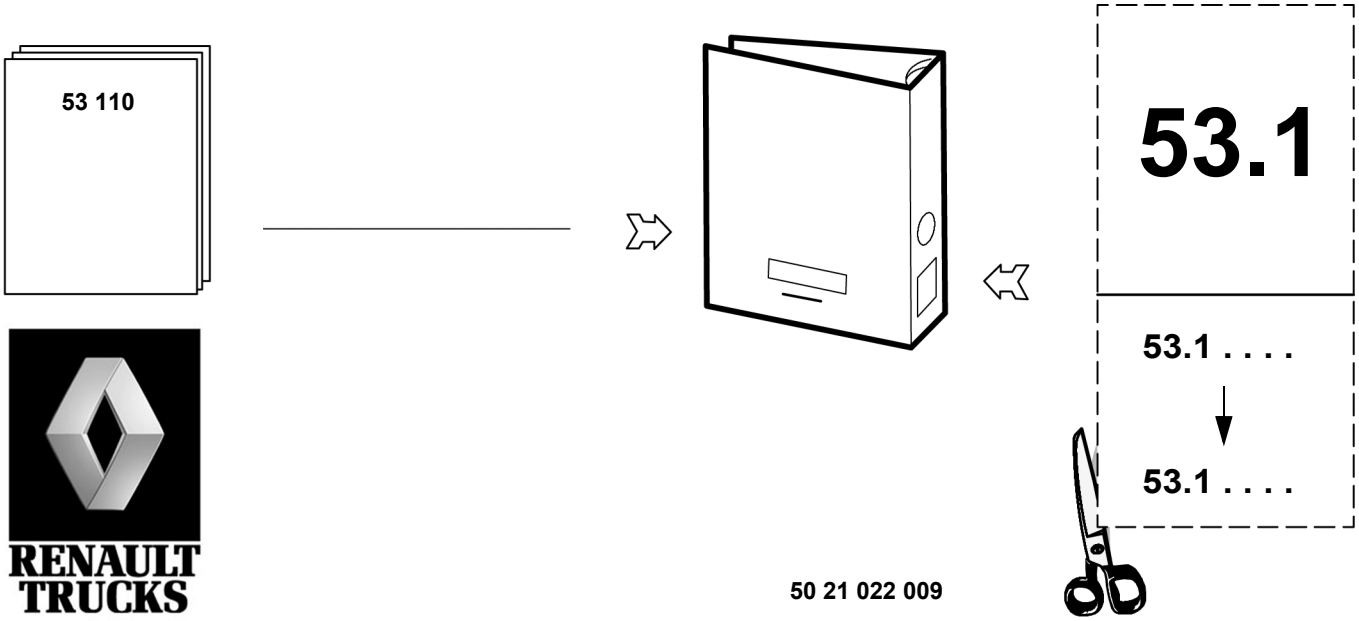
53 110 - GB - 11/2004

EBS BRAKING SYSTEM

RANGE	FAMILY	VARIANT
RENAULT MAGNUM DXi 12 440 - 480	17RD	-
	17SD	
	17TD	

The above information may change in the course of time. Only the "Consult" section of the workshop manuals repertory in standard N° 10320 serves as reference.



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GENERALITIES

APPLICABILITY

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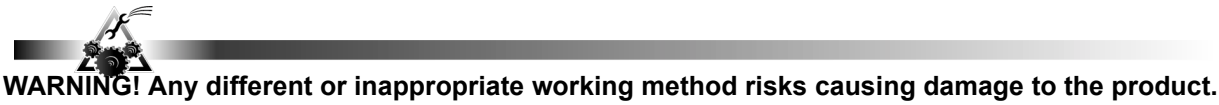
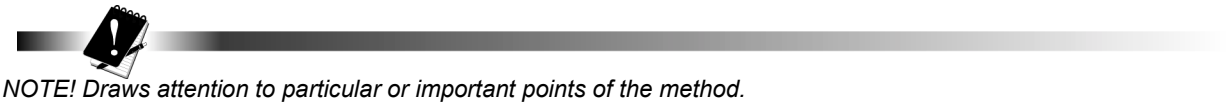
Warnings

In this document, safety instructions are symbolized as follows:

DANGER! NON-OBSERVANCE OF THE PROCEDURE DESCRIBED OR LACK OF CARE OR ATTENTION, RISK CAUSING SERIOUS INJURY OR EVEN DEATH.



WARNING! Any different or inappropriate working method risks causing damage to the product.



NOTE! Draws attention to particular or important points of the method.

Comply without fail with the regulations in force relative to the recovery and treatment of used parts and waste.

Conventional symbols

Fitting

	Tighten to torque (Nm) (left-hand thread)		Tighten by indicated value
	Tighten to torque (Nm) (right-hand thread)		Loosen by indicated value
	Tightening torque with lubricated threaded hardware		

Dimensioning

	Tightening		... Greater than or equal to ...
	Equal to		Wear limit
	... Less than ...		Machining limit or dimension
	... Greater than ...		Maximum out-of-true
	... Less than or equal to ...		Maximum parallelism error

Repair

	Force to be exerted in the direction shown (hammer - press)		Smear or coat (see "Consumables" table)
	Heat or cool: Temperature in degrees Celsius (e.g. + 80 °C)		Fill to level (see "Technical Data" and "Consumables" table)
	Weld bead		Grease or oil (see "Consumables" table)
	Repair time - Heating time		Mark - Assemble according to marking

Adjustment

	Rotating friction torque		Turn anti-clockwise
	Turn in alternate directions		Turn anti-clockwise (the figure shows the number of turns)
	Turn clockwise		Turn clockwise (the figure shows the number of turns)
	Place in contact		Move in the direction shown
	Dimension to be assured (mm)		

Various information

	Exhaust - Outlet		Operation with a sequence
	Intake - Inlet		Involves
	Weight in kg (example: 275 kg)		Return to numbered operation - Connected with numbered operation
	Depending on versions or options		Withdraw - Delete
	Wrong		Direction of disassembly (the arrow shows the direction)
	Correct		Direction of assembly (the arrow shows the direction)
	Injection		... to ...
	Repair dimension		Inspect - Check condition of part
	Part to be replaced		Danger for persons, vehicle or equipment

Operation of the system

Generalities

Definition of braking control system EBS 5
This electronic system ensures service braking of the vehicle and includes complementary functions. The main functions are:
- Anti-lock braking system **(ABS)**, emergency braking assistance and anti-slip regulation **(ASR)**
- Tractor / trailer harmonization - coupling force control system **(CFCS)**
- Wear control system **(WCS)**
- Differential locking synchronization
- Hill-start assist control
- Trajectory and anti-tipover control - electronic stability program **(ESP)**

Operation
During deceleration, the **EBS-5** system regulates: a brake pedal deceleration position corresponding to a given degree of deceleration, whatever the load conditions and braking state of the vehicle.
The system comprises 4 independent supply circuits (front brake circuit, rear brake circuit, trailer and parking brake circuit, electrical circuit).
The brake valve (9520) includes 2 pneumatic stages and 1 electrical stage. Coherence between the electrical and pneumatic signals of the brake valve is assured by calibration of the brake valve by the component supplier.
System operating faults are signalled by the illumination of pictograms on the instrument panel information display.
See page(s) A-9.

Service braking
The electrical stage of the brake valve informs the **EBS** electronic control unit (ECU) of the braking demand from the driver and its degree of deceleration.
The EBS ECU converts the deceleration demand into a demand for pressure at the front and rear modules.
Each module controls the brake cylinders of the axle that it monitors in relation to the information received by the ECU and the speed and wear sensors to which it is connected.
Distribution of braking forces between the front and rear axles depends on the braking demand from the driver and the vehicle load calculated by the EBS system.
The basic parameters are defined by a graph representing the necessary deceleration calculated in terms of the travel of the brake pedal. The pressure level sent to the brake cylinders is determined by internal parameters contained in the ECU.
The system adapts its braking strategy as a function of the deceleration demanded.
Three zones are covered:
- between 0 and 3 m/s2: The EBS seeks to balance brake wear between the axles.
- between 3.5 and 8 m/s2: The EBS works on the principle of equal wheel grip.
- above 8 m/s2: Emergency braking - all the parameters are raised to their maximum values.

Whenever the ignition is switched on, the system calculates the weight of the road rig when the accelerator is used the first few times.
An adaptation phase is triggered off whenever a change in weight is detected. During the adaptation phase (between 4 and 6 applications of the brakes), **the wear control system and the system coupling the retarders with the brakes are inactive**.
The trailer is pilot-controlled by a piloting valve controlled by the EBS ECU, which ensures harmonization of braking between the tractor and the trailer.

Anti-lock braking system (ABS)
Each brake modulator measures the speeds of the roadwheels on its axle with sensors fitted in the wheel hubs. The speed information is sent by the modulators to the ECU. On the basis of this information, the ECU can manage the ABS regulation of one or other of the wheels.
Two ABS electrovalves, installed on the front axle, regulate the wheel in question.
A double brake modulator, installed on the rear axle, regulates the wheel in question.

Emergency braking assistance
When the brake pedal is applied suddenly, the EBS amplifies the "normal" braking request.
The function is inactive below the threshold of **2.5** m/s2.

Anti-slip regulation (ASR)
ASR is brought into operation by the EBS system by means of differential braking on the drive axle by the rear module and controlling the engine speed via the vehicle CAN link.
When the function enters into action, it is signalled by the information display pictogram **(G45)**.
See page(s) A-9.

Roller bench mode
This mode serves for a vehicle equipped with EBS to be able to be tested on a power roller bench without the ASR function being activated and thus not limiting the engine power.
This mode is activated as follows, with the vehicle already on the roller bench:
- *Keep the ASR "off-road" switch pressed for at least **5** seconds.*
- *The "roller bench" mode is indicated to the driver by the mention "ROLLER BENCH" on the information display.*

Quit this mode:
- *either by switching off the ignition;*
- *or by increasing the front roadwheels speed to more than **12** km/h ;*
- *or by pressing the ASR "off-road" switch again.*

Trailer braking (CFCS)
The link between the tractor and the trailer is ensured by an electropneumatic trailer control valve piloted by the ECU.
Depending on the trailer braking performance calculated by the EBS, the system adds or subtracts a control pressure at the yellow coupling head within regulatory limits.

*To check out a coupled vehicle on the brake-testing bench, it is essential to take the pressure **P1** at the yellow coupling head as reference pressure and not the pressure at the valve outlet.*

Brake pad wear control (WCS)
Each brake is equipped with a sensor measuring the accumulated thickness of the disc and the pads. The EBS system calculates an average left-hand/right-hand wear value and make an automatic pressure correction to balance the wear between the front and the rear.
The EBS system detects a change of discs and "readjusts" its sensor graph to take account of the disc wear and distribute 100% of the lining to be worn.

Differential locking synchronization
The EBS manages engagement of the rear differential, which allows it to be engaged while the vehicle is moving.
When the function enters into action, it is signalled by the information display pictogram **(G44)**.
See page(s) A-9.

Hill-start assist control
The EBS maintains the maximum pressure that has served to stop the vehicle.
For manual gearboxes, the pressure is maintained as long as:
- the clutch pedal is depressed;
- a moving off phase has not been detected.

The function is selected by an instrument panel switch (an LED built into the switch confirms account being taken) and remains active as long as the switch is not pressed again, the ignition is not switched off and a speed of **35** km/h has not been exceeded.
When the function enters into action, it is signalled by the information display pictogram **(G21)**.
See page(s) A-9.

Vehicle stability control (ESP).
The EBS monitors and corrects the trajectory of the road rig in relation to what is desired by the driver by dealing with the instability caused by cornering.
Pictogram **(G17)** appears during the detection phase.
Pictogram **(G17)** is illuminated for **3** seconds when the ignition is switched on.
See page(s) A-9.

Anti-tipover
The EBS applies this function to deal with risks of road rig tipover.
Pictogram **(G19)** appears during the detection phase.
See page(s) A-9.
The pictogram remains illuminated for **5** seconds after the end of the correction phase so as to alert the driver that he has overstepped the limits of his road rig.

Poor deceleration performance alert
An alert is given when the EBS does not manage to obtain the desired deceleration.
The EBS minor alert pictogram **(G12)** together with the yellow "SERVICE" warning light are illuminated.
See page(s) A-9.

Trailer brake
When the dedicated instrument panel switch is kept pressed, the EBS builds up a pressure of **4** bars at the yellow coupling head.
The function is only disabled when the vehicle speed is below **4** km/h.
Once it is activated, it is automatically disabled (even if the switch is kept pressed) when the vehicle speed exceeds **7** km/h.

Coupling of retarders to the brakes
Coupling is only active when:
- the "AUTO/MANUAL" switch is in the "AUTO" position.
- the retarder control is in the **"0"** position.
- the BS is not in an adaptation phase.

The EBS gives priority to coupling the engine brake.
The retarders are fully integrated in the deceleration loop strategy.

Safety temperature
The EBS calculates the temperature of the brakes full-time and consequently modifies the travel of the brake pedal as from a temperature threshold the parameters of which can be programmed.
Warning pictogram **(G14)** appears when the alert threshold is crossed.
See page(s) A-9.

Testing of the brakes
An alert is given when the EBS detects a faulty brake (mechanical component).
The EBS minor alert pictogram **(G12)** together with the yellow "SERVICE" warning light are illuminated.
See page(s) A-9.

EBS (WAKE UP)
When the brake pedal is depressed with the battery isolating switch closed and the ignition switched off, the EBS is set into service in fall-back electronic mode.

