar, driver's side	18

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1	2	3	4	5	6
554	21	Yellow	Roof wiring	Connector partition, behind left-hand steering column cover	2
555	21	Black	Tachograph roof wiring	Connector partition, behind left-hand steering column cover	2
556	9	Yellow	Sill wiring	Connector partition, behind left-hand steering column cover	2
557	6	Green	Engine speed remote control	Connector partition, behind left-hand steering column cover	2
558	18	Blue	Panel switches	Connector partition, behind left-hand steering column cover	2
559	18	Black	Substructure, driver's side	Connector partition, behind right-hand steering column cover	2
560	9	Blue	Substructure, EBS valve	Connector partition, behind right-hand steering column cover	2
561	12	Yellow	Steering column - B-conn.	Behind radio panel cover	2
562	6	Green	Immobiliser	Behind radio panel cover	2
563	14	Black	Instrument panel	Rear of DIP-4	11
564	9	Green	PTO instrument panel	Behind radio panel cover	2
565	6	Black	Instrument panel, 4x4	Behind radio panel cover	2
566	18	Black	Steering column - A-conn.	Behind radio panel cover	2
567	6	Yellow	Radio panel	Behind radio panel cover	3
568	21	Black	Air conditioning feed-through	Behind radio panel cover	2
569	2	Yellow	Air conditioning pressure switch	Above coolant expansion tank, co-driver's side	21
570	21	Yellow	Heater panel	Right-hand side of heater panel	3
571	9	Blue	Instrument lighting/roof hatch switch	Right-hand side of heater panel	3
572	21	Yellow	Substructure, co-driver's side	Right-hand side of foot plate, co-driver's side	4
573	9	Black	Sill wiring	Right-hand side of foot plate, co-driver's side	4

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1	2	3	4	5	6
574	21	Green	Alarm system	Connector partition under PCB, central box	3
575	21	Green	Engine wiring	Dashboard lead-through, location C3/4	5
576	21	Green	UPEC/ECS-DC3 application connector (A070)	Dashboard lead-through, location C5/6	5
577	21	Blue	UPEC/ECS-DC3 rear chassis wiring lead-through connector/application connector (A070)	Dashboard lead-through, location D5/6	5
578	6	Blue	MTCO speed sensor lead-through connector	Dashboard lead-through, location D9	5
579	6	Blue	Continuous lighting	Connector partition under PCB, central box	4
580	6	Green	Superstructure accessories	Connector partition under PCB, central box	3
581	6	Black	Roof wiring	Next to connector partition, behind left-hand steering column cover	2
582	12	Black	Eberspächer Hydronic 10 cab heater	Connector partition under PCB, central box	3
583	12	Blue	Intarder	Connector partition under PCB, central box	4
584	21	Black	EBS	Connector partition under PCB, central box	3
585	21	Black	ABS	Connector partition under PCB, central box	3
586	21	Black	Brake lining	Connector partition under PCB, central box	3
587	6	Green	Grease lubrication	Dashboard lead-through, location C1	5
588	12	Yellow	UPEC/ECS-DC3 application connector (A068)	Dashboard lead-through, location A4	5
589	21	Black	UPEC / ECS-DC3	Dashboard lead-through, location B3/4	5

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1	2	3	4	5	6
590	2	Black	ABS, drawn vehicle	Dashboard lead-through, location B9	5
591	16	Grey	Door wiring	Door pillar, driver's side	18
592	9	Black	A-connector, electronic unit, VIC	Central box	7
593	24	Black	B-connector, VIC electronic unit	Central box	7
594	52	Black	C-connector, VIC electronic unit	Central box	7
595	40	Black	D-connector, VIC electronic unit	Central box	7
596	9	Black	E-connector, VIC electronic unit	Central box	7
597	12	Black	Roof wiring	Roof console, driver's side	6
598	8	White	A-connector	On rear of tachograph	7
599	8	Yellow	B-connector	On rear of tachograph	7
600	16	Black	Electronic unit, CDS-3	Roof console, driver's side	10
601	6	Black	Interior alarm/loadspace detection	Right-hand side of heater panel	3
602	6	Green	Alarm system siren	Under instrument panel	10
603	12	Black	Electronic unit, ASL-S, A-connector	Central box	20
604	21	Black	Electronic unit, ASL-S, B-connector	Central box	20
605	21	Black	Chassis wiring harness	In cable duct above front wheel, co-driver's side (only FT type)	20
606	3	Black	Roof spotlights	Behind spotlights on roof, outside cab, driver's side	27
607	18	Black	Allison gear selector	Behind radio panel cover	4
608	21	Grey	EBS chassis	Dashboard lead-through, location B5/6	5

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1	2	3	4	5	6
609	21	Green	EBS substructure	Dashboard lead-through, location C7/8	5
610	21	Grey	ABS chassis	Dashboard lead-through, location B5/6	5
611	21	Green	ABS substructure	Dashboard lead-through, location C7/8	5
612	18	Black	A-connector, electronic unit, EBS	Central box	14
613	15	Black	B-connector, EBS electronic unit	Central box	14
614	9	Black	C-connector, EBS electronic unit	Central box	14
615	12	Black	D-connector, EBS electronic unit	Central box	14
616	6	Black	E-connector, EBS electronic unit	Central box	14
617	21	Black	Chassis wiring harness	In cable duct above front wheel, co-driver's side (only FA type)	25
618	2	Black	Cooler box door-sill wiring	Next to co-driver's seat, behind cover	13
619	2	Black	Storage compartment door-sill wiring	Next to driver's seat, behind cover	24
620	12	Blue	ZF intarder	Dashboard lead-through, location D8	5
621	9	Blue	Eberspächer Airtronic cab heater wiring	Behind co-driver's seat	13
622	88	Black	Electronic unit, EST 42 intarder	Central box	25
623	12	Black	Roof wiring, spotlights, SH cab	In roof console, driver's side	6
624	2	Black	Fuel heater extension cable	Behind fuel tank, driver's side Special vehicle model	19

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1	2	3	4	5	6
625	4	Black	Fuel level sensor extension cable	Behind cab in side member. Special vehicle model	19
626	21	Blue	Gearbox wiring feed-through	Manual gearbox chassis wiring, location D5/6	5
627	12	Grey	Chassis wiring, ECAS-2 (6x2)	Dashboard lead-through, location B8	6
628	8	Black	ECS-DC3 engine wiring harness	Front of engine block	19
629	12	Yellow	Eberspächer Hydronic 10 cab heater	Dashboard lead-through, location A6	5
630	9	Blue	Eberspächer Airtronic cab heater wiring	Right-hand side of foot plate, co-driver's side	4
631	2	White	External temperature sensor for cab heater	Rear wall corner, driver's side	11
632	12	Black	Timer for Eberspächer Airtronic cab heater	Rear wall corner, driver's side	11
633	12	Black	Timer for Eberspächer Hydronic 10 cab heater	Rear wall corner, driver's side	12
634	12	Black	Chassis wiring, ECAS-3 (4x2)	Dashboard lead-through, location B8	6
635	6	Black	Air-sprung front axle	Dashboard lead-through, location B7	5
636	7	Black	Air pressure sensor wiring	Under cab, co-driver's side	26
637	12	Black	Gearbox	On the right next to gearbox	33
638	6	Blue	Main switch	Dashboard lead through, location D4	5
639	8	Black	Main switch	Between battery pack and chassis side member, driver's side	26

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1	2	3	4	5	6
642	21	Black	Tail light chassis wiring, trailer plugs	On cross member behind rear axle (only FA type)	29
643	4	Black	PTO	On gearbox	33
644	18	Blue	Allison transmission	Connector partition under PCB, central box	4
646	4	Black	Coolant level sensor	Next to coolant expansion tank, driver's side	21
647	89	Red	On ECS-DC3 electronic unit	On ECS-DC3 electronic unit against engine block, driver's side	22
648	21	Grey	Allison gearbox	Dashboard lead-through, location B1/2	6
649	12	Green	Allison gearbox	Dashboard lead-through, location C2	6
650	8	Black	Allison gearbox	On gearbox, middle rear	22
651	8	Black	ECAS chassis wiring harness	Above cross member, in front of driven rear axle	15
652	18	Yellow	FAG	Connector partition under PCB, central box	3
653	6	Green	FAG	Dashboard lead-through, location C9	6
654	9	Blue	Accessories connector	Behind radio panel cover	3
655	6	Yellow	Accessories connector	Right-hand side of heater panel	3
656	21	Blue	Accessories connector	Dashboard lead-through, location D1/2	5
657	12	Black	Superstructure application connector	Depending on type of cab: under or behind cab, co-driver's side	24
658	8	Black	Superstructure application connector	Depending on type of cab: under or behind cab, co-driver's side	24

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1	2	3	4	5	6
659	3	Black	Alarm system extension cable	Rear of cab, driver's side	30
660	6	Black	Alarm system charger	Under foot plate, co-driver's side	12
661	8	Black	Chassis wiring harness for mechanical lifting axle	In cable duct above front wheel, co-driver's side	32
662	7	Black	Chassis wiring harness for mechanical lifting axle	In distribution box, inside of chassis on co-driver's side, front of driven rear axle	33
663	6	Green	FAS/FTS dashboard wiring harness	Dashboard lead-through, location C9	5
664	18	Yellow	FAS/FTS dashboard wiring harness	Connector partition under PCB, central box	4
665	6	Yellow	Racor fuel pre-heating filter	Dashboard lead-through, location A5	6
666	6	Green	Fuel pre-heating	Right-hand side of heater panel	4
667	2	Black	Thermoline fuel pre-heating	Dashboard lead-through, location A9	6
668	4	Black	Air conditioning compressor	Against engine under cab, co-driver's side	8
669	4	Black	Work lamp	Against bridge piece, rear of cab	8
670	7	Black	Windscreen wiper motor	Above coolant expansion tank, driver's side	21
671	4	Black	Main switch	Under main switch cover, next to battery pack	27
672	6	Black	Intermediate connector for alarm system radar	In roof console, driver's side	21
673	6	Black	Intermediate connector for ultrasonic alarm system	In roof console, driver's side	21

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1	2	3	4	5	6
674	21	Yellow	EMAS chassis wiring	Dashboard lead-through, location A1/2	6
675	18	Green	EMAS electronic unit, A-connector	Under foot plate, co-driver's side	30
676	18	Blue	EMAS electronic unit, B-connector	Under foot plate, co-driver's side	30
677	15	Black	EMAS electronic unit, C-connector	Under foot plate, co-driver's side	30
678	18	Yellow	EMAS electronic unit, D-connector	Under foot plate, co-driver's side	30
679	7	Green	EMAS valve block	EMAS steering cylinder control valve block (B386)	29
680	7	Grey	EMAS valve block	EMAS steering cylinder control valve block (B386)	29
681	6	Yellow	Fleet Guard fuel pre-heating	Dashboard lead-through, location A5	6
682	36	Black	On ECS-DC3 electronic unit	On ECS-DC3 electronic unit against engine block, driver's side	22
683	16	Black	On ECS-DC3 electronic unit	On ECS-DC3 electronic unit against engine block, driver's side	22
684	4	Black	Intermediate connector for EMAS chassis wiring	On front axle angle sensor on steering box	31
685	4	Black	Intermediate connector for EMAS chassis wiring	On trailing axle angle sensor	31
686	4	Black	EMAS valve block	EMAS fluid flow control valve block (B372)	31
687	21	Green	Application connector, Allison gearbox (A074)	Connector partition under PCB, central box	4

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1	2	3	4	5	6
688	3	Black	FAS/FTS chassis wiring harness	Above distribution box, above driven rear axle, co-driver's side	33
689	3	Black	FAS/FTS chassis wiring harness	Above distribution box, above driven rear axle, co-driver's side	33
690	4	Black	FAS/FTS chassis wiring harness	In front of lifting axle cross member, co-driver's side	32
691	2	Black	FAS/FTS chassis wiring harness	Behind lifting cylinder, in front of lifting axle	32
860	21	Yellow	ECAS-2 dashboard wiring harness (4x2) + front axle air suspension	Connector partition under PCB, central box	38
861	21	Yellow	ECAS-2 dashboard wiring harness (6x2) + EMAS	Connector partition under PCB, central box	38
862	21	Yellow	ECAS-2 dashboard wiring harness (6x2) + front axle air suspension	Connector partition under PCB, central box	38
868	9	Violet	AS Tronic gear lever unit wiring	In connector partition behind radio panel	38
869	21	Black	AS Tronic chassis wiring	Dashboard lead-through, location B1/2	5
871	18	White	A-connector, EMAS electronic unit	On EMAS electronic unit	36
872	18	Grey	D-connector, EMAS electronic unit	On EMAS electronic unit	36
873	39	Black	Drawn vehicle connection / FA lighting	Above front wheel, co-driver's side	37
874	39	Black	Drawn vehicle connection / FT lighting	Above front wheel, co-driver's side	37
879	15	Black	AS Tronic gear lever unit wiring	On AS Tronic gear lever unit	34
880	20	Black	AS Tronic gearbox	On AS Tronic electronic unit, gearbox	35

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1	2	3	4	5	6
882	21	Yellow	Lifting gear wiring	Connector partition under PCB, central box	38
883	9	Yellow	CDM wiring	Connector partition under PCB, central box	4
884	18	Black	CDM unit wiring	On CDM electronic unit, under foot plate, co-driver's side	38
911	7	Grey	Windscreen wiper motor	Above coolant expansion tank, driver's side	35

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1.2 DRAWINGS SHOWING LOCATION OF CONNECTORS

Explanation of connector drawings

A: Connector coding

B: Colour of connector

- BN = brown
- BW = blue
- GL = yellow
- GS = grey
- OE = orange
- RD = red
- VI = violet
- WT = white
- ZT = black

C: Overview of pin numbers on the connector. The pin numbers on the connector are viewed from the wire input side

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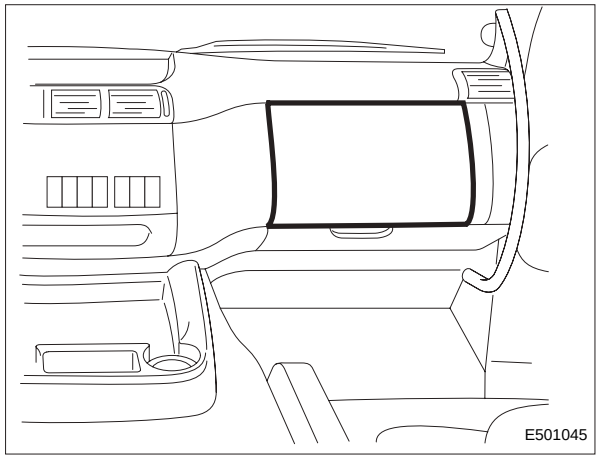

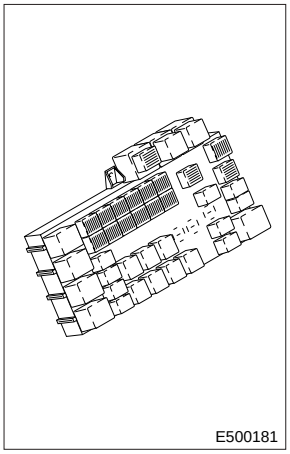

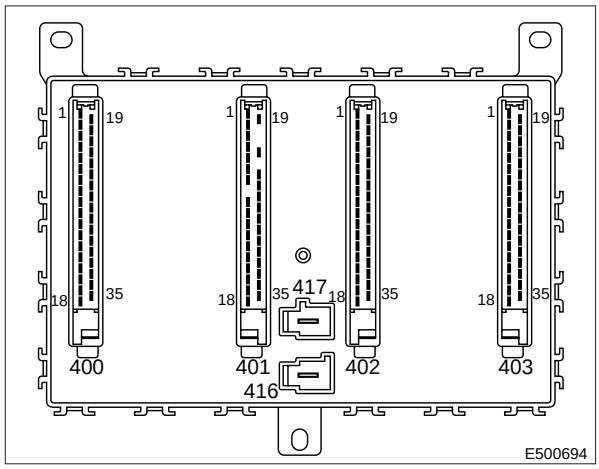

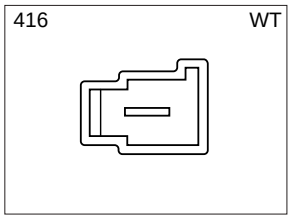

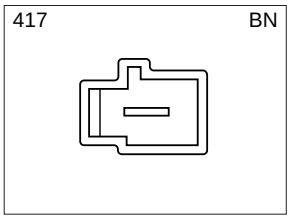

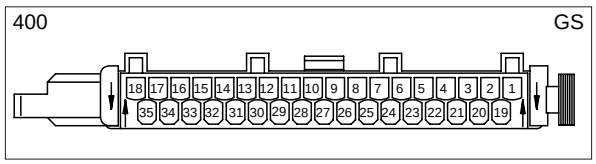

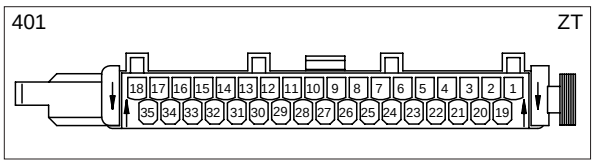

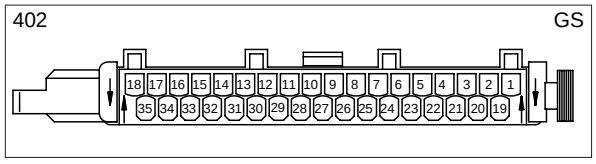

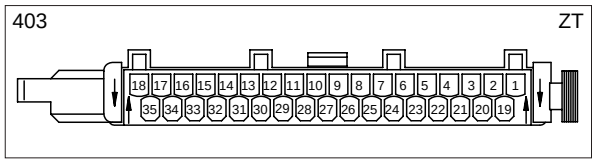

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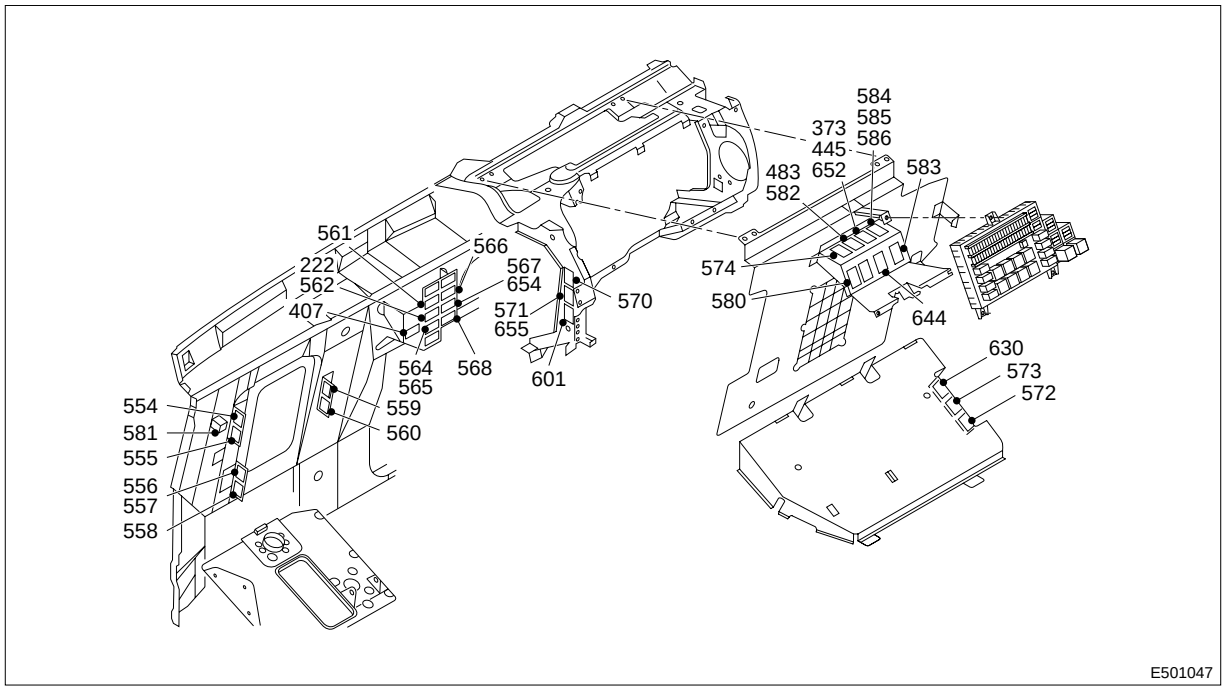

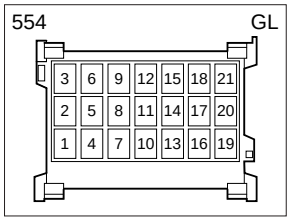

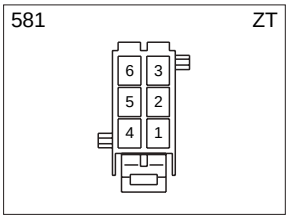

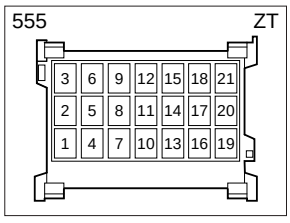

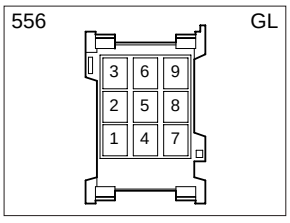

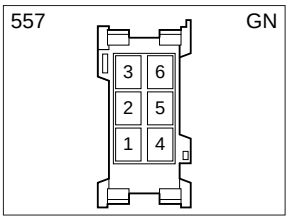

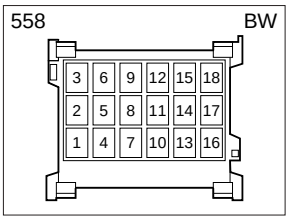

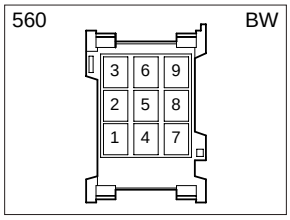

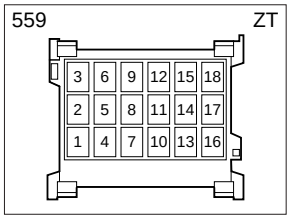

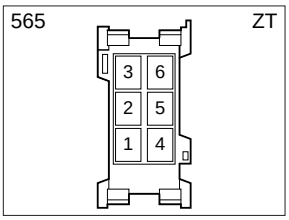

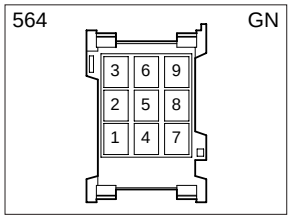

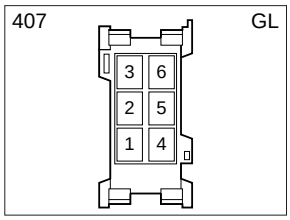

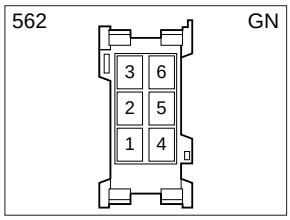

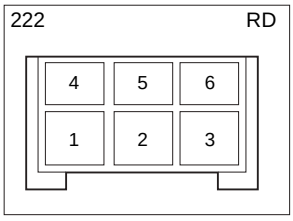

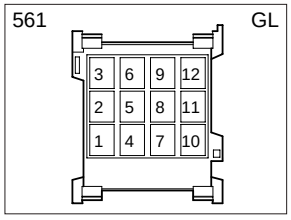

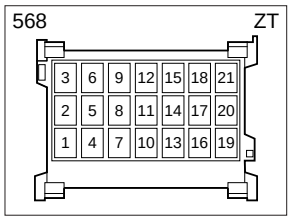

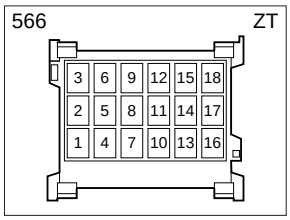

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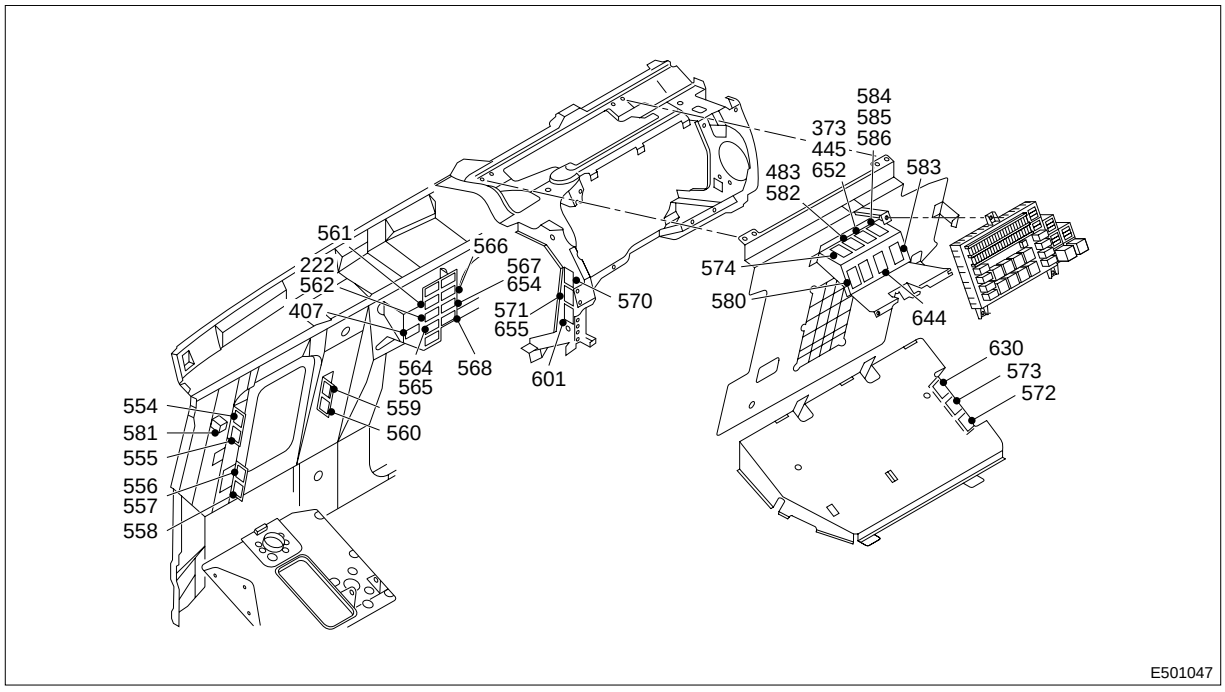

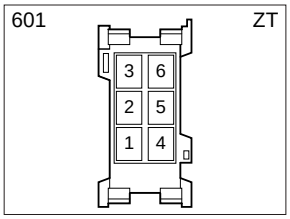

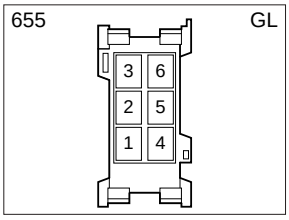

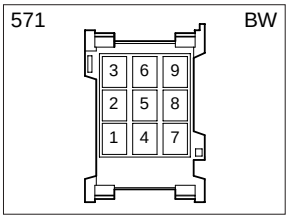

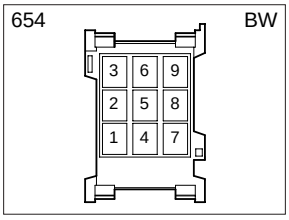

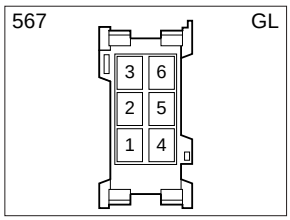

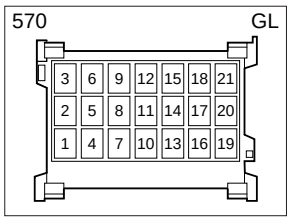

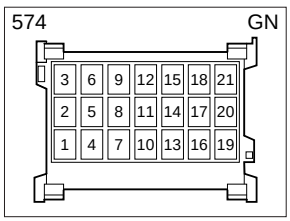

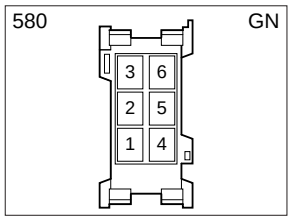

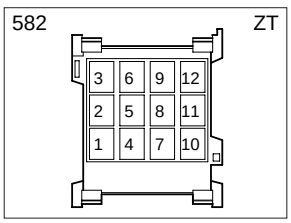

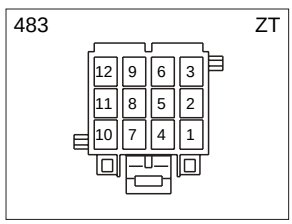

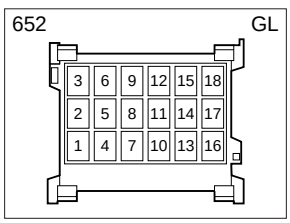

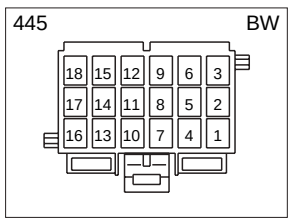

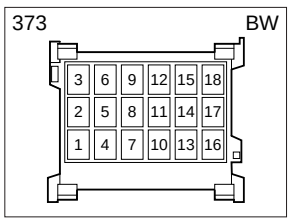

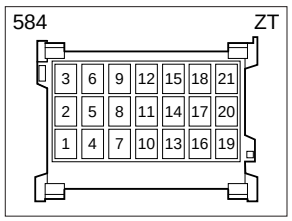

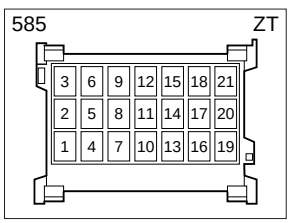

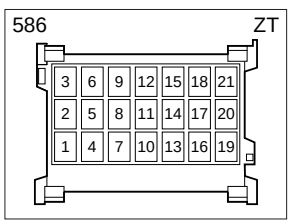

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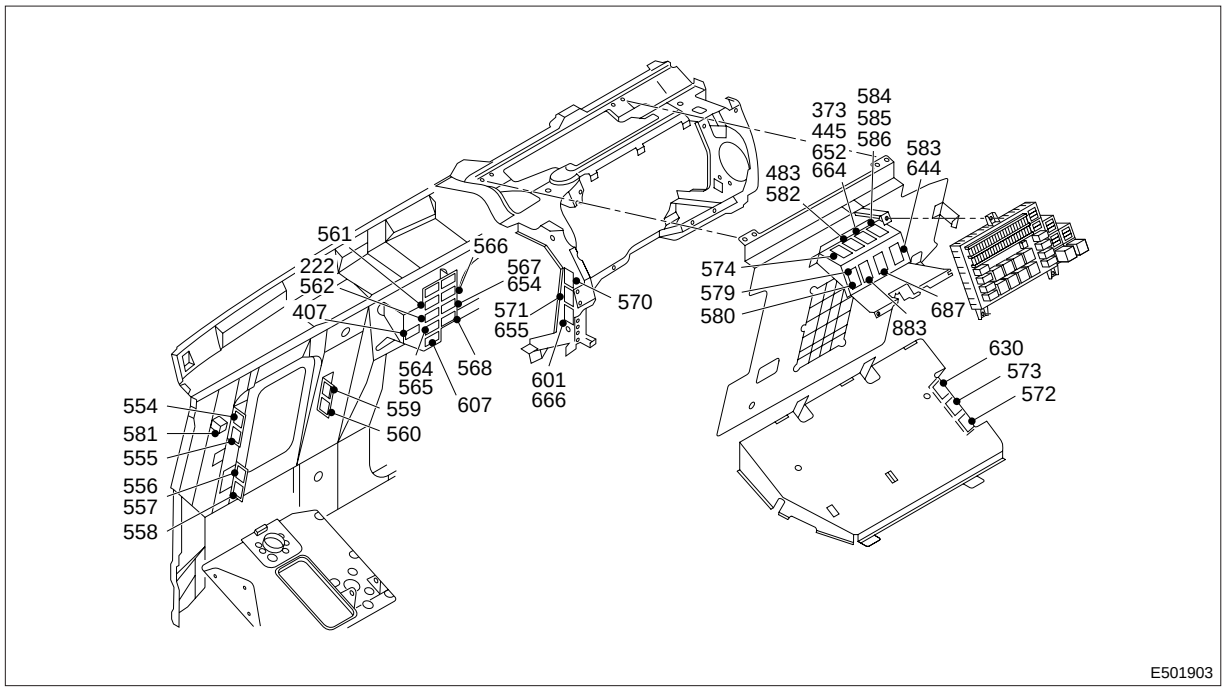

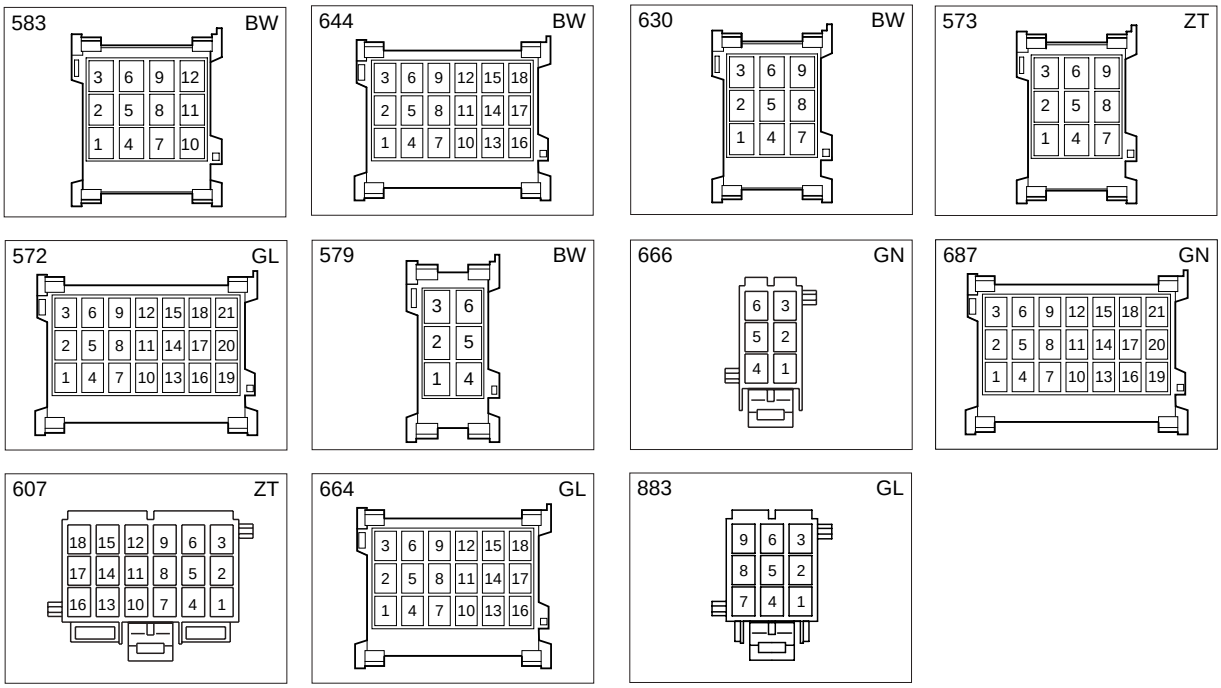

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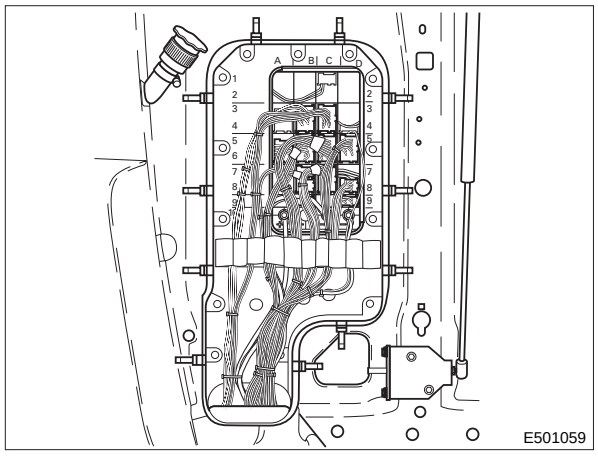

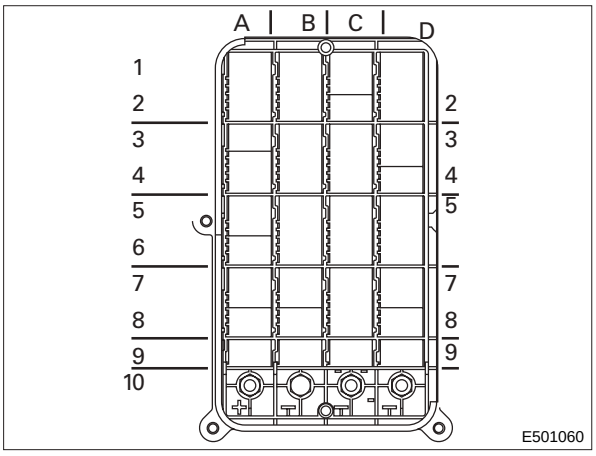

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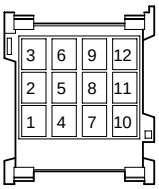

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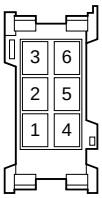

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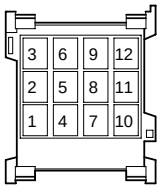

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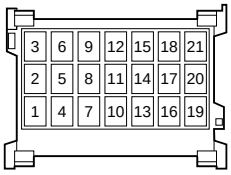

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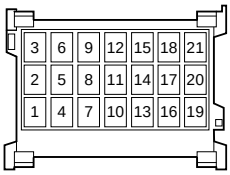

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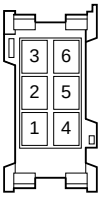

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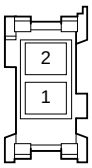

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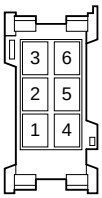

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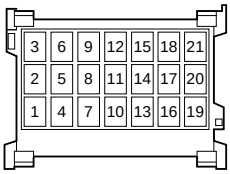

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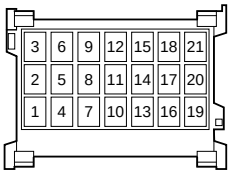

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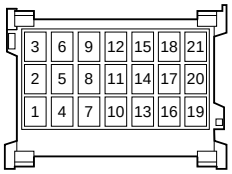

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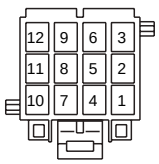

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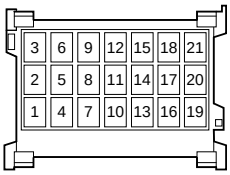

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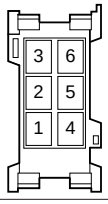

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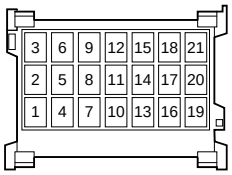

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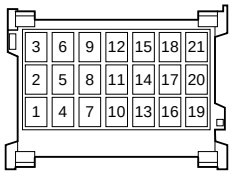

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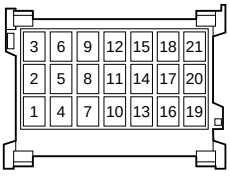

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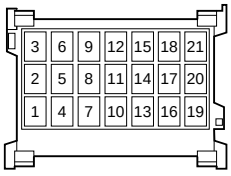

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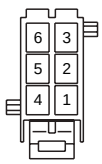

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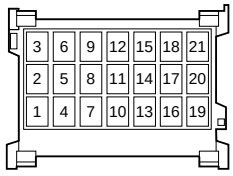

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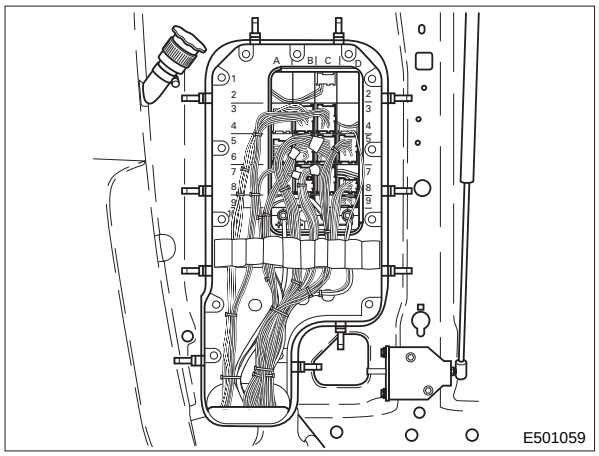

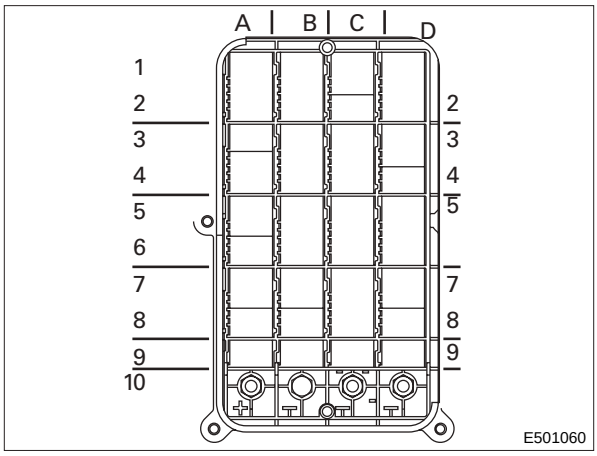

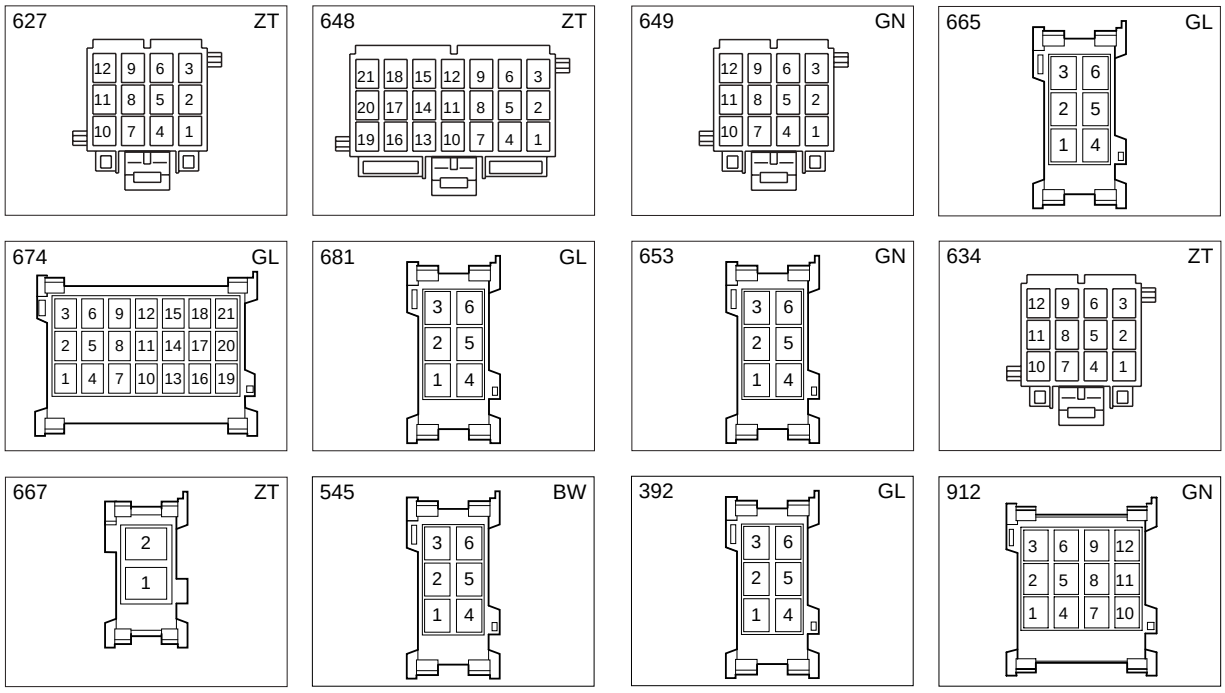

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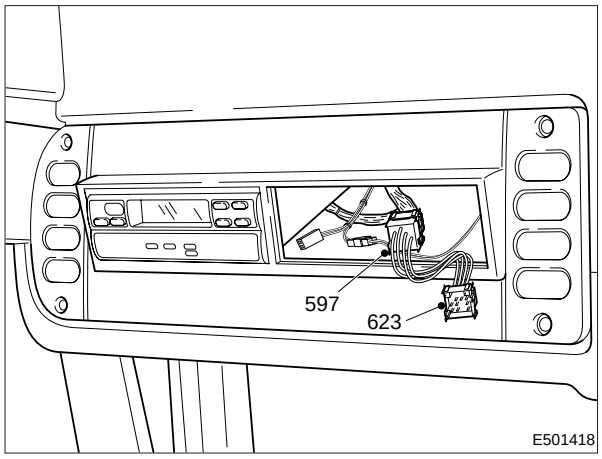

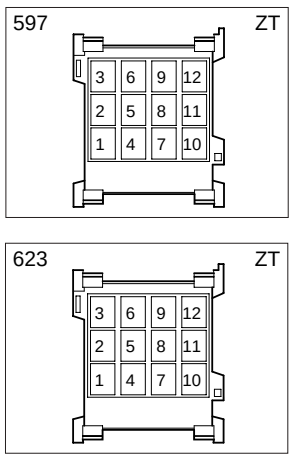

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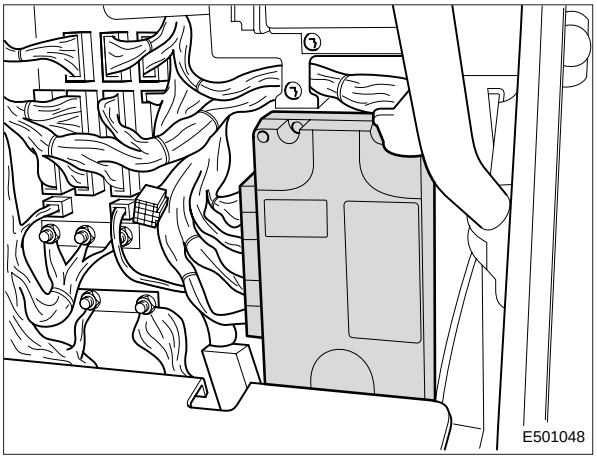

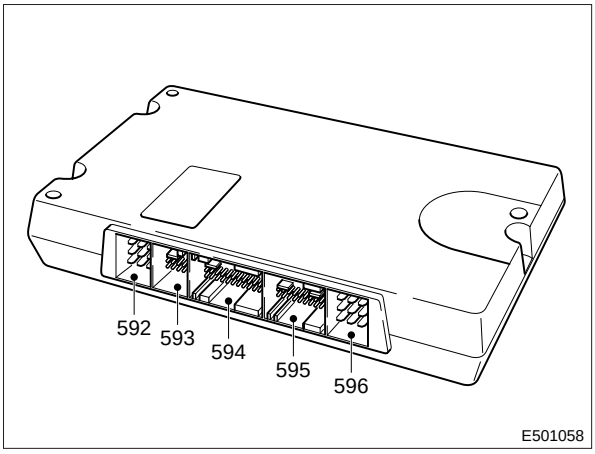

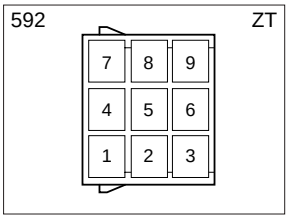

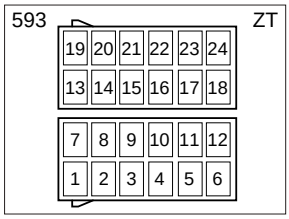

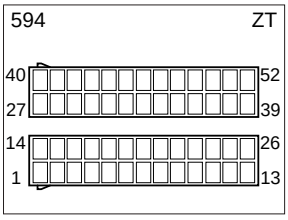

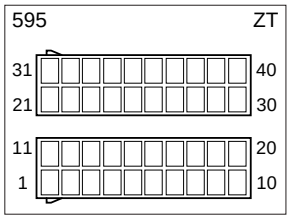

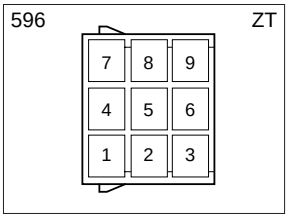

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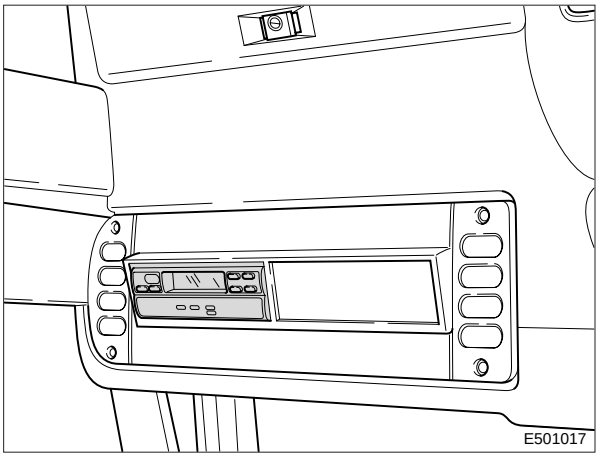

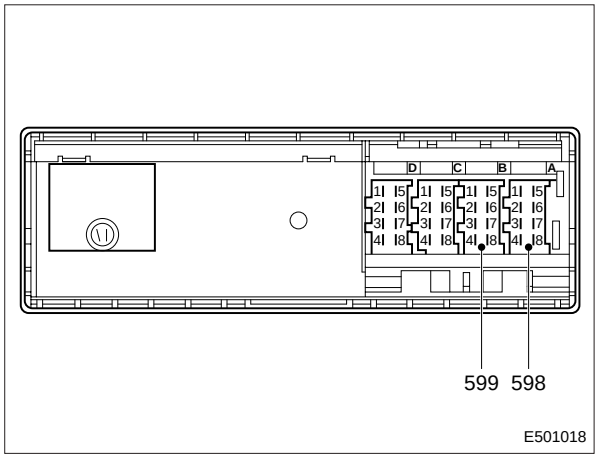

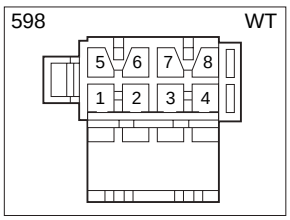

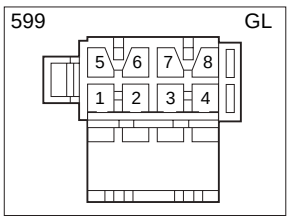

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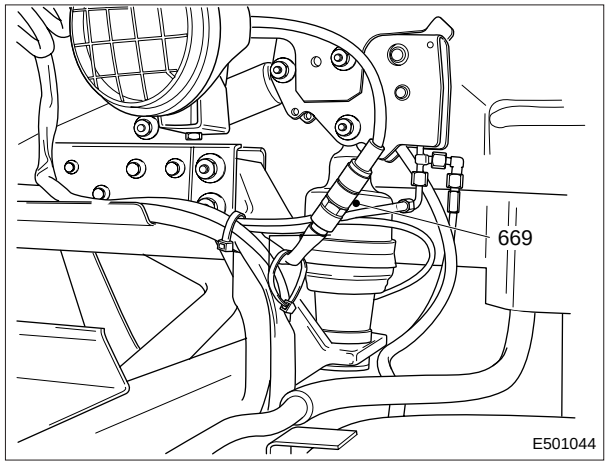

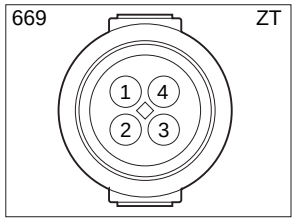

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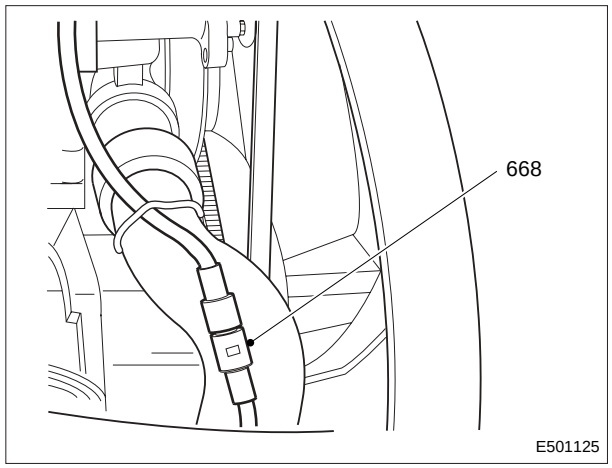

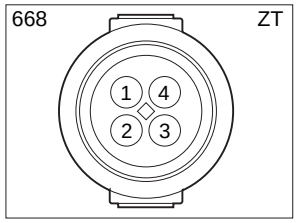

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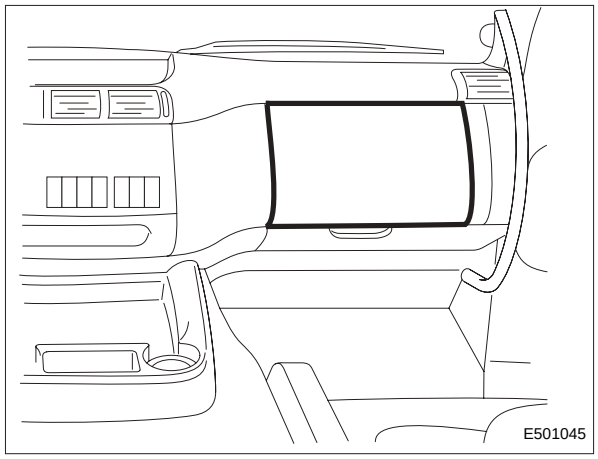

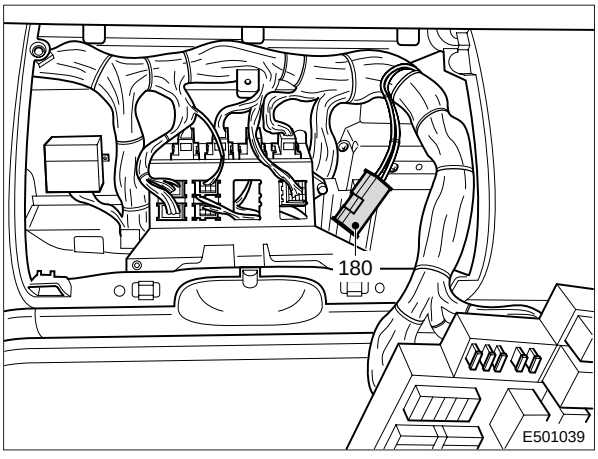

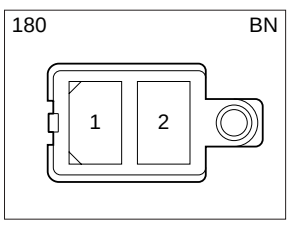

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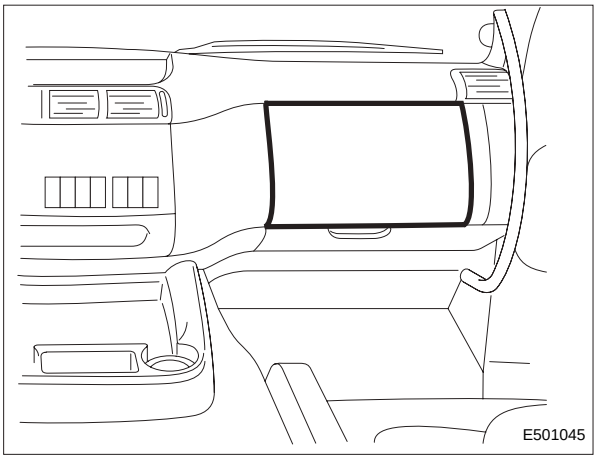

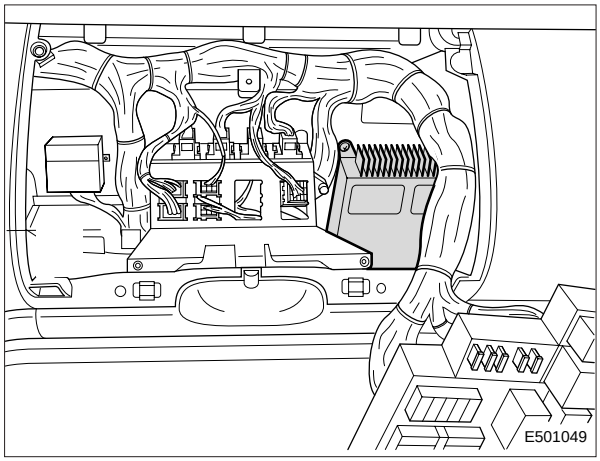

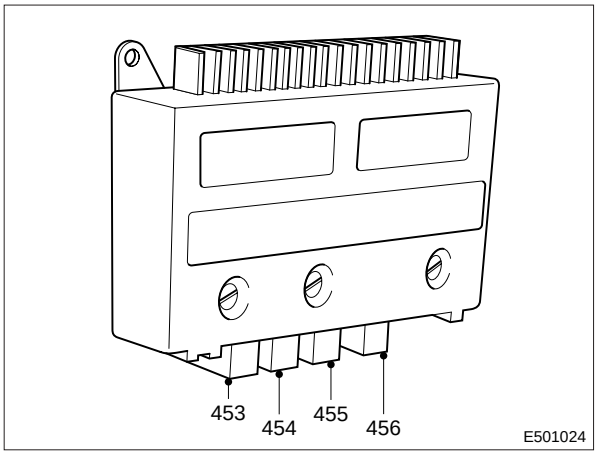

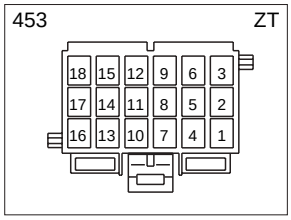

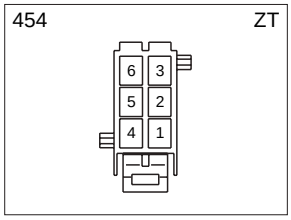

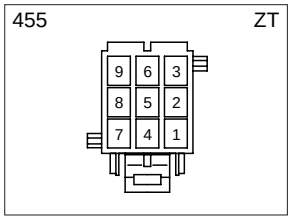

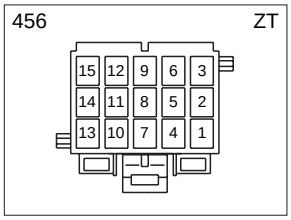

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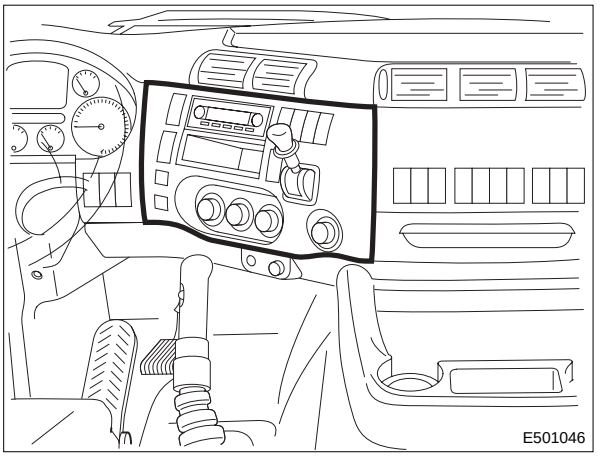

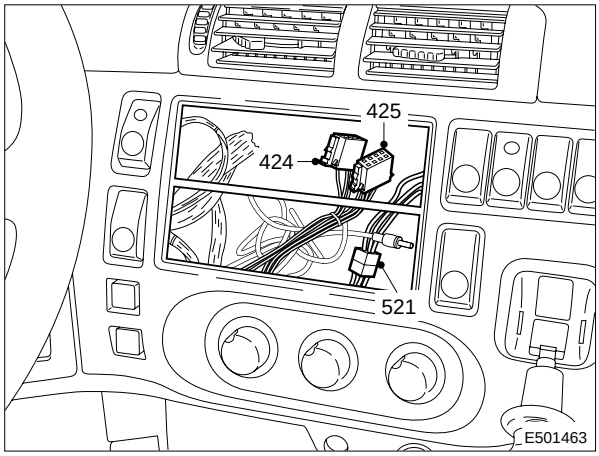

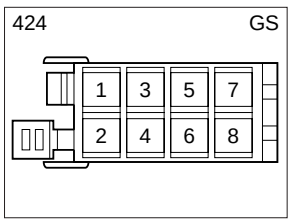

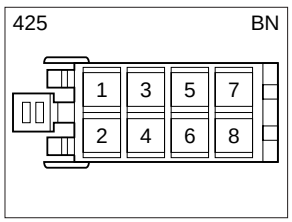

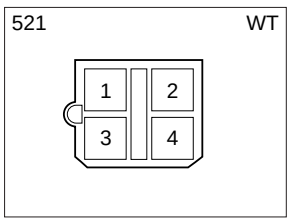

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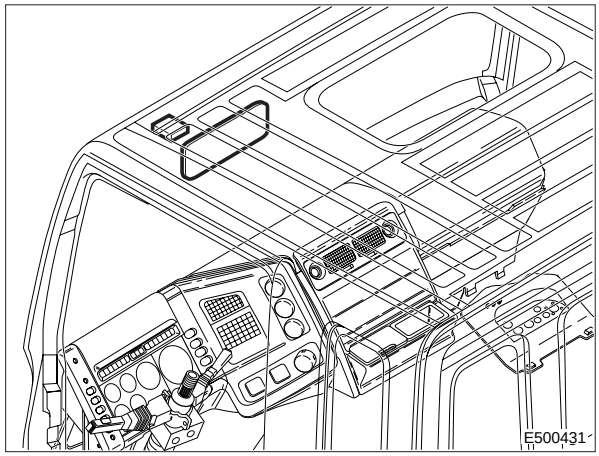

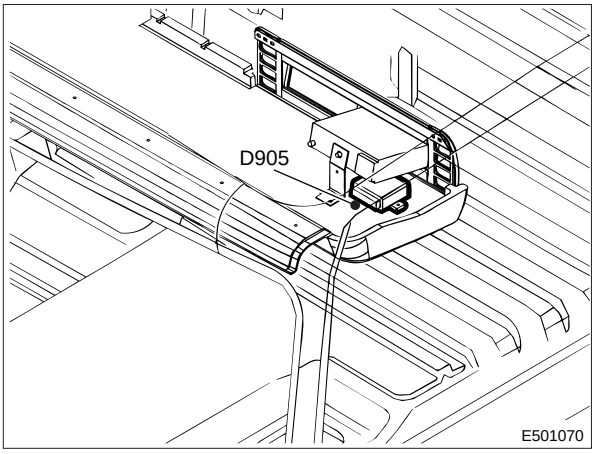

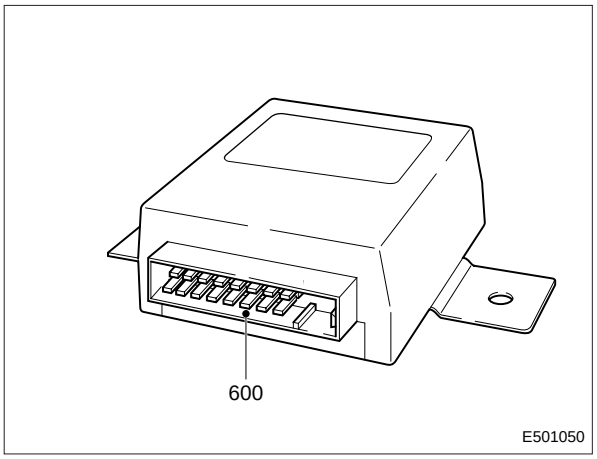

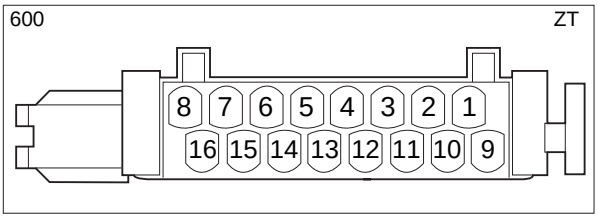

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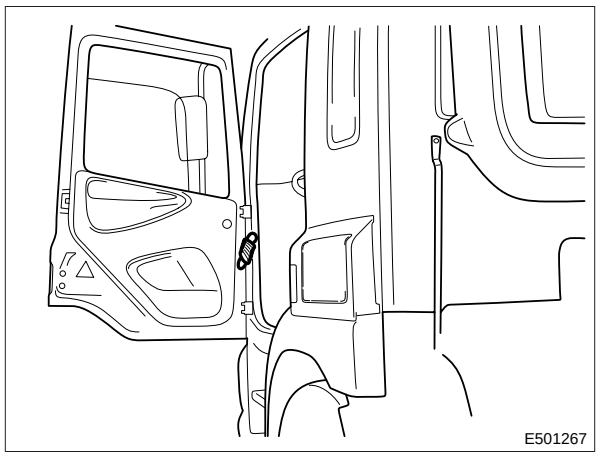

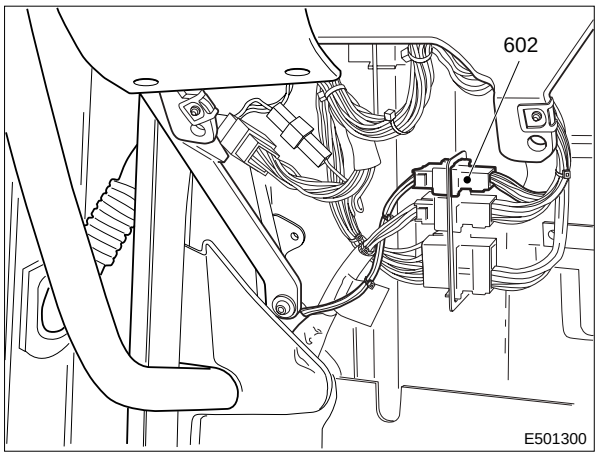

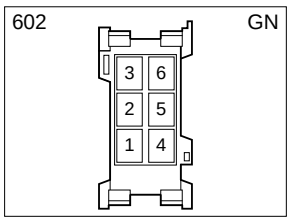

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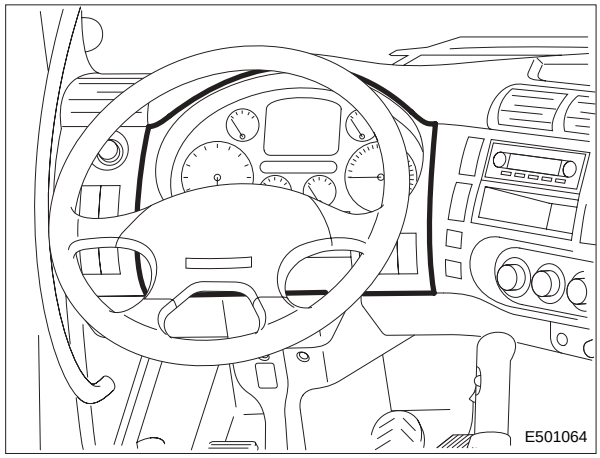

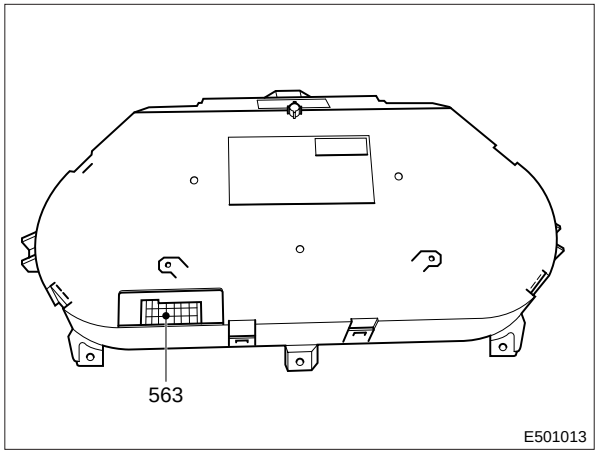

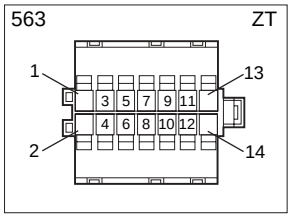

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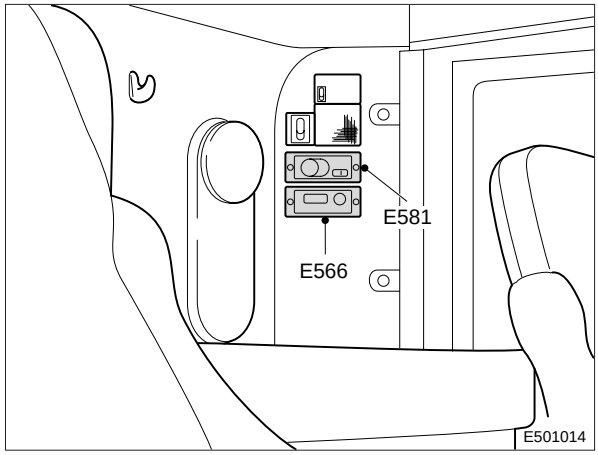

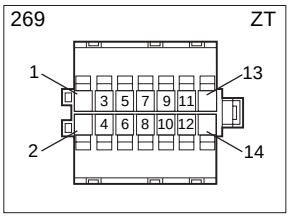

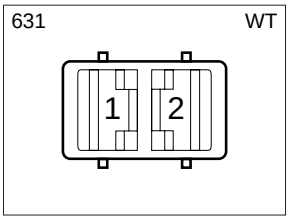

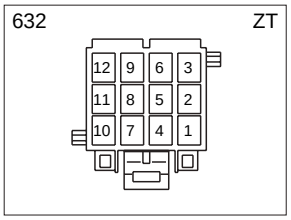

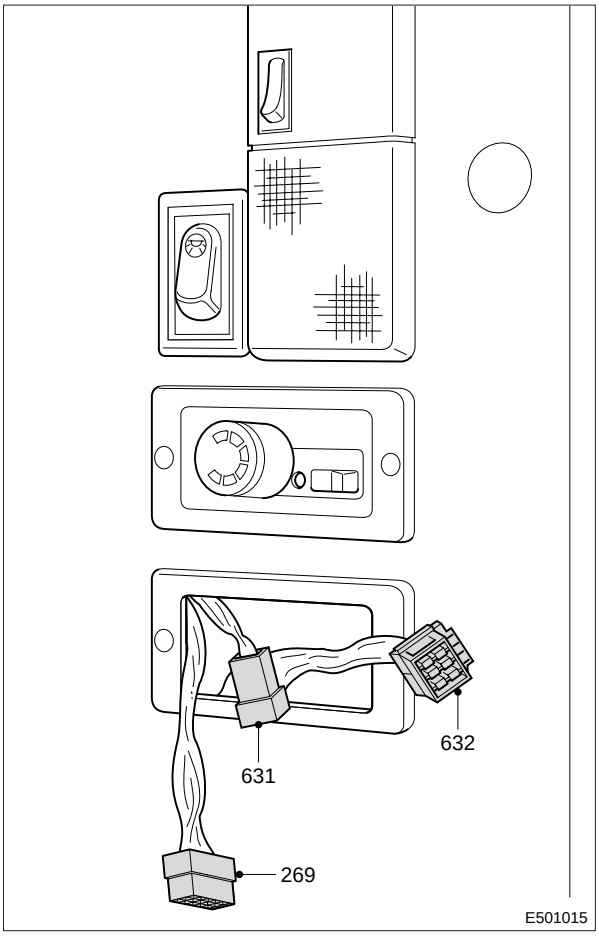

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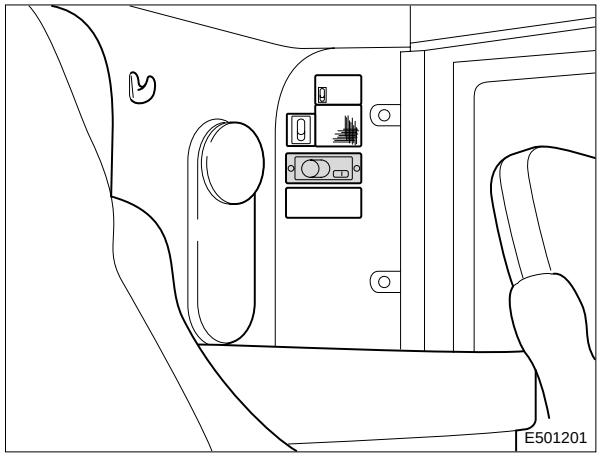

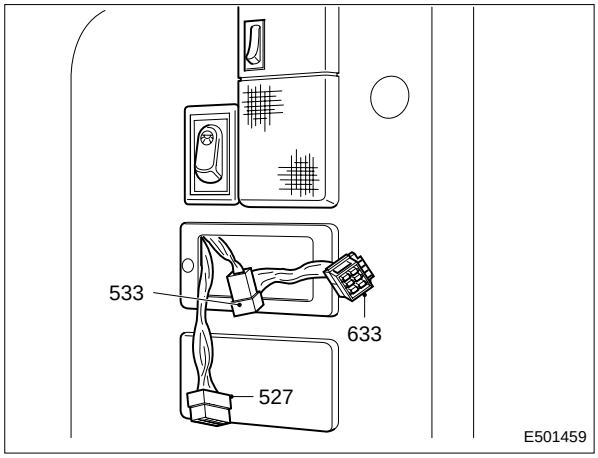

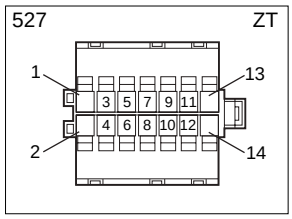

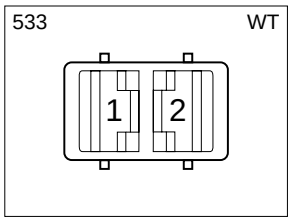

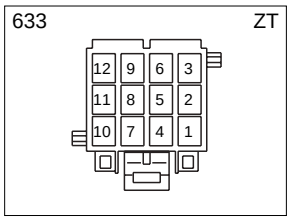

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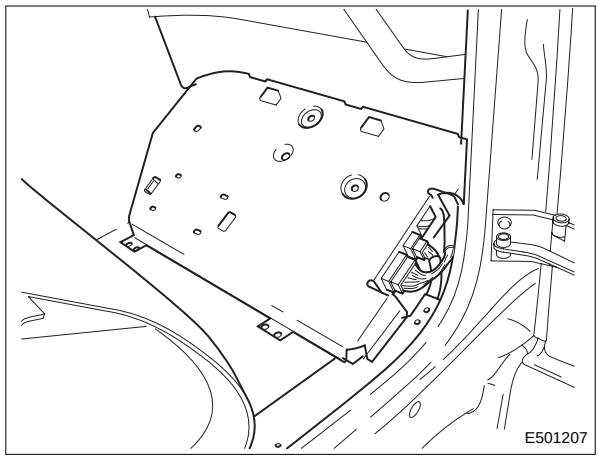

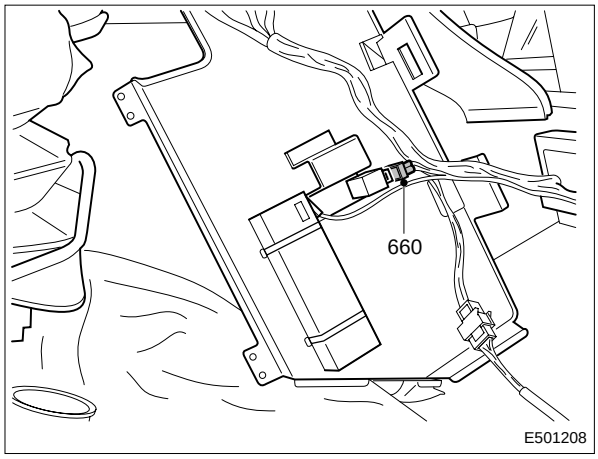

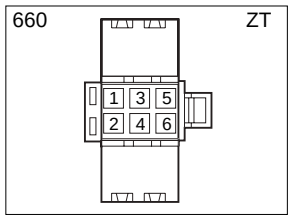

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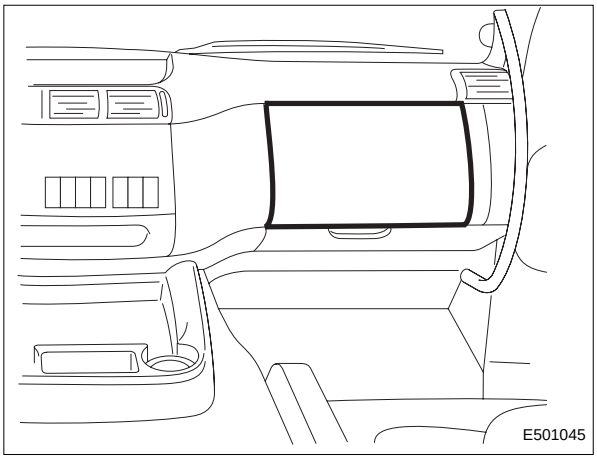

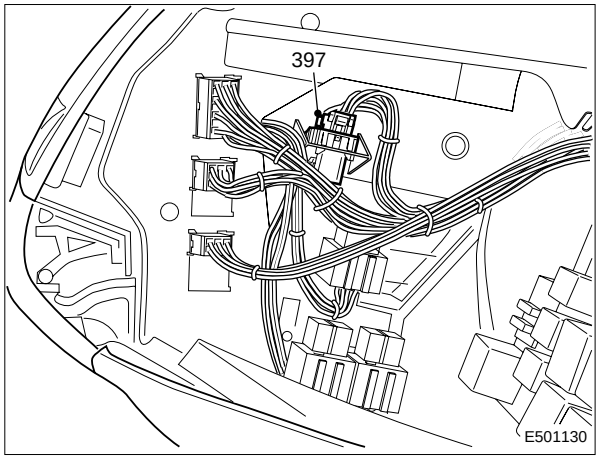

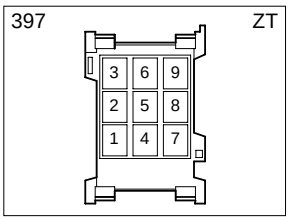

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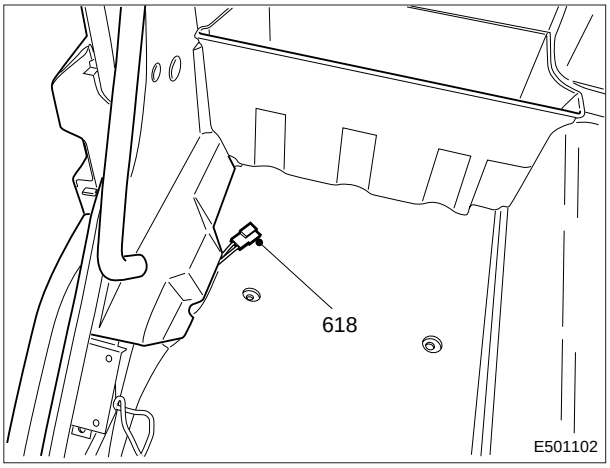

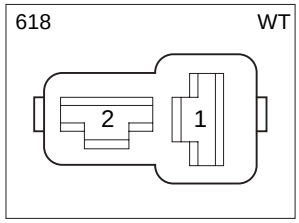

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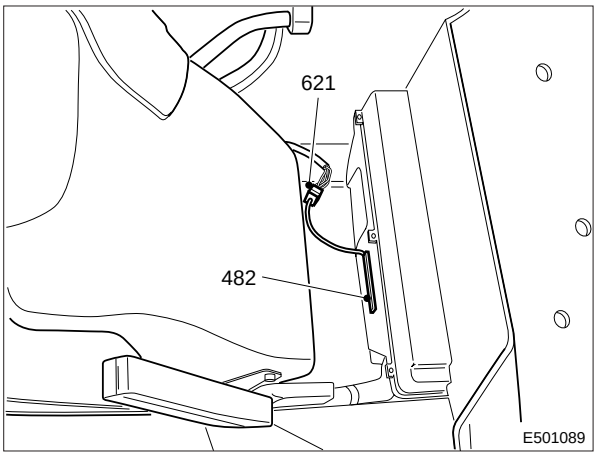

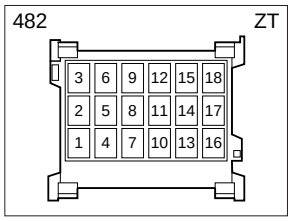

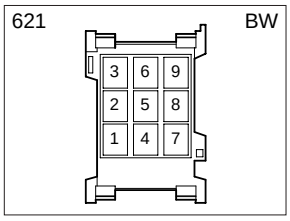

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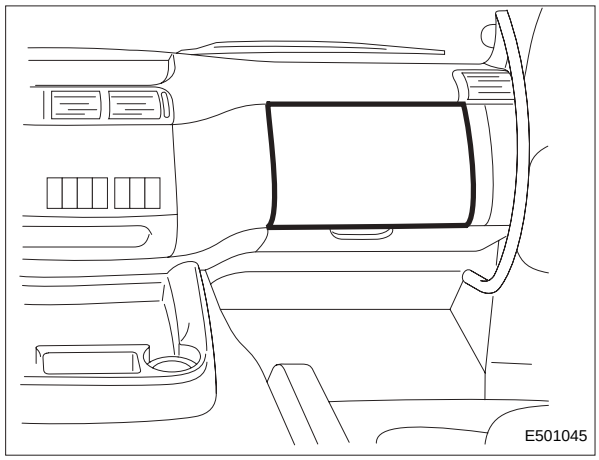

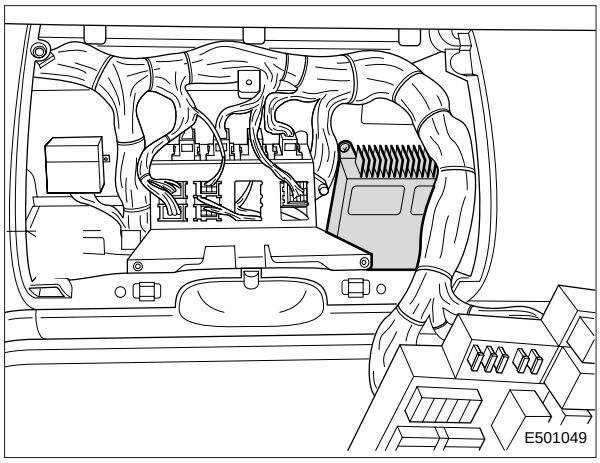

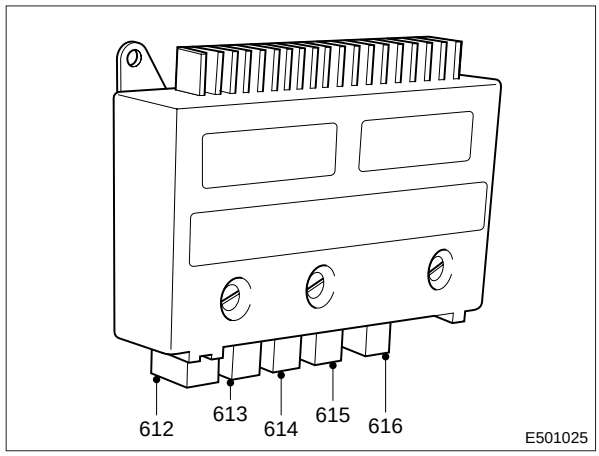

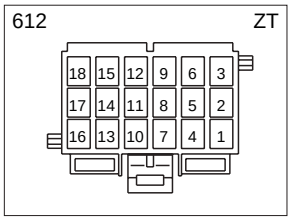

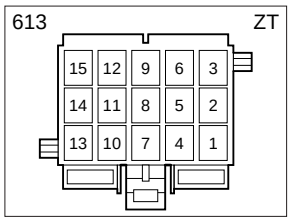

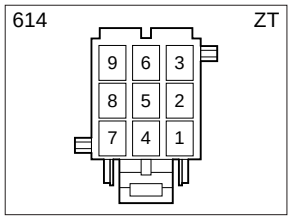

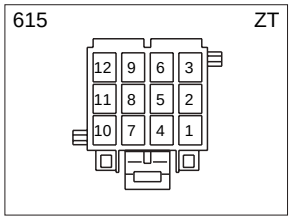

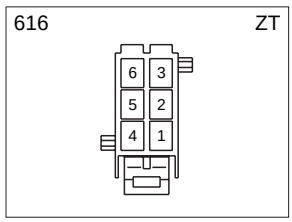

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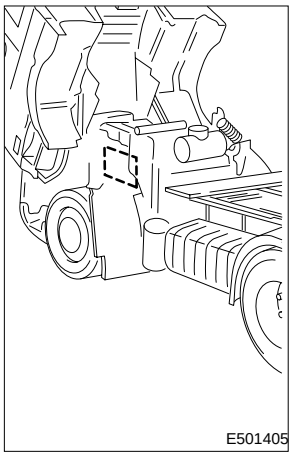

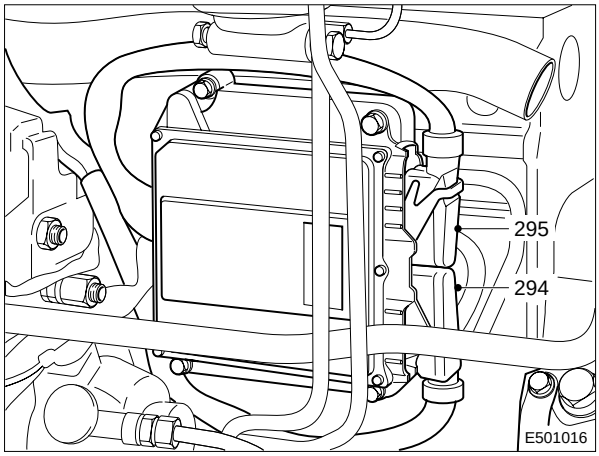

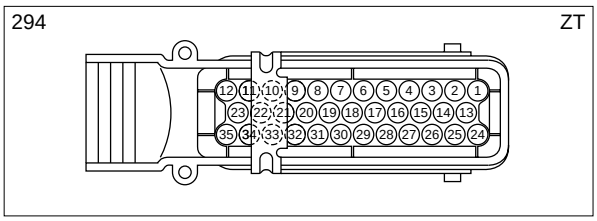

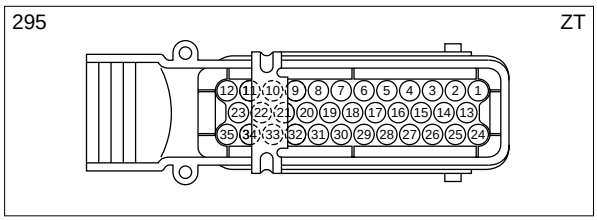

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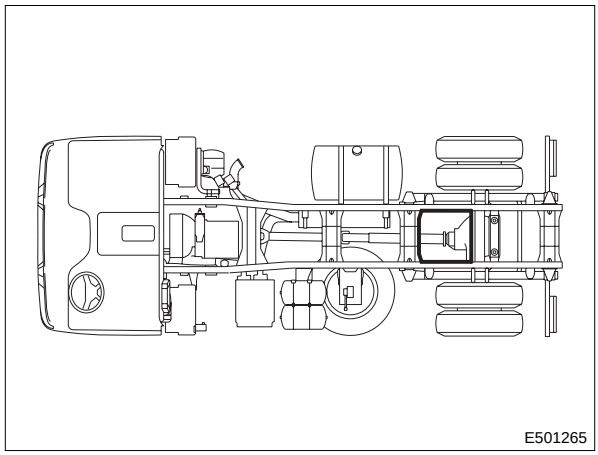

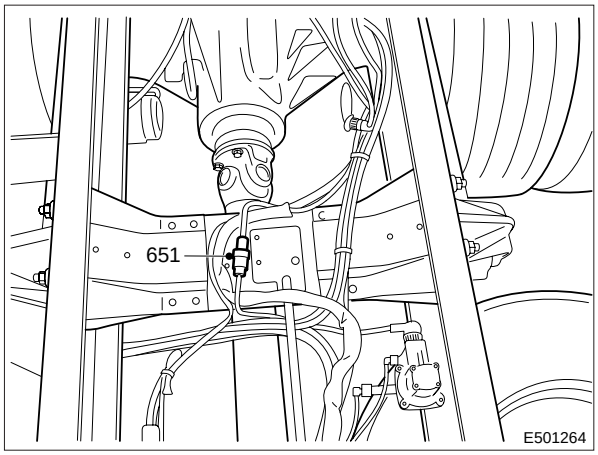

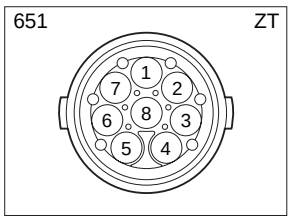

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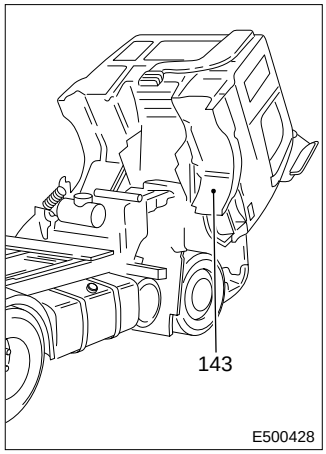

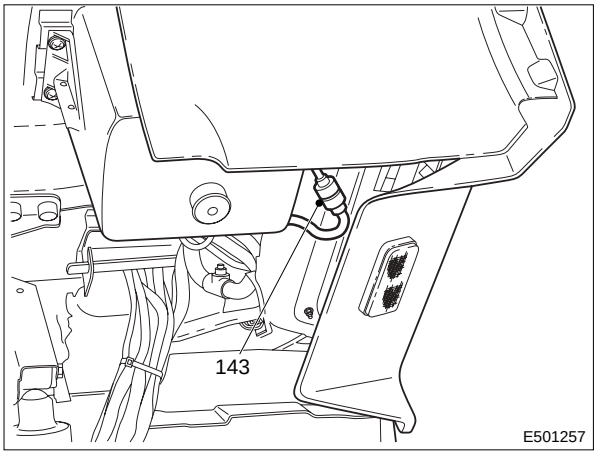

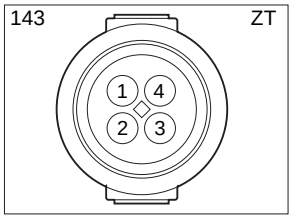

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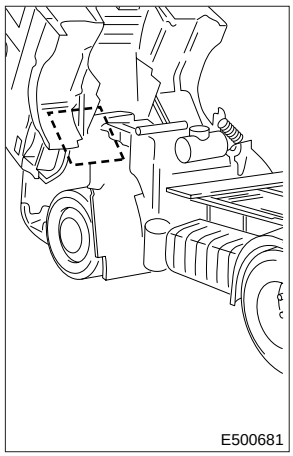

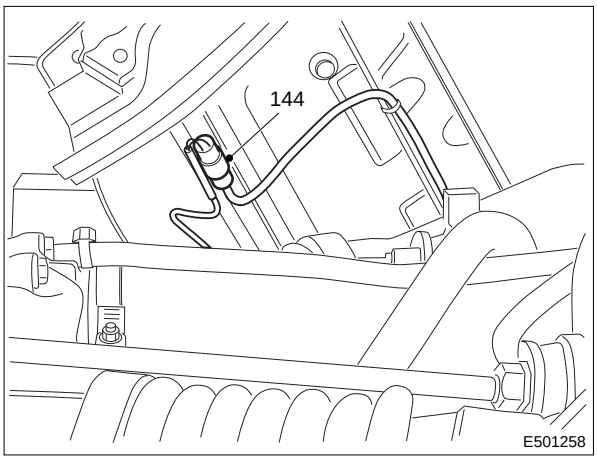

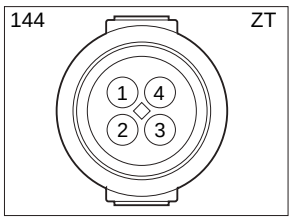

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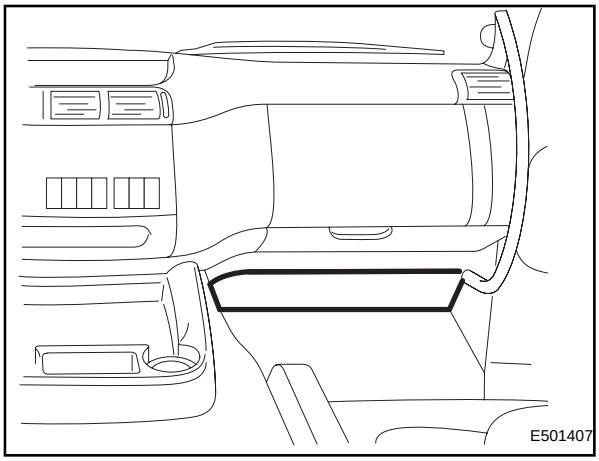

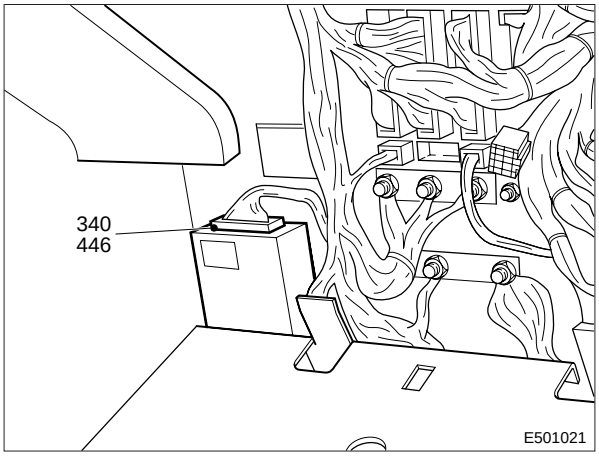

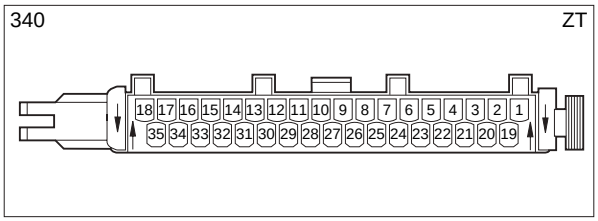

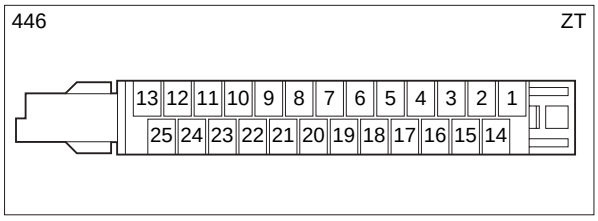

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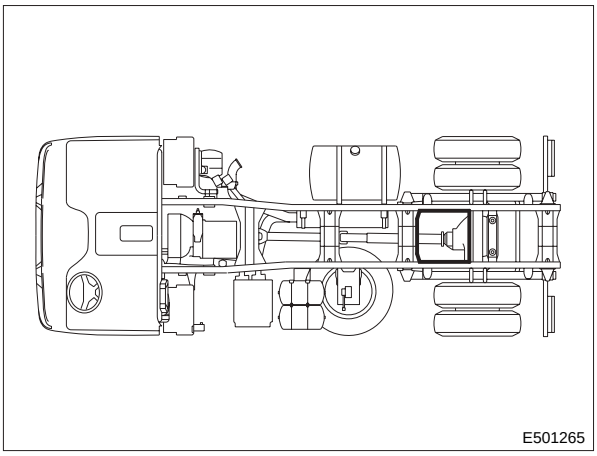

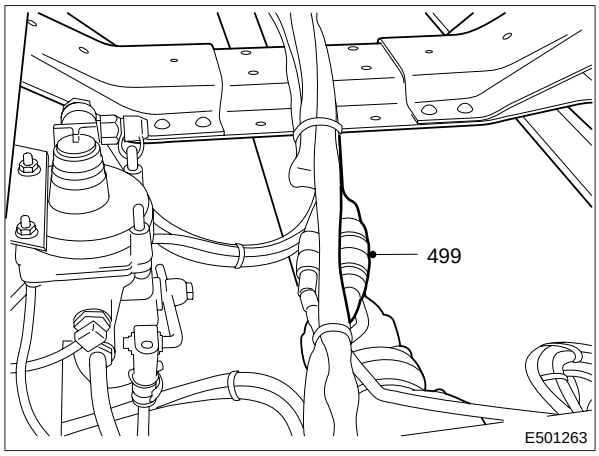

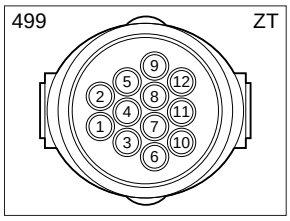

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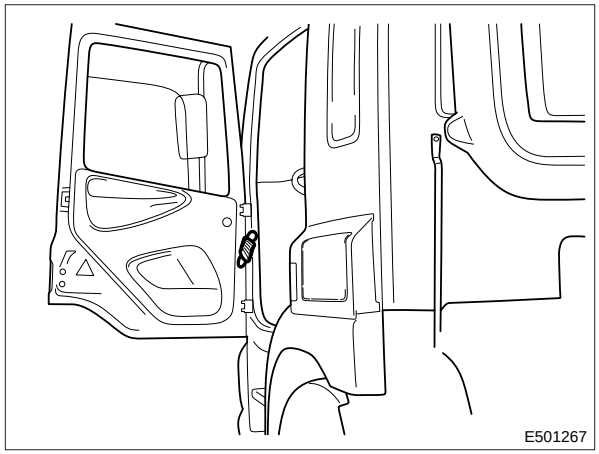

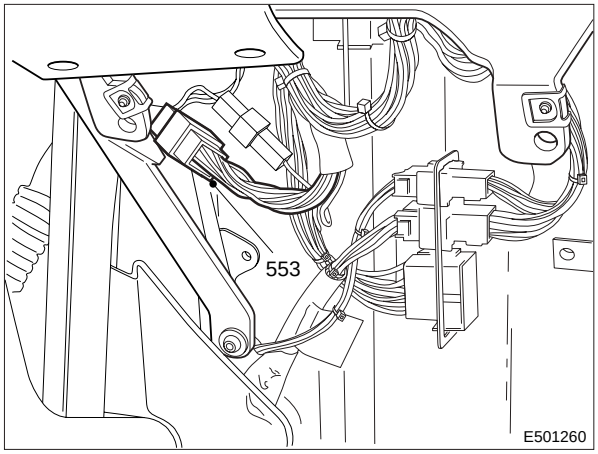

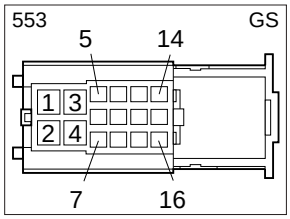

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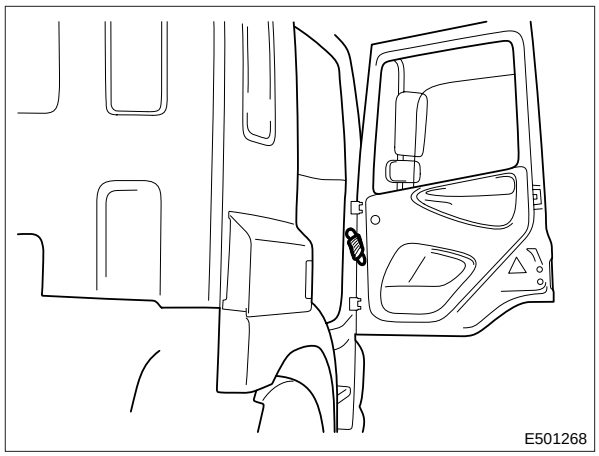

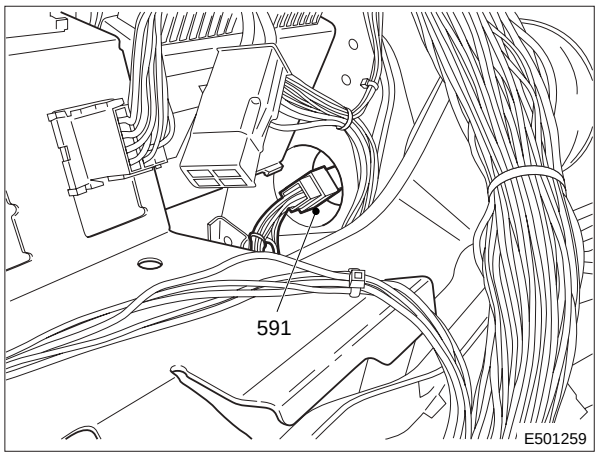

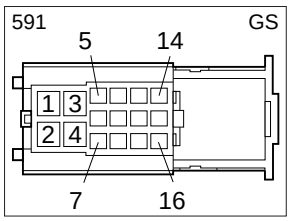

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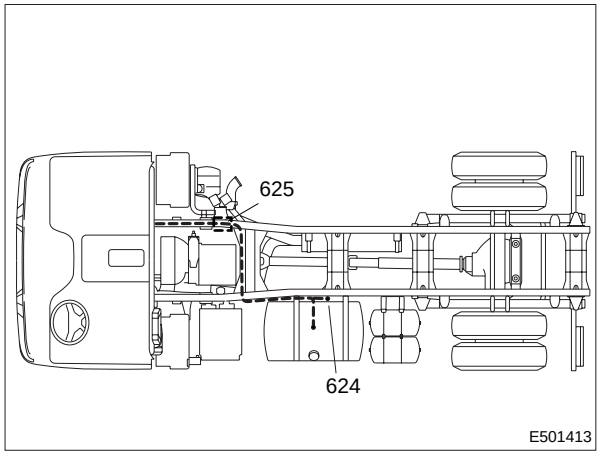

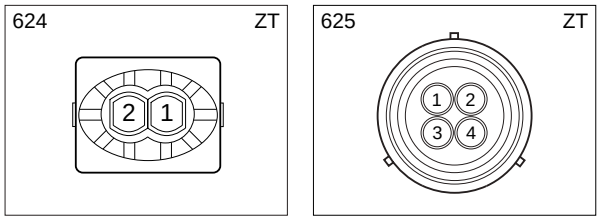

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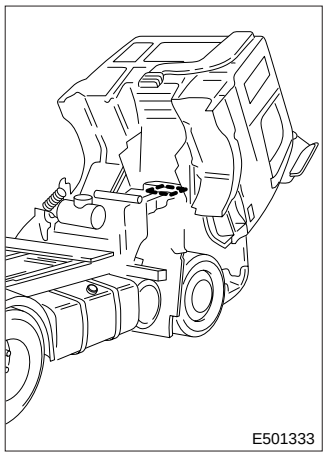

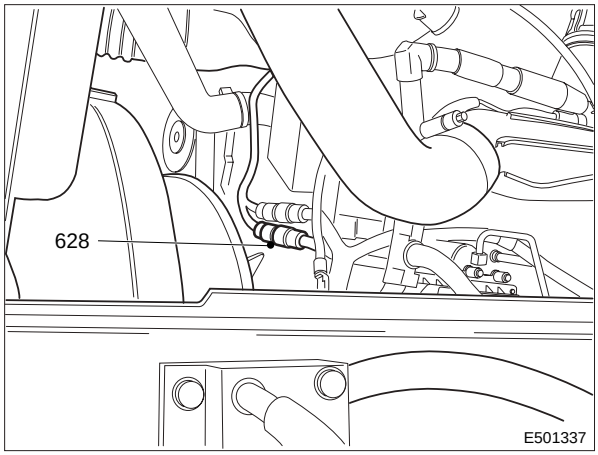

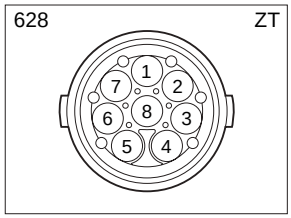

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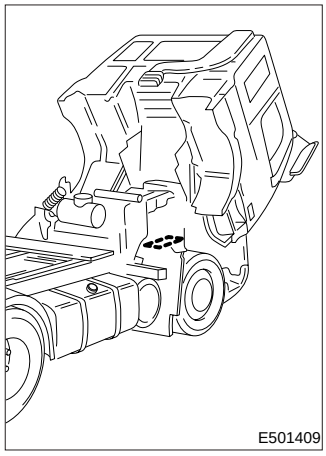

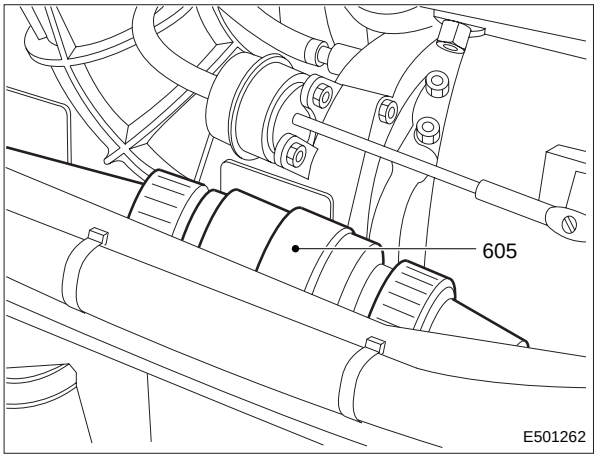

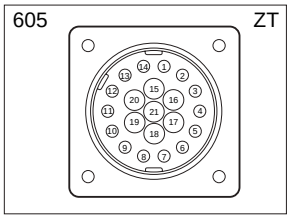

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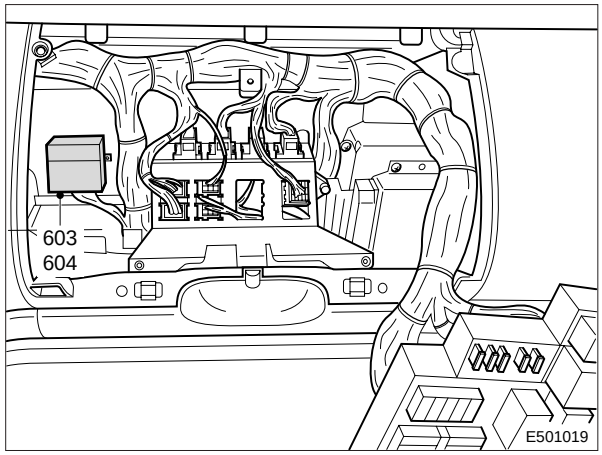

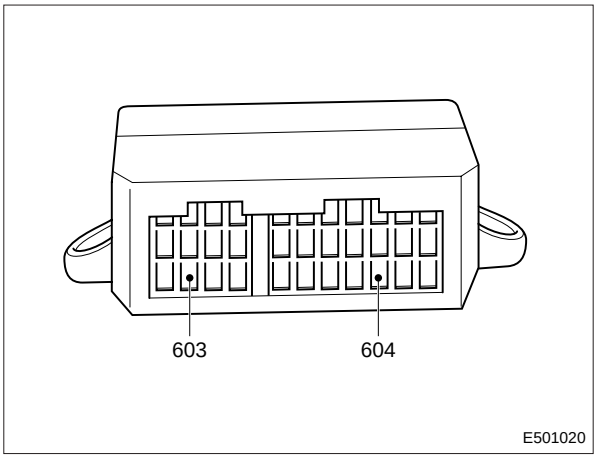

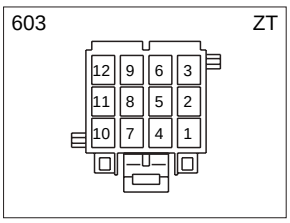

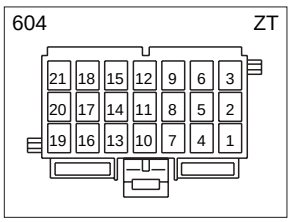

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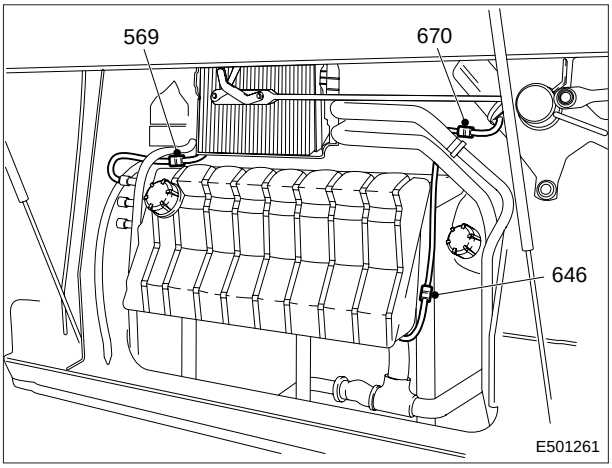

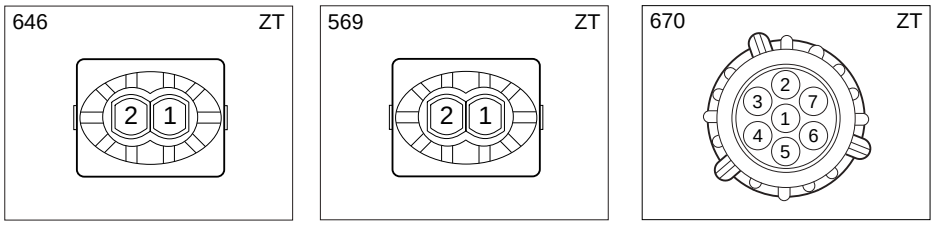

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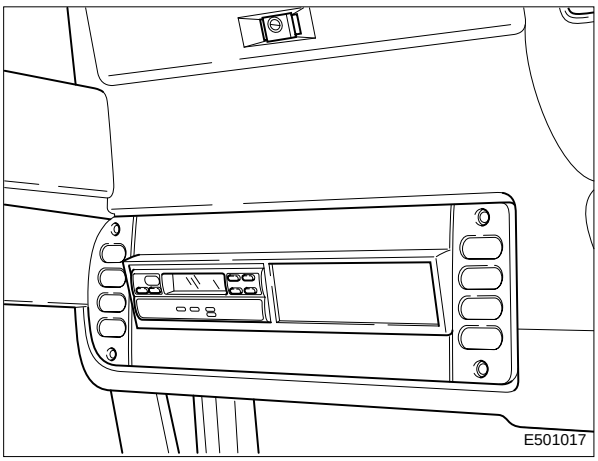

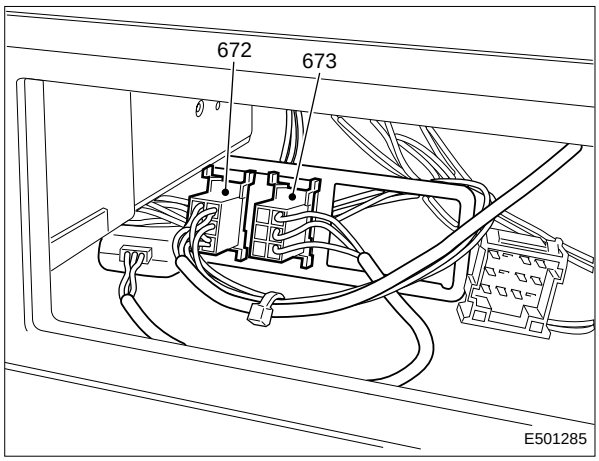

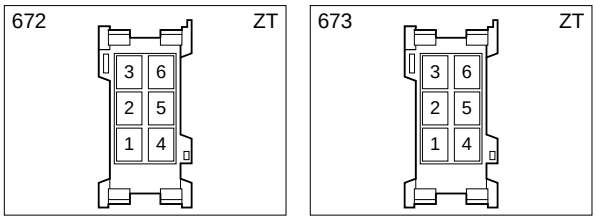

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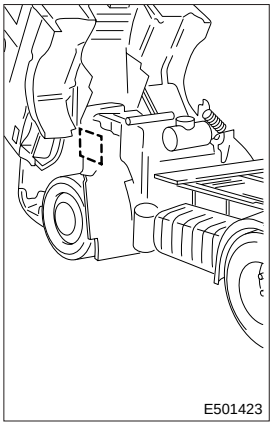

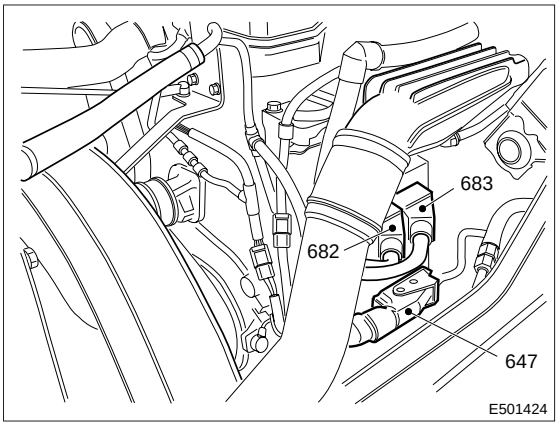

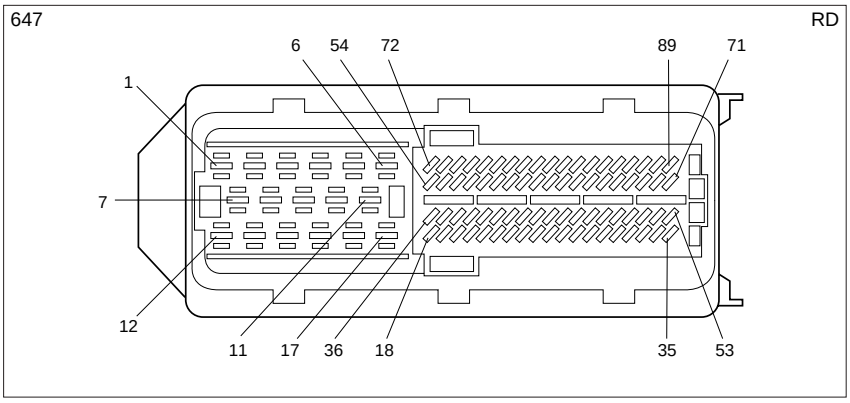

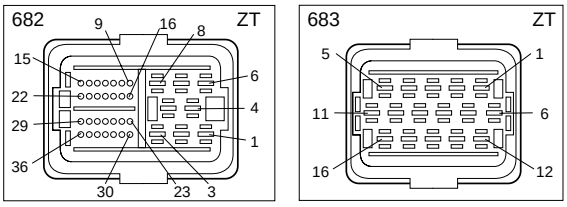

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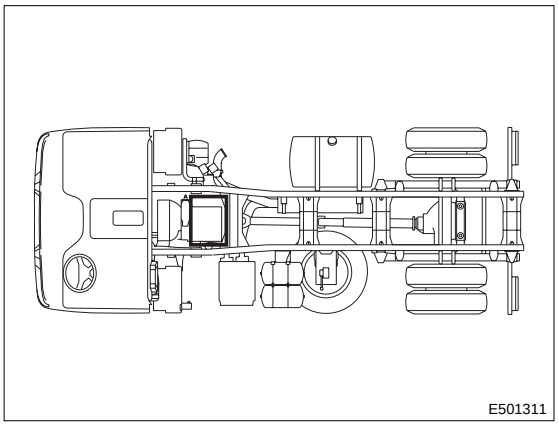

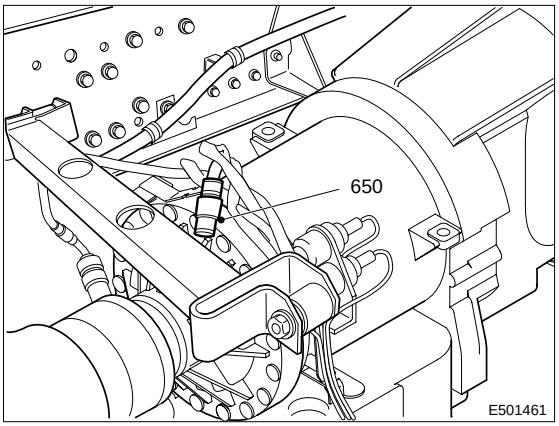

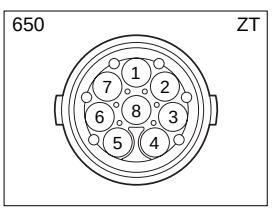

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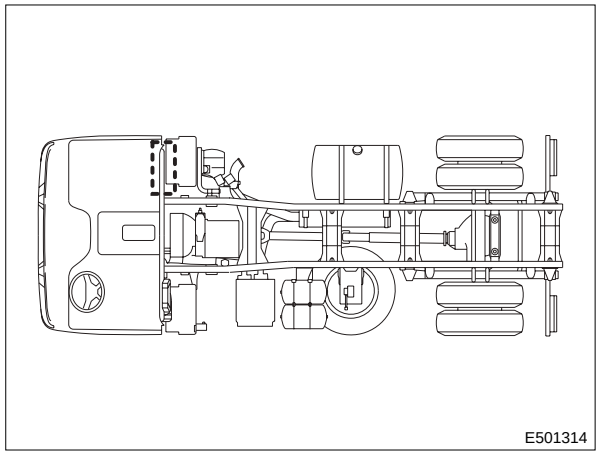

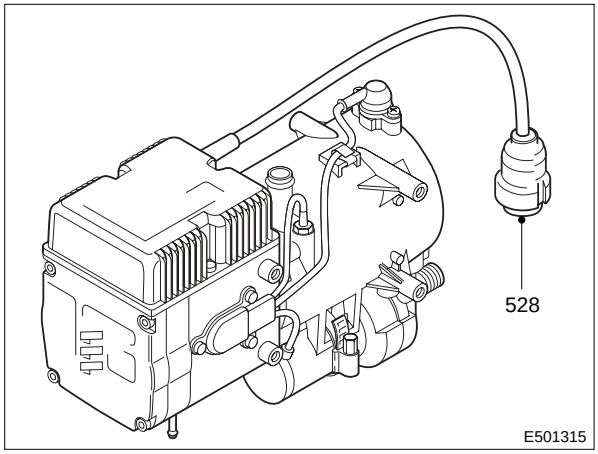

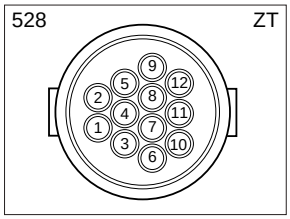

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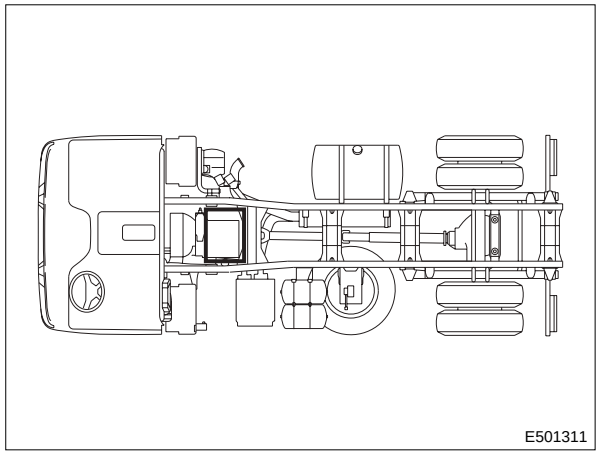

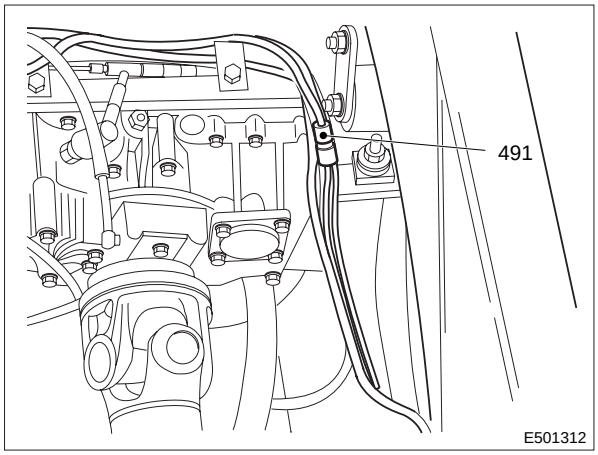

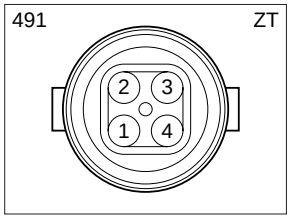

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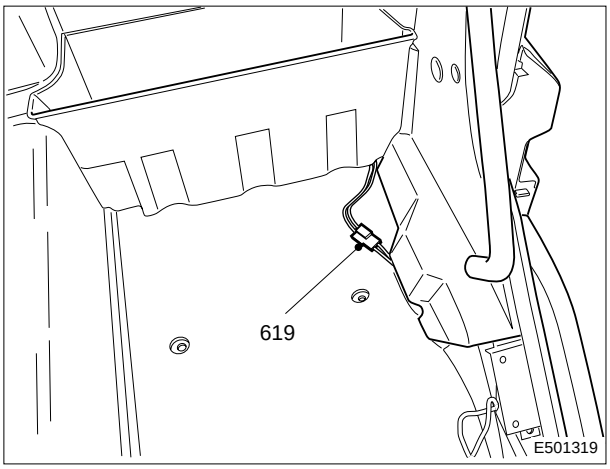

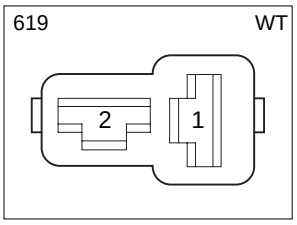

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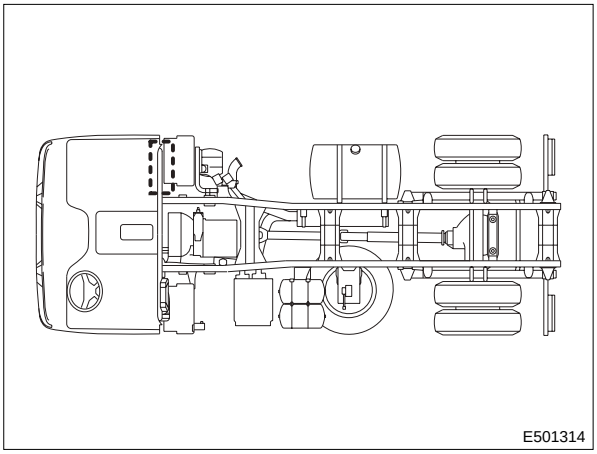

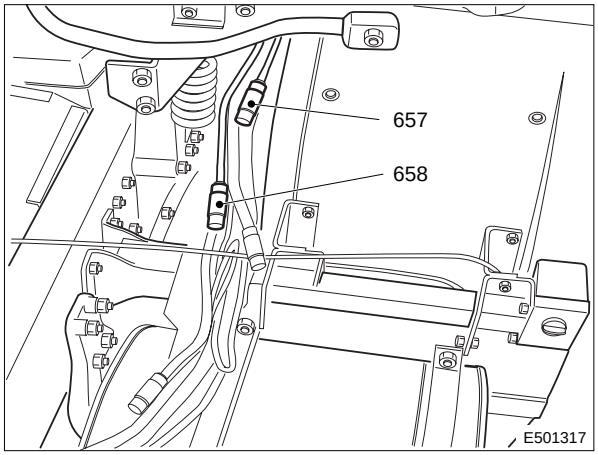

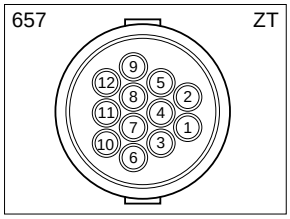

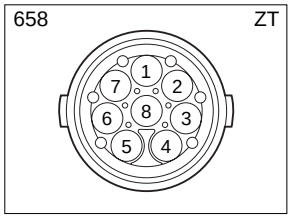

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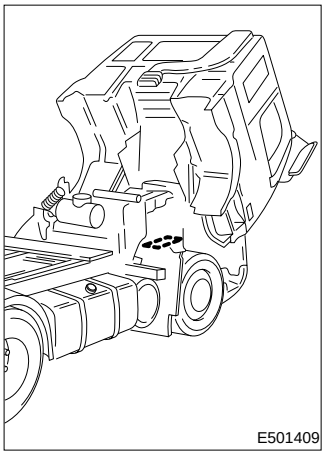

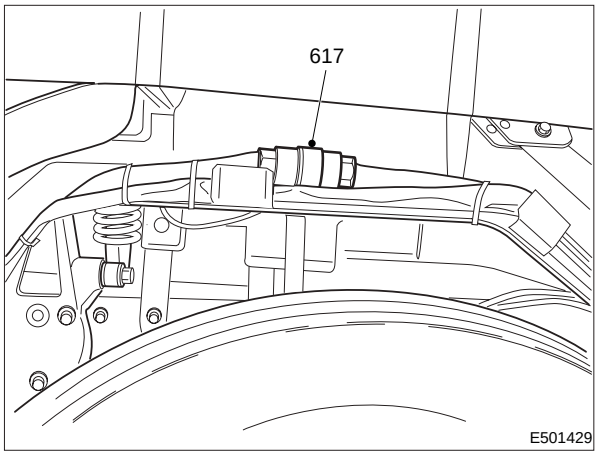

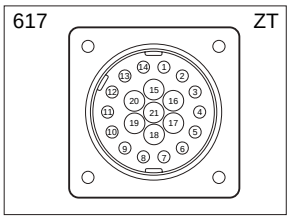

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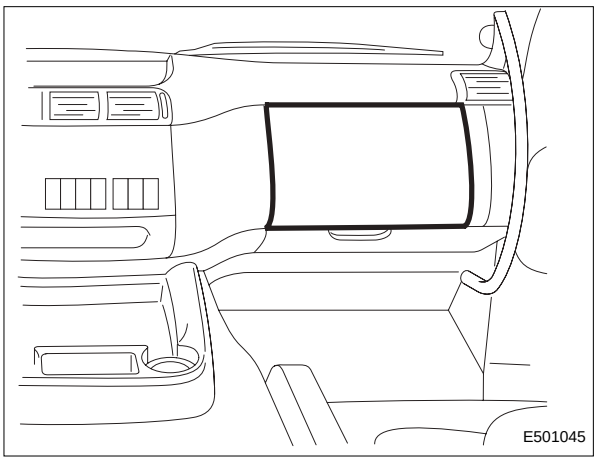

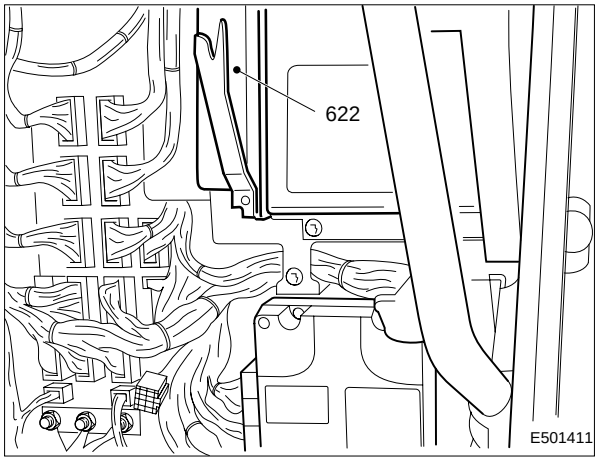

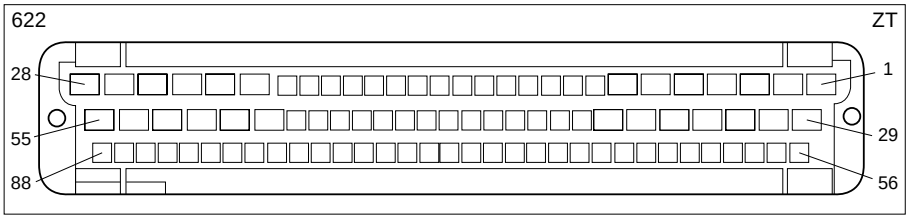

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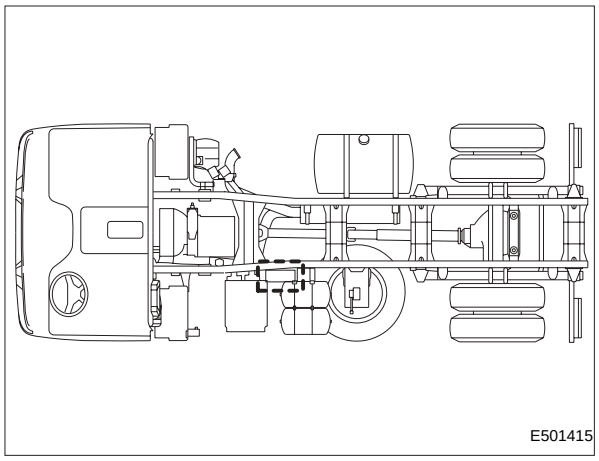

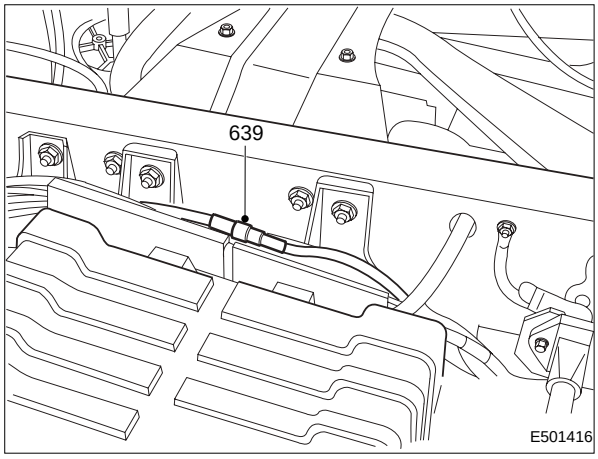

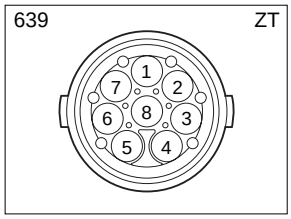

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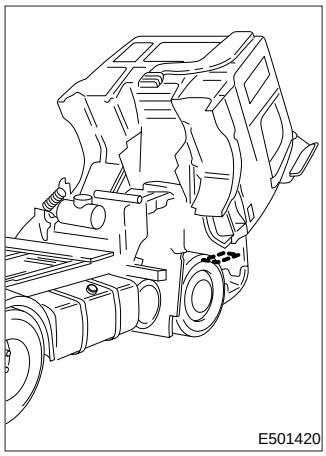

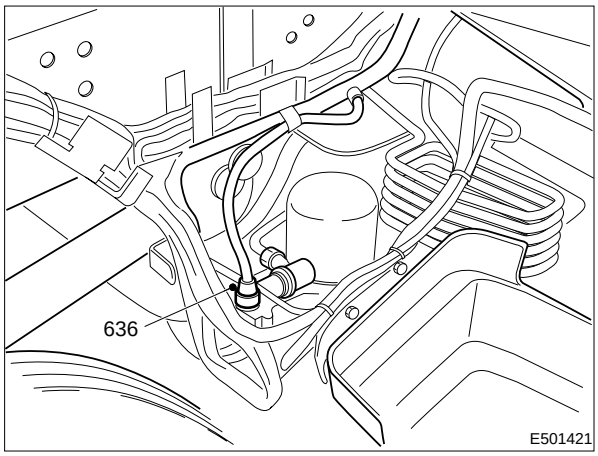

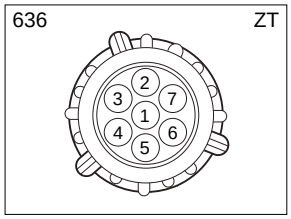

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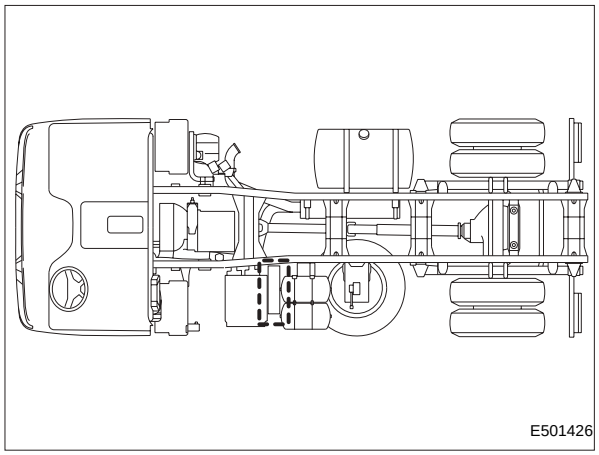

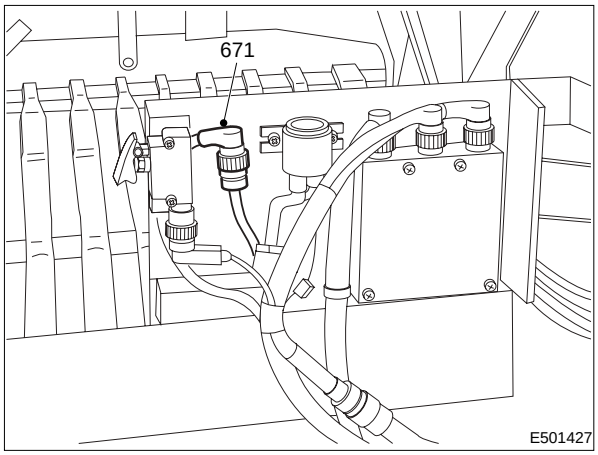

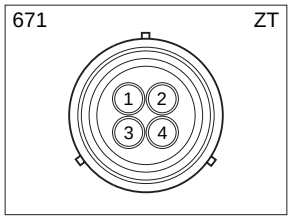

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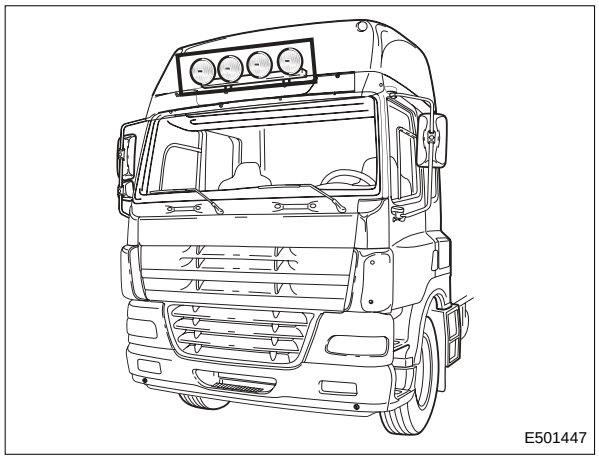

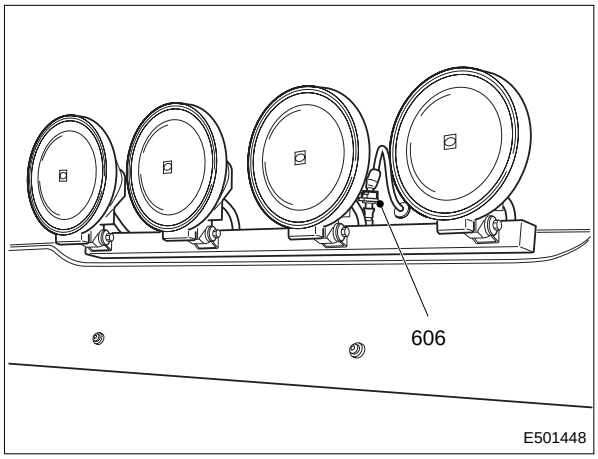

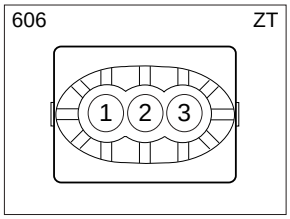

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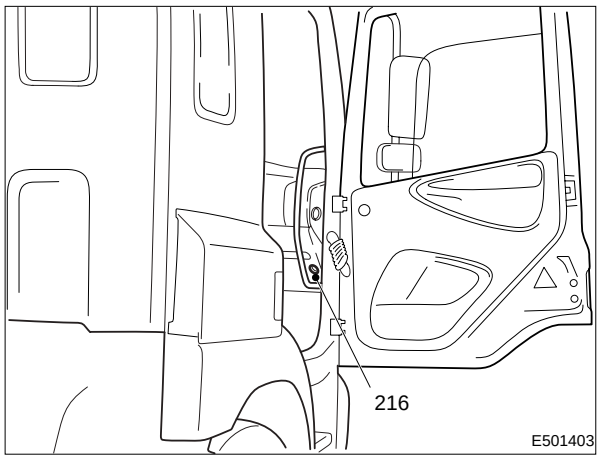

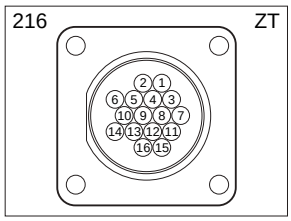

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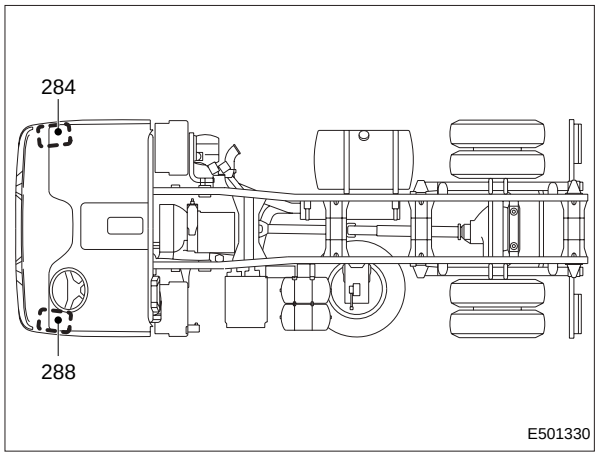

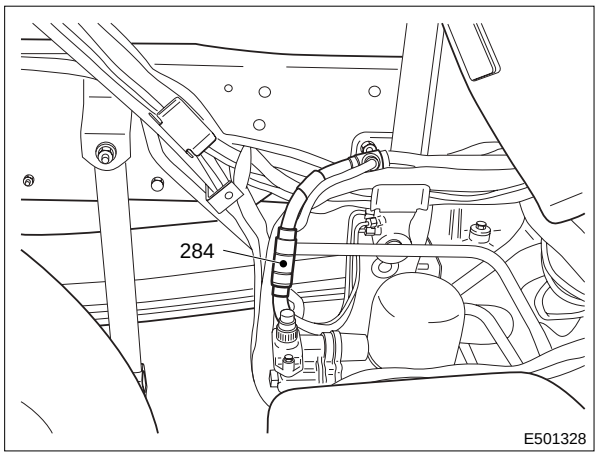

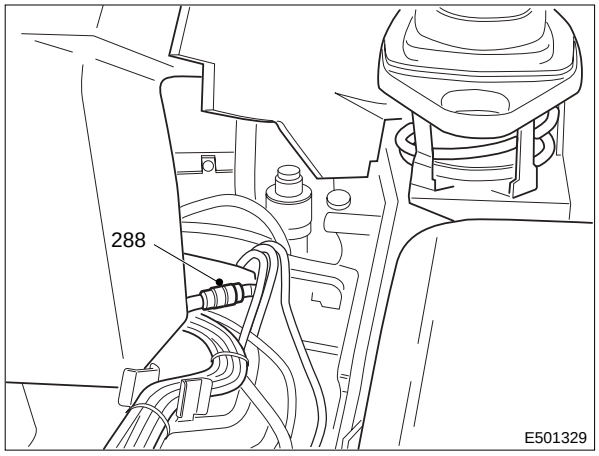

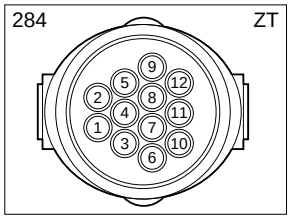

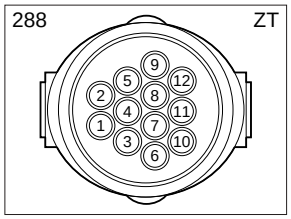

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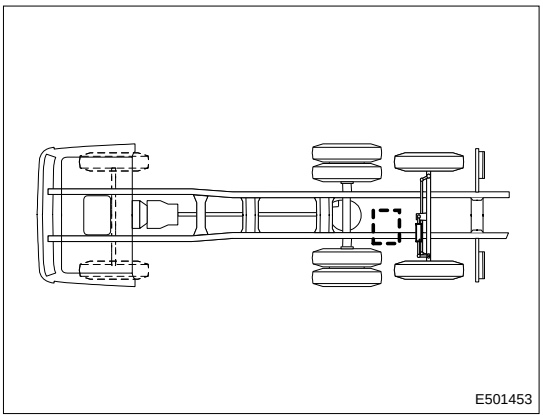

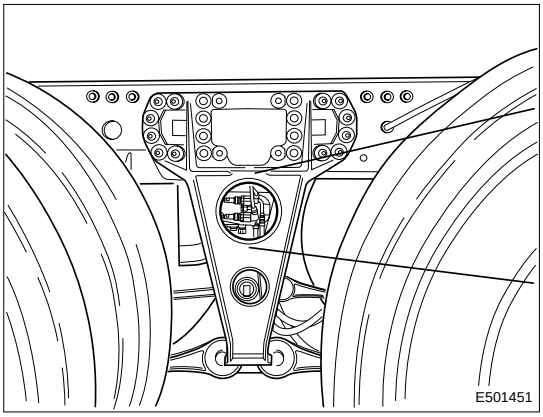

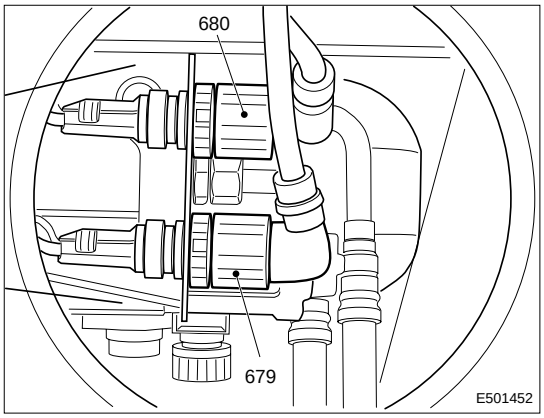

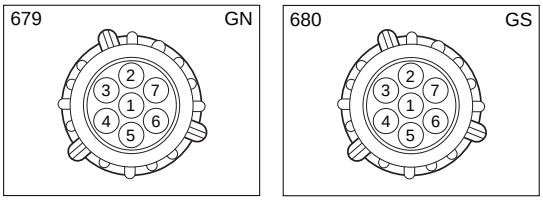

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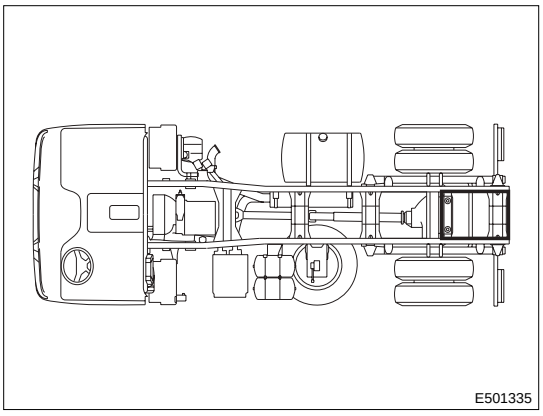

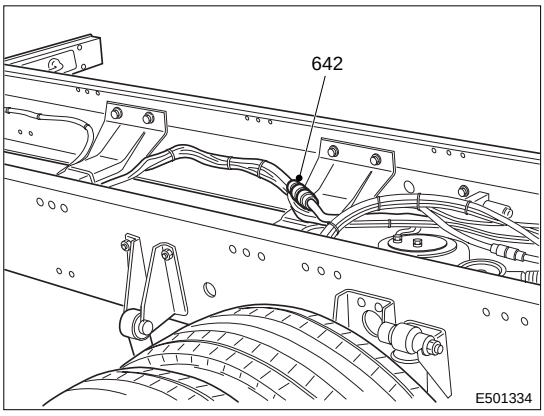

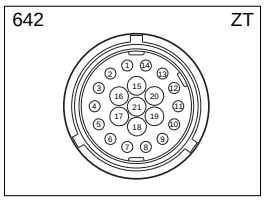

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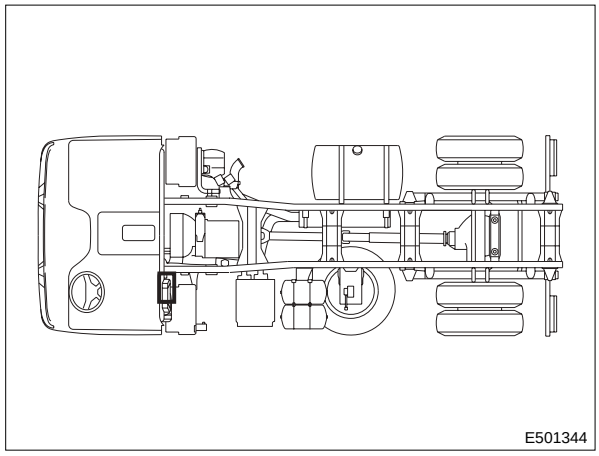

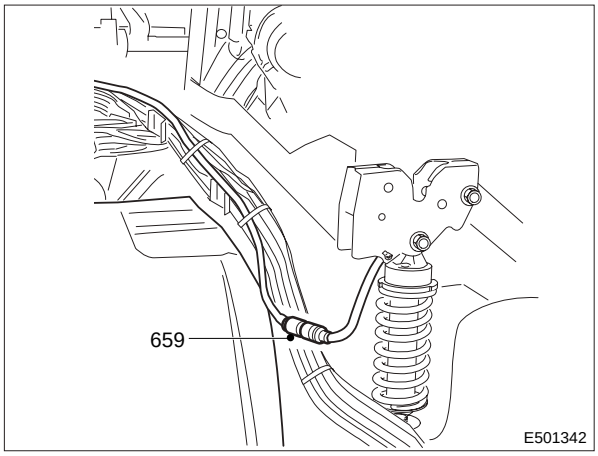

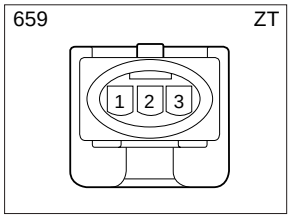

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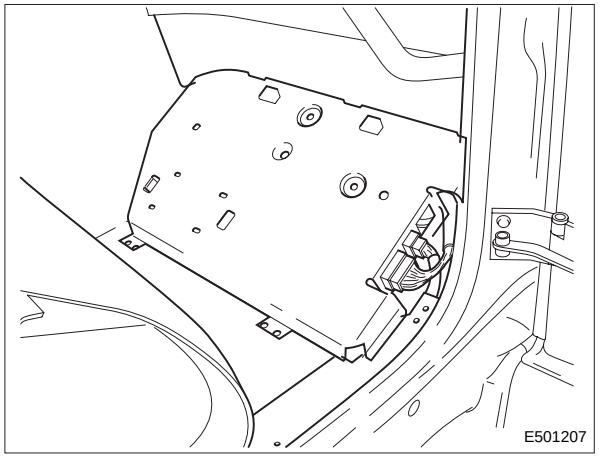

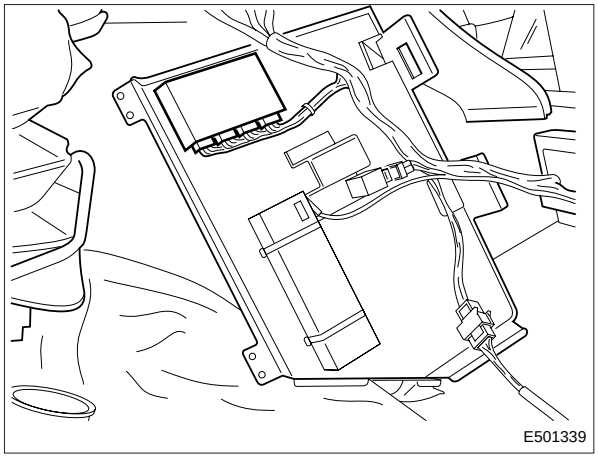

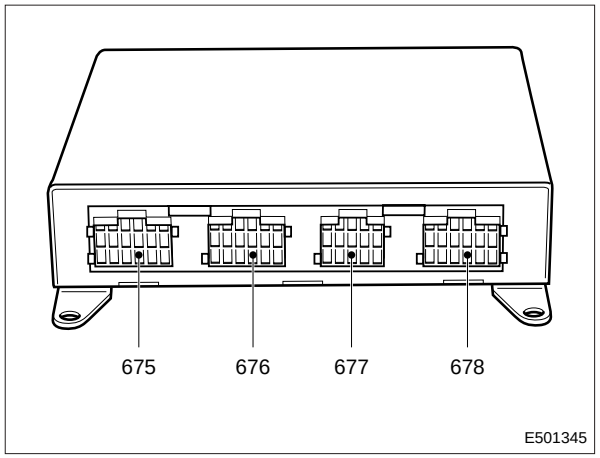

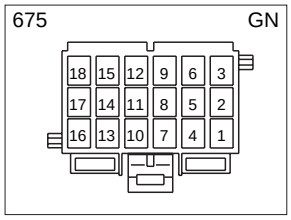

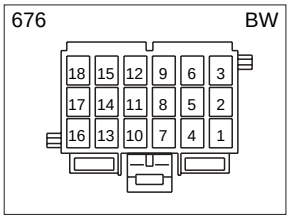

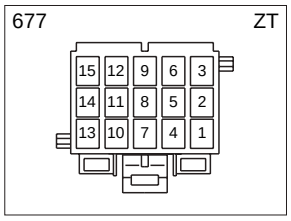

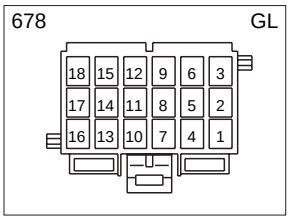

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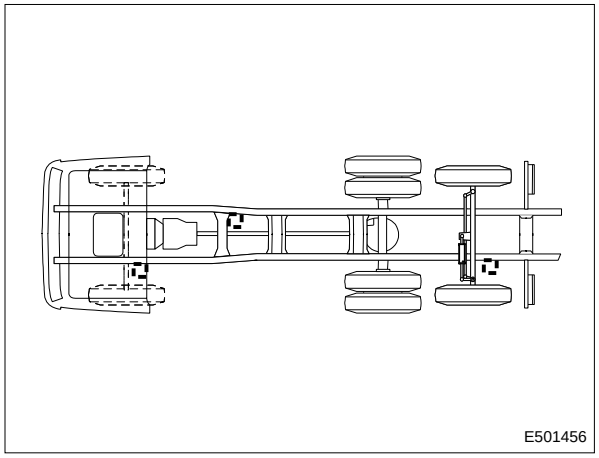

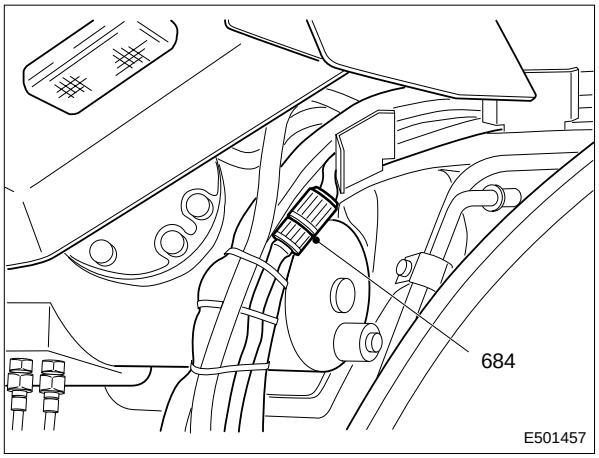

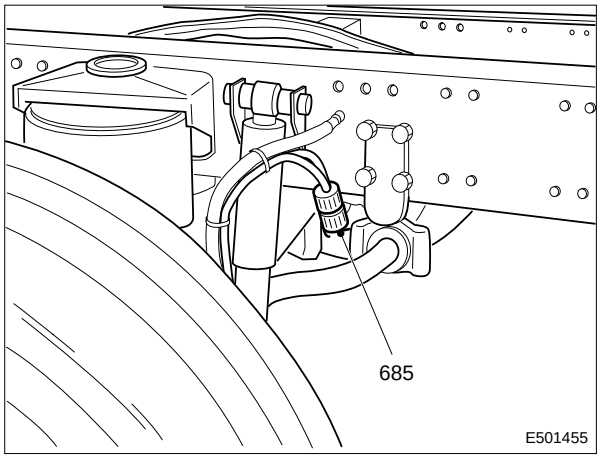

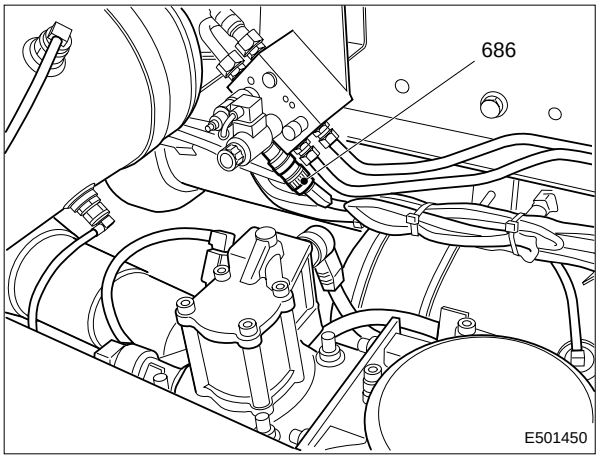

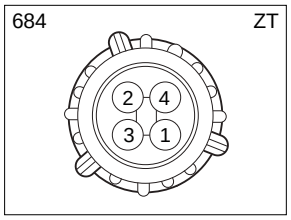

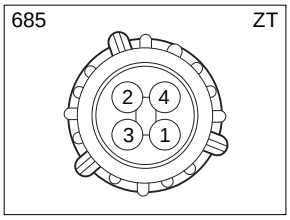

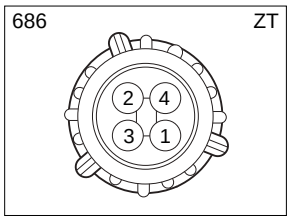

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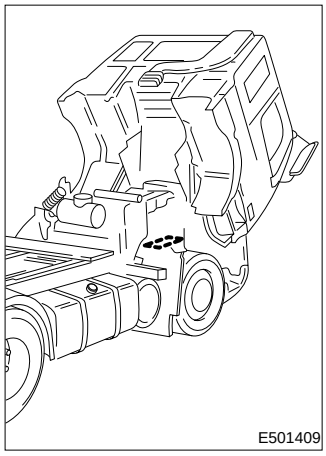

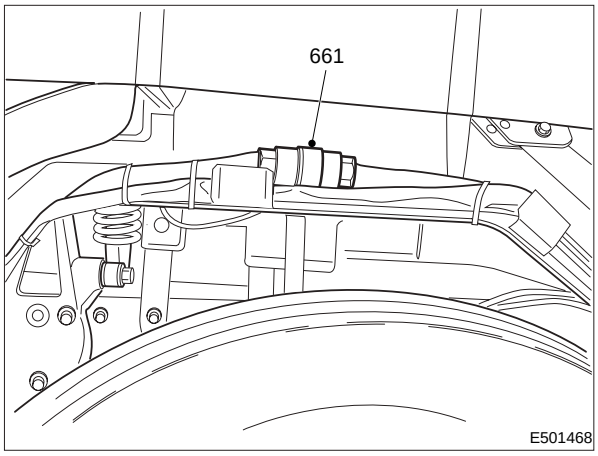

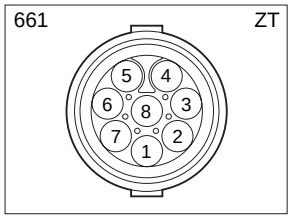

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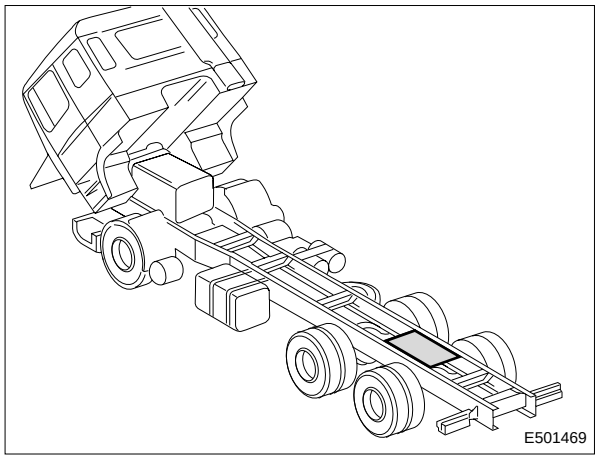

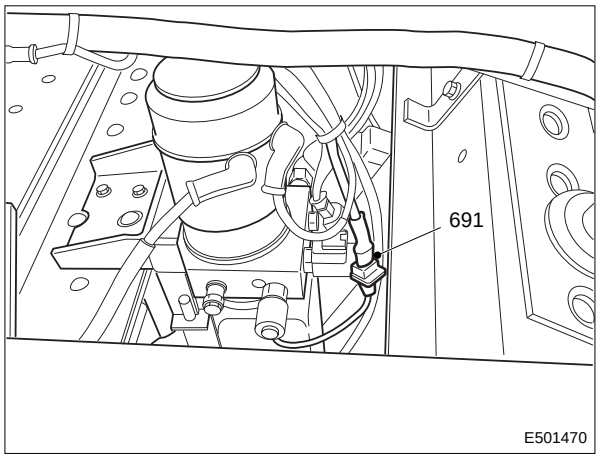

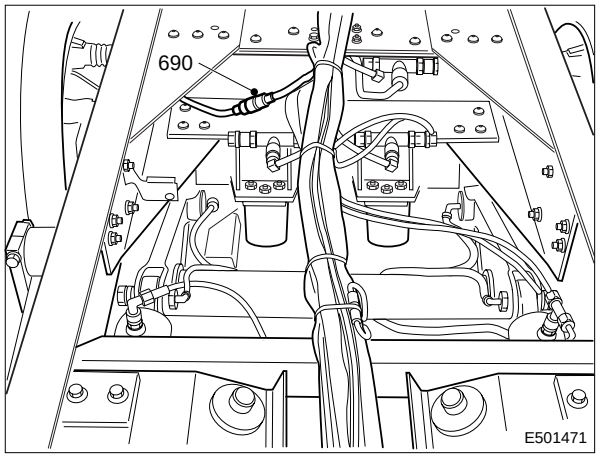

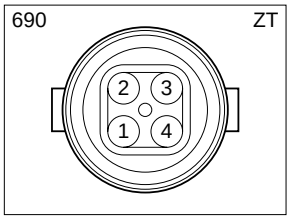

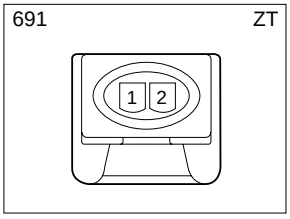

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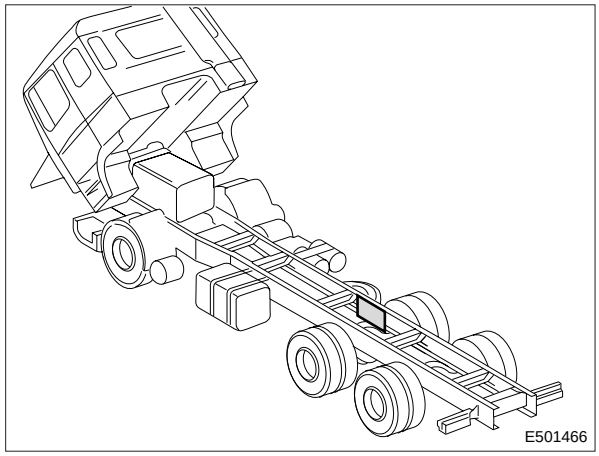

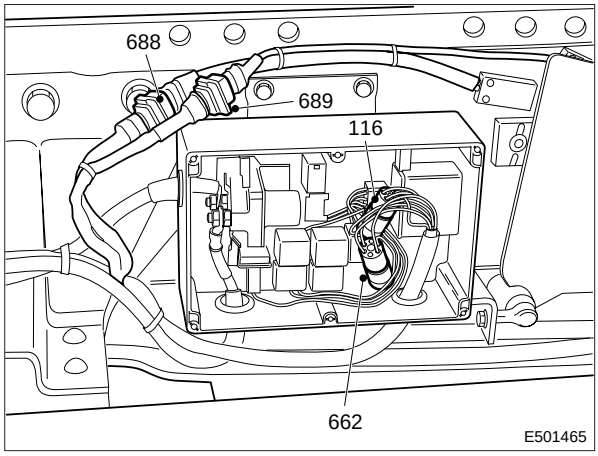

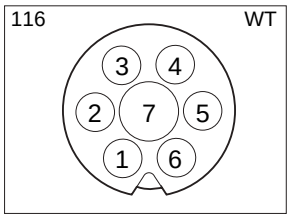

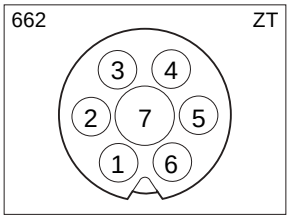

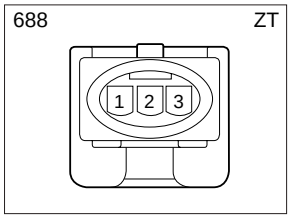

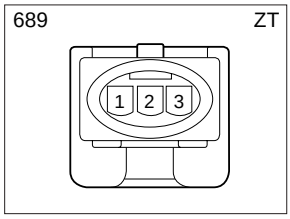

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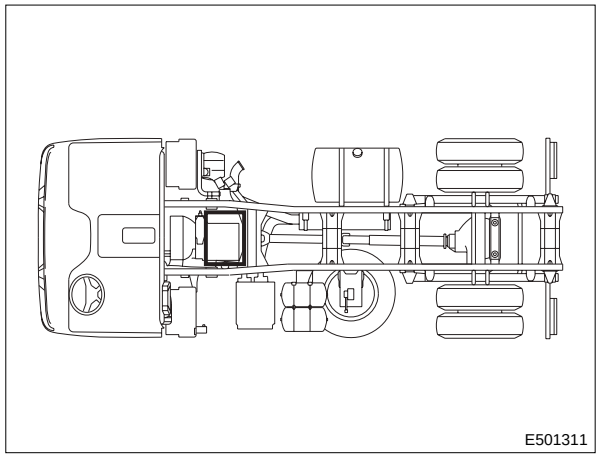

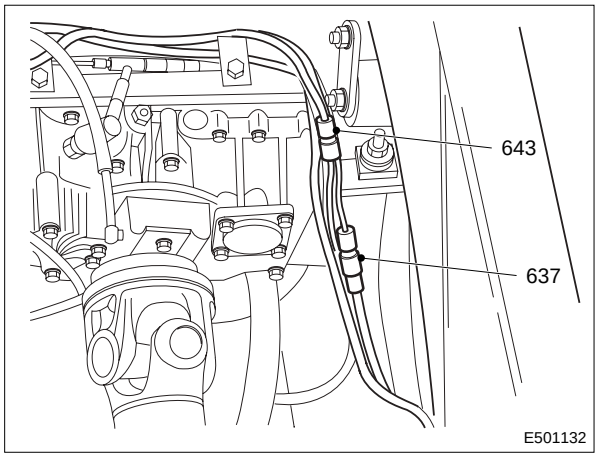

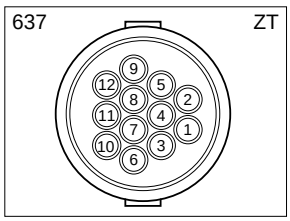

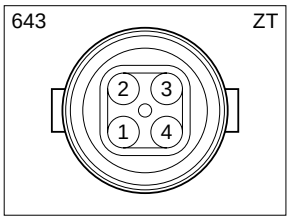

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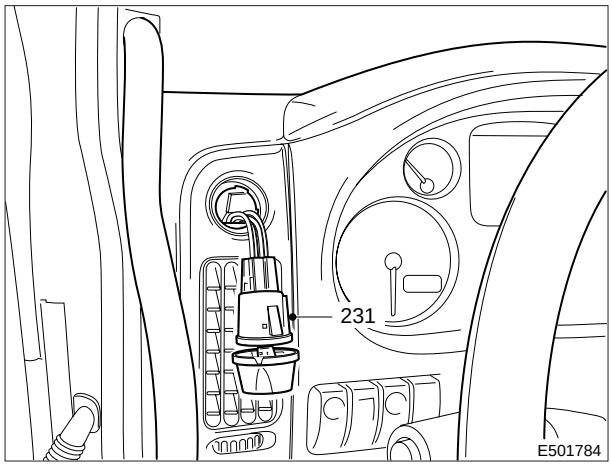

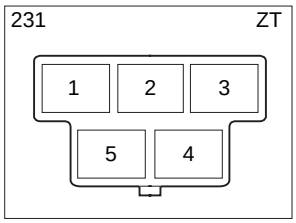

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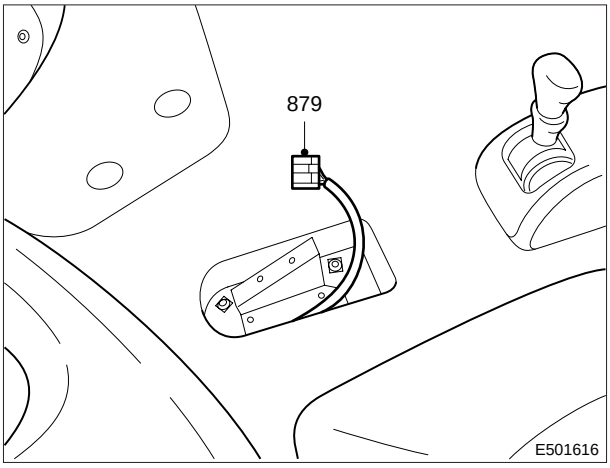

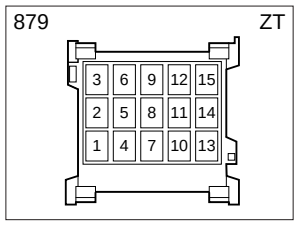

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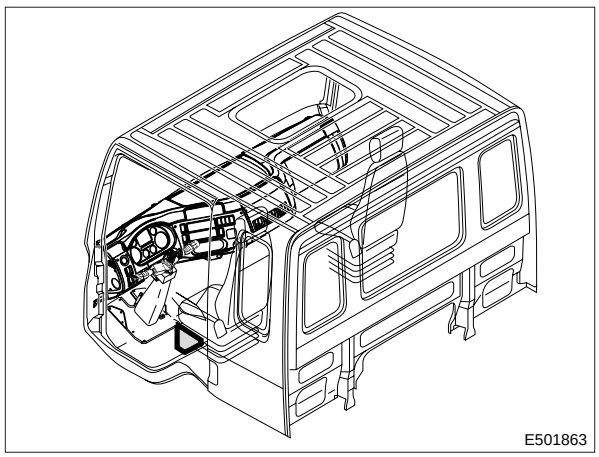

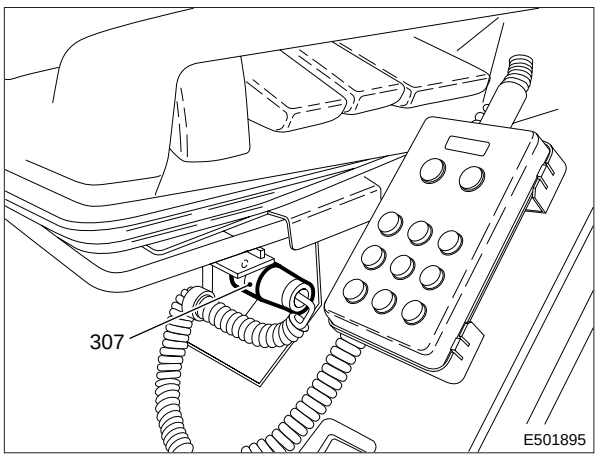

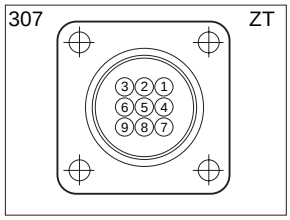

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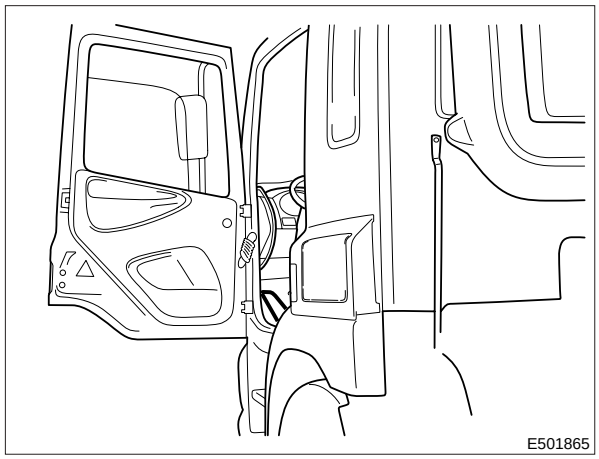

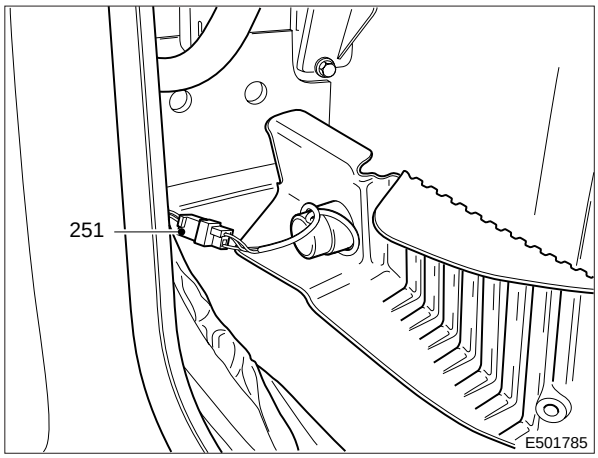

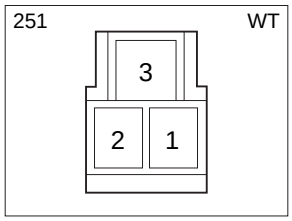

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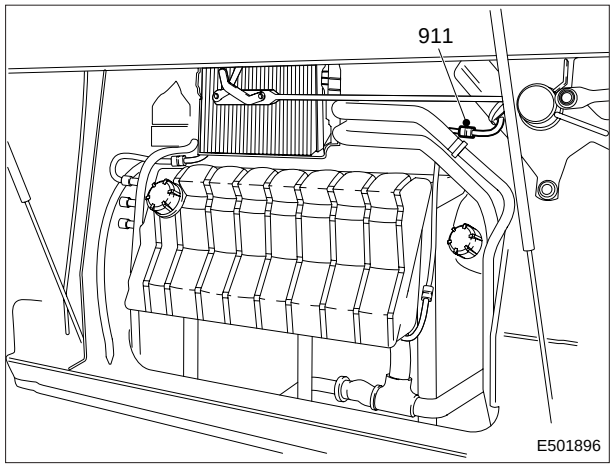

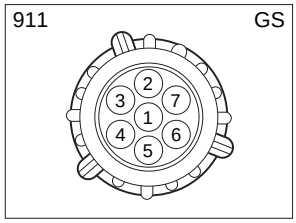

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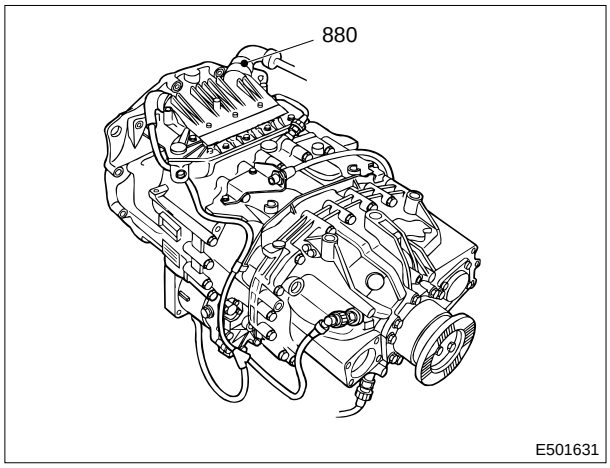

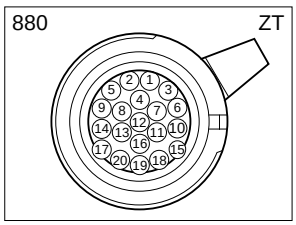

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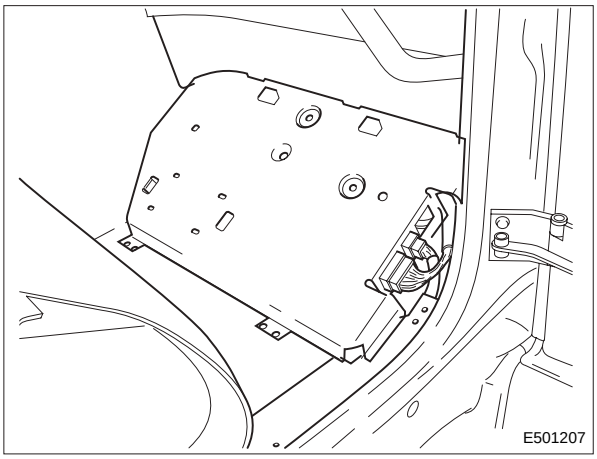

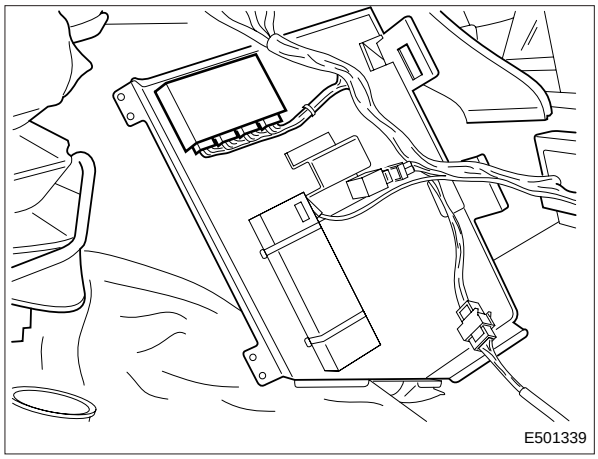

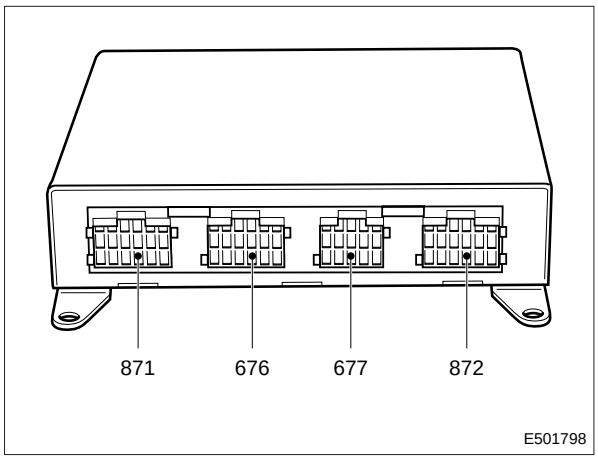

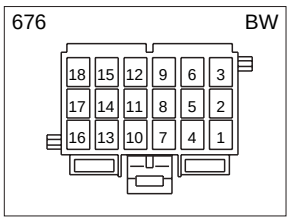

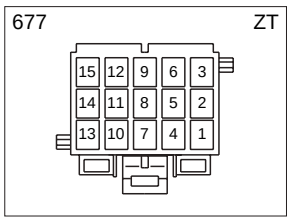

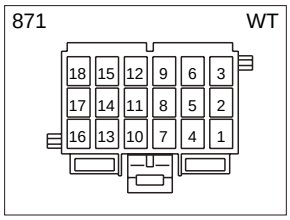

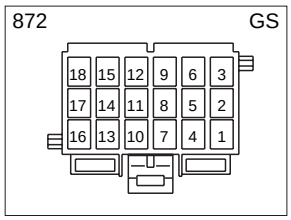

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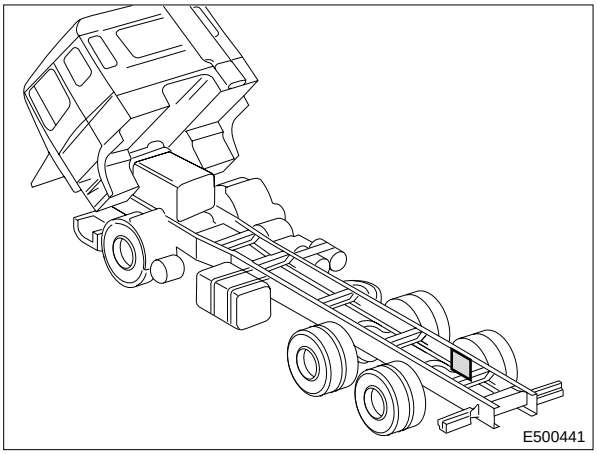

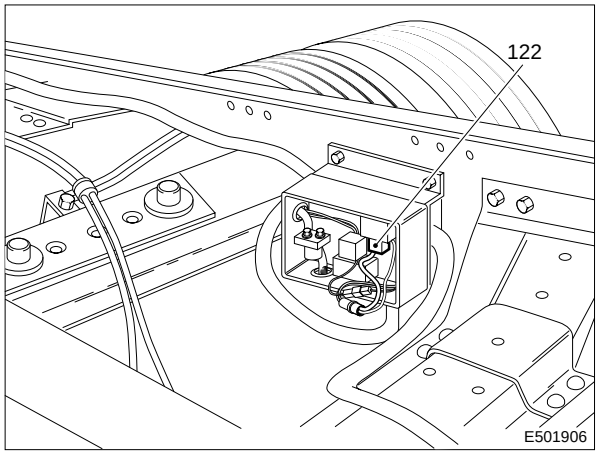

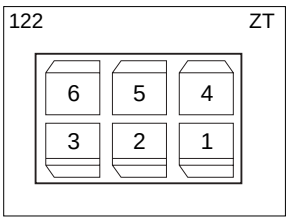

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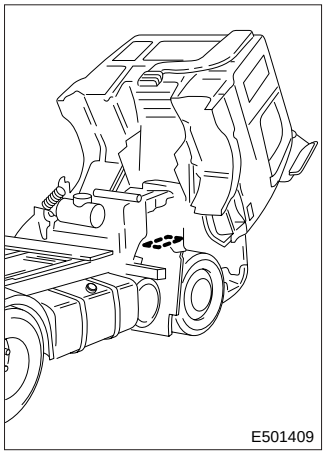

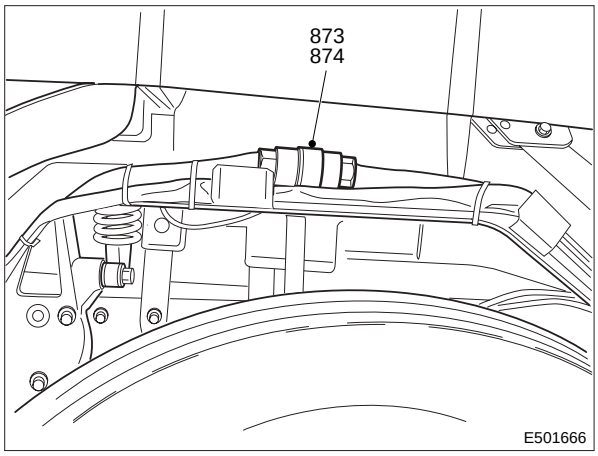

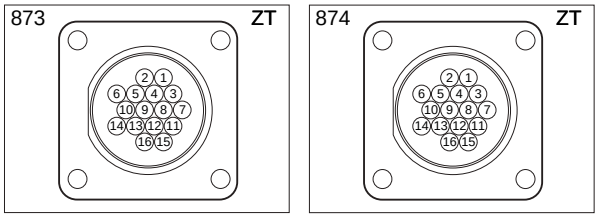

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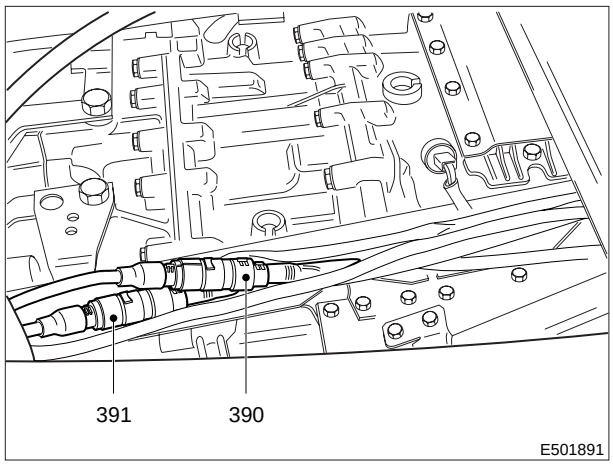

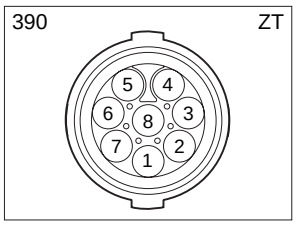

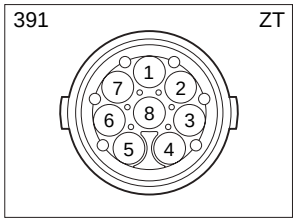

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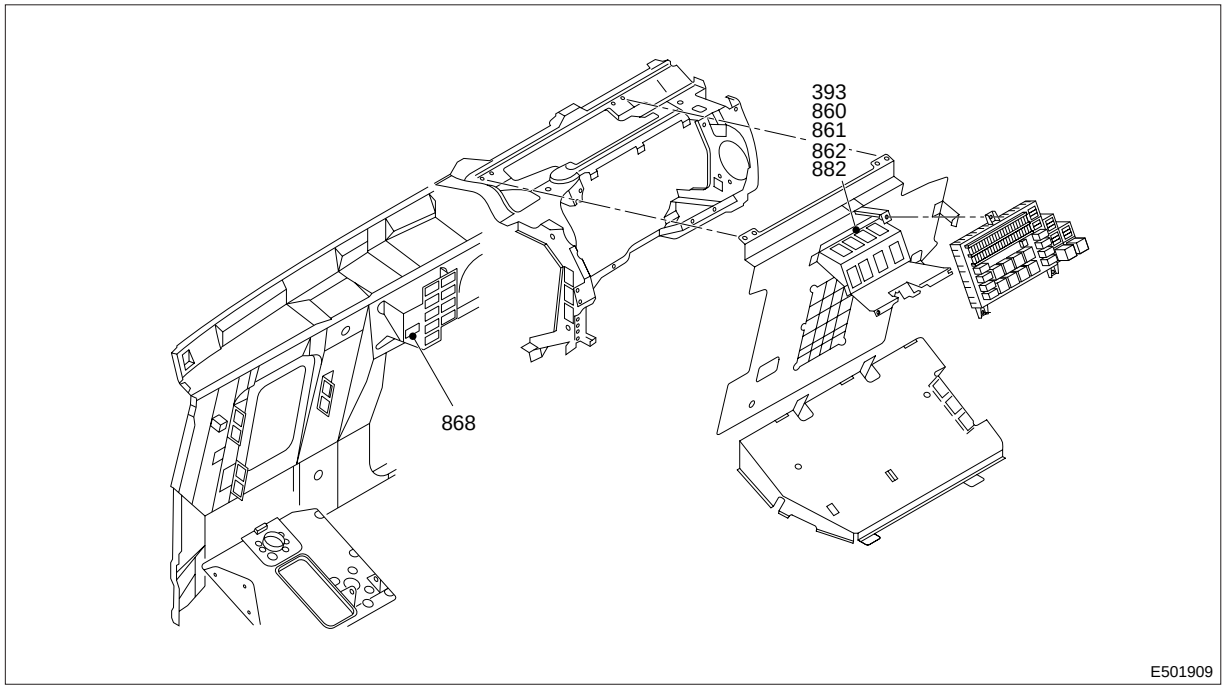

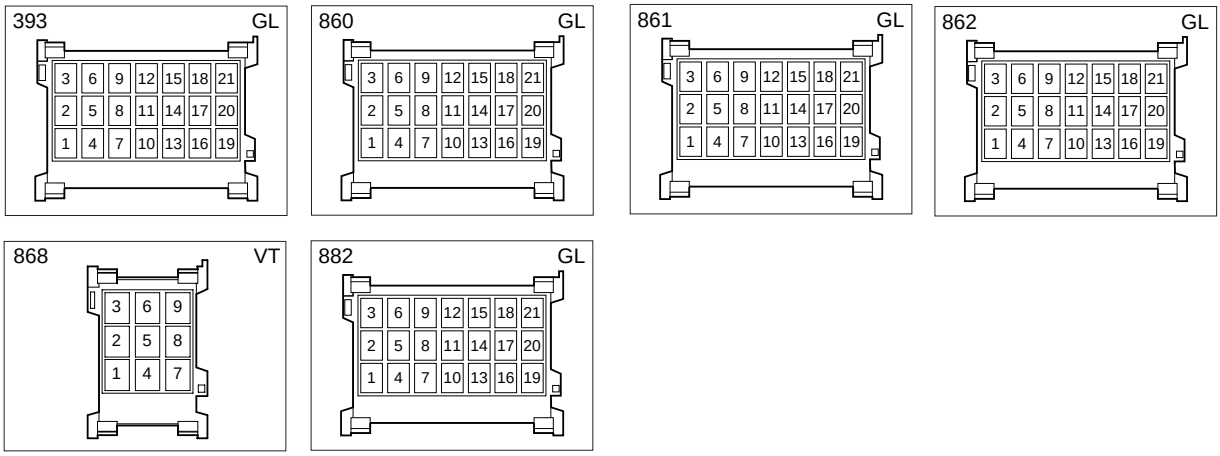

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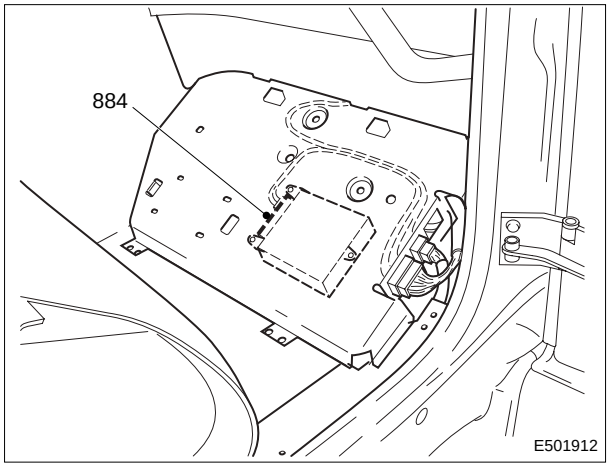

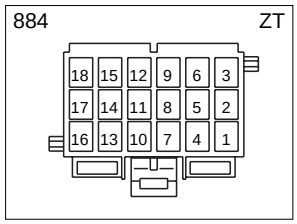

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1. INTRODUCTION

This chapter shows the entire electrical system in the form of **circuit diagrams** and an **overview of connectors/pin patterns**.

