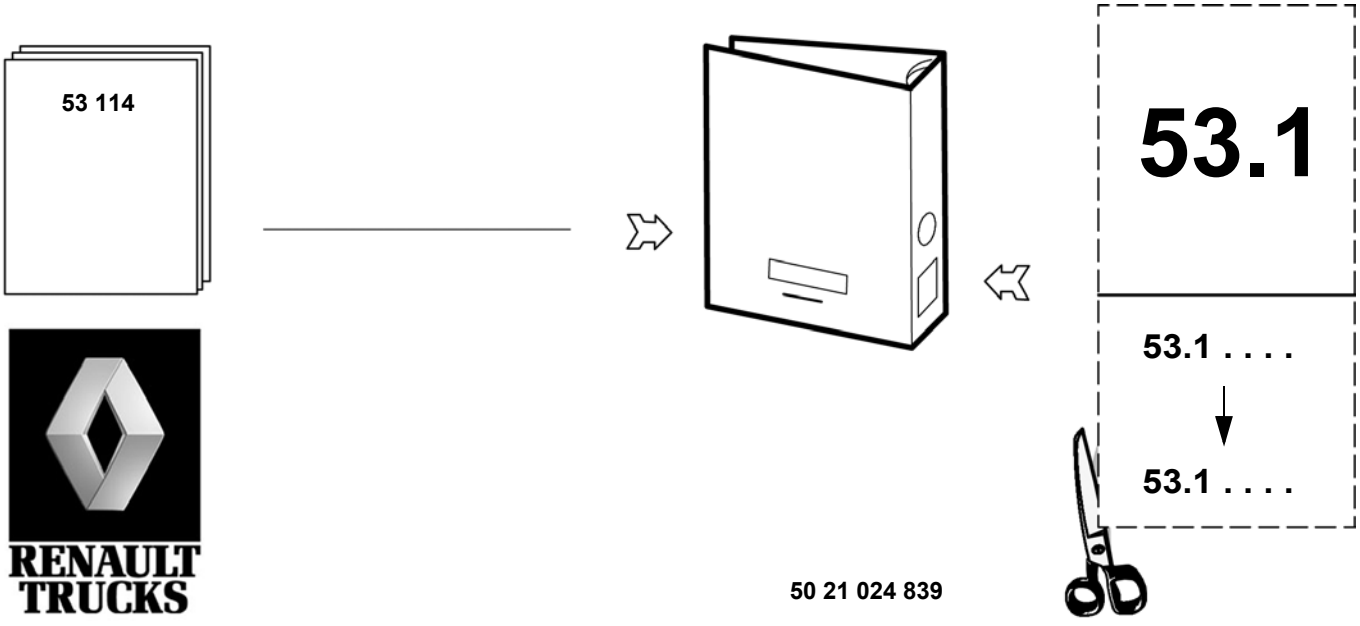
53 114 - GB - 09/2005

EBS BRAKING SYSTEM

RANGE	FAMILY	VARIANT
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	-
	27JC - TR 6X2 Pusher	
	27RC - PR 6x2	
	27SC - PR 4x2	
	27TC - TR 4x2	

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

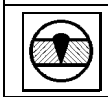
Fitting

	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

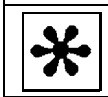
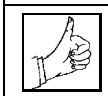
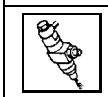
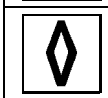
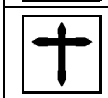
Repair

	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 deceleration demand, 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-11.

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 controls 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-11.

"Roller bench" mode

This mode serves to be able to test a vehicle equipped with EBS on a power roller bench without the ASR feature being activated and thus without limiting the engine power.
This mode is activated as follows, with the vehicle already on the roller bench:

Vehicle with **ASR** switch:
- 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.

Vehicle without **ASR** switch:
- Follow the instructions in the information display menu.
- 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;
- or by following the instructions in the information display menu.

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-11.

Hill-start assist control
The EBS maintains the maximum pressure that has served to stop the vehicle.
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 **30** km/h has not been exceeded.

For manual gearboxes, the pressure is maintained as long as:
– the clutch pedal is depressed;
– a moving off phase has not been detected.

For robotized or automatic gearboxes, the pressure is maintained as long as:
– the clutch pedal is depressed;
– a moving off phase has not been detected.
When the function enters into action, it is signalled by the information display pictogram **(G20)**.
See page(s) A-11.

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 **(G75)** appears during the detection phase.
Pictogram **(G75)** is illuminated for **3** seconds when the ignition is switched on.
See page(s) A-11.

Anti-tipover
The EBS applies this function to deal with risks of road rig tipover.
Pictogram **(G76)** appears during the detection phase.
See page(s) A-11.
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 **(G15)** together with the yellow "SERVICE" warning light are illuminated.
See page(s) A-11.

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 defined temperature threshold.
Warning pictogram **(G17)** appears when the alert threshold is crossed.
See page(s) A-11.

Testing of the brakes
An alert is given when the EBS detects a faulty brake (mechanical component).
The EBS minor alert pictogram **(G15)** together with the yellow "SERVICE" warning light are illuminated.
See page(s) A-11.

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 serves to be able to test a vehicle equipped with EBS on a power roller bench without the ASR feature being activated and thus without limiting the engine power.
This mode is activated as follows, with the vehicle already on the roller bench:
Vehicle with **ASR** switch:
- 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.

Vehicle without **ASR** switch:
- Follow the instructions in the information display menu.
- 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;
- or by following the instructions in the information display menu.

For electrical diagrams, see **"Electrics"** workshop manual for the vehicle concerned.

*To check the different air pressures, use test case **2423** and flexible pipe **7096**.*

To unclip the pipes, use only one of the dismantling tools 2467 in relation to the diameter of the tube.
To replace a union, use test case 2464 or 2599, or box 5132.

To unclip the flexible brake pipes, use only tool 2901.

Parameter programming – Calibration

The programming of parameters allows the ECU to memorize the data defined for correct operation of the EBS system.

This operation must be carried out, without fail, after:
- replacement of the EBS ECU;
- upon modification to the make-up of the vehicle (retarder, final drive...).

The ESP sensors are calibrated to customize the sensors to the vehicle under consideration in order to ensure correct operation of the electronic stability program.

The flywheel angle sensor must be calibrated without fail:
- if the sensor has been replaced, or subsequent to any work on its attachment or on the steering kinematic chain (from steering column to roadwheel). This consists of a static procedure followed by a dynamic procedure.

The chassis acceleration sensor must be calibrated without fail:
- if the sensor has been replaced, or subsequent to any work on its attachment according to a static procedure.

If the EBS ECU has been replaced, these **2** sensors must be calibrated without fail.

To carry out these operations, it is essential to use the RENAULT TRUCKS test tool

Key to warning pictograms

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

G13

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

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

G14

- 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.

G15

- 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.

G16 - Brake pads wear warning pictogram

G17 - Brakes high temperature warning pictogram

G18 - Low air pressure warning pictogram

G19 - Parking brake not applied upon opening of driver's door warning pictogram

G20 - Hill-start assist warning pictogram

G25 - Driver's presence warning pictogram: brake or accelerator pedal depressed

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

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

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

G74 - ESP calibration mode warning pictogram

G75 - Information pictogram: vehicle equipped with ESP system.

G76 - Anti-tipover device in service warning pictogram

G77 - ASR in service warning pictogram

SPECIFICATIONS

APPLICABILITY

Tightening torques

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Definitions				27/02/2003	B1-6
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Standard nut and bolt tightening torques table				06/06/2003	B1-7
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Tightening of unions				24/05/2002	B1-8
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Tightening the wheel nuts				04/05/2004	B1-9
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						

Technical data

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Air compressor				04/11/2004	B2-1
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Compressor pipes				05/04/2005	B2-3
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Air production management unit (APM)				14/02/2005	B2-6
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Air tanks				28/02/2005	B2-9
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Footbrake control valve				04/11/2004	B2-10
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Brake modulator				05/11/2004	B2-11
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	ABS electrovalve				04/11/2004	B2-14
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Speed sensors				05/11/2004	B2-15
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Brake chamber, cylinder				04/11/2004	B2-16
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Trailer control valve				04/11/2004	B2-18
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Parking brake valve				04/11/2004	B2-20
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Single relay valve				04/11/2004	B2-21
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Piloted reduction valve				04/02/2005	B2-22
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Double check valve				04/02/2005	B2-23
	27SC - PR 4x2						
	27TC - TR 4x2						

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.

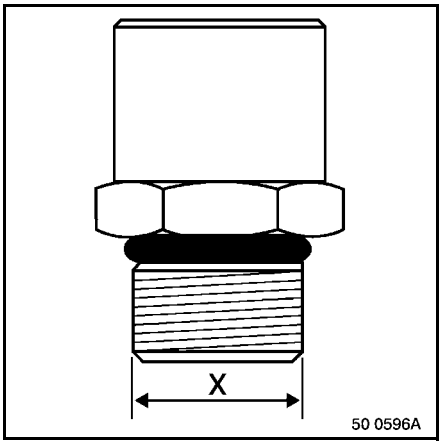
Standard nut and bolt tightening torques table

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

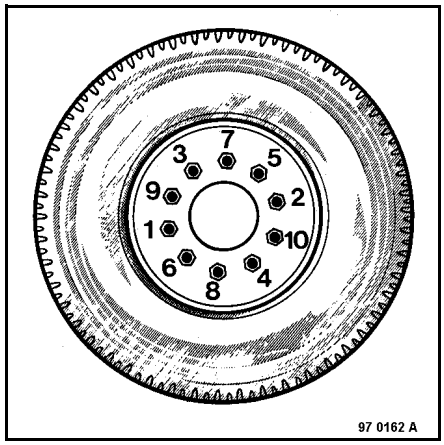
dia. X	Tightening torque
1/8 gas	**9 ± 1 Nm**
M 10x100	**9 ± 1 Nm**
M 12x150	**15 ± 3 Nm**
M 14x150	**15 ± 3 Nm**
M 16x150	**25 ± 5 Nm**
M 22x150	**25 ± 5 Nm**



Tightening the wheel nuts

Tightening sequence

– Disc wheels



Steel wheels

Wheel nuts tightening torque:
200$^{\pm 8}$ Nm.+ **90**$^{\pm 10}$°

Light alloy wheels

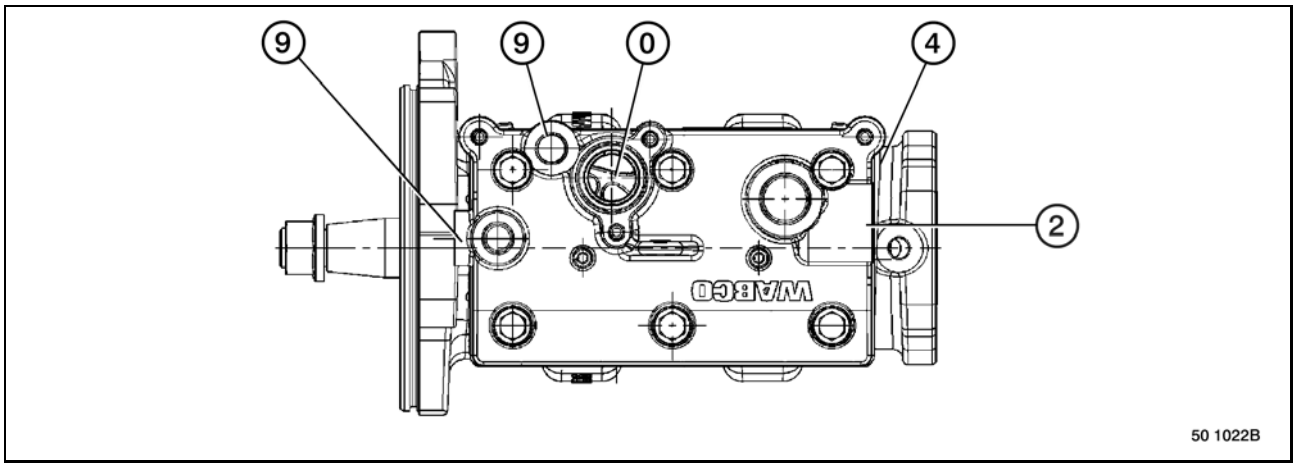
Wheel nuts tightening torque:
200$^{\pm 8}$ Nm. + **90**$^{\pm 10}$°.
Wheel nuts tightening torque: at least **670** Nm.