"Roller bench" mode
This mode is activated as follows, with the vehicle already on the roller bench:
- Keep the ASR "off-road" switch pressed for at least **5** seconds.
- The "roller bench" mode is indicated to the driver by the mention "ROLLER BENCH" on the information display.

Quit this mode:
- either by switching off the ignition;
- or by increasing the front roadwheels speed to more than **12** km/h ;
- or by pressing the ASR "off-road" switch again.

Key to warning pictograms

A message specifying the nature of the fault may appear on information display.

G10

– Air minimum pressure "Alert" warning pictogram
– EBS fault warning pictogram

This pictogram is coupled with the vehicle **STOP** warning light.

G11

- Trailer "ABS/EBS" warning pictogram:
  – small pictogram: check-out of device upon ignition switch-on (no fault)
  – large pictogram: device fault "Information"

This pictogram is coupled with the vehicle **SERVICE** warning light.

G12

- Tractor "ABS/EBS" warning pictogram:
  – small pictogram: check-out of device upon ignition switch-on (no fault)
  – large pictogram: device fault "Information"

This pictogram is coupled with the vehicle **SERVICE** warning light.

G13 - Brake pads wear warning pictogram

G14 - Brakes high temperature warning pictogram

G15 - Low air pressure warning pictogram

G16 - Parking brake not applied upon opening of driver's door warning pictogram

G17 - ESP calibration lode warning pictogram

- Information pictogram: vehicle equipped with ESP system.

G18 - ASR in operation warning pictogram

G19 - Anti-tipover device in operation warning pictogram

G21 - Hill-start assist warning pictogram

G26 - Driver presence warning pictogram - depress brake pedal

G44 - Inter-wheel diff. lock in operation warning pictogram

G45
- Wheel slip or "ASR" in operation warning pictogram
- "ASR" threshold change warning pictogram

G46 - "ASR" disconnected warning pictogram (roller bench testing)

SPECIFICATIONS

APPLICABILITY

Tightening torques

Range	Family	Title	Variant	Applicability date		Updating	Page N°
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RENAULT MAGNUM DXi 12 440 - 480	17RD	Standard nut and bolt tightening torques table				06/06/2003	B1-5
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Tightening of unions				24/05/2002	B1-6
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	17TD						

Technical data

Range	Family	Title	Variant	Applicability date		Updating	Page N°
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RENAULT MAGNUM DXi 12 440 - 480	17RD	Air compressor				11/02/2004	B2-1
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Air production management (APM) unit				16/09/2004	B2-2
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Air tanks				11/02/2004	B2-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Footbrake control valve				05/02/2004	B2-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Brake modulator				05/02/2004	B2-5
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	17TD						

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	ABS electrovalve				09/02/2004	B2-7
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	17SD						
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RENAULT MAGNUM DXi 12 440 - 480	17RD	Brake cylinders				09/02/2004	B2-9
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Trailer control valve				09/02/2004	B2-10
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Parking brake valve				12/02/2004	B2-12
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Single relay valve				11/02/2004	B2-12
	17SD						
	17TD						

Tightening torques

Definitions

There are several types of tightening:
- Tightening to torque (in **Nm**)
- Tightening to angle (in °)
- Tightening to torque-angle (in **Nm + °**)

Torques given in **Nm** are nominal torques (average value calculated on the basis of the minimum torque and the maximum torque).
The tightening precision class defines the tolerance of this torque in percent as a function of the nominal torque applied.

Tightening precision classes:
- **Class I:** Special threaded hardware (tolerances ± 10% of the final torque).
- **Class II:** Reserved for precise tightening (tolerance ± 10% of the nominal torque).
- **Class III:** Reserved for normal standard tightening (tolerance ± 20% of the nominal torque)

For standard threaded hardware indicated in the table below, use tightening class **III**.
For other torques, see the following page(s).

"FIH" type (Nylstop) locknuts must be replaced whenever removed. "DRH" type (oval) locknuts can be re-used. If locknuts (DRH, FIH or other) are re-used, make absolutely certain that the screw-thread of the bolt protrudes least two threads above the top edge of the nut.

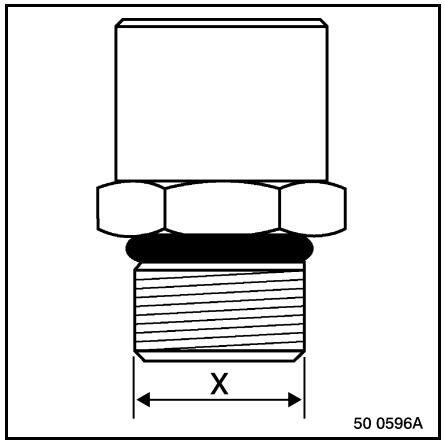
Standard nut and bolt tightening torques table

The tightening torque values given in the table are based on standard 01.50.4002 and apply to new nuts and bolts fitted dry and re-used nuts and bolts with oil applied to the screw-threads. If any nuts and bolts are replaced, ***it is absolutely essential to use nuts and bolts recommended by the RENAULT TRUCKS Spare Parts Department (coefficient of friction in compliance with standard 01.50.4002)****.*

Tightening torque values in Nm for conventional "metric system" threaded hardware based on standard 01.50.4002 (H: normal and HE: with flange)		
Diameter and pitch of nuts and bolts	**Quality class III**	
	Quality class 8.8	**Quality class 10.9**
6 x 1.00	7.5 ± 1.5	11 ± 2.2
7 x 1.00	15 ± 3	20 ± 4
8 x 1.00	20 ± 4	30 ± 6
8 x 1.25	20 ± 4	27 ± 5.4
10 x 1.00	40 ± 8	60 ± 12
10 x 1.25	40 ± 8	60 ± 12
10 x 1.50	40 ± 8	50 ± 10
12 x 1.25	70 ± 14	100 ± 20
12 x 1.50	65 ± 13	95 ± 19
12 x 1.75	60 ±12	90 ± 18
14 x 1.50	105 ± 21	155 ± 31
14 x 2.00	100 ± 20	145 ± 29
16 x 1.50	160 ± 32	220 ± 44
16 x 2.00	150 ± 30	220 ± 44
18 x 1.50	240 ± 48	340 ± 68
18 x 2.50	210 ± 42	310 ± 62
20 x 1.50	330 ± 66	480 ± 96
20 x 2.50	300 ± 60	435 ± 87
22 x 1.50	450 ± 90	650 ± 130
22 x 2.50	410 ± 82	595 ± 119
24 x 2.00	560 ± 112	820 ± 164
24 x 3.00	510 ± 102	750 ± 150

Tightening of unions

dia. X	Tightening torque
1/8 gas	**9** ± **1** Nm
M 10x100	**9** ± **1** Nm
M 12x150	**15** ± **3** Nm
M 14x150	**15** ± **3** Nm
M 16x150	**25** ± **5** Nm
M 22x150	**25** ± **5** Nm



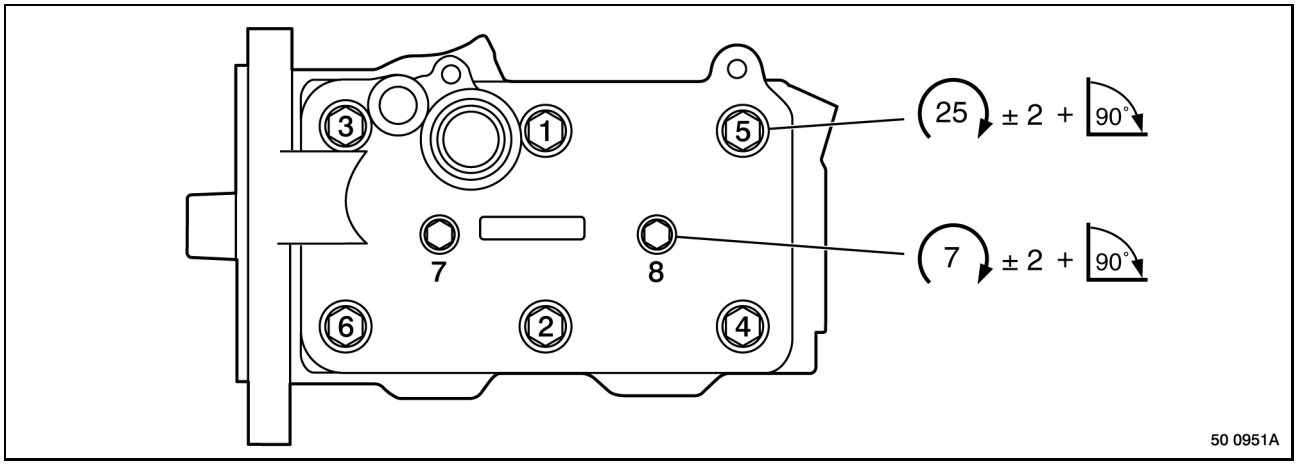
Technical data

Air compressor

Twin-cylinder compressor WABCO 4127040010

Reference N°	**7420547525**
Displacement	**704 cm3**
Port screw-threads **0 - 2**	**M 26x1.5**
Port screw-threads **4**	**M 12x1.5**
Port screw-threads **9**	**M 14x1.5**

The item numbers indicate the tightening sequence.



Driving pinion tightening torque **225$^{\pm 25}$ Nm**.

Air production management (APM) unit

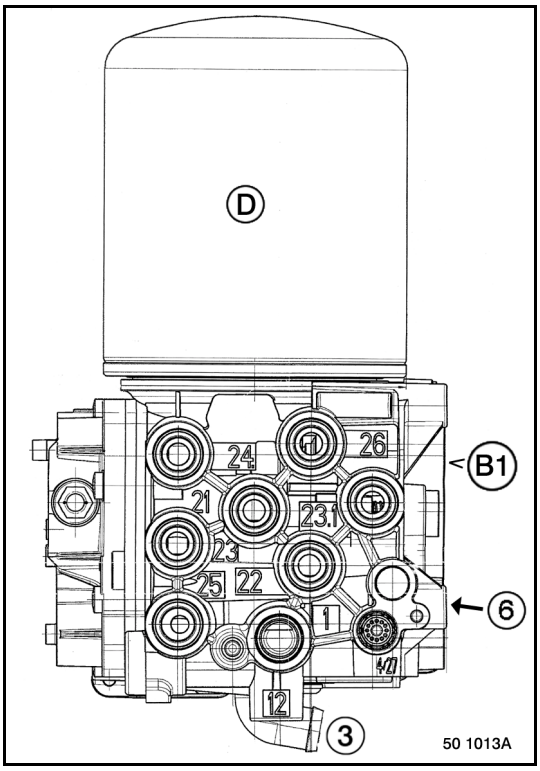
This unit cannot be dismantled and cannot be adjusted.
For all diagnostic checks, use the RENAULT TRUCKS test tool.

Description
(D) - Air dryer cartridge

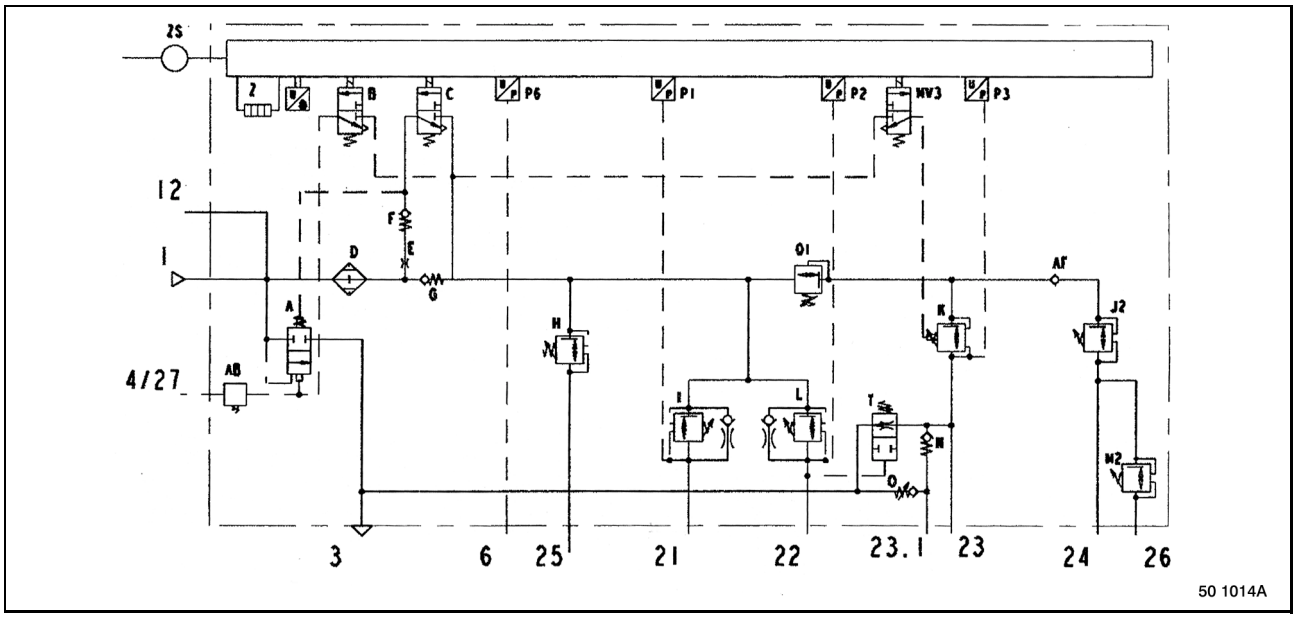
The air dryer cartridge bolt has a left-hand screw-thread.

(B1) - Air production management unit body

It is forbidden to dismantle the unit.