Circuit diagrams
All information that has a bearing on the complete electrical installation of the vehicle is found in the circuit diagrams with the exception of the connectors.

Note:
For the location of the connectors in the vehicle, see “Location of connectors”.

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2. ELECTRICAL SYSTEM

2.1 CIRCUIT DIAGRAM 1358030/15

This page can be used to make your own notes on the circuit diagram.

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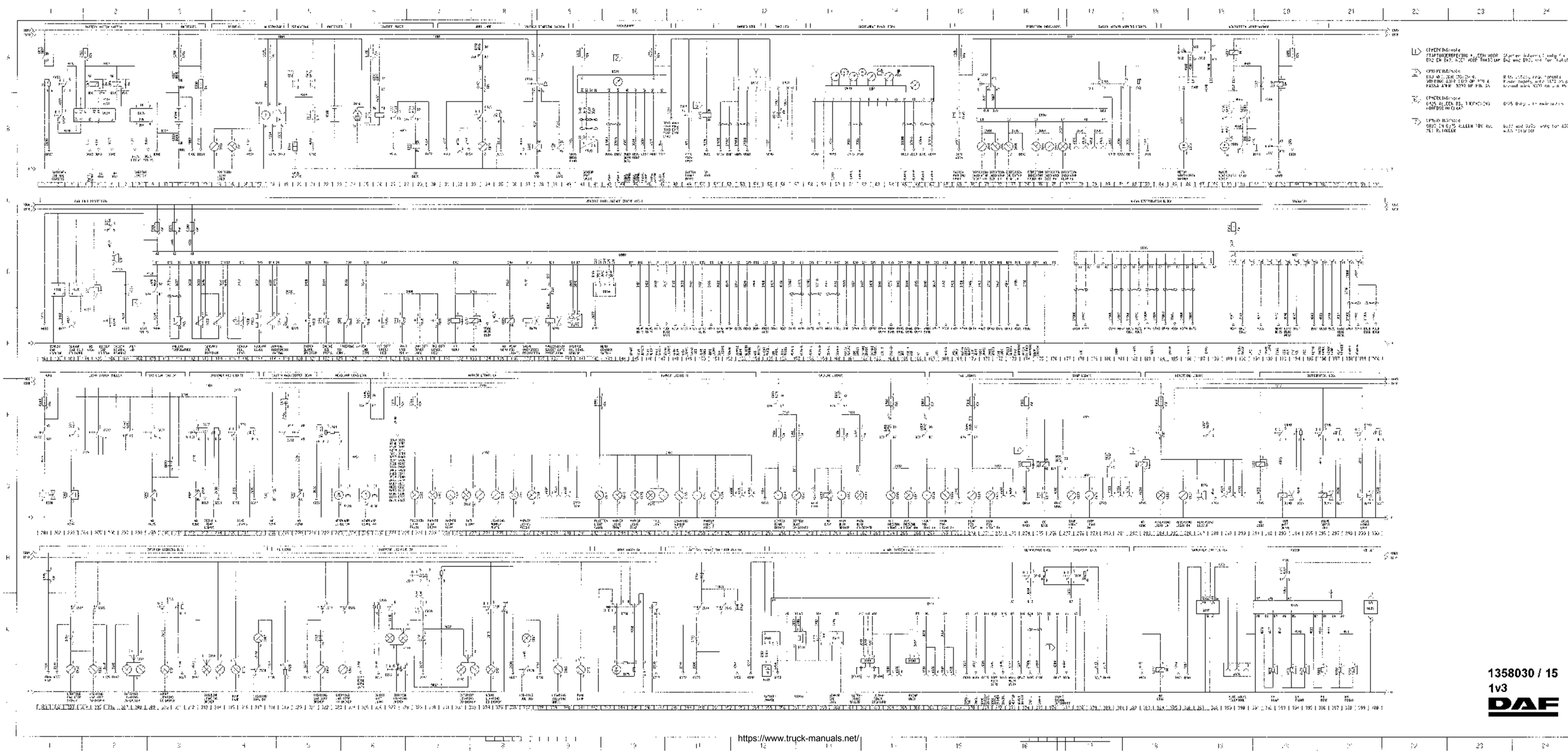

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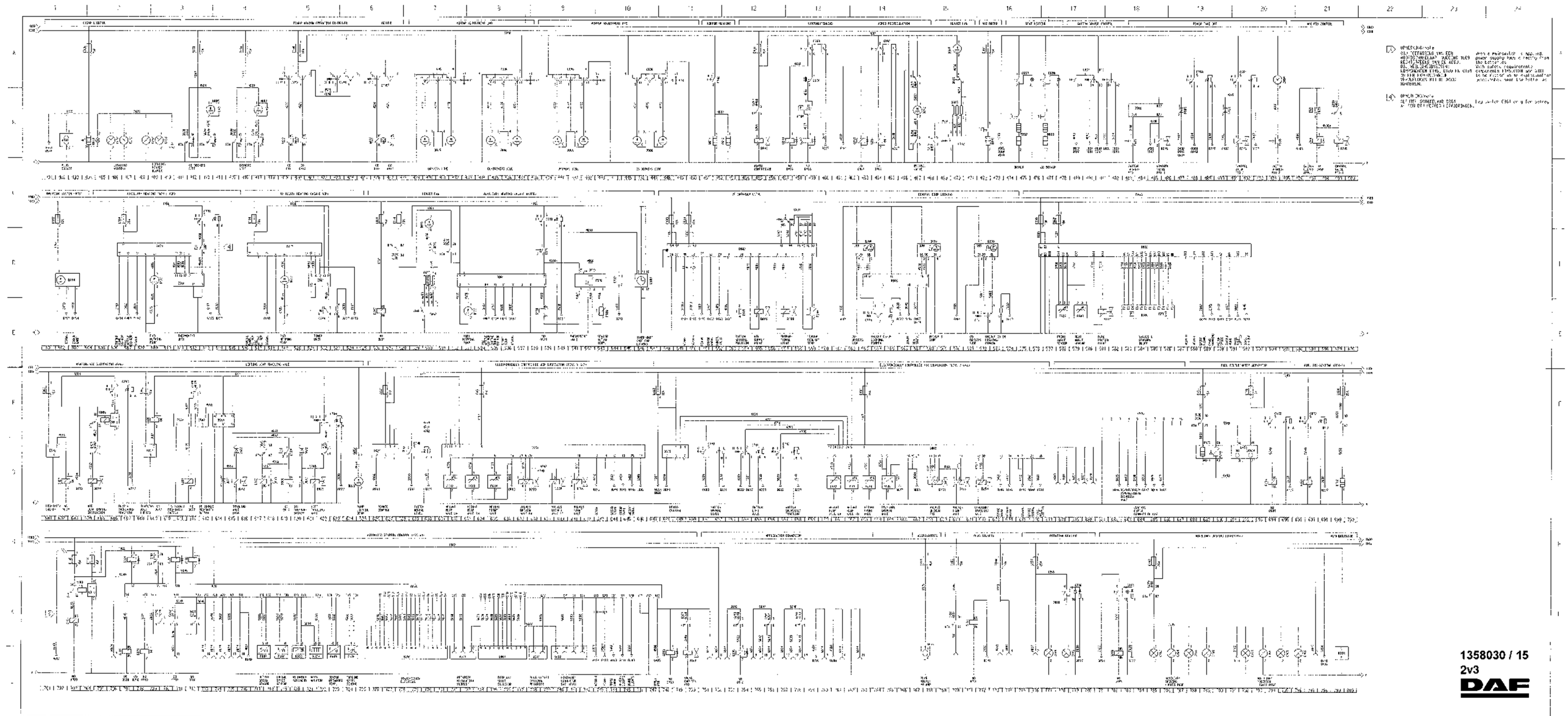

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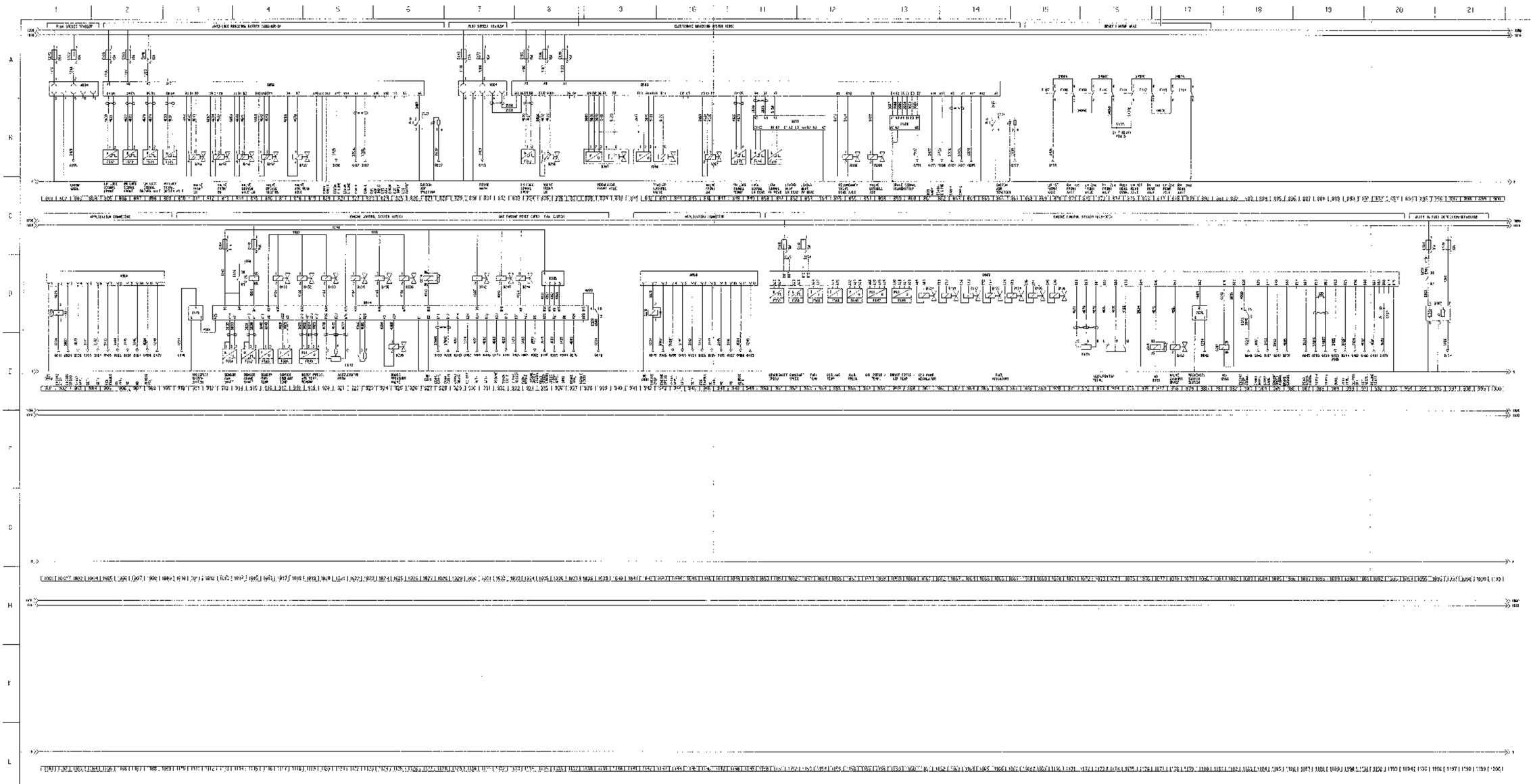

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2.2 OVERVIEW OF BASIC CODES FOR CIRCUIT DIAGRAM 1358030/15

Basic code	Description	Number on search bar
A000	Trailer socket (7-pin)	78, 80, 238, 252, 280, 678
A001	Rear fog light/reversing light socket (7-pin)	272, 289, 367, 364, 368, 678, 774
A004	Trailer ABS/EBS socket	803, 831
A007	24V socket, 2 -pin	402
A021	Diagnostic socket (16-pin)	194
A026	Superstructure socket	239, 253
A027	24V accessories socket (4 –pin)	103, 135, 679, 680, 797, 776
A032	Diagnostic socket	740
A038	Accessories socket	768
A058	Trailer socket (15-pin)	79, 78, 240, 254, 273, 281, 289
A068	Application connector, engine speed control	906, 945
A070	Application connector, superstructure (8-pin)	32, 282, 290, 365, 367, 369,680, 770, 773
A071	Automatic gearbox socket, retarder functions	738
A073	Automatic gearbox socket, operation	732
A074	Automatic gearbox socket, superstructure	711, 713, 714, 715, 751, 752, 753, 755, 756, 757, 758, 760, 761, 763, 706, 716
A076	Telephone socket	389
A500	Batteries (2x)	11, 22
A510	Battery, alarm system	355
A513	Integrated voltage regulator generator	17
B000	Windscreen wiper motor	89
B001	Windscreen washer pump motor	86
B003	Electric window motor, driver’s side	417

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Basic code	Description	Number on search bar
B004	Electric window motor, co-driver's side	414
B005	Left mirror adjustment motor	430, 440
B006	Right mirror adjustment motor	435, 446
B010	Starter motor	24
B015	4-speed heater fan	470, 530
B017	Mirror heating, driver's side	451
B018	Mirror heating, co-driver's side	452
B024	Loudspeaker, left	392
B025	Loudspeaker, right	396
B026	CB	399
B028	Horn	201
B030	Cigarette lighter, driver's side	404
B032	Seat heating, driver's side	475
B033	Seat heating, co-driver's side	477
B042	Air dryer heating element	473
B043	Air conditioning compressor	455
B071	Lifting-gear lifting valve	622
B072	Lifting-gear lowering valve	616
B073	Lifting-gear pump motor	624
B079	Low range downshift protection valve	137
B084	Air suspension bleed valve	605
B088	Proportional intarder valve	558
B089	Intarder air supply valve	556
B122	Fuel dosage pump for Eberspächer cab heater	510, 520, 534
B129	Motor, headlamp height adjustment, left	223
B130	Headlamp height adjustment motor, right	225
B131	Pump unit/injector solenoid valve, cylinder 1	917

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Basic code	Description	Number on search bar
B132	Pump unit/injector solenoid valve, cylinder 2	919
B133	Pump unit/injector solenoid valve, cylinder 3	920
B134	Pump unit/injector solenoid valve, cylinder 4	922
B135	Pump unit/injector solenoid valve, cylinder 5	924
B136	Pump unit/injector solenoid valve, cylinder 6	926
B166	ECAS valve, front axle	641, 670
B169	Chelsea PTO control valve	750
B175	Roof hatch motor	344
B176	Reversing buzzer	287
B178	Loudspeaker, left	394
B179	Loudspeaker, left	395
B180	Loudspeaker, right	397
B181	Loudspeaker, right	398
B182	Fuel heating element	699
B192	Engine brake valve	931, 978
B199	Central door lock, driver's side	568
B200	Central door locking motor, co-driver's side	563, 572
B201	Electronic unit, gearbox, AGC	728
B237	ABS/ASR-D differential lock valve, rear axle	818
B238	ECAS2 driven axle left/right air supply valve (FT)	640
B241	Fuel filter/water separator heating element sensor	690
B243	Cross-axle lock operation valve	296
B244	Longitudinal controlled slip differential control valve	299
B245	PTO control valve	486, 499
B246	PTO control valve	492

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Basic code	Description	Number on search bar
B247	Engine brake (DEB) valve	932
B248	Engine brake (DEB) valve	934
B250	ECAS driven axle left/right air supply valve (FA)	638
B251	Neutral position buzzer, tilting cab	107
B252	Recirculation valve	468
B253	ECAS driven axle left/right air supply valve	669
B254	ECAS steered leading front axle/trailing axle, left/right, lifting bellows valve	672
B256	ABS/ASR–D valve, front axle, left	811, 835
B257	ABS/ASR–D valve, front axle, right	813, 846
B258	ABS/ASR–D valve, driven axle, left	814
B259	ABS/ASR–D valve, driven axle, right	816
B290	Electropneumatic boost pressure valve	925
B293	Gearbox gate protection valve	139
B306	EBS redundancy valve	856
B307	EBS front axle modulator	839
B308	EBS trailer control valve	842
B309	ASR cut-off valve	858
B334	Fuel pump control solenoid valve	961
B335	Electronically controlled viscous fan clutch	935
B338	Alarm system horn	357
B340	Four-wheel drive valve	293
B341	Glow plug	19
B344	Automatic lubrication pump with integrated electronic unit	503
B353	Automatic gearbox control solenoid, retarder	720

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Basic code	Description	Number on search bar
B354	Automatic gearbox accumulator	721
B358	Coolbox	799
B365	Radio	394
B372	EMAS proportional flow-control valve	581
B386	EMAS valves and sensors block	584
B387	Fuel heater/water separator electronic unit	996
B525	Modular tachograph	43
C000	Dipped beam, left	256
C001	Dipped beam, right	258
C002	Main beam, left	261
C003	Main beam, right	262
C006	Spotlight, left	265
C007	Spotlight, right	266
C008	Fog light, front left	267
C009	Fog light, front right	269
C010	Side-light, left	14, 229
C011	Side-light, right	16, 243
C012	Side-light, front left	231
C013	Side-light, front right	244
C014	Direction indicator, front left	71
C015	Direction indicator, front right	75
C016	Direction indicator, side left	72
C017	Direction indicator, side right	76
C018	Direction indicator, rear left	73
C019	Direction indicator, rear right	77
C020	Stop light, left	278

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Basic code	Description	Number on search bar
C021	Stop light, right	279
C022	Rear light, left	232
C023	Tail light, right	246
C024	Fog light, rear left	271
C025	Fog light, rear right	272
C026	Reversing light, left	285
C027	Reversing light, right	286
C052	Heater fan light, left	409
C053	Heater fan light, right	410
C062	Driver's side stepwell lighting	304, 322
C063	Co-driver's side stepwell lighting	305, 324
C067	Left-hand storage compartment lighting	318, 338
C071	Work lamp	34
C072	Ashtray light, left	406
C073	Ashtray light, right	407
C074	Side-light, rear left	232
C075	Side-light, rear right	246
C115	Bunk lamp with switch	316, 342
C119	Interior lighting with switch, driver's side	313, 328
C129	Interior lighting with switch	319
C144	Blue rotating light, left	778
C145	Blue rotating light, right	779
C154	Rear number plate light, left (tractors)	235
C155	Rear number plate light, left (tractors)	249
C156	1st side-light, left (tractors)	237
C157	1st side-light, right (tractors)	250
C158	2nd side-light, left (tractors)	238

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Basic code	Description	Number on search bar
C159	2nd side-light, right (tractors)	252
C162	Roof spotlight	786
C163	Side-light/roof spotlight	793
C164	Roof spotlight	787
C165	Side-light/roof spotlight	794
C166	Roof spotlight	788
C167	Side-light/roof spotlight	795
C168	Roof spotlight	790
C169	Side-light/roof spotlight	797
C185	Light with switch	340
C191	Middle nightlight	311, 335
C192	Interior lighting with switch, co-driver's side	308, 332
C539	Accessories/ignition/starter switch	37
C622	Switch, lighting	205, 209
C695	Mirror adjustment switch, driver's side	431, 441
C696	Mirror adjustment switch , co-driver's side	436, 447
C697	Switch for seat heating, driver's side	475
C698	Switch for seat heating, co-driver's side	477
C704	Lifting-gear switch	623
C716	Rotating light switch	779
C725	Work lamp switch	34
C727	Front and rear fog light switch	213
C735	Interior nightlight switch	310, 335
C736	Roof hatch switch	345
C737	ABS/ASC-D traction switch	827, 866
C740	ECAS switch, normal driving level	629, 651

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Basic code	Description	Number on search bar
C741	Switch for lifting ECAS axle	655
C742	Traction assistance switch	657
C743	Electric window switch, co-driver's side (driver's side door)	420
C744	Electric window switch, co-driver's side (co-driver's side door)	424
C745	Electric window switch, driver's side (driver's side door)	427
C746	Mirror heating switch	452
C748	Axial controlled slip differential control switch	296
C749	Longitudinal controlled slip differential control switch	299
C750	PTO operation switch	488
C751	PTO operation switch	492
C760	Air conditioning switch	459
C763	Instrument lighting dimming potentiometer	119
C764	Potentiometer, headlamp height adjustment	222
C765	Hazard warning light switch (with LED visibility lighting)	80
C773	Rear fog light switch	216
C774	Central door locking switch	572, 564
C778	Cab heater switch	513, 539
C802	Recirculation switch	464
C813	Spotlights switch, roof	783
C831	Cruise control/engine speed control/retarder steering column switch	480, 559
C832	Direction indicator/windscreen wiper steering column switch	71, 85, 87, 92, 201, 219
C835	Switch to switch off interior detection system	375
C836	Switch to switch off superstructure/trailer loadspace detection	378

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Basic code	Description	Number on search bar
C837	Interior lighting switch	327,328
C840	Four-wheel drive switch	293
C844	Cab heater main switch	522
C853	Cab main switch	2
C854	Chassis main switch	3
C858	Interior spot lighting switch	326
C859	Interior lighting roof console switch, driver's side	330
C861	PETREG key switch	513
C872	Fuel filter/water separator control switch	694, 697
C882	Heater fan switch	470, 530
C883	FAG traction assistance switch	607
D094	PTO warning light (orange) (2^{nd})	495
D503	Electronic unit for lifting gear	614
D529	Electronic unit, ECAS remote control	626, 648
D609	Diode, light switch	210
D610	Diode, main beam/dipped beam	219
D611	Diode, damping valve for lowering lifting-gear	615
D612	Diode, damping valve for lifting lifting-gear	621
D613	Diode, damping relay for lifting-gear pump	618
D622	Diode for lifting-gear lifting locks	621
D623	Diode for lifting gear lowering locks	616
D703	Diode for switching off cab heater/door, contact on driver's side	491
D705	Diode for switching off the cab heater with running engine	487
D710	Diode for interior lighting to prevent feedback to driver's side switch	329

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Basic code	Description	Number on search bar
D715	Alarm system LED	55, 358
D782	Diode, prevent door locking feedback, driver's side	91
D783	Interior lighting diode, driver's side	303, 321, 349
D791	Door switch diode	350
D792	Door switch diode	353
D802	Electronic unit for ECAS-2 (6x2)	668
D814	UPEC electronic unit	923
D826	Electronic unit for VLG current limiter	8
D850	Electronic unit for ABS/ASR, D-model	816
D851	Electronic unit for ECAS-3 (4x2)	638
D855	Electronic unit for water separator	692
D866	Electronic unit for automatic gearbox control (AGC-A)	729
D867	Automatic gearbox gear selection display	735
D871	Electronic unit for Airtronic D2 auxiliary heater	509, 519
D879	Rear axle modulator	852
D880	Electronic unit for EBS	842
D895	Electronic unit for (10A) converter with power supply for radio memory	387
D899	DIP-4 instrument panel	61
D900	VIC electronic unit	75, 87, 144, 484
D901	Electronic unit for Hydronic 10 cab heater	535
D902	Electronic unit for ZF-intarder with CAN	554
D903	Electronic unit for ECS-DC3	965
D904	Menu Control Switch, MCS	143
D905	Electronic unit for central door locking	565
D909	Electronic unit for ultrasonic alarm system	362

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Basic code	Description	Number on search bar
D910	Electronic unit for battery charger	355
D911	Electronic unit for alarm system (ALS - S)	367
D912	Electronic unit for immobiliser	54
D924	Electronic unit for main switch	5
D931	Immobiliser LED	56
D932	EMAS electronic unit	584
E000	Fuse, rear left side-light	228
E001	Fuse, rear right side-light	242
E004	Fuse, driver's side dipped beam	255
E005	Fuse, co-driver's side dipped beam warning light	257
E006	Fuse, driver's side main beam	260
E007	Fuse, co-driver's side main beam warning light	261
E008	Fuse, spotlights	264
E009	Fuse, front fog lights	266
E010	Fuse, rear fog lights	270
E013	Fuse, stop lights	274
E016	Fuse, reversing lights/gearbox neutral position	284
E023	Fuse, cold start/tachograph/cab heater program clock/alarm system switch	41
E025	Fuse, headlight cleaner wiper motor	93
E026	Fuse, cigar lighter/door switches	404
E029	Fuse, retarders/engine brake	549
E031	Heater fan fuse	455, 526
E033	Fuse, electric window motor, co-driver's side	412
E034	Fuse, electric window motor, driver's side	416

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Basic code	Description	Number on search bar
E035	Fuse, instruments and warning lights/parking brake switch	69
E037	Fuse, ignition switch	37
E040	ABS/EBS fuse	807, 836
E043	Fuse, trailer ABS/EBS	801, 829
E044	Fuse, mirror heating	420
E045	Cab interior lighting fuse	301
E048	Fuse, trailer power supply	773
E051	ECAS fuse	634, 663
E052	Fuse, ECAS remote control/work lamp	33
E053	Fuse for diagnostic connector (16-pin)	189
E062	Fuse, lifting gear and ECAS	577, 601, 608, 626, 647
E084	Fuse, lighting	201
E091	Fuse, air dryer heating element/steering column switch/PTO	472
E108	VIC fuse	109
E112	Fuse, glow indicator light	21
E114	Fuse, cab heater (Eberspächer)	506, 516, 527
E117	Fuse for visibility lighting	227
E118	Fuse, UPEC/ECS-DC3 supply voltage	915, 952
E142	Fuse, accessories before ignition	785
E143	Fuse, UPEC/tachograph/alarm system	46
E144	Fuse, Allison gearbox	704
E145	Fuse, Allison gearbox	703
E153	Main switch fuse for timer/engine stop/main switch power supply	4
E156	Fuse for accessories lighting	770
E157	Fuse, automatic lubrication	501

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Basic code	Description	Number on search bar
E160	Fuse, ECS-DC3	951
E163	Fuse, accessories after ignition	776
E164	Fuse for fuel heater before ignition	699, 995
E168	Fuse for accessories/microwave	767
E170	Fuse, fuel heater after ignition	692, 996
E171	Fuse for fuel filter/water separator	688
E172	Fuse, trailer ABS/EBS	802, 830
E184	UPEC fuse	913
E189	Fuse for rear axle EBS	805, 833
E190	Fuse for front axle EBS	806, 835
E199	Fuse, ZF intarder	548
E277	VIC fuse	110
E279	Fuse, voltage regulation generator	17
E280	VIC fuse	112
E286	Fuse for reserve capacity	11, 25
E290	EMAS fuse	576
E330	Fuse, main switch	12
E501	Reversing light operating switch	284
E507	Approximation switch for axle load protection lifting-gear (10 tons)	612
E508	Air-conditioning compressor temperature cut-out	459
E509	Air conditioning operating switch, high/low pressure	458
E511	Brake light control switch	276
E514	Operating switch for stepwell/interior lighting door switch, driver's side	303, 322, 350
E515	Operating switch for stepwell/interior lighting, co-driver's side	305, 324, 352

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Basic code	Description	Number on search bar
E524	Oil pressure limit switch for lifting-gear operating switch	620
E528	Control switch for left-hand storage compartment lighting	317, 337
E542	Proximity switch for axle load protection (13 tons)	601
E548	Gearbox neutral position switch	106
E561	Gearbox gate protection operating switch	139
E564	Operating switch, engine brake	49
E566	Control switch for Eberspächer cab heater thermostat (DILC)	511
E569	Neutral position switch	554
E570	Pneumatic switch for clutch PTO N10	498
E571	Control switch for Thermo 90 cab heater	539
E575	Proximity switch, clutch	911, 979
E579	Operating switch for thermostat/cab heater, fan, Eberspächer (water)	543
E580	Operating switch for thermostat/cab heater, fan, Eberspächer (timer)	547
E581	Operating switch, cab heater	522
E584	Proximity switch for axle load protection lifting-gear (7.5 tons)	611
F000	Control switch for parking brake	69
F006	Control switch for differential lock, 1st differential	127
F007	Control switch for differential lock, 3rd differential	131
F011	Control switch for engine oil pressure	122
F033	Control switch for splitter signalling	121

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Basic code	Description	Number on search bar
F038	Control switch for differential lock, 2nd differential	129
F047	Control switch, steering system (1st circuit)	124
F048	Control switch, steering system (2nd circuit)	125
F050	Control switch, differential lock pressure (1st and 2nd differential)	128
F087	Control switch for gearbox PTO	484
F088	Control switch for gearbox PTO	495
F097	Operating switch for lifting-gear, trailing axle	608
F107	Brake pad wear switch, front left	869
F108	Brake pad wear switch, front right	871
F109	Brake pad wear switch, front left, 2nd front axle	872
F110	Brake pad wear switch, front right, 2nd front axle	873
F111	Brake pad wear switch, rear left	874
F112	Brake pad wear switch, rear right	876
F113	Brake pad wear switch, rear left, 2nd rear axle	877
F114	Brake pad wear switch, rear right, 2nd rear axle	879
F509	Cab temperature sensor of cab heater	544
F512	Wheel speed sensor, front axle left	805, 834
F513	Wheel speed sensor, front axle right	806, 848
F514	Wheel speed sensor, driven axle left	808
F515	Wheel speed sensor, driven axle right	809
F533	Speed sensor (4-pin, 1st)	42
F544	Coolant temperature sensor for secondary retarder	561
F552	Sensor, crankshaft	914
F558	Sensor, camshaft	913
F565	Sensor, fuel temperature	916

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Basic code	Description	Number on search bar
F566	Sensor, engine coolant temperature	917
F601	Sensor, AGS	717
F602	Sensor, AGS	719
F608	Fuel level sensor	116
F612	ECAS height sensor, left rear axle	631, 660
F613	ECAS height sensor, right rear axle	633, 662
F614	ECAS height sensor front axle	635, 663
F615	ECAS pressure sensor driven axle left/right	665
F616	Cab locking sensor	102
F619	Cab locking sensor, alarm system	360
F628	EBS foot brake valve	859
F649	Boost pressure and air inlet temperature sensor	919
F651	Ambient temperature sensor	112
F652	Air pressure sensor	113
F656	Coolant level sensor	117
F669	Temperature sensor, automatic gearbox retarder	723
F670	Automatic gearbox turbine speed sensor	724
F671	ECS-DC3 accelerator pedal sensor	972
F672	UPEC accelerator pedal sensor	921
F673	Engine oil level and temperature sensor	140
F676	Cab locking sensor	103
F686	Alarm system, radar sensor	365
F687	EMAS front axle angle sensor	578
F688	EMAS rear axle angle sensor	579
G000	Relay, tail light/side-light	209, 225

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Basic code	Description	Number on search bar
G001	Relay, dipped beam	218, 255
G002	Relay, main beam	220, 260
G003	Relay, spotlights	259, 264
G004	Relay, front fog light	212, 266
G005	Relay, rear fog light	135, 270
G014	Relay, glow plug	19, 21, 927, 976
G015	Relay, ignition	1, 37
G028	Relay, electric window, co-driver's side	411, 419
G029	Relay, electric window, co-driver's side	413, 420
G030	Relay, electric window, driver's side	415, 426
G031	Relay, electric window, driver's side	417, 427
G036	Relay, stop light	275, 276
G037	Stop light microrelay for AGC with retarder	280, 282
G052	Relay, lifting-gear motor	617, 624
G066	Relay, lifting-gear takeover	617, 619
G095	Relay, traction mode 60 sec. venting	604, 605
G126	Relay, UPEC/ECS-DC3 supply voltage	914, 915
G170	Relay, cab heater fan	527, 538
G178	Relay, accessories	33, 39
G180	Time relay power supply, Allison, 12 V	703
G181	Takeover relay power supply, Allison, 12 V	703, 709
G185	Relay to break start circuit	28, 707
G188	Relay, accessories lighting	770, 771
G201	Relay for EFPH fuel heater	696, 699, 981
G203	Relay, starter motor takeover	26, 28
G234	Control relay for fuel filter/water separator	688, 694

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Basic code	Description	Number on search bar
G236	Microrelay, windscreen wipers (speed 1 or 2)	89, 92
G237	Microrelay, windscreen wipers (automatic zero position)	89, 90
G247	Relay, cab heater fan	526, 531
G257	Recirculation valve microrelay	464, 467
G258	Recirculation valve microrelay	462, 467
G259	PTO control takeover relay	497, 499
G267	Air conditioning microrelay	455, 458
G279	Air conditioning microrelay	457, 468
G291	Relay, automatic gearbox	710, 758
G292	Microrelay, automatic gearbox	710, 712
G293	Microrelay, automatic gearbox	748, 753
G294	Microrelay, automatic gearbox	707, 756
G295	Microrelay, automatic gearbox	712, 753
G299	Relay, roof spotlights	782, 785
G301	Microrelay, lighting D+	131, 203
G302	Microrelay, Swedish lighting	203, 207
G328	Relay, engine stop	901, 938, 942, 983
G350	Microrelay, automatic gearbox reversing lights	287, 291
G351	Microrelay, cab tilt protection	104, 106
G367	Relay, main switch power supply	4, 11
G368	Relay, main switch earth	6, 11
G371	Automatic gearbox relay, superstructure	708, 749
G372	Microrelay, starting circuit interrupter	27, 133
G375	Stop light microrelay for AGC with retarder	274, 709
G377	Microrelay, accessories power supply for radio	384, 393

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Basic code	Description	Number on search bar
G380	Relay, mechanical lifting axle	609, 612
G381	Relay, mechanical lifting axle	611, 622
G425	Main switch relay	50, 109
G427	Microrelay, FAG traction assistance	602, 604
G516	Central cab earth, co-driver's side	684
G535	CAN distributor block	183
G725	Connection for D3LC cab heater	509, 519
G732	Through-connection for cab heater	544
G733	Through-connection for intarder neutral position	108
G734	Brake lining wear through-connection	875
G736	V-CAN connection	198
G737	Through-connection for ECS-DC3 speed control	993

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2.3 SUB-DIAGRAMS OF CIRCUIT DIAGRAM 1358030/ 15

A	Voltage before and after ignition
B	Overview of earth connections
C	CAN overview
1	Main switch
2	Alternator/ignition/starter switch/charging circuit
3	Tachograph
4	Immobiliser
5	Pre-glowing
6	DIP4
7	Direction indicators and warning lights
8	VIC
9	Marker lights and parking lights FA
10	Marker lights and parking lights FA
11	UPEC
12	Reversing lights
13	Light switch/fog lights/dipped beam and main beam switch, FA/FT
14	Swedish lighting
15	Stop lights/cab tilting gear
16	Differential lock
17	Interior lighting day/sleeper cab
18	Interior lighting SH cab
19	Mirror heating/mirror adjustment
20	Visibility lighting
21	Air conditioning/recirculation valve/heater fan
22	Seat heating/accessories
23	Horn/cigarette lighter/work lamp/air dryer
24	ABS-ASR-D
25	DEB

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26	Intarder EST42
27	ECS-DC3
28	AGS
29	EMAS
30	AGC
31	FAG
32	PTO
33	Roof spotlights/cooler box/rotating lights
34A	ECAS 3 (4x2)
34B	ECAS 2 (6x2)
35	Headlight-height adjustment
36	24V/12V converter for radio/CB
37	Electric windows/central door locking/roof hatch SH cab
38	Mechanical lifting-gear
39	Fuel line heater
40	Windscreen wipe/wash system
41	Eberspächer (ACH-E) cab heater with/without timer
42	Hydronic 10 (ACH-H) cab heater with/without timer
43	UPEC/CUMMINS/AGC application connector
44	EBS
45	Brake lining wear switch
46	Alarm system/battery charger for BV3 alarm
47	Plug sockets, FA/FT
48	Fuel filter/water separator (Racor)
49	Water separator (Fleet Guard)

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A POWER BEFORE AND AFTER IGNITION

POWER BEFORE IGNITION

A constant voltage is supplied to pin 1 of connector 416 through wire 1000, point 30 on the starter motor, fuse E286, the + bolt in the dashboard connector lead-through and the voltage distributor block.
Power is also supplied (via wire 1000) from point 30 on the starter motor to the B+ connection of the alternator and to relay G014 (glow plug relay).

Only wire 1000 to the + bolt in the dashboard connector lead-through is fuse-protected by a 125 A fuse.
The other wires are NOT fuse-protected and they can only be made dead by disconnecting the battery leads.

There is a voltage on the "S"(sens)-connection of the alternator from point 30 of the starter motor via fuse E279 and wire 3084.

POWER AFTER IGNITION

Power is supplied to contact relay G015 (point 30) via the starter motor (connection point 30). This connection point may be connected to wire 1010 over contact relay G015.
This wire is NOT fuse-protected.

OPERATION

When the ignition/starter switch (C539) is set to the "accessories" position (connection between points 1 and 6), power is supplied to relay G178 via wire 1000, fuse E037, ignition/starter switch (C539) (contact points 1 - 3) and wire 1130.

When the ignition/starter switch (C539) is set to the "contact" position (connection between points 1 and 4), relay G015 is energised via wire 1000, fuse E037, ignition/starter switch (C539) (contact points 1 - 4) and wire 4001. This then connects wire 1000 (power before ignition) to wire 1010 (power after ignition).

When the ignition/starter switch (C539) is turned against the pressure of the spring (connection between points 1 and 2), relay G015 remains energised and power is supplied to the alarm system (D911) (if present) or directly to connector 403 connection point 2 via wire 1000, fuse E037, ignition/starter switch (C539) (contact points 1 - 2) and wire 4004. The coil of relay G372 is energised via the central PCB. When the ignition/starter key is released, the ignition/starter switch automatically springs back and remains in the "contact" position.

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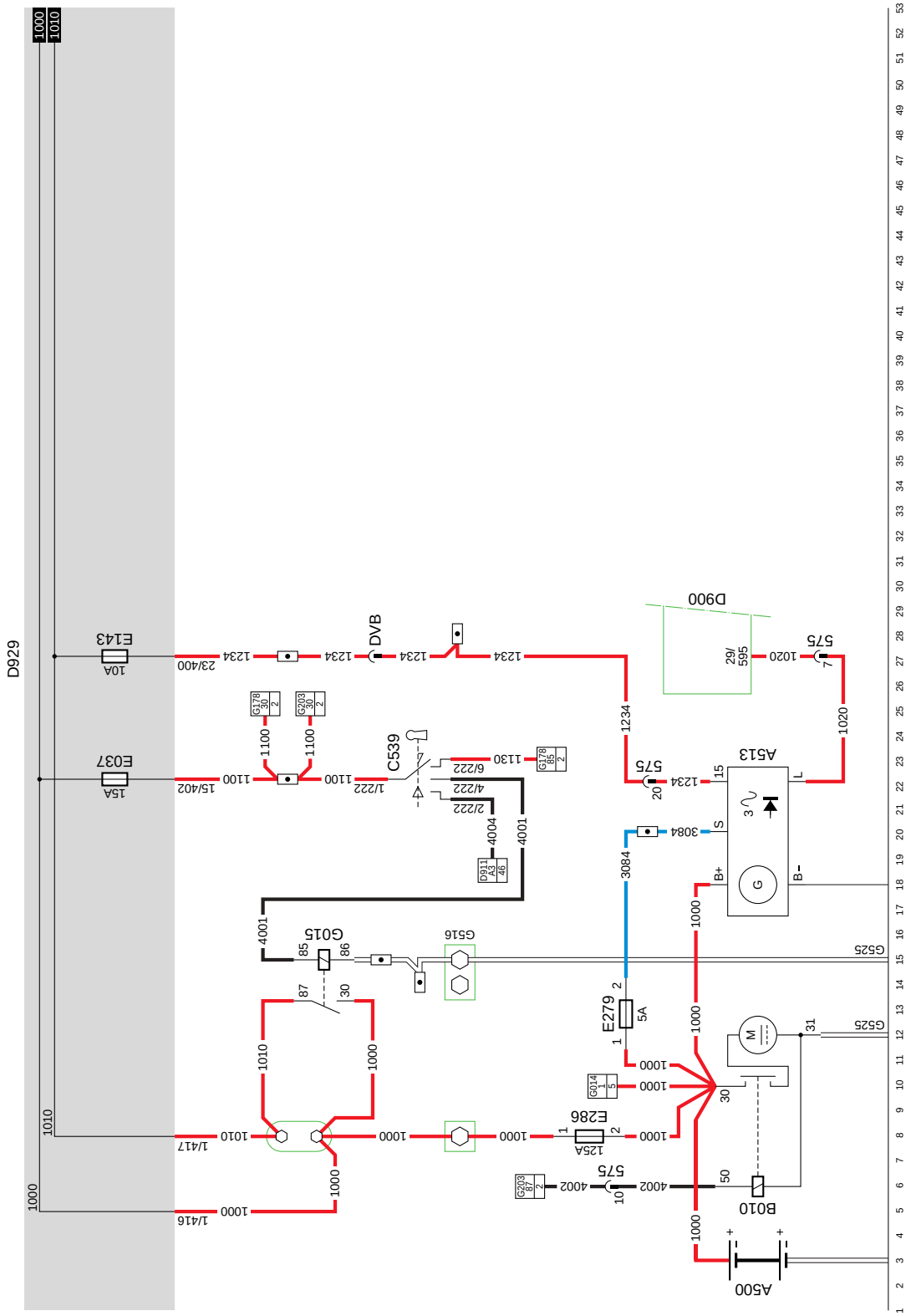
D929
E143
10A
E037
15A
DVB
C539
D900
A513
A500
B010
E279
5A
E286
125A
G015
G516
G525
1000
1010
1020
1234
1100
1130
3084
4001
4002
4004
23/400
15/402
1/222
6/222
4/222
2/222
1/417
1/416
29/595
EL000483

A **1358030/15**

10

B OVERVIEW OF EARTH CONNECTIONS

This section diagram gives an overview of all the earth connections, with wire markings and connector points.

VARIANTS
Location

9 = 1 = accessories superstructure connection

61 = 2 = for ABS/ASR-D (D850) connector 585, pin 21. for EBS (D880) connector 584, pin 21

59 = 3 = 40 A accessories connector.

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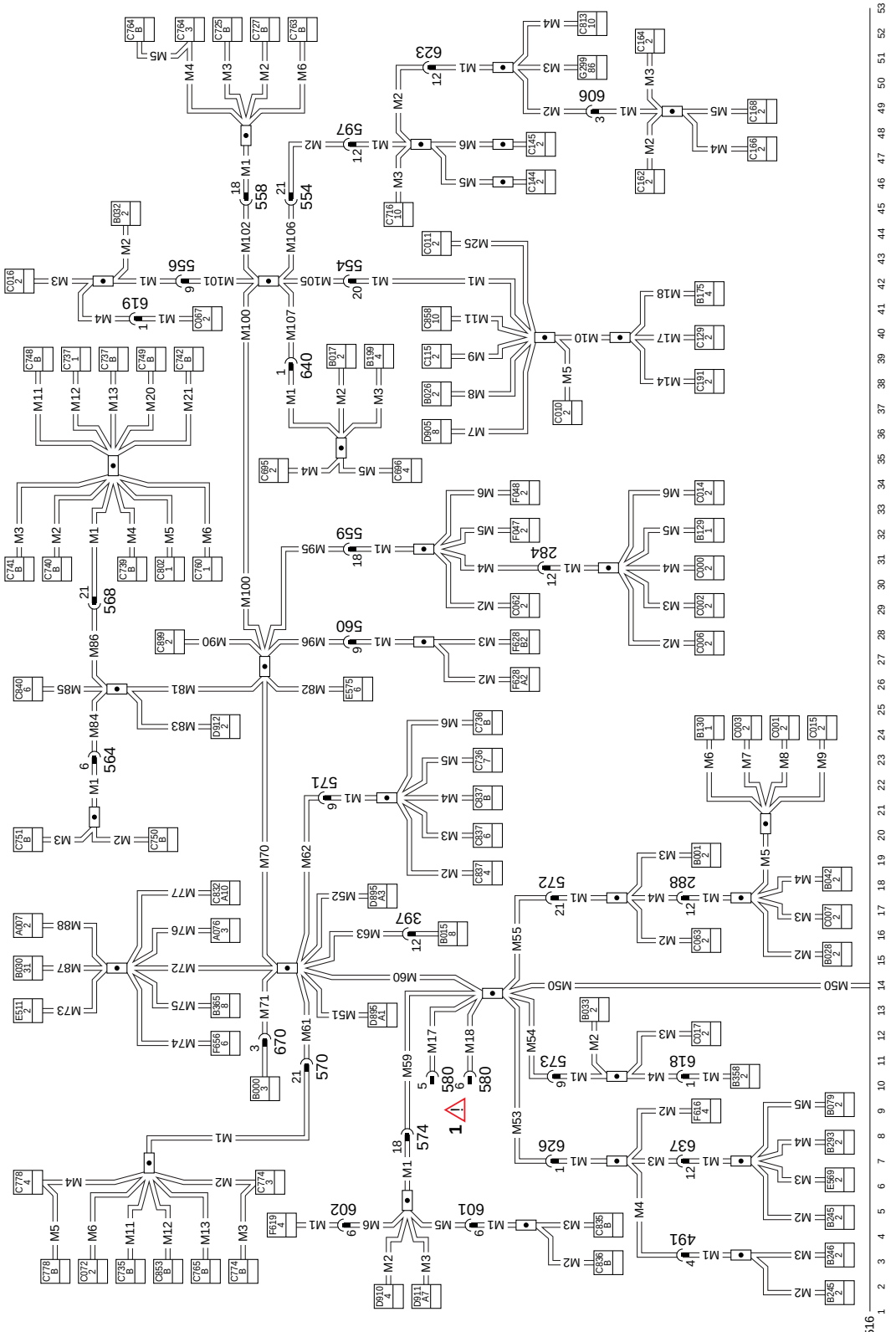

B **1358030/15** EL000484

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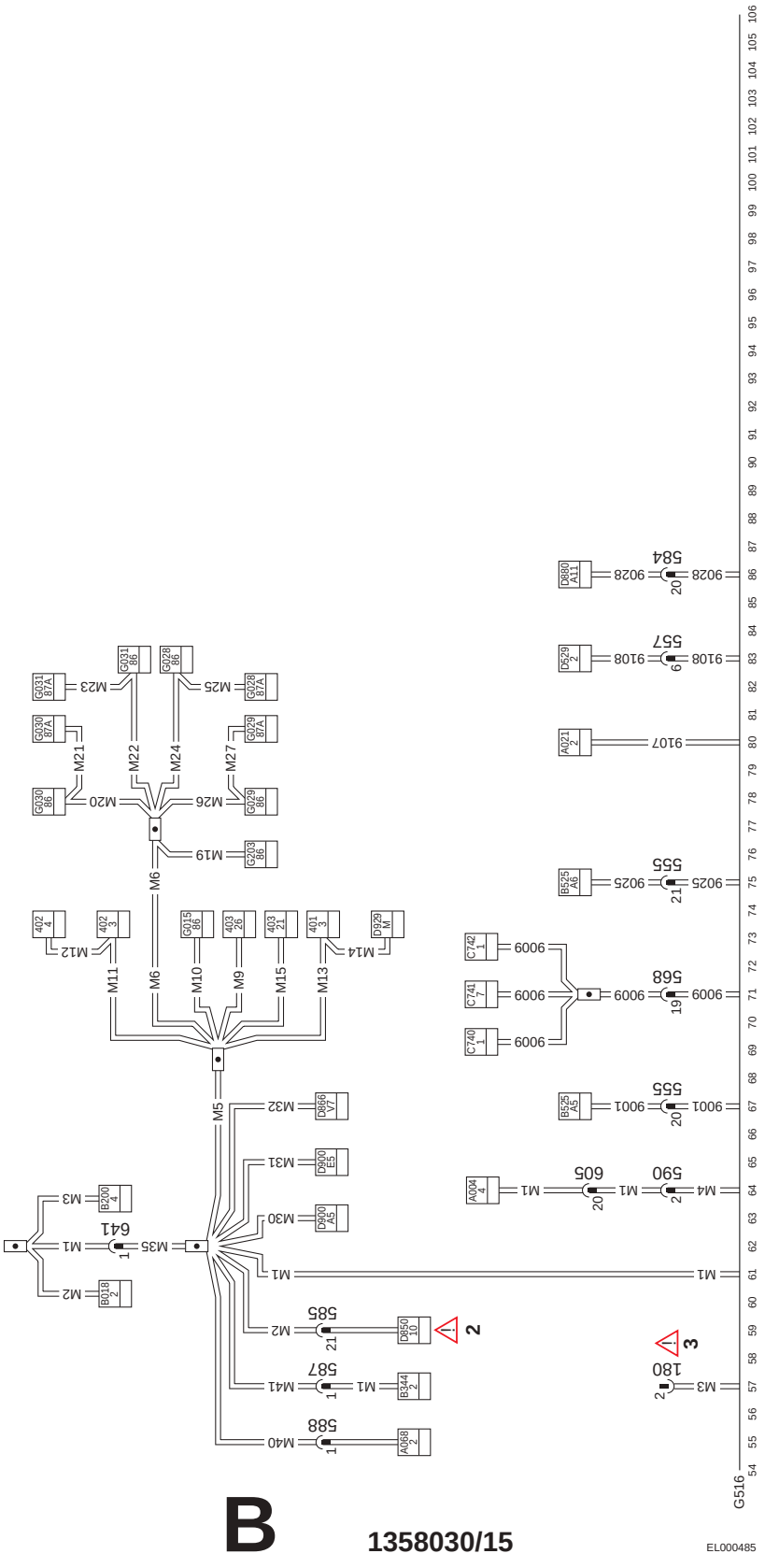
B
1358030/15
EL000485
G516
584
557
568
555
590
605
180
585
587
588
641

10

C CAN OVERVIEW

This section diagram gives an overview of all the CAN connections, with wire markings and connector points.

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

35 If the vehicle has an ABS system, ABS/ASR-D (D850) electronic unit should be read in conjunction with this.

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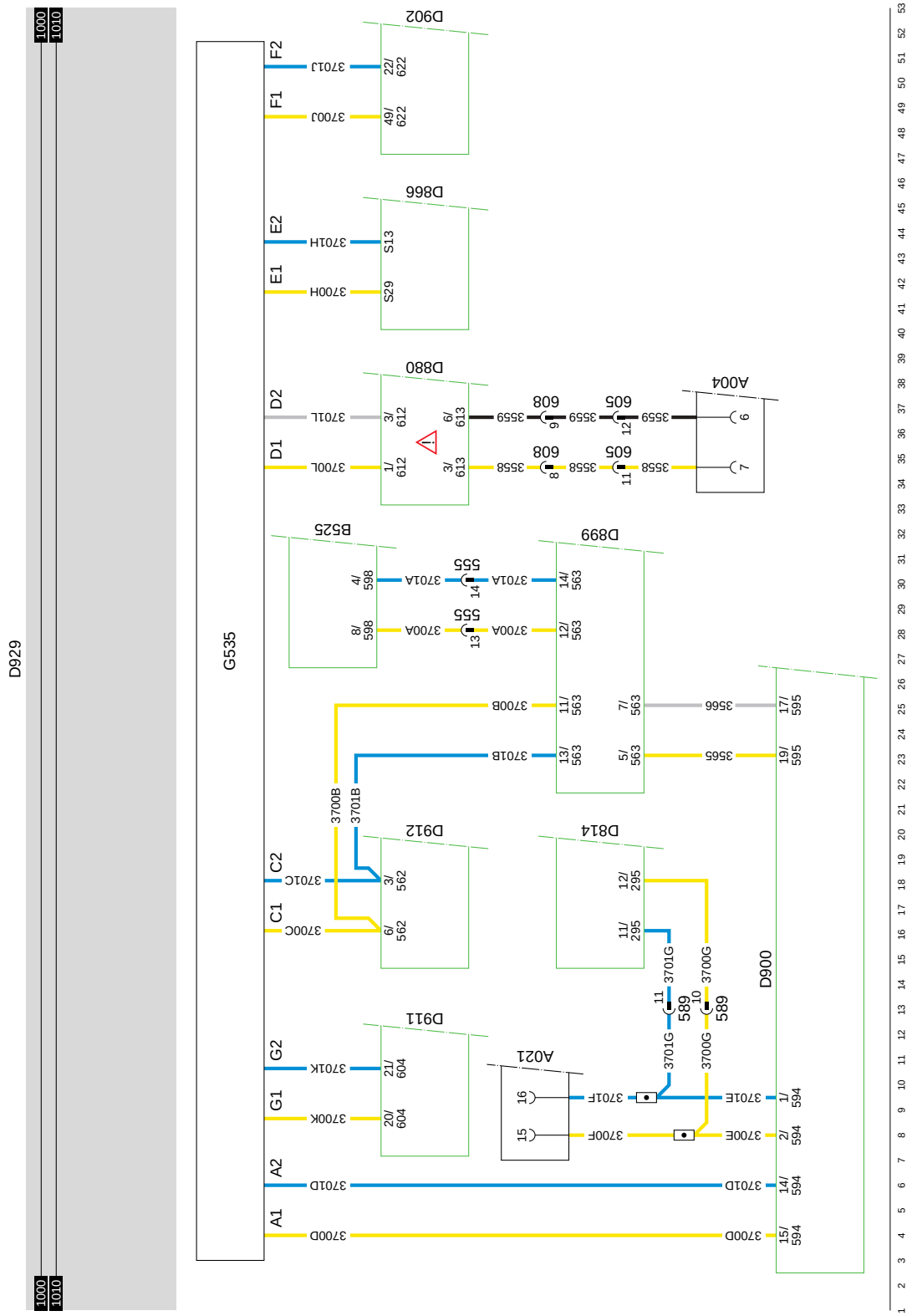

C **1358030/15** EL000486

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10

1 MAIN SWITCH

MAIN SWITCH FOR VLG/ADR

	Basic code	Description
	A500	Batteries
	A513	Integrated voltage regulator generator
	B525	Tachograph
	C853	Switch for main switch in cab
	C854	Switch for main switch on chassis
	D826	Electronic unit for VLG current limiter
	D900	CF 65/75/85 VIC electronic unit
	D924	Electronic unit, main switch
	E117	Fuse for visibility lighting
	E153	Fuse for engine stop main switch before main switch
	E286	High capacity fuse
	E330	'Sens' wire main switch fuse
	G367	Main switch power supply relay
	G425	Main switch relay

* If the vehicle has an Allison gearbox and the system must meet specific safety requirements, wire no. 1009 (Allison power supply) should be connected to connection 88a of relay G367.

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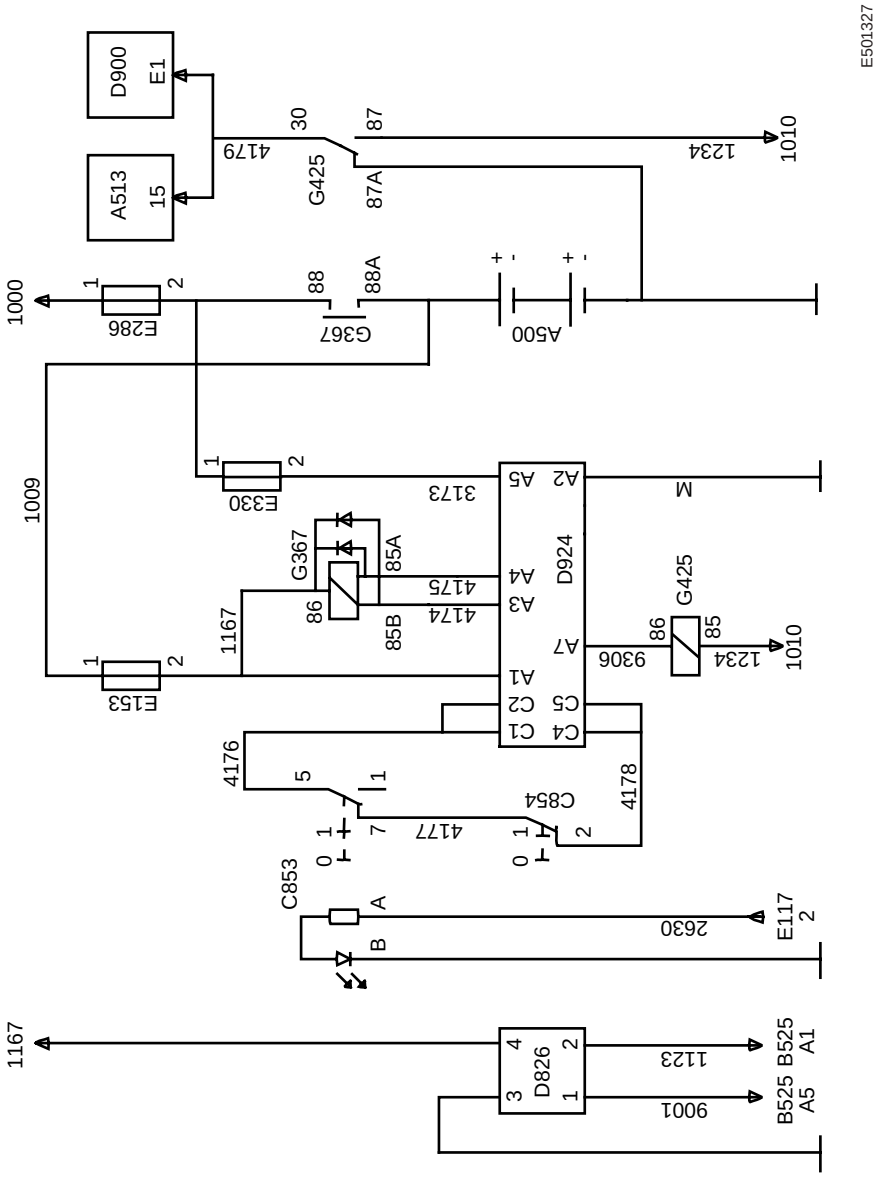
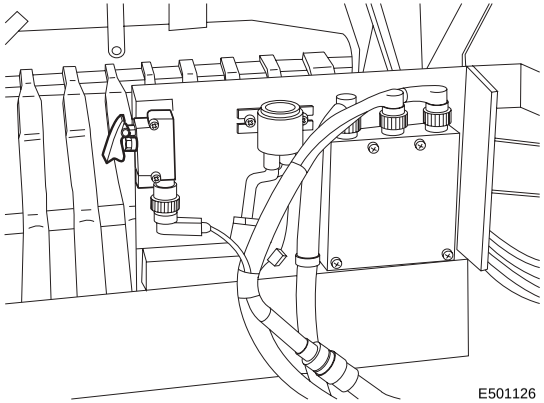

E501327
D900
E1
A513
15
4179
30
87
G425
87A
1234
1010
1000
E286
88
88A
G367
A500
1009
E330
3173
M
G367
85A
4175
4174
85B
86
1167
D924
A3
A4
A7
A1
C5
C2
C1
C4
G425
9306
E153
4176
4178
C854
4177
C853
A
B
2630
E117
1167
D826
1123
B525 A1
9001
B525 A5

10

The main switch (D924) can be closed:
- Electrically in the cab
- Electrically on the chassis

Closing the main switch electrically in the cab



ATTN: switch C854 must be in the “main switch on” position (connection between contacts 1 - 2).

Switch C853 (switch for main switch in cab) connects the C1 and C2 connections to the C4 and C5 connections via wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178. Relay G367 is immediately energised via wire 4174 and connection point A3 (A3 is connected to earth in the unit for 0.5 seconds). This connects point 88a to 88 of relay G367. The positive pole of the batteries is now connected to the vehicle’s power supply
Immediately after switch C853 closes, connection point C2 is internally connected to point A7.

Connection point A5 is connected to the positive pole via wire 3173 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Closing the main switch electrically on the chassis

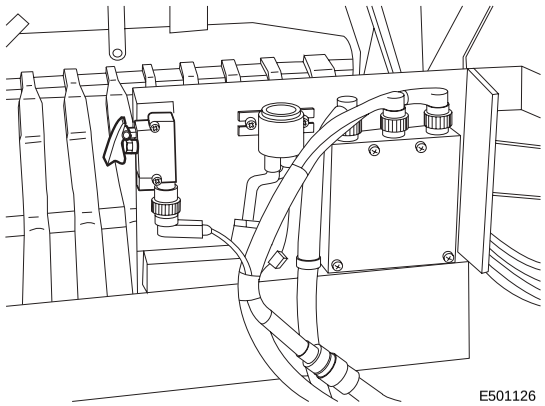
ATTN: switch C853 must be in the “main switch on” position (connection between contacts 5 - 7).

Switch C854 (switch for main switch on the chassis) connects the C1 and C2 connections to the C4 and C5 connections via wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178. Relay G367 is immediately energised via wire 4174 and connection point A3 (A3 is connected to earth in the unit for 0.5 seconds). This connects point 88a to 88 of relay G367. The positive pole of the batteries is now connected to the vehicle’s power supply
Immediately after switch C854 closes, connection point C2 is internally connected to point A7.

Connection point A5 is connected to the positive pole via wire 3173 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

The main switch (D924) can be opened:
- Electrically in the cab
- Electrically on the chassis

Opening the main switch electrically in the cab



ATTN: switch C854 must be in the “main switch on” position (connection between contacts 1 - 2).

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Switch C853 (switch for main switch in cab) disconnects the C1 and C2 connections from the C4 and C5 connections via wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Two actions are carried out immediately after switch C853 opens:

1. Connection point A7 is connected to earth (A2) in the unit.
2. After a delay of approx. 6 seconds, relay G367 is connected to earth in the unit for approx. 0.5 seconds via wire 4175 and connection point A4. This breaks the connection between point 88a and 88 of relay G367. The batteries are now disconnected from the vehicle's power supply.
   If the engine is running, it is switched off.

Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Opening the main switch electrically on the chassis

ATTN: switch C853 must be in the "main switch on" position (connection between contacts 5 - 7).

Switch C854 (switch for main switch in cab) breaks the connection from C1 and C2 to C4 and C5 via wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Two actions are carried out immediately after switch C854 opens:

1. Connection point A7 is connected to earth (A2) in the unit.
2. After a delay of approx. 6 seconds, relay G367 is connected to earth for approx. 0.5 seconds via wire 4175 and connection point A4. This breaks the connection between point 88a and 88 of relay G367. The batteries are now disconnected from the vehicle's power supply.
   If the engine is running, it is switched off.

Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Note:
When one of the switches (C853 or C854) that activate the electronic unit (close main switch) are operated, relay G367 is activated after approximately 3 seconds. If one of the switches is operated again within the 3 seconds, the electronic unit (D924) will select the priority 'main switch ON'.

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10

MAIN SWITCH FOR PETREG

If the vehicle has an Allison gearbox and the system must meet specific safety requirements, wire no. 1009 (Allison power supply) should be connected to connection 88a of relay G367.
The earth connection of D866 should be connected to connection 88 of relay G368.

Basic code	Description
A500	Batteries
A513	Integrated voltage regulator generator
B525	Tachograph
C010	Driver's side corner marker light
C011	Co-driver's side corner marker light
C853	Switch for main switch in cab
C854	Switch for main switch on chassis
D826	Electronic unit for VLG current limiter
D900	Electronic unit for VIC LF 65/5785
D924	Electronic unit, main switch
E045	Cab interior lighting fuse
E117	Fuse for visibility lighting
E153	Fuse for engine stop main switch before main switch
E286	High capacity fuse
E330	Main switch 'sens'-wire fuse
G367	Main switch power supply relay
G368	Main switch earth relay
G425	Main switch relay

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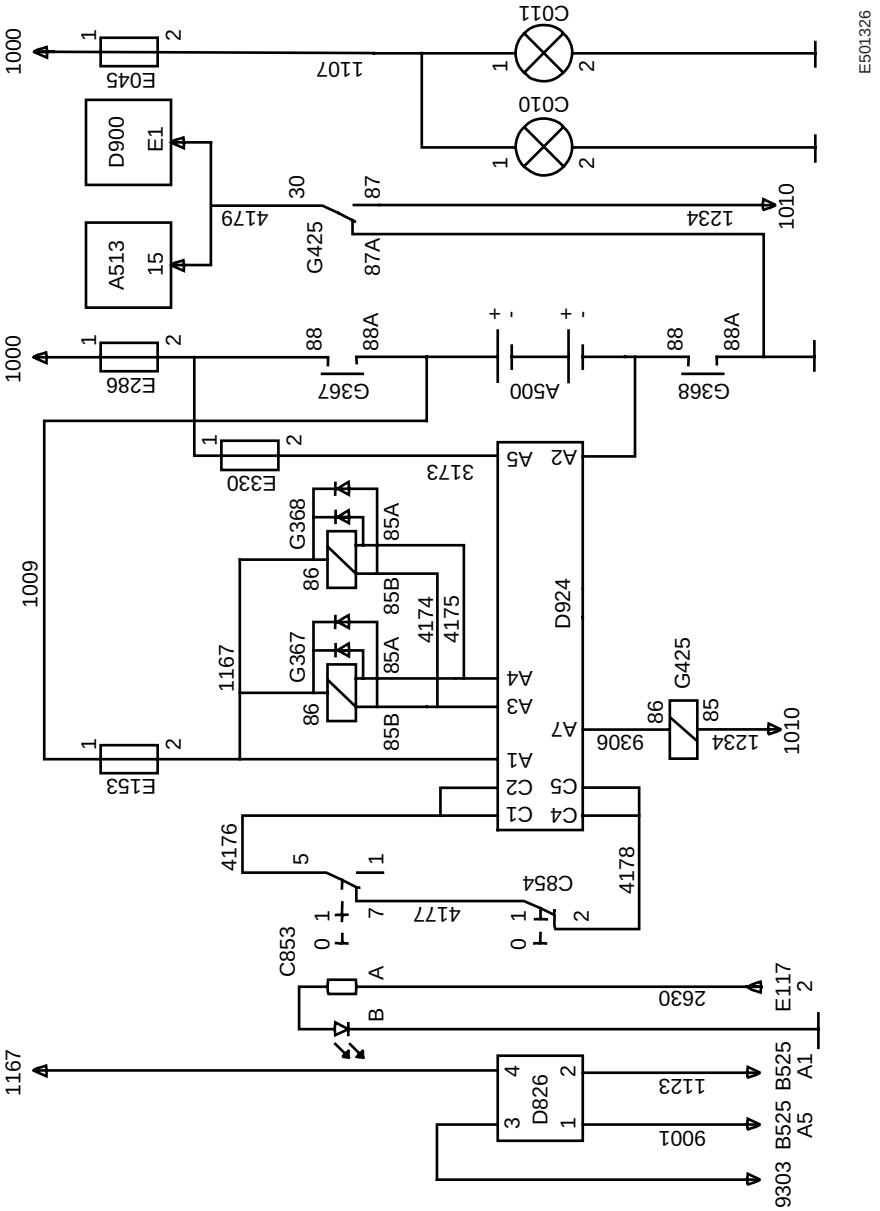
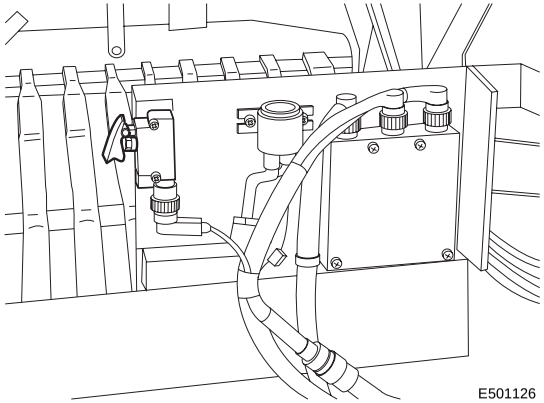

E501326
1000
E045
1107
C011
C010
D900
E1
A513
15
30
87
G425
87A
4179
1234
1010
E286
G367
G368
A500
G368
88
88A
E330
3173
A2
A5
D924
85A
85B
86
4174
4175
1167
1009
G367
G425
A4
A3
A7
A1
C5
C2
C4
C1
9306
E153
4176
4177
4178
C854
C853
E117
2630
A
B
1167
D826
1123
9001
B525 A1
B525 A5
9303

10

The main switch (D924) can be closed:
- Electrically in the cab
- Electrically on the chassis

Closing the main switch electrically in the cab



ATTN: switch C854 must be in the “main switch on” position (connection between contacts 1 - 2).

Switch C853 (switch for main switch in cab) connects the C1 and C2 connections to the C4 and C5 connections via wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178. Relays G367 and G368 are immediately energised via wire 4174 and connection point A3 (A3 is connected to earth for 0.5 seconds). This closes the connection between point 88a and 88 of both relay G367 and relay G368. The positive and negative poles of the batteries are now connected to the vehicle’s power supply

Immediately after switch C853 closes, connection point C2 is internally connected to point A7.

Connection point A5 is connected to the positive pole via wire 3173 after connection point 88 of relay G367.
This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Closing the main switch electrically on the chassis

ATTN: switch C853 must be in the “main switch on” position (connection between contacts 5 - 7).

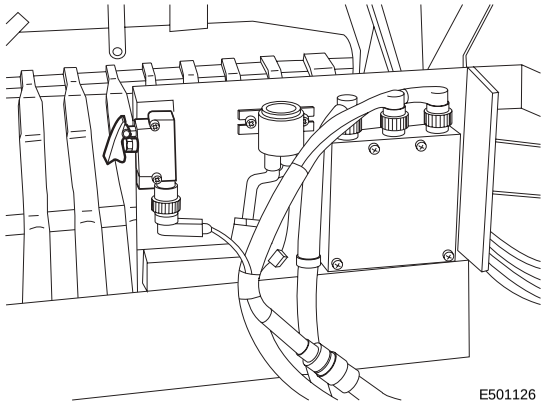
Switch C854 (switch for main switch on the chassis) connects the C1 connection to the C4 and C5 connections via wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178. Relays G367 and G368 are immediately energised via wire 4174 and connection point A3 (A3 is connected to earth for 0.5 seconds). This closes the connection between point 88a and 88 of both relay G367 and relay G368. The positive and negative poles of the batteries are now connected to the vehicle’s power supply

Immediately after switch C854 closes, connection point C2 is internally connected to point A7.

Connection point A5 is connected to the positive pole via wire 3173 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

The main switch (D924) can be opened:
- Electrically in the cab
- Electrically on the chassis

Opening the main switch electrically in the cab



ATTN: switch C854 must be in the “main switch on” position (connection between contacts 1 - 2).

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Switch C853 (switch for main switch in cab) disconnects wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and the C1 and C2 connections from the C4 and C5 connections via wire 4178.

Two actions are carried out immediately after switch C853 is opened:
1. Connection point A7 is connected to earth (A2).
2. After a delay of approx. 6 seconds, relay G367 and G368 are connected to earth for approx. 0.5 seconds via wire 4175 and connection point A4. This breaks the connection between point 88a and 88 of relay G367 and G368. The positive and negative poles of the batteries are now disconnected from the vehicle's power supply
   If the engine is running, it is switched off.

Connection point A5 is connected to the positive pole via wire 3173 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Opening the main switch electrically on the chassis

ATTN: switch C853 must be in the "main switch on" position (connection between contacts 5 - 7).

Switch C854 (switch for main switch in cab) breaks the connection from C1 and C2 to C4 and C5 via wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.

Two actions are carried out immediately after switch C854 is opened:
1. Connection point A7 is connected to earth (A2) in the unit.
2. After a delay of approx. 6 seconds, relay G367 and G368 are connected to earth for approx. 0.5 seconds via wire 4175 and connection point A4. This breaks the connection between point 88a and 88 of relay G367 and G368. The positive and negative poles of the batteries are now disconnected from the vehicle's power supply
   If the engine is running, it is switched off.

Connection point A5 is connected to the positive pole via wire 3173 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Note:
When one of the switches (C853 or C854) that activate the electronic unit (close main switch) are operated, relay G367 and G368 are activated after approximately 3 seconds. If one of the switches is operated again within the 3 seconds, the electronic unit (D924) will select the priority 'main switch ON'.

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10

VARIANTS

Location

24 Only if the vehicle has been fitted out to meet PETREG specifications.

31 Connect wire 1234 to dashboard wiring harness in central box (see illustration).

34 Connect wire 4179 to dashboard wiring harness in central box (see illustration).

39 Attach wire 4176 to pin 11 of connector 570.

41 Attach wire 4177 to pin 12 of connector 570.

44 Attach wire 1123 to pin 2 instead of wire 1127. Isolate wire 1127.

47 Attach wire 9303 to pin 20 instead of wire 9001. Isolate wire 9001.

50 Only if the vehicle has been fitted out to meet PETREG specifications.

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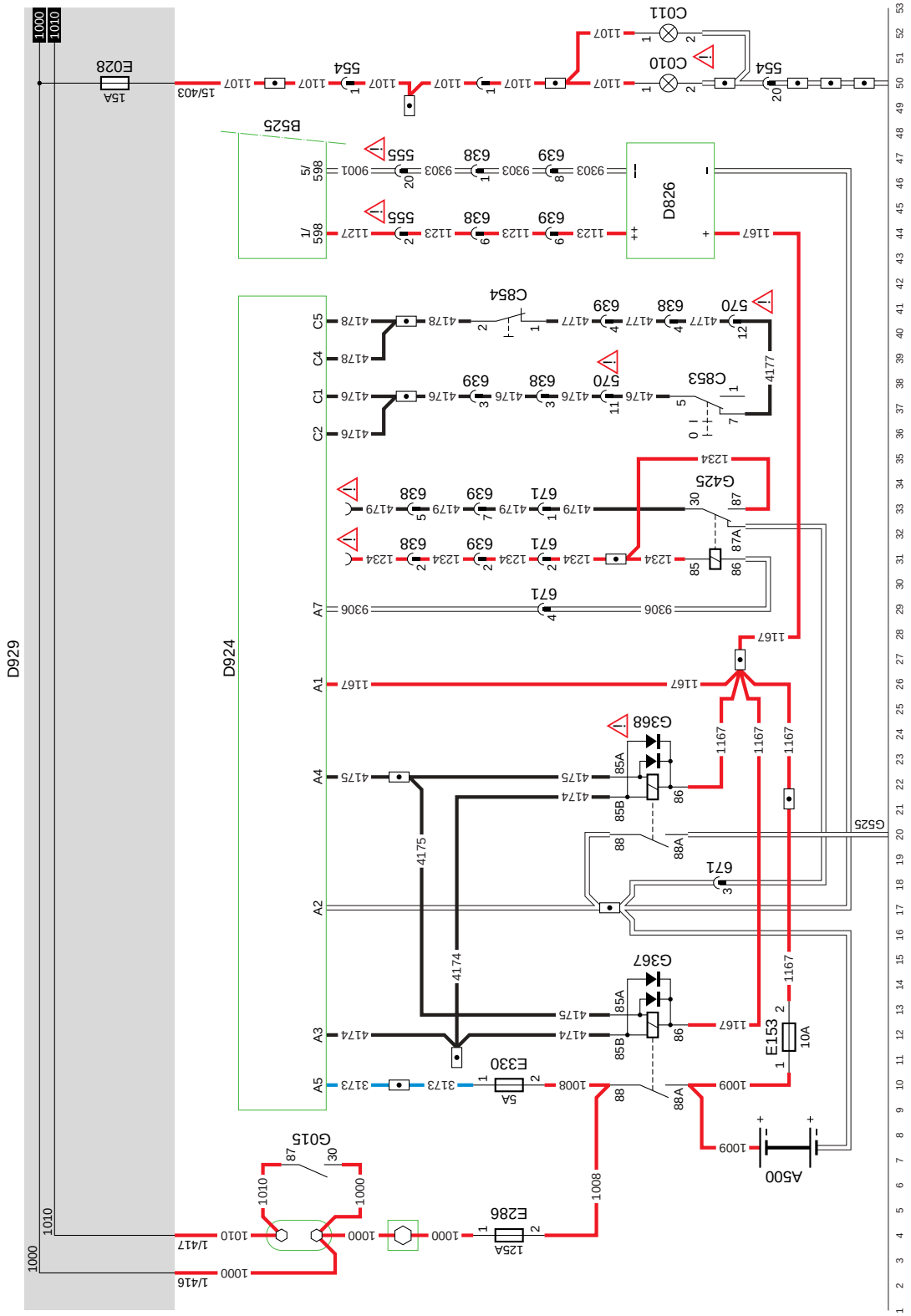
D929
D924
D826
B525
C011
C010
E028
15A
554
555
570
C854
C853
G425
G368
G367
G525
E330
E153
10A
5A
E286
125A
G015
A500
1000
1010
1167
4175
4174
1008
1009
EL000487

1 **1358030/15**

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2 IGNITION/STARTER SWITCH/CHARGING CIRCUIT

IGNITION CIRCUIT
If ignition/starter switch C539 is turned (contact 1 is connected to pin 6), the “accessories” relay (G178) will be activated. Voltage is now applied through fuse E037, switch C539 and wire 1130 to contact 85 of relay G178. As a result of the activation of relay G178 a connection is made between contacts 30 and 87 and a voltage is applied through fuse E052 and wire 1110 to the work lamp switch (C725) and the microrelay (G377) for the accessories power supply to the radio.

STARTER CIRCUIT
If the ignition switch C539 is turned (contact 1 is connected to 4), contact relay G015 will be activated via wire 4001.
When the ignition switch is turned to the “start” position, points 1 and 2 in this switch are connected. The power is now supplied from the batteries through fuse E037, the connection 1-2 of the ignition/starter switch and wire 4004 on connection point 3 of the alarm system.
When the alarm system has been switched off using the remote control, or by turning on the ignition (the immobiliser switches the alarm off via CAN), wire 4004 is connected to 4004A. Relay G203 coil will be activated.
This closes the 30 - 87 connection. A voltage is now applied to connection point 50 of the starter motor through fuse E037, wire 1100, relay contacts 30 - 87 and wire 4002 so that the starter motor starts running.
When the alarm has been switched off and the door has opened, the start interrupter will be deactivated for 60 seconds. If the engine is not started within this time, the start interrupter is reactivated. If the alarm is switched off and the doors are not opened, the start interrupter remains deactivated for 9 minutes.

When the immobiliser applies a voltage to wire 4009, the cab heater is also switched off if the vehicle must meet requirements for the transportation of hazardous substances.

CHARGING CIRCUIT
When the ignition is switched on, power is supplied to both the B+ connection and connection 15 of the alternator.
An internal resistor in the alternator is energised by an IC in the carbon brush holder. This resistor ensures that a low level of current passes through the energising resistor. This excites a magnetic field in the alternator.
After starting, the voltage on terminals B+ and 15 will rise to about 28.5 V. Once this voltage is reached, the IC in the regulator interrupts the pre-exciter coil to enable the voltage to be controlled. The magnetic field will now disappear, so that the generator will not be energised for a short period of time. As a result, the voltage on outputs B+ and B15 will drop.

The regulator reactivates when the voltage drops below 27.6 V. This means that the generator voltage supply remains relatively constant. The batteries are supplied through the B+ generator output.

The alternator charging current warning light is activated via wire 1020 that is connected to the VIC. (D900). The VIC controls the DIP via the CAN network. The voltage on wire 1020 is supplied by the control IC.

The alternator also has a ’sens’ line. This connection continuously measures the voltage on connection point 30 of the starter motor. If the voltage on connection point 30 drops, the voltage is immediately corrected by the control IC. The alternator will increase the voltage until a value of 28.5 V is reached again.

VARIANTS

Location
42 If there is no alarm system, wire 4004 and 4004A are connected in connector 603.

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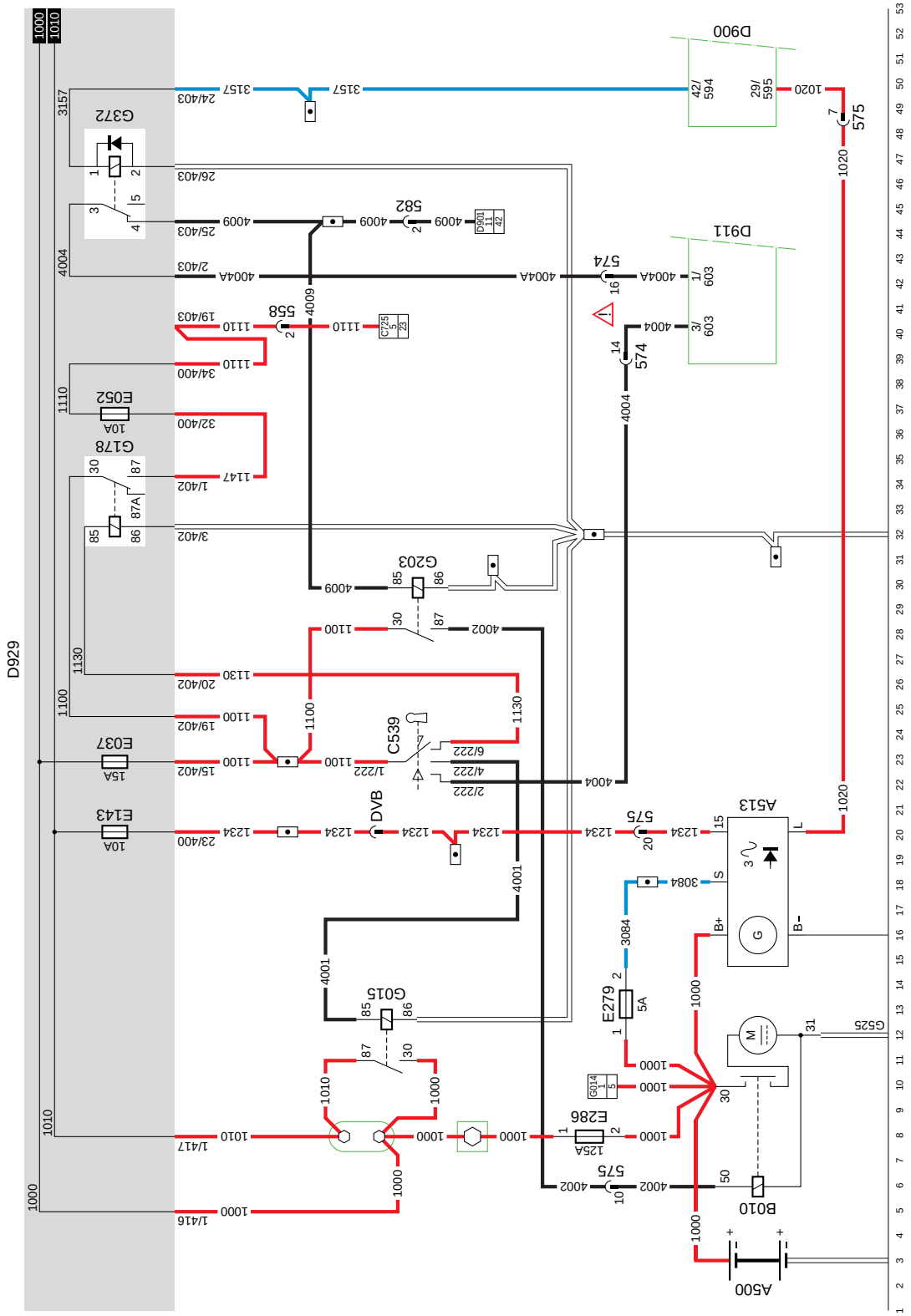

2 **1358030/15** EL000489

10

3 TACHOGRAPH

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
17 If the vehicle has ECAS-2, this is connector: 445
If the vehicle has ECAS-3, this is connector: 373

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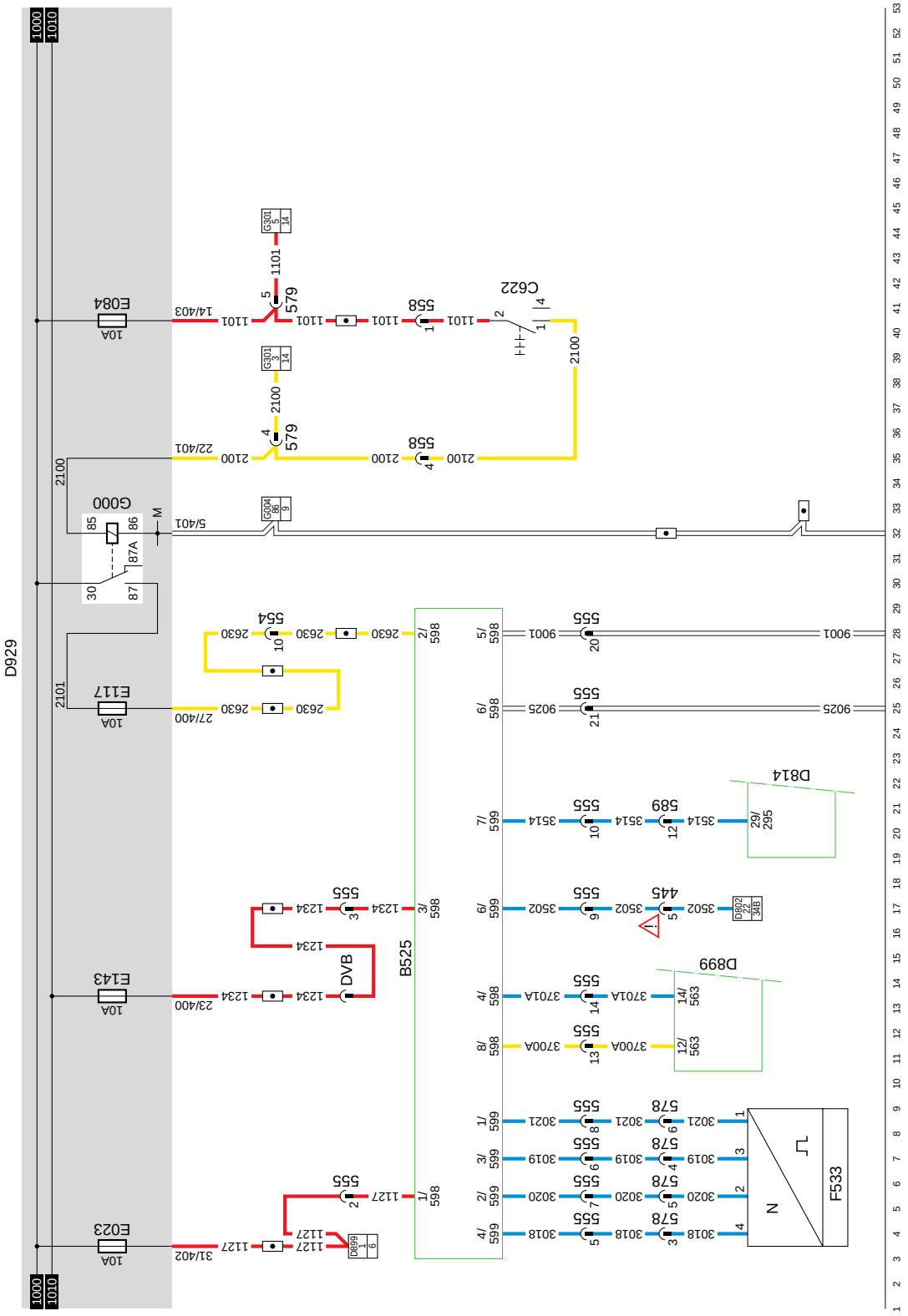

3 **1358030/15** EL000490

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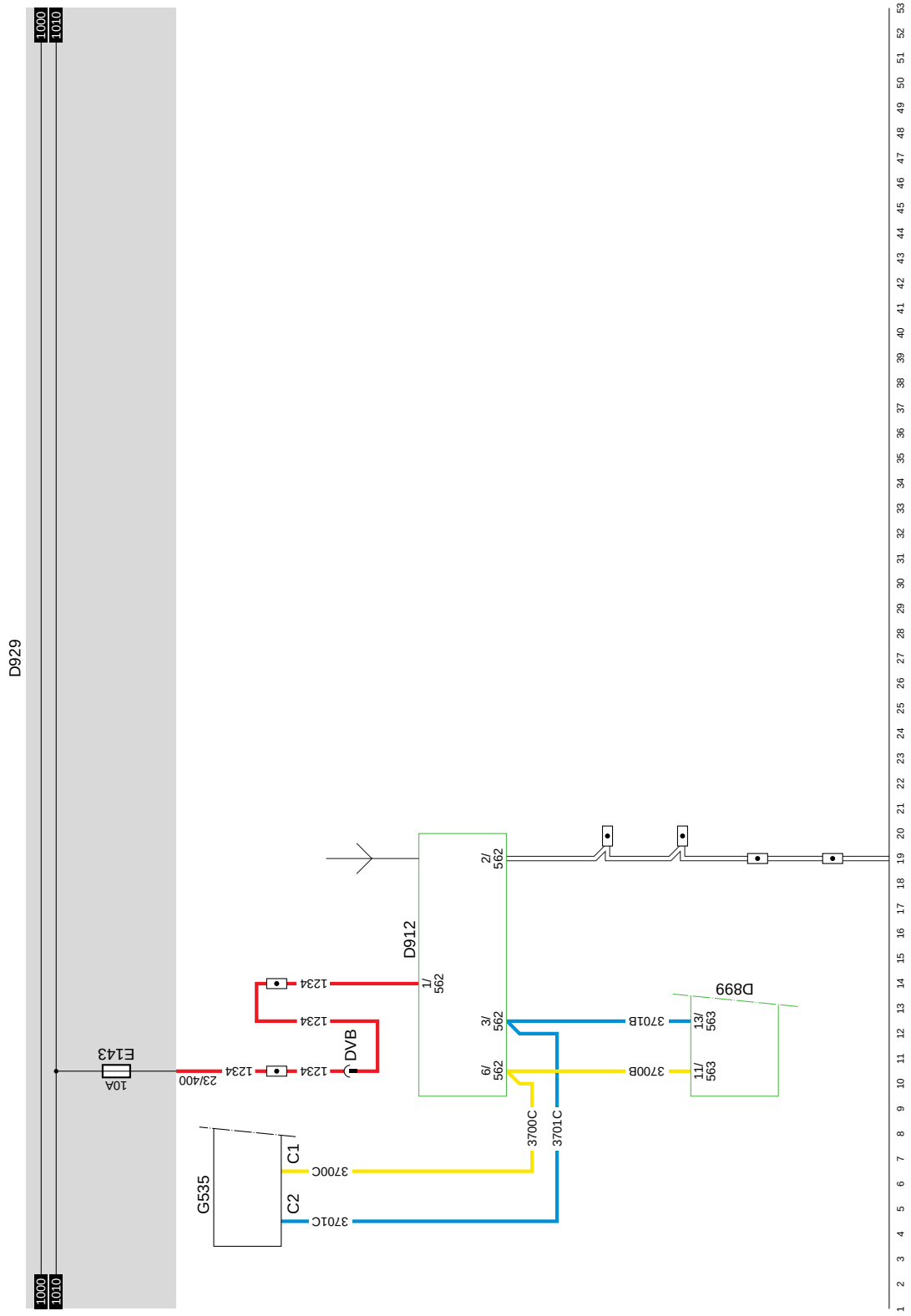
4 IMMOBILISER
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

https://www.truck-manuals.net/



4 **1358030/15** EL000491

10

5 PREGLOWING

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location	
37	If there is no preglowing system: the wires are attached to a 'dummy'-relay.
41	For vehicles with ECS-DC3: D903 (ECS-DC3 electronic unit)

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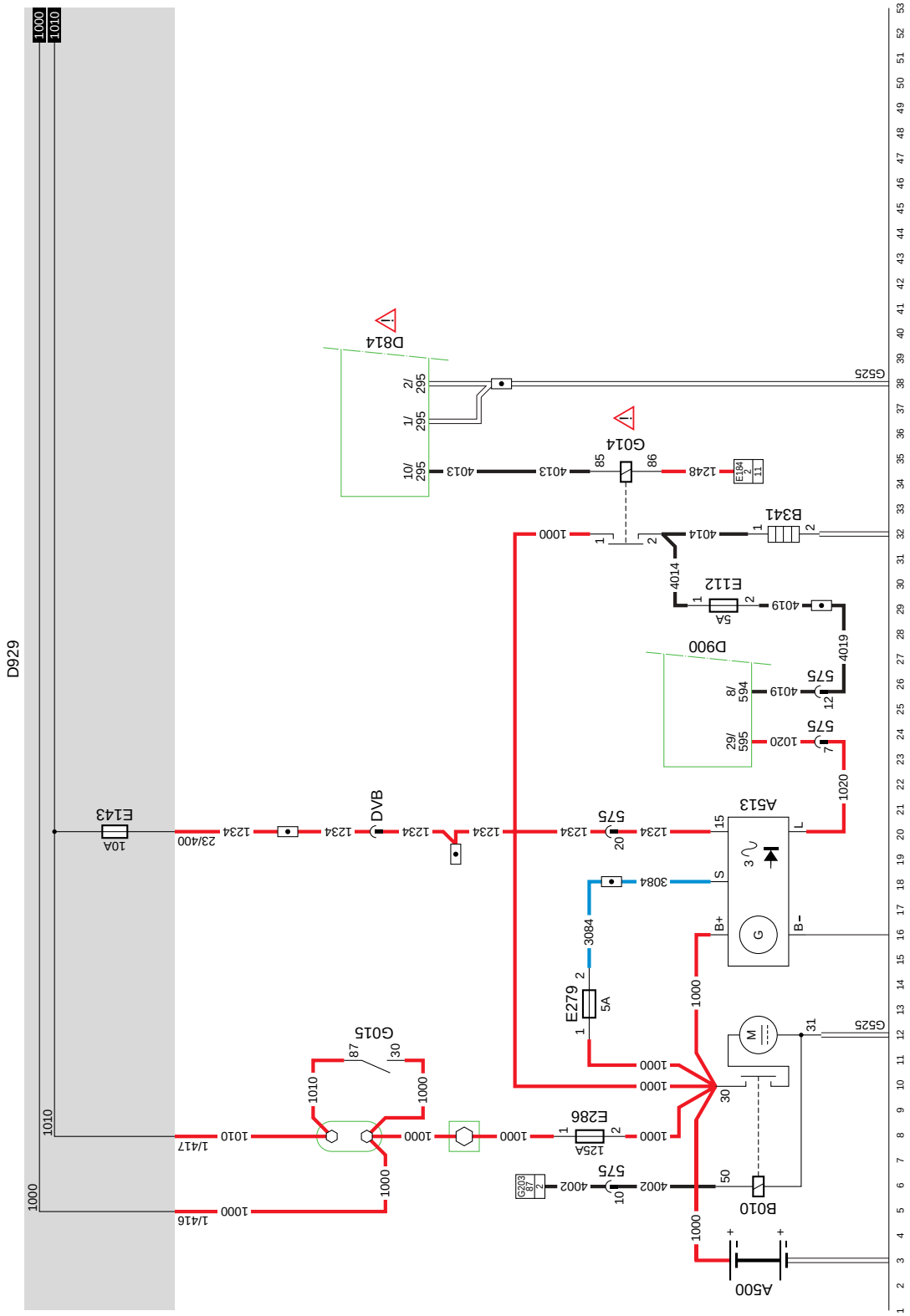
D929
1000
1010
D814
G525
G014
B341
E112
D900
575
A513
E143
DVB
G015
E279
E286
B010
A500
1358030/15
EL000492

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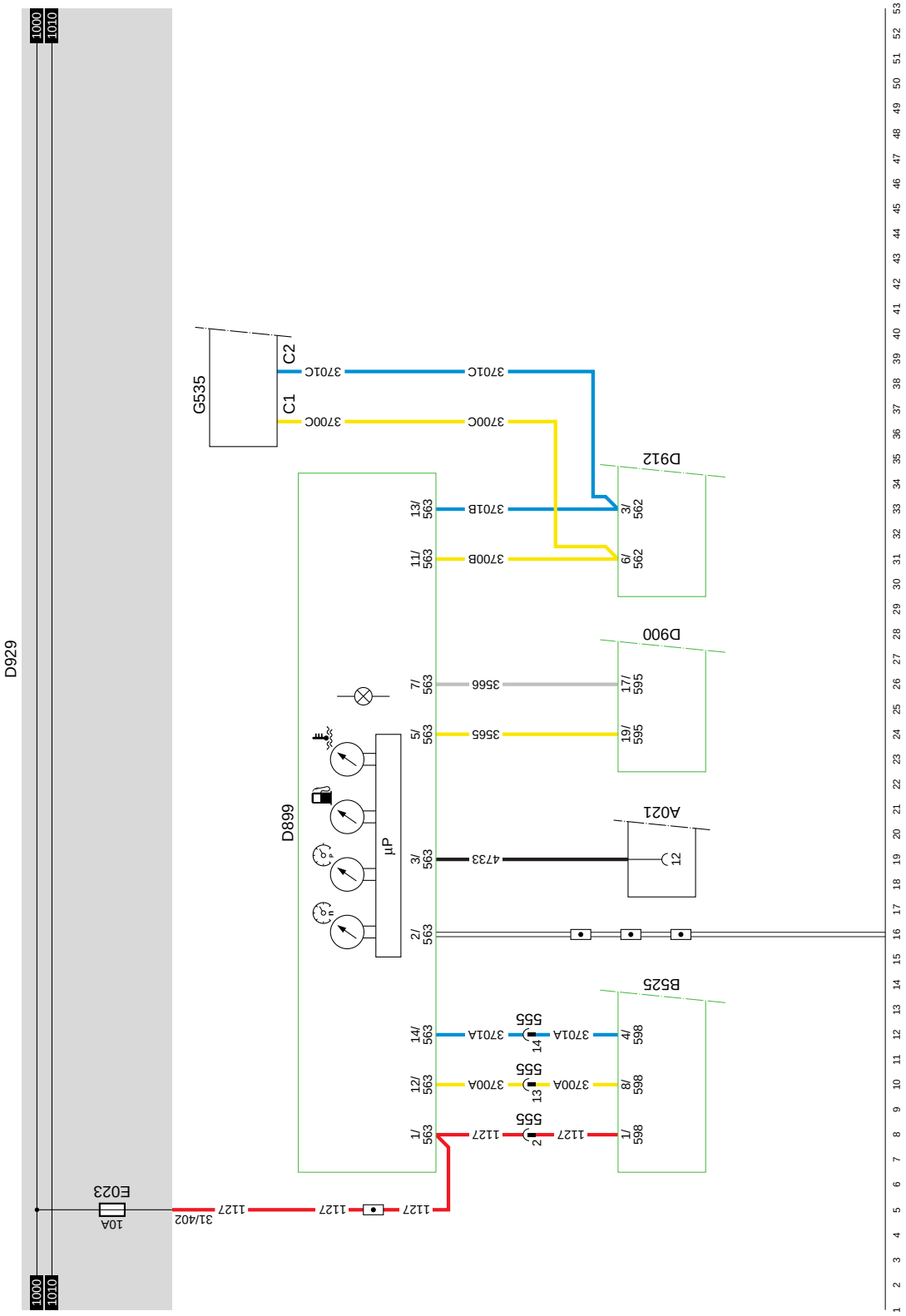
6 DIP-4
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

https://www.truck-manuals.net/



6 **1358030/15** EL000493

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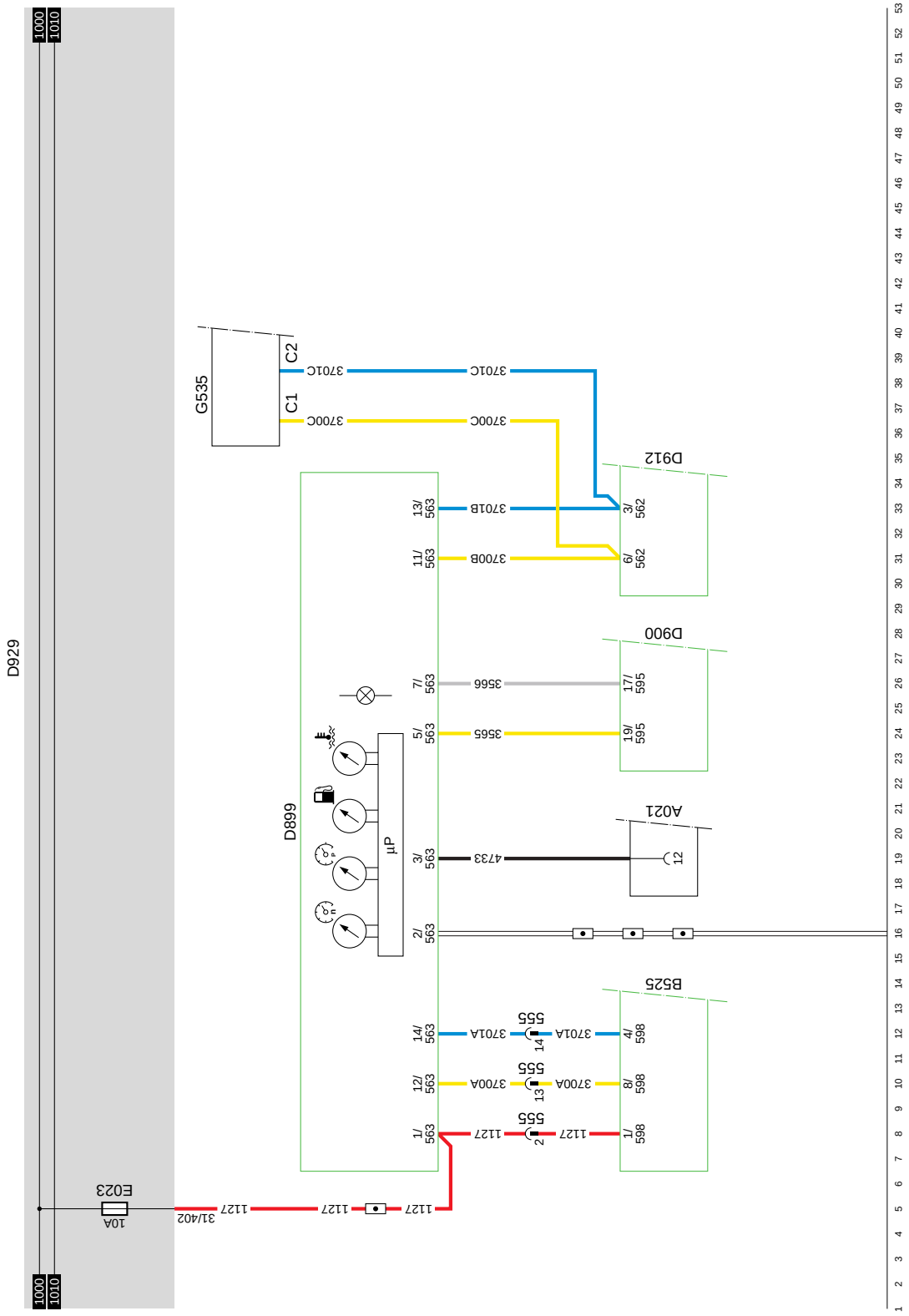

6 **1358030/15** EL000493

10

7 DIRECTION INDICATORS AND WARNING LIGHTS

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

3, 8 Connector 617 is only used for an FA type vehicle.

8 Depends on whether the vehicle has a 7-pin or 15-pin socket. See sub-diagram 47.

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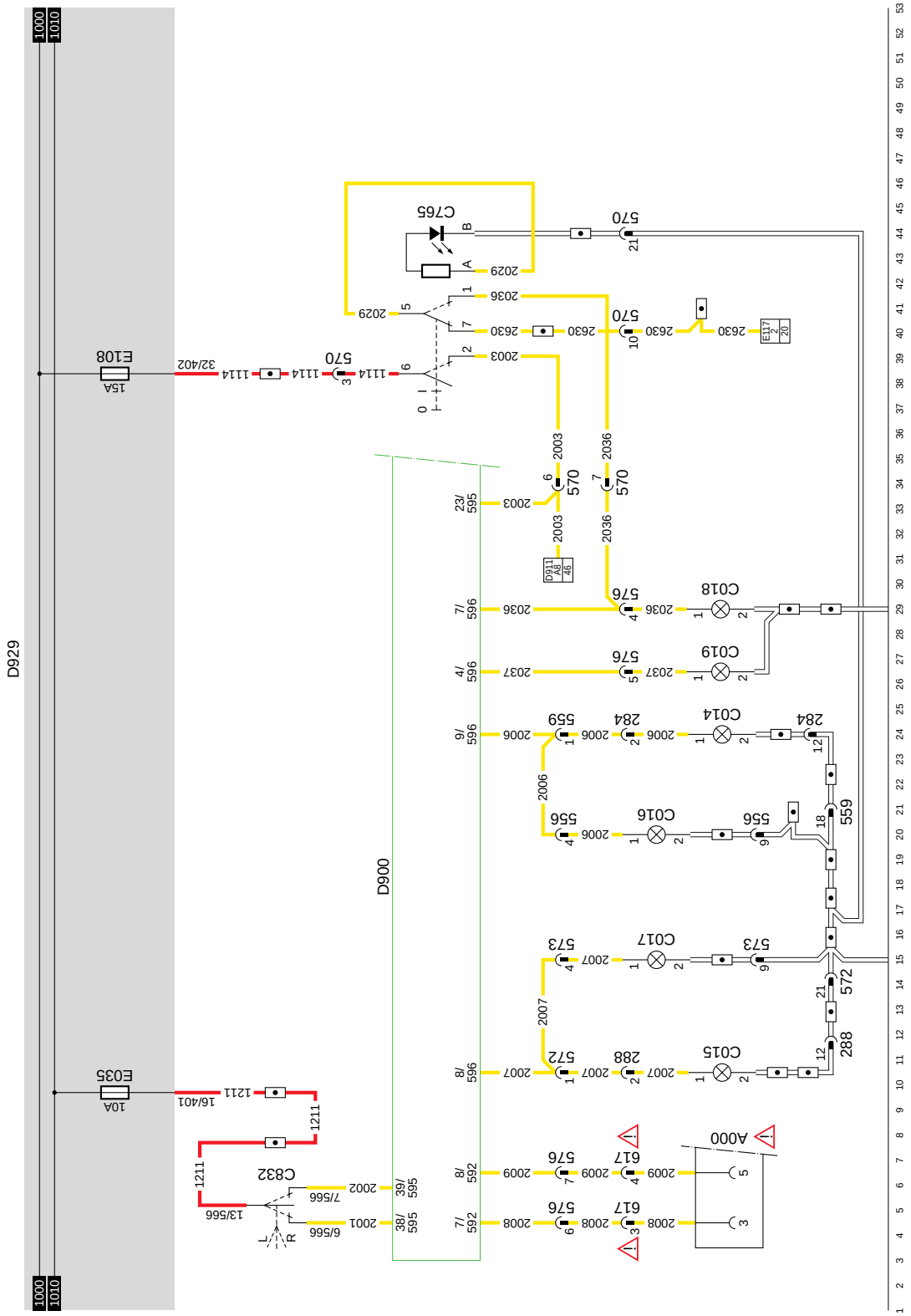

7 **1358030/15** EL000494

10

8 VIC

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

21 Wire 4179, only if PTO 1 has been connected.

182 For vehicles with ABS/ASR-D-connector 584.
For vehicles with EBS-connector 585.

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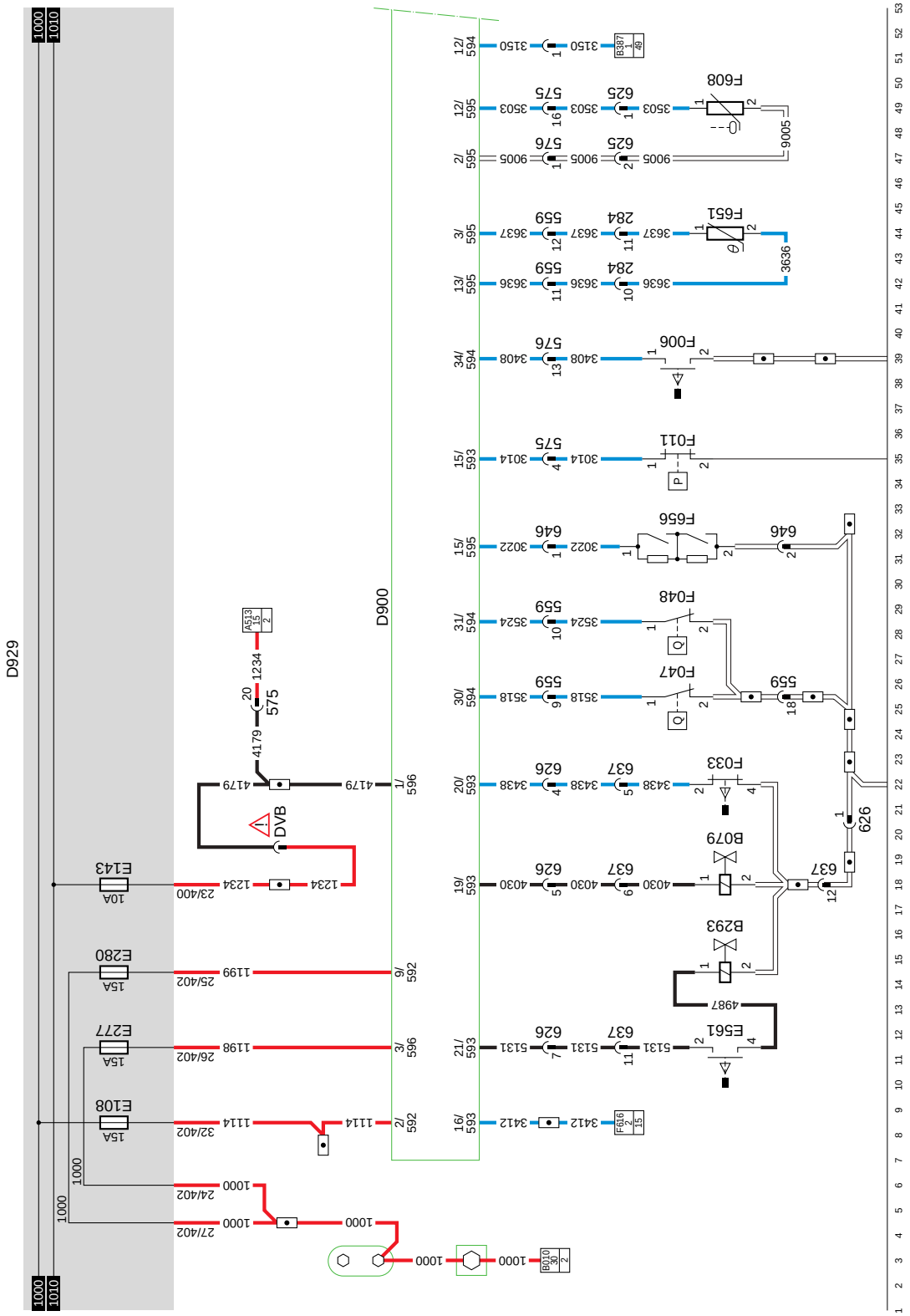
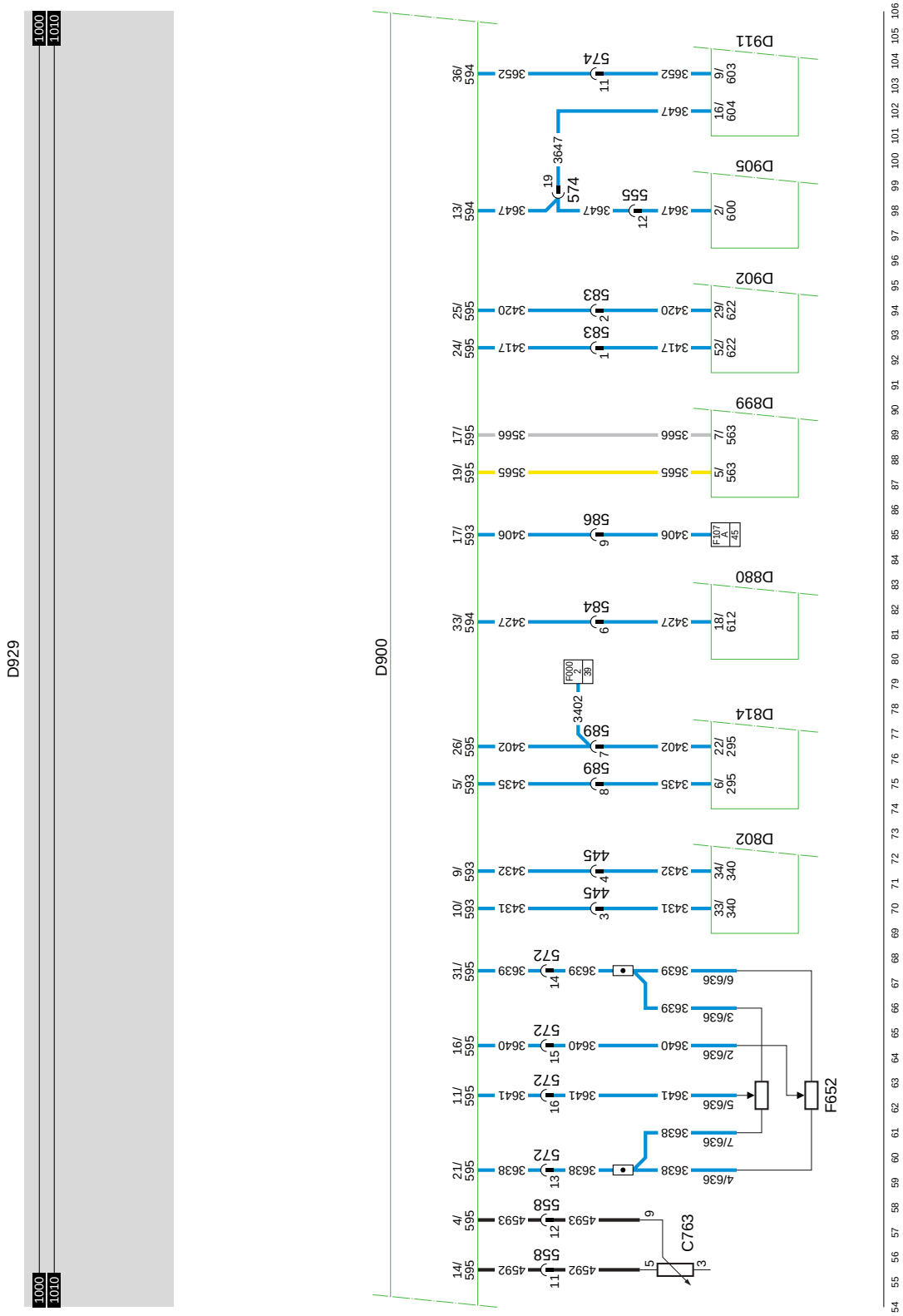


8 **1358030/15** EL000495



8 **1358030/15** EL000496

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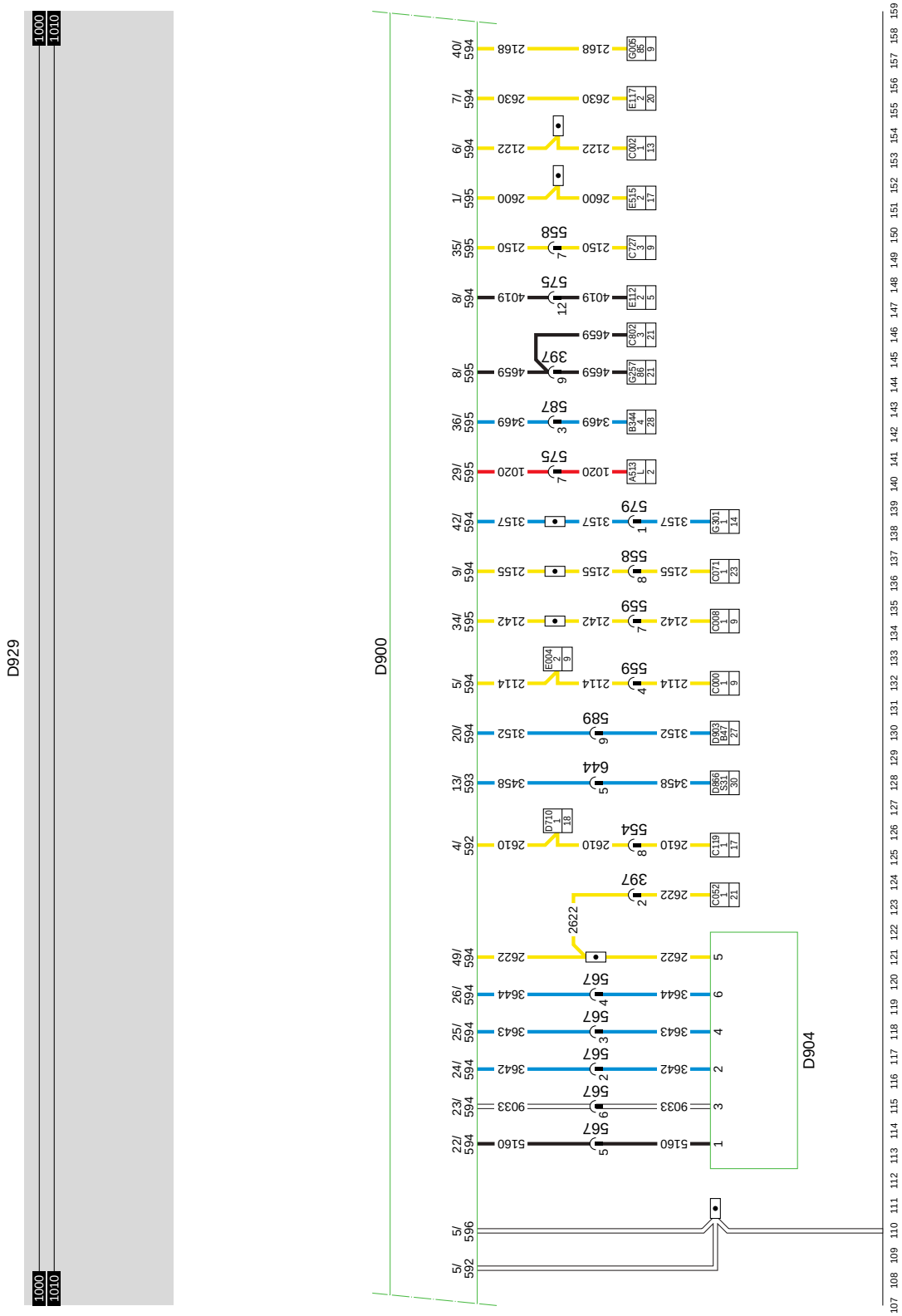
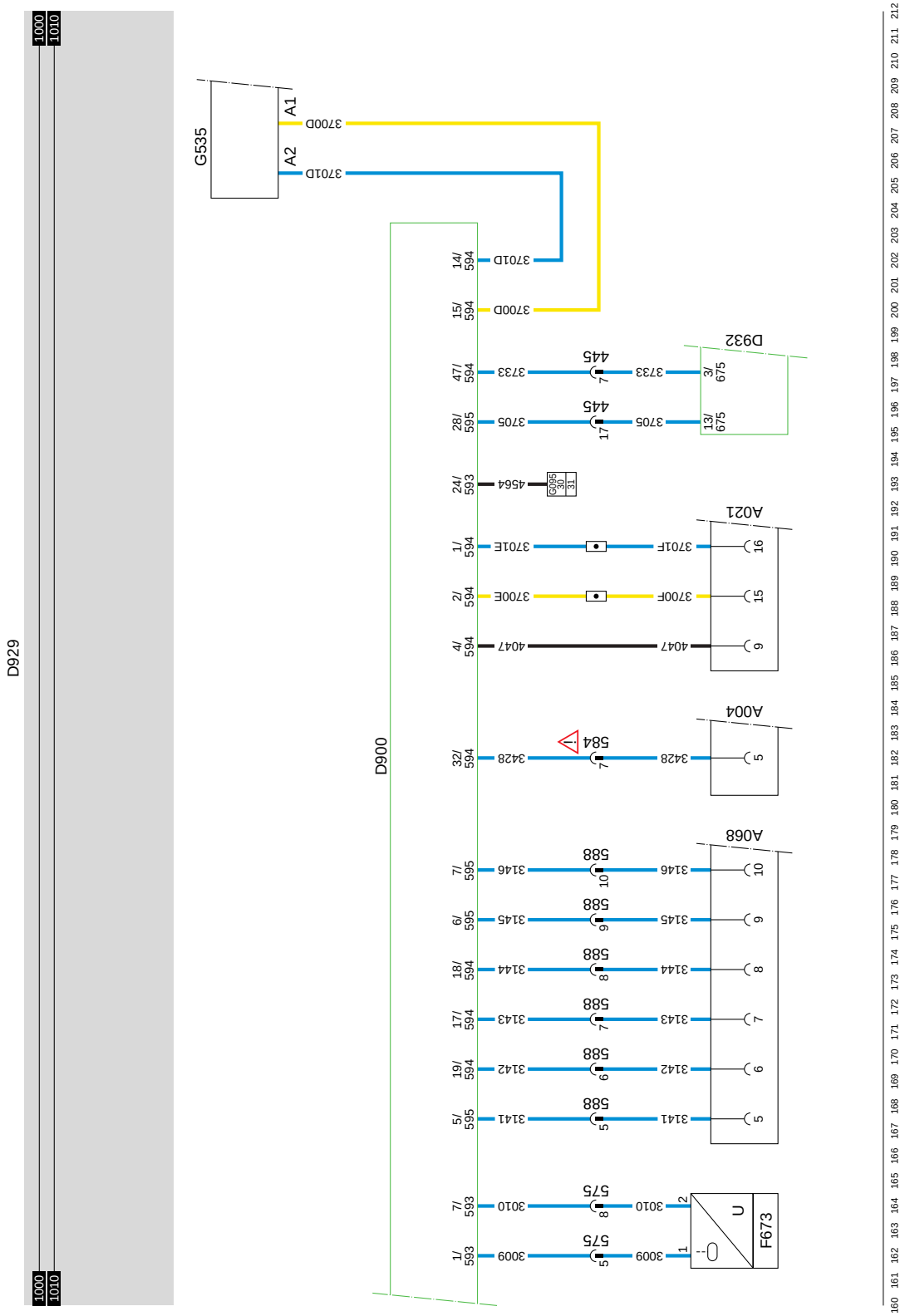


8 **1358030/15** EL000497



8 **1358030/15** EL000498

10

9 MARKER AND PARKING LIGHTS FA

Switching the lighting switch (C622) to the first (1st) position (connection between contacts 2 and 1) energises the tail light/side-light relay (G000) via fuse E084, wire 1101, contacts 2 - 1 of switch C622 and wire 2100.
A voltage is applied to the left and right lights respectively through the G000 relay contacts (30 - 87) and fuses E000 and E001.

Linked to fuse E000 are: C010, C012, C156, C158, C074 and C022. There is also a connection in connector A000 (pin 2) and connector A070 (pin 2).

Linked to fuse E001 are: C011, C013, C157, C159, C075 and C023. There is also a connection in connector A000 (pin 6) and connector A070 (pin 3).

VARIANTS

Location
45 This may be a 7-pin or 15-pin connector. For more information see sub-diagram 47.

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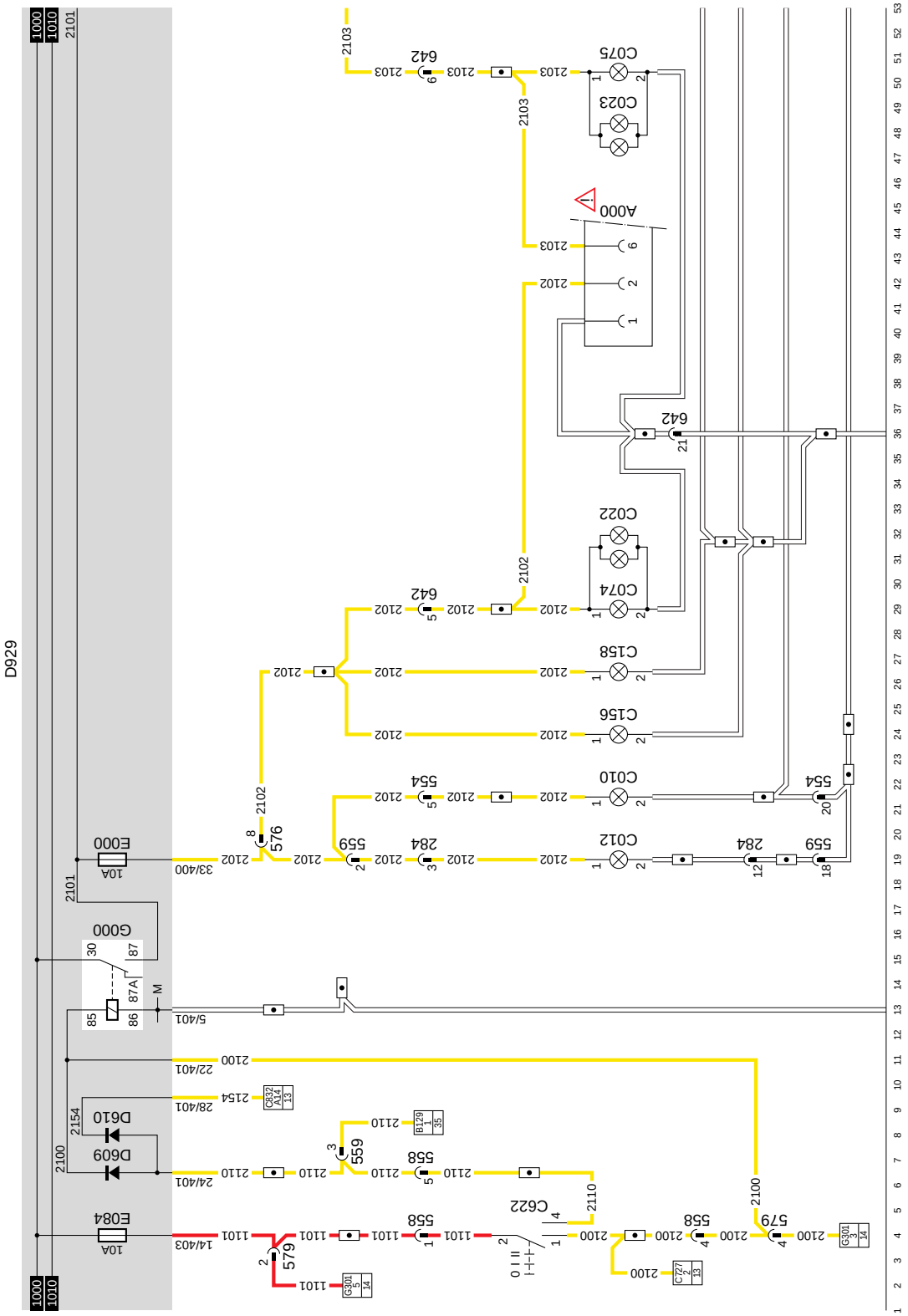
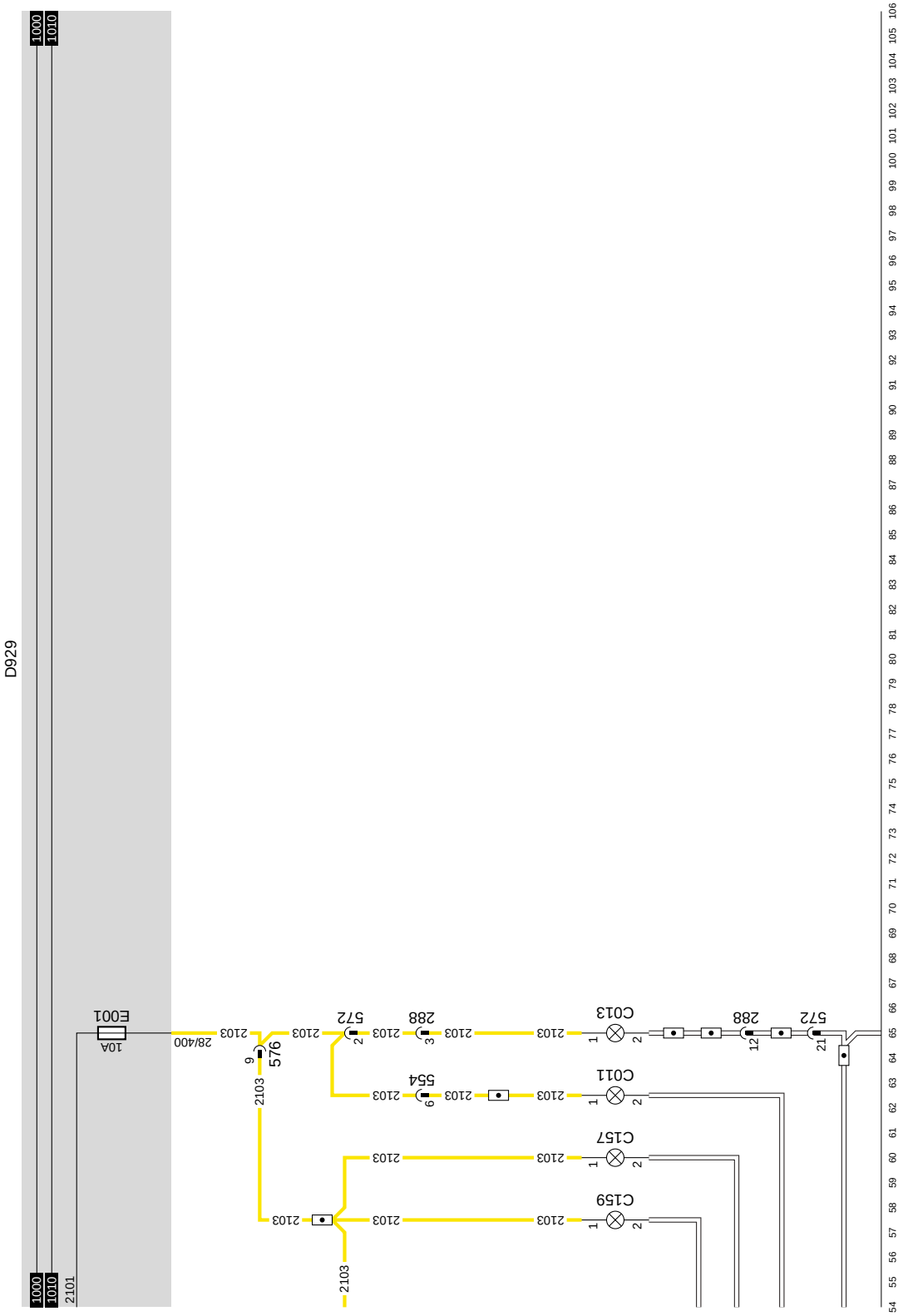


9 **1358030/15** EL000499



9 **1358030/15**

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10

10 MARKER AND PARKING LIGHTS FT

Switching the lighting switch (C622) to the first (1st) position (connection between contacts 2 and 1) energises the tail light/side-light relay (G000) via fuse E084, wire 1101, contacts 2 - 1 of switch C622 and wire 2100.
A voltage is applied to the left and right lights respectively through the G000 relay contacts (30 - 87) and fuses E000 and E001.

Linked to fuse E000 are: C010, C012, C158, C074 and C154. There is also a connection in connector A002 (pin 2).

Linked to fuse E001 are: C011, C013, C159, C075 and C155. There is also a connection in connector A002 (pin 6).

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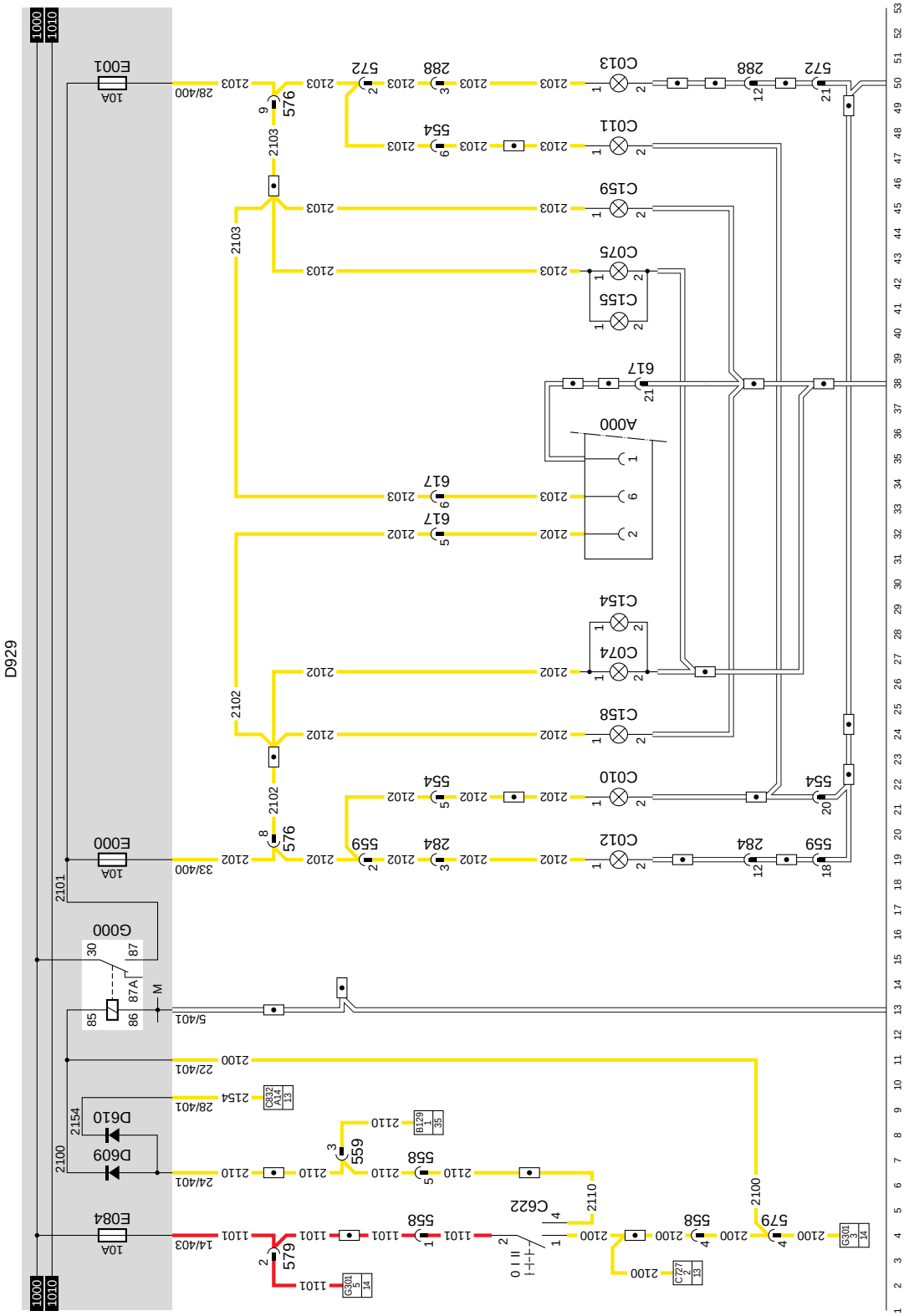

10 **1358030/15** EL000501

10

11 UPEC

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location	
5, 20	If there is no preglowing system: the wires are attached to a 'dummy'-relay.
38	Wire 4681 does not go any further than connector 589. This wire does **NOT** have a function.

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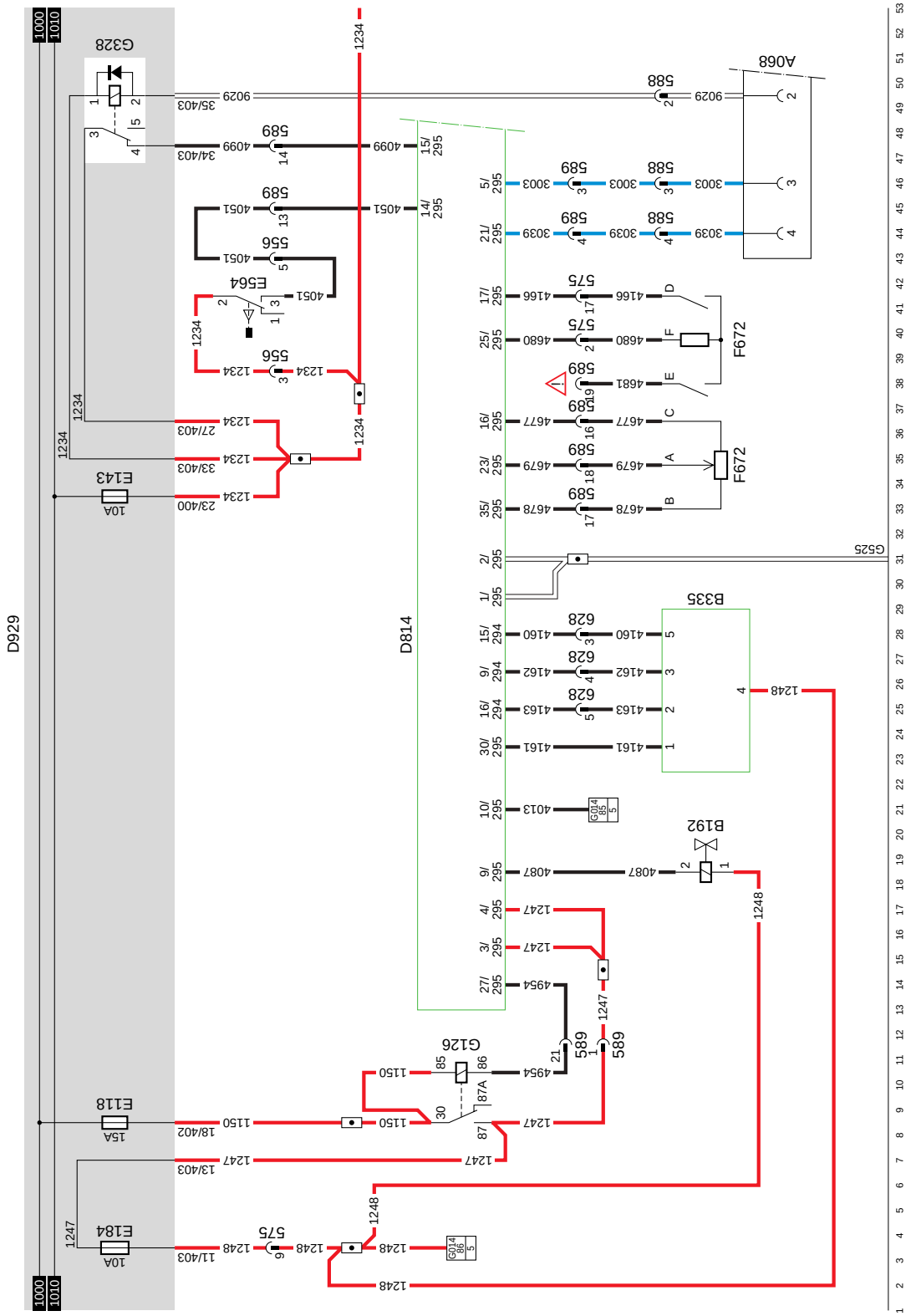
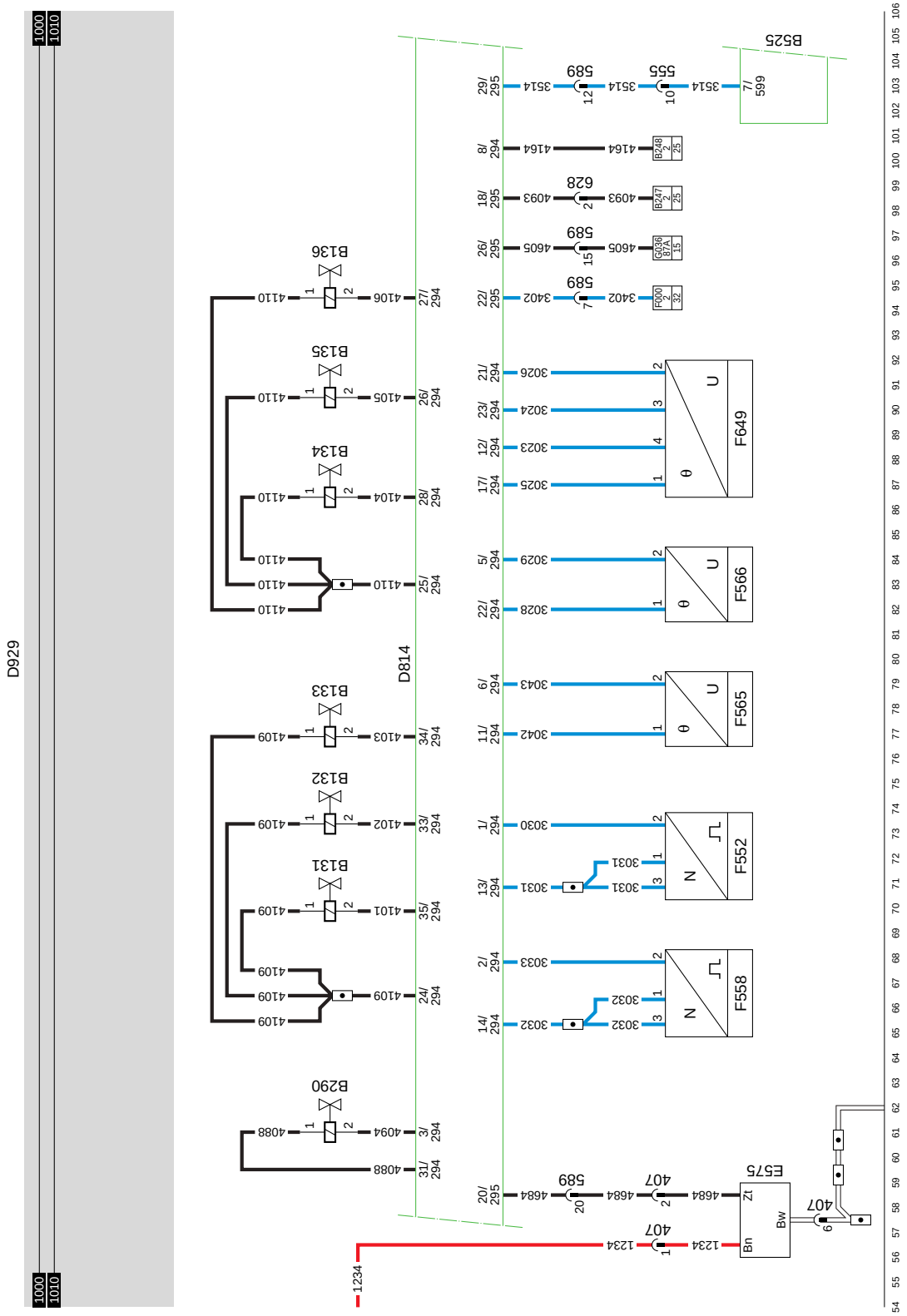


11 **1358030/15** EL000502



11 **1358030/15** EL000503

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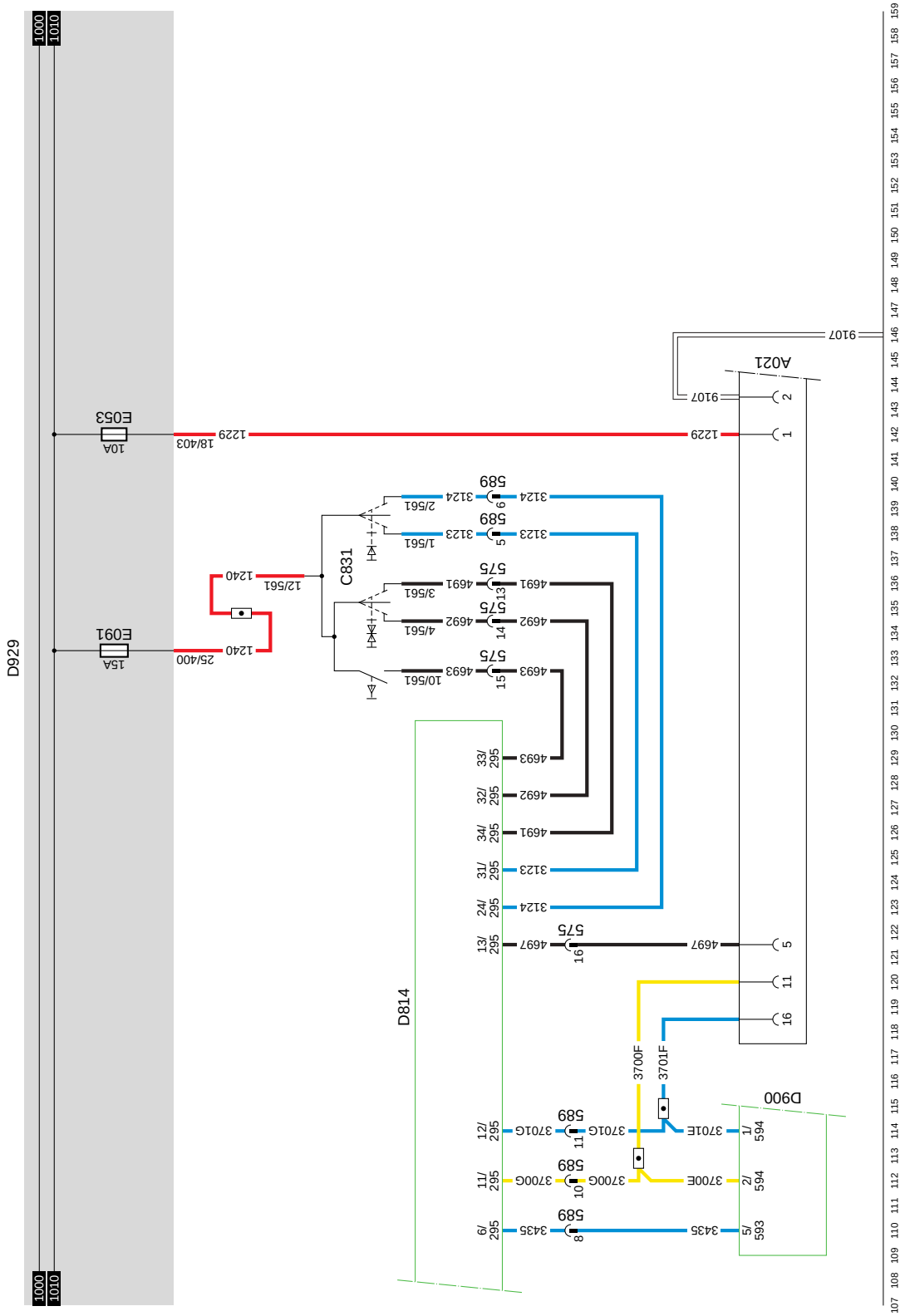

11 **1358030/15** EL000504

10

12 REVERSING LIGHTS

When contact has been made, power is supplied to the operating switch of the reversing lights (E501) via E016 and wire 1217.
This switch is mounted in the gearbox. The contacts are closed when the gearbox is in the “reverse” position.
The voltage is then applied to the reversing lights (C026) and (C027), reversing buzzer (B176) and to the trailer connector (A001or A070) via wire 4591.
The above description applies to the FA model.

VARIANTS

Location

21 Connector 642 if FA type vehicle.
29 Depends on whether the vehicle has a 7-pin or 15-pin socket. See sub-diagram 47.

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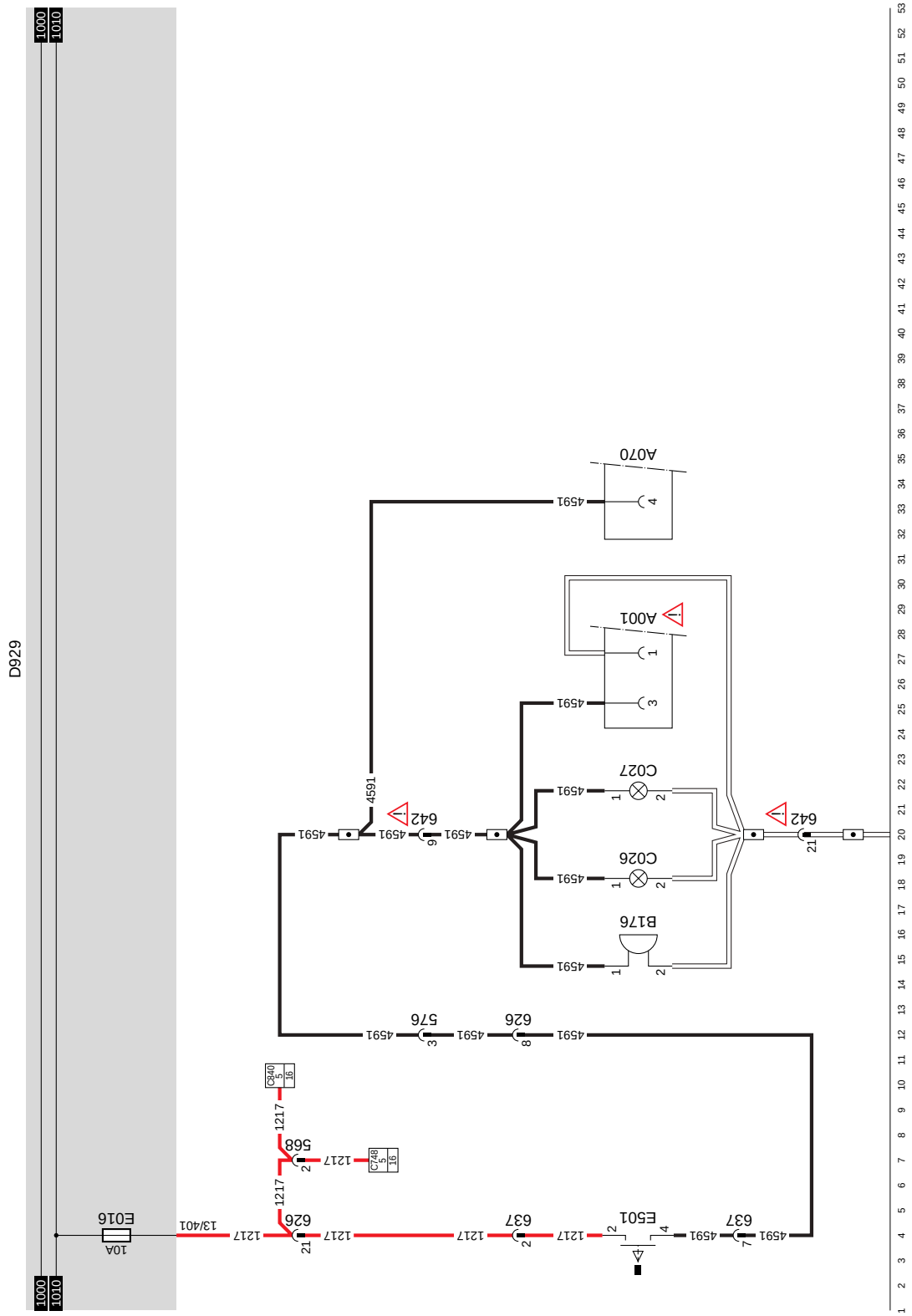

12 **1358030/15** EL000505

13 LIGHT SWITCH/FOG LIGHTS/DIPPED BEAM AND MAIN BEAM SWITCH FA

MARKER LIGHTS AND PARKING LIGHTS
FOR SUB-DIAGRAM AND EXPLANATION, SEE SUB-DIAGRAM 9

LIGHT SWITCH (C622)

Position 1 (“town lights”)
A voltage is applied to connection point 2 of light switch C622 through fuse E084 and wire 1101. If this switch is in the “town lights ” position (connection between contacts 2 - 1), the voltage is transmitted to connection point 85 of relay G000 (tail light/side-light relay) via wire 2100. This is energised and contacts 30 - 87 will close. Through contacts 30 - 87 of relay G000 and wire 2101, a voltage is now applied to corner marker lights, marker lights and tail lights through fuses E000 and E001 and wires 2102 and 2103 respectively.

Position 2 (“dipped beam”)
If switch C622 is in the 2nd position (connection between contacts 2 - 4), the following takes place:
A voltage is applied to connection point 2 of light switch C622 through fuse E084 and wire 1101. Through contacts 2 - 4 of C622 the voltage is applied to connection point 85 of G000 through wire 2110 and diode D609. The voltage is also applied to connection point 5 of C773 through wire 2100.
The voltage is also applied to connection point 85 of G001 through wire 2110. This is energised. Through contacts 30 - 87 of relay G001 and wire 2112, a voltage is now applied to the left and right dipped beam through fuses E004 and E005 and wires 2114 and 2113 respectively. They will now switch on.

Signalling light
The voltage on connection point 85 of relay G001, is also on connection point 14 of steering column switch C832 through diode D610, through wire 2154. If this (spring-loaded) part of the switch is operated (connection between points 14 and 9), relay G002 is energised through wire 2120. A connection is now made between contacts 30 - 87 and this applies a voltage to lights C002 and C003 through contacts 30 - 87, wire 2121 and fuses E006 and E007 and wires 2122 and 2123 respectively. The lights remain on as long as there is a connection between contacts 14 and 9 of steering column switch C832.

Main beam
A voltage is applied to connection point 8 of steering column switch C832 through fuse 084 and wire 1101. If this part of the switch is operated (’fixed’ connection between points 8 and 9), relay G002 is energised through wire 2120.
A connection is now made between contacts 30 - 87 and this applies a voltage to lights C002 and C003 through contacts 30 - 87, wire 2121 and fuses E006 and E007 and wires 2122 and 2123 respectively. The lights remain on as long as there is a ’fixed’ connection between contacts 8 and 9.

The dipped beam does **NOT** go out while the signalling light or main beam is in use.

REAR FOG LIGHTS (standard model)
To activate the rear fog lights, light switch C622 must be in the “dipped beam” position (connection between contacts 2 - 4). The voltage is then applied to D609 through fuse E084, wire 1101, contacts 2 - 4 of switch C622 and wire 2110. The voltage is split after this diode. The voltage is applied to connection point 85 of G000 through a PCB track. This switches on the corner marker lights, marker lights and tail lights. The same voltage is also applied to connection point 5 of C773 through wire 2100. The VIC receives a voltage signal at pin D35 when the fog light switch (C773) is operated (connection between 5 - 1).
The VIC then activates the rear fog light relay (G005) via pin C40 of the VIC, so that the rear fog lights come on. The VIC activates the “rear log lights” warning indicator on the instrument panel via the I-CAN.

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FRONT FOG LIGHTS (optional)

To activate the front fog lights, light switch C622 must be in the "town lights" position (connection between contacts 2 - 1). There is now a voltage on connection point 85 of relay G000 (corner marker, marker and tail lights). Turning the fog light switch (C727) to position I (connection between contacts 2 - 6) activates relay G004. A voltage is now applied through fuse E009, wire 2141, contacts 30 - 87 to relay G004 and wire 2142. The fog lights will now go on.

A voltage is also sent to the VIC via wire 2142 and pin C34. VIC controls the DIP and ensures that the "front log lights" warning indicator illuminates on the instrument panel. The VIC receives a voltage signal at pin D35 through wire 2150 when the fog light switch (C727) is turned to position 2 (connection between contacts 2 - 3).

The VIC then activates the rear fog light relay (G005) via pin C40 of the VIC, so that the rear fog lights come on. The VIC activates the "rear log lights" warning indicator on the instrument panel via the I-CAN.

VARIANTS

Location	
15	C773 is fitted as standard. If the front fog lights option is selected, switch C773 and C727 should be swapped over.
83, 86	Connector 617 if FA type vehicle.
87	This may be a 7-pin or 15-pin connector. For more information see sub-diagram 47.
88	Connector 642 if FA type vehicle.

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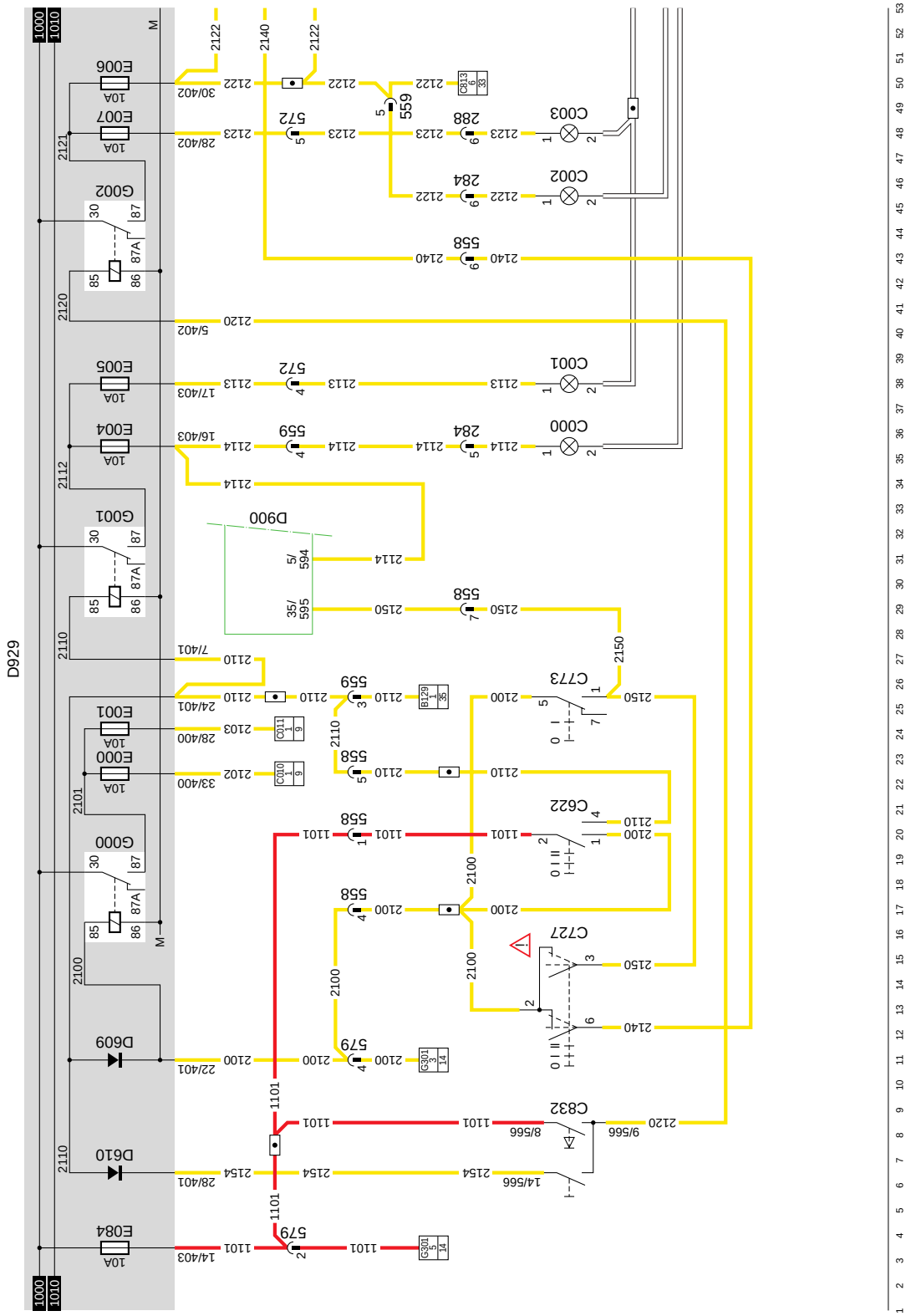

13 **1358030/15**

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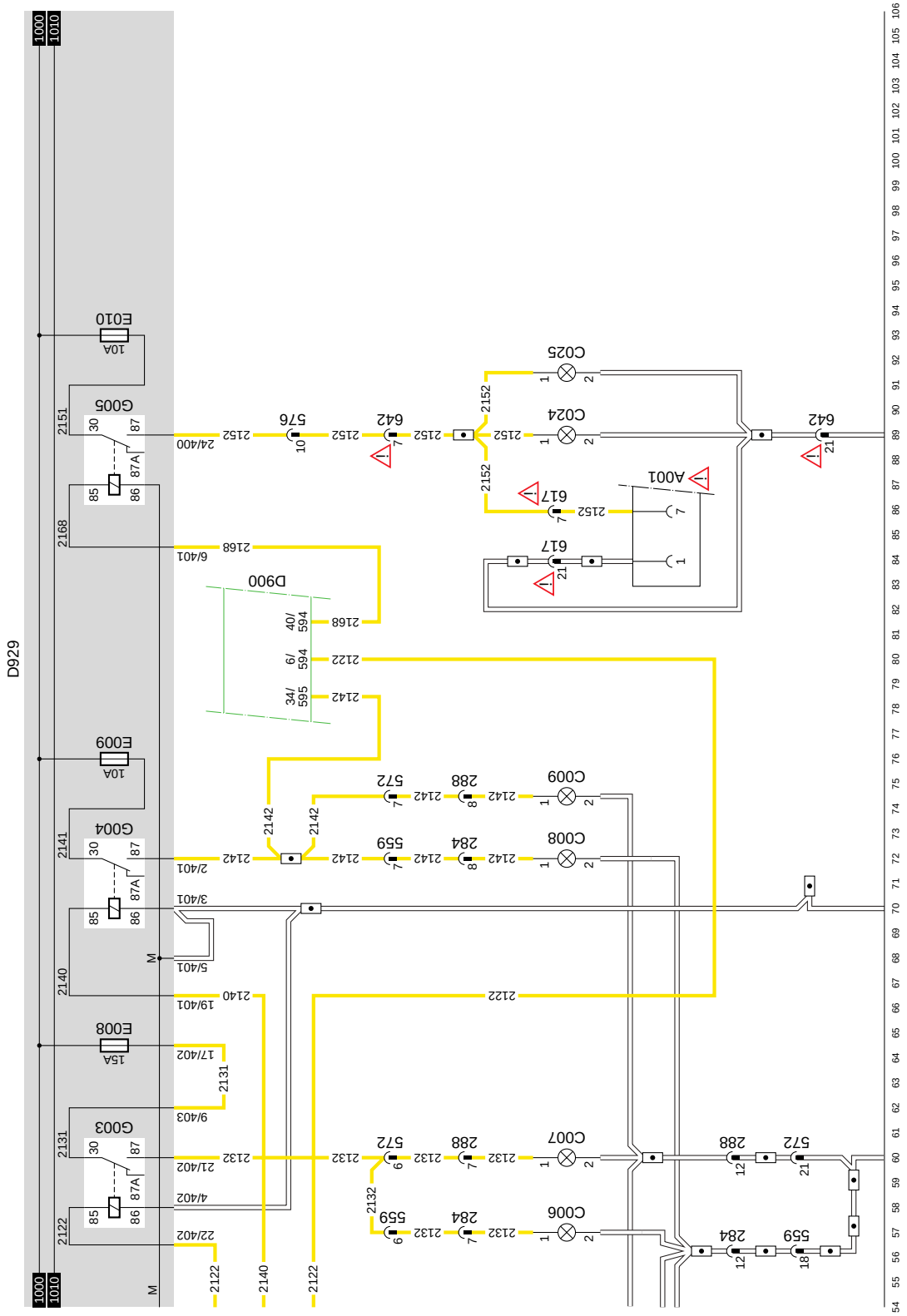

13 **1358030/15** EL000507

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14 SWEDISH LIGHTING

Engine running, switch C622 has NOT been operated
If the engine is running and switch C622 has **NOT** been operated, relay G301 is activated by a voltage from connection point 42 and connector 594 of D900 (VIC). A voltage is then applied through fuse E084, wire 1101, contacts 5 - 3 of relay G301, wire 2100, contacts 3 - 4 of relay G302 and wire 2110 to connection point 85 of relay G001 (dipped beam relay). The same voltage is also applied to connection point 85 of relay G000 (tail light/side-light relay) through diode D609. Both relays are energised.
When relay G000 is energised (connection between contacts 30 - 87), a voltage is applied to the left and right side-lights in the headlights through contacts 30 - 87 of relay G000, PCB track 2102, fuses E000 and E001 and wire 2102.
When relay G001 is energised (connection between contacts 30 - 87), a voltage is applied through contacts 30 - 87 of relay G001, PCB track 2112, fuse E004 and fuse E005. The voltage through wire 2114 is applied to connection point 1 of C000 (left dipped beam) through fuse E004. The voltage through wire 2113 is applied to connection point 1 of C001 (right dipped beam) through fuse E005.
A voltage is also sent to the VIC via wire 2114 and pin C5. VIC controls the DIP and ensures that the “dipped beam” warning indicator illuminates on the instrument panel.

Engine running, switch C622 in marker lights position (position 1)
When the engine is running and switch C622 is in the ’marker lights’ position (connection between 2 - 1), the following occurs:
Relay G301 is energised and, as a result, a connection is made between contacts 5 - 3. The voltage is then applied to wire 2100 and to connection point 85 of relay G000 through fuse E084, wire 1101 and contacts 5 - 3 of relay G301. When relay G000 is energised a voltage is applied through relay contacts 30 - 87 of relay G000, wire 2101, fuses E000 and E001 and wire 2102 and wire 2103 respectively. The corner marker lights, marker lights and tail lights (on both the driver’s and co-driver’s side) now go on.
There is also a voltage on connection point 1 of relay G302 through fuse E084, wire 1101, contacts 2 - 1 of relay C622 and wire 2105. Relay G302 is energised thereby breaking contacts 3 - 4.
There is no longer a voltage on wire 2110 and, as a result, relay G001 is no longer energised. Contacts 30 - 87 are broken and, as a result, the driver’s and co-driver’s side headlights go out.

Engine running, switch C622 in dipped beam position (position 2)
When the engine is running and switch C622 is in the ’dipped beam’ position (position 2) (connection between 2 - 4), the following occurs:
Relay G301 is energised and, as a result, a connection is made between contacts 5 - 3. The voltage is then applied to wire 2100 and to connection point 85 of relay G000 through fuse E084, wire 1101 and contacts 5 - 3 of relay G301. When relay G000 is energised a voltage is applied through relay contacts 30 - 87 of relay G000, wire 2101, fuses E000 and E001 and wire 2102 and wire 2103 respectively. The corner marker lights, marker lights and tail lights (on both the driver’s and co-driver’s side) now go on. Because there is a voltage on connection point 85 of relay G001 through contacts 2 - 4 of switch C622 and wire 2110, this relay is energised. When relay G001 is energised a voltage is applied to both the left and right dipped beam through contacts 30 - 87, wire 2112, fuses E004 and E005 and wire 2113 and wire 2114 respectively. A voltage is also sent to the VIC via wire 2114 and pin C5. VIC controls the DIP and ensures that the “dipped beam” warning indicator illuminates on the instrument panel.

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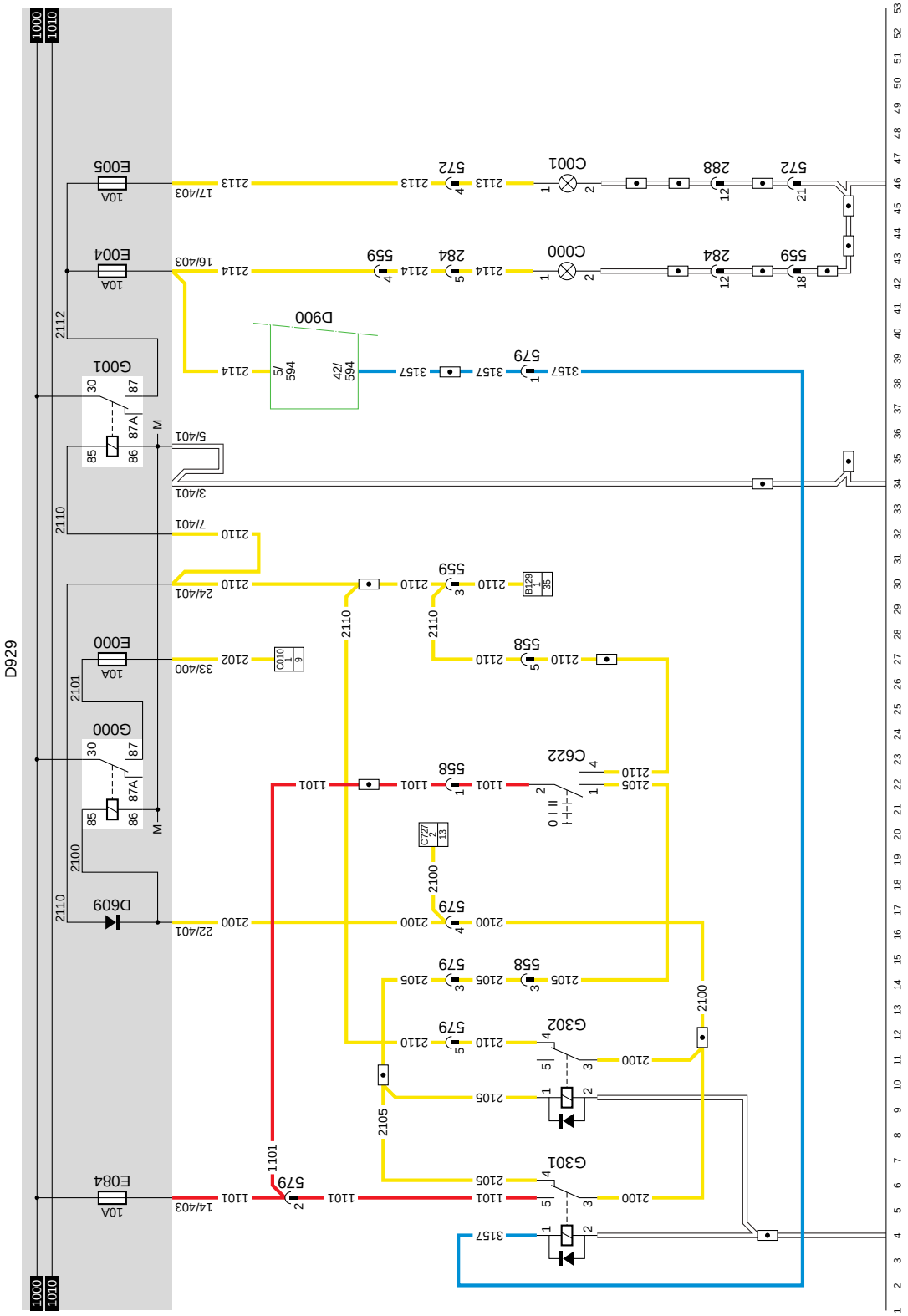

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15 STOP LIGHTS/CAB TILTING GEAR

STOP LIGHTS
When the brake pedal is pressed, the stop light control switch E511 is activated (connection between contacts 2 - 1) and the relay (G036) will be energised. There is also a voltage on F628. Through fuse E013, wire 1209, contacts 30 and 87 of relay G036 and wire 4601 a voltage is now applied to the right stop light (C021) and the left stop light (C020), so that they go on. The lights that are connected via the trailer plug socket A000 will also go on.
When relay G036 is energised, the connection 30 - 78a is broken. The voltage on D814 (UPEC electronic unit) or D903 (ECS-DC3 electronic unit) is lost.

CAB TILTING GEAR
There is a voltage on sensor F676 (cab locking sensor) and on sensor F616 (cab tilting cylinder sensor) through fuse E018 and wire 1114. There is also a voltage on connection point 2 of sensor F676 through connection points 1 - 2 of relay G351 (cab tilt protection microrelay) and wire 4723. When this sensor is activated, the voltage is transmitted to connection point 16 of D900 (VIC) and to connection point 2 of sensor F616. The VIC now sends a message to the DIP that then activates the "cab tilted" warning light. When sensor F616 is activated, relay G351 is energised and, as a result, a voltage is applied to B251 through contacts 3 and 5 and wire 4722 (neutral position buzzer, tilting cab). If the contacts in switch E569 (neutral position switch) are closed (connection between pins 4 - 2), the horn will go off.

VARIANTS

Location	
9	Depends on whether the vehicle has a UPEC or ECS-DC3 engine.
12, 15	Connector 642 if FA type vehicle.
21	Depends on whether the vehicle has a 7-pin or 15-pin socket. See sub-diagram 47.

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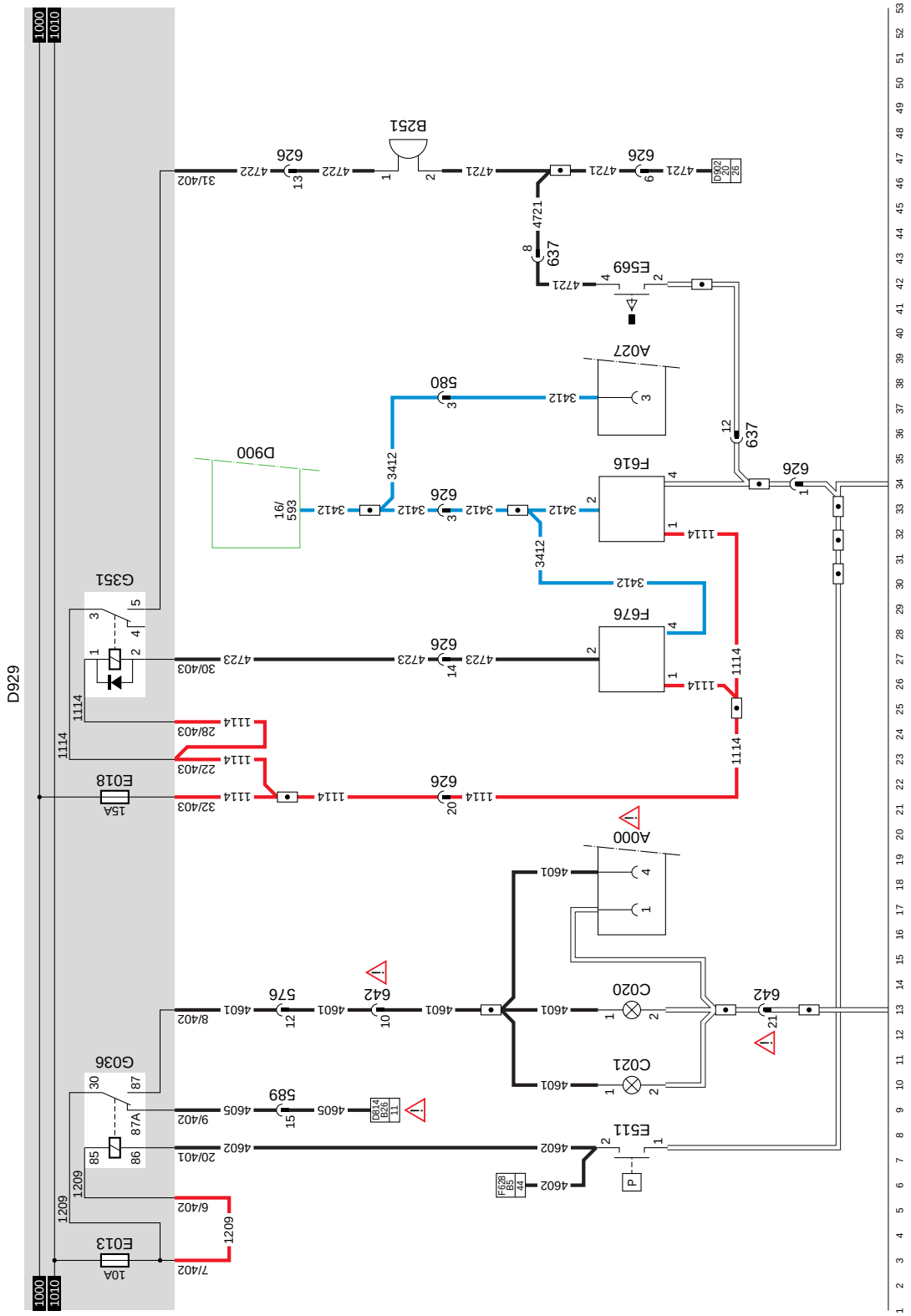

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16 DIFFERENTIAL LOCK

When the contact switch (G015) is activated, a voltage is applied through fuse E016 and wire 1217 to the control switch for the axial controlled slip differential (C748) and control switch for the longitudinal controlled slip differential (C749). A voltage is also applied to the reversing control switch (E501) and four-wheel drive switch (C840).
When the axial controlled slip differential (C748) is activated, a voltage is applied through wire 4517 to the axial controlled slip differential valve (B243). As a result, the valve is activated.

When the longitudinal controlled slip differential (C749) is activated, a voltage is applied through wire 4518 to the longitudinal controlled slip differential valve (B244). As a result, the valve is activated.

VARIANTS

Location
4 Only if the vehicle has four-wheel drive.