CHECK THE TIGHTNESS OF THE WHEEL NUTS AFTER FITTING A NEW WHEEL OR AFTER A WHEEL CHANGE: AFTER 20 TO 30 KM, THEN BETWEEN 150 AND 250 KM.
CHECK THE TIGHTNESS OF THE WHEEL NUTS EVERY 6 MONTHS WHETHER THE WHEEL HAVE BEEN REMOVED OR NOT.
DURING THE CHECK, IF JUST ONE WHEEL NUT HAS NOT BEEN TIGHTENED TO THE MINIMUM TORQUE OF 670 NM, LOOSEN ALL THE WHEEL NUTS AND RETIGHTEN TO THE RECOMMENDED TORQUE AND ANGLE.
FAILURE TO CARRY OUT THESE ELEMENTARY PRECAUTIONS MAY RESULT IN LOOSENING OF THE WHEEL NUTS AND LEAD TO SERIOUS CONSEQUENCES.

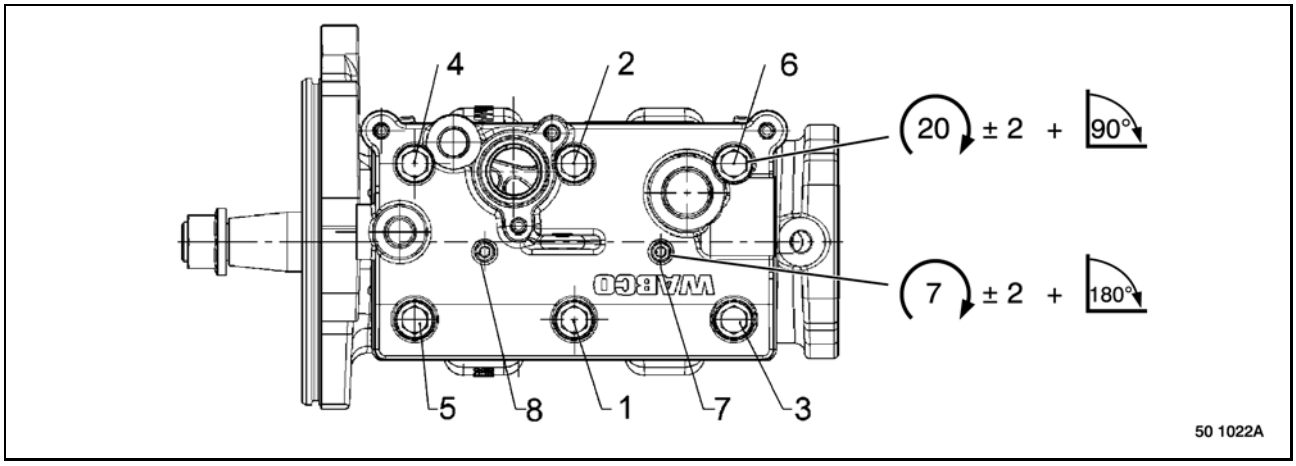
Technical data

Air compressor

Twin-cylinder compressor

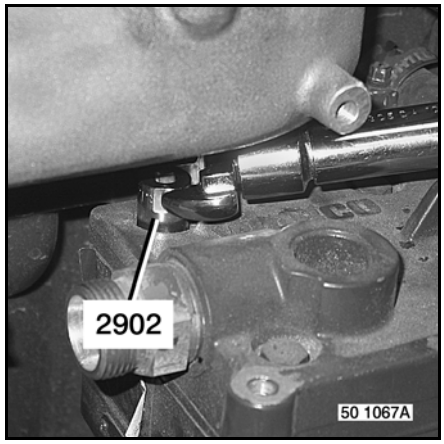


Coding system for appliance ports
0 - Air supply
2 - Compressed air outlet
4 - Air compressor pilot-control
9 - Cooling circuit
The item numbers indicate the tightening sequence.



Driving pinion tightening torque **290 Nm**.

Dismantling of the compressor cylinder head
To dismantle the compressor cylinder head without having to remove the unit, use tool **2902**.



Technical data

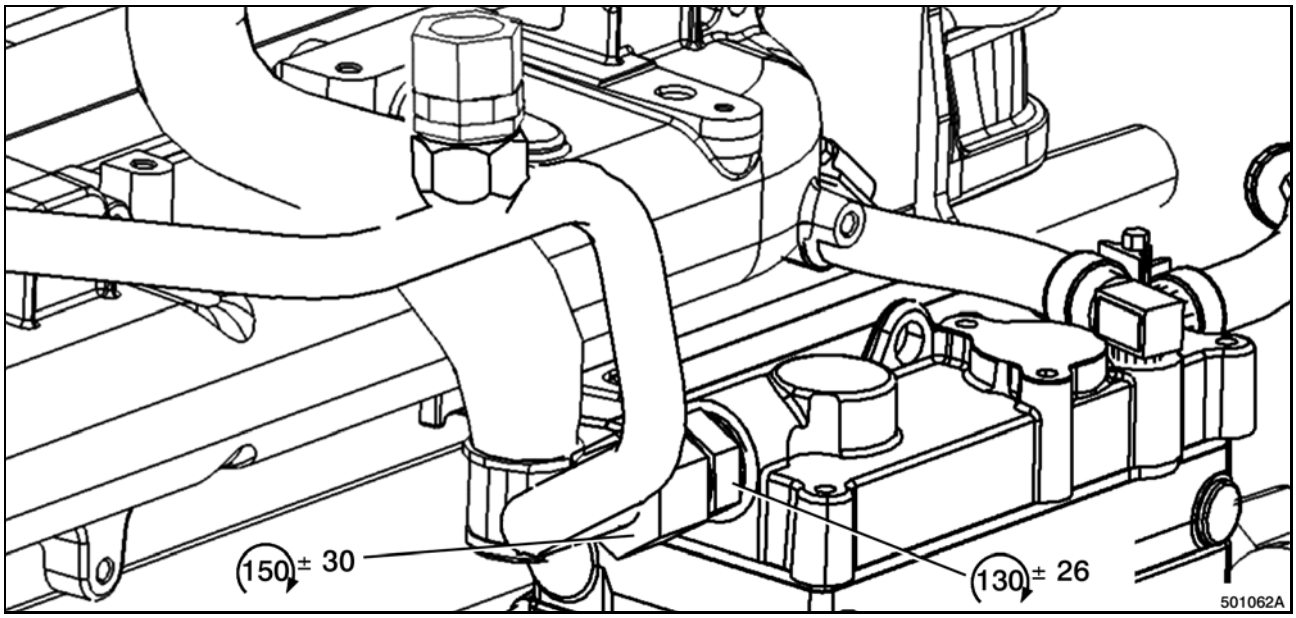
Wabco reference N°	**912 512 002 0**
Renault Trucks reference N°	**7420524352**
Displacement	**636 cm3**
Port screw-threads **0 – 2**	**M 26x1.5**
Port screw-threads **4 – 9**	**M 16x1.5**

*This compressor features an energy saving function **(power reduction)**.*
*This is a load-shedding feature that cuts the supply of air from the compressor to the compressed air system when the preset pressure is reached in the air production management unit **(APM)**.*
When the pressure in the compressed air circuits has fallen to the preset cut-in pressure, the compressor begins to fill the compressed air system again.

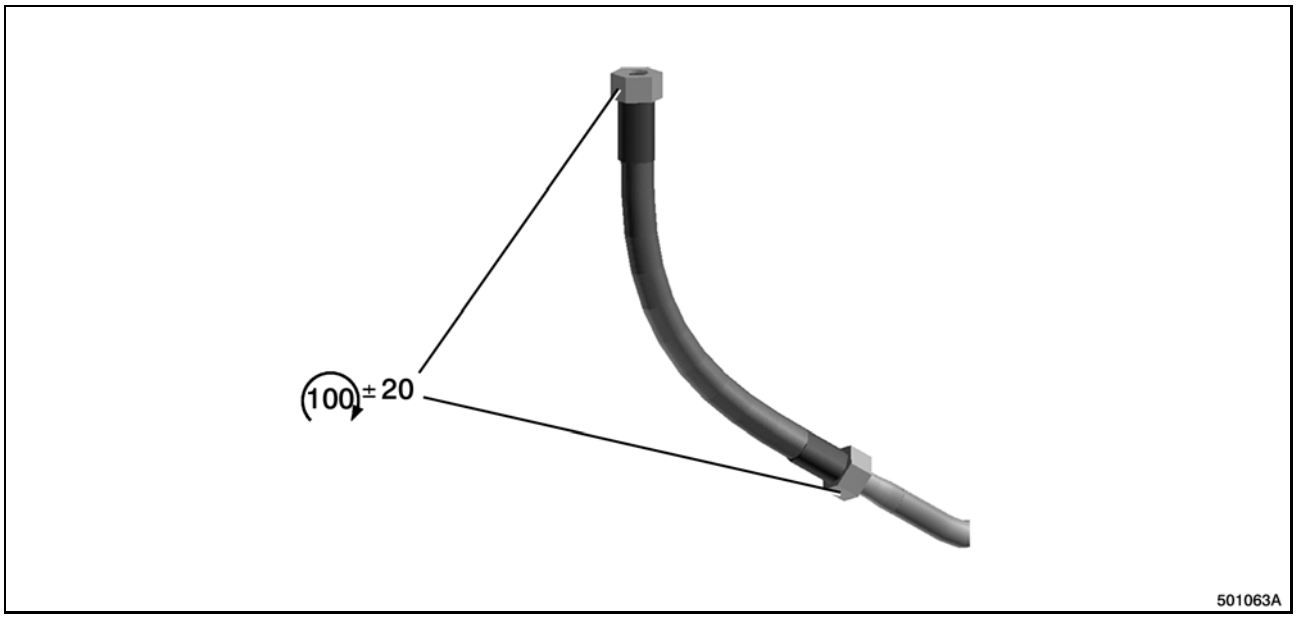
Compressor pipes

Apply oil to the bush before tightening to torque.

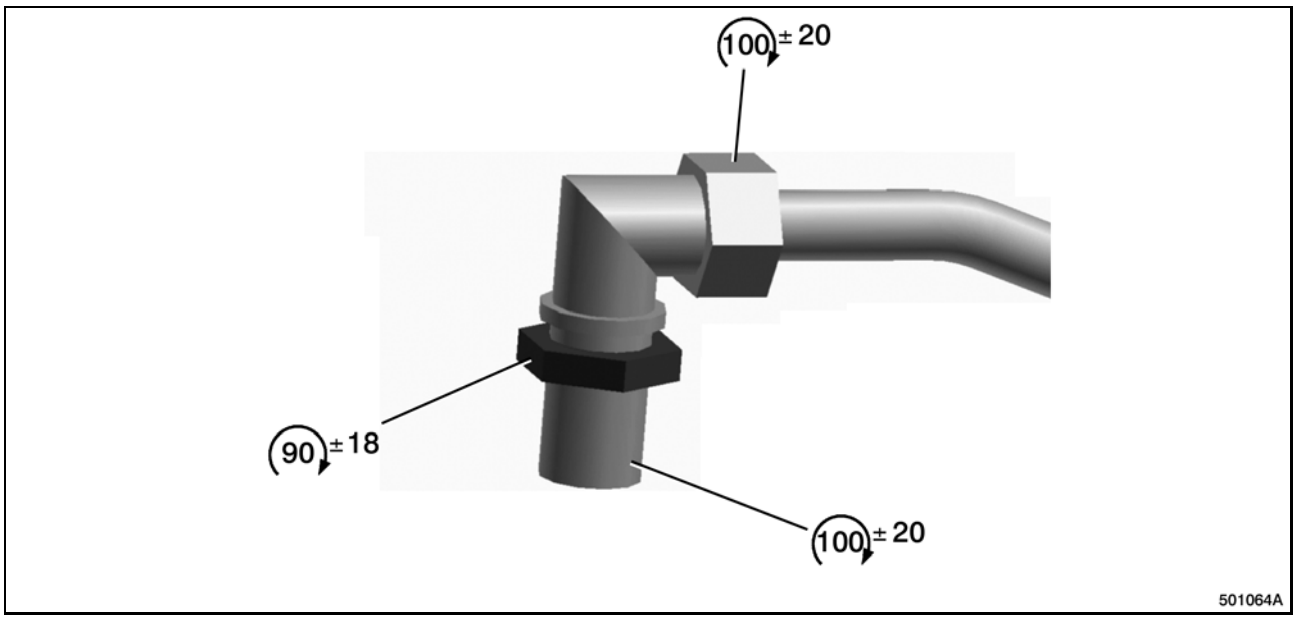
Compressor tightening torque(s)