Coding system for appliance ports
1 - Air compressor air inlet
3 - Exhaust
4/27 - Air compressor pilot-control
6 - Parking brake information
12 - External air supply inlet
21 - Front brake air tank air supply
22 - Rear brake air tank air supply
23 - Trailer circuit air supply
23.1 - Parking brake circuit air supply
24 - Retarder auxiliary equipment circuit air supply
25 - Air suspension circuit air supply
26 - Gearbox circuit air supply



A - Pressure regulating valve
B - Trip-out electrovalve
C - Regeneration electrovalve
D - Air dryer cartridge
F – G – N - Non-return valve
H – I – J2 – K – L – M2 - Overflow valve
MV3 - Parking brake solenoid valve
O - Overpressure valve
O1 - Pressure reducing valve
P. - Air pressure sensor
T - Valve **R1309**
Z - Heater **1000 W**
2S - connector

When replacing the air dryer cartridge, use the RENAULT TRUCKS test tool to re-initialize the air production management unit.

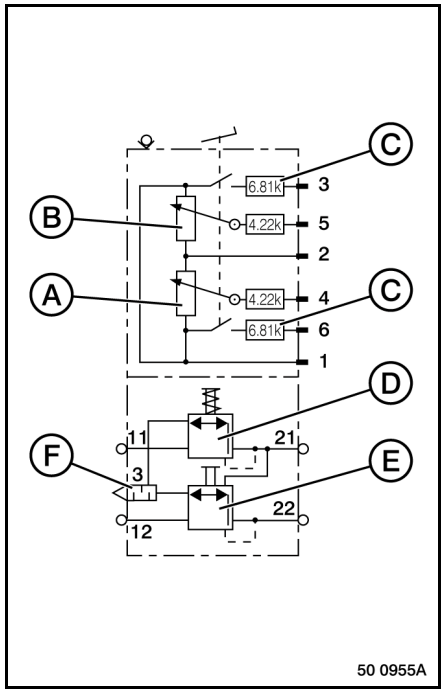
Air tanks

Diameter	**276 mm**
Capacity	**40 L**
Validity time	**15 year(s)**
Maximum working pressure	**13 bars**
Port screw-threads	**M 22x1.5**

Footbrake control valve

Description

(A) - Potentiometer **1**
(B) - Potentiometer **2**
(C) - EBS wake-up switch
(D) - Front brake circuit pneumatic stage
(E) - Rear brake circuit pneumatic stage
(F) - Exhaust



Coding system for appliance ports

3 - Exhaust
11 - Front brake air tank air supply
12 - Rear brake air tank air supply
21 - Front brake modulator control pressure
22 - Rear brake modulator control pressure

Technical data

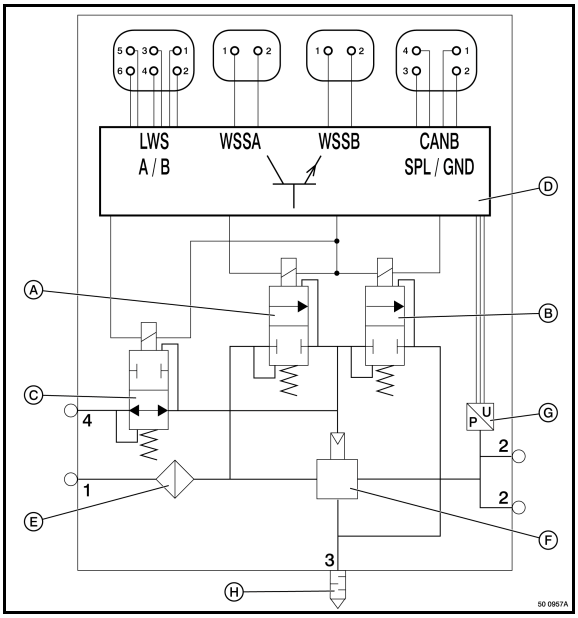
Knorr-Bremse reference N°	**K001428**
Renault Trucks reference N°	**5010457644**
Maximum working pressure	**13 bars**
Maximum delivery pressure	**$9^{0 / +1}$ bars**
Difference between **P21** and **P22** in back-up mode	**+ 2 bars**
Push-rod minimum travel	**10.5 mm**
Push-rod clearance	**0.5 mm**
Port screw-threads **11 - 12 - 21 - 22**	**Flanged**
Power supply voltage	**$5^{\pm 0.2}$ V**
Potentiometer **1** electrical resistance	**4.2 → 7.5 KΩ**
Potentiometer **2** electrical resistance	**5.3 → 2 KΩ**

Brake modulator

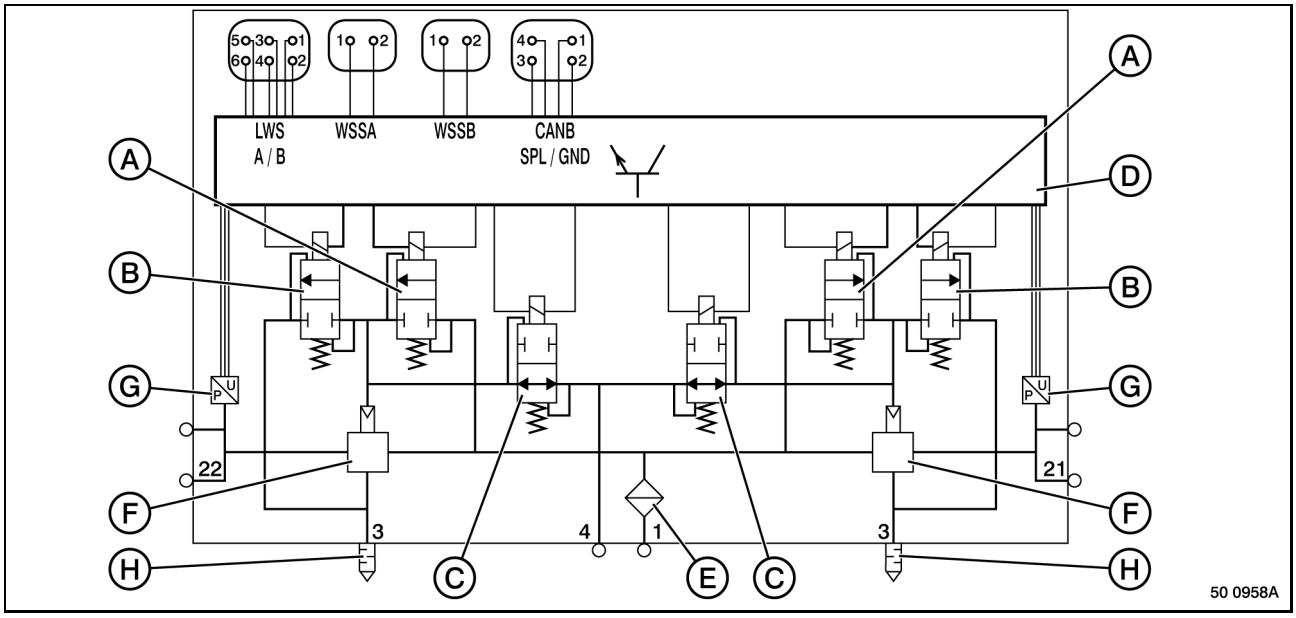
Description
(A) - Intake electrovalve
(B) - Exhaust electrovalve
(C) - Back-up mode electrovalve
(D) - Electronic card
(E) - Internal filter
(F) - Relay valve
(G) - Air pressure sensor
(H) - Exhaust

Front axle brake modulator

Coding system for appliance ports
1 - Front brake air tank air supply
2 - Pressure delivered to front brake cylinders
3 - Exhaust
4 - Control pressure



Rear drive axle brake modulator



Coding system for appliance ports
1 - Rear brake air tank air supply
21 - Pressure delivered to RH rear brake cylinder
22 - Pressure delivered to LH rear brake cylinder
3 - Exhaust
4 - Control pressure

Electrical connection
LWS A/B - RH/LH brake pads wear sensor
WSSA - RH speed sensor
WSSB - LH speed sensor
CANB - SPL/GND - CAN power supply / earth + lines to EBS ECU

Technical data
Front axle brake modulator

Knorr-Bremse reference N°	**K000914**
Renault Trucks reference N°	**7420428938**

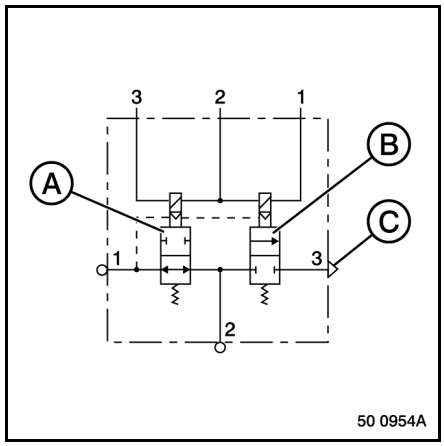
Rear drive axle brake modulator

Knorr-Bremse reference N°	**K001411**
Renault Trucks reference N°	**7420502537**
Maximum supply pressure	**12.5 bars**
Maximum control pressure	**10 bars**
Port screw-threads **1 - 2 - 21 - 22**	**M 22x1.5**
Port screw-threads **4**	**M 16x1.5**
Power supply voltage	**24 V**

ABS electrovalve

Description

(A) - Intake electrovalve
(B) - Exhaust electrovalve
(C) - Exhaust



Technical data

Knorr-Bremse reference N°	**BR 9191**
Renault Trucks reference N°	**7420516342**
Maximum working pressure	**10.2 bars**
Port screw-threads	**M 22x1.5**
Power supply voltage	**24 V**
Electrovalve(s) coil resistance **(A) - (B)**	**$15^{\pm 3}$ Ω**

Speed sensors

LH front

Wabco reference N°	**4410329840**
Renault Trucks reference N°	**5010457860**
Cable length	**2450$^{\pm 20}$ mm**

RH front

Wabco reference N°	**4410329830**
Renault Trucks reference N°	**5010457861**
Cable length	**3900$^{\pm 20}$ mm**

LH rear

Wabco reference N°	**4410329820**
Renault Trucks reference N°	**5010457862**
Cable length	**1900$^{\pm 20}$ mm**

RH rear

Wabco reference N°	**4410329810**
Renault Trucks reference N°	**5010457863**
Cable length	**1500$^{\pm 20}$ mm**

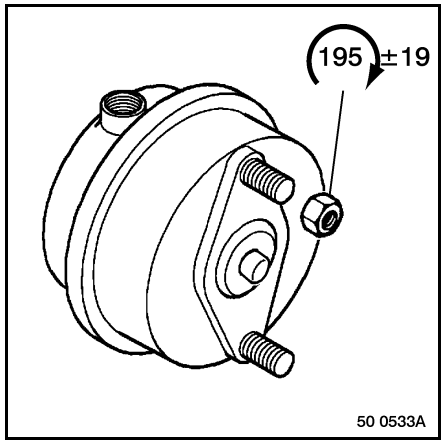
Diameter	**16 mm**
Electrical resistance	**≥ 1150 $^{+100}/_{-50}$ Ω**

Brake cylinders

Axle 1

Diaphragm chamber Meritor type "24"

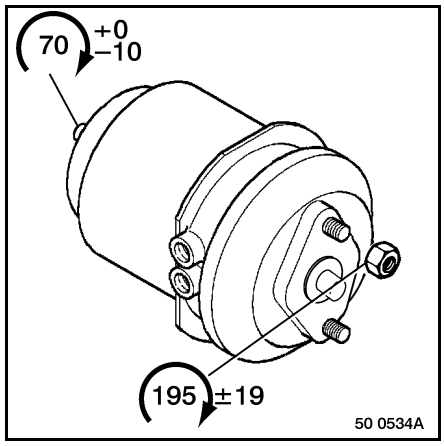
Reference N°	**68325460**
Active diameters	**163 mm**
Port screw-threads	**M 16x1.5**



Axle 2

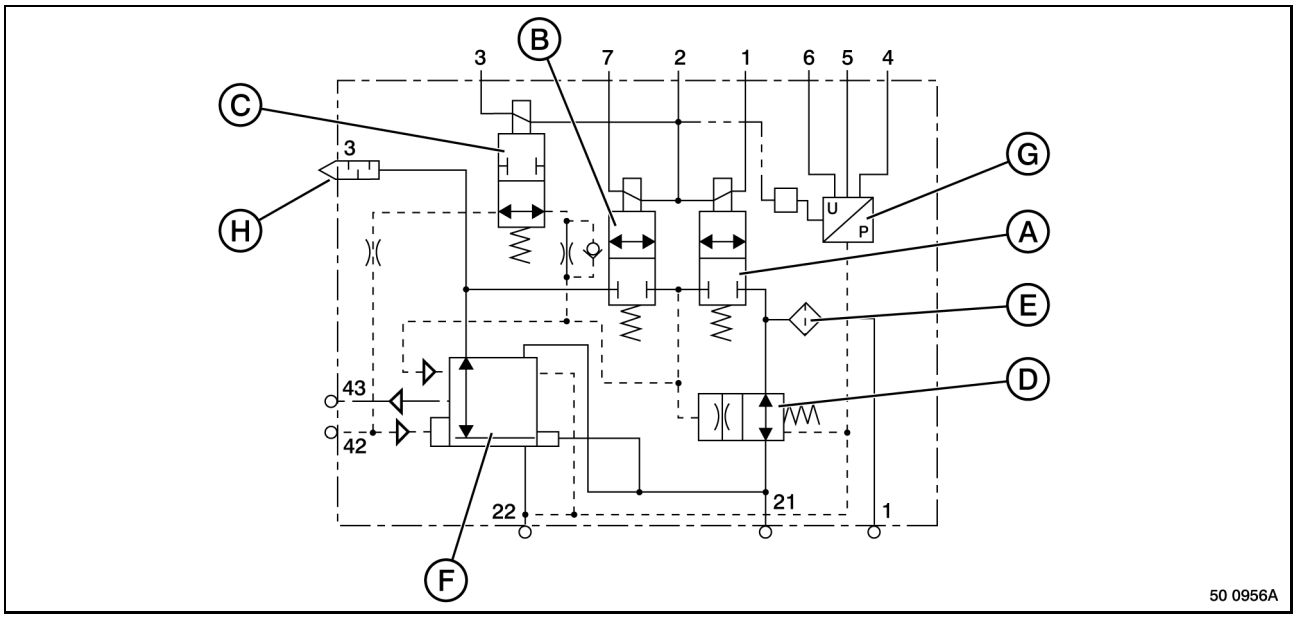
Spring cylinder Meritor type "24/30"
Reference