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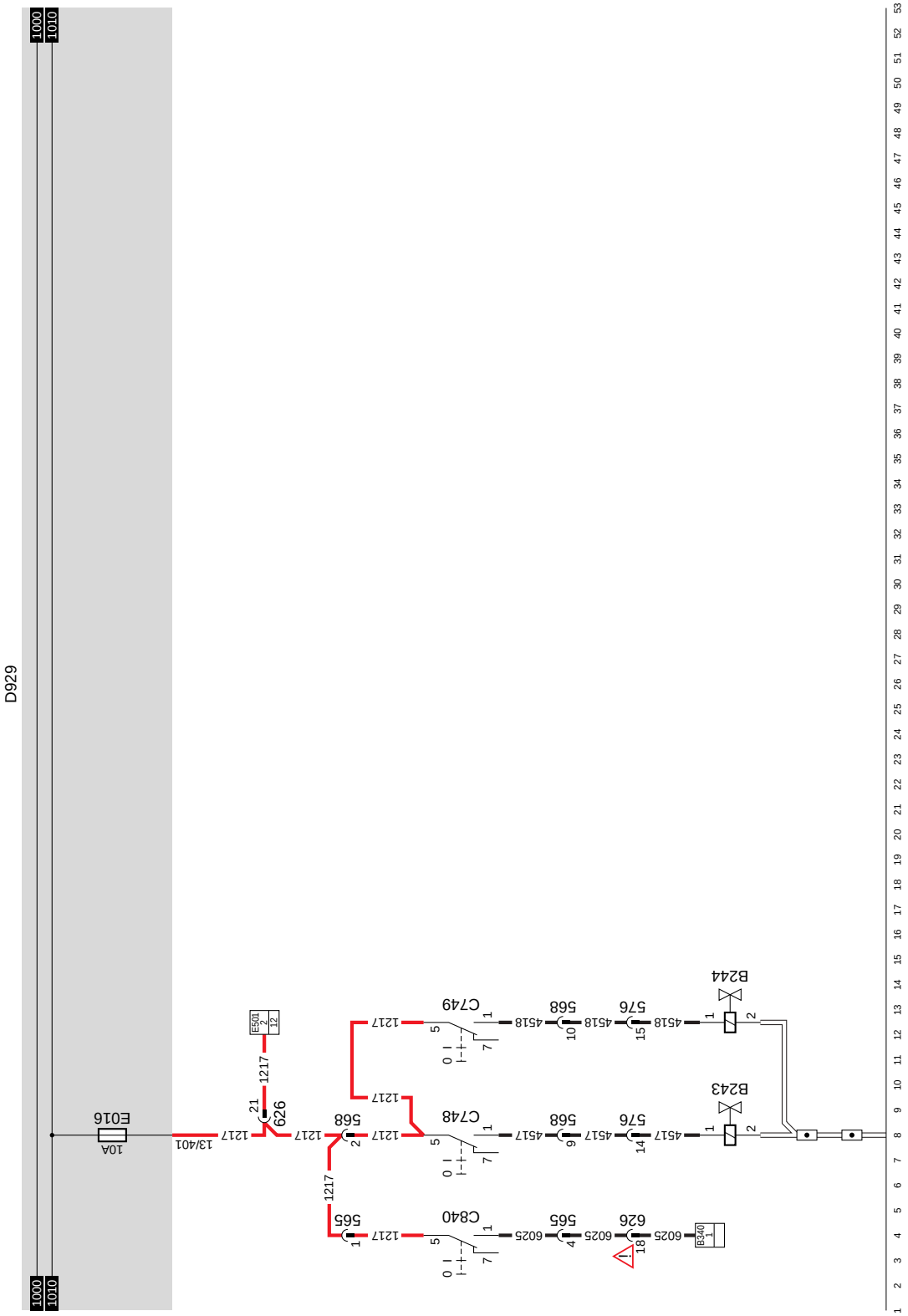

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17 INTERIOR LIGHTING DAY/SLEEPER CAB

DRIVER'S SIDE STEPWELL LIGHTING, INTERIOR LIGHTING AND DOOR SWITCH

When the door on the driver's side is opened, door switch E514 is activated (connection between 1 - 2). A a result, there is a voltage on C062, C063 and on D911 through fuse E045 (interior lighting fuse), wire 1107, contacts 1 - 2 of door switch E514, wire 2647, diode D783 (driver's side interior lighting diode) and wire 2600. This activates the stepwell lighting on both the driver's side (C062) and the co-driver's side (C063). The VIC (D900) also receives a voltage on connection point 1, connector 595. The VIC then turns on the cab lighting (C119/C192), provided the switch is in the correct position, activating it via connection point 4, connector 492.

When the door on the driver's side is closed (contacts 1 - 2 interrupted), the voltage to connection point 1, connector 595 of the VIC is lost. Connection point 4, connector 592 will then continue to be supplied with power for another 9 seconds approximately. After approximately 9 seconds, the power supply is switched off and the lights go out.

If the vehicle ignition is switched on (contact made) within 9 seconds, the power supply to connection point 4, connector 592 of the VIC will be switched off immediately. The interior lighting will be switched off immediately. If the alarm system (D911) sends a voltage to connection point 13, connector 594 of the VIC to indicate that the doors have locked correctly, the lighting will also go off immediately.

CO-DRIVER'S SIDE STEPWELL LIGHTING, INTERIOR LIGHTING AND DOOR SWITCH

When the door on the co-driver's side is opened, door switch (E515) is activated (connection between 1 - 2).
As a result, there is also a voltage on both C062 and C063 through fuse E045 (interior lighting fuse), wire 1107, contacts 1 - 2 of door switch E515 and wire 2600. This activates the stepwell lighting on both the driver's side (C062) and the co-driver's side (C063).

INTERIOR LIGHT WITH MAP-READING LIGHT (DRIVER'S AND CO-DRIVER'S SIDE)

A combined interior light and map-reading light on both sides of the cab in the overhead console. The lights operate in the same way on the driver's side and co-driver's side.

A voltage is applied to connection point 2 of C119 and C192 respectively through fuse E045 and wire 1107. Depending on the switch position, the interior light or the map-reading light can be switched on individually or together.

STORAGE COMPARTMENT LIGHTING

When the storage compartment is opened, storage compartment light switch E528 is activated (connection between 1 - 2). As a result, there is a voltage on C067 through fuse E142 (accessories before ignition fuse), wire 1154, contacts 1 - 2 of storage compartment light switch E528 and wire 2608. This switches on the storage compartment light. The storage compartment light works independently of the ignition.

BUNK LAMP

The bunk lamp C115 is switched on by a switch in the light fitting. The bunk lamp works independently of the ignition. Voltage is applied to connection point 1 of C115 through fuse E045, wire 1107. When the switch is operated (connection between contact 1 - 2), connection point 2 is connected to earth. The lamp will now switch on.

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INTERIOR NIGHTLIGHT

When switch C735 (interior nightlight switch) is operated (connection between 5 - 1), a voltage is applied to C191 through fuse E045 (interior lighting fuse), wire 1107, contacts 5 -1 of nightlight switch C735 and wire 2617. This switches the nightlight on. The nightlight works independently of the ignition.

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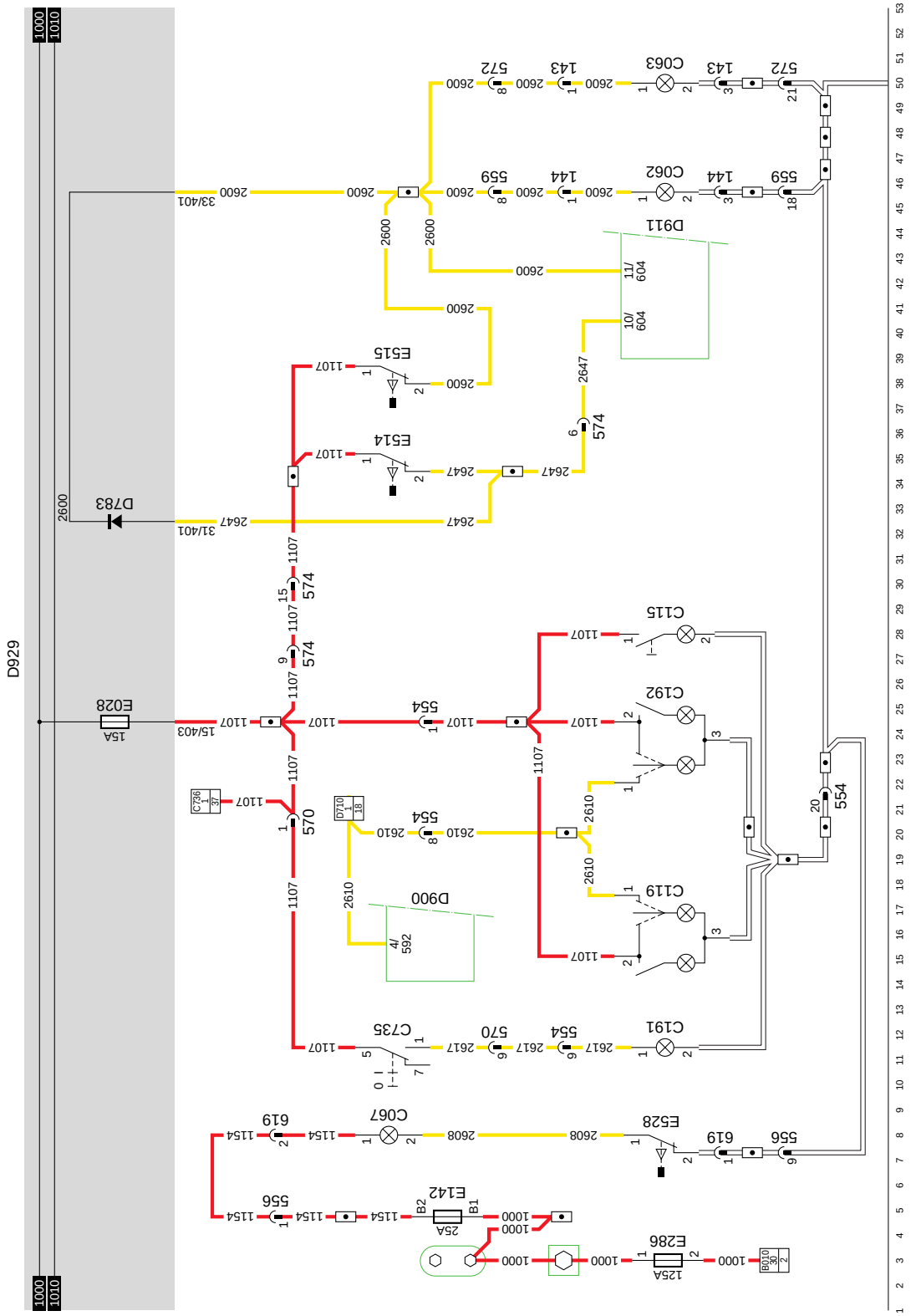

17 **1358030/15** EL000511

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18 INTERIOR LIGHTING SH CAB

DRIVER'S SIDE STEPWELL LIGHTING, INTERIOR LIGHTING AND DOOR SWITCH

When the door on the driver's side is opened, door switch (E514) is activated (connection between 1 - 2). A a result, there is a voltage on C062, C063 and on D911 (alarm system) through fuse E045 (interior lighting fuse), wire 1107, contacts 1 - 2 of door switch E514, wire 2647, diode D783 (driver's side interior lighting diode) and wire 2600. This activates the stepwell lighting on both the driver's side (C062) and the co-driver's side (C063). The VIC (D900) also receives a voltage on connection point 1 and connector 595. The VIC then turns on the cab lighting (C119/C192), provided the switches (C119, C192, C859 and C837) are in the correct position, activating it through wire 2610 (connection point 4, connector 592 of the VIC unit).

When the door on the driver's side is closed (contacts 1 - 2 of door switch E514 interrupted), the voltage to connection point 1 and connector 595 of the VIC is lost. Connection point 4 and connector 592 will then continue to be supplied with power for another 9 seconds approximately. After approximately 9 seconds, the power supply is switched off and the lights go out.

If the vehicle ignition is switched on (contact made) within 9 seconds, the power supply to connection point 4, connector 592 of the VIC will be switched off immediately. The interior lighting will be switched off immediately. If the alarm system (D911, connection point 16 of connector 604, wire 3647) sends a voltage to connection point 13, connector 594 of the VIC to indicate that the doors have locked correctly, the lighting will also go off immediately.

CO-DRIVER'S SIDE STEPWELL LIGHTING, INTERIOR LIGHTING AND DOOR SWITCH

When the door on the co-driver's side is opened, door switch (E515) is activated (connection between 1 - 2).
As a result, there is also a voltage on both C062 and C063 through fuse E045 (interior lighting fuse), wire 1107, contacts 1 - 2 of door switch E515 and wire 2600. This activates the stepwell lighting on both the driver's side (C062) and the co-driver's side (C063).

Interior lighting with map-reading light (driver's and co-driver's side)
There is an interior light with map-reading light on both sides of the cab in the overhead console. The lamps operate in the same way on the driver's side and co-driver's side.

A voltage is applied to connection point 2 of C119 and C192 respectively through fuse E045 and wire 1107. Depending on the switch position, the interior light or the map-reading light can be switched on individually or together.

INTERIOR LIGHTS TWO-WAY SWITCHING

The condition to turn on both interior lights is that C119 (interior light with switch, driver's side) and C192 (interior light with switch, co-driver's side) must be switched together. Therefore, the switch is connected to contact 1.

Situation 1: Switch C837 in '0' position.
Switch C837 in middle position (contacts 5 - 3 and 6 - 4 connected).
The supply voltage and the earth are now interrupted and the light does not work.

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Situation 2:
Switch C837 set to position 'I' (contacts 5 - 7 and 8 - 6 connected). A voltage is now applied to connection point 1 of C119 and to connection point 1 of C192 through fuse E028, wire 1107, contacts 5 - 7 of C837, wire 2644, contacts 7 - 5 of C859 (driver's side roof console interior light) and wire 2632. The earth is formed because connection point 3 of C119 and connection point 3 of C192 are connected to the vehicle earth through wire 9032 and contacts 8 - 6 of C837.
The lighting can now be switched on or off using switch C859.

Situation 3:
Switch C837 set to position 'II' (contacts 3 - 1 and 2 - 4 connected). A voltage is now applied to connection point 1 of C119 and to connection point 1 of C192 through fuse E028, wire 1107, contacts 3 - 1 of C837, wire 2645, contacts 1 - 5 of C859 (driver's side roof console interior light) and wire 2632. The earth is formed because connection point 3 of C119 and connection point 3 of C192 are connected to the vehicle earth through wire 9032 and contacts 2 - 4 of C837.
The lighting can now be switched on or off using switch C859.
Explanation of two-way switching in vehicle

Storage compartment lighting
When the door of the storage compartment is closed there is a voltage on C067 (left storage compartment lighting) through fuse E142 (accessories before ignition fuse), wire 1154. When the door of the storage compartment is opened (contacts 1 - 2 of storage compartment lighting switch E528 are connected), the voltage is connected to earth through wire 2608 and contacts 1 - 2 of E528 (storage compartment lighting switch). This switches on the storage compartment light. The storage compartment light works independently of the ignition.

Bunk lamp
The bunk lamp C115 is switched on by a switch in the light fitting. The bunk lamp works independently of the ignition. Voltage is applied to connection point 1 of C115 through fuse E045, wire 1107. Connection point 2 of C115 is connected to earth. When the switch is operated (connection between contact 1 - 2) the lamp goes on.

Interior nightlight
When switch C735 (interior nightlight switch) is operated (connection between 5 - 1), a voltage is applied to connection point 1 of C191 (middle nightlight) through fuse E045 (interior lighting fuse), wire 1107, contacts 5-1 of nightlight switch C735 and wire 2617. This switches the nightlight on. The nightlight works independently of the ignition.

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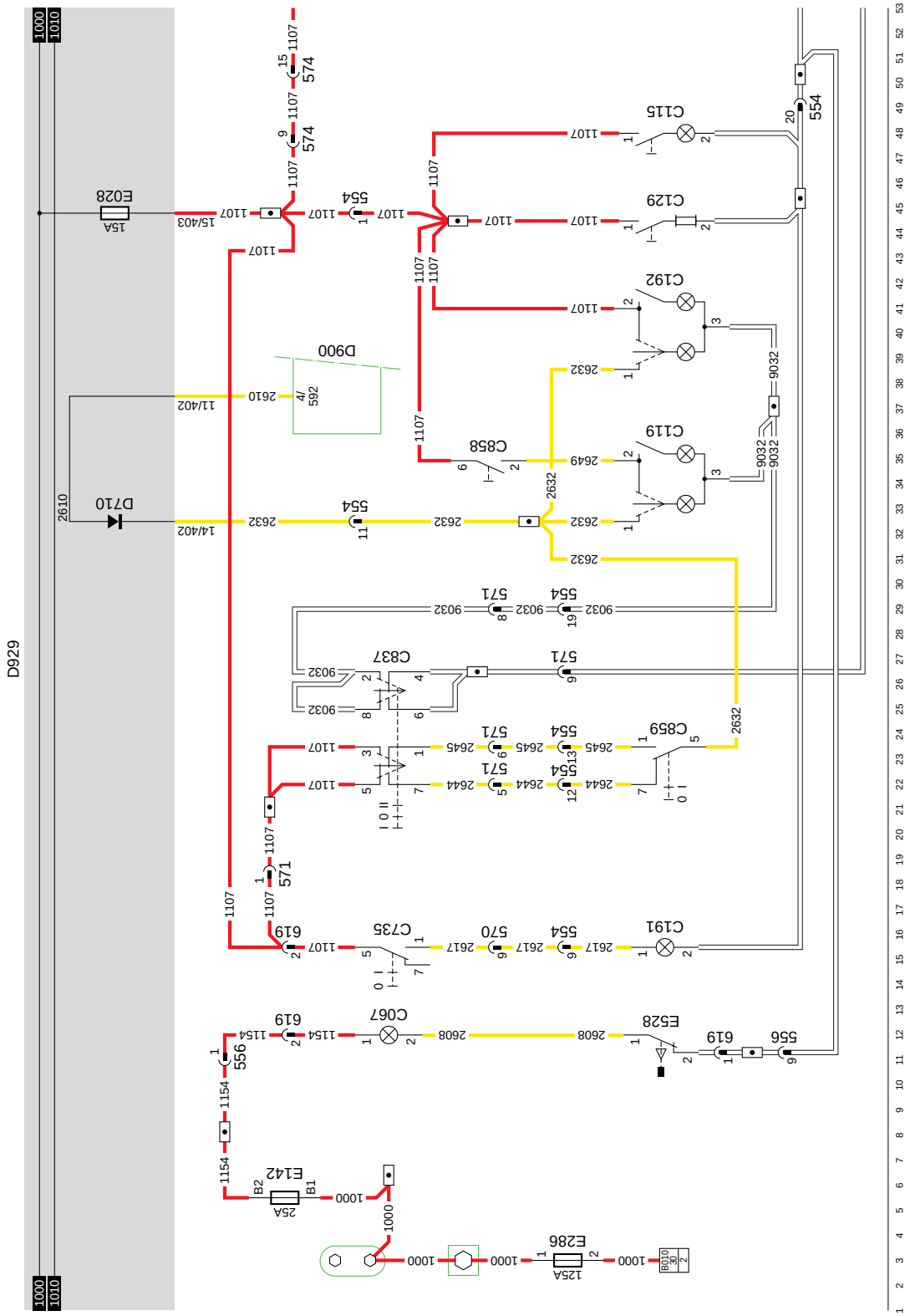

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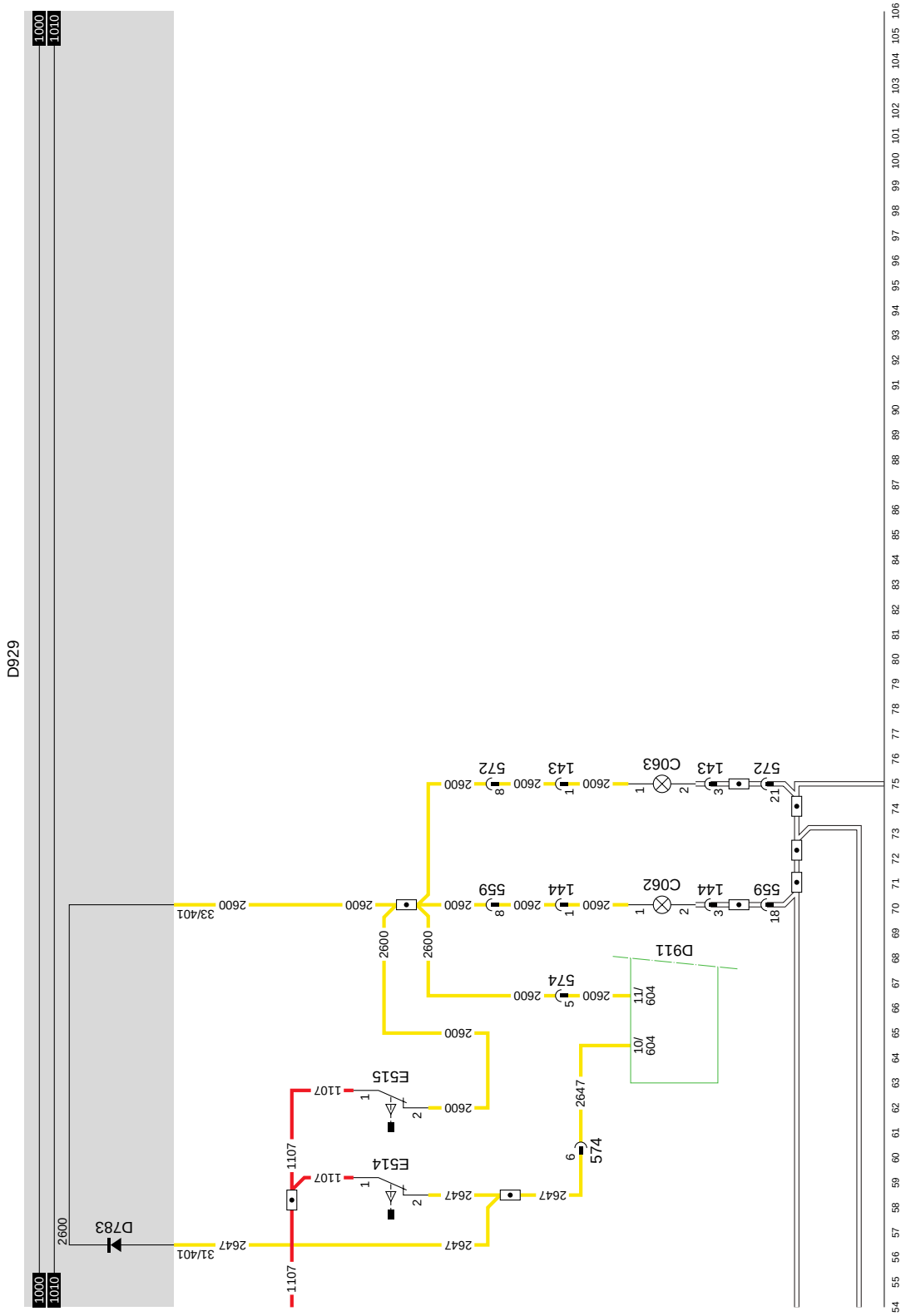

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19 MIRROR HEATING/MIRROR ADJUSTMENT

MIRROR HEATING
When the mirror heating switch (C746) is operated, a voltage is applied to heating element B017 (driver's side) and B018 (co-driver's side) through fuse E044, wire 1208 and switch C746 (contacts 1 - 2) and wire 4532.
The mirror heating can only be switched on when the contact relay has been energised (contact 'on').

MIRROR ADJUSTMENT
The outside mirrors are adjusted using the "joystick" switches C695 (driver's side) and C696 (co-driver's side). When the handle of the switch is moved from the rest position (centre) in a particular direction, power is supplied to the mirror adjustment motor B005 (driver's side) or B006 (co-driver's side) and the corresponding mirror responds following the movement of the handle.
Wires 4770 and 4774 (driver's side) or 4771 and 4775 (co-driver's side) supply power to the motor for left-right movement. Wires 4772 and 4774 (driver's side) or 4773 and 4775 (co-driver's side) supply power to the motor for the up-down movement.

The mirror adjustment system can only be used if the contact relay is energised.

VARIANTS

Location	
7	If RHD pin 4 is connected to wire 1208 and pin 2 is connected to earth.
17	If RHD pin 4 is connected to wire 1208 and pin 2 is connected to earth.

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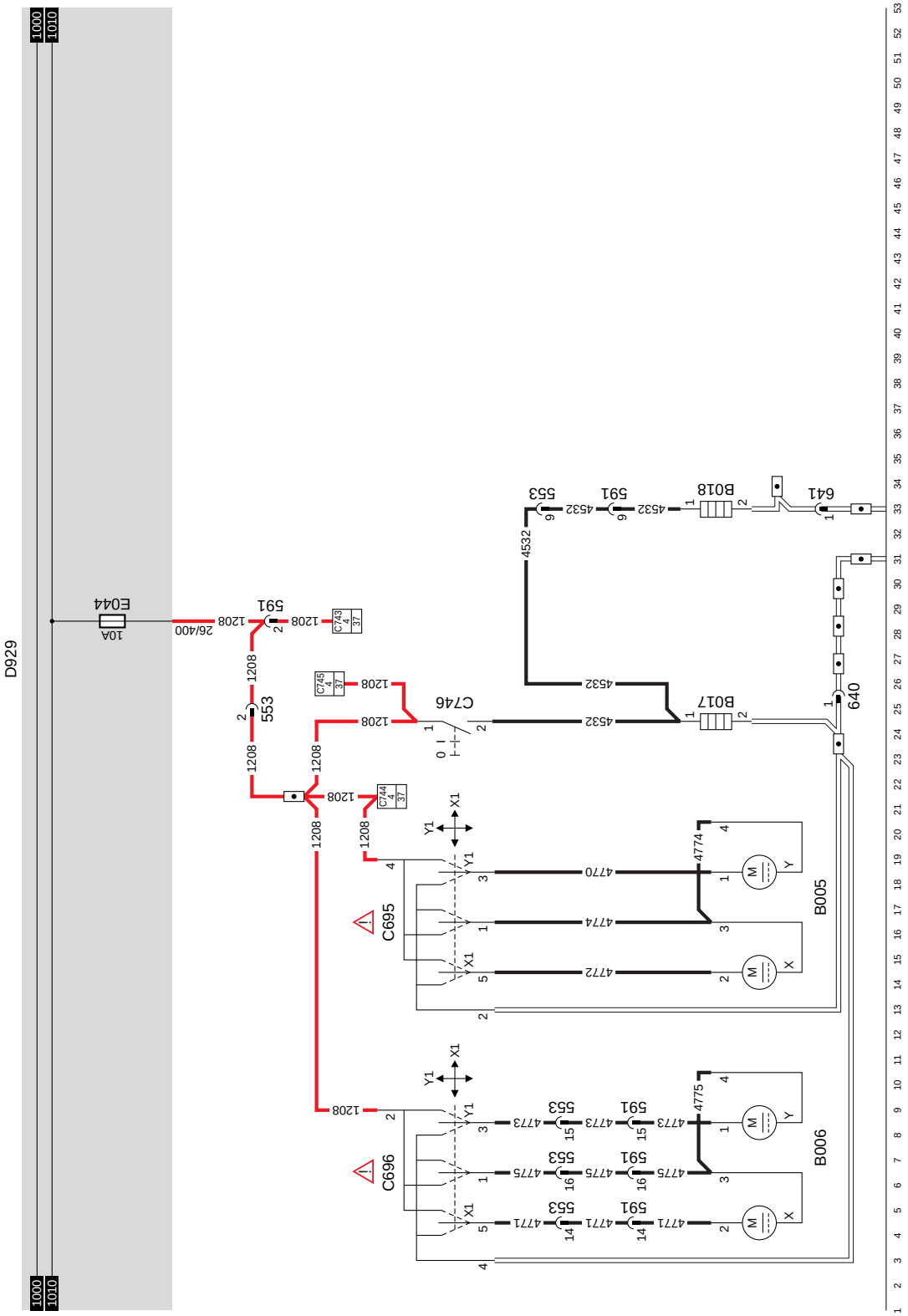

19 **1358030/15** EL000514

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20 VISIBILITY LIGHTING

VISIBILITY LIGHTING

Visibility lighting refers to lights or LEDs in the various function switches.
When the light switch (C622) is operated, a supply voltage is present on relay G000 (connection point 85) through fuse E084 and the light switch (C622) contacts 2 - 1 and wire 2100.
Relay G000 is energised ((connection between connection points 30 - 87), PCB track 2101 and fuse (E117)) when there is a voltage on the visibility lighting (through wire 2630). All visibility lighting connected to this will come on.

The following switches are illuminated by a light: B030, C072, C073, C716, C813 and C858.

The following switches are illuminated by a LED:
C725 C727 C735 C736 C737 C739 C740
C741 C748 C749 C750 C751 C760 C763
C764 C765 C774 C778 C742 C802 C835
C836 C837 C840 C853 C858

LIGHT BUZZER

When the light switch (C622) is operated, a supply voltage is present on relay G000 through fuse E084, light switch (C622) and wire 2100.
Relay G000 is energised so that a voltage is applied to the visibility lighting (wire 2630) through fuse E117. This wire is also connected to the VIC (D900), pin 7/594.
If the pre-programmed condition in the VIC is met, the VIC sends a message to the DIP that, in its turn, activates the buzzer (fitted in the DIP).

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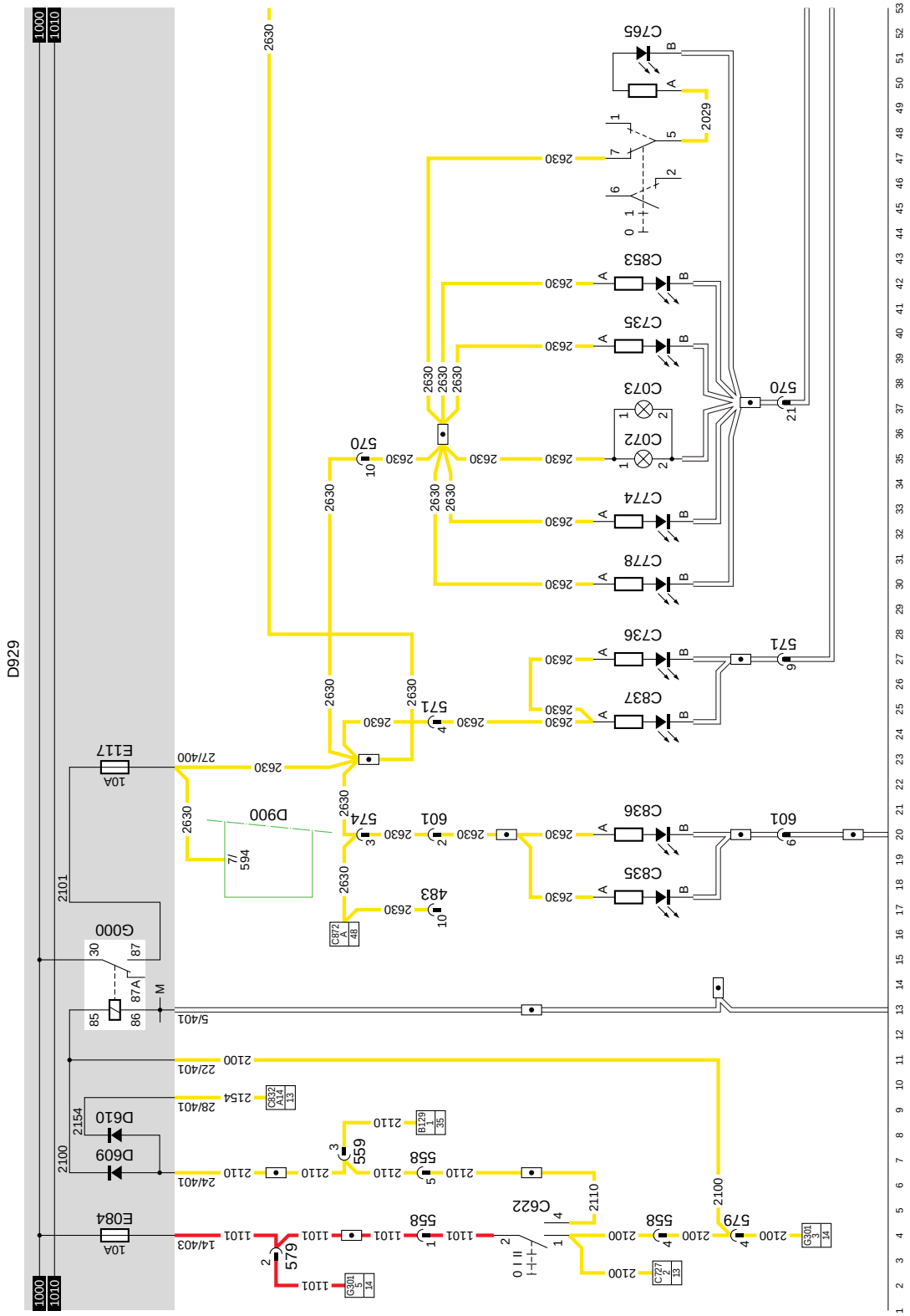

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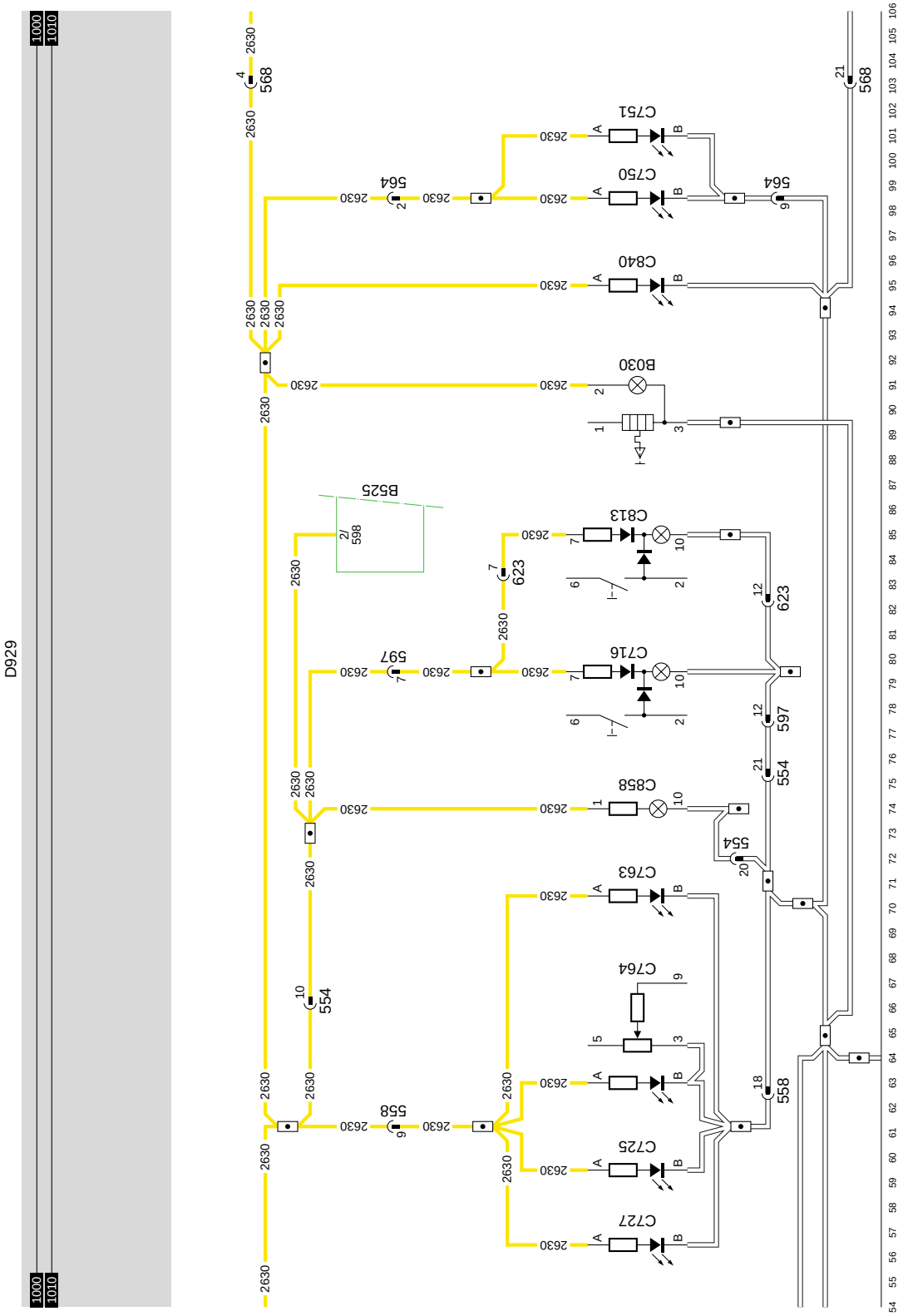

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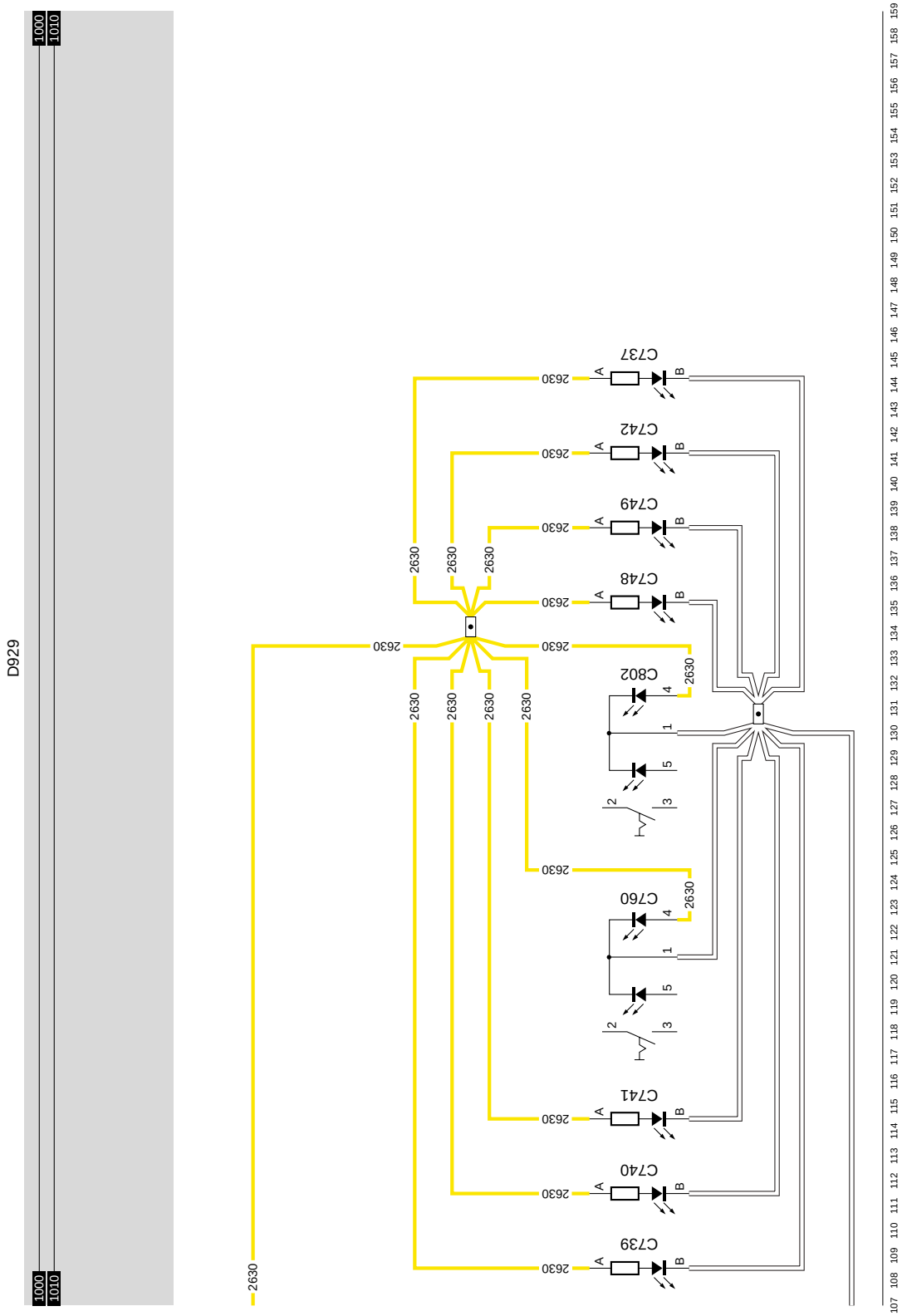

20 **1358030/15** EL000517

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21 AIR CONDITIONING/RECIRCULATION VALVE/HEATER FAN

AIR CONDITIONING

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

RECIRCULATION VALVE

When C802 is operated (connection between contacts 2 - 3), a voltage is applied to connection point 1 of G257 and G258 through fuse E031, wire 1201, contacts 2-3 of C802 and wire 4659. This relay is energised and, as a result, a connection is made between contacts 3 - 5. This causes a voltage to be applied to connection point 1 of relay B252 through fuse E031, wire 1201 and contacts 5 - 3 of relay G257 and wire 5053. The other connection point 2 is connected to earth through wire 5054 and contacts 3 - 5 of relay G258. The recirculation valve, driven by B252, will now close.
The VIC (D900) also receives a voltage on connection point 8. The VIC activates the “recirculation” warning indicator on the instrument panel via the I-CAN.

HEATER FAN

A voltage is applied to connection point 8 of B015 (4-speed heater fan) through fuse E031 and wire 1201.
Depending on the position of C882 (heater fan switch), the fan will start operating.

The heater knob has five positions:

Off: (position 0): Heater fan (B015) off.

Position 1: (Connection between contacts 2 and 6). The fan runs at the lowest speed. Voltage is applied to connection point 8 of B015 through fuse E031 and wire 1201. The earth is formed through connection point 7 of B015, wire 4658, the contacts of thermal switch 6 - 5 (B015), wire 4654, through three resistors (B015), wire 4650 and contacts 2 - 6 of C882.

Position 2: (Connection between contacts 2 and 6). The fan runs slightly faster.
Voltage is applied to connection point 8 of B015 through fuse E031 and wire 1201. The earth is formed through connection point 7 of B015, wire 4658, the contacts of thermal switch 6 - 5 (B015), wire 4654, through two resistors (B015), wire 4651 and contacts 4 - 6 of C882.

Position 3: (Connection between contacts 3 and 6). The fan runs at the highest speed but one.
Voltage is applied to connection point 8 of B015 through fuse E031 and wire 1201. The earth is formed through connection point 7 of B015, wire 4658, the contacts of thermal switch 6 - 5 (B015), wire 4654, through one resistor (B015), wire 4652 and contacts 3 - 6 of C882.

Position 4: (Connection between contacts 1 and 6). The fan runs at the highest speed. Voltage is applied to connection point 8 of B015 through fuse E031 and wire 1201. The earth is formed through connection point 7 of B015, wire 4658, contacts 6 - 5 of the thermal switch (B015)

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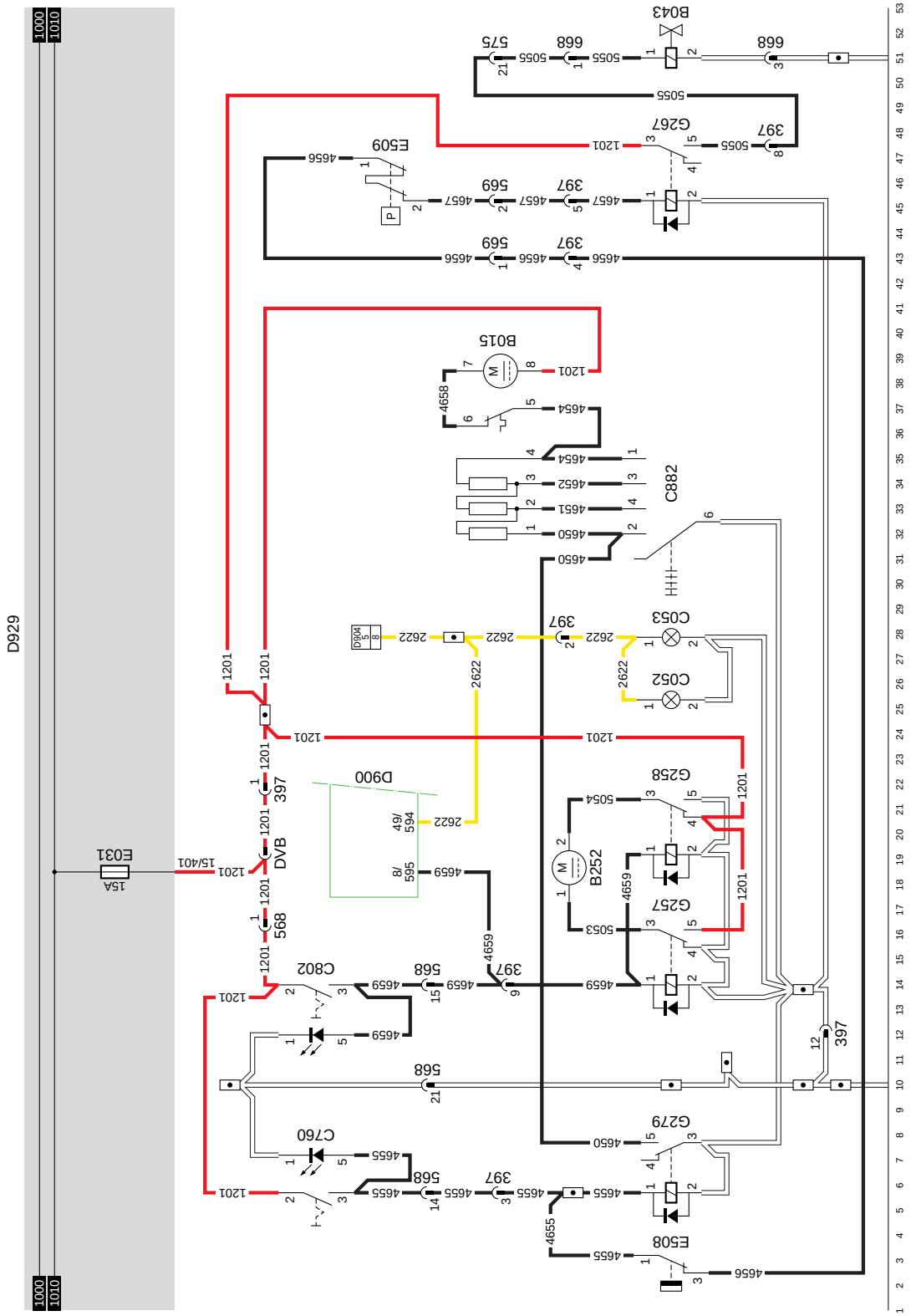

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22 SEAT HEATING/ACCESSORIES CONNECTION

SEAT HEATING
When contact is made, a voltage is applied to switch C697 (driver's side seat heating switch) and switch C698 (co-driver's side seat heating switch) through fuse E091 and wire 1240.
When one of the switches (C697 or C698) is operated, the heating element B032 or B033 is switched on. When the maximum temperature is reached, a thermal switch in the seat switches off the heating element.

CONNECTION FOR ACCESSORIES
There is a 2-pin connector (connector number: 180) in the central box in each vehicle below the PCB.
This is connected before ignition (wire 1000) and has a 25 A fuse.

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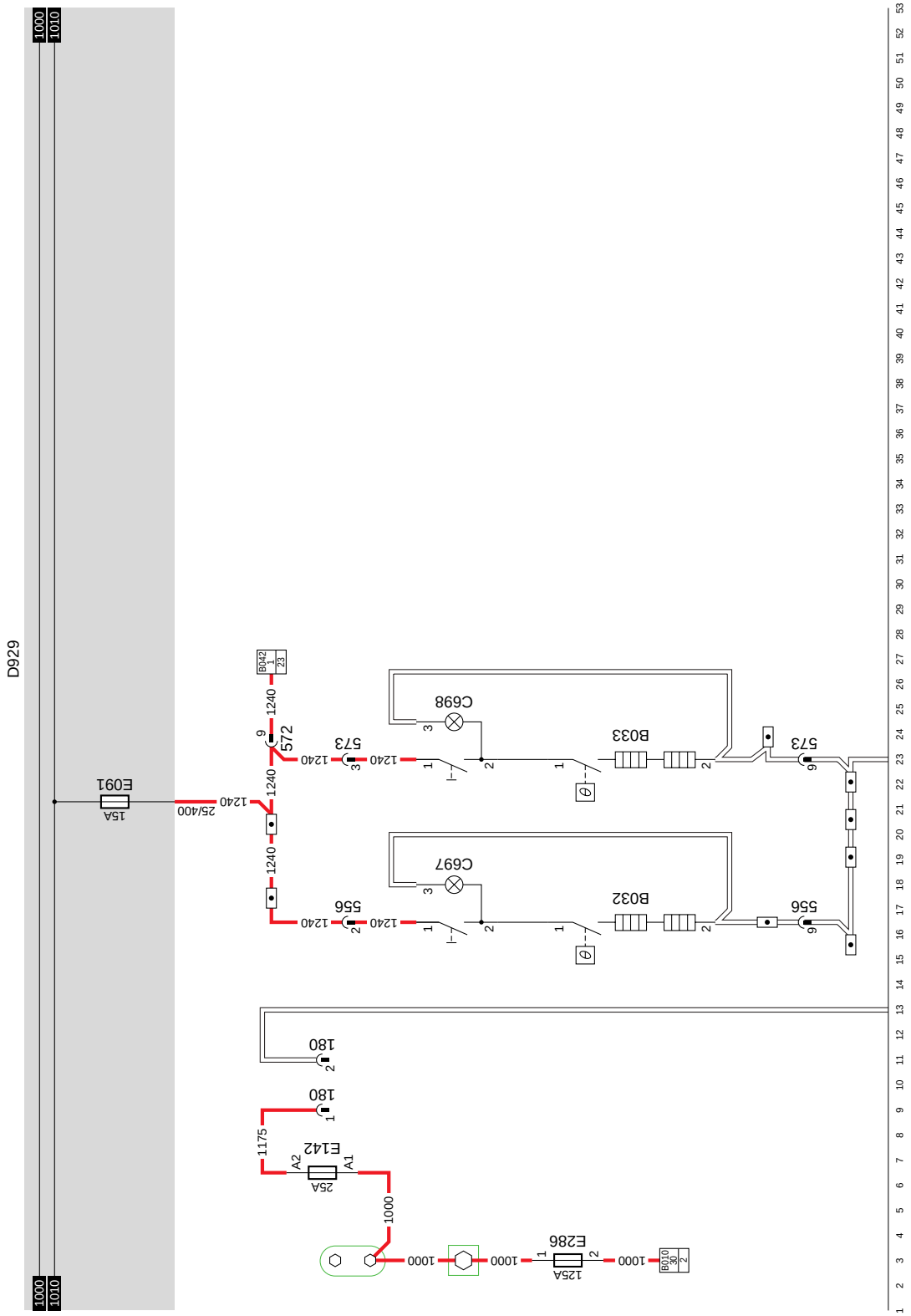

22 **1358030/15**

https://www.truck-manuals.net/

23 HORN/CIGAR LIGHTER/WORK LAMP/AIR DRYER

HORN

A voltage is applied to connection point 5 of C832 (right direction indicator/windscreen wiper steering column switch) through fuse E084 and wire 1101. When this switch is operated (connection between contacts 5 - 12), the voltage is applied through wire 4535 to connection point 1 of valve B028 (horn). This is activated. The air duct in the pneumatic horn is now released.

CIGAR LIGHTER

A voltage is applied to connection point 1 of B030 (driver's side cigar lighter) through fuse E026 (power supply before ignition) and wire 1105. When the cigar lighter is pressed in (connection between contacts 1 - 3), a current flows through an internal resistor. When the temperature goes above a specific value, the heating element springs back and the electric circuit is broken.

WORK LAMP

When contact (switch C539) is made (connection between contacts 1 - 6), a voltage is applied through wire 1130 to connection point 85 of relay G178 (accessories relay). A voltage is now applied through fuse E037, wire 1100, contacts 30 and 87 of relay G178 through fuse E052 to connection point 5 of C725 (work lamp switch). When the work lamp switch is operated (connection between connection points 5 - 1), the work lamp (C071) is supplied with voltage. The VIC (D900) also receives a voltage on connection point 9. The VIC activates the "work lamp" warning indicator on the instrument panel via the I-CAN.

AIR DRYER

A voltage is applied to connection point 1 of B042 (air dryer heating element) through fuse E091 (power supply after ignition) and wire 1240. When the built-in temperature switch is closed (connection between contacts 1 - 2), a current flows through an internal resistor. If the temperature goes above a specific value, the temperature switch switches the heating element off.

VARIANTS

Location

46	Connector A070 if fitted. Optional.
50	Connector 605 if FA type vehicle.

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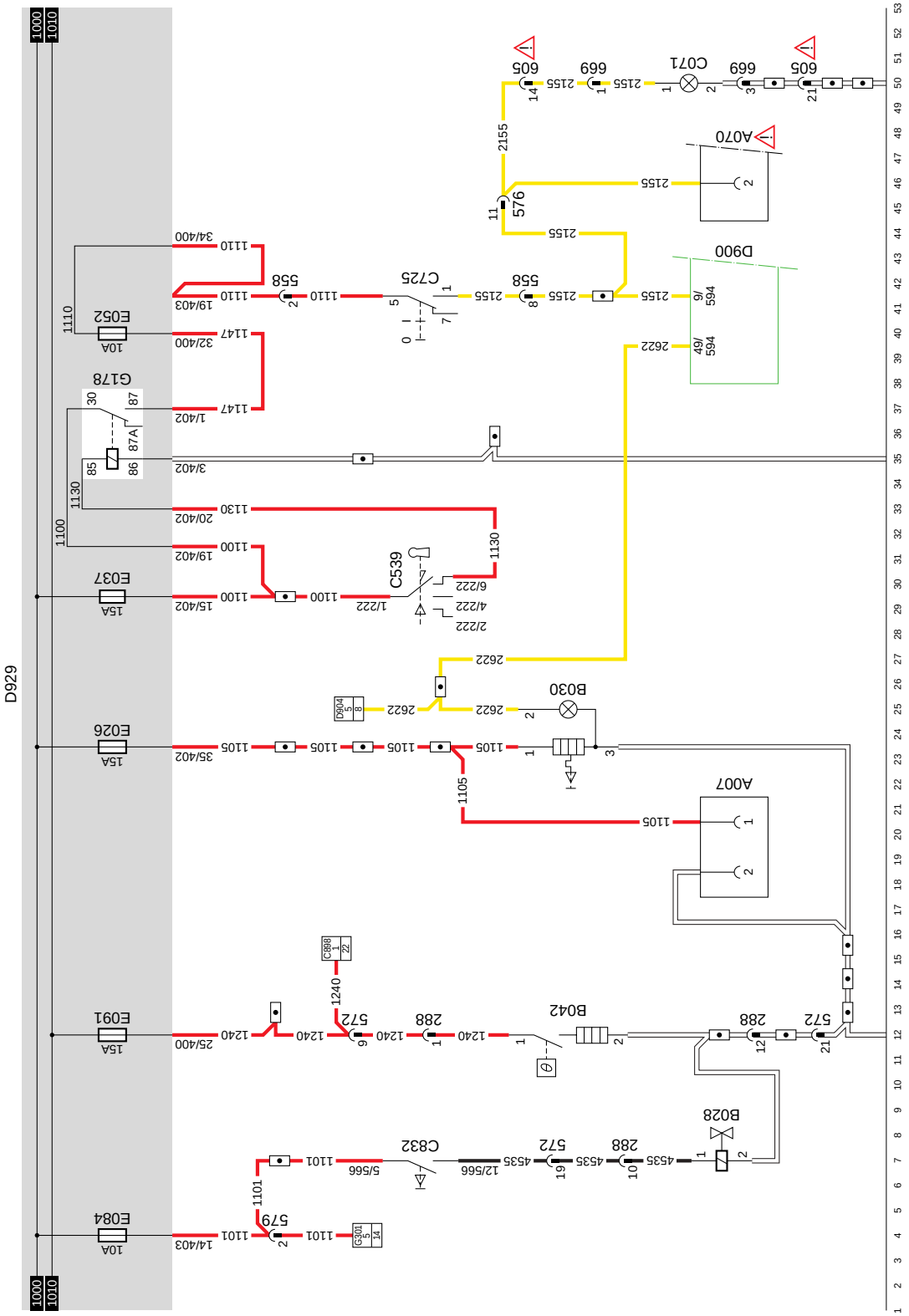

23 **1358030/15** EL000520

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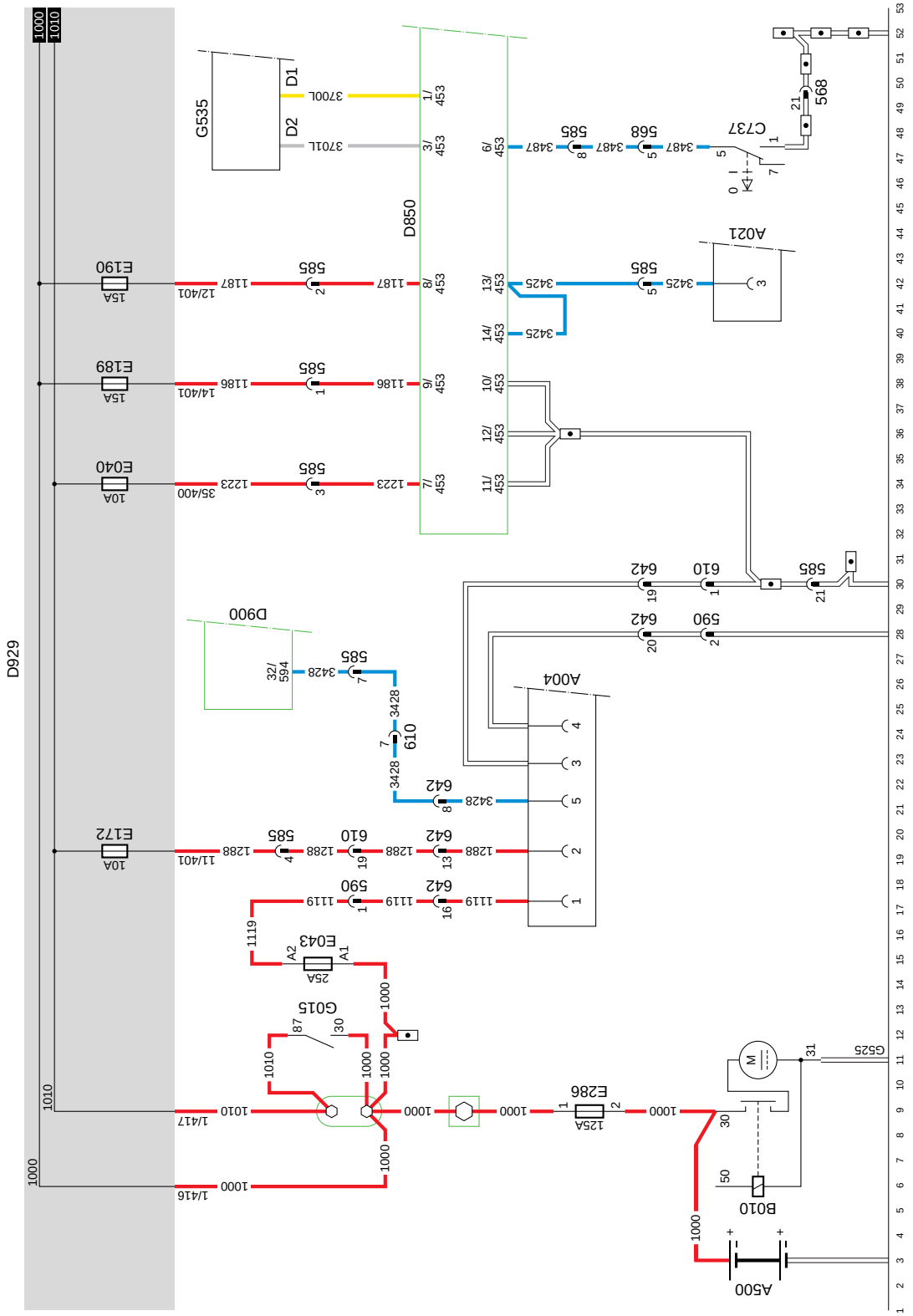
24 ABS - ASR - D
SEE THE SYSTEM MANUAL FOR MORE INFORMATION.

https://www.truck-manuals.net/



24 **1358030/15** EL000521

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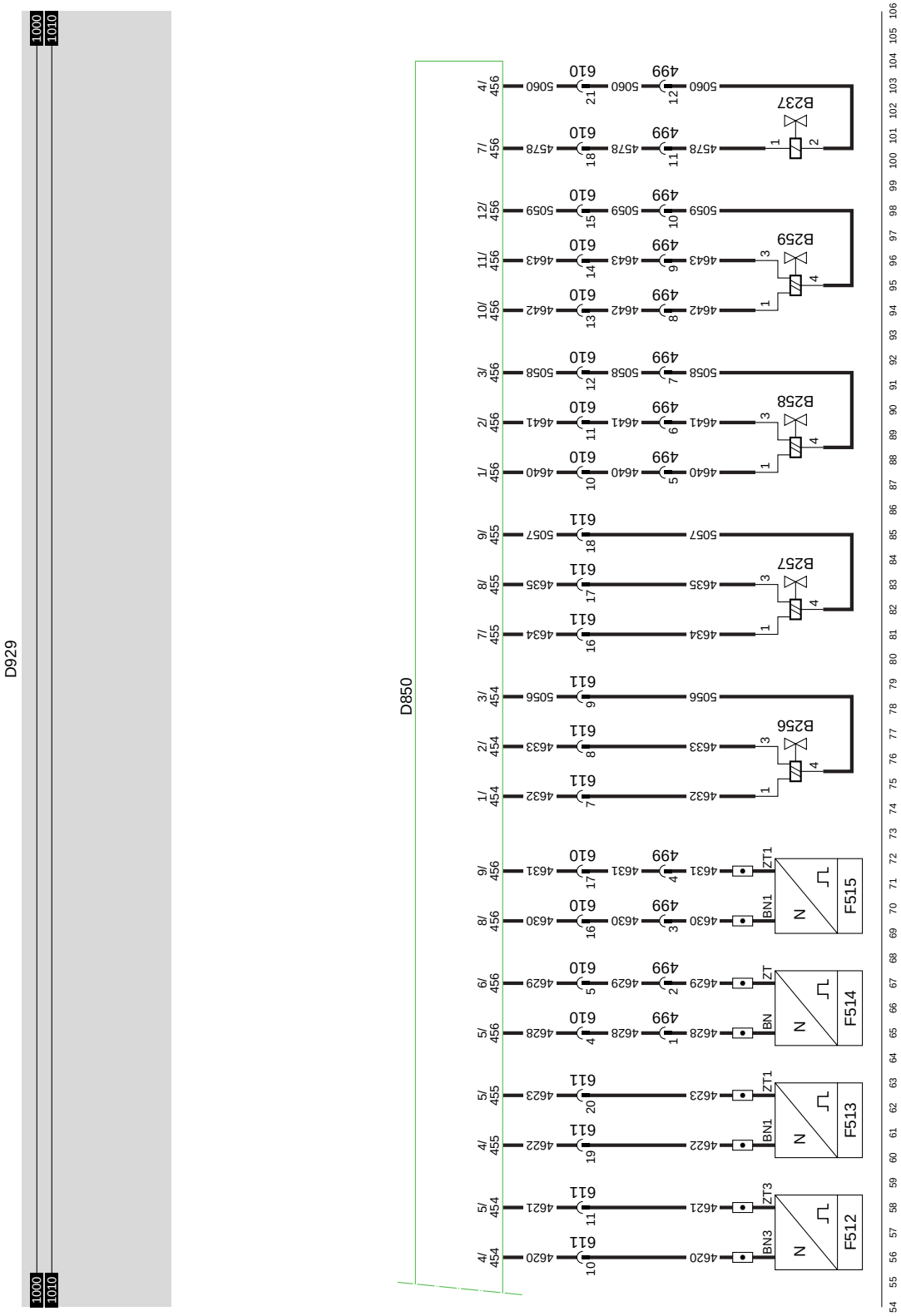

24 **1358030/15** EL000522

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25 DEB

Voltage is applied through fuse E118 and relay G126 to D814 (UPEC electronic unit) and through fuse E184 to valves B192, B247 and B248.
Depending on the position of unit D814, relay G126 is activated, after which a charge is applied to engine brake valve (B192) and engine brake valves (DEB) (B247 and B248).
Depending on unit D814 these valves are connected to earth or are not connected to earth.

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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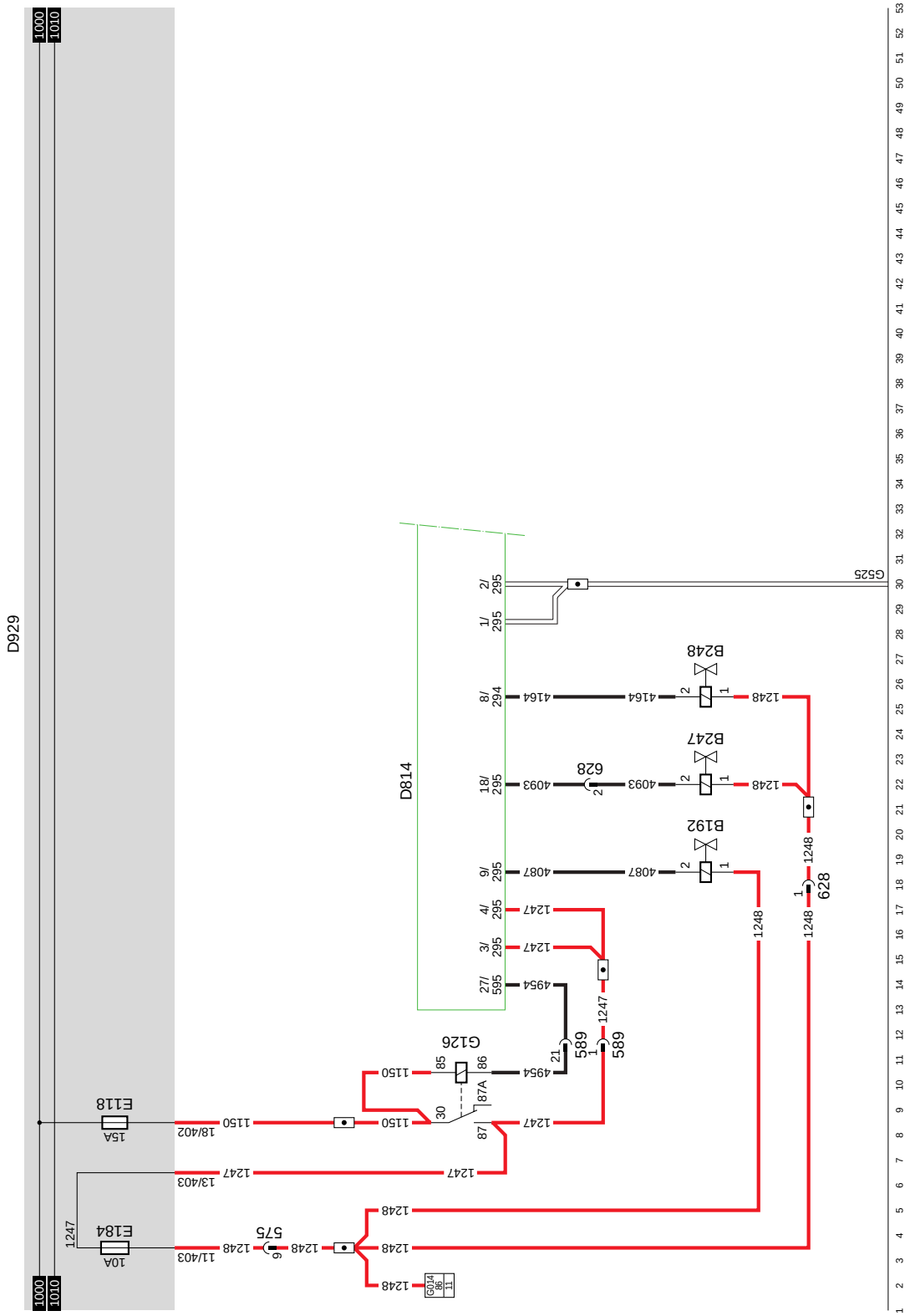

25 **1358030/15** EL000523

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26 INTARDER EST42

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

8 The housing is connected to earth by a separate wire.

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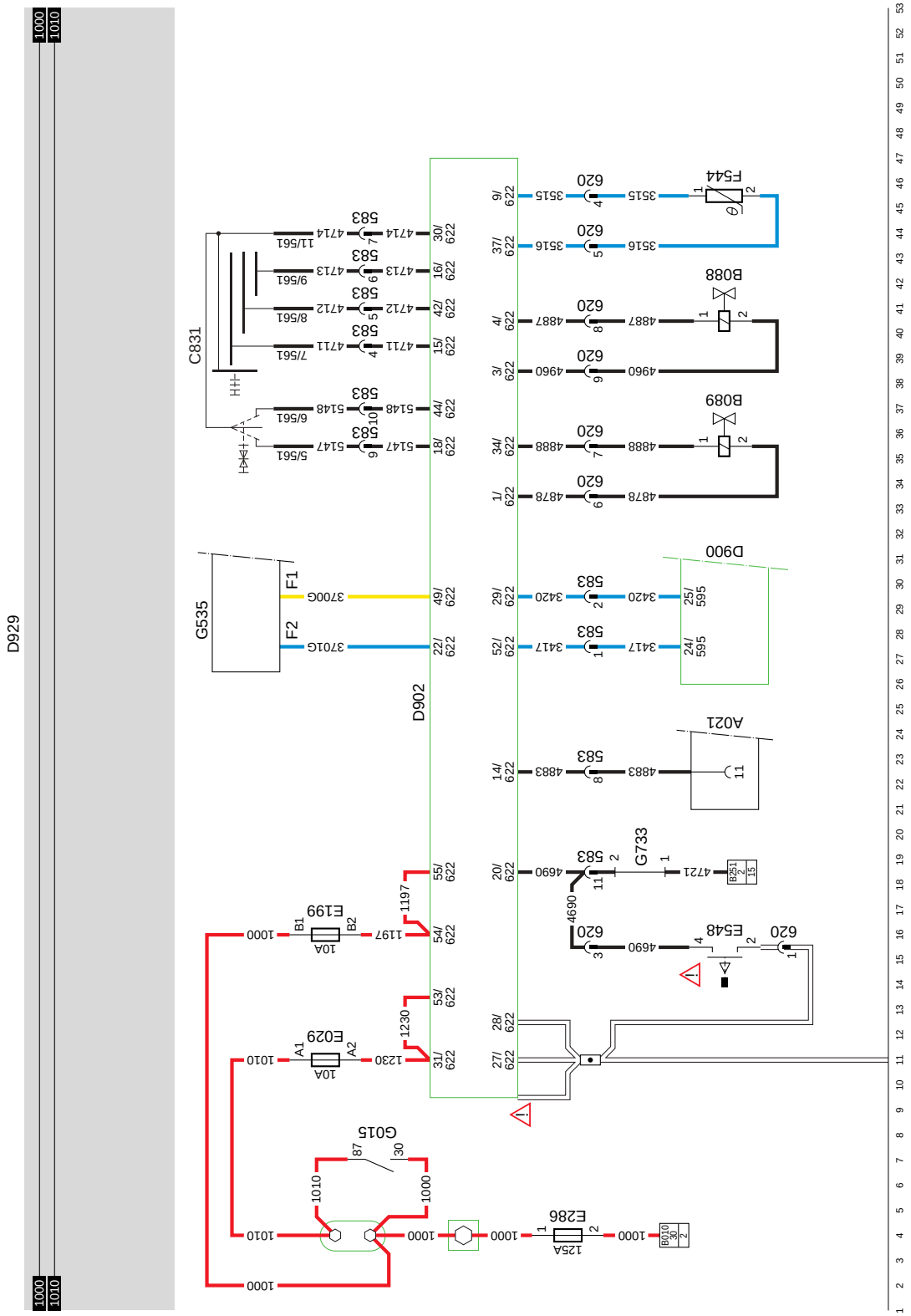

26 **1358030/15** EL000524

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27 ECS-DC3
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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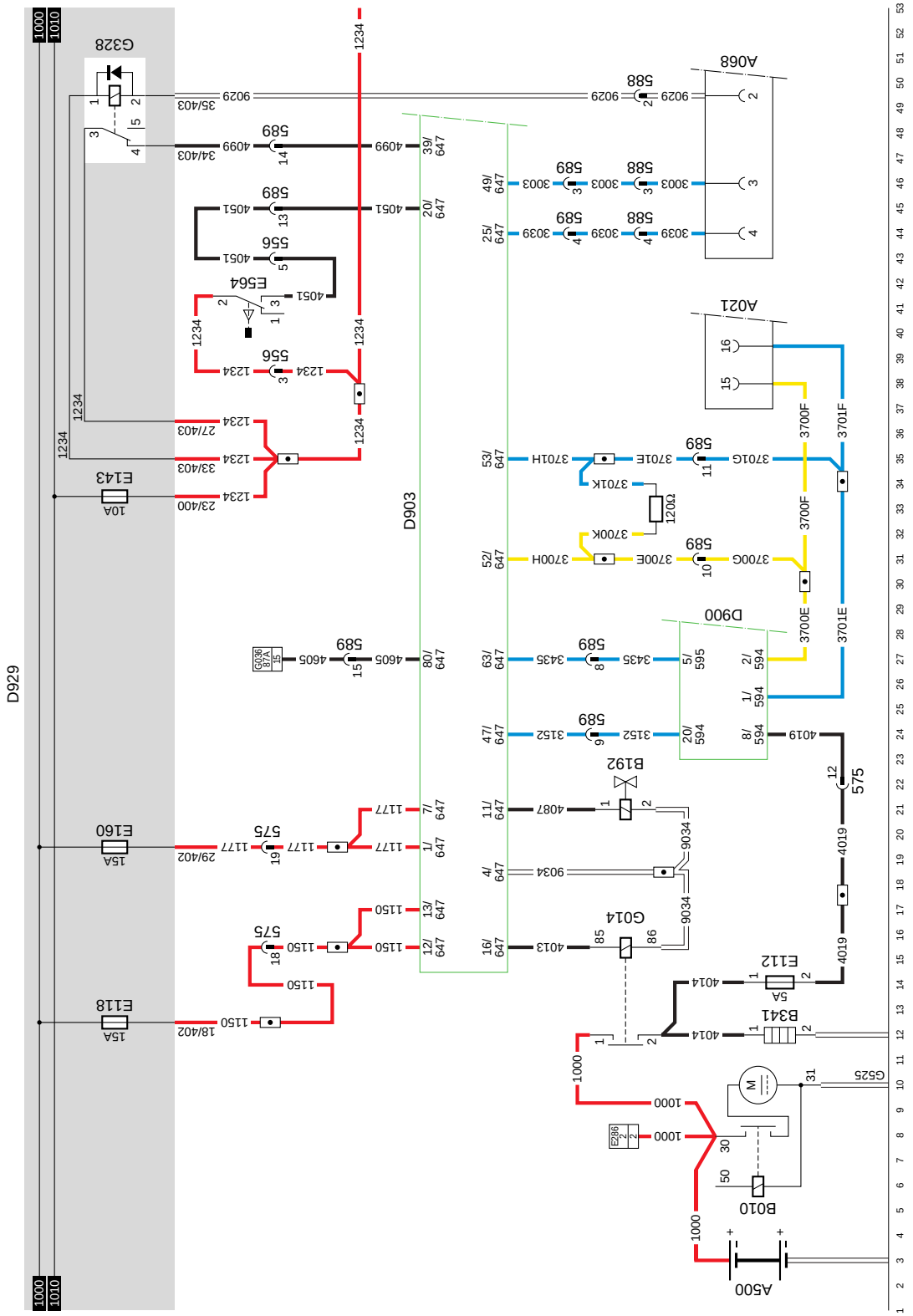

27 **1358030/15** EL000525

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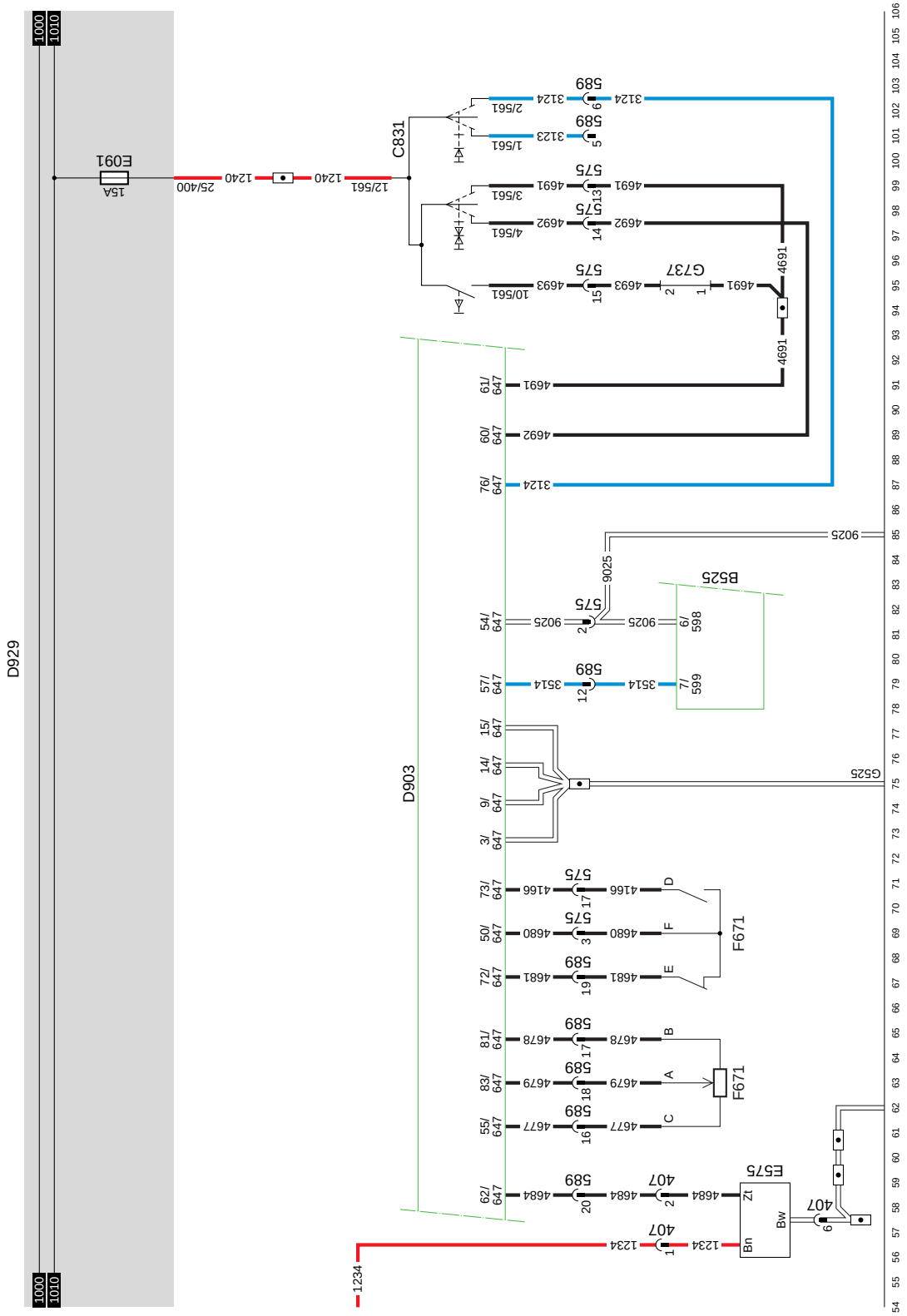

27 **1358030/15** EL000526

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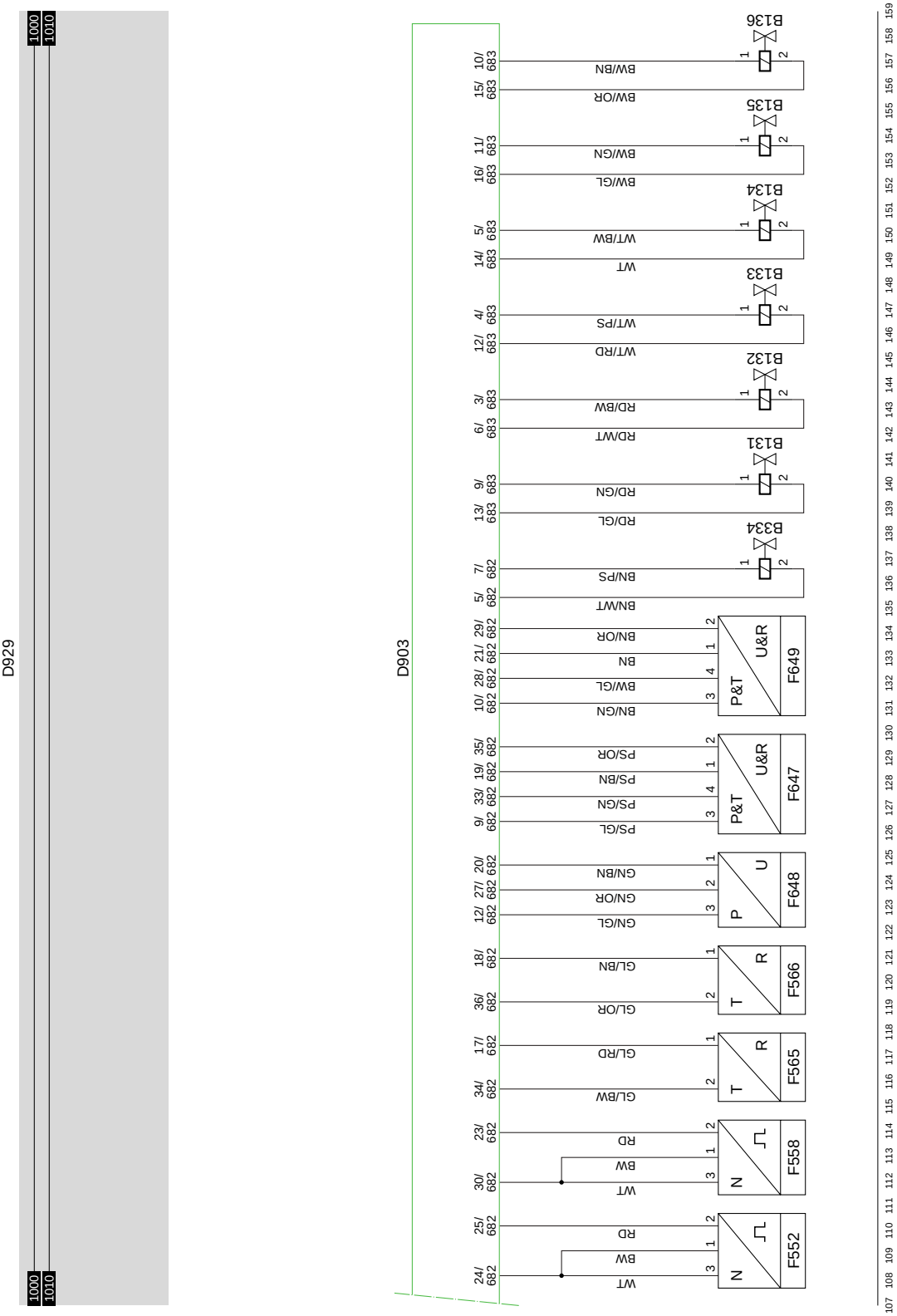

27 **1358030/15** EL000528

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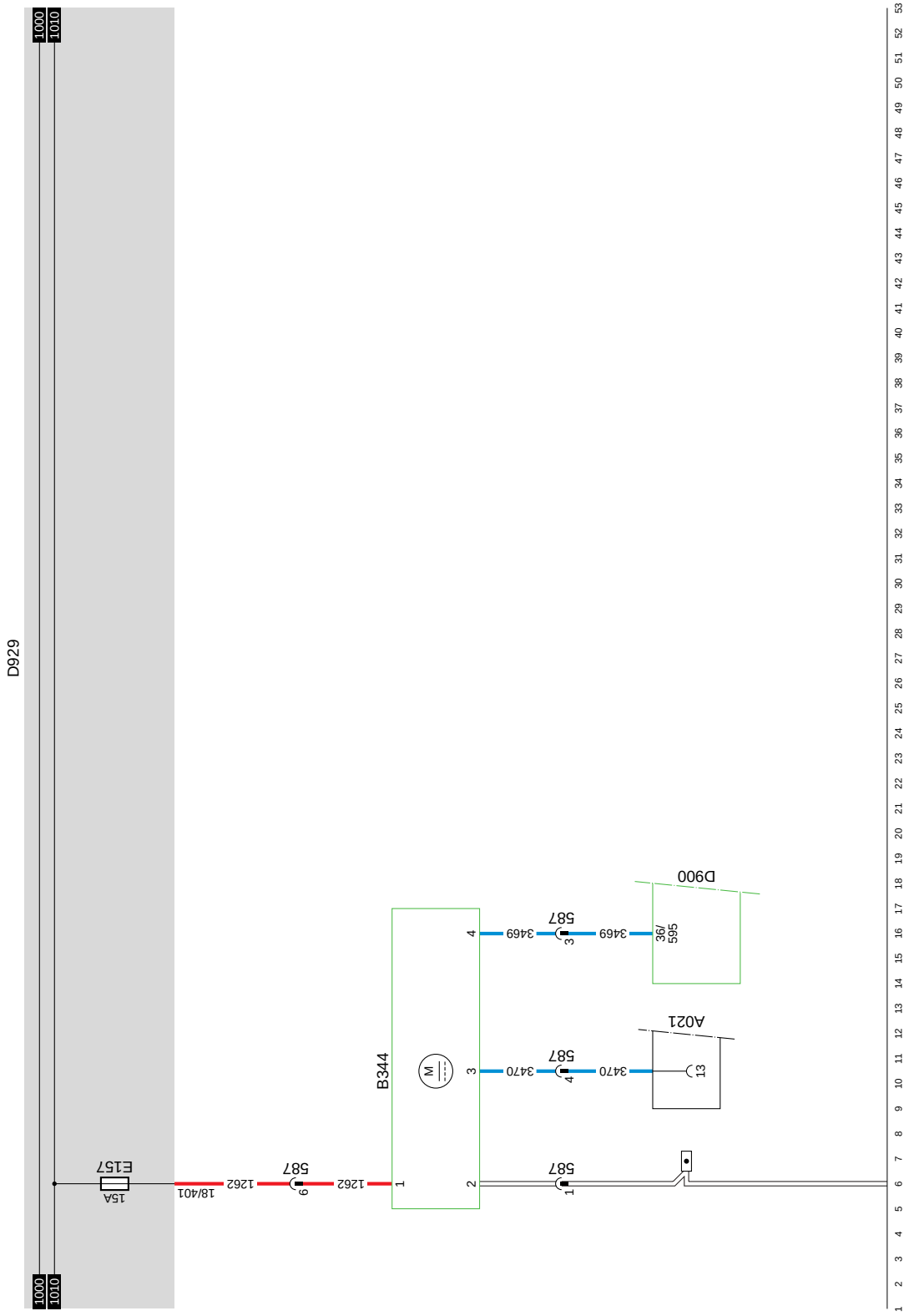
28 AGS
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

https://www.truck-manuals.net/



28 **1358030/15** EL000527

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29 EMAS

SEE THE SYSTEM MANUAL FOR MORE INFORMATION.

VARIANTS

Location
40 Wires from connectors: 679 and 680 do **NOT** have DAF-marking.

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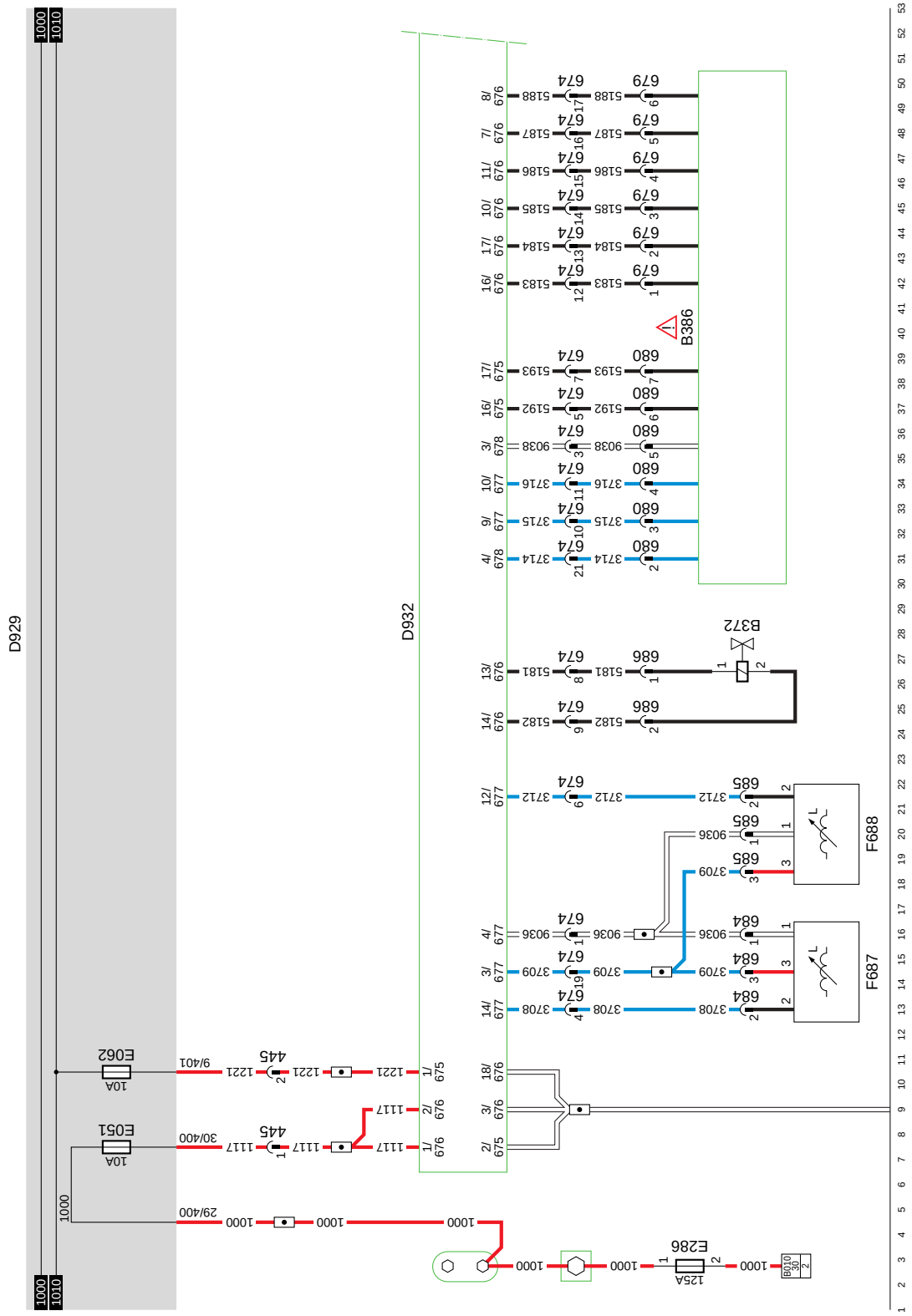

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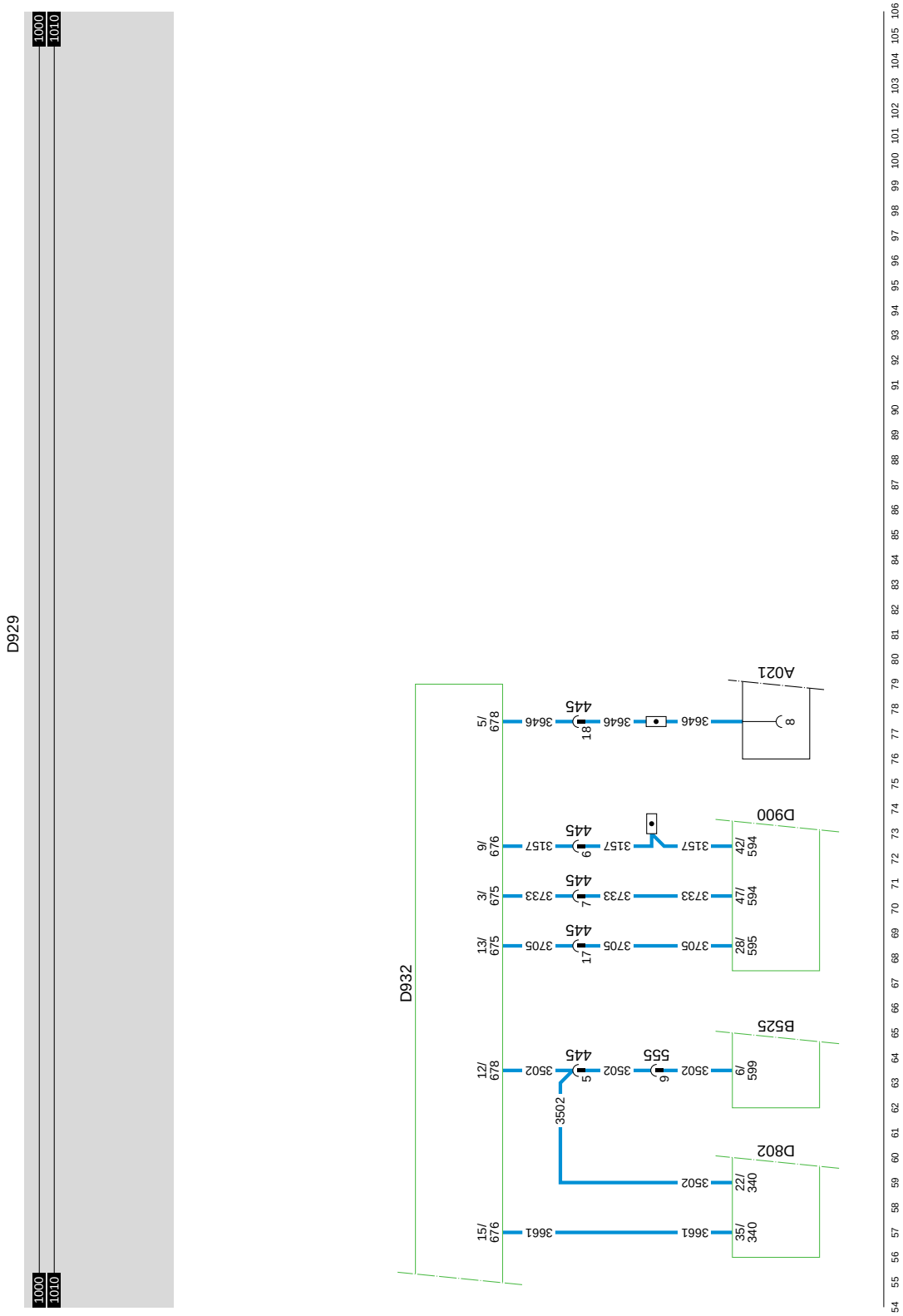

29 **1358030/15** EL000569

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30 AGC
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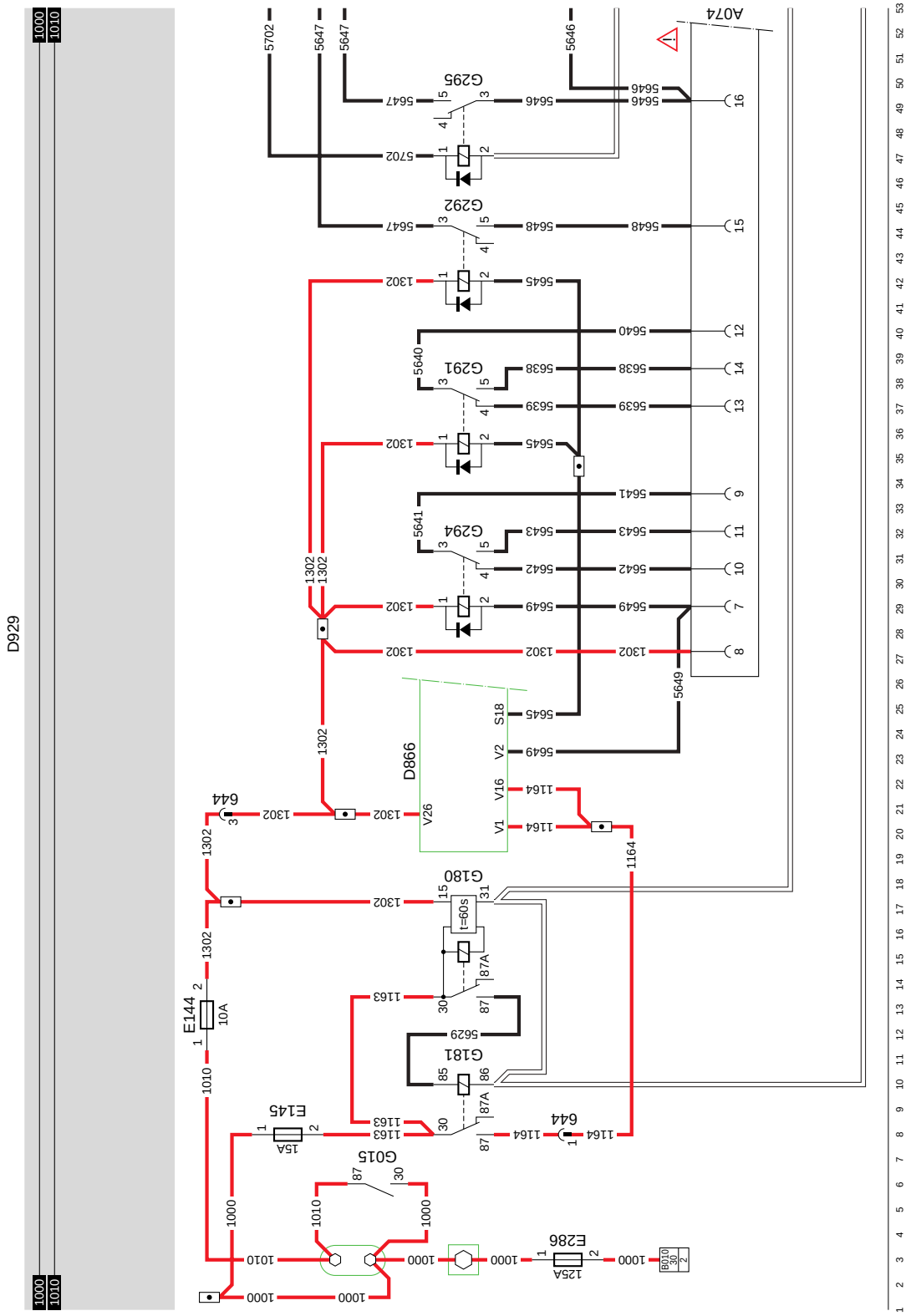

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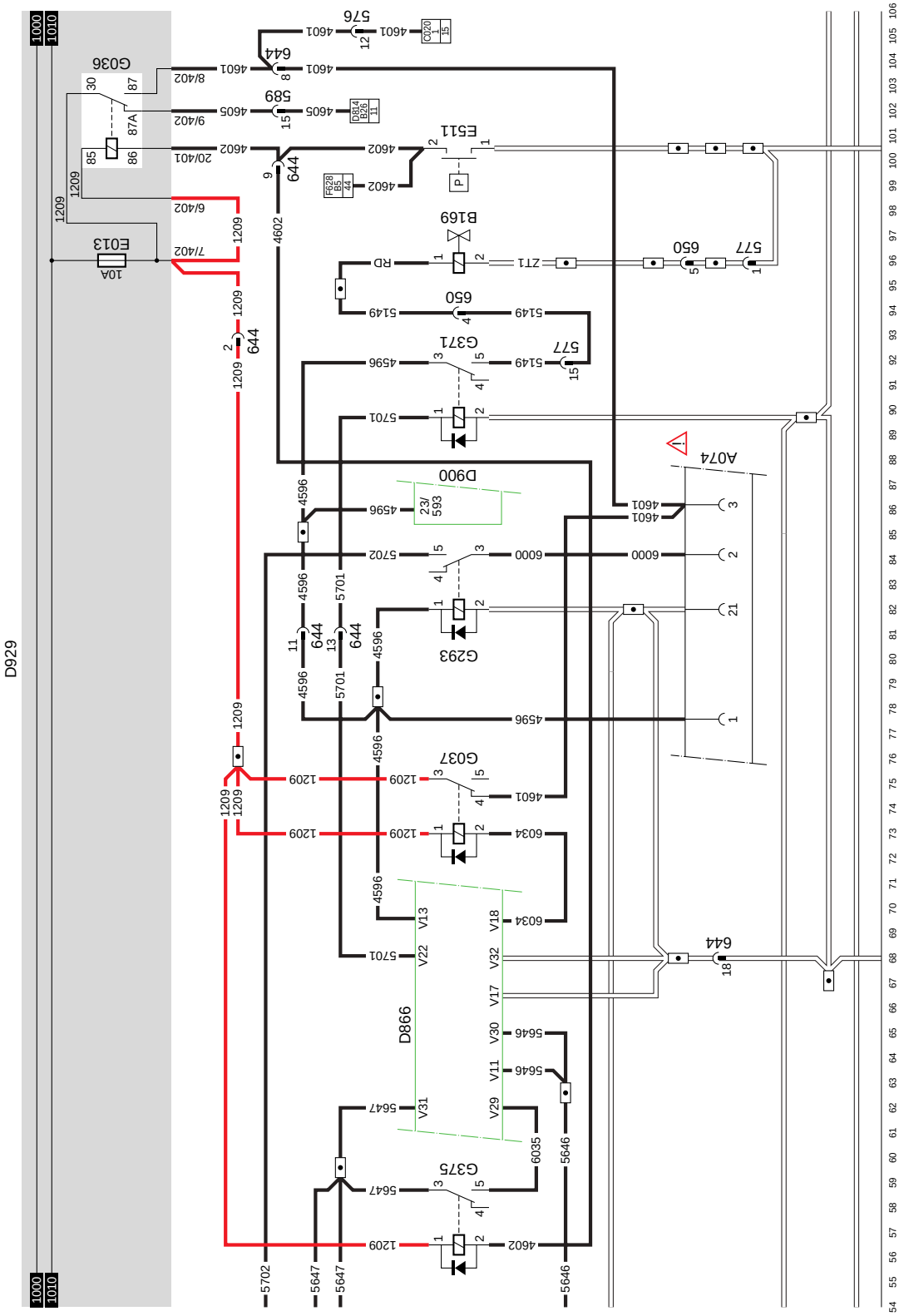

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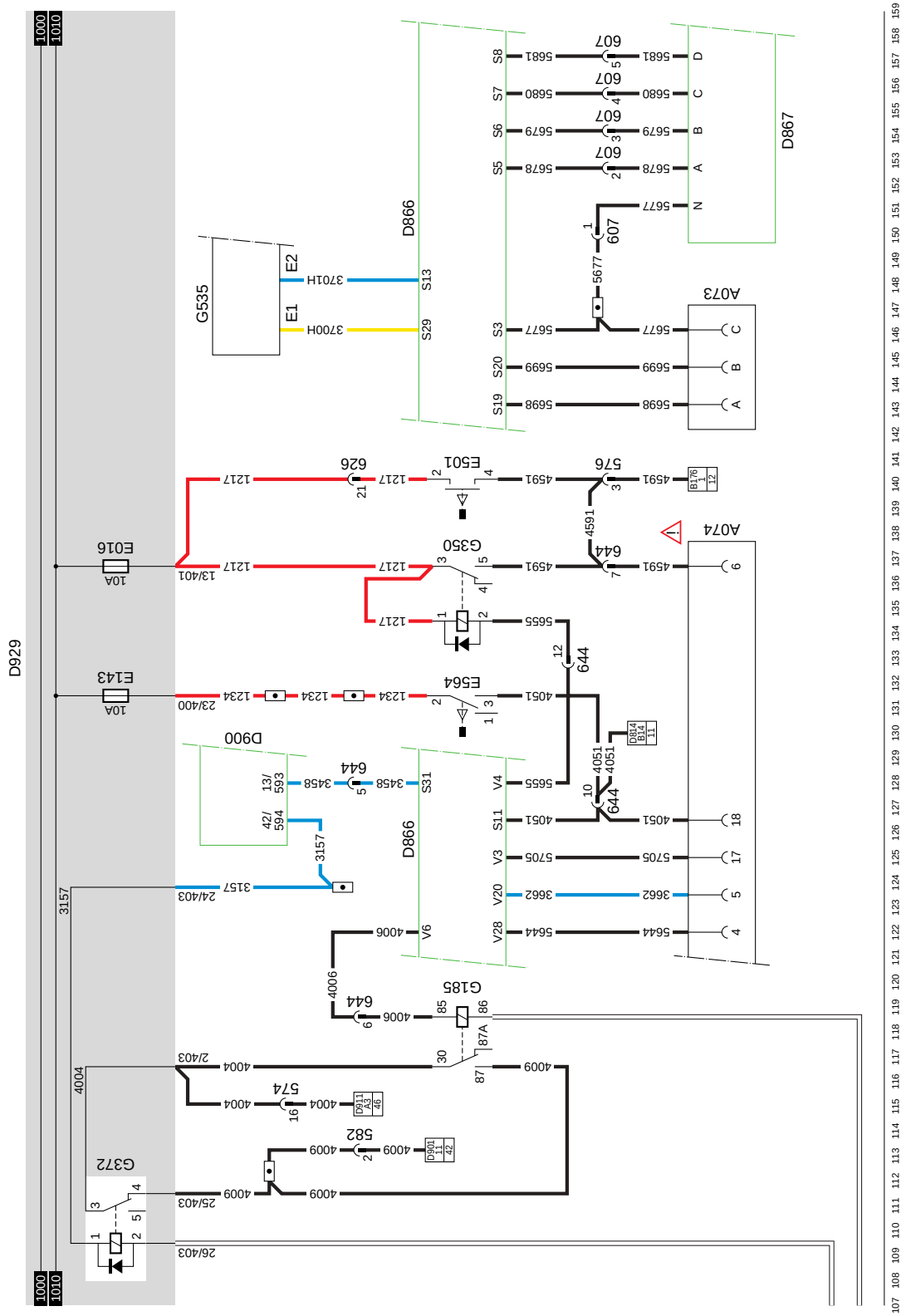

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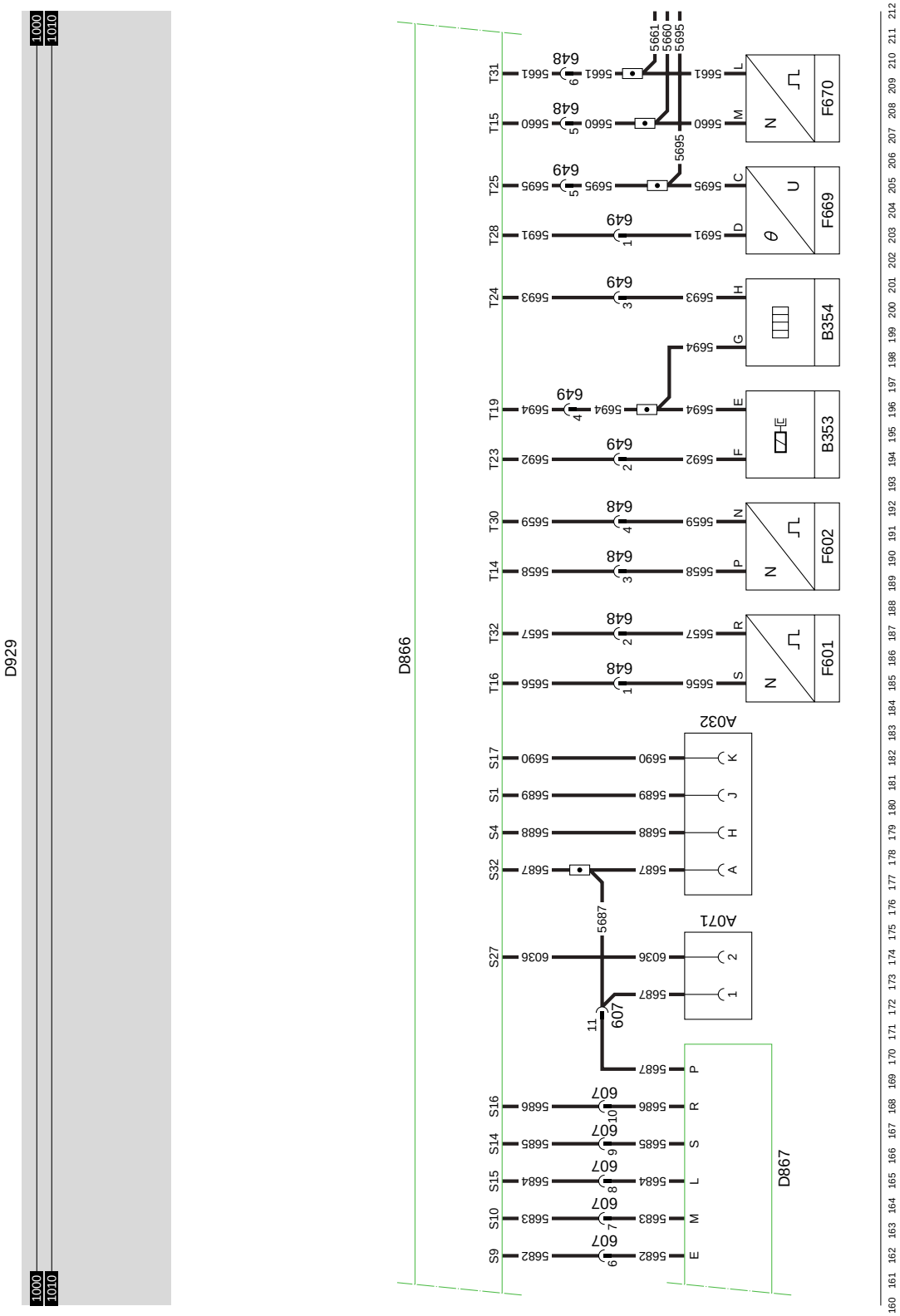
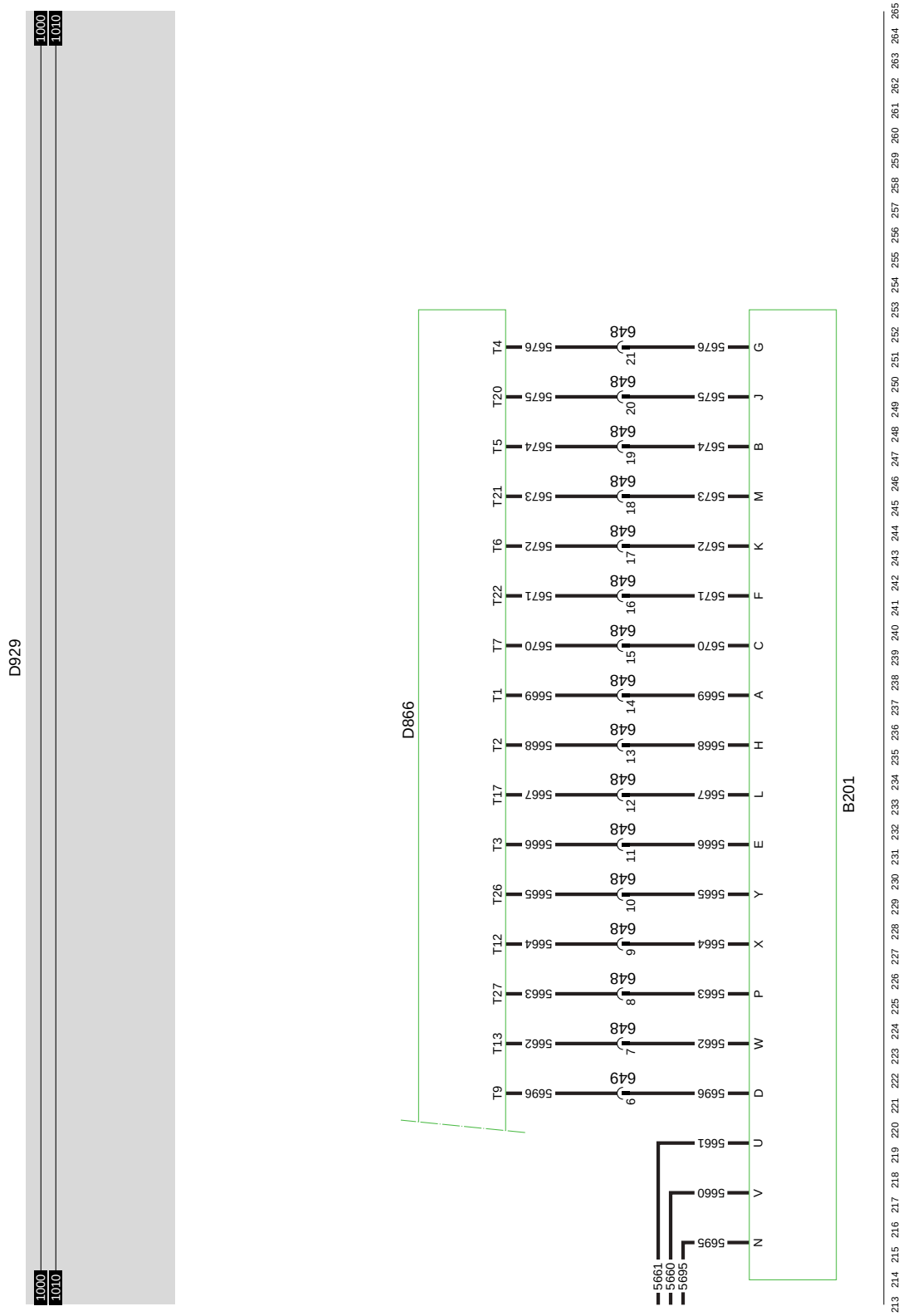


30 **1358030/15** EL000532



30 **1358030/15** EL000533

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31 FAG

A distinction can be made between three different situations:
- rest position (normal position when driving).
- venting steered leading rear axle (increase pressure on driving axle).
- ventilating steered leading rear axle (return to rest).

Operation of traction control mode is limited to a maximum time: 90 seconds.
Traction control mode can only be operated again after a pause of 50 seconds.
By now adjusting a time relay (G095) to a delay time of 60 ± 8 seconds, the pause period is fulfilled.

REST POSITION
When the traction control mode switch C882 is operated (connection between contacts 5 - 1), a voltage is applied to connection point 15 of time relay G095 through fuse E062, wire 1221, contacts 5-3 of C883 and wire 4563.
During normal driving, the traction control mode switch contact (C709) is open. The switch is spring-loaded.

VENTING STEERED LEADING REAR AXLE
Pressing and then releasing the traction control mode switch activates the traction control mode (vents steered leading rear axle).

The time relay (G095) is now switched on for a period of 60 seconds. Contacts 30 - 87 are closed.
Voltage is now applied from the VIC to connection point 1 of BV084. The VIC will only supply a voltage below the programmed speed. This energises the solenoid valve (B084), venting the bellows of the steered leading rear axle. As a result a greater load is placed on the driving axle (more traction).
When the 60 ± 8 seconds have elapsed, the connection 30 - 87 of time relay G095 is broken. As a result, the voltage on valve B084 is also lost.

There is a safety mechanism to prevent overload of the axle. The proximity switch (E542) monitors the axle load.
When the maximum value is reached, the proximity switch (E542) is activated and a supply voltage is applied to connection point 1 of relay G427.
Relay G427 is now energised thereby breaking contacts 3 - 4. The air-vent valve (B084) is no longer activated, so that it is no longer vented, but is immediately ventilated.

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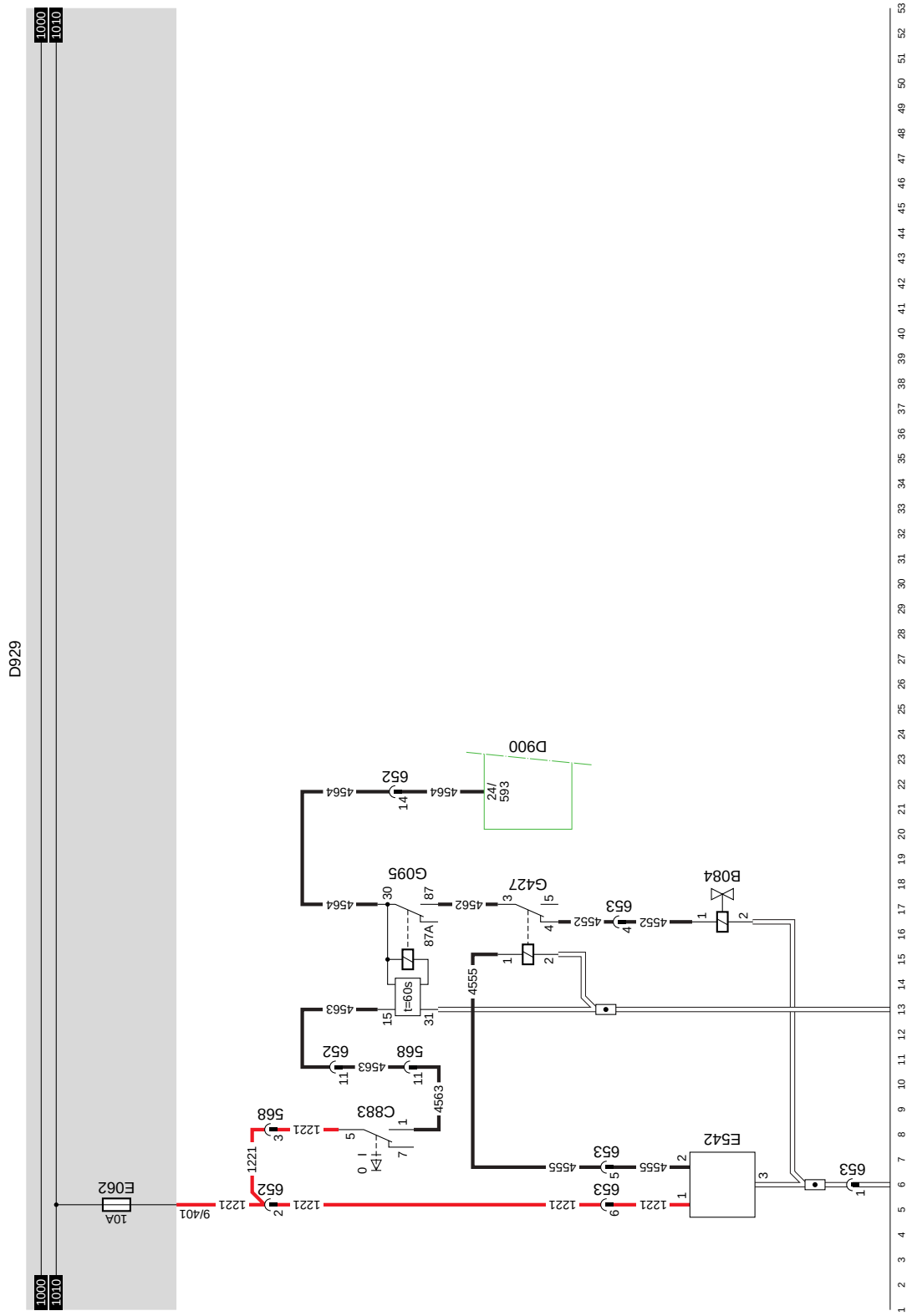

31 **1358030/15** EL000534

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32 PTO

'REQUEST' PTO 1 (= SWITCH ON)
When the PTO operation switch (C750) is operated, a voltage is applied to connection point 11 of A068 (engine speed application connector) and connection point 27 of connector 595 of D900 (VIC) through fuse E091, wire 1240, contacts 5 - 1 of switch C750 and wire 4594. This means that a 'request' to use the PTO has been made. This 'request' is carried out depending on the condition programmed in the VIC. A condition might be that the parking brake must be engaged. In this case, a voltage is applied to connection point 1 of parking switch control switch F000 through fuse E035 and wire 1211. This voltage is also on connection point 1 of connector 596 of D900 (VIC). If parking brake control switch F000 is closed (connection between contacts 1 - 2), this voltage is also on connection point B22 of D814 (UPEC electronic unit) and on connection point 26 of connector 595 of D900 through wire 3402.

OPERATION
When the 'PTO request' is carried out, the following takes place:

A voltage is applied from connection point 23 and connector 593 of D900 to connection point 1 of E570 (clutch - PTO N10 pneumatic switch) (if present) and to connection point 3 of relay G259 (PTO-operation takeover relay) (if present) through wire 4596. When switch E570 (clutch - PTO N10 switch) is operated by depressing the clutch pedal, (connection between contacts 1 - 2), a voltage is applied to connection point 1 of relay G259 and to connection point 1 of B245 (PTO operation valve). Relay G259 is energised and, as a result, a connection is made between contacts 3 - 5 of relay G259. Relay G259 now remains energised irrespective of E570 (this is a 'memory' function). B245 is also activated and this switches the PTO on.

The VIC checks that the PTO is actually switched on. This takes place as follows: When the PTO has been switched on, F087 is operated mechanically. Contacts 1 - 2 of F087 close. Connection point 14 of VIC connector 593 is now connected to earth.

The VIC then sends a message to the DIP and the "PTO active" warning is activated. In the event that the PTO does **NOT** switch on, F087 is **NOT** operated and connection point 14 of connector 593 is **NOT** connected to earth. After a period of time programmed in the VIC a 'message' is sent to the DIP and the "PTO fault" warning symbol is activated.

'CANCEL' PTO 1 (= SWITCH OFF)
Breaking contacts 5 - 1 of C750 switches the PTO off. This interrupts the voltage from connection point 27 of connector 595. One of the switch on conditions for operation of the PTO is now absent. The VIC responds to this by removing the voltage on connection point 23 of connector 593. The voltage on relay G259 is interrupted and, as a result, the coil is no longer energised. Contacts 5 - 3 open and, as a result, the voltage on connection point 1 of B245 is lost. The valve is no longer energised and the PTO is switched off.

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SWITCHING ON PTO 2
A voltage is applied to connection point 5 of C751 (PTO operation switch) through fuse E091 and wire 1240. When this switch is operated (connection between contacts 5 - 1), voltage is applied to connection point 1 of valve B246 (PTO operation valve) through wire 4595. This valve is activated following which the PTO switches on.
When the PTO is switched on, F088 (PTO gearbox control switch) is operated mechanically. A voltage is now applied to connection point 1 of D094 (PTO 2 (orange) warning light) through fuse E091 and wire 1240. Connection point 2 of D094 is connected to earth through switch F088 (connection between contacts 1 - 2) and wire 3668. D094 is activated.

SWITCHING OFF PTO 2
Breaking contacts 5 - 1 of C751 switches off PTO 2.
This interrupts the voltage on connection point 1 of C751. Valve C751 is no longer energised and the PTO is switched off.
Switch F088 is re-opened (connection between contacts 2 - 1 no longer exists). The earth connection with D094 is interrupted and the light goes out.

VARIANTS

Location	
7	Option
26	Connection if there is no N10 PTO clutch switch present.
32, 35, 44, 47:	Connector 626: only applicable for FA type vehicle.
35, 44	Connector 650: only applicable if the vehicle has an Allison gearbox.

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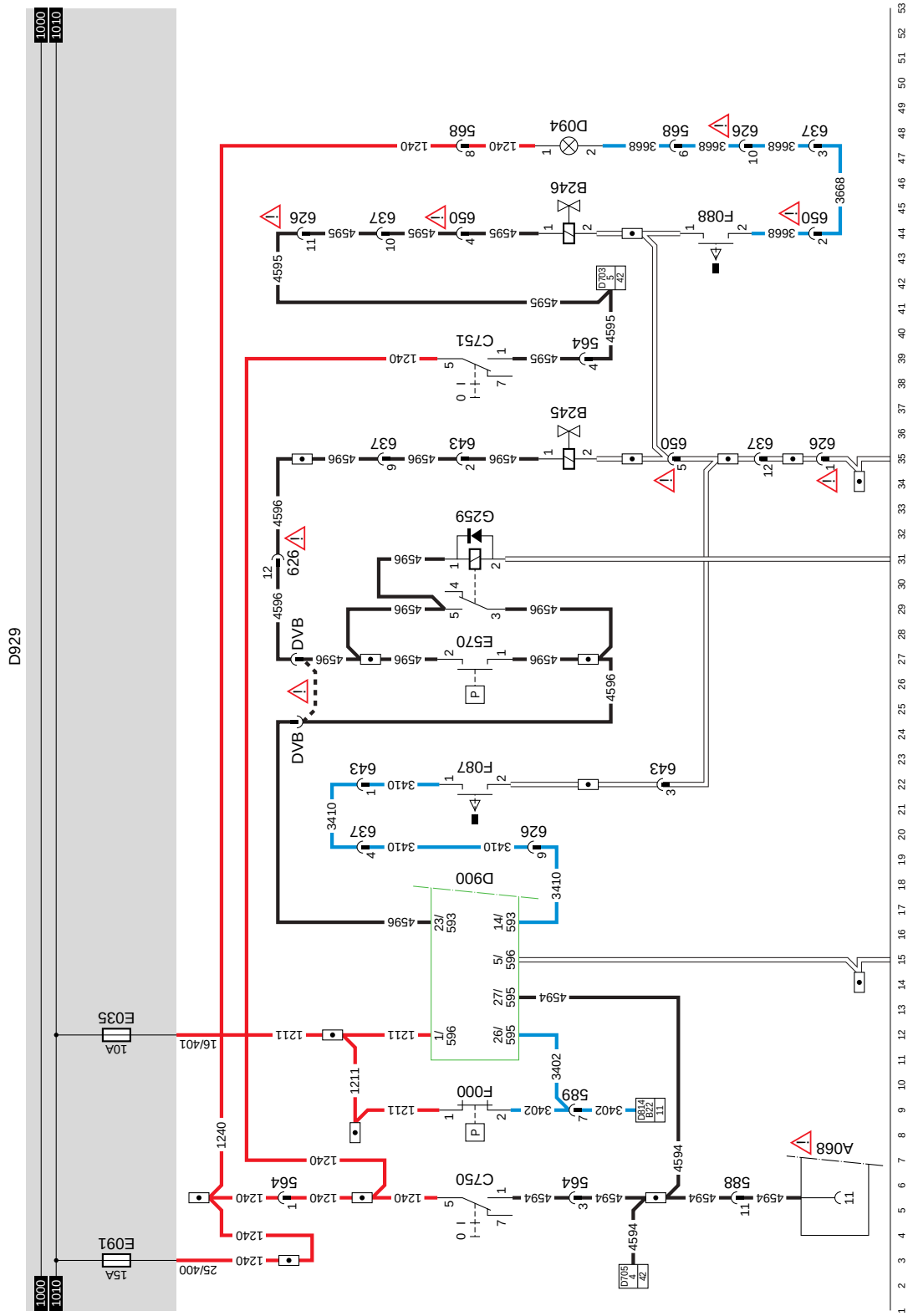

32 **1358030/15** EL000535

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33 ROOF SPOTLIGHTS/COOLER BOX/ROTATING LIGHTS

SPOTLIGHTS ON ROOF

Marker/parking lights in roof spotlights.
A voltage is applied to connection point 2 of C622 (light switch) through fuse E084 and wire 1101. When this switch is switched on (connection between contacts 2 - 1), the voltage is applied to connection point 85 of relay G000 (tail light/side-light relay) via wire 2100. This is energised. A voltage is now applied to C074 (left rear side-light) and C012 (left front side-light) respectively and to C163, C165, C167 and C169 (side-light/roof spotlights) respectively through contacts 30 - 87 of relay G000, fuse E000 and wire 2102. The marker and parking lights in the spotlights now come on.

Roof spotlights
A voltage is applied to connection point 8 of C832 (right direction indicator/windscreen wiper steering column switch) through fuse E084 and wire 1101. When this switch is switched on (connection between contacts 8 - 9), voltage is applied to connection point 85 of relay G002 (main beam relay) via wire 2120. This is energised. A voltage is now applied to C002 (left main beam) and connection point 6 of C813 (roof spotlights switch) respectively through contacts 30 - 87 of relay G002, fuse E006 and wire 2122.

When this switch is closed (connection between contacts 6 - 2), voltage is also applied to connection point 85 of G299 (roof spotlights relay). This is energised. A voltage is now applied to connection point 1 of C162, C164, C166 and C168 (roof spotlights) respectively through fuse E142, wire 1154 and contacts 30 - 87 of G299. These will now light up.

COOLER BOX
The cooler box is connected to voltage BEFORE ignition. Voltage is also applied to connection point 1 of B358 (cooler box) through fuse E142 and wire 1154.

ROTATING LIGHTS
The rotating lights are connected to voltage AFTER ignition. A voltage is applied to connection point 6 of C716 (blue rotating light switch) through fuse E163 and wire 1258. When the switch is closed (connection between contacts 6 - 2), voltage is applied to C144 (driver's side blue rotating light) and C145 (co-driver's side blue rotating light) through wire 2017. These rotating lights will now come on. Orange rotating lights can be used instead of blue rotating lights in combination with switch C715.

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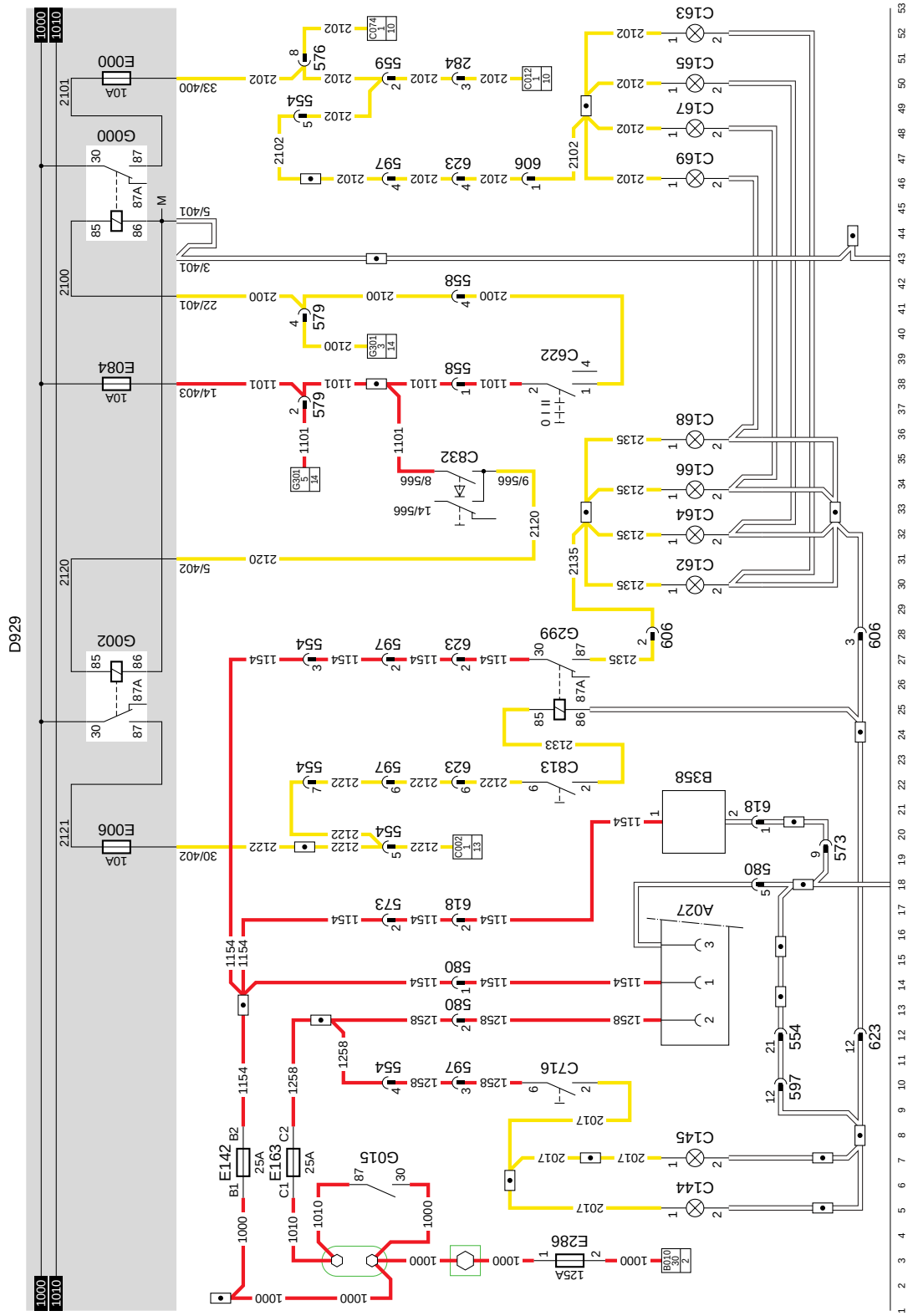

33 **1358030/15** EL000536

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34A ECAS 3 (4x2)

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

69 Connector 651 only for FA type vehicle.

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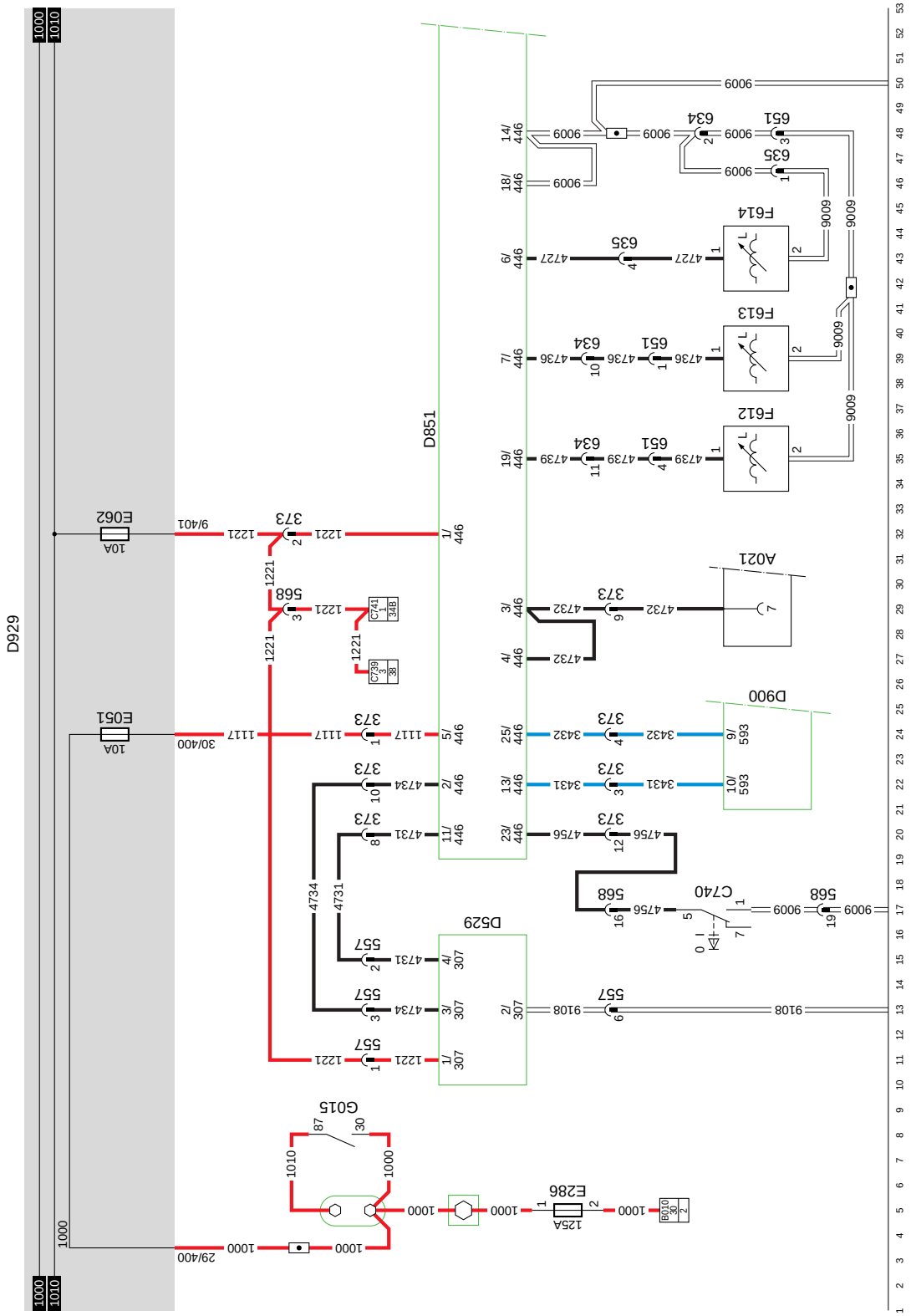

34A **1358030/15** EL000537

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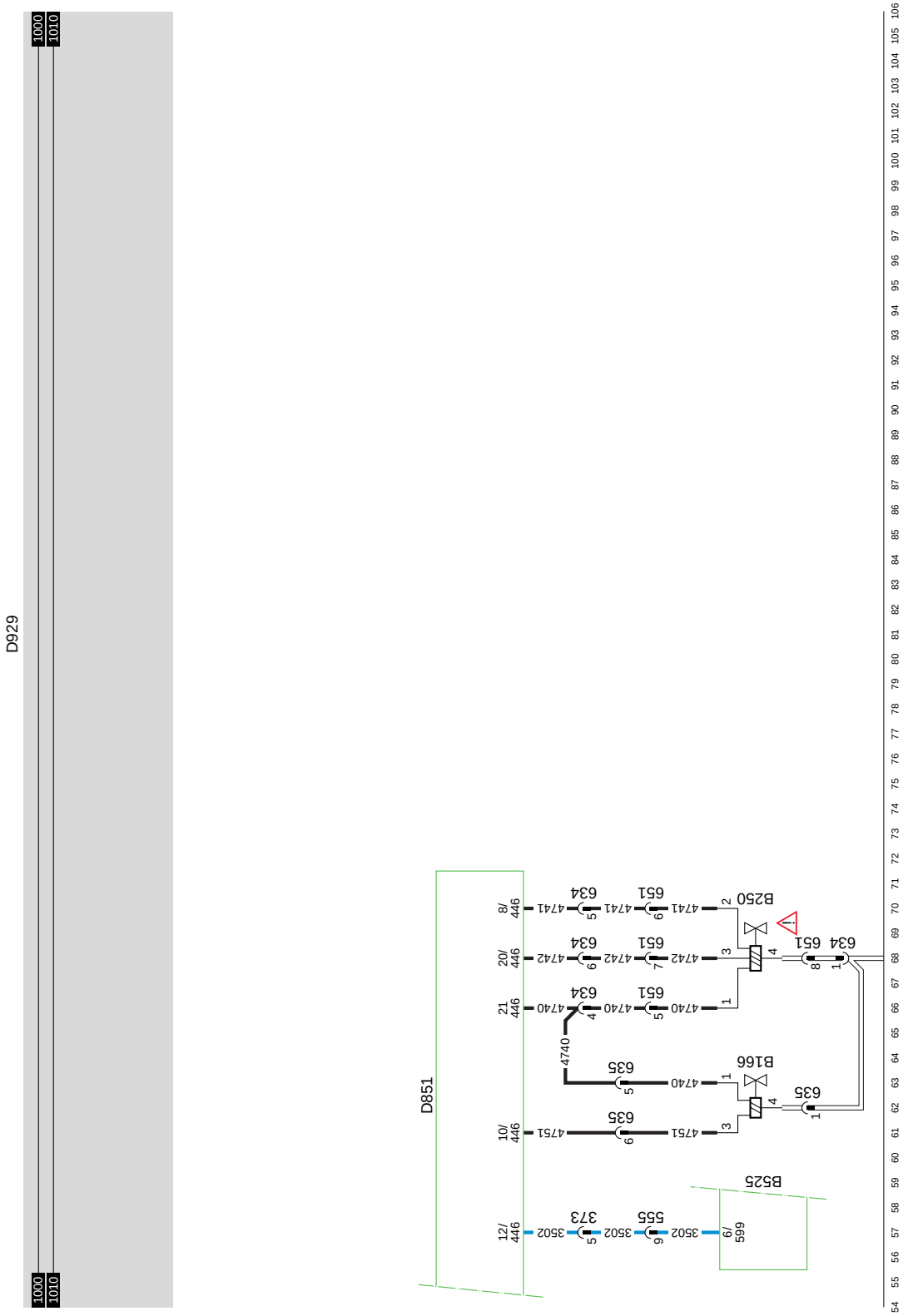

34A **1358030/15**

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34B ECAS 2 (6x2)
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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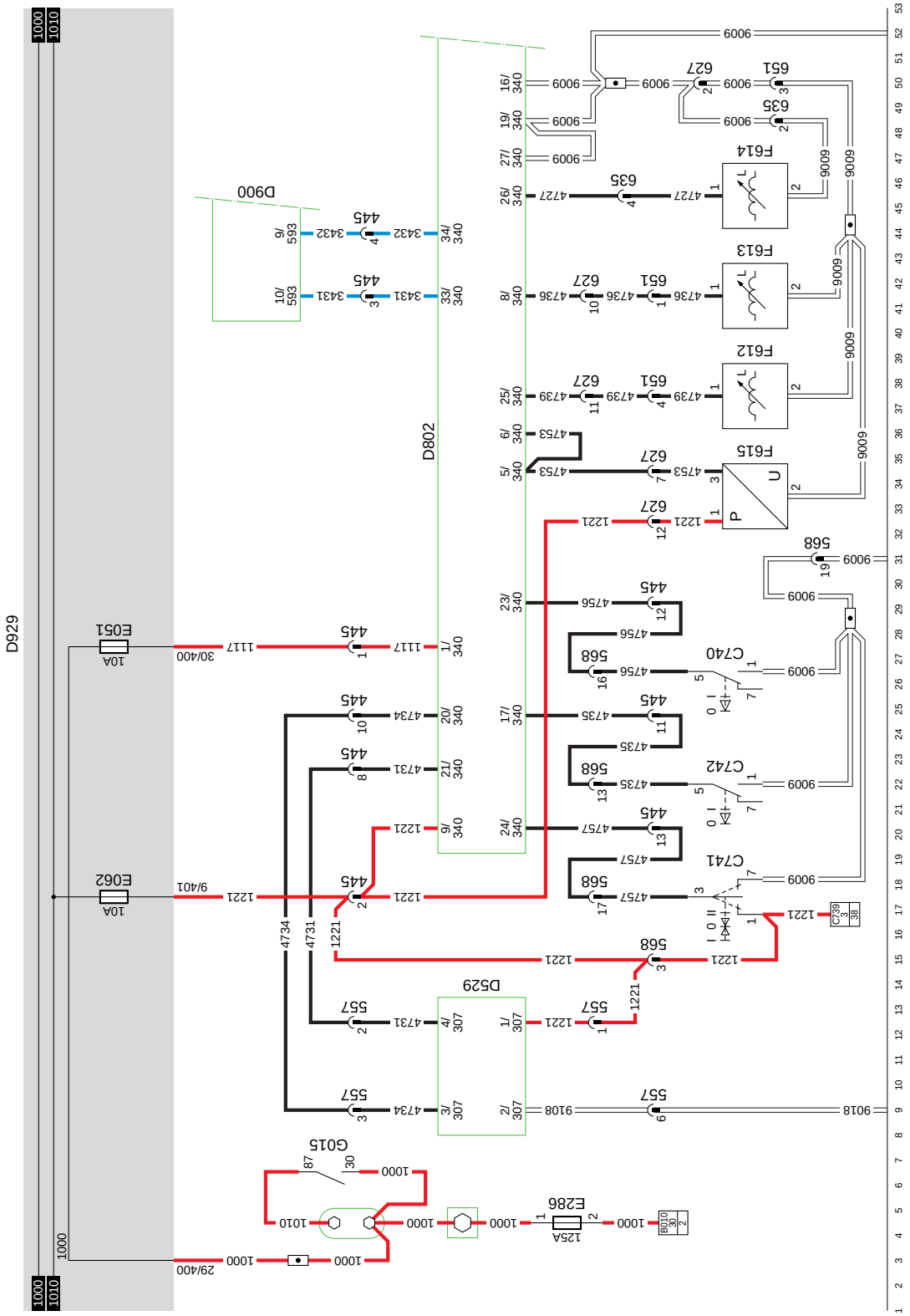

34B **1358030/15**

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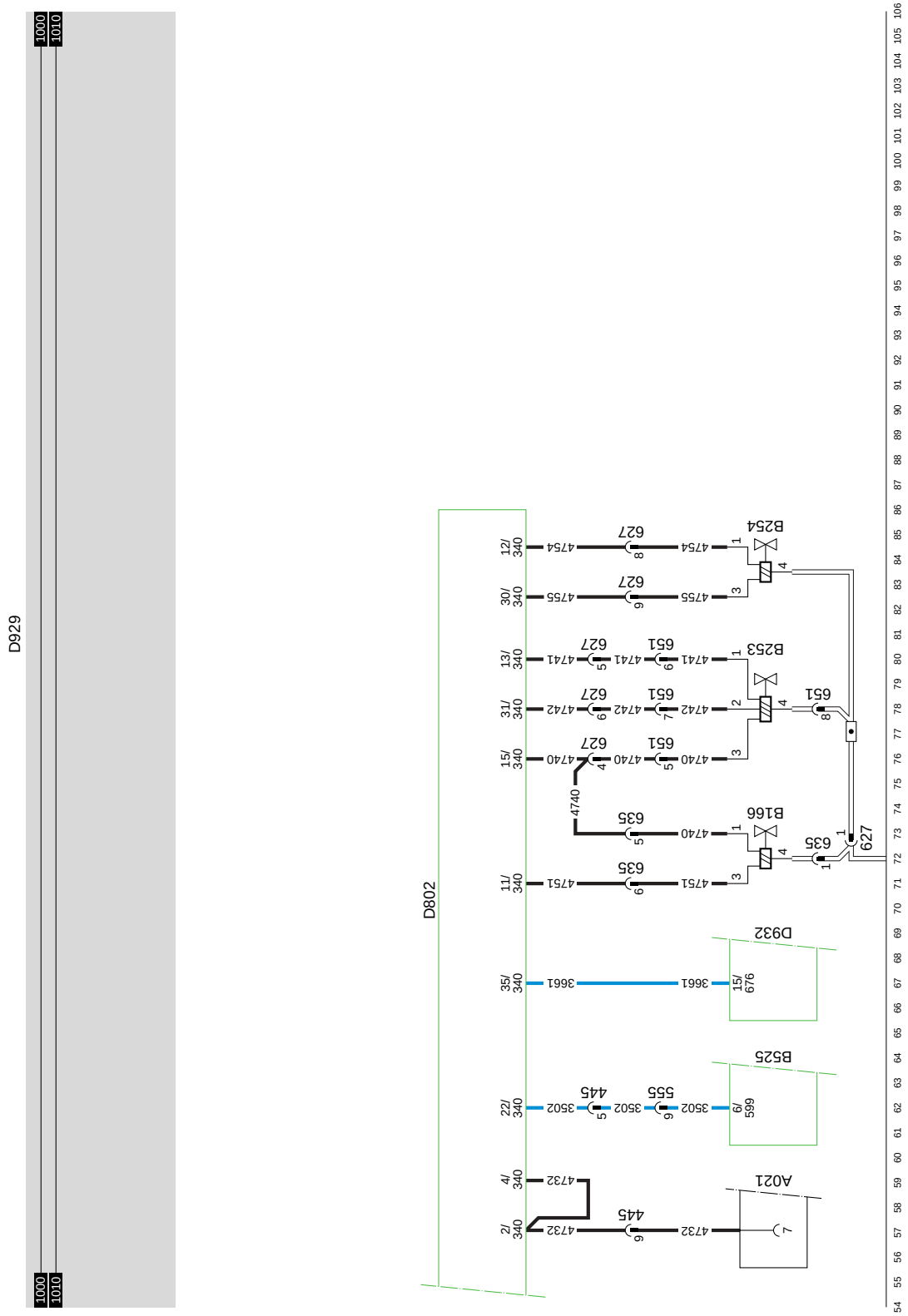

34B **1358030/15**

EL000540

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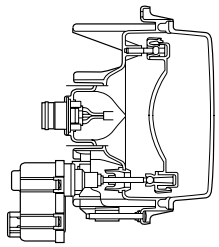
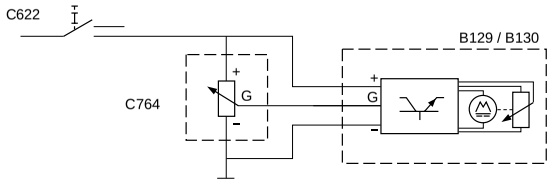
35 HEADLAMP HEIGHT ADJUSTMENT

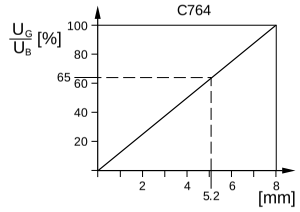
Operation

Parking and marker lights position
A voltage is applied to connection 2 of switch C622 (light switch) through fuse E084 and wire 1101. If a connection is made to switch C622 (contacts 2 and 85), a voltage is applied to contact 1 of relay G000 (tail light/side-light relay) via wire 2100. When this relay is energised, a connection is made between points 30 and 87. As a result, a voltage is applied to connection point A of switch C764 (headlamp-height adjustment potentiometer) through relay G000 (contacts 30 - 87), wire 2101, fuse E117 and wire 2630. The LED in the switch will now illuminate.

Dipped beam position
When a connection is made between contacts 2 and 4 on switch C622, a voltage is applied to connection point 85 of relay G000 through fuse E084, wire 1101, switch C622, wire 2110, through D609 (light switch diode). There is also a voltage on B129 (left headlamp-height adjustment motor), connection point 4, B130 (right headlamp-height adjustment motor), connection point 1 and connection point 5 of C764 (headlamp-height adjustment potentiometer). Depending on the position of C764 (headlamp height-adjustment potentiometer), the motor in the headlamp will be activated. The headlamp-height adjustment motor remains activated until there is an electrical equilibrium. This equilibrium refers to the voltage difference that exists between wires 2110 and 4953 of C764, B129 and B130. The voltage difference should be the same for all three components.







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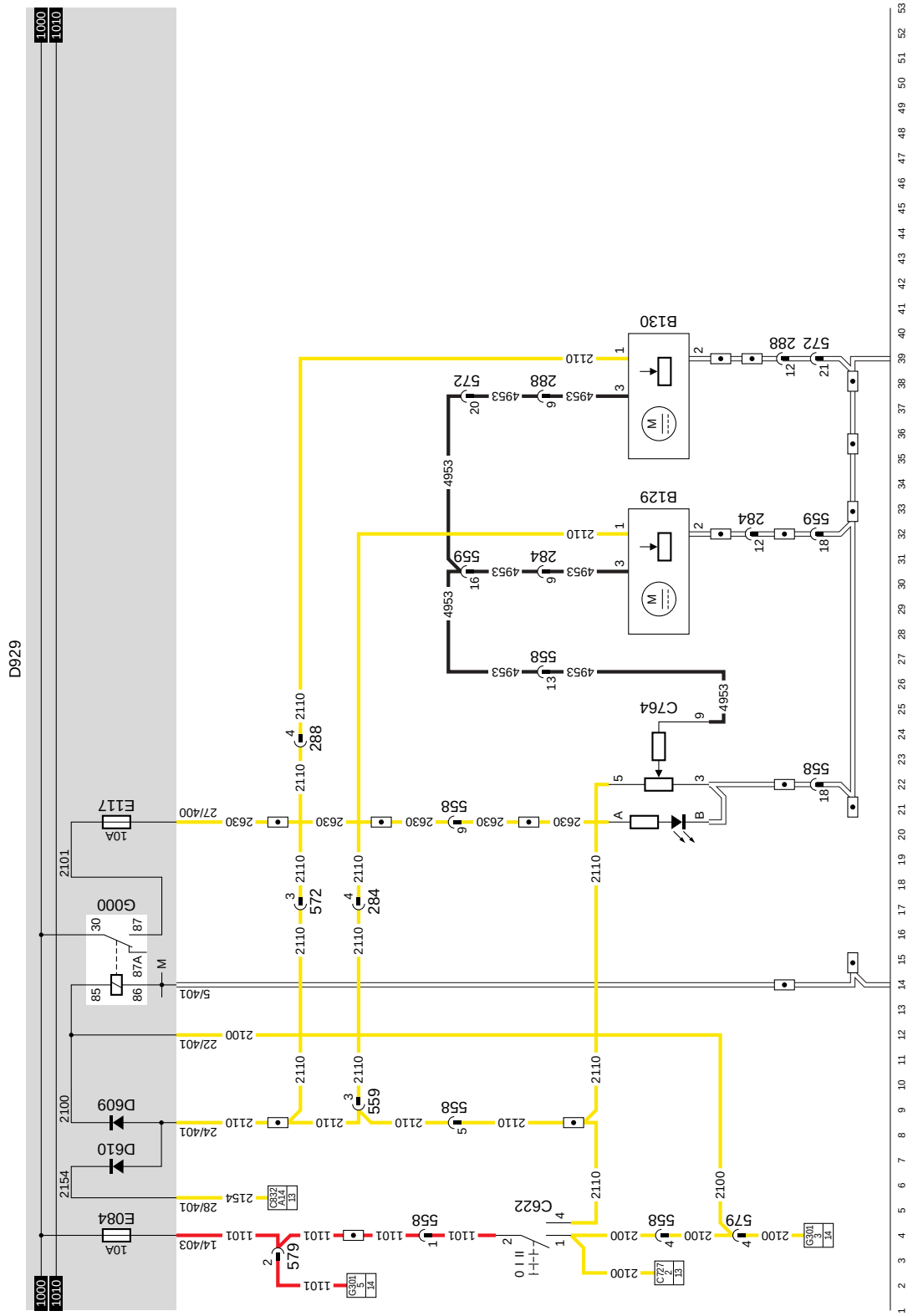

35 **1358030/15** EL000541

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36 24V/12V CONVERTER FOR RADIO/CB

The following description of the operation and connection is intended as a general guideline only.

Also refer to the manufacturer's installation instructions supplied with the radio.

If the contact switch (C539) is switched to accessory position 1, pin 1 is connected to pin 6 (wire 1100 is connected to wire 1130). As a result, a voltage is applied to connection point 85 of relay G178. This is activated. A voltage is now applied to connection point 1 of relay G377 through fuse E037, wire 1100, contacts 30 - 87 of relay G178, wire 1147, fuse E052 and wire 1110. This is activated. There is now a power supply of 12 volts to connection point A7 of the 'ISO' connector through wire 1108, contacts 3 - 5 of relay G377 and wire 1363. The radio has an aerial connection and two loudspeaker outputs, to which the speakers B024 and B025 are connected. Two high volume and two low volume speakers (B178, B179 and B180 and B181) can also be connected to the radio.

CB

Wire 1108 is also available (in a white connector) to use for a transmitter (B026). This connector is in the roof console on the driver's side.

For more information, see block 6, Connecting accessories.

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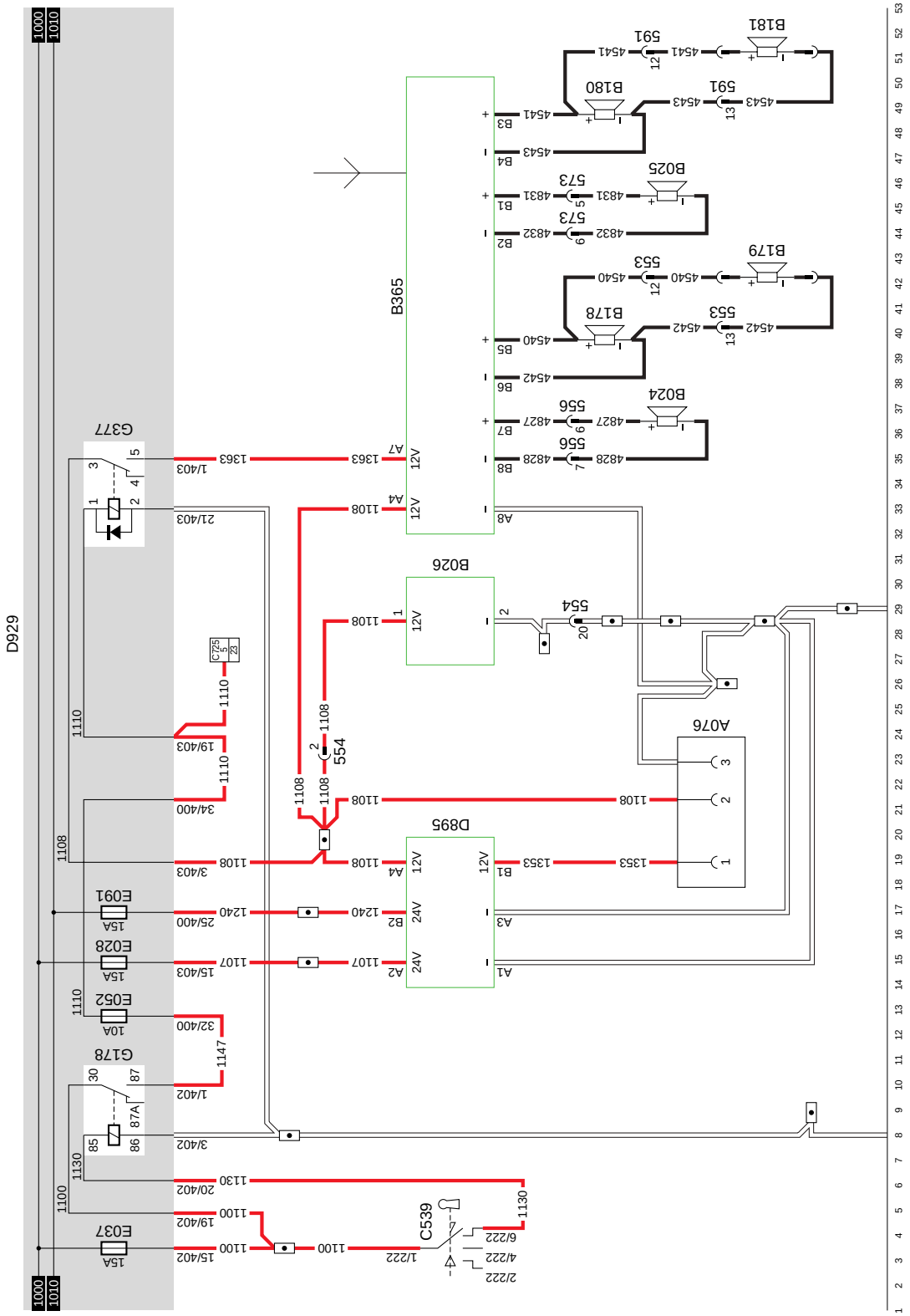

36 **1358030/15** EL000542

37 ELECTRIC WINDOWS/CENTRAL DOOR LOCKING/ROOF HATCH SH CAB

ELECTRIC WINDOWS, DRIVER'S SIDE (OPENING)
(Switch in door panel, driver's side)
When the electric window switch (C745) is operated and a connection is made (contacts 2 and 4), relay G030 will be energised through fuse E044 and switch C745 (wire 4526). As a result of this, there is a supply voltage on connection point 1 of the motor (B003) through fuse E034. The other connection point (2) is connected to earth through relay G31. The motor starts running anti-clockwise and the driver's side electric window opens.

ELECTRIC WINDOWS, DRIVER'S SIDE (CLOSING)
(Switch in door panel, driver's side)
When the electric window switch (C745) is operated and a connection is made (contacts 4 and 1), relay G031 will be energised through fuse E044 and switch C745 (wire 4527). As a result of this, there is a supply voltage on connection point 2 of the motor (B003) through fuse E034. The other connection point (1) is connected to earth through relay G030. The motor starts running clockwise and the driver's side electric window closes.

ELECTRIC WINDOWS, CO-DRIVER'S SIDE (OPENING)
(Switch in door panel, driver's side)
When the electric window switch (C743) is operated and a connection is made (contacts 2 and 4), relay G028 will be energised through fuse E044 and switch C743 (wire 4522). As a result of this, there is a supply voltage on connection point 1 of the motor (B004) through fuse E033. The other connection point (2) is connected to earth through relay G029.
The motor starts to run anti-clockwise and the co-driver's side electric window opens.

ELECTRIC WINDOWS, CO-DRIVER'S SIDE (CLOSING)
(Switch in door panel, driver's side)
When the electric window switch (C743) is operated and a connection is made (contacts 4 and 1), relay G029 will be energised through fuse E044 and switch C743 (wire 4523). As a result, there is a supply voltage on connection point 2 of the motor (B004) through fuse E033. The other connection point (1) is connected to earth through relay G028.
The motor starts to run clockwise and the co-driver's side electric window closes.

ELECTRIC WINDOWS, CO-DRIVER'S SIDE (Switch in door panel, co-driver's side)
Operation of the electric window control through switch C744 on the co-driver's side works in exactly the same way as on the driver's side. When switch C744 (connection between contacts 4 and 2) is operated, relay G028 is activated through switch C743 (contacts 5 and 2) and the motor (B004) opens the window. When switch C744 (connection between contacts 4 and 1) is operated, relay G029 is activated through switch C743 (contacts 3 and 1), the motor runs clockwise and the window closes as a result.

The electric windows will only operate if the contact is switched on.

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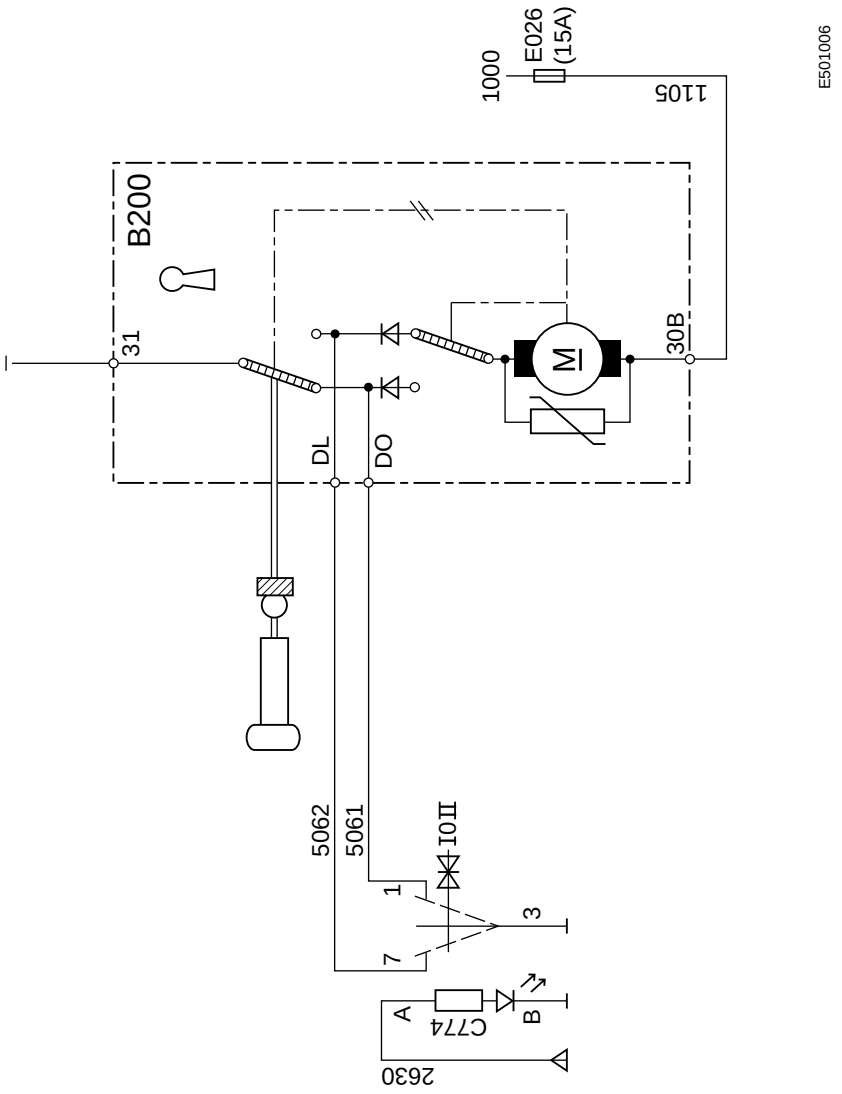

CENTRAL DOOR LOCKING, CO-DRIVER'S SIDE (STANDARD)

Purpose:
To lock the co-driver's side door using button/key or switch C744.

The driver can lock/unlock the co-driver's side door from the driving position using the switch.

Central door locking motor on co-driver's side (B200):

The motor has two (internal) switches:
- an "end stroke" switch (switches over at the end of each stroke) (the bottom switch in the diagram).
- a switch that is mechanically connected to the locking button (switches over at the beginning of each upward or downward movement of the locking button) (the top switch in the diagram).

Note:
A mechanical connection (rod linkage) between the cylinder lock and the locking button is maintained.

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Starting with: door unlocked (see drawing)

- **Locking door using the button/key.**

The top switch is directly switched over via the rod linkage. As a result, a current will flow through the fuse (E026), connection 30b, the motor, the bottom switch and the top switch through connection 31 to earth. Because of the mechanical connection between the motor and the locking button, the button moves downwards. When the bottom position is reached, the “end stroke” switch (the bottom switch in the diagram) switches over. The same occurs during unlocking. The direction of rotation of the motor is the same. But the switches are in a different position. The forces are transmitted from the motor to the locking button via a crank/connecting rod linkage.

- **Locking door using switch C774.**

When spring-loaded switch C774 makes a connection between connections 3 and 7, point DL of B200 is connected to earth. A brief moment is sufficient to start the motor. Since there is a mechanical connection between the motor and the locking button, the top switch will switch over immediately. A current will flow until the “end stroke” switch interrupts the circuit.

- **Unlocking door using switch C774.**

When spring-loaded switch C774 makes a connection between connection points 3 and 1, point DO (B200) is momentarily connected to earth. The action is the same, except that the switches assume their other positions again once the locking button has moved up.

CENTRAL DOOR LOCKING (OPTION)

Purpose:

- Automatic locking of both doors by locking one of the doors with the key/button.
- Automatic locking of both doors using remote control.
- If one of the two doors is unlocked using the key/button, only this door will be unlocked; the other door remains locked.
- Automatic unlocking of the driver’s side door using remote control.

Description of central door locking motor on driver’s side (B199) and central door locking motor on co-driver’s side (B200).

The operation of the two components is as described above for the B200.

Starting with: both doors locked.

Unlocking co-driver’s side door using key. This is the same as in the standard model. The other door remains locked.

Unlocking the co-driver’s side door using switch C774.

When switch C774 is operated (pin 3 connected to pin 1), connection DO of component B200 is connected to earth. B200 is activated in the same way as in the standard model.

Unlocking driver’s side door using remote control.
When the door unlocking button on the remote control unit is pressed, the remote control unit will send a fixed-code signal to the CDS-3 unit (D905). When the CDS-3 unit (D905) recognises the remote control unit on the basis of the fixed code, the remote control unit will send coded messages to the CDS-3 unit (D905). These messages are coded with a rolling code. This rolling code will change every time a remote control button is used. After the CDS-3 unit (D905) has accepted the messages, it will send a signal to the VIC unit (D900) and, if the vehicle has an alarm system, it will also send a signal to the alarm unit (D911).

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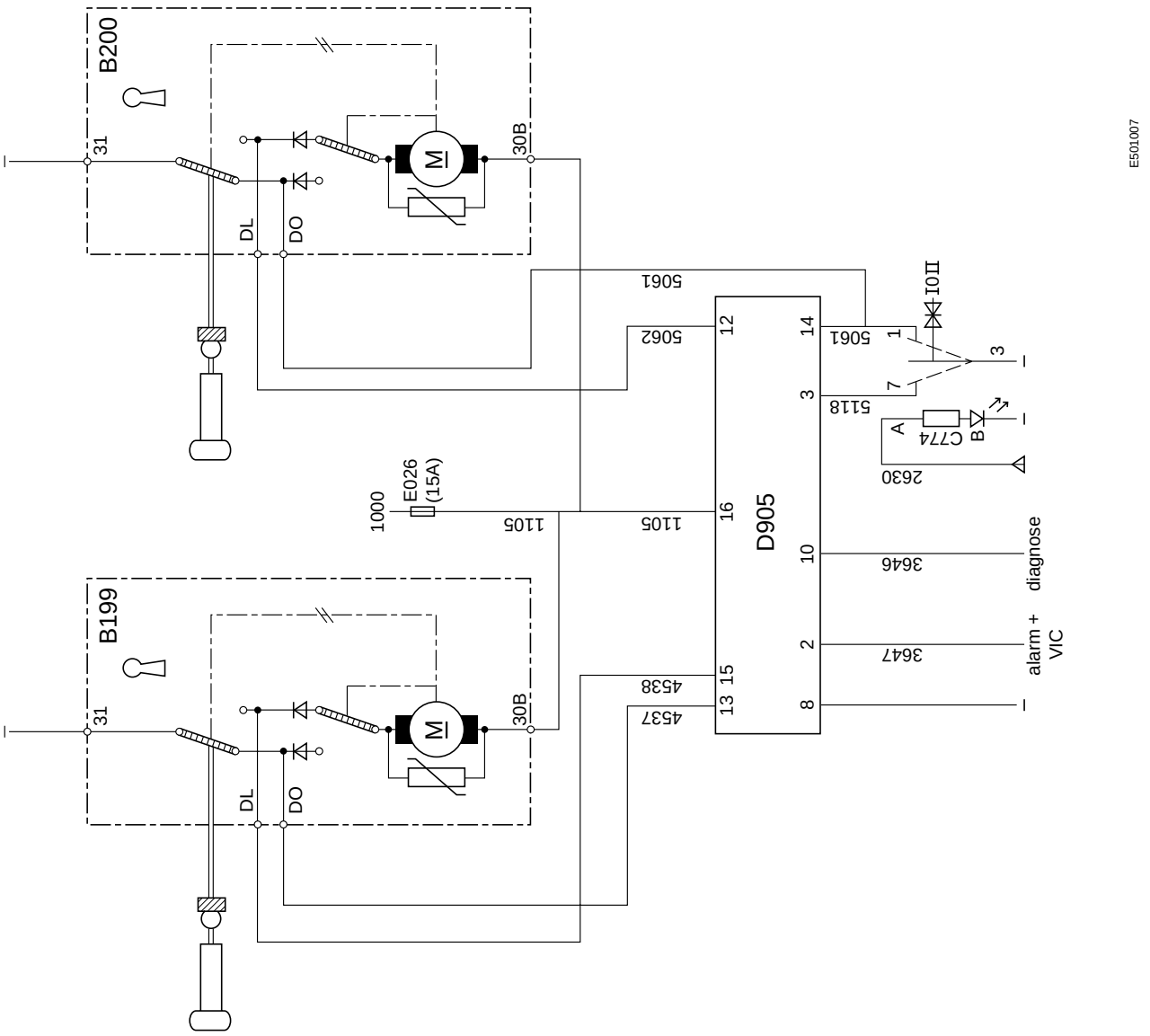

As a result, CDS-3 unit (D905) will connect pin 13 (wire 4537) to earth. This will activate the motor (B199). The CDS-3 unit (D905) then checks the status of the output to the motor (B199). It uses this information to determine whether the driver's side door has successfully unlocked. The CDS-3 unit (D905) will then send a message to the VIC unit (D900) via pin 2 (wire 3647), to inform it that the driver's side door has successfully unlocked. As a result, the VIC unit (D900) will switch on the interior lighting for a specific period of time. If the driver's side door is not unlocked properly after three attempts, a message will be sent to the VIC unit (D900) to inform it that the door has not unlocked successfully.
If the vehicle has an alarm system, a signal is also sent from the CDS-3 unit (D905) pin 2 (wire 3647) to the alarm unit (D911), so that the alarm is switched off.

Starting with: both doors unlocked.

Locking driver's side door with key/button.
The operation is similar to that in the standard model, except that unit D905 will now measure an earth signal at pin 15 via connection DL (wire 4538). D905 will now connect pin 12 to earth, which will also activate B200. The co-driver's side door will now lock as well.

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Locking the co-driver's side door with key/button.
The operation is as described above, except that unit D905 will now measure an earth signal at pin 12 (wire 5062), and it will connect pin 15 (wire 4538) of component B199 to earth. The door on the driver's side will now also lock and the alarm will be set.

Locking co-driver's side door using switch C774.
When switch C774 is operated (pin 3 connected to pin 7), an earth signal is created at pin 3 (wire 5118) of unit D905. D905 now connects pin 12 (wire 5062) to earth, so that B200 is activated and the co-driver's side door is locked.

Locking the doors on the driver's and co-driver's sides using the remote control unit.
When the door locking button on the remote control unit is pressed, the remote control unit will send a fixed-code signal to the CDS-3 unit (D905). When the CDS-3 unit (D905) recognises the remote control unit on the basis of the fixed code, the remote control unit will send coded messages to the CDS-3 unit (D905). These messages are coded with a rolling code. This rolling code will change every time the remote control is operated. After the CDS-3 unit (D905) has accepted the messages, it will send a signal to the VIC unit (D900) and, if the vehicle has an alarm system, it will also send a signal to the alarm unit (D911).

As a result, the CDS-3 unit (D905) will connect pins 12 (wire 5062) and 15 (wire 4538) to earth. This will activate the motors (B199 and B200). The CDS-3 unit (D905) then checks the status of the outputs to the motors (B199 and B200). It uses this information to determine whether the doors have been successfully locked. The CDS-3 unit (D905) will send a message to the VIC unit (D900) via pin 2 (wire 3647) to inform it that the doors have successfully locked. As a result, the VIC unit (D900) will switch off the interior lighting. If the doors have not locked properly after three attempts, a message will be sent to the VIC unit (D900), to inform it that the doors have not locked successfully; the interior lighting remains on.
If the vehicle has an alarm system, a signal is also sent from the CDS-3 unit (D905) pin 2 (wire 3647) to the alarm unit (D911). This switches the alarm on.

INITIALISATION

When the CDS-3 unit is supplied with power for the first time (on installing or replacing the electronic unit), or if new hand-held transmitters are used (max. 8), the CDS–3 unit must be able to recognise these transmitters. Follow the procedure below to enable the CDS-3 unit to communicate with hand-held transmitters.

When installing or replacing CDS-3 electronic unit.

Step 1:

Lock the co-driver's side door using the switch (C774) on the central console.
After 2 to max.10 seconds, unlock the co-driver's side door using the switch (C774).
After 2 to max.10 seconds, lock the co-driver's side door using the switch (C774).

The CDS-3 electronic unit is now aware that the hand-held transmitters are being initialised and it will send a signal to the VIC. The VIC will activate the direction indicators and make them flash once.

Step 2:

Press the "locking" button on the hand-held transmitter (▶◀), and keep it pressed.
Inside the cab, press "lock co-driver's door".

ROOF HATCH (SH CAB)

OPENING ROOF HATCH
When the roof hatch switch (C736) is operated and a connection is made between contacts 2 and 6 and therefore between contacts 1 and 3, a voltage is applied to pin 1 of the roof hatch motor (B175) through fuse E045, switch C736 and wire 4761. The roof hatch will open.

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CLOSING ROOF HATCH
When the roof hatch switch (C736) is operated and a connection is made between contacts 8 and 6 and therefore between contacts 7 and 3, a voltage is applied to pin 2 of the roof hatch motor (B175) through fuse E045, switch C736 and wire 4760. The roof hatch will close.

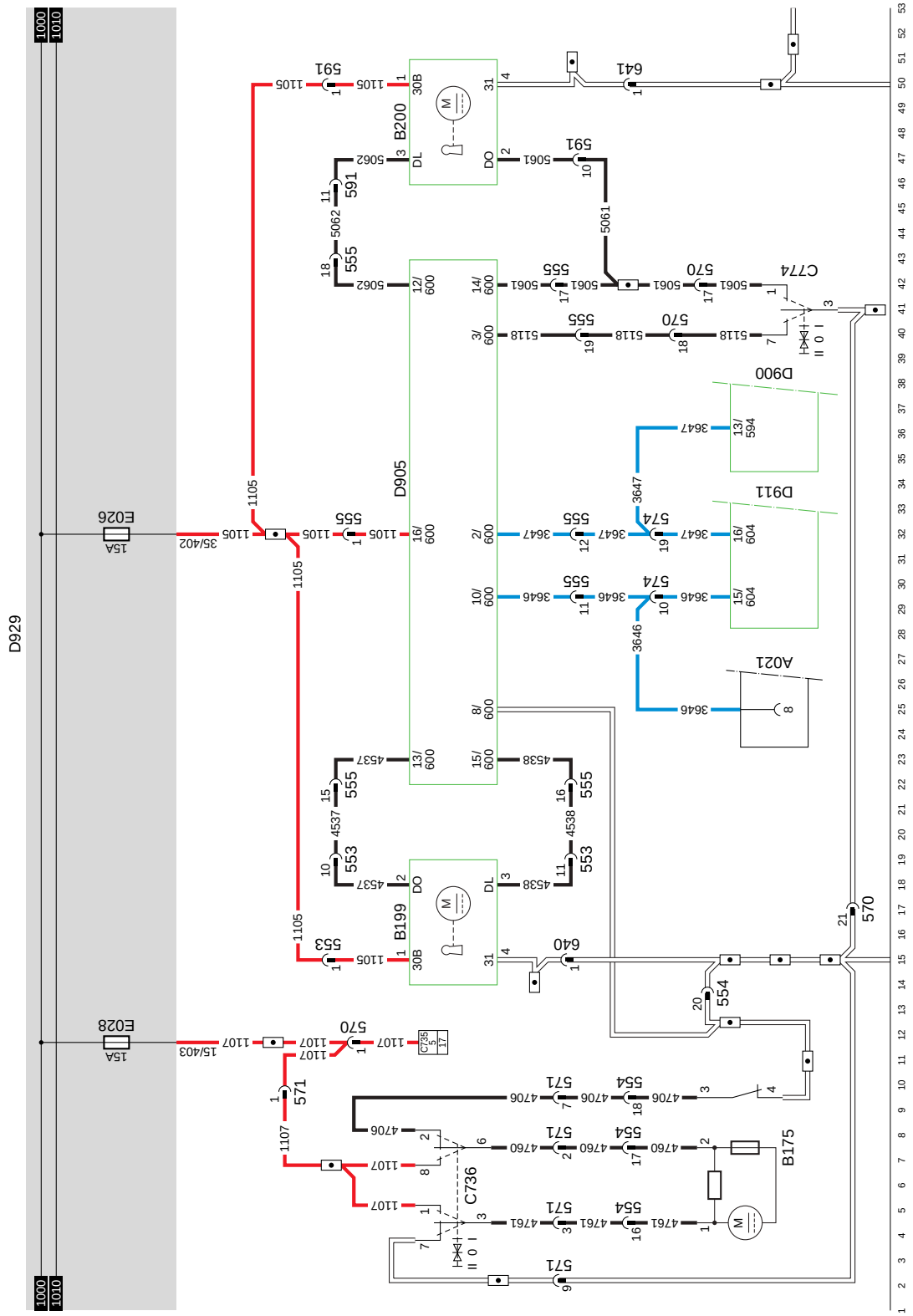
VARIANTS

Location
36 If the standard model is fitted, the driver's side central door locking motor (B199) and the central door locking electronic unit (D905) will not be fitted either.

The connections on B200 are as follows:

Connection point	Wire number:	Description
1	1105	Power supply
2	5061	Open door
3	5062	Close door
4	M	Earth

Wire 5062 is directly connected to connection point 7 of switch C774.