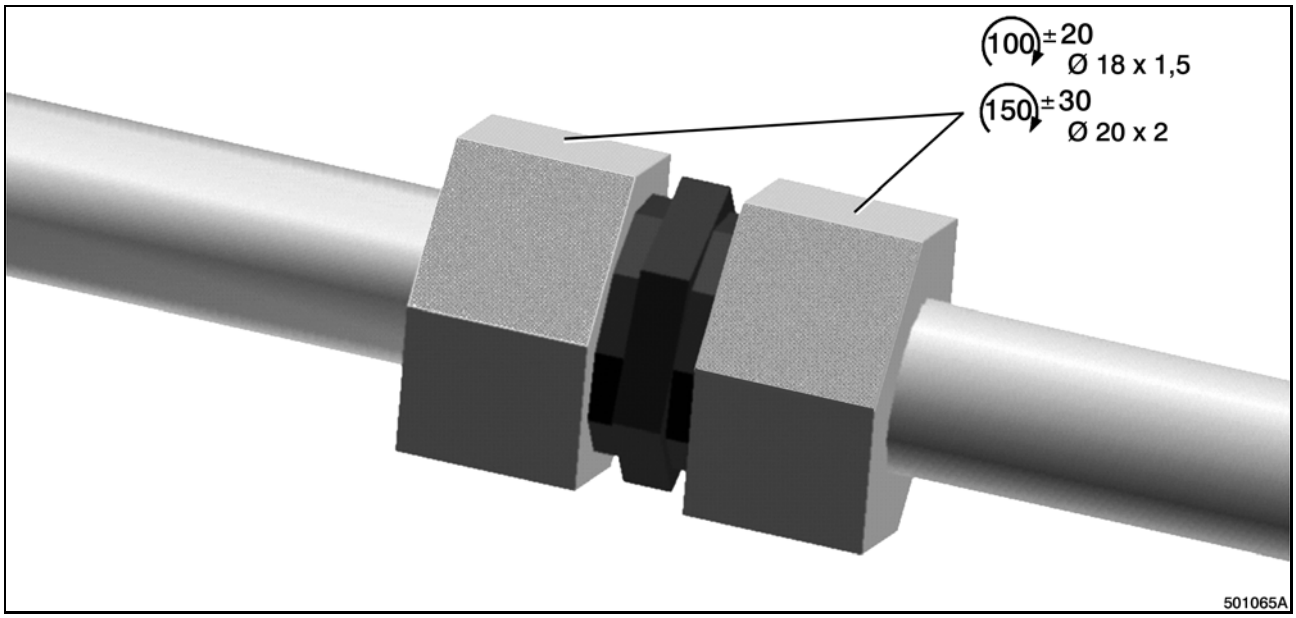
Flexible pipe tightening torque(s)



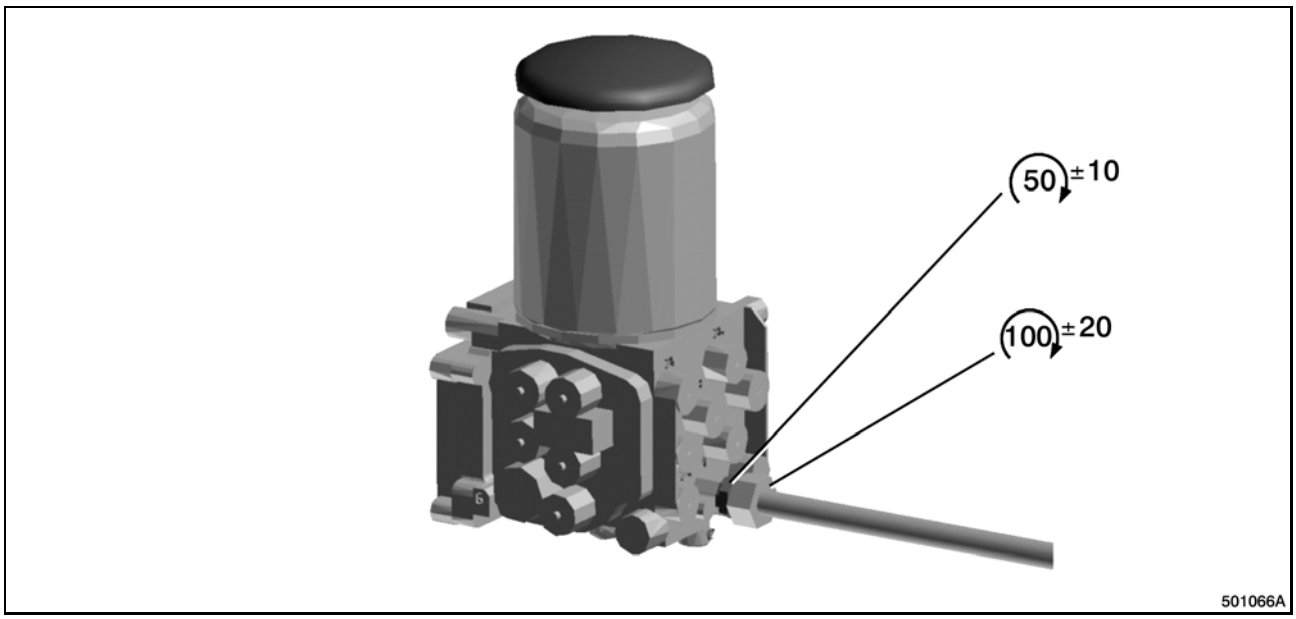
Bulkhead grommet tightening torque(s)



"Union" couplings tightening torque(s)



Air production management unit (APM) tightening torque(s)



Tightening torques are given in **Nm**.
For other tightening torques, see page(s) B-1-7.

Air production management unit (APM)

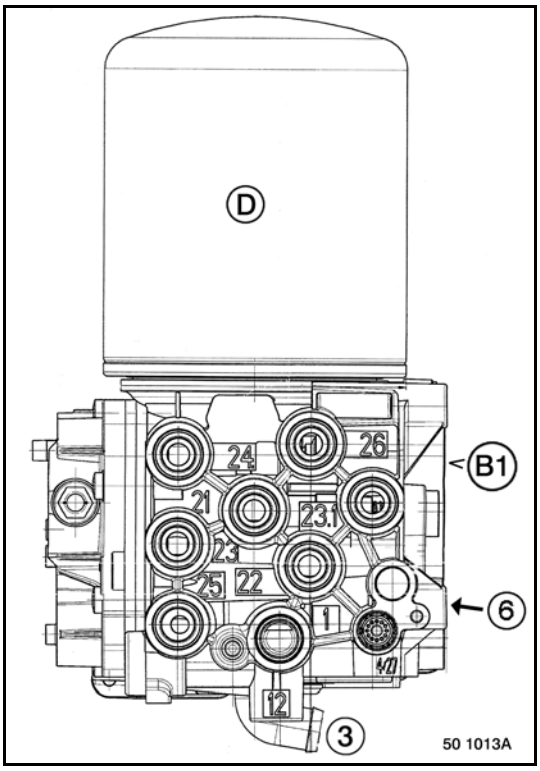
This unit cannot be dismantled and cannot be adjusted.
For all diagnostic checks, use the RENAULT TRUCKS test tool.

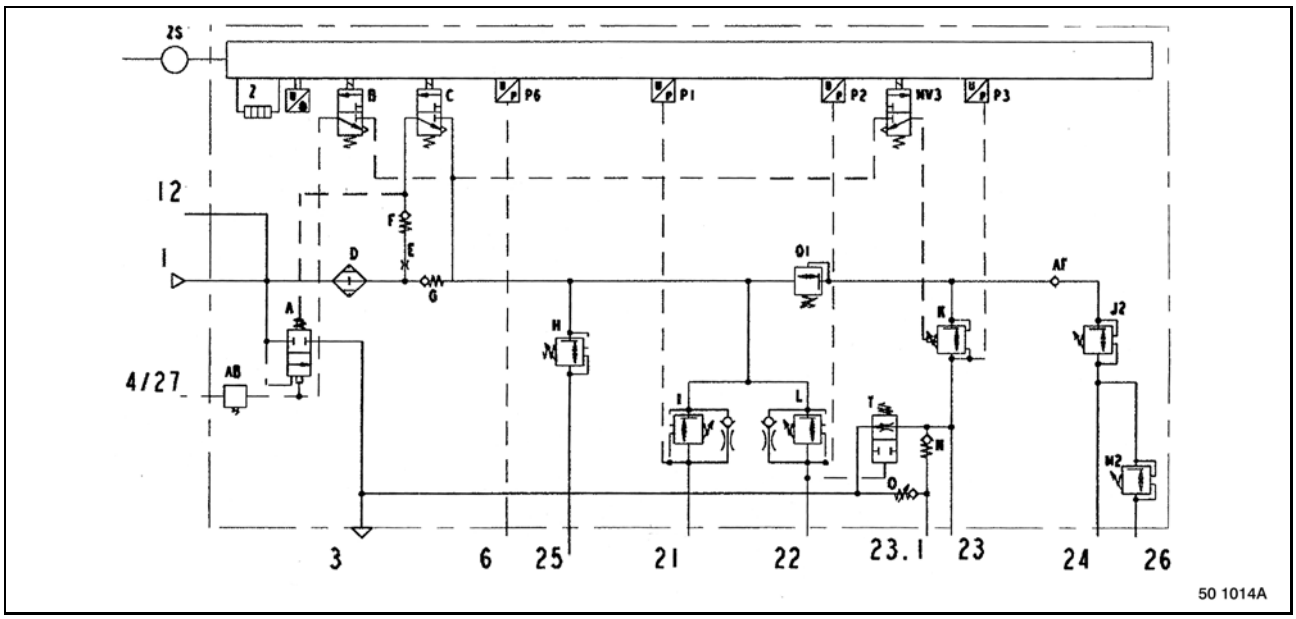
The air dryer cartridge bolt has a left-hand screw-thread.

It is forbidden to dismantle the unit.

Description
D - Air dryer cartridge
B1 - Air production management unit body

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 **100 W**
ZS - connector

Technical data

Knorr-Bremse reference N°	**Z002897**
Renault Trucks reference N°	**5010457873**
Governing pressure in normal mode	**$12.5^{\pm 0.3}$bars**
Cut-in pressure in fall-back (back-up) mode	**$9.5^{+3.5}$bars**
Cut-out pressure	**11bars**

The priority opening of circuits **21 – 22** is performed electrically.

Circuits opening pressure	
Port(s) **21 – 22**	**$6.5^{-0.4}$bars**
Port(s) **23 – 23.1**	**$7.6^{-0.4}$ bars**
Port(s) **24 – 25**	**$6.9^{-0.4}$ bars**
Port(s) **26**	**$6.6^{+0.9}$ bars**

Maximum pressure delivered to the circuits in normal mode	
Port(s) **21 – 22 – 25**	**$12.5^{\pm 0.3}$ bars**
Port(s) **23**	**$8.5^{-0.4}$ bars**
Port(s) **23.1 – 24 – 26**	**$8.3^{-0.6}$ bars**

Maximum pressure delivered to the circuits in fall-back (back up) mode	
Port(s) **21 – 22 – 25**	**$9.5^{+3.5}$ bars**
Port(s) **23**	**$8.5^{-0.4}$ bars**
Port(s) **23.1 – 24 – 26**	**$8.3^{-0.6}$ bars**

Port screw-thread(s) **1 – 21 – 22 – 23 – 23.1 – 24 – 25 – 26**	**M 22x1.5**
Port screw-thread(s) **4/27 – 6 – 12**	**M 16x1.5**
Power supply voltage	**24 V**

*The presence of water in the air tanks means that the cartridge must be replaced or that there is an air production management unit **(APM)** malfunction.*

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

Air tanks

Steel air tank 30 l

Renault Trucks reference N°	**5010612687**

Aluminium air tank 30 l

Renault Trucks reference N°	**5010633415**

Steel air tank 40 l

Renault Trucks reference N°	**5010525149**

Aluminium air tank 40 l

Renault Trucks reference N°	**5010588748**

Technical data

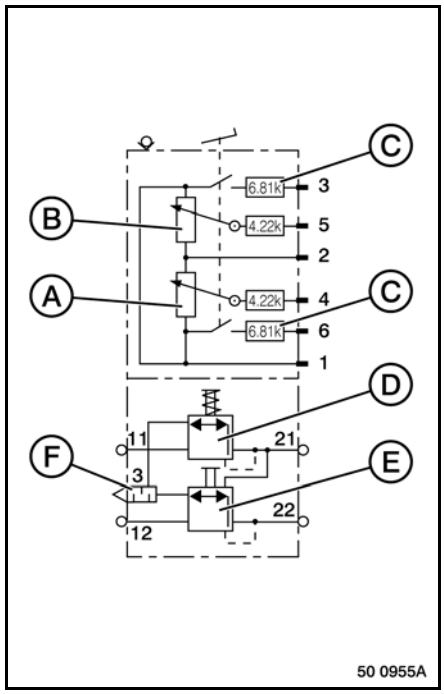
Diameter	**276 mm**
Validity time	**15 year(s)**
Maximum working pressure	**13 bars**
Port screw-threads	**M 22x1.5**