- left	**68325483**
- right	**68325484**
Release pressure	**5.5$^{\pm 0.3}$ bars**
Port screw-threads	**M 16x1.5**



Trailer control valve

Description
(A) - Intake electrovalve
(B) - Exhaust electrovalve
(C) - Back-up mode electrovalve
(D) - Breakaway valve
(E) - Internal filter
(F) - Relay valve
(G) - Air pressure sensor
(H) - Exhaust



Coding system for appliance ports
1 - Air supply
21 - Constant pressure at red coupling head
22 - Pressure delivered to yellow coupling head
3 - Exhaust
42 - Footbrake control modulator control pressure
43 - Parking brake valve control pressure

Technical data

Knorr-Bremse reference N°	**K000918**
Renault Trucks reference N°	**7420456402**
Maximum supply pressure	**8.5 bars**
Maximum control pressure	
Port **42**	**12.5 bars**
Port **43**	**8.5 bars**
Port screw-threads **1 - 21 - 22**	**M 22x1.5**
Port screw-threads **42 - 43**	**M 16x1.5**
Power supply voltage	
Pin **2**	**24 V**
Pin **4**	**5 V**
Electrovalve(s) coil resistance **(A) - (B)**	**17.1 Ω**
Electrovalve(s) coil resistance **(C)**	**11.1 Ω**

Parking brake valve

Parking brake valve KNORR DPM28A with "test" position

Reference N°	**5010422400**
Maximum working pressure	**10 bars**
Port screw-threads	**M 16x150**

Single relay valve

Single relay valve Wabco 9730110040

Reference N°	**5010588146**
Maximum supply pressure	**13 bars**
Maximum control pressure	**10.2 bars**
Port screw-threads **1 – 2**	**M 22x1.5**
Port screw-threads **4**	**M 16x1.5**

COMPRESSED AIR CIRCUIT

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17RD	Identification of brake air pipes				21/05/2002	C-3
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Coding system for appliance ports				21/05/2002	C-4
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Diagram colours				21/05/2002	C-5
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17SD	Pneumatic diagram				26/01/2004	C-6
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Pneumatic diagram				29/09/2004	C-8
RENAULT MAGNUM DXi 12 440 - 480	17RD	Key				26/01/2004	C-10
	17SD						
	17TD						

Identification of brake air pipes

RENAULT TRUCKS STANDARD

Polyamide braking circuit pipes are identified according to a code using rings of different colours. A colour range indicates the function of the circuit. Two extra colours specify the sub-function of the circuit.

Function codes

Orange	→	Front service brake
Blue	→	Rear service brake
Green	→	Parking brake
Red	→	Trailer brake
Brown	→	Auxiliary equipment
Without identification	→	Air supply circuit

Sub-function codes

Function colour only	→	Constant pressure
Yellow	→	Pilot-control pressure
White	→	Delivered pressure

Colour abbreviations

Bc	→	White
Bu	→	Blue
J	→	Yellow
M	→	Brown
Or	→	Orange
R	→	Red
Ve	→	Green

Marking example:

(M) = Brown
(M-M) = Brown / Brown
(M-J-Bc) = Brown / Yellow / White

Coding system for appliance ports

D.I.N. - I.S.O. 6786 STANDARDS

The numbering of ports, used by the majority of braking equipment manufacturers, conforms to DIN and ISO standards.

The ports are coded according to their function

- **0**..... Air aspiration
- **1**..... Supply pressure
- **2**..... Delivered pressure
- **3**..... Atmospheric air venting
- **4**..... Control pressure
- **5**..... Available
- **6**..... Available
- **7**..... Antifreezer
- **8**..... Lubrication
- **9**..... Water cooling

Some ports include 2 figures.

The **first figure** indicates the function

The **second figure** indicates a sequence number

Example

41: Control port N° **1**

42: Control port N° **2**

Diagram colours

Compressed air supply	

Front service brake circuit

Constant pressure	
Pilot-control pressure	
Delivered pressure	

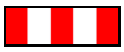
Rear service brake circuit

Constant pressure	
Pilot-control pressure	
Delivered pressure	

Parking brake circuit

Constant pressure	
Pilot-control pressure	
Delivered pressure	

Trailer brake circuit

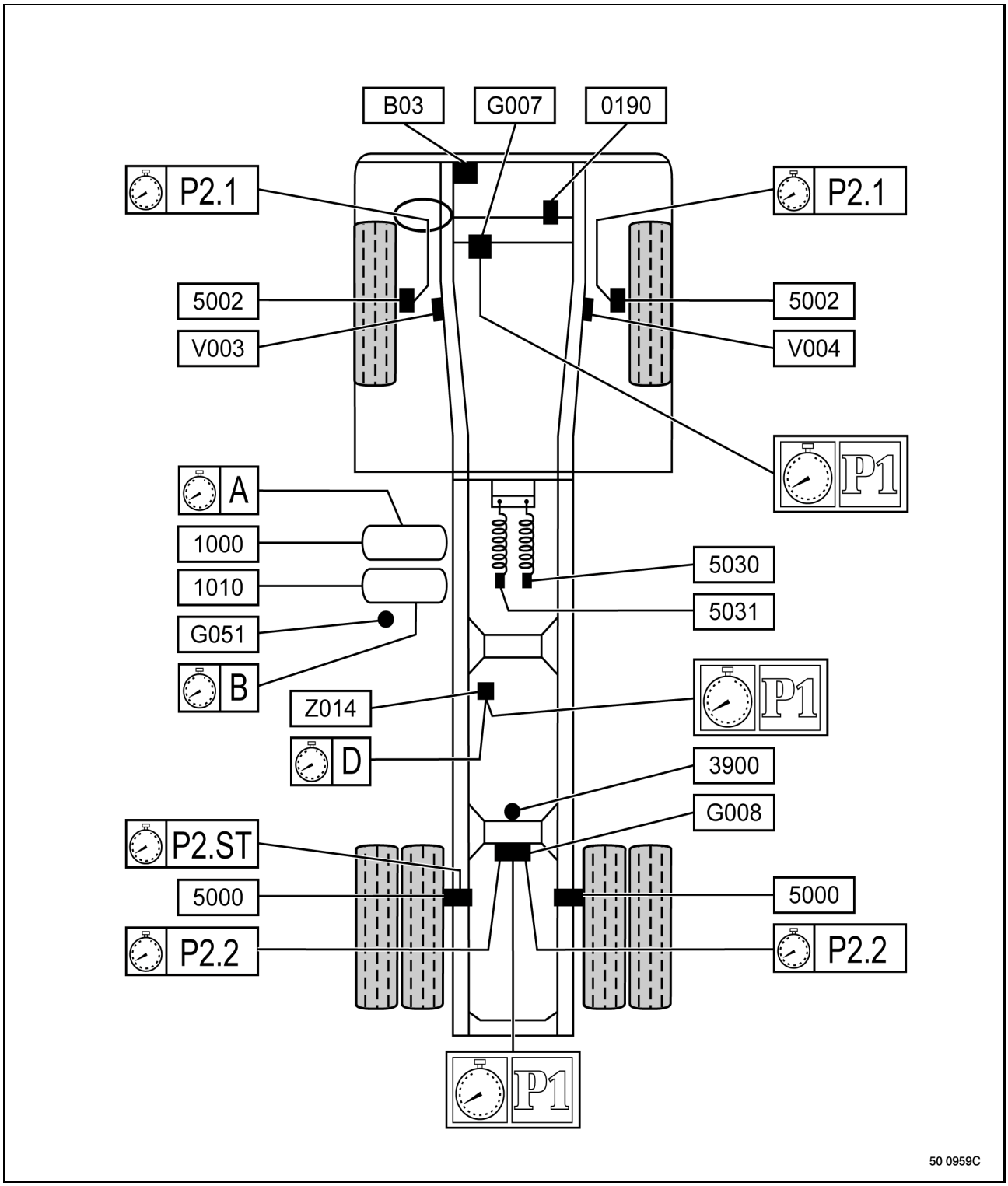
Constant pressure	
Pilot-control pressure	
Delivered pressure	