37 **1358030/15** EL000543

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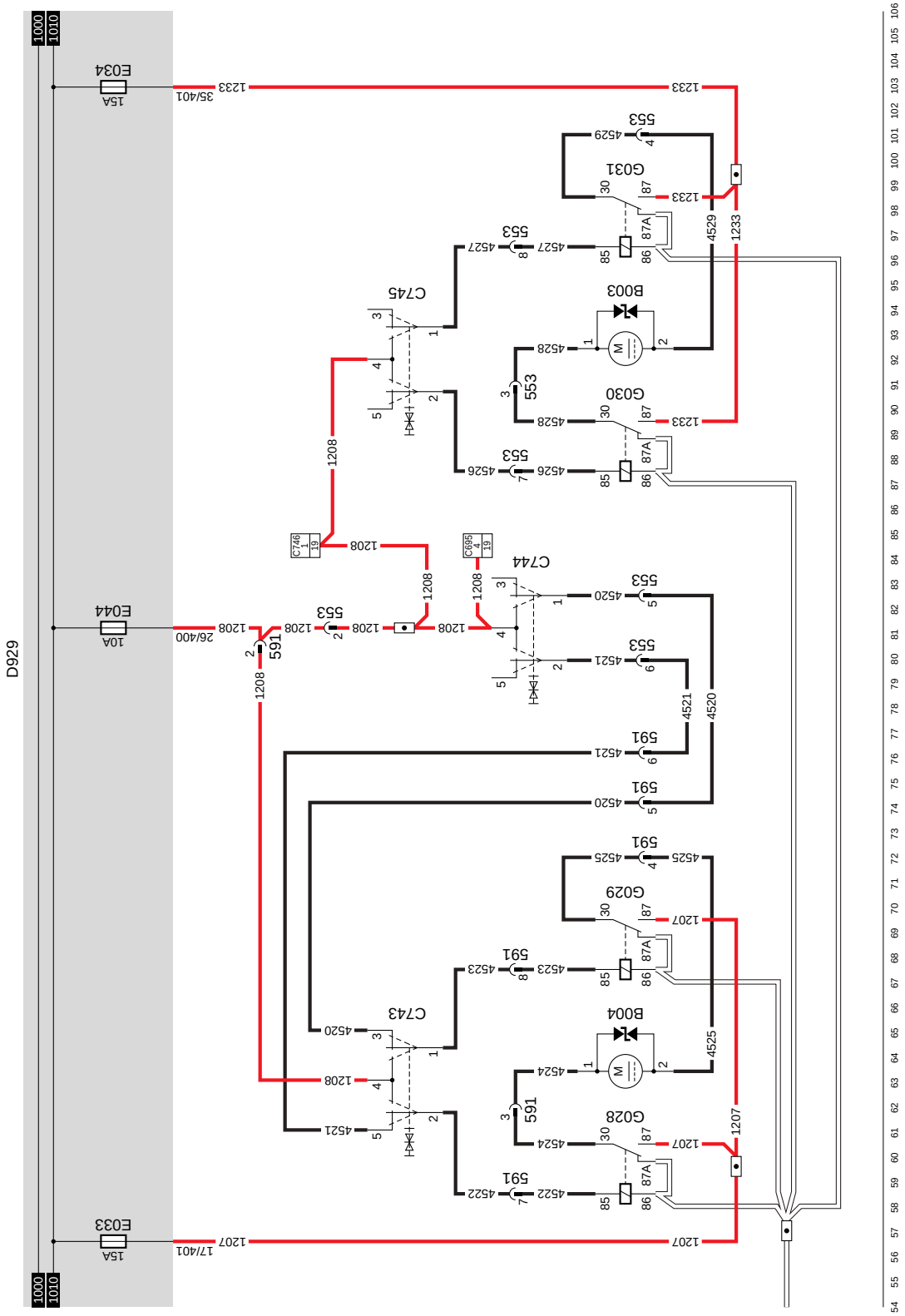

37 **1358030/15** EL000544

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38 MECHANICAL LIFTING GEAR

Manual lifting:
When switch C704 (lifting gear switch) is operated (connection between contacts 3 - 1), a voltage is applied to connection point 1 of B071 through fuse E062, wire 1221, contacts 3 - 1 of switch C704, wire 4550, contacts 3 - 4 of relay G381 and wire 5180. This valve is energised. The voltage is applied to connection point 85 of relay G052 at the same time through D622, wire 4552, contacts 30 - 87a of relay G066 and wire 4557. This is activated and closes contacts 1 - 2. A voltage is now applied to connection point 1 of B073 through contacts 1 - 2 of relay G052 and wire 4554. The oil pump motor starts to run.
If the oil pressure becomes too high (> 160 bar), E524 will close. Voltage is now applied to connection point 85 of relay G066 through contacts 1 - 2 of E524. This is energised and it breaks the connection 30 - 87a. Voltage is now applied to connection point 85 of relay G066 from wire 4552 through contacts 30 - 87 of relay G066 and wire 4558. This remains energised. At the same time the voltage through relay G052 is lost. Contacts 1 - 2 open and the voltage on connection point 1 of B073 is lost. The pump motor is no longer driven and the oil pressure drops.

Manual lowering:
When switch C704 (lifting gear switch) is operated (connection between contacts 3 - 7), a voltage is applied to connection point S1 of D503 through fuse E062, wire 1221, contacts 3 - 7 of switch C704 and wire 4551. A voltage is applied to connection point 1 of B072 through connection point 87 of D503 and wire 4553. This valve is energised. The voltage is applied to connection point 85 of relay G052 at the same time through D623, wire 4552, contacts 30 - 87a of relay G066 and wire 4557. This is activated and closes contacts 1 - 2. A voltage is now applied to connection point 1 of B073 through contacts 1 - 2 of relay G052 and wire 4554. The oil pump motor starts to run.
If the oil pressure becomes too high (> 160 bar), E524 will close. Voltage is now applied to connection point 85 of relay G066 through contacts 1 - 2 of E524. This is energised and breaks the connection 30 - 87a. Voltage is now applied to connection point 85 of relay G066 from wire 4552 through contacts 30 - 87 of relay G066 and wire 4558. This remains energised. At the same time the voltage through relay G052 is lost. Contacts 1 - 2 open and the voltage on connection point 1 of B073 is lost. The pump motor is no longer driven and the oil pressure drops.

Automatic axle load protection:
If the pressure on the driven axle is greater than the legal maximum, sensor E584 is activated. This puts sensor E507 in 'stand-by' mode. If the acceptable axle load increases further (> 10 ton), sensor E507 automatically lowers the trailing axle.

If the axle has been lifted, F097 (proximity switch for trailing axle lifting gear) ensures that relay G380 is energised through wire 3661. A voltage is now applied through fuse E062, wire 1221, contacts 3 - 5 of relay G380 to connection point 1 of E507. This is activated.
The voltage is immediately transmitted to S2 on D503. The signal sent by the axle load protection proximity switch (E507) to S2 must be maintained for at least 10 seconds before the lifting gear electronic unit (D503) will activate the valve (B072) and the lifting-gear pump motor (B073) to lower the trailing axle. This is to prevent the legal maximum axle load being exceeded.
If the dashboard switch is operated within this 2.5 minute period, the electronic unit will be reset and another 2.5 minute period will start.

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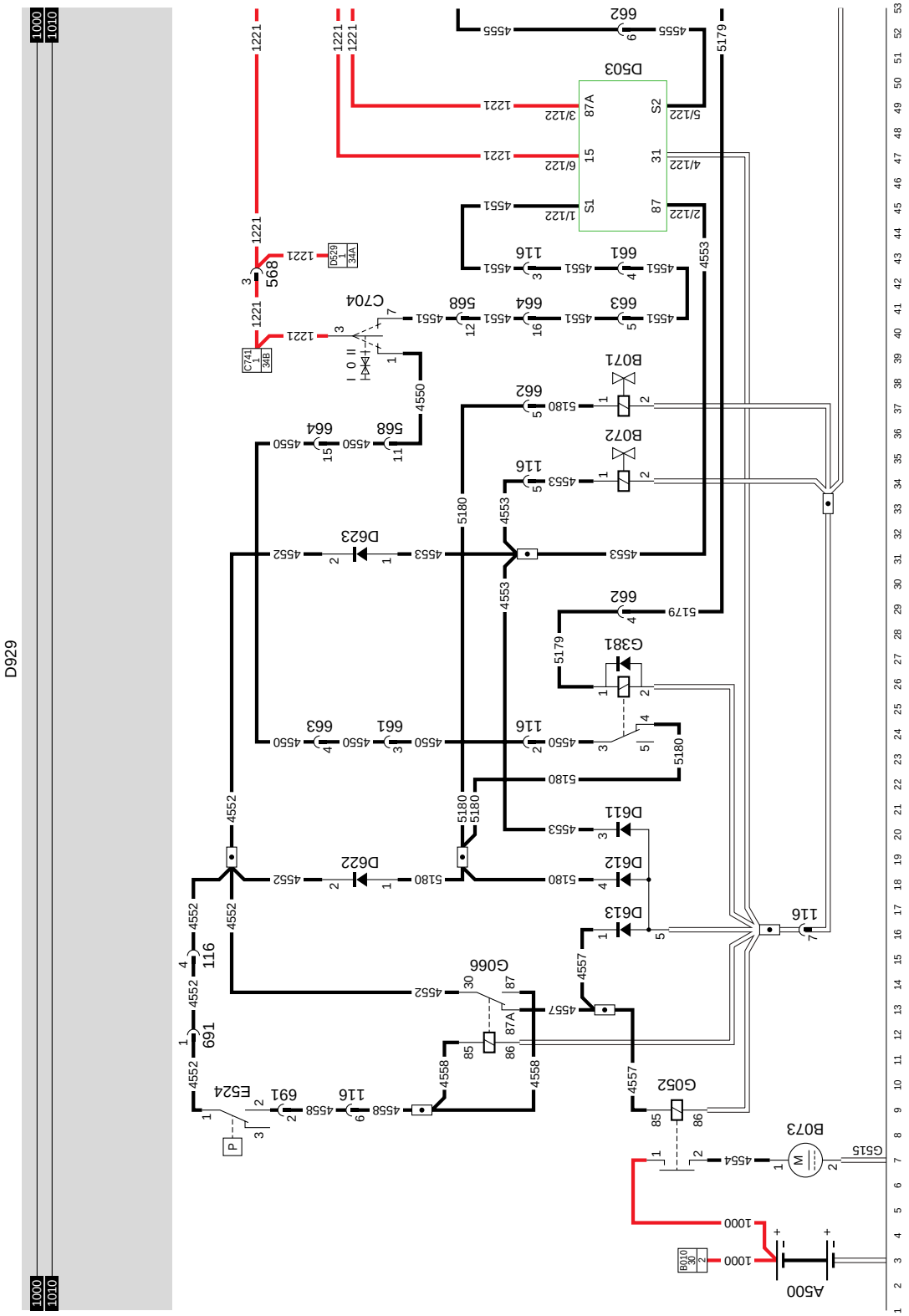
The lifting-gear motor relay (G052) will also be activated, thus activating the lifting-gear pump motor (B073). This takes place through D623, relay G066 (connection between points 30 and 87a) to connection point 85 of relay G052. When a pressure of 160 bar is reached, the oil-pressure limit switch (E524) switches the lifting-gear pump motor (B073) off through relay (G066) and relay (G052).

The trailing axle cannot be lifted for a period of 2.5 minutes as the valve (B072) remains energised. This valve must be in the **non**-energised position to lift the trailing axle.



38 **1358030/15** EL000545

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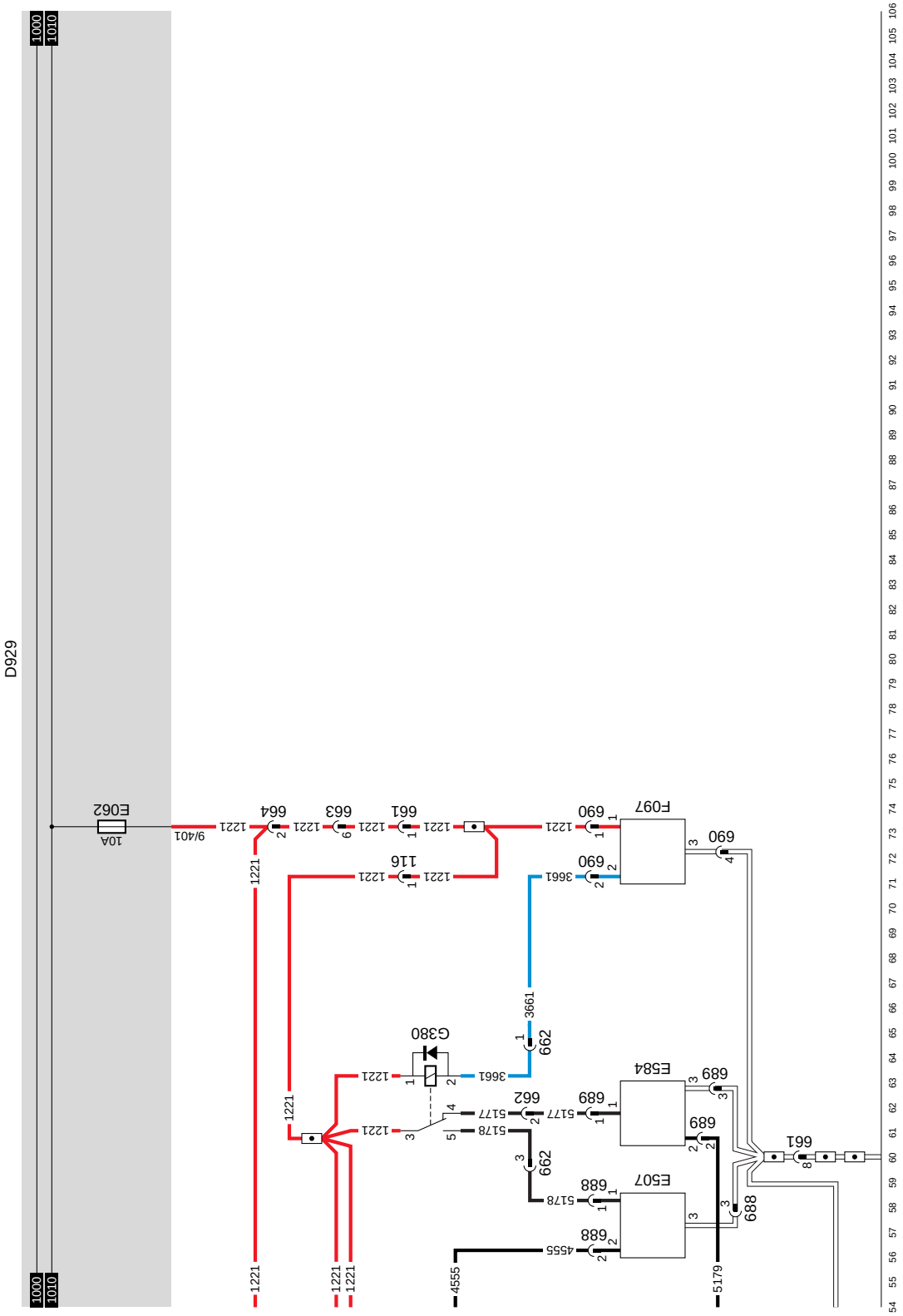
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F097
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G380
E584
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E507
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4555
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39 FUEL PRE-HEATING (THERMOLINE)

A voltage is applied to connection point 5 of C872 (fuel filter/water separator operation switch) through wire 1010, fuse E170 and wire 1285. When this switch is switched on (connection between contacts 5 - 1), voltage is applied to connection point 85 of relay G201 (Thermoline fuel heating relay) via wire 5048. This relay is energised and contacts 30 - 87 close.
A voltage is now applied to connection point 1 of relay B182 (fuel pre-heating element) through wire 1000, fuse E164, wire 1190, contacts 30 - 87 of relay G201 and wire 5051. This now warms up and will keep the fuel fluid.

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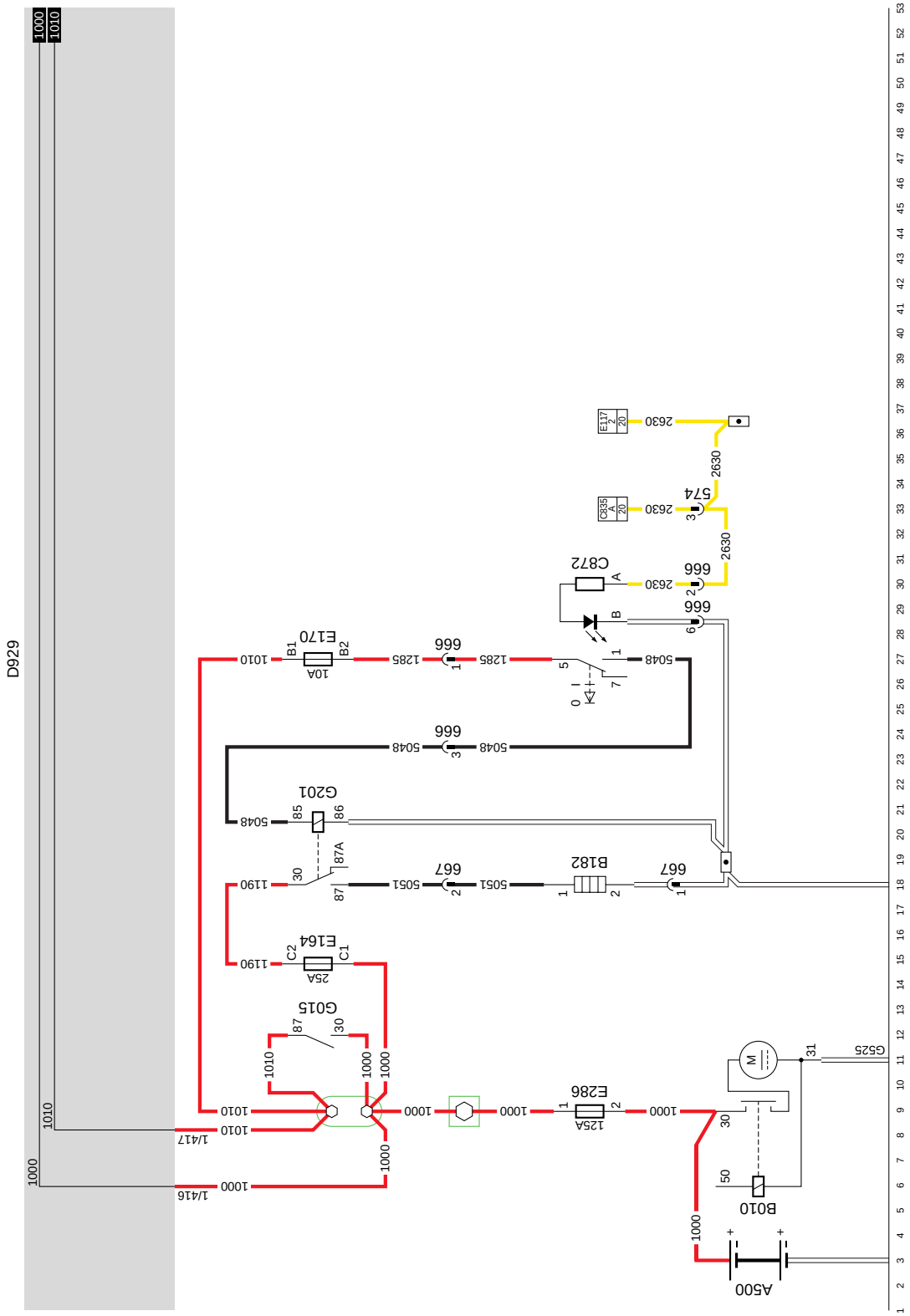

39 **1358030/15** EL000547

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40 WINDSCREEN WIPER/WASHER SYSTEM

Speed I (low speed)
When windscreen wiper switch C832 is set to position I (connection between contacts 13 - 2), there is a voltage on connection pin 9 of connector 595 through fuse E035, wire 1211, contacts 13 - 2 of switch C832 and wire 4501. The VIC (D900) switches connection pin 50 of connector 594 to earth. Voltage is now applied to connection pin 1 of relay G237 through fuse E025, wire 1205. Because the VIC has connected wire 4505 to earth through connection pin 50 (connector 594), relay G237 is energised.
A voltage is now applied to connection point 53 of B000 through fuse E025, wire 1205 and contacts 3 - 4 of relay G236 and wire 4507.

Speed II (high speed)
When windscreen wiper switch C832 is set to position II (connection between contacts 3 - 10), relays G236 and G237 are switched to earth through fuse E025, wire 1205, relay G236 and G237, wire 4505, diode D782, wire 4504 and switch C832 (contacts 3 - 10).
Both relays are now energised. A voltage is now applied to connection point 53b of B000 through fuse E025, wire 1205, contacts 5 - 3 of relay G237, wire 4506, contacts 3 - 5 of relay G236 and wire 4508.
The VIC is bypassed at speed II (high speed).

Intermittent wipe
When windscreen wiper switch C832 is set to intermittent wipe (connection between contacts 13- 1), there is a voltage on connection pin 37 of connector 595 through fuse E035, wire 1211, contacts 13 - 1 of switch C832 and wire 4502. The VIC (D900) switches connection pin 50 of connector 595 to earth. Voltage is now applied to connection pin 1 of relay G237 through fuse E025 and wire 1205. The earth is formed through wire 4505 and connection point 50 of connector 594. As a result, relay G237 is energised. A voltage is now applied to connection point 53 of B000 through fuse E025, wire 1205, contacts 5 - 3 of relay G237, wire 4506, contacts 3 - 5 of relay G236 and wire 4507.

A voltage is applied to connection point 32 of VIC connector 595 through fuse E025, wire 1205, the cut-off switch in the windscreen wiper motor (B000) and wire 4509. The earth of pin 50 (connector 594) is broken and, as a result, relay G237 is no longer energised.

When the cut-off switch pin 32 (connector 595), is connected to earth again, pin 50 (connector 594) is switched to earth again after the set interval and relay G237 is energised again, as a result. This starts the cycle again.

Wash/wipe
When a voltage is applied briefly and then is lost again (windscreen wiper switch C832 no longer operated) through fuse E035, wire 1211, contacts 4 - 11 of C832, wire 3648, connection point 33 (connector 595), connection point 50 (connector 594) is switched to earth for a specific period of time. As a result, the relay (G237) is energised and the windscreen wipers perform 1 wiper stroke.

When a voltage is applied to windscreen wiper switch C832 through fuse E035, wire 1211, contacts 4 - 11 of C832 and wire 3648 for approximately 2 seconds, a voltage is applied to connection point 1 of connector 592, as a result of which the windscreen wiper motor (B001) is activated. After approximately 1 second, C50 is connected to earth for a specific period of time. As a result, the relay (G237) is energised and the windscreen wiper motor is operated.

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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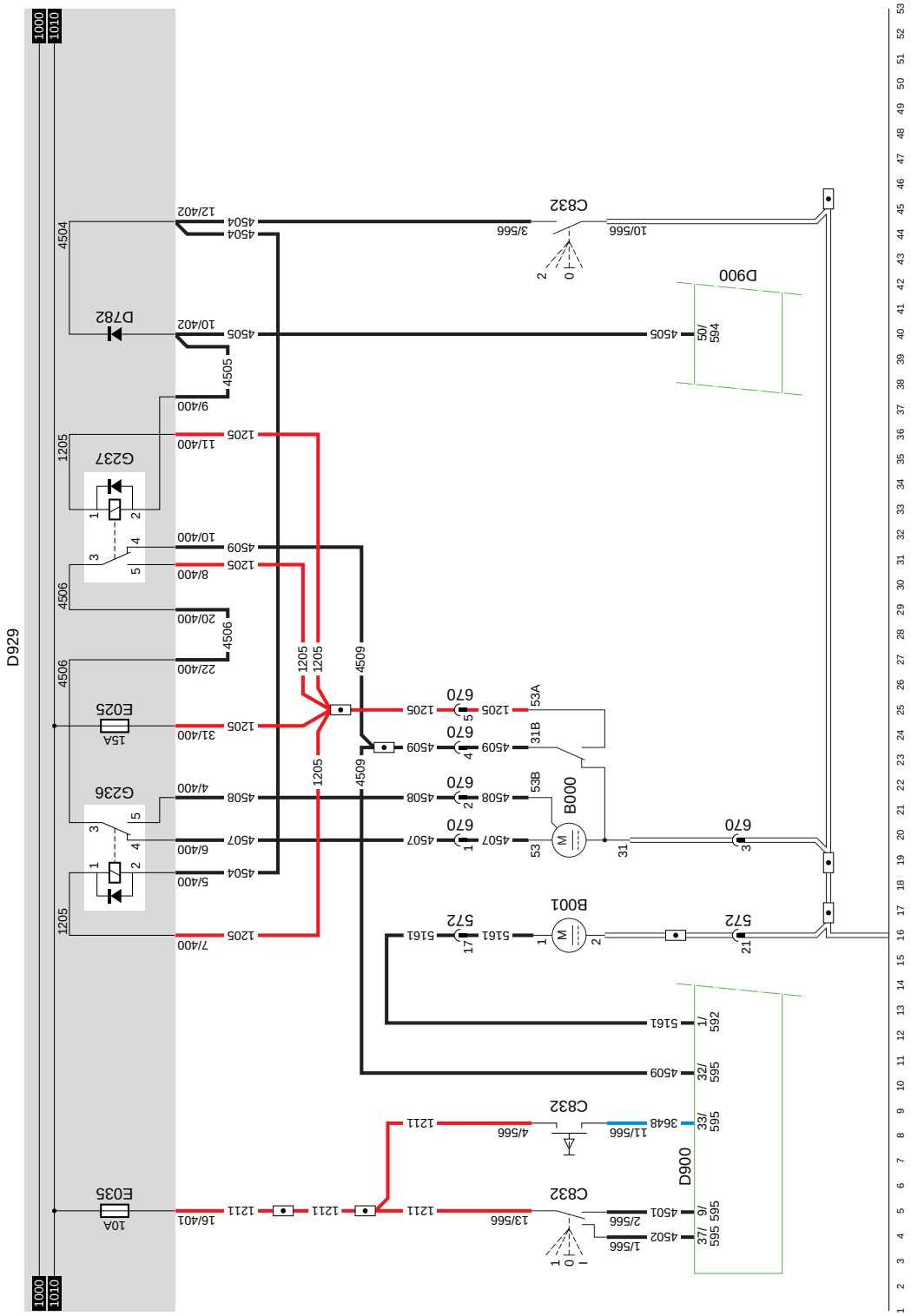

40 **1358030/15** EL000548

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41 EBERSPÄCHER (ACH-E) AIRTRONIC CAB HEATER WITH/WITHOUT TIMER

SEE THE SYSTEM MANUAL FOR MORE INFORMATION.

VARIANTS

Location	
10	Only if the vehicle has been equipped to transport hazardous substances in accordance with RTMDR requirements.
34, 49	Only if the vehicle has a timer.
37	Only if the vehicle has been equipped to transport hazardous substances in accordance with RTMDR requirements.
44, 49	Only if the vehicle has a thermostat unit.

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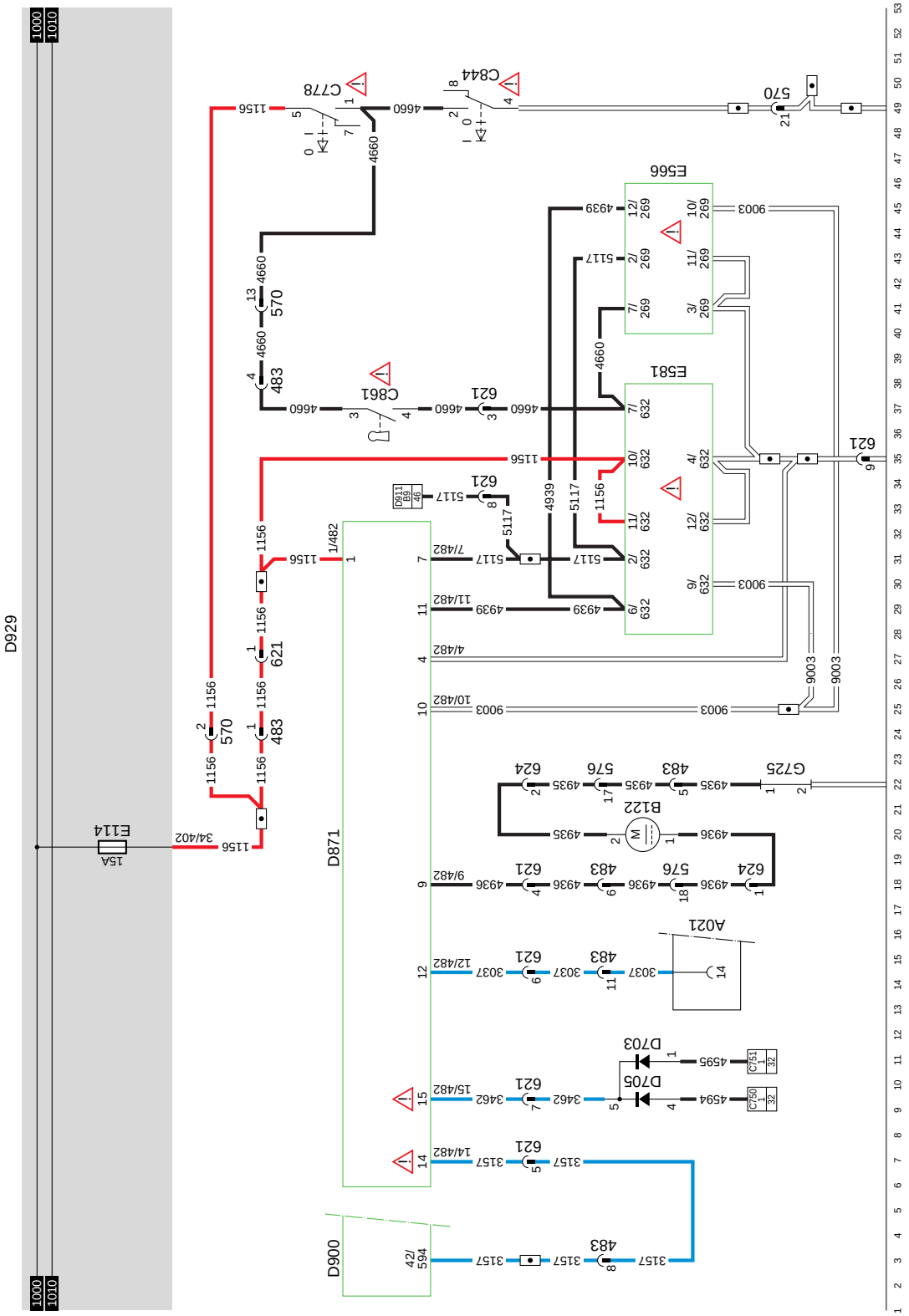

41 **1358030/15**

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42 EBERSPÄCHER (ACH-E) HYDRONIC 10 CAB HEATER WITH TIMER

SEE THE SYSTEM MANUAL FOR MORE INFORMATION.

VARIANTS

Location	
3	Only if the vehicle has been equipped to transport hazardous substances.
19	Only if the vehicle has been equipped to transport hazardous substances.

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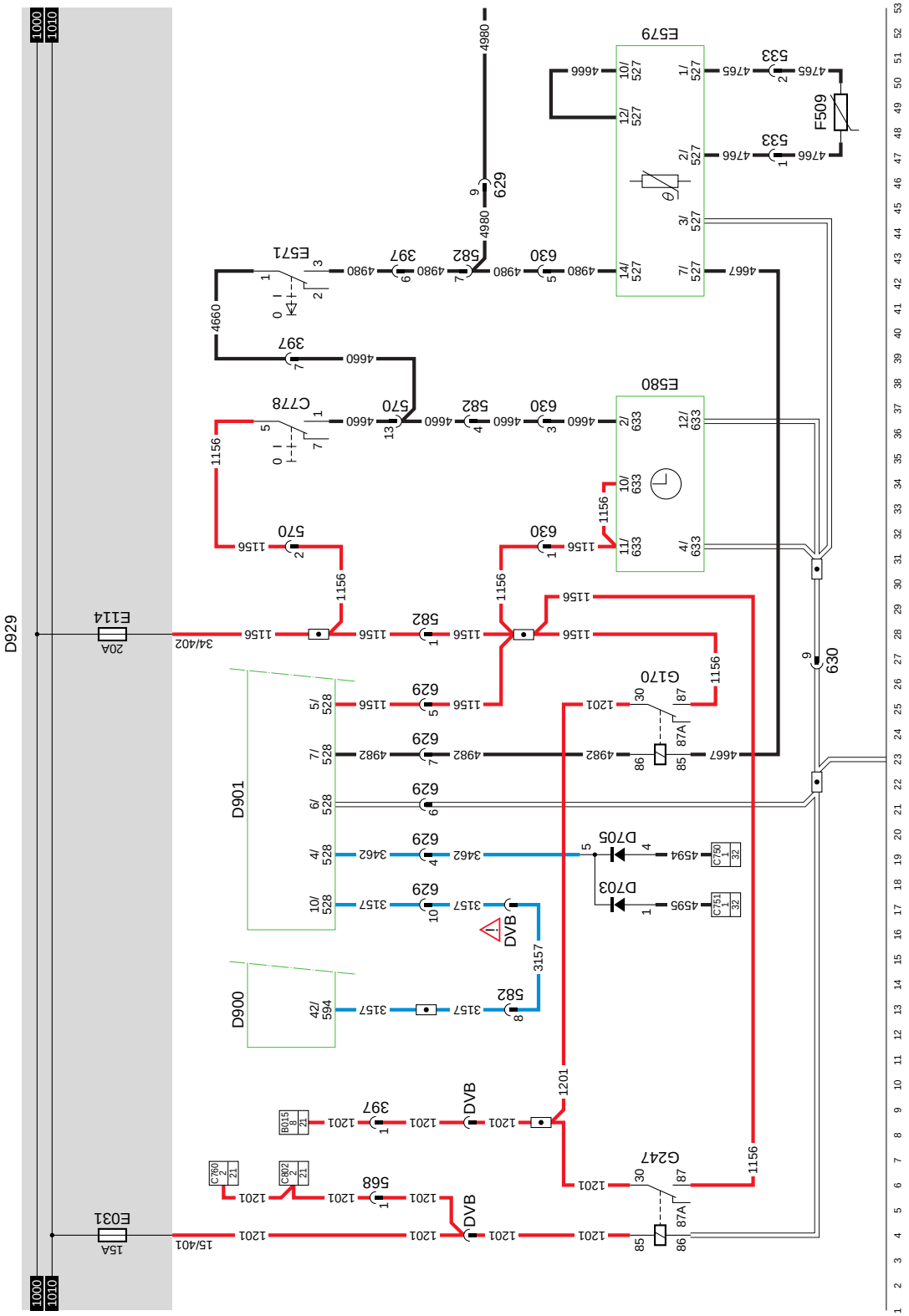
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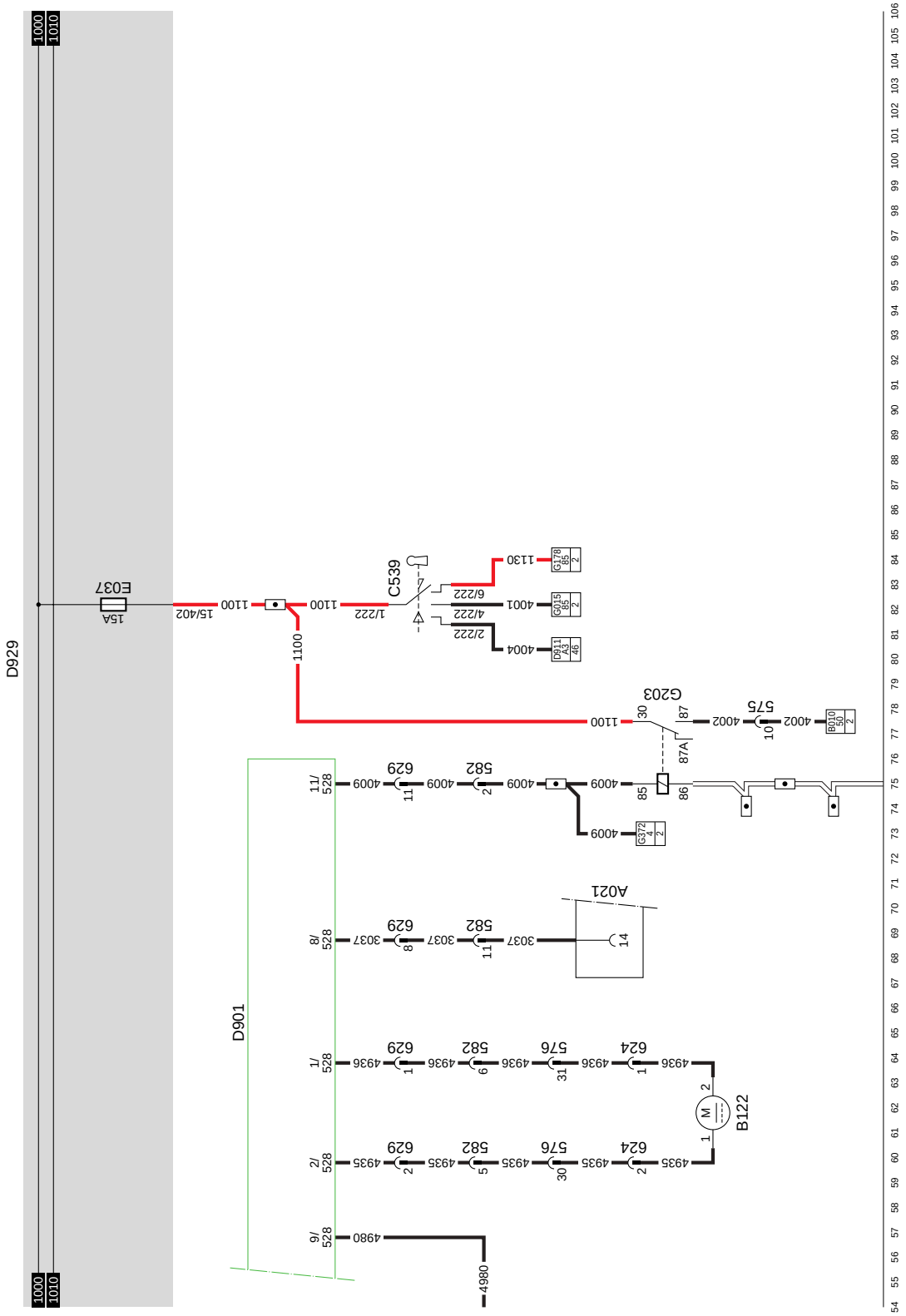

42 **1358030/15** EL000551

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43 UPEC/CUMMINS/AGC/SUPERSTRUCTURE FUNCTIONS APPLICATION CONNECTOR

FOR MORE INFORMATION, SEE BLOCK 6:
CONNECTING ACCESSORIES

VARIANTS

Location	
73 - > 105:	Only if the vehicle has UPEC.
109 - > 137:	Only if the vehicle has ECS-DC3.
165 - > 183:	All 658 connectors: Option.
185 - > 195:	All 654 connectors: Option.
165 - > 182 and 185 - > 207 :	All 656 connectors: Option.
185 - > 207:	All 657 connectors: Option.
197 - > 207:	All 655 connectors: Option.

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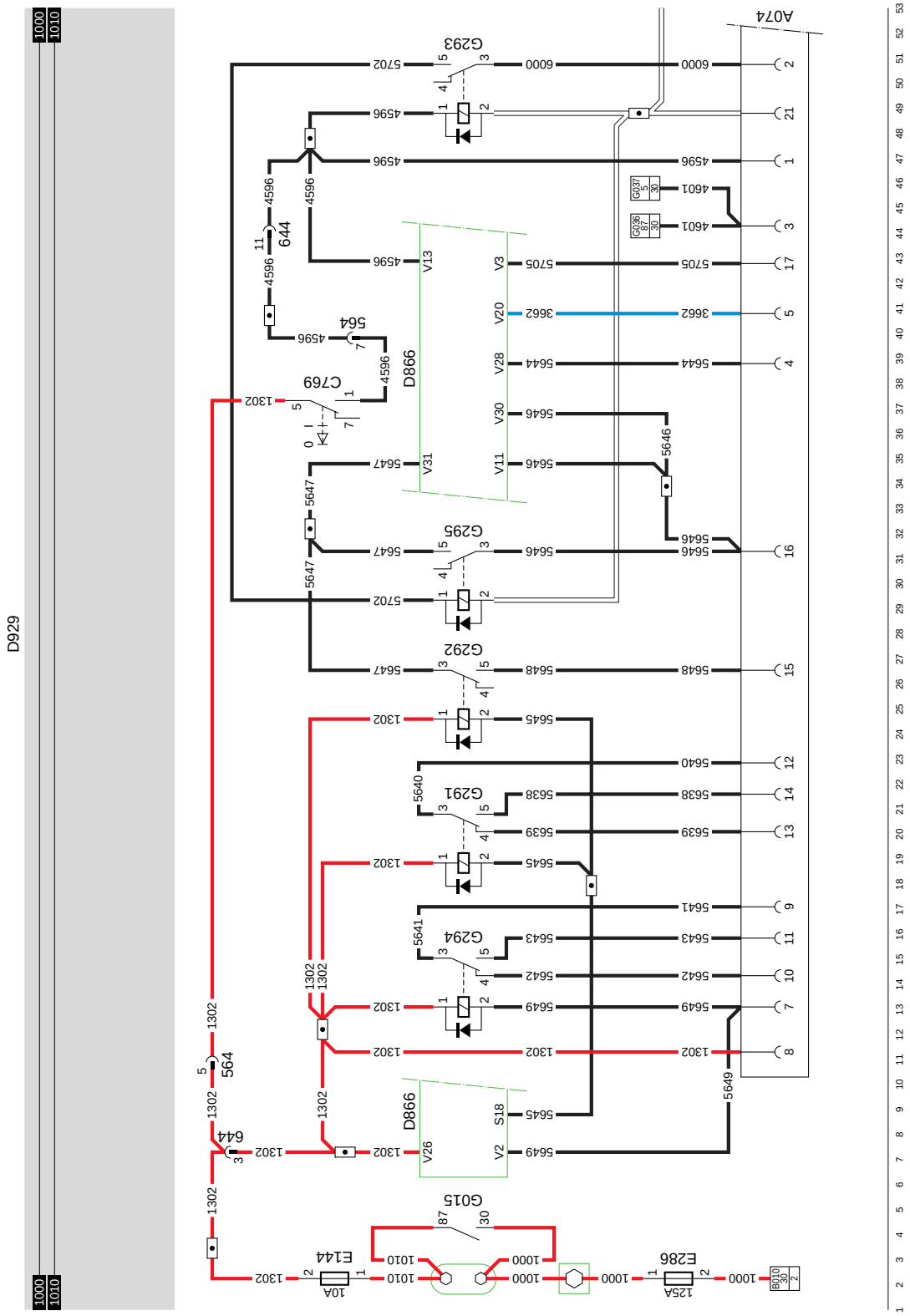
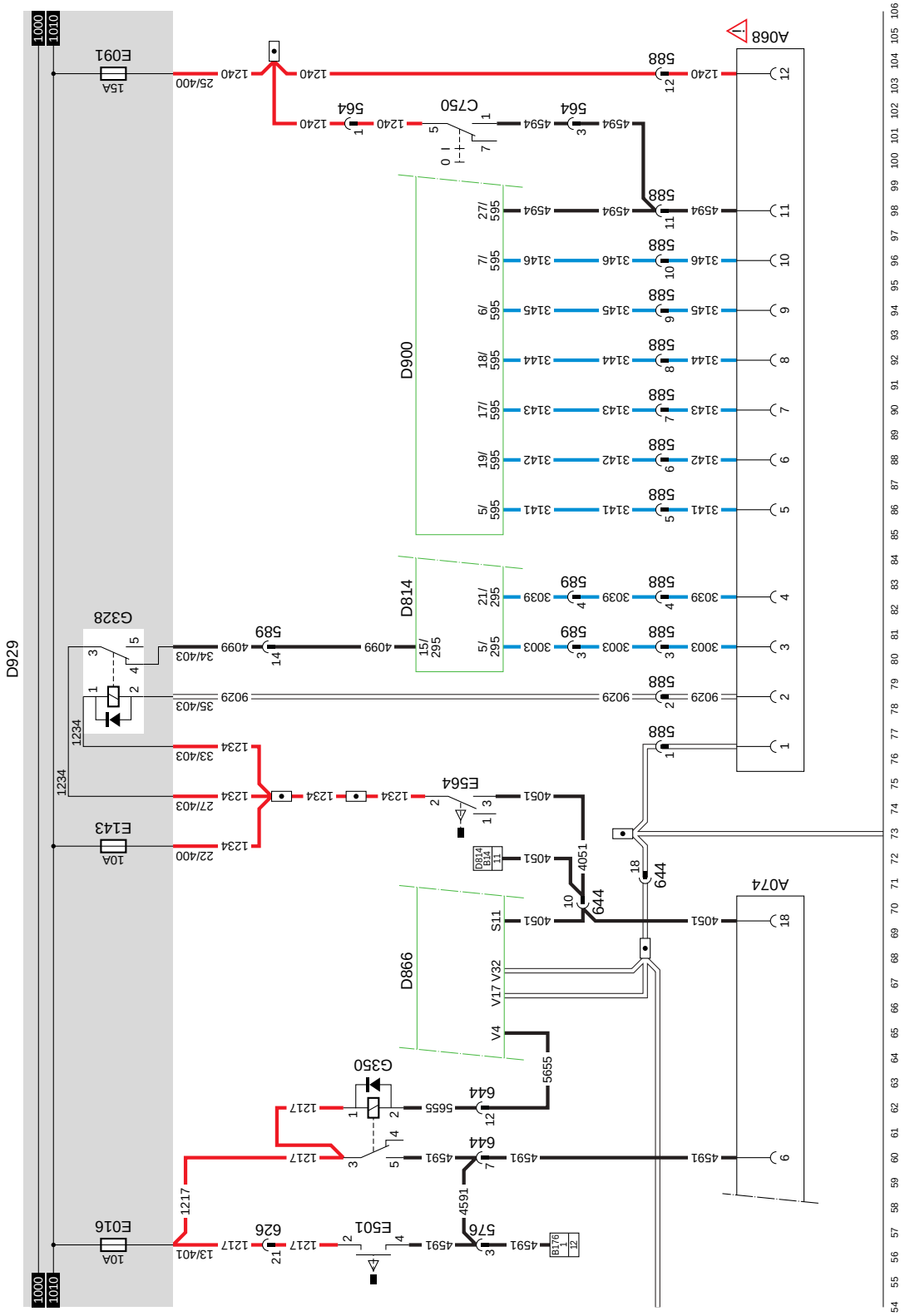


43 **1358030/15** EL000552



43 **1358030/15** EL000553

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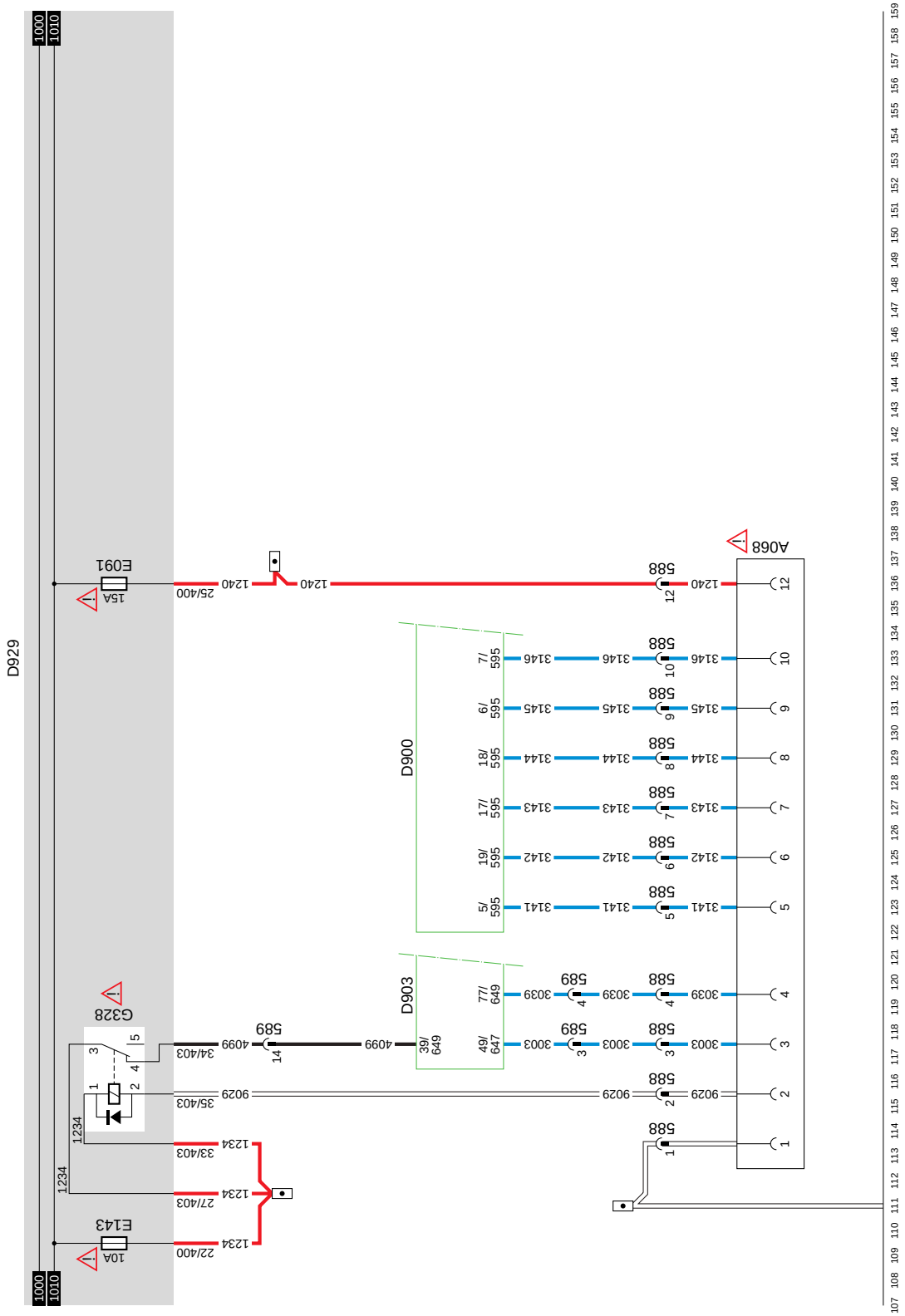
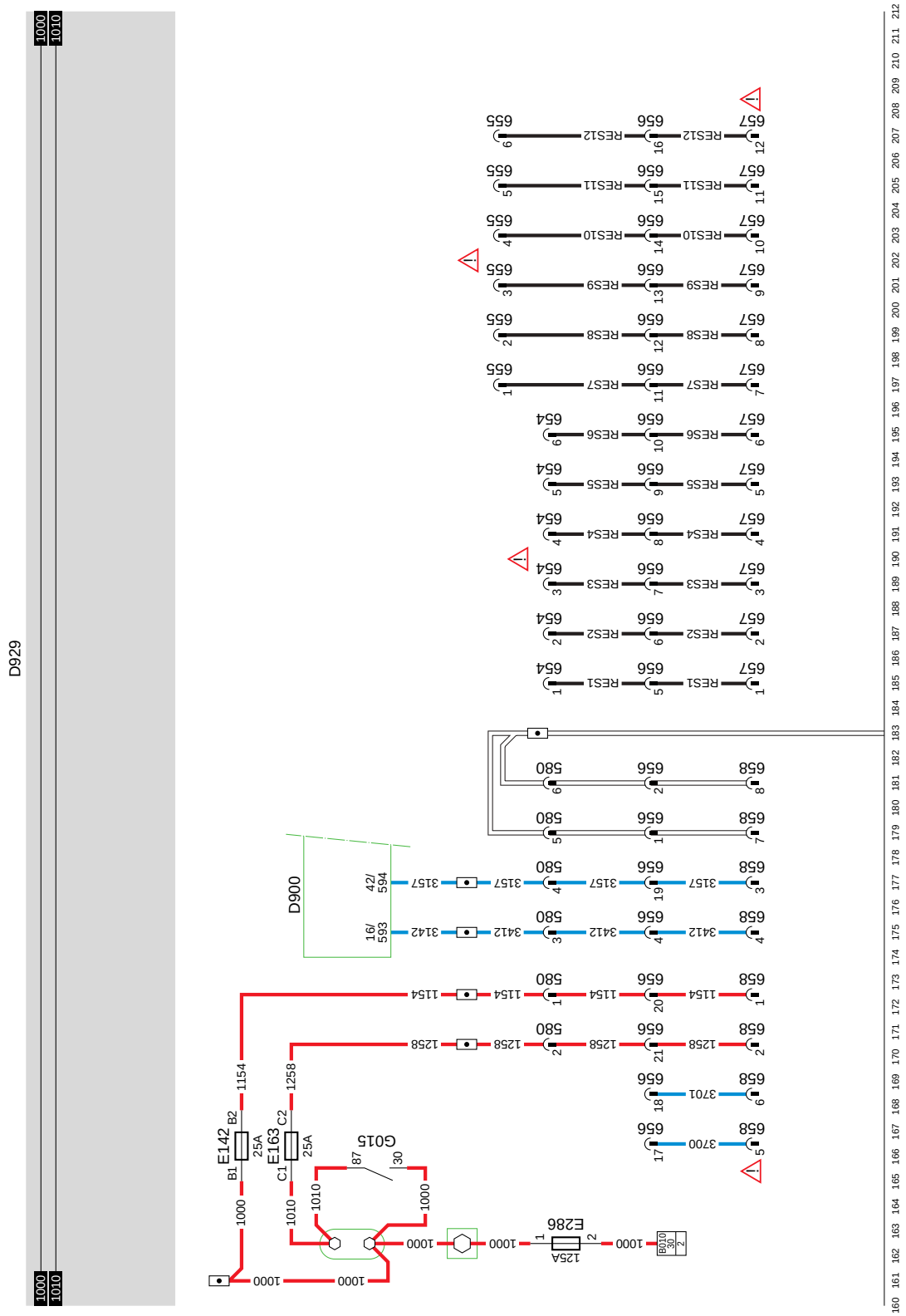


43 **1358030/15** EL000554



43 **1358030/15** EL000555

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10

44 EBS

SEE THE SYSTEM MANUAL FOR MORE INFORMATION.

VARIANTS

Location
4, 7, 10, 13, 16, 19, 22:
For D type cab: connector 605.
For SL cab and SH cab: connector 617.
14 A004 if FA type vehicle.
A005 if FT type vehicle.

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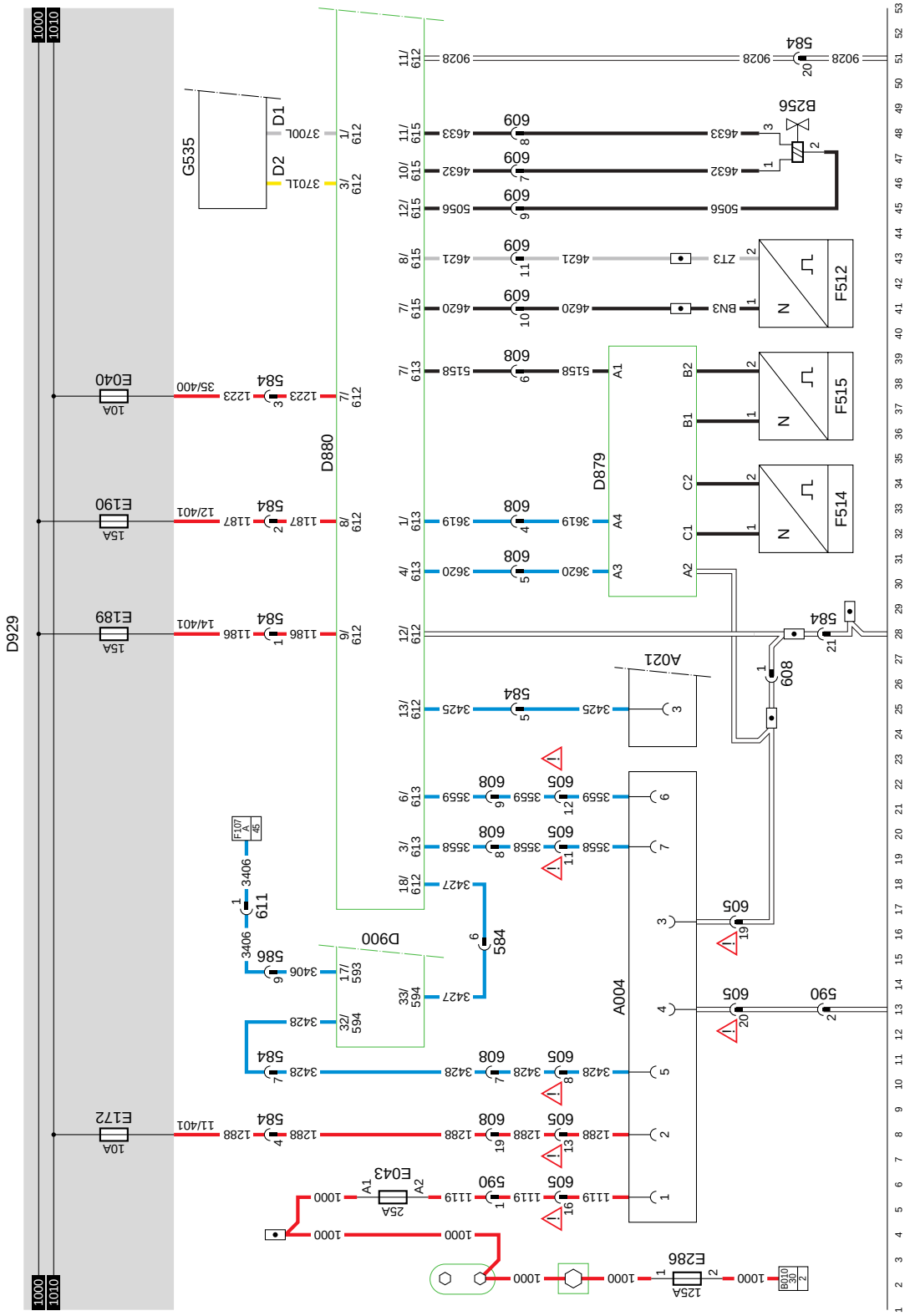

44 **1358030/15** EL000556

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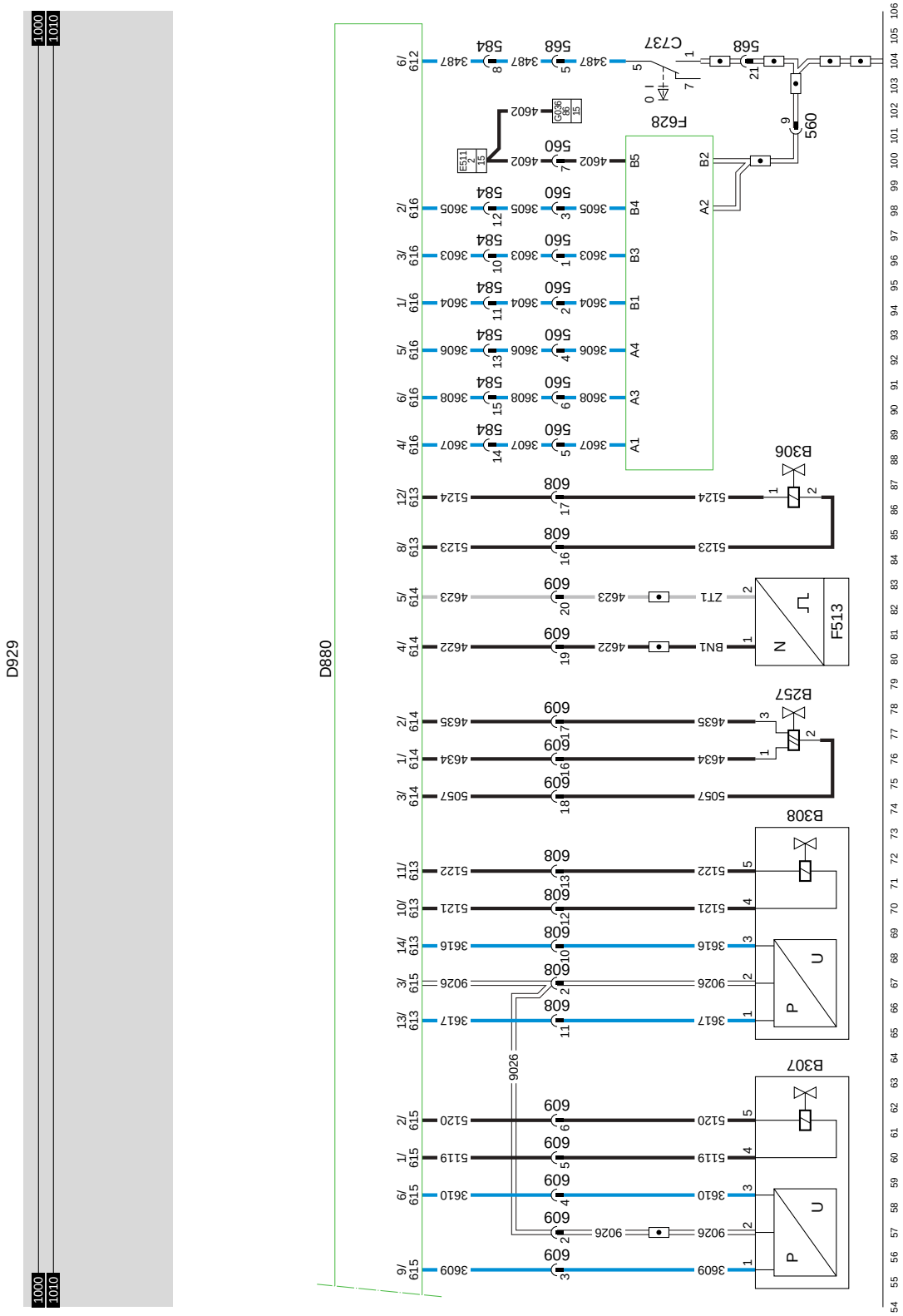

44 **1358030/15**

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45 BRAKE LINING WEAR SWITCH

If one of the brake linings is too thin, connection point B17 of the VIC will be interrupted by the corresponding brake pad wear switch (F107 or F108 or F109 or F110 or F111 or F112 or F113 or F114) through wire 3406. The VIC will send a message to the instrument panel, which will then activate the "brake lining wear" indicator.

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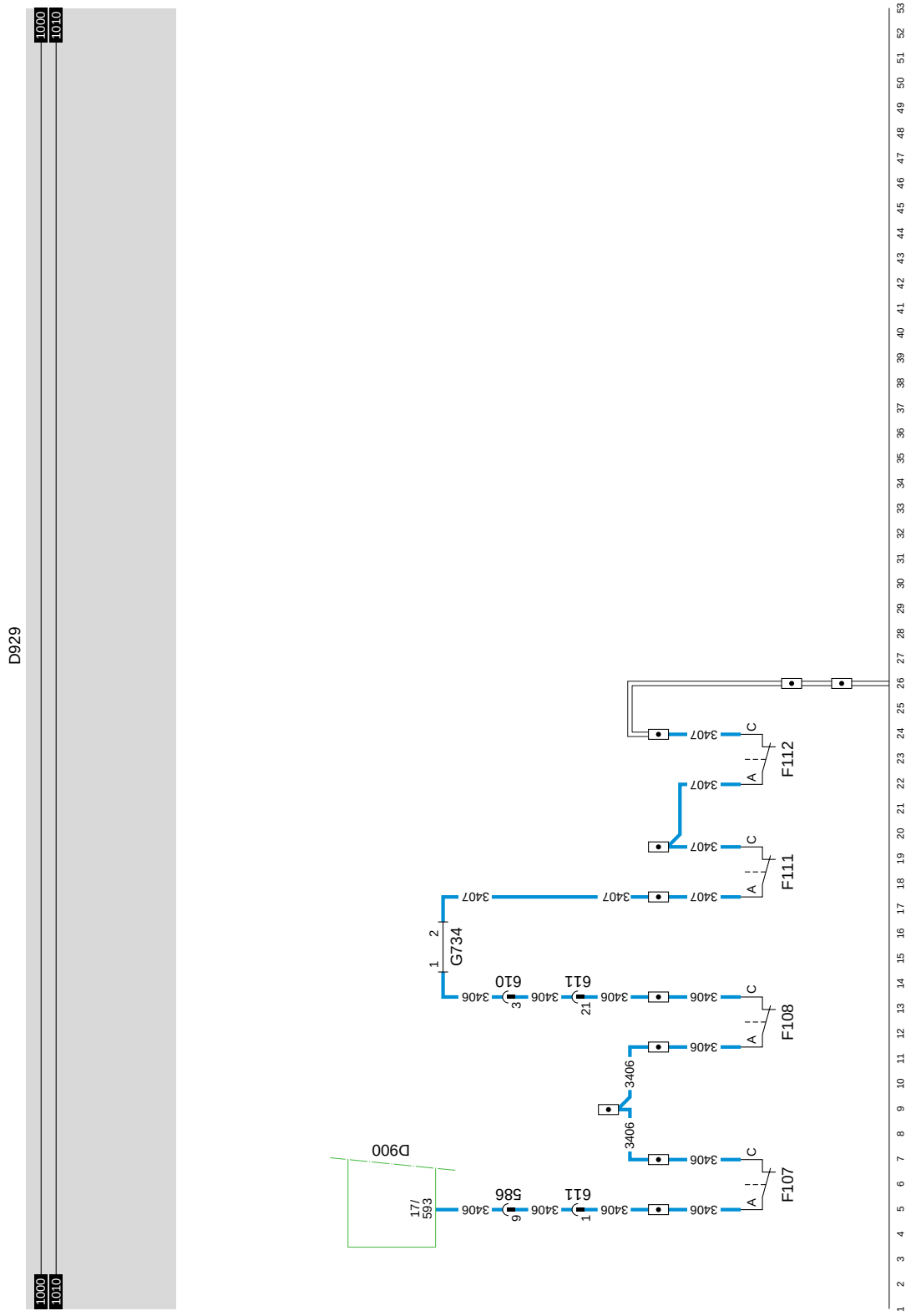

45 **1358030/15** EL000558

46 ALARM SYSTEM/BATTERY CHARGER FOR BV3 ALARM SYSTEM

SEE THE SYSTEM MANUAL FOR MORE INFORMATION.

VARIANTS

Location	
2	Present if an alarm system is **NOT** installed.
5, 11, 13	**NOT** present with BV02 model.
17	For more information on , see sub-diagram 17 & 18.
46 -> 50	connector 642: if FA type vehicle; connector 605: if FT type vehicle.
47	52 connector A001: if FA type vehicle. connector A003 if FT type vehicle.;
63	Only applies for SL cab.
56	Connection for F686 (this is optional). Only applies for an SL cab and for model BV2, BV3 or H1.
116	**NOT** present with H1 model.
122	Present if **NO** alarm system is present.
137	D931; only if **NO** alarm system is present.

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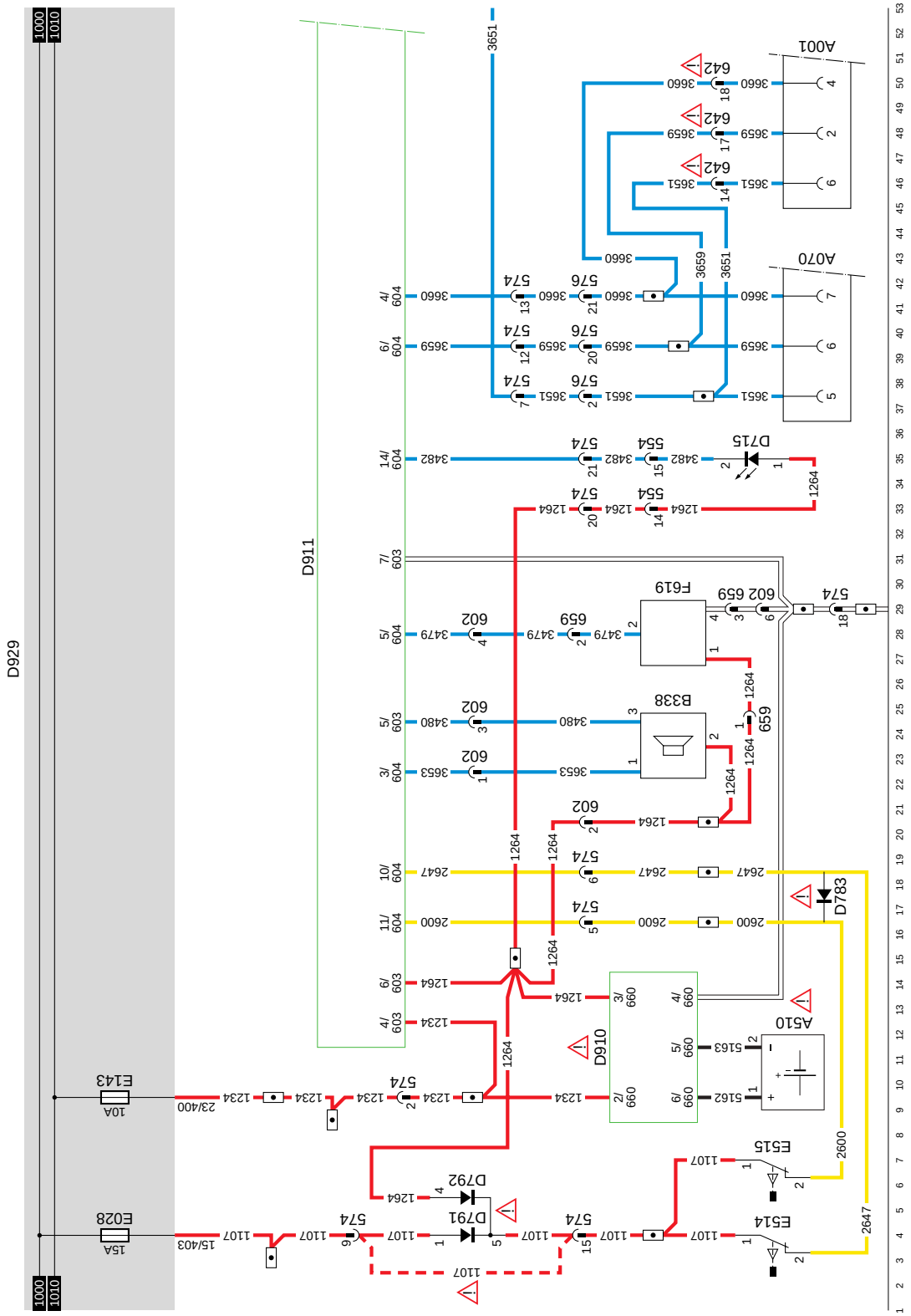

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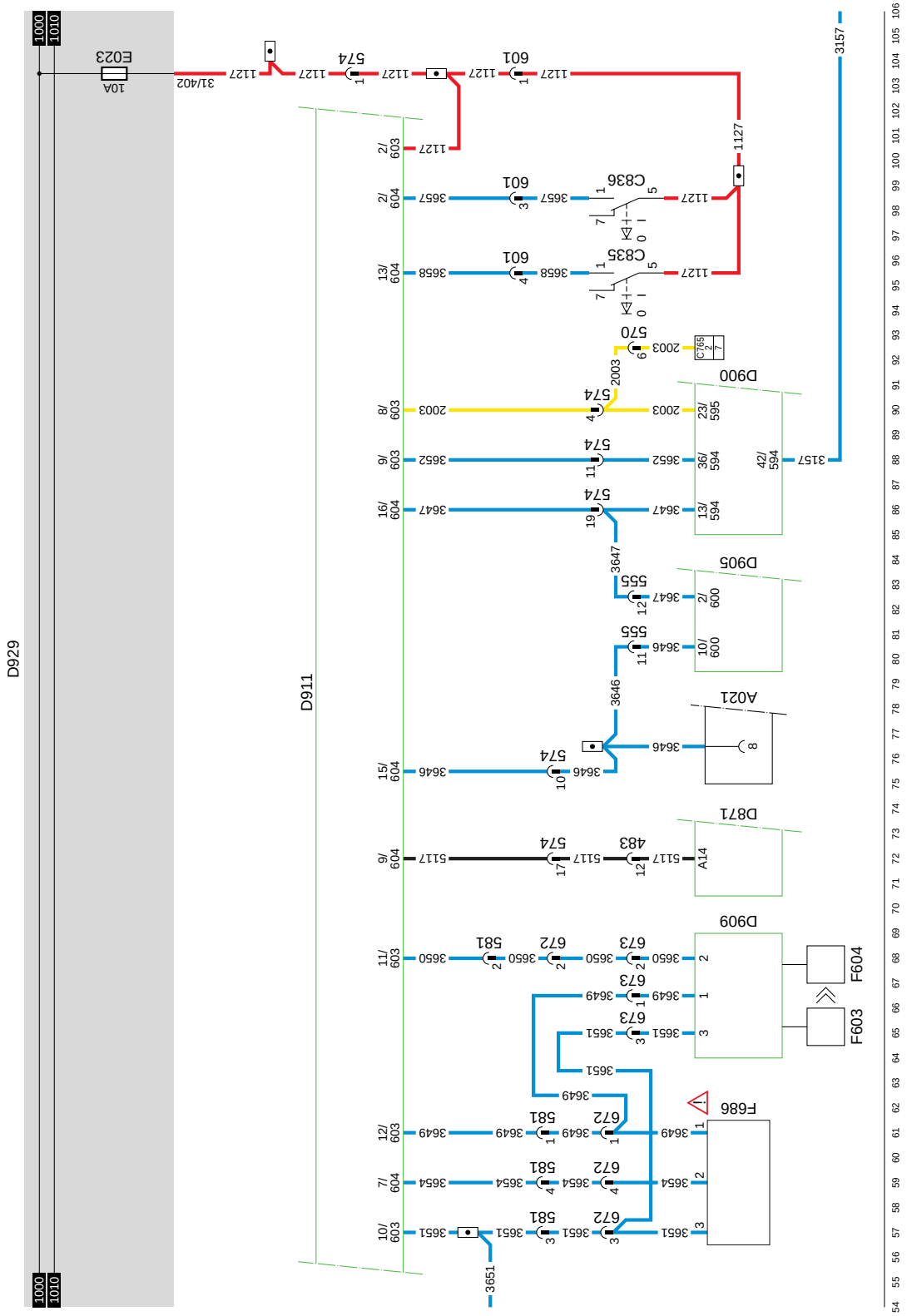

46 **1358030/15** EL000560

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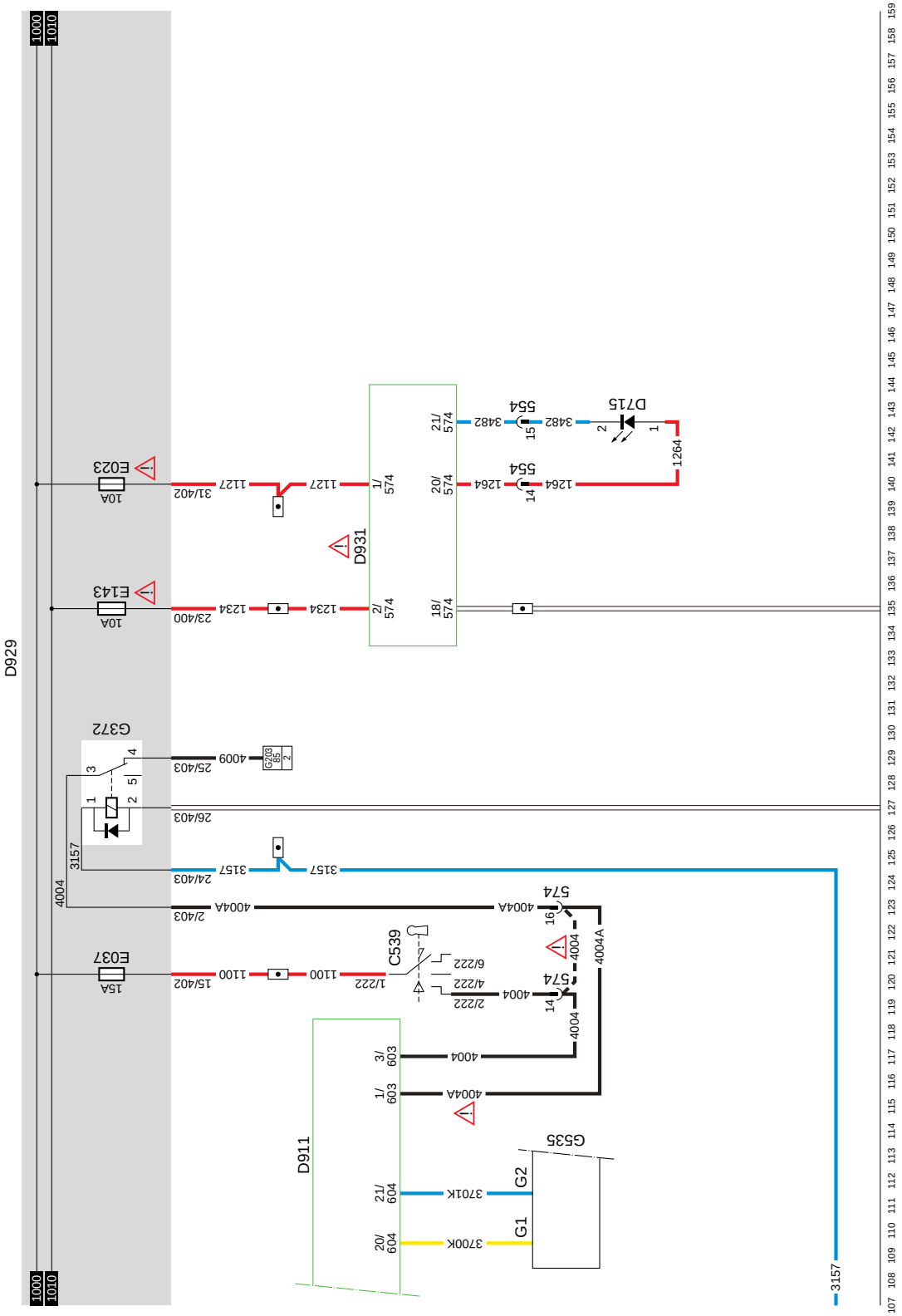

46 **1358030/15** EL000561

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47 PLUG SOCKETS, FA/FT

DIAGNOSTICS PLUG (A021)

The diagnostics plug is on the bottom right on the outside of the central box. This is the plug for the DAVIE connection. After the contact is switched on, power is supplied to pin 1 via fuse E053. Pin 2 is connected to earth. The remaining pins are for communication with the various systems, and are connected to those systems.

Pin no.	Wire no.	Colour	Description
1	1229	red	Power supply for DAVIE
2	9107	white	Earth
3	3425	blue	ABS - ASR - D
4			
5	4697	black	UPEC, ECS-DC3
6			
7	4732	black	ECAS-3
8	3646	blue	CDS, ALS-S
9	4047	black	VIC
10			
11	4883	black	ZF intarder
12	4733	black	DIP-4
13	3470	blue	AGS
14	3037	blue	Cab heater
15	3700	yellow	V-CAN-L
16	3701	blue	V-CAN-H

24V PLUG (A007)

Pin 1 of the 24V plug (A007) is connected directly to the power supply through wire 1105 and fuse E026.

Pin 2 is connected to earth.

ABS/EBS PLUG (A004)

Pin 1 of the ABS (EBS) plug (A004) is connected directly to power before ignition via fuse E043 and wire 1119.

Pin 2 is connected directly to power after ignition via fuse E172 and wire 1288.

Pin 3+4 are both connected to earth.

Pin 5 is connected to pin 32 of the VIC (D900) via wire 3428.

Pin 6 is connected to pin B6 of D880 (EBS) via wire 3559. Only if vehicle has EBS.

Pin 7 is connected to pin B3 of D880 (EBS) via wire 3558. Only if vehicle has EBS.

FT-TRAILER PLUG (A000) 7-pin

Pin 1 is connected to earth.

Pin 2 switches the left tail light.

Pin 3 is connected via wire 2008 to connection point 7 of the VIC (D900) (direction, left).

Pin 4 is connected via wire 4601 to relay G036 (relay for brake lights).

Pin 5 is connected via wire 2009 to connection point 8 of the VIC (D900) (direction, right).

Pin 6 switches the right tail light.

FT-TRAILER PLUG (A000) 15-pin

Pin 1 is connected via wire 2008 to connection point 7 of the VIC (D900) (direction, left).

Pin 2 is connected via wire 2009 to connection point 8 of the VIC (D900) (direction, right).

Pin 3 is connected via wire 2152 to connection point 87 of relay G005 (rear fog light relay).

Pin 4 is connected to earth.

Pin 5 switches the left tail light via wire 2102.

Pin 6 switches the right tail light via wire 2103.

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Pin 4 is connected via wire 4591 to connection point 4 of E501 (reversing light operating switch).

Pin 5 is connected via wire 1264 to connection point 3 of D910 (ALS-S battery charger).

Pin 6 is connected via wire 36598 to connection point B6 of D911 (ALS-S).

Pin 7 is connected via wire 3660 to connection point B4 of D911 (ALS-S).

Pin 3 is directly connected to earth.

TELEPHONE CONNECTOR (A076)

Pin 1 is connected to connection B1 (12V) of D895 via wire 1353.

Pin 2 is connected to connection A4 (12V) of D895 via wire 1108.

Pin 3 is connected to earth.

Pin 3 is connected via wire 4591 to connection point 4 of E501 (reversing light operating switch).

Pin 4 is connected via wire 3660 to connection point B4 of ALS-S (D911).

Pin 5 is connected directly to the supply voltage through fuse E048 and wire 1113.

Pin 6 is connected via wire 1264 to connection point 3 of D910 (ALS-S battery charger).

Pin 7 is connected via wire 2152 to connection point 87 of relay G005 (rear fog light relay).

SUPERSTRUCTURE APPLICATION CONNECTOR (A070)

Pin 1 is connected to power before ignition via wire 1113 and fuse E048.

Pin 2 is connected to connection point 87 of relay G000 (tail light/side-light relay) via wire 2155, fuse E000 and wire 2101.

Pin 3 is connected via wire 4601 to connection point 87 of G036 (stop light relay).

Pin 7 is connected via wire 4601 to connection point 87 of relay G036 (rear brake light relay).

Pin 8 is connected via wire 4591 to connection point 4 of E501 (reversing light operating switch).

Pin 9 is connected to power before ignition via wire 1113 and fuse E048.

Pin 10 is connected via wire 3659 to connection point B6 of D911 (ALS-S).

Pin 11 is connected via wire 3660 to connection point B4 of D911 (ALS-S).

Pin 12 is connected via wire 1264 to connection point 3 of D910 (ALS-S battery charger).

Pin 13 Not connected.

Pin 14 Not connected.

Pin 15 Not connected.

REAR FOG LIGHT AND REVERSING LIGHT PLUG (A001)

Pin 1 is connected to earth.

Pin 2 is connected via wire 3659 to connection point B6 of ALS-S (D911).

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VARIANTS

Location	
22, 25	Connector 585: For ABS/ASR-D-connector 585. For EBS-connector 584.
22, 25, 37	Connector 610: For ABS/ASR-D-connector 610. For EBS-connector 608.
20 -> 33	Connector 642: A 7-pin or 15-pin connector can be connected to this.
26	A004: This is for an FA type vehicle. A005: This is for an FT type vehicle.
59	Connector 585: For ABS/ASR-D-connector 585. For EBS-connector 584. For ABS/ASR-D-unit: D850. For EBS-unit: D880
63	If vehicle has an EMAS system: The diagnostics plug for the EMAS system is also connected to connection point 8 (wire 3646) (unit: D850). Wire 3646 to the EMAS system includes connector: 445.
125	A000 and A001: May be 2x 7-pin connector or 1x 15-pin connector.
185	Only applicable for an FA type vehicle.

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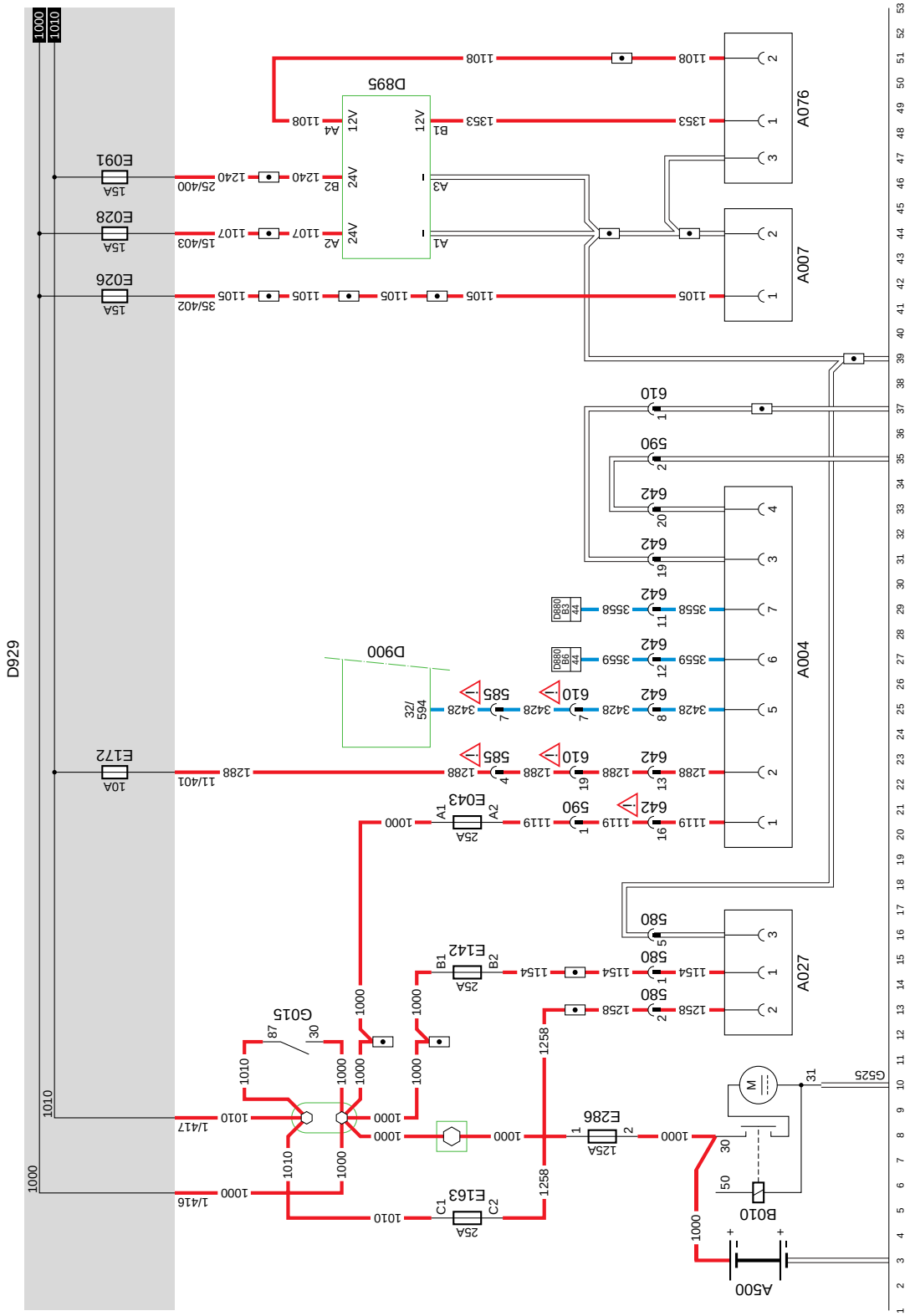
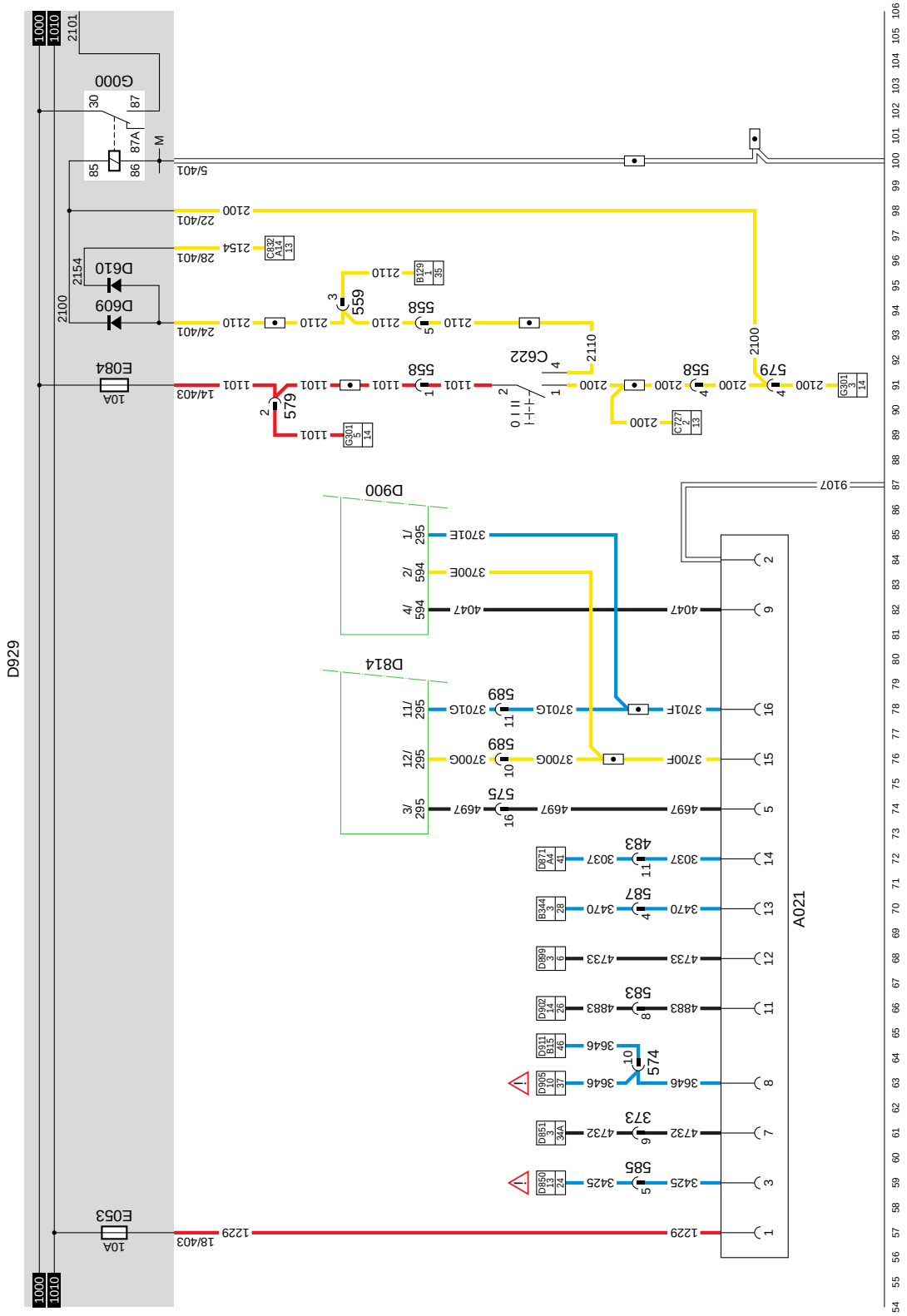


47 **1358030/15** EL000562



47 **1358030/15** EL000563

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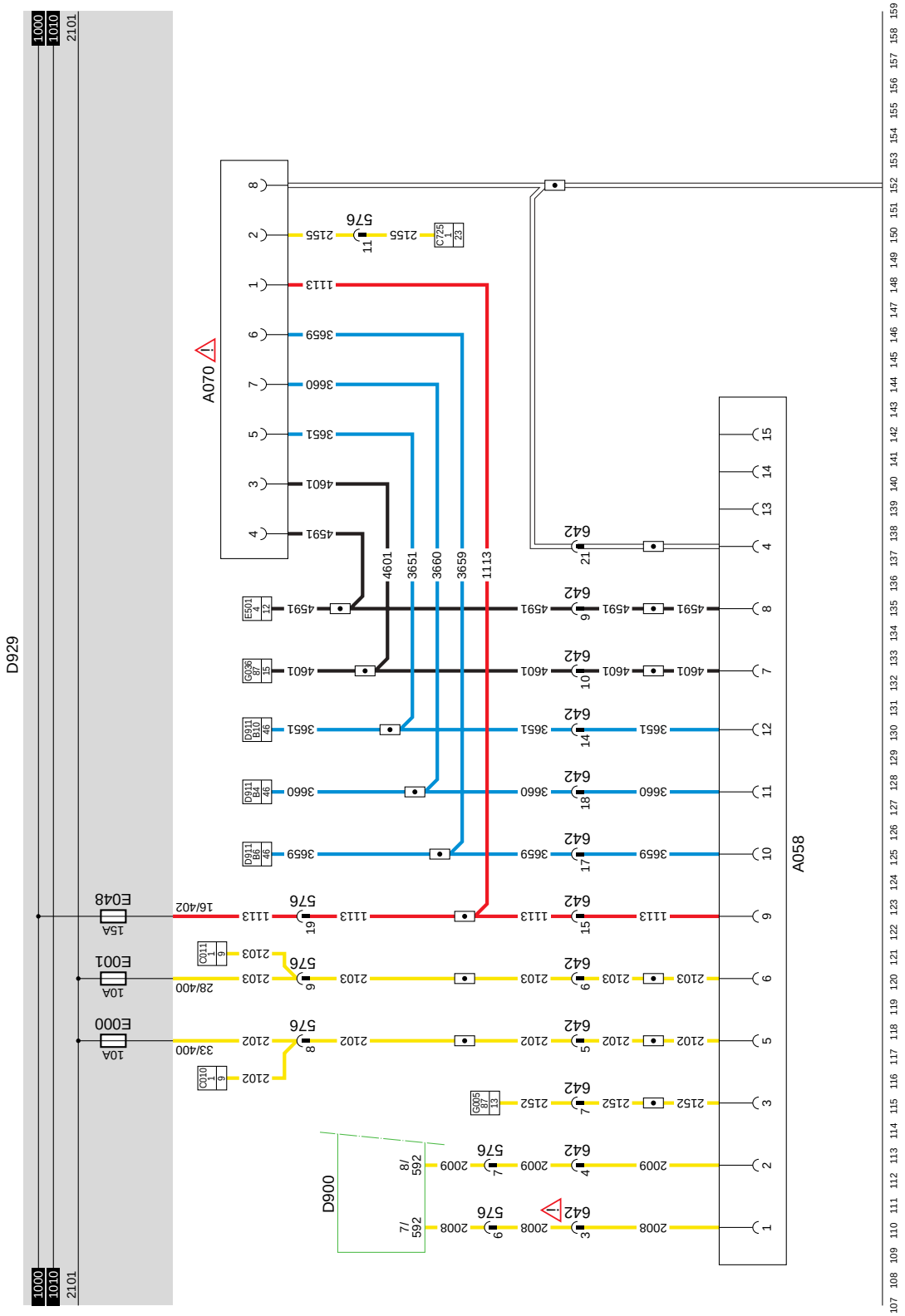

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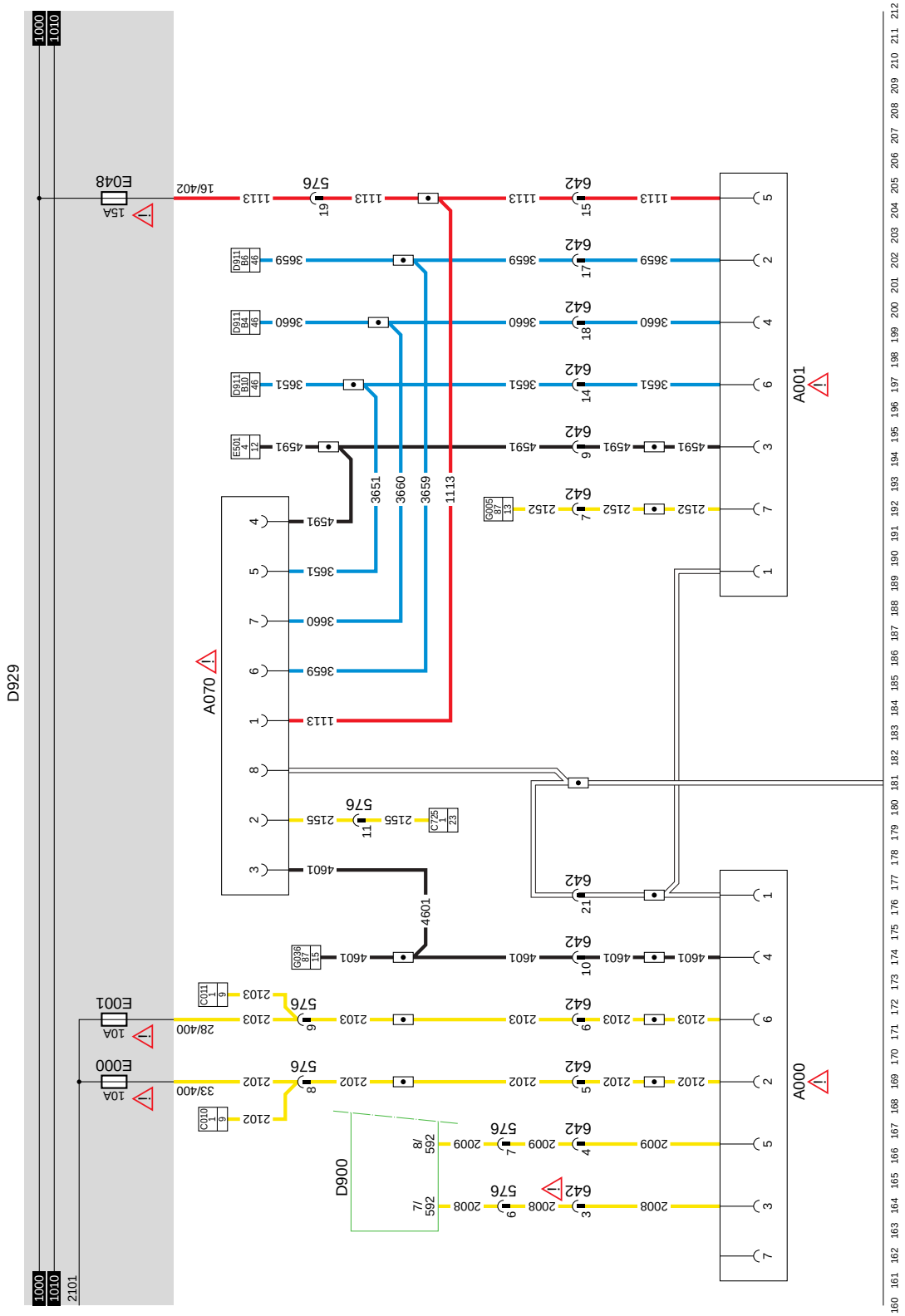

47 1358030/15 EL000565

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48 FUEL FILTER/WATER SEPARATOR (RACOR)

When the vehicle contact is switched on, there is a voltage on both connection point 1 of the electronic unit (D855) and on the fuel filter/water separator switch (C872) through wire 1010 and fuse E170. When this switch is operated, relay G234 will be energised. The voltage is now applied to connection point 3 of the fuel filter/water separator heating element sensor (B241) through wire 1000, fuse E171, wire 1179, contacts 30 and 87 of relay G234 and wire 5051. The LED "ON" indicator now comes on.

Wires 5049 and 5050 signal that there is water in the water separator. The LED "DRAIN" indicator now comes on.

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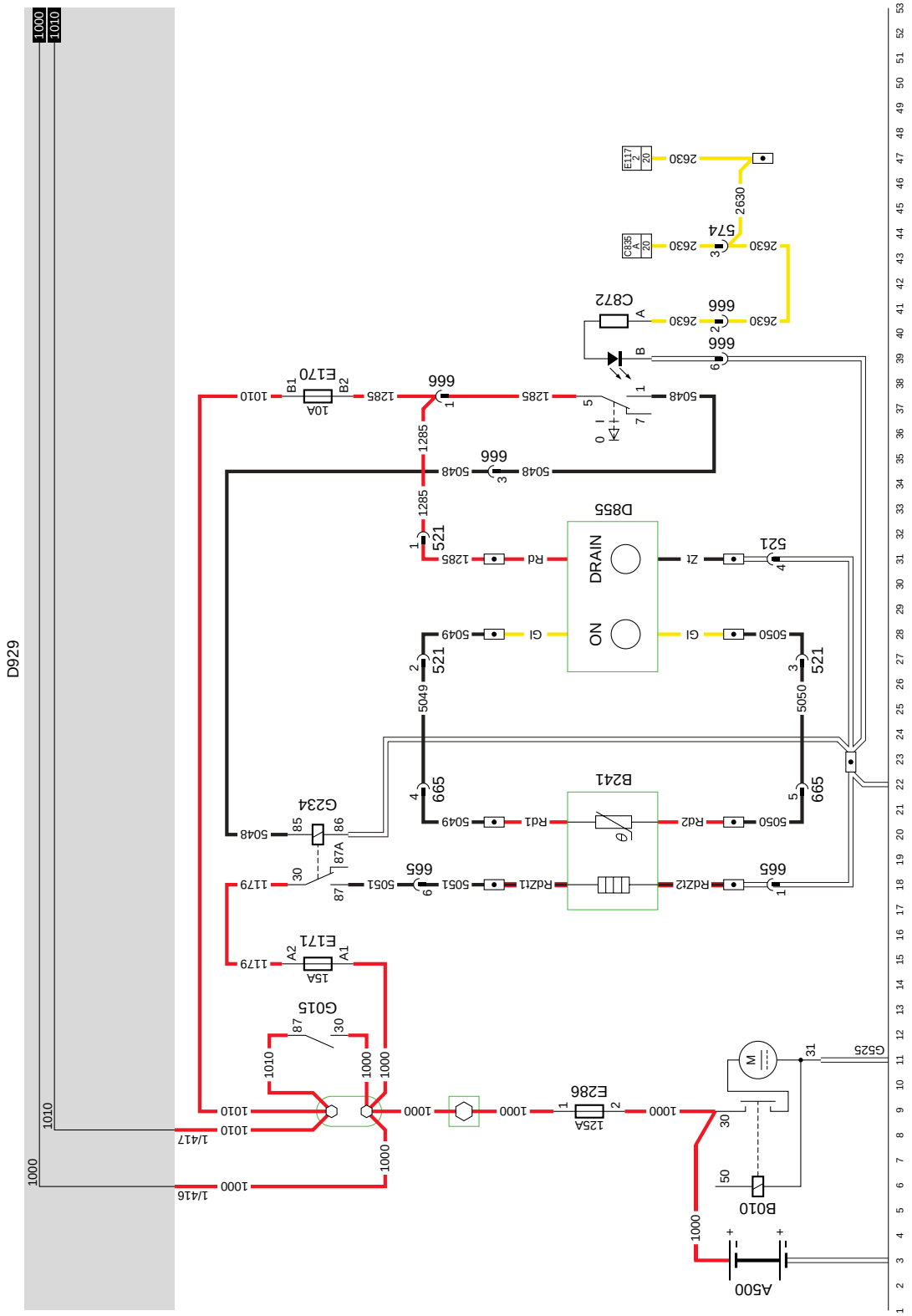

48 **1358030/15** EL000566

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49 FUEL FILTER/WATER SEPARATOR (FLEET GUARD)

When the vehicle contact is switched on, there is a voltage on connection point 2 of the electronic unit B387 (fuel filter/water separator electronic unit) through wire 1010 and fuse E170.

If the temperature of the fuel is too low, relay G201 is activated by the ECS-DC3 electronic unit (D903).
A voltage is applied from connection point 18, connector 647 and wire 5048 to connection point 85 of relay G201. Connection point 86 of relay G201 is connected through an earth wire to connection point 2, connector 647. The VIC now switches the earth on or off, so that relay G201 is switched on or off depending on the fuel temperature.

When relay G201 is energised, contacts 30 - 87 close. A voltage is now applied to connection point A of electronic unit B387 through wire 1000, fuse E164, wire 1190, contacts 30 - 87 of relay G201 and wire 5051. The glow plug is now activated.

If there is too much water in the fuel prefilter/water separator, a voltage is applied to connection 12, connector 594 of the VIC-unit through connection 1 of B387 and wire 3150. This in its turn sends a signal to the DIP via the I-CAN. The DIP will now send a message to indicate that there is too much water in the fuel filter/water separator.

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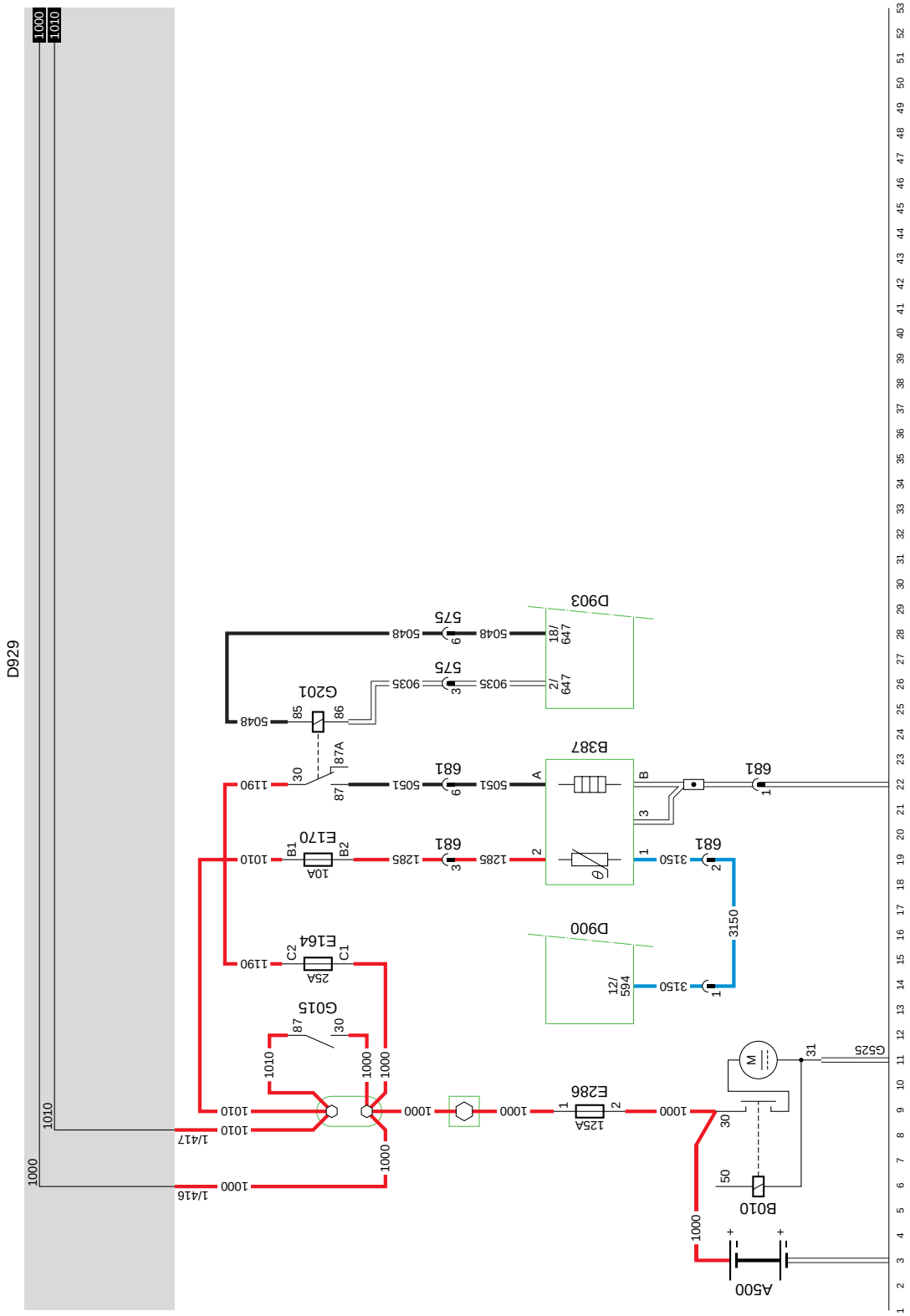

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1. INTRODUCTION

This main group includes the entire electrical system shown in the form of **circuit diagrams and the modified section diagrams.**

Circuit diagrams
All information that relates to the complete electrical system of the vehicle is found in the circuit diagrams with the exception of the connectors.

Section diagrams
Only the modified parts of the electrical system are shown on the section diagrams. These diagrams also contain the connectors.

Note:
For the location of the connectors in the vehicle, see “Location of connectors”.

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2. CHANGES IN THE ELECTRICAL SYSTEM FROM CHASSIS NUMBER 0E570448

2.1 OVERVIEW OF THE CHANGES IN THE ELECTRICAL SYSTEM

Section diagram	Electrical system	Changes	From chassis number
A	Voltage before and after contact	Contact relay (G426) added. Fuse E143 changed to E350. Various wires changed.	0E595070
1	Main switch	Mechanical main switch added.	0E597518
2	Alternator/ignition/starter switch/charging circuit	Circuit in power supply after contact changed.	0E595070
3	MTCO tachograph	Circuit in power supply after contact changed.	0E595070
4	Immobiliser	Circuit in power supply after contact changed.	0E595070
5	Pre-glowing	Circuit in power supply after contact changed.	0E595070
8	VIC	Circuit in power supply after contact changed.	0E595070
11	UPEC	Wire 1234 changed to 1211. B290 withdrawn. Wire 6158 added.	0E595070
12	Reversing lights	Relay G350 (reversing lights) and switch C814 (reversing buzzer) added.	0E595070
15	Stop lights/cab tilting gear	Switch E569 changed to E594.	0E595070
20	Search lighting	Connector 397 and warning lamp C814 added.	0E595070
23	Horn/cigar lighter/work lamp/air dryer	Wire 2622 changed to 2630.	0E570448
24	ABS-ASC-D	Circuit in power supply after contact changed.	0E595070
26	Intarder EST42	Circuit in power supply after contact changed.	0E595070
27	ECS-DC-3	Circuit in power supply after contact changed.	0E595070

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Section diagram	Electrical system	Changes	From chassis number
29	EMAS	Circuit in power supply after contact changed. Wire 3157 changed to 3003. Pins A16 and A17 changed to B4 and B5.	0E595070
30	AGC	Circuit in power supply after contact changed. Wire 5722 in connector A074 on pin19 added.	0E578830
32	PTO	Activation of 2nd PTO via VIC added.	0E602132
33	Roof spotlights/cooler box/rotating beams	Wire 1258 (rotating beams power supply) changed from 1154.	0E595070
34A	ECAS-3 (4x2)	Circuit in power supply after contact changed.	0E595070
34B	ECAS-2 (6x2)	Circuit in power supply after contact changed.	0E595070
37	Electric drop glass/central door locking/roof hatch, SH cab	Fuse E026 changed to E084. Wire 1105 changed to 1101.	0E595070
42	Hydronic 10 (ACH-EW) cab heater with timer	Wire 4595 changed to 5241.	0E602132
43	UPEC/Cummins/AGC application connector	Relay G350 (reversing lights) added	0E595070
44	EBS	Circuit in power supply after contact changed. Switch C890, third brake integration added.	0E595070
46	Alarm system/battery charger for BV3 alarm	Circuit in power supply after contact changed.	0E595070
47	Plug sockets, FA/FT	Fuse E026 changed to E036. Fuse E168, wire 1175, socket A038 added. Wire 1105 changed to 1103.	0E595070
50	Water separator	Preline, “water in fuel” sensor.	0E590212
51	AS Tronic	AS Tronic added.	0E602132

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2.2 CIRCUIT DIAGRAM 1358030/16-24

This page can be used to make your own notes
on the circuit diagram.

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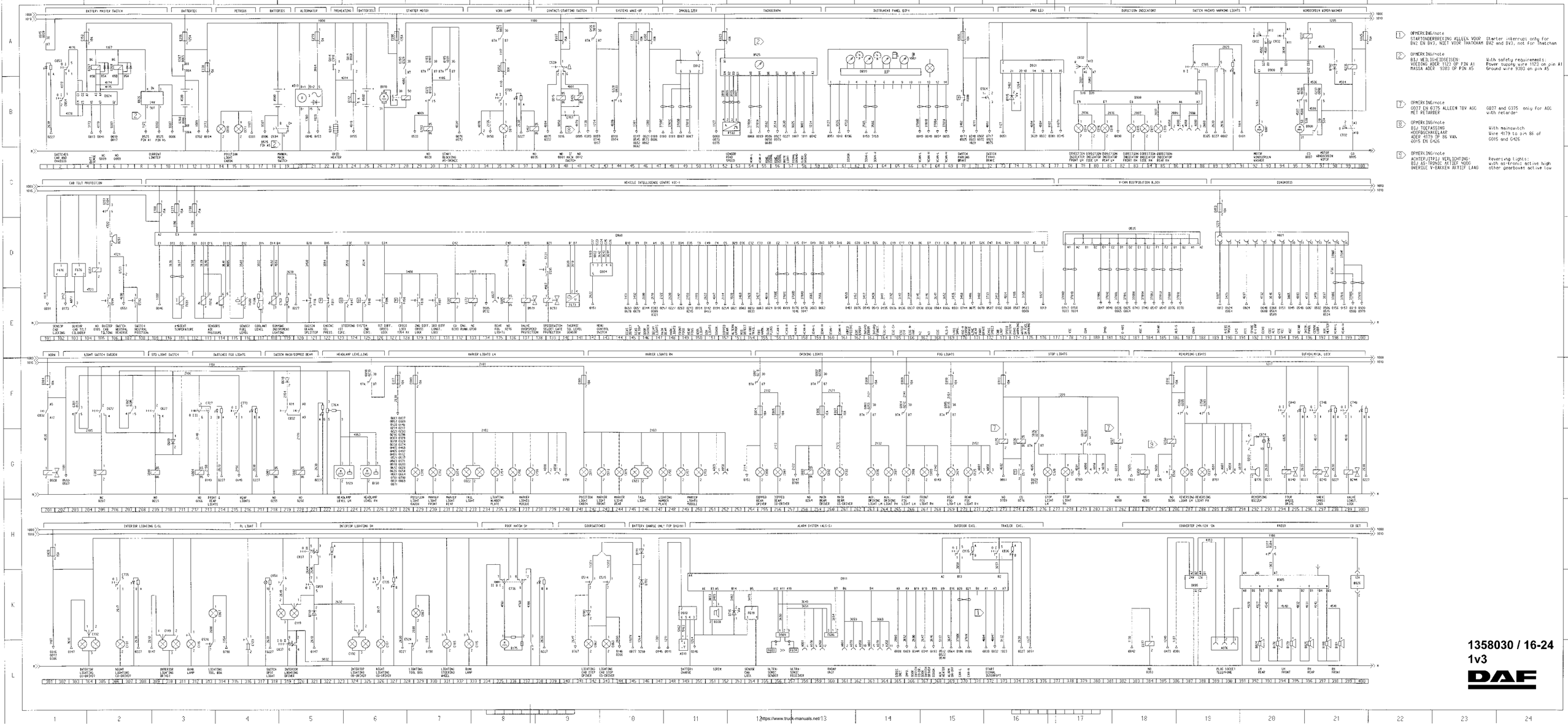
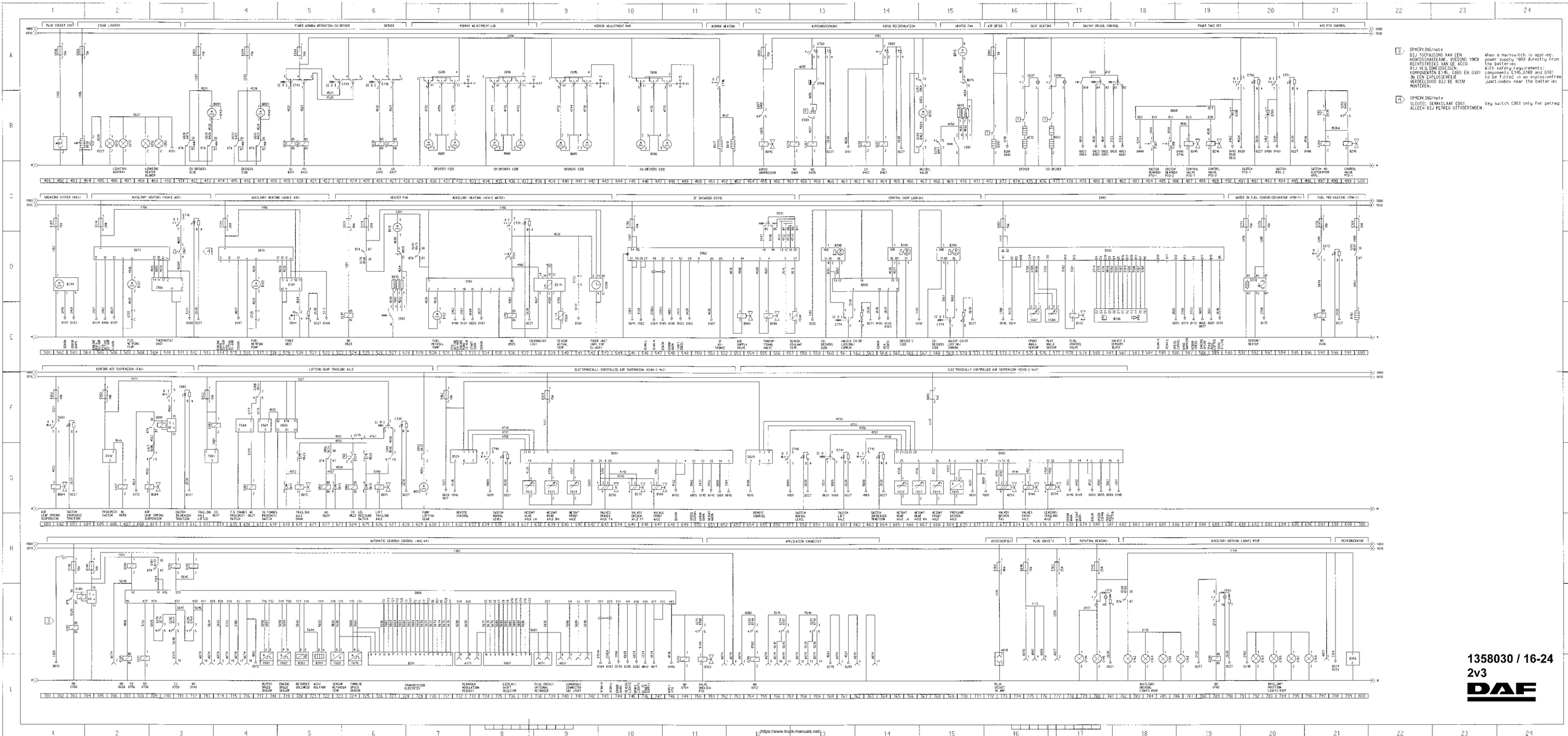

BATTERY MASTER SWITCH
BATTERIES
PETROL
BATTERIES
ALTERNATOR
PREHEATING
BATTERIES
STARTER MOTOR
WORK LAMP
CONTACT/STARTING SWITCH
SYSTEMS WAKE-UP
IMMOBILIZER
TACHOGRAPH
INSTRUMENT PANEL DIP-1
J1939 LED
DIRECTION INDICATORS
SWITCH HAZARD WARNING LIGHTS
WINDSCREEN WIPER/WASHER
CAB TILT PROTECTION
VEHICLE INTELLIGENCE CENTRE VIC-1
V-CAN DISTRIBUTION BLOCK
DIAGNOSIS
HORN
LIGHT SWITCH SWEDEN
STD LIGHT SWITCH
SWITCHES FOG LIGHTS
SWITCH MAIN/DIPPED BEAM
HEADLAMP LEVELLING
MARKER LIGHTS LH
MARKER LIGHTS RH
DRIVING LIGHTS
FOG LIGHTS
STOP LIGHTS
REVERSING LIGHTS
WIPER/WASH. LOCK
INTERIOR LIGHTING EXCL.
FL LIGHT
INTERIOR LIGHTING RH
ROOF HATCH DP
COORDSWITCHES
BATTERY CHARGE ONLY FOR SV2/XF
ALARM SYSTEM (ALS-S)
INTERIOR EXCL.
TRAILER EXCL.
CONVERTER 24V/12V -DA
RADIO
CB SET
1 OPMERKING/note
STARTONDERBREKING ALLEEN VOOR BV2 EN BV3, NIET VOOR THATCHAM
Starter interrupt only for BV2 and BV3, not for Thatcham
2 OPMERKING/note
BIJ VEILIGHEIDSEISEN:
VOEDING ADER 1123 OP PIN A1
MASSA ADER 9303 OP PIN A5
With safety requirements:
Power supply wire 1123 on pin A1
Ground wire 9303 on pin A5
7 OPMERKING/note
G037 EN G375 ALLEEN TBV AOC MET RETARDER
G037 and G375 only for AOC with retarder
8 OPMERKING/note
BIJ TOEPASSING MISTVOORLICHTLAMP
ADER 4179 OP 86 VAN G015 EN G426
With mainswitch
Wire 4179 to pin 86 of G015 and G426
6 OPMERKING/note
ACHTERUITRIJLICHTING:
BIJ AS-TRONIC ARTIEF HOOG:
OVERIGE V-BAKKEN ARTIEF LAAG
Reversing lights:
with as-tronic active high
other gearboxes active low
1358030 / 16-24
1v3
DAF



3 OPMERKING/note
BIJ TOEPASSING VAN EEN HOOFDSCHAKELAAR, VOEDING 1909 RECHTSTREEKS VAN DE ACCU. BIJ VEILIGHEIDSEISEN: KOMPONENTEN E195, G180 EN G181 IN EEN EXPLOSIEVEILIGE VERDEELDOOS BIJ DE ACCU MONTEREN.

When a mainswitch is applied, power supply 1909 directly from the batteries
With safety requirements: components E195,G180 and G181 to be fitted in an explosionfree junctionbox near the batteries

4 OPMERKING/note
SLEUTEL SCHAKELAAR C851 ALLEEN BIJ PETREG UITVOERINGEN.

key switch C851 only for petreg

1358030 / 16-24
2v3

DAF

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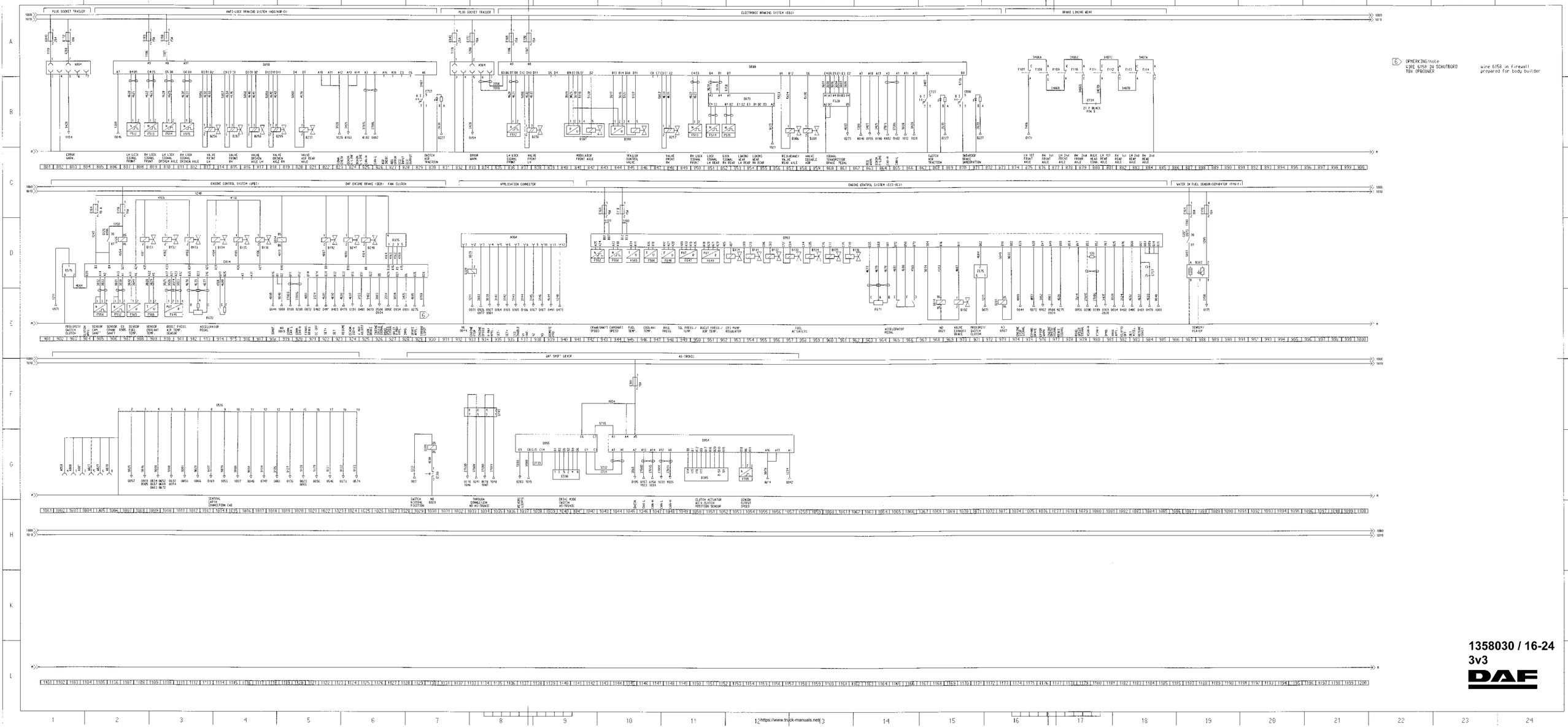

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2.3 OVERVIEW OF BASIC CODE NUMBERS IN CIRCUIT DIAGRAM 1358030/16-24

Basic code number	Description	Search bar number
A000	Drawn vehicle socket (7-pin)	86, 87, 238, 251, 279, 1003
A001	Rear fog lamp/reversing lamp socket (7-pin)	270, 289, 358, 361, 363, 775, 1004
A004	Drawn vehicle ABS/EBS socket	803, 834
A007	24V socket (2-pin)	403
A021	Diagnostics socket (16-pin)	194
A027	Socket, 24V accessories (4-pin)	103, 135, 777, 797, 1004, 1005
A032	AGC diagnostics socket	740
A038	Socket, 40A accessories (2-pin)	773
A058	Drawn vehicle socket (15-pin)	85, 87, 239, 252, 271, 280, 290, 359, 362, 364, 776, 1002
A068	Application connector, engine speed control	939
A070	Application connector, superstructure (8-pin)	32, 280, 291, 359, 362, 364, 775, 1006
A071	Automatic gearbox socket, retarder functions	738
A073	Automatic gearbox socket, operation	732
A074	Automatic gearbox socket, superstructure	706, 711, 713, 714, 715, 716, 752, 753, 755, 756, 757, 758, 759, 761, 762, 763
A076	Telephone socket	389
A500	Batteries (2x)	10, 17, 24
A510	Alarm system battery	349
A513	Alternator	19
B000	Windscreen wiper motor	96
B001	Windscreen washer pump motor	93
B003	Electric drop glass motor, driver's side	419
B004	Electric drop glass motor, co-driver's side	415
B005	Left mirror adjustment motor	432, 442

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Basic code number	Description	Search bar number
B006	Right mirror adjustment motor	437, 448
B010	Starter motor	25
B015	4-speed heater fan	470, 471, 527, 528
B017	Mirror heating, driver's side	452
B018	Mirror heating, co-driver's side	453
B024	Loudspeaker, left	392
B025	Loudspeaker, right	396
B026	CB	399
B028	Horn	402
B030	Cigar lighter, driver's side	406
B032	Seat heating, driver's side	475
B033	Seat heating, co-driver's side	477
B042	Air dryer heating element	473
B043	Air conditioning compressor	455
B071	Lifting-gear lifting valve	626
B072	Lifting-gear lowering valve	620
B073	Lifting-gear pump motor	629
B079	Low-range downshift protection valve	137
B084	Air suspension bleed valve	602, 609
B088	Intarder proportional valve	556
B089	Intarder air supply valve	554
B122	Fuel dosage pump for Eberspächer cab heater	508, 517, 531
B129	Left-hand headlight height adjuster motor	223
B130	Right-hand headlight height adjuster motor	225
B131	Solenoid valve, pump unit/injector of cylinder 1	909
B132	Solenoid valve, pump unit/injector of cylinder 2	910
B133	Solenoid valve, pump unit/injector of cylinder 3	912
B134	Solenoid valve, pump unit/injector of cylinder 4	914
B135	Solenoid valve, pump unit/injector of cylinder 5	916
B136	Solenoid valve, pump unit/injector of cylinder 6	917

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Basic code number	Description	Search bar number
B166	ECAS valve, front axle	647, 675
B169	PTO operation valve, Chelsea	751
B175	Roof hatch motor	336
B176	Reversing buzzer	292
B178	Loudspeaker, left	394
B179	Loudspeaker, left	395
B180	Loudspeaker, right	397
B181	Loudspeaker, right	398
B182	Heating element for fuel filter/water separator	599
B192	Engine brake valve	922, 973
B199	Central door locking motor, driver's side	565
B200	Central door locking motor, co-driver's side	560, 569
B201	Internal electrical components for AGC automatic gearbox	728
B237	Valve, ABS/ASC-D, differential lock, rear axle	821
B238	ECAS-2 (6x2) driven axle left/right air supply valve (FT)	645
B243	Cross-axle differential lock operation valve	297
B244	Longitudinal controlled slip differential operation valve	299
B245	PTO operation valve	487
B246	PTO operation valve	489, 500
B247	Solenoid valve (DEB)	924
B248	Solenoid valve (DEB)	925
B250	ECAS driven axle, left/right, air supply valve (FA)	643
B251	Neutral position buzzer, cab tilting	106
B252	Recirculation valve	468
B253	ECAS driven axle, left/right, air supply valve	673
B254	Valve, ECAS second steered axle/trailing axle, left/right, lifting bellows	677
B256	Valve, ABS-D, ABS/ASC-E, front axle, left	813, 838

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Basic code number	Description	Search bar number
B257	Valve, ABS/ASC-D, front axle, right	815, 848
B258	Valve, ABS/ASC-D, driven axle, left	817
B259	Valve, ABS/ASC-D, driven axle, right	818
B293	Gearbox gate protection valve	139
B306	EBS redundancy valve	857
B307	EBS front axle modulator	841
B308	Drawn vehicle EBS control valve	845
B309	ASC cut-off valve	859
B335	Electronically controlled viscous fan clutch	927
B338	Alarm system horn	351
B340	Four-wheel drive valve	295
B341	Glow element	22
B344	Automatic lubrication pump with integrated electronic unit	503
B353	Automatic gearbox control solenoid, retarder	720
B354	Automatic gearbox accumulator	721
B356	Cooler box	799
B365	Radio	394
B372	Fluid flow control valve block	579
B378	Heating element for fuel filter/water separator	592
B385	AS Tronic clutch unit	
B386	Steering cylinder control valve block	581
B387	Fuel heater/water separator electronic unit	990
B525	Modular tachograph, MTCO	54
C000	Dipped beam, left	255
C001	Dipped beam, right	256
C002	Main beam, left	260
C003	Main beam, right	261
C006	Spotlight, left	262

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Basic code number	Description	Search bar number
C007	Spotlight, right	264
C008	Fog lamp, front left	265
C009	Fog lamp, front right	266
C010	Width marker light (headlight), left	14, 229
C011	Width marker light (headlight), right	15, 242
C012	Width marker light, front left	231
C013	Width marker light, front right	243
C014	Direction indicator lamp, front left	79
C015	Direction indicator lamp, front right	83
C016	Direction indicator lamp, side left	80
C017	Direction indicator lamp, side right	84
C018	Direction indicator lamp, rear left	81
C019	Direction indicator lamp, rear right	85
C020	Stop light, left	277
C021	Stop light, right	278
C022	Rear light, left	232
C023	Rear light, right	245
C024	Fog lamp, rear left	268
C025	Fog lamp, rear right	270
C026	Reversing light, left	287
C027	Reversing light, right	288
C052	Heater fan light, left	411
C053	Heater fan light, right	412
C062	Cab stepwell lighting, driver's side	342
C063	Cab stepwell lighting, co-driver's side	344
C067	Left-hand tool compartment lighting	314, 329
C071	Work lamp	34
C072	Ashtray light, left	408
C073	Ashtray light, right	409
C074	Width marker light, rear left	232
C075	Width marker light, rear right	245

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Basic code number	Description	Search bar number
C115	Bunk light with switch	315, 333
C119	Interior lighting with switch, driver's side	310, 320
C129	Interior lighting with switch	316
C144	Rotating beam, left	779
C145	Rotating beam, right	781
C154	Rear number plate light, left (tractors)	235
C155	Rear number plate light, left (tractors)	248
C156	Width marker light, left, 1st (tractors)	237
C157	Width marker light, right, 1st (tractors)	249
C158	Width marker light, left, 2nd (tractors)	238
C159	Width marker light, right, 2nd (tractors)	251
C162	Roof spotlight	783
C163	Width marker light in roof spotlight	793
C164	Roof spotlight	784
C165	Width marker light in roof spotlight	794
C166	Roof spotlight	786
C167	Width marker light in roof spotlight	795
C168	Roof spotlight	787
C169	Width marker light in roof spotlight	797
C185	Light with switch	332
C191	Nightlight, centre	307, 327
C192	Interior lighting with switch, co-driver's side	304, 324
C539	Accessories/ignition/starter switch	38
C622	Switch, lighting	205, 209
C694	Main switch, mechanical	17
C695	Mirror adjustment switch, driver's side	433, 443
C696	Mirror adjustment switch, co-driver's side	438, 448
C697	Seat heating switch, driver's side	475
C698	Seat heating switch, co-driver's side	477
C716	Switch, rotating beams	781

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Basic code number	Description	Search bar number
C725	Work lamp switch	34
C727	Front/rear fog lamp switch	212
C735	Interior nightlight switch	307, 326
C736	Roof hatch switch	336
C737	ABS/ASC-D traction switch	830, 868
C739	Mechanical lifting-gear switch	627
C740	ECAS switch, normal level	635, 657
C741	ECAS switch, axle lifting	661
C742	Traction assistance switch	663
C743	Electric drop glass switch, co-driver's side (driver's side door)	422
C744	Electric drop glass switch, co-driver's side (co-driver's side door)	425
C745	Electric drop glass switch, driver's side (driver's side door)	428
C746	Mirror heating switch	453
C748	Cross-axle differential lock operation switch	297
C749	Longitudinal controlled slip differential control switch	299
C750	PTO operation switch	492
C751	PTO operation switch	495
C760	Air conditioning switch	459
C763	Instrument lighting dimming potentiometer	119
C764	Potentiometer, headlamp height adjustment	222
C765	Switch, warning lamps (with LED search lighting)	88
C773	Rear fog lamp switch	215
C774	Central door locking switch	561, 569
C778	Cab heater switch	511, 536
C802	Switch, recirculation valve	464
C813	Spotlight switch, roof	790
C814	Reversing buzzer switch	292
C831	Cruise control/engine speed control/retarder stalk switch	480, 556

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Basic code number	Description	Search bar number
C832	Direction indicator/windscreen wiper stalk switch	79, 92, 93, 98, 219, 402
C835	Switch to turn off interior detection	370
C836	Switch to turn off superstructure/drawn vehicle loadspace detection	373
C837	Interior lighting switch	318,320
C840	Four-wheel drive switch	295
C844	Cab heater main switch	519
C853	Cab main switch	2
C854	Chassis main switch	3
C858	Interior spot lighting switch	318
C859	Roof console interior lighting switch, driver's side	321
C861	PETREG key switch	511
C872	Fuel filter/water separator operating switch	597
C882	Heater fan switch	470, 527
C883	FAG traction assistance switch	602, 611
C890	Switch to switch off integration of third brake	870
D503	Electronic unit, mechanical lifting gear	619
D529	Electronic unit, ECAS remote control	632, 654
D609	Light switch diode	209
D610	Diode, main beam/dipped beam	218
D611	Diode, damping valve for lowering mechanical lifting gear	619
D612	Diode, damping valve for lifting mechanical lifting gear	625
D613	Diode for pump damping relay, mechanical lifting gear	623
D622	Diode for mechanical lifting gear, lifting lock	625
D623	Diode for mechanical lifting gear, lowering lock	620
D703	Diode for switching off cab heater/door, contact on driver's side	494

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Basic code number	Description	Search bar number
D705	Diode for switching off the cab heater with running engine	491
D710	Interior lighting diode to prevent feedback to driver's side switch	321
D715	Alarm system LED	73, 352
D782	Diode to prevent door locking feedback, driver's side	97
D783	Interior lighting diode, driver's side	341
D791	Door switch diode	345
D792	Door switch diode	346
D802	ECAS-2 (6x2) electronic unit	673
D814	UPEC electronic unit	914
D826	Electronic unit for VLG current limiter	7
D850	Electronic unit for ABS/ASC, D model	817
D851	Electronic unit, ECAS-3 (4x2)	644
D866	Electronic unit, AGC-A automatic gearbox control	729
D867	Automatic gearbox gear selection display	735
D871	Electronic unit for Airtronic D2 cab heater	508 517
D879	Rear axle modulator	854
D880	Electronic unit for EBS	854
D895	Electronic unit for (10 A) converter with power supply for radio memory	387
D899	DIP-4 instrument panel	62
D900	VIC electronic unit	83, 93, 143, 486
D901	Electronic unit for Hydronic 10 cab heater	533
D902	Electronic unit, ZF intarder with CAN	550
D903	Electronic unit, ECS-DC3	959
D904	Menu control switch, MCS	145
D905	Electronic unit for central door locking	562
D909	Electronic unit, ultrasonic alarm system	356
D910	Electronic unit, battery charger	349

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Basic code number	Description	Search bar number
D911	Electronic unit, ALS-S alarm system	361
D912	Electronic unit, immobiliser	49
D924	Electronic unit for main switch	5
D931	LED unit, immobiliser	75
D932	EMAS electronic unit	581
D954	AS Tronic gearbox modulator	1050
D955	AS Tronic gear lever unit	1038
D969	CAN data manager, CDM	379
E000	Fuse, rear left width marker light	228
E001	Fuse, rear right width marker light	241
E004	Fuse, dipped beam on driver's side	254
E005	Fuse, dipped beam/warning lamp, co-driver's side	255
E006	Fuse, main beam on driver's side	259
E007	Fuse, main beam/warning lamp, co-driver's side	260
E008	Fuse, spotlights	261
E009	Fuse, front fog lamps	264
E010	Fuse, rear fog lamps	26
E013	Fuse, stop lights	272
E016	Fuse, reversing lights/gearbox neutral position/windscreen wiper motor/cross-axle differential lock	284
E023	Fuse, cold start switch/tachograph clock/cab heater program clock/alarm system	51
E025	Fuse, windscreen wiper motor/headlamp washer/windscreen washer motor	100
E026	Fuse, cigar lighter/door switches/electronic unit, 24/12 V converter with power supply for radio memory	405
E028	Fuse, interior lighting/bunk lamps/central door lock	301
E031	Fuse, heater fan	455, 523

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Basic code number	Description	Search bar number
E033	Fuse, electric drop glass motor, co-driver's side	414
E034	Fuse, electric drop glass motor, driver's side	417
E035	Fuse, instruments and warning lamps/parking brake switch	69
E036	Fuse, 24V socket	403
E037	Fuse, ignition switch	38
E043	Fuse, drawn vehicle ABS/EBS	801, 831
E044	Fuse, mirror heating/electric mirror adjustment/electric drop glass operation	421
E048	Fuse, drawn vehicle power supply	774
E051	Fuse, ECAS/EMAS	573, 638
E052	Fuse, ECAS remote control/work lamp	33
E053	Fuse, diagnosis connector (16-pin)/LED unit/alarm system	189
E062	Fuse, mechanical lifting gear/ECAS/EMAS	601, 605, 613, 631
E084	Fuse, lighting	201
E091	Fuse, air dryer heating element/stalk switch/PTO/clutch switch/engine speed control application connector	472
E108	Fuse, VIC	109
E112	Fuse, glow warning lamp	23
E114	Fuse, cab heater (Eberspächer)/warning lamps	505, 514, 525
E117	Fuse, search light	227
E118	Fuse, UPEC/ECS-DC3 supply voltage	906, 947
E142	Fuse, accessories before contact	780
E144	Fuse, AGC-A4 automatic gearbox	704
E145	Fuse, AGC-A4 automatic gearbox	703
E153	Fuse, main switch for timer/engine stop/main switch power supply	4
E157	Fuse, automatic lubrication	501
E160	ECS-DC3 fuse	945

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Basic code number	Description	Search bar number
E163	Fuse, accessories after contact (connector A027)/rotating beams/roof hatch	777
E164	Fuse for fuel heater before contact	599, 989
E168	Fuse, accessories/microwave	772
E170	Fuse, fuel heater after contact	592, 597, 991
E171	Fuse, electronic unit for fuel filter/water separator, Racor	591
E172	Fuse, drawn vehicle ABS/EBS	802, 833
E184	Fuse, UPEC	904
E189	Fuse, rear axle EBS	808, 836
E190	Fuse, front axle EBS	810, 837
E199	Fuse, ZF intarder	545
E277	Fuse, VIC	110
E279	Fuse, generator voltage control	20
E280	Fuse, VIC	112
E286	Main fuse	10, 26
E301	Fuse, AS Tronic	1045
E330	Fuse, ‘sens’ wire main switch	12
E350	Fuse, various electrical systems	45
E351	Fuse, various electrical systems	44
E507	Proximity switch for axle-load protection lifting gear (10 tons)	617
E508	Temperature switch for air conditioning compressor	459
E509	Air conditioning operating switch, high/low pressure	458
E511	Stop light operating switch	274
E514	Operating switch for stepwell/interior lighting, driver’s side door switch	341
E515	Operating switch for stepwell/interior lighting, co driver’s side	343
E524	Mechanical lifting-gear operating switch, oil pressure limit switch	624
E528	Control switch for left-hand tool compartment lighting	313, 328

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Basic code number	Description	Search bar number
E542	Proximity switch for axle load protection (13 tons)	605
E564	Operating switch, engine brake	72
E566	Control switch for Eberspächer cab heater thermostat (DILC)	509
E570	Pneumatic switch, clutch PTO N10	498
E571	Thermo 90/Hydronic 10 cab heater operating switch	536
E575	Proximity switch, clutch	902, 974
E579	Operating switch for thermostat/cab heater, fan, Eberspächer (water)	539
E580	Operating switch for thermostat/cab heater, fan, Eberspächer (timer)	543
E581	Operating switch/combination clock, Eberspächer Airtronic cab heater	519
E584	Proximity switch for axle-load protection lifting gear (7.5 tons)	615
E590	AS Tronic selector switch	1040
E592	Reversing light operating switch	286
E593	Neutral position switch	108
E594	Operating switch for neutral position/reverse gear	106
E595	Gearbox gate protection operating switch	141
E599	Neutral position switch	1031
F000	Control switch for parking brake	70
F006	Differential lock control switch, 1st differential	127
F007	Differential lock control switch, 3rd differential	131
F011	Control switch for engine oil pressure	123
F038	Differential lock control switch, 2nd differential	129
F047	Control switch for steering system (1st circuit)	124
F048	Control switch for steering system (2nd circuit)	125

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Basic code number	Description	Search bar number
F050	Differential lock pressure control switch (1st and 2nd differentials)	128
F087	Control switch, gearbox PTO	485
F088	Control switch, gearbox PTO	486
F097	Proximity switch for trailing axle mechanical lifting gear	613
F107	Brake pad wear switch, front left	874
F108	Brake pad wear switch, front right	876
F109	Brake pad wear switch, front left, 2nd front axle	877
F110	Brake pad wear switch, front right, 2nd front axle	879
F111	Brake pad wear switch, rear left	880
F112	Brake pad wear switch, rear right	881
F113	Brake pad wear switch, rear left, 2nd rear axle	882
F114	Brake pad wear switch, rear right, 2nd rear axle	884
F118	Control switch for splitter signalling	121
F120	Clutch protection switch	142
F509	Cab temperature sensor of cab heater	540
F512	Wheel speed sensor, front axle, left	807, 836
F513	Wheel speed sensor, front axle, right	809, 850
F514	Wheel speed sensor, driven axle, left	810
F515	Wheel speed sensor, driven axle, right	811
F533	Speed sensor (4-pin, 1st)	52
F544	Coolant temperature sensor for secondary retarder	558
F552	Crankshaft sensor	906
F558	Camshaft sensor	905
F565	Sensor, fuel temperature	907
F566	Sensor, engine coolant temperature	909
F601	Sensor, AGS	717
F602	Sensor, AGS	719
F608	Sensor, fuel level	116

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Basic code number	Description	Search bar number
F612	Height sensor, ECAS, rear axle, left	637, 665
F613	Height sensor, ECAS, rear axle, right	639, 666
F614	ECAS height sensor, front axle	640, 668
F615	ECAS pressure sensor, driven axle, left/right	669
F616	Cab locking sensor	102
F619	Cab locking sensor, alarm system	354
F628	EBS foot brake valve	860
F649	Boost pressure and air inlet temperature sensor	910
F651	Ambient temperature sensor	112
F652	Air pressure sensor	113
F656	Coolant level sensor	117
F669	Temperature sensor, automatic gearbox retarder	723
F670	Automatic gearbox turbine speed sensor	724
F671	Sensor, accelerator pedal, ECS-DC3	966
F672	UPEC accelerator pedal sensor	913
F673	Sensor, engine oil level and temperature	143
F676	Cab locking sensor	103
F686	Alarm system sensor, radar	360
F687	EMAS front axle angle sensor	575
F688	EMAS rear axle angle sensor	576
F705	Speed sensor	1053
G000	Relay, tail light/width marker light/search lighting	208, 225
G001	Relay, dipped beam	217, 254
G002	Relay, main beam	219, 259
G003	Relay, spotlights	258, 261
G004	Relay, front fog lamp	211, 264
G005	Relay, rear fog lamp	135, 267
G014	Relay, glowing	22, 23, 918, 971
G015	Relay, contact	1, 38
G028	Relay, electric drop glass operation, co-driver's side	413, 421

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Basic code number	Description	Search bar number
G029	Relay, electric drop glass operation, co-driver's side	415, 422
G030	Relay, electric drop glass operation, driver's side	417, 427
G031	Relay, electric drop glass operation, driver's side	418, 428
G036	Relay, stop light	274, 275
G037	Stop light micro relay for AGC with retarder	279, 281
G052	Relay, mechanical lifting gear motor	622, 629
G066	Relay, mechanical lifting-gear takeover	622, 624
G095	Relay, traction assistance, 60 sec. bleeding	609
G126	Relay, UPEC/ECS-DC3 supply voltage	905, 906
G170	Relay, cab heater fan	525, 536
G180	Time relay power supply, Allison, 12V	703
G181	Takeover relay power supply, Allison, 12V	703, 709
G185	Starting circuit interrupter relay	29, 30, 707, 1030
G201	Relay for EFPH fuel heater	597, 599, 975, 989
G203	Relay, starter motor takeover	27, 28
G236	Relay, windscreen wiper (speed 1 or 2)	95, 99
G237	Relay, windscreen wiper (automatic zero position)	95, 96
G247	Relay, heater fan, Eberspächer Hydronic cab heater	523, 529
G257	Recirculation valve relay	464, 467
G258	Recirculation valve relay	462, 467
G259	PTO control takeover relay	498, 499
G267	Air conditioning relay	455, 458
G279	Air conditioning relay	457, 468
G291	Relay, automatic gearbox	710, 759
G292	Relay, automatic gearbox	710, 712
G293	Relay, automatic gearbox	749, 754
G294	Relay, automatic gearbox	707, 756
G295	Relay, automatic gearbox	712, 754

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Basic code number	Description	Search bar number
G299	Relay, roof spotlights	782, 789
G301	Relay, light D+	131, 202
G302	Relay for Swedish lighting	204, 302
G328	Relay, engine stop	43, 935
G350	Relay, reversing lights, automatic gearbox	283, 285, 286, 288
G351	Cab tilt protection relay	104, 105
G367	Relay, main switch power supply	4, 10
G368	Relay, main switch earth	6, 10
G371	Automatic gearbox relay, superstructure	708, 750
G372	Starting circuit interrupter relay	29, 133
G375	Stop light relay for AGC with retarder	272, 709
G377	Relay, accessories power supply for radio	384, 393
G380	Relay, mechanical lifting axle	613, 617
G381	Relay, mechanical lifting axle	616, 627
G426	Relay, contact	39, 41
G427	FAG traction assistance relay	606, 609
G462	Relay for work lamp	33, 35
G469	Relay, braking signal	929, 931
G516	Central cab earth, co-driver's side	1014
G535	CAN distribution block	183
G725	Through-connection for D3LC cab heater	507, 516
G732	Through-connection for cab heater	541
G733	Through connection for intarder neutral position	107
G734	Through-connection for brake lining wear	880
G736	V-CAN connection	198
G737	Through-connection, ECS-DC3 speed control	987
G745	Through-connection, mechanical lifting gear	625
G757	Through-connection for main switch	39
I020	Diode, gearbox gate protection	140

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2.4 SECTION DIAGRAMS FROM CIRCUIT DIAGRAM 1358030/16-24

A	Voltage before and after contact
1	Main switch
2	Alternator/ignition/starter switch/charging circuit
3	MTCO tachograph
4	Immobiliser
5	Pre-glowing
8	VIC
11	UPEC
12	Reversing lights
15	Stop lights/cab tilting gear
20	Search lighting
23	Horn/cigar lighter/work lamp/air dryer
24	ABS-ASC-D
26	Intarder EST-42
27	ECS-DC3
29	EMAS
30	AGC
32	PTO
33	Roof spotlights/cooler box/rotating beams
34A	ECAS-3 (4x2)
34B	ECAS-2 (6x2)
37	Electric drop glass/central door locking/roof hatch, SH cab
42	Hydronic 10 (ACH-EW) cab heater with timer unit
43	UPEC/Cummins/AGC application connector
44	EBS
46	Alarm system/battery charger for BV3 alarm
47	Sockets, FA/FT
50	Water separator
51	AS Tronic

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A VOLTAGE BEFORE AND AFTER CONTACT

VOLTAGE BEFORE CONTACT
A constant voltage is supplied to pin 1 of connector 416 through wire 1008, point 30 on the starter motor, fuse E286, the + bolt in the dashboard connector lead-through and the voltage distribution block.
Power is also provided (by wire 1008) from point 30 on the starter motor to the B+ connection of the alternator.

Only wire 1008 to the + bolt in the dashboard connector lead-through is fuse-protected by fuse E286 (125A).
The other wires are NOT fuse-protected and they can only be made dead by disconnecting the battery leads..

Power is supplied to the 'S' (sens) connection of the alternator from point 30 of the starter motor via fuse E279 and wire 3084.

VOLTAGE AFTER CONTACT
A voltage is supplied to contact relay G015 (connection point 30) via the starter motor (connection point 30). This connection point may be connected to wire 1010 over contact relay G015.
This wire is only fuse-protected with fuse E286 (125A).

OPERATION
When the ignition/starter switch (C539) is set to the "accessories" position (connection between points 1 and 6), a voltage is supplied to connection point 1 of relay G377 via wire 1000, fuse E037, ignition/starter switch (C539) (contact points 1 - 6) and wire 1130.

When the ignition/starter switch (C539) is set to the "contact" position (connection between points 1 and 4), relay G015 is energised via wire 1000, fuse E037, ignition/starter switch (C539) (contact points 1 - 4) and wire 4001. This then connects wire 1000 (voltage before contact) to wire 1010 (voltage after contact).

At the same moment this voltage is also applied to connection point 85 of relay G426. This relay is also activated and connects contacts 30 and 87. A voltage is now applied both to fuse E350 and to fuse E351 via fuse E037, contacts 30 - 87 and wire 1234. The voltage goes to connection point 15 of the alternator via fuse E350.

When the ignition/starter switch (C539) is turned against the pressure of the spring (connection between points 1 and 2), relay G015 and relay G426 remain energised and a voltage is supplied to the alarm system (D911) (if present) or directly to connector 403, connection point 2, via wire 1000, fuse E037, ignition/starter switch (C539), contacts 1 - 2 and wire 4004. When the ignition/starter key is released, the ignition/starter switch automatically springs back and remains in the "contact" position.

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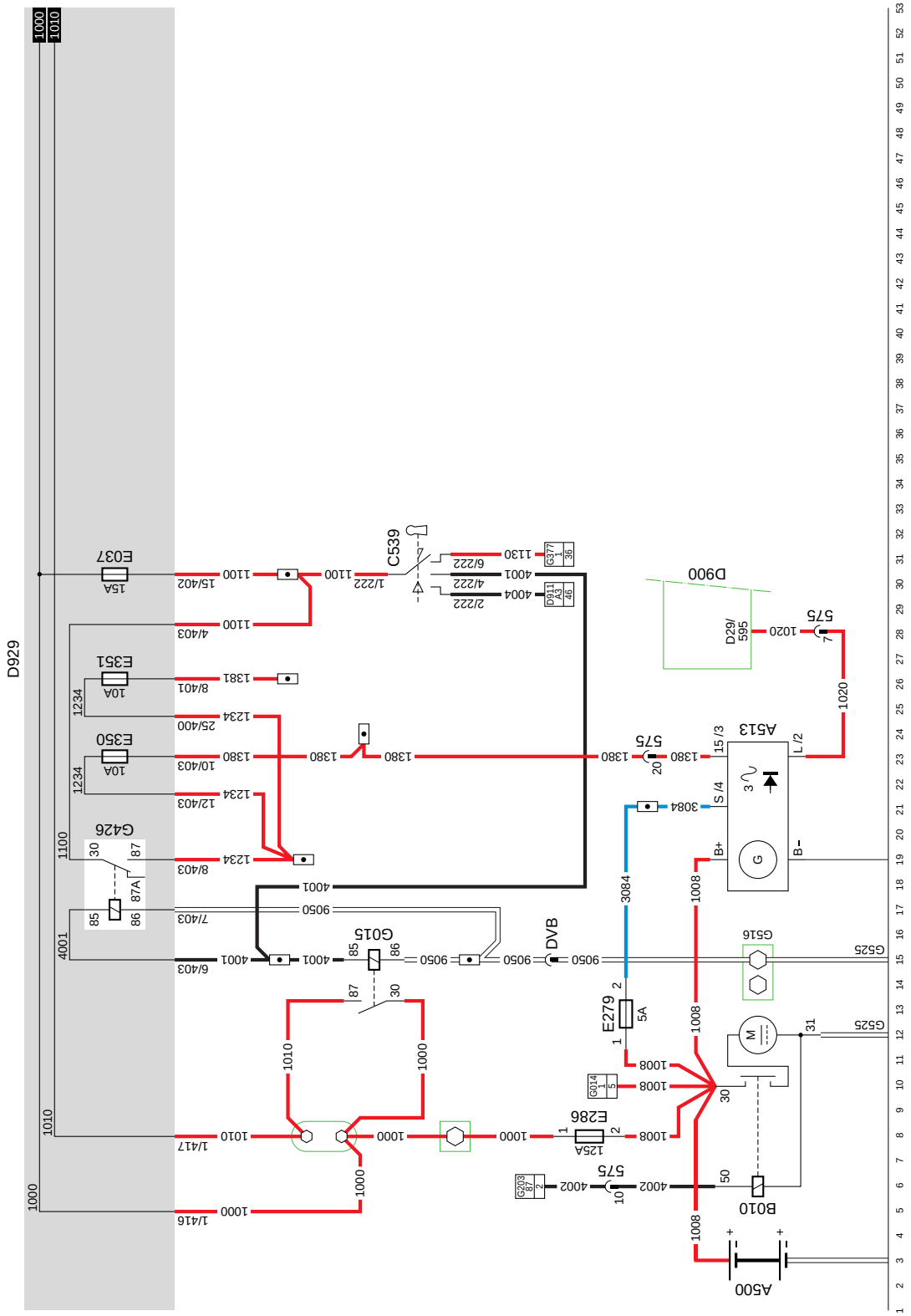

A **1358030/16-24** EL001052

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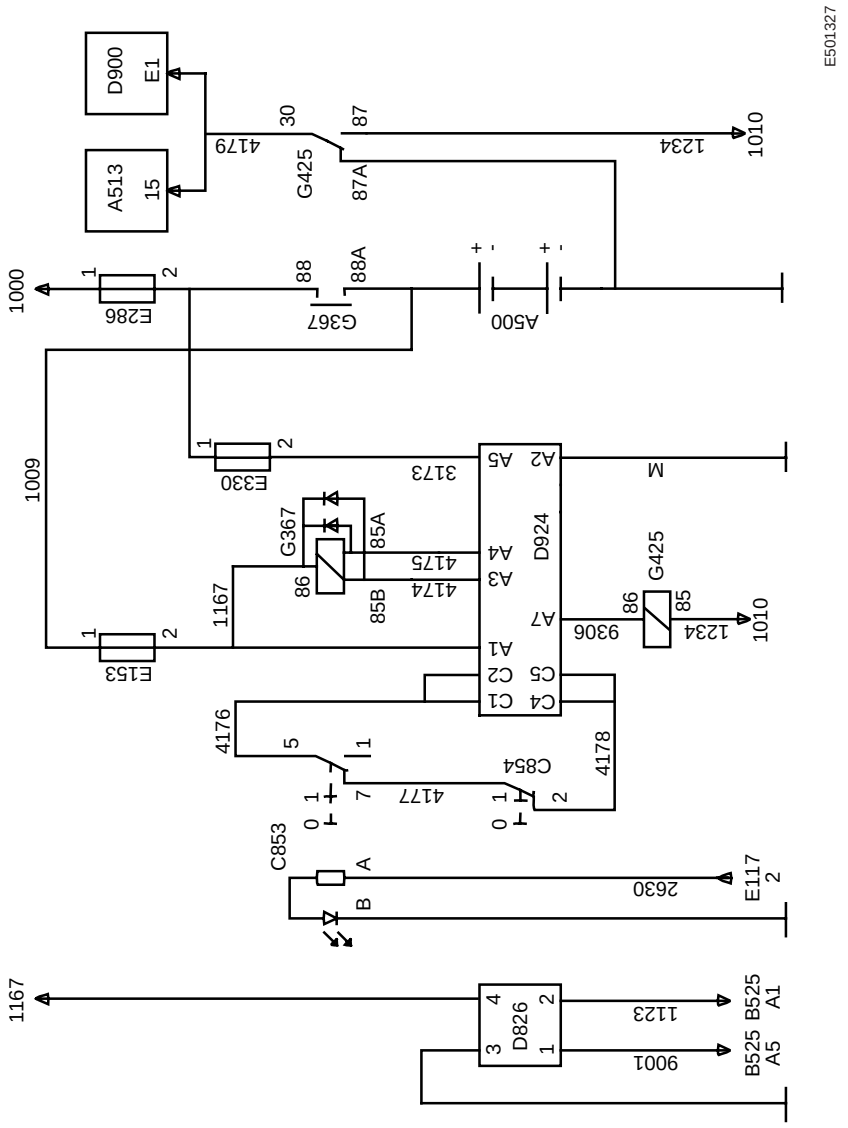

1 MAIN SWITCH

MAIN SWITCH FOR VLG/ADR IN COMBINATION WITH AN ALLISON GEARBOX

If the vehicle has an Allison gearbox and the system must meet specific safety requirements, wire no. 1009 (Allison power supply) should be connected to connection 88a of relay G367.

Basic code number	Description
A500	Batteries
A513	Integrated voltage regulator generator
B525	Tachograph
C853	Switch for main switch in cab
C854	Switch for main switch on chassis
D826	Electronic unit for VLG current limiter
D900	CF65/75/85 VIC electronic unit
D924	Electronic unit for main switch
E153	Engine stop main switch fuse for main switch
E286	High output fuse
E330	Fuse, 'sens' wire main switch
G367	Relay, power supply main switch
G425	Relay, main switch

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Electrically closing the main switch
The main switch (D924) can be closed:
- Electrically in the cab using switch C853
- Electrically on the chassis using switch C854

ATTENTION: Switches C853 and C854 are connected in series. When C853 or C854 is switched on, the other switch must be in the 'main switch on' position.

When C853 or C854 is operated, the C1 and C2 connections are connected to the C4 and C5 connections through wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Relay G367 is immediately energised through wire 4174 and connection point A3 (A3 is connected to earth in the unit for 0.5 seconds). This connects point 88a to 88 of relay G367. The positive pole of the batteries is now connected to the vehicle's power supply.
Immediately after switch C853 closes, connection point A7 is internally connected to earth.

Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Electrically opening the main switch
The main switch (D924) can be opened:
- Electrically in the cab using switch C853
- Electrically on the chassis using switch C854

ATTENTION: Switches C853 and C854 are connected in series. When C853 or C854 is switched on, the other switch must be in the 'main switch on' position.

When C853 or C854 is operated, the C1 and C2 connections are disconnected from the C4 and C5 connections through wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Two actions are carried out immediately after switch C853 is opened:
1. Connection point A7 is disconnected from earth (A2) in the unit.
   If the engine is running, it is switched off.
2. After a delay of approx. 6 seconds, relay G367 is connected to earth in the unit for approx. 0.5 seconds via wire 4175 and connection point A4. This breaks the connection between points 88a and 88 of relay G367. The batteries are now disconnected from the vehicle's power supply.

Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Note:
When one of the switches (C853 or C854) that activate the electronic unit (close main switch) is operated, relay G367 is activated after approximately 3 seconds. If one of the switches is operated again within the 3 seconds, the electronic unit (D924) will select the priority 'main switch ON'.

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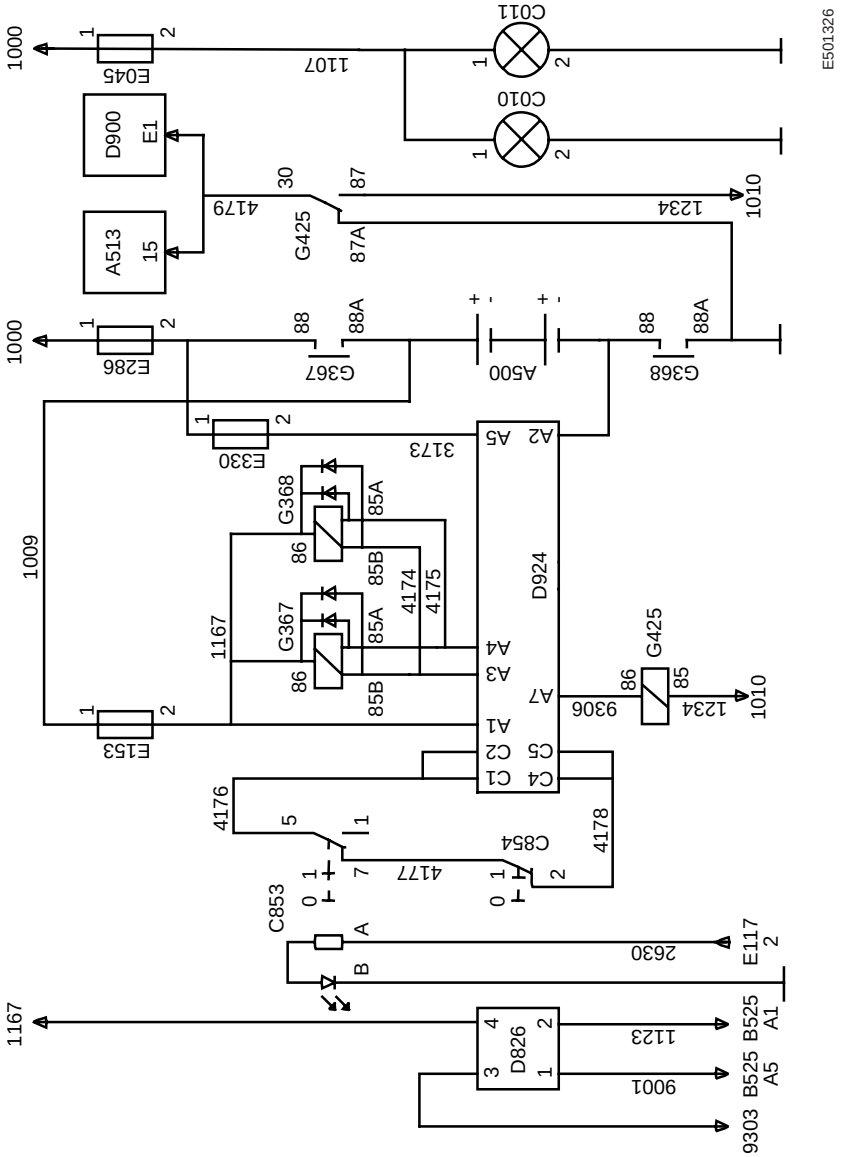

MAIN SWITCH FOR PETREG

Basic code number	Description
A500	Batteries
A513	Integrated voltage regulator generator
B525	Tachograph
C010	Position of cab lamp on driver's side
C011	Position of co-driver's side cab lamp
C853	Switch for main switch in cab
C854	Switch for main switch on chassis
D826	Electronic unit for VLG current limiter
D900	CF 65/75/85 VIC electronic unit
D924	Electronic unit for main switch
E045	Fuse, interior lighting
E117	Fuse, search light
E153	Engine stop main switch fuse for main switch
E286	High output fuse
E330	Fuse, 'sens' wire main switch
G367	Relay, power supply main switch
G368	Relay, main switch earth
G425	Relay, main switch

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Electrically closing the main switch
The main switch (D924) can be closed:
- Electrically in the cab using switch C853
- Electrically on the chassis using switch C854

ATTENTION: Switches C853 and C854 are connected in series. When C853 or C854 is switched on, the other switch must be in the 'main switch on' position.

When C853 or C854 is operated, the C1 and C2 connections are connected to the C4 and C5 connections through wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Relays G367 and G368 are immediately energised through wire 4174 and connection point A3 (A3 is connected to earth in the unit for 0.5 seconds). This connects point 88a to 88 of relays G367 and G368. The positive and the negative poles of the batteries are now connected to the vehicle's power supply.
Immediately after switch C853 closes, connection point A7 is internally connected to earth.
Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Electrically opening the main switch
The main switch (D924) can be opened:
- Electrically in the cab using switch C853
- Electrically on the chassis using switch C854

ATTENTION: Switches C853 and C854 are connected in series. When C853 or C854 is switched on, the other switch must be in the 'main switch on' position.

When C853 or C854 is operated, the C1 and C2 connections are disconnected from the C4 and C5 connections through wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Two actions are carried out immediately after switch C853 is opened:
1. Connection point A7 is disconnected from earth (A2) in the unit.
   If the engine is running, it is switched off.
2. After a delay of approx. 6 seconds, relays G367 and G368 are connected to earth in the unit for approx. 0.5 seconds via wire 4175 and connection point A4. This breaks the connection between points 88a and 88 of relays G367 and G368.
   The batteries are now disconnected from the vehicle's power supply.

Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Note:
When one of the switches (C853 or C854) that activate the electronic unit (close main switch) is operated, relays G367 and G368 are activated after approximately 3 seconds. If one of the switches is operated again within the 3 seconds, the electronic unit (D924) will select the priority 'main switch ON'.

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MECHANICAL MAIN SWITCH
When C694 (mechanical main switch) is operated, connections B and G are connected. The earth of the batteries is now connected to the chassis. The earth connection of B525 (MTCO) is independent of the position of the main switch.

VARIANTS

Location
24 Only if the vehicle is equipped to PETREG requirements.
36 Conn. 570: Attach wire 4176 to pin 11
39 Conn. 570: Attach wire 4177 to pin 12
43 Attach wire 1123 to pin 2 instead of wire 1127. Insulate wire 1127.
45 Attach wire 9303 to pin 20 instead of wire 9001. Insulate wire 9001.
49 Only if the vehicle is equipped to PETREG requirements.
64 Attach wire 9307 to pin 20 instead of wire 9001. Insulate wire 9001.

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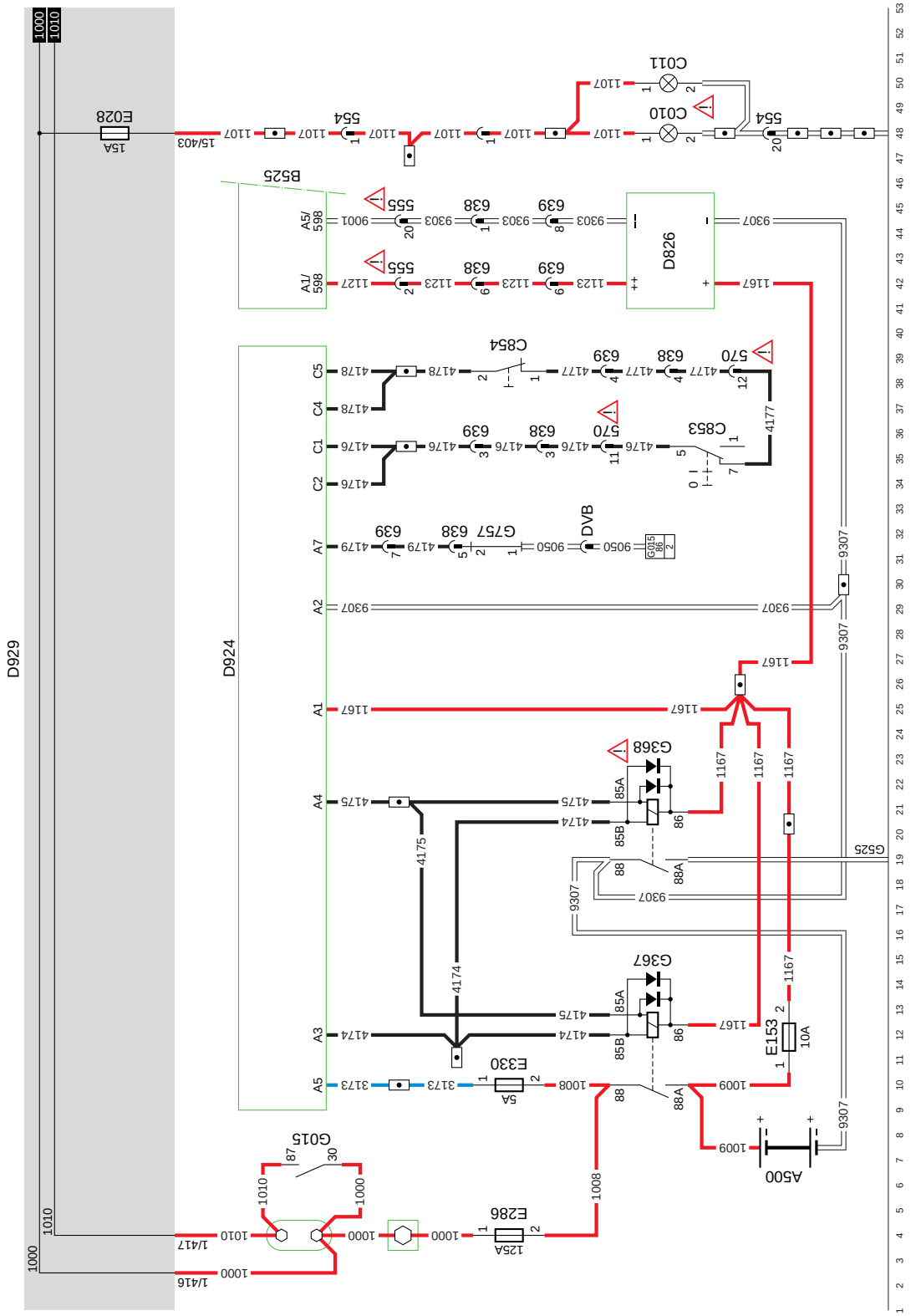

1 **1358030/16-24** EL001053

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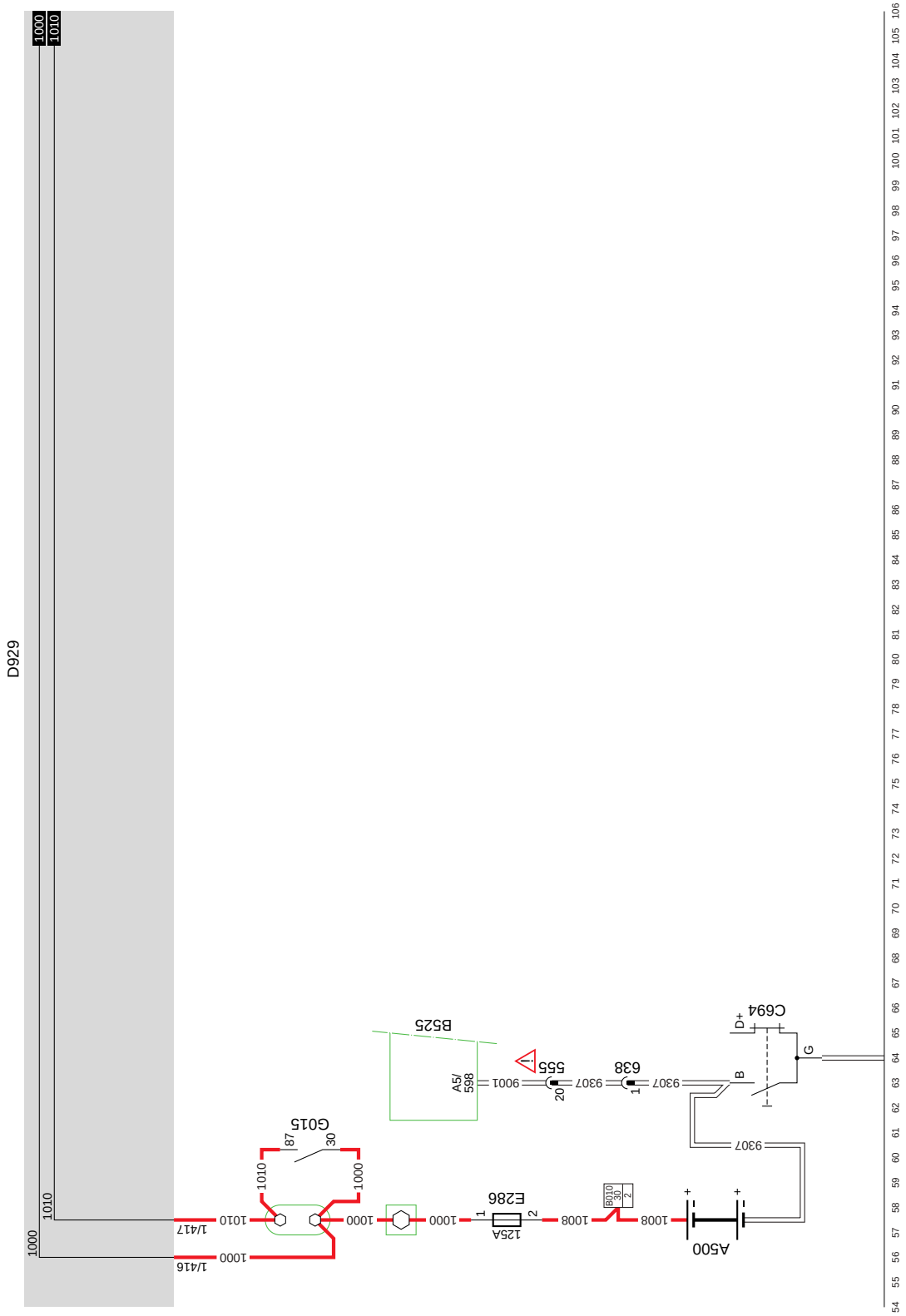

1 1358030/16-24 EL001054

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2. ALTERNATOR/IGNITION/STARTER SWITCH/CHARGING CIRCUIT

CONTACT CIRCUIT
If ignition/starter switch C539 is turned (contact 1 is connected to pin 6), the 'radio accessories power supply' relay (G377) will be energised.
Voltage is now applied to contact 1 of relay G377 through fuse E037, wire 1100, contacts 1 - 6 of switch C539, wire 1130. When G377 is energised, a connection is made between contacts 3 and 5 of G377 and a voltage is switched from the converter to the radio.

STARTING CIRCUIT
If the ignition switch C539 is turned (contact 1 is connected to 4), both contact relay G015 and G426 will be activated via wire 4001.
If the ignition switch is turned to the "start" position, a contact is made in this switch between points 1 and 2. The power is now supplied from the batteries through fuse E037, the connection 1-2 from the ignition/starter switch and wire 4004 on connection point A3 of the alarm system.
When the alarm system has been switched off using the remote control, or by activating the contact (the immobiliser switches the alarm off via CAN), wire 4004, connection point A3, is connected to wire 4004, connection point A1.

The coil of relay G203 will be activated. This closes connection 30 - 87. A voltage is now applied to connection point 50 of the starter motor, through fuse E037, wire 1100, relay contacts 30 - 87, wire 4002, causing the starter motor to turn.

When the alarm has been switched off and the door has opened, the start interrupter will be deactivated for 60 seconds. If the engine is not started within this time, the start interrupter is reactivated. If the alarm is switched off and the doors are not opened, the start interrupter remains deactivated for 9 minutes.

If the vehicle has an AS Tronic gearbox
If the vehicle has an AS Tronic gearbox, relay G185 is also fitted. When the contact is switched on and the gearbox is in neutral, relay G185 will be energised.
The voltage is now applied to the coil of relay of G203 through wire 4004, contacts 30 - 87 of relay G185, wire 4186, contacts 3 - 4, wire 4009. This relay is energised. A voltage is now applied to connection point 50 of the starter motor, through E037, wire 1100, contacts 30 - 87 and wire 4002, causing the starter motor to turn.
As soon as the motor turns, the VIC applies a voltage to connection point C42. The voltage is then applied to connection point 1 of relay G372 via wire 3157. This relay is energised, breaking the starting circuit.

Note:
When the immobiliser applies a voltage to wire 4009, the cab heater is also switched off if the vehicle must meet requirements for the transportation of hazardous substances.

CHARGING CIRCUIT
If the contact is activated, there is voltage on connection point 85 of relay G426. This relay is activated. Voltage is now applied to connection point 15 of the alternator through fuse E037, contacts 30 - 87 of relay G426, fuse E350 and wire 1380.
An internal resistor in the alternator is energised by an IC in the carbon brush holder. This resistor ensures that a low level of current passes through the energising resistor. This excites a magnetic field in the alternator.

After starting, the voltage on terminals B+ and 15 will rise to about 28.5 V. Once this voltage is reached, the IC in the regulator interrupts the pre-exciter coil to enable the voltage to be regulated. The magnetic field will now disappear, so that the generator will not be energised for a short period of time. As a result, the voltage on outputs B+ and 15 will drop.

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VARIANTS

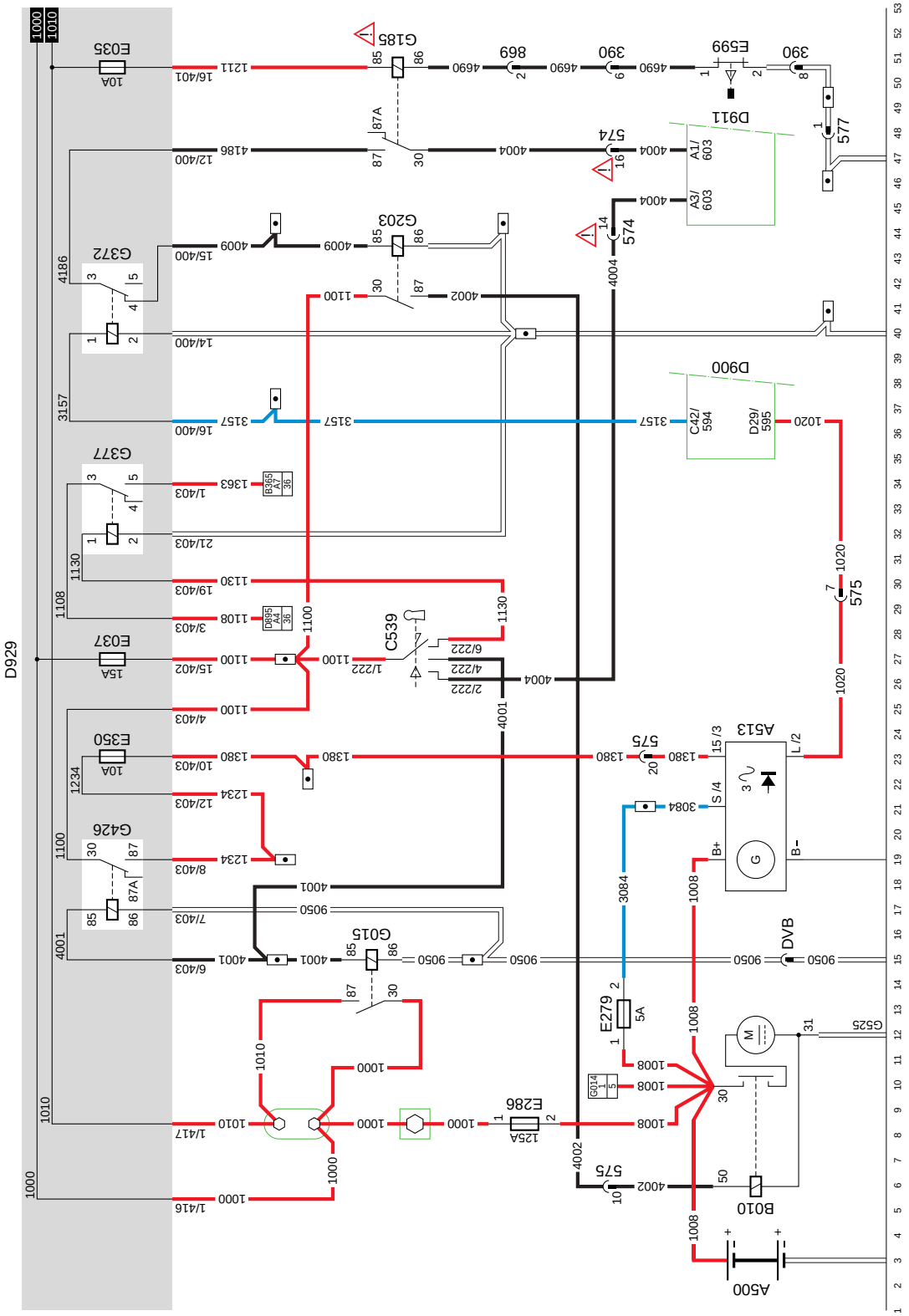
Location

42 If no alarm system is fitted, wires 4004 and 4004A are connected through in connector 603.

The regulator reactivates when the voltage drops below 27.6V. This means that the voltage supplied by the generator remains relatively constant. The batteries are supplied through the B+ generator output.

The alternator charging current warning lamp is activated via wire 1020, which is connected to the VIC (D900). The VIC controls the DIP via the CAN network. The voltage on wire 1020 is switched by the control IC.