*The air tanks have a service validity of **15 years** and cannot be re-used. **They must be replaced.***

Footbrake control valve

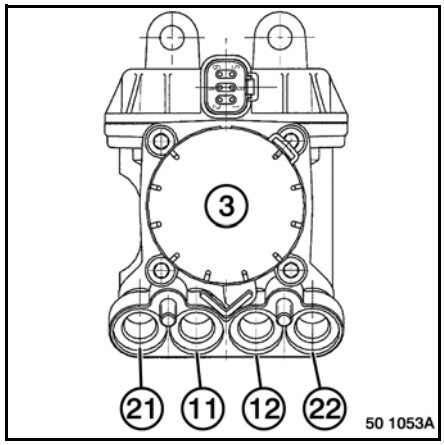
Description

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°	**Z007792**
Renault Trucks reference N°	**5010633321**

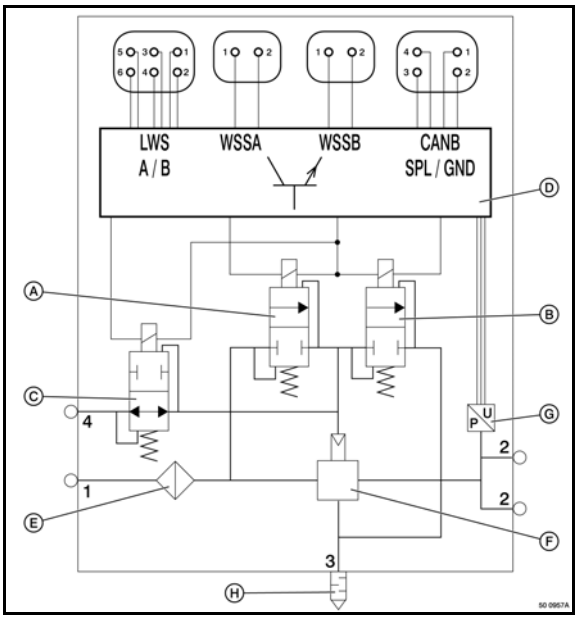
Maximum working pressure	**13 bars**
Maximum delivery pressure	$\mathbf{9}^{\mathbf{0\,/\,+\,1}}$ **bars**
Difference between **P21** and **P22** in back-up mode	**+ 2 bars**
Push-rod minimum travel	**10.5 mm**
Push-rod clearance	**0.5 mm**
Port screw-threads **11 - 12 - 21 - 22**	**Flanged**
Power supply voltage	$\mathbf{5}^{\pm\,\mathbf{0.2}}$ **V**
Potentiometer **1** electrical resistance	$\geq$ **4.2** $\leq$ **7.5** Ω
Potentiometer **2** electrical resistance	$\geq$ **2** $\leq$ **5.3** Ω

Brake modulator

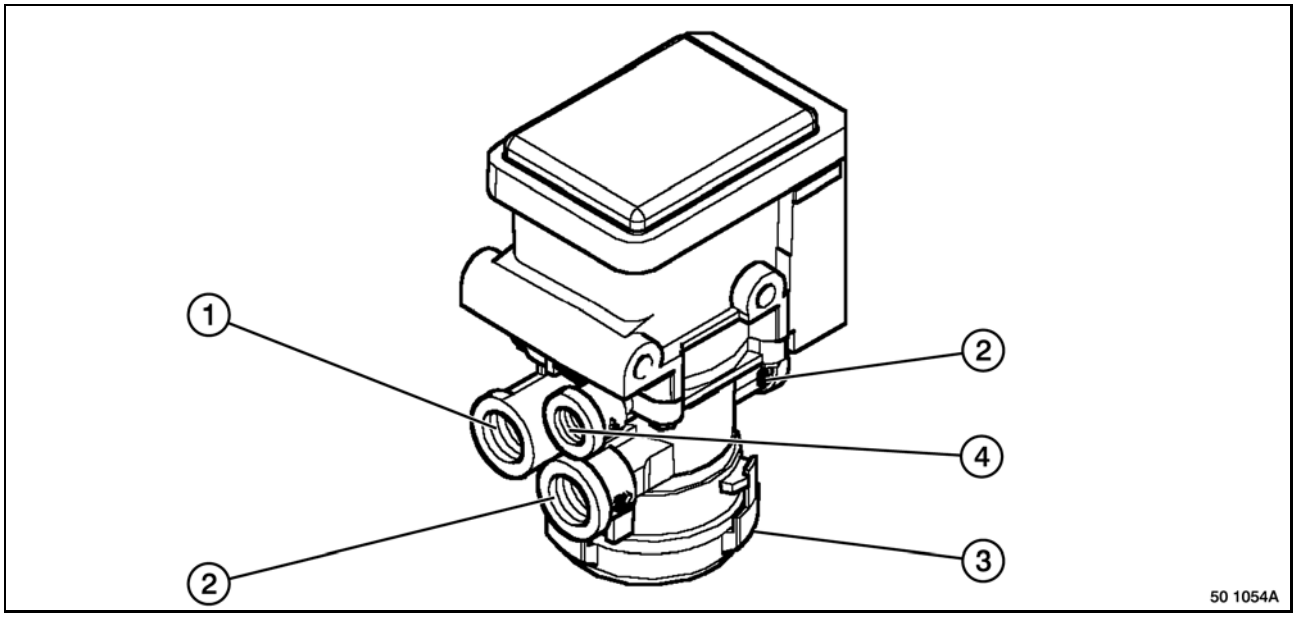
Description
A - Intake electrovalve
B - Exhaust electrovalve
C - Back-up mode electrovalve
D - Electronic card
E - Internal filter
F - Relay valve
G - Air pressure sensor
H - Exhaust

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
Single modulator

Knorr-Bremse reference N°	**Z004038**
Renault Trucks reference N°	**7420570906**

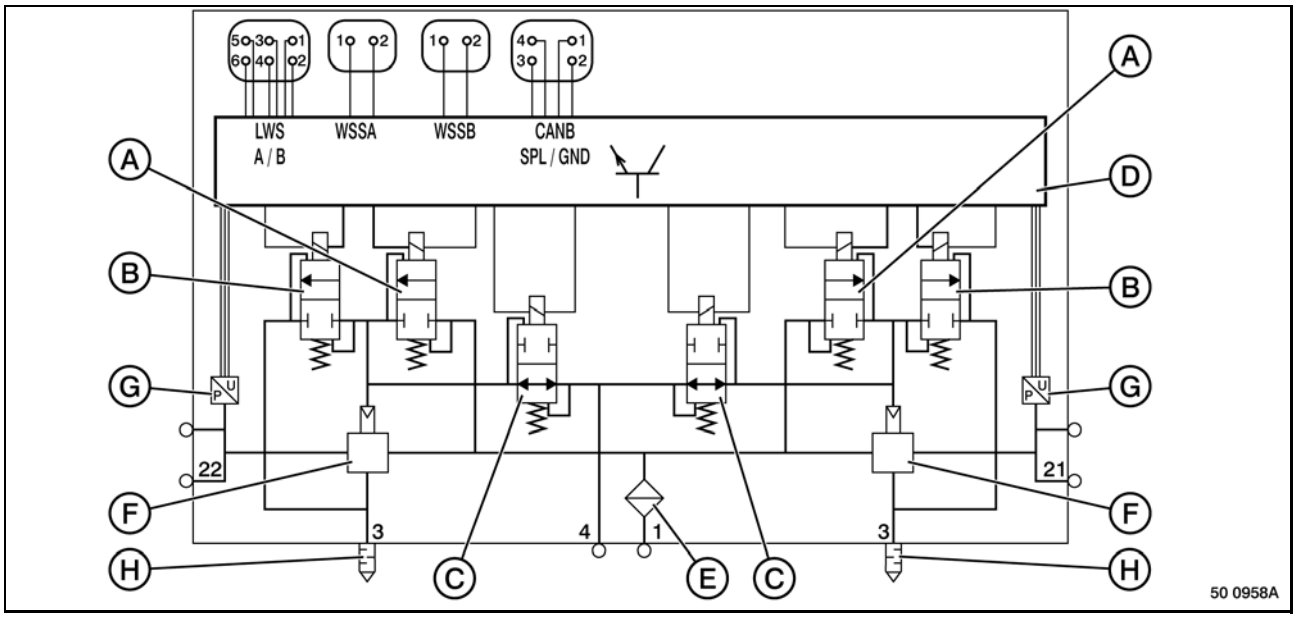


Coding system for appliance ports
1 - Front brake air tank air supply
2 - Pressure delivered to front brake cylinders
3 - Exhaust
4 - Control pressure



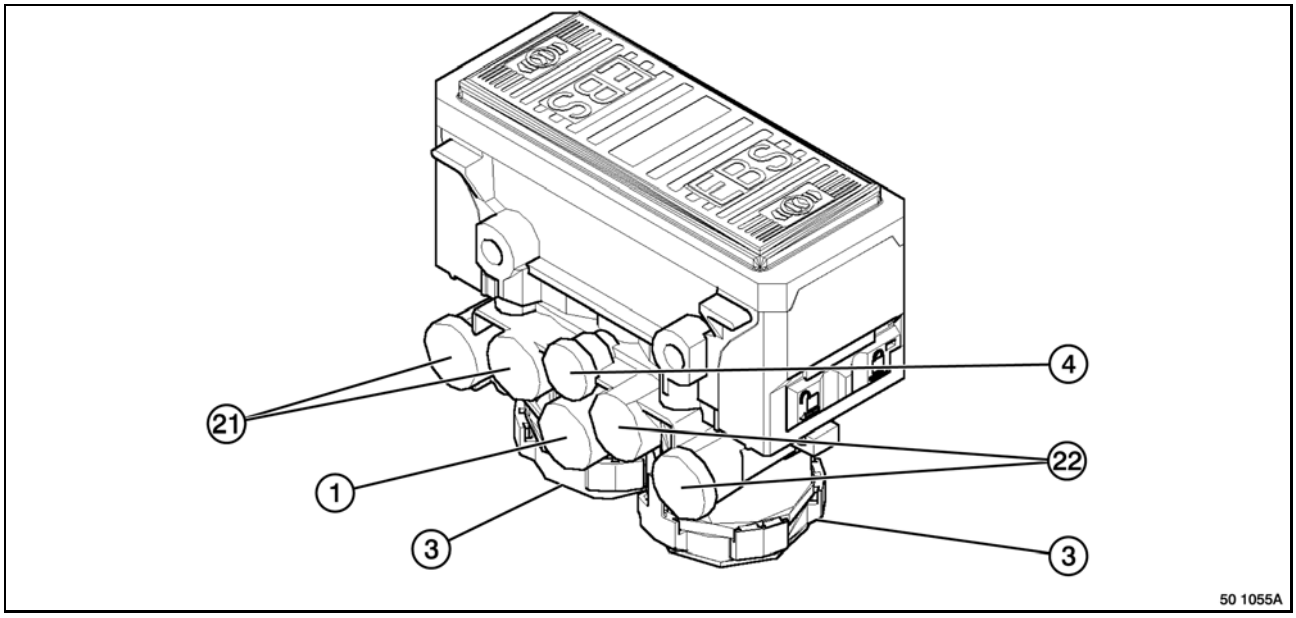
Double modulator - **1** connector .