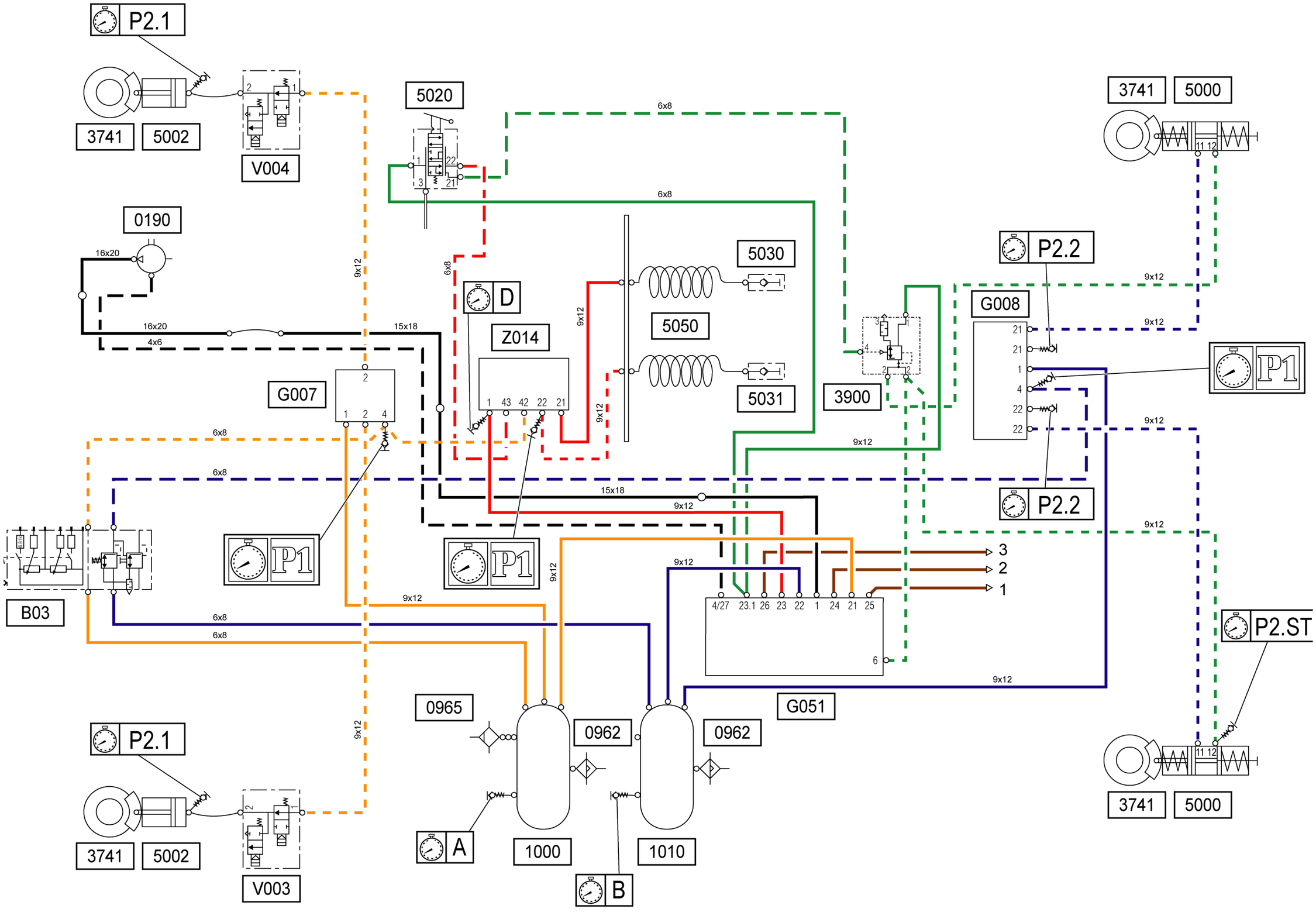
Auxiliary equipment circuit

Constant pressure	
Pilot-control pressure	
Delivered pressure	

Pneumatic diagram

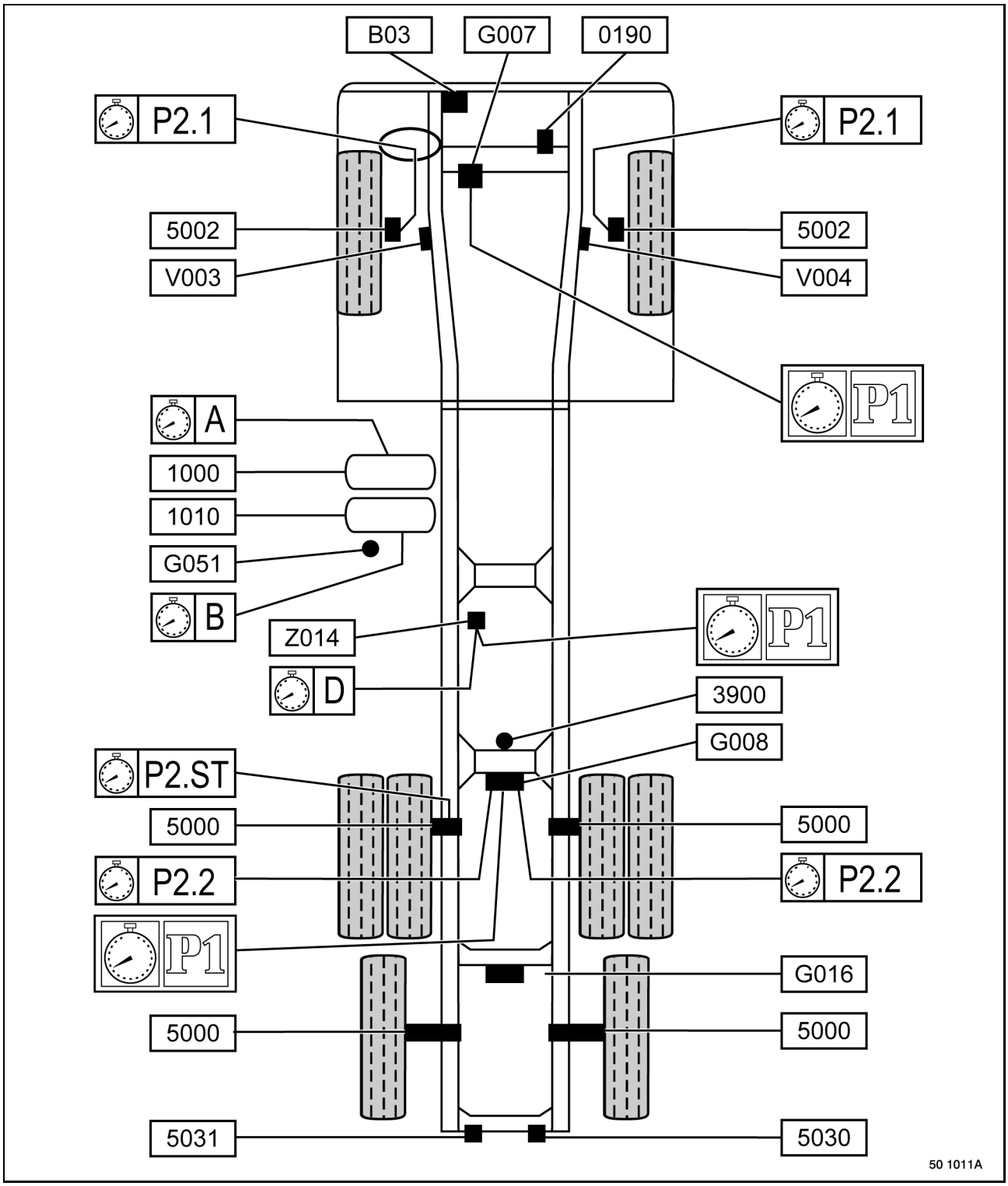
Location of appliances
4X2 vehicle.

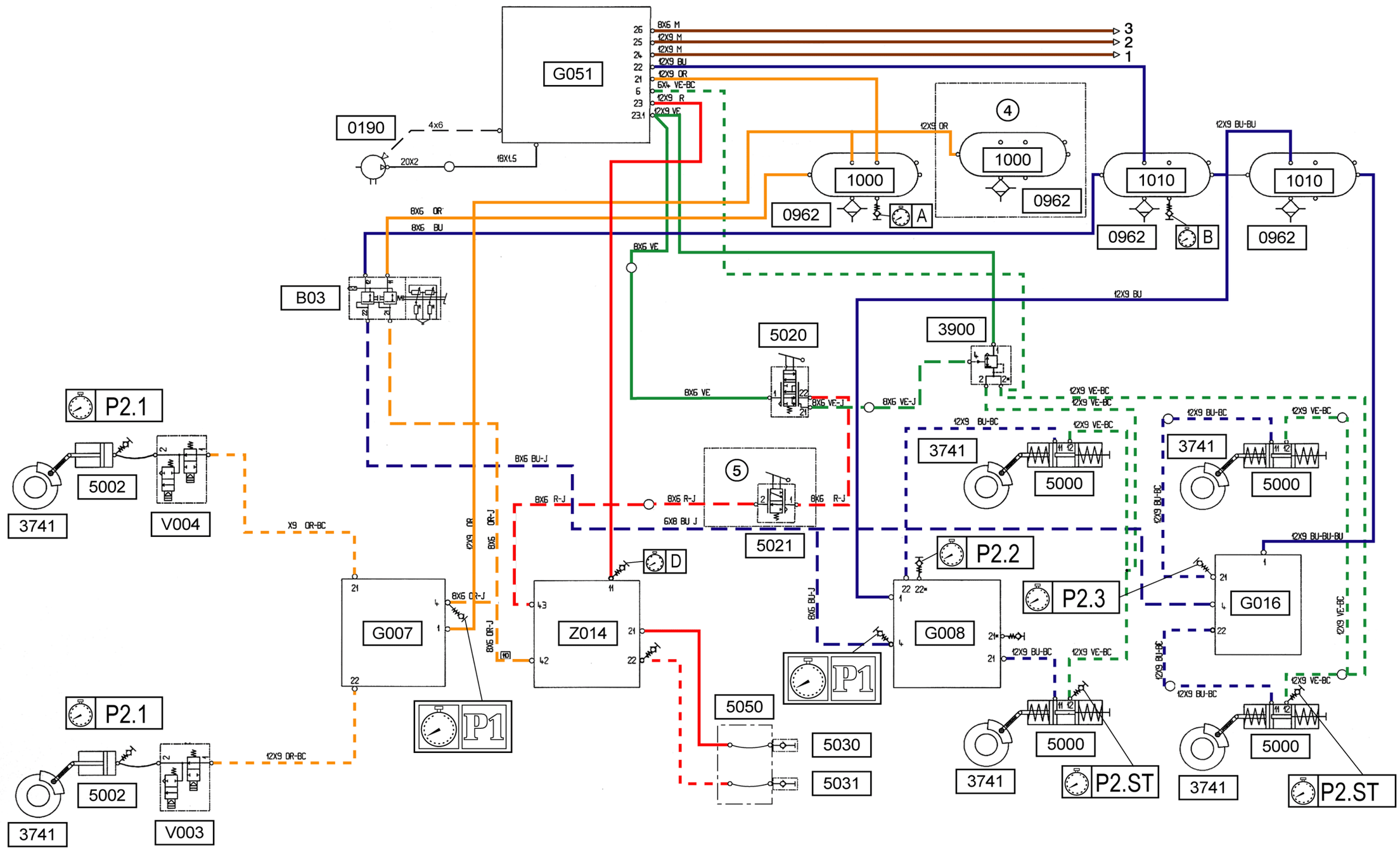



P2.1
3741
5002
V004
5020
6x8
6x8
0190
16x20
16x20
4x6
9x12
15x18
6x8
D
Z014
1 43 42 22 21
9x12
5030
5050
5031
9x12
3900
3741
5000
11 12
P2.2
9x12
G008
21
21
1
4
22
22
9x12
P1
9x12
G007
2
1 2 4
6x8
6x8
15x18
9x12
P1
P1
9x12
9x12
9x12
3
2
1
4/27 23.1 26 23 22 1 24 21 25
6
B03
6x8
6x8
9x12
9x12
G051
P2.ST
0965
0962
0962
A
1000
1010
B
P2.1
3741
5002
V003
3741
5000
11 12
AV 588524E

Pneumatic diagram

Location of appliances
6X2 vehicle.




G051
26
25
24
22
21
6
23
23.1
8X6 M
12X9 M
12X9 M
12X9 BU
12X9 OR
6X4 VE-BC
12X9 R
12X9 VE
3
2
1
0190
4x6
20X2
18X1.5
4
12X9 OR
1000
0962
A
1000
0962
1010
0962
B
1010
0962
12X9 BU-BU
8X6 OR
8X6 BU
8X6 VE
B03
12X9 BU
5020
3900
8X6 VE
8X6 VE-J
12X9 VE-BC
12X9 VE-BC
12X9 BU-BC
3741
5000
12X9 BU-BC
12X9 VE-BC
3741
5000
P2.1
5002
3741
V004
X9 OR-BC
8X6 BU-J
5
8X6 R-J
8X6 R-J
8X6 R-J
8X6 BU J
5021
12X9 OR
8X6 OR-J
8X6 OR-J
D
P2.2
P2.3
12X9 BU-BU-BU
G007
G008
G016
Z014
P1
P1
5050
5030
5031
8X6 BU-J
12X9 BU-BC
12X9 VE-BC
12X9 BU-BC
12X9 VE-BC
12X9 VE-BC
P2.1
5002
3741
V003
12X9 OR-BC
5000
3741
P2.ST
5000
3741
P2.ST
AV 588565J

Key

Key to appliances

B03	Footbrake control modulator unit
G007	Front axle braking assistance modulator unit
G008	Drive axle braking assistance modulator unit
G051	Air production management ECU
V003	LH roadwheel ABS electrovalve
V004	RH roadwheel ABS electrovalve
Z014	Trailer brake control EBS brake modulator unit
0190	Air compressor
0962	Manual bleed valve
0965	Inflation valve
1000	Front brake air tank
1010	Rear brake air tank
3741	Air brake caliper
3900	Single relay valve
5000	Spring brake cylinder
5002	Single brake cylinder
5020	Parking brake valve
5021	Trailer brake valve
5030	Brake air supply coupling head with valve (red)
5031	Brake air supply coupling head with valve (yellow)
5050	Tractor / trailer flexible connecting pipe

Key to cross-references

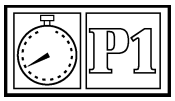
1 – To gearbox auxiliary equipment circuit
2 – To air suspensions
3 – To other auxiliary equipment.
4 – With front air suspension (variant **20704/11/18**)
5 – With trailer brake valve (variant **70302**)

Air circuit test points

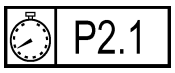
Front service brake air tank pressure.

Rear service brake air tank pressure.

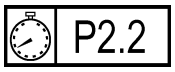
Trailer control brake modulator air supply pressure (port **1**).



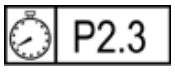
Braking reference point (priority circuit). Port **4** for brake modulators and port **21** for trailer control brake modulator.



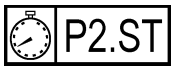
Pressure delivered to front axle cylinders.



Pressure delivered to rear axle cylinders (port **11**).



Pressure delivered to rear axle cylinders (port **11**).



Pressure delivered to parking brake spring cylinders (port **12**).