The alternator is also equipped with a 'sens' line. This connection continuously measures the voltage on connection point 30 of the starter motor. If the voltage on connection point 30 drops, the voltage is immediately corrected by the control IC. The alternator will increase the voltage until a value of 28.5V is reached again.



2 **1358030/16-24** EL001055

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3 MTCO TACHOGRAPH

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

22 Connector 861: connection to ECAS system

29 If the vehicle is fitted with an ECS-DC3 system, electronic unit ECS-DC3 (D903) should be read here.

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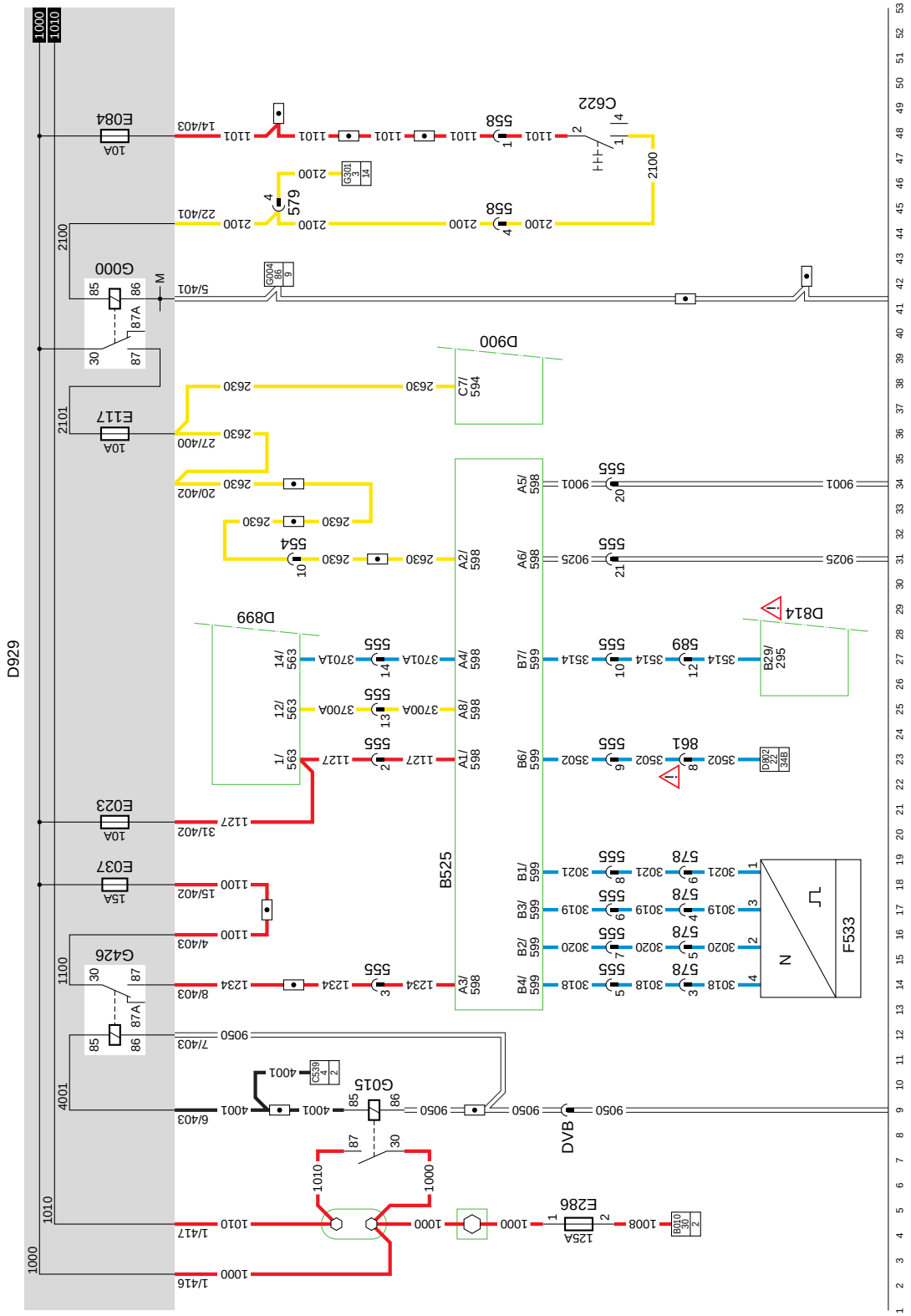

3 **1358030/16-24** EL001185

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4 IMMOBILISER
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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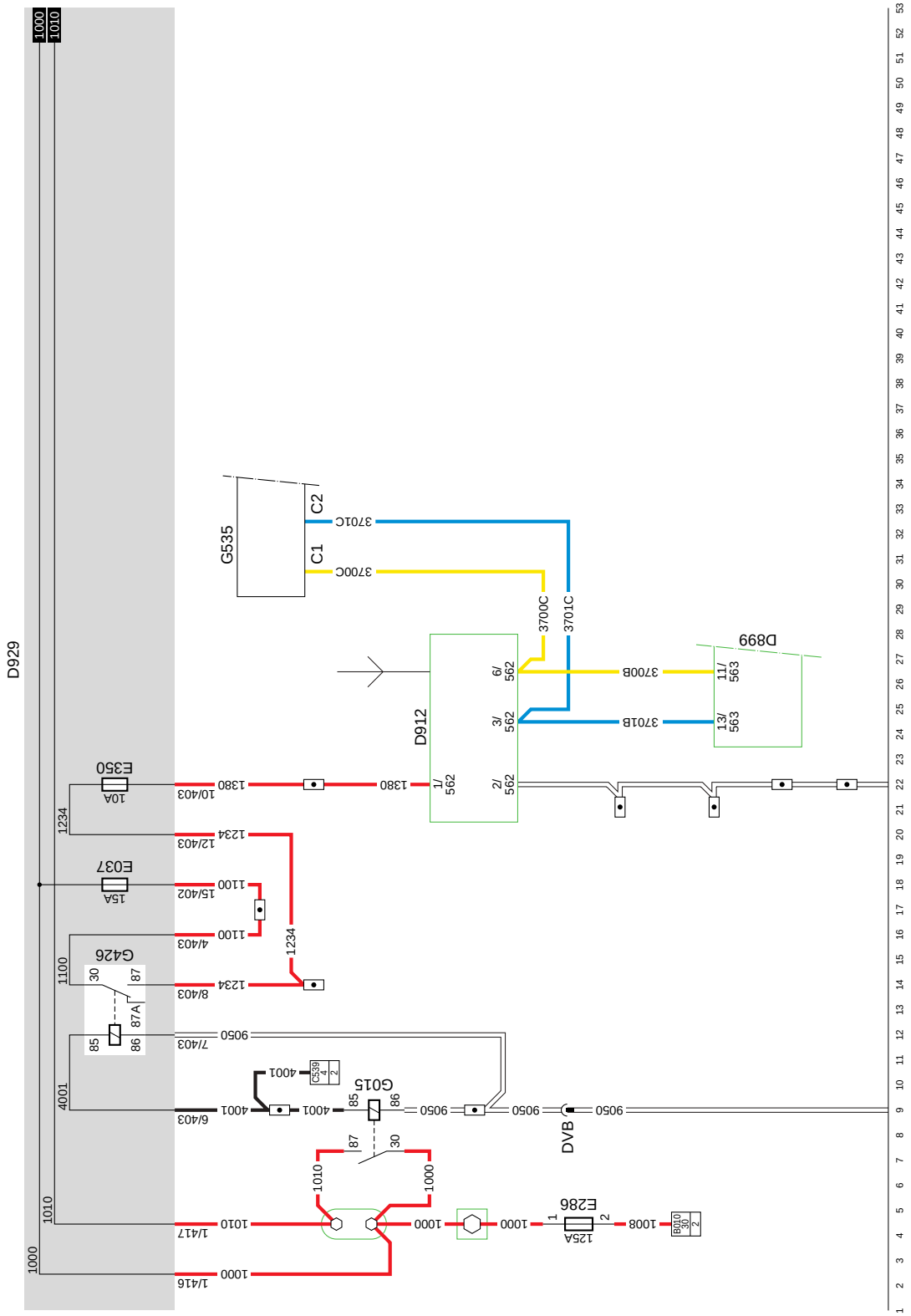

4 **1358030/16-24** EL001196

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5 PRE-GLOWING

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

37 If no pre-glowing system has been fitted: the wires are attached to a 'dummy' relay.

44 If the vehicle is fitted with an ECS-DC3 system, electronic unit ECS-DC3 (D903) should be read here.

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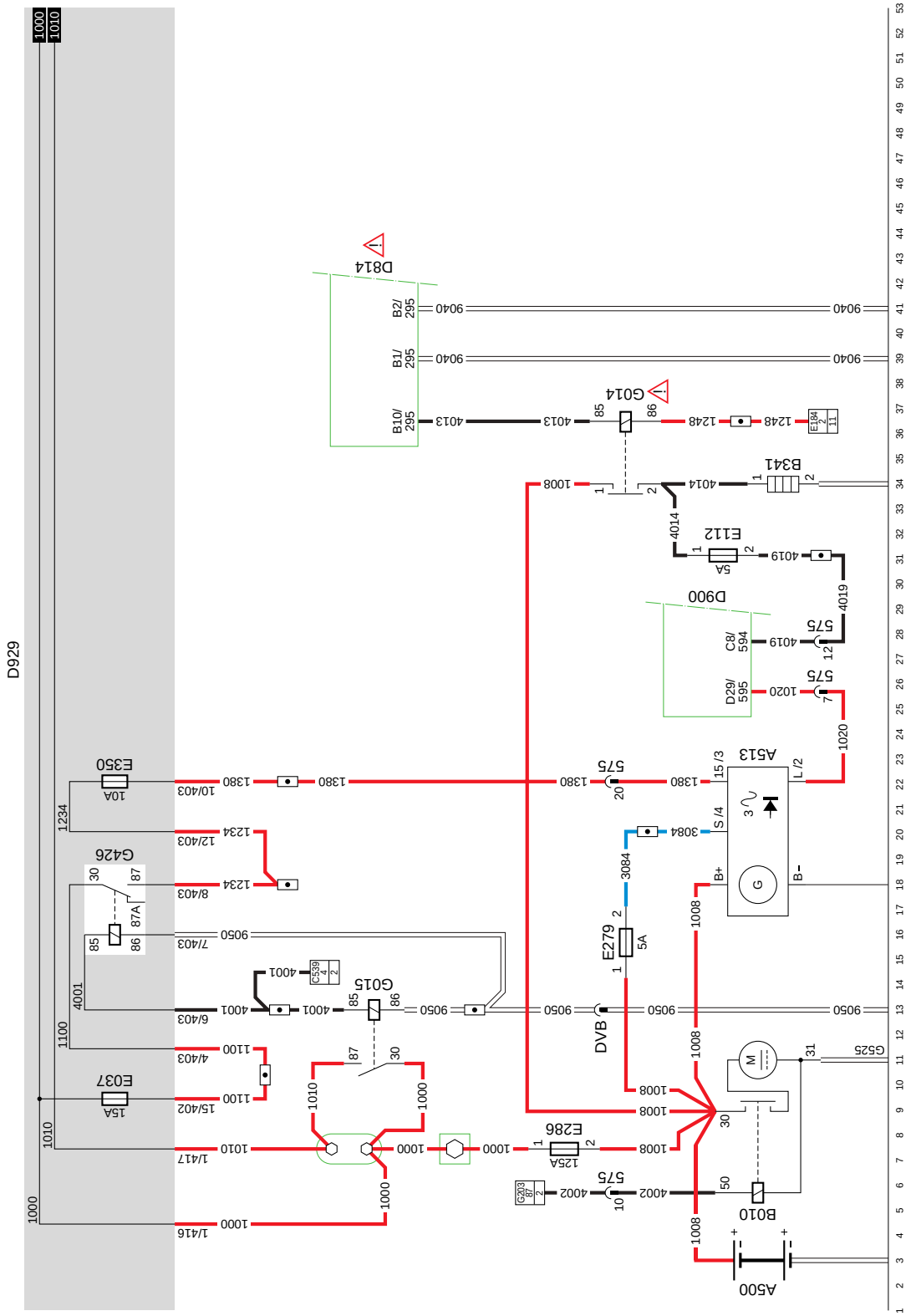

5 **1358030/16-24** EL001197

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8 VIC

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
202 Connector 584 for vehicles with ABS/ASC-D
Connector 585 for vehicles with EBS.

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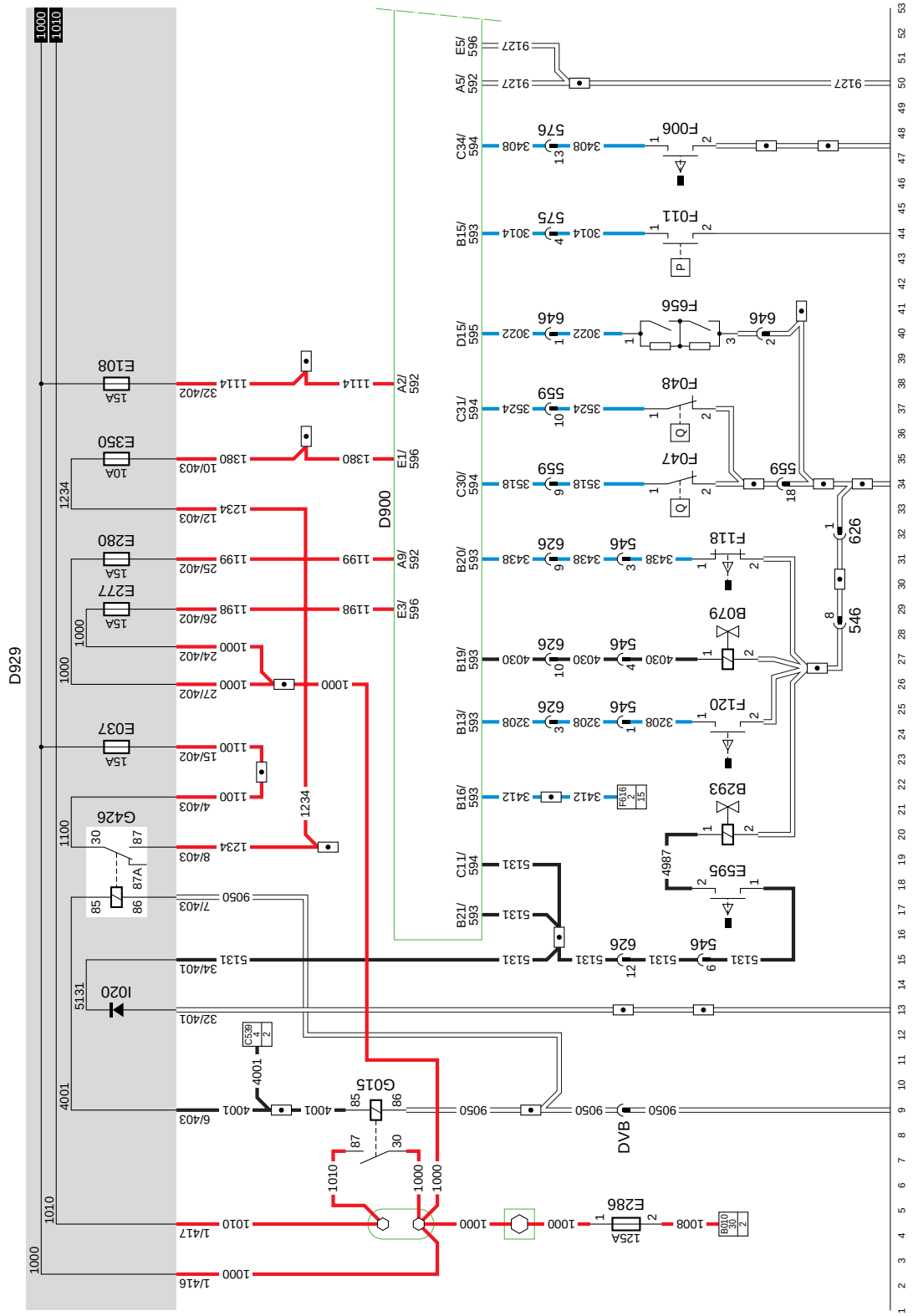

8 1358030/16-24 EL001186

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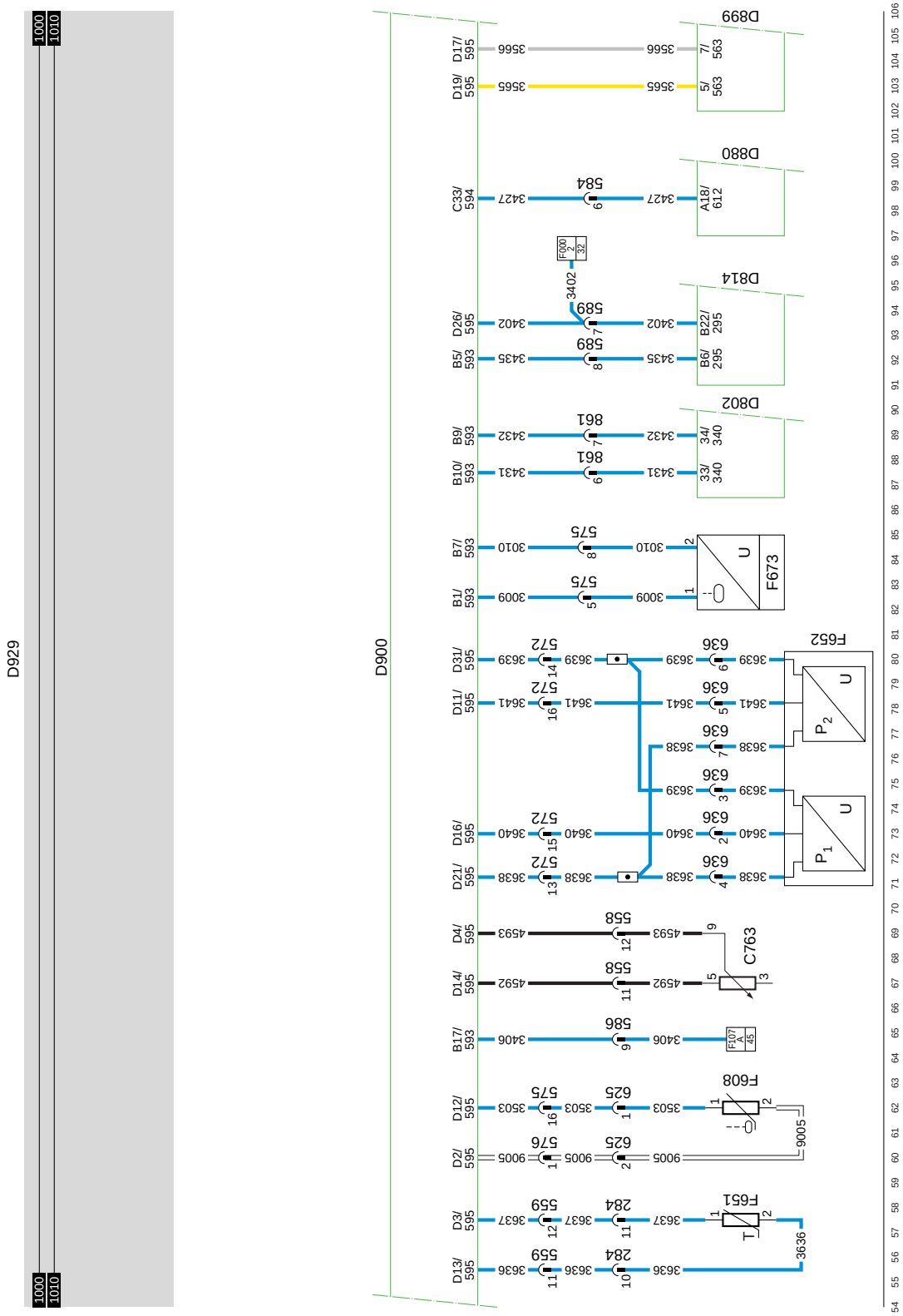

8 **1358030/16-24** EL001187

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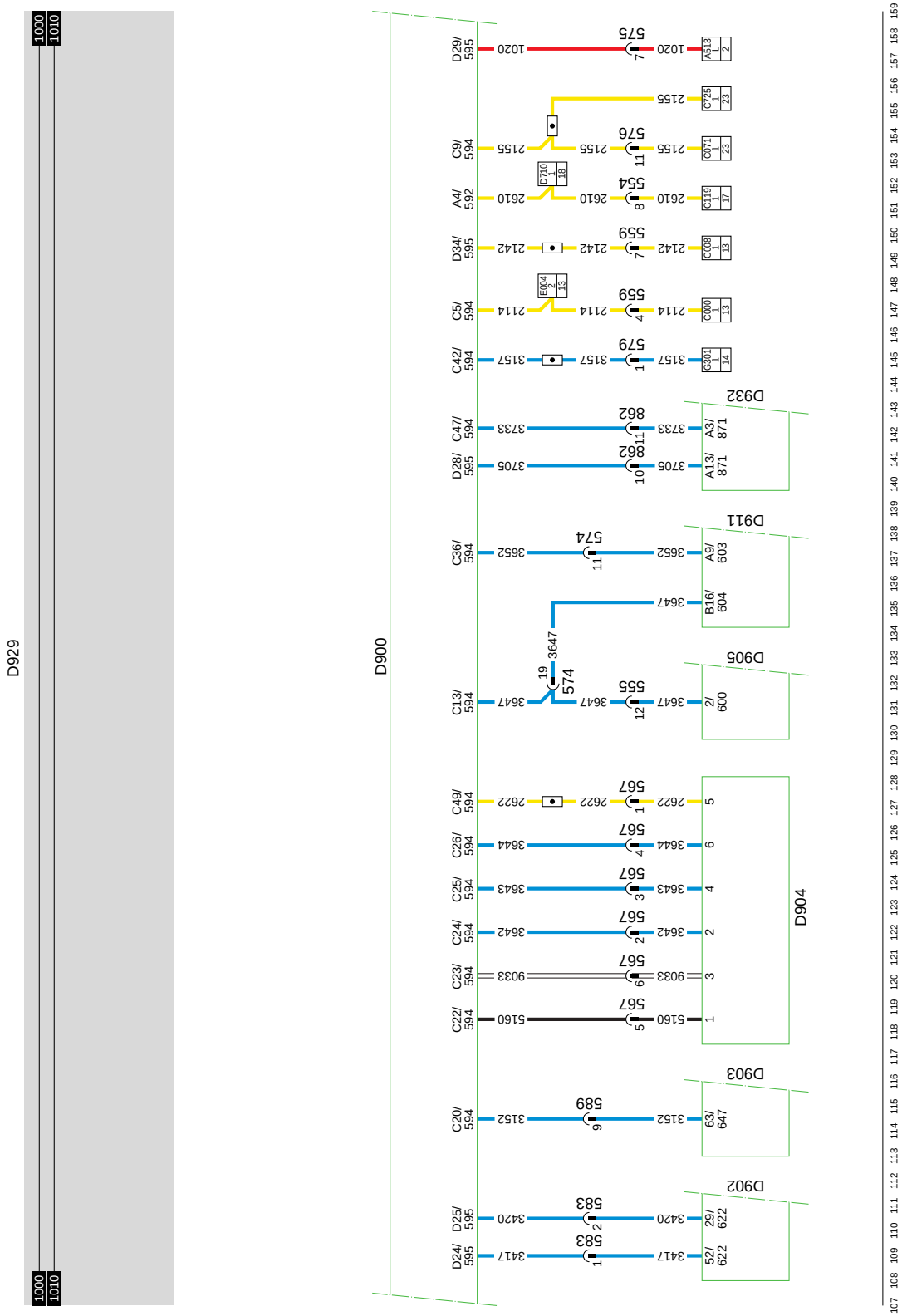

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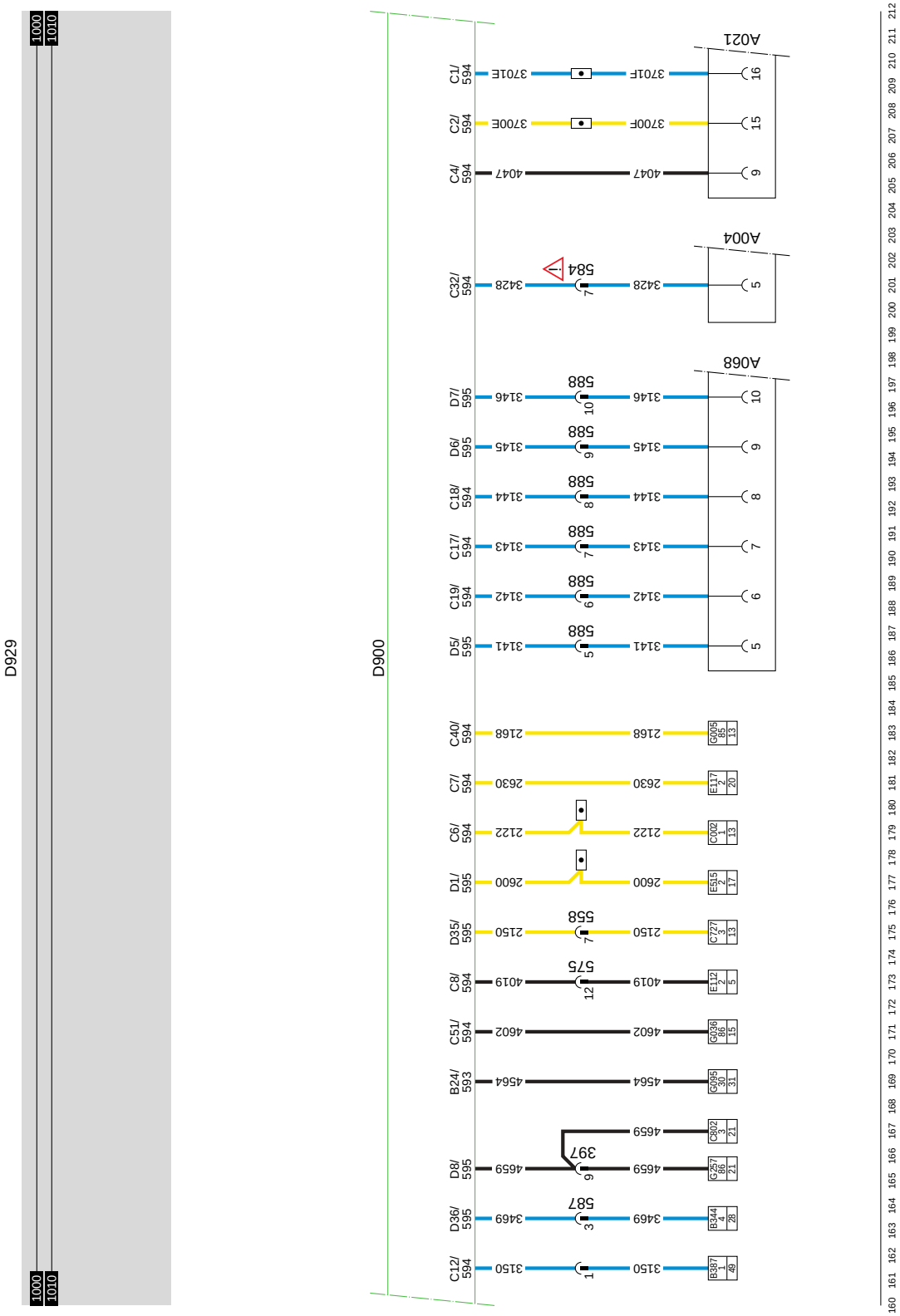

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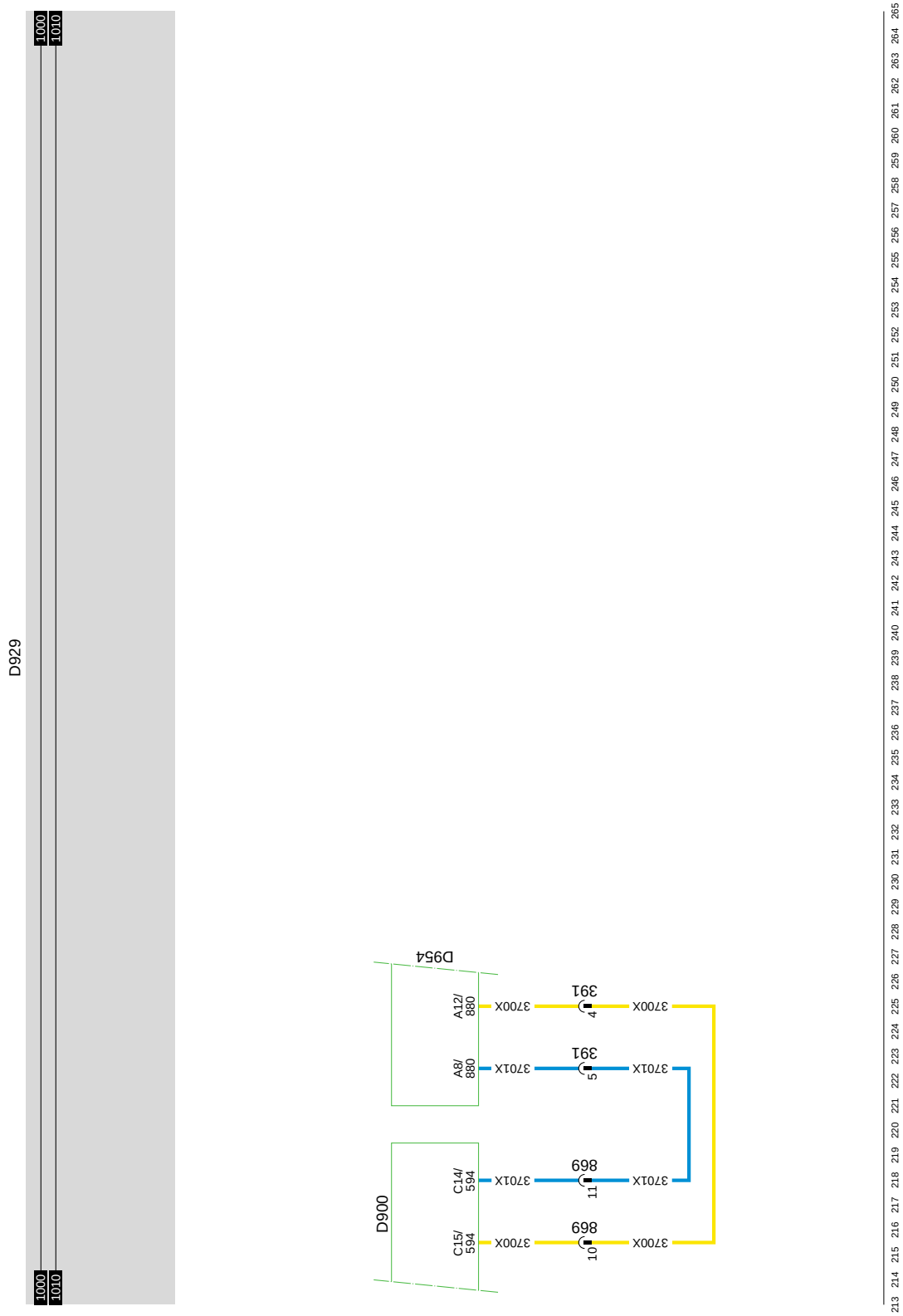

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11 UPEC

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
119 Wire 6158 ends in lead-through connector 575, pin 11.

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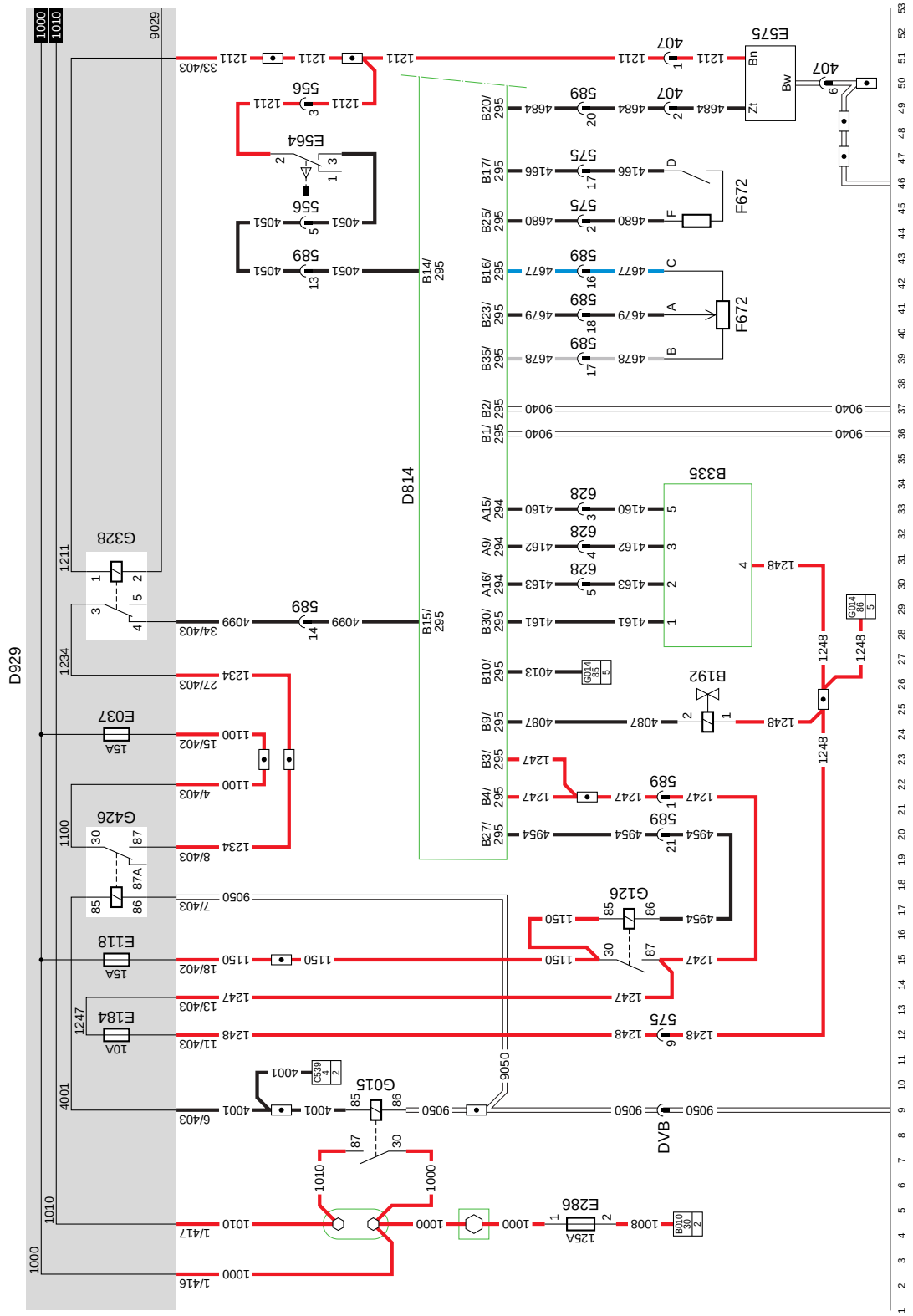
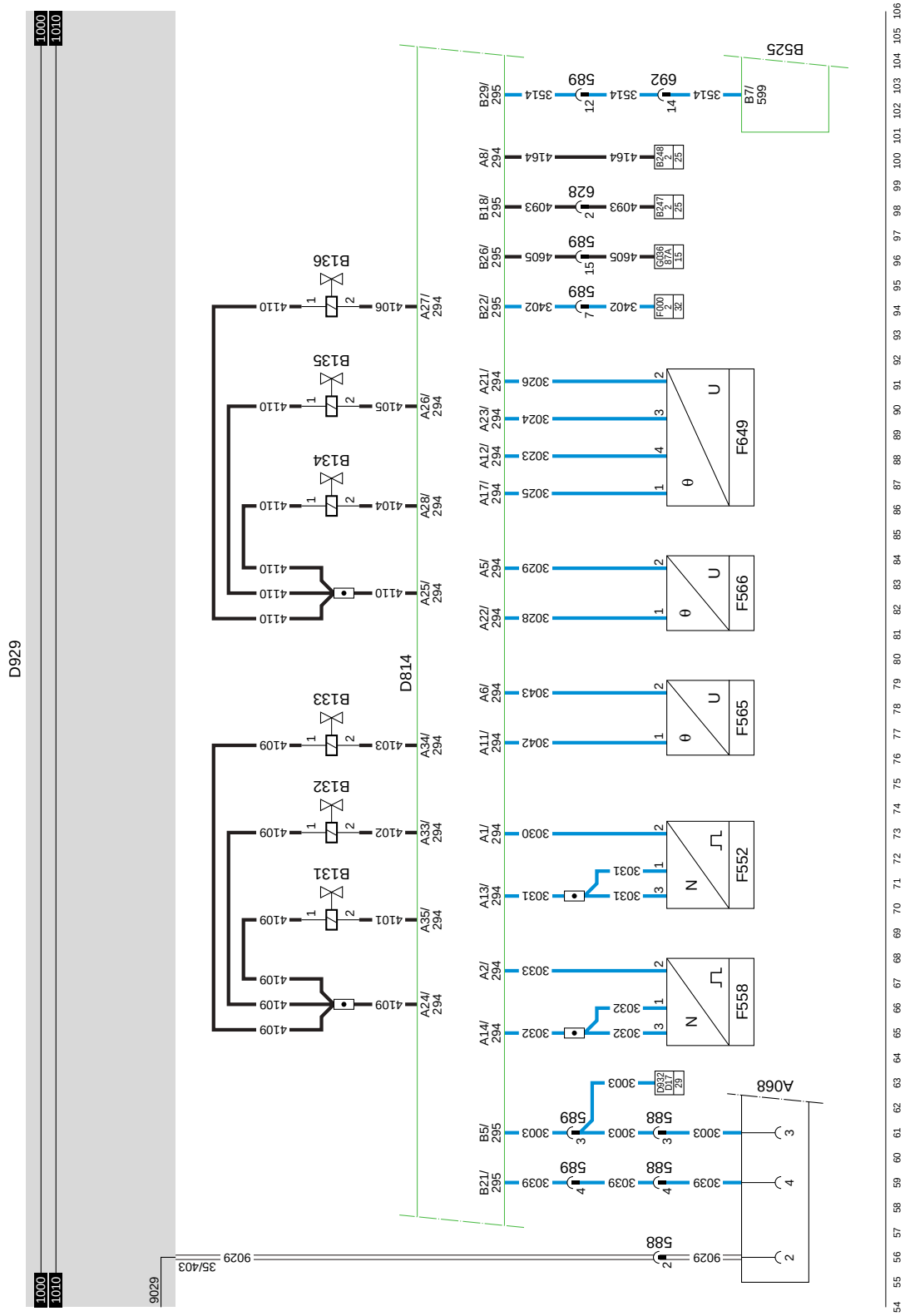


11 1358030/16-24 EL001056



11 **1358030/16-24** EL001057

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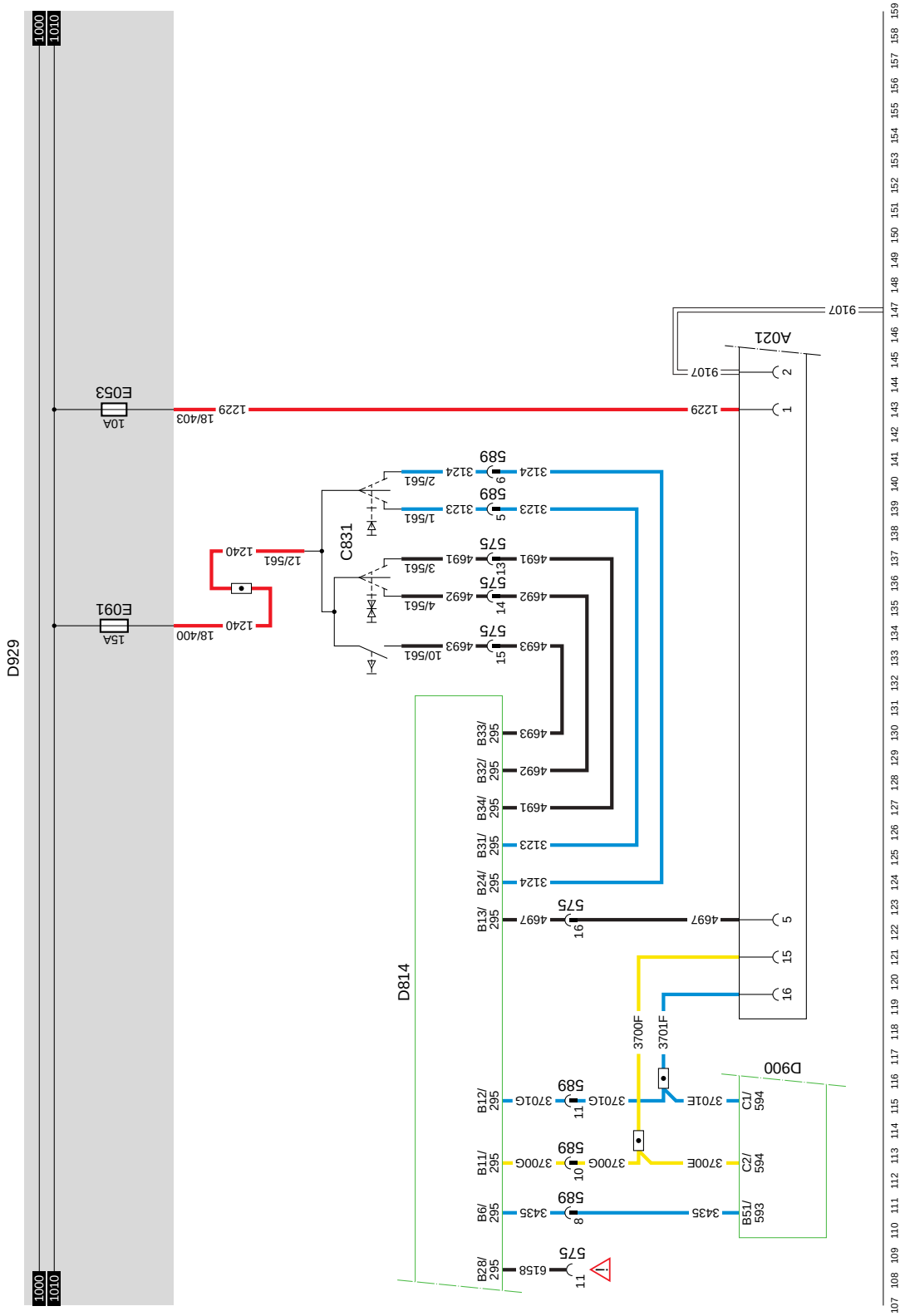

11 **1358030/16-24**

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12 REVERSING LIGHTS

When the ignition is switched on, power is supplied to both connection points 1 and 3 of relay G350 via E016 and wire 1217. When the reversing light operating switch (E592) is energised (connection between connection points 1 and 2), the coil of G350 is connected to earth. This relay is now energised and contacts 3 - 5 are closed. A voltage will now be applied to the reversing lights (C026, C027) and the drawn vehicle connector (A001 or A070) via wire 4591. The voltage also goes to the reversing buzzer (B176) via switch C814

The reversing light operating switch (E592) is mounted in the gearbox. The contacts are closed when the gearbox is set to the "reverse" position.

The above description applies to vehicle type FA.

VARIANTS

Location	
18,24, 27	Connector 873 on vehicle type FA. Connector 874 on vehicle type FT.
33	Depending on whether vehicle is fitted with a 7-pin or 15-pin plug. See also section diagram 47.

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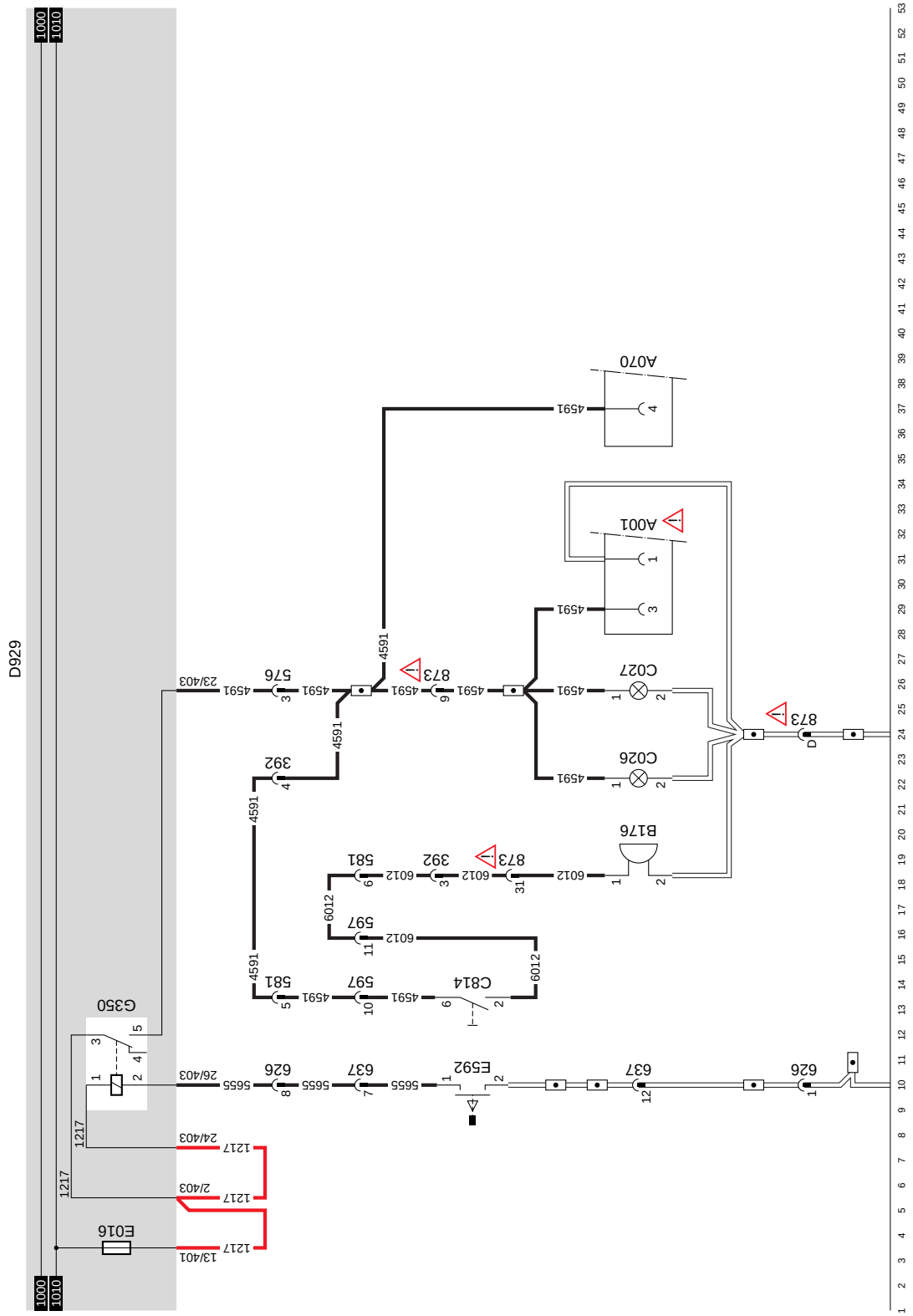

12 **1358030/16-24** EL001059

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15 STOP LIGHTS/CAB TILTING GEAR

STOP LIGHTS

When the brake pedal is pressed, stop light operating switch E511 is activated (connection between contacts 2 and 1) and relay G036 will be energised. Through fuse E013, wire 1209, contacts 30 and 87 of relay G036 and wire 4601 a voltage is now applied to the right stop light (C021) and the left stop light (C020), so that they go on. The lights that are connected via the drawn vehicle socket (A000) will also go on.
When relay G036 is energised, the connection 30 - 78a is broken. The voltage on D900 (VIC electronic unit) is lost.

CAB TILTING GEAR

There is a voltage on sensor F676 (cab locking sensor) and on sensor F616 (cab tilting cylinder sensor) through fuse E018 and wire 1114. There is also a voltage on connection point 2 of sensor F676 through connection points 1 - 2 of relay G351 (cab tilt protection micro-relay) and wire 4723. When this sensor is activated, the voltage is transmitted to connection point 16 of D900 (VIC) and to connection point 2 of sensor F616. The VIC now sends a message to the DIP, which then activates the “cab tilted” warning lamp. When sensor F616 is activated, relay G351 is energised and, as a result, a voltage is applied to B251 through contacts 3 and 5 and wire 4722 (neutral position buzzer, tilting cab). If the contacts in switch E569 (neutral position switch) are closed (connection between pins 4 and 2), the horn will go off.

VARIANTS

Location	
36	D814 in the case of UPEC; D903 in the case of ECS-DC3
39, 41	Connector 642: only on vehicle type FT
47	Depending on whether vehicle is fitted with a 7-pin or 15-pin plug. See also section diagram 47.
33	If the vehicle is fitted with a conventional braking system, there is NO connection to F628. If the vehicle is fitted with the EBS braking system, there is NO brake light switch (E511) or earth connection.

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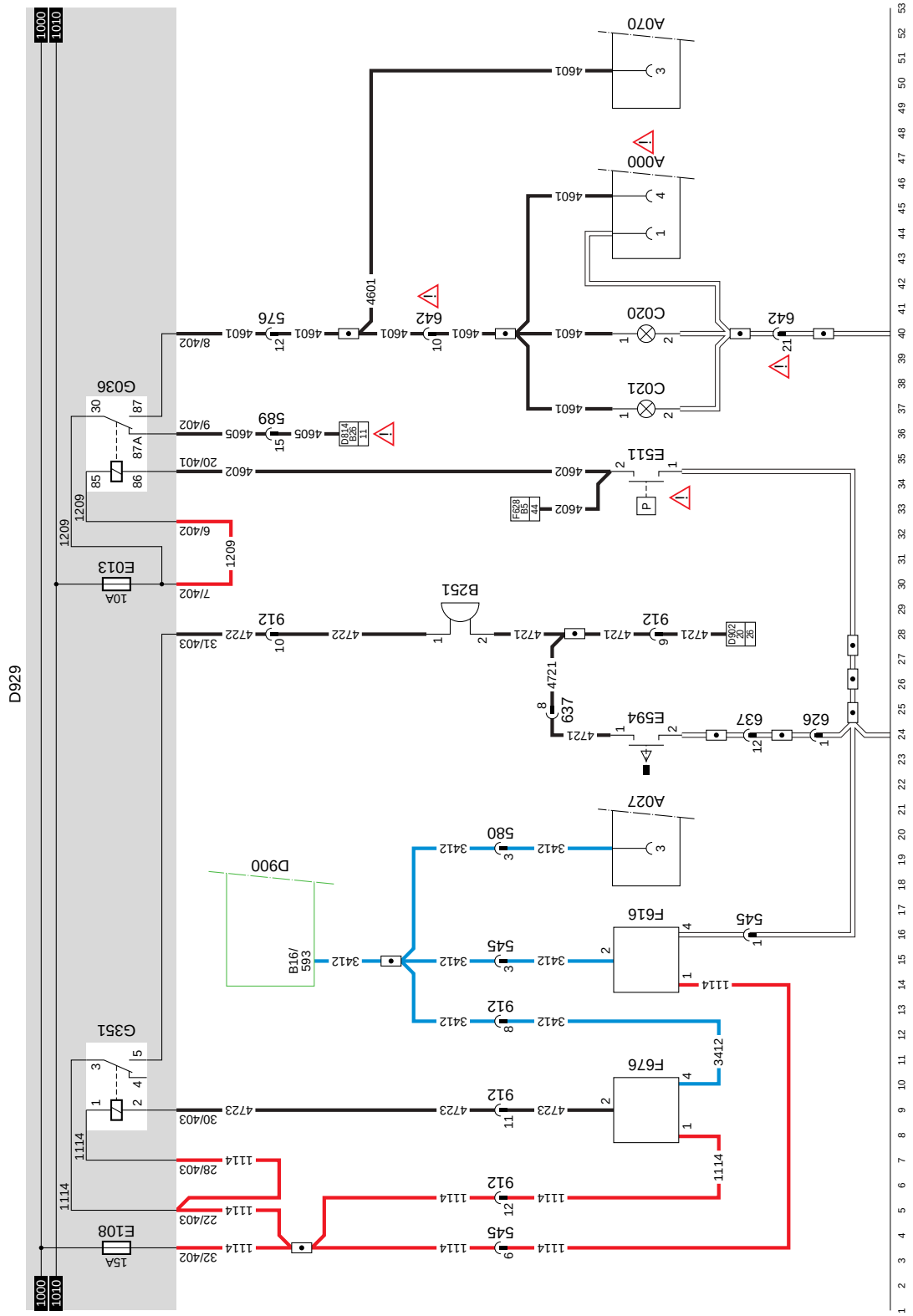

15 **1358030/16-24** EL001060

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20 SEARCH LIGHTING

SEARCH LIGHTING

Search lighting refers to lights or LEDs in the various function switches.
When the light switch (C622) is operated, a supply voltage is present on relay G000 (connection point 85) through fuse E084 and the light switch (C622), contacts 2 - 1, wire 2100.
Relay G000 is energised ((connection between connection points 30 and 87), PCB track 2101 and fuse (E117)) when there is a voltage on the search lighting (through wire 2630). All search lighting connected to this will come on.

The following switches are illuminated by a light: B030, C072, C073, C716, C813, C814 and C858.

The following switches are illuminated by an LED:
C725 C727 C735 C736 C737 C739 C740
C741 C748 C749 C750 C751 C760 C763
C764 C765 C774 C778 C742 C802 C835
C836 C837 C840 C853 C858

LIGHT BUZZER

When the lighting switch (C622) is operated, supply voltage will be applied to relay G000 through fuse E084, lighting switch (C622) and wire 2100.
Relay G000 is energised so that a voltage is applied to the search lighting (wire 2630) through fuse E117. This wire is also connected to the VIC (D900), pin 7/594.
If the pre-programmed condition in the VIC is met, the VIC sends a message to the DIP, which in turn activates a buzzer (fitted in the DIP).

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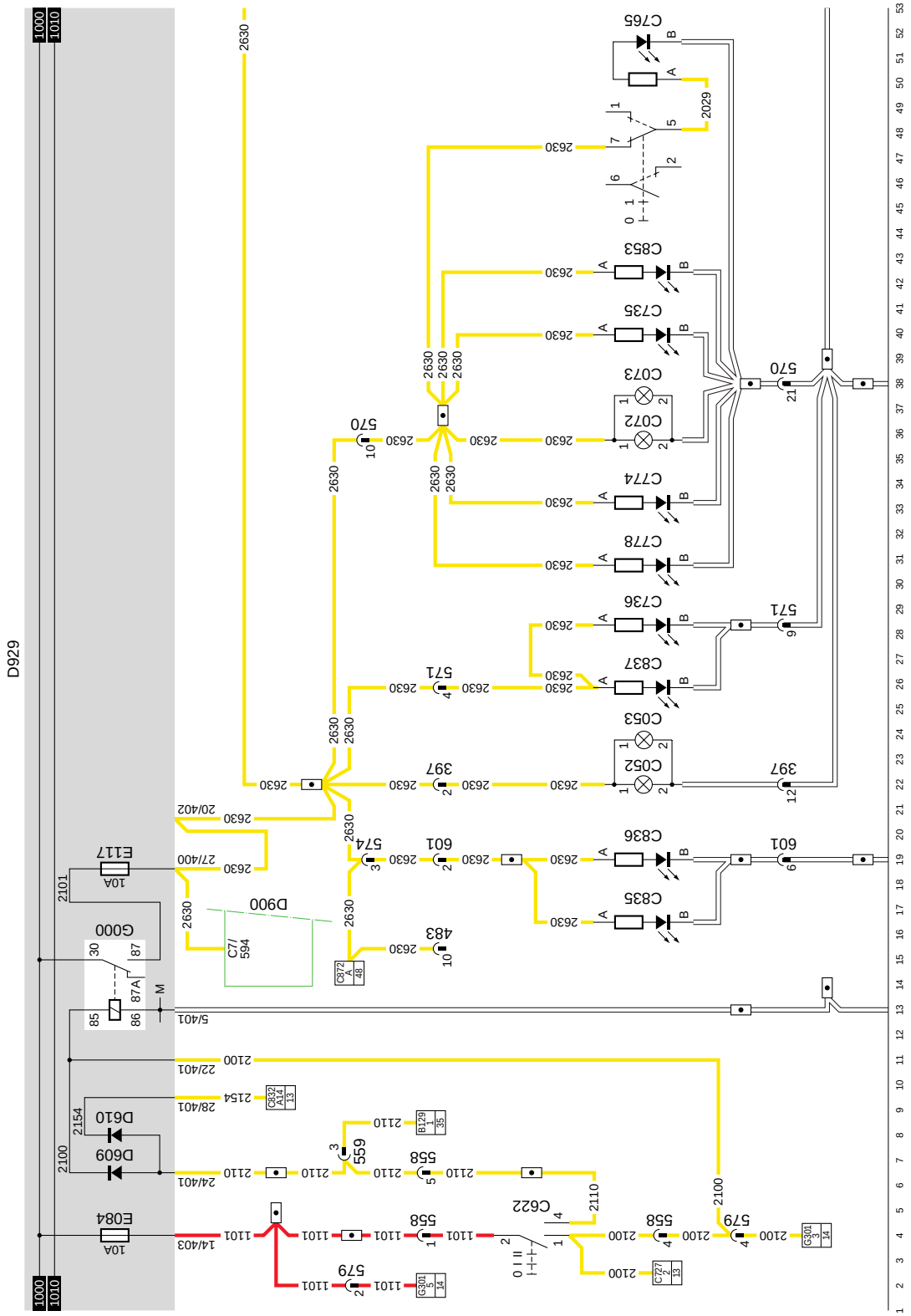

20 **1358030/16-24** EL001061

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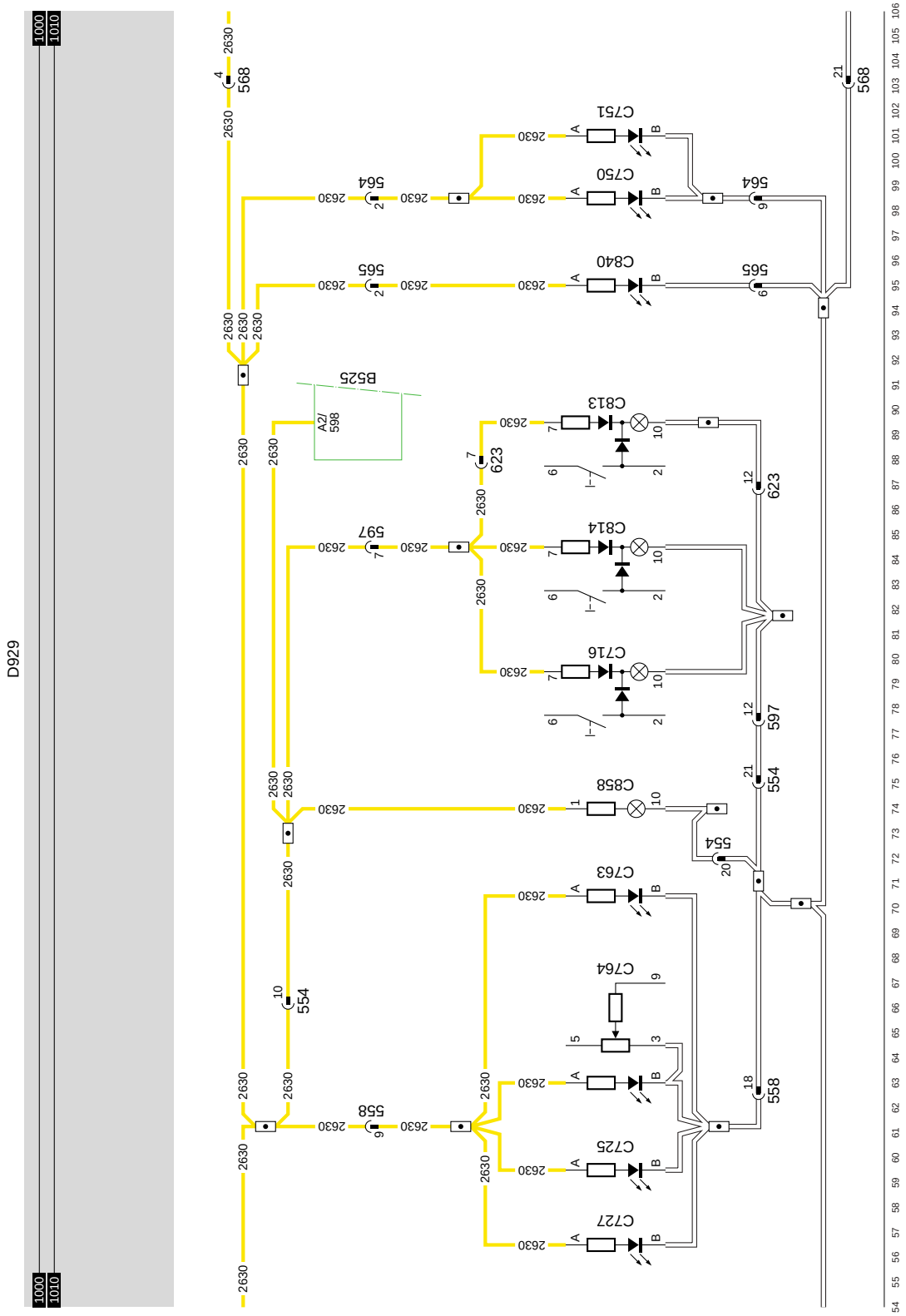

20 1358030/16-24 EL001062

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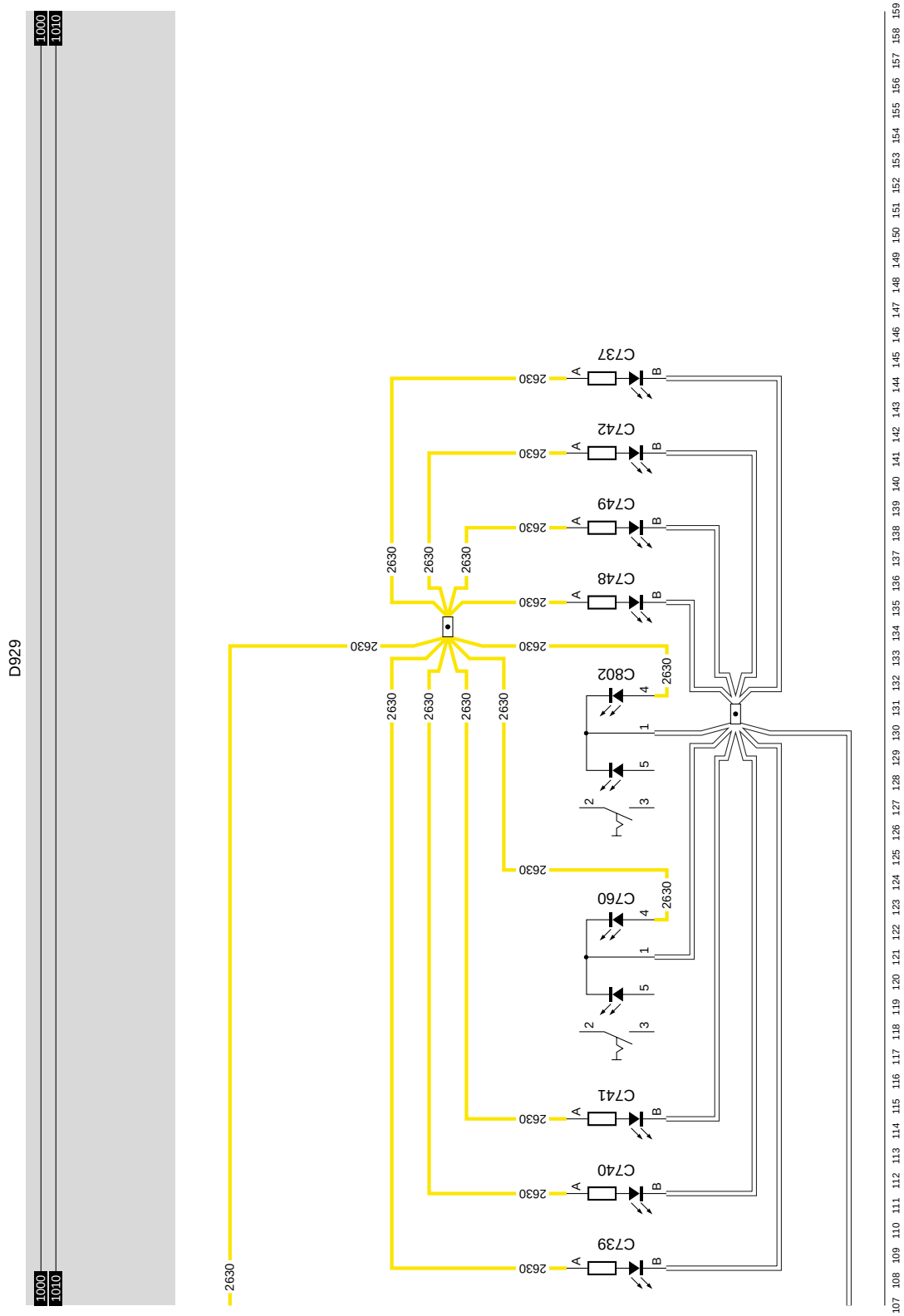

20 1358030/16-24 EL001063

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23. HORN/CIGAR LIGHTER/WORK LAMP/AIR DRYER

HORN
A voltage is applied to connection point 5 of C832 (direction indicator/windscreen wiper stalk switch) via fuse E084 and wire 1101. When this switch is operated (connection between contacts 5 and 12), voltage is applied to connection point 1 of valve B028 (horn) via wire 4535. The horn is activated. The air duct in the pneumatic horn is now released.

CIGAR LIGHTER
A voltage is applied to connection point 1 of B030 (driver's side cigar lighter) through fuse E026 (power supply before contact) and wire 1105. When the cigar lighter is pressed in (connection between contacts 1 and 3), a current flows through an internal resistor. When the temperature exceeds a specific value, the heating element springs back and the electric circuit is broken.

WORK LAMP
When the vehicle lighting is switched on (relay G000 activated), the work lamp can also be activated. Contacts 30 - 87 of relay G000 are connected through. Voltage is now applied to connection point 85 of G462 through contacts 30 - 87, fuse E117 and wire 2630. This relay is now energised. Voltage is now applied to connection point 5 of switch C725 through fuse E037, wire 1100, connection points 30 - 87 of G462, wire 1147 and fuse E052. When the switch is operated, this voltage is also applied to lamp C071 and connection C9. The VIC switches on the "work lamp" indicator on the instrument panel via the I-CAN.

AIR DRYER
A voltage is applied to connection point 1 of B042 (air dryer heating element) through fuse E091 (power supply after contact) and wire 1240. If the built-in temperature switch is closed (connection between contacts 1 and 2), a current flows through an internal resistor. If the temperature exceeds a specific value, the temperature switch turns the heating element back off.

VARIANTS

Location
48 Connector A070 if fitted. Optional.

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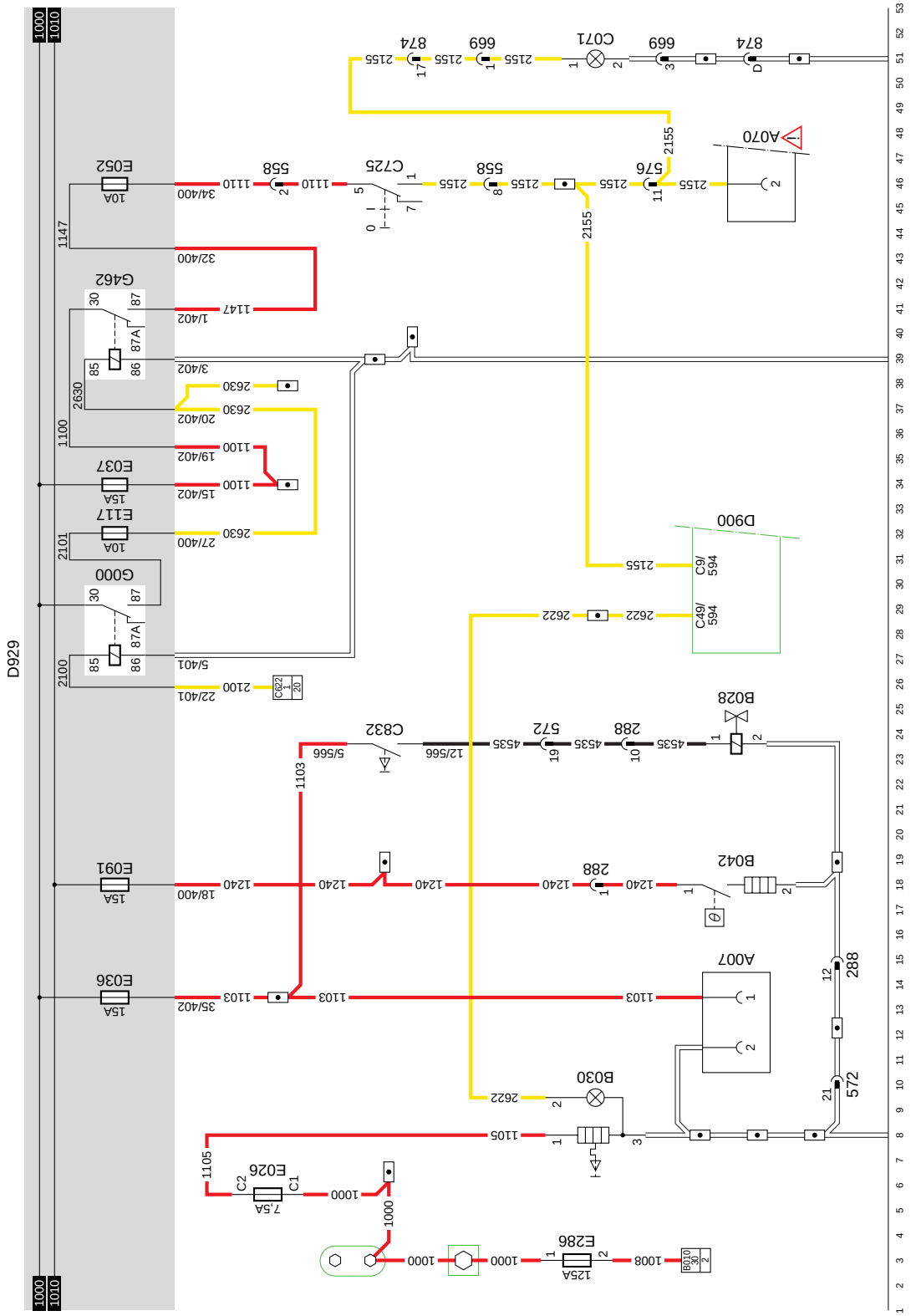

23 **1358030/16-24** EL001064

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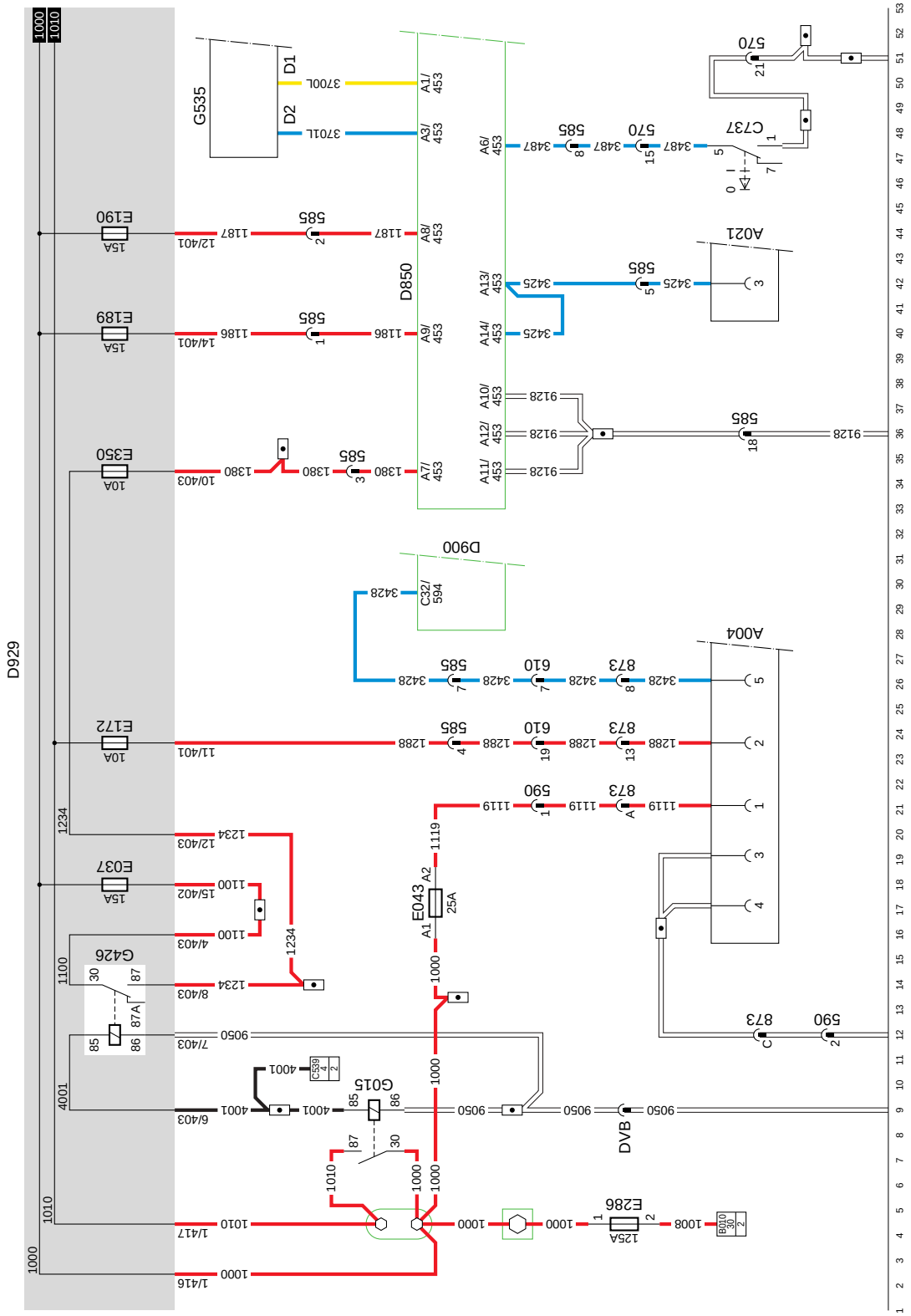
24 ABS - ASC-D
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

https://www.truck-manuals.net/



24 **1358030/16-24** EL001198

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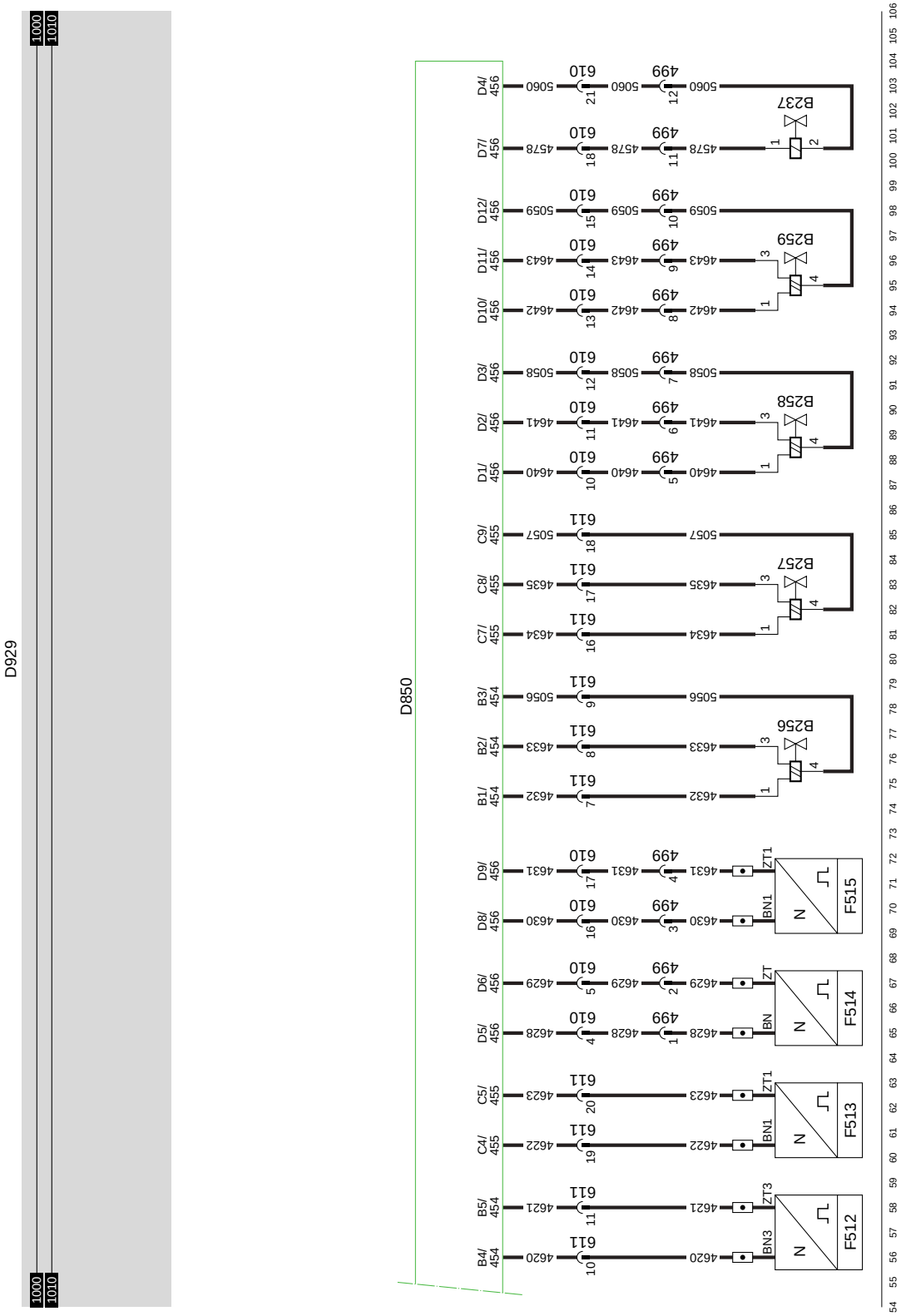

24 1358030/16-24 EL001199

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26 INTARDER EST42

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

15 The housing is connected to earth by a separate wire.

24 Pin 11, connector 583, is connected directly to earth only if the vehicle is fitted with an AS Tronic gearbox.

11

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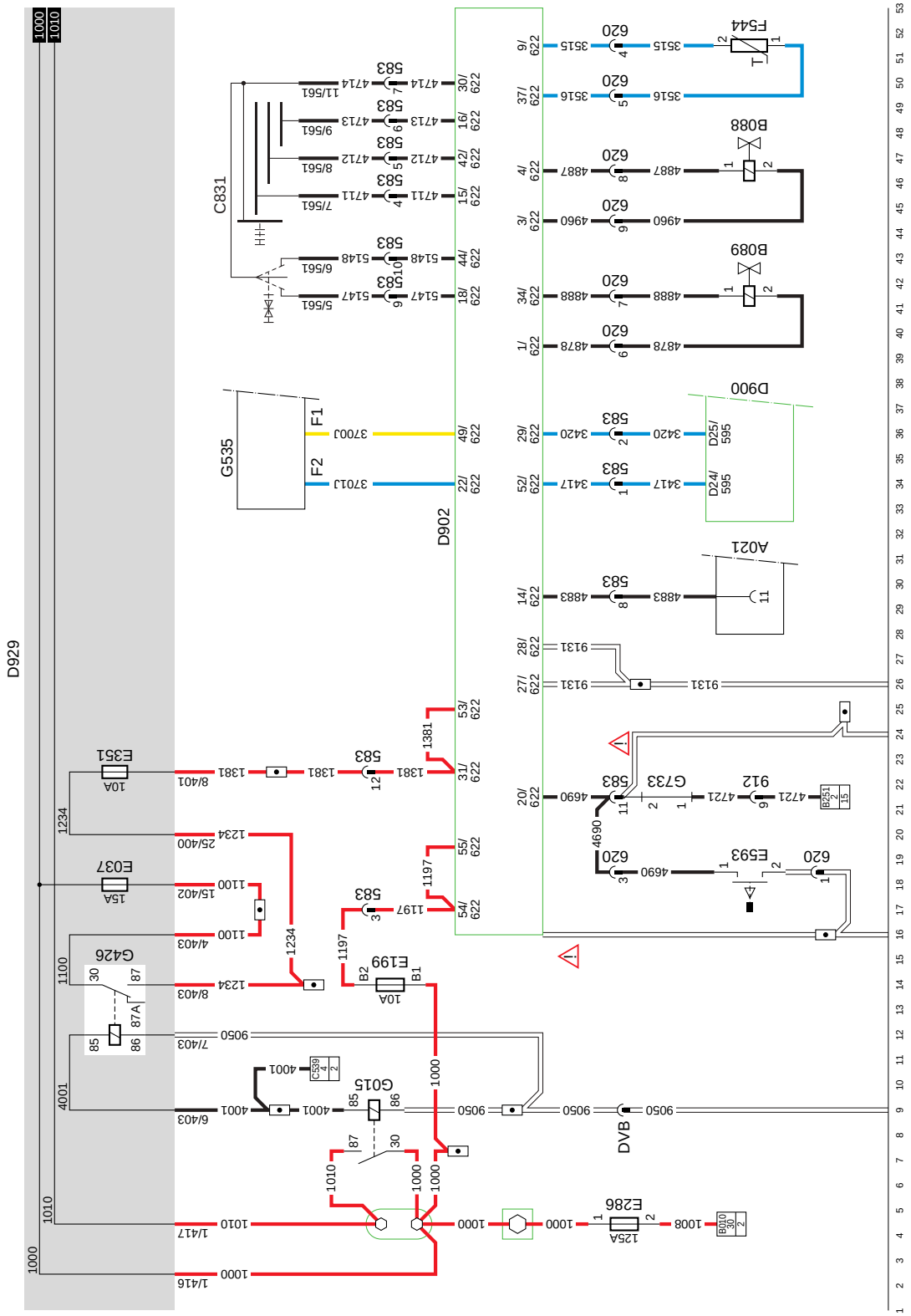

26 1358030/16-24 EL001191

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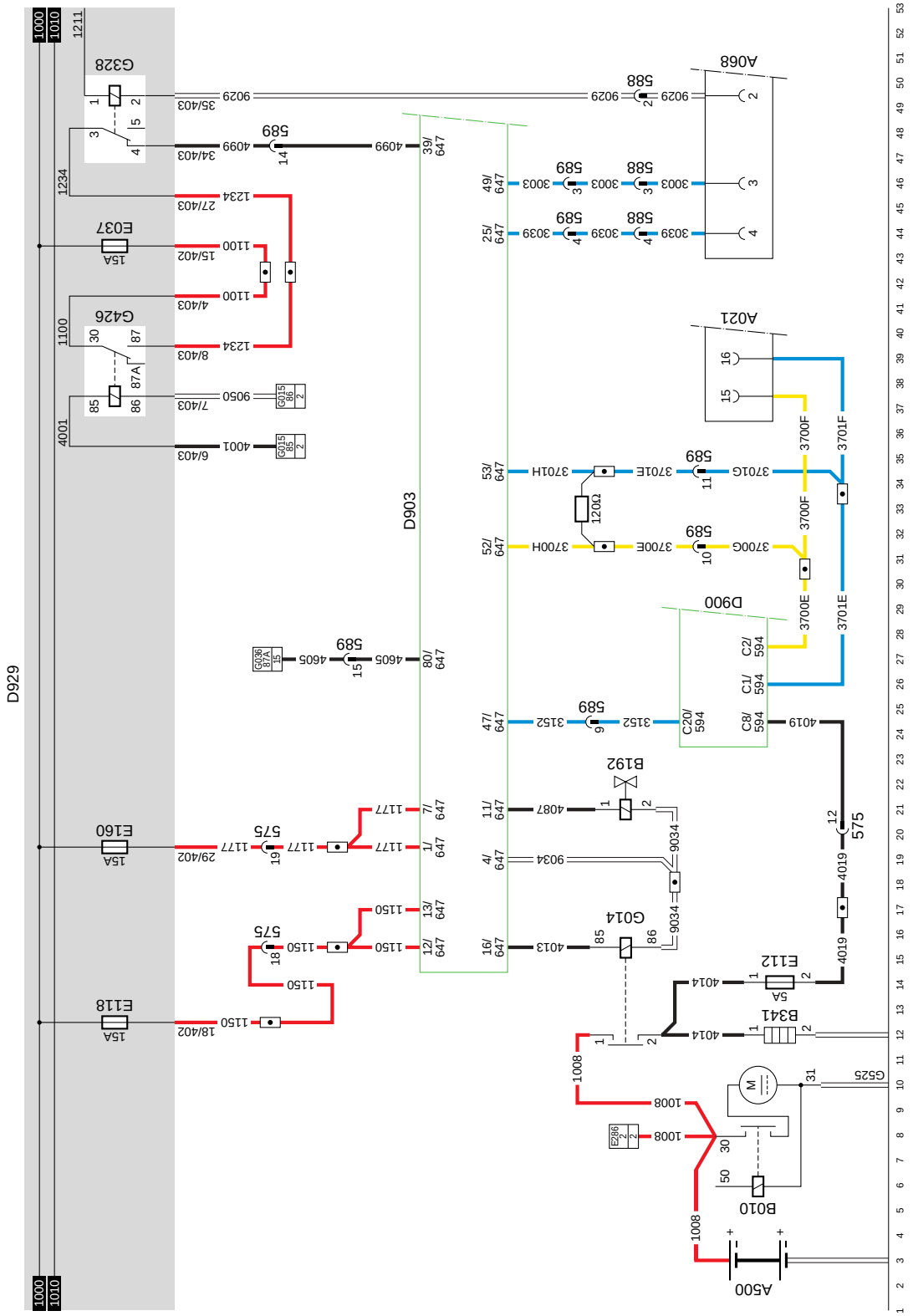
27 ECS-DC3
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

https://www.truck-manuals.net/



27 1358030/16-24 EL001200

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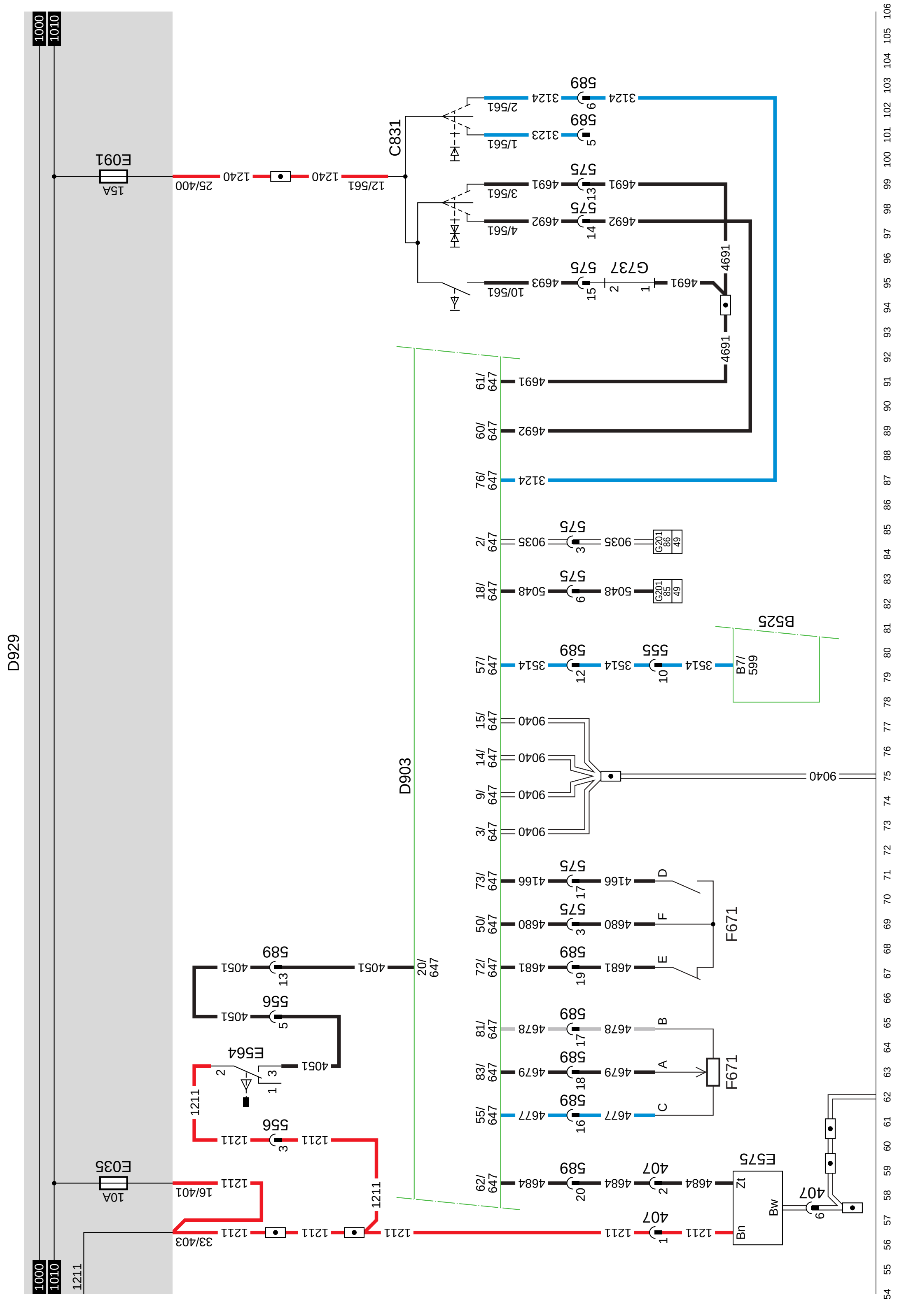
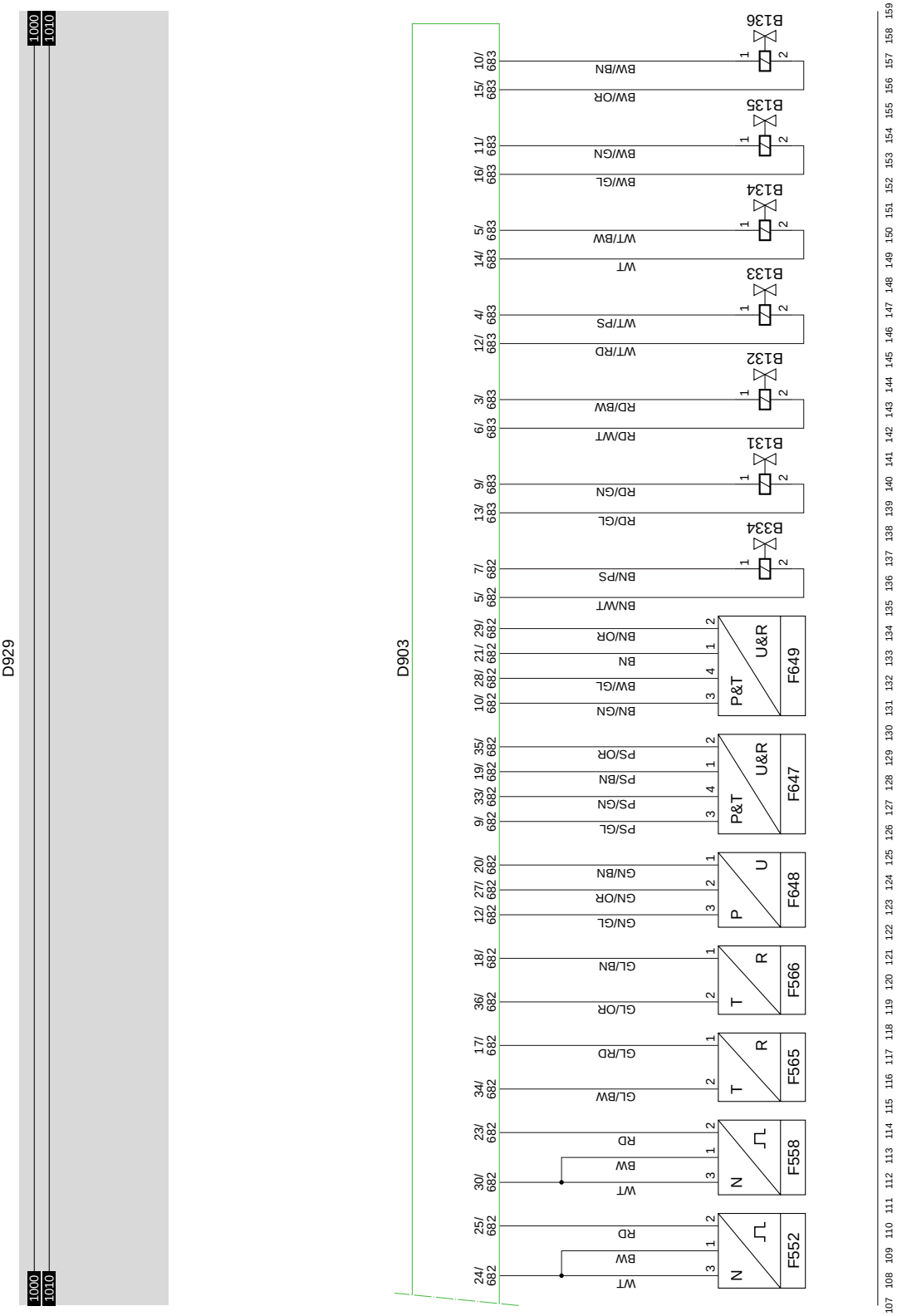


27 **1358030/16-24**

EL001201



27 **1358030/16-24** EL001202

29. EMAS

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

42 No wire marking between connector 679 and unit.

42 No wire marking between connector 680 and unit.

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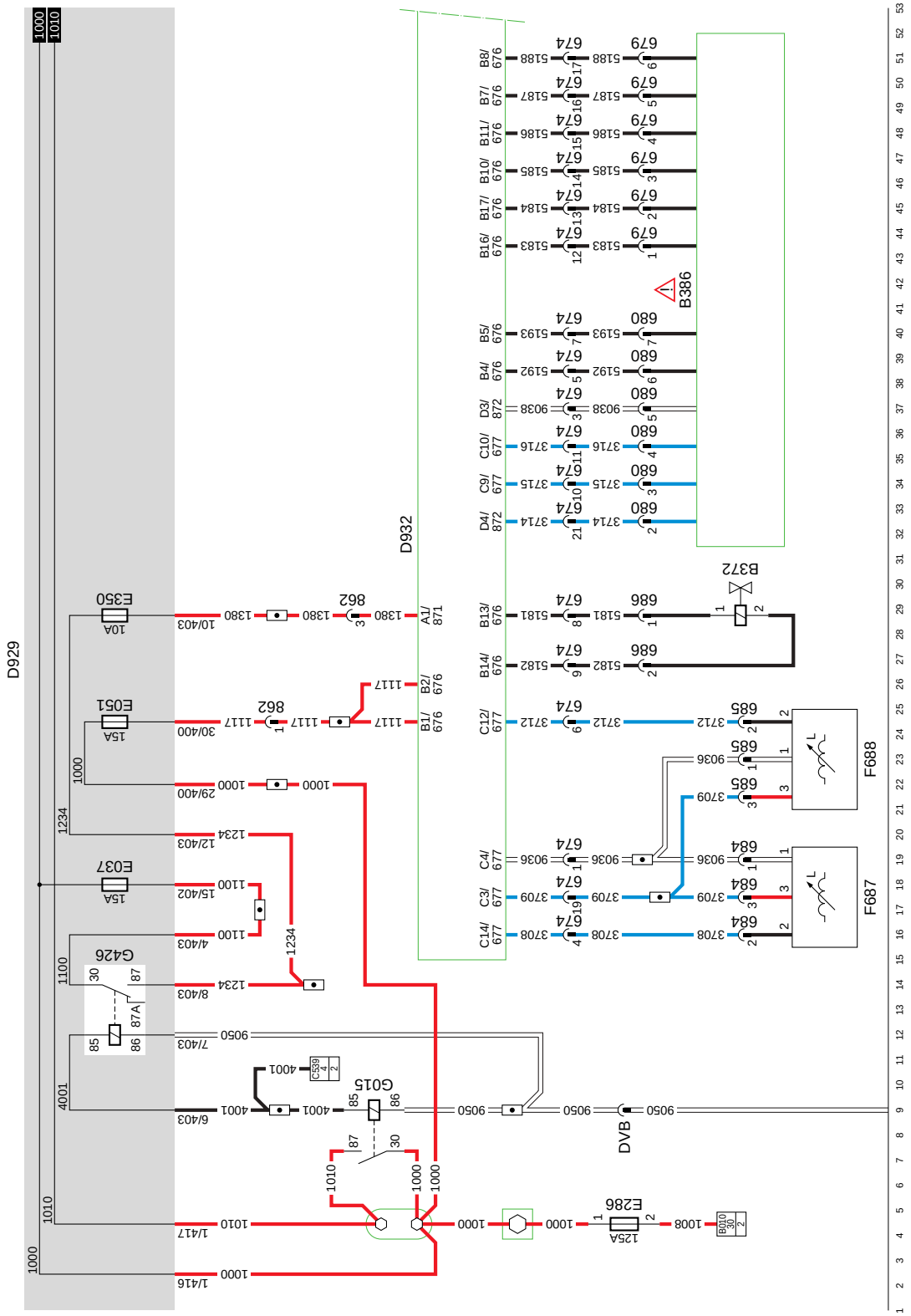
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D932
B386
B372
E350
E051
E037
G426
G015
F688
F687
DVB
E286
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1010
1234
1100
4001
9050
1358030/16-24
EL001065

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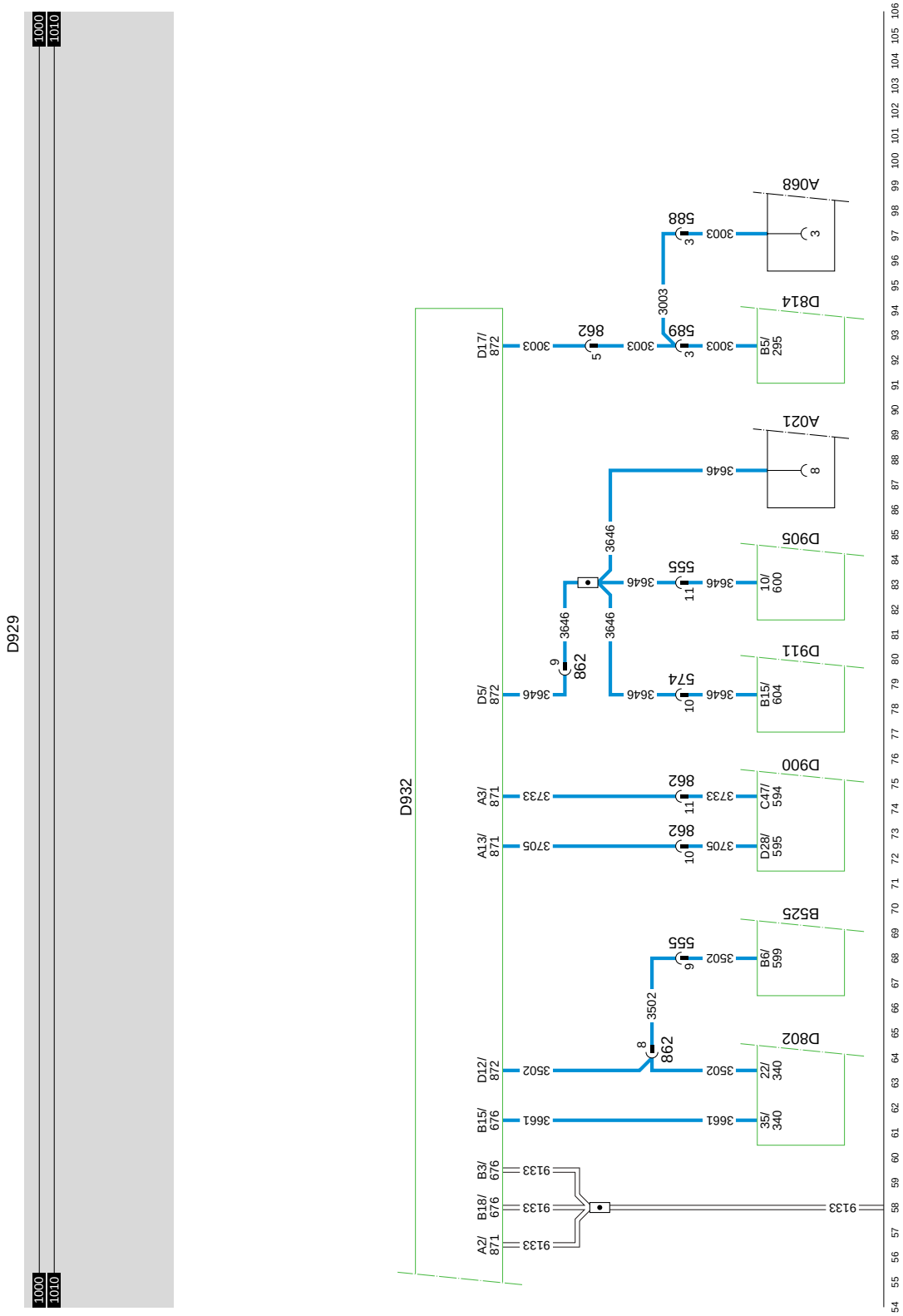

29 **1358030/16-24** EL001066

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30 AGC

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location	
52, 72, 83	Connector A074: connector for superstructure.
115	Depending on whether alarm system is fitted.

11

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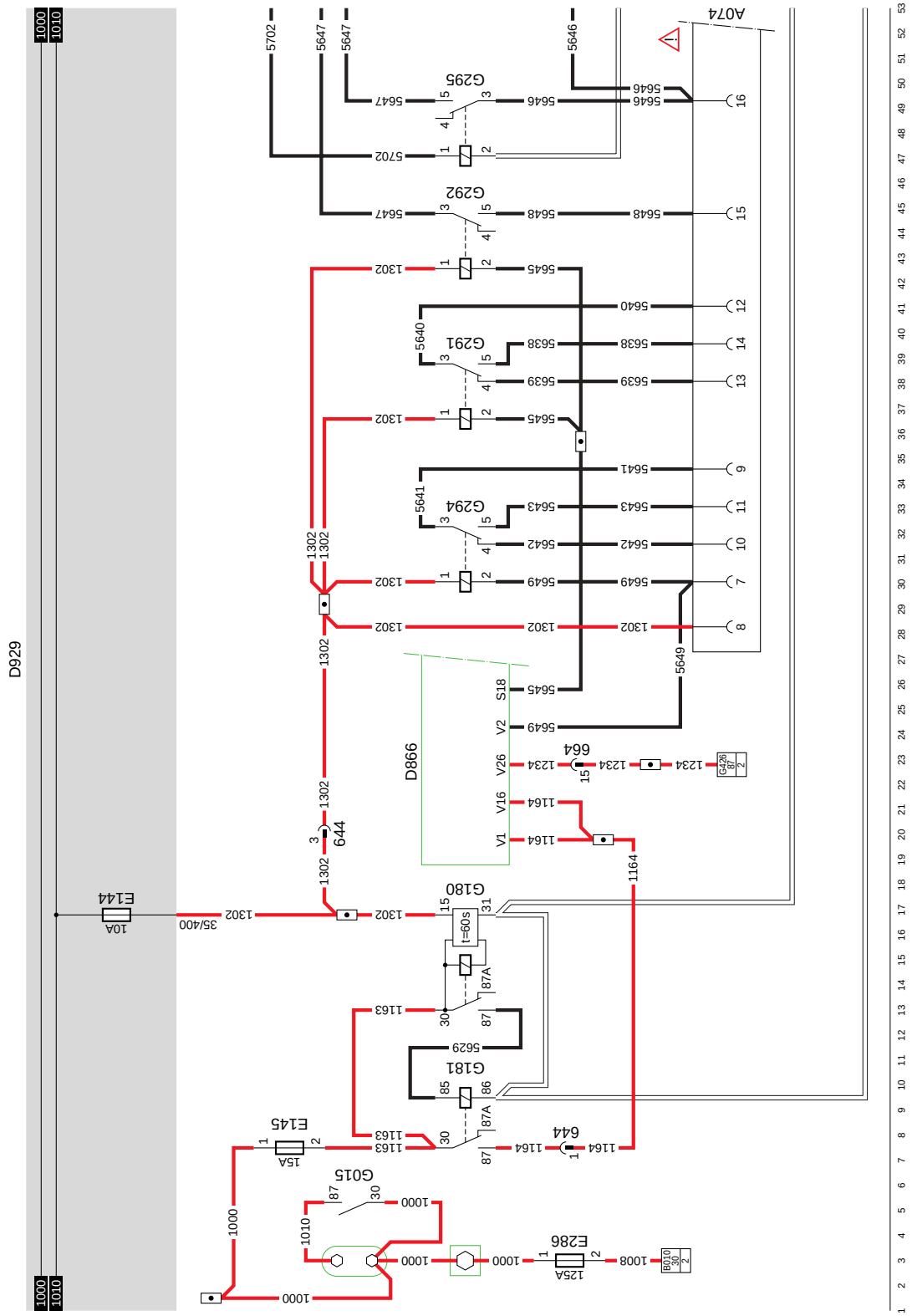

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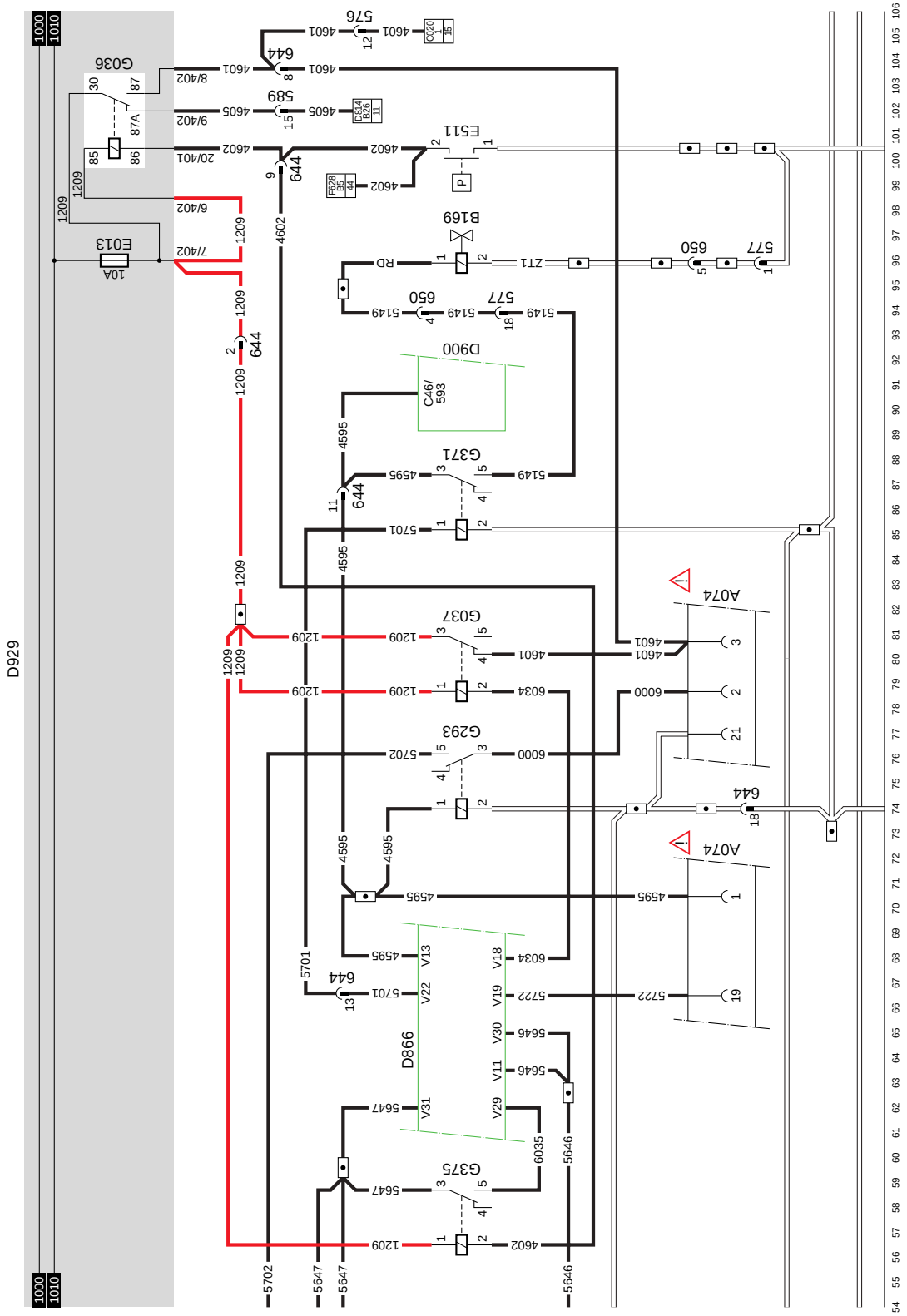

30 **1358030/16-24** EL001068

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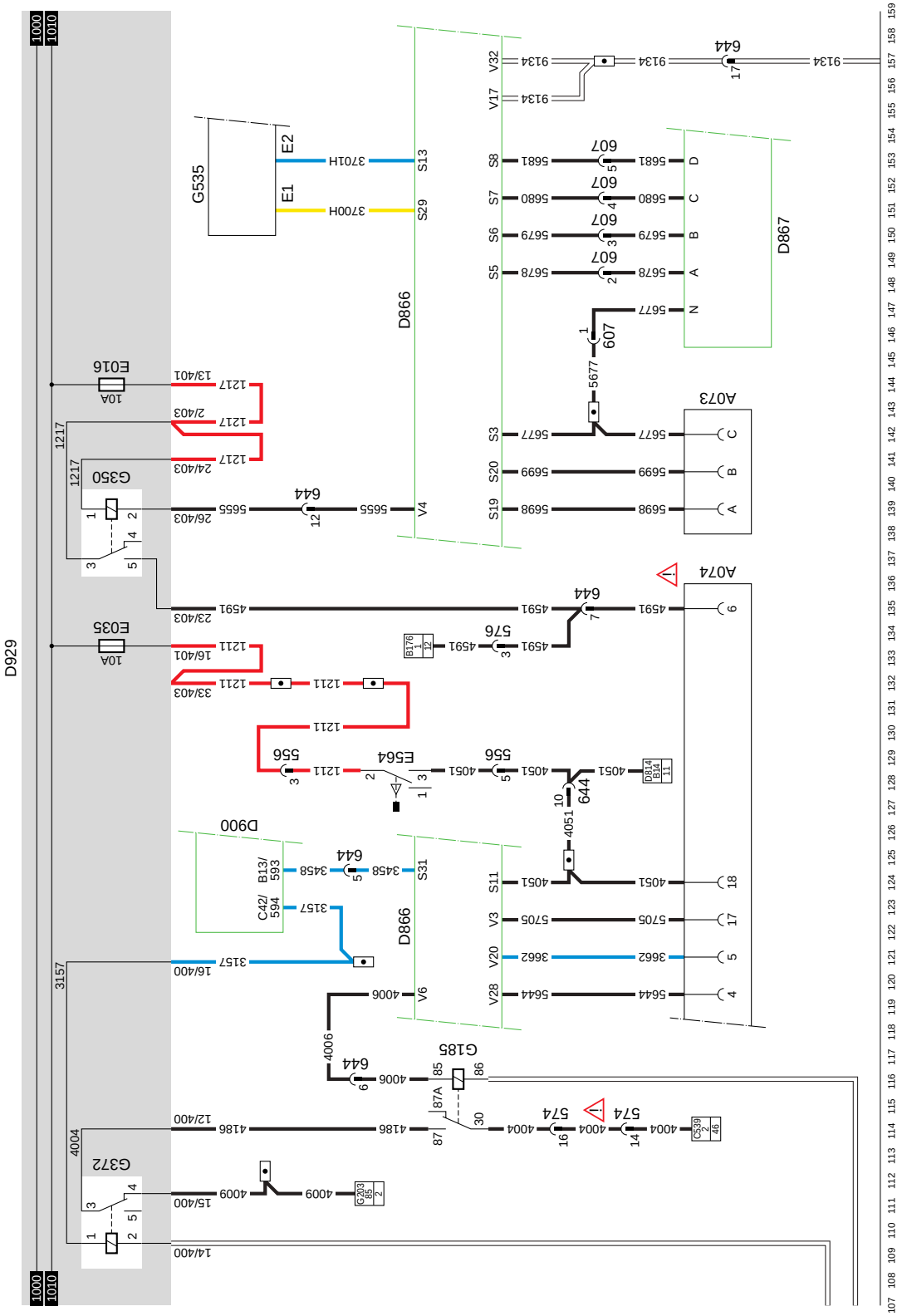
D929
D866
D867
D900
G535
G350
G372
G185
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E035
E564
A073
A074
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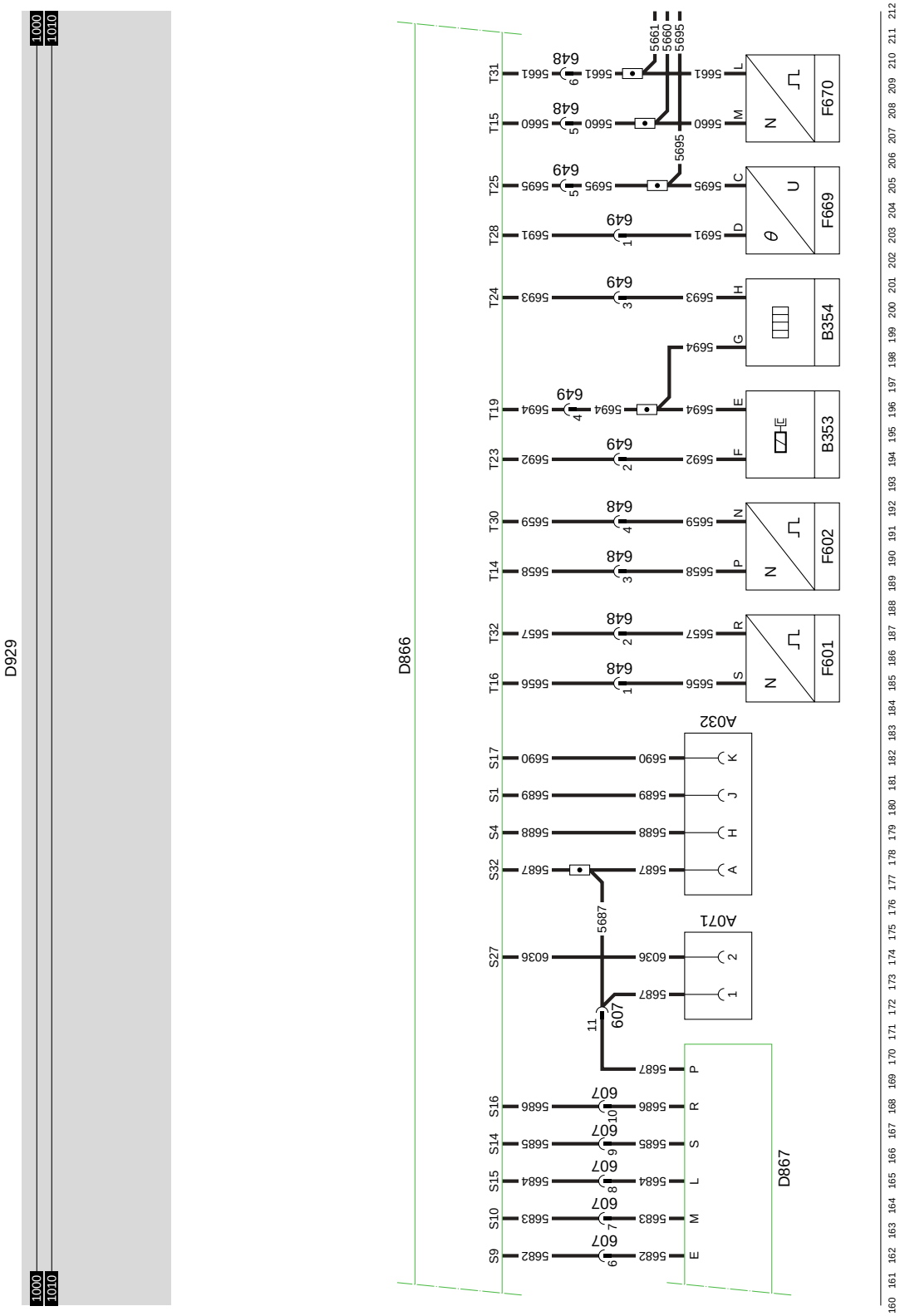
1358030/16-24
EL001069



30 **1358030/16-24** EL001070

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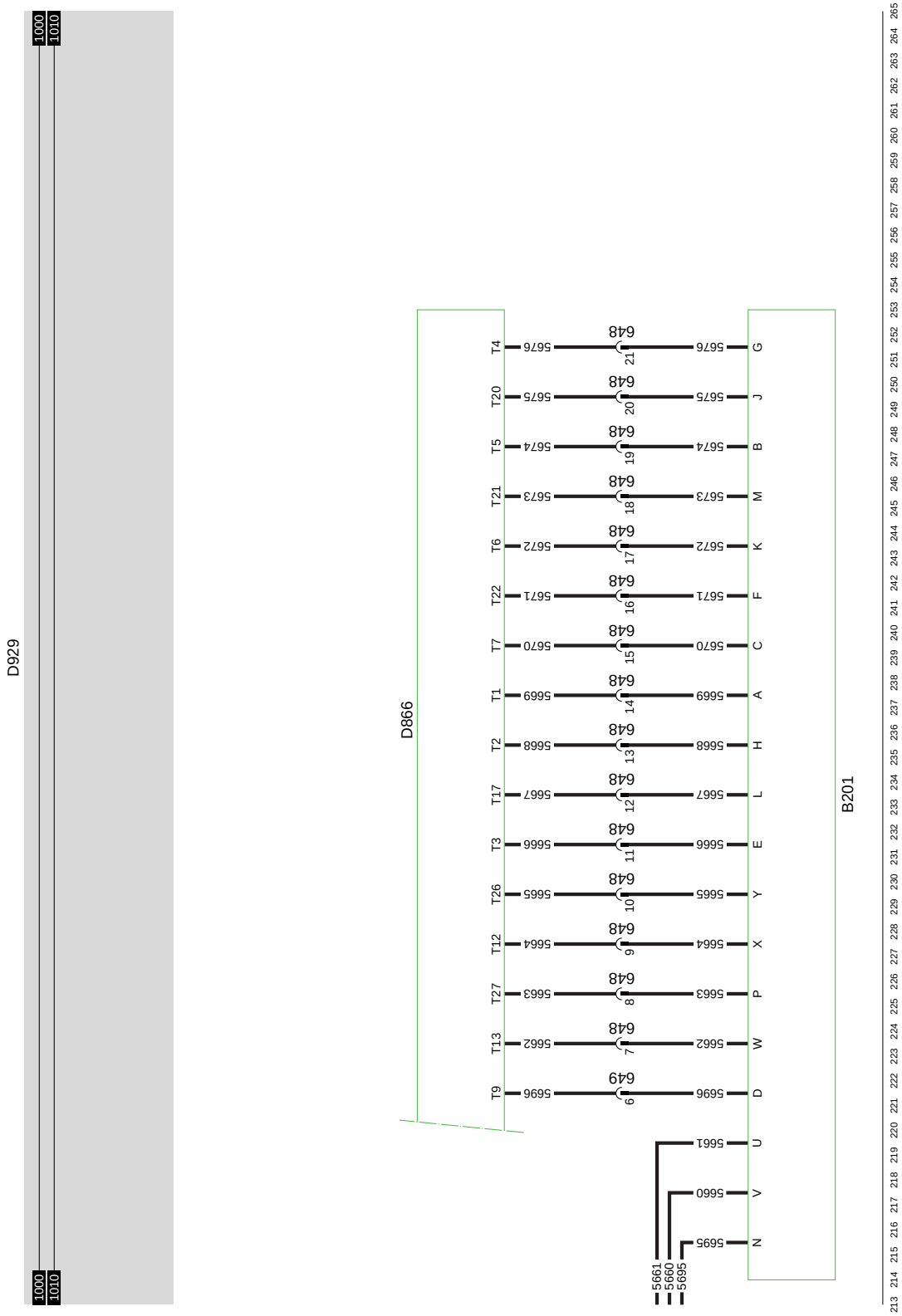

30 **1358030/16-24** EL001071

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32 PTO

'REQUEST' PTO 1 (= SWITCH ON)
When the PTO operation switch (C750) is operated, a voltage is applied to connection point 11 of A068 (engine speed application connector) and connection point 27 of connector 595 of D900 (VIC) through fuse E091, wire 1240, contacts 5 - 1 of switch C750 and wire 4594. This means that a 'request' to use the PTO has been made. This 'request' is carried out depending on the condition programmed in the VIC. A condition might be that the parking brake must be engaged. In this case, a voltage is applied to connection point 1 of parking switch control switch F000 through fuse E035, wire 1211. This voltage is also on connection point 26 of connector 595 of D900 (VIC). If parking brake control switch F000 is closed (connection between contacts 1 and 2), this voltage is also on connection point B22 of D814 (UPEC electronic unit) through wire 3402.

OPERATION
When the 'PTO request' is carried out, the following takes place:
A voltage is applied from connection point 23, connector 593 of D900 to connection point 1 of E570 (clutch - PTO N10 pneumatic switch) (if present) and to connection point 3 of relay G259 (PTO-operation takeover relay) (if present) through wire 4596.

When switch E570 (clutch - PTO N10 switch) is operated by depressing the clutch pedal (connection between contacts 1 and 2), a voltage is applied to connection point 1 of relay G259 and to connection point 1 of B245 (PTO operation valve). Relay G259 is energised and, as a result, a connection is made between contacts 3 and 5 of relay G259. Relay G259 now remains energised irrespective of E570 (this is a 'memory' function). B245 is also activated and this switches the PTO on.

The VIC checks whether the PTO is actually switched on. This takes place as follows:
When the PTO has been switched on, F087 is operated mechanically. Contacts 1 - 2 of F087 close. Connection point 14 of VIC connector 593 is now connected to earth. The VIC then sends a message to the DIP and the "PTO active" warning is activated. If the PTO does **NOT** switch on, F087 is **NOT** operated and connection point 14 of connector 593 is **NOT** connected to earth. After a period of time programmed in the VIC a 'message' is sent to the DIP and the "PTO fault" warning symbol is activated.

'CANCEL' PTO 1 (= SWITCH OFF)
Breaking contacts 5 - 1 of C750 switches the PTO off. This interrupts the voltage from connection point 27 of connector 595. One of the switch-on conditions for operation of the PTO is now absent. The VIC responds to this by removing the voltage on connection point 23, connector 593. The voltage on relay G259 is interrupted and, as a result, the coil is no longer energised. Contacts 5 - 3 open and, as a result, the voltage on connection point 1 of B245 is lost. The valve is no longer energised and the PTO is switched off.

SWITCHING ON PTO 2
A voltage is applied to connection point 5 of C751 (PTO operation switch) through fuse E091, wire 1240. When this switch is operated (connection between contacts 5 and 1), voltage is applied to connection point 22 of D900 via wire 5241.

A voltage is applied from connection point 46 of D900 to connection point 1 of B246 (PTO operation valve) through wire 4595. This valve is activated and the PTO switches on.

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The VIC checks whether the PTO is actually switched on. This takes place as follows: When the PTO has been switched on, F088 is operated mechanically. Contacts 1 - 2 of F088 close. Connection point 11 of the VIC is now connected to earth. The VIC then sends a message to the DIP and the "PTO active" warning is activated. If the PTO does **NOT** switch on, F088 is **NOT** operated and connection point 11 is **NOT** connected to earth. After a period of time programmed in the VIC a 'message' is sent to the DIP and the "PTO fault" warning symbol is activated.

Valve B246 is now no longer energised and the PTO is switched off.

SWITCHING OFF PTO 2

Breaking contacts 5 - 1 of C751 switches the PTO 2 off.
This interrupts the voltage on connection point 22 of D900. Valve B246 is no longer energised and the PTO is switched off.
Switch F088 is re-opened (connection between contacts 2 and 1 no longer exists).
The earth connection with D900 is interrupted and the light goes out.

VARIANTS

Location	
9	Optional
36	Connection if there is no N10 PTO clutch switch present.
22, 25, 32, 41	Connector 626: only applicable on vehicle type FA
29, 32	Connector 650: only applicable if the vehicle has an Allison gearbox.

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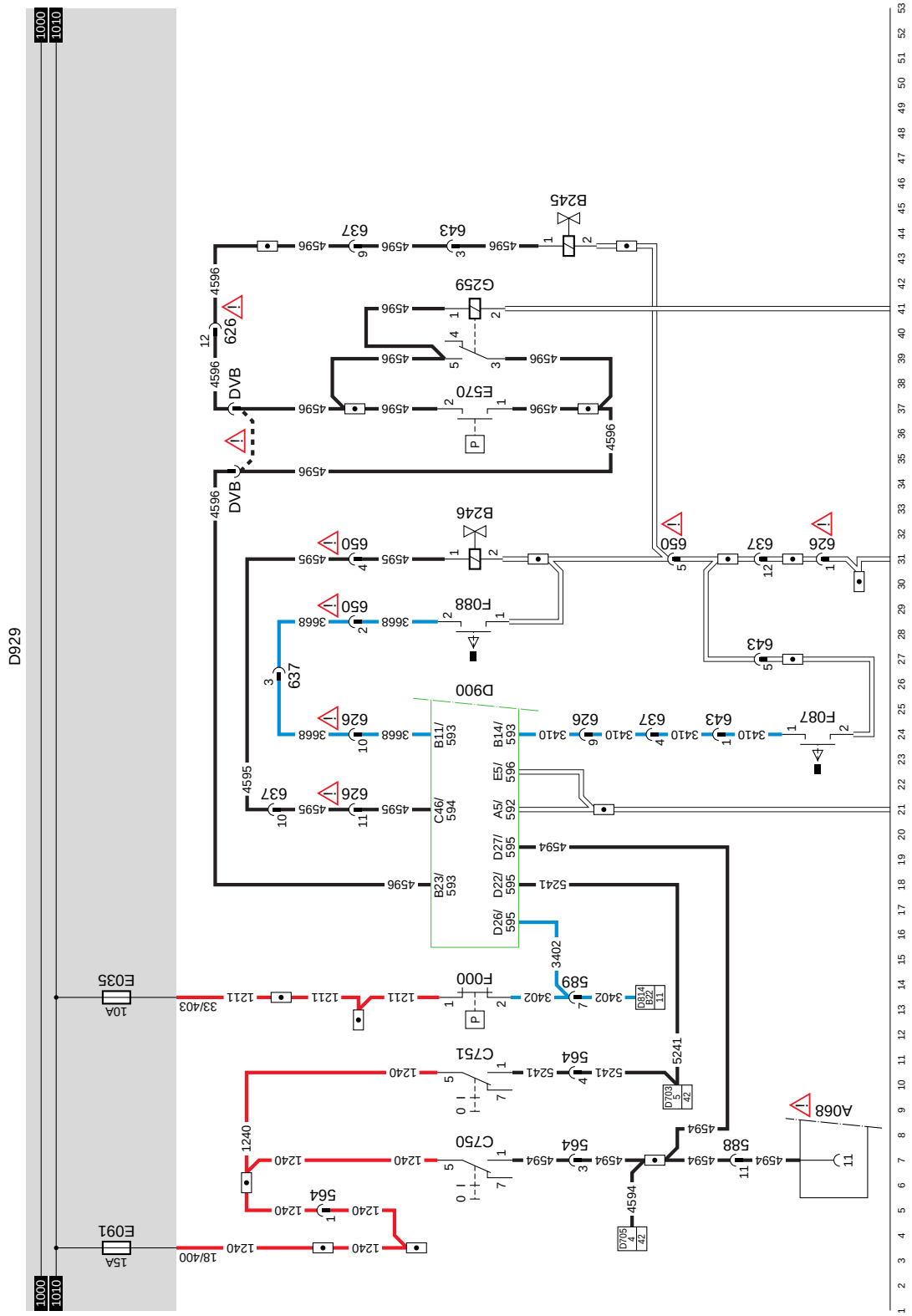

32 1358030/16-24 EL001072

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33 ROOF SPOTLIGHTS/COOLER BOX/ROTATING BEAMS

ROOF SPOTLIGHTS

Marker/parking lights in roof spotlights.
A voltage is applied to connection point 2 of C622 (lighting switch) via fuse E084 and wire 1101. When this switch is operated (connection between contacts 2 and 1), voltage is applied to connection point 85 of relay G000 (tail light/width marker light relay) via wire 2100. This relay is activated. A voltage is now applied through contacts 30 - 87 of relay G000, fuse E000 and wire 2102 to C074 (left rear width marker light) and C012 (left front width marker light) respectively and to C163, C165, C167 and C169 (width marker light/roof spotlights). The marker and parking lights in the spotlights now come on.

Roof spotlights
A voltage is applied to connection point 8 of C832 (direction indicator/windscreen wiper stalk switch) via fuse E084 and wire 1101. When this switch is operated (connection between contacts 8 and 9), voltage is applied to connection point 85 of relay G002 (main beam relay) via wire 2120. This relay is activated. A voltage is now applied through contacts 30 - 87 of relay G002, fuse E006 and wire 2122 to C002 (left main beam) and connection point 6 of C813 (roof spotlights switch) respectively. When this switch is closed (connection between contacts 6 and 2), voltage is also applied to connection point 85 of G299 (roof spotlights relay). This relay is activated. A voltage is now applied to connection point 1 of C162, C164, C166 and C168 (roof spotlights) respectively through fuse E142, wire 1154, contacts 30 - 87 of G299. The spotlights will now light up.

COOLER BOX
The cooler box is connected to voltage BEFORE contact. Voltage is applied to connection point 1 of B356 (cooler box) from fuse E142 via wire 1154.

ROTATING BEAMS
The rotating beams are connected to voltage BEFORE contact. Voltage is applied to connection point 6 of C716 (rotating beams switch) from fuse E142 via wire 1154. When the switch is closed (connection between contacts 6 and 2), voltage is applied to C144 (left rotating beam, driver's side) and C145 (right rotating beam, co-driver's side) via wire 2017. These rotating beams will now light up.

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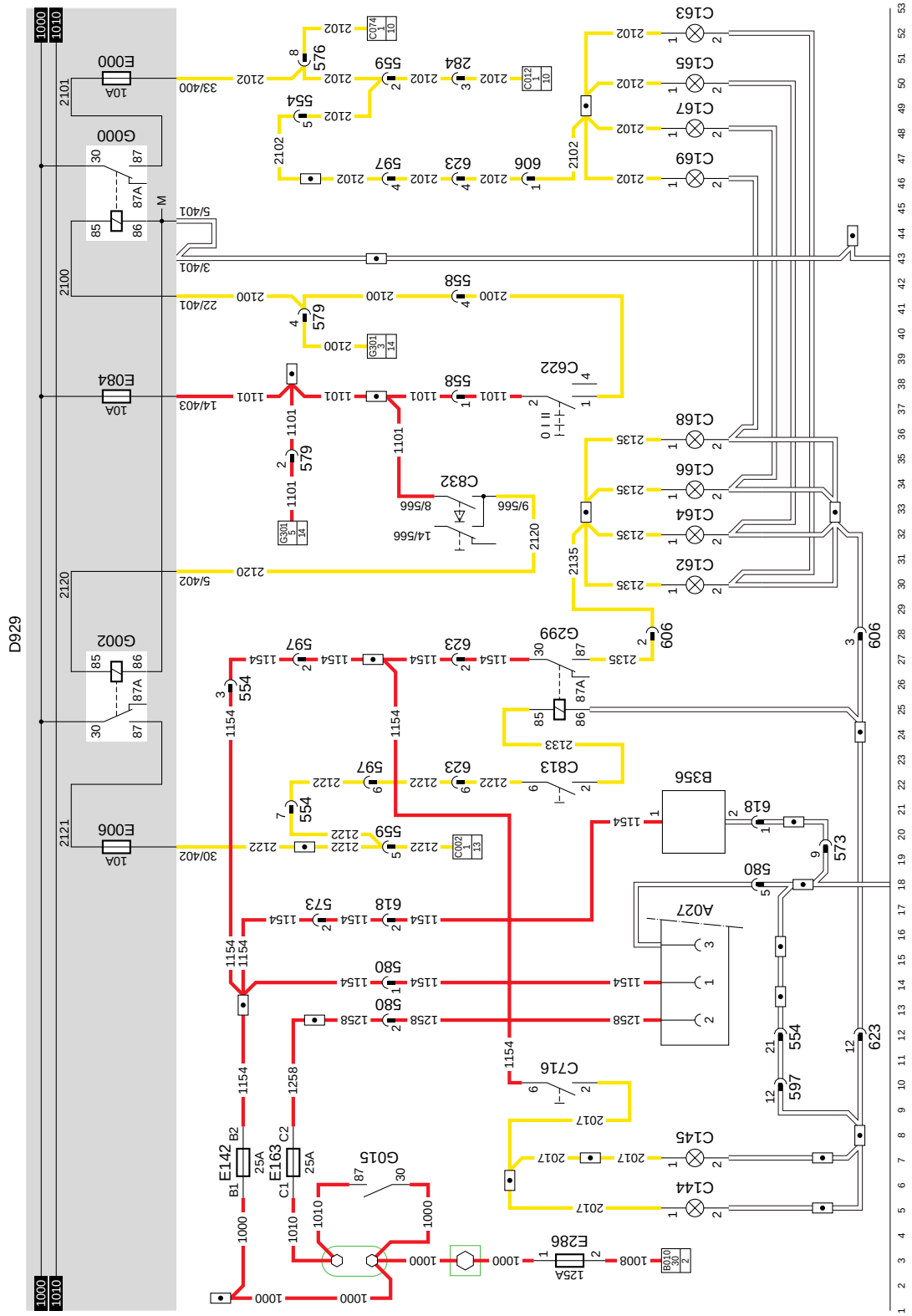

33 **1358030/16-24** EL001073

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34A ECAS-3 (4X2)

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
98 On vehicle type FA, B250; on vehicle type FT, B238.

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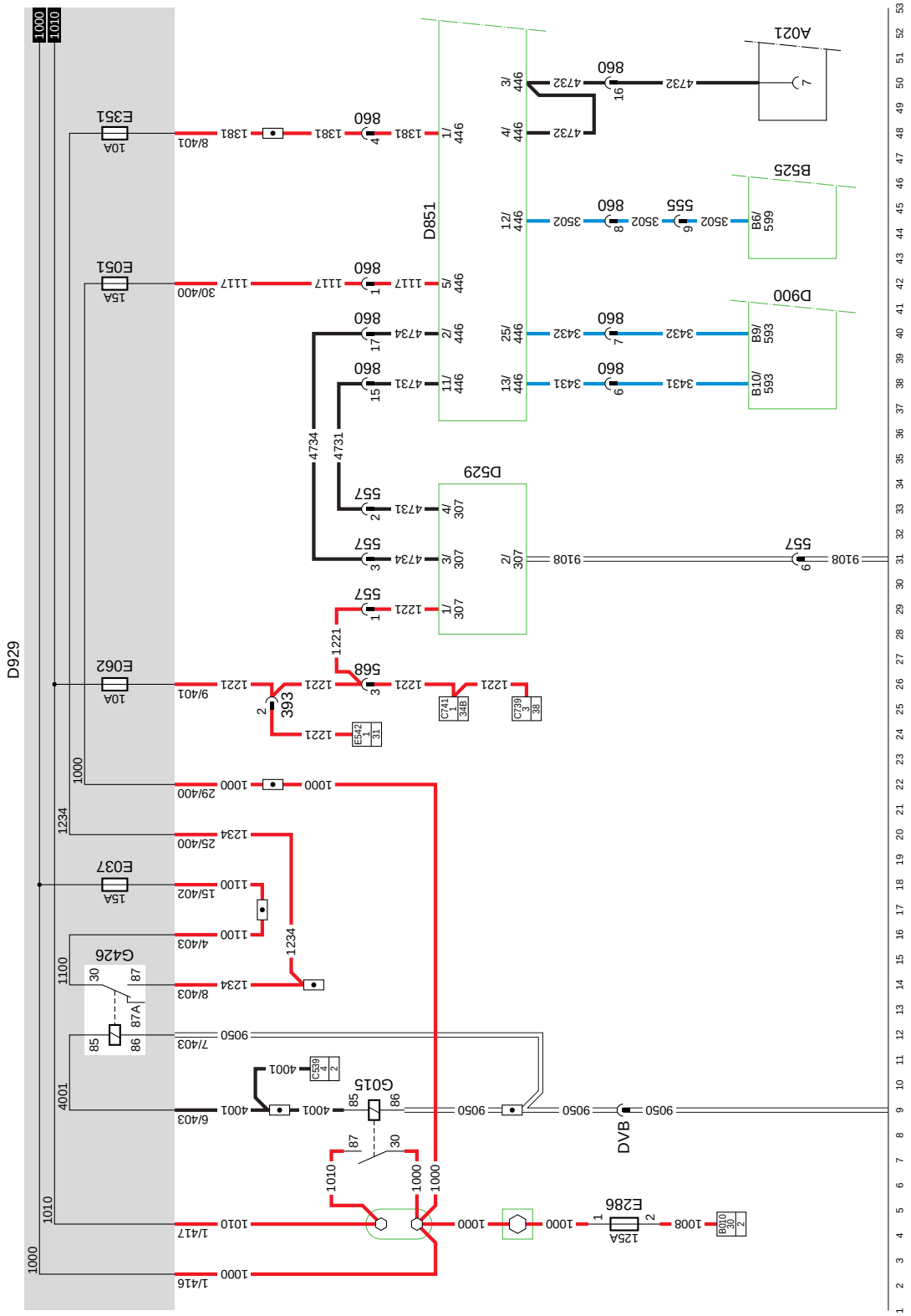

34A **1358030/16-24** EL001192

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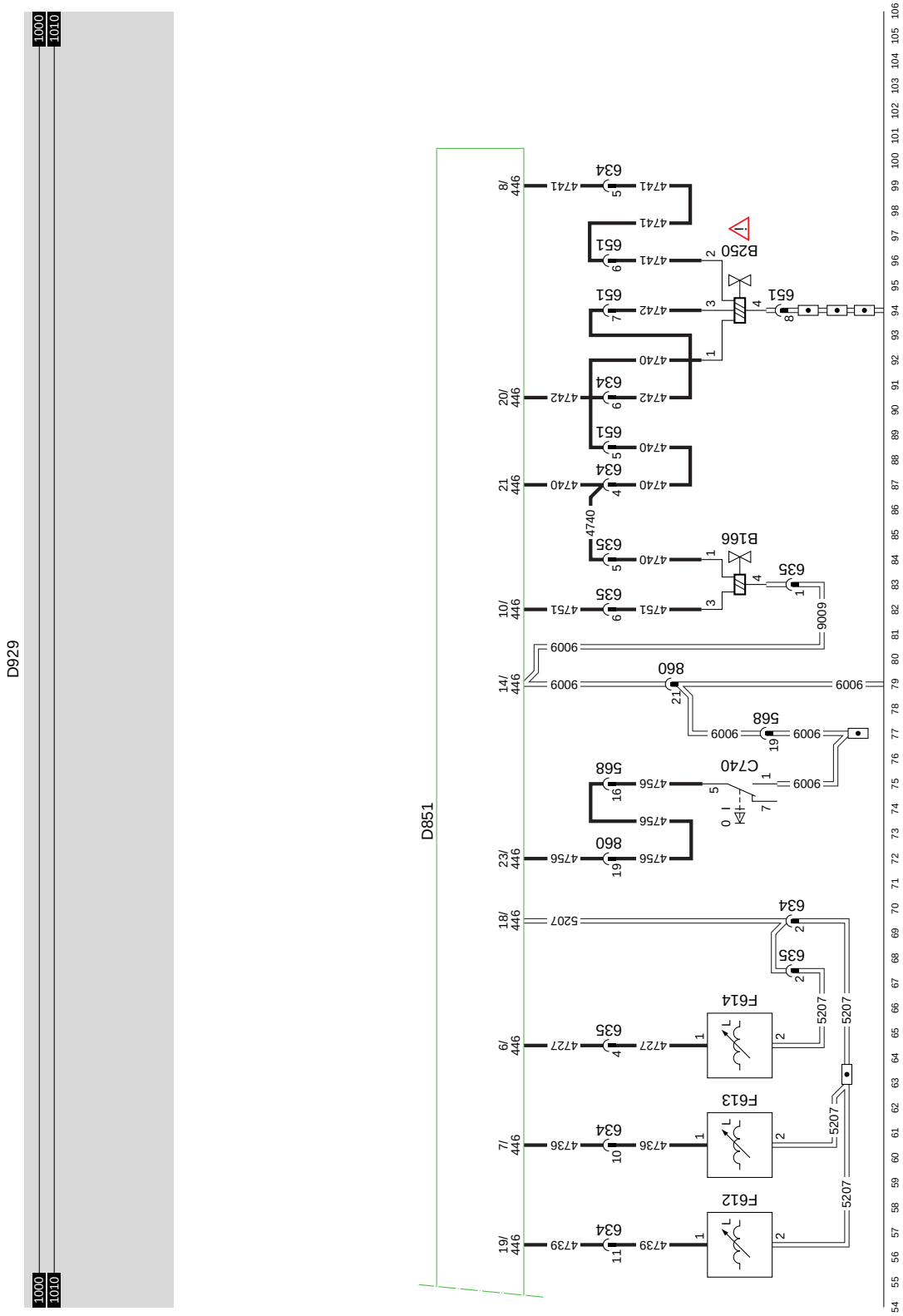

34A **1358030/16-24** EL001193

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34B ECAS-2 (6X2)
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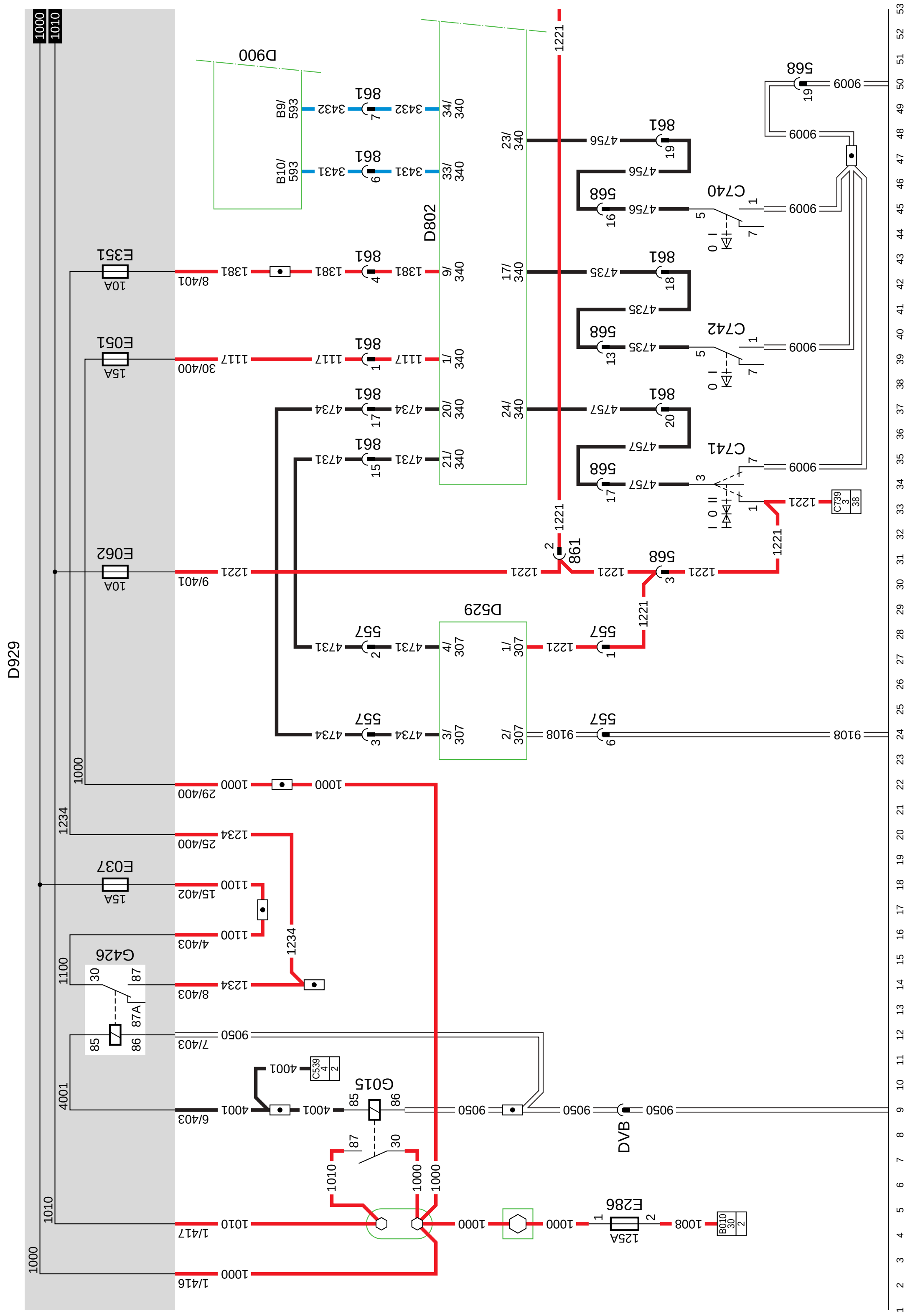
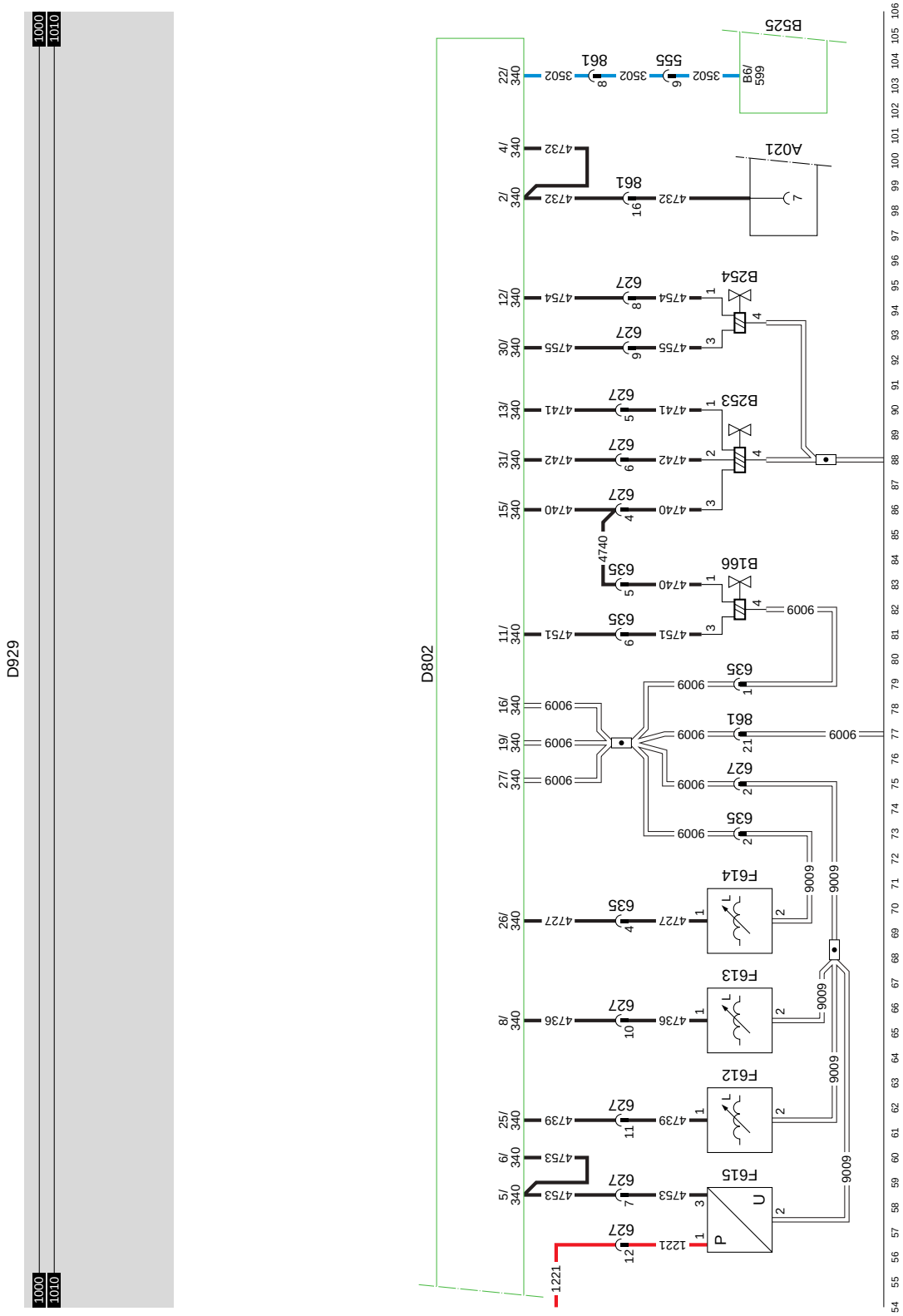


34B **1358030/16-24**

EL001194



34B **1358030/16-24**

11

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37 DROP GLASS OPERATION / CENTRAL DOOR LOCKING / SH CAB ROOF HATCH

CENTRAL DOOR LOCKING

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

ELECTRIC DROP GLASS OPERATION, DRIVER'S SIDE (OPENING)
(Switch in door panel, driver's side)
When the electric drop glass operation switch (C745) makes a connection (contacts 2 and 4), relay G030 will be energised through fuse E044, switch C745 (wire 4526). As a result of this, there is a supply voltage on connection point 1 of the motor (B003) through fuse E034. The other connection point (2) is connected to earth via relay G031. The motor starts running anti-clockwise and the driver's side window opens.

ELECTRIC DROP GLASS OPERATION, DRIVER'S SIDE (CLOSING)
(Switch in door panel, driver's side)
When the electric drop glass operation switch (C745) makes a connection (contacts 4 and 1), relay G031 will be energised through fuse E044, switch C745 (wire 4527). As a result of this, there is a supply voltage on connection point 1 of the motor (B003) through fuse E034. The other connection point (2) is connected to earth via relay G030. The motor starts running clockwise and the driver's side window will close.

ELECTRIC DROP GLASS OPERATION, CO-DRIVER'S SIDE (OPENING)
(Switch in door panel, driver's side)
When the electric drop glass operation switch (C743) makes a connection (contacts 2 and 4), relay G028 will be energised through fuse E044, switch C743 (wire 4522). As a result of this, there is a supply voltage on connection point 2 of the motor (B004) through fuse E033. The other connection point (1) is connected to earth via relay G029.
The motor starts running anti-clockwise and the co-driver's side window will open.

ELECTRIC DROP GLASS OPERATION, CO-DRIVER'S SIDE (CLOSING)
(Switch in door panel, driver's side)
When the electric drop glass operation switch (C743) makes a connection (contacts 4 and 1), relay G029 will be energised through fuse E044, switch C743 (wire 4523). As a result of this, there is a supply voltage on connection point 1 of the motor (B004) through fuse E033. The other connection point (2) is connected to earth via relay G028.
The motor starts running clockwise and the co-driver's side window will close.

ELECTRIC DROP GLASS OPERATION, CO-DRIVER'S SIDE
(Switch in door panel, co-driver's side)
Operation of the drop glass on the co-driver's side through switch C744 works in exactly the same way as on the driver's side. When switch C744 is operated (connection between contacts 4 and 2), relay G028 is switched via switch C743 (contacts 5 and 2) and the motor (B004) will open the window. When switch C744 (connection between contacts 4 and 1) is operated, relay G029 is activated through switch C743 (contacts 3 and 1), the motor runs clockwise and the window closes as a result.

The electric drop glass will only operate if the contact is activated.

SH CAB ROOF HATCH

OPENING ROOF HATCH
When the roof hatch switch (C736) is operated and a connection is made between contacts 2 and 6 and therefore between contacts 1 and 3, a voltage is applied to pin 1 of the roof hatch motor (B175) through fuse E028, switch C736 and wire 4761. The roof hatch will open.

CLOSING ROOF HATCH
When the roof hatch switch (C736) is operated and a connection is made between contacts 8 and 6 and therefore between contacts 7 and 3, a voltage is applied to pin 2 of the roof hatch motor (B175) through fuse E028, switch C736 and wire 4760. The roof hatch will now close.

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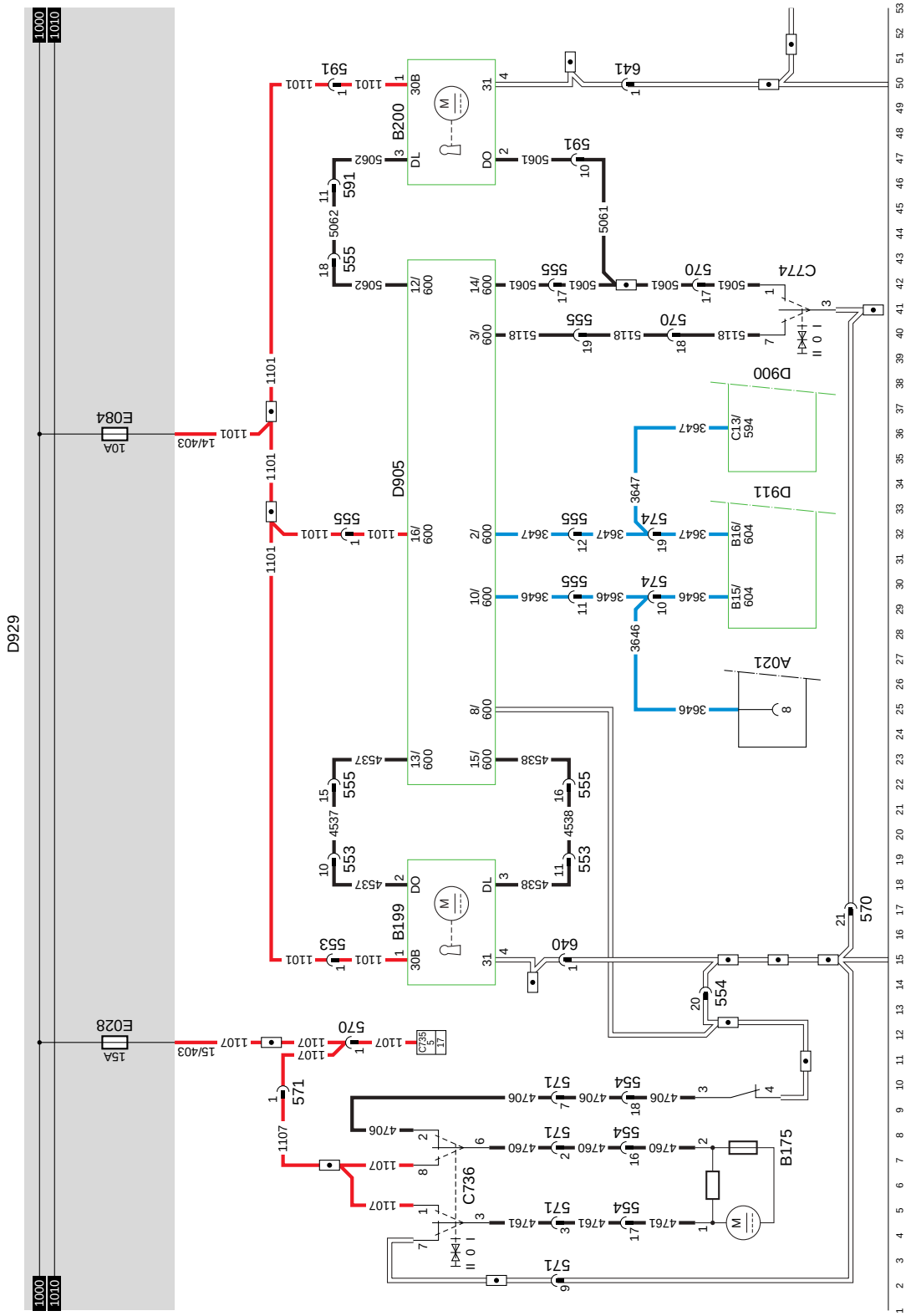

37 **1358030/16-24** EL001074

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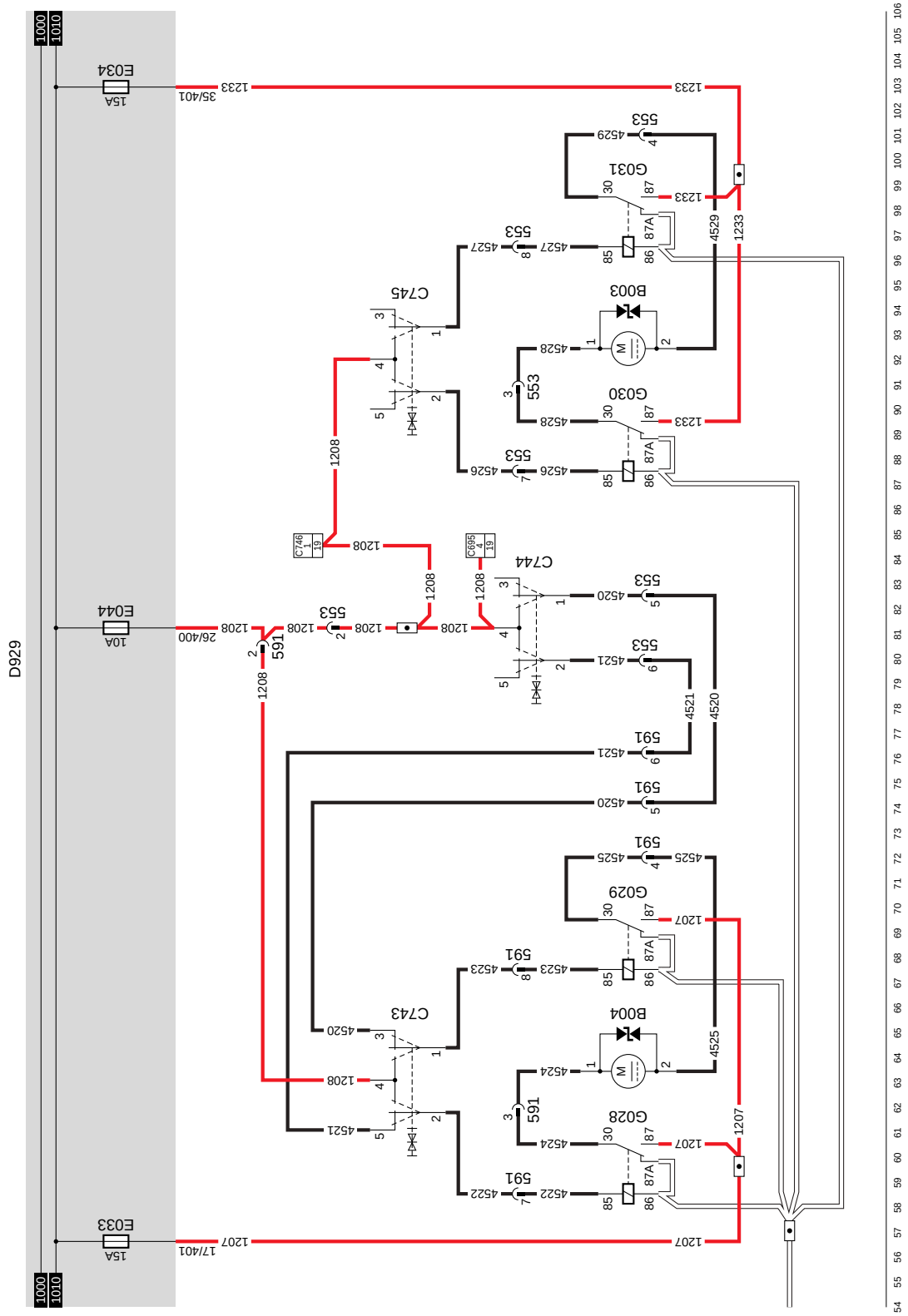

37 **1358030/16-24** EL001075

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11

42 HYDRONIC 10 (ACH-EW) CAB HEATER WITH TIMER UNIT

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
17 Only if the vehicle has been equipped to transport hazardous substances.

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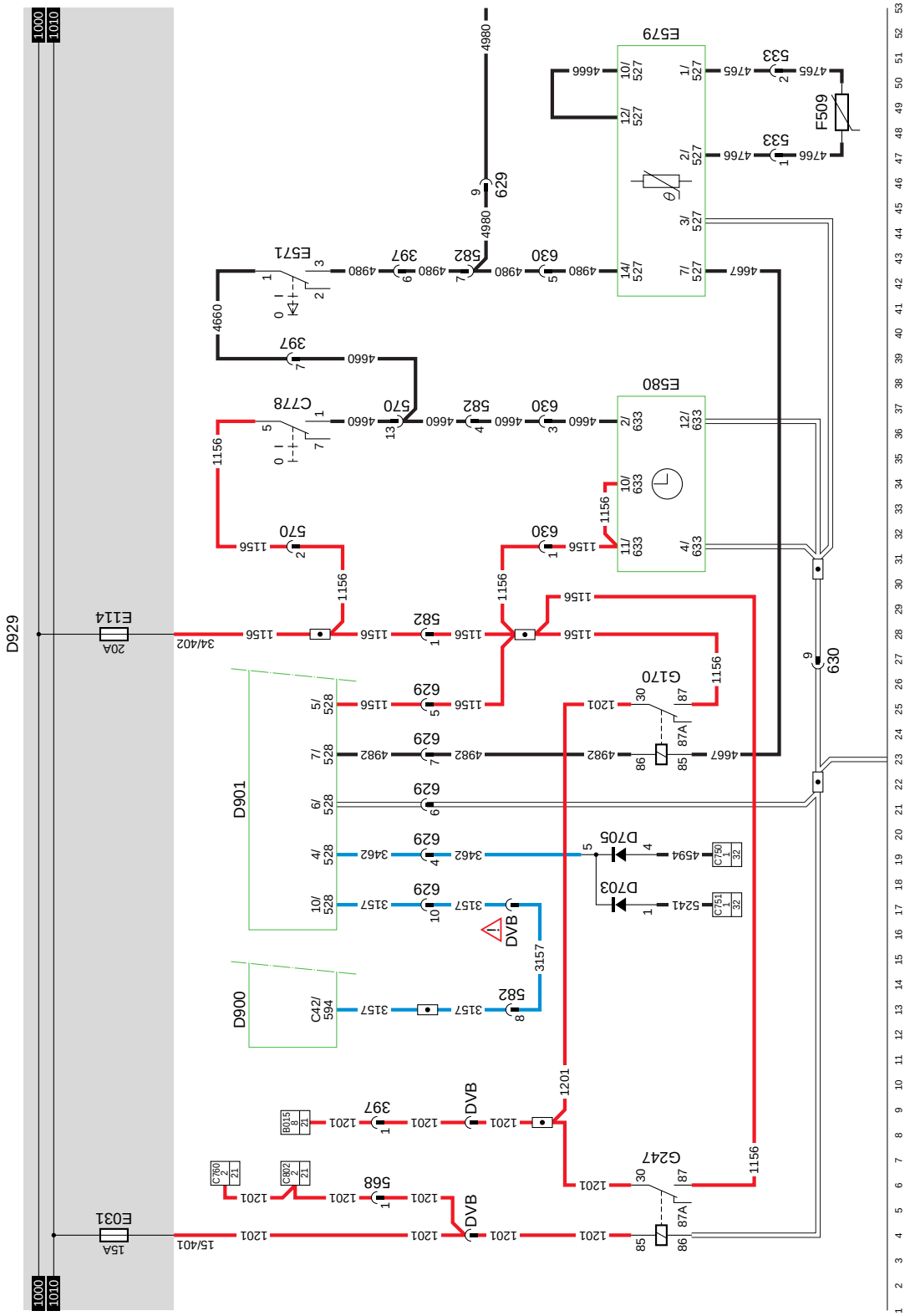
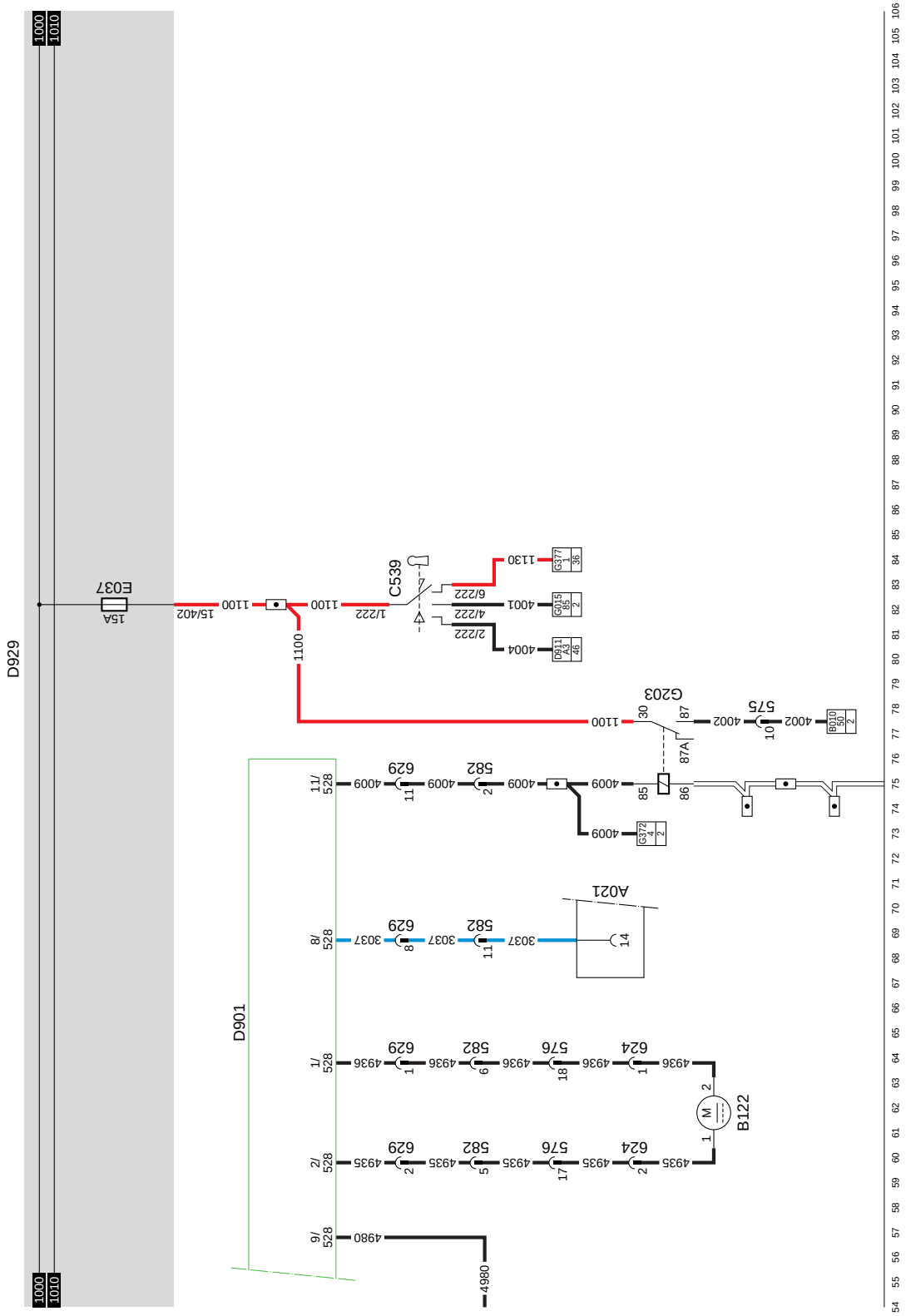


42 **1358030/16-24**



42 **1358030/16-24** EL001077

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43 UPEC/CUMMINS/AGC APPLICATION CONNECTOR

FOR MORE INFORMATION: SEE BLOCK 6: CONNECTION OF ACCESSORIES

VARIANTS

Location	
73 -> 105:	If the vehicle has UPEC.
109 -> 137:	If the vehicle has ECS-DC3.
165 -> 183	All 658 connectors: Option.
185 -> 195	All 654 connectors: Option.
165 -> 182 and 185 -> 207 :	All 656 connectors: Option.
185 -> 207	All 657 connectors: Option.
197 -> 207	All 655 connectors: Option.

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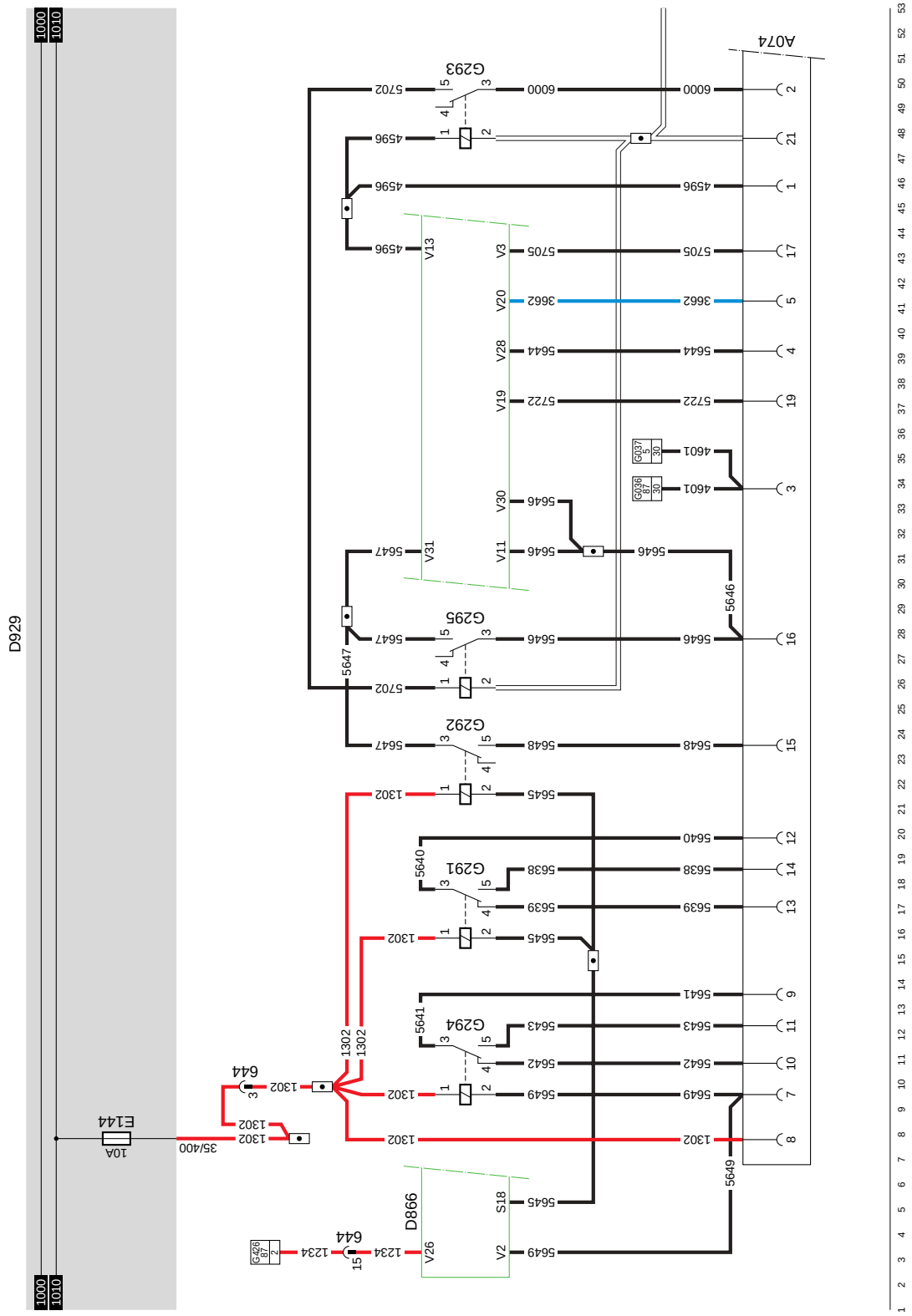

43 **1358030/16-24** EL001078

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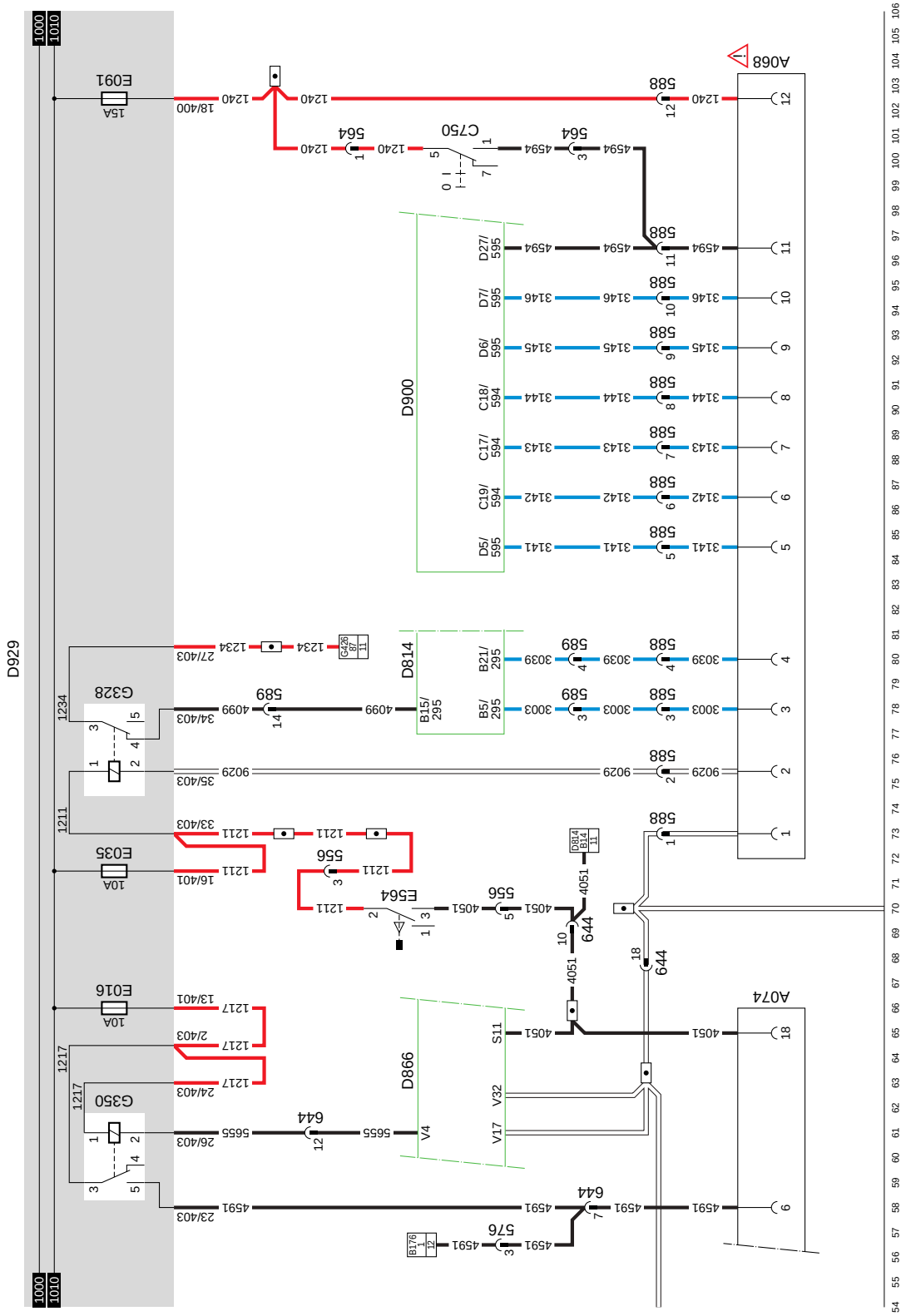

43 1358030/16-24 EL001079

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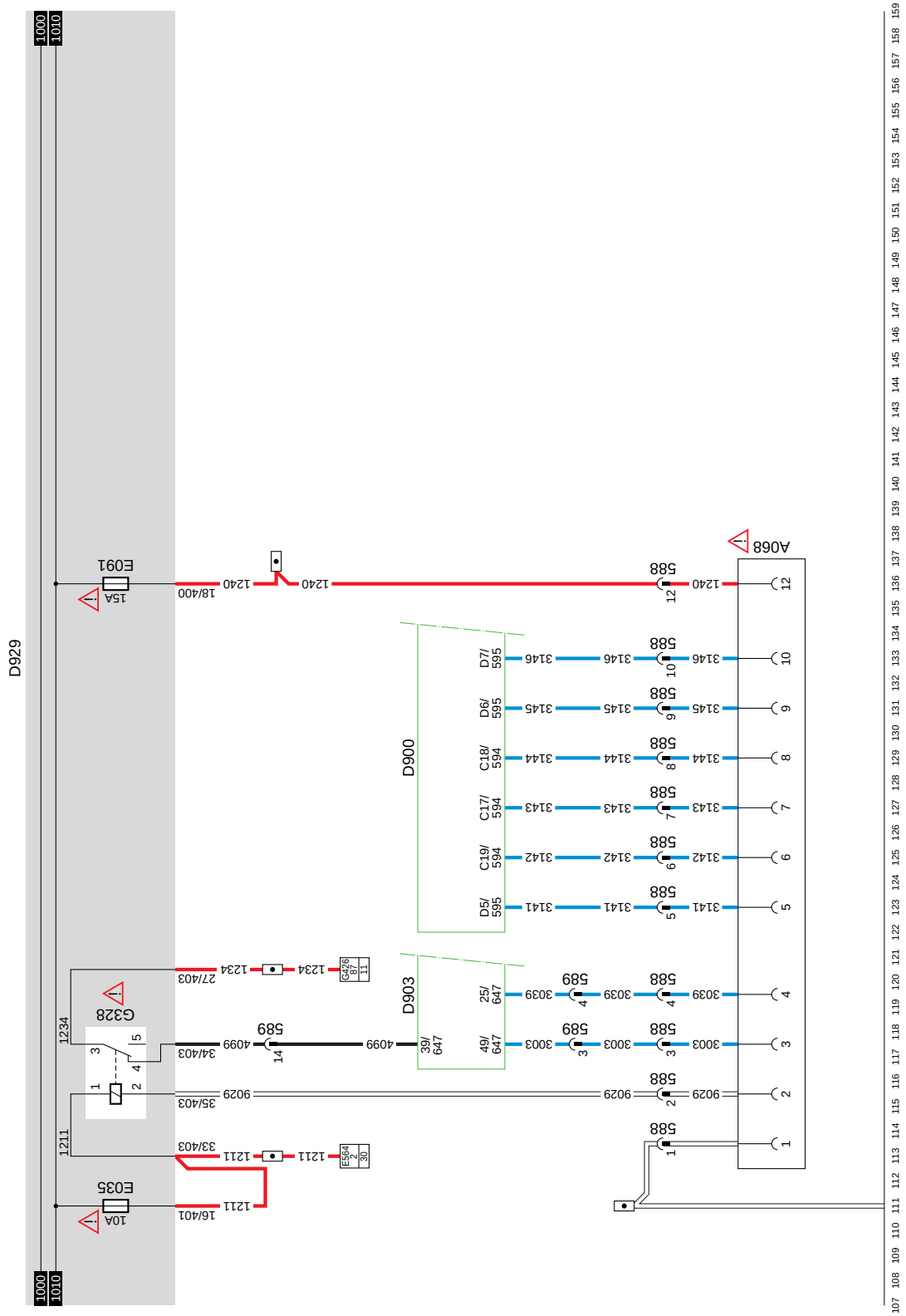

43 1358030/16-24 EL001080

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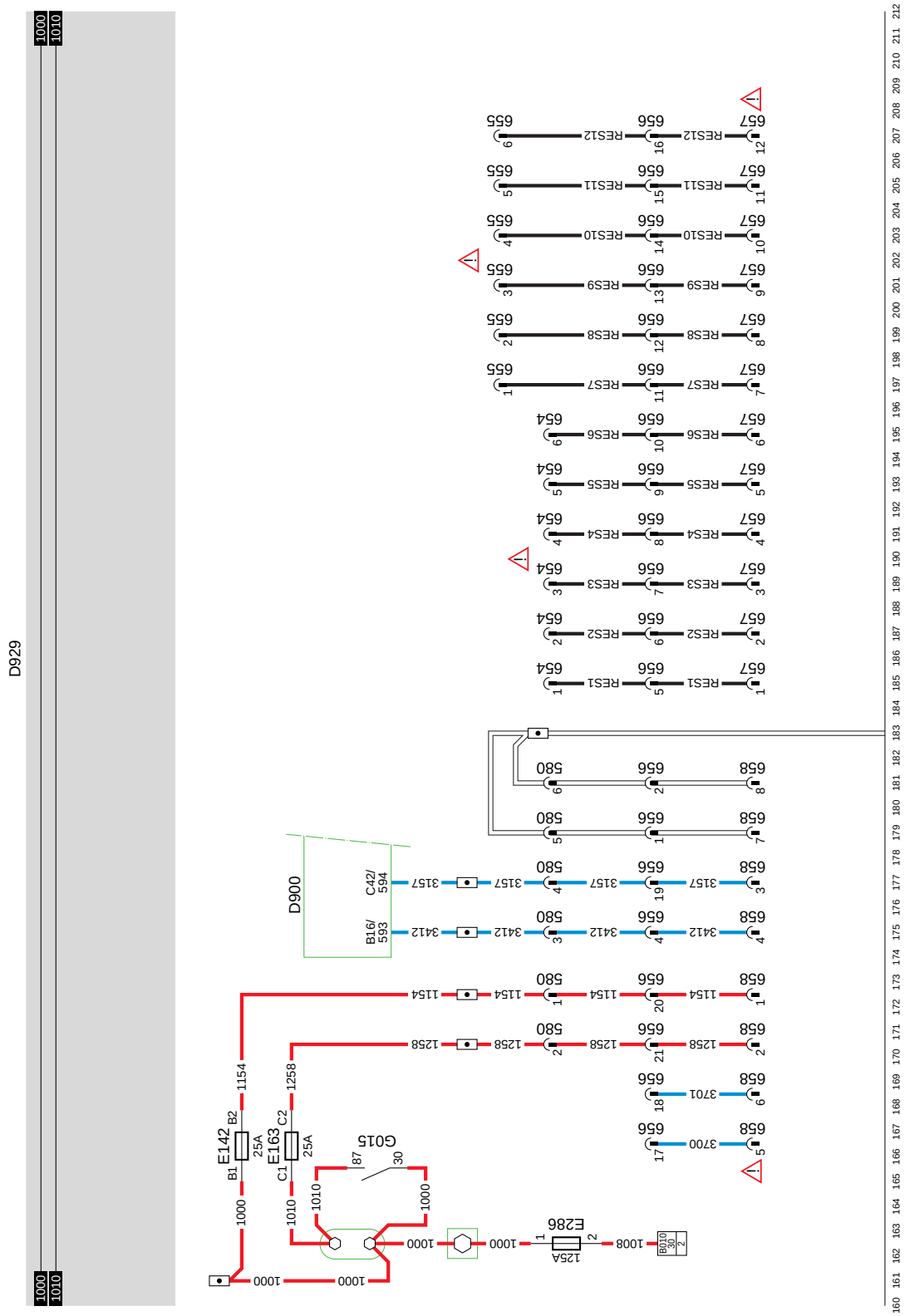

43 **1358030/16-24** EL001081

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44 EBS

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
18 - > 36:
For vehicle type FA: connector 873.
For vehicle type FT: connector 874.