Knorr-Bremse reference N°	**Z006953**
Renault Trucks reference N°	**7420570910**



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



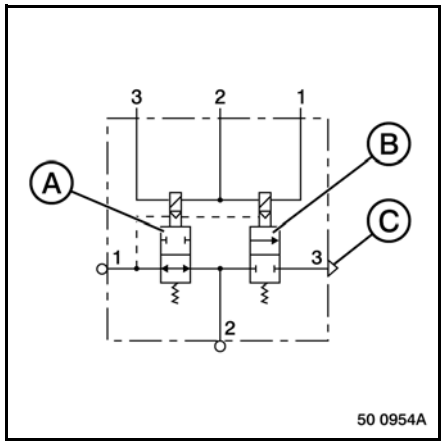
Technical data

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

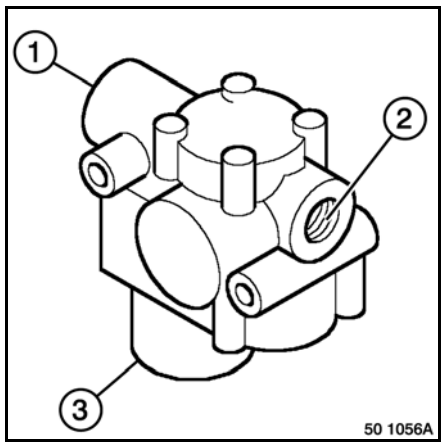
Description

A - Intake electrovalve
B - Exhaust electrovalve
C - Exhaust



Coding system for appliance ports

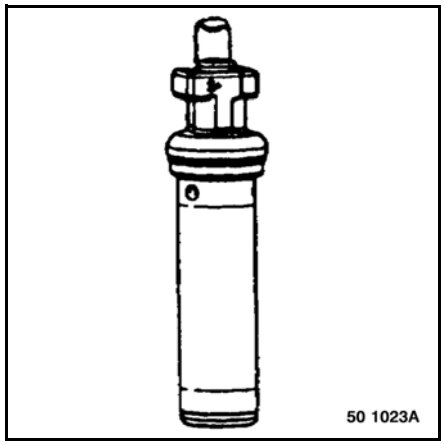
1 - Air supply
2 - Utilization
3 - Exhaust



Technical data

Knorr-Bremse reference N°	**Z009997**
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



Cable lengths and reference numbers

		LH side	RH side	
Front axle	LH drive	**3950**$^{\pm 40}$ mm	**5550**$^{\pm 40}$ mm	cable length
		5010457870	**5010457871**	**Renault Trucks** reference N°
	RH drive	**5550**$^{\pm 40}$ mm	**3950**$^{\pm 40}$ mm	cable length
		5010457876	**5010457861**	**Renault Trucks** reference N°
Rear drive axle Rear axle **6x2**	Air suspension	**2000**$^{\pm 20}$ mm	**1750**$^{\pm 20}$ mm	cable length
		5010457862	**5010457863**	**Renault Trucks** reference N°
	Mechanical suspension	**2450**$^{\pm 20}$ mm	**2250**$^{\pm 20}$ mm	cable length
		5010457860	**7420795150**	**Renault Trucks** reference N°
Rear axle **6x2 Pusher**		**2000**$^{\pm 20}$ mm	**3050**$^{\pm 40}$ mm	cable length
		5010457862	**7420794630**	**Renault Trucks** reference N°

Technical data

Diameter	**16 mm**
Electrical resistance	≥ **1100** ≤ **1250** Ω|

Assembly

Push the speed sensor into support against the toothed wheel, without knocking.

Push the sensor with your hand. Do not use tools.

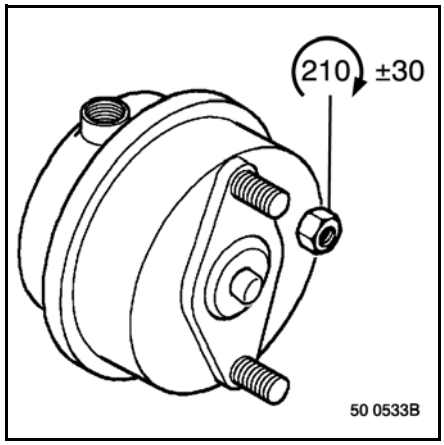
Assembly with application of grease permitted.

Pull the cable gently to check that the sensor is a tight fit in its support. If it can be withdrawn without resistance, the elastic holding ring must be replaced.

Brake chamber, cylinder

Diaphragm chamber Wabco type "24"

Part N°	**7420533191**
Active diameters	**163 mm**
Travel	**65 mm**
Port screw-threads	**M 16x1.5**

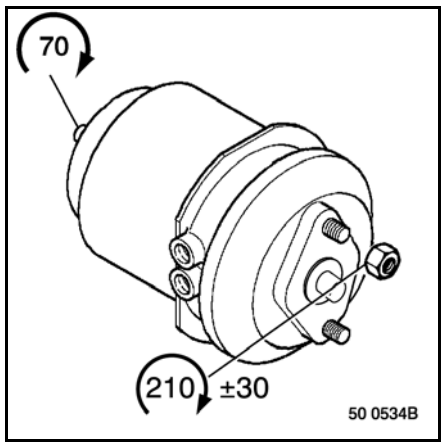


Spring cylinder Wabco type "24/24"
Front axle

- left	**7424425719**
- right	**7424425720**

Fixed **TAG** axle

- left	**7420573922**
- right	**7420573923**



Steering **TAG** axle
Pusher axle

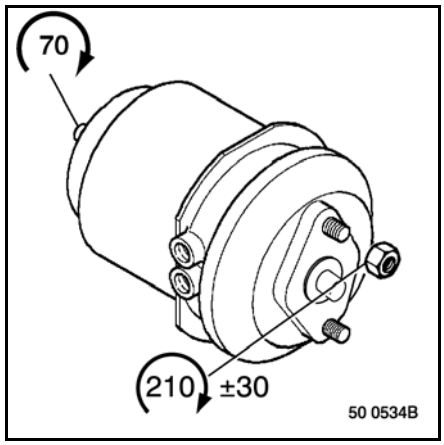
Part N°	**7420533213**

Technical data

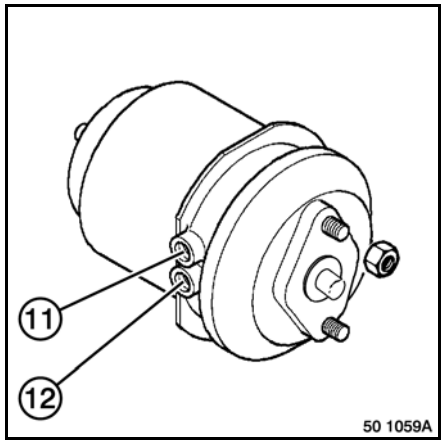
Active diameters	**163/173.5 mm**
Travel	**65 mm**
Release pressure	**5.3 bars**
Port screw-threads	**M 16x1.5**

Spring cylinder Wabco type "24/30"

- left	**7420533192**
- right	**7420533193**
Active diameters	**163/189 mm**
Travel	**65 mm**
Release pressure	**5.3 bars**
Port screw-threads	**M 16x1.5**



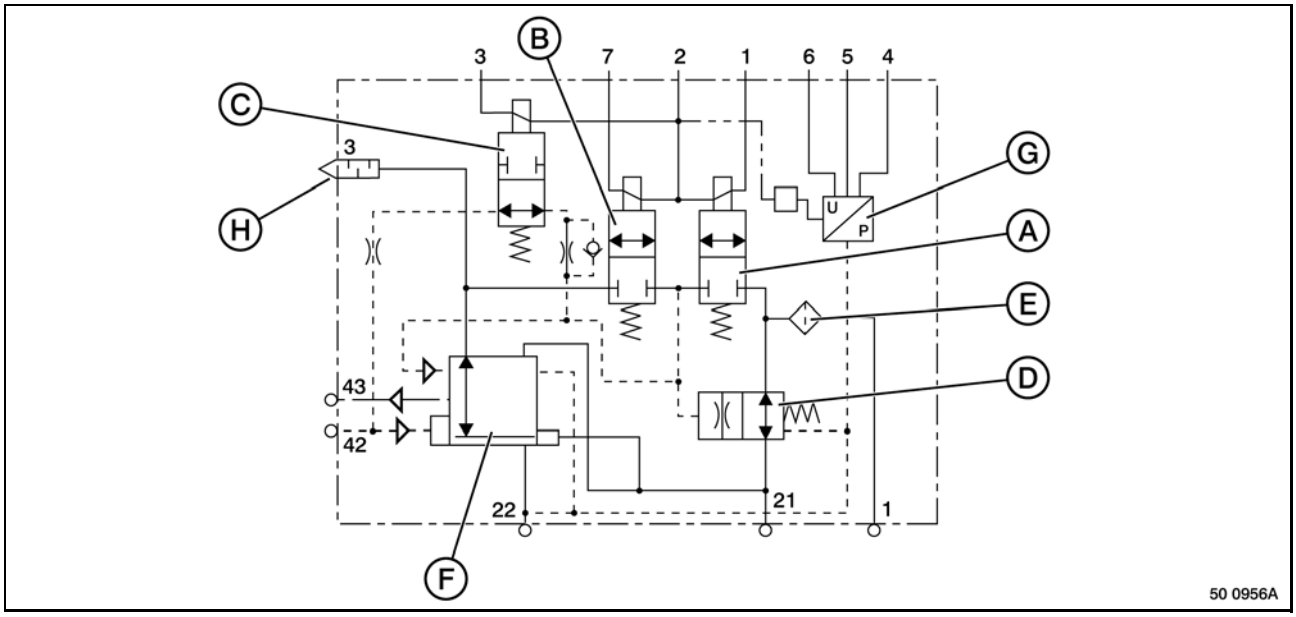
Coding system for appliance ports
11 - Service brake circuit air supply
12 - Parking brake circuit air supply



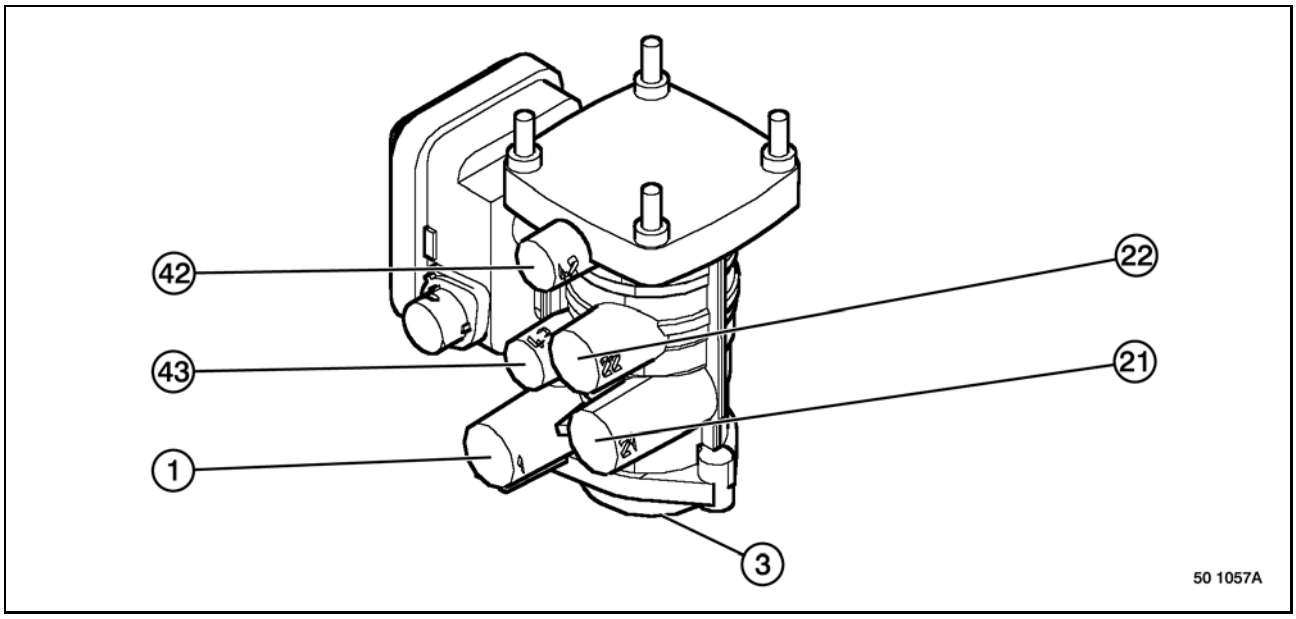
Trailer control valve

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

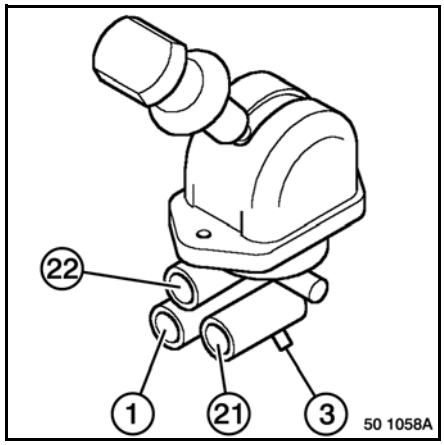


Technical data

Knorr-Bremse reference N°	**Z014817**
Renault Trucks reference N°	**5010612854**
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**
Electrical supply voltage	
Pin **2**	**24 V**
Pin **4**	**5 V**
Electrovalve(s) coil resistance **A – B – C**	**2** Ω