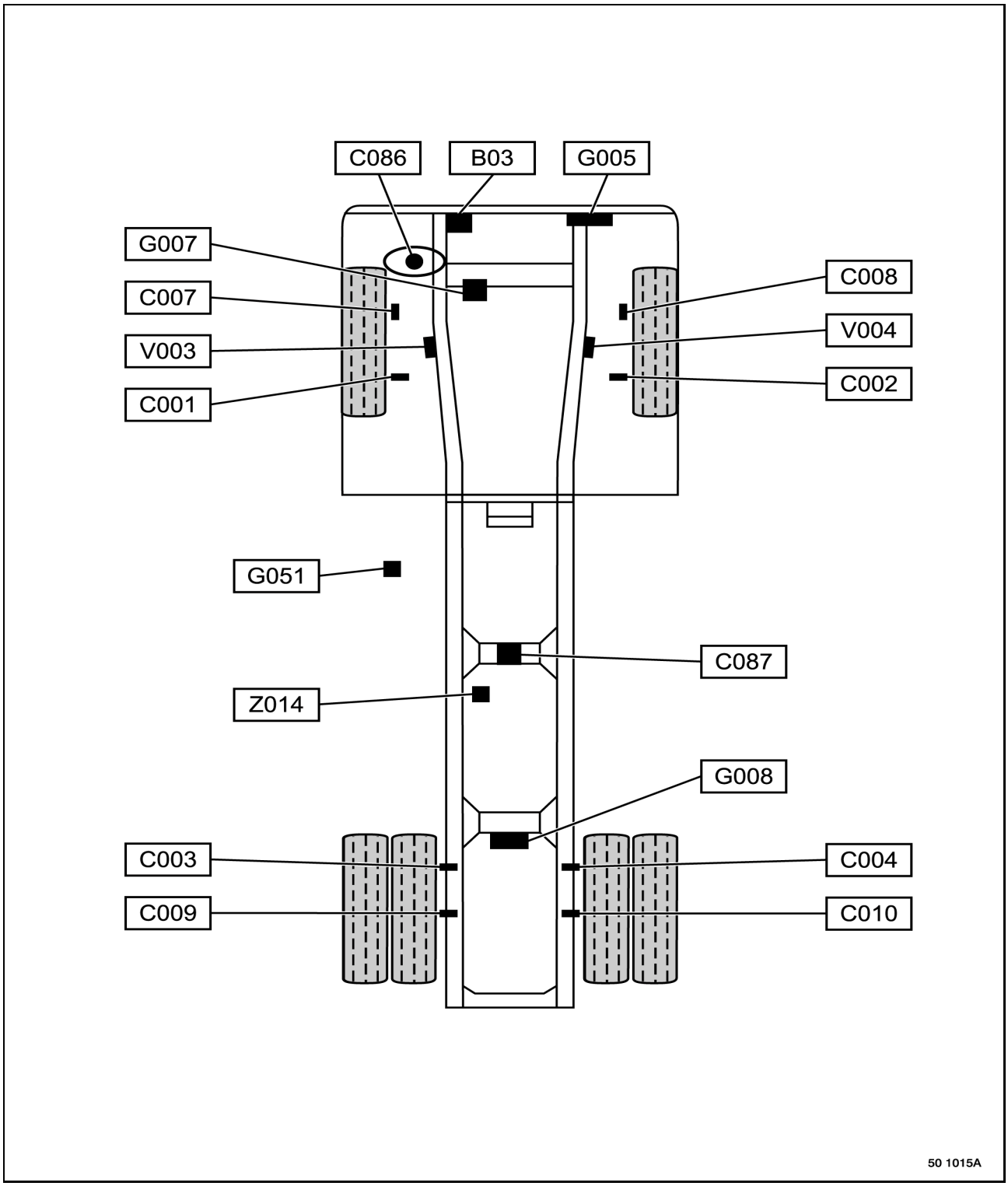
ELECTRICAL CIRCUIT

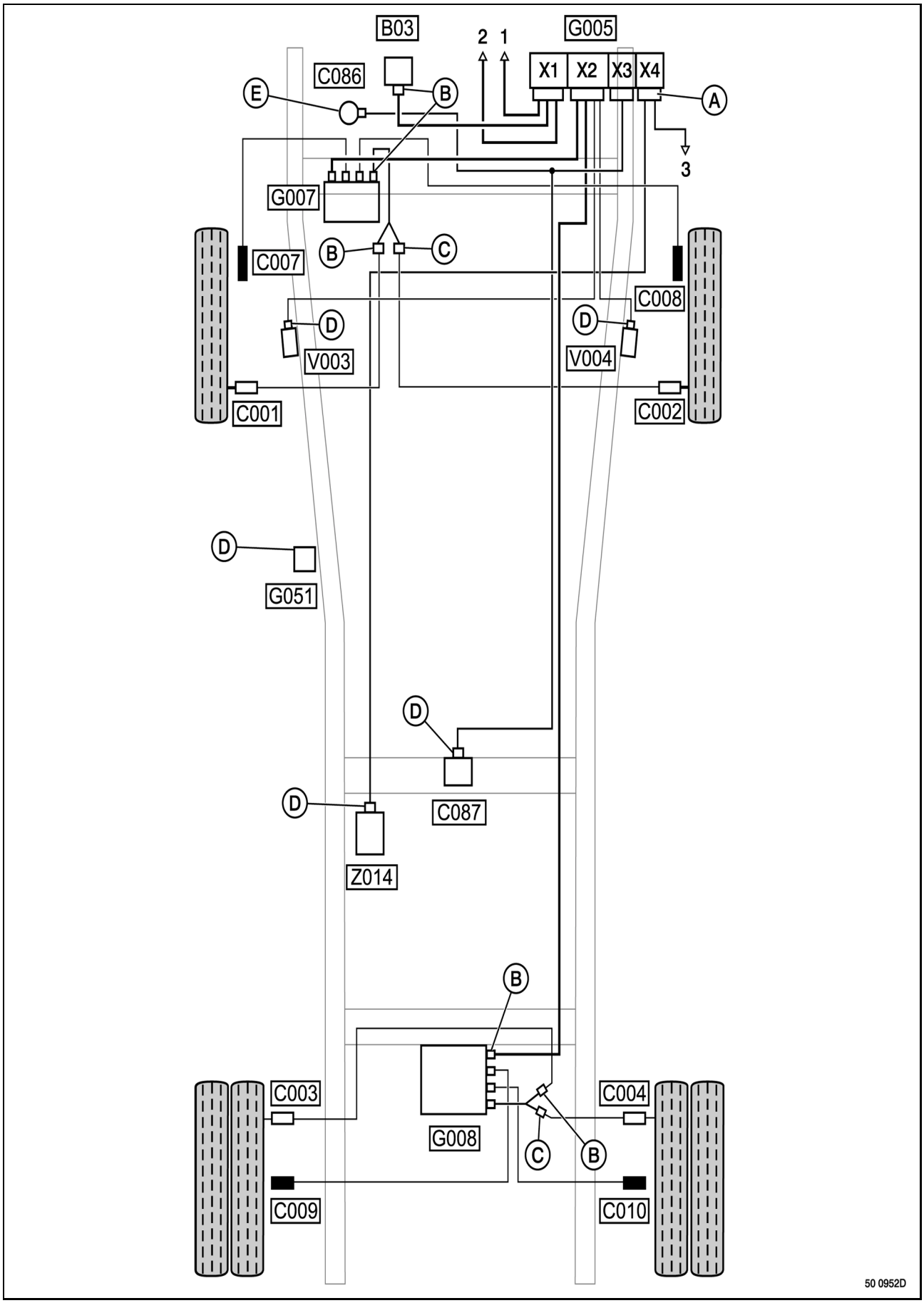
APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT MAGNUM DXi 12 440 - 480	17SD	Electrical diagram				27/01/2004	D-3
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Electrical diagram				29/09/2004	D-5
RENAULT MAGNUM DXi 12 440 - 480	17RD	Key				27/01/2004	D-7
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Electrical connection to EBS ECU				30/01/2004	D-9
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Electrical connection to front axle brake' modulator				02/02/2004	D-11
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Electrical connection to rear drive axle brake modulator				05/03/2004	D-12
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Electrical connection to other appliances				02/02/2004	D-13
	17SD						
	17TD						
RENAULT MAGNUM DXi 12 440 - 480	17RD	Wear sensors wiring				04/02/2004	D-15
	17SD						
	17TD						

Electrical diagram

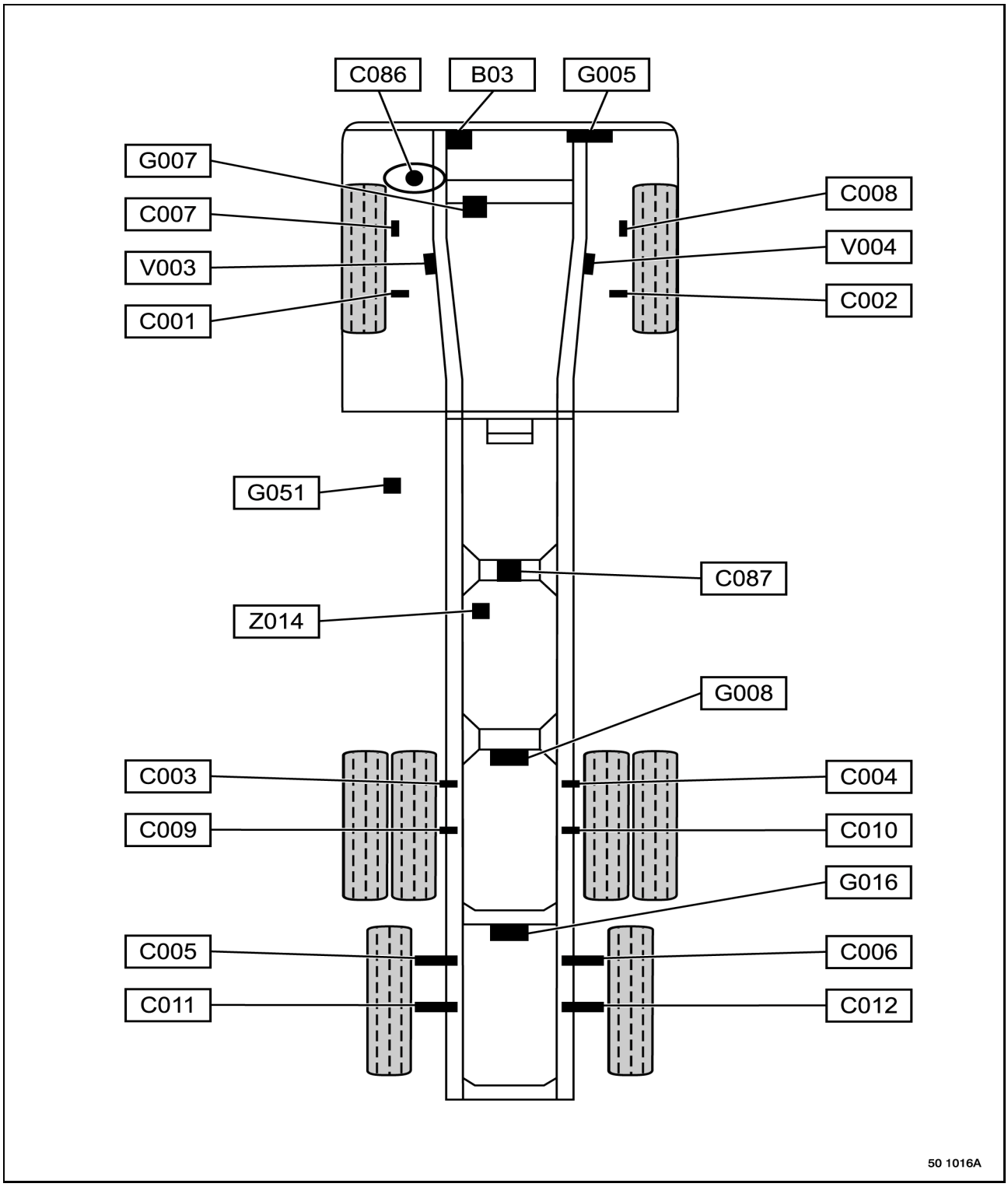
Location of appliances
4x2 vehicle.

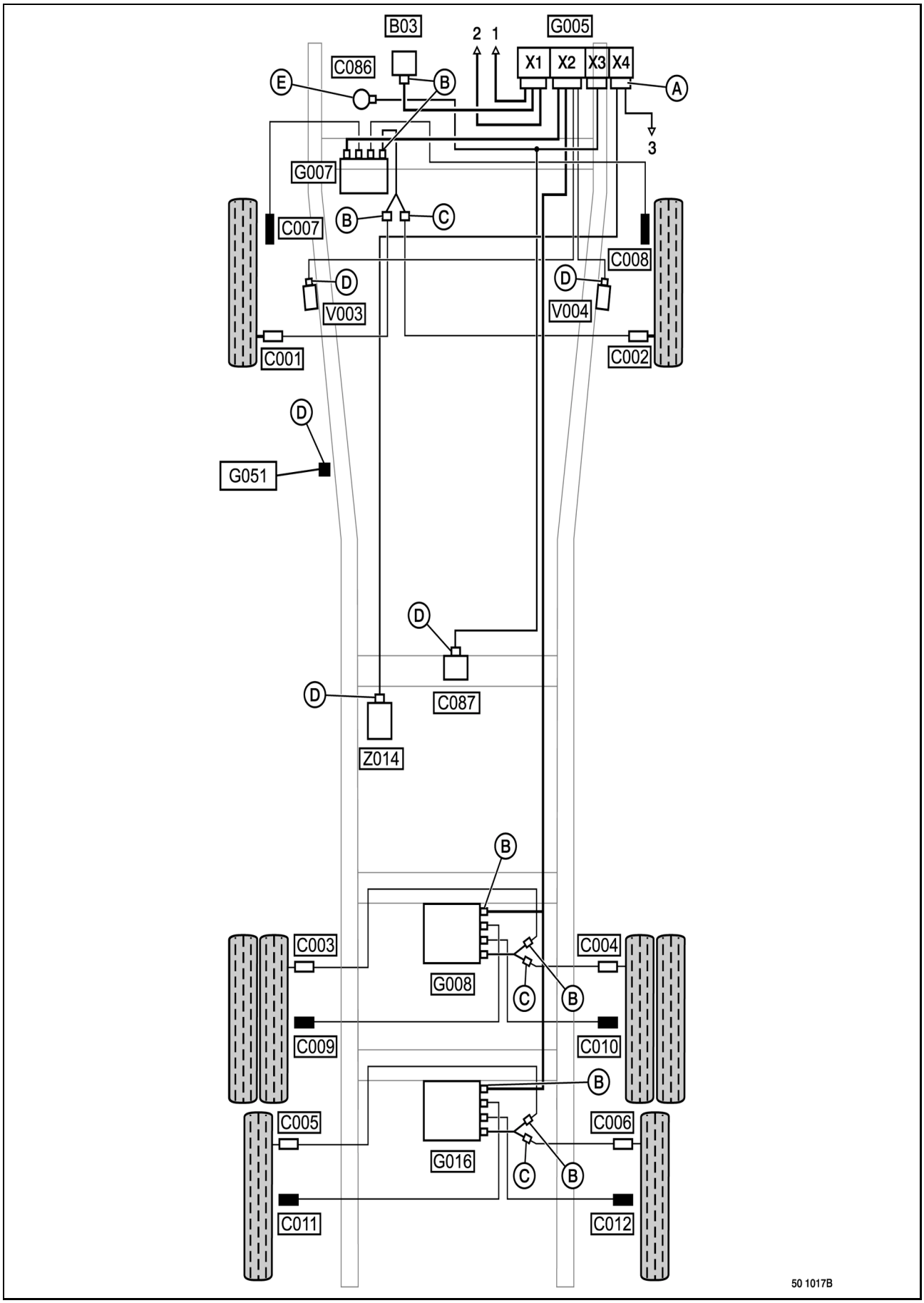



B03
2 1
G005
X1 X2 X3 X4
C086
E
B
A
3
G007
C007
B
C
C008
D
V003
D
V004
C001
C002
D
G051
D
C087
D
Z014
B
C003
C004
G008
C
B
C009
C010
50 0952D

Electrical diagram

Location of appliances
6x2 vehicle.