11

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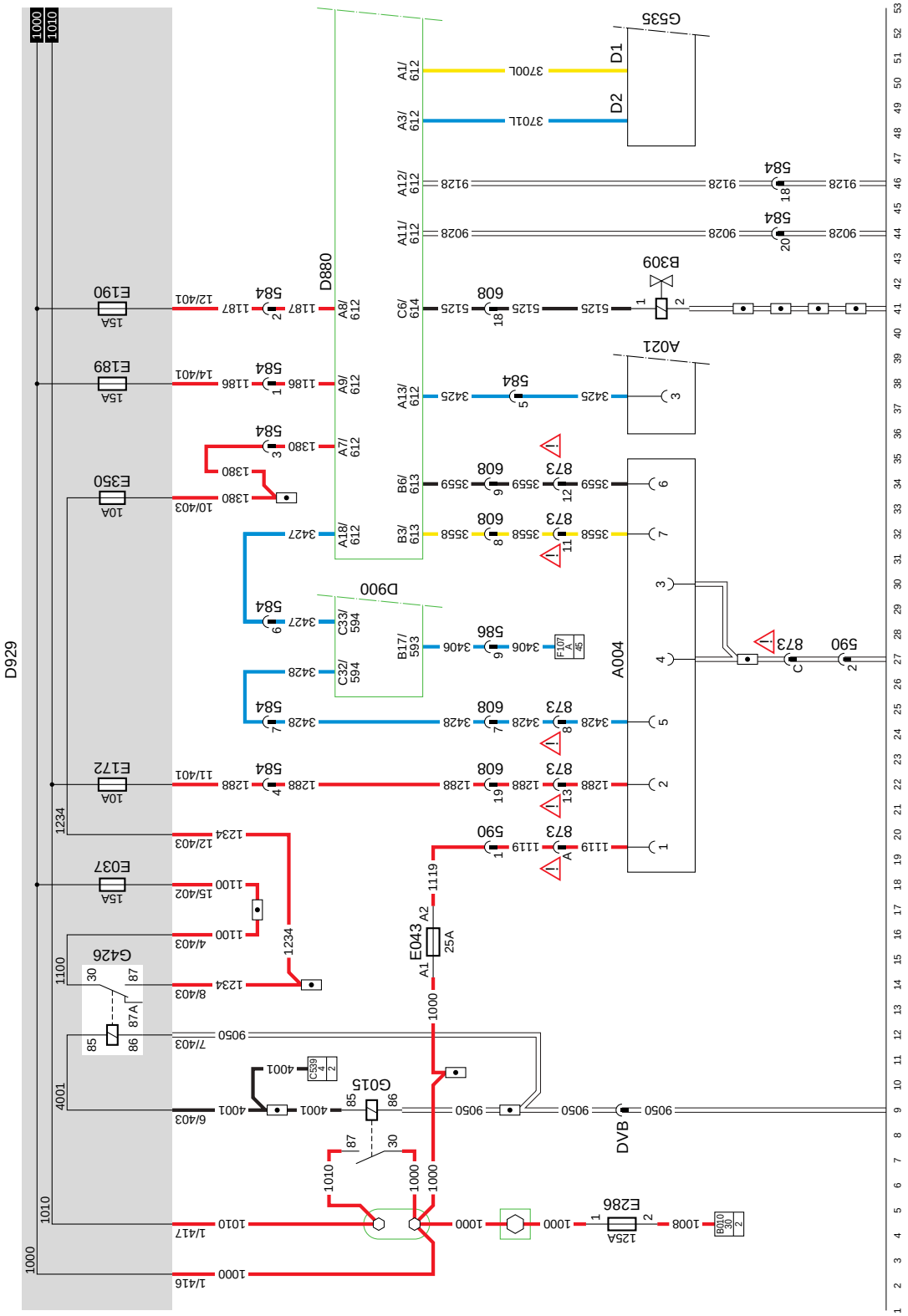

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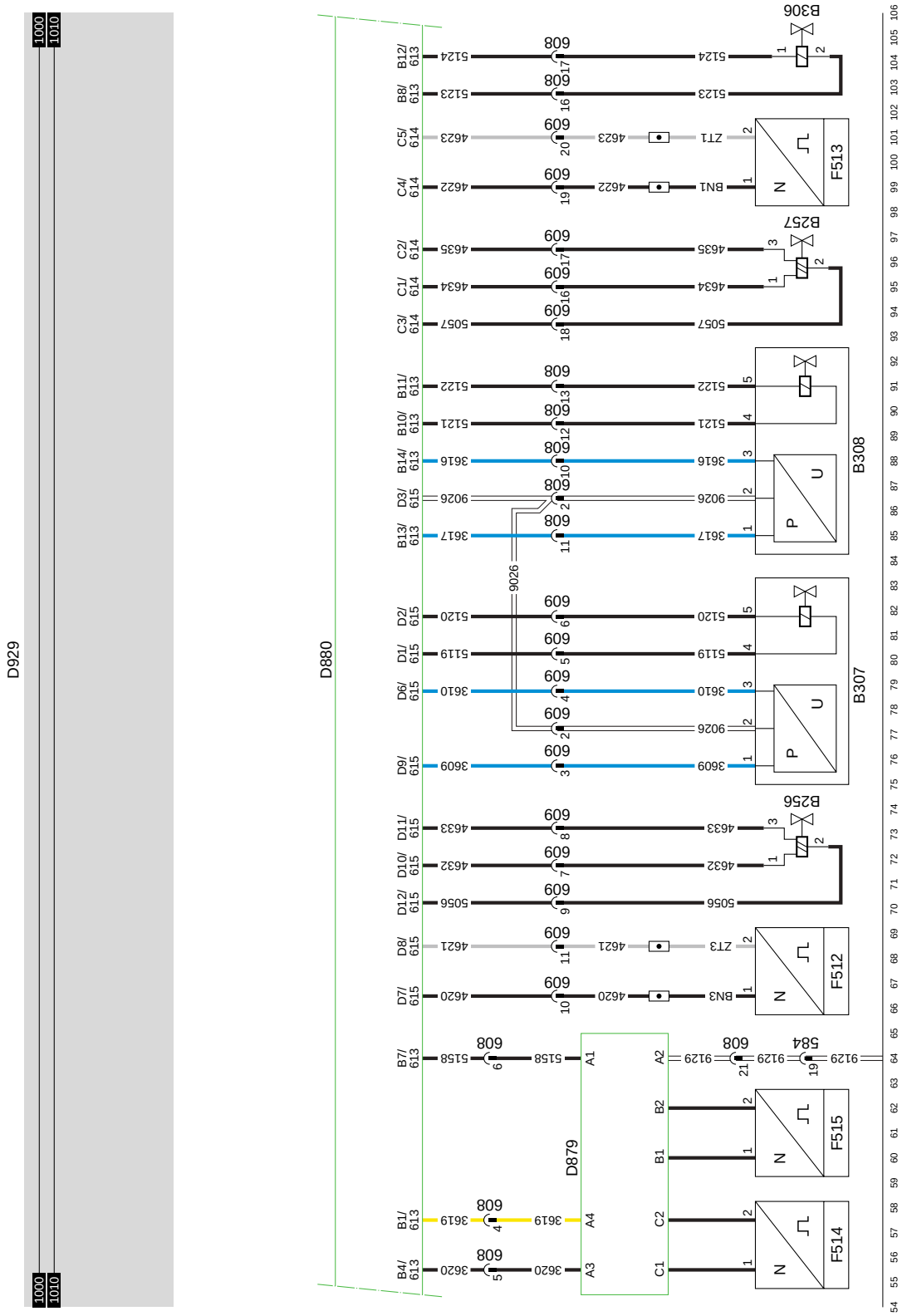

44 1358030/16-24 EL001083

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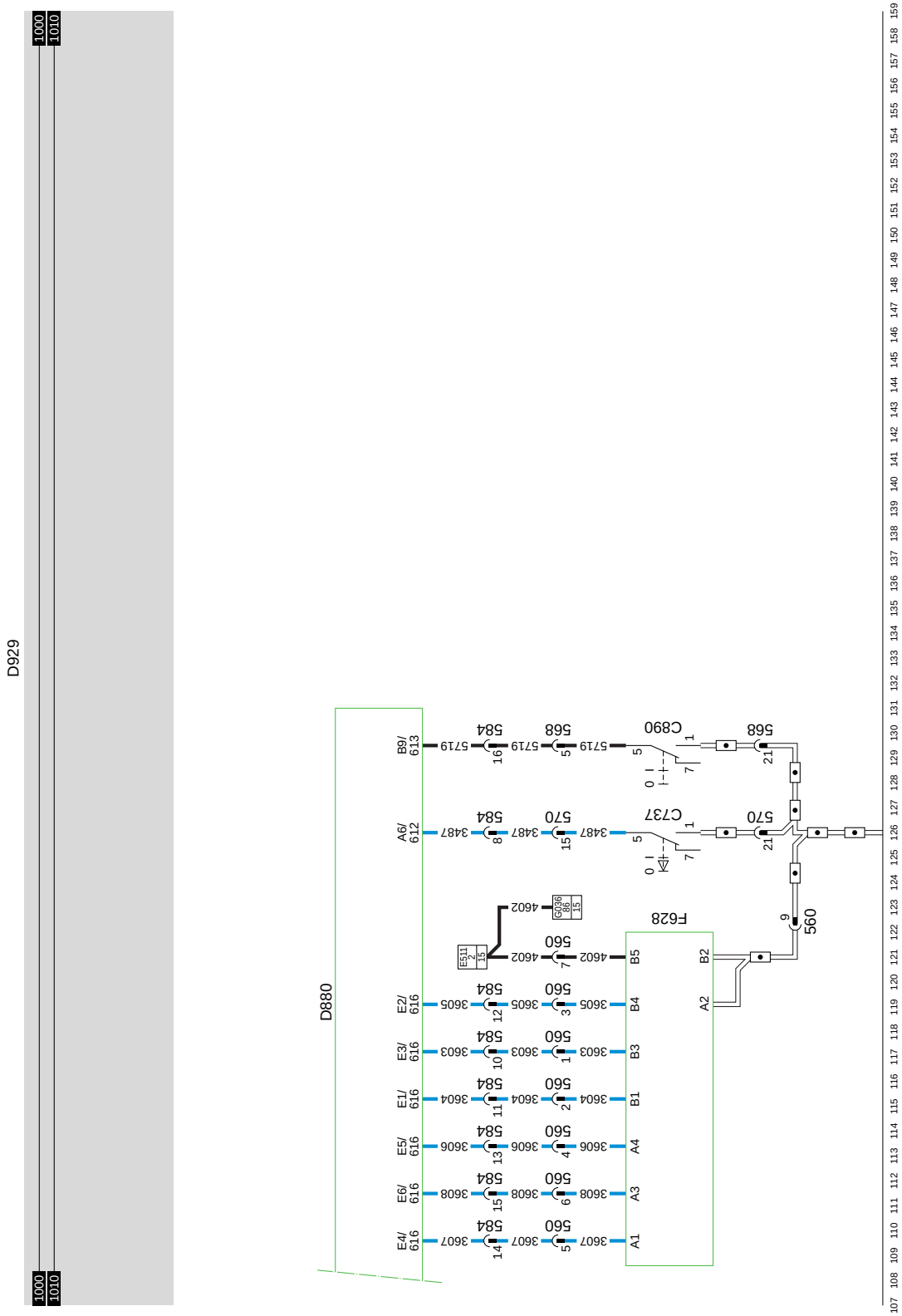

44 **1358030/16-24** EL001084

11

46 ALARM SYSTEM/BATTERY CHARGER FOR BV3 ALARM SYSTEM

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location	
18	Fitted if **NO** alarm system installed.
50	**NOT** fitted on H1 version
57	Fitted if **NO** alarm system installed.
60, 69, 70	**NOT** fitted on BV02 version.
90 - > 96	Connector 873: on vehicle type FA. Connector 874: on vehicle type FT.
90 - > 96	Connector A001: on vehicle type FA. Connector A003: on vehicle type FT.
115	Only applies to SL cab.
154	D931; only if **NO** alarm system fitted

11

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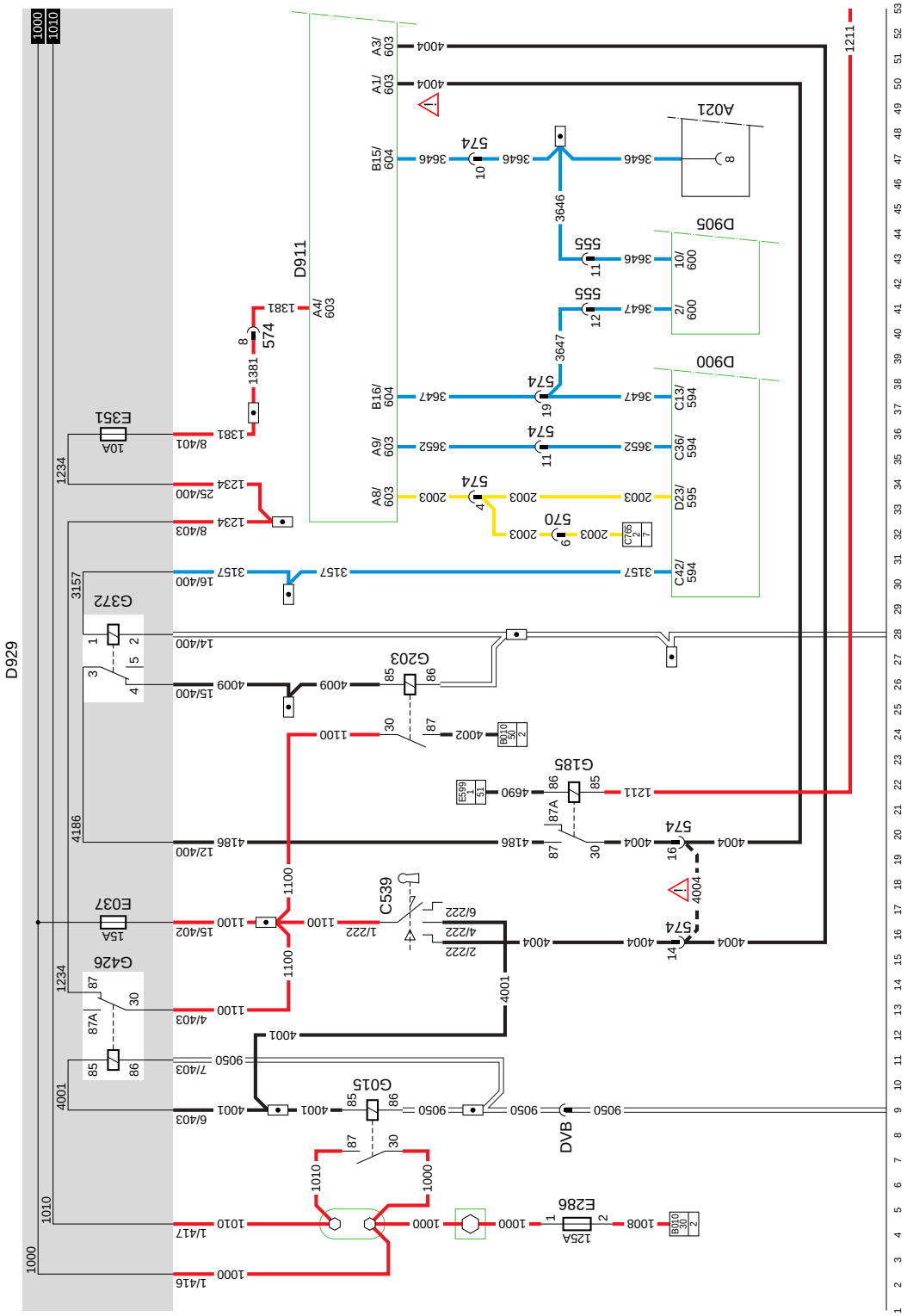

46 **1358030/16-24** EL001203

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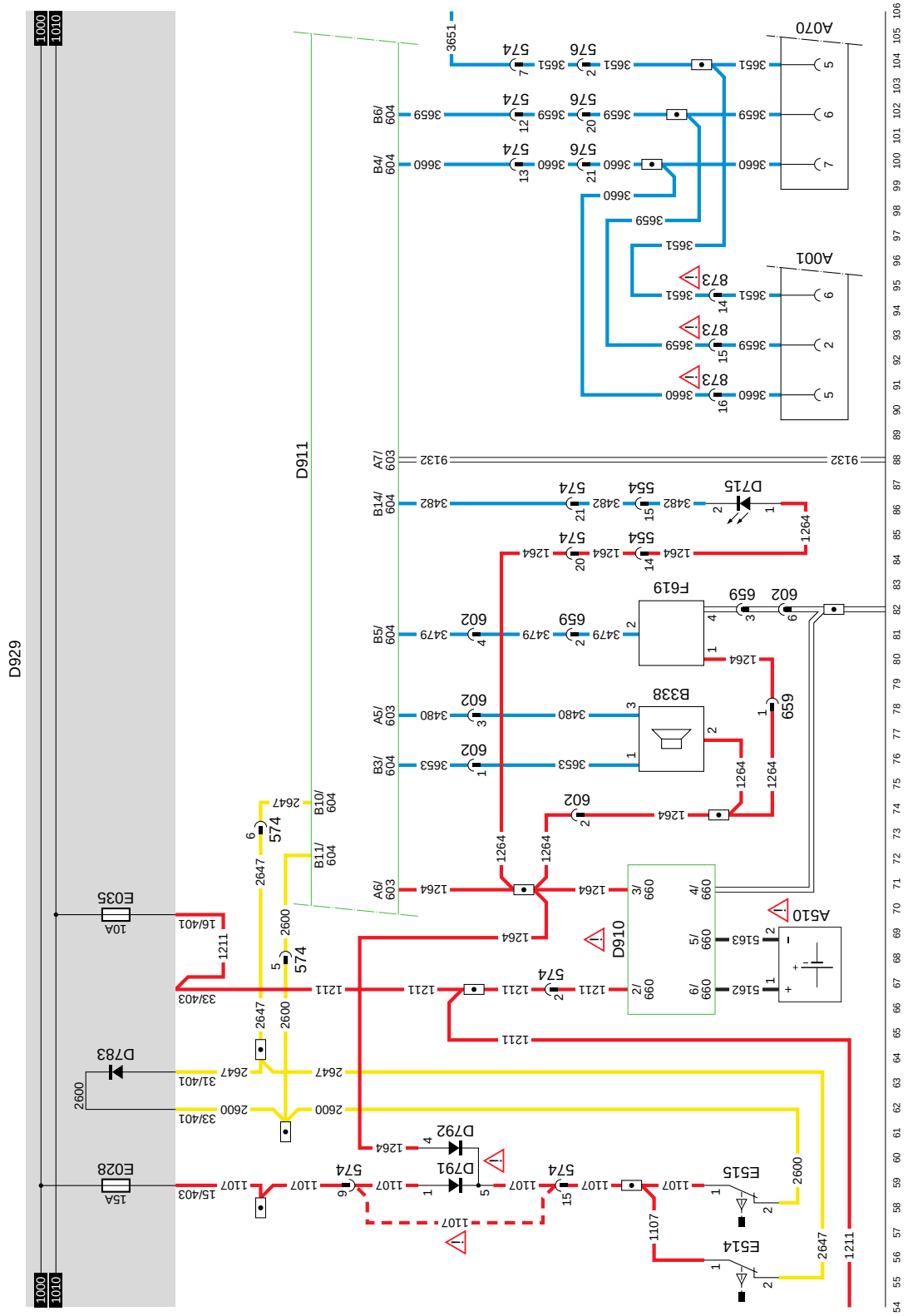

46 1358030/16-24 EL001204

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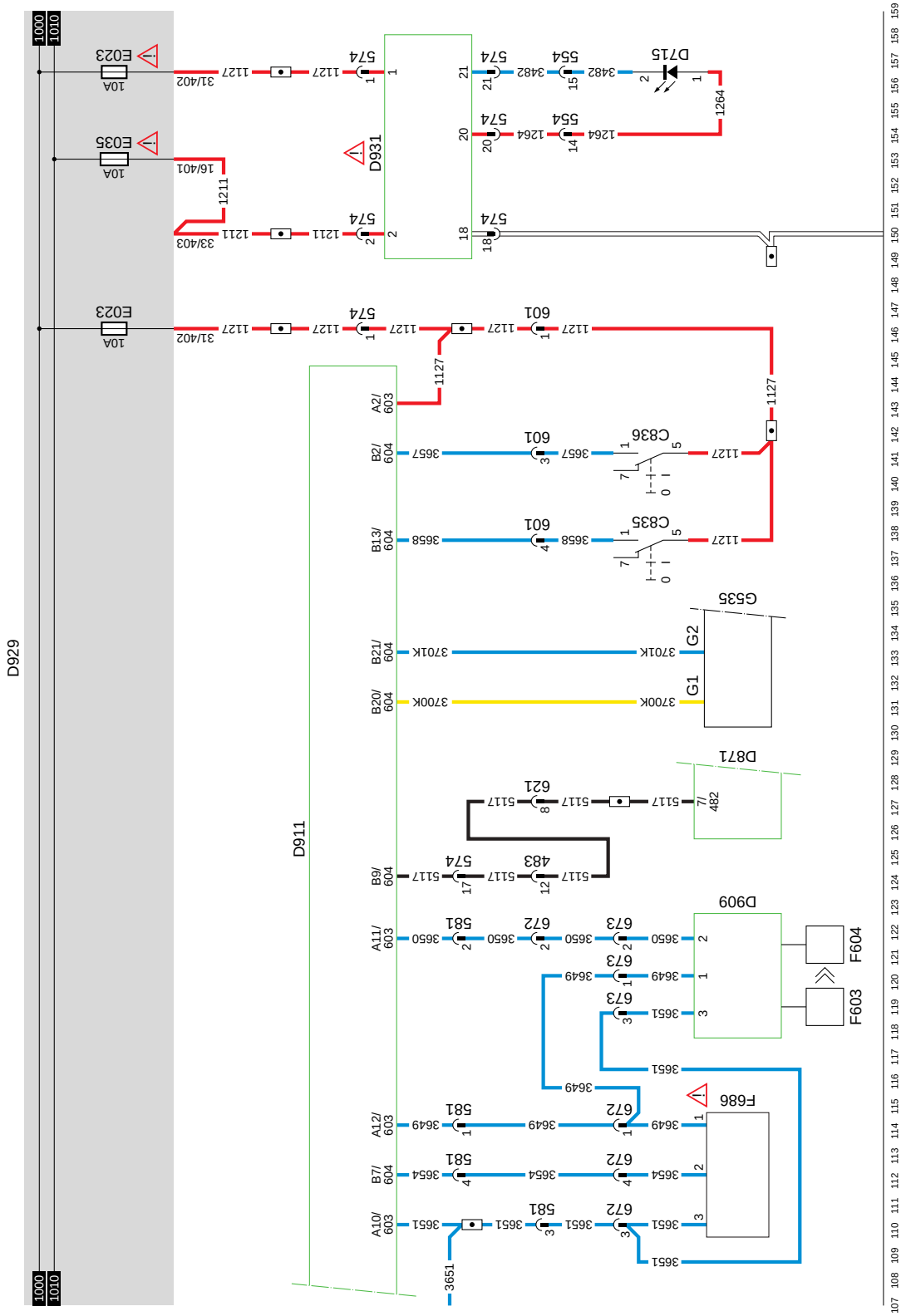

46 **1358030/16-24** EL001205

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47 SOCKETS, FA/FT

DIAGNOSTICS PLUG (A021)

The diagnostics plug is on the bottom right on the outside of the central box. This is the plug for the DAVIE connection. After the ignition is switched on, power is supplied to pin 1 via fuse E053. Pin 2 is connected to earth. The remaining pins are for communication with the various systems, and are connected to those systems.

Pin no.	Wire no.	Colour	Description
1	1229	red	Power supply for DAVIE
2	9107	white	Earth
3	3425	blue	ABS - ASC-D
4			
5	4697	black	UPEC, ECS-DC3
6			
7	4732	black	ECAS-3
8	3646	blue	CDS, ALS-S
9	4047	black	VIC
10			
11	4883	black	ZF intarder
12	4733	black	DIP-4
13	3470	blue	AGS
14	3037	blue	Cab heater
15	3700	yellow	V-CAN-L
16	3701	blue	V-CAN-H

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24V PLUG (A007)

Pin 1 of the 24V plug (A007) is connected directly to power via wire 1103, fuse E036.

Pin 2 is connected to earth.

ABS/EBS PLUG (A004)

Pin 1 of the ABS (EBS) plug (A004) is connected directly to power before contact through fuse E043 and wire 1119.

Pin 2 is connected directly to power after contact through fuse E172 and wire 1288.

Pin 3 + 4 are both connected to earth.

Pin 5 is connected to pin 32 of the VIC (D900) via wire 3428.

Pin 6 is connected to pin B6 of D880 (EBS) via wire 3559. Only if vehicle has EBS.

Pin 7 is connected to pin B3 of D880 (EBS) via wire 3558. Only if vehicle has EBS.

FT TRAILER PLUG (A000) 7-pin

Pin 1 is connected to earth.

Pin 2 switches the left tail light.

Pin 3 is connected via wire 2008 to connection point 7 of the VIC (D900) (direction, left).

Pin 4 is connected to relay G036 (stop lights relay) through wire 4601.

Pin 5 is connected via wire 2009 to connection point 8 of the VIC (D900) (direction, right).

Pin 6 switches the right tail light.

FT TRAILER PLUG (A058) 15-pin

Pin 1 is connected via wire 2008 to connection point 7 of the VIC (D900) (direction, left).

Pin 2 is connected via wire 2009 to connection point 8 of the VIC (D900) (direction, right).

Pin 3 is connected via wire 2152 to connection point 87 of relay G005 (relay, rear fog lamp).

Pin 4 is connected to earth.

Pin 5 switches the left tail light via wire 2102.

Pin 6 switches the right tail light via wire 2103.

Pin 7 is connected to connection point 87 of relay G036 (stop lights relay) through wire 4601.

Pin 8 is connected via wire 4591 to connection point 4 of E501 (operating switch, reversing light).

Pin 9 is connected to power before contact through wire 1113 and fuse E048.

Pin 10 is connected via wire 3659 to connection point B6 of D911 (ALS-S).

Pin 11 is connected via wire 3660 to connection point B4 of D911 (ALS-S).

Pin 12 is connected via wire 1264 to connection point 3 of D910 (ALS-S battery charger).

Pin 13 Not connected.

Pin 14 Not connected.

Pin 15 Not connected.

REAR FOG LAMP AND REVERSING LIGHT PLUG (A001)

Pin 1 is connected to earth.

Pin 2 is connected via wire 3659 to connection point B6 of ALS-S (D911).

Pin 3 is connected via wire 4591 to connection point 4 of E501 (operating switch, reversing light).

Pin 4 is connected via wire 3660 to connection point B4 of ALS-S (D911).

Pin 5 is connected directly to power through fuse E048 and wire 1113.

Pin 6 is connected via wire 1264 to connection point 3 of D910 (ALS-S battery charger).

Pin 7 is connected via wire 2152 to connection point 87 of relay G005 (relay, rear fog lamp).

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VARIANTS

Location	
25	Connector 873 on vehicle type FA. Connector 874 on vehicle type FT.
20 - > 33	Connector 642: Either a 7-pin or a 15-pin connector can be connected to this.
24 - 38:	Connector 610 with ABS application. Connector 608 with EBS application. Connector 585 with ABS application. Connector 584 with ABS application.
26	A004: on vehicle type FA. A005: on vehicle type FT. For ABS/ASC-D unit:. D850. For EBS unit: D880
63	If the vehicle is fitted with EMAS system: The diagnostics plug of the EMAS system (unit D850) is also connected to connection point 8 (wire 3646). Connector 445 is located in wire 3646 to the EMAS system.
169	A000 and A001: May be either 2x a 7-pin connector or 1x a 15-pin connector.
185	Only applicable to vehicle type FA.

TELEPHONE CONNECTOR (A076)

Pin 1 is connected via wire 1353 to connection B1 (12V) of D895.

Pin 2 is connected via wire 1108 to connection A4 (12V) of D895.

Pin 3 is connected to earth.

SUPERSTRUCTURE APPLICATION CONNECTOR (A070)

Pin 1 is connected to power before contact through wire 1113 and fuse E048. This wire is also connected to pin 9 of connector A058.

Pin 2 is connected to connection point 1 of C725 (front/rear fog lamp switch) through wire 2155.

Pin 3 is connected to connection point 87 of G036 (stop light relay) through wire 4601. This wire is also connected to pin 7 of connector A058.

Pin 4 is connected via wire 4591 to connection point 4 of E501 (operating switch, reversing light). This wire is also connected to pin 8 of connector A058.

Pin 5 is connected via wire 4591 to connection point 4 of E501 (operating switch, reversing light). This wire is also connected to pin 12 of connector A058.

Pin 6 is connected via wire 3659 to connection point B6 of D911 (ALS-S). This wire is also connected to pin 10 of connector A058.

Pin 7 is connected via wire 3660 to connection point B4 of D911 (ALS-S). This wire is also connected to pin 11 of connector A058.

Pin 8 is connected directly to earth. This wire is also connected to pin 4 of connector A058.

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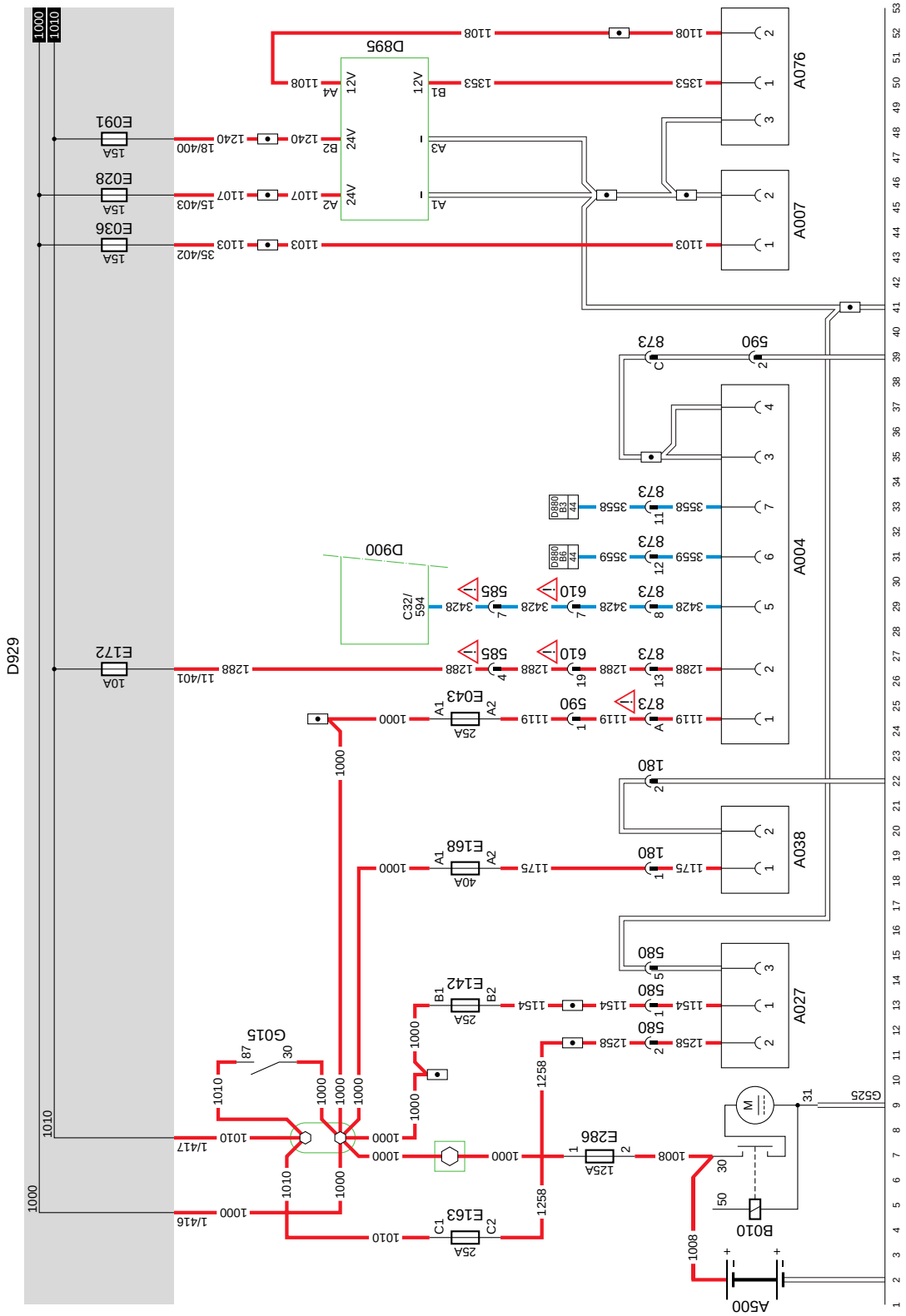

47 **1358030/16-24** EL001085

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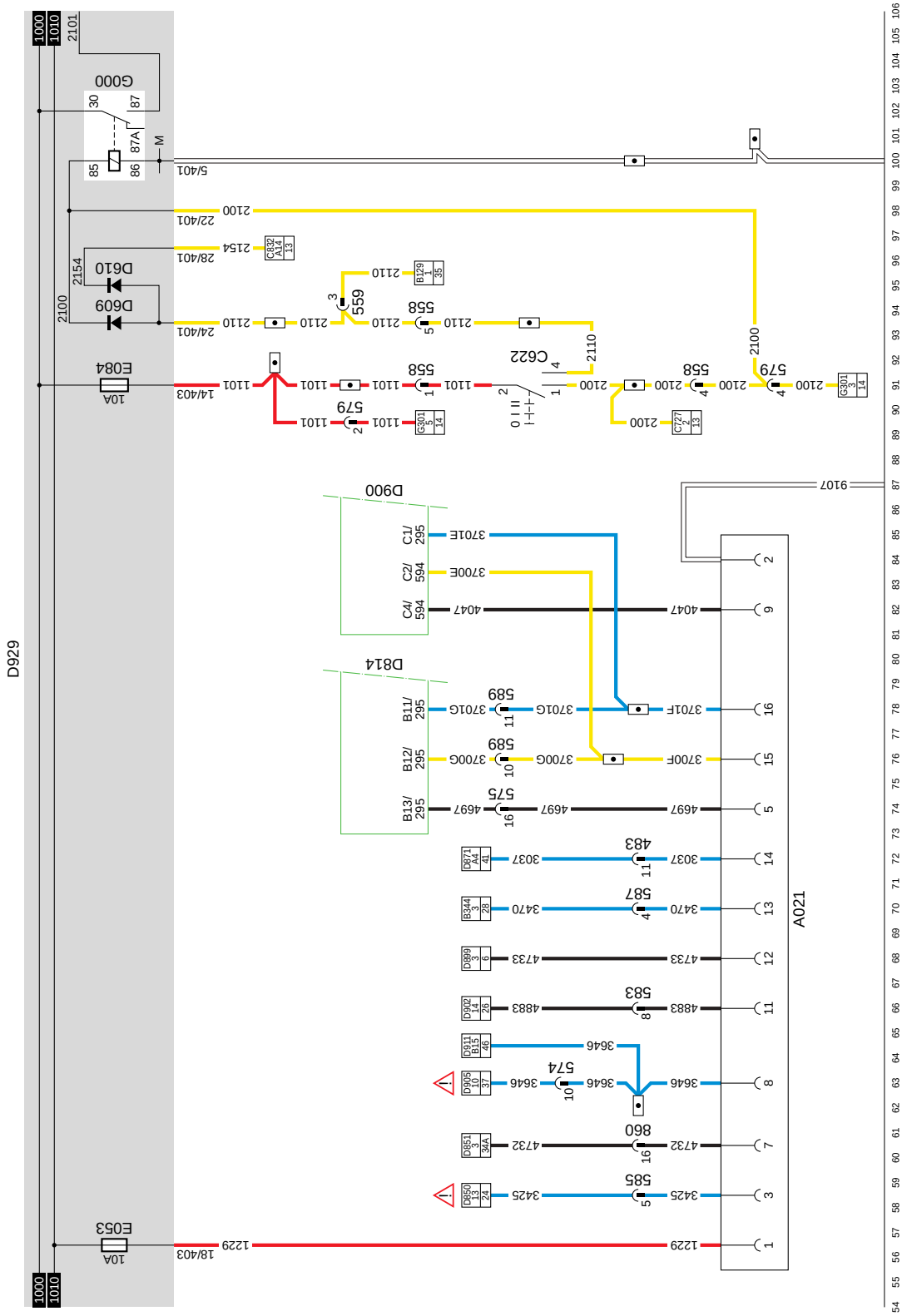

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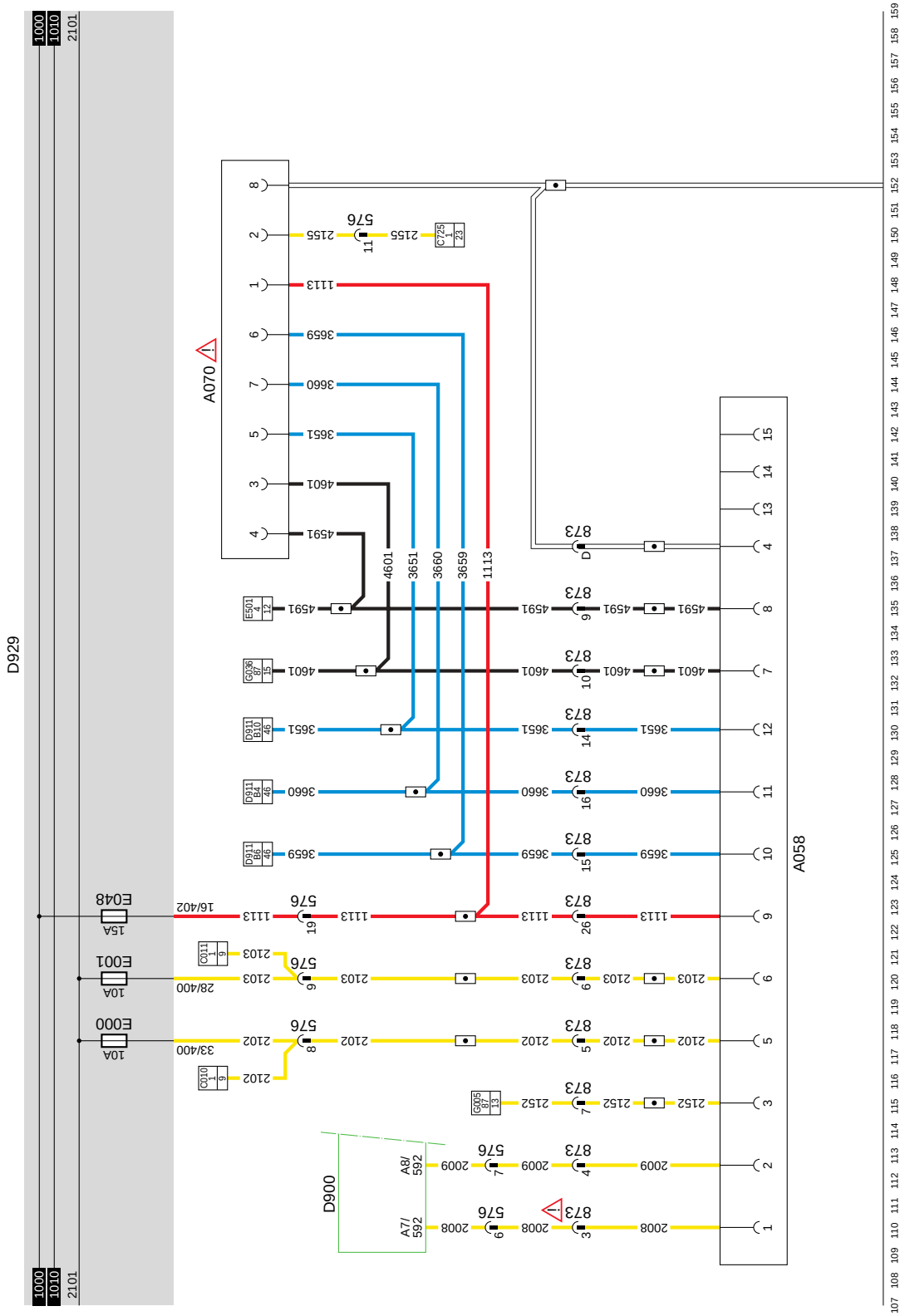

47 1358030/16-24 EL001087

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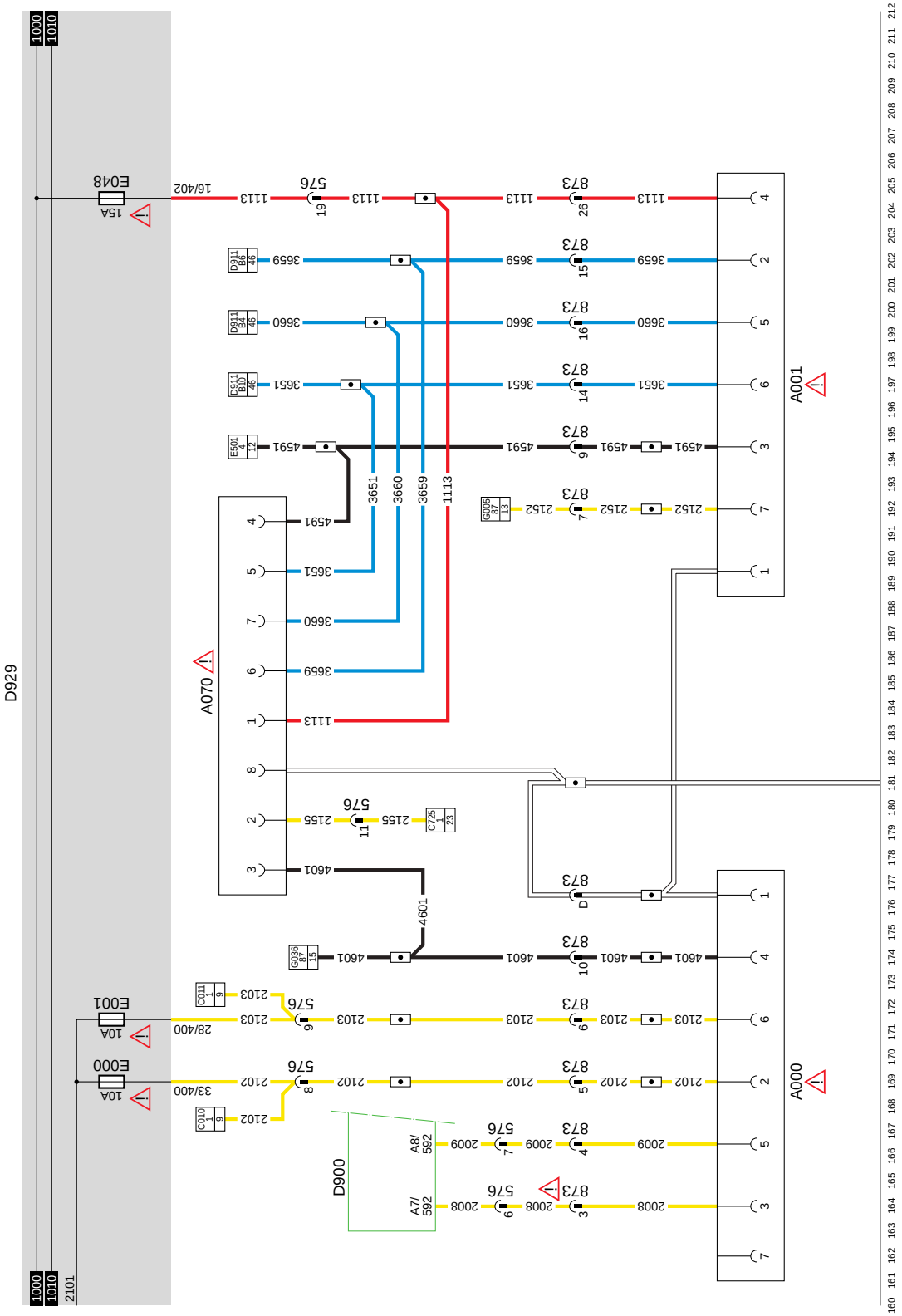

47 1358030/16-24 EL001088

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50 WATER SEPARATOR

When the vehicle contact is activated, there is a voltage on both connection points B1 and A3 of the electronic unit (B378) through wire 1010 and fuse E170. A voltage is also applied to connection point A1 of the fuel filter/water separator heating element sensor (B378) through wire 1000, fuse E171, wire 1179.

A signal that there is water in the water separator is given via wire 3150. This signal goes to the VIC (D900). The VIC activates the 'Water separator/fuel filter' symbol on the instrument panel.

VARIANTS

Location

15 This is a 1-pin plug located in the wiring harness behind the central PCB.

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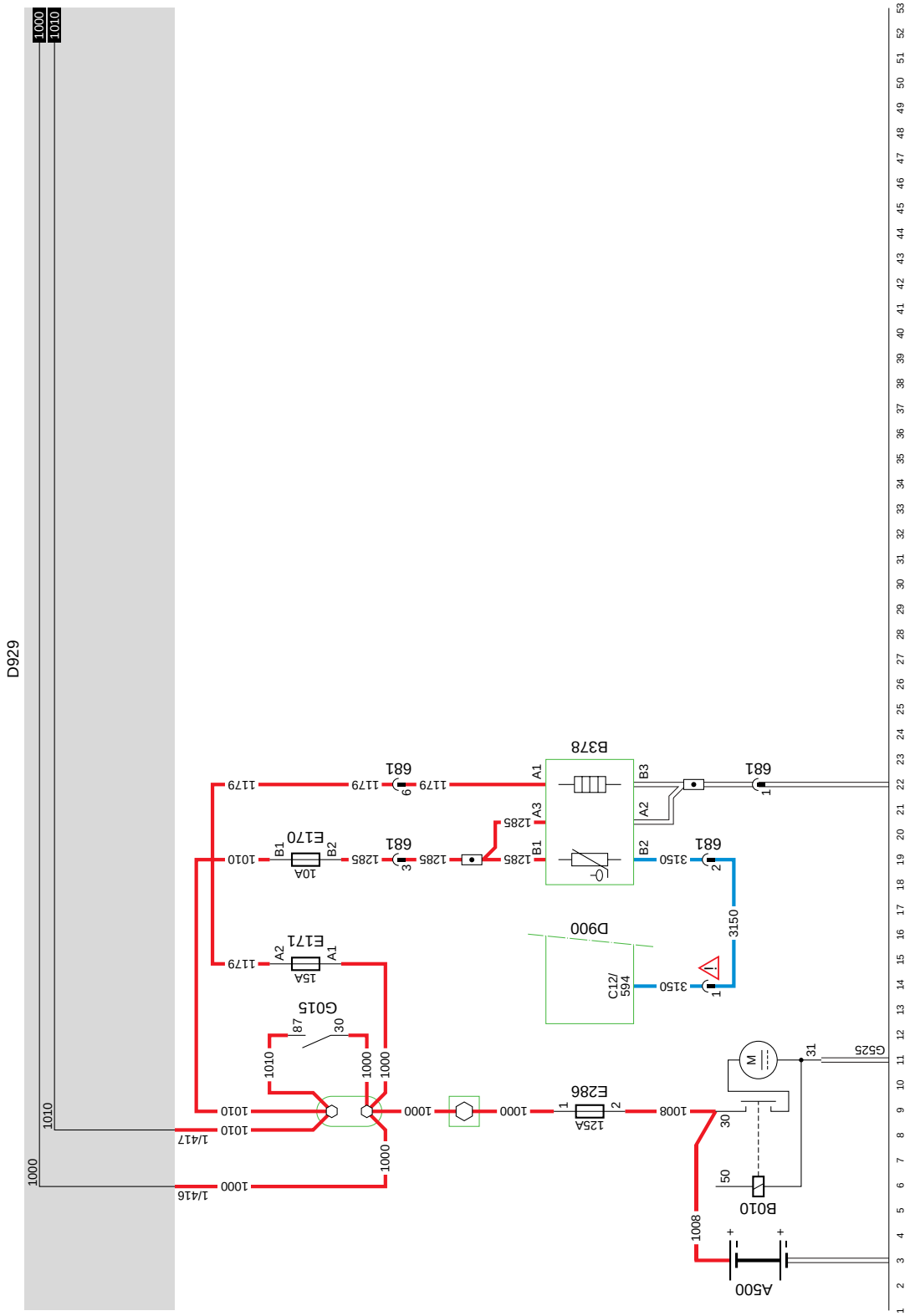

50 **1358030/16-24** EL001089

11

51 AS TRONIC
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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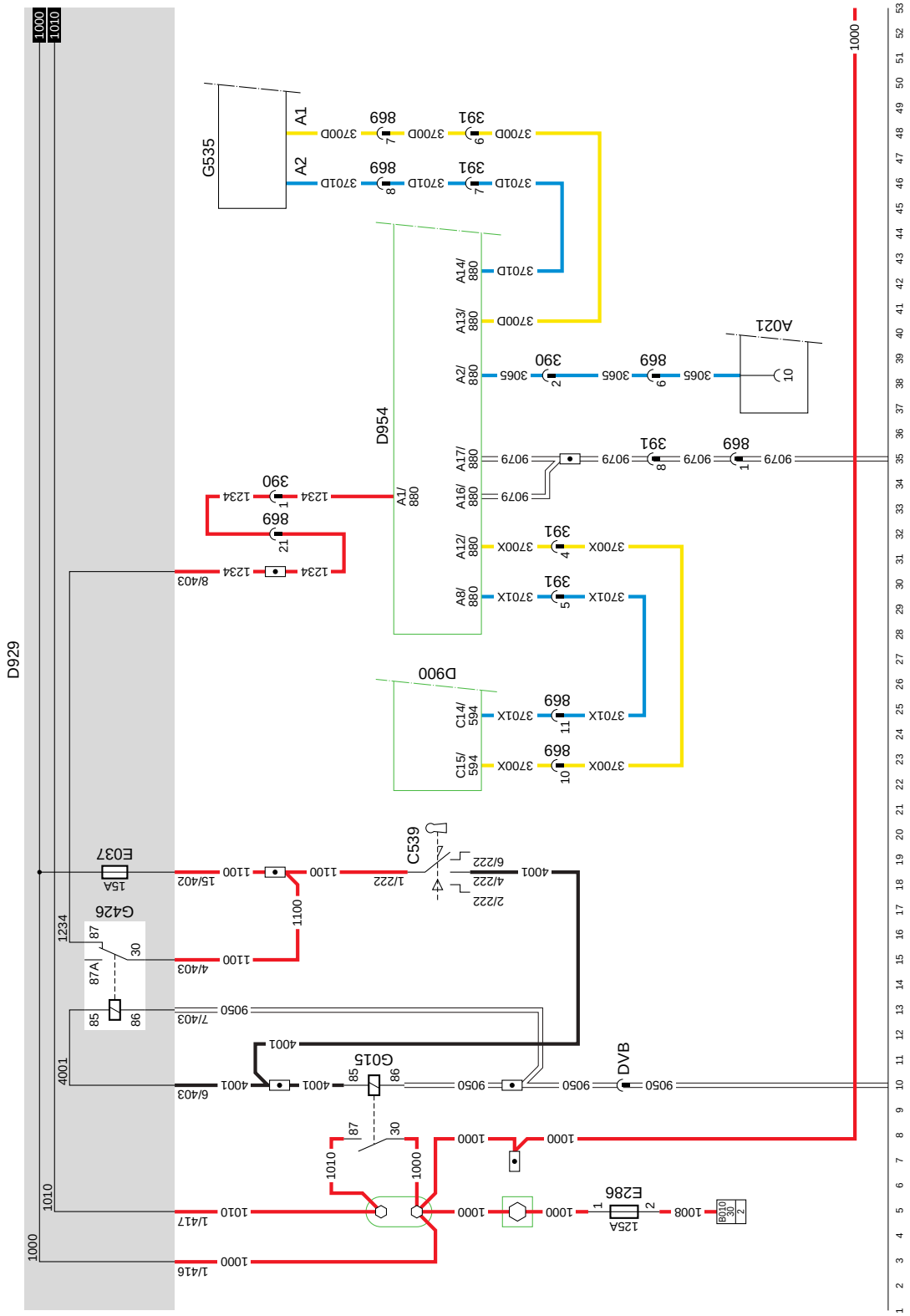

51 **1358030/16-24** EL001090

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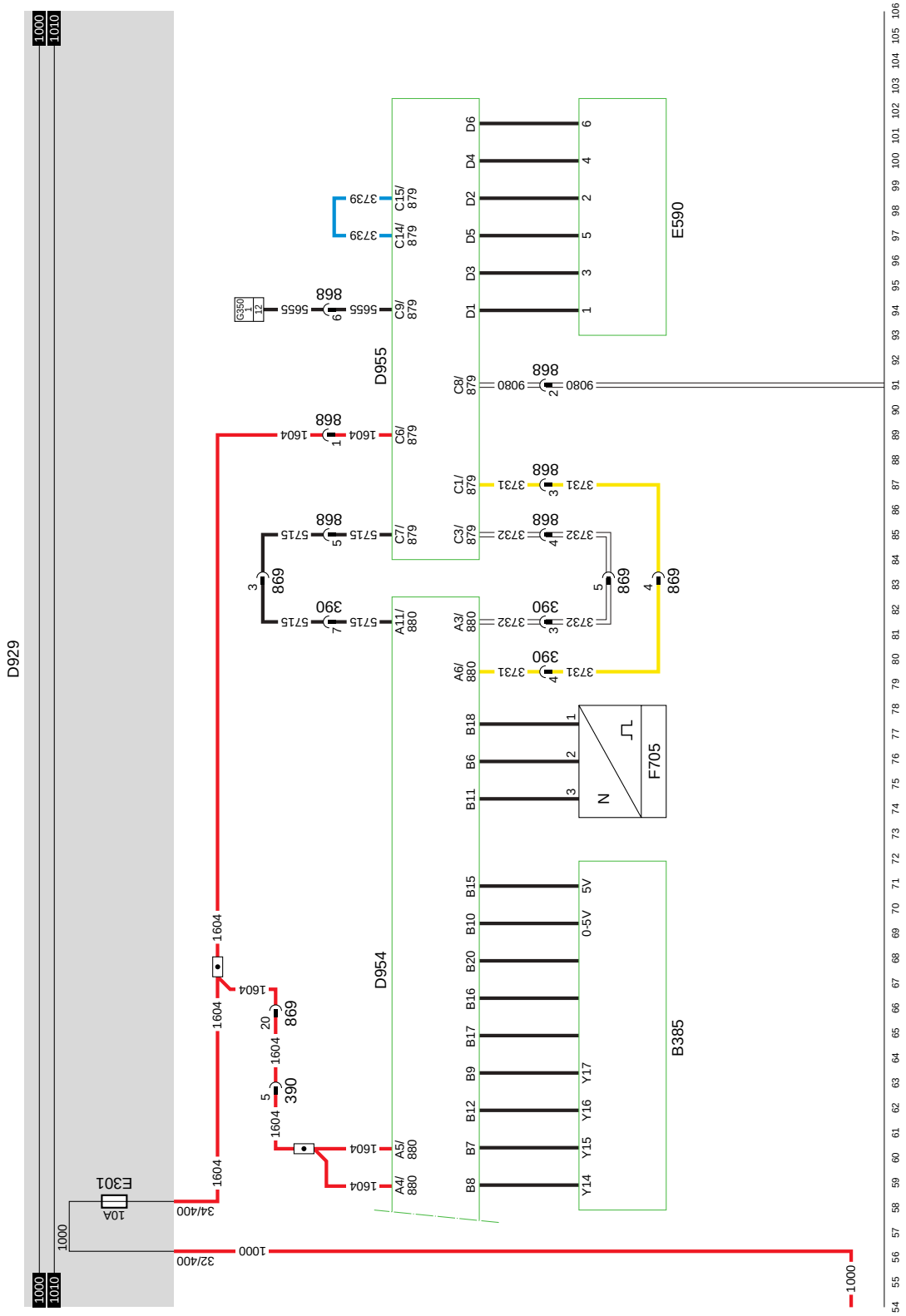

51 **1358030/16-24** EL001091

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3. CHANGES IN THE ELECTRICAL SYSTEM FROM CHASSIS NUMBER 0E608863

3.1 OVERVIEW OF THE CHANGES IN THE ELECTRICAL SYSTEM

Section diagram	Electrical system	Changes	From chassis number
B	Overview of earthing points	Various earthing points changed.	0E608863
C	CAN overview	Various connectors changed.	0E608863
2	Ignition/starter switch/ charging circuit	Various connectors and wire markings changed.	0E608863
3	MTCO tachograph	Various connectors and wire markings changed.	0E608863
8	VIC	Clutch protection added.	0E608863
		Various connectors and wire markings changed.	
11	UPEC	Relay G469 added. Wire 3435 withdrawn.	0E608863
18	Interior lighting, SH cab	Connector 610 changed to 570.	0E608863
22	Seat heating/accessories	Connector A038 added.	0E608863
23	Horn/cigar lighter/work lamp/air dryer	Various connectors changed. Wire 1103 added.	0E608863
24	ABS-ASC-D	Various connectors changed.	0E608863
29	EMAS	Connector 692 changed to 555.	0E608863
31	FAG	Connector 652 changed to 393.	0E608863
34A	ECAS-3 (4x2)	Various connectors changed.	0E608863
34B	ECAS-2 (6x2)	Various connectors changed.	0E608863
38	Mechanical lifting gear	Connector 878 changed to 568.	0E608863
39	Fuel pre-heating	Value of fuse E164 changed to 30 A.	0E608863
40	Windscreen wipe/ wash system	Connector 402 changed to 911.	0E608863

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Section diagram	Electrical system	Changes	From chassis number
41	Airtronic cab heater (ACH-EA) with/without timer	Wire 4595 changed to 5241. Value of fuse E114 changed to 20 A.	0E608863
46	Alarm system/battery charger for BV3 alarm	Various connectors changed and added.	0E608863
49	Water separator (Fleet Guard)	Value of fuse E164 changed to 30 A.	0E608863
51	AS Tronic	Various connectors changed.	0E608863
52	CDM	CAN Data Manager	0E608863

There are no functional changes compared with circuit diagram 1358030/16-24 in the remaining section diagrams of circuit diagram 1358030/25.

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3.2 CIRCUIT DIAGRAM 1358030/25

This page can be used to make your own notes on the circuit diagram.

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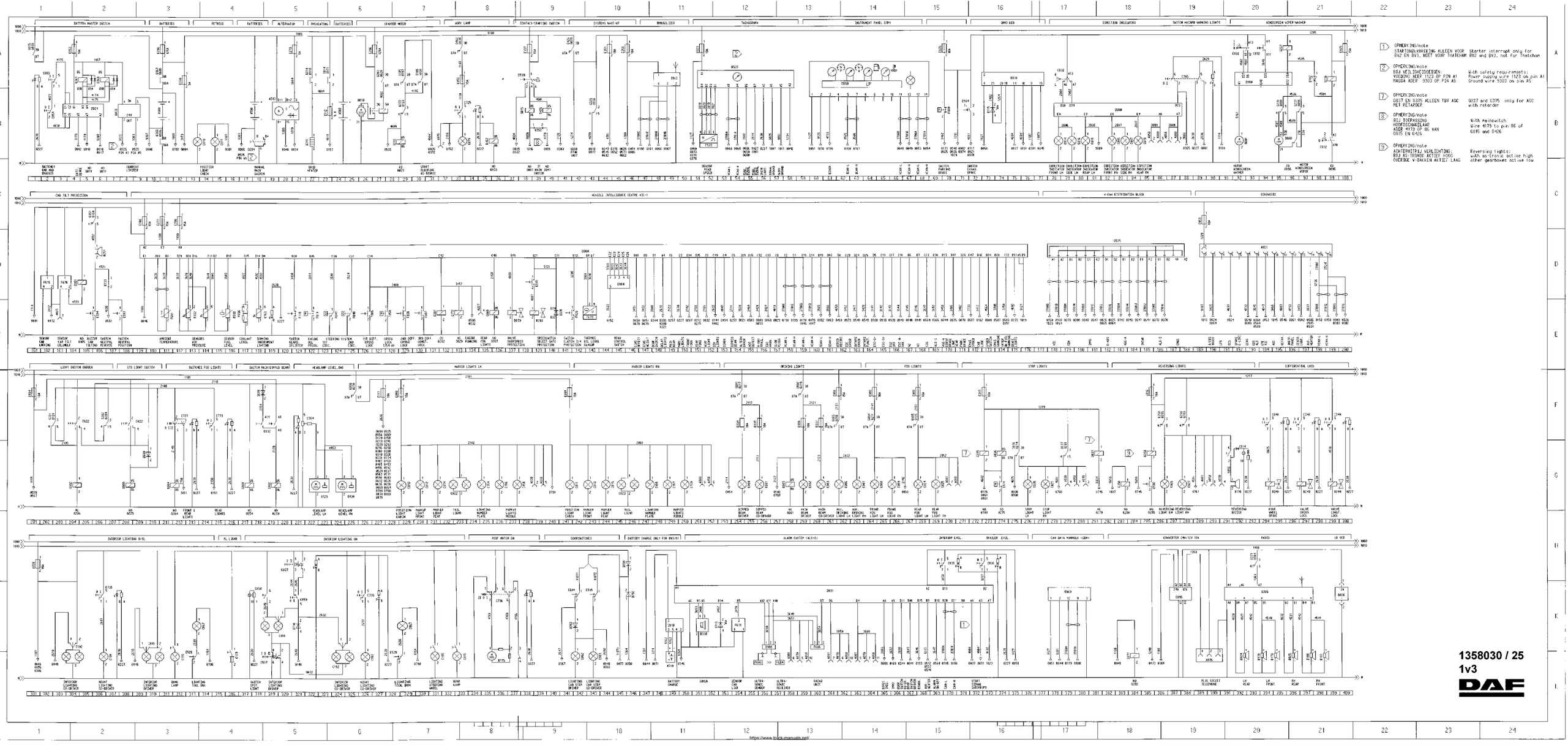


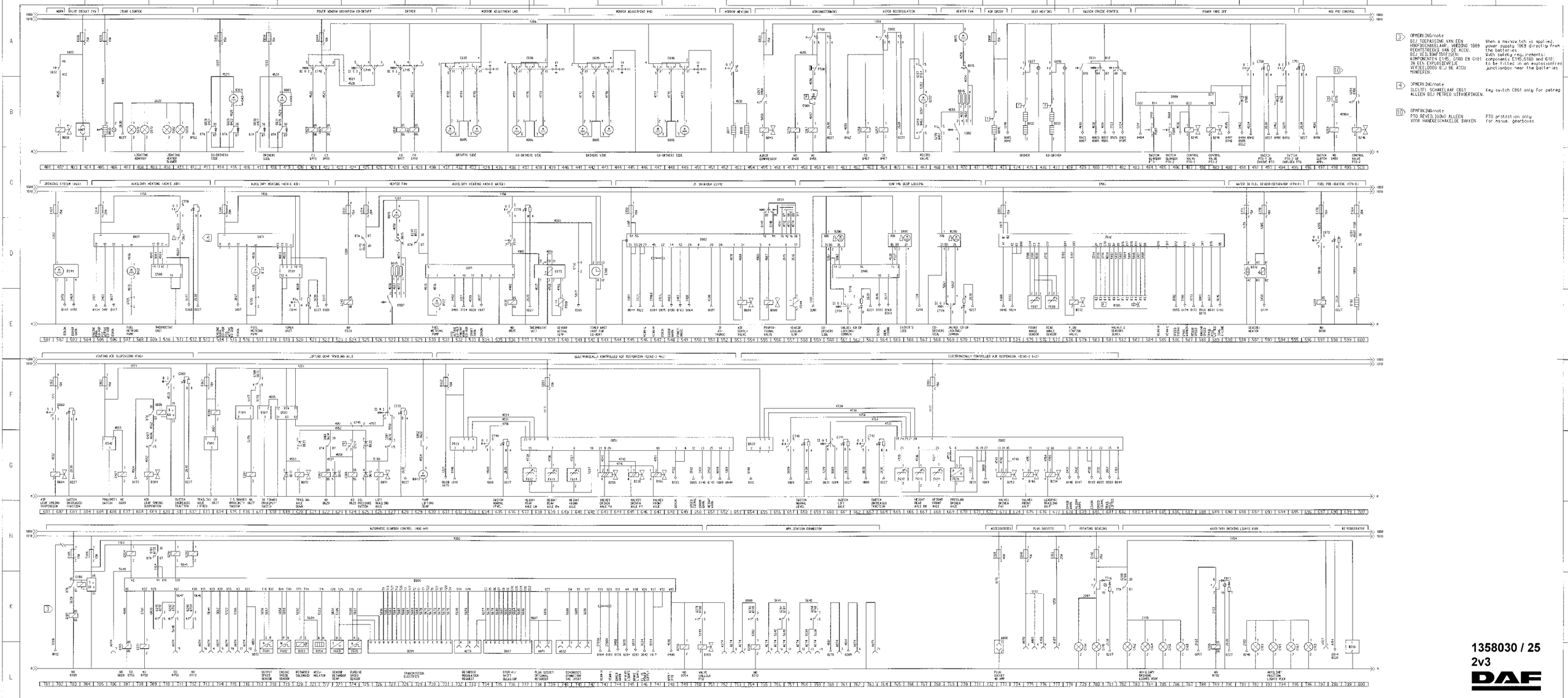
1 OPMERKING/note
STARTONDERBREKING ALLEEN VOOR BV2 EN BV3, NIET VOOR THATCHAM BV2 and BV3, not For Thatcham
Starter interrupt only for

2 OPMERKING/note
BIJ VEILIGHEIDSEISEN:
MASSA ADER 9303 OP PIN A5
With safety requirements:
Ground wire 9303 on pin A5

7 OPMERKING/note
G027 EN G375 ALLEEN TBV AGC MET RETARDER
G027 and G375 only for AGC with retarder

8 OPMERKING/note
BIJ TOEPASSING HOOFDSCHAKELAAR
ADER 4178 OP 86 VAN G015 EN G426
With mainswitch
Wire 4178 to pin 86 of G015 en G426

9 OPMERKING/note
ACHTERUITRIJ VERLICHTING:
BIJ AS-TRONIC ACTIEF HOOG
OVERDRIVE V-BAKKEN ACTIEF LAAG
Reversing lights:
with as-tronic active high other gearboxes active low



OPMERKING/note
BIJ TOEPASSING VAN EEN HOOFDSCHAKELAAR, VOEDING 1089 RECHTSTREEKS VAN DE ACCU
BIJ VEILIGHEIDSEISEN: KOMPONENTEN E145, G180 EN G181 IN EEN EXPLOSIEVRIJE VERSCHLOSS BIJ DE ACCU MONTEREN.
When a mainswitch is applied, power supply (DE9 directly from the batteries
With safety requirements: components E145, G180 and G181 to be fitted in an explosionfree junctionbox near the batteries

OPMERKING/note
SLEUTEL SCHAKELAAR C861 ALLEEN BIJ PETRED UITVOERINGEN.
Key switch C861 only for petreg

OPMERKING/note
PTO BEVEILIGING ALLEEN VOOR HANDSCHAKELBOX BAKKEN
PTO protection only for manua. gearboxes

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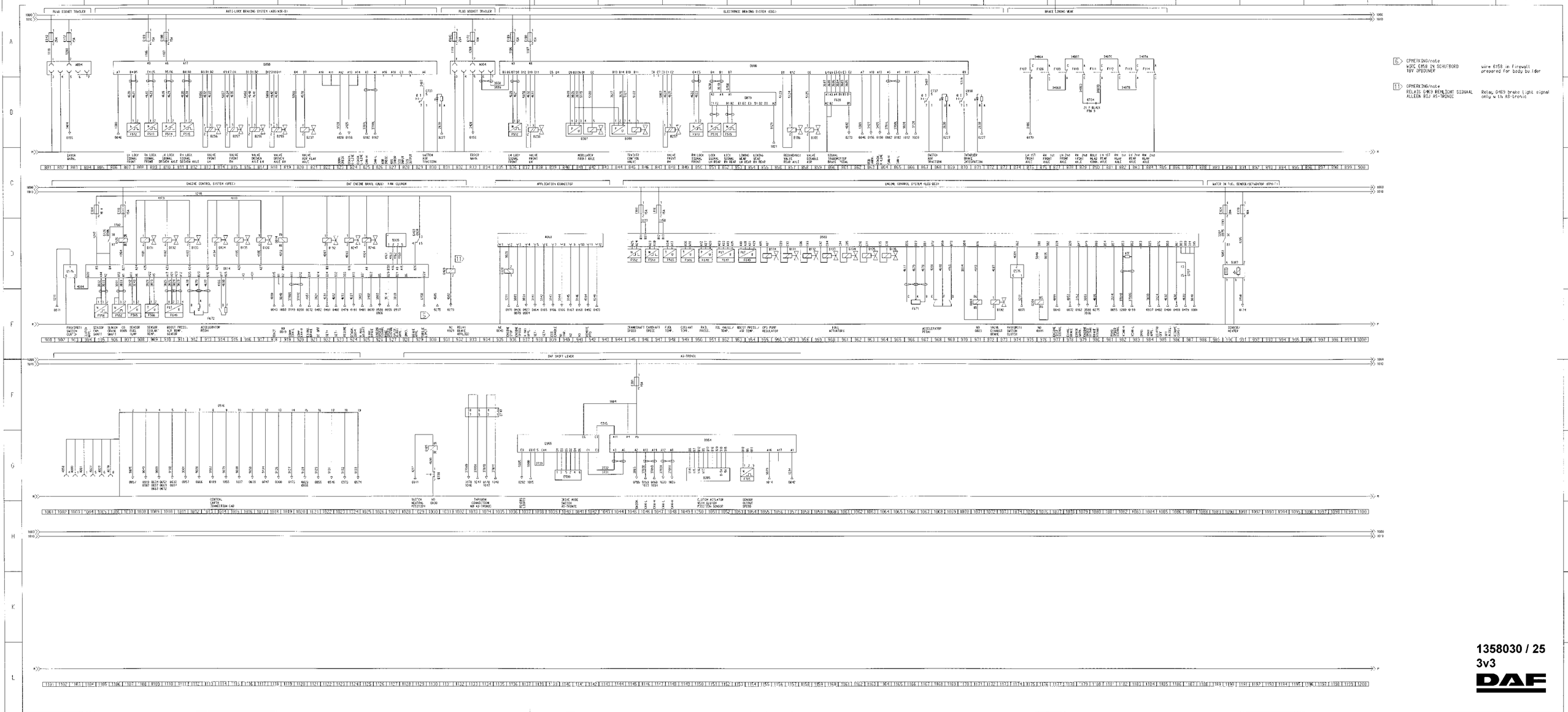
1358030 / 25
2v3
DAF



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3.3 OVERVIEW OF BASIC CODES FOR CIRCUIT DIAGRAM 1358030/25

Basic code number	Description	Search bar number
A000	Drawn vehicle socket (7-pin)	86, 87, 238, 251, 279, 1003
A001	Rear fog lamp/reversing lamp socket (7-pin)	270, 289, 358, 361, 363, 775, 1004
A004	Drawn vehicle ABS/EBS socket	803, 834
A007	24V socket (2-pin)	403
A021	Diagnostics socket (16-pin)	194
A027	Socket, 24V accessories (4-pin)	103, 135, 777, 797, 1004, 1005
A032	AGC diagnostics socket	740
A038	Socket, 40A accessories (2-pin)	773
A058	Drawn vehicle socket (15-pin)	85, 87, 239, 252, 271, 280, 290, 359, 362, 364, 776, 1002
A068	Application connector, engine speed control	939
A070	Application connector, superstructure (8-pin)	32, 280, 291, 359, 362, 364, 775, 1006
A071	Automatic gearbox socket, retarder functions	738
A073	Automatic gearbox socket, operation	732
A074	Automatic gearbox socket, superstructure	706, 711, 713, 714, 715, 716, 752, 753, 755, 756, 757, 758, 759, 761, 762, 763
A076	Telephone socket	389
A500	Batteries (2x)	10, 17, 24
A510	Alarm system battery	349
A513	Alternator	19
B000	Windscreen wiper motor	96
B001	Windscreen washer pump motor	93
B003	Electric drop glass motor, driver's side	419
B004	Electric drop glass motor, co-driver's side	415
B005	Left mirror adjustment motor	432, 442

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Basic code number	Description	Search bar number
B006	Right mirror adjustment motor	437, 448
B010	Starter motor	25
B015	4-speed heater fan	470, 471, 527, 528
B017	Mirror heating, driver's side	452
B018	Mirror heating, co-driver's side	453
B024	Loudspeaker, left	392
B025	Loudspeaker, right	396
B026	CB	399
B028	Horn	402
B030	Cigar lighter, driver's side	406
B032	Seat heating, driver's side	475
B033	Seat heating, co-driver's side	477
B042	Air dryer heating element	473
B043	Air conditioning compressor	455
B071	Lifting-gear lifting valve	626
B072	Lifting-gear lowering valve	620
B073	Lifting-gear pump motor	629
B079	Low-range downshift protection valve	137
B084	Air suspension bleed valve	602, 609
B088	Intarder proportional valve	556
B089	Intarder air supply valve	554
B122	Fuel dosage pump for Eberspächer cab heater	508, 517, 531
B129	Left-hand headlight height adjuster motor	223
B130	Right-hand headlight height adjuster motor	225
B131	Solenoid valve, pump unit/injector of cylinder 1	909
B132	Solenoid valve, pump unit/injector of cylinder 2	910
B133	Solenoid valve, pump unit/injector of cylinder 3	912
B134	Solenoid valve, pump unit/injector of cylinder 4	914
B135	Solenoid valve, pump unit/injector of cylinder 5	916
B136	Solenoid valve, pump unit/injector of cylinder 6	917

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Basic code number	Description	Search bar number
B166	ECAS valve, front axle	647, 675
B169	PTO operation valve, Chelsea	751
B175	Roof hatch motor	336
B176	Reversing buzzer	292
B178	Loudspeaker, left	394
B179	Loudspeaker, left	395
B180	Loudspeaker, right	397
B181	Loudspeaker, right	398
B182	Heating element for fuel filter/water separator	599
B192	Engine brake valve	922, 973
B199	Central door locking motor, driver's side	565
B200	Central door locking motor, co-driver's side	560, 569
B201	Internal electrical components for AGC automatic gearbox	728
B237	Valve, ABS/ASC-D, differential lock, rear axle	821
B238	ECAS-2 (6x2) driven axle left/right air supply valve (FT)	645
B243	Cross-axle differential lock operation valve	297
B244	Longitudinal controlled slip differential operation valve	299
B245	PTO operation valve	487
B246	PTO operation valve	489, 500
B247	Solenoid valve (DEB)	924
B248	Solenoid valve (DEB)	925
B250	ECAS driven axle, left/right, air supply valve (FA)	643
B251	Neutral position buzzer, cab tilting	106
B252	Recirculation valve	468
B253	ECAS driven axle, left/right, air supply valve	673
B254	Valve, ECAS second steered axle/trailing axle, left/right, lifting bellows	677
B256	Valve, ABS-D, ABS/ASC-E, front axle, left	813, 838

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Basic code number	Description	Search bar number
B257	Valve, ABS/ASC-D, front axle, right	815, 848
B258	Valve, ABS/ASC-D, driven axle, left	817
B259	Valve, ABS/ASC-D, driven axle, right	818
B293	Gearbox gate protection valve	139
B306	EBS redundancy valve	857
B307	EBS front axle modulator	841
B308	Drawn vehicle EBS control valve	845
B309	ASC cut-off valve	859
B335	Electronically controlled viscous fan clutch	927
B338	Alarm system horn	351
B340	Four-wheel drive valve	295
B341	Glow element	22
B344	Automatic lubrication pump with integrated electronic unit	503
B353	Automatic gearbox control solenoid, retarder	720
B354	Automatic gearbox accumulator	721
B356	Cooler box	799
B365	Radio	394
B372	Fluid flow control valve block	579
B378	Heating element for fuel filter/water separator	592
B385	AS Tronic clutch unit	1051
B386	Steering cylinder control valve block	581
B387	Fuel heater/water separator electronic unit	990
B525	Modular tachograph, MTCO	54
C000	Dipped beam, left	255
C001	Dipped beam, right	256
C002	Main beam, left	260
C003	Main beam, right	261
C006	Spotlight, left	262

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Basic code number	Description	Search bar number
C007	Spotlight, right	264
C008	Fog lamp, front left	265
C009	Fog lamp, front right	266
C010	Width marker light (headlight), left	14, 229
C011	Width marker light (headlight), right	15, 242
C012	Width marker light, front left	231
C013	Width marker light, front right	243
C014	Direction indicator lamp, front left	79
C015	Direction indicator lamp, front right	83
C016	Direction indicator lamp, side left	80
C017	Direction indicator lamp, side right	84
C018	Direction indicator lamp, rear left	81
C019	Direction indicator lamp, rear right	85
C020	Stop light, left	277
C021	Stop light, right	278
C022	Rear light, left	232
C023	Rear light, right	245
C024	Fog lamp, rear left	268
C025	Fog lamp, rear right	270
C026	Reversing light, left	287
C027	Reversing light, right	288
C052	Heater fan light, left	411
C053	Heater fan light, right	412
C062	Cab stepwell lighting, driver's side	342
C063	Cab stepwell lighting, co-driver's side	344
C067	Left-hand tool compartment lighting	314, 329
C071	Work lamp	34
C072	Ashtray light, left	408
C073	Ashtray light, right	409
C074	Width marker light, rear left	232
C075	Width marker light, rear right	245

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Basic code number	Description	Search bar number
C115	Bunk light with switch	312, 333
C119	Interior lighting with switch, driver's side	310, 320
C129	Interior lighting with switch	316
C144	Rotating beam, left	779
C145	Rotating beam, right	781
C154	Rear number plate light, left (tractors)	235
C155	Rear number plate light, left (tractors)	248
C156	Width marker light, left, 1st (tractors)	237
C157	Width marker light, right, 1st (tractors)	249
C158	Width marker light, left, 2nd (tractors)	238
C159	Width marker light, right, 2nd (tractors)	251
C162	Roof spotlight	783
C163	Width marker light in roof spotlight	793
C164	Roof spotlight	784
C165	Width marker light in roof spotlight	794
C166	Roof spotlight	786
C167	Width marker light in roof spotlight	795
C168	Roof spotlight	787
C169	Width marker light in roof spotlight	797
C185	Light with switch	332
C191	Nightlight, centre	307, 327
C192	Interior lighting with switch, co-driver's side	304, 324
C539	Accessories/ignition/starter switch	38
C622	Switch, lighting	205, 209
C694	Main switch, mechanical	17
C695	Mirror adjustment switch, driver's side	433, 443
C696	Mirror adjustment switch, co-driver's side	438, 448
C697	Seat heating switch, driver's side	475
C698	Seat heating switch, co-driver's side	477
C716	Switch, rotating beams	781

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Basic code number	Description	Search bar number
C725	Work lamp switch	34
C727	Front/rear fog lamp switch	212
C735	Interior nightlight switch	307, 326
C736	Roof hatch switch	336
C737	ABS/ASC-D traction switch	830, 868
C739	Mechanical lifting-gear switch	627
C740	ECAS switch, normal level	635, 657
C741	ECAS switch, axle lifting	661
C742	Traction assistance switch	663
C743	Electric drop glass switch, co-driver's side (driver's side door)	422
C744	Electric drop glass switch, co-driver's side (co-driver's side door)	425
C745	Electric drop glass switch, driver's side (driver's side door)	428
C746	Mirror heating switch	453
C748	Cross-axle differential lock operation switch	297
C749	Longitudinal controlled slip differential control switch	299
C750	PTO operation switch	492
C751	PTO operation switch	495
C760	Air conditioning switch	459
C763	Instrument lighting dimming potentiometer	119
C764	Potentiometer, headlamp height adjustment	222
C765	Switch, warning lamps (with LED search lighting)	88
C773	Rear fog lamp switch	215
C774	Central door locking switch	561, 569
C778	Cab heater switch	511, 536
C802	Switch, recirculation valve	464
C813	Spotlight switch, roof	790
C814	Reversing buzzer switch	292
C831	Cruise control/engine speed control/retarder stalk switch	480, 556

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Basic code number	Description	Search bar number
C832	Direction indicator/windscreen wiper stalk switch	79, 92, 93, 98, 219, 402
C835	Switch to turn off interior detection	370
C836	Switch to turn off superstructure/drawn vehicle loadspace detection	373
C837	Interior lighting switch	318,320
C840	Four-wheel drive switch	295
C844	Cab heater main switch	519
C853	Cab main switch	2
C854	Chassis main switch	3
C858	Interior spot lighting switch	318
C859	Roof console interior lighting switch, driver's side	321
C861	PETREG key switch	511
C872	Fuel filter/water separator operating switch	597
C882	Heater fan switch	470, 527
C883	FAG traction assistance switch	602, 611
C890	Switch to switch off integration of third brake	870
D503	Electronic unit, mechanical lifting gear	619
D529	Electronic unit, ECAS remote control	632, 654
D609	Light switch diode	209
D610	Diode, main beam/dipped beam	218
D611	Diode, damping valve for lowering mechanical lifting gear	619
D612	Diode, damping valve for lifting mechanical lifting gear	625
D613	Diode for pump damping relay, mechanical lifting gear	623
D622	Diode for mechanical lifting gear, lifting lock	625
D623	Diode for mechanical lifting gear, lowering lock	620
D703	Diode for switching off cab heater/door, contact on driver's side	494

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Basic code number	Description	Search bar number
D705	Diode for switching off the cab heater with running engine	491
D710	Interior lighting diode to prevent feedback to driver's side switch	321
D715	Alarm system LED	73, 352
D782	Diode to prevent door locking feedback, driver's side	97
D783	Interior lighting diode, driver's side	341
D791	Door switch diode	345
D792	Door switch diode	346
D802	ECAS-2 (6x2) electronic unit	673
D814	UPEC electronic unit	914
D826	Electronic unit for VLG current limiter	7
D850	Electronic unit for ABS/ASC, D model	817
D851	Electronic unit, ECAS-3 (4x2)	644
D866	Electronic unit, AGC-A automatic gearbox control	729
D867	Automatic gearbox gear selection display	735
D871	Electronic unit for Airtronic D2 cab heater	508 517
D879	Rear axle modulator	854
D880	EBS electronic unit	854
D895	Electronic unit for (10 A) converter with power supply for radio memory	387
D899	DIP-4 instrument panel	62
D900	VIC electronic unit	83, 93, 143, 486
D901	Electronic unit for Hydronic 10 cab heater	533
D902	Electronic unit, ZF intarder with CAN	550
D903	Electronic unit, ECS-DC3	959
D904	Menu control switch, MCS	145
D905	Electronic unit for central door locking	562
D909	Electronic unit, ultrasonic alarm system	356
D910	Electronic unit, battery charger	349

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Basic code number	Description	Search bar number
D911	Electronic unit, ALS-S alarm system	361
D912	Electronic unit, immobiliser	49
D924	Electronic unit for main switch	5
D931	LED unit, immobiliser	75
D932	EMAS electronic unit	581
D954	AS Tronic gearbox modulator	1050
D955	AS Tronic gear lever unit	1038
D969	CAN data manager, CDM	379
E000	Fuse, rear left width marker light	228
E001	Fuse, rear right width marker light	241
E004	Fuse, dipped beam on driver's side	254
E005	Fuse, dipped beam/warning lamp, co-driver's side	255
E006	Fuse, main beam on driver's side	259
E007	Fuse, main beam/warning lamp, co-driver's side	260
E008	Fuse, spotlights	261
E009	Fuse, front fog lamps	264
E010	Fuse, rear fog lamps	267
E013	Fuse, stop lights	272
E016	Fuse, reversing lights/gearbox neutral position/windscreen wiper motor/cross-axle differential lock	285
E023	Fuse, cold start switch/tachograph clock/cab heater program clock/alarm system	51
E025	Fuse, windscreen wiper motor/headlamp washer/windscreen washer motor	100
E026	Fuse, cigar lighter/door switches/electronic unit, 24/12 V converter with power supply for radio memory	405
E028	Fuse, interior lighting/bunk lamps/central door lock	301
E031	Fuse, heater fan	455, 523

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Basic code number	Description	Search bar number
E033	Fuse, electric drop glass motor, co-driver's side	414
E034	Fuse, electric drop glass motor, driver's side	417
E035	Fuse, instruments and warning lamps/parking brake switch	69
E036	Fuse, 24V socket	403
E037	Fuse, ignition switch	38
E043	Fuse, drawn vehicle ABS/EBS	801, 831
E044	Fuse, mirror heating/electric mirror adjustment/electric drop glass operation	421
E048	Fuse, drawn vehicle power supply	774
E051	Fuse, ECAS/EMAS	573, 638, 667
E052	Fuse, ECAS remote control/work lamp	33
E053	Fuse, diagnosis connector (16-pin)/LED unit/alarm system	189
E062	Fuse, mechanical lifting gear/ECAS/EMAS	601, 605, 613, 631
E084	Fuse, lighting	201
E091	Fuse, air dryer heating element/stalk switch/PTO/clutch switch/engine speed control application connector	472
E108	Fuse, VIC	109
E112	Fuse, glow warning lamp	23
E114	Fuse, cab heater (Eberspächer)/warning lamps	505, 514, 525
E117	Fuse, search light	227
E118	Fuse, UPEC/ECS-DC3 supply voltage	906, 947
E142	Fuse, accessories before contact	780
E144	Fuse, AGC-A4 automatic gearbox	704
E145	Fuse, AGC-A4 automatic gearbox	703
E153	Fuse, main switch for timer/engine stop/main switch power supply	4
E157	Fuse, automatic lubrication	501
E160	ECS-DC3 fuse	945

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Basic code number	Description	Search bar number
E163	Fuse, accessories after contact (connector A027)/rotating beams/roof hatch	777
E164	Fuse for fuel heater before contact	599, 989
E168	Fuse, accessories/microwave	772
E170	Fuse, fuel heater after contact	592, 597, 991
E171	Fuse, electronic unit for fuel filter/water separator, Racor	591
E172	Fuse, drawn vehicle ABS/EBS	802, 833
E184	Fuse, UPEC	904
E189	Fuse, rear axle EBS	808, 836
E190	Fuse, front axle EBS	810, 837
E199	Fuse, ZF intarder	545
E277	Fuse, VIC	110
E279	Fuse, generator voltage control	20
E280	Fuse, VIC	112
E286	Main fuse	10, 26
E301	Fuse, AS Tronic	1045
E330	Fuse, ‘sens’ wire main switch	12
E350	Fuse, various electrical systems	45
E351	Fuse, various electrical systems	44
E507	Proximity switch for axle-load protection lifting gear (10 tons)	617
E508	Temperature switch for air conditioning compressor	459
E509	Air conditioning operating switch, high/low pressure	458
E511	Stop light operating switch	274
E514	Operating switch for stepwell/interior lighting, driver’s side door switch	341
E515	Operating switch for stepwell/interior lighting, co driver’s side	343
E524	Mechanical lifting-gear operating switch, oil pressure limit switch	624
E528	Control switch for left-hand tool compartment lighting	313, 328

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Basic code number	Description	Search bar number
E542	Proximity switch for axle load protection (13 tons)	605
E564	Operating switch, engine brake	72
E566	Control switch for Eberspächer cab heater thermostat (DILC)	509
E570	Pneumatic switch, clutch PTO N10	498
E571	Thermo 90/Hydronic 10 cab heater operating switch	536
E575	Proximity switch, clutch	902, 974
E579	Operating switch for thermostat/cab heater, fan, Eberspächer (water)	539
E580	Operating switch for thermostat/cab heater, fan, Eberspächer (timer)	543
E581	Operating switch/combination clock, Eberspächer Airtronic cab heater	519
E584	Proximity switch for axle-load protection lifting gear (7.5 tons)	615
E590	AS Tronic selector switch	1040
E592	Reversing light operating switch	286
E593	Neutral position switch	108
E594	Operating switch for neutral position/reverse gear	106
E595	Gearbox gate protection operating switch	141
E599	Neutral position switch	1031
F000	Control switch for parking brake	70
F006	Differential lock control switch, 1st differential	127
F007	Differential lock control switch, 3rd differential	131
F011	Control switch for engine oil pressure	123
F038	Differential lock control switch, 2nd differential	129
F047	Control switch for steering system (1st circuit)	124
F048	Control switch for steering system (2nd circuit)	125

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Basic code number	Description	Search bar number
F050	Differential lock pressure control switch (1st and 2nd differentials)	128
F087	Control switch, gearbox PTO	485
F088	Control switch, gearbox PTO	486
F097	Proximity switch for trailing axle mechanical lifting gear	613
F107	Brake pad wear switch, front left	874
F108	Brake pad wear switch, front right	876
F109	Brake pad wear switch, front left, 2nd front axle	877
F110	Brake pad wear switch, front right, 2nd front axle	879
F111	Brake pad wear switch, rear left	880
F112	Brake pad wear switch, rear right	881
F113	Brake pad wear switch, rear left, 2nd rear axle	882
F114	Brake pad wear switch, rear right, 2nd rear axle	884
F118	Control switch for splitter signalling	121
F120	Clutch protection switch	142
F509	Cab temperature sensor of cab heater	540
F512	Wheel speed sensor, front axle, left	807, 836
F513	Wheel speed sensor, front axle, right	809, 850
F514	Wheel speed sensor, driven axle, left	810
F515	Wheel speed sensor, driven axle, right	811
F533	Speed sensor (4-pin, 1st)	52
F544	Coolant temperature sensor for secondary retarder	558
F552	Crankshaft sensor	906
F558	Camshaft sensor	905
F565	Sensor, fuel temperature	907
F566	Sensor, engine coolant temperature	909
F601	Sensor, AGS	717
F602	Sensor, AGS	719
F608	Sensor, fuel level	116

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Basic code number	Description	Search bar number
F612	Height sensor, ECAS, rear axle, left	637, 665
F613	Height sensor, ECAS, rear axle, right	639, 666
F614	Height sensor, ECAS, front axle	640, 668
F615	ECAS pressure sensor, driven axle, left/right	669
F616	Cab locking sensor	102
F619	Cab locking sensor, alarm system	354
F628	EBS foot brake valve	860
F649	Boost pressure and air inlet temperature sensor	910
F651	Ambient temperature sensor	112
F652	Air pressure sensor	113
F656	Coolant level sensor	117
F669	Retarder temperature sensor, automatic gearbox	723
F670	Automatic gearbox turbine speed sensor	724
F671	Sensor, accelerator pedal, ECS-DC3	966
F672	UPEC accelerator pedal sensor	913
F673	Sensor, engine oil level and temperature	143
F676	Cab locking sensor	103
F686	Alarm system sensor, radar	360
F687	EMAS front axle angle sensor	575
F688	EMAS rear axle angle sensor	576
F705	Speed sensor	1053
G000	Relay, tail light/width marker light/search lighting	208, 225
G001	Relay, dipped beam	217, 254
G002	Relay, main beam	219, 259
G003	Relay, spotlights	258, 261
G004	Relay, front fog lamp	211, 264
G005	Relay, rear fog lamp	135, 267
G014	Relay, glowing	22, 23, 918, 971
G015	Relay, contact	1, 38
G028	Relay, electric drop glass operation, co-driver's side	413, 421

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Basic code number	Description	Search bar number
G029	Relay, electric drop glass operation, co-driver's side	415, 422
G030	Relay, electric drop glass operation, driver's side	417, 427
G031	Relay, electric drop glass operation, driver's side	418, 428
G036	Relay, stop light	274, 275
G037	Stop light micro relay for AGC with retarder	279, 281
G052	Relay, mechanical lifting gear motor	622, 629
G066	Relay, mechanical lifting-gear takeover	622, 624
G095	Relay, traction assistance, 60 sec. bleeding	609
G126	Relay, UPEC/ECS-DC3 supply voltage	905, 906
G170	Relay, cab heater fan	525, 536
G180	Time relay power supply, Allison, 12V	703
G181	Takeover relay power supply, Allison, 12V	703, 709
G185	Starting circuit interrupter relay	29, 30, 707, 1030
G201	Relay for EFPH fuel heater	597, 599, 975, 989
G203	Relay, starter motor takeover	27, 28
G236	Relay, windscreen wiper (speed 1 or 2)	95, 99
G237	Relay, windscreen wiper (automatic zero position)	95, 96
G247	Relay, heater fan, Eberspächer Hydronic cab heater	523, 529
G257	Recirculation valve relay	464, 467
G258	Recirculation valve relay	462, 467
G259	PTO control takeover relay	498, 499
G267	Air conditioning relay	455, 458
G279	Air conditioning relay	457, 468
G291	Relay, automatic gearbox	710, 759
G292	Relay, automatic gearbox	710, 712
G293	Relay, automatic gearbox	749, 754
G294	Relay, automatic gearbox	707, 756
G295	Relay, automatic gearbox	712, 754

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Basic code number	Description	Search bar number
G299	Relay, roof spotlights	782, 789
G301	Relay, light D+	131, 202
G302	Relay for Swedish lighting	204, 306
G328	Relay, engine stop	43, 935
G350	Relay, reversing lights, automatic gearbox	283, 285, 286, 288
G351	Cab tilt protection relay	104, 105
G367	Relay, main switch power supply	4, 10
G368	Relay, main switch earth	6, 10
G371	Automatic gearbox relay, superstructure	708, 750
G372	Starting circuit interrupter relay	29, 133
G375	Stop light relay for AGC with retarder	272, 709
G377	Relay, accessories power supply for radio	384, 393
G380	Relay, mechanical lifting axle	613, 617
G381	Relay, mechanical lifting axle	616, 627
G426	Relay, contact	39, 41
G427	FAG traction assistance relay	606, 609
G462	Relay for work lamp	33, 35
G469	Relay, braking signal	929, 931
G516	Central cab earth, co-driver's side	1014
G535	CAN distribution block	183
G725	Through-connection for D3LC cab heater	507, 516
G732	Through-connection for cab heater	541
G733	Through connection for intarder neutral position	107
G734	Through-connection for brake lining wear	880
G736	V-CAN connection	198
G737	Through-connection, ECS-DC3 speed control	987
G745	Through-connection, mechanical lifting gear	625
G757	Through-connection for main switch	39
I020	Diode, gearbox gate protection	140

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3.4 SECTION DIAGRAMS FROM CIRCUIT DIAGRAM 1358030/25

A	Voltage before and after contact
B	Overview of earthing points
C	CAN overview
1	Main switch
2	Alternator/ignition/starter switch/charging circuit
3	Tachograph
4	Immobiliser
5	Pre-glowing
6	DIP4
7	Direction indicators and warning lamps
8	VIC
9	FA marker and parking lights
10	FT marker and parking lights
11	UPEC
12	Reversing lights
13	Light switch/fog lamps/dipped beam and main beam switch, FA/FT
14	Swedish lighting
15	Stop lights/cab tilting gear
16	Differential lock
17	Interior lighting, D/SL cab
18	Interior lighting, SH cab
19	Mirror heating/mirror adjustment
20	Search lighting
21	Air conditioning/recirculation valve/heater fan
22	Seat heating/accessories
23	Horn/cigar lighter/work lamp/air dryer
24	ABS-ASC-D
25	DEB
26	Intarder EST42
27	ECS-DC3
28	AGS

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29	EMAS
30	AGC
31	FAG
32	PTO
33	Roof spotlights/cooler box/rotating beams
34A	ECAS-3 (4x2)
34B	ECAS-2 (6x2)
35	Headlight-height adjustment
36	24 V/12 V converter for radio/CB set
37	Electric drop glass/central door locking/roof hatch, SH cab
38	Mechanical lifting gear
39	Fuel pre-heating
40	Windscreen wipe/wash system
41	Airtronic cab heater (ACH-EA) with/without timer unit
42	Hydronic 10 (ACH-EW) cab heater with timer unit
43	UPEC/CUMMINS/AGC application connector
44	EBS
45	Brake lining wear switch
46	Alarm system/battery charger for BV3 alarm
47	Sockets, FA/FT
48	Fuel filter/water separator (Racor)
49	Water separator (Fleet Guard)
50	“Water in fuel” sensor (Preline)
51	AS Tronic
52	CDM

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A VOLTAGE BEFORE AND AFTER CONTACT

VOLTAGE BEFORE CONTACT

A constant voltage is supplied to pin 1 of connector 416 through wire 1008, point 30 on the starter motor, fuse E286, the + bolt in the dashboard connector lead-through and the voltage distribution block.
Power is also provided (by wire 1008) from point 30 on the starter motor to the B+ connection of the alternator.

Only wire 1000 to the + bolt in the dashboard connector lead-through is fuse-protected by fuse E286 (125A).
The other wires are NOT fuse-protected and they can only be made dead by disconnecting the battery leads..

Power is supplied to the 'S' (sens) connection of the alternator from point 30 of the starter motor via fuse E279 and wire 3084.

VOLTAGE AFTER CONTACT

A voltage is supplied to contact relay G015 (connection point 30) via the starter motor (connection point 30). This connection point may be connected to wire 1010 over contact relay G015.
This wire is only fuse-protected with fuse E286 (125A).

OPERATION

When the ignition/starter switch (C539) is set to the "accessories" position (connection between points 1 and 6), a voltage is supplied to connection point 1 of relay G377 via wire 1000, fuse E037, ignition/starter switch (C539) (contact points 1 - 6) and wire 1130.

When the ignition/starter switch (C539) is set to the "contact" position (connection between points 1 and 4), relay G015 is energised via wire 1000, fuse E037, ignition/starter switch (C539) (contact points 1 - 4) and wire 4001. This then connects wire 1000 (voltage before contact) to wire 1010 (voltage after contact).

At the same moment this voltage is also applied to connection point 85 of relay G426. This relay is also activated and connects contacts 30 and 87. A voltage is now applied both to fuse E350 and to fuse E351 via fuse E037, contacts 30 - 87 and wire 1234. The voltage goes to connection point 15 of the alternator via fuse E350.

When the ignition/starter switch (C539) is turned against the pressure of the spring (connection between points 1 and 2), relay G015 and relay G426 remain energised and a voltage is supplied to the alarm system (D911) (if present) or directly to connector 403, connection point 2, via wire 1000, fuse E037, ignition/starter switch (C539), contacts 1 - 2 and wire 4004. When the ignition/starter key is released, the ignition/starter switch automatically springs back and remains in the "contact" position.

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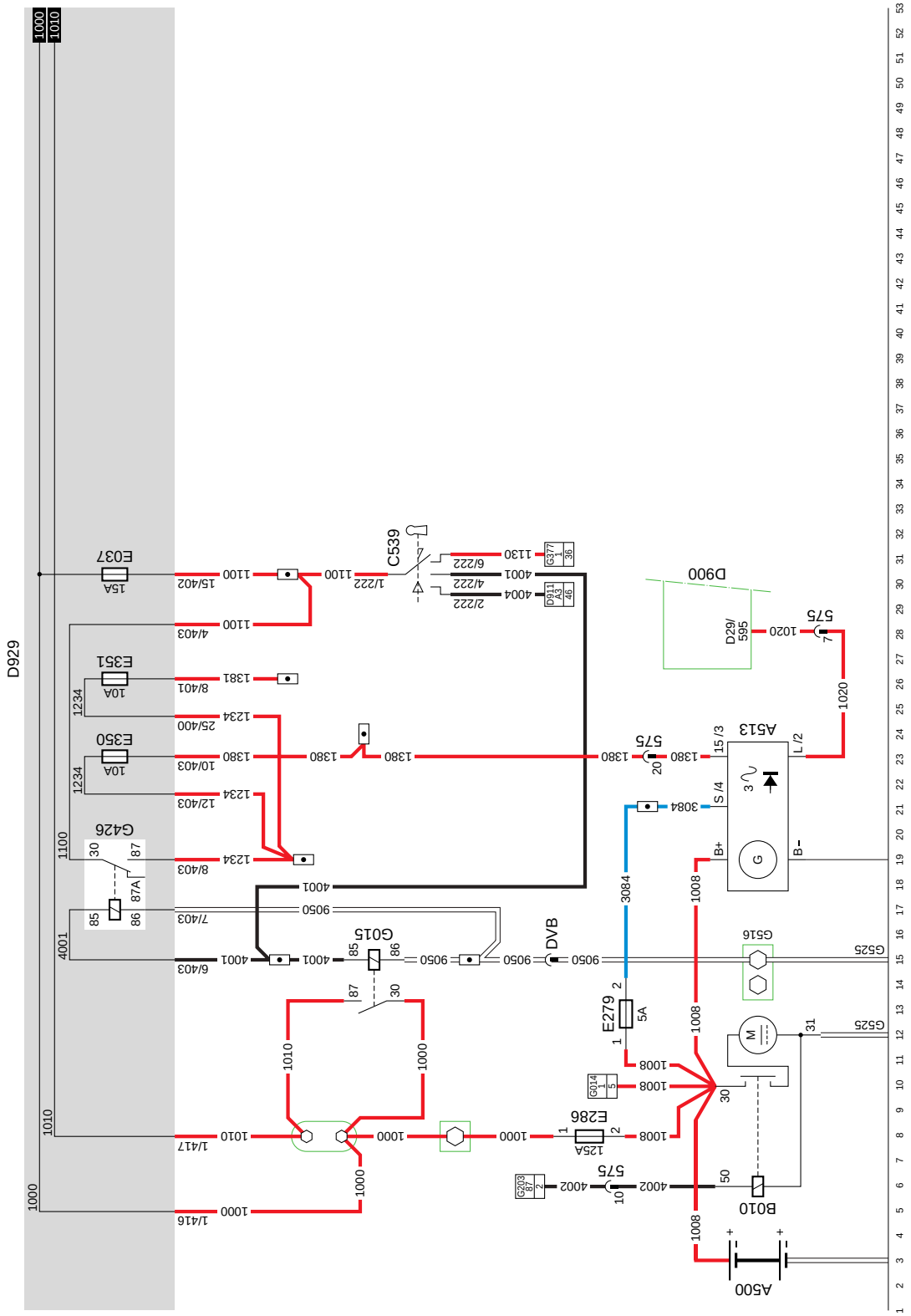

A **1358030/25** EL001092

B OVERVIEW OF EARTHING POINTS

This section diagram gives an overview of all the earth connections, with wire markings and connector points.

VARIANTS

Location

9 = 1 = accessories superstructure connection

61 = 2 = 40 A accessories connector.

70 = connector 860: loop-through to earth with ECAS.

11

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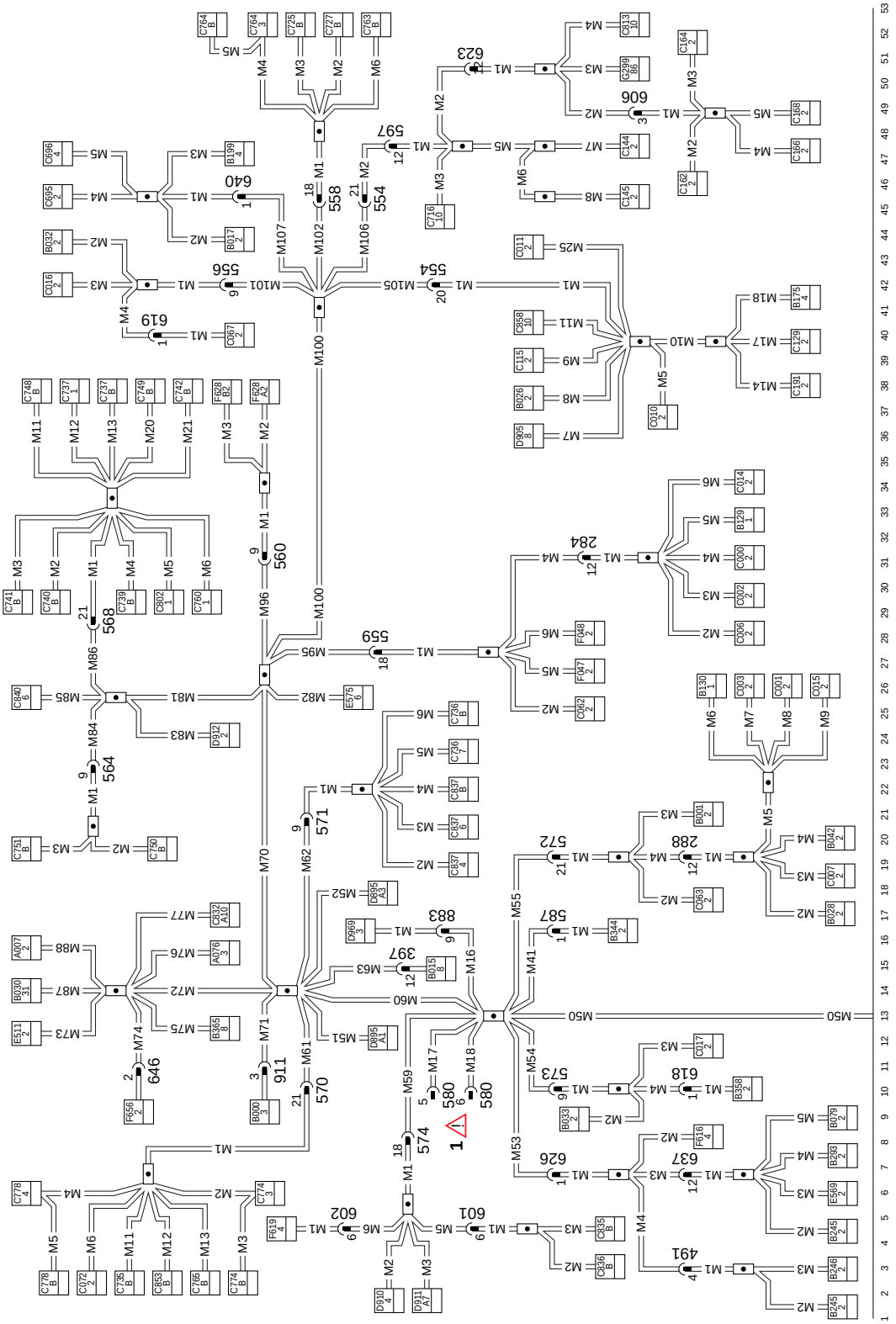
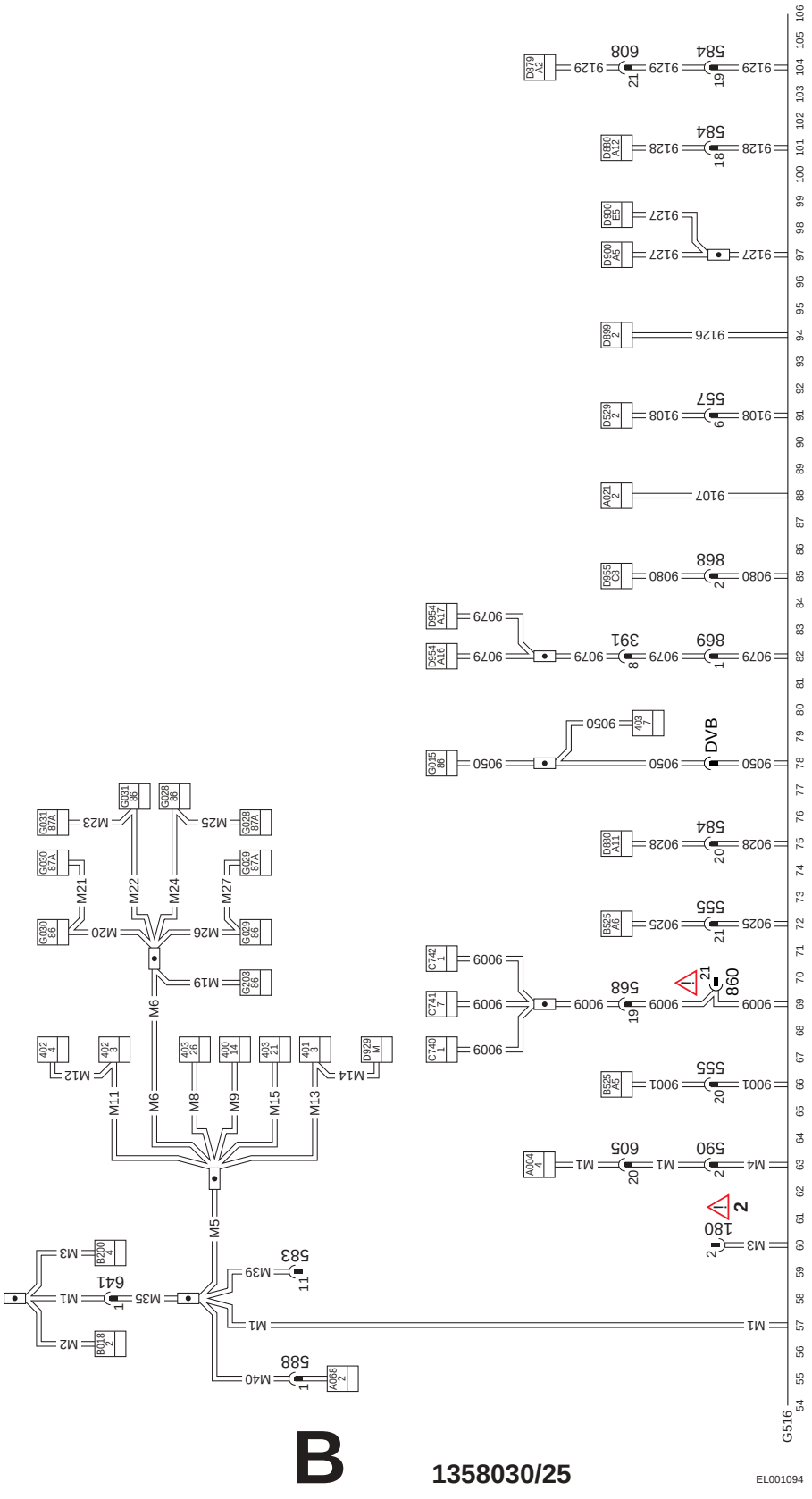


B 1358030/25

EL001093



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C CAN-OVERVIEW

This section diagram gives an overview of all the CAN connections, with wire markings and connector points.

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

8 Connectors 391 and 869 only applicable to an AS Tronic gearbox.

22 If the vehicle is fitted with an ECS-DC3 system, electronic unit ECS-DC3 (D903) should be read here.

37 If the vehicle is fitted with an ABS system, electronic unit ABS/ASC-DC3 (D850) should be read here.

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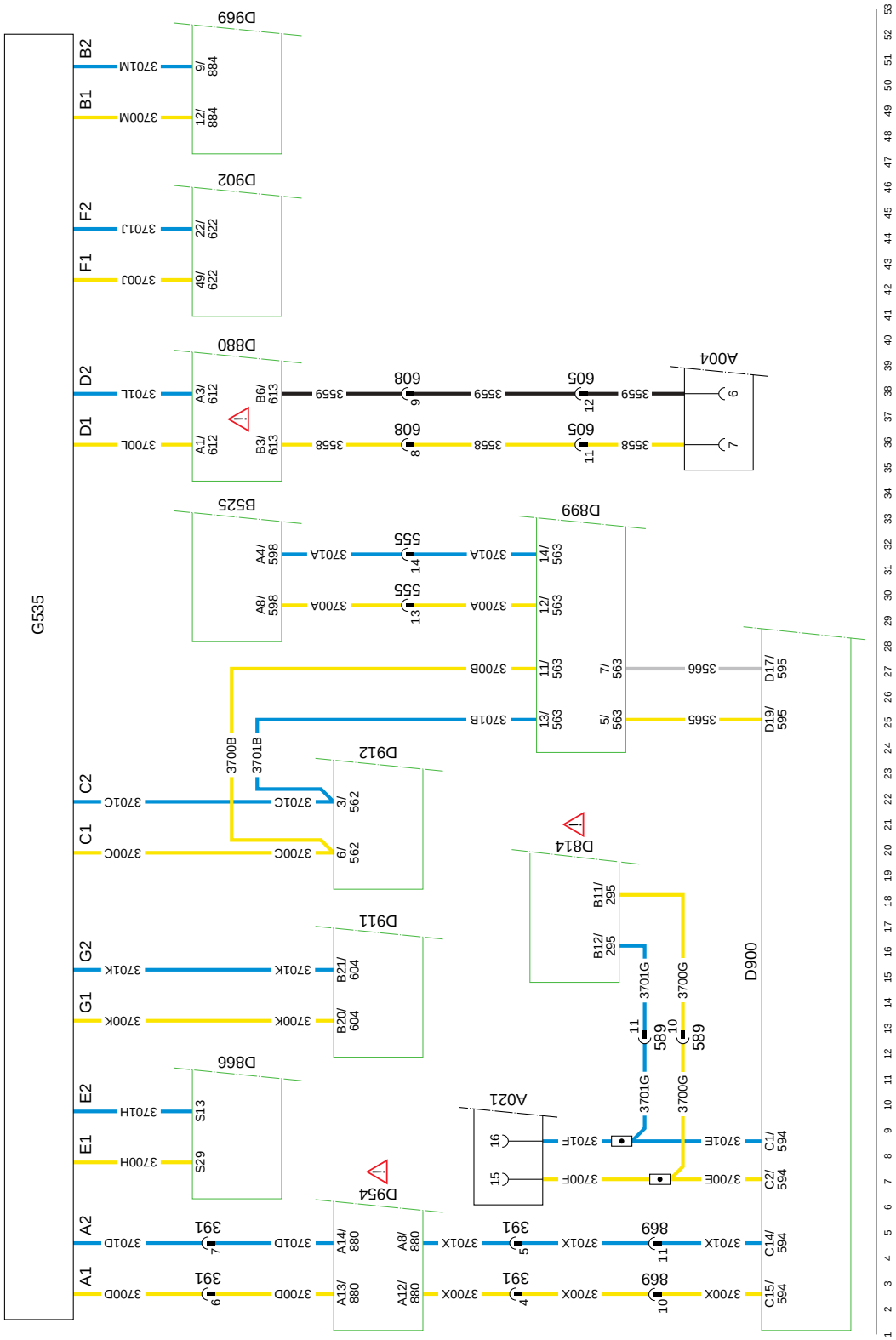

C **1358030/25** EL001095

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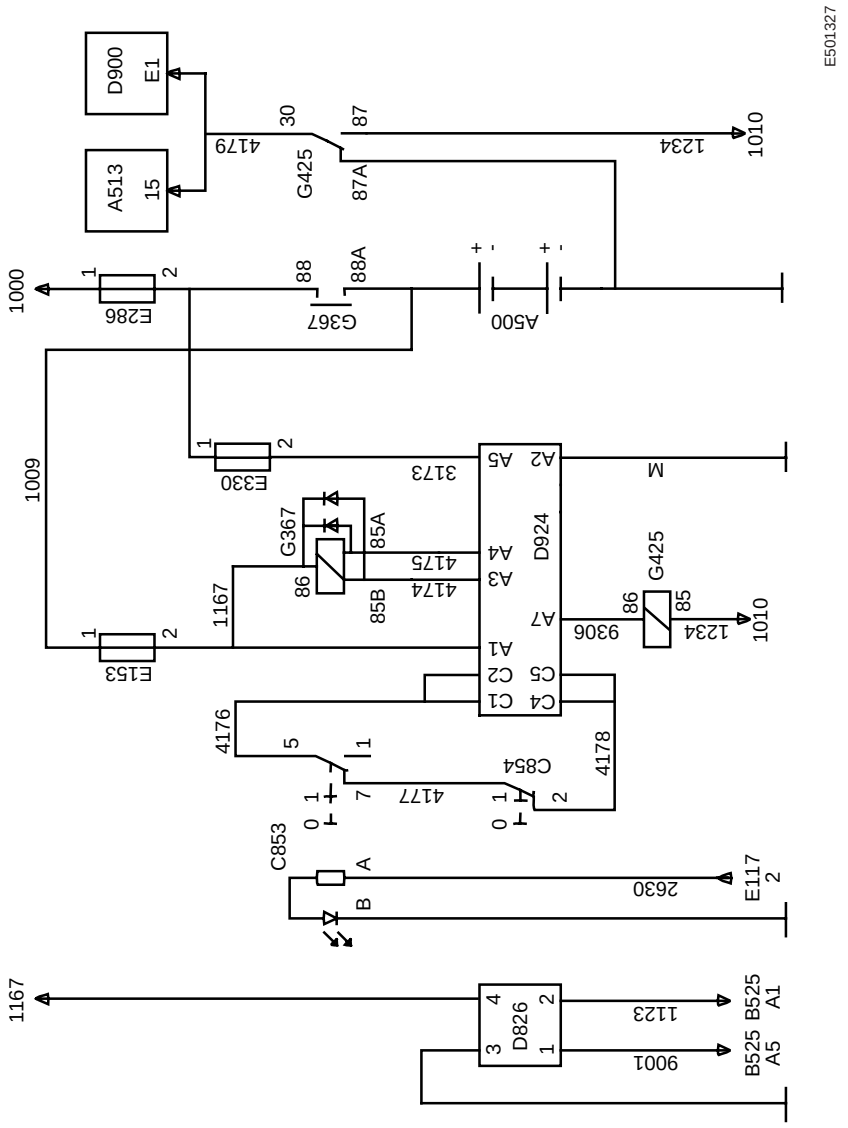

1 MAIN SWITCH

MAIN SWITCH FOR VLG/ADR IN COMBINATION WITH AN ALLISON GEARBOX

If the vehicle has an Allison gearbox and the system must meet specific safety requirements, wire no. 1009 (Allison power supply) should be connected to connection 88a of relay G367.

Basic code number	Description
A500	Batteries
A513	Integrated voltage regulator generator
B525	Tachograph
C853	Switch for main switch in cab
C854	Switch for main switch on chassis
D826	Electronic unit for VLG current limiter
D900	CF65/75/85 VIC electronic unit
D924	Electronic unit for main switch
E153	Engine stop main switch fuse for main switch
E286	High output fuse
E330	Fuse, 'sens' wire main switch
G367	Relay, power supply main switch
G425	Relay, main switch

11

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Electrically closing the main switch
The main switch (D924) can be closed:
- Electrically in the cab using switch C853
- Electrically on the chassis using switch C854

ATTENTION: Switches C853 and C854 are connected in series. When C853 or C854 is switched on, the other switch must be in the 'main switch on' position.

When C853 or C854 is operated, the C1 and C2 connections are connected to the C4 and C5 connections through wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Relay G367 is immediately energised through wire 4174 and connection point A3 (A3 is connected to earth in the unit for 0.5 seconds). This connects point 88a to 88 of relay G367. The positive pole of the batteries is now connected to the vehicle's power supply.
Immediately after switch C853 closes, connection point A7 is internally connected to earth.

Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Electrically opening the main switch
The main switch (D924) can be opened:
- Electrically in the cab using switch C853
- Electrically on the chassis using switch C854

ATTENTION: Switches C853 and C854 are connected in series. When C853 or C854 is switched on, the other switch must be in the 'main switch on' position.

When C853 or C854 is operated, the C1 and C2 connections are disconnected from the C4 and C5 connections through wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Two actions are carried out immediately after switch C853 is opened:
1. Connection point A7 is disconnected from earth (A2) in the unit.
   If the engine is running, it is switched off.
2. After a delay of approx. 6 seconds, relay G367 is connected to earth in the unit for approx. 0.5 seconds via wire 4175 and connection point A4. This breaks the connection between points 88a and 88 of relay G367. The batteries are now disconnected from the vehicle's power supply.

Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Note:
When one of the switches (C853 or C854) that activate the electronic unit (close main switch) is operated, relay G367 is activated after approximately 3 seconds. If one of the switches is operated again within the 3 seconds, the electronic unit (D924) will select the priority 'main switch ON'.

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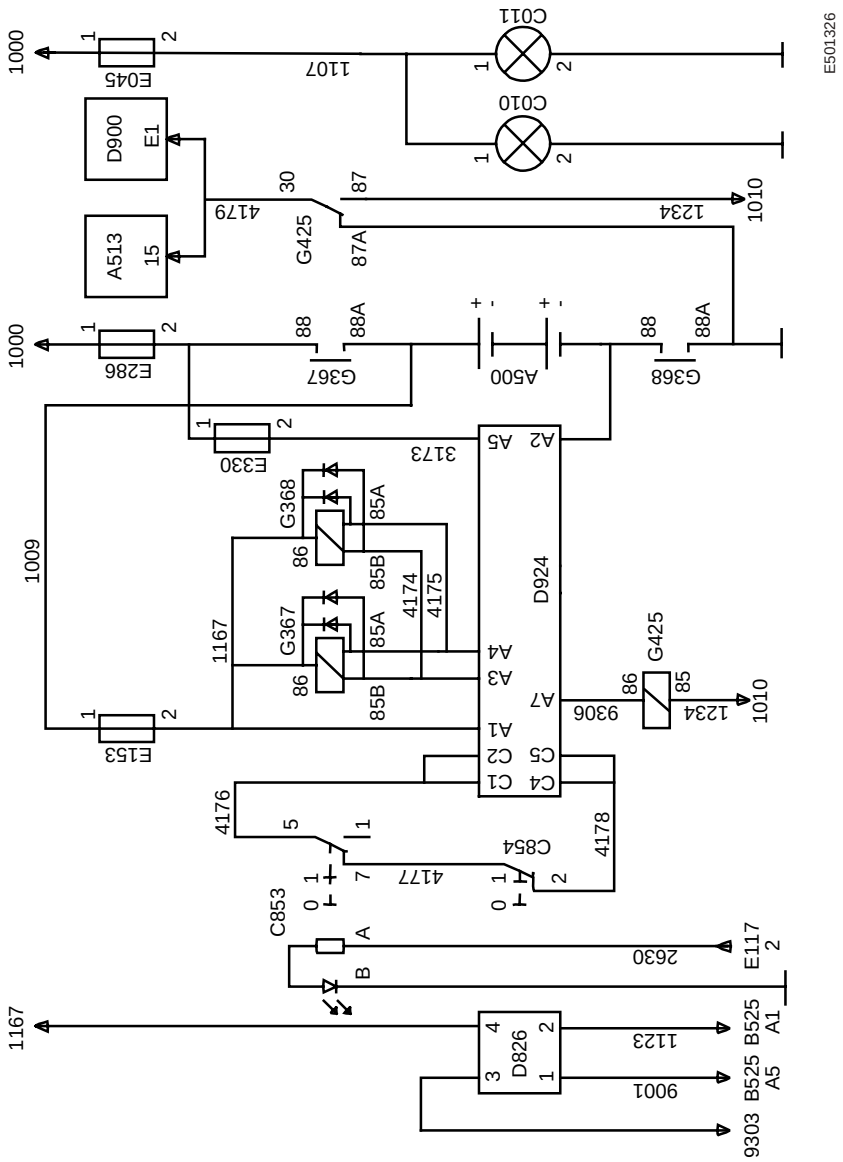

MAIN SWITCH FOR PETREG
If the vehicle has an Allison gearbox and the system must meet specific safety requirements, wire no. 1009 (Allison power supply) should be connected to connection 88a of relay G367.

Basic code number	Description
A500	Batteries
A513	Integrated voltage regulator generator
B525	Tachograph
C010	Position of cab lamp on driver's side
C011	Position of co-driver's side cab lamp
C853	Switch for main switch in cab
C854	Switch for main switch on chassis
D826	Electronic unit for VLG current limiter
D900	CF 65/75/85 VIC electronic unit
G368	Relay, main switch earth
D924	Electronic unit for main switch
E045	Fuse, interior lighting
E117	Fuse, search light
E153	Engine stop main switch fuse for main switch
E286	High output fuse
E330	Fuse, 'sens' wire main switch
G367	Relay, power supply main switch
G425	Relay, main switch

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Electrically closing the main switch
The main switch (D924) can be closed:
- Electrically in the cab using switch C853
- Electrically on the chassis using switch C854

ATTENTION: Switches C853 and C854 are connected in series. When C853 or C854 is switched on, the other switch must be in the 'main switch on' position.

When C853 or C854 is operated, the C1 and C2 connections are connected to the C4 and C5 connections through wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Relays G367 and G368 are immediately energised through wire 4174 and connection point A3 (A3 is connected to earth in the unit for 0.5 seconds). This connects point 88a to 88 of relays G367 and G368. The positive and the negative poles of the batteries are now connected to the vehicle's power supply.
Immediately after switch C853 closes, connection point A7 is internally connected to earth.
Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Electrically opening the main switch
The main switch (D924) can be opened:
- Electrically in the cab using switch C853
- Electrically on the chassis using switch C854

ATTENTION: Switches C853 and C854 are connected in series. When C853 or C854 is switched on, the other switch must be in the 'main switch on' position.

When C853 or C854 is operated, the C1 and C2 connections are disconnected from the C4 and C5 connections through wire 4176, contacts 5 - 7 of switch C853, wire 4177, contacts 1 - 2 of switch C854 and wire 4178.
Two actions are carried out immediately after switch C853 is opened:
1. Connection point A7 is disconnected from earth (A2) in the unit.
   If the engine is running, it is switched off.
2. After a delay of approx. 6 seconds, relays G367 and G368 are connected to earth in the unit for approx. 0.5 seconds via wire 4175 and connection point A4. This breaks the connection between points 88a and 88 of relays G367 and G368.
   The batteries are now disconnected from the vehicle's power supply.

Connection point A5 is connected to the positive pole via wire 3173 and fuse E330 after connection point 88 of relay G367. This connection transmits a signal to the ECU to indicate that relay G367 has switched.

Note:
When one of the switches (C853 or C854) that activate the electronic unit (close main switch) is operated, relays G367 and G368 are activated after approximately 3 seconds. If one of the switches is operated again within the 3 seconds, the electronic unit (D924) will select the priority 'main switch ON'.

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MECHANICAL MAIN SWITCH
When C694 (mechanical main switch) is operated, connections B and G are connected. The earth of the batteries is now connected to the chassis. The earth connection of B525 (MTCO) is independent of the position of the main switch.

VARIANTS

Location
24 Only if the vehicle is equipped to PETREG requirements.
36 Conn. 570: Attach wire 4176 to pin 11
39 Conn. 570: Attach wire 4177 to pin 12
42 Attach wire 1123 in connector 555, pin 2.
46 Attach wire 9303 in connector 555, pin 20.
49 Only if the vehicle is equipped to PETREG requirements.
64 Attach wire 9307 in connector 555, pin 20.

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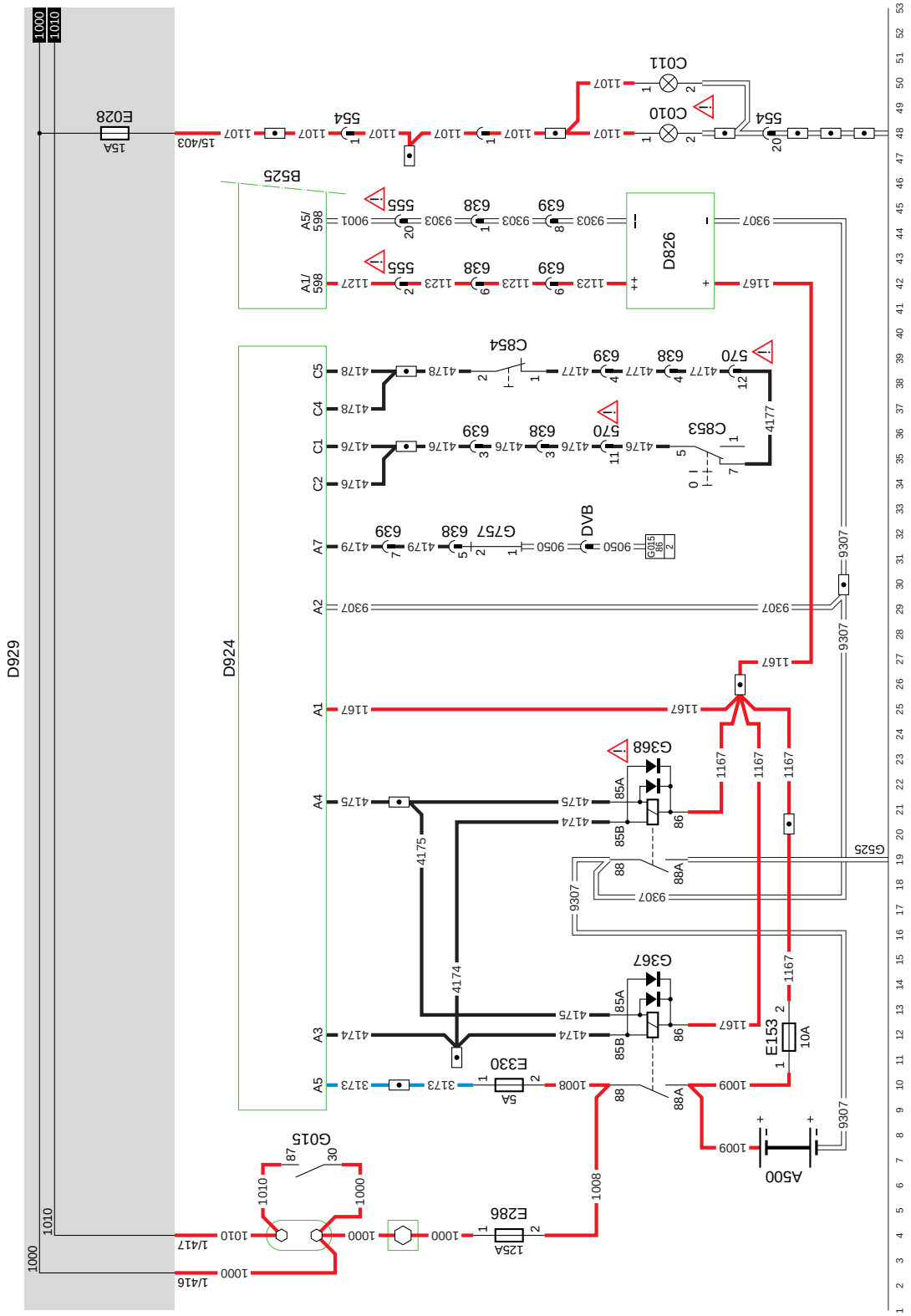
D929
D924
D826
B525
C011
C010
E028
15A
554
555
570
638
639
C854
C853
4177
DVB
G757
9050
G368
G367
85A
85B
86
88
88A
4175
4174
E153
10A
E330
5A
G015
87
30
E286
125A
A500
1167
1167
1167
9307
9307
9307
G525
1008
1009
1009
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1010
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1/417
1/416
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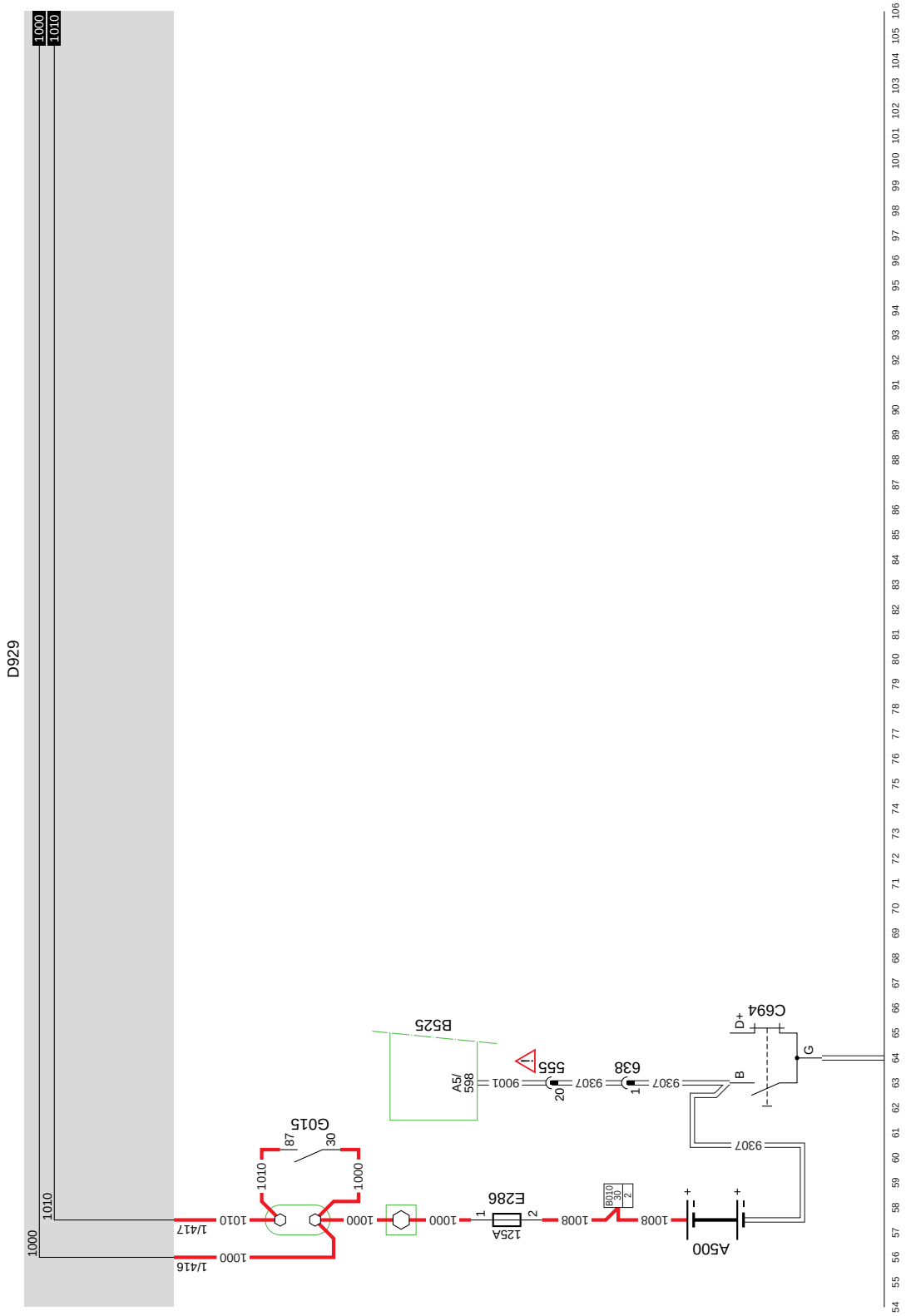
EL001096



1 **1358030/25** EL001097

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2. ALTERNATOR/IGNITION/STARTER SWITCH/CHARGING CIRCUIT

CONTACT CIRCUIT
If ignition/starter switch C539 is turned (contact 1 is connected to pin 6), the 'radio accessories power supply' relay (G377) will be energised.
Voltage is now applied to contact 1 of relay G377 through fuse E037, wire 1100, contacts 1 - 6 of switch C539, wire 1130. When G377 is energised, a connection is made between contacts 3 and 5 of G377 and a voltage is switched from the converter to the radio.

STARTING CIRCUIT
If the ignition switch C539 is turned (contact 1 is connected to 4), both contact relay G015 and G426 will be activated via wire 4001.
If the ignition switch is turned to the "start" position, a contact is made in this switch between points 1 and 2. The power is now supplied from the batteries through fuse E037, the connection 1-2 from the ignition/starter switch and wire 4004 on connection point A3 of the alarm system.
When the alarm system has been switched off using the remote control, or by activating the contact (the immobiliser switches the alarm off via CAN), wire 4004, connection point A3, is connected to wire 4004, connection point A1.

The coil of relay G203 will be activated. This closes connection 30 - 87. A voltage is now applied to connection point 50 of the starter motor, through fuse E037, wire 1100, relay contacts 30 - 87, wire 4002, causing the starter motor to turn.

When the alarm has been switched off and the door has opened, the start interrupter will be deactivated for 60 seconds. If the engine is not started within this time, the start interrupter is reactivated. If the alarm is switched off and the doors are not opened, the start interrupter remains deactivated for 9 minutes.

If the vehicle has an AS Tronic gearbox
If the vehicle has an AS Tronic gearbox, relay G185 is also fitted. When the contact is switched on and the gearbox is in neutral, relay G185 will be energised.
The voltage is now applied to the coil of relay of G203 through wire 4004, contacts 30 - 87 of relay G185, wire 4186, contacts 3 - 4, wire 4009. This relay is activated. A voltage is now applied to connection point 50 of the starter motor, through E037, wire 1100, contacts 30 - 87 and wire 4002, causing the starter motor to turn.
As soon as the motor turns, the VIC applies a voltage to connection point C42. The voltage is then applied to connection point 1 of relay G372 via wire 3157. This relay is energised, breaking the starting circuit.

Note:
When the immobiliser applies a voltage to wire 4009, the cab heater is also switched off if the vehicle must meet requirements for the transportation of hazardous substances.

CHARGING CIRCUIT
If the contact is activated, there is voltage on connection point 85 of relay G426. This relay is activated. Voltage is now applied to connection point 15 of the alternator through fuse E037, contacts 30 - 87 of relay G426, fuse E350 and wire 1380.
An internal resistor in the alternator is energised by an IC in the carbon brush holder. This resistor ensures that a low level of current passes through the energising resistor. This excites a magnetic field in the alternator.

After starting, the voltage on terminals B+ and 15 will rise to about 28.5 V. Once this voltage is reached, the IC in the regulator interrupts the pre-exciter coil to enable the voltage to be regulated. The magnetic field will now disappear, so that the generator will not be energised for a short period of time. As a result, the voltage on outputs B+ and 15 will drop.

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The regulator reactivates when the voltage drops below 27.6V. This means that the voltage supplied by the generator remains relatively constant. The batteries are supplied through the B+ generator output.

The alternator charging current warning lamp is activated via wire 1020, which is connected to the VIC (D900). The VIC controls the DIP via the CAN network. The voltage on wire 1020 is switched by the control IC.

The alternator is also equipped with a 'sens' line. This connection continuously measures the voltage on connection point 30 of the starter motor. If the voltage on connection point 30 drops, the voltage is immediately corrected by the control IC. The alternator will increase the voltage until a value of 28.5V is reached again.

VARIANTS

Location

44 If no alarm system is fitted, wires 4004 and 4004A are connected through in connector 574.

46 If no alarm system is fitted, wires 4004 and 4004A are connected through in connector 574.

52 Only for AS Tronic.

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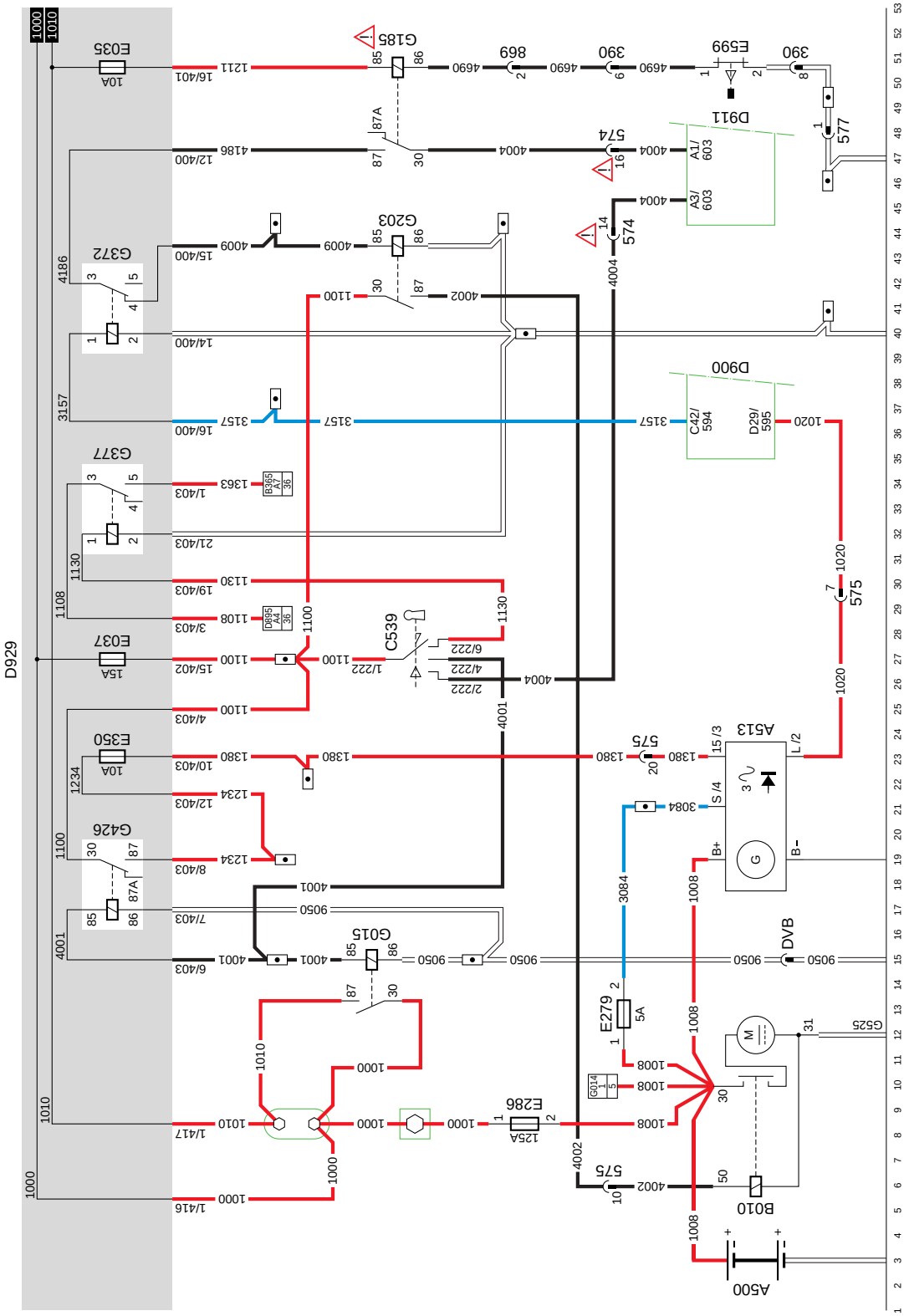

2 **1358030/25** EL001098

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11

3 TACHOGRAPH

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

22 Connector 861: connection to ECAS system

29 If the vehicle is fitted with an ECS-DC3 system, electronic unit ECS-DC3 (D903) should be read here.

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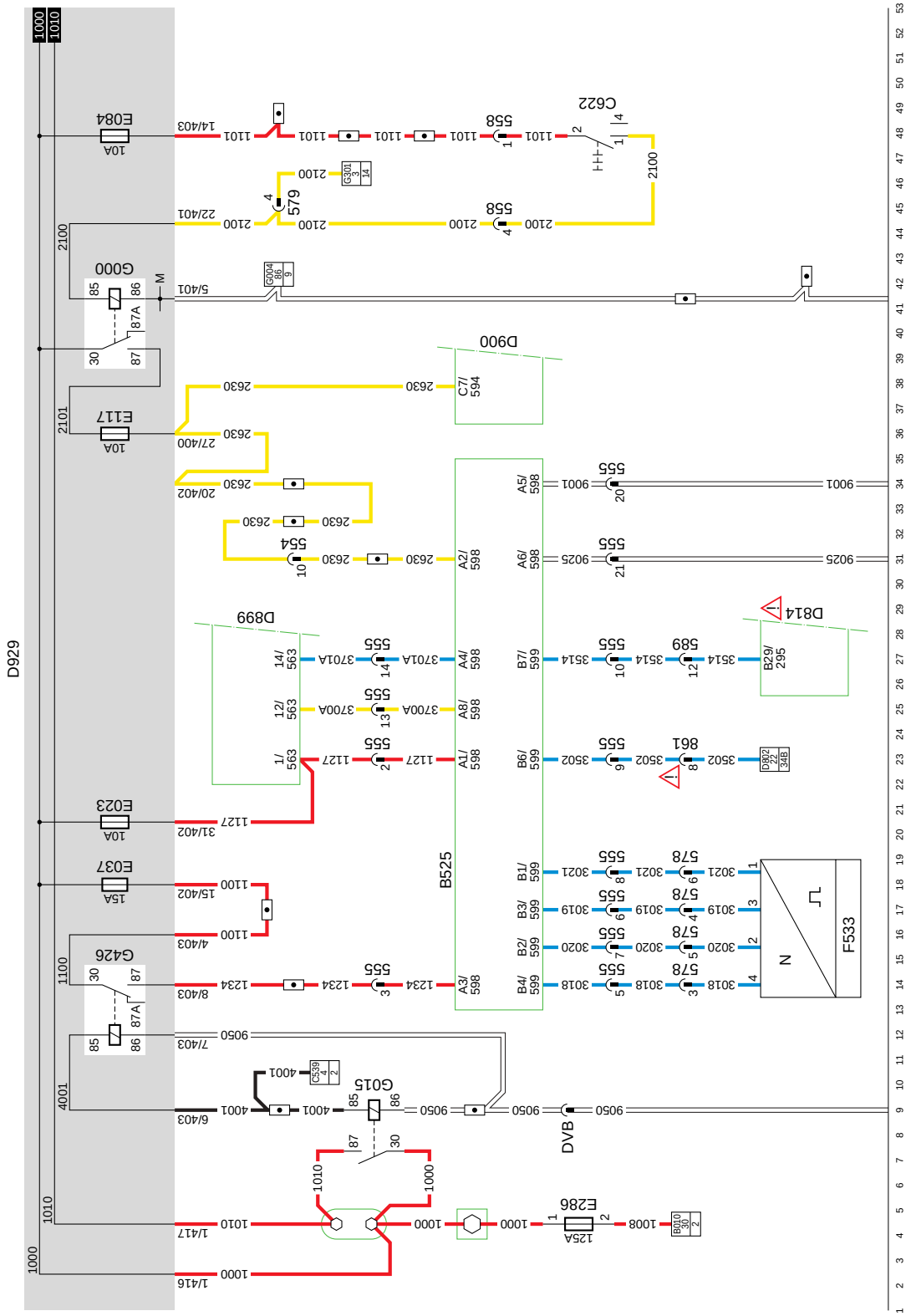

3 **1358030/25** EL001099

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4 IMMOBILISER
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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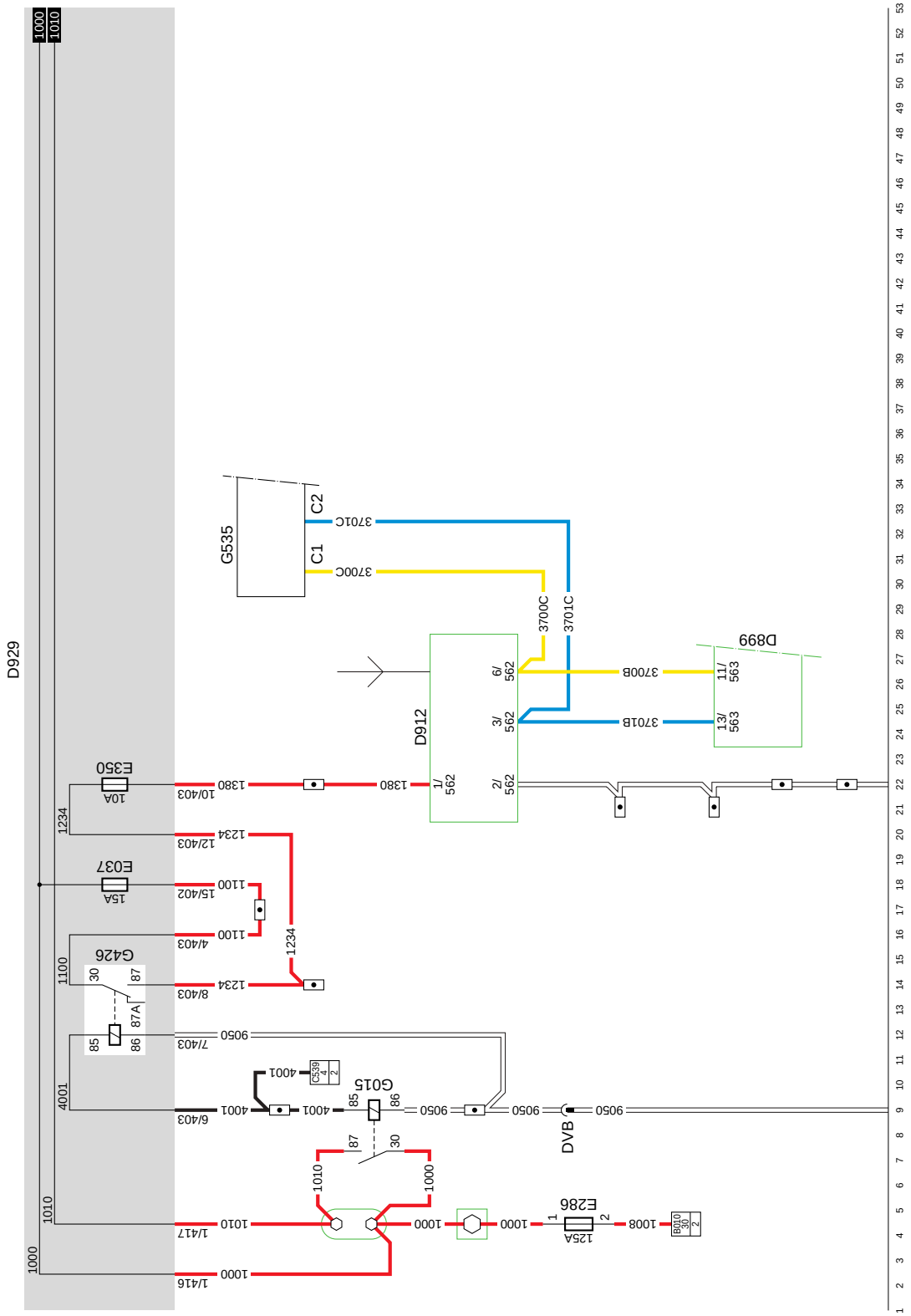

4 **1358030/25** EL001100

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5 PRE-GLOWING

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

37 If no pre-glowing system has been fitted, the wires are attached to a 'dummy' relay.

44 If the vehicle is fitted with an ECS-DC3 system, electronic unit ECS-DC3 (D903) should be read here.

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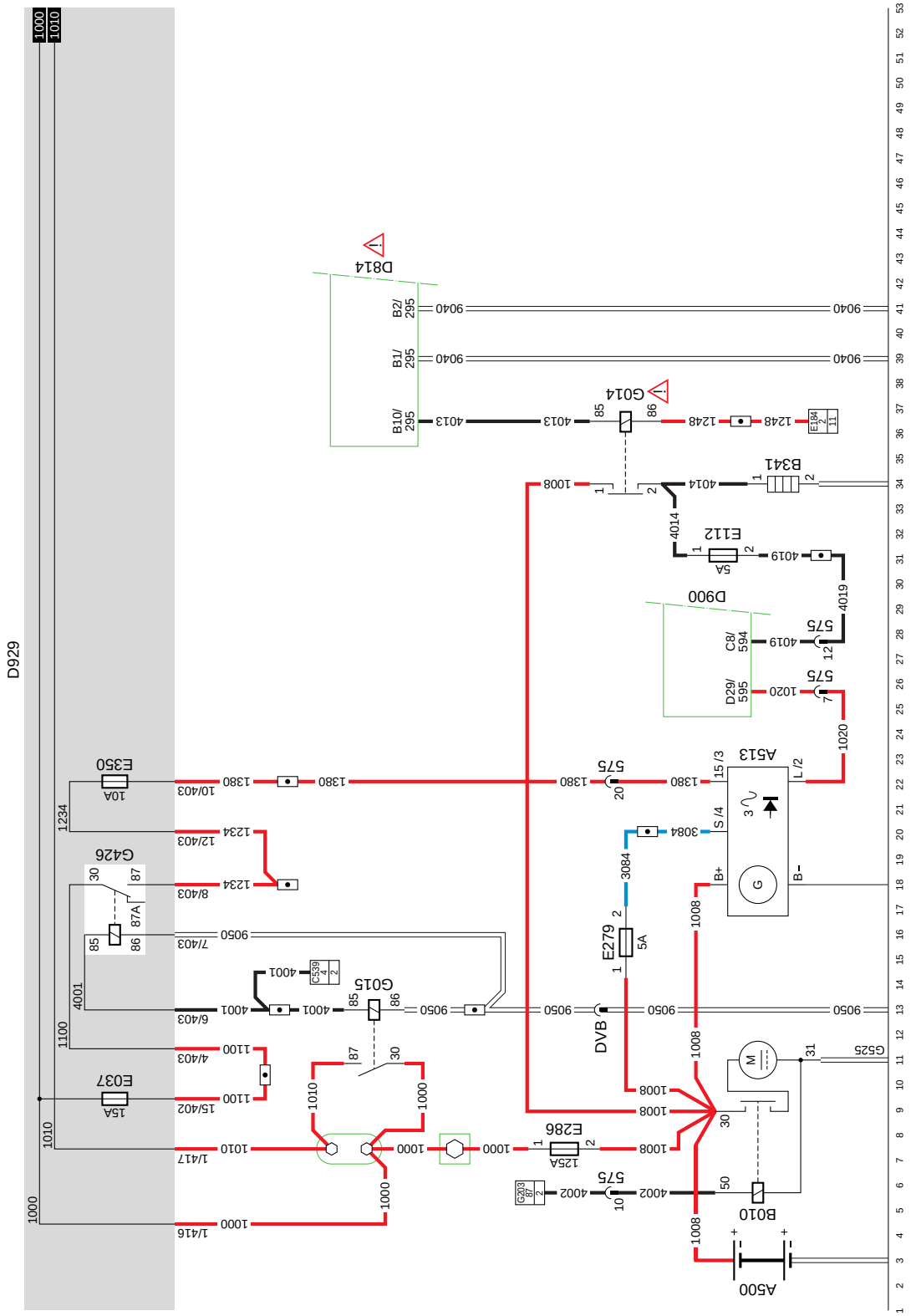

5 **1358030/25** EL001101

6 DIP-4
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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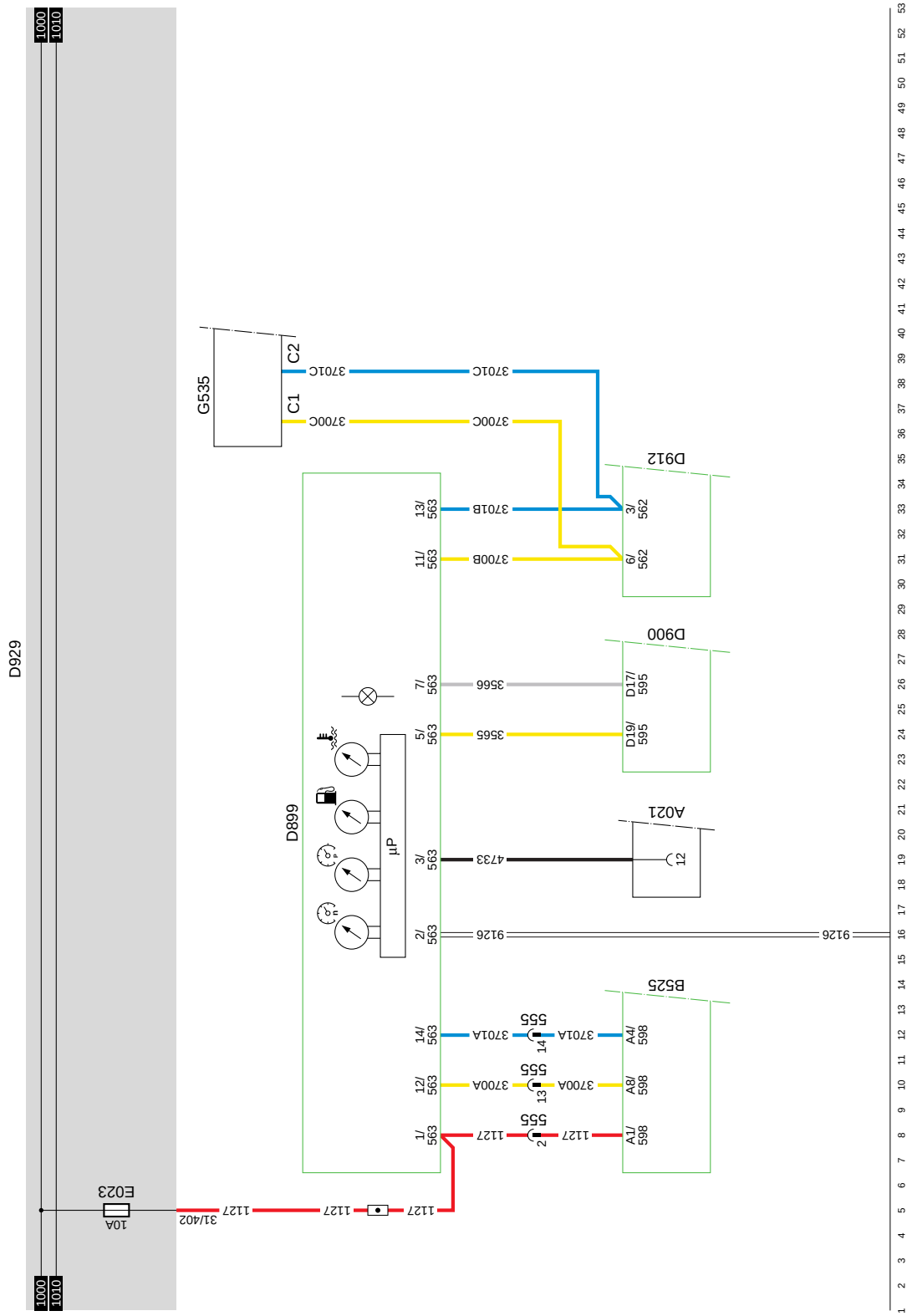

6 **1358030/25** EL001102

7 DIRECTION INDICATORS AND WARNING LIGHTS

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

3, 8 Connector 617 only for vehicle type FA.

8 Depending on whether the vehicle is fitted with a 7-pin or 15-pin plug. See also section diagram 47.

11

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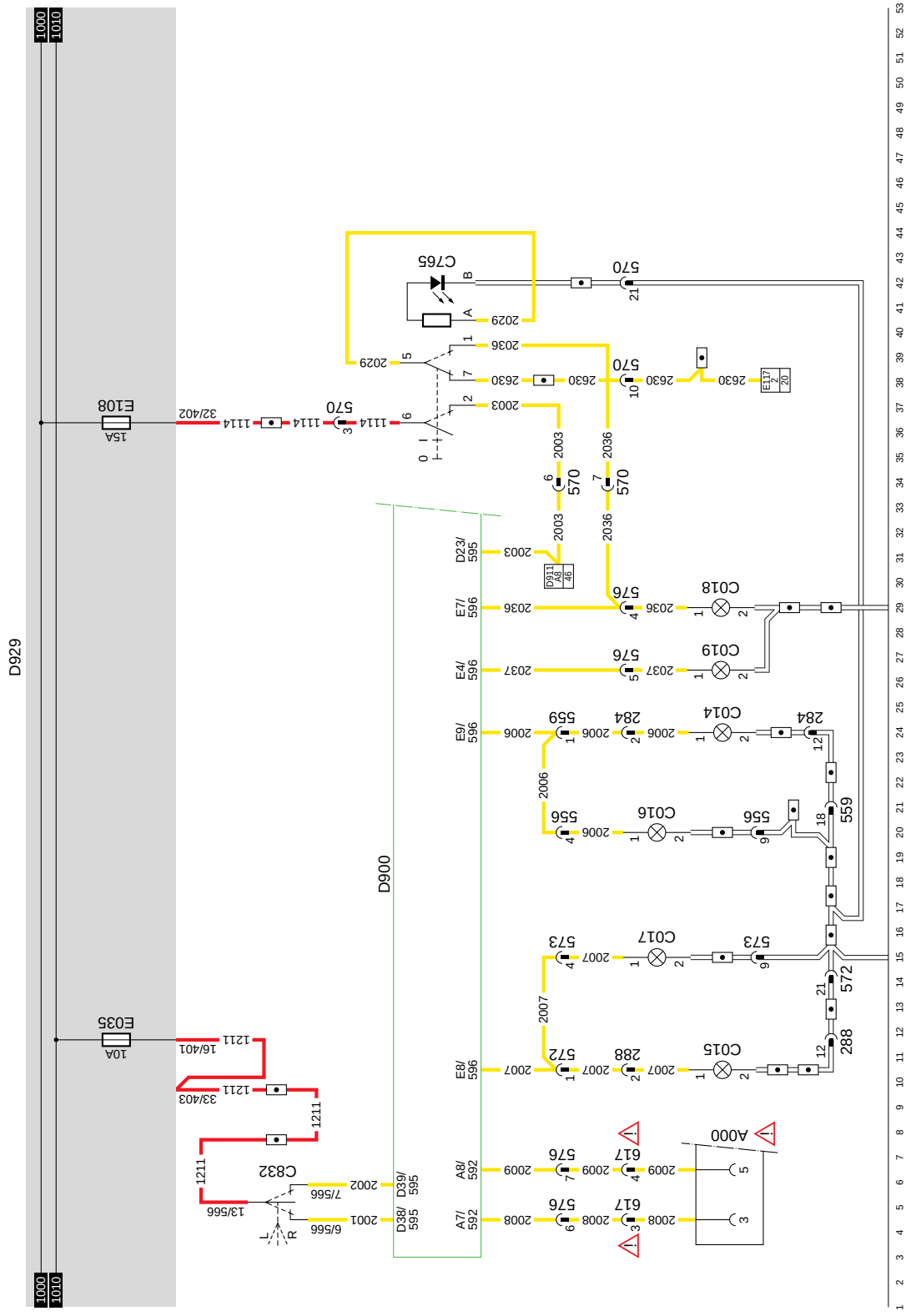

7 1358030/25 EL001103

8 VIC

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
202 Connector 584 for vehicles with ABS/ASC-D.
Connector 585 for vehicles with EBS.

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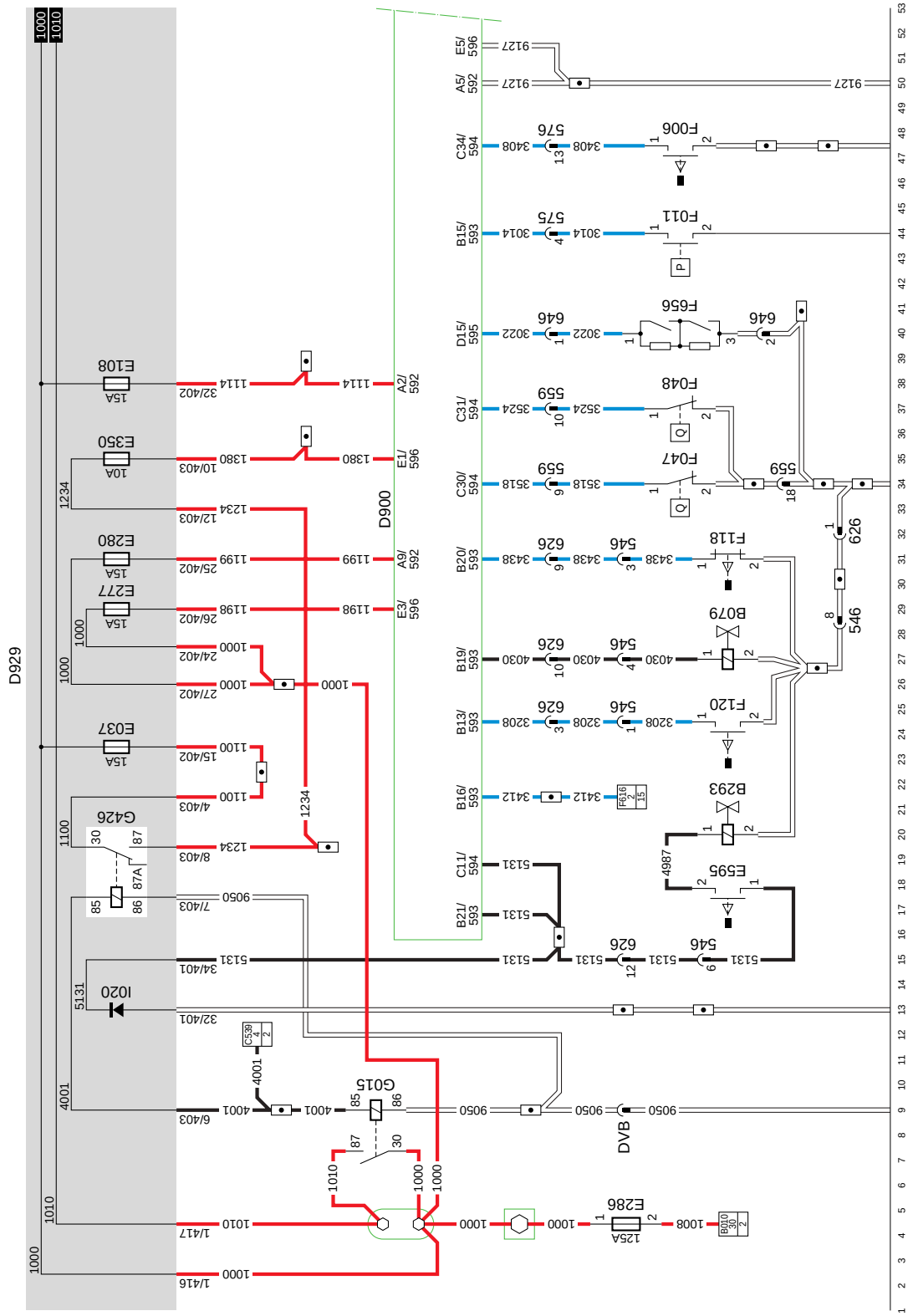
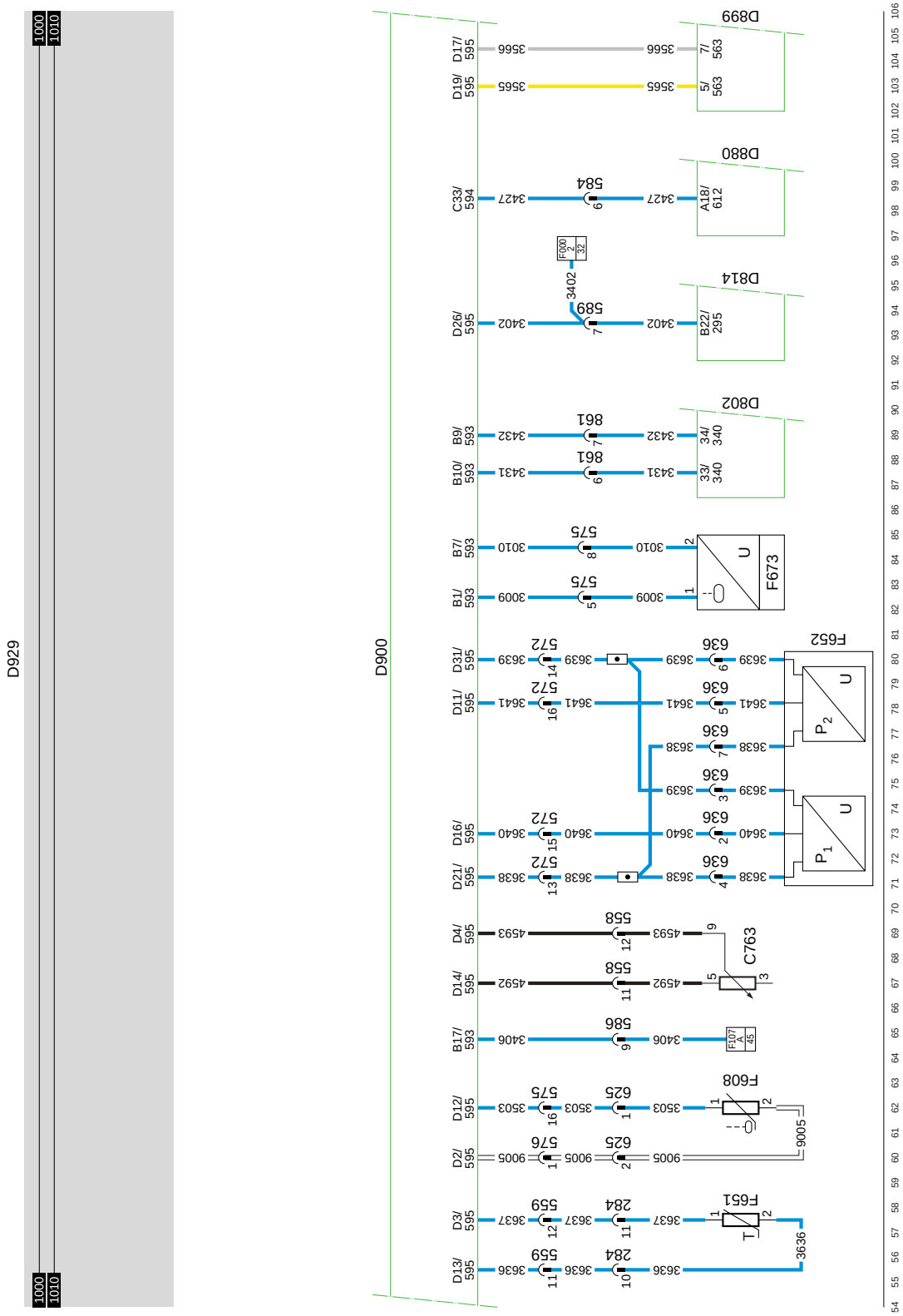


8 **1358030/25** EL001104



8 **1358030/25** EL001105

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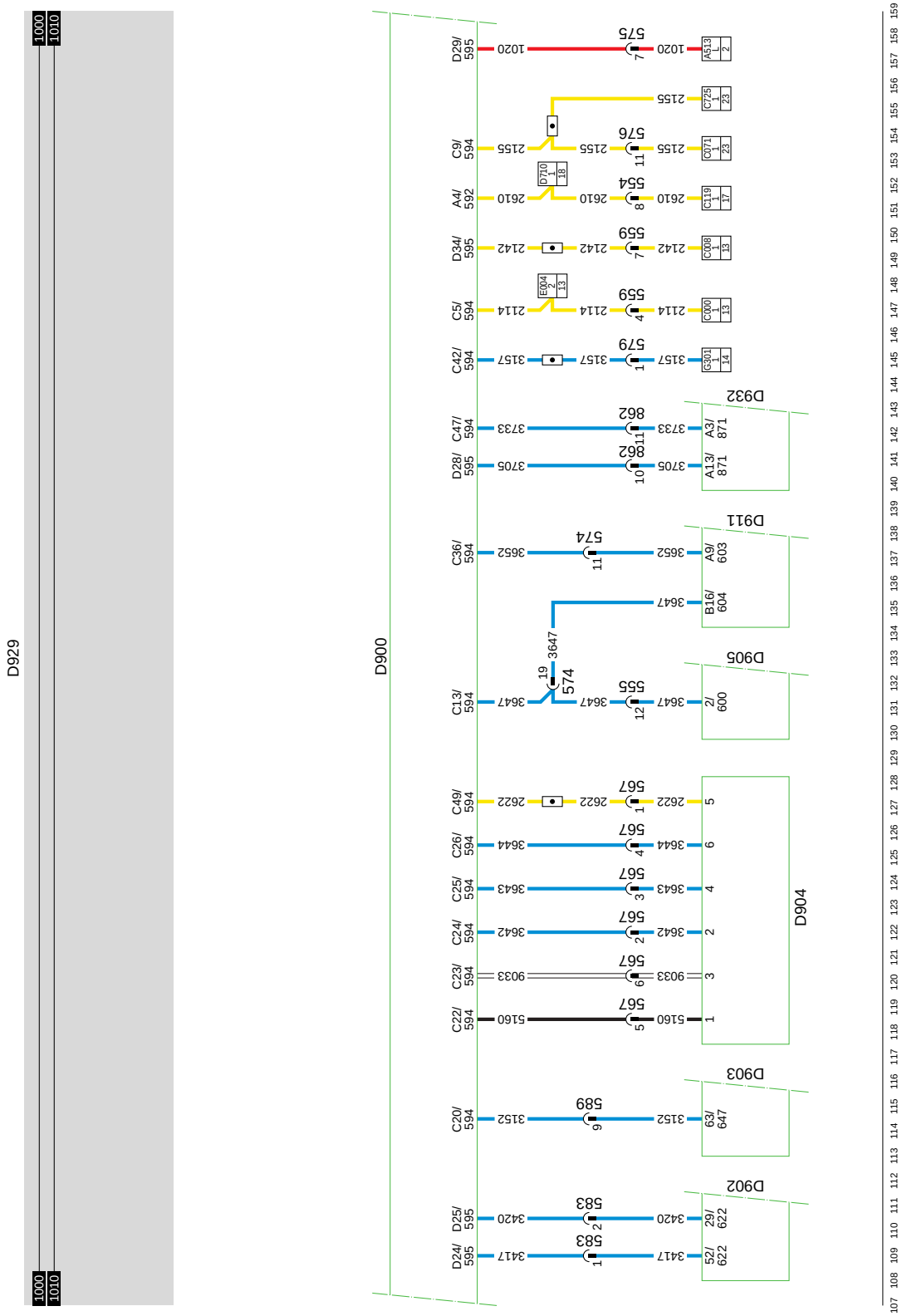
D929
1000
1010
D900
D904
D903
D902
D911
D905
D932
575
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3647
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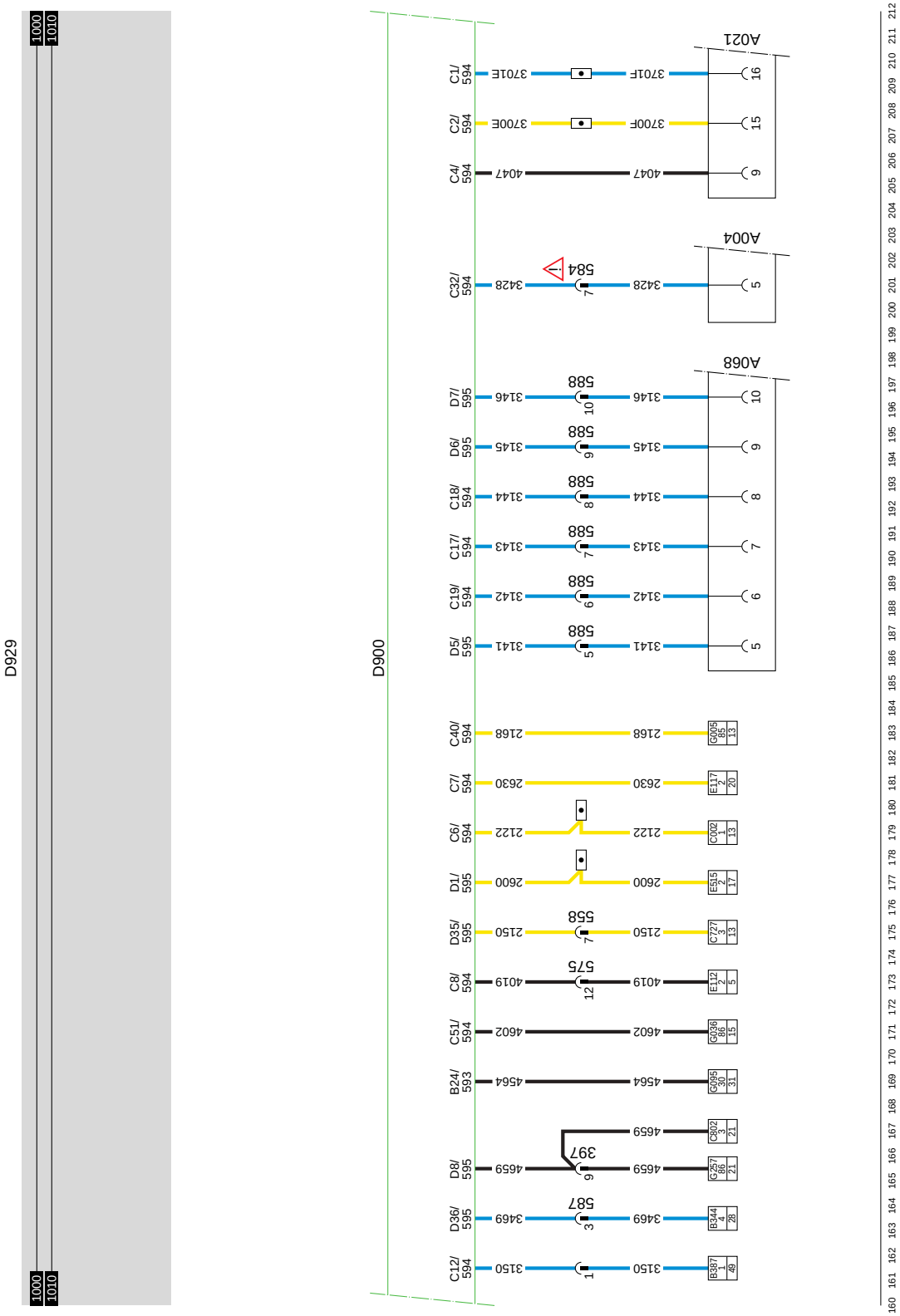
EL001106

8 **1358030/25**



8 **1358030/25** EL001107

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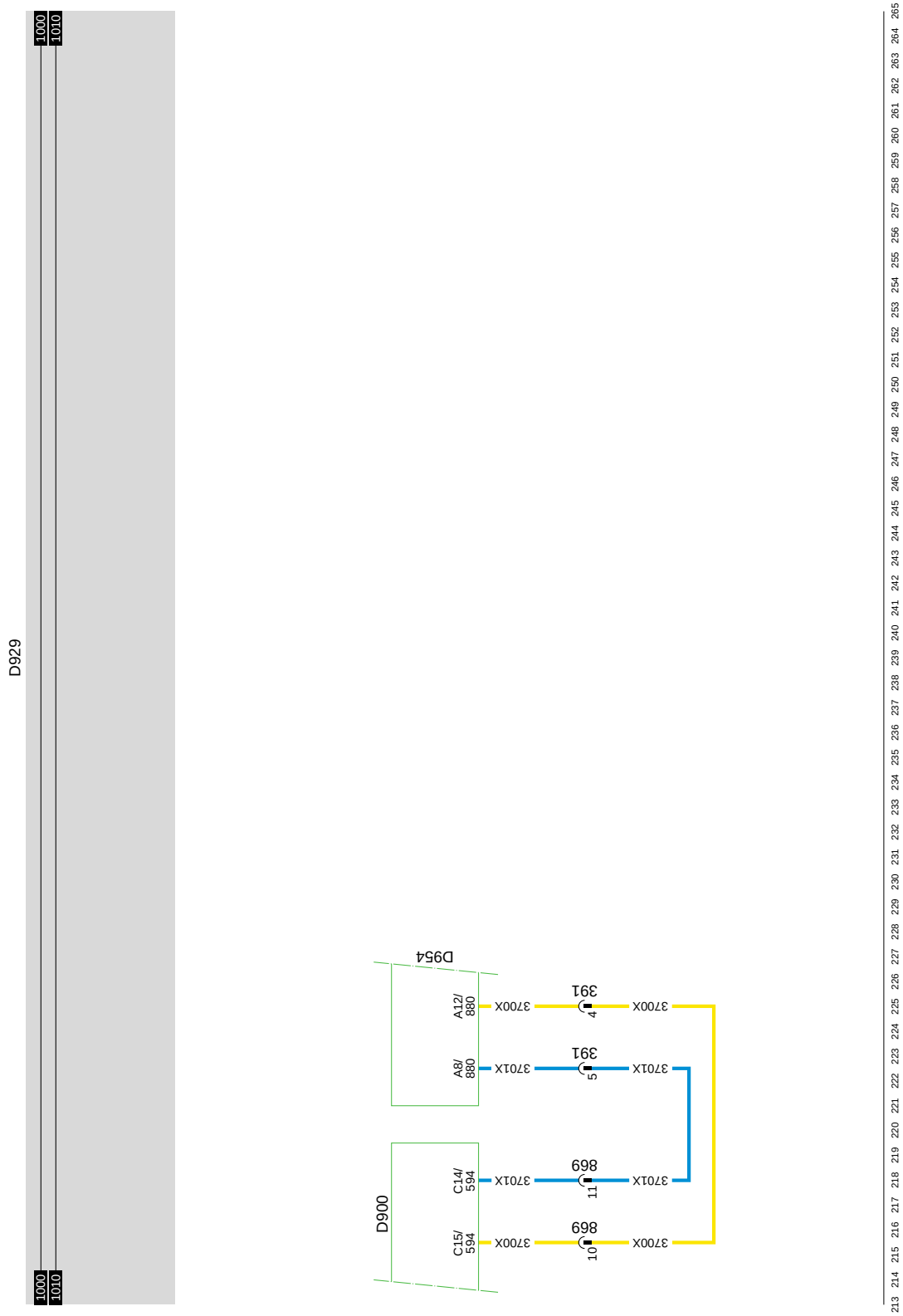

8 **1358030/25** EL001108

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9 FA MARKING AND PARKING LIGHTS

Switching the lighting switch (C622) to the 1st position (connection between contacts 2 and 1) energises the rear light/width marker light relay (G000) through fuse E084, wire 1101, contacts 2 - 1 of switch C622, wire 2100.
A voltage is applied to the left and right lights through the G000 relay contacts (30 - 87 respectively) and fuses E000 and E001.