Parking brake valve

Coding system for appliance ports
1 - Air supply
3 - Exhaust
21 – 22 - Utilization



Parking brake valve without "test" position

Knorr-Bremse reference N°	**DPM29A 65182901**
Renault Trucks reference N°	**5010422401**

Parking brake valve with "test" position

Knorr-Bremse reference N°	**DPM28A 65182801**
Renault Trucks reference N°	**5010422400**

Trailer brake valve

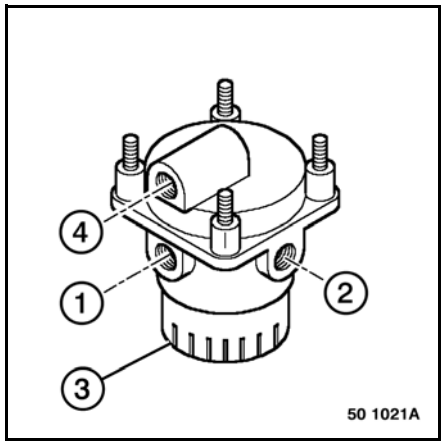
Knorr-Bremse reference N°	**DPM96EY 65189659**
Renault Trucks reference N°	**5010422403**

Technical data

Maximum supply pressure	**12,5 bars**
Maximum control pressure	**10 bars**
Port screw-threads	**M 16x1.5**

Single relay valve

Coding system for appliance ports
1 - Air supply
2 - Delivered pressure
3 - Exhaust
4 - Control pressure



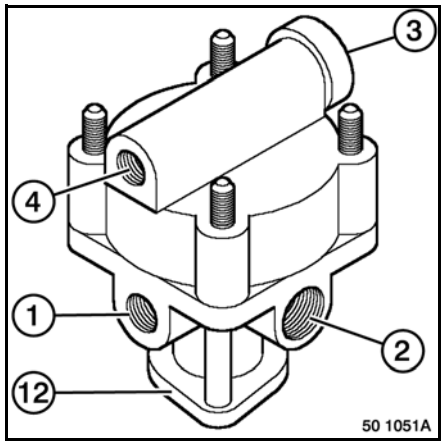
Technical data

Wabco reference N°	**973 011 004 0**
Renault Trucks reference N°	**5010588146**

Maximum supply pressure	**13 bars**
Maximum control pressure	**10 bars**
Port screw-threads **1 – 2**	**M 22x1.5**
Port screw-threads **4**	**M 16x1.5**

Piloted reduction valve

Coding system for appliance ports
1 - Air supply
2 - Delivered pressure
3 - Exhaust
4 - Control pressure
12 - Supply pressure



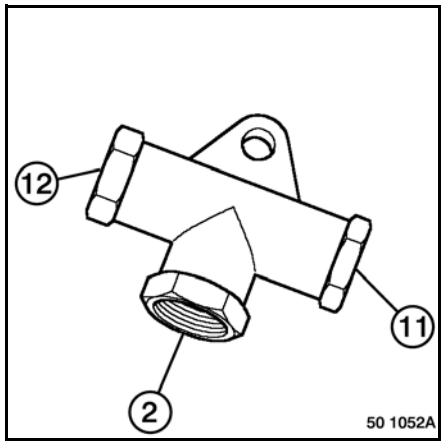
Technical data

Wabco reference N°	**973 011 300 0**
Renault Trucks reference N°	**5010588270**

Maximum supply pressure	**13 bars**
Maximum control pressure	**10 bars**
Port screw-threads **1 – 2 – 12**	**M 22x1.5**
Port screw-threads **4**	**M 16x1.5**

Double check valve

Coding system for appliance ports
2 - Utilization
11 – 12 - Air supply



Technical data

Wabco reference N°	**434 208 021 0**
Renault Trucks reference N°	**5010038414**

Maximum supply pressure	**10 bars**
Port screw-threads	**M 22x1.5**

TOOLS

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT PREMIUM DXi 11 EURO3	27BC - TR 4X2 LC	Generalities				24/11/2004	C-3
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						

Generalities

RENAULT TRUCKS divides tools into three categories:

- **General-purpose tools**: proprietary tools
  - **50 00 26 .... reference number** (possibility of purchasing through the RENAULT TRUCKS Spare Parts department).
  - **4-figure reference number** (tools classified by RENAULT TRUCKS but available from the supplier).

- **Special tools**: specifically created tools distributed by the RENAULT TRUCKS Spare Parts Department
  - To be ordered according to the reference numbers appearing in the list of tools on the following pages.

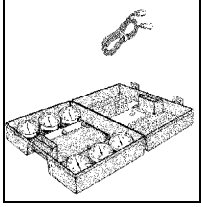
- **Locally manufactured tools**:
  - **4-figure reference number** (represented by a drawing): tools that are simple to make without need for special qualification.

Three levels (or echelons) determine their assignment:
- **Level 1**: tools for servicing, maintenance and minor tasks
- **Level 2**: tools for major repairs
- **Level 3**: tools for refurbishment

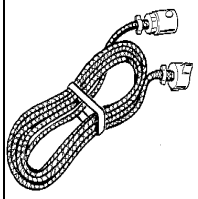
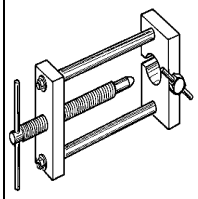
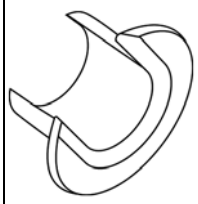
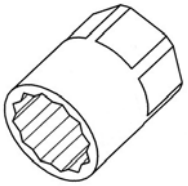
Proprietary tools mentioned in this manual do not appear in the tools list.
These tools are identified in the standard tools manual (MO) by a 4-figure number.

TOOLS

General-purpose tools

Illustration	RENAULT TRUCKS Ref.	Designation	Manu-facturer reference	Manu-facturer code	Level	Qty
	**5000262423**	Test case			1	1

Special Tools

Illustration	RENAULT TRUCKS Ref.	Designation	Manu-facturer reference	Manu-facturer code	Level	Qty
	**5000267096**	Flexible pipe			1	1
	**5000262467**	Unclipper			1	1
	5000262464	RILAX 2000 case			1	1
	5000262599	RILAX 2000 case			1	1
	**5000265132**	Clamp			1	1
	**5000262901**	Unclipper			1	1
	**2902**	Socket			1	1

COMPRESSED AIR CIRCUIT

APPLICABILITY

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Identification of brake air pipes				21/05/2002	D-4
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Coding system for appliance ports				21/05/2002	D-5
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Diagram colours				05/11/2004	D-6
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Pneumatic diagram				09/11/2004	D-7
	27TC - TR 4x2						
RENAULT PREMIUM PNG	27BC - TR 4X2 LC	Pneumatic diagram				09/12/2004	D-10
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Pneumatic diagram				09/11/2004	D-13
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Pneumatic diagram				09/12/2004	D-16
	27TC - TR 4x2						
RENAULT PREMIUM DXi 11 EURO 3	27SC - PR 4x2	Pneumatic diagram				09/12/2004	D-19
RENAULT PREMIUM DXi 11 EURO 3	27SC - PR 4x2	Pneumatic diagram				09/12/2004	D-22
RENAULT PREMIUM DXi 11 EURO 3	27SC - PR 4x2	Pneumatic diagram				09/12/2004	D-25

Range	Family	Title	Variant	Applicability date		Updating	Page N°
				Start	End		
RENAULT PREMIUM DXi 11 EURO 3	27RC - PR 6x2	Pneumatic diagram				15/12/2004	D-28
RENAULT PREMIUM DXi 11 EURO 3	27RC - PR 6x2	Pneumatic diagram				15/12/2004	D-31
RENAULT PREMIUM DXi 11 EURO 3	27JC - TR 6X2 Pusher	Pneumatic diagram				17/12/2004	D-34
RENAULT PREMIUM DXi 11 EURO 3	27BC - TR 4X2 LC	Key				09/11/2004	D-37
	27JC - TR 6X2 Pusher						
	27RC - PR 6x2						
	27SC - PR 4x2						
	27TC - TR 4x2						

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**

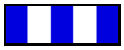
Diagram colours

Compressed air supply	
Pilot-control pressure	

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

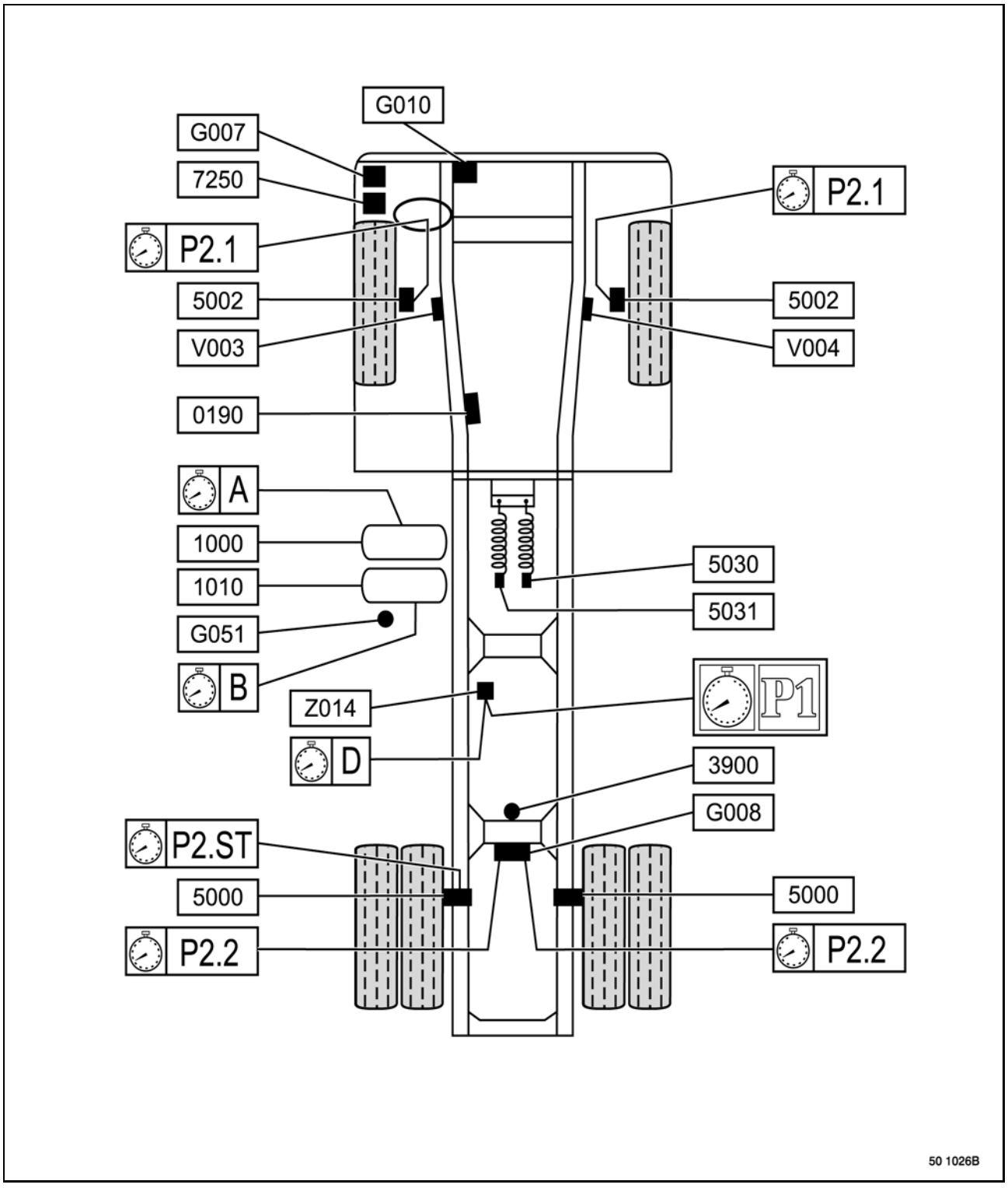
Constant pressure	
Pilot-control pressure	
Delivered pressure	