B03
2 1
G005
X1 X2 X3 X4
C086
E
B
A
3
G007
C007
B
C
C008
D
V003
D
V004
C001
C002
D
G051
D
C087
D
Z014
B
C003
G008
C004
C
B
C009
C010
B
C005
C006
G016
C
B
C011
C012
50 1017B

Key

Key to appliances

B03	Footbrake control modulator unit
C001	LH front wheel brake linings wear sensor
C002	RH front wheel brake linings wear sensor
C003	LH rear wheel brake linings wear sensor
C004	RH rear wheel brake linings wear sensor
C005	Lift-up axle or second rear axle LH wheel brake linings wear sensor
C006	Lift-up axle or second rear axle RH wheel brake linings wear sensor
C007	LH front wheel speed sensor
C008	RH front wheel speed sensor
C009	LH rear wheel speed sensor
C010	RH rear wheel speed sensor
C011	Lift-up axle or second rear axle LH wheel speed sensor
C012	Lift-up axle or second rear axle RH wheel speed sensor
C086	Steering lockover angle sensor
C087	Chassis lateral acceleration sensor
G005	EBS braking management ECU
G007	Front axle braking assistance modulator unit
G008	Drive axle braking assistance modulator unit
G016	Second rear axle braking assistance modulator unit
G051	Air production management ECU
V003	LH roadwheel ABS electrovalve
V004	RH roadwheel ABS electrovalve
Z014	Trailer brake control EBS brake modulator unit

Key to cross-references
1 – To VECU (vehicle CAN).
2 – To junction box.
3 – To trailer EBS socket (trailer CAN).

Connecting arrangement type
The EBS system wiring harnesses feature several types of connector:

(A) - **AMP / JPT** connector
On EBS ECU
- **17** ways (black).
- **18** ways (grey).
- **15** ways (purple).
- **12** ways (green).

(B) - **Deutsch** connector
On brake modulators.
- **2** ways (speed sensors harnesses).
- **4** ways (ECU connecting harnesses).
- **6** ways (wear sensor harnesses).

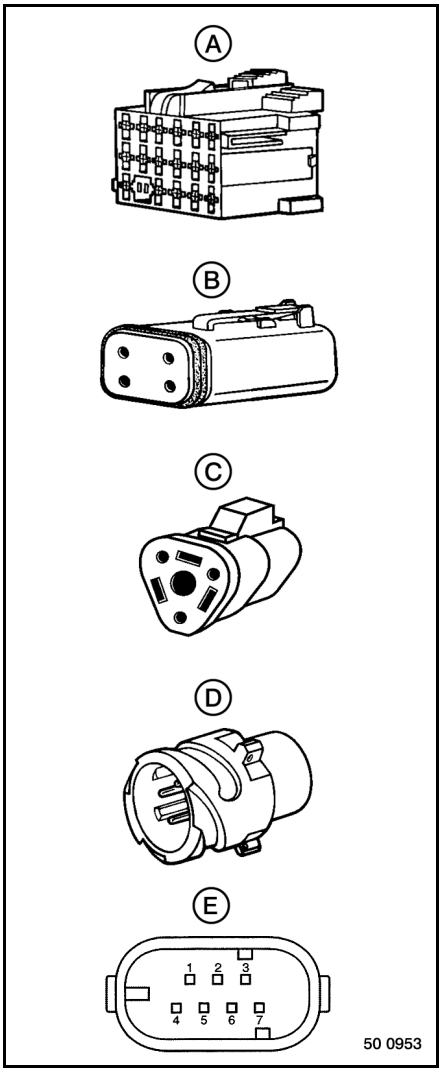
(B) - **Deutsch** connector
- **6** ways on the brake valve.

(B) - **Deutsch** connector
- **4** ways on the LH wear sensors.

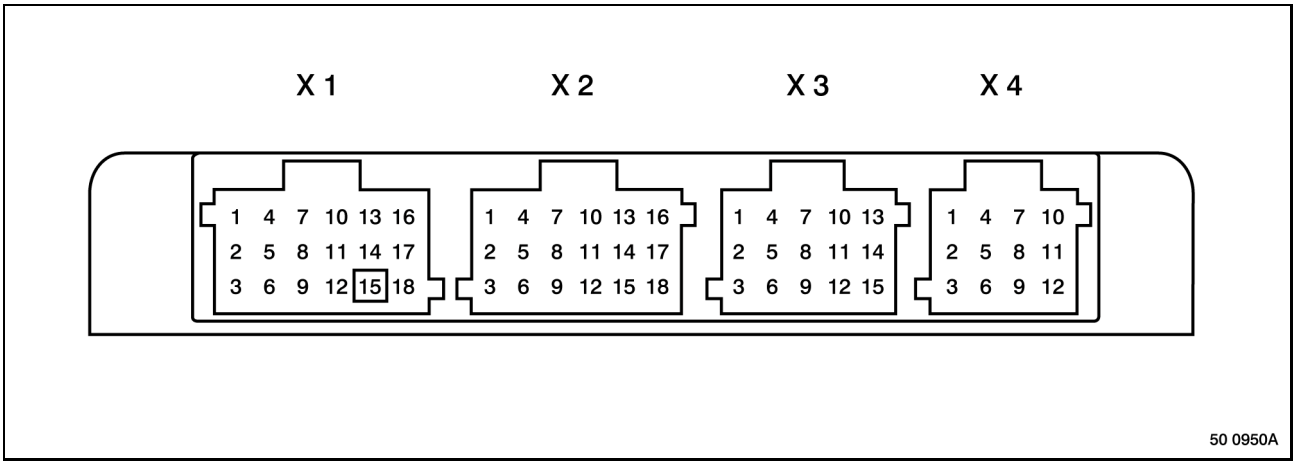
(C) - **Deutsch** connector
- **3** ways on the RH wear sensors.

(D) - **AMP / DIN** connector
- **3** ways on the front wheels ABS electrovalves.
- **4** ways on the lateral acceleration sensor.
- **7** ways on the trailer control brake modulator.
- **7** ways on the air production management **(APM)** unit.

(E) - **Bosch** connector
- **7** ways on the lockover angle sensor.



Electrical connection to EBS ECU



Numbers in brackets correspond to **wire polarity numbers**.

Connector X1.

1° Communication bus J1939-1 (- signal) **(0013)**.
2° Not used.
3° Communication bus J1939-1 (+ signal) **(0012)**.
4° Brake valve EBS ECU earth **(072)**.
5° Brake pedal position sensor (EBS) signal **(039)**.
6° Brake pedal position sensor (EBS) information **(5077)**.
7° Brake pedal position sensor (EBS) power supply (+5V) **(056)**.
8° Brake pedal position sensor (EBS) signal **(040)**.
9° Not used.
10° Front wheels diff. lock electrovalve control **(8128)**.
11° Chassis earth **(1)**.
12° Chassis earth **(1)**.
13° ABS and EBS positive (+) power supply after ignition **(2025)**.
14° Rear wheels diff. lock electrovalve control **(8129)**.
15° Negative **(-)** disconnection detection.
16° Power supply after master switch (EBS ECU) **(2309)**.
17° Power supply after master switch (EBS ECU) **(2309)**.
18° Not used.

Connector X2.

1° First additional module (EBS) power supply (+24V) **(5083)**.
2° Communication bus between EBS ECU and first additional module (+ signal) **(0149)**.
3° Communication bus between EBS ECU and first additional module (- signal) **(0150)**.
4° Rear module (EBS) power supply (+24V) **(5081)**.
5° Communication between EBS ECU and rear double module (+ signal) **(066)**.
6° Communication between EBS ECU and rear double module (- signal) **(064)**.
7° Front module (EBS) power supply (+24V) **(5079)**.
8° Communication between EBS ECU and front double module (+ signal) **(0148)**.
9° Communication between EBS ECU and front double module (- signal) **(0147)**.
10° ABS system LH front air exhaust solenoid valve control **(540)**.
11° Not used.
12° Rear module (EBS) earth **(5082)**.
13° ABS system LH front air intake solenoid valve control **(539)**.
14° ABS system RH front air exhaust solenoid valve control **(557)**.
15° Front module (EBS) earth **(5080)**.
16° ABS system RH front air intake solenoid valve control **(556)**.
17° Not used.
18° EBS solenoid valve earth **(1012)**.

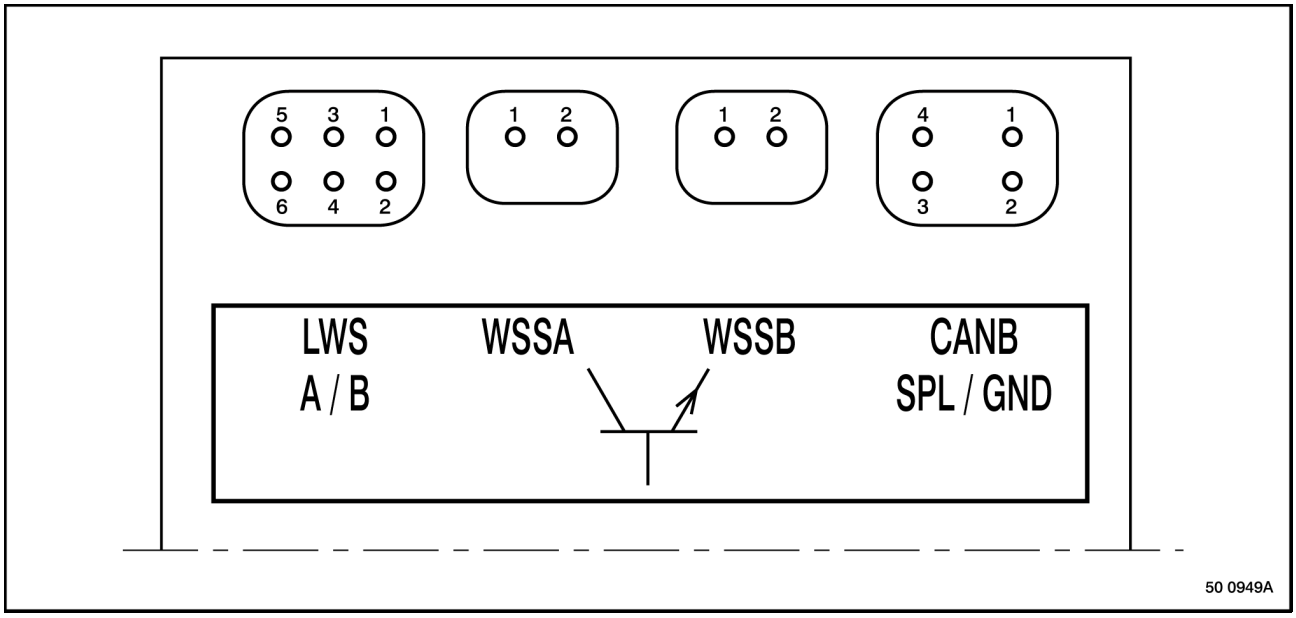
Connector X3.

1° EBS sensor earth (ESP) **(1124)**.
2° Not used.
3° Communication bus J1587-1 (- signal) **(0011)**.
4° Communication bus between EBS ECU and acceleration sensor module (- signal) **(0416)**.
5° Not used.
6° Communication bus J1587-1 (+ signal) **(0010)**.
7° Communication bus between EBS ECU and acceleration sensor module (+ signal) **(0415)**.
8° Not used.
9° ASR switch **(846)**.
10° Acceleration sensor module (VDC) power supply **(5048)**.
11° Not used.
12° Not used.
13° Brake holding authorization control **(5086)**.
14° Brake holding authorization information **(5085)**.
15° Not used.

Connector X4.

1° EBS trailer control module pressure sensor power supply **(0376)**.
2° EBS trailer control module pressure sensor signal **(0377)**.
3° EBS trailer control module pressure sensor earth **(0380)**.
4° Trailer EBS module power supply (+24V) **(5050)**.
5° EBS-TCM air intake electrovalve control **(5091)**.
6° EBS-TCM air exhaust electrovalve control **(5092)**.
7° EBS-TCM load electrovalve power supply **(5093)**.
8° Communication bus for EBS trailer socket (line H) **(0045)**.
9° Communication bus for EBS trailer socket (line H) **(0046)**.
10° Trailer brake (EBS) information **(5089)**.
11° Not used.
12° Not used.

Electrical connection to front axle brake' modulator



Numbers in brackets correspond to **wire polarity numbers**.