Linked to fuse E000 are: C010, C012, C156, C158, C074 and C022. There is also a connection in connector A000 (pin 2) and connector A070 (pin 2).

Linked to fuse E001 are: C011, C013, C157, C159, C075 and C023. There is also a connection in connector A000 (pin 6) and connector A070 (pin 3).

VARIANTS

Location
45 This may be either a 7-pin or a 15-pin connector. For more information: see section diagram 47.

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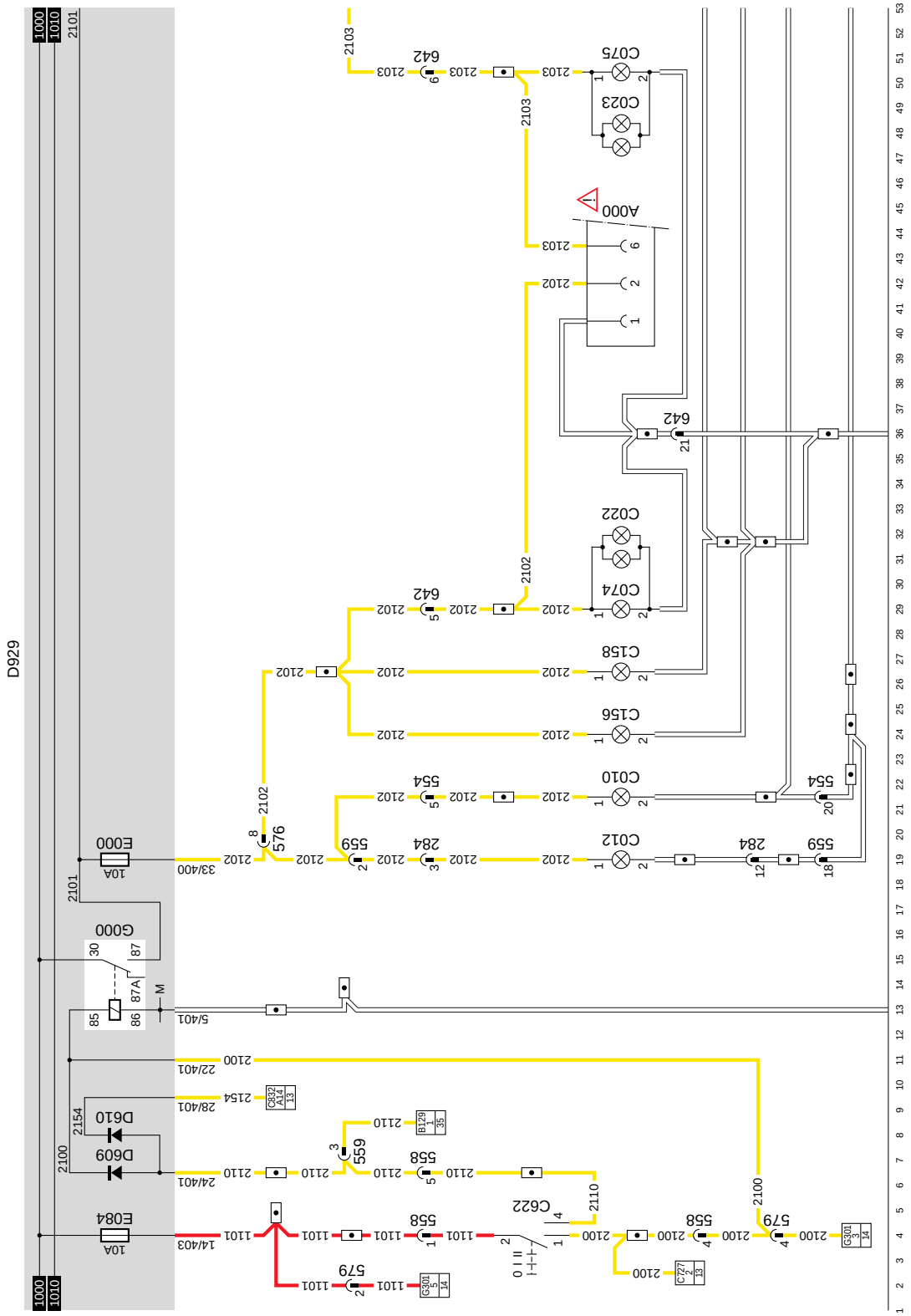
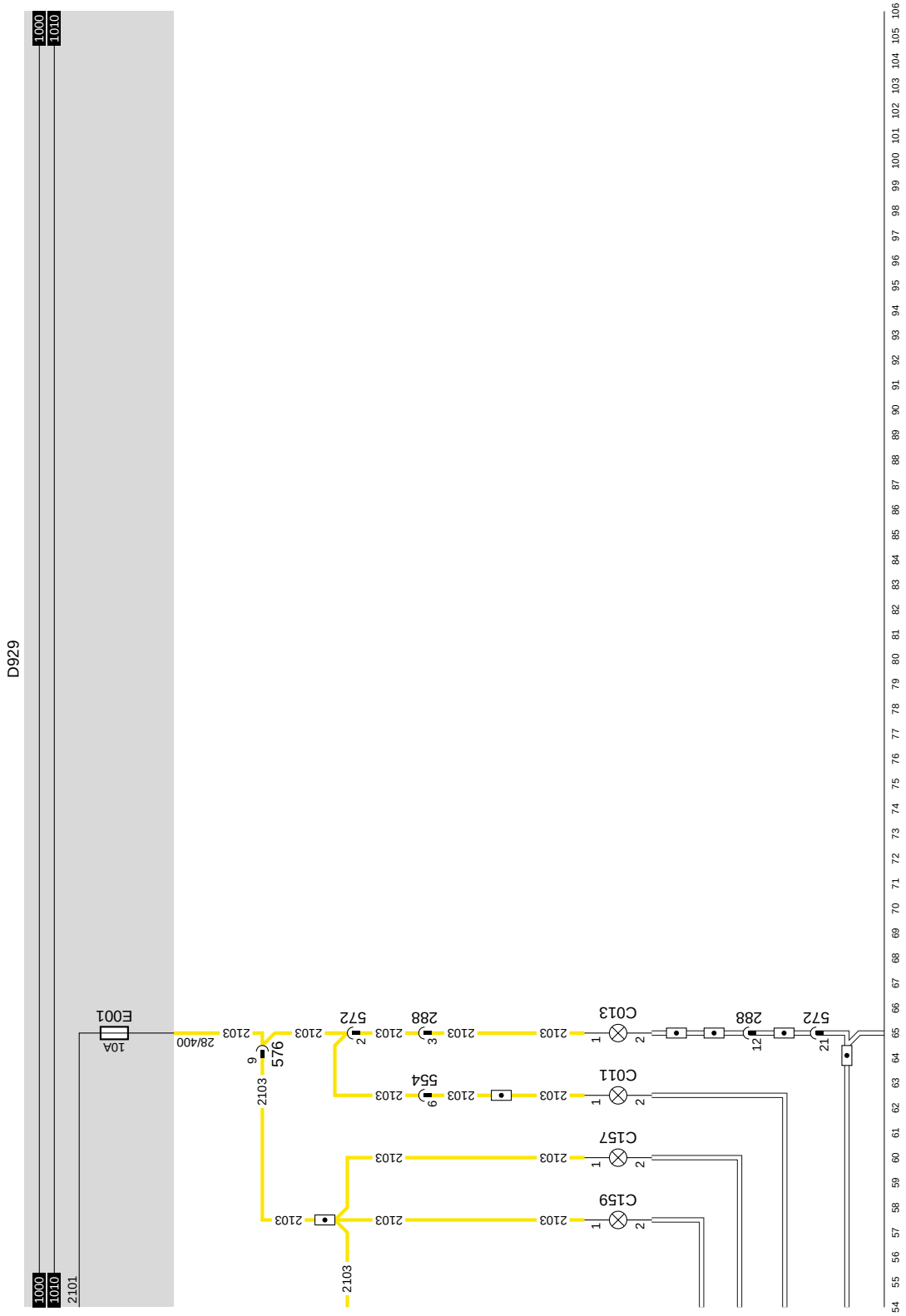


9 **1358030/25** EL001109



9 **1358030/25** EL001110

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10 FT MARKING AND PARKING LIGHTS

Switching the lighting switch (C622) to the 1st position (connection between contacts 2 and 1) energises the rear light/width marker light relay (G000) through fuse E084, wire 1101, contacts 2 - 1 of switch C622, wire 2100. A voltage is applied to the left and right lights through the G000 relay contacts (30 - 87 respectively) and fuses E000 and E001.

Linked to fuse E000 are: C010, C012, C158, C074 and C154. There is also a connection in connector A002 (pin 2).

Linked to fuse E001 are: C011, C013, C159, C075 and C155. There is also a connection in connector A002 (pin 6).

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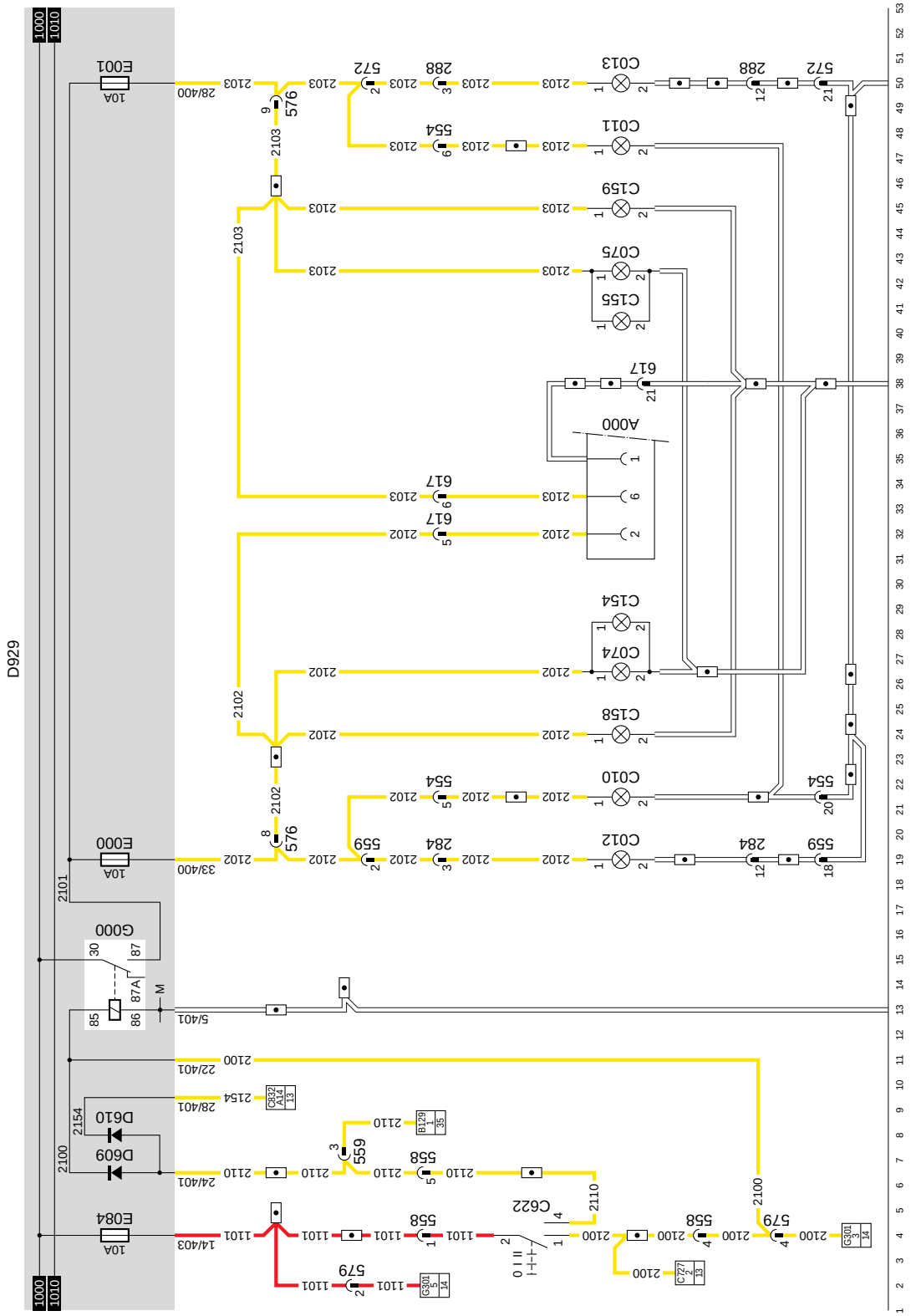

10 **1358030/25** EL001111

11

11 UPEC

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
118 Wire 6158 goes no further than connector 575.

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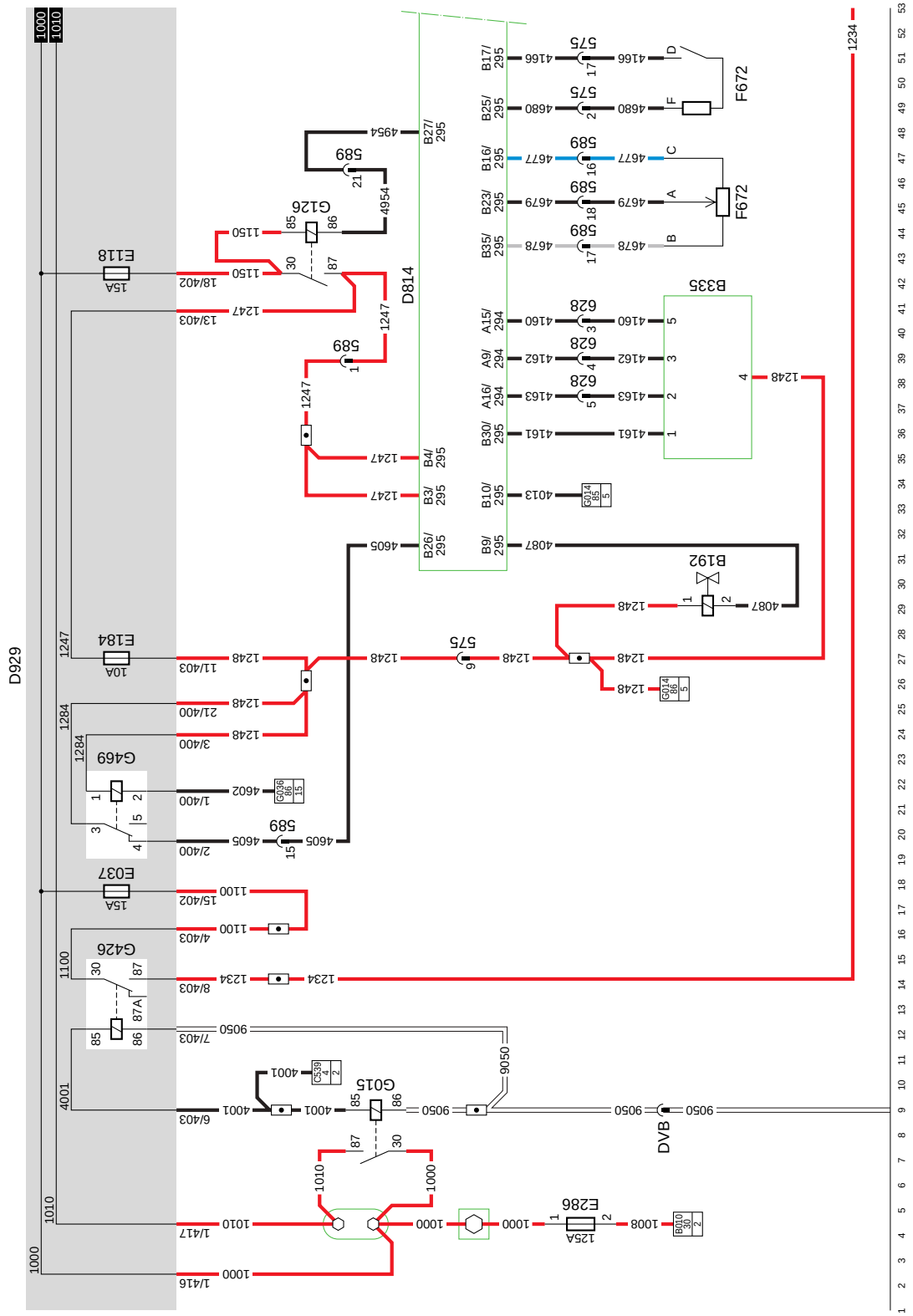
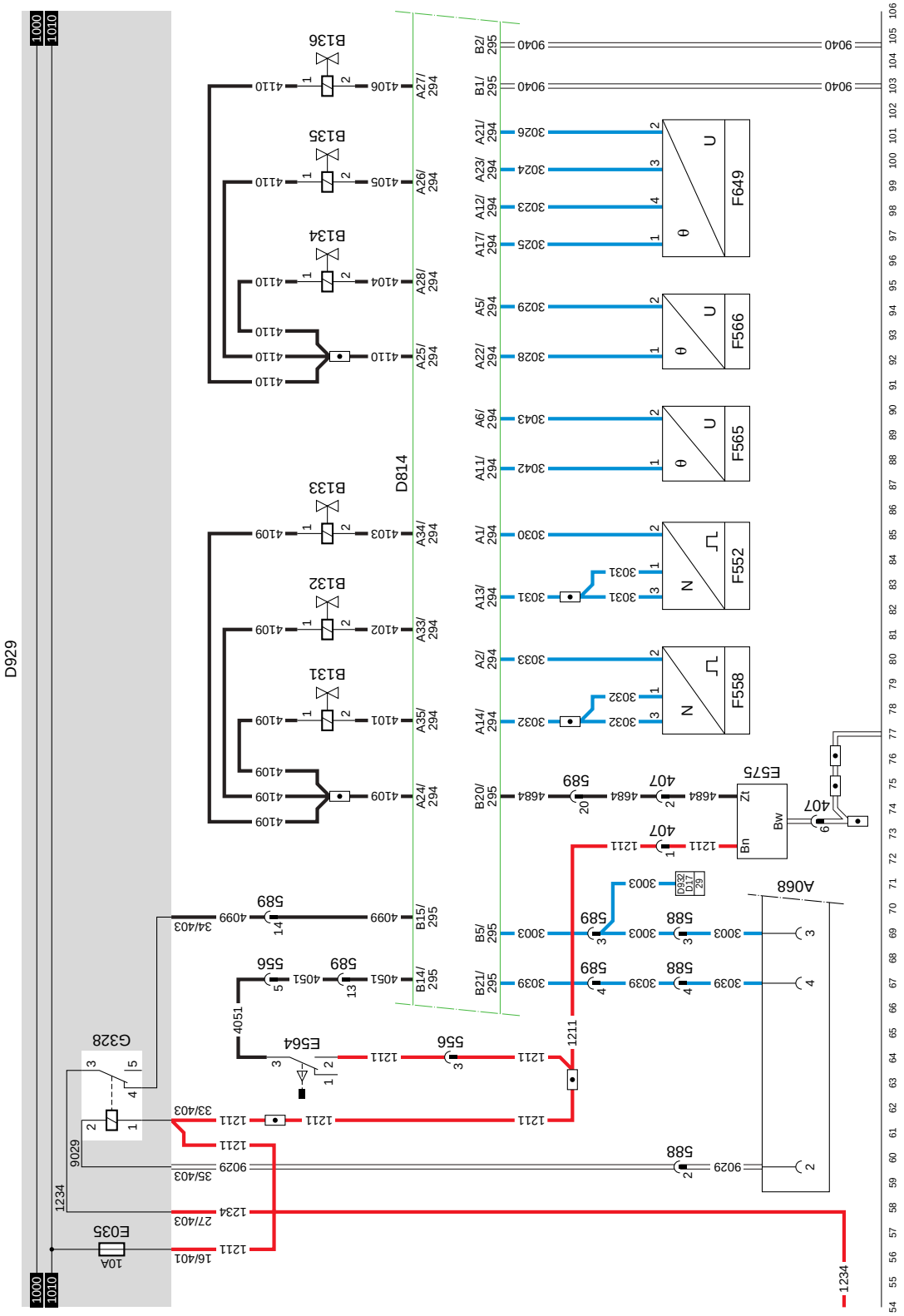


11 **1358030/25** EL001112



11 **1358030/25** EL001113

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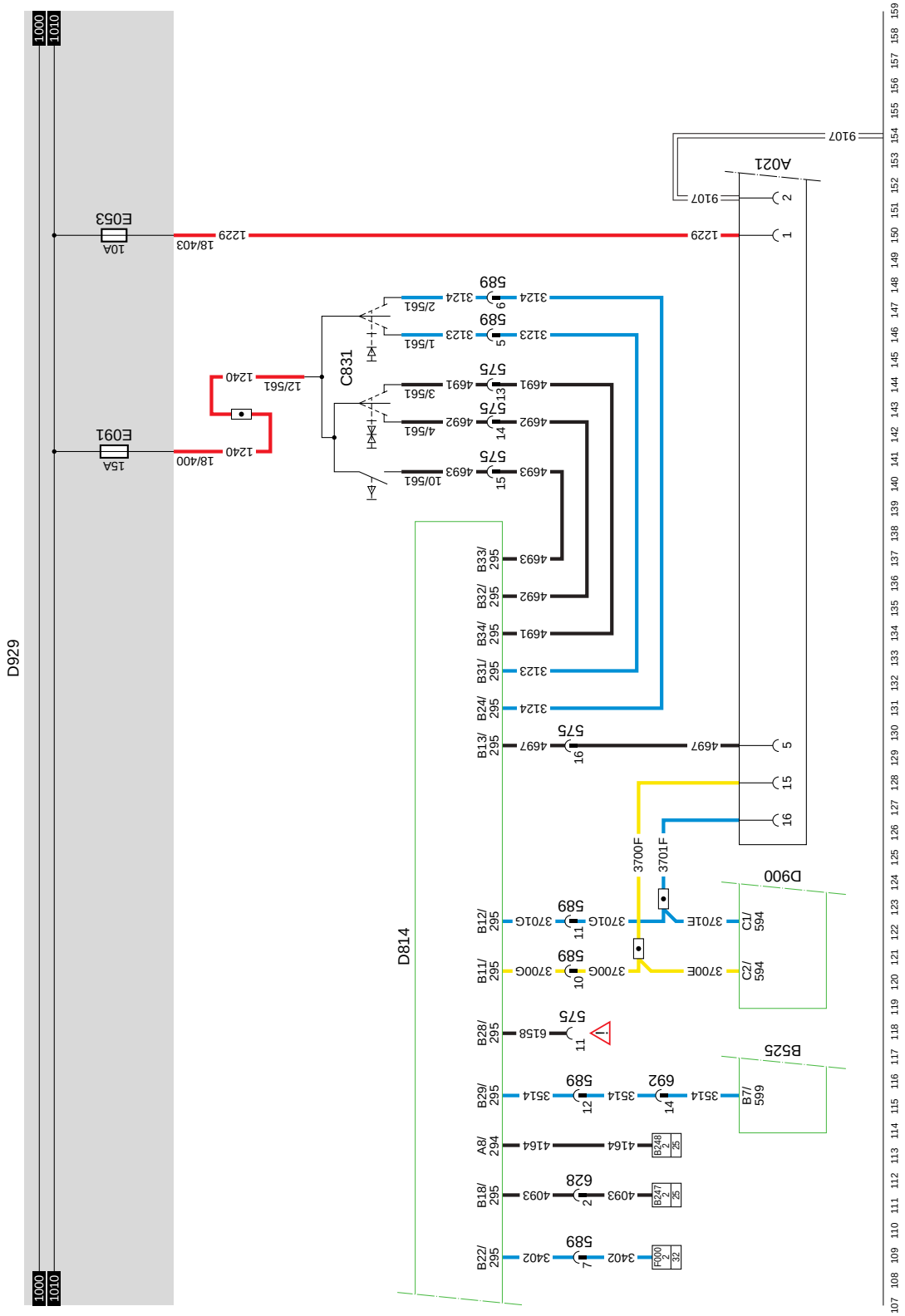

11 **1358030/25**

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11

12 REVERSING LIGHTS

When contact has been made, power is supplied to the operating switch of the reversing lights (E501) via E016 and wire 1217.
This switch is mounted in the gearbox. The contacts are closed when the gearbox is set to the "reverse" position.
The voltage is then applied to the reversing lights (C026 and C027), reversing buzzer (B176) and to the trailer connector (A001or A070) via wire 4591.
The above description applies to vehicle type FA.

VARIANTS

Location	
18, 25, 27	Connector 642 on vehicle type FA.
33	Depending on whether the vehicle is fitted with a 7-pin or 15-pin plug. See also section diagram 47.

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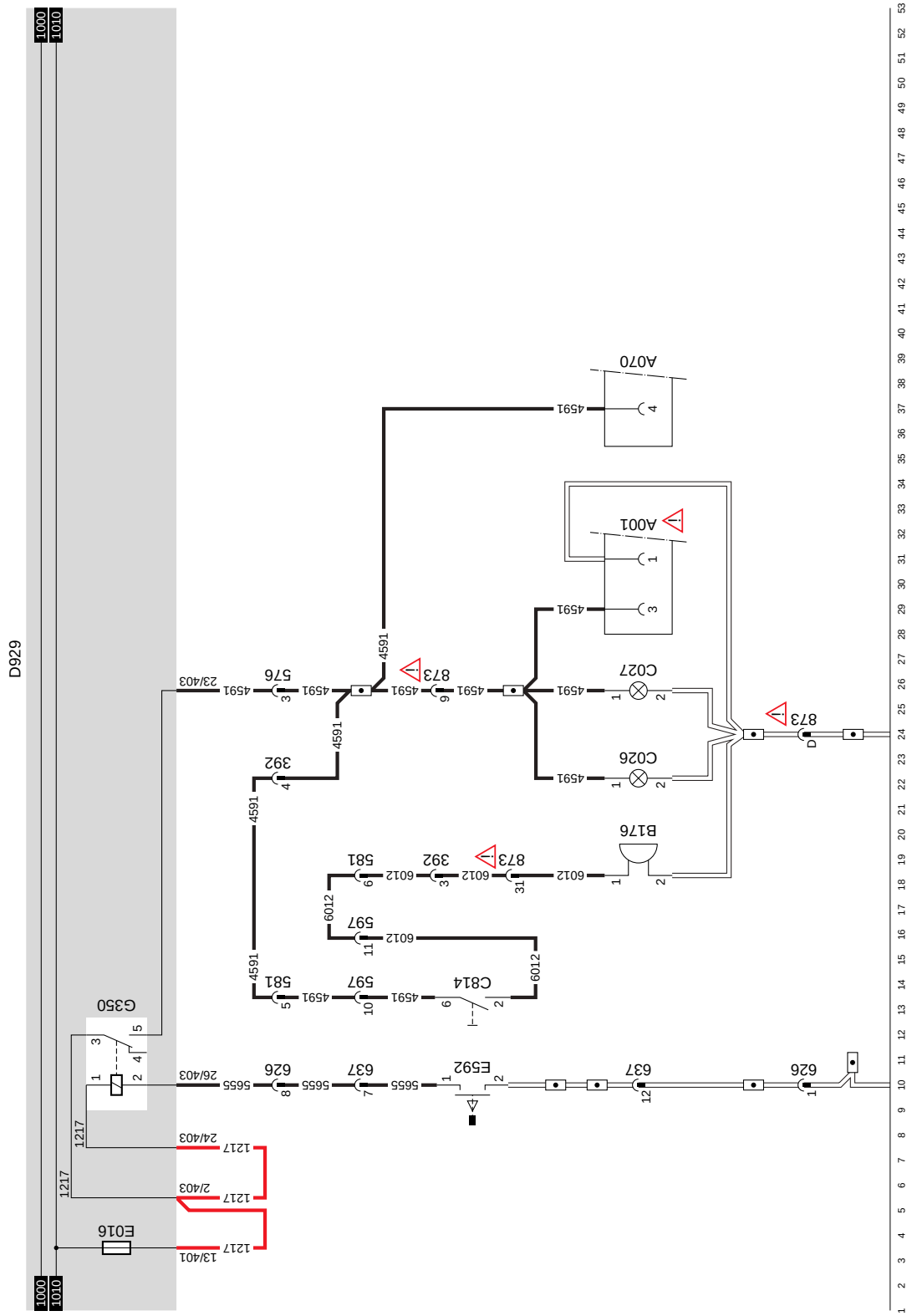

12 **1358030/25** EL001115

11

13 LIGHT SWITCH / FOG LAMPS / FA DIPPED BEAM AND MAIN BEAM SWITCH

MARKING AND PARKING LIGHTS

FOR SECTION DIAGRAM AND EXPLANATION: SEE SECTION DIAGRAM 9

LIGHT SWITCH (C622)

position 1 (“town lights”)
A voltage is applied to connection point 2 of light switch C622 through fuse E084, wire 1101. If this switch is in the “town lights” position (connection between contacts 2 and 1), the voltage is transmitted to connection point 85 of relay G000 (rear light/width marker light relay) through wire 2100. This relay is energised and contacts 30 - 87 will close. Through contacts 30 - 87 of relay G000, wire 2101, a voltage is now applied to corner marker lights, marker lights and rear lights through fuses E000 and E001 and wires 2102 and 2103 respectively.

position 2 (“dipped beam”)
If switch C622 is put in the 2nd position (connection between contacts 2 and 4), the following takes place:
A voltage is applied to connection point 2 of light switch C622 through fuse E084, wire 1101. Through contacts 2 - 4 of C622 the voltage is applied to connection point 85 of G000 through wire 2110 and diode D609. The voltage is also applied to connection point 5 of C773 through wire 2100.
The voltage is also applied to connection point 85 of G001 through wire 2110. This relay is activated. Through contacts 30 - 87 of relay G001, wire 2112, and through fuses E004 and E005 and wires 2114 and 2113 respectively, a voltage is now applied to the left and right dipped beams. They will now switch on.

Signalling light
The voltage on connection point 85 of relay G001 is also on connection point 14 of stalk switch C832 through diode D610, via wire 2154. If this (spring-loaded) part of the switch is operated (connection between points 14 and 9), relay G002 is energised through wire 2120. A connection is now made between contacts 30 and 87 and this applies a voltage to lights C002 and C003 through contacts 30 - 87, wire 2121, and fuses E006 and E007 and wires 2122 and 2123 respectively. These lights remain on as long as there is a connection between contacts 14 and 9 of stalk switch C832.

Main beam
A voltage is applied to connection point 8 of stalk switch C832 through fuse E084 and wire 1101. If this part of the switch is operated (’fixed’ connection between points 8 and 9), relay G002 is energised through wire 2120. A connection is now made between contacts 30 and 87 and this applies a voltage to lights C002 and C003 through contacts 30 - 87, wire 2121, and fuses E006 and E007 and wires 2122 and 2123 respectively. These lights remain on as long as there is a ‘fixed’ connection between contacts 8 and 9.

The dipped beam does **NOT** go out while the signalling light or main beam is in use.

REAR FOG LAMPS (standard version)
To activate the rear fog lamps, light switch C622 must be in the “dipped beam” position (connection between contacts 2 and 4). The voltage is then applied to D609 through fuse E084, wire 1101, contacts 2 - 4 of switch C622 and wire 2110. The voltage is split after this diode. The voltage is applied to connection point 85 of G000 through a PCB track. This switches on the corner marker lights, marker lights and rear lights. The same voltage is also applied to connection point 5 of C773 through wire 2100. The VIC receives a voltage signal at pin D35 when the fog lamp switch (C773) is operated (connection between 5 and 1).
The VIC then activates the rear fog lamp relay (G005) via pin C40 of the VIC, so that the rear fog lamps come on. The VIC then switches on the “rear fog lamps” indicator on the instrument panel via the I-CAN.

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FRONT FOG LAMPS (optional)

To activate the front fog lights, light switch C622 must be in the "town lights" position (connection between contacts 2 and 1). There is now a voltage on connection point 85 of relay G000 (corner marker lights, marker lights and rear lights on). Turning the fog lamp switch (C727) to position I (connection between contacts 2 and 6) (front fog lamps) activates relay G004. A voltage is now applied through fuse E009, wire 2141, contacts 30 - 87 of relay G004 and wire 2142. The front fog lamps will now go on.

A voltage is also sent to the VIC via wire 2142, pin C34. The VIC controls the DIP and ensures that the "front fog lamps" warning indicator illuminates on the instrument panel.

The VIC receives a voltage signal at pin D35 through wire 2150 when the fog lamp switch (C727) is turned to position 2 (connection between contacts 2 and 3).

The VIC then activates the rear fog lamp relay (G005) via pin C40 of the VIC, so that the rear fog lamps come on. The VIC then switches on the "rear fog lamps" indicator on the instrument panel via the I-CAN.

VARIANTS

Location	
16	C773 is fitted as standard . If the front fog lamps option is selected, switches C773 and C727 should be swapped over.
83, 86	Connector 617 on vehicle type FA.
87	This may be either a 7-pin or a 15-pin connector. For more information: see section diagram 47
88	Connector 642 on vehicle type FA.

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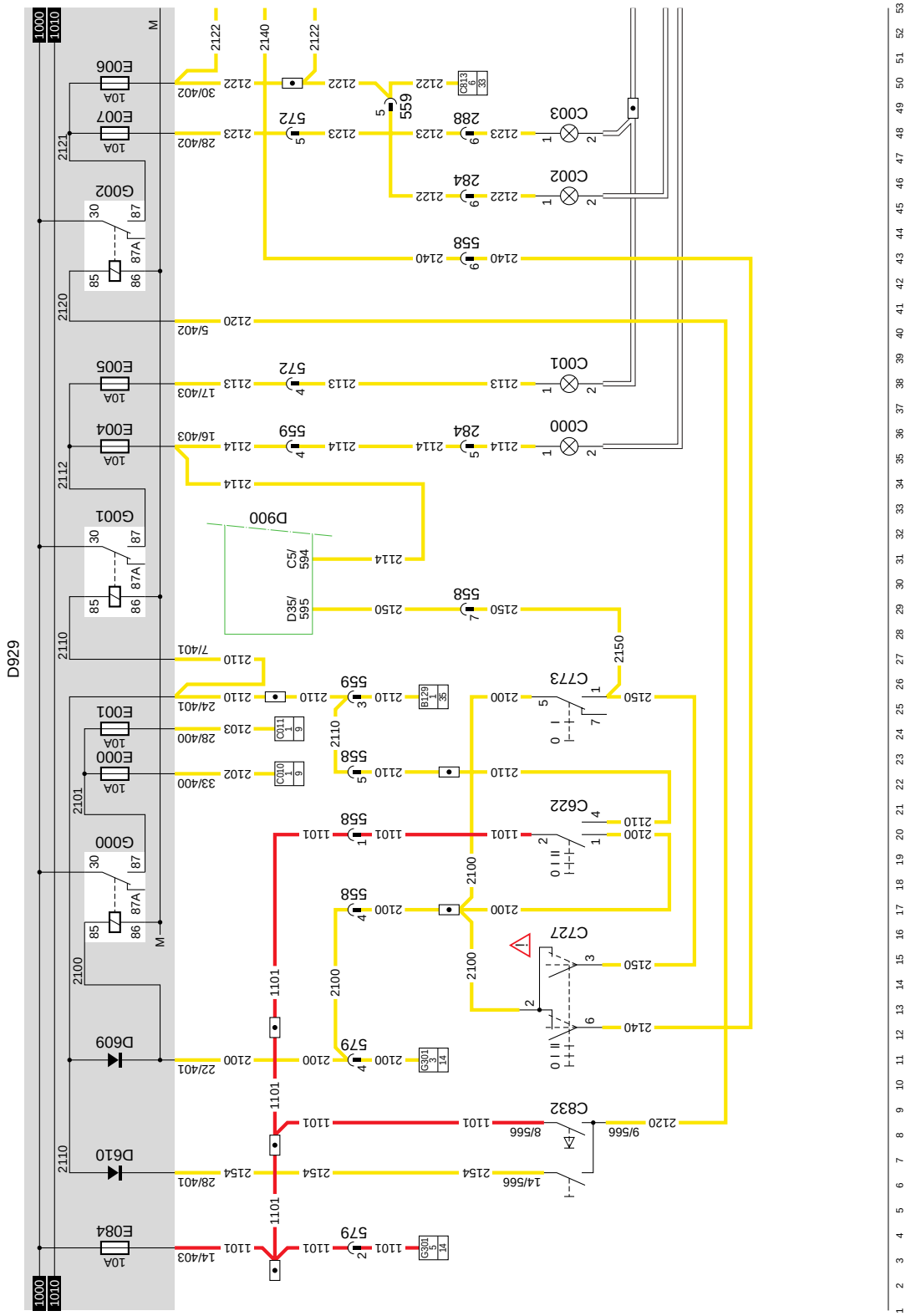

13 **1358030/25**

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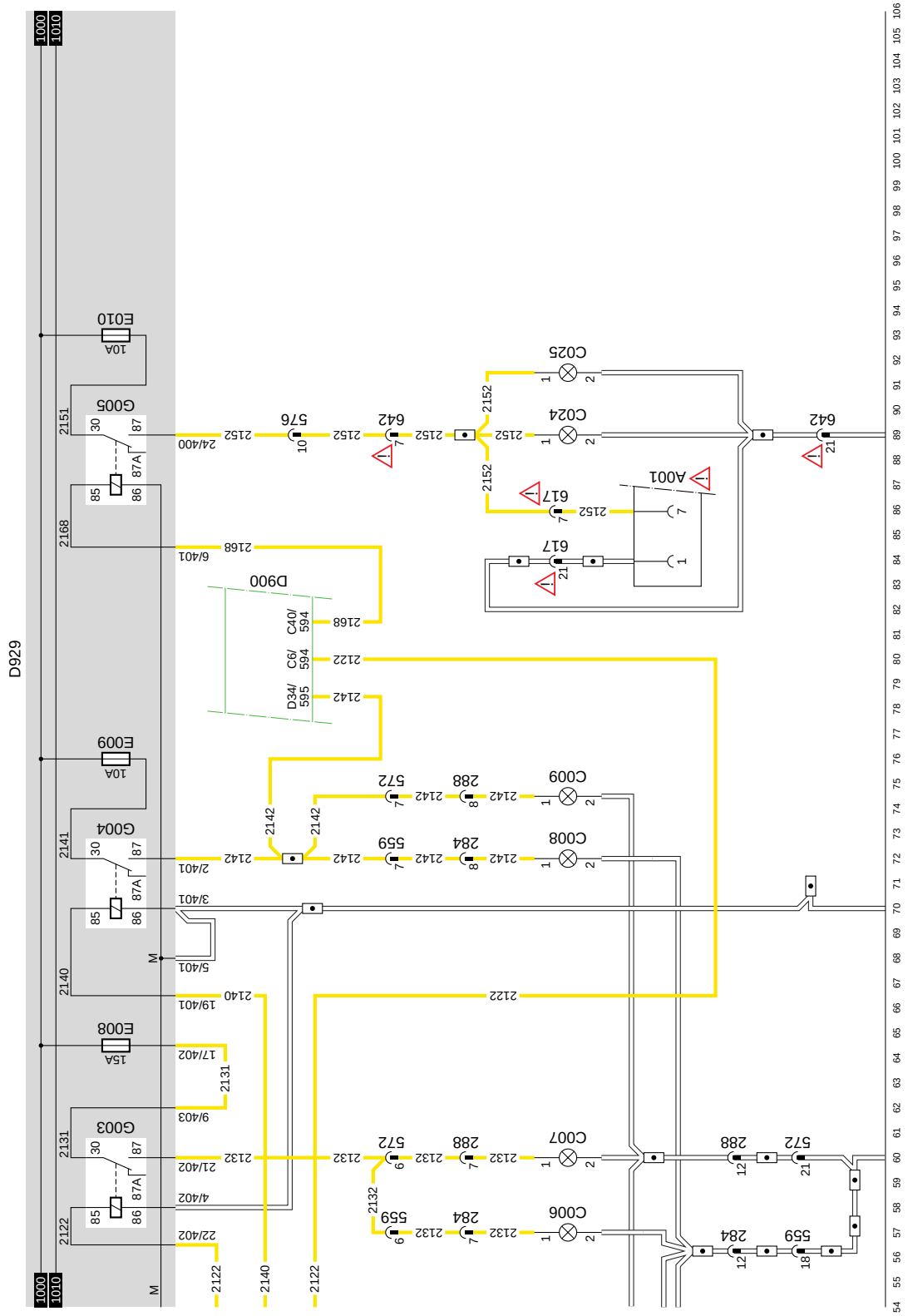

13 **1358030/25** EL001117

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14 SWEDISH LIGHTING

Conditions: Engine running, switch C622 has NOT been operated.
If the engine is running and switch C622 has **NOT** been operated, relay G301 is activated by a voltage from connection point 42, connector 594 of D900 (VIC). A voltage is then applied to connection point 85 of relay G001 (dipped beam relay) through fuse E084, wire 1101, contacts 5 - 3 of relay G301, wire 2100, contacts 3 - 4 of relay G302 and wire 2110. The same voltage is also applied to connection point 85 of relay G000 (rear light/width marker light) through diode D609. Both relays are energised.
When relay G000 is energised (connection between contacts 30 and 87), a voltage is applied to the left and right width marker lights in the headlights through contacts 30 - 87 of relay G000, PCB track 2102, fuses E000 and E001 and wire 2102.
When relay G001 is energised (connection between contacts 30 and 87), a voltage is applied through contacts 30 - 87 of relay G001, PCB track 2112, fuse E004 and fuse E005. The voltage through wire 2114 is applied to connection point 1 of C000 (left dipped beam) through fuse E004. The voltage through wire 2113 is applied to connection point 1 of C001 (right dipped beam) through fuse E005. A voltage is also sent to the VIC via wire 2114, pin C5. The VIC controls the DIP and ensures that the “dipped beam” warning indicator illuminates on the instrument panel.

Conditions: Engine running, switch C622 in position: marker lights (position 1).
When the engine is running and switch C622 is in the ‘marker lights’ position (connection between 2 and 1), the following occurs:
Relay G301 is energised, making a connection between contacts 5 and 3. The voltage is now applied to wire 2100 and to connection point 85 of relay G000 through fuse E084, wire 1101, contacts 5 -3 of relay G301 . When relay G000 is energised a voltage is applied through relay contacts 30 - 87 of relay G000, wire 2101, fuses E000 and E001 and wire 2102 and wire 2103 respectively. The corner marker lights, marker lights and rear lights (on both the driver’s and co-driver’s side) now come on.
There is also a voltage on connection point 1 of relay G302 through fuse E084, wire 1101, contacts 2 - 1 of switch C622, wire 2105. Relay G302 is energised, breaking contacts 3 - 4.
There is no longer a voltage on wire 2110 and, as a result, relay G001 is no longer energised. Contacts 30 - 87 are broken and, as a result, the driver’s and co-driver’s side headlights go out.

Conditions: Engine running, switch C622 in position: dipped beam (position 2).
When the engine is running and switch C622 is in the ‘dipped beam’ position (position 2) (connection between 2 and 4), the following takes place:
Relay G301 is energised, making a connection between contacts 5 and 3. The voltage is now applied to wire 2100 and to connection point 85 of relay G000 through fuse E084, wire 1101, contacts 5 -3 of relay G301 . When relay G000 is energised a voltage is applied through relay contacts 30 - 87 of relay G000, wire 2101, fuses E000 and E001 and wire 2102 and wire 2103 respectively. The corner marker lights, marker lights and rear lights (on both the driver’s and co-driver’s side) now come on. Because there is a voltage on connection point 85 of relay G001 through contacts 2 - 4 of switch C622, wire 2110, this relay is energised. When relay G001 is energised, a voltage is applied to both the left and right dipped beam through contacts 30 - 87, wire 2112, fuses E004 and E005 and wires 2113 and 2114 respectively. A voltage is also sent to the VIC via wire 2114, pin C5. The VIC controls the DIP and ensures that the “dipped beam” warning indicator illuminates on the instrument panel.

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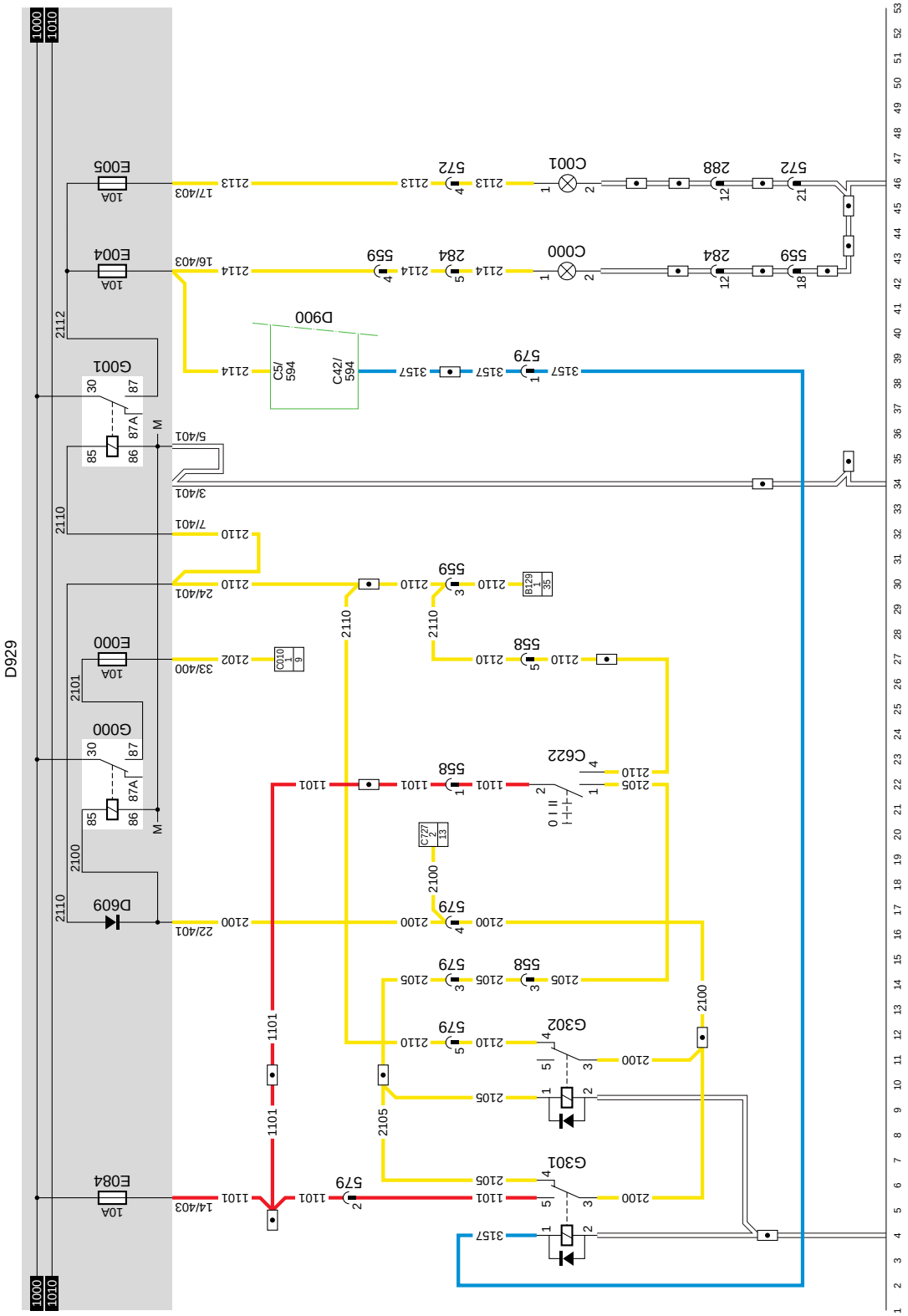

14 **1358030/25**

15 STOP LIGHTS/CAB TILTING GEAR

STOP LIGHTS

When the brake pedal is pressed, stop light operating switch E511 is activated (connection between contacts 2 and 1) and relay G036 will be energised. Through fuse E013, wire 1209, contacts 30 and 87 of relay G036 and wire 4601 a voltage is now applied to the right stop light (C021) and the left stop light (C020), so that they go on. The lights that are connected via the drawn vehicle socket (A000) will also go on.
When relay G036 is energised, the connection 30 - 78a is broken. The voltage on D814 (UPEC electronic unit) or D903 (ECS-DC3 electronic unit) is lost.

CAB TILTING GEAR

There is a voltage on sensor F676 (cab locking sensor) and on sensor F616 (cab tilting cylinder sensor) through fuse E018 and wire 1114. There is also a voltage on connection point 2 of sensor F676 through connection points 1 - 2 of relay G351 (cab tilt protection micro-relay) and wire 4723. When this sensor is activated, the voltage is transmitted to connection point 16 of D900 (VIC) and to connection point 2 of sensor F616. The VIC now sends a message to the DIP, which then activates the “cab tilted” warning lamp. When sensor F616 is activated, relay G351 is energised and, as a result, a voltage is applied to B251 through contacts 3 and 5 and wire 4722 (neutral position buzzer, tilting cab). If the contacts in switch E569 (neutral position switch) are closed (connection between pins 4 and 2), the horn will go off.

VARIANTS

Location	
36	Depending on whether the vehicle is fitted with a UPEC or ECS-DC3 engine
39, 41	Connector 642 on vehicle type FA.
48	Depending on whether the vehicle is fitted with a 7-pin or 15-pin plug. See also section diagram 47.
33	If the vehicle is fitted with a conventional braking system, there is NO connection to F628. If the vehicle is fitted with the EBS braking system, there is NO brake light switch (E511) or earth connection.

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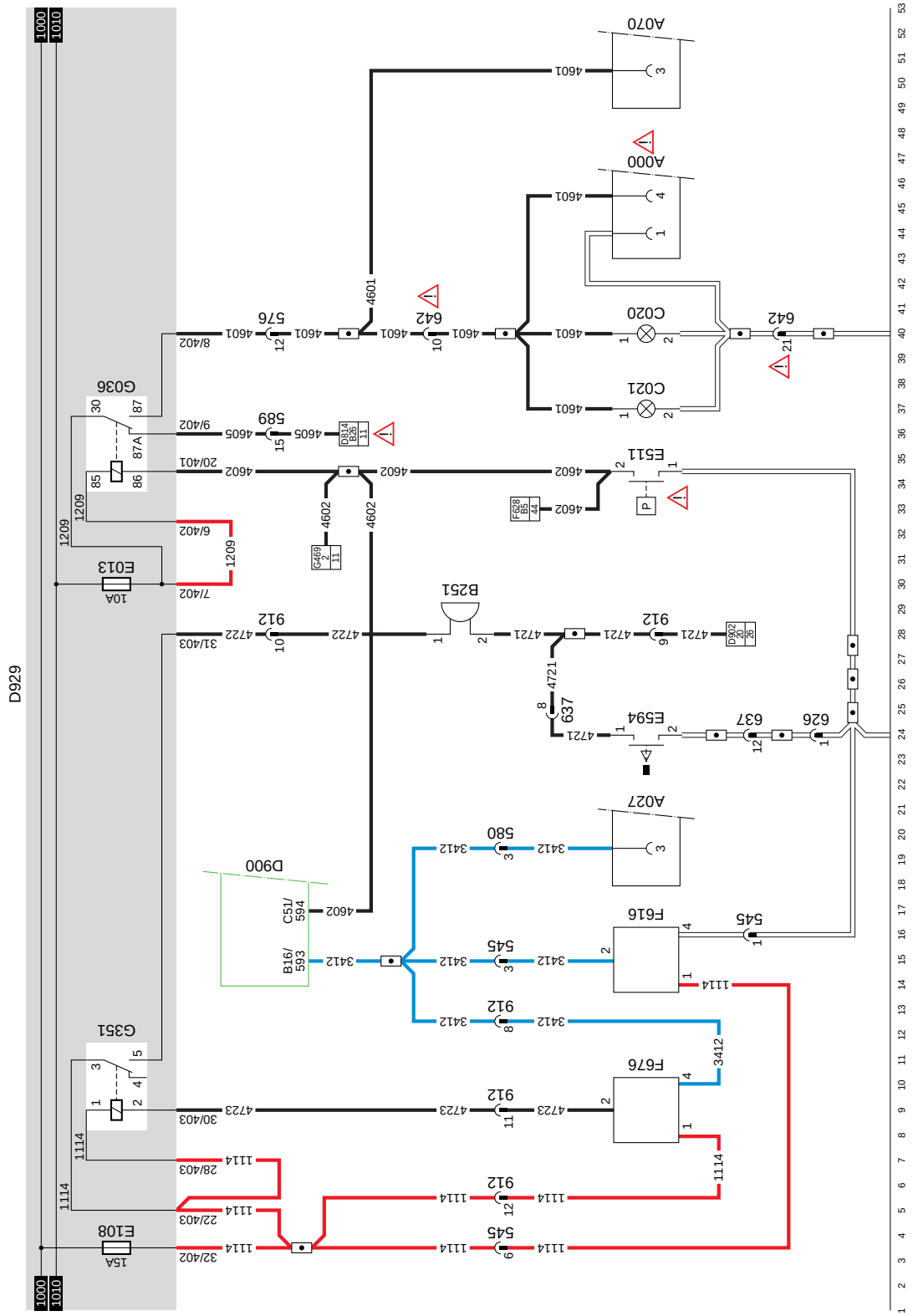

15 **1358030/25**

11

16 DIFFERENTIAL LOCK

When the ignition switch (G015) is activated, a voltage is applied through fuse E016 and wire 1217 to the cross-axle lock differential control switch (C748) and the longitudinal controlled slip differential control switch (C749). A voltage is also applied to the reversing control switch (E350) and four-wheel drive switch (C840).

When the cross-axle differential lock (C748) is activated, a voltage is applied through wire 4517 to the cross-axle differential lock valve (B243). As a result, the valve is activated.

When the longitudinal controlled slip differential (C749) is activated, a voltage is applied through wire 4518 to the longitudinal controlled slip differential valve (B244). As a result, the valve is activated.

VARIANTS

Location
7 Only if the vehicle is fitted with four-wheel drive .

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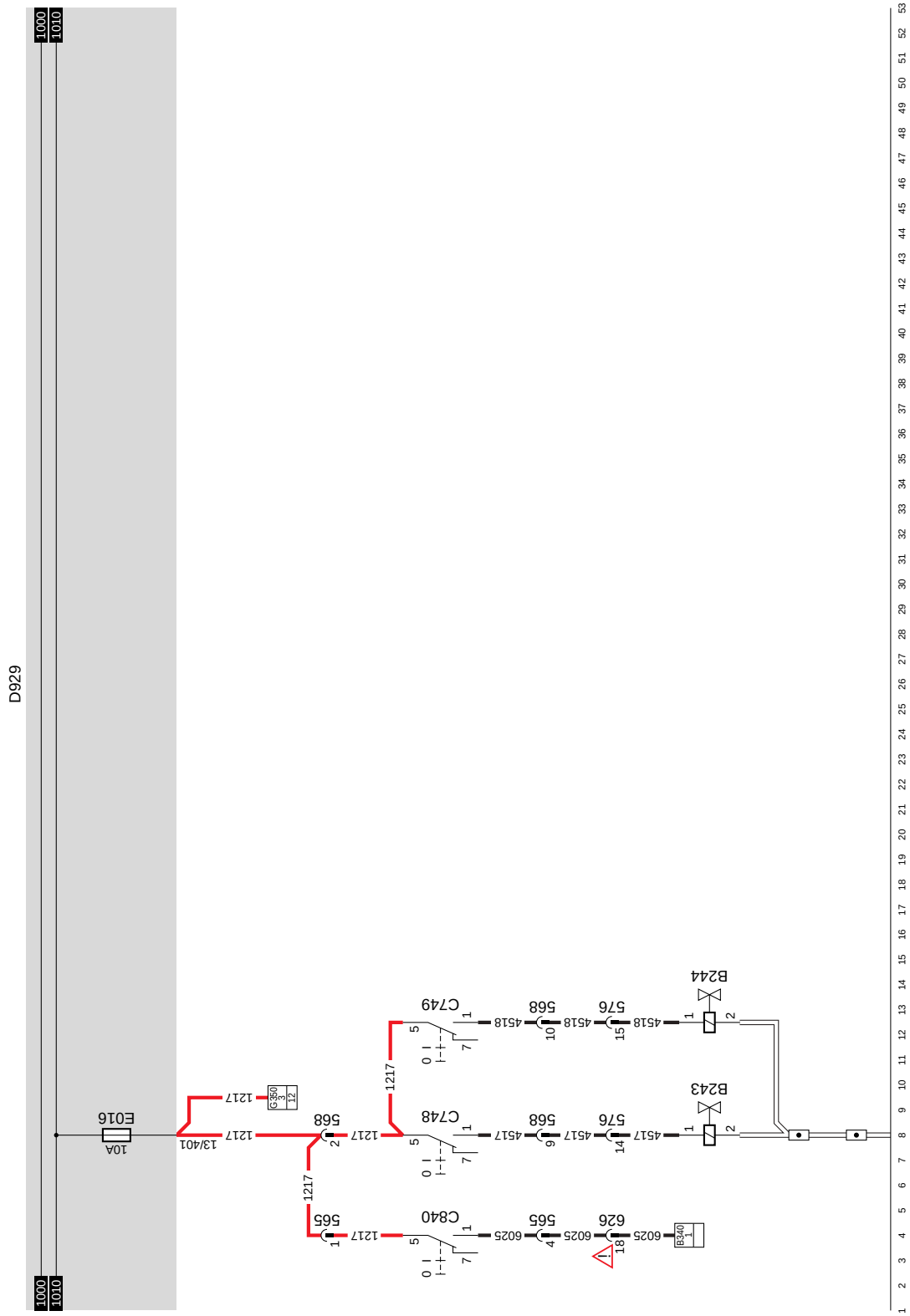

16 **1358030/25** EL001120

17 INTERIOR LIGHTING, DAY/SLEEPER CAB

CAB STEPWELL LIGHTING/INTERIOR LIGHTING DOOR SWITCH, DRIVER'S SIDE
If the door on the driver's side is opened, door switch E514 is activated (connection between 1 and 2). A result, there is a voltage on C062, C063 and D911 through fuse E045 (interior lighting fuse), wire 1107, contacts 1 - 2 of door switch E514, wire 2647, diode D783 (driver's side interior lighting diode), wire 2600. This activates the cab stepwell lighting on both the driver's side (C062) and the co-driver's side (C063). The VIC (D900) also receives a voltage on connection point 1, connector 595. The VIC then turns on the cab lighting (C119/C192), provided the switch is in the correct position, activating it via connection point 4, connector 492.

When the door on the driver's side is closed (contacts 1 - 2 interrupted), the voltage to connection point 1, connector 595 of the VIC is lost. Connection point 4, connector 592 will then continue to be supplied with power for another 9 seconds approximately. After approximately 9 seconds, the supply voltage is switched off and the lights go out.

If the vehicle ignition is switched on (contact made) within 9 seconds, the power supply to connection point 4, connector 592 of the VIC will be switched off immediately. The lighting will be switched off immediately. If the alarm system (D911) sends a voltage to connection point 13, connector 594 of the VIC to indicate that the doors have locked correctly, the lighting will also go off immediately.

CAB STEPWELL LIGHTING/INTERIOR LIGHTING DOOR SWITCH, CO-DRIVER'S SIDE
If the door on the co-driver's side is opened, door switch E515 is activated (connection between 1 and 2).
As a result, there is also a voltage on both C062 and C063 through fuse E045 (interior lighting fuse), wire 1107, contacts 1 - 2 of door switch E515, wire 2600. This activates the cab stepwell lighting on both the driver's side (C062) and the co-driver's side (C063).

INTERIOR LIGHT WITH MAP-READING LIGHT (DRIVER'S SIDE AND CO-DRIVER'S SIDE)
There is a combined interior light and map-reading light on both sides of the cab against the roof. The lamps operate in the same way on the driver's side and co-driver's side.

A voltage is applied to connection point 2 of C119 and C192 respectively through fuse E045, wire 1107. Depending on the switch position, the interior light or the map-reading light is now switched on individually or together.

TOOL COMPARTMENT LIGHTING
When the tool compartment is opened, tool compartment light switch E528 is activated (connection between 1 and 2). As a result, there is a voltage on C067 through fuse E142 (accessories before contact fuse), wire 1154, contacts 1 - 2 of storage compartment light switch E528, wire 2608. This switches on the tool compartment light. The tool compartment light works independently of the contact.

BUNK LAMP
The bunk light C115 is switched on by a switch in the light fitting. The bunk light works independently of the contact. Voltage is applied to connection point 1 of C115 through fuse E045, wire 1107. When the switch is operated (connection between contacts 1 and 2), connection point 2 is connected to earth. The lamp will now switch on.

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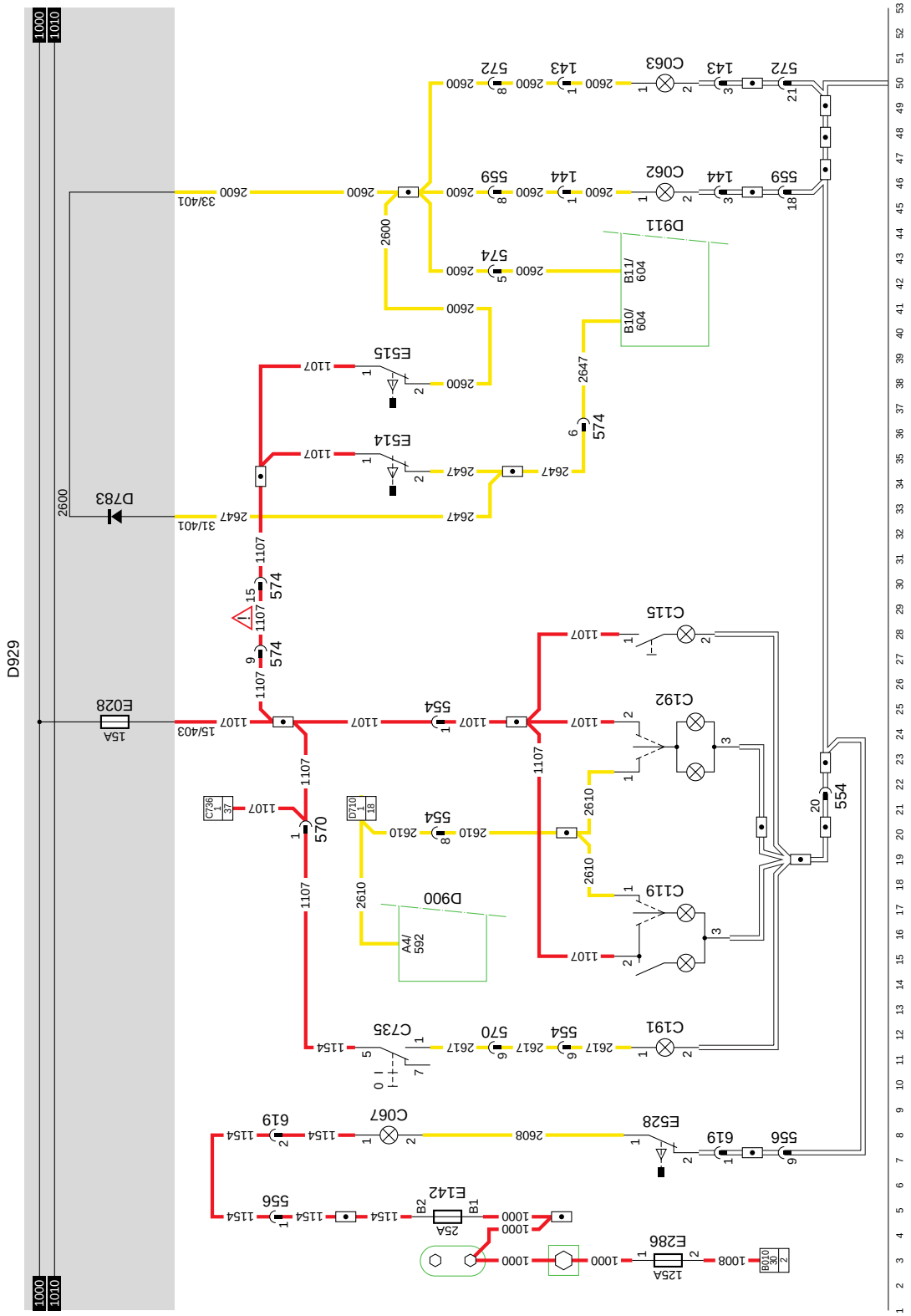
INTERIOR NIGHTLIGHT

When switch C735 (interior nightlight switch) is operated (connection between 5 and 1), a voltage is applied to C191 through fuse E045 (interior lighting fuse), wire 1107, contacts 5 - 1 of nightlight switch C735, wire 2617. This switches the nightlight on. The nightlight works independently of the contact.

VARIANTS

Location

29 Wire 1107 only fitted if there is NO alarm system.



17 **1358030/25** EL001121

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18 SH CAB INTERIOR LIGHTING

CAB STEPWELL LIGHTING/INTERIOR LIGHTING DOOR SWITCH, DRIVER'S SIDE
If the door on the driver's side is opened, door switch E514 is activated (connection between 1 and 2). A a result, there is a voltage on C062, C063 and D911 (alarm system) through fuse E045 (interior lighting fuse), wire 1107, contacts 1 - 2 of door switch E514, wire 2647, diode D783 (driver's side interior lighting diode), wire 2600. This activates the cab stepwell lighting on both the driver's side (C062) and the co-driver's side (C063). The VIC (D900) also receives a voltage on connection point 1, connector 595. The VIC then turns on the cab lighting (C119/C192), provided the switches (C119, C192, C859 and C837) are in the correct position, activating it through wire 2610 (connection point 4, connector 592 of the VIC unit).

When the door on the driver's side is closed (contacts 1 - 2 of door switch E514 interrupted), the voltage to connection point 1, connector 595 of the VIC is lost. Connection point 4, connector 592 will then continue to be supplied with power for another 9 seconds approximately. After approximately 9 seconds, the supply voltage is switched off and the lights go out.

If the vehicle ignition is switched on (contact made) within 9 seconds, the power supply to connection point 4, connector 592 of the VIC will be switched off immediately. The lighting will be switched off immediately. If the alarm system (D911, connection point 16 of connector 604, wire 3647) sends a voltage to connection point 13, connector 594 of the VIC to indicate that the doors have locked correctly, the lighting will also go off immediately.

CAB STEPWELL LIGHTING/INTERIOR LIGHTING DOOR SWITCH, CO-DRIVER'S SIDE
If the door on the co-driver's side is opened, door switch E515 is activated (connection between 1 and 2).
As a result, there is also a voltage on both C062 and C063 through fuse E045 (interior lighting fuse), wire 1107, contacts 1 - 2 of door switch E515, wire 2600. This activates the cab stepwell lighting on both the driver's side (C062) and the co-driver's side (C063).

Interior lighting with map-reading light (driver's and co-driver's side)
There is a combined interior light and map-reading light on both sides of the cab against the roof. The lamps operate in the same way on the driver's side and co-driver's side.

A voltage is applied to connection point 2 of C119 and C192 respectively through fuse E045, wire 1107. Depending on the switch position, the interior light or the map-reading light is now switched on individually or together.

INTERIOR LIGHTS TWO-WAY SWITCHING
The condition to turn on both interior lights is that C119 (interior light with switch, driver's side) and C192 (interior light with switch, co-driver's side) must be switched together. In other words: the switch is connected to contact 1.

Situation 1: Switch C837 in '0' position.
Switch C837 in middle position (contacts 5 - 3 and 6 - 4 connected).
The supply voltage and the earth are now interrupted and the light does not work.

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Situation 2:
Switch C837 set to position 'I' (contacts 5 - 7 and 8 - 6 connected). A voltage is now applied to connection point 1 of C119 and to connection point 1 of C192 through fuse E028, wire 1107, contacts 5 - 7 of C837, wire 2644, contacts 7 - 5 of C859 (driver's side roof console interior light switch), wire 2632. The earth is formed because connection point 3 of C119 and connection point 3 of C192 are connected to the vehicle earth through wire 9032, contacts 8 - 6 of C837.
The lighting can now be switched on or off using switch C859.

Situation 3:
Switch C837 set to position 'II' (contacts 3 - 1 and 2 - 4 connected). A voltage is now applied to connection point 1 of C119 and to connection point 1 of C192 through fuse E028, wire 1107, contacts 3 - 1 of C837, wire 2645, contacts 1 - 5 of C859 (driver's side roof console interior light switch), wire 2632. The earth is formed because connection point 3 of C119 and connection point 3 of C192 are connected to the vehicle earth through wire 9032, contacts 2 - 4 of C837.
The lighting can now be switched on or off using switch C859.

Tool compartment lighting
When the door of the tool compartment is closed there is a voltage on C067 (left tool compartment lighting) through fuse E142 (accessories before contact fuse), wire 1154. When the door of the tool compartment is opened (contacts 1 - 2 of tool compartment lighting switch E528 are connected), the voltage is connected to earth through wire 2608 and contacts 1 - 2 of E528 (tool compartment lighting switch). This switches on the tool compartment light. The tool compartment light works independently of the contact.

Bunk light
The bunk light C115 is switched on by a switch in the light fitting. The bunk light works independently of the contact. Voltage is applied to connection point 1 of C115 through fuse E045, wire 1107. Connection point 2 of C115 is connected to earth. When the switch is operated (connection between contacts 1 and 2), the lamp goes on.

Nightlight
When switch C735 (interior nightlight switch) is operated (connection between 5 and 1), a voltage is applied to connection point 1 of C191 (middle nightlight) through fuse E045 (interior lighting fuse), wire 1107, contacts 5 -1 of nightlight switch C735, wire 2617. This switches the nightlight on. The nightlight works independently of the contact.

VARIANTS

Location
49 Wire 1107 only fitted if there is NO alarm system.

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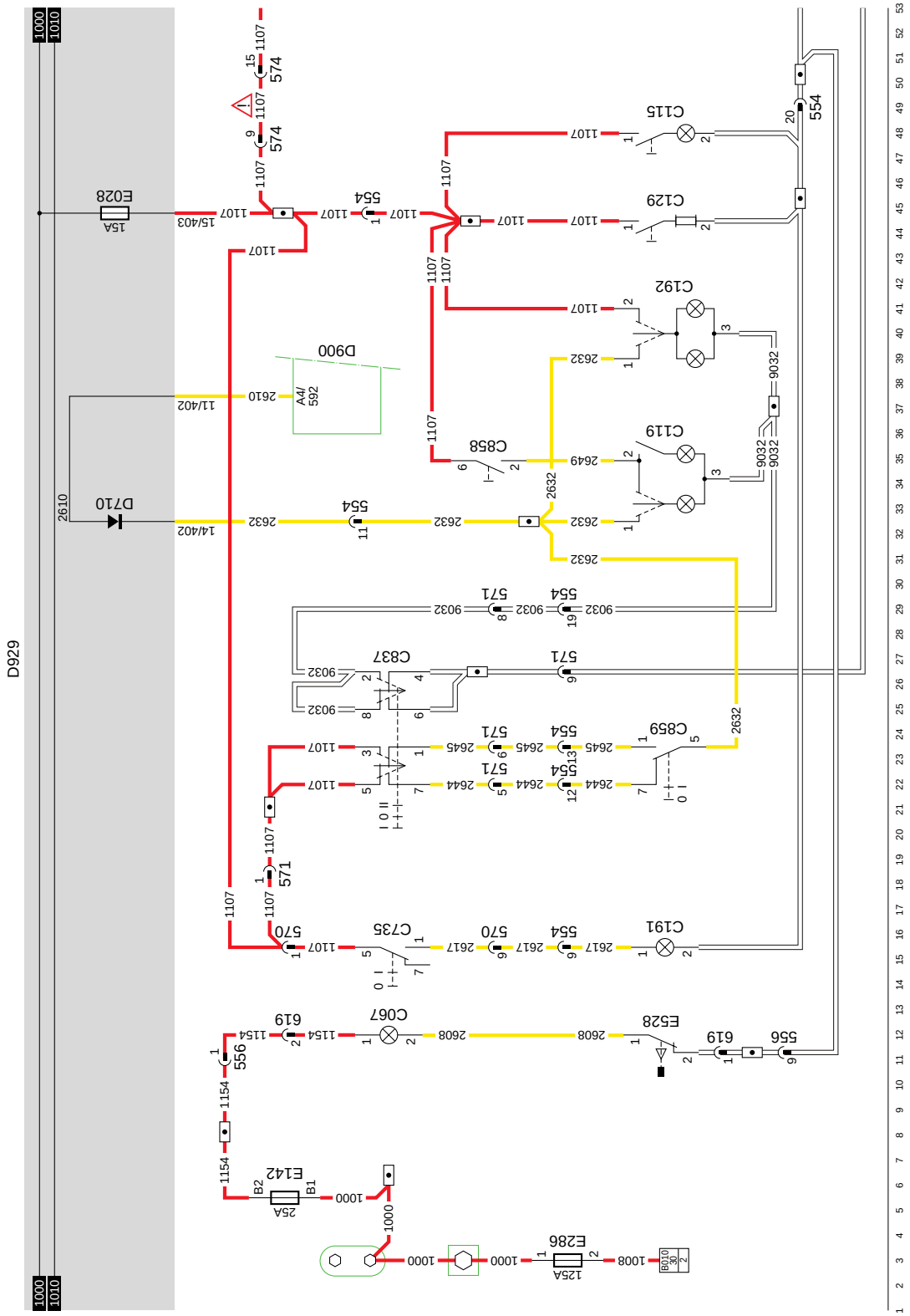

18 **1358030/25**

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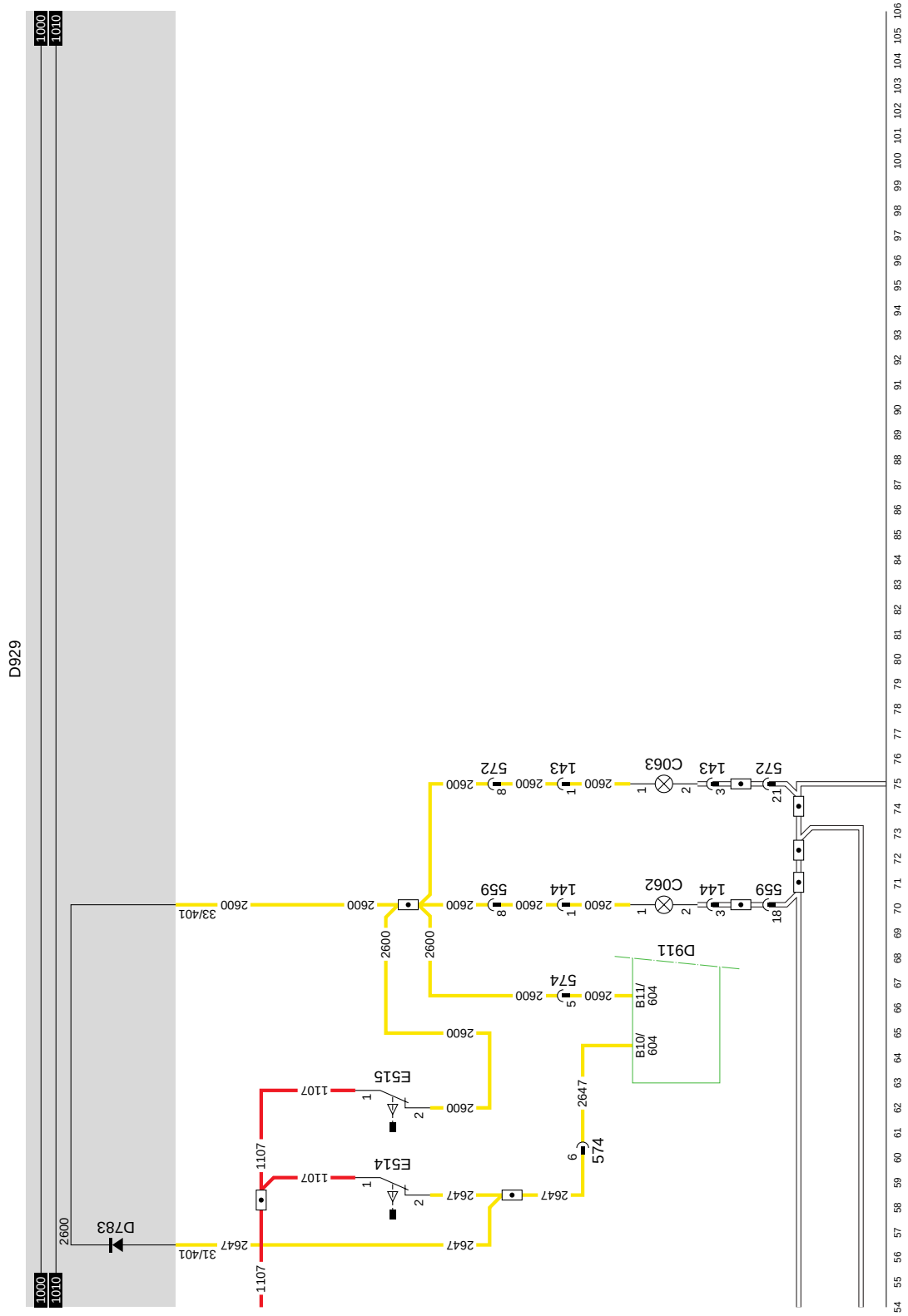

18 **1358030/25** EL001123

19 MIRROR HEATING/MIRROR ADJUSTMENT

MIRROR HEATING

When the mirror heating switch (C746) is operated, a voltage is applied to heating element B017 (driver's side) and B018 (co-driver's side) through fuse E044, wire 1208, switch C746 (contacts 1 - 2) and wire 4532.
The mirror heating can only be switched on when the contact relay has been energised (contact 'on').

MIRROR ADJUSTMENT

The outside mirrors are adjusted using two so-called "joystick" switches C695 (driver's side) and C696 (co-driver's side). If the handle of the switch is moved from the rest position (centre) in a particular direction, power will be supplied to mirror adjustment motor B005 (driver's side) or B006 (co-driver's side) and the mirror in question will follow the movement of the handle.
For this, wires 4770 and 4774 (driver's side) or 4771 and 4775 (co-driver's side) supply power to the motor for the left/right movement. Wires 4772 and 4774 (driver's side) or 4773 and 4775 (co-driver's side) supply power to the adjusting motor for the up and down movement.

The mirror adjustment system can only be used if the contact relay is energised.

VARIANTS

Location
7 If RHD, pin 4 is connected to wire 1208 and pin 2 is connected to earth.
17 If RHD, pin 4 is connected to wire 1208 and pin 2 is connected to earth.

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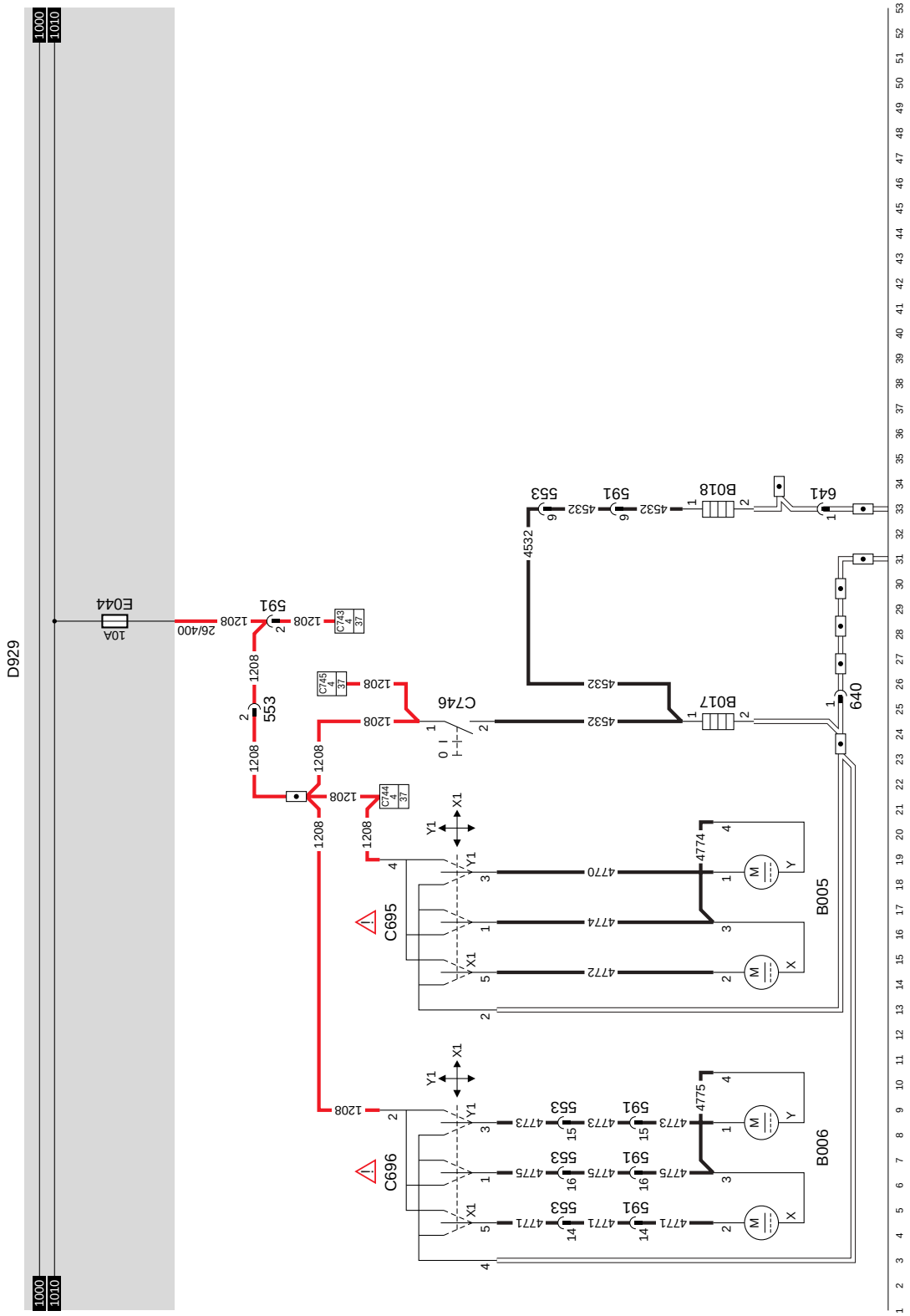

19 **1358030/25** EL001124

20 SEARCH LIGHTING

SEARCH LIGHTING

Search lighting refers to lights or LEDs in the various function switches.
When the light switch (C622) is operated, a supply voltage is present on relay G000 (connection point 85) through fuse E084 and the light switch (C622), contacts 2 - 1, wire 2100.
Relay G000 is energised ((connection between connection points 30 and 87), PCB track 2101 and fuse (E117)) when there is a voltage on the search lighting (through wire 2630). All search lighting connected to this will come on.

The following switches are illuminated by a light: B030, C072, C073, C716, C813 and C858.

The following switches are illuminated by an LED:
C725 C727 C735 C736 C737 C739 C740 C741 C748 C749 C750 C751 C760 C763 C764 C765 C774 C778 C742 C802 C835 C836 C837 C840 C853 C858.

LIGHT BUZZER

When the lighting switch (C622) is operated, supply voltage will be applied to relay G000 through fuse E084, lighting switch (C622) and wire 2100.
Relay G000 is energised so that a voltage is applied to the search lighting (wire 2630) through fuse E117. This wire is also connected to the VIC (D900), pin 7/594.
If the pre-programmed condition in the VIC is met, the VIC sends a message to the DIP, which in turn activates a buzzer (fitted in the DIP).

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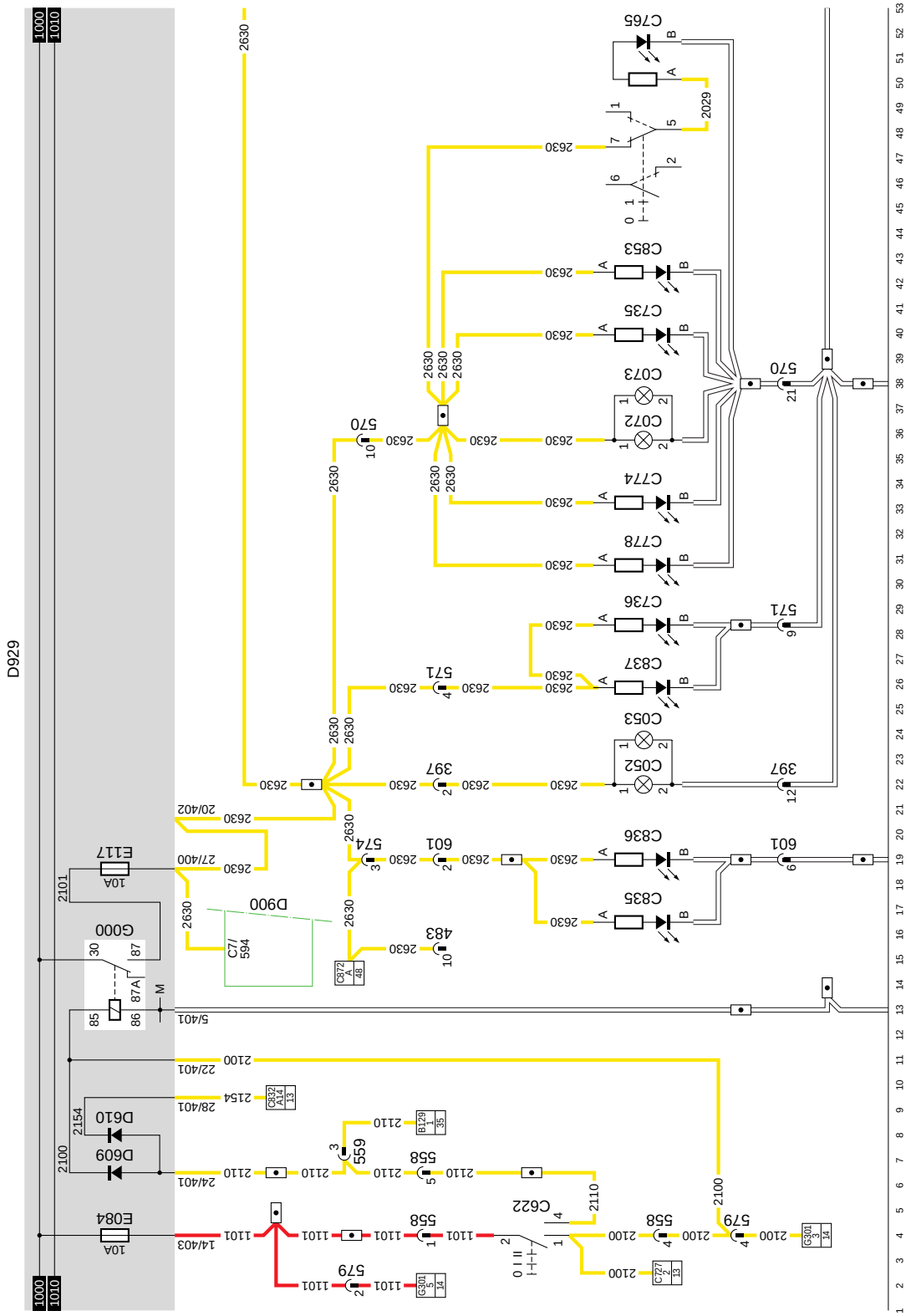

20 **1358030/25**

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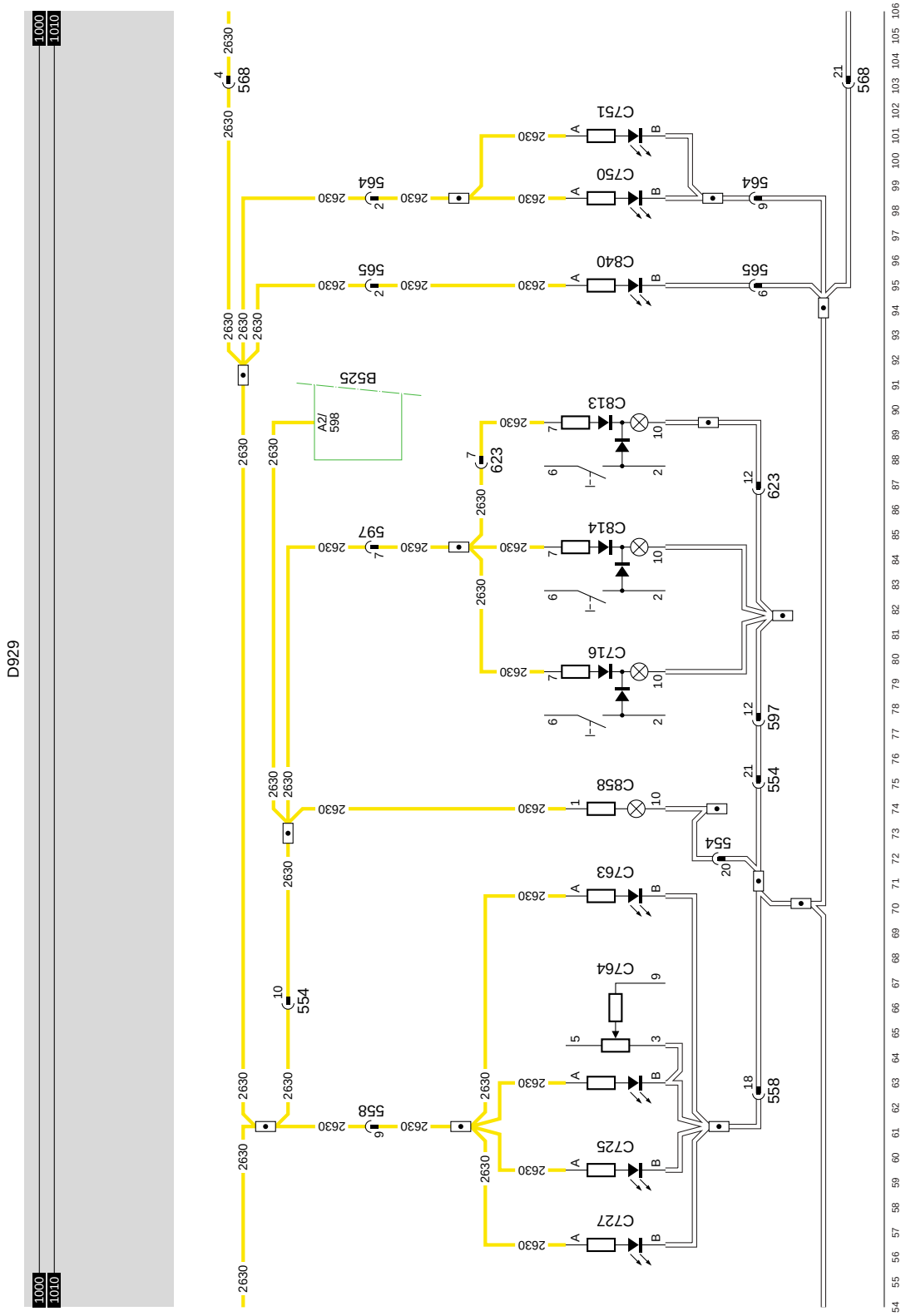

20 **1358030/25**

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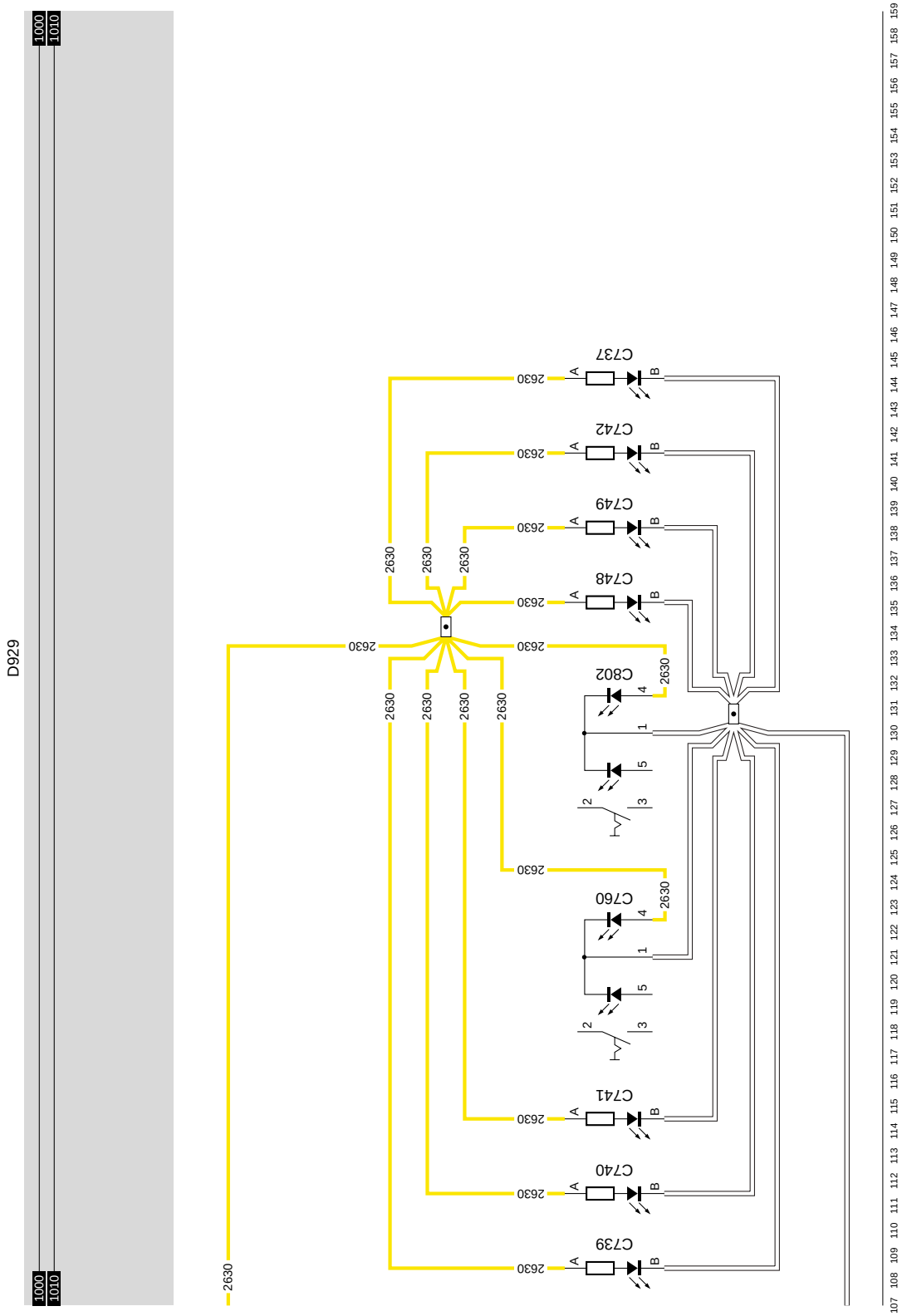

20 **1358030/25** EL001127

11

21 AIR CONDITIONING/RECIRCULATION VALVE/HEATER FAN

AIR CONDITIONING

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

RECIRCULATION VALVE
When C802 is operated (connection between contacts 2 and 3), a voltage is applied to connection points 1 of G257 and G258 through fuse E031, wire 1201, contacts 2 - 3 of C802, wire 4659. This relay is energised and, as a result, a connection is made between contacts 3 and 5. This causes a voltage to be applied to connection point 1 of B252 through fuse E031, wire 1201, contacts 5 - 3 of relay G257 and wire 5053. The other connection point 2 is connected to earth through wire 5054, contacts 3 - 5 of relay G258. The recirculation valve, driven by B252, will now close.
The VIC (D900) also receives a voltage on connection point 8. The VIC activates the "recirculation" warning indicator on the instrument panel via the I-CAN.

HEATER FAN
A voltage is applied to connection point 8 of B015 (4-speed heater fan) through fuse E031 (heater fan) and wire 1201.
Depending on the position of C882 (heater fan switch), the fan will start operating.
The knob has five positions:

Off: (position 0): Heater fan (B015) off.

Position 1: (Connection between contacts 2 and 6). The fan runs at the lowest speed.
Voltage is applied to connection point 8 of B015 through fuse E031 and wire 1201. The earth is formed through connection point 7 of B015, wire 4658, contacts 6 - 5 of thermal switch B015, wire 4654, through three resistors (B015), wire 4650 and contacts 2 - 6 of C882.

Position 2: (Connection between contacts 2 and 6). The fan runs slightly faster.
Voltage is applied to connection point 8 of B015 through fuse E031 and wire 1201. The earth is formed through connection point 7 of B015, wire 4658, contacts 6 - 5 of thermal switch B015, wire 4654, through two resistors (B015), wire 4651 and contacts 4 - 6 of C882.

Position 3: (Connection between contacts 3 and 6). The fan runs at the highest speed but one.
Voltage is applied to connection point 8 of B015 through fuse E031 and wire 1201. The earth is formed through connection point 7 of B015, wire 4658, contacts 6 - 5 of thermal switch B015, wire 4654, through one resistor (B015), wire 4652 and contacts 3 - 6 of C882.

Position 4: (Connection between contacts 1 and 6). The fan runs at the highest speed.
Voltage is applied to connection point 8 of B015 through fuse E031 and wire 1201. The earth is formed through connection point 7 of B015, wire 4658, contacts 6 - 5 of the thermal switch (B015).

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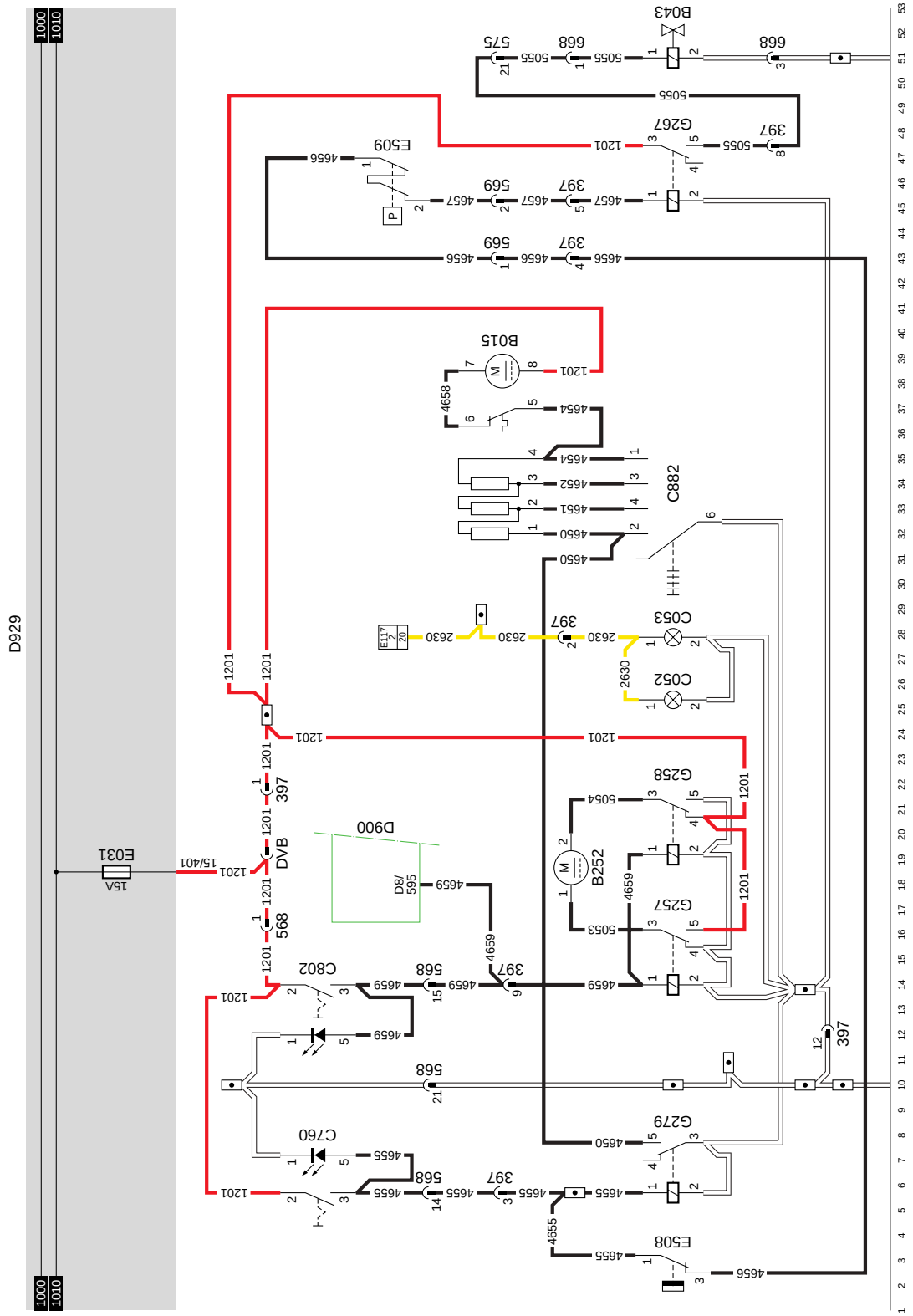

21 **1358030/25** EL001128

11

22 CONNECTION FOR SEAT HEATING/ACCESSORIES

SEAT HEATING
When the contact is activated, a voltage is applied to switch C697 (driver's side seat heating switch) and switch C698 (co-driver's side seat heating switch) through fuse E091 and wire 1240.
When one of the switches (C697 or C698) is operated, heating element B032 or B033 is switched on. When the maximum temperature is reached, a thermal switch in the seat switches off the heating element.

ACCESSORIES CONNECTION
In every vehicle there is a 2-pin connector (connector number: 180) in the central box, under the PCB.
This is connected before contact (wire 1000) and has a 25 A fuse.

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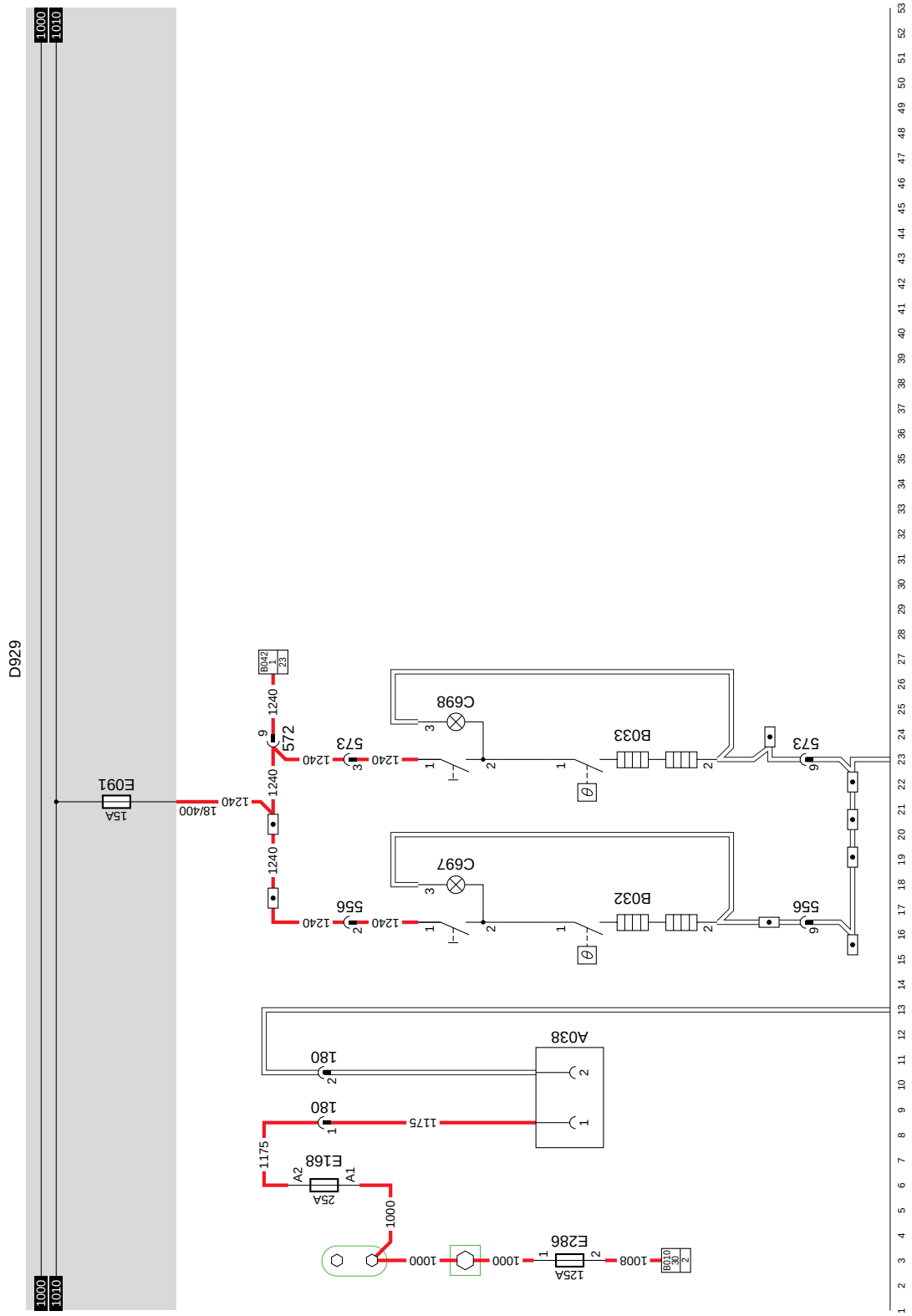

22 **1358030/25** EL001129

11

23 HORN/CIGAR LIGHTER/WORK LAMP/AIR DRYER

HORN
A voltage is applied to connection point 5 of C832 (direction indicator/windscreen wiper stalk switch) via fuse E084 and wire 1101. When this switch is operated (connection between contacts 5 and 12), voltage is applied to connection point 1 of valve B028 (horn) via wire 4535. The horn is activated. The air duct in the pneumatic horn is now released.

CIGAR LIGHTER
A voltage is applied to connection point 1 of B030 (driver's side cigar lighter) through fuse E026 (power supply before contact) and wire 1105. When the cigar lighter is pressed in (connection between contacts 1 and 3), a current flows through an internal resistor. When the temperature exceeds a specific value, the heating element springs back and the electric circuit is broken.

WORK LAMP
When contact (switch C539) is made (connection between contacts 1 and 6), a voltage is applied through wire 1130 to connection point 85 of relay G178 (accessories relay). A voltage is now applied through fuse E037, wire 1100, contacts 30 and 87 of relay G178 through fuse E052 to connection point 5 of C725 (work lamp switch). When the work lamp switch is operated (connection between connection points 5 and 1), the work lamp (C071) is supplied with voltage. The VIC (D900) also receives a voltage on connection point 9. The VIC switches on the "work lamp" indicator on the instrument panel via the I-CAN.

AIR DRYER
A voltage is applied to connection point 1 of B042 (air dryer heating element) through fuse E091 (power supply after contact) and wire 1240. If the built-in temperature switch is closed (connection between contacts 1 and 2), a current flows through an internal resistor. If the temperature exceeds a specific value, the temperature switch turns the heating element back off.

VARIANTS

Location
48 Connector A070 if fitted. Optional.

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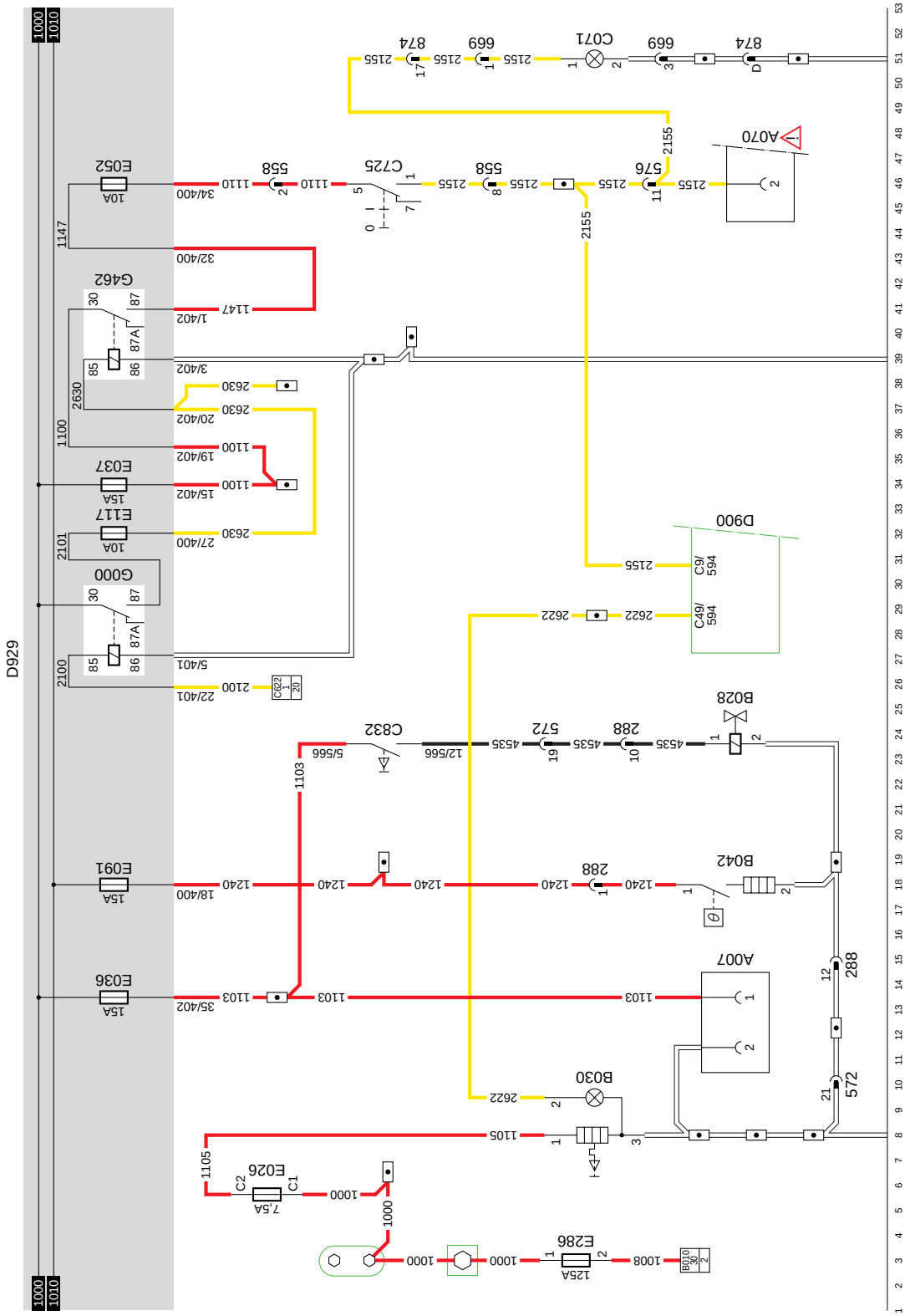

23 **1358030/25** EL001130

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24 ABS - ASC-D
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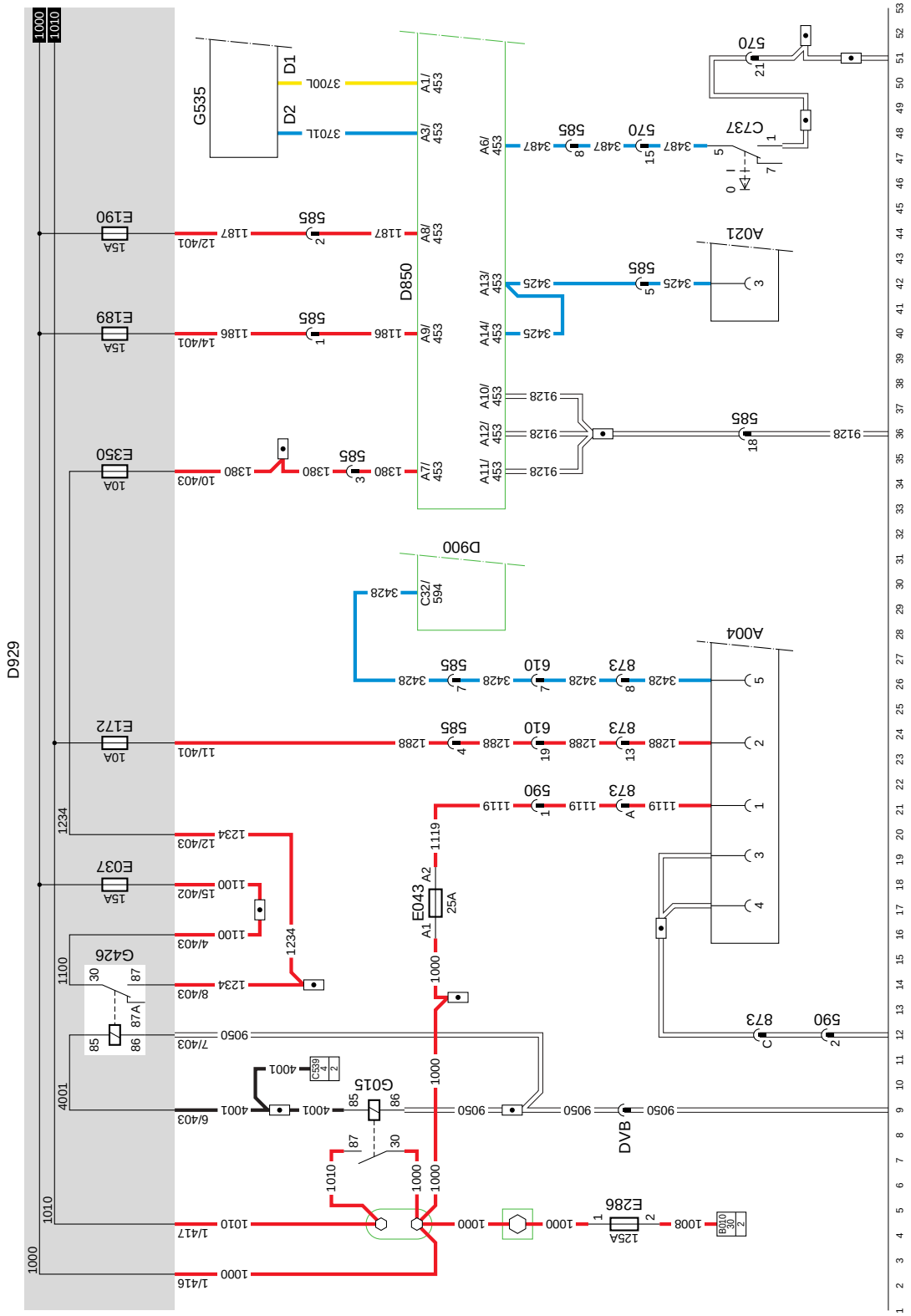

24 **1358030/25** EL001131

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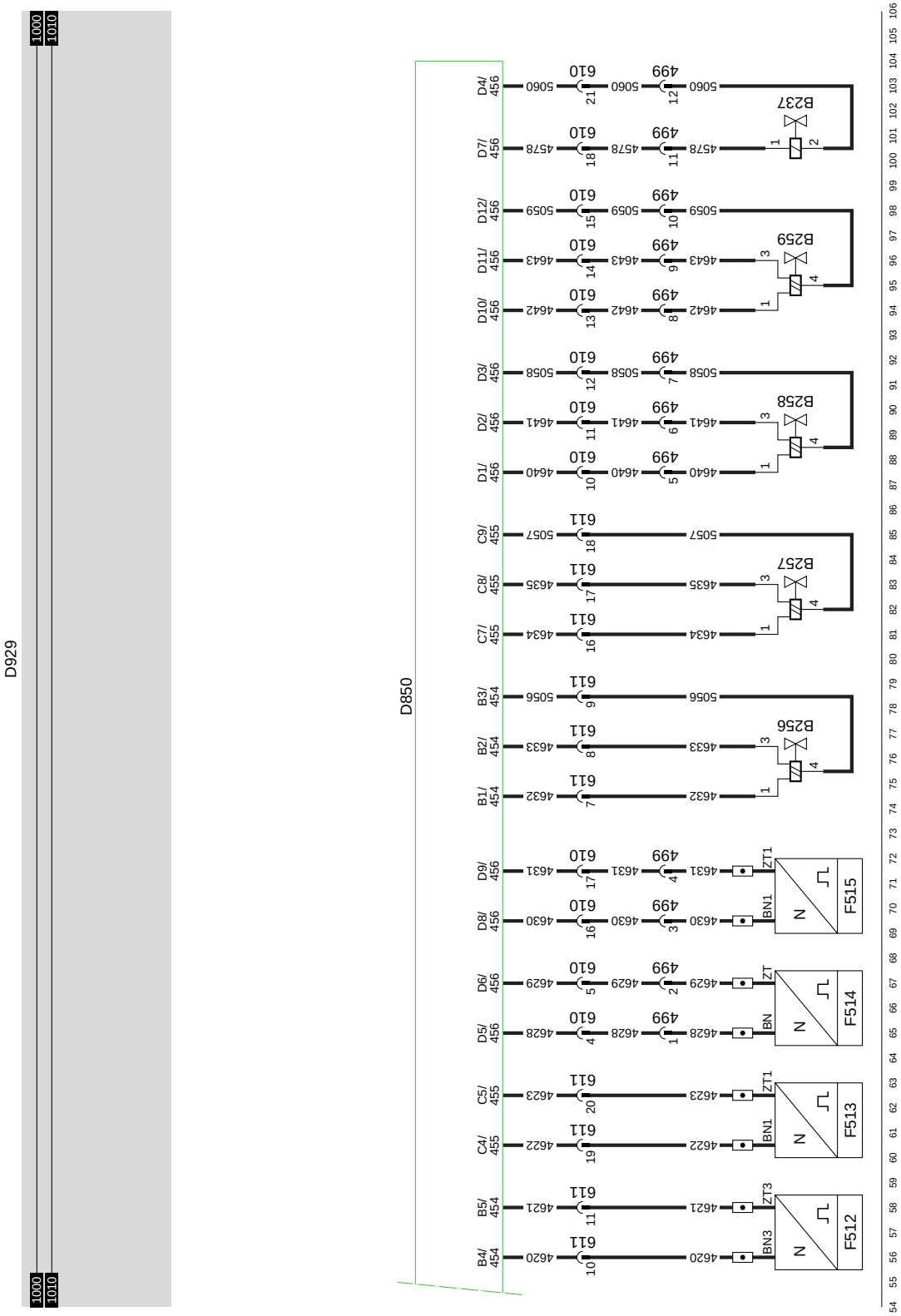

24 **1358030/25** EL001132

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25 DEB

Voltage is applied through fuse E118 and relay G126 to D814 (UPEC electronic unit) and through fuse E184 to valves B192, B247 and B248.
Depending on the position of unit D814, relay G126 is activated, after which a voltage is applied to engine brake valve B192 and engine brake valves (DEB) B247 and B248.
Depending on unit D814 these valves are connected to earth or are not connected to earth.

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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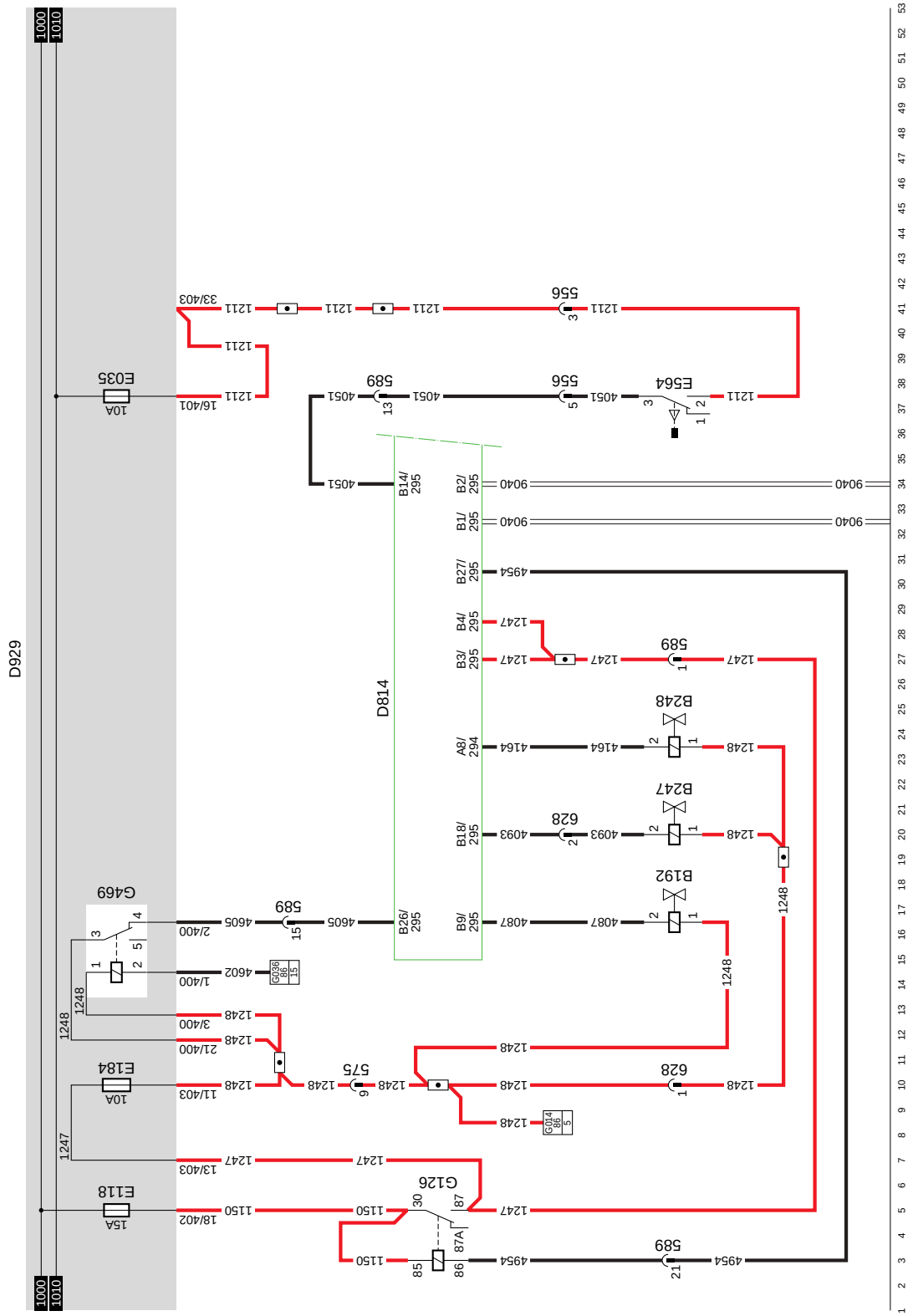

25 **1358030/25** EL001133

26 INTARDER EST42

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

15 The housing is connected to earth by a separate wire.

24 Pin 11, connector 583, is connected directly to earth only if the vehicle is fitted with an AS Tronic gearbox.

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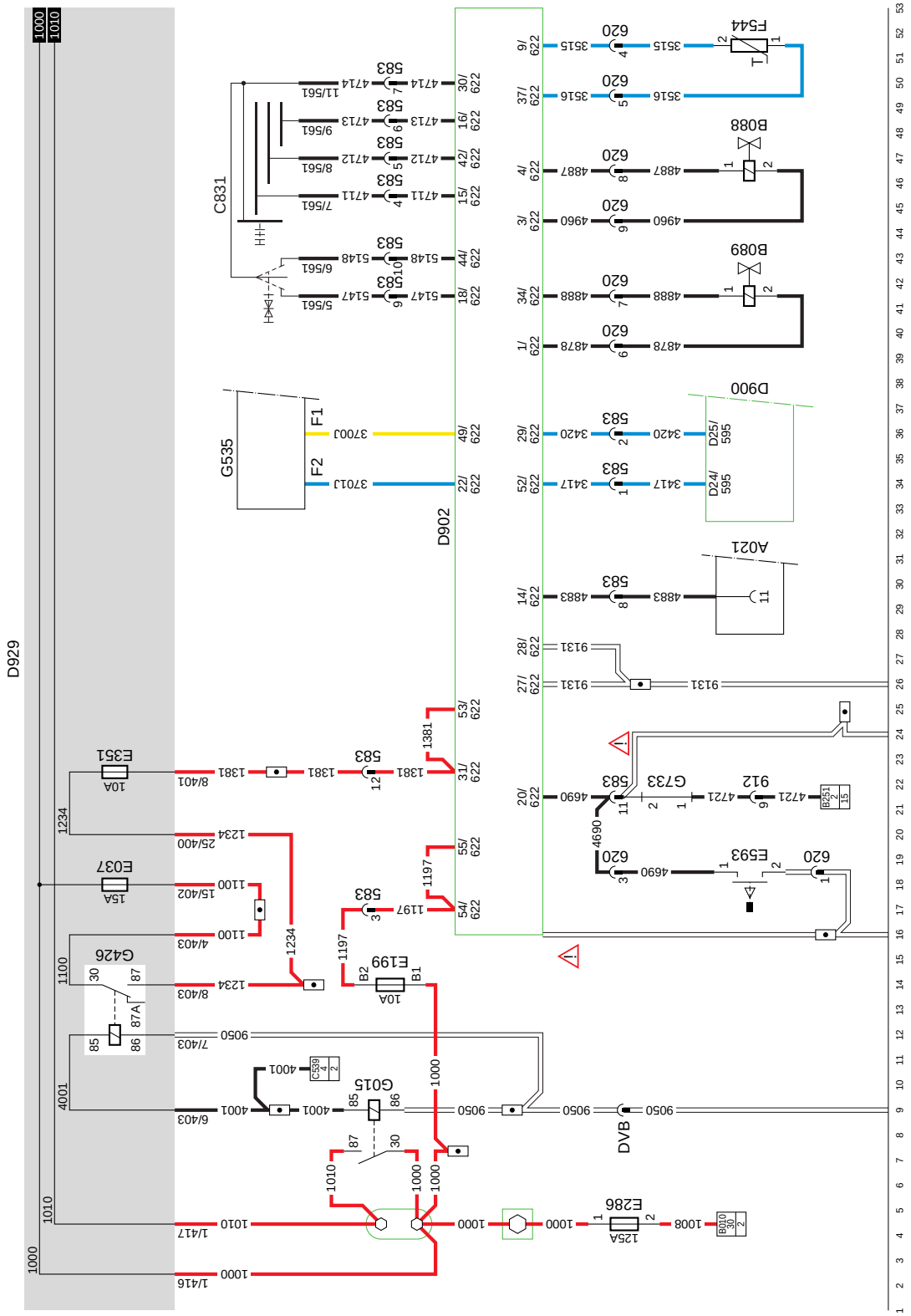

26 **1358030/25** EL001134

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27 ECS-DC3
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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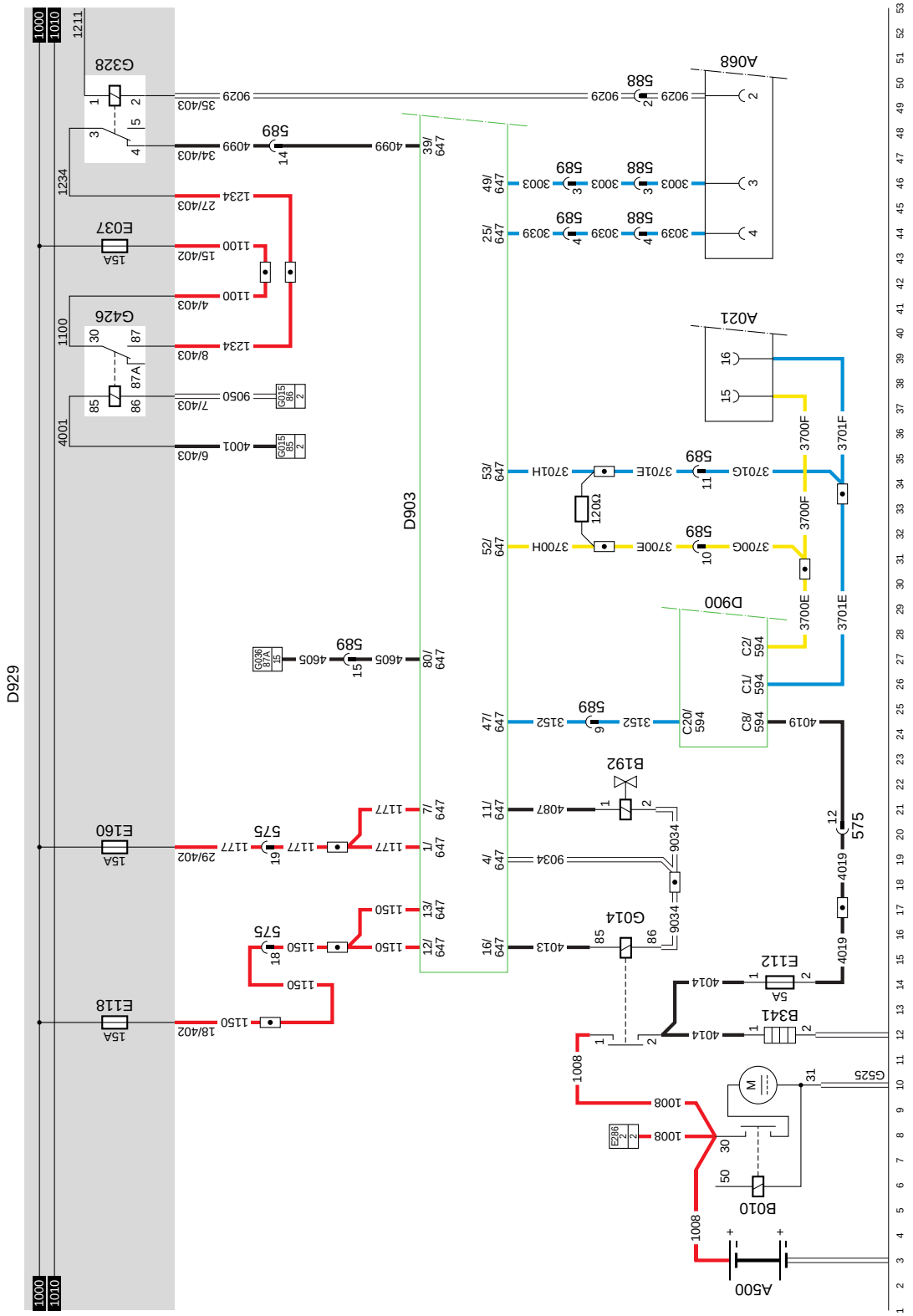

27 1358030/25 EL001135

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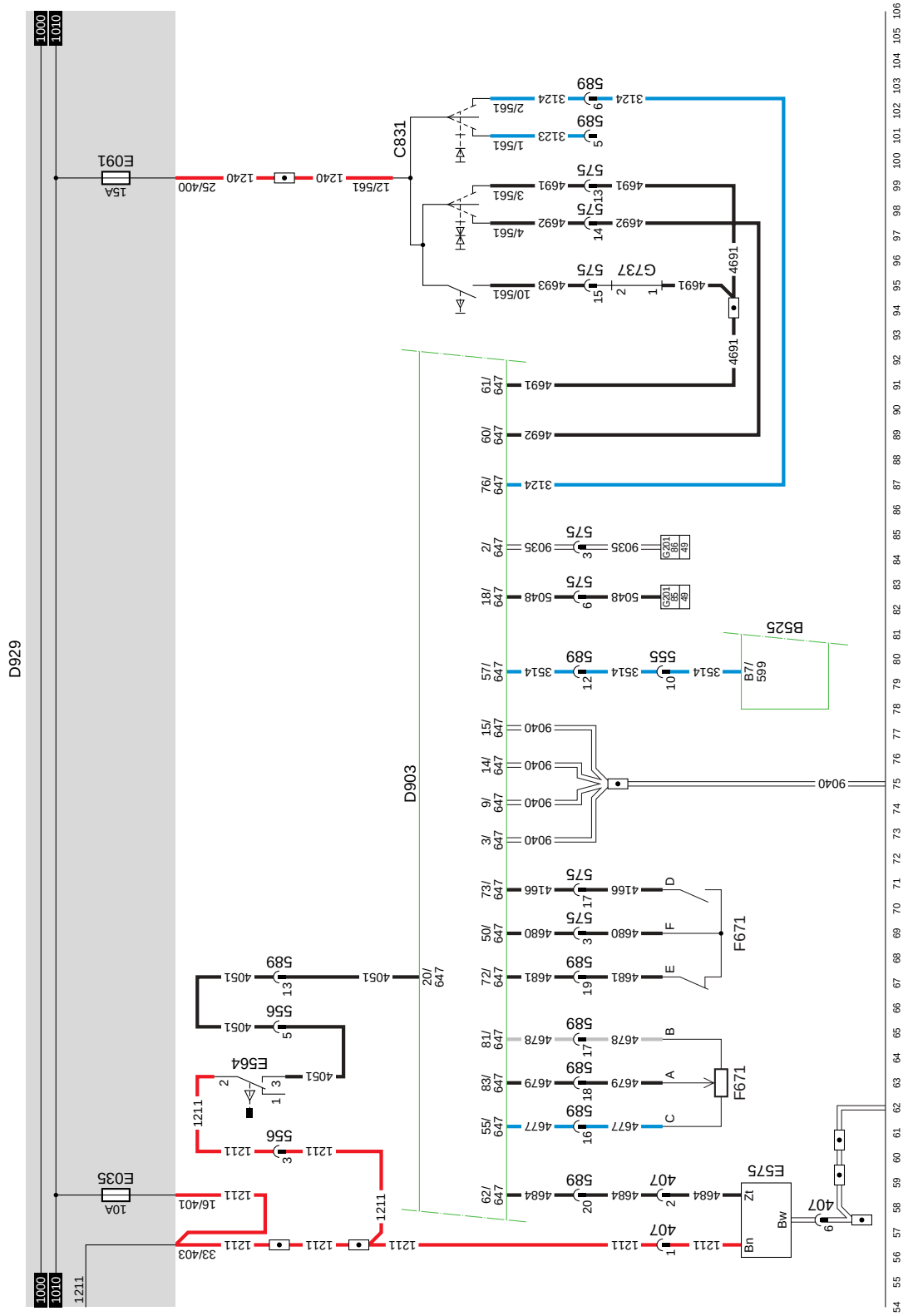

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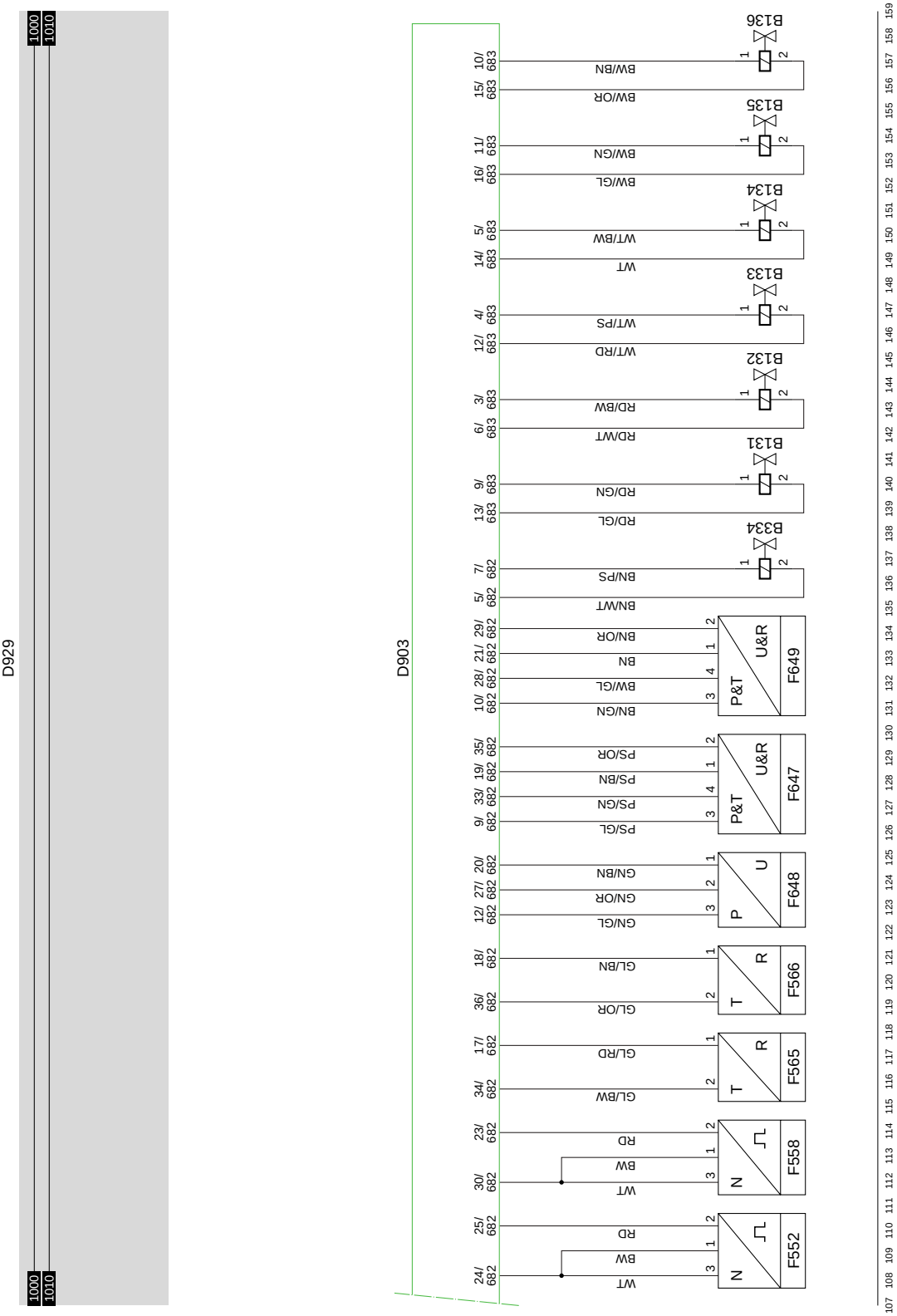

27 **1358030/25** EL001137

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28 AGS
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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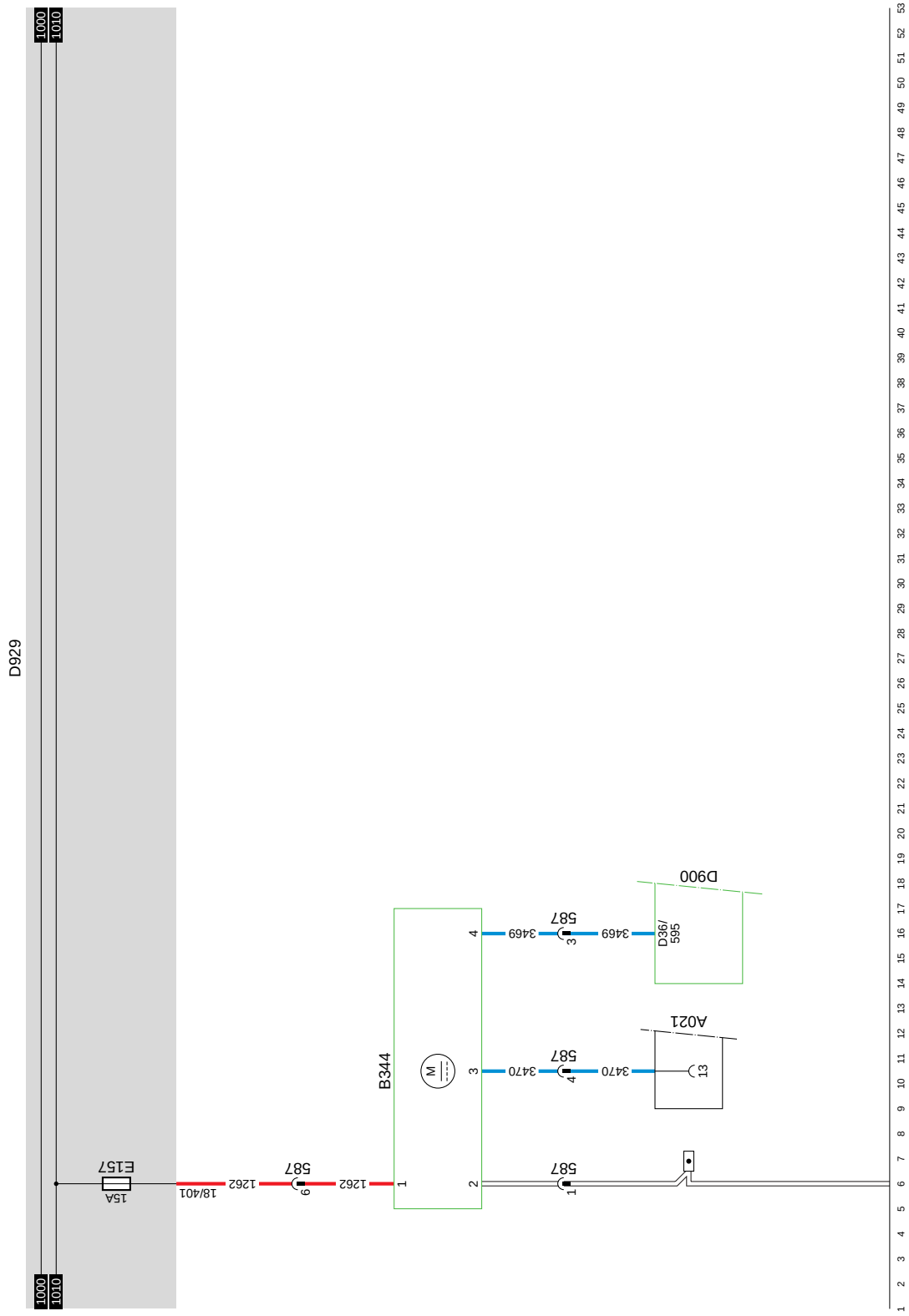

28 **1358030/25** EL001138

11

29 EMAS

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
42 No wire marking between connector 679 and unit.

11

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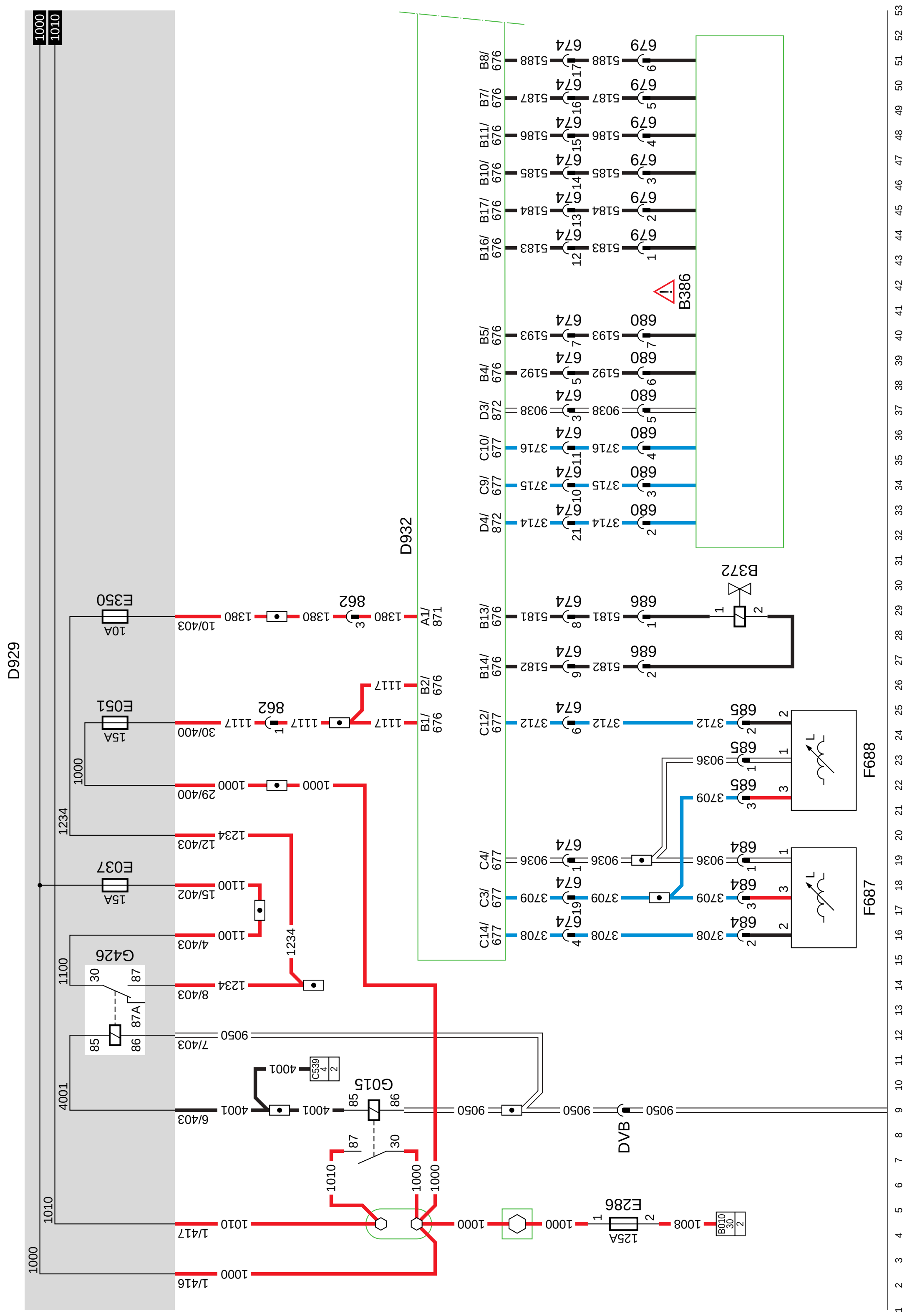
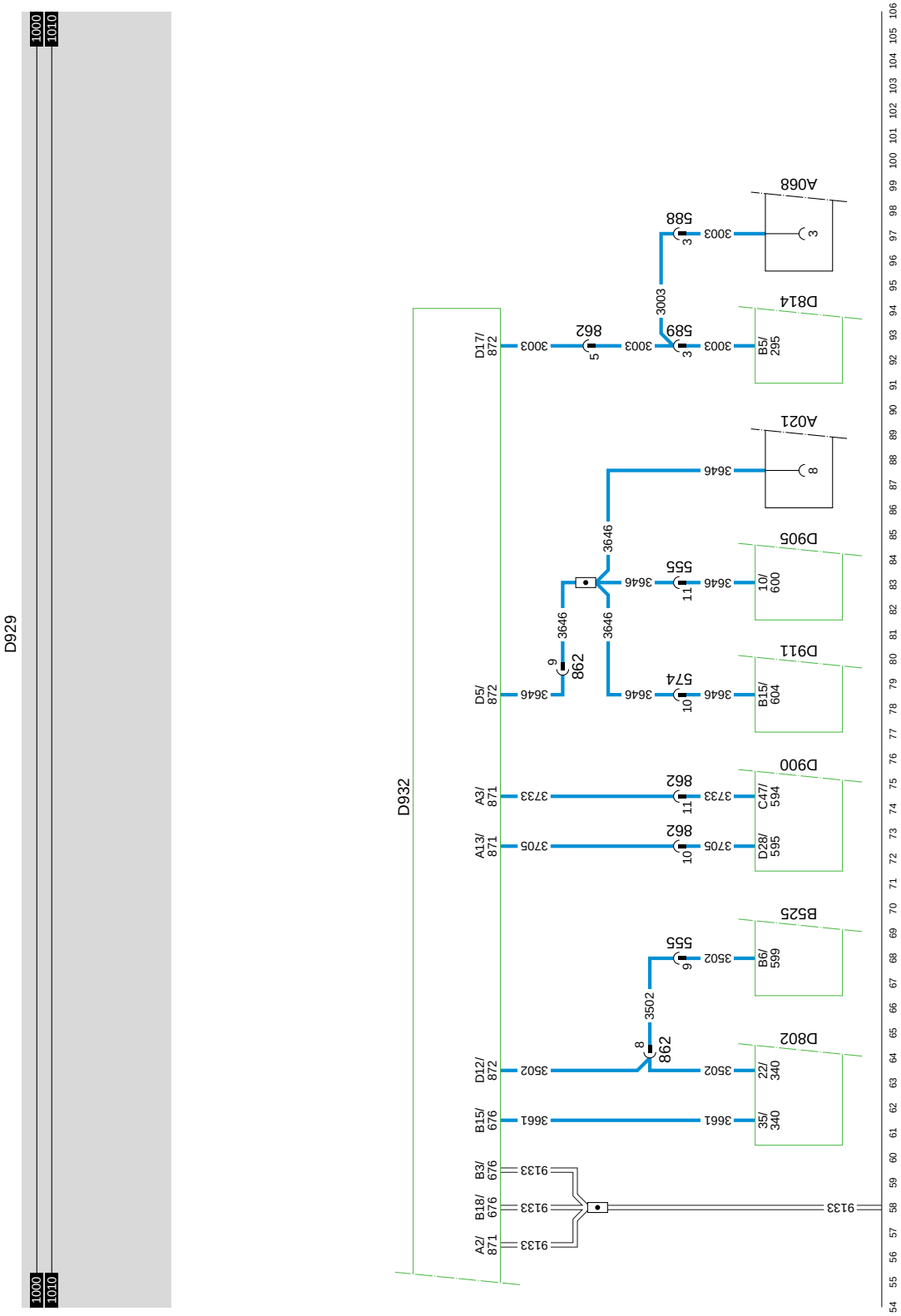


29 **1358030/25**

EL001139



29 **1358030/25** EL001140

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30 AGC

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location

52, 72, 83, 136
Connector A074: connector for superstructure.

114 Depending on whether alarm system is fitted.

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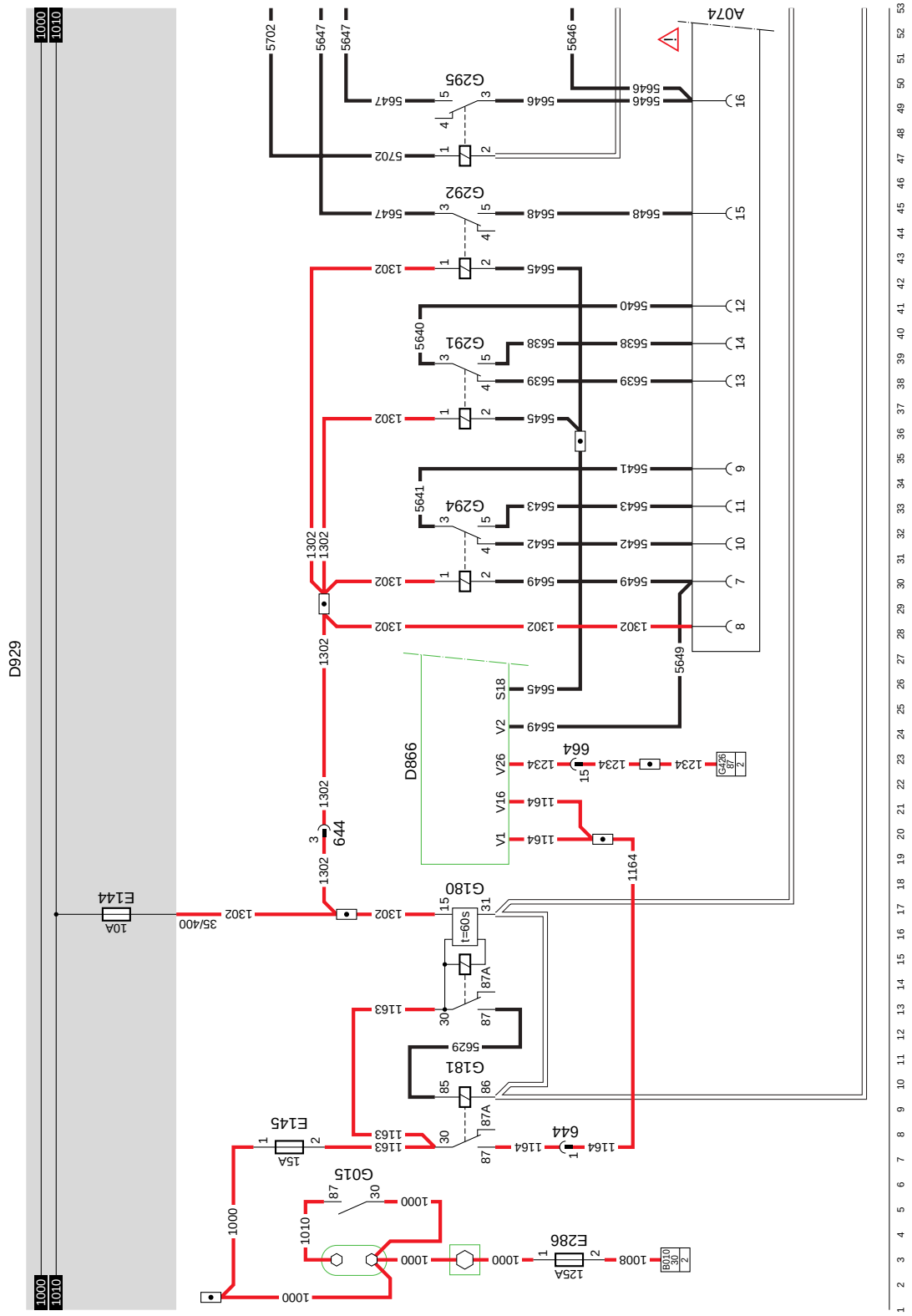

30 **1358030/25** EL001141

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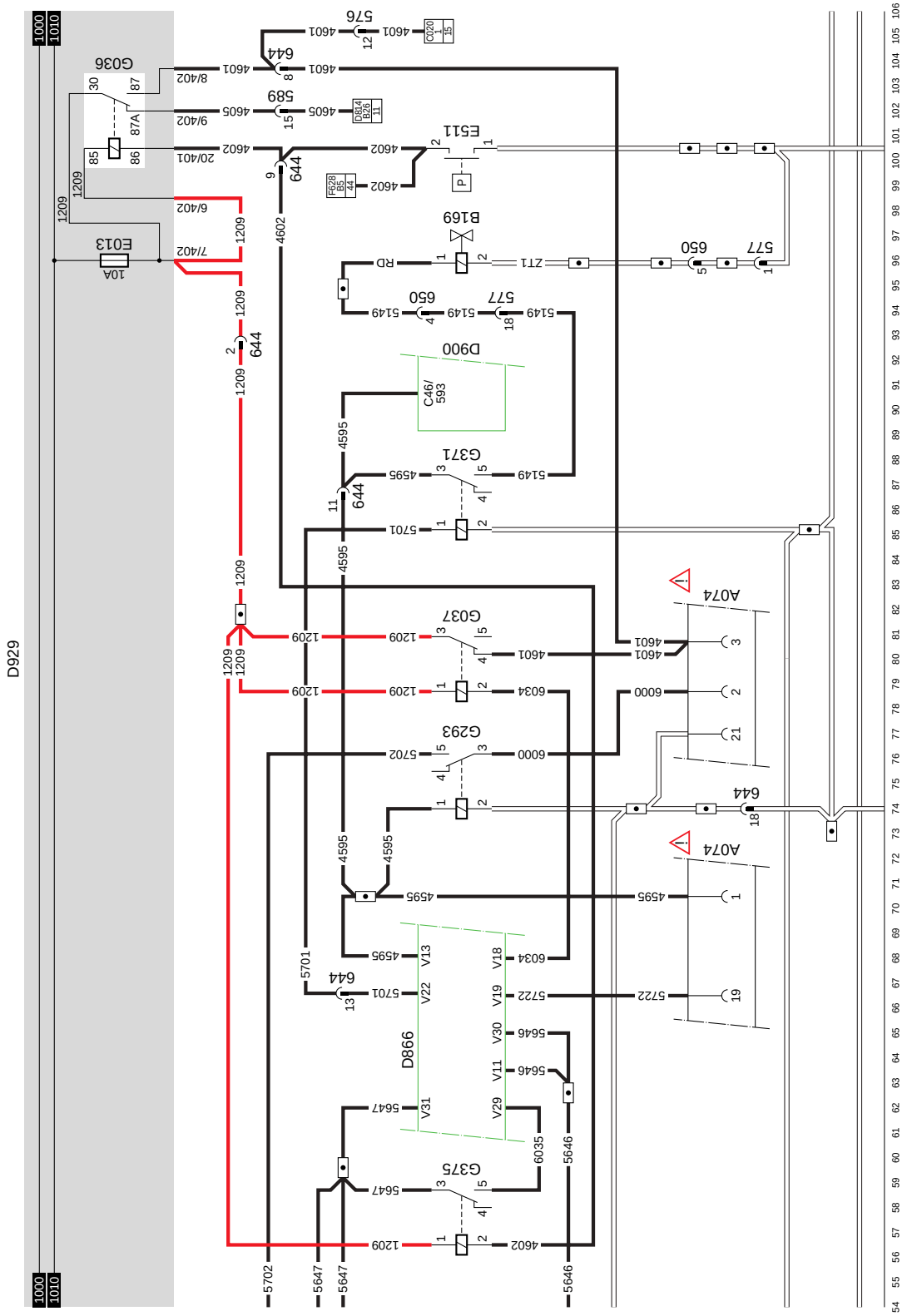

30 **1358030/25** EL001142

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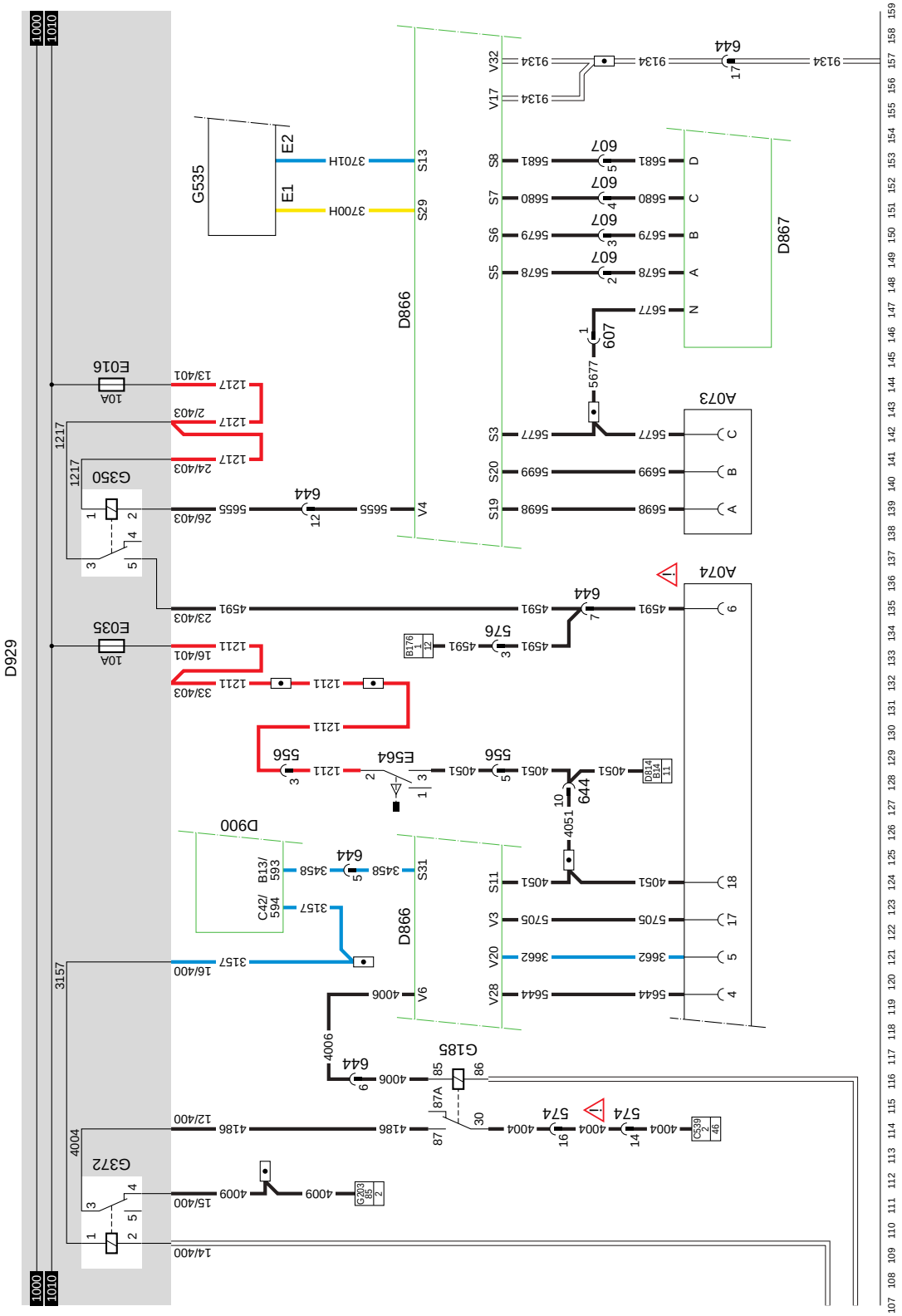

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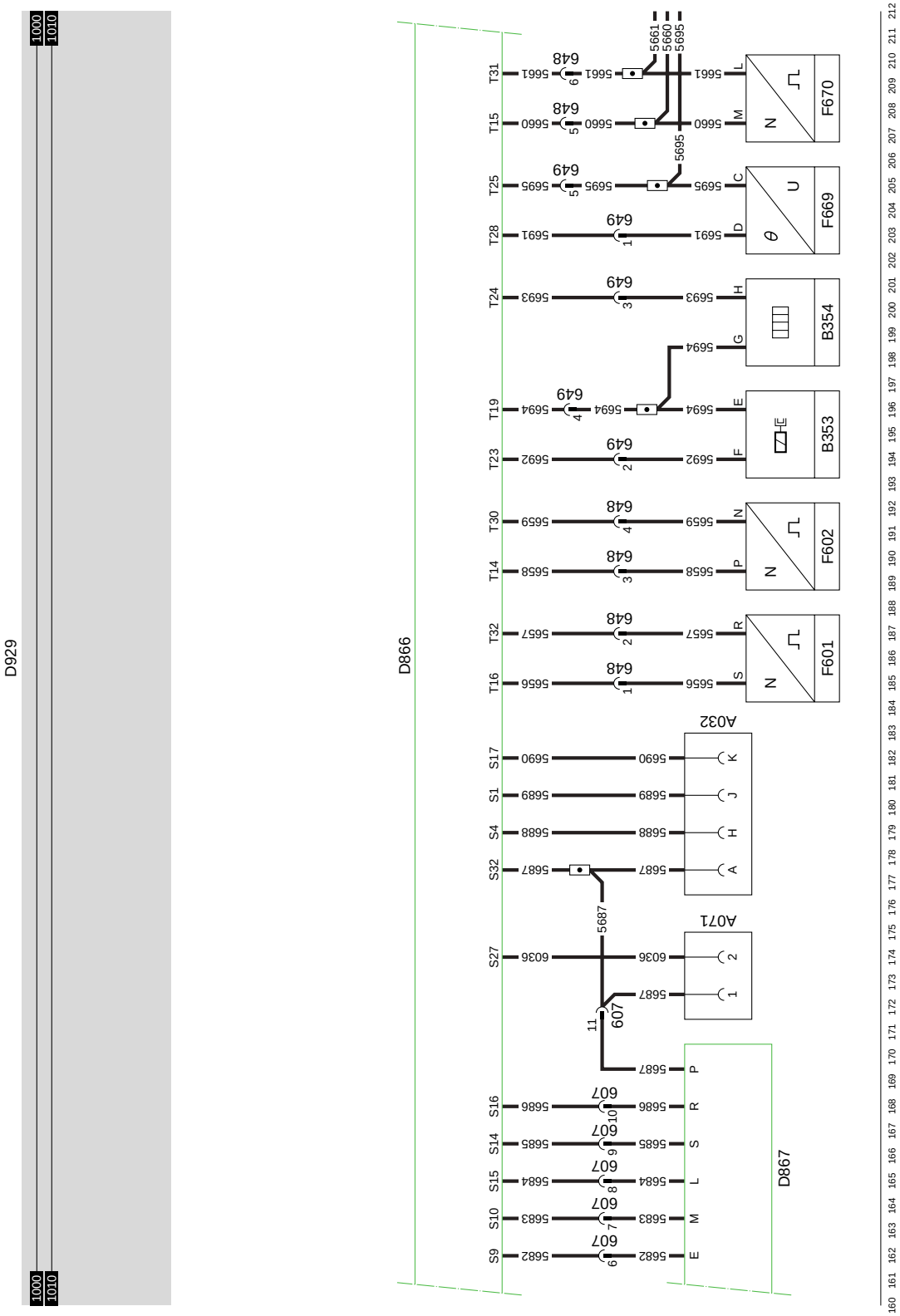

30 **1358030/25** EL001144

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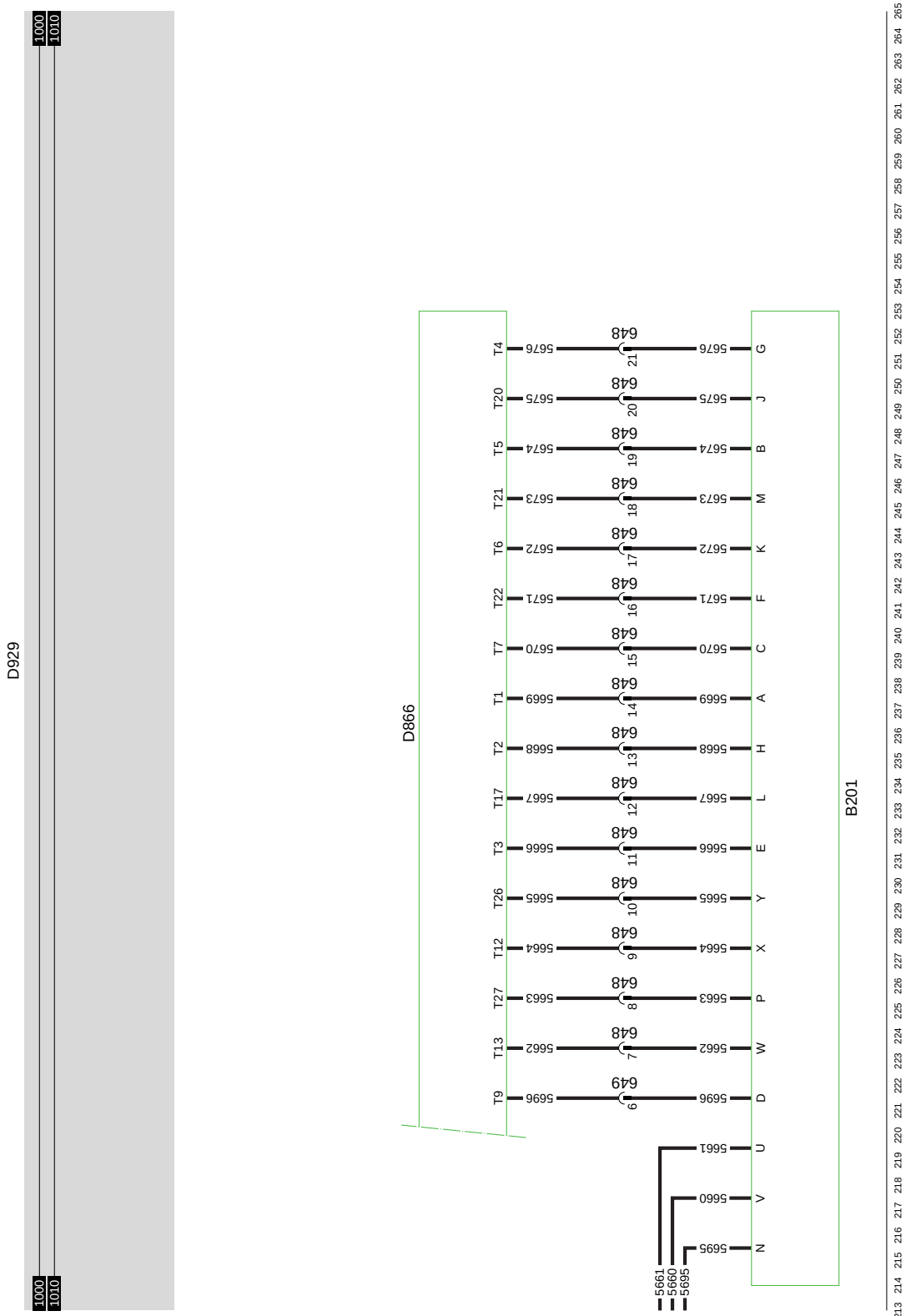

30 **1358030/25** EL001145

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11

31 FAG

A distinction can be made between three different situations:
- rest position (normal position during driving).
- bleeding leading rear axle (increased pressure on driving axle).
- ventilating leading rear axle (returned to rest).

Operation of traction assistance is limited to a maximum time: 90 seconds.
A further operation of traction assistance may only be started after a pause of 50 seconds after the end of the previous operation.
By now adjusting a time relay (G095) to a delay time of 60 ± 8 seconds, the pause period is fulfilled.

REST POSITION
When traction assistance switch C882 is operated (connection between contacts 5 and 1), a voltage is applied to connection point 15 of time relay G095 through fuse E062, wire 1221, contacts 5 - 1 of C883, wire 4563.
During normal driving, the traction assistance switch contact (C709) is open. The switch is self-returning.

BLEEDING LEADING REAR AXLE
Pressing and then releasing the traction assistance switch activates traction assistance (bleeding leading rear axle).
The time relay (G095) is now switched on for a period of 60 seconds. Contacts 30 - 87 are closed.
Voltage is now applied from the VIC to connection point 1 of BV084. The VIC will only supply a voltage below the programmed speed. This activates the solenoid valve (B084), thus bleeding the bellows of the leading rear axle. As a result, a greater load is placed on the driving axle (more traction).
When the 60 ± 8 seconds have elapsed, the connection 30 - 87 of time relay G095 is broken. As a result, the voltage on valve B084 is also lost.

There is a safety mechanism to prevent overload of the axle. The proximity switch (E542) monitors the axle load.
When the maximum value is reached, the proximity switch (E542) is activated and a supply voltage is applied to connection point 1 of relay G427.
Relay G427 is now energised, thereby breaking contacts 3 - 4. The bleed valve (B084) is no longer activated, so that bleeding is no longer performed, but is immediately ventilated again.

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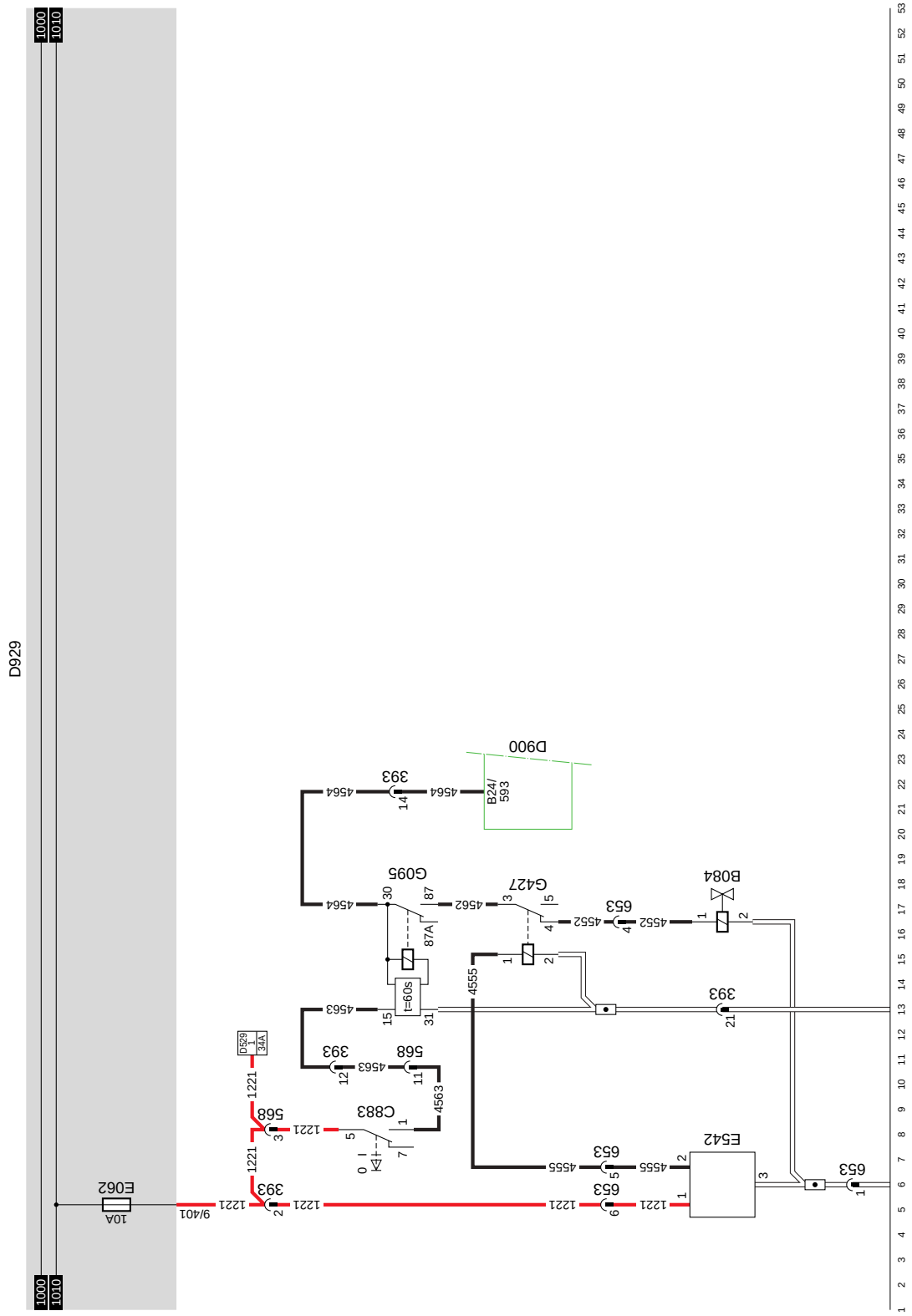

31 **1358030/25** EL001146

11

32 PTO

'REQUEST' PTO 1 (= SWITCH ON)
When the PTO operation switch (C750) is operated, a voltage is applied to connection point 11 of A068 (engine speed application connector) and connection point 27 of connector 595 of D900 (VIC) through fuse E091, wire 1240, contacts 5 - 1 of switch C750 and wire 4594. This means that a 'request' to use the PTO has been made.

This 'request' is carried out depending on the condition programmed in the VIC. A condition might be that the parking brake must be engaged. In this case, a voltage is applied to connection point 1 of parking switch control switch F000 through fuse E035, wire 1211. This voltage is also on connection point 26 of connector 595 of D900 (VIC). If parking brake control switch F000 is closed (connection between contacts 1 and 2), this voltage is also on connection point B22 of D814 (UPEC electronic unit) through wire 3402.

OPERATION
When the 'PTO request' is carried out, the following takes place:
A voltage is applied from connection point 23, connector 593 of D900 to connection point 1 of E570 (clutch - PTO N10 pneumatic switch) (if present) and to connection point 3 of relay G259 (PTO operation takeover relay) (if present) through wire 4596.

When switch E570 (clutch - PTO N10 switch) is operated by depressing the clutch pedal (connection between contacts 1 and 2), a voltage is applied to connection point 1 of relay G259 and to connection point 1 of B245 (PTO operation valve). Relay G259 is energised and, as a result, a connection is made between contacts 3 and 5 of relay G259. Relay G259 now remains energised irrespective of E570 (this is a 'memory' function). B245 is also activated and this switches the PTO on.

The VIC checks whether the PTO is actually switched on. This takes place as follows:
When the PTO has been switched on, F087 is operated mechanically. Contacts 1 - 2 of F087 close. Connection point 14 of VIC connector 593 is now connected to earth. The VIC then sends a message to the DIP and the "PTO active" warning is activated. If the PTO does **NOT** switch on, F087 is **NOT** operated and connection point 14 of connector 593 is **NOT** connected to earth. After a period of time programmed in the VIC a 'message' is sent to the DIP and the "PTO fault" warning symbol is activated.

'CANCEL' PTO 1 (= SWITCH OFF)
Breaking contacts 5 - 1 of C750 switches the PTO off. This interrupts the voltage from connection point 27 of connector 595. One of the switch-on conditions for operation of the PTO is now absent. The VIC responds to this by removing the voltage on connection point 23, connector 593. The voltage on relay G259 is interrupted and, as a result, the coil is no longer energised. Contacts 5 - 3 open and, as a result, the voltage on connection point 1 of B245 is lost. The valve is no longer energised and the PTO is switched off.

SWITCHING ON PTO 2
A voltage is applied to connection point 5 of C751 (PTO operation switch) through fuse E091, wire 1240. When this switch is operated (connection between contacts 5 and 1), voltage is applied to connection point 22 of D900 via wire 5241.

A voltage is applied from connection point 46 of D900 to connection point 1 of B246 (PTO operation valve) through wire 4595. This valve is activated and the PTO switches on.

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The VIC checks whether the PTO is actually switched on. This takes place as follows: When the PTO has been switched on, F088 is operated mechanically. Contacts 1 - 2 of F088 close. Connection point 11 of the VIC is now connected to earth. The VIC then sends a message to the DIP and the "PTO active" warning is activated. If the PTO does **NOT** switch on, F088 is **NOT** operated and connection point 11 is **NOT** connected to earth. After a period of time programmed in the VIC a 'message' is sent to the DIP and the "PTO fault" warning symbol is activated.

Valve B246 is now no longer energised and the PTO is switched off.

SWITCHING OFF PTO 2

Breaking contacts 5 - 1 of C751 switches the PTO 2 off.
This interrupts the voltage on connection point 22 of D900. Valve B246 is no longer energised and the PTO is switched off.
Switch F088 is re-opened (connection between contacts 2 and 1 no longer exists).
The earth connection with D900 is interrupted and the light goes out.

VARIANTS

Location	
9	Optional
36	Connection if there is no N10 PTO clutch switch present.
21, 24, 32	Connector 626: only applicable on vehicle type FA.
28, 32	Connector 650: only applicable if the vehicle has an Allison gearbox.