Auxiliary equipment circuit

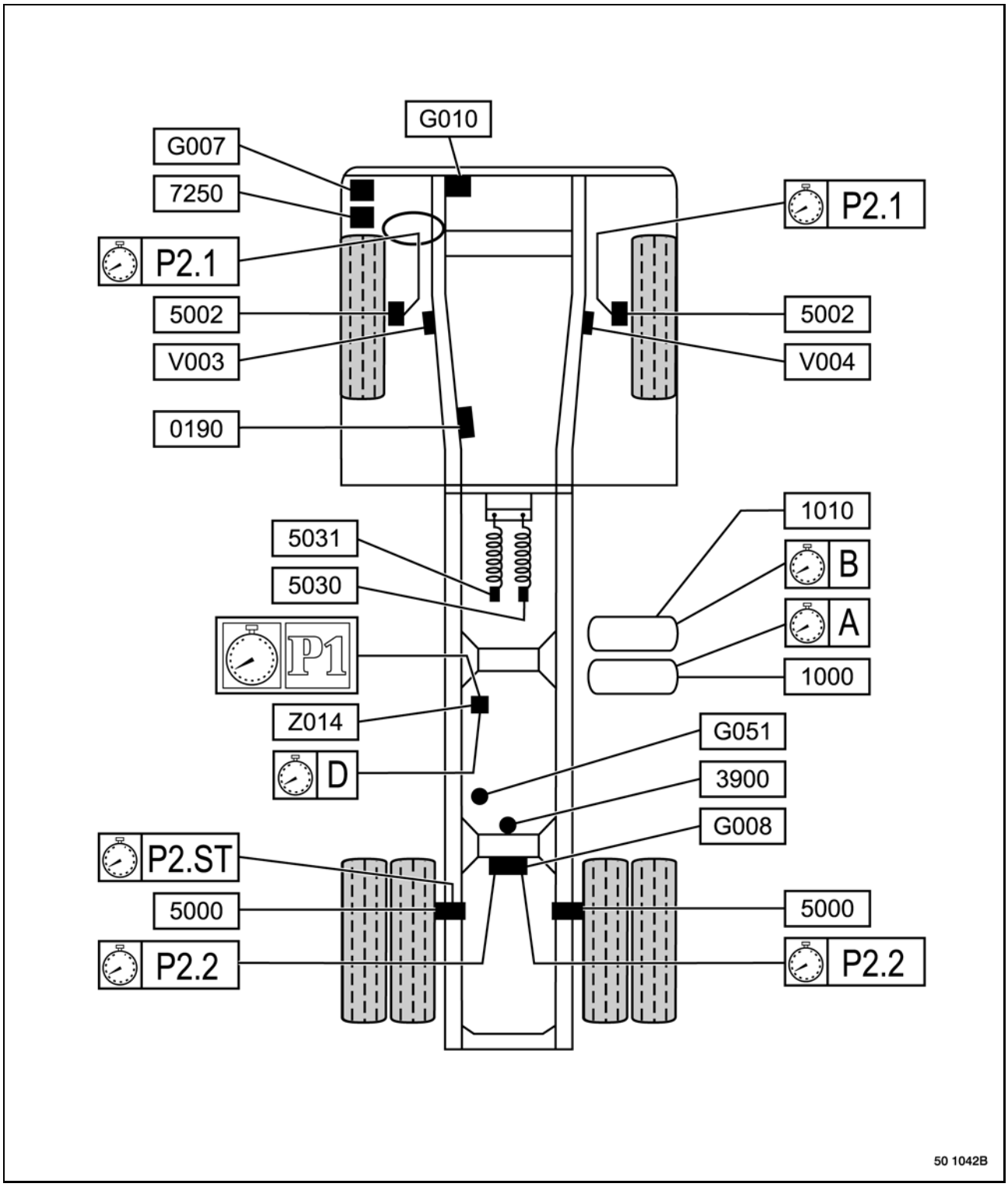
Constant pressure	
Pilot-control pressure	
Delivered pressure	

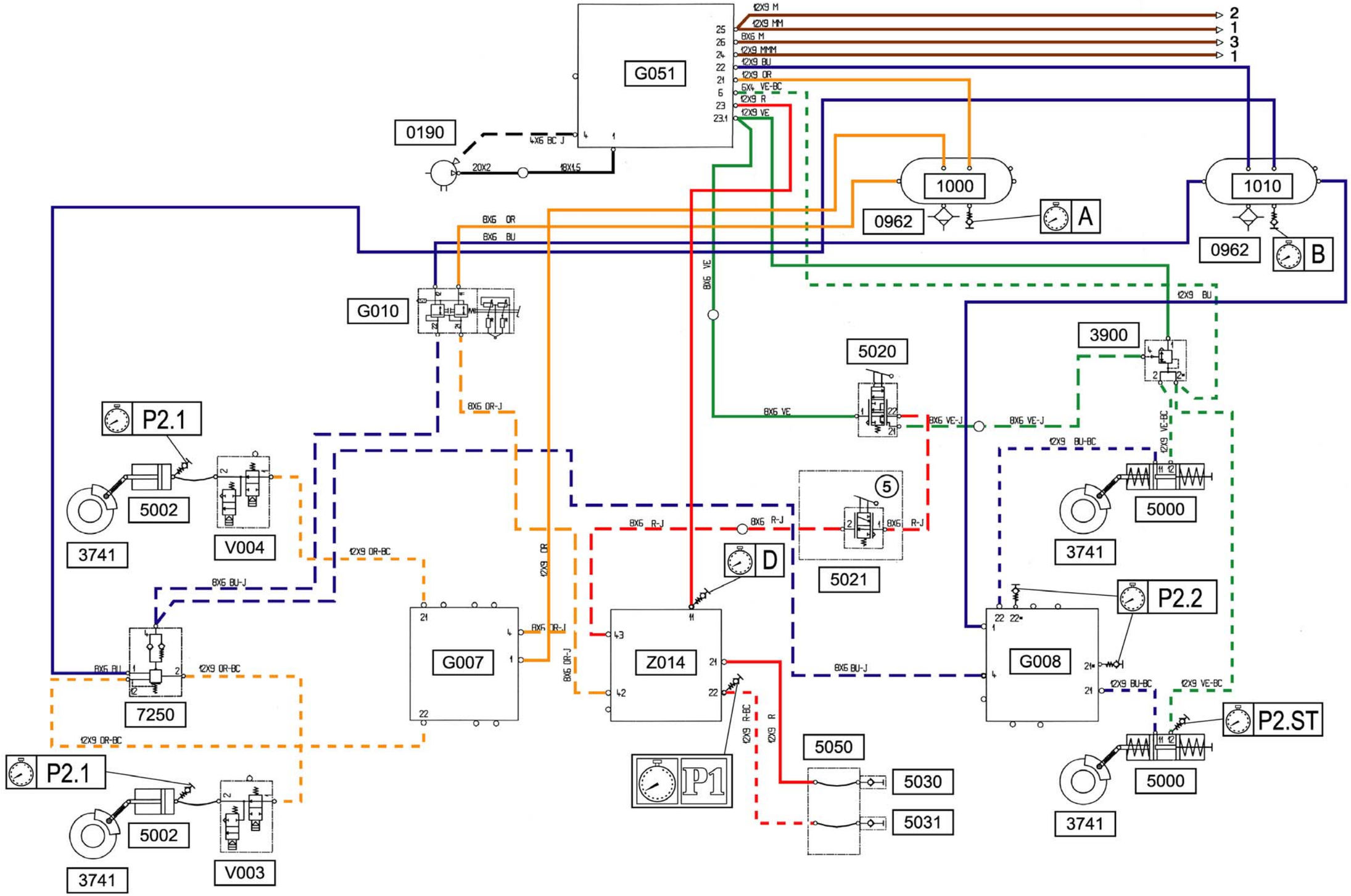
Pneumatic diagram

Location of appliances
LH drive **4X2** ≤ **60** tonnes tractor vehicle.



Location of appliances
LH drive **4X2** ≤ **60** tonnes tractor vehicle.
Wheelbase **3900**.

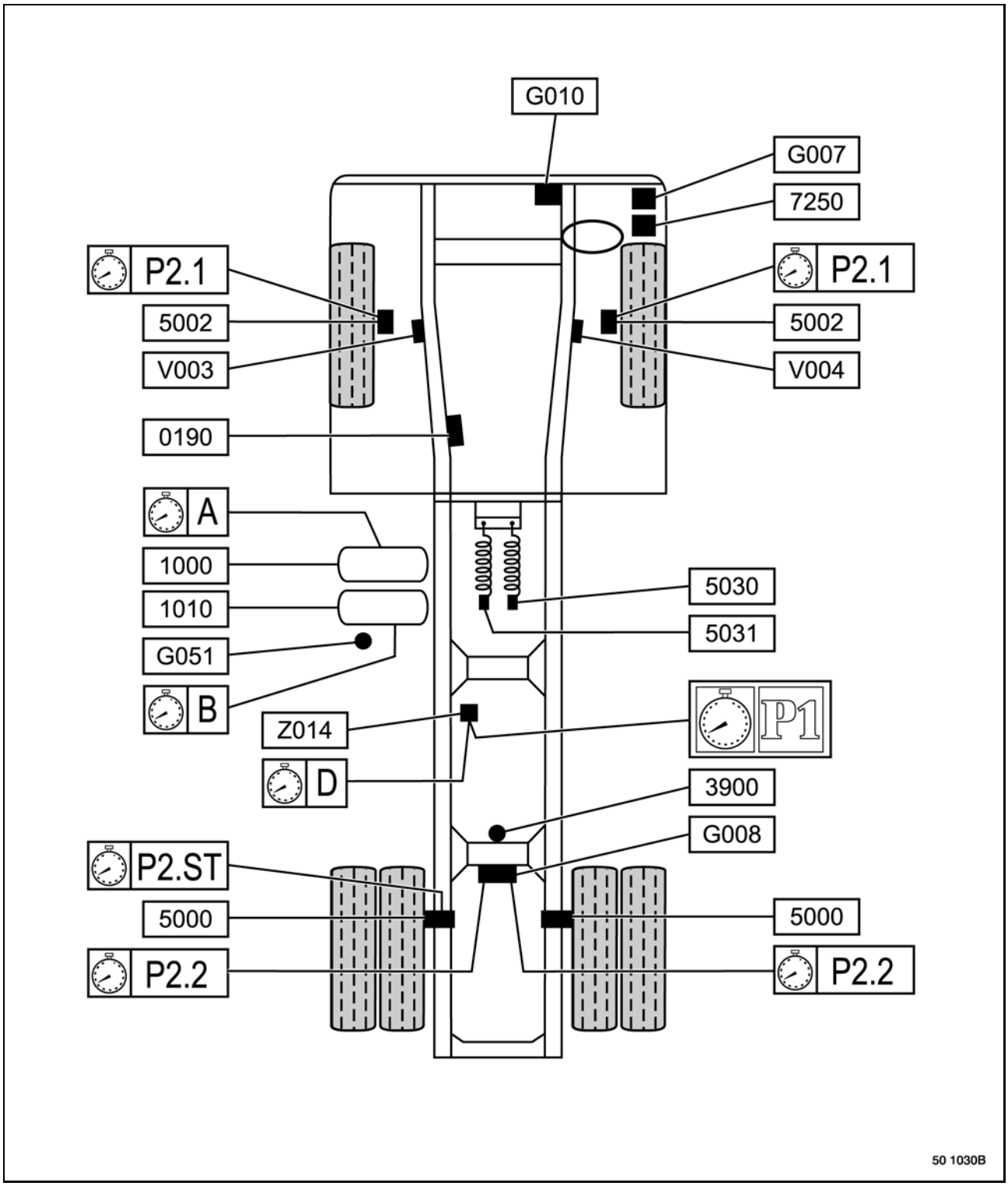



G051
0190
4X6 BC J
20X2
18X1,5
12X9 M
12X9 MM
8X6 M
12X9 MMM
12X9 BU
12X9 OR
6X4 VE-BC
12X9 R
12X9 VE
25
26
24
22
21
5
23
23.1
2
1
3
1
1000
0962
A
1010
0962
B
8X6 OR
8X6 BU
8X6 VE
G010
12X9 BU
3900
5020
8X6 VE
8X6 VE-J
8X6 VE-J
12X9 BU-BC
12X9 VE-BC
P2.1
5002
3741
V004
8X6 OR-J
12X9 OR-BC
8X6 BU-J
5021
5
8X6 R-J
8X6 R-J
D
12X9 OR
8X6 OR-J
G007
Z014
8X6 BU-J
G008
P2.2
5000
3741
7250
8X6 BU
12X9 OR-BC
12X9 OR-BC
P2.1
5002
3741
V003
P1
12X9 R-BC
12X9 R
5050
5030
5031
12X9 BU-BC
12X9 VE-BC
P2.ST
5000
3741