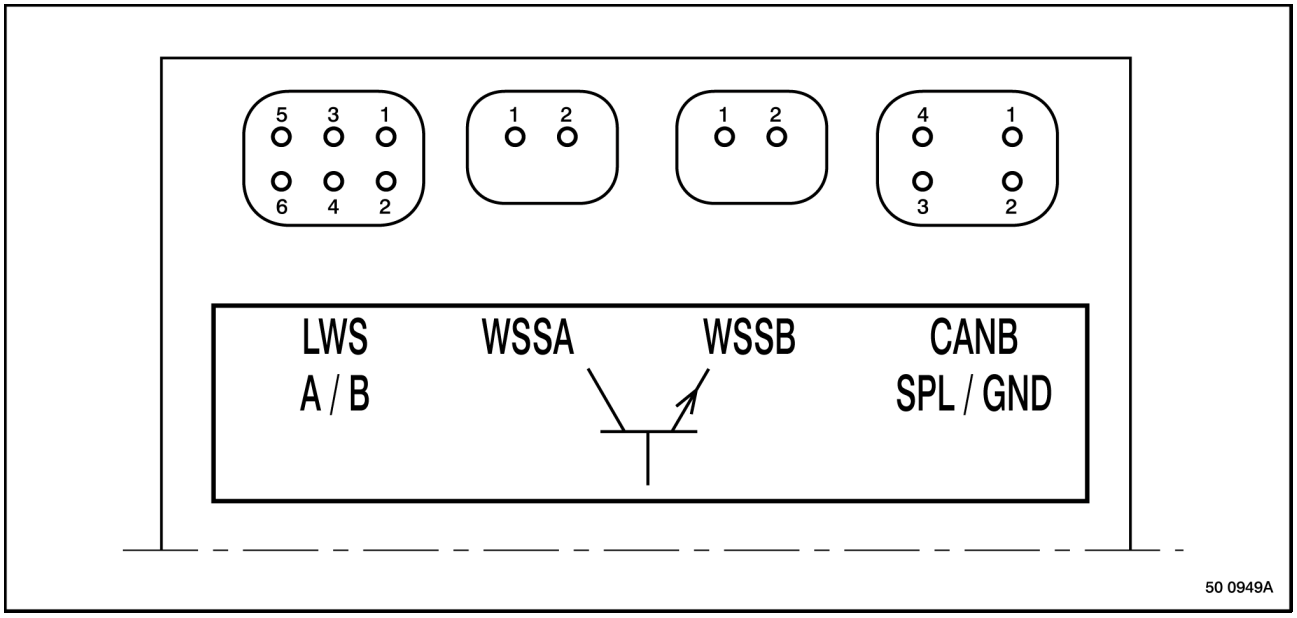
Connector LWS A/B.
1° LH front brake pads wear analogue sensor earth **(0160)**.
2° LH front brake pads wear analogue sensor signal **(0161)**.
3° LH front brake pads wear analogue sensor power supply (+5V) **(0162)**.
4° RH front brake pads wear analogue sensor earth **(0107)**.
5° RH front brake pads wear analogue sensor signal **(0108)**.
6° RH front brake pads wear analogue sensor power supply (+5V) **(0109)**.

Connector WSSA.
1° RH front speed sensor signal (- signal) **(-)**
2° RH front speed sensor signal (+ signal) **(-)**.

Connector WSSB.
1° LH front speed sensor signal (- signal) **(-)**.
2° LH front speed sensor signal (+ signal) **(-)**.

Connector CANB - SPL/GND.
1° Front module (EBS) earth **(5080)**.
2° Front module (EBS) power supply (+24V) **(5079)**.
3° Communication bus between EBS ECU and front module (+ signal) **(0148)**.
4° Communication bus between EBS ECU and front module (- signal) **(0147)**.

Electrical connection to rear drive axle brake modulator



Numbers in brackets correspond to **wire polarity numbers**.

Connector LWS A/B.
1° 1st axle LH rear brake pads wear analogue sensor earth **(0166)**.
2° 1st axle LH rear brake pads wear analogue sensor signal **(0167)**.
3° 1st axle LH rear brake pads wear analogue sensor power supply (+5V) **(0168)**.
4° 1st axle RH rear brake pads wear analogue sensor earth **(0163)**.
5° 1st axle RH rear brake pads wear analogue sensor signal **(0164)**.
6° 1st axle RH rear brake pads wear analogue sensor power supply (+5V) **(0165)**.

Connector WSSA.
1° RH rear speed sensor signal (- signal) **(-)**.
2° RH rear speed sensor signal (+ signal) **(-)**.

Connector WSSB.
1° LH rear speed sensor signal (- signal) **(-)**.
2° LH rear speed sensor signal (+ signal) **(-)**.

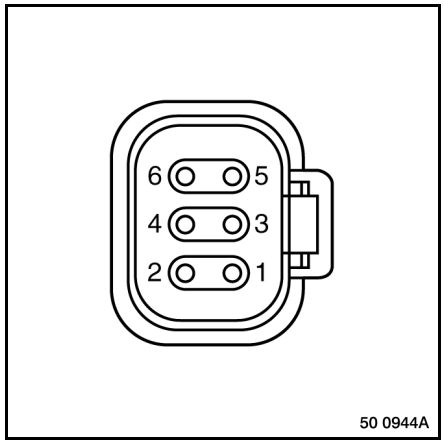
Connector CANB - SPL/GND.
1° Rear module (EBS) earth **(5082)**.
2° Rear module (EBS) power supply (+24V) **(5081)**.
3° Communication bus between EBS ECU and rear double module (+ signal) **(066)**.
4° Communication bus between EBS ECU and rear double module (- signal) **(064)**.

Electrical connection to other appliances

Numbers in brackets correspond to **wire polarity numbers**.

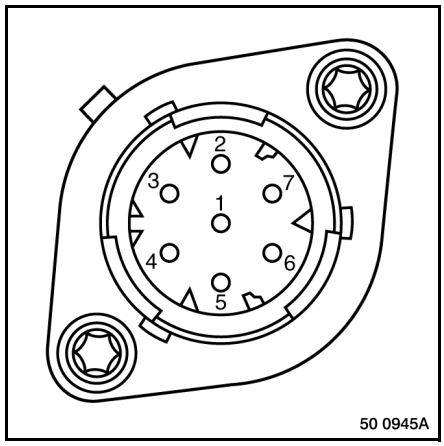
Brake valve

1° Brake valve EBS ECU earth **(072)**.
2° Brake pedal position sensor (EBS) power supply (+5V) **(056)**.
3° Not used.
4° Brake pedal position sensor (EBS) signal **(039)**.
5° Brake pedal position sensor (EBS) signal **(040)**.
6° Brake pedal position sensor (EBS) information **(5077)**.



Trailer control valve

1° EBS-TCM air intake electrovalve control **(5091)**.
2° Trailer EBS module power supply (+24V) **(5050)**.
3° EBS-TCM load electrovalve power supply **(5093)**.
4° EBS trailer control module pressure sensor power supply **(0376)**.
5° EBS trailer control module pressure sensor earth **(0380)**.
6° EBS trailer control module pressure sensor signal **(0377)**.
7° EBS-TCM air exhaust electrovalve control **(5092)**.



Air production management (APM) unit

1° Positive (+) power supply after ignition **(24)**.
2° Communication bus J1587-1 (+ signal) **(0010)**.
3° Positive (+) power supply after master switch **(2230)**.
4° Chassis earth **(1)**.
5° Communication bus J1939-1 (+ signal) **(0012)**.
6° Communication bus J1939-1 (- signal) **(0013)**.
7° Communication bus J1587-1 (- signal) **(0011)**.

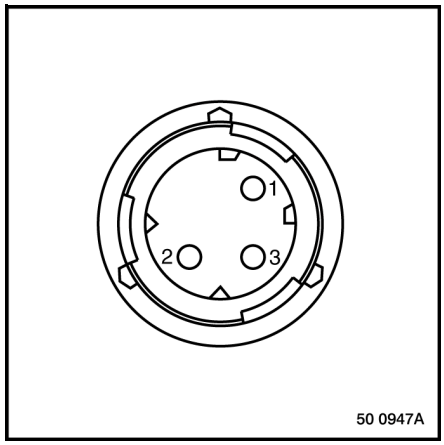
ABS electrovalve

LH roadwheel

1° ABS system LH front air exhaust solenoid valve control **(540)**.
2° EBS solenoid valve earth **(1012)**.
3° ABS system LH front air intake solenoid valve control **(539)**.

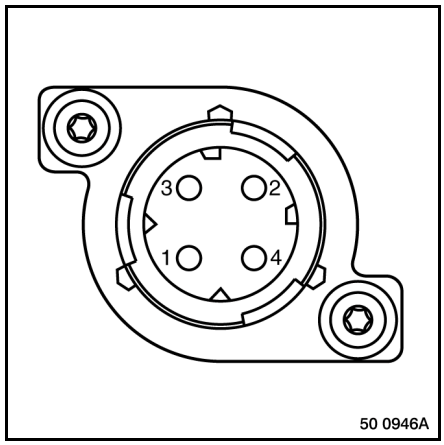
RH roadwheel

1° ABS system RH front air exhaust solenoid valve control **(557)**.
2° EBS solenoid valve earth **(1012)**.
3° ABS system RH front air intake solenoid valve control **(556)**.



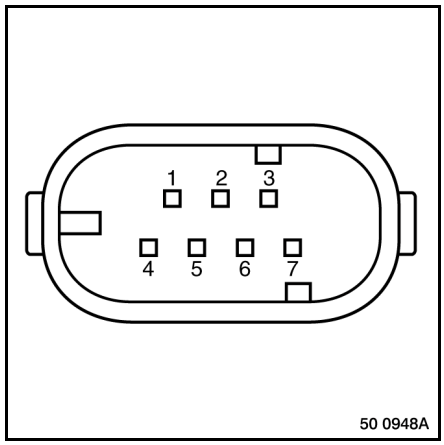
Lateral acceleration sensor

1° Acceleration sensor module (VDC) power supply) **(5048)**.
2° EBS sensor earth (ESP) **(1124)**.
3° Communication bus between EBS ECU and acceleration sensor module (+ signal) **(0415)**.
4° Communication bus between EBS ECU and acceleration sensor module (- signal) **(0416)**.

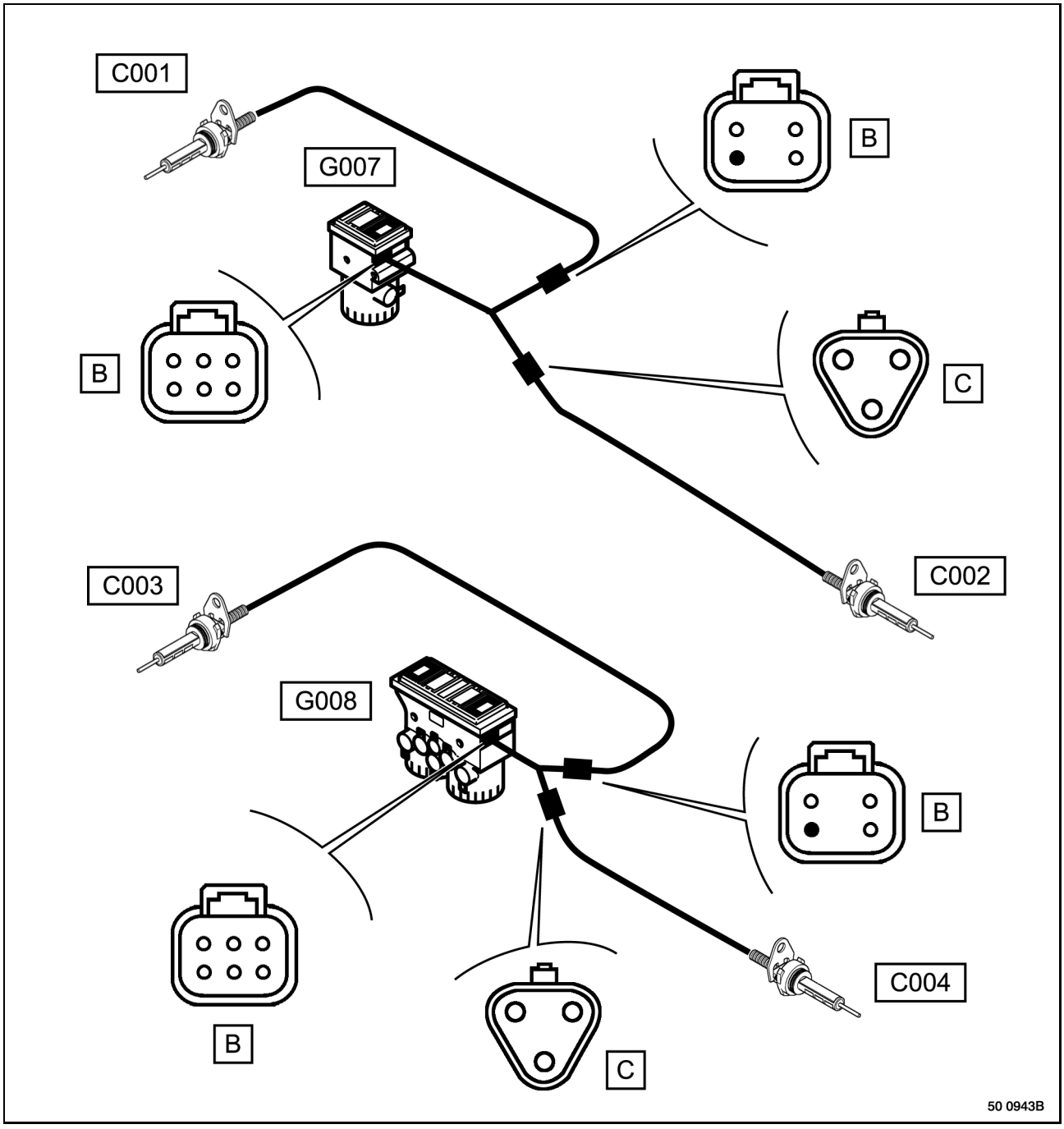


Lockover angle sensor

1° EBS sensor earth (ESP) **(1124)**.
2° Acceleration sensor module (VDC) power supply **(5048)**.
3° Communication bus between EBS ECU and acceleration sensor module (+ signal) **(0415)**.
4° Communication bus between EBS ECU and acceleration sensor module (- signal) **(0416)**.
5° Not used
6° Not used
7° Not used



Wear sensors wiring



C001	LH front wheel brake linings wear sensor
C002	RH front wheel brake linings wear sensor
C003	LH rear wheel brake linings wear sensor
C004	RH rear wheel brake linings wear sensor
G007	Front axle braking assistance modulator unit
G008	Drive axle braking assistance modulator unit