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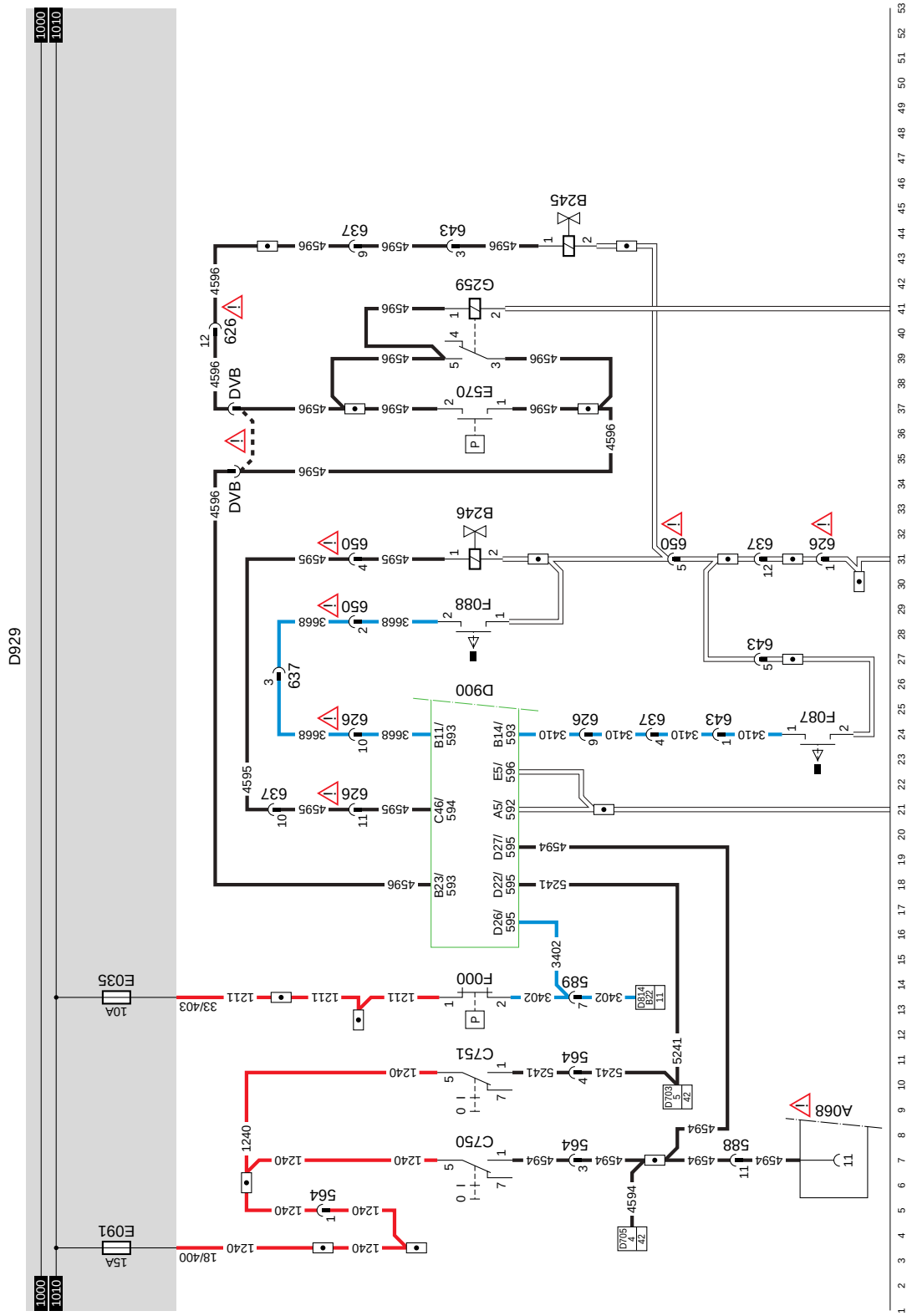

32 **1358030/25**

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33 ROOF SPOTLIGHTS/COOLER BOX/ROTATING BEAMS

ROOF SPOTLIGHTS

Marker/parking lights in roof spotlights.
A voltage is applied to connection point 2 of C622 (lighting switch) via fuse E084 and wire 1101. When this switch is operated (connection between contacts 2 and 1), voltage is applied to connection point 85 of relay G000 (tail light/width marker light relay) via wire 2100. This relay is activated. A voltage is now applied through contacts 30 - 87 of relay G000, fuse E000 and wire 2102 to C074 (left rear width marker light), C012 (left front width marker light) respectively and to C163, C165, C167 and C169 (width marker light/roof spotlights). The marker and parking lights in the spotlights now come on.

Roof spotlights
A voltage is applied to connection point 8 of C832 (direction indicator/windscreen wiper stalk switch) via fuse E084 and wire 1101. When this switch is operated (connection between contacts 8 and 9), voltage is applied to connection point 85 of relay G002 (main beam relay) via wire 2120. This relay is activated. A voltage is now applied through contacts 30 - 87 of relay G002, fuse E006 and wire 2122 to C002 (left main beam) and connection point 6 of C813 (roof spotlights switch) respectively. When this switch is closed (connection between contacts 6 and 2), voltage is also applied to connection point 85 of G299 (roof spotlights relay). This relay is activated. A voltage is now applied to connection point 1 of C162, C164, C166 and C168 (roof spotlights) respectively through fuse E142, wire 1154, contacts 30 - 87 of G299. The spotlights will now light up.

COOLER BOX
The cooler box is connected to voltage BEFORE contact. Voltage is applied to connection point 1 of B356 (cooler box) from fuse E142 via wire 1154.

ROTATING BEAMS
The rotating beams are connected to voltage BEFORE contact. Voltage is applied to connection point 6 of C716 (rotating beams switch) from fuse E142 via wire 1154. When the switch is closed (connection between contacts 6 and 2), voltage is applied to C144 (left rotating beam, driver's side) and C145 (right rotating beam, co-driver's side) via wire 2017. These rotating beams will now light up.

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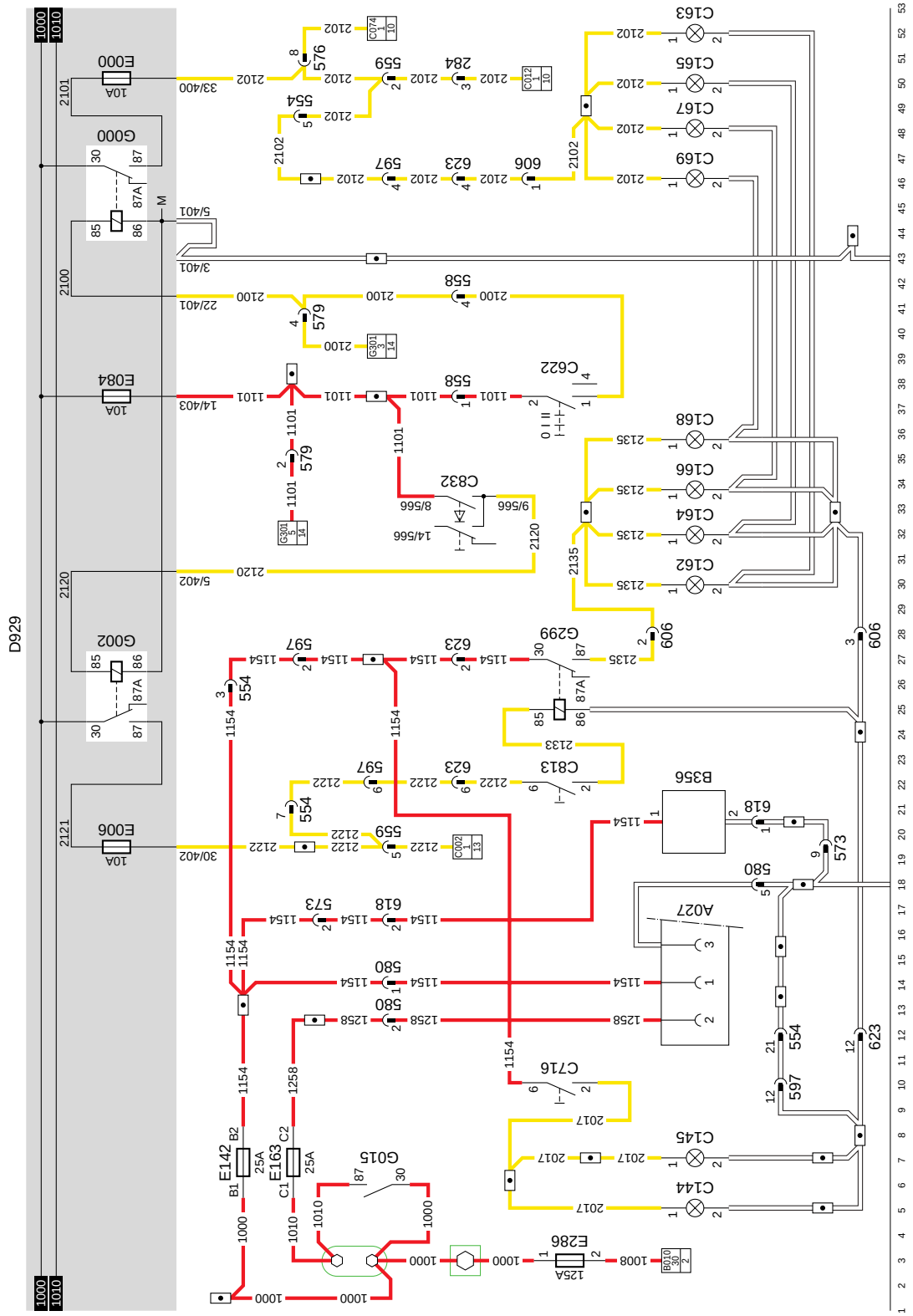

33 **1358030/25** EL001148

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34A ECAS-3 (4x2)

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
98 On vehicle type FA, B250; on vehicle type FT, B238.

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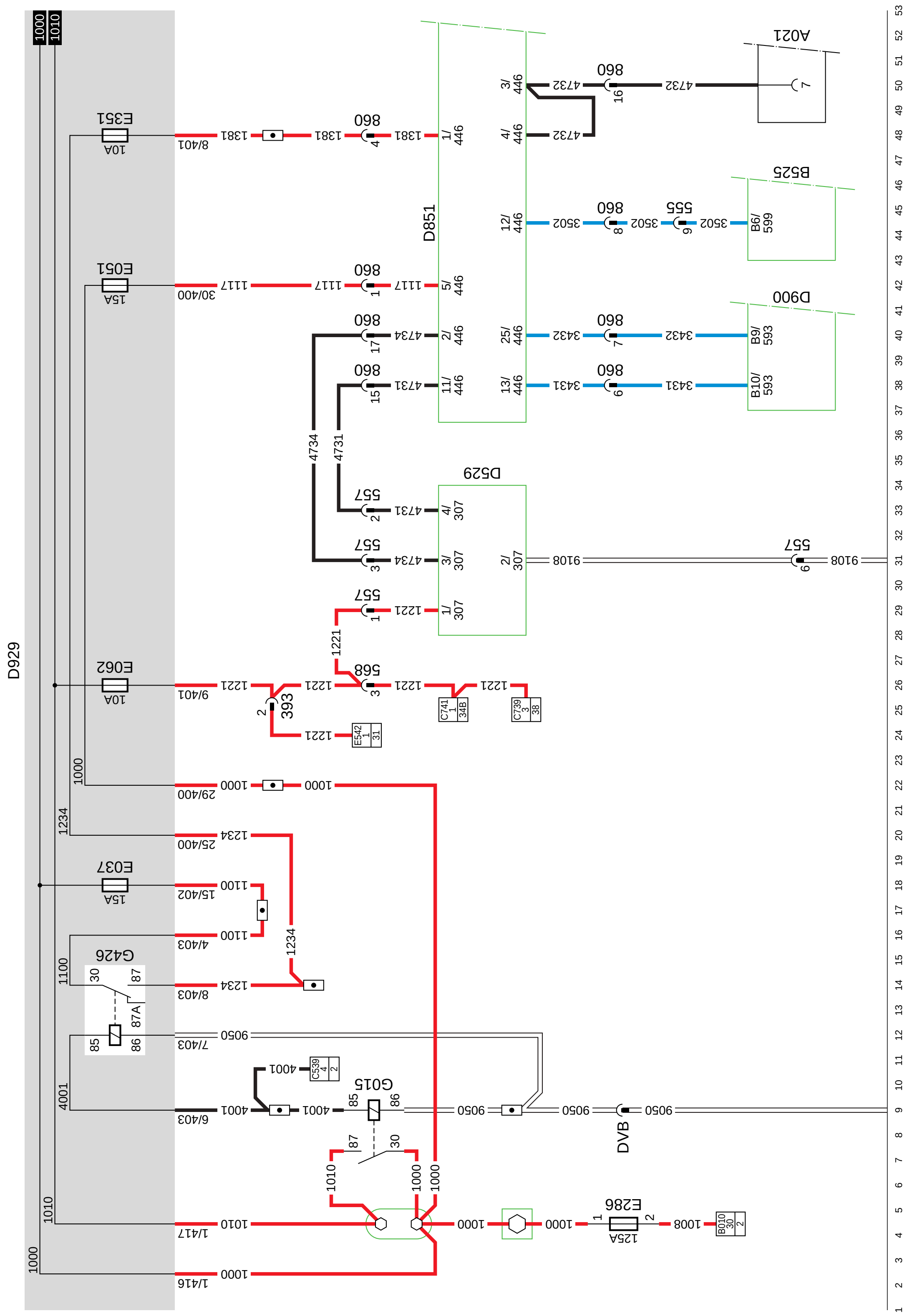
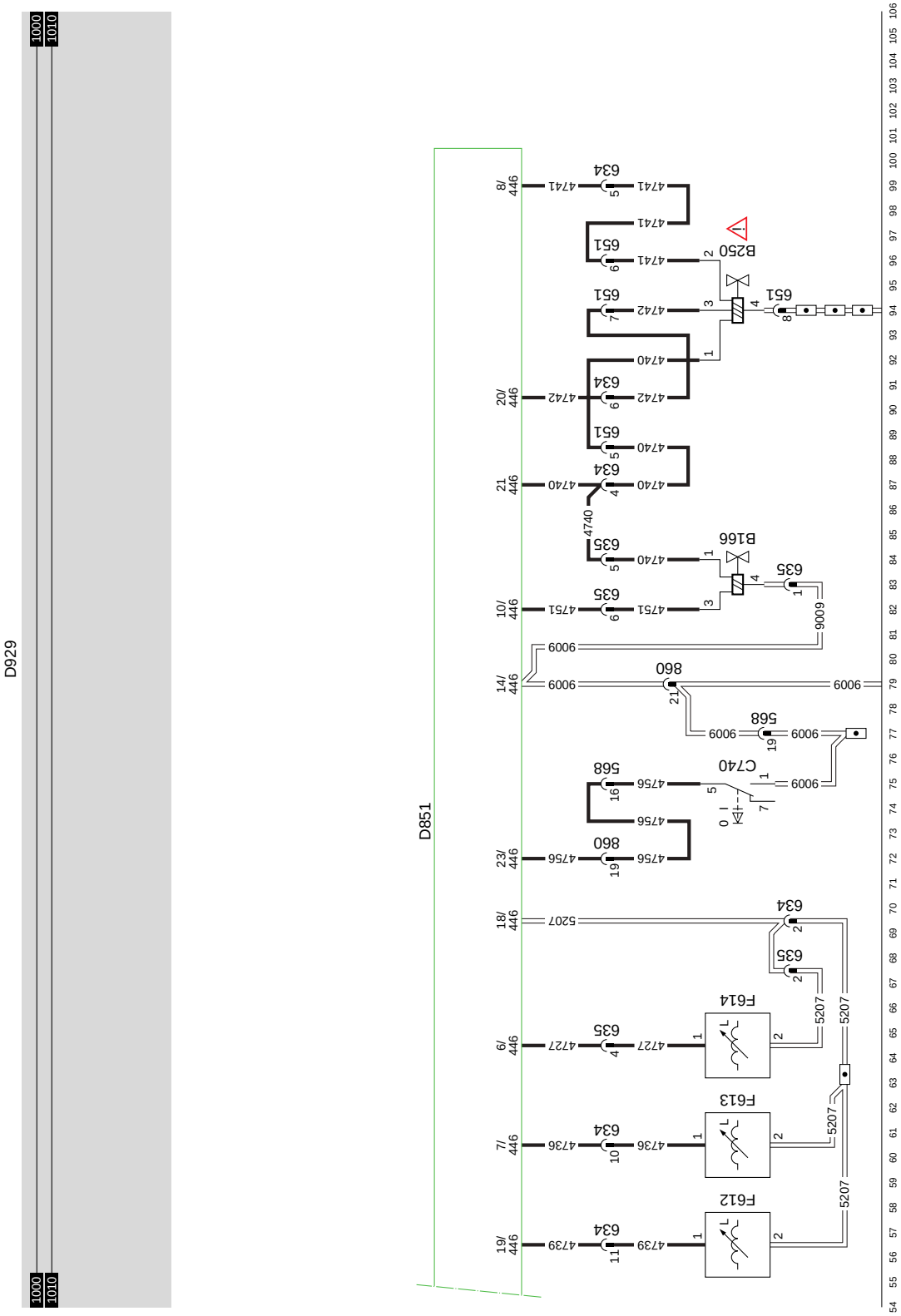


34A 1358030/25

EL001149



34A **1358030/25**

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34B ECAS-2 (6x2)
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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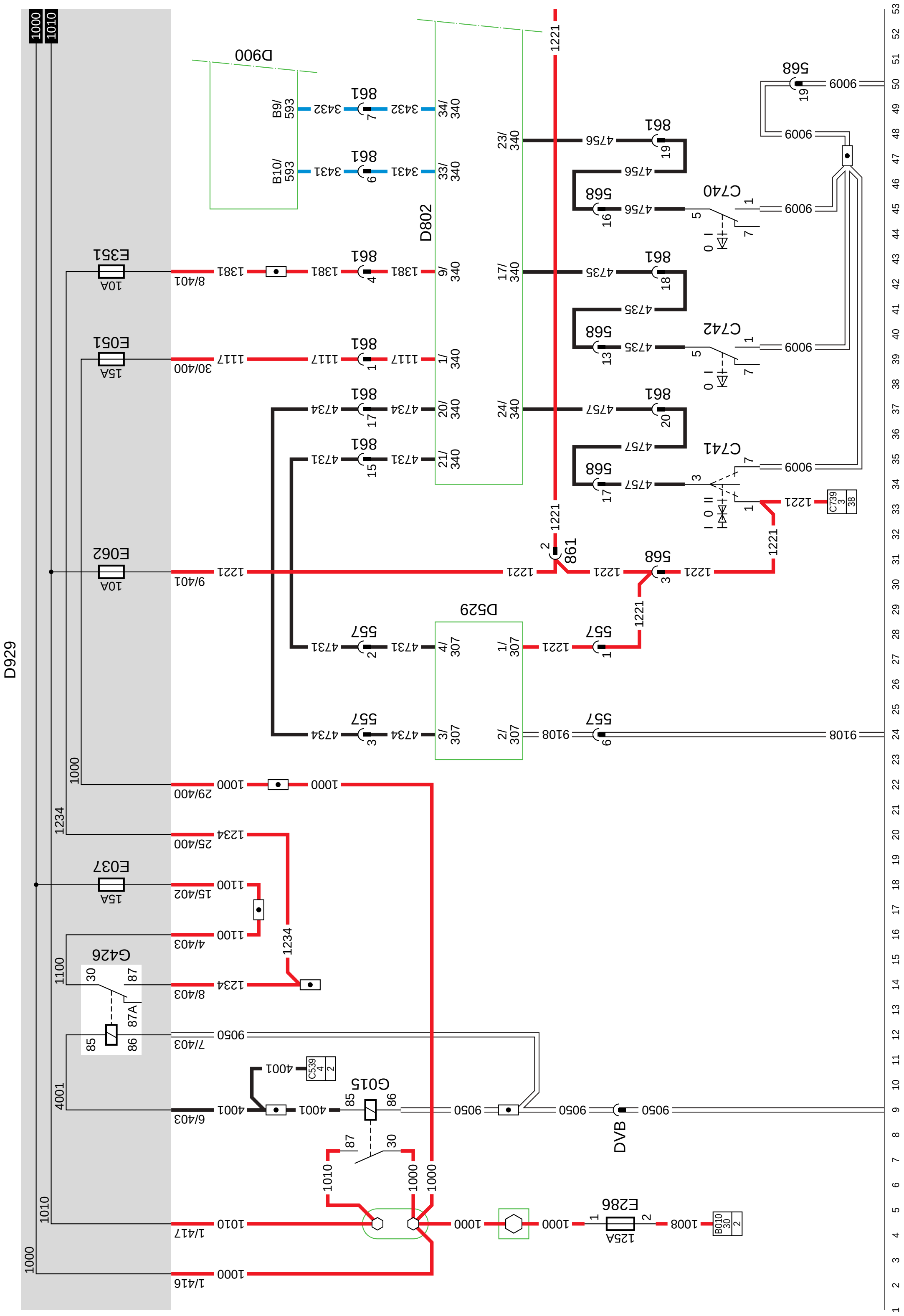
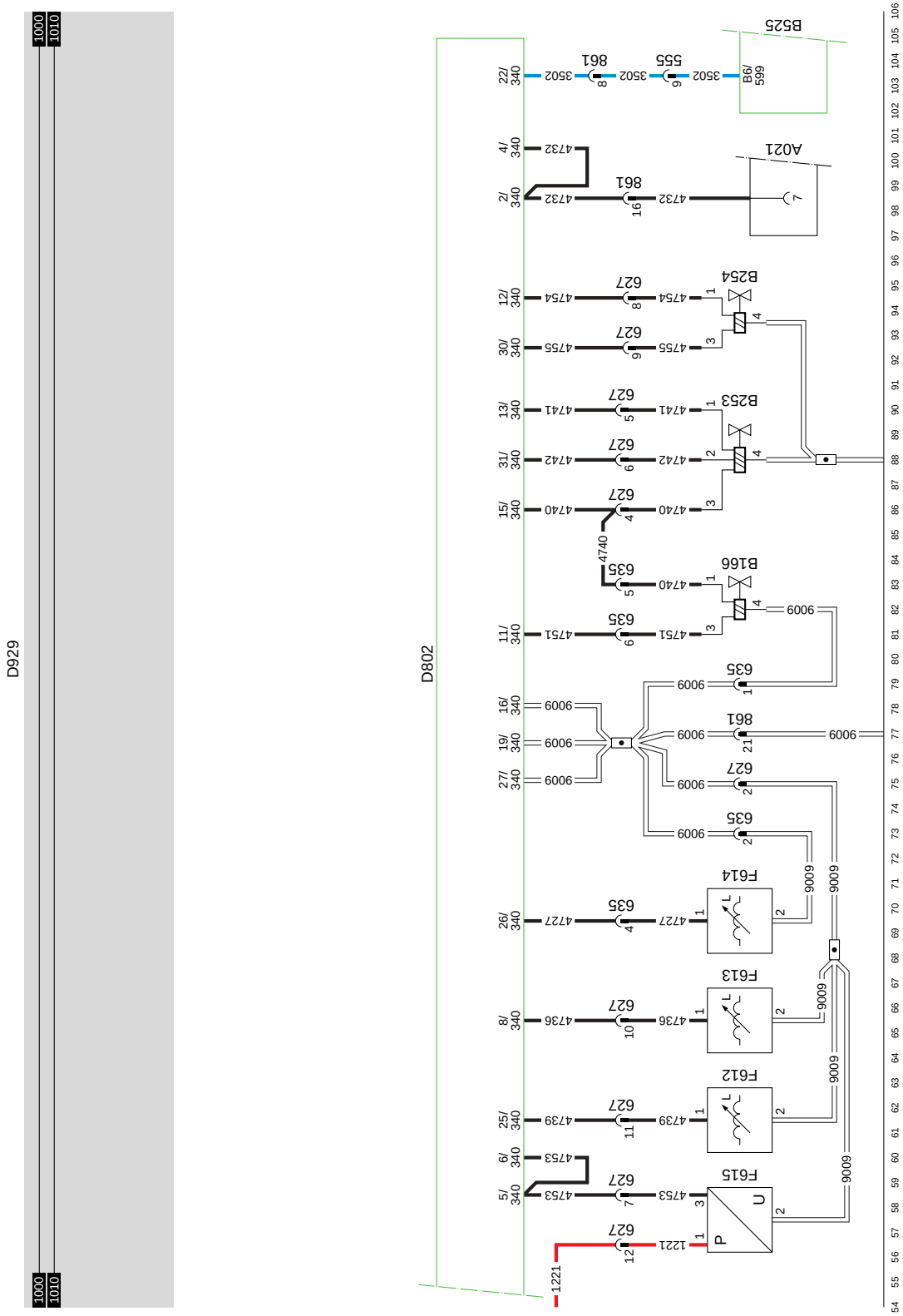


34B **1358030/25**

EL001151



34B **1358030/25**

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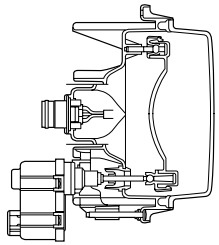
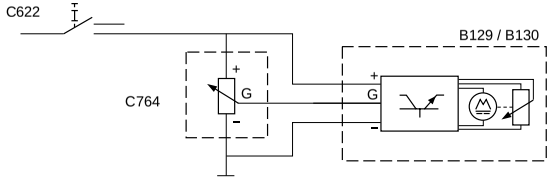
35 HEADLAMP HEIGHT ADJUSTMENT

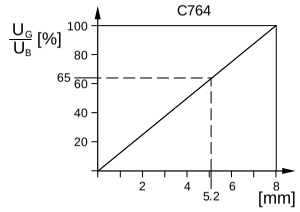
Operation

Parking/marker lights position
A voltage is applied to connection 2 of switch C622 (light switch) through fuse E084, wire 1101. If a connection is made to switch C622 (contacts 2 and 1), a voltage is applied to contact 85 of relay G000 (rear light/width marker light relay) via wire 2100. Once the relay is activated, a connection is made between points 30 and 87. As a result, a voltage is applied through relay G000 (contacts 30 - 87), wire 2101, fuse E117 and wire 2630 to connection point A of switch C764 (headlamp height adjustment potentiometer). The LED in the switch will now illuminate.

Dipped beam position
When a connection is made between contacts 2 and 4 through switch C622, a voltage is applied to connection point 85 of relay G000 through fuse E084, wire 1101, switch C622, wire 2110, via D609 (light switch diode). There is also a voltage on both B129 (left headlamp height adjustment motor), connection point 1, and on B130 (right headlamp height adjustment motor), connection point 1 and connection point 3 of C764 (headlamp height adjustment potentiometer). Depending upon the position of C764 (headlamp height adjustment potentiometer), the motor in the headlamp will be activated. The headlamp height adjustment motor remains activated until there is an electrical equilibrium. This equilibrium refers to the voltage difference that exists between wires 2110 and 4953 of C764, B129 and B130. The voltage difference should be the same for all three components.







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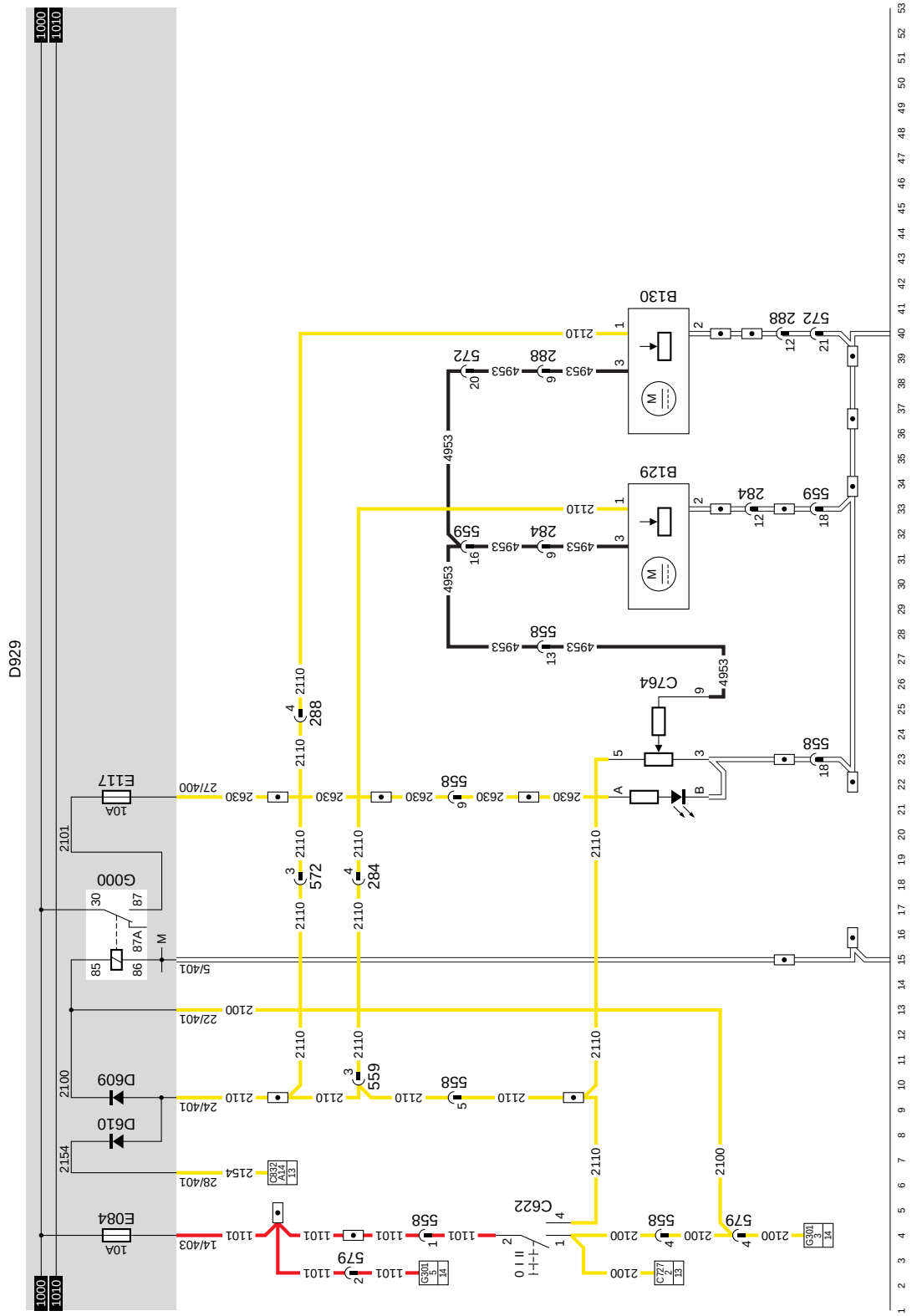

35 **1358030/25** EL001153

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11

36 24 V/12 V CONVERTER FOR RADIO/CB SET

The following description of the operation and connection is intended as a general guideline only.

Also refer to the manufacturer's installation instructions supplied with the radio.

If the ignition switch (C539) is switched to accessory position, pin 1 is connected to pin 6 (wire 1100 is connected to wire 1130). As a result, a voltage is applied to connection point 85 of relay G178. This relay is activated. A voltage is now applied to connection point 1 of relay G377 through fuse E037, wire 1100, contacts 30 - 87 of relay G178, wire 1147, fuse E052 and wire 1110. This relay is activated. There is now a power supply of 12 volts to connection point A7 of the 'ISO' connector through wire 1108 and contacts 3 - 5 of relay G377 and wire 1363. The radio has an aerial connection and 2 loudspeaker outputs which can be used to connect loudspeakers B024 and B025. Two high-tone and two low-tone speakers (B178, B179, B180 and B181) can also be connected to the radio.

CB SET
Wire 1108 is also available in a white connector for a transmitter (B026). This connector is in the roof console on the driver's side.

For more information see also block 6: Connection of accessories.

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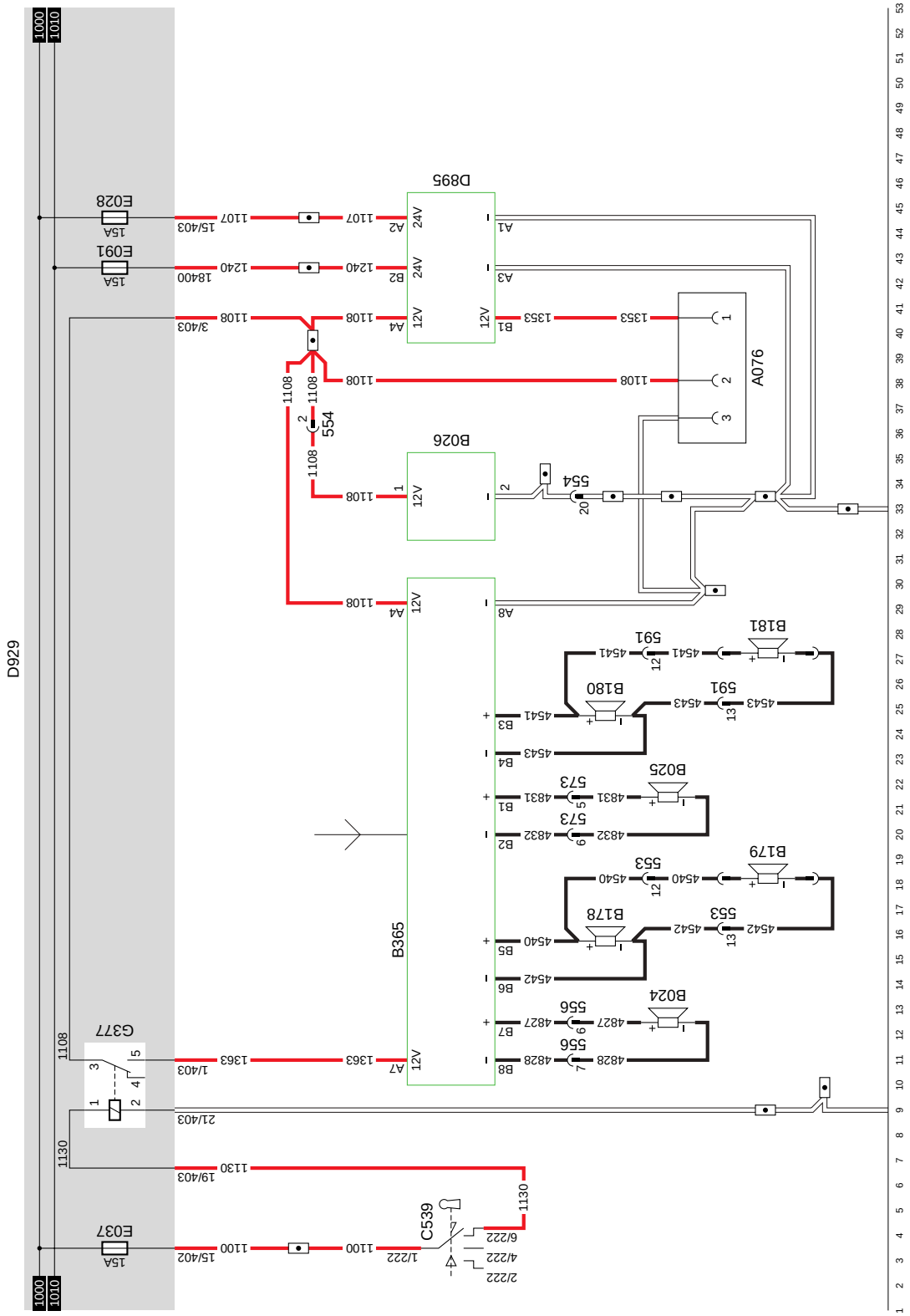

36 **1358030/25** EL001154

11

37 DROP GLASS OPERATION / CENTRAL DOOR LOCKING / SH CAB ROOF HATCH

CENTRAL DOOR LOCKING

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

ELECTRIC DROP GLASS OPERATION, DRIVER'S SIDE (OPENING)
(Switch in door panel, driver's side)
When the electric drop glass operation switch (C745) makes a connection (contacts 2 and 4), relay G030 will be energised through fuse E044, switch C745 (wire 4526). As a result of this, there is a supply voltage on connection point 1 of the motor (B003) through fuse E034. The other connection point (2) is connected to earth via relay G031. The motor starts running anti-clockwise and the driver's side window opens.

ELECTRIC DROP GLASS OPERATION, DRIVER'S SIDE (CLOSING)
(Switch in door panel, driver's side)
When the electric drop glass operation switch (C745) makes a connection (contacts 4 and 1), relay G031 will be energised through fuse E044, switch C745 (wire 4527). As a result of this, there is a supply voltage on connection point 1 of the motor (B003) through fuse E034. The other connection point (2) is connected to earth via relay G030. The motor starts running clockwise and the driver's side window will close.

ELECTRIC DROP GLASS OPERATION, CO-DRIVER'S SIDE (OPENING)
(Switch in door panel, driver's side)
When the electric drop glass operation switch (C743) makes a connection (contacts 2 and 4), relay G028 will be energised through fuse E044, switch C743 (wire 4522). As a result of this, there is a supply voltage on connection point 2 of the motor (B004) through fuse E033. The other connection point (1) is connected to earth via relay G029.
The motor starts running anti-clockwise and the co-driver's side window will open.

ELECTRIC DROP GLASS OPERATION, CO-DRIVER'S SIDE (CLOSING)
(Switch in door panel, driver's side)
When the electric drop glass operation switch (C743) makes a connection (contacts 4 and 1), relay G029 will be energised through fuse E044, switch C743 (wire 4523). As a result of this, there is a supply voltage on connection point 1 of the motor (B004) through fuse E033. The other connection point (2) is connected to earth via relay G028.
The motor starts running clockwise and the co-driver's side window will close.

ELECTRIC DROP GLASS OPERATION, CO-DRIVER'S SIDE
(Switch in door panel, co-driver's side)
Operation of the drop glass on the co-driver's side through switch C744 works in exactly the same way as on the driver's side. When switch C744 is operated (connection between contacts 4 and 2), relay G028 is switched via switch C743 (contacts 5 and 2) and the motor (B004) will open the window. When switch C744 (connection between contacts 4 and 1) is operated, relay G029 is activated through switch C743 (contacts 3 and 1), the motor runs clockwise and the window closes as a result.

The electric drop glass will only operate if the contact is activated.

SH CAB ROOF HATCH

OPENING ROOF HATCH
When the roof hatch switch (C736) is operated and a connection is made between contacts 2 and 6 and therefore between contacts 1 and 3, a voltage is applied to pin 1 of the roof hatch motor (B175) through fuse E028, switch C736 and wire 4761. The roof hatch will open.

CLOSING ROOF HATCH
When the roof hatch switch (C736) is operated and a connection is made between contacts 8 and 6 and therefore between contacts 7 and 3, a voltage is applied to pin 2 of the roof hatch motor (B175) through fuse E028, switch C736 and wire 4760. The roof hatch will now close.

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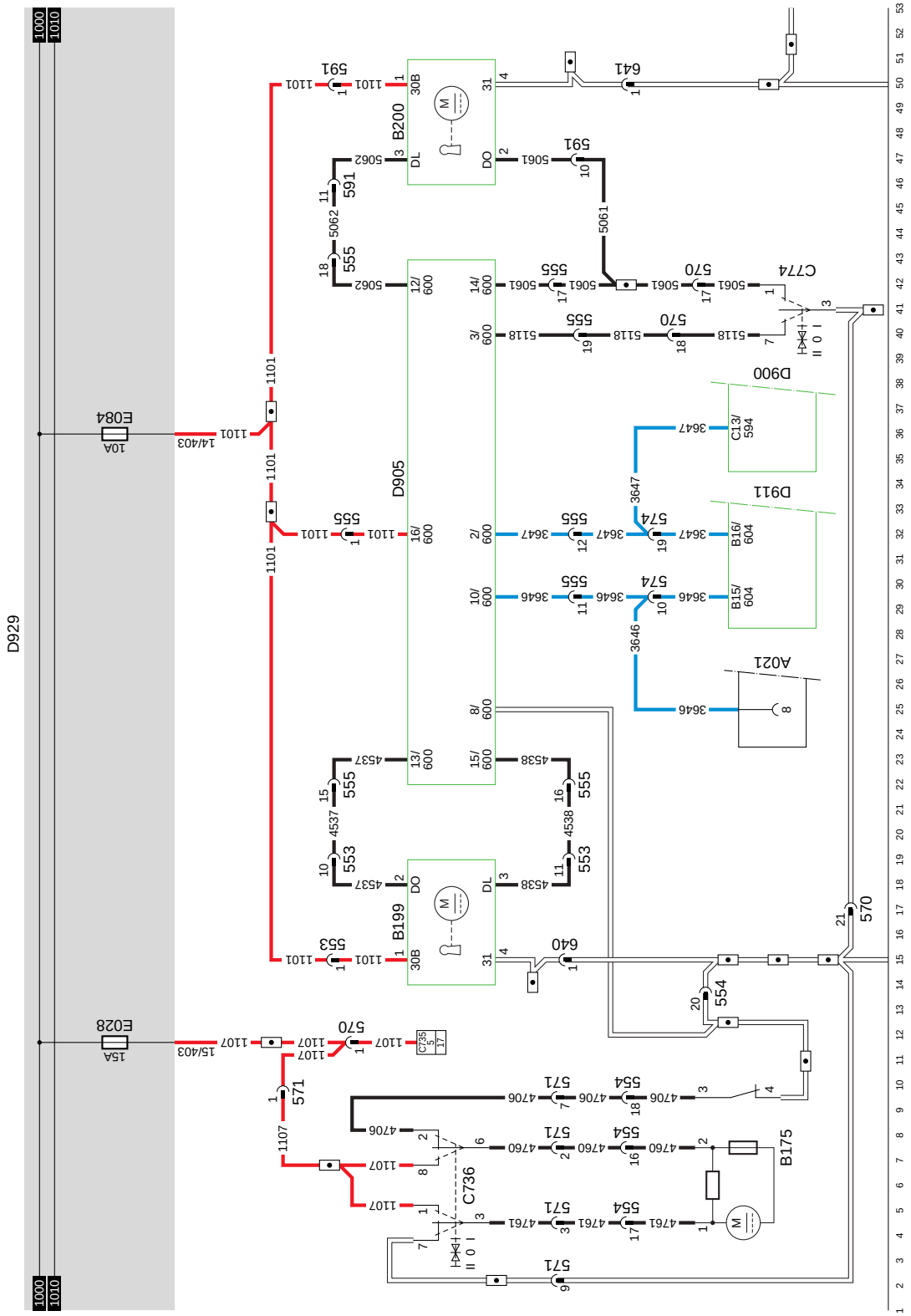

37 **1358030/25**

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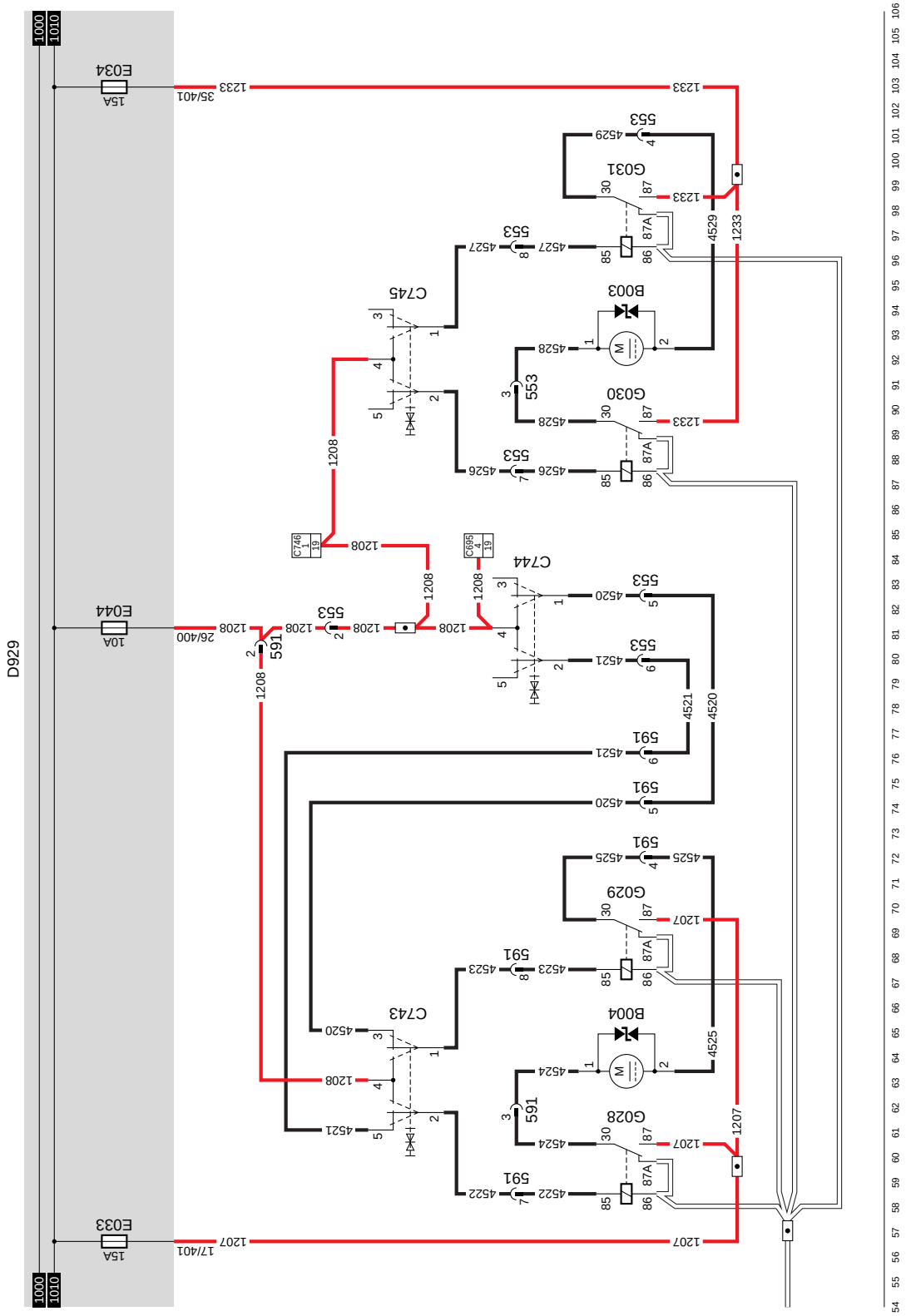

37 **1358030/25** EL001156

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38 MECHANICAL LIFTING GEAR

Manual lifting:
When switch C704 (lifting gear switch) is operated (connection between contacts 3 - 1), a voltage is applied to connection point 1 of B071 through fuse E062, wire 1221, contacts 3 - 1 of switch C704, wire 4550, contacts 3 - 4 of relay G381 and wire 5180. This valve is energised. The voltage is applied to connection point 85 of relay G052 at the same time through D622, wire 4552, contacts 30 - 87a of relay G066, wire 4557. This relay is activated and closes contacts 1 - 2. A voltage is now applied to connection point 1 of B073 through contacts 1 - 2 of relay G052, wire 4554. The oil pump motor starts to run.
If the oil pressure becomes too high (> 160 bar), E524 will close. Voltage is now applied to connection point 85 of relay G066 through contacts 1 - 2 of E524. This relay is energised and breaks the connection 30 - 87a. Voltage is now applied to connection point 85 of relay G066 from wire 4552 through contacts 30 - 87 of relay G066 and wire 4558. This relay continues to be activated. At the same time the voltage through relay G052 is lost. Contacts 1 - 2 open and the voltage on connection point 1 of B073 is lost. The pump motor is no longer driven and the oil pressure drops.

Manual lowering:
When switch C704 (lifting gear switch) is operated (connection between contacts 3 - 7), a voltage is applied to connection point S1 of D503 through fuse E062, wire 1221, contacts 3 - 7 of switch C704 and wire 4551. A voltage is applied to connection point 1 of B072 through connection point 87 of D503, wire 4553. This valve is energised. The voltage is applied to connection point 85 of relay G052 at the same time through D623, wire 4552, contacts 30 - 87a of relay G066, wire 4557. This relay is activated and closes contacts 1 - 2. A voltage is now applied to connection point 1 of B073 through contacts 1 - 2 of relay G052, wire 4554. The oil pump motor starts to run.
If the oil pressure becomes too high (> 160 bar), E524 will close. Voltage is now applied to connection point 85 of relay G066 through contacts 1 - 2 of E524. This relay is energised and breaks the connection 30 - 87a. Voltage is now applied to connection point 85 of relay G066 from wire 4552 through contacts 30 - 87 of relay G066 and wire 4558. This relay continues to be activated. At the same time the voltage through relay G052 is lost. Contacts 1 - 2 open and the voltage on connection point 1 of B073 is lost. The pump motor is no longer driven and the oil pressure drops.

Automatic axle load protection:
If the pressure on the driven axle is greater than the legal maximum, sensor E584 is activated. This puts sensor E507 in 'stand-by' mode. If the permitted axle load increases further (> 10 tons), sensor E507 automatically lowers the trailing axle.

If the axle has been lifted, F097 (proximity switch for trailing axle lifting gear) ensures that relay G380 is energised through wire 3661. A voltage is now applied through fuse E062, wire 1221, contacts 3 - 5 of relay G380 to connection point 1 of E507. This relay is activated.
The voltage is immediately transmitted to S2 on D503. The signal sent by the proximity switch for axle load protection (E507) to S2 should last for at least 10 seconds before the lifting gear electronic unit (D503) will activate the valve (B072) and the lifting-gear pump motor (B073), so that the trailing axle is lowered. This is to prevent the legal maximum axle load from being exceeded.
If the dashboard switch is operated within this 2.5 minute period, the electronic unit will be reset and another 2.5 minute period will start.

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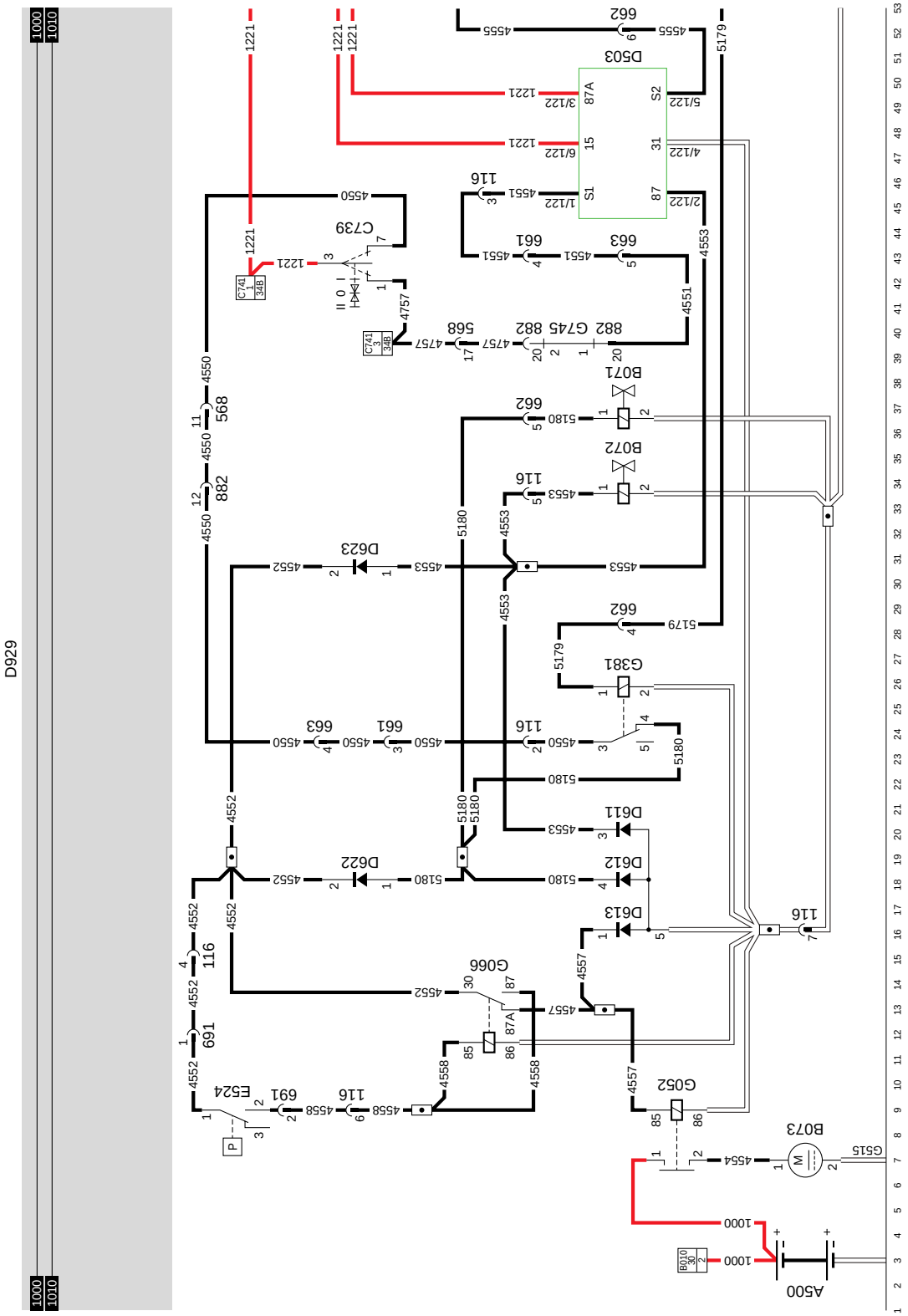
As a result, the lifting-gear motor relay (G052) will also be activated, thus activating the lifting-gear pump motor (B073). The motor is activated through D623, relay G066 (connection between points 30 and 87a) to connection point 85 of relay G052. When a pressure of 160 bar is reached, the limit switch (E524) switches the lifting-gear pump motor (B073) off through relay G066 and relay G052.

The trailing axle cannot be lifted for a period of 2.5 minutes as the valve (B072) remains energised. This valve should be in the **non**-activated position for lifting.



38 **1358030/25** EL001157

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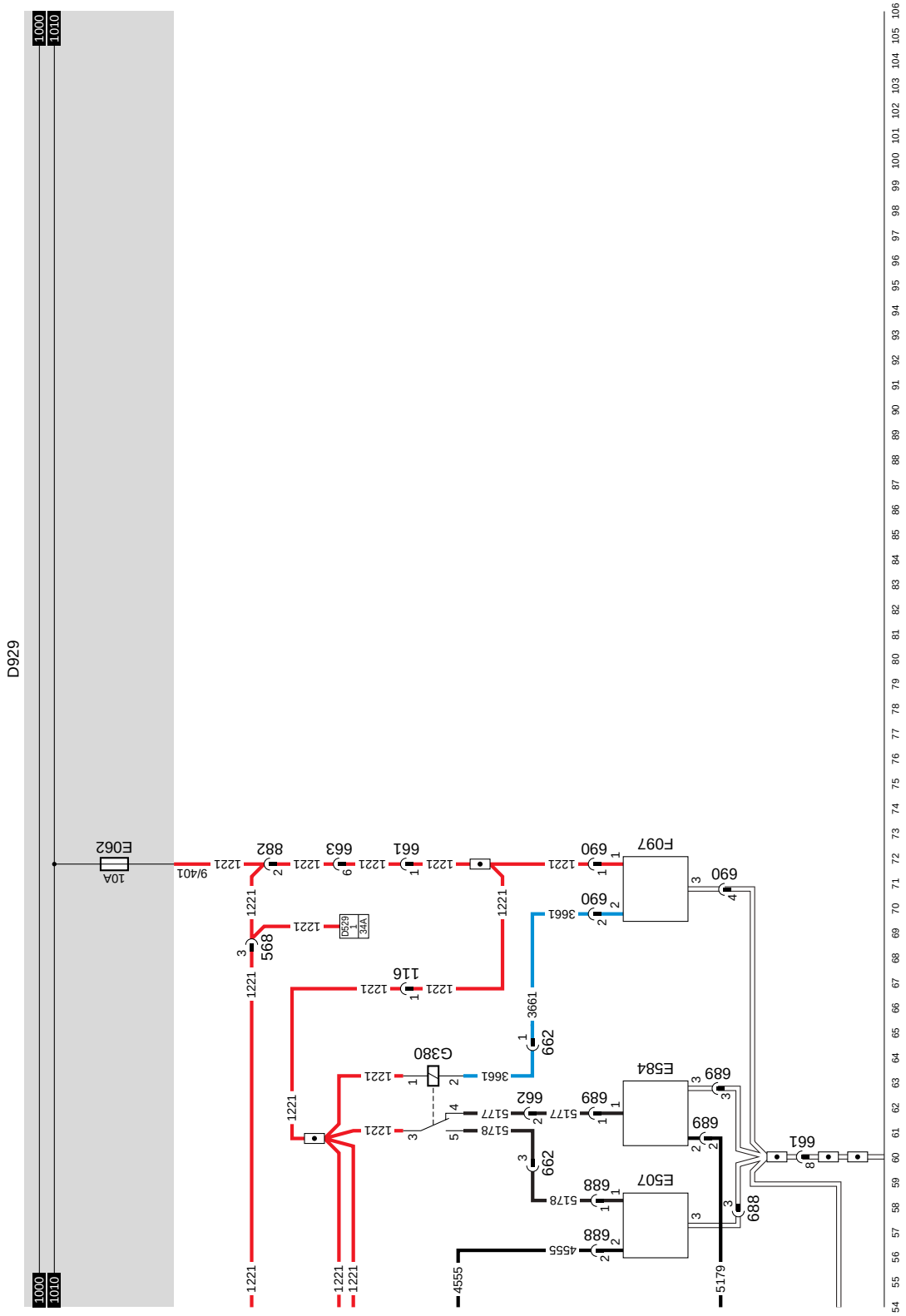

38 **1358030/25** EL001158

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39 FUEL PRE-HEATING (THERMOLINE)

A voltage is applied to connection point 5 of C872 (fuel filter/water separator operation switch) through wire 1010, fuse E170, wire 1285. When this switch is switched on (connection between contacts 5 and 1), voltage is applied to connection point 85 of relay G201 (Thermoline fuel heating relay) via wire 5048. This relay is energised and contacts 30 - 87 close.
A voltage is now applied to connection point 1 of B182 (fuel heating element) through wire 1000, fuse E164, wire 1190, contacts 30 - 87 of relay G201 and wire 5051. This element now warms up and will keep the fuel fluid.

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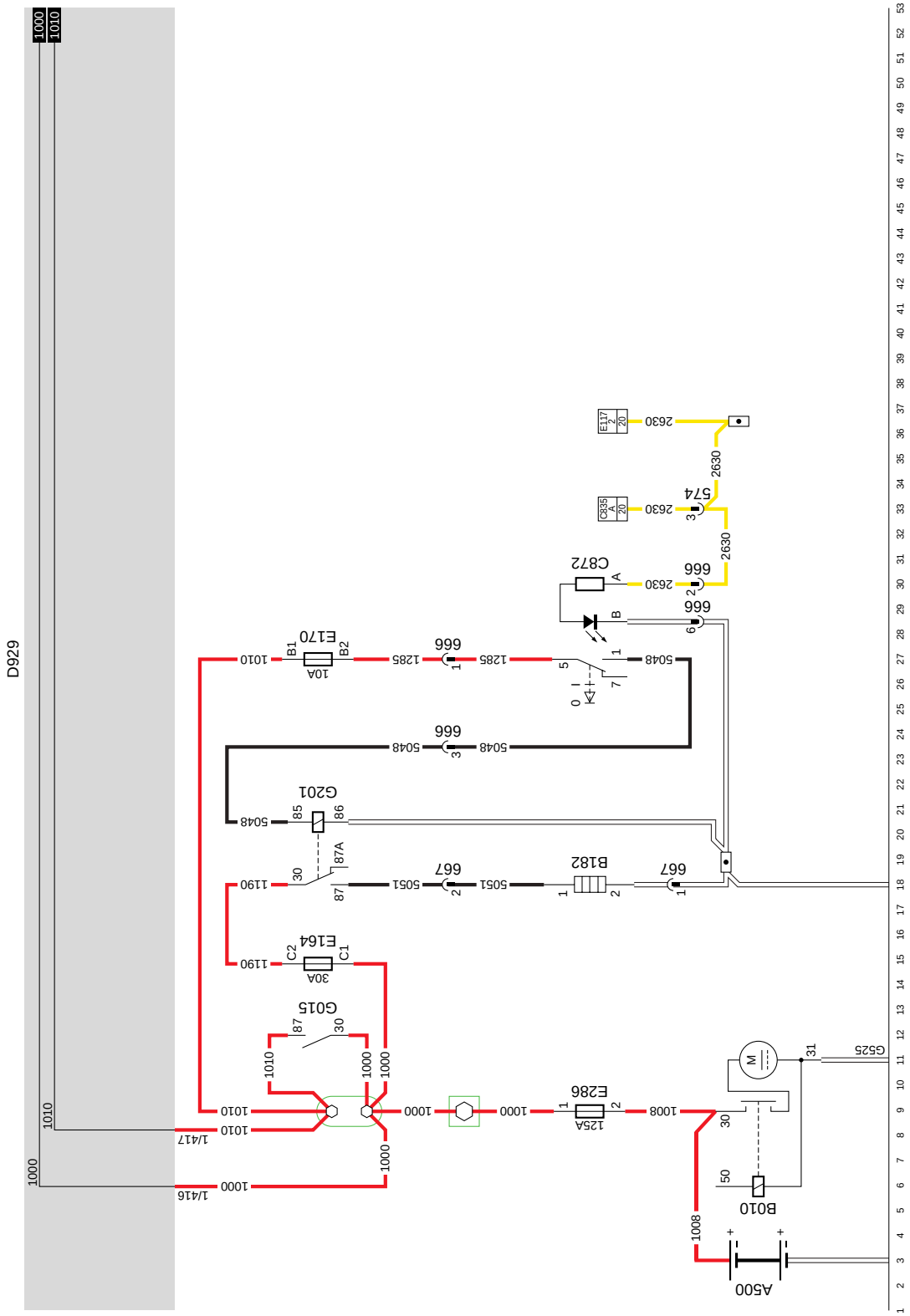

39 **1358030/25** EL001159

11

40 WINDSCREEN WIPE/WASH INSTALLATION

Speed I (low speed)
When windscreen wiper switch C832 is set to position I (connection between contacts 13 and 2), there is a voltage on connection pin 9 of connector 595 through fuse E035, wire 1211, contacts 13 - 2 of switch C832 and wire 4501. The VIC (D900) switches connection pin 50 of connector 594 to earth. Voltage is now applied to connection pin 1 of relay G237 through fuse E025, wire 1205. Because the VIC has connected wire 4505 to earth through connection pin 50 (connector 594), relay G237 is energised.
A voltage is now applied to connection point 53 of B000 through fuse E025, wire 1205, contacts 3 - 4 of relay G236, wire 4507.

Speed II (high speed)
When windscreen wiper switch C832 is set to position II (connection between contacts 3 and 10), relays G236 and G237 are switched to earth through fuse E025, wire 1205, relays G236 and G237, wire 4505, diode D782, wire 4504 and switch C832 (contacts 3 - 10).
Both relays are now energised. A voltage is now applied to connection point 53b of B000 through fuse E025, wire 1205, contacts 5 - 3 of relay G237, wire 4506, contacts 3 - 5 of relay G236 and wire 4508.
The VIC is bypassed at speed II (high speed).

Intermittent wipe
When windscreen wiper switch C832 is set to intermittent (connection between contacts 13 and 1), there is a voltage on connection point 37, connector 595 through E035, wire 1211, contacts 13 - 1 of C832 and wire 4502. The VIC (D900) switches connection pin 50, connector 594 to earth. Voltage is now applied to connection pin 1 of relay G237 through E025, wire 1205. The earth is formed through wire 4505 and connection point 50 of connector 594. As a result, relay G237 is energised. A voltage is now applied to connection point 53 of B000 through fuse E025, wire 1205, contacts 5 - 3 of relay G237, wire 4506, contacts 3 - 4 of relay G236, wire 4507.

A voltage is applied to connection point 32 of VIC connector 595 through fuse E025, wire 1205, the cut-off switch in the windscreen wiper motor (B000), wire 4509. The earth of pin 50 (connector 594) is broken and, as a result, relay G237 is no longer energised.

When pin 32 (connector 595) is connected to earth again via the cut-off switch, pin 50 (connector 594) is switched to earth again after the set interval and relay G237 is energised again as a result. This starts the cycle again.

Wash/wipe
When a voltage is applied briefly and then is lost again (windscreen wiper switch C832 no longer operated) through fuse E035, wire 1211, contacts 4 - 11 of C832, wire 3648, connection point 33 (connector 595), connection point 50 (connector 594) is switched to earth for a specific period of time. As a result, the relay (G237) is energised and the windscreen wipers perform 1 wiper stroke.

When a voltage is applied to windscreen wiper switch C832 through fuse E035, wire 1211, contacts 4 - 11 of C832 and wire 3648 for approximately 2 seconds, a voltage is applied to connection point 1, connector 592, as a result of which the windscreen wiper motor (B001) is activated. After approximately 1 second, C50 is connected to earth for a specific period of time. As a result, the relay (G237) is energised and the windscreen wiper motor is operated.

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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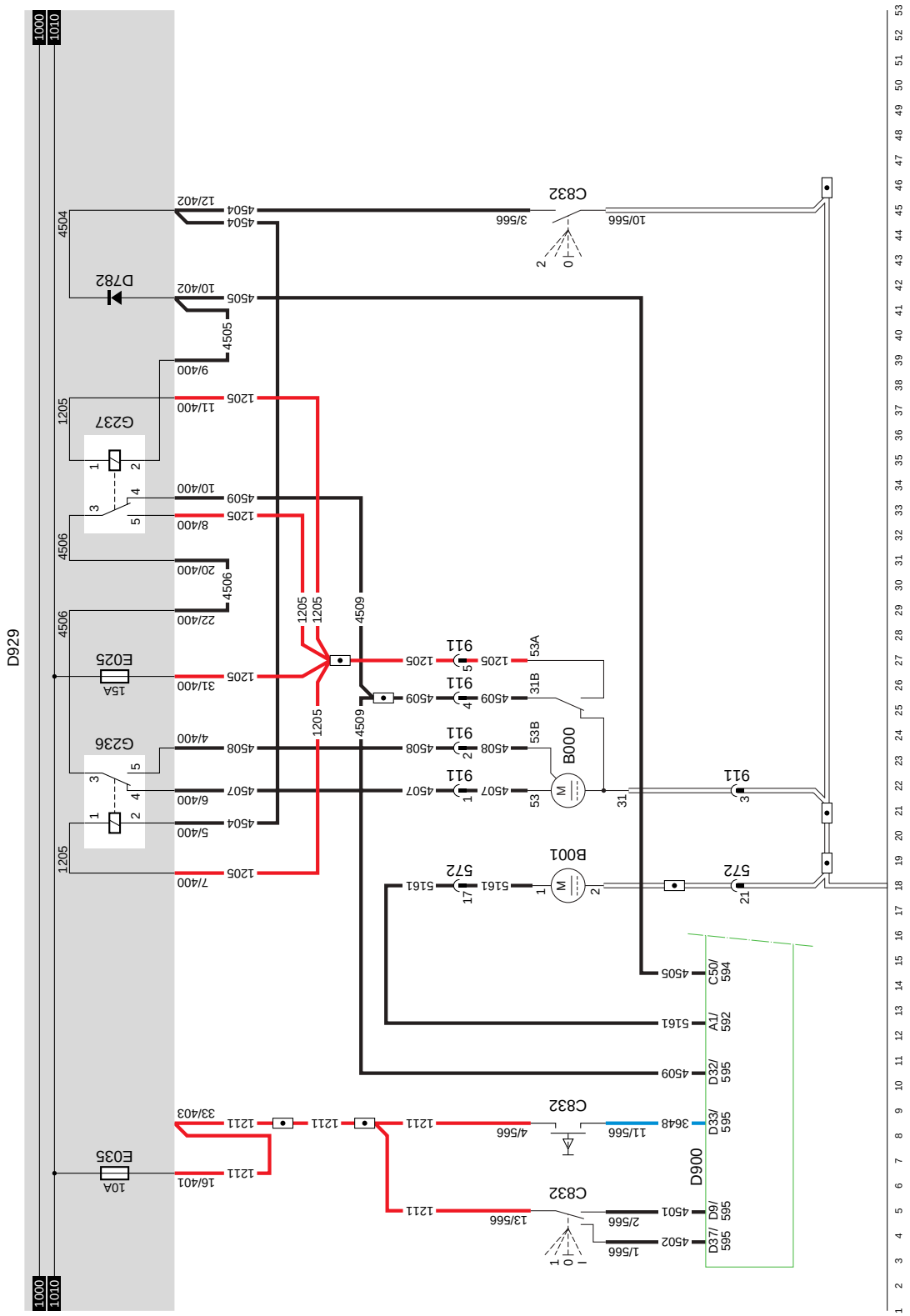

40 **1358030/25** EL001160

41 AIRTRONIC (ACH-EA) CAB HEATER WITH/WITHOUT TIMER UNIT

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location	
7, 10	Only if the vehicle has been equipped to transport hazardous substances in accordance with RTMDR requirements.
34, 49	Only if the vehicle has a timer.
38	Only if the vehicle has been equipped to transport hazardous substances in accordance with RTMDR requirements.
44, 50	Only if the vehicle has a thermostat unit.

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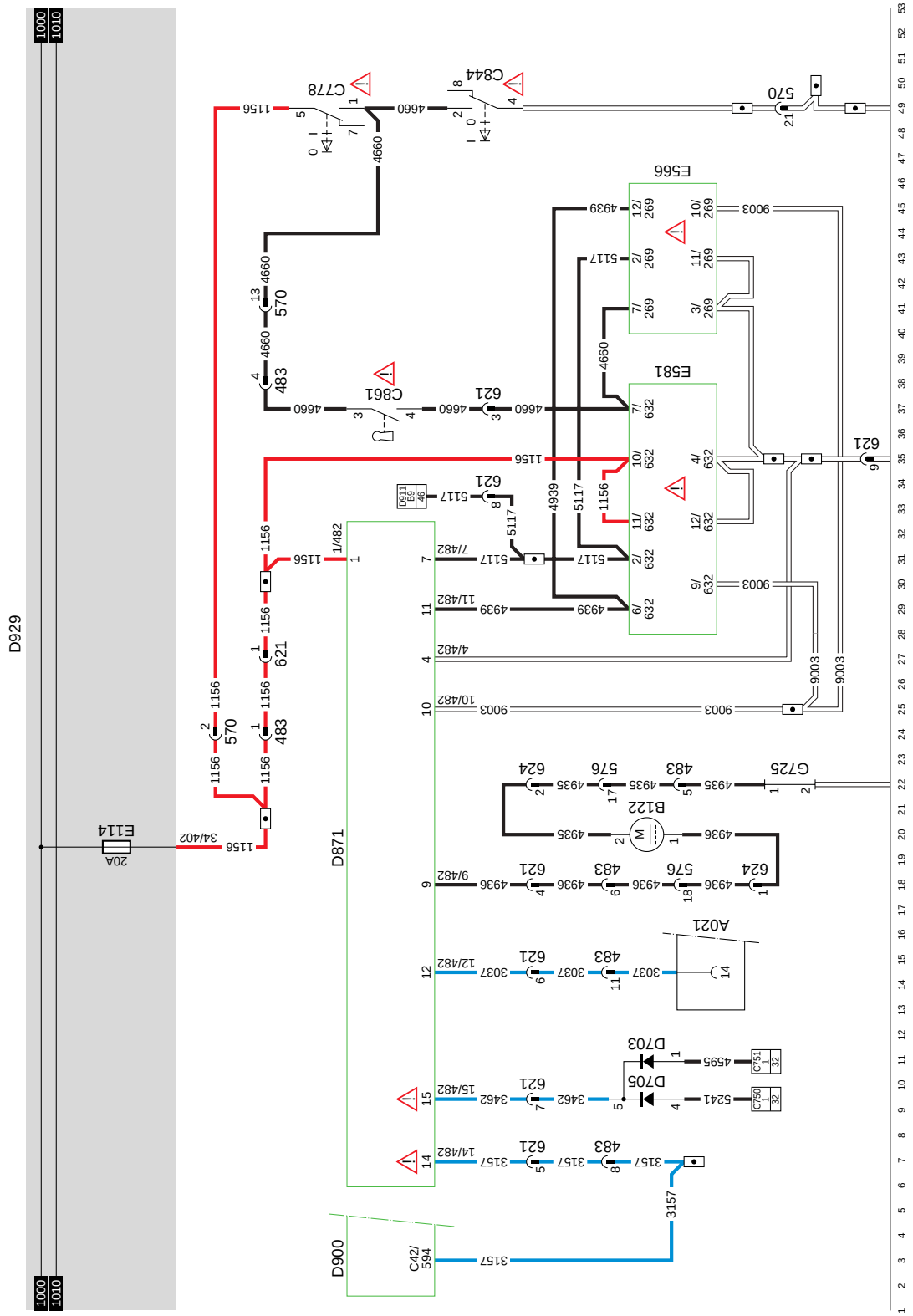

41 **1358030/25** EL001161

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42 HYDRONIC 10 (ACH-EW) CAB HEATER WITH TIMER UNIT

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
16 Only if the vehicle has been equipped to transport hazardous substances.

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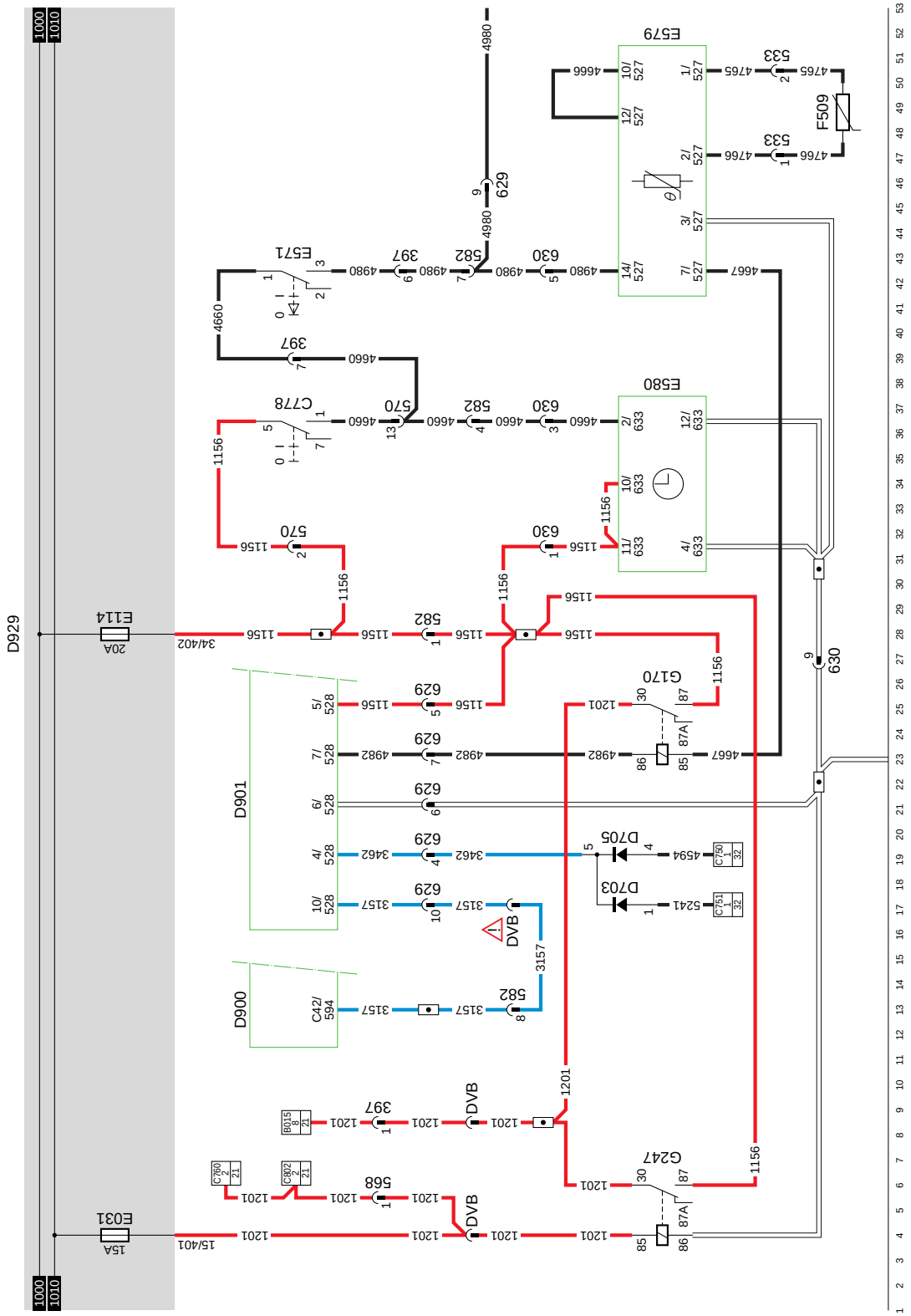
E579
E580
E571
C778
F509
E114
E031
D929
D901
D900
G170
G247
D705
D703
DVB
20A
15A
1000
1010
4980
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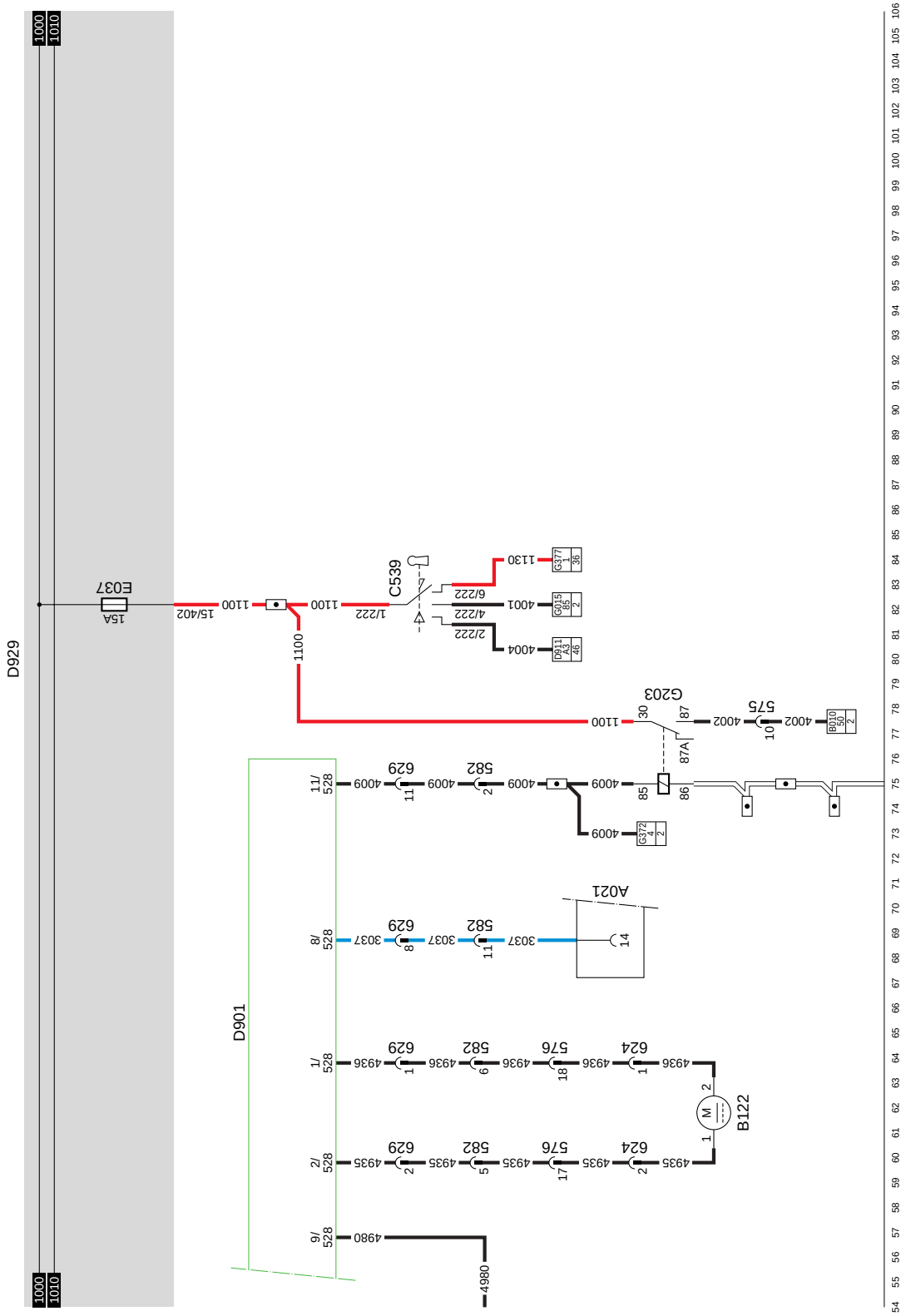
EL001162



42 **1358030/25** EL001163

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43 UPEC/CUMMINS/AGC APPLICATION CONNECTOR

FOR MORE INFORMATION SEE BLOCK 6: CONNECTION OF ACCESSORIES

VARIANTS

Location	
73 - > 105:	If the vehicle has UPEC.
109 - > 137:	If the vehicle has ECS-DC3.
165 - > 183	All 658 connectors: Optional.
185 - > 195	All 654 connectors: Optional.
165 - > 182 and 185 - > 207 :	
	All 656 connectors: Optional.
185 - > 207	All 657 connectors: Optional.
197 - > 207	All 655 connectors: Optional.

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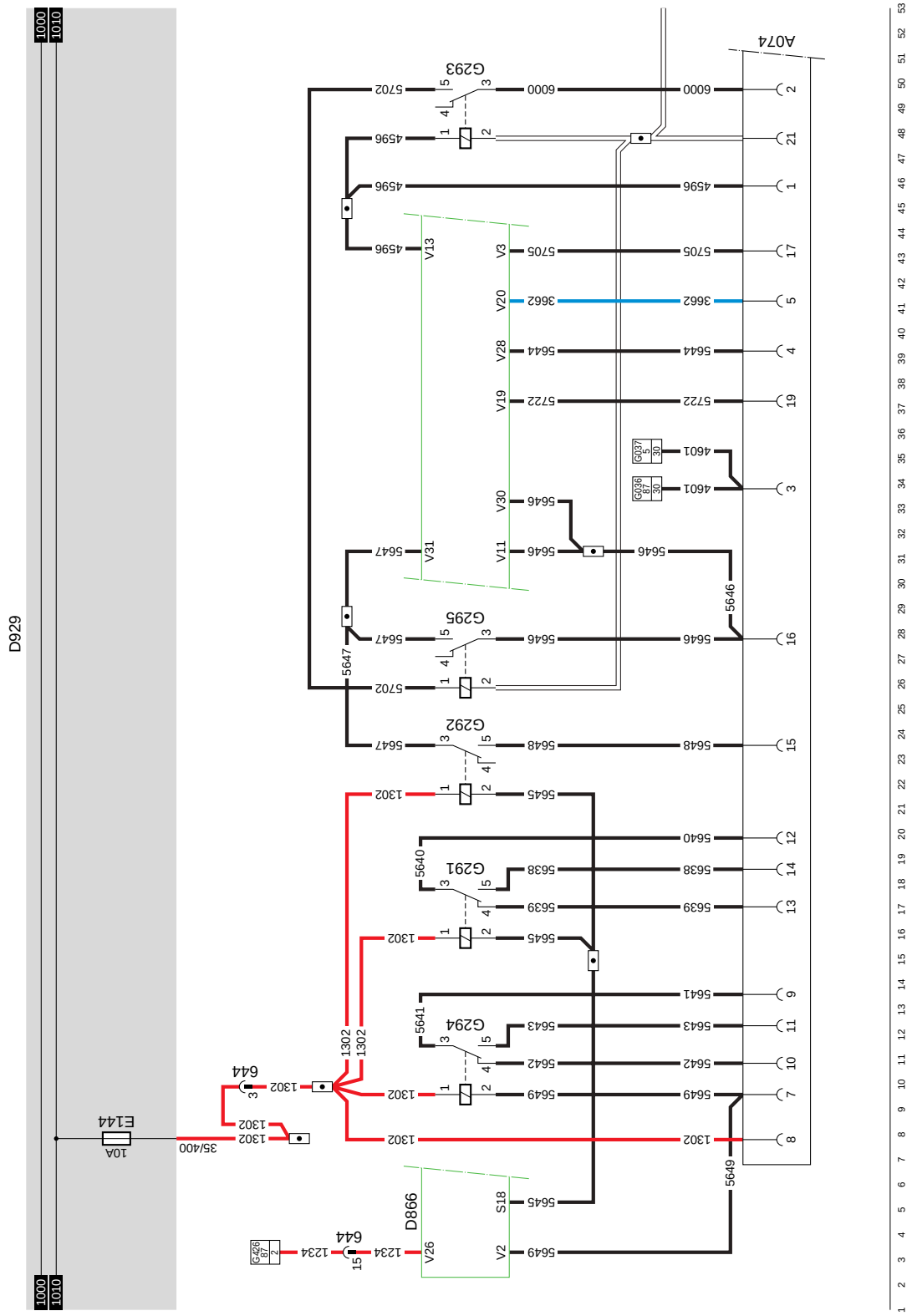
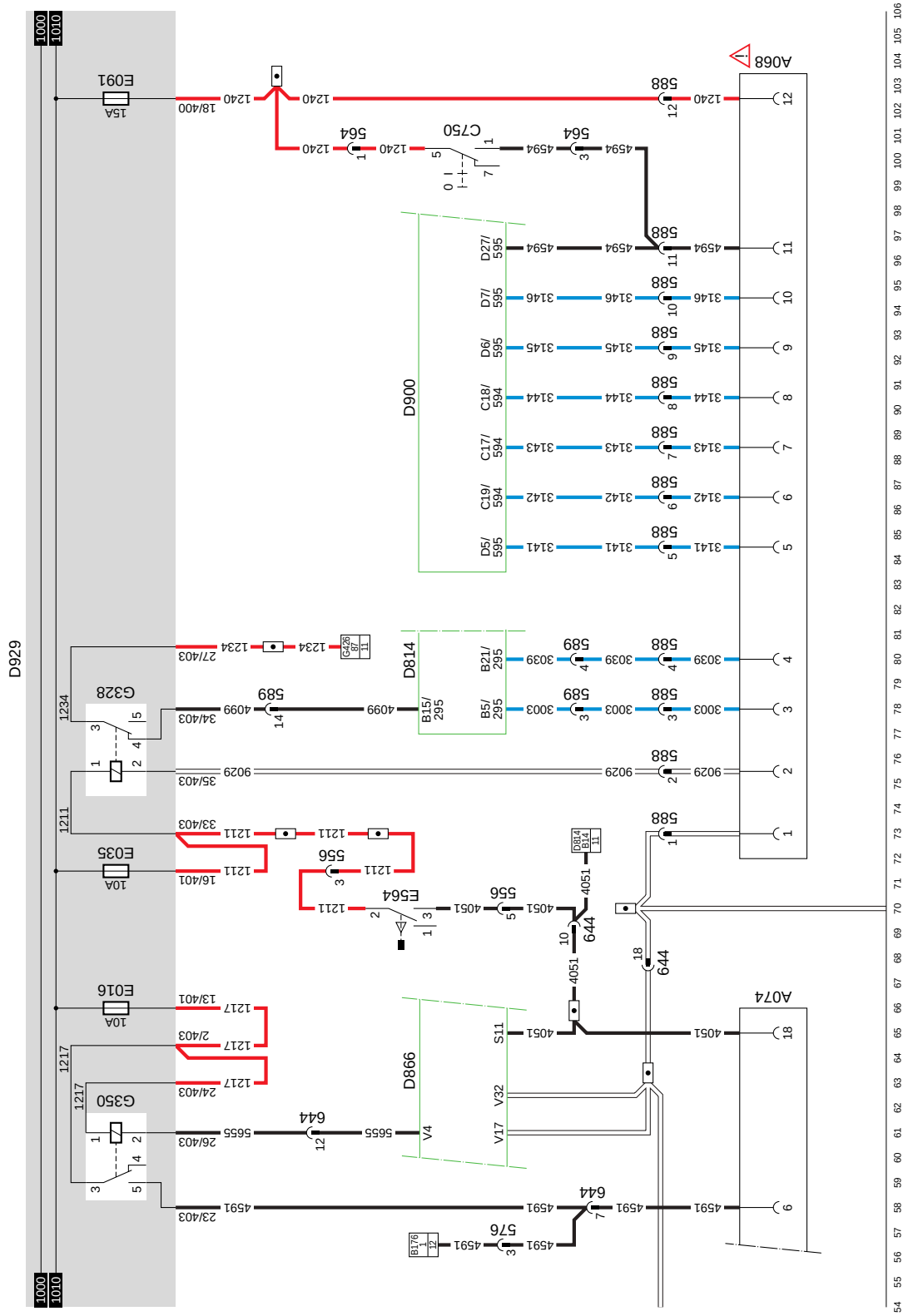


43 **1358030/25** EL001164



43 **1358030/25** EL001165

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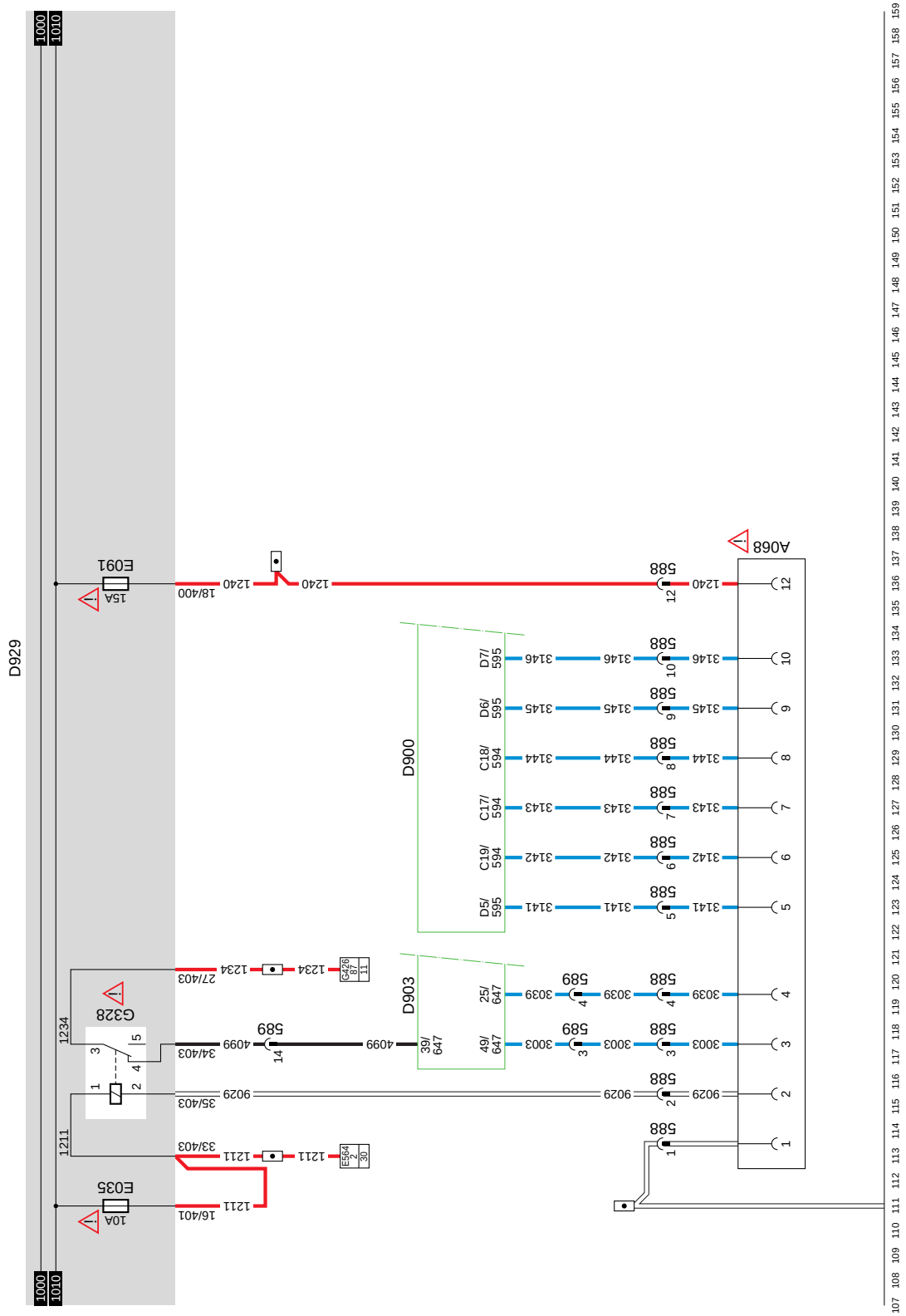
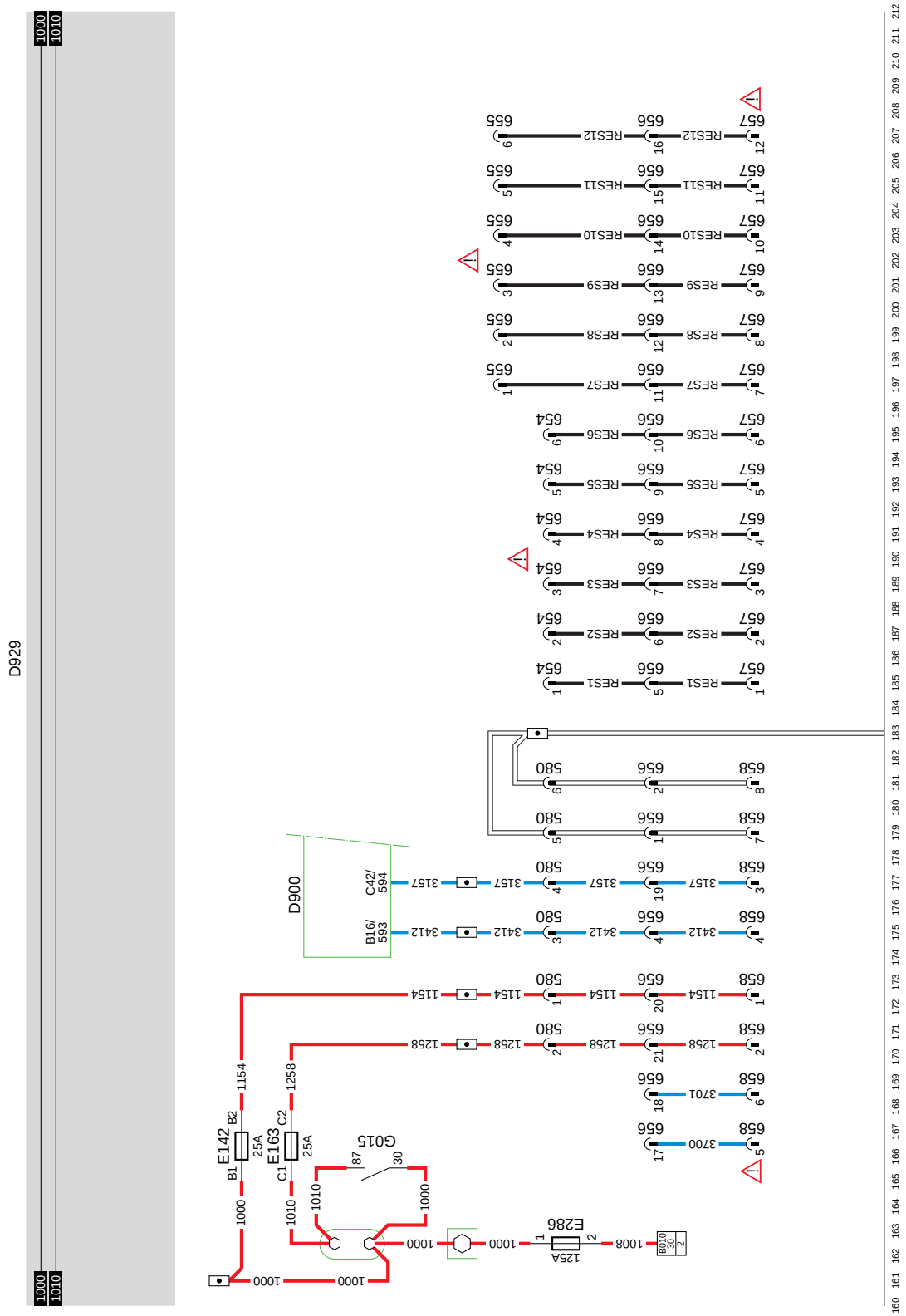


43 1358030/25 EL001166



43 **1358030/25** EL001167

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44 EBS

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location
18 to 35:
For vehicle type FA: connector 873.
For vehicle type FT: connector 874.

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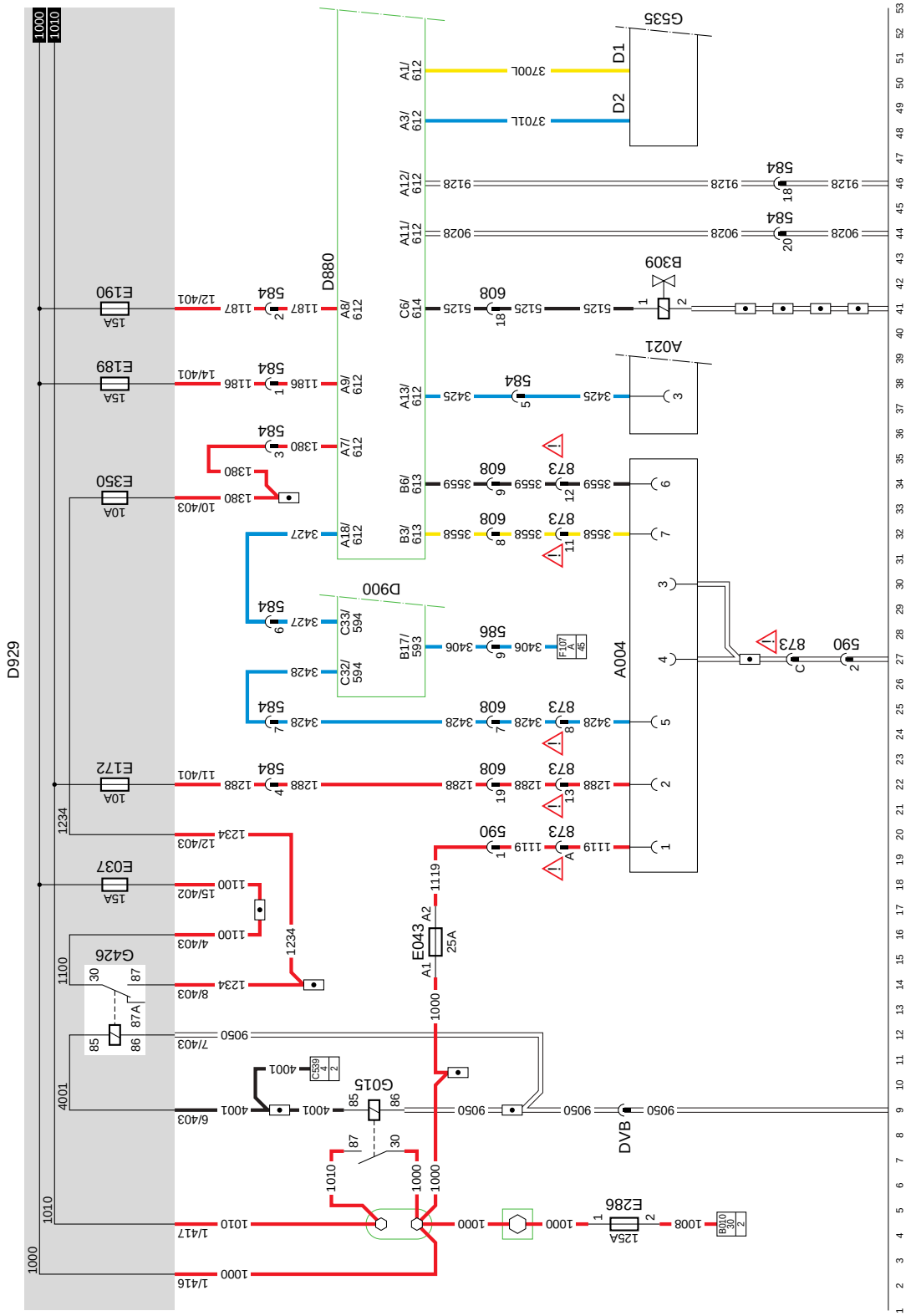

44 1358030/25 EL001168

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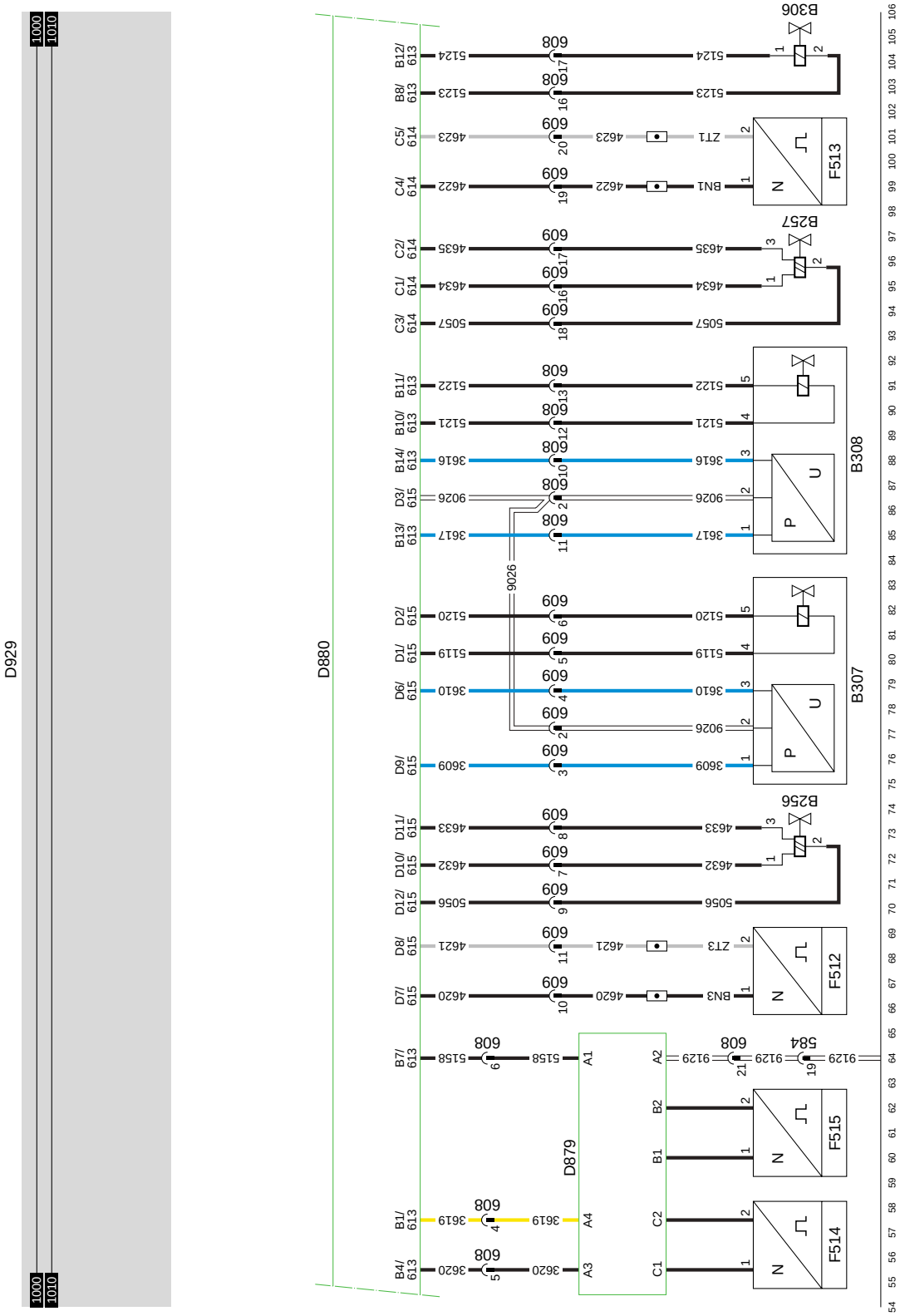

44 **1358030/25** EL001169

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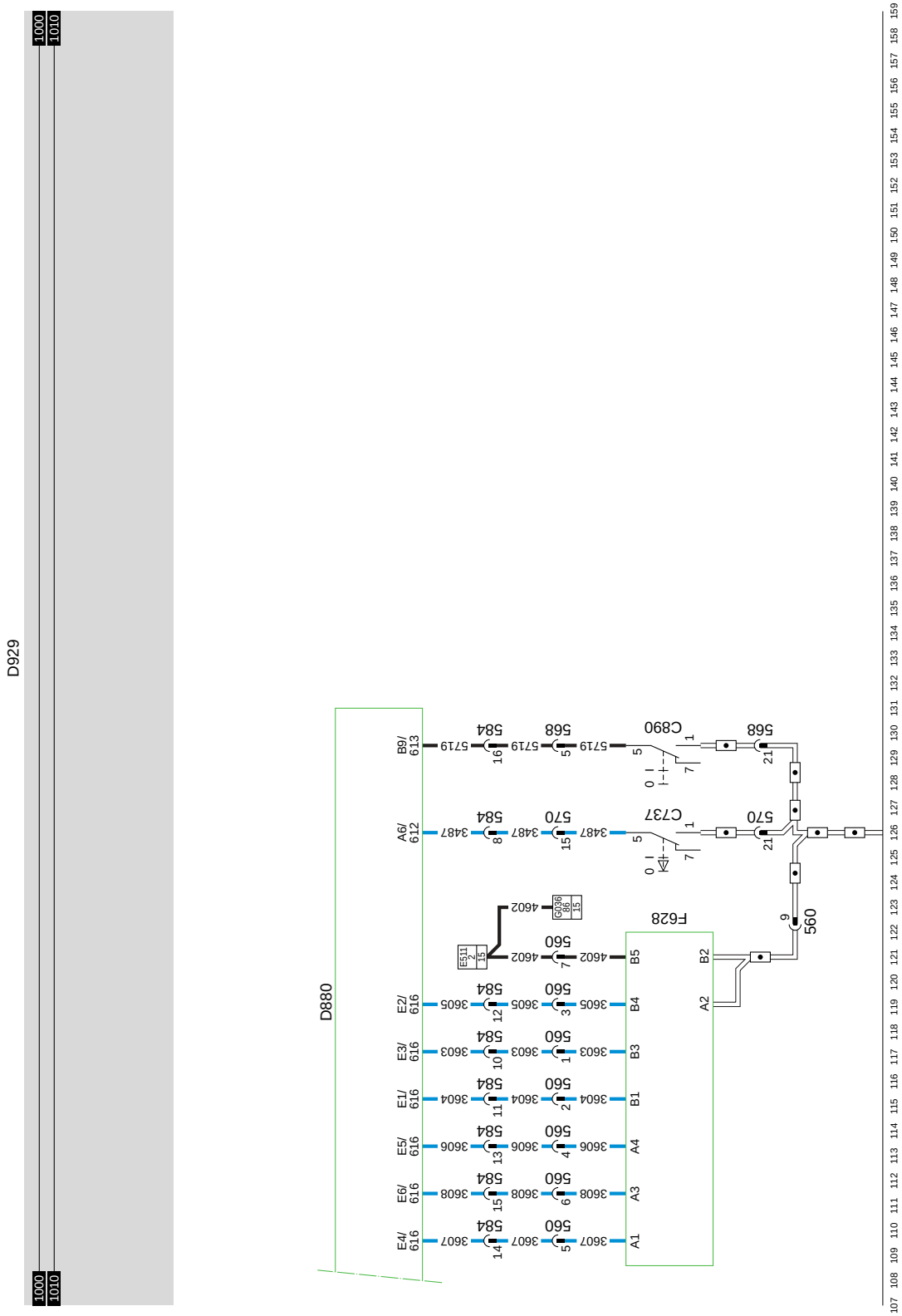

44 **1358030/25** EL001170

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45 BRAKE LINING WEAR SWITCH

If one of the brake linings is too thin, connection point B17 of the VIC will be interrupted by the corresponding brake pad wear switch (F107 or F108 or F109 or F110 or F111 or F112 or F113 or F114) through wire 3406. The VIC will send a message to the instrument panel, which will then activate the "brake lining wear" indicator.

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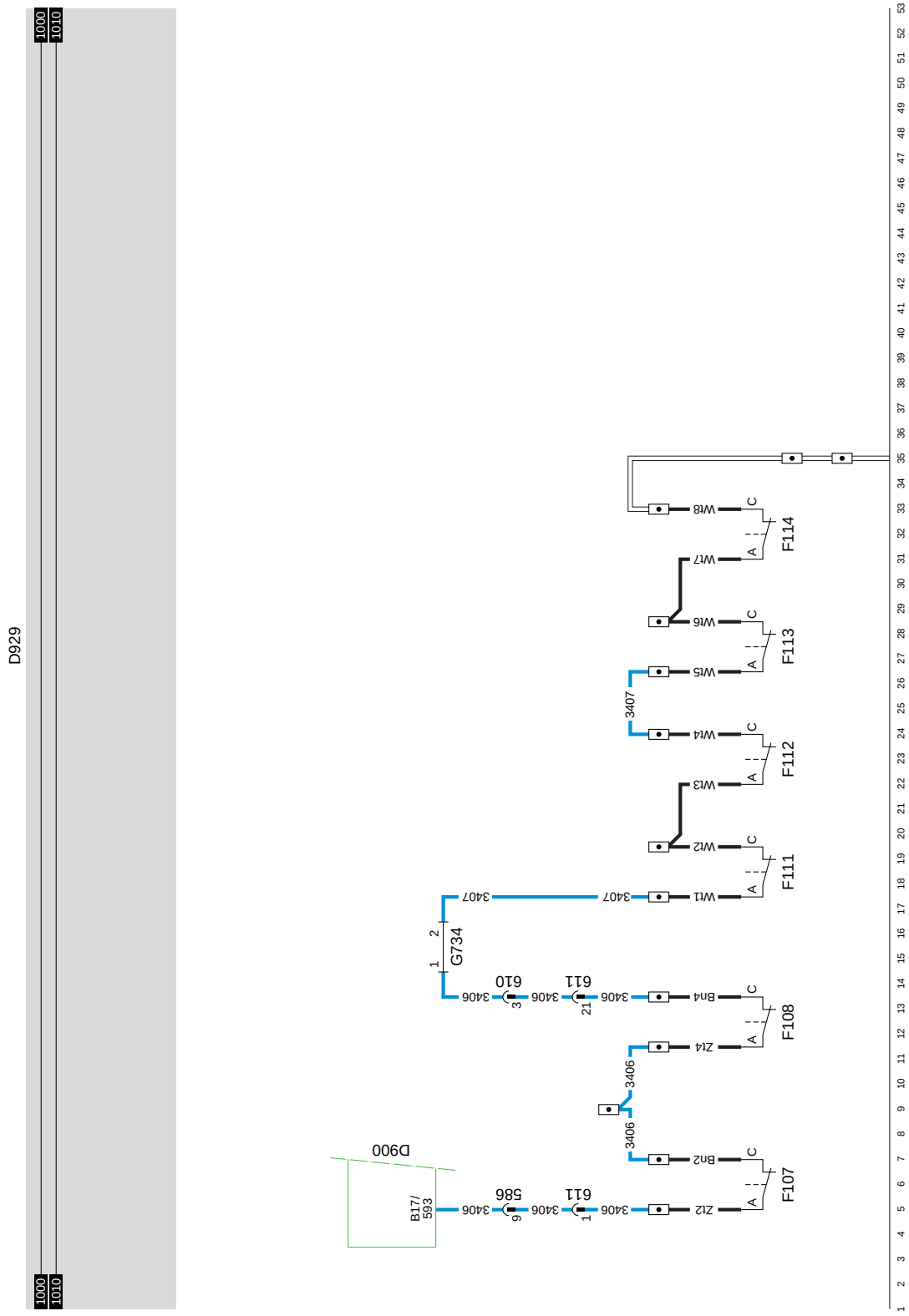

45 **1358030/25** EL001171

46 ALARM SYSTEM/BATTERY CHARGER FOR BV3 ALARM SYSTEM

SEE THE SYSTEM MANUAL FOR MORE INFORMATION

VARIANTS

Location	
18	Fitted if **NO** alarm system installed.
50	**NOT** fitted on H1 version
57	Fitted if **NO** alarm system installed.
60, 69, 70	**NOT** fitted on BV02 version.
90 - > 96	Connector 873 on vehicle type FA.
	Connector 874 on vehicle type FT.
90 - > 96	Connector A001 on vehicle type FA.
	Connector A003 on vehicle type FT.
115	Only applies to SL cab.
154	D931; only if **NO** alarm system fitted

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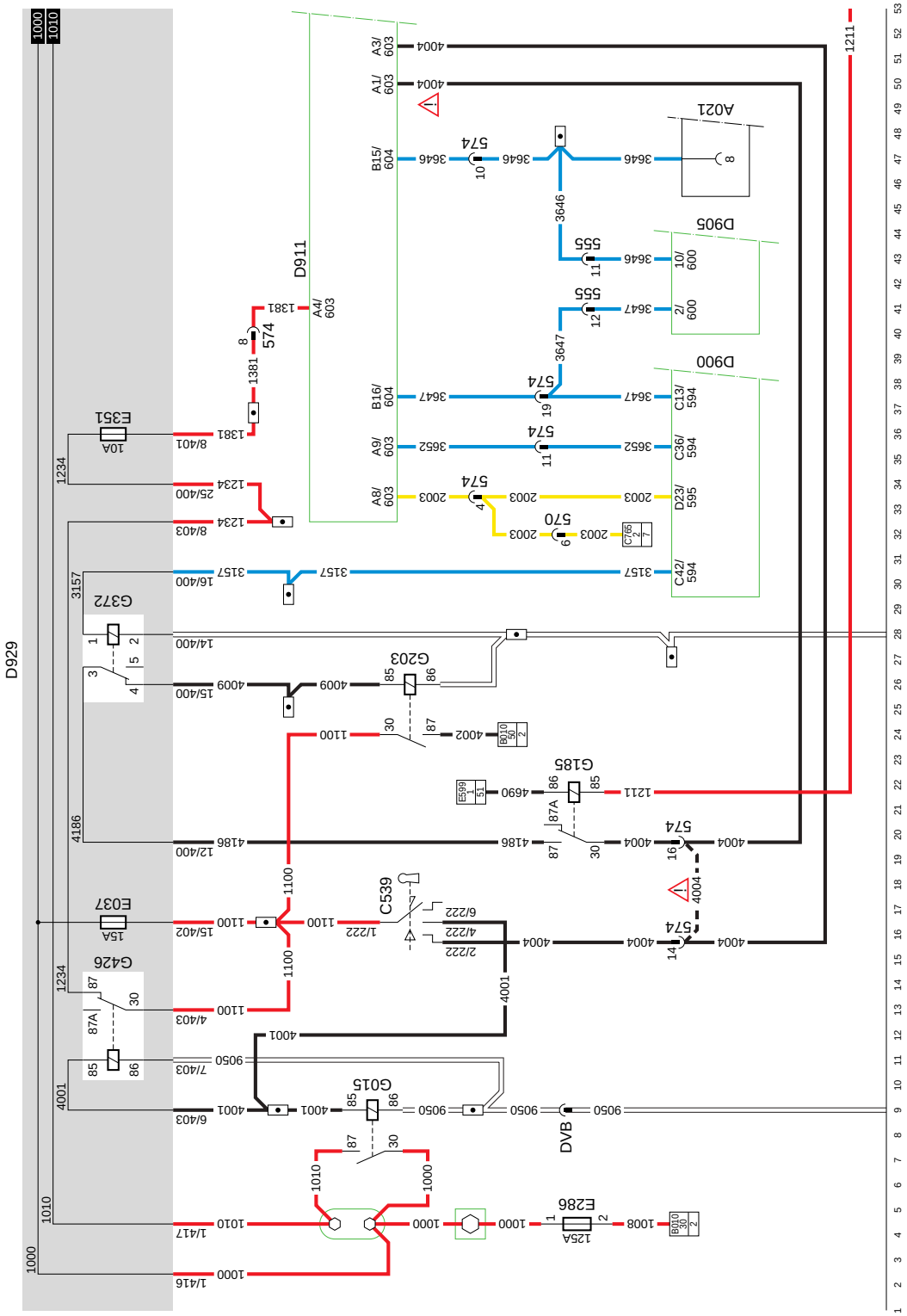

46 **1358030/25** EL001172

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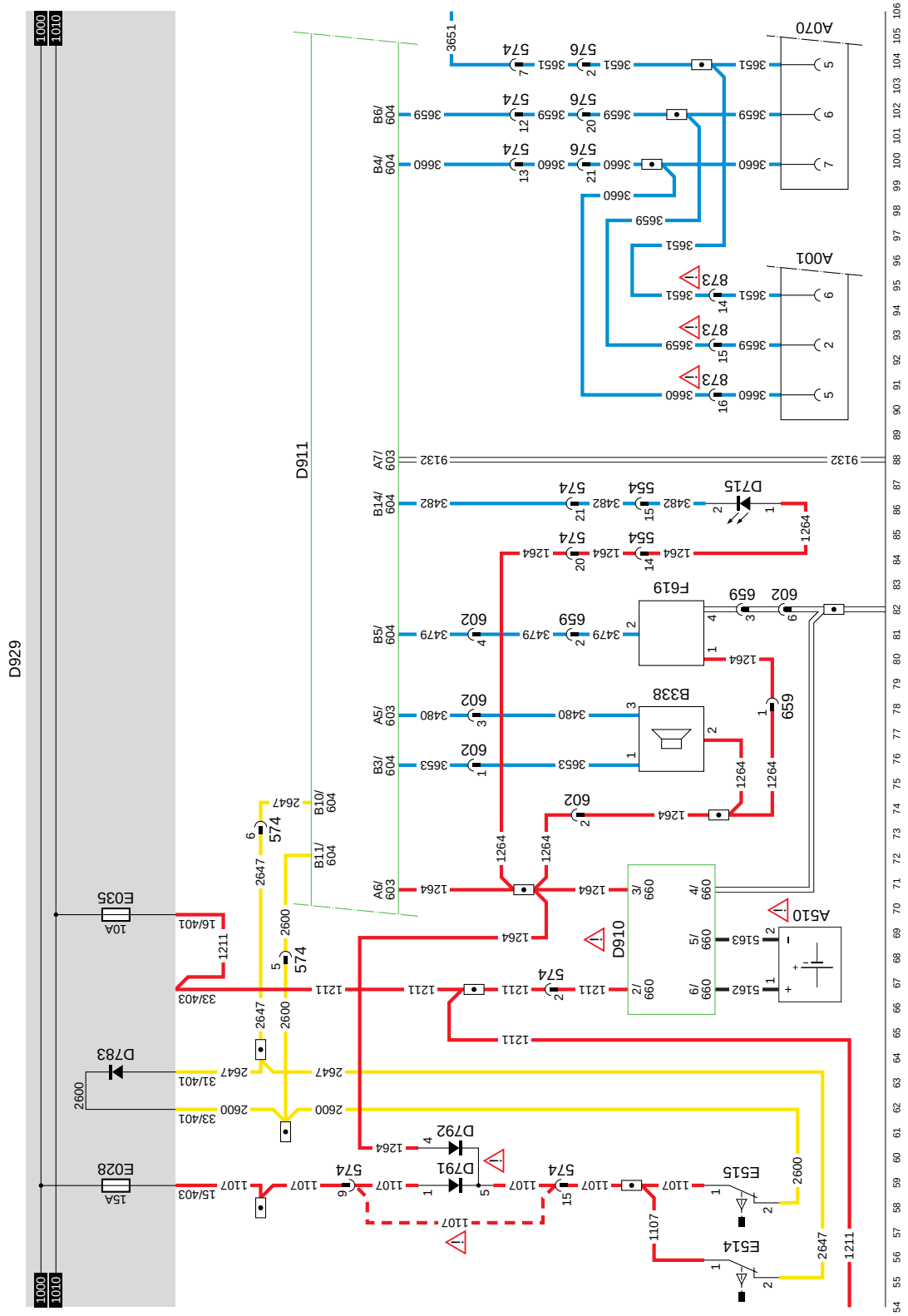

46 **1358030/25** EL001173

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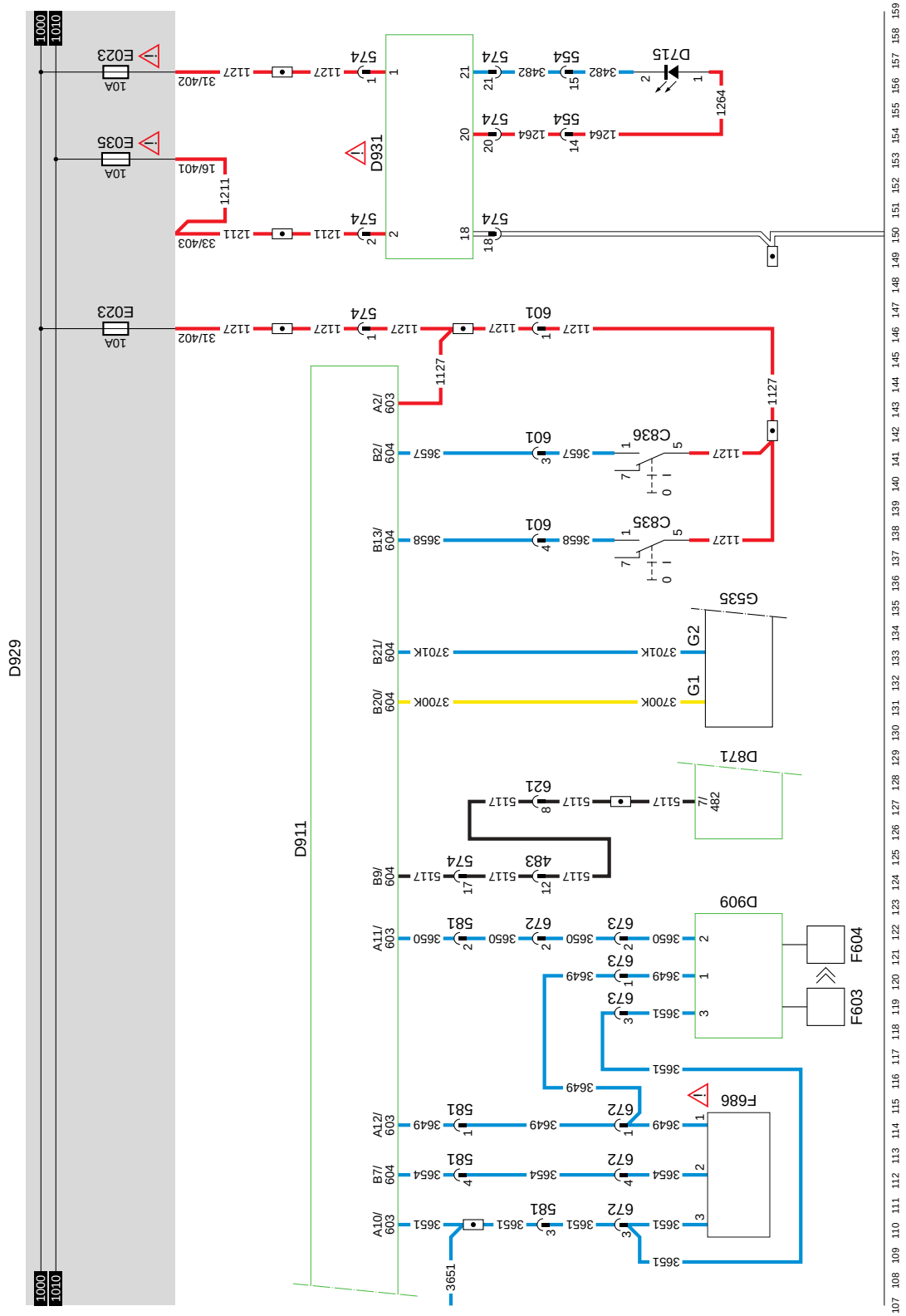

46 1358030/25 EL001174

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47 SOCKETS, FA/FT

DIAGNOSTICS PLUG (A021)

The diagnostics plug is on the bottom right on the outside of the central box. This is the plug for the DAVIE connection. After the ignition is switched on, power is supplied to pin 1 via fuse E053. Pin 2 is connected to earth. The remaining pins are for communication with the various systems, and are connected to those systems.

Pin no.	Wire no.	Colour	Description
1	1229	red	Power supply for DAVIE
2	9107	white	Earth
3	3425	blue	ABS - ASC-D
4			
5	4697	black	UPEC, ECS-DC3
6			
7	4732	black	ECAS-3
8	3646	blue	CDS, ALS-S
9	4047	black	VIC
10			
11	4883	black	ZF intarder
12	4733	black	DIP-4
13	3470	blue	AGS
14	3037	blue	Cab heater
15	3700	yellow	V-CAN-L
16	3701	blue	V-CAN-H

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24V PLUG (A007)

Pin 1 of the 24V plug (A007) is connected directly to power via wire 1103, fuse E036.

Pin 2 is connected to earth.

ABS/EBS PLUG (A004)

Pin 1 of the ABS (EBS) plug (A004) is connected directly to power before contact through fuse E043 and wire 1119.

Pin 2 is connected directly to power after contact through fuse E172 and wire 1288.

Pins 3 + 4 are both connected to earth.

Pin 5 is connected to pin 32 of the VIC (D900) via wire 3428.

Pin 6 is connected to pin B6 of D880 (EBS) via wire 3559. Only if the vehicle has EBS.

Pin 7 is connected to pin B3 of D880 (EBS) via wire 3558. Only if the vehicle has EBS.

FT TRAILER PLUG (A000) 7-pin

Pin 1 is connected to earth.

Pin 2 switches the left tail light.

Pin 3 is connected via wire 2008 to connection point 7 of the VIC (D900) (direction, left).

Pin 4 is connected to relay G036 (stop lights relay) through wire 4601.

Pin 5 is connected via wire 2009 to connection point 8 of the VIC (D900) (direction, right).

Pin 6 switches the right tail light.

FT TRAILER PLUG (A058) 15-pin

Pin 1 is connected via wire 2008 to connection point 7 of the VIC (D900) (direction, left).

Pin 2 is connected via wire 2009 to connection point 8 of the VIC (D900) (direction, right).

Pin 3 is connected via wire 2152 to connection point 87 of relay G005 (relay, rear fog lamp).

Pin 4 is connected to earth.

Pin 5 switches the left tail light via wire 2102.

Pin 6 switches the right tail light via wire 2103.

Pin 7 is connected to connection point 87 of relay G036 (stop lights relay) through wire 4601.

Pin 8 is connected via wire 4591 to connection point 4 of E501 (operating switch, reversing light).

Pin 9 is connected to power before contact through wire 1113 and fuse E048.

Pin 10 is connected via wire 3659 to connection point B6 of D911 (ALS-S).

Pin 11 is connected via wire 3660 to connection point B4 of D911 (ALS-S).

Pin 12 is connected to connection point B10 of D911 (ALS-S battery charger) through wire 3651.

Pin 13 Not connected.

Pin 14 Not connected.

Pin 15 Not connected.

REAR FOG LAMP AND REVERSING LIGHT PLUG (A001)

Pin 1 is connected to earth.

Pin 2 is connected via wire 3659 to connection point B6 of ALS-S (D911).

Pin 3 is connected via wire 4591 to connection point 4 of E501 (operating switch, reversing light).

Pin 4 is connected directly to power through fuse E048 and wire 1113.

Pin 5 is connected via wire 3660 to connection point B4 of ALS-S (D911).

Pin 6 is connected via wire 3651 to connection point B10 of D911 (ALS-S).

Pin 7 is connected via wire 2152 to connection point 87 of relay G005 (relay, rear fog lamp).

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VARIANTS

Location

24 -> 39,110 -> 139
Connector 873 on vehicle type FA.
Connector 874 on vehicle type FT.

26 -> 31 Connector 585 for ABS/ASC-D.
Connector 584 for EBS.

26 -> 30 Connector 610 for ABS/ASC-D.
Connector 608 for EBS.

26 Connector A004 on vehicle type FA.
Connector A005 on vehicle type FT.

59 Connector 585 for ABS/ASC-D.
Connector 584 for EBS.
For ABS/ASC-D unit: D850.
For EBS unit: D880.

63 If the vehicle is fitted with EMAS system.

169, 205 A000 and A001: May be either 2x a 7-pin connector or 1x a 15-pin connector.

185 Only applicable to vehicle type FA.

TELEPHONE CONNECTOR (A076)

Pin 1 is connected via wire 1353 to connection B1 (12V) of D895.

Pin 2 is connected via wire 1108 to connection A4 (12V) of D895.

Pin 3 is connected to earth.

SUPERSTRUCTURE APPLICATION CONNECTOR (A070)

Pin 1 is connected to power before contact through wire 1113 and fuse E048. This wire is also connected to pin 9 of connector A058.

Pin 2 is connected to connection point 1 of C725 (front/rear fog lamp switch) through wire 2155.

Pin 3 is connected to connection point 87 of G036 (stop light relay) through wire 4601. This wire is also connected to pin 7 of connector A058.

Pin 4 is connected via wire 4591 to connection point 4 of E501 (operating switch, reversing light). This wire is also connected to pin 8 of connector A058.

Pin 5 is connected to connection point 4 of D911 (ALS-S) through wire 3651. This wire is also connected to pin 12 of connector A058.

Pin 6 is connected via wire 3659 to connection point B6 of D911 (ALS-S). This wire is also connected to pin 10 of connector A058.

Pin 7 is connected via wire 3660 to connection point B4 of D911 (ALS-S). This wire is also connected to pin 11 of connector A058.

Pin 8 is connected directly to earth. This wire is also connected to pin 4 of connector A058.

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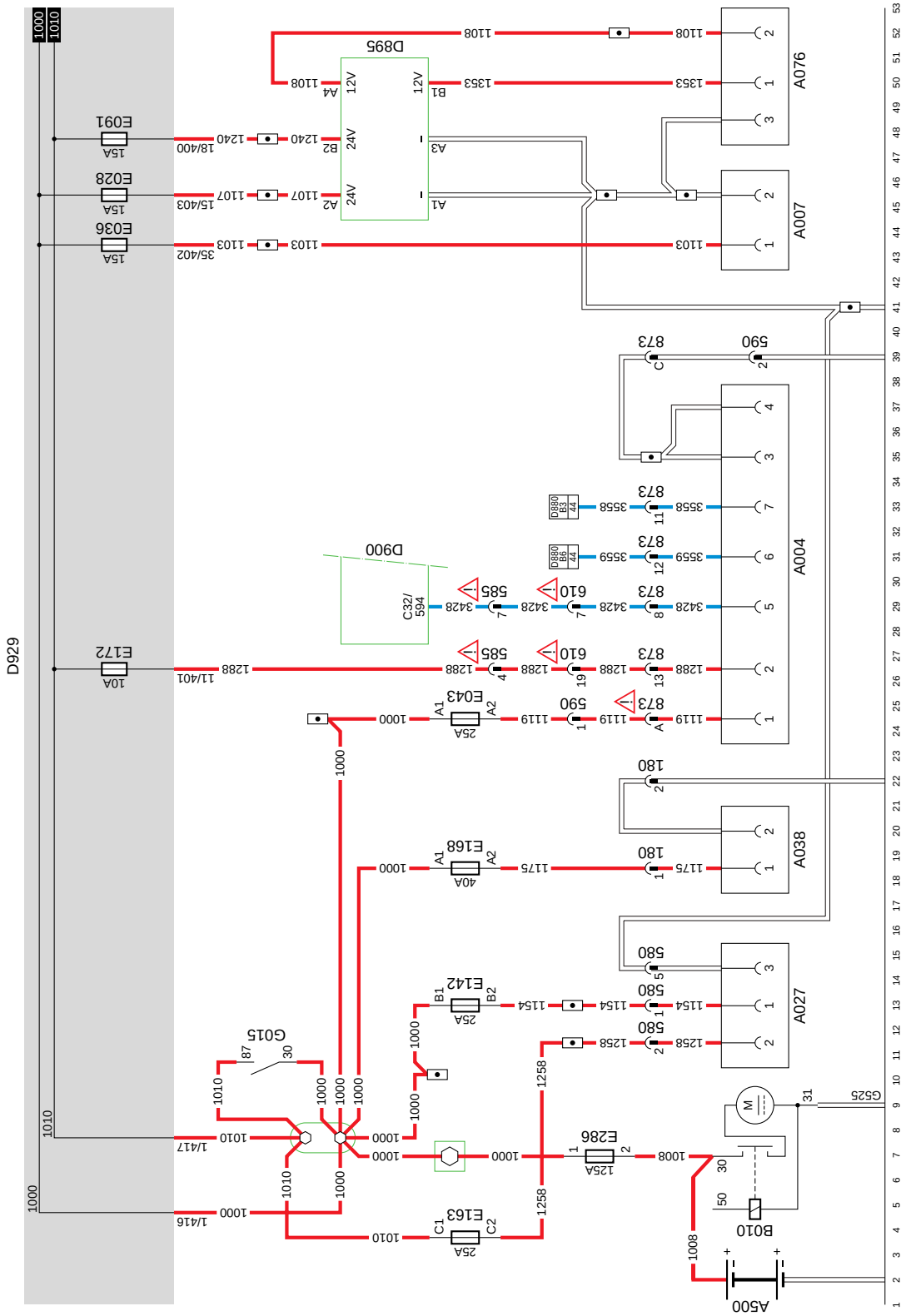

47 **1358030/25** EL001175

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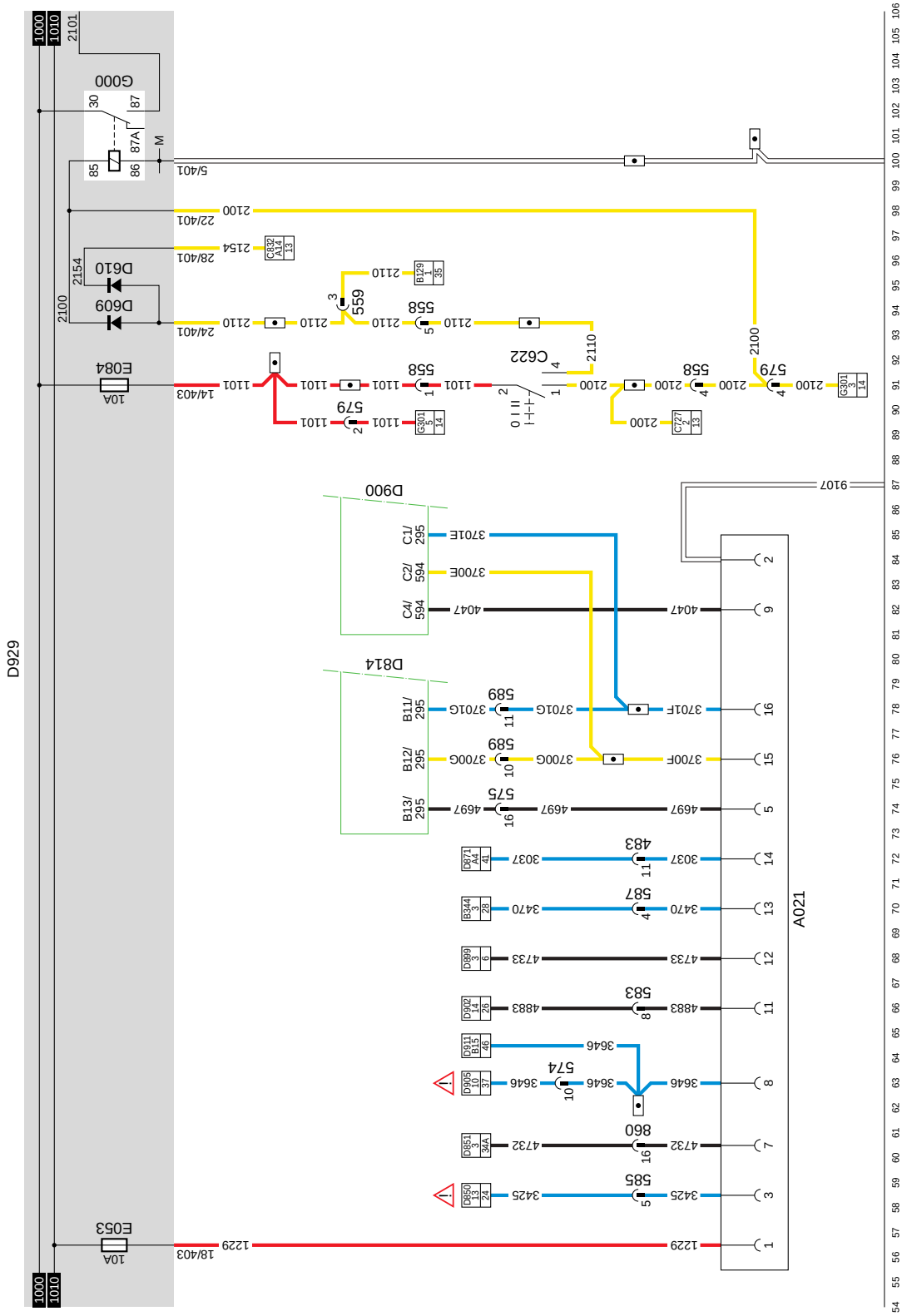

47 **1358030/25**

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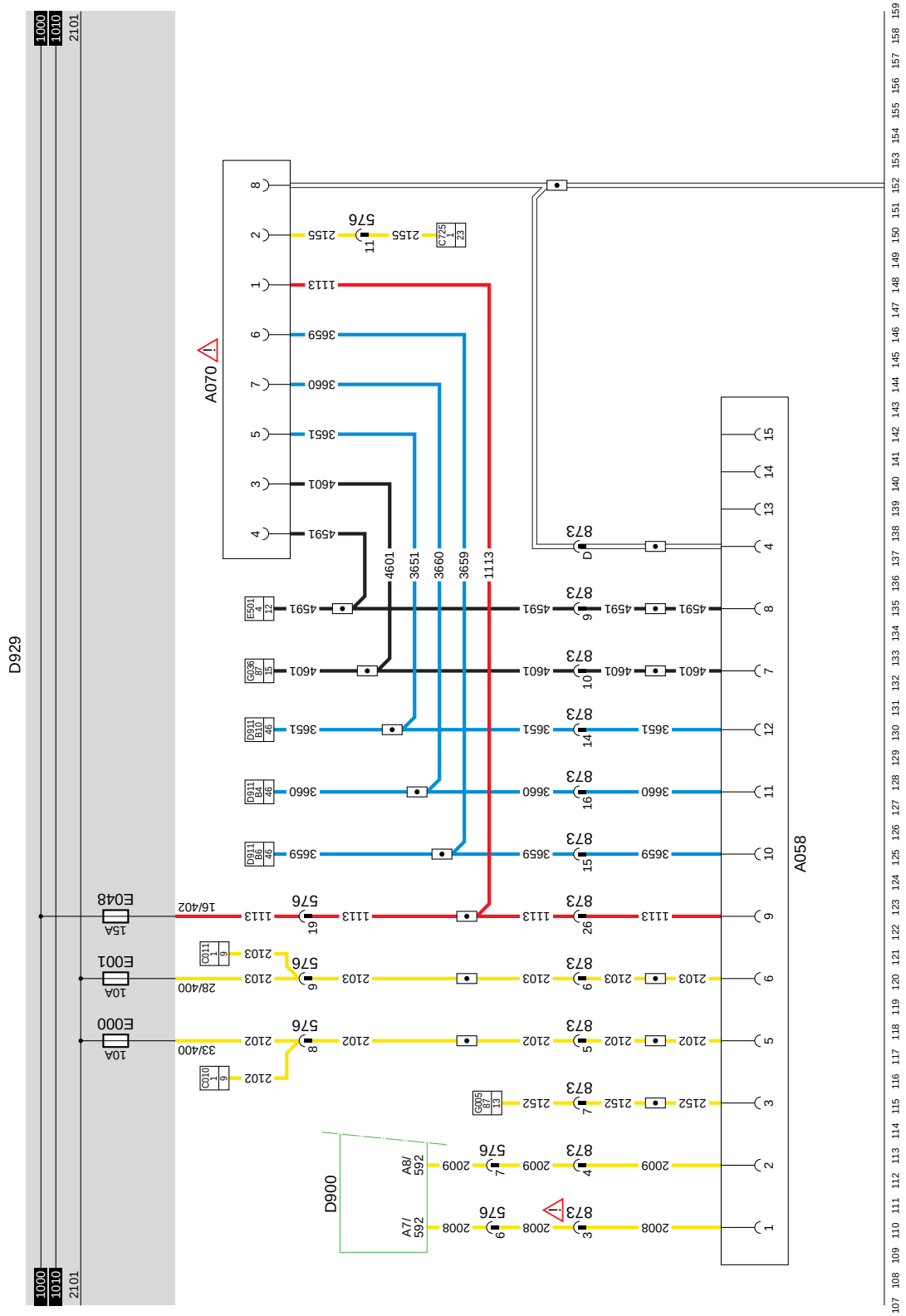

47 **1358030/25** EL001177

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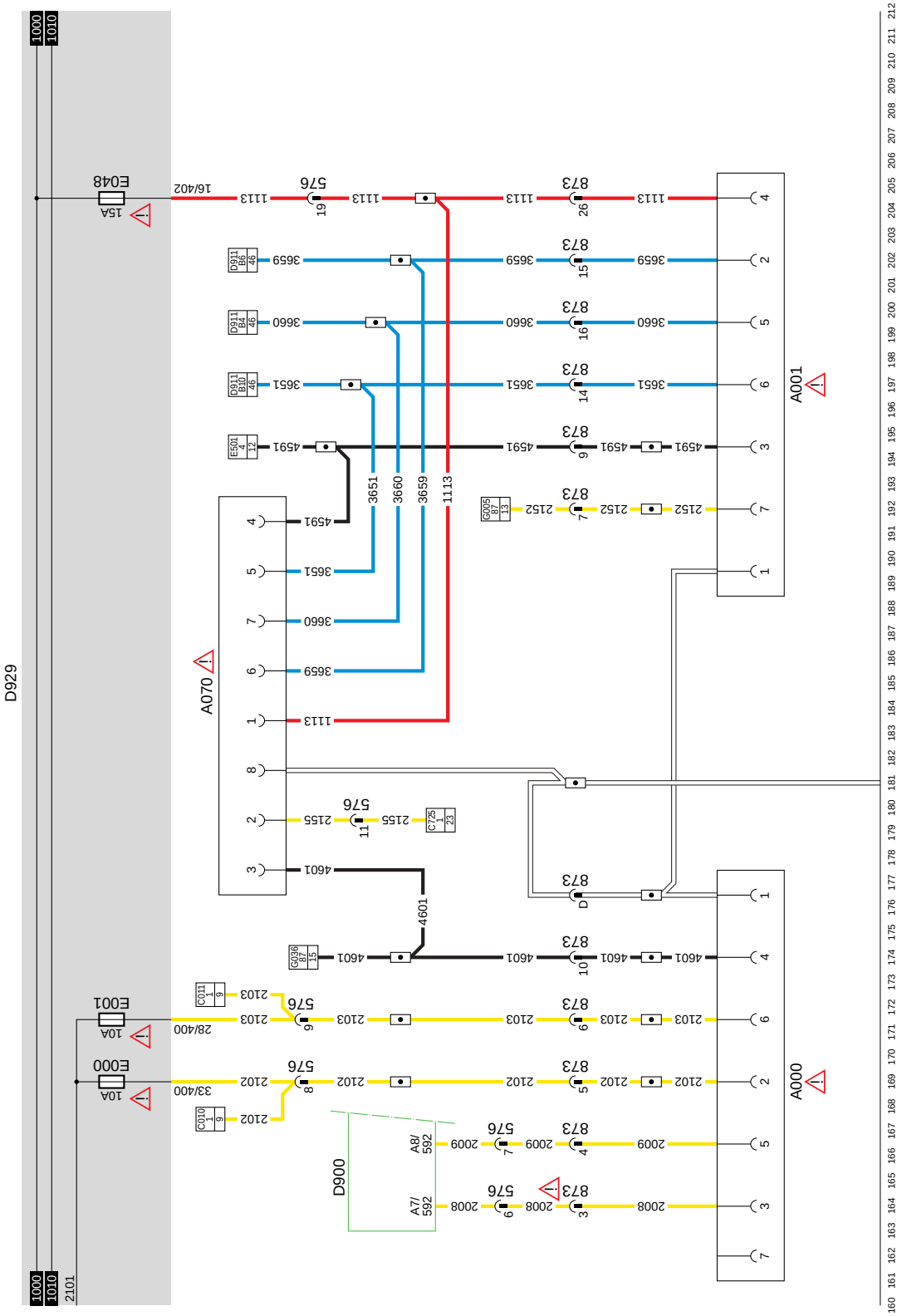

47 **1358030/25**

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48 FUEL FILTER/WATER SEPARATOR (RACOR)

When the vehicle contact is switched on, there is a voltage on both connection point 1 of the electronic unit (D855) and on the fuel filter/water separator switch (C872) through wire 1010 and fuse E170. When this switch is operated, relay G234 will be energised. The voltage is now applied to connection point 3 of the fuel filter/water separator heating element sensor (B241) through wire 1000, fuse E171, wire 1179, contacts 30 and 87 of relay G234 and wire 5051. The "ON" indicator LED now comes on.

Wires 5049 and 5050 signal that there is water in the water separator. The "DRAIN" indicator LED now comes on.

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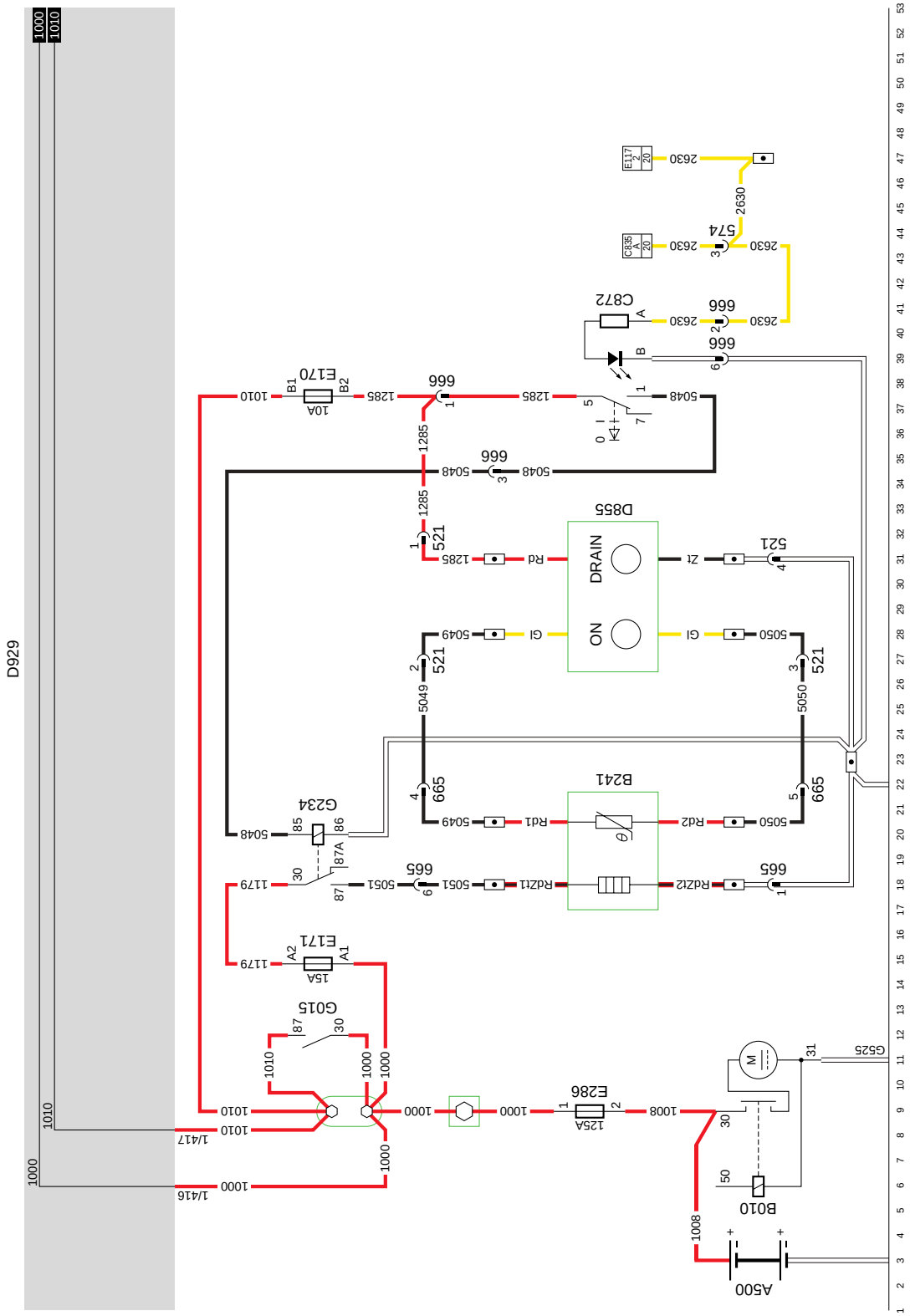

48 **1358030/25** EL001179

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49 FUEL FILTER/WATER SEPARATOR (FLEET GUARD)

When the vehicle contact is switched on, there is a voltage on connection point 2 of the electronic unit B387 (fuel filter/water separator electronic unit) through wire 1010 and fuse E170.

If the temperature of the fuel is too low, relay G201 is activated by the ECS-DC3 electronic unit (D903).
A voltage is applied from connection point 18, connector 647, wire 5048 to connection point 85 of relay G201. Connection point 86 of relay G201 is connected through an earth wire to connection point 2, connector 647. The VIC now switches the earth on or off, so that relay G201 is switched on or off depending on the fuel temperature.

When relay G201 is energised, contacts 30 - 87 close. A voltage is now applied to connection point A of electronic unit B387 through wire 1000, fuse E164, wire 1190, contacts 30 - 87 of relay G201, wire 5051. The glow element is now activated.

If there is too much water in the fuel prefilter/water separator, a voltage is applied to connection 12, connector 594 of the VIC unit through connection 1 of B387, wire 3150. This in its turn sends a signal to the DIP via the I-CAN. The DIP will now send a message to indicate that there is too much water in the fuel filter/water separator.

VARIANTS

Location
30 Attach wire 5048 in connector 575, pin 6.
Attach wire 9305 in connector 575, pin 3.

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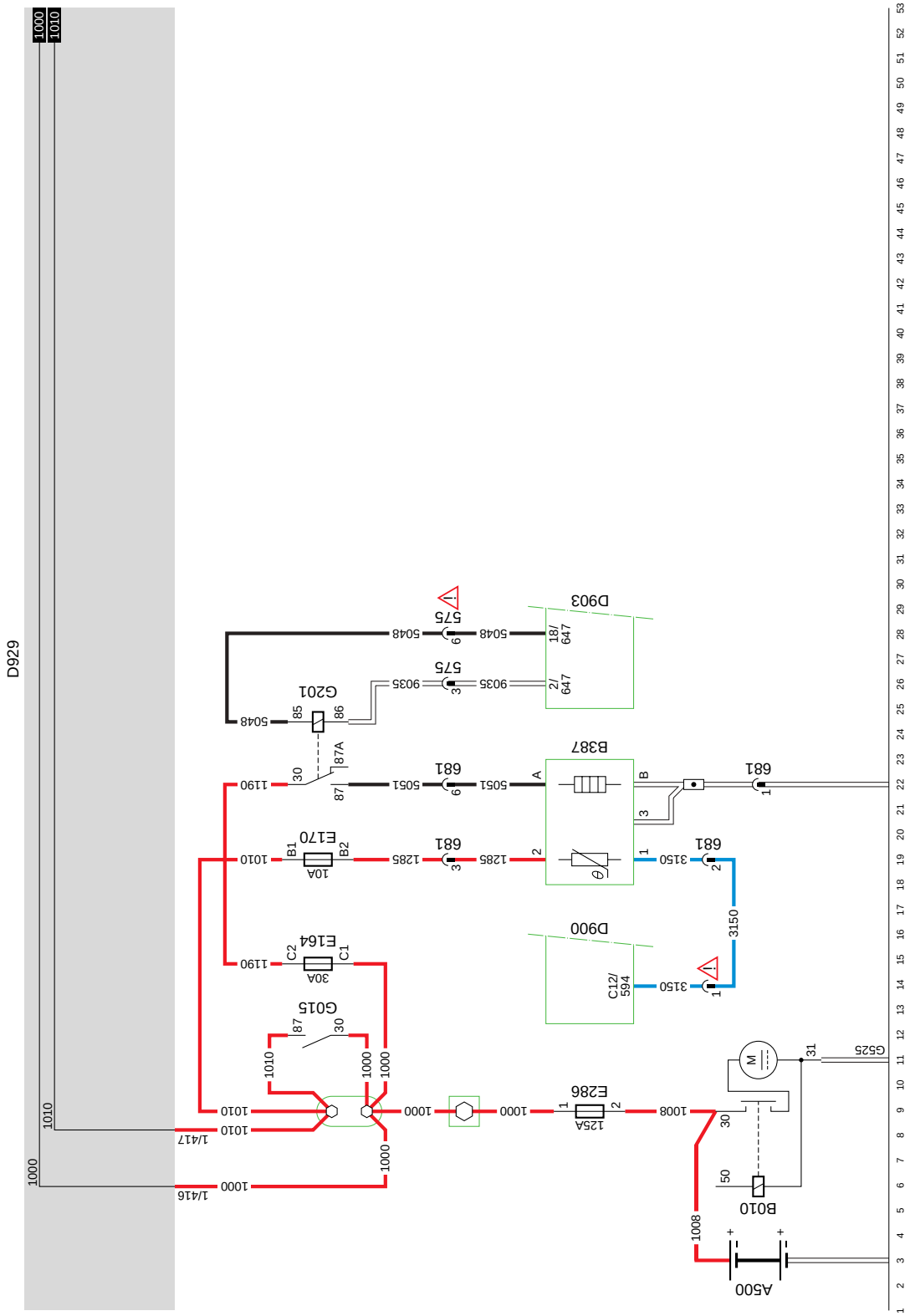

49 **1358030/25** EL001180

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50 WATER SEPARATOR

When the vehicle contact is activated, there is a voltage on both connection points B1 and A3 of the electronic unit (B378) through wire 1010 and fuse E170. A voltage is also applied to connection point A1 of the fuel filter/water separator heating element sensor (B378) through wire 1000, fuse E171, wire 1179.

A signal that there is water in the water separator is given via wire 3150. This signal goes to the VIC (D900). The VIC activates the 'Water separator/fuel filter' symbol on the instrument panel.

VARIANTS

Location

15 This is a 1-pin plug. It is located in the wire harness behind the central PCB.

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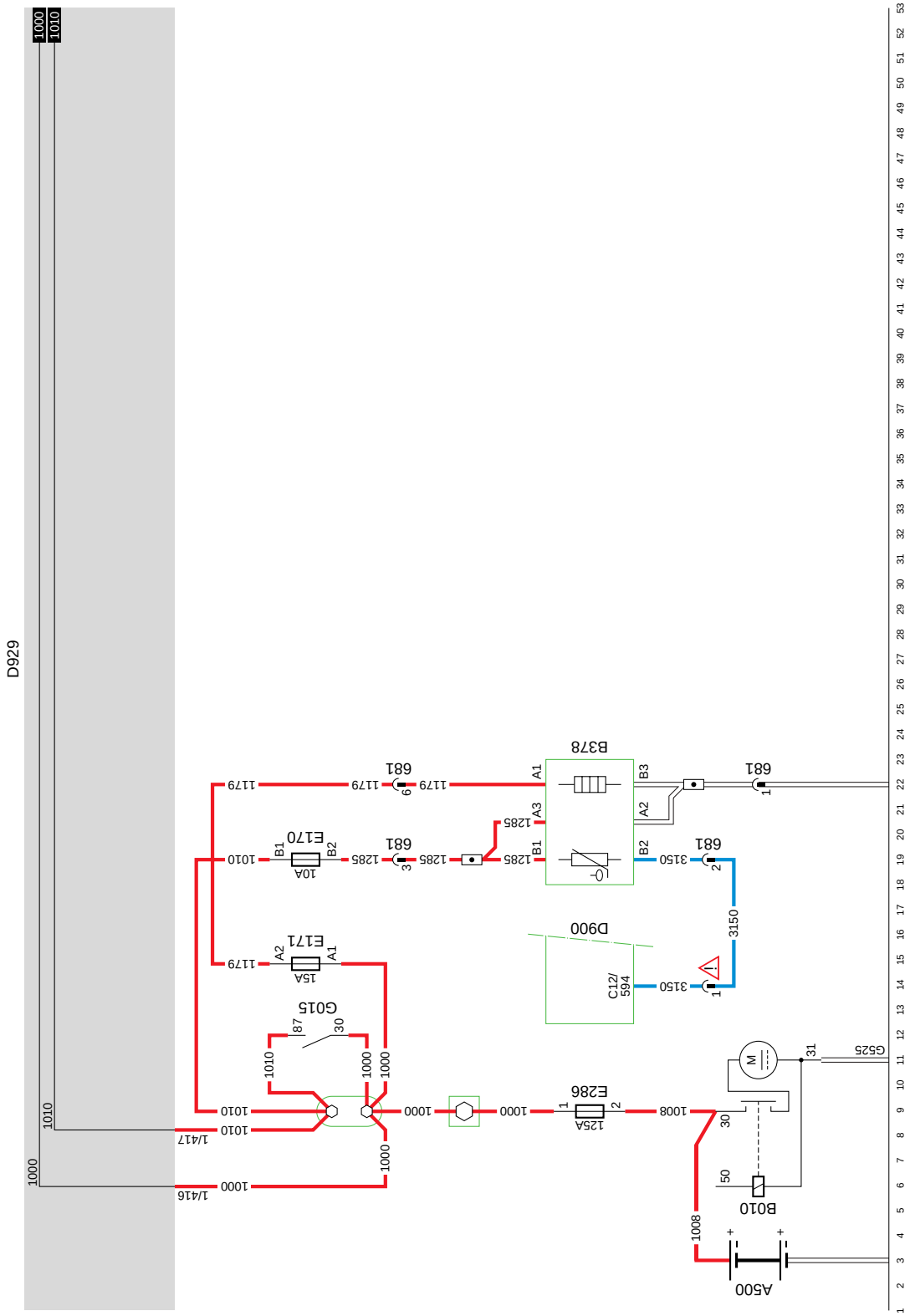

50 **1358030/25** EL001181

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51 AS TRONIC
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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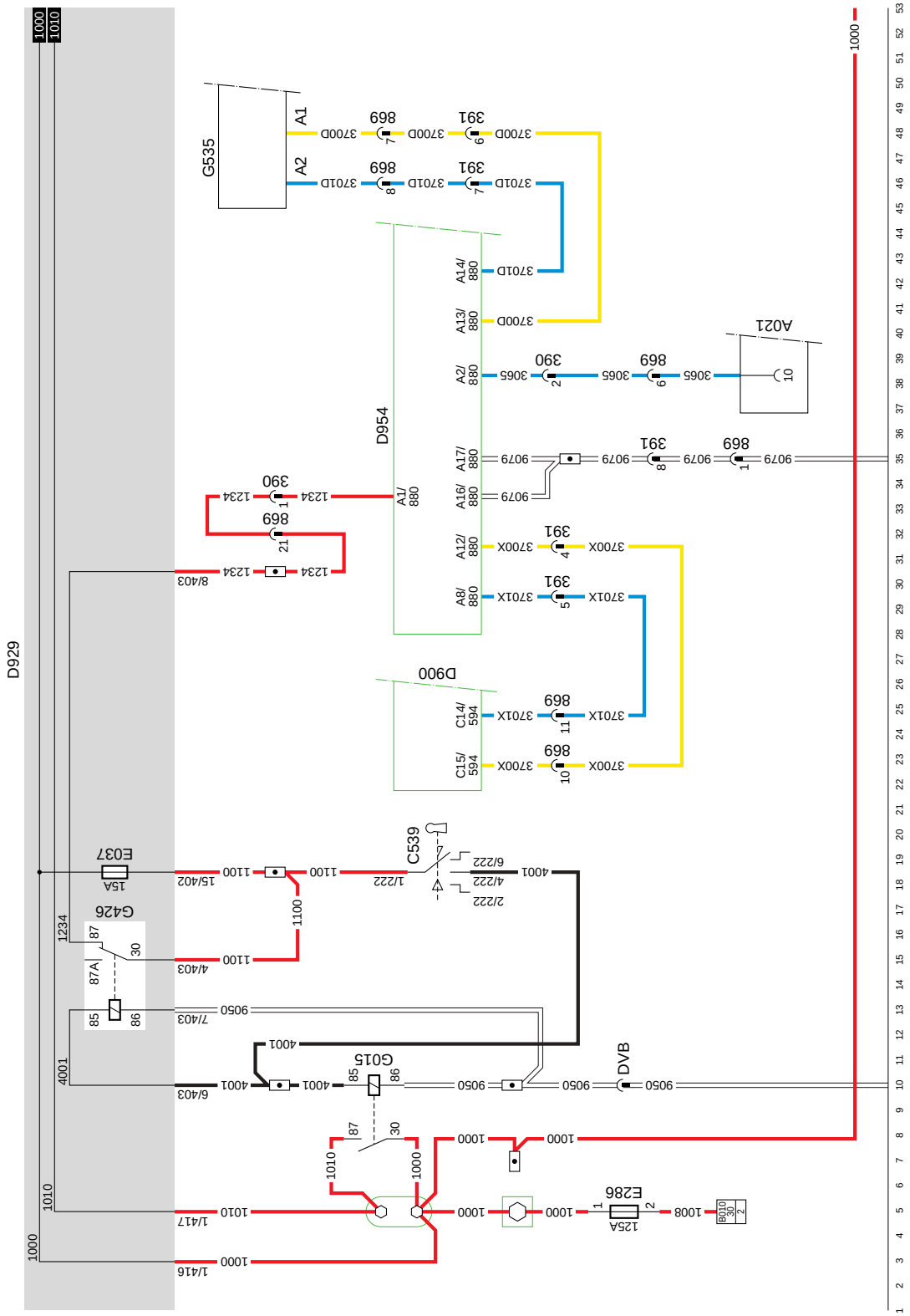

51 **1358030/25** EL001182

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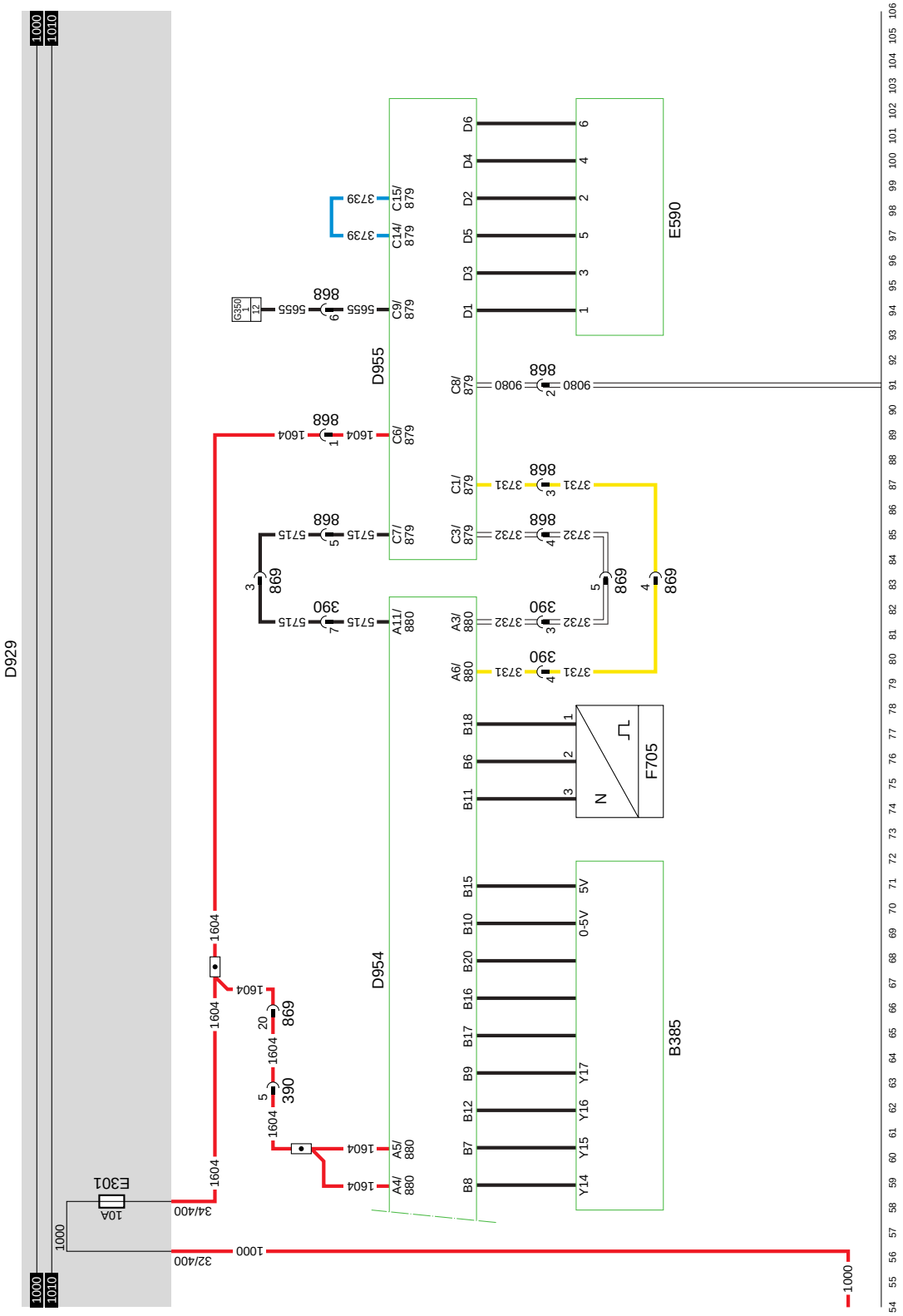

51 **1358030/25**

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52 CDM
SEE THE SYSTEM MANUAL FOR MORE INFORMATION

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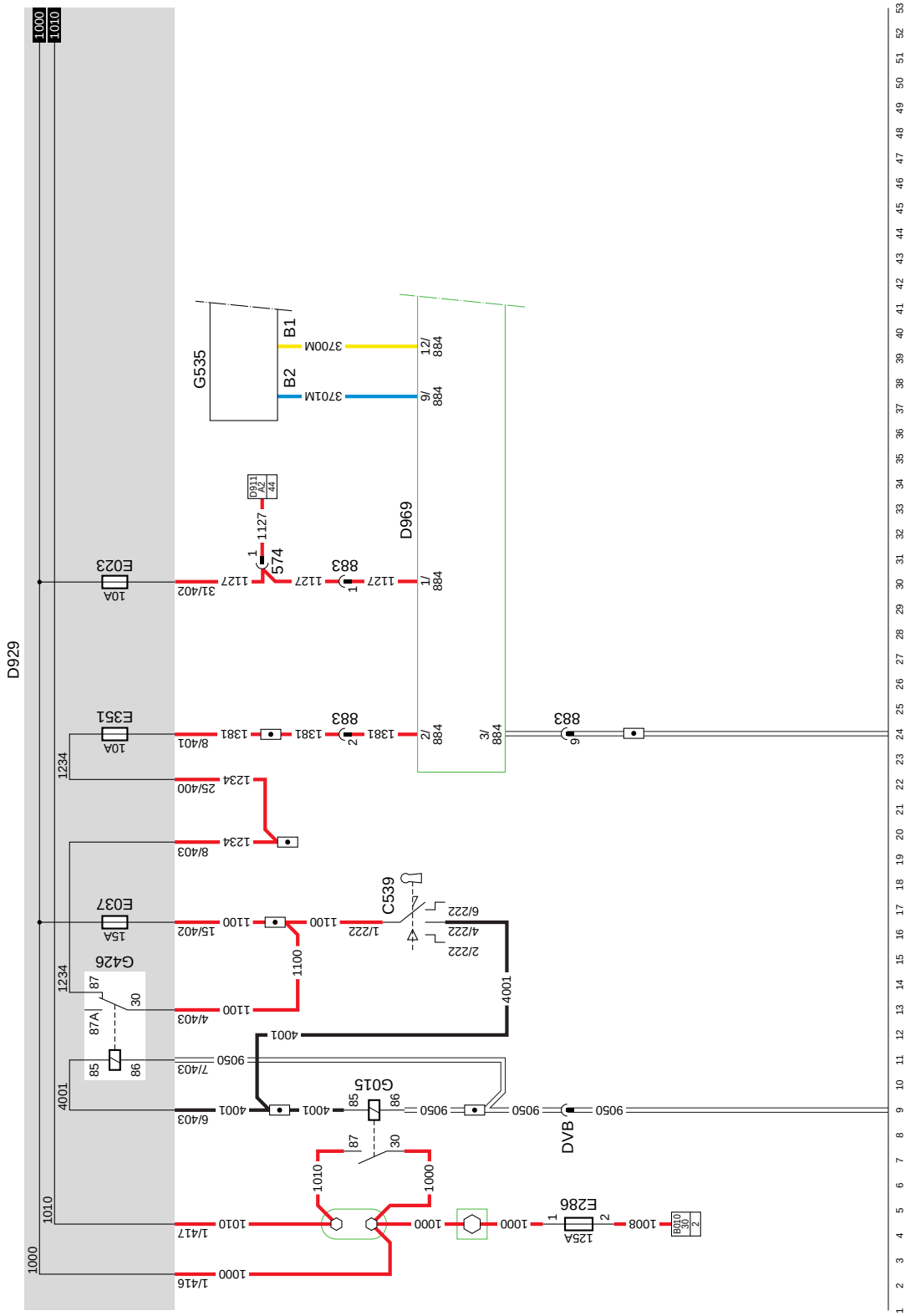

52 **1358030/25** EL001184

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2.2	Overview of basic codes for circuit diagram 1454219/03	2-2	200332

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1. INTRODUCTION

This main group contains the entire electrical system, “Options and special applications”, by means of **circuit diagrams**.

Circuit diagram
The circuit diagram contains all information relating to the entire electrical system: options and special applications which can be used in the vehicle, with the exception of the connectors.

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2. ELECTRICAL SYSTEM: OPTIONS AND SPECIAL APPLICATIONS

2.1 CIRCUIT DIAGRAM 1454219/03

This page can be used to make your own notes on the circuit diagram.

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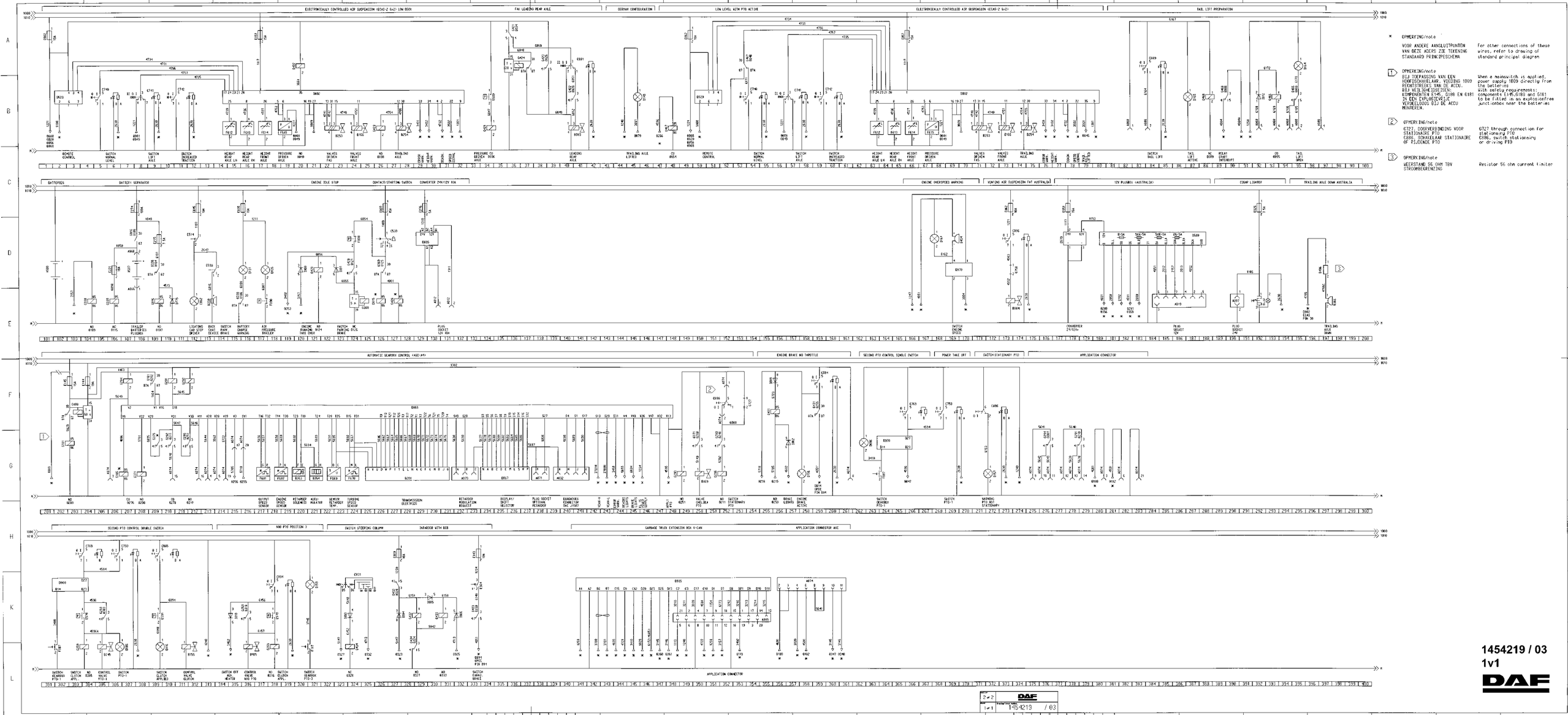

* OPMERKING/note

VOOR ANDERE AANSLUITPUNTEN VAN DEZE ADERS ZIE TEKENING STANDAARD PRINCIPESCHEMA

For other connections of these wires, refer to drawing of standard principal diagram

1 OPMERKING/note

BIJ TOEPASSING VAN EEN HOOFDSCHAKELAAR, VOEDING 1809 RECHTSTREEKS VAN DE ACCU. BIJ VEILIGHEIDSUITSCHAKELING COMPONENTEN EN45,0180 EN 0181 IN EEN EXPLOSIEVRIJE VERDEELDOOS BIJ DE ACCU MONTEREN.

When a mainswitch is applied, power supply 1809 directly from the battery. With safety requirements: components EN45,0180 and 0181 to be fitted in an explosionfree junctionbox near the batteries.

2 OPMERKING/note

6727 DOORVERBINDING VOOR STATIONAIRE PTO

6727 through connection for stationairy PTO

6996 SCHAKELAAR STATIONAIRE OF RIJDENDE PTO

6996 switch stationairy or driving PTO

3 OPMERKING/note

WEERSTAND 56 OHM TBV STROOMBEGRENZING

Resistor 56 ohm current limiter

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2.2 OVERVIEW OF BASIC CODES FOR CIRCUIT DIAGRAM 1454219/03

Basic code number	Description	Search bar number
A012	12V socket (2-pin)	130, 131
A019	12V socket (7-pin)	186
A032	AGC automatic gearbox diagnostics socket	239
A066	Semi-trailer socket (2-pin)	107, 108
A071	Automatic gearbox socket, intarder functions	238
A073	Automatic gearbox socket, operation	232
A074	Automatic gearbox socket, superstructure	206, 210, 212, 213, 214, 215, 216, 252, 261, 275, 276, 277, 278, 279, 280, 282, 283, 359
A088	Superstructure socket, tail lift (21-pin)	82, 84, 92, 93, 94, 95, 97
A095	Application connector	355
A500	Batteries (2x)	101
A507	Batteries for box/radio/tail lift (2x)	107
B030	Cigar lighter, driver's side	192
B084	Air suspension bleed valve	174
B155	PTO operation valve, 2nd	312
B166	ECAS valve, front axle	24, 73
B169	PTO operation valve, Chelsea	250
B201	Internal electrical components for AGC automatic gearbox	228
B245	PTO operation valve	305
B253	ECAS driven axle, left/right, air supply valve	23, 71
B254	Valve, ECAS second steered axle/trailing axle, left/right, lifting bellows	28, 75
B330	Buzzer indicating door open, handbrake not in use	114

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Basic code number	Description	Search bar number
B353	Automatic gearbox control solenoid, retarder	220
B354	Accumulator, AGC-A4 automatic gearbox	221
B366	Buzzer indicating trailing axle lowering	198
B383	Valve, ECAS leading rear axle FAK/FTM	41
B405	PTO operation valve, 3rd	316
B406	Resistor, trailing axle lowering	197
B434	Buzzer indicating engine speed too high	170
C062	Cab stepwell lighting, driver's side	113
C539	Accessories/ignition/starter switch	127
C740	ECAS switch, normal level	5, 54
C741	ECAS switch, axle lifting	9, 57
C742	Traction assistance switch	11, 60
C750	PTO operation switch	269, 307
C769	PTO operation switch	266, 304
C831	Cruise control/engine speed control/retarder stalk switch	324
C881	ECAS switch, lifting	41
C884	Engine brake switch, retarder function	259
C885	Clutch operation switch	310
C886	PTO switch, idling	251, 272
C889	Tail lift switch	84
C894	PTO operation switch, 3rd	318
C896	Air suspension bleed switch	174
D086	PTO warning light (orange)	263, 307
D116	Warning lamp (red) for second PTO operation, on	310
D131	Warning lamp (red), semi-trailer connection	116
D135	Warning lamp, semi-trailer air pressure	118
D149	Warning lamp, lifting axle lifted	46
D156	Engine brake retarder function warning lamp	258

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Basic code number	Description	Search bar number
D157	Warning lamp, idling PTO	272
D159	PTO warning lamp, 3rd	321
D161	Warning lamp indicating engine speed too high	168
D164	Warning lamp, tail lift open	96
D165	Tail lift warning lamp on	87
D529	Electronic unit, ECAS remote control	2, 50
D579	Electronic unit for converter, 24/12 V (15 A)	177
D580	Electronic unit for voltage reduction, 24/12V	187
D775	Diode, battery partition, semi-trailer	111
D802	ECAS-2 (6x2) electronic unit	21, 70
D866	Electronic unit, AGC-A4 automatic gearbox control	228
D867	Selector for AGC automatic gearbox	235
D895	Electronic unit for (10 A) converter with power supply for radio memory	129
D900	VIC electronic unit	264, 302
D935	CAN extension box CXB	348
D970	Electronic unit for engine speed switch	169
E026	Fuse, cigar lighter/door switches/electronic unit, 24/12 V converter with power supply for radio memory	192
E029	Fuse, intarders/engine brake	327
E035	Fuse, instruments and warning lamps/parking brake switch/power supply after contact	115
E037	Fuse, ignition switch	126
E045	Fuse, interior lighting	112
E051	Fuse, ECAS/EMAS	17, 65, 177
E062	Fuse, mechanical lifting gear/ECAS/EMAS	1, 49, 173
E143	Fuse, UPEC/tachograph/alarm system/immobiliser/ABS-D/ABS/ASC-E	333
E144	Fuse, AGC-A4 automatic gearbox	204
E145	Fuse, AGC-A4 automatic gearbox	202

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Basic code number	Description	Search bar number
E221	Fuse for box	106
E274	Main fuse, battery partition	107
E275	Fuse, battey partition	109
E276	Fuse, converter	129
E514	Operating switch for stepwell/interior lighting, driver's side door switch	112
E564	Operating switch, engine brake	334
E570	Proximity switch, clutch PTO N10	304, 318
E589	ECAS operating switch, driven axle	35
E591	Operating switch, clutch	310
E598	Operating switch, buzzer	113
F000	Control switch for parking brake	124
F087	Control switch, gearbox PTO	264, 302
F090	Control switch for ABS, drawn vehicle parking brake	118
F117	PTO control switch, 3rd	321
F601	Sensor, output shaft speed, AGC automatic gearbox	217
F602	Sensor, input shaft speed, AGC automatic gearbox	218
F612	Height sensor, ECAS, rear axle, left	14, 63
F613	Height sensor, ECAS, rear axle, right	16, 64
F614	Height sensor, ECAS, front axle	17, 66
F615	ECAS pressure sensor, driven axle, left/right	19, 67
F669	Retarder temperature sensor - AGC-A4 automatic gearbox	222
F670	Sensor, turbine speed, AGC automatic gearbox AT1000/2000	224
G015	Relay, contact	126
G016	Partition relay	107, 109
G180	Time relay power supply, Allison, 12V	203
G181	Takeover relay power supply, Allison, 12V	202, 209
G185	Starting circuit interrupter relay	206
G259	PTO control takeover relay	303, 305, 316, 318

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G292	Relay, AGC-A4 automatic gearbox	210, 211
G293	Relay, AGC-A4 automatic gearbox	248, 251
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G295	Relay, AGC-A4 automatic gearbox	211, 251
G338	Relay, battery partition	104, 109
G339	Relay, battery partition warning lamp	106, 115
G360	Relay, engine stop	125, 126
G371	Automatic gearbox relay, superstructure	208, 250
G375	Relay, stop light for AGC-A4 automatic gearbox with retarder	209
G421	Relay, ECAS, leading rear axle lowering	34, 35
G422	Relay, ECAS, leading rear axle, lifting	20, 40
G423	Relay, ECAS, leading rear axle lowering before trailing axle is lowered	26, 38
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G426	Relay, contact	127
G429	Relay, parking brake	121, 124
G431	Engine brake retarder function relay	255, 259
G432	Intarder + DEB relay	327, 328
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G466	Relay, tail lift open	93, 95
G467	Relay, ECAS, lowering if PTO active	48, 54
G468	Relay for interrupting starting circuit during use of tail lift	88, 89
G727	Connection for PTO	254
G758	Air suspension bleed through-connection	174
I000	Diode to prevent “engine running” takeover relay feedback	120
I001	Diode to prevent “engine stop” takeover relay feedback	123
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I004	Diode to prevent “cruise control/engine speed control/retarder stalk switch” feedback	328
I005	Diode to prevent intarder/DEB relay feedback	330
I006	Diode to prevent “cruise control/engine speed control/retarder stalk switch” feedback	332
I009	Diode to prevent stop-lights feedback	255
I010	Diode to prevent feedback from PTO, 3rd	315
I012	Polarity diode, tail lift open indication	92

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