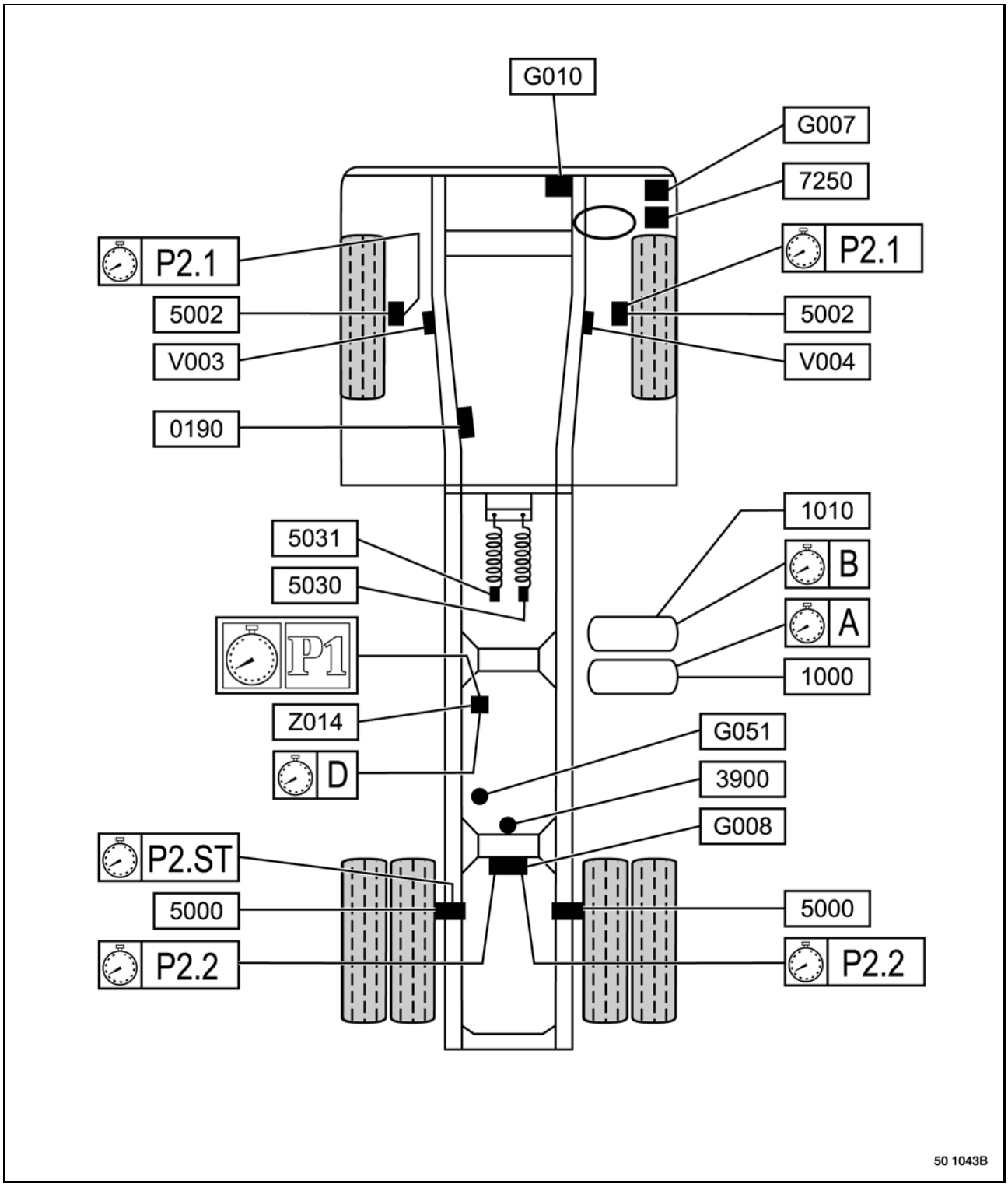
AV 569790K

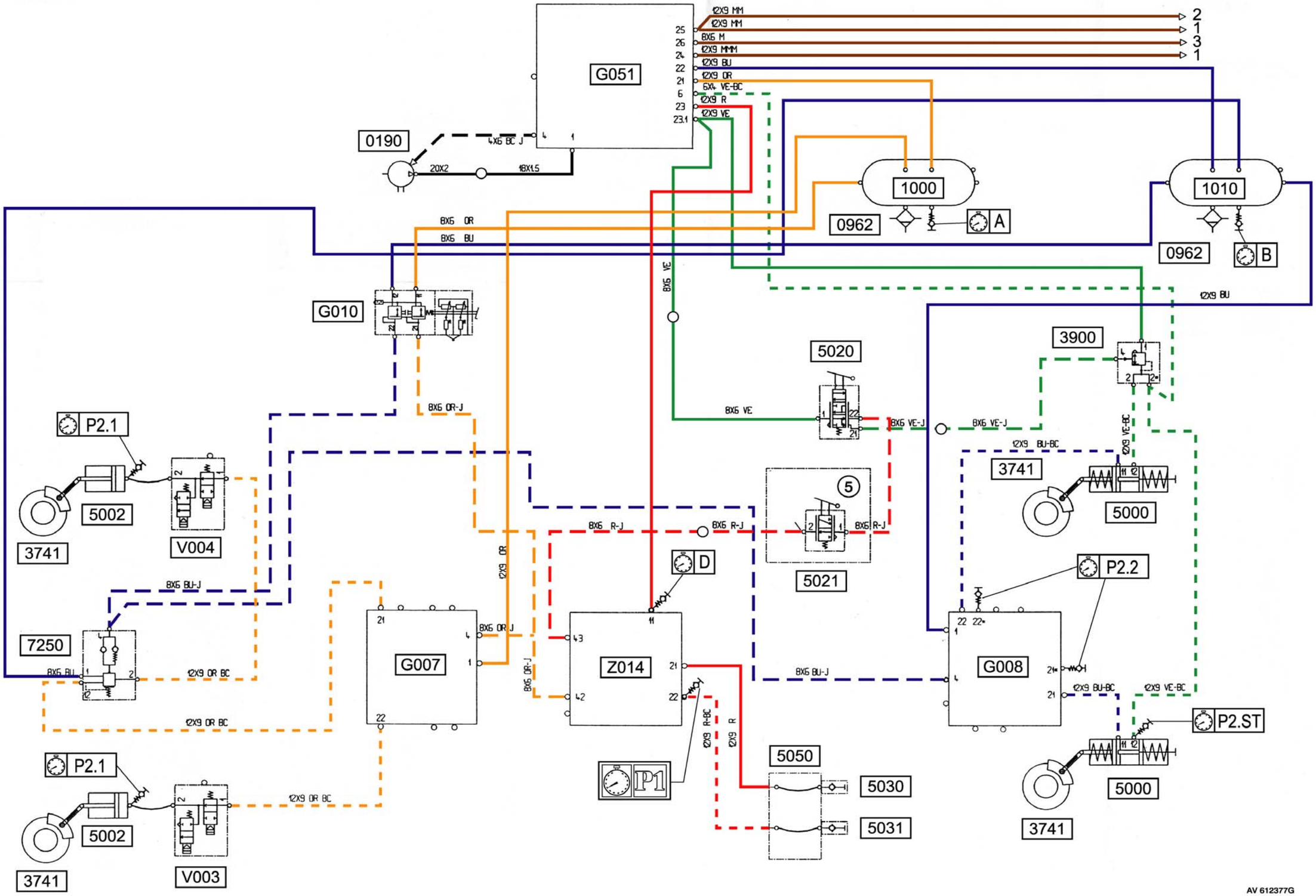
Pneumatic diagram

Location of appliances
LH drive **4X2** ≤ **60** tonnes tractor vehicle.



Location of appliances
LH drive **4X2** ≤ **60** tonnes tractor vehicle.
Wheelbase **3900**.

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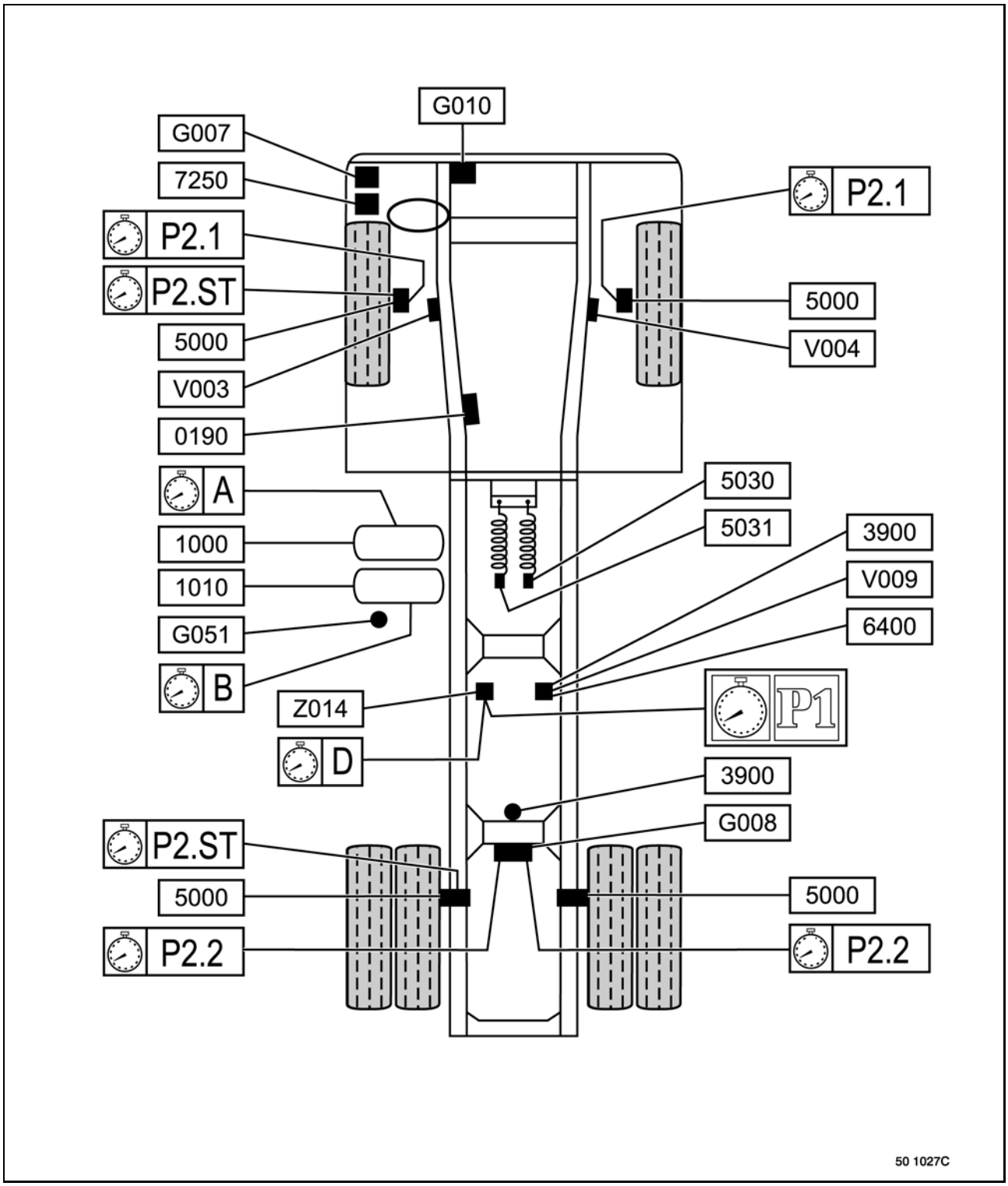
26
24
22
21
6
23
23.1
12X9 MM
12X9 MM
8X6 M
12X9 MMM
12X9 BU
12X9 OR
5X4 VE-BC
12X9 R
12X9 VE
2
1
3
1
0190
4X6 BC J
20X2
18X1.5
1000
0962
A
1010
0962
B
8X6 OR
8X6 BU
8X6 VE
12X9 BU
G010
3900
5020
8X6 VE
8X6 OR-J
P2.1
5002
3741
V004
8X6 VE-J
8X6 VE-J
12X9 BU-BC
12X9 VE-BC
3741
5000
5
5021
8X6 R-J
8X6 R-J
D
12X9 OR
8X6 BU-J
7250
8X6 BU
12X9 OR BC
G007
8X6 OR-J
Z014
G008
P2.2
12X9 OR BC
8X6 OR-J
12X9 BU-BC
12X9 VE-BC
P2.ST
P1
12X9 R-BC
12X9 R
5050
5030
5031
P2.1
5002
3741
V003
12X9 OR BC
5000
3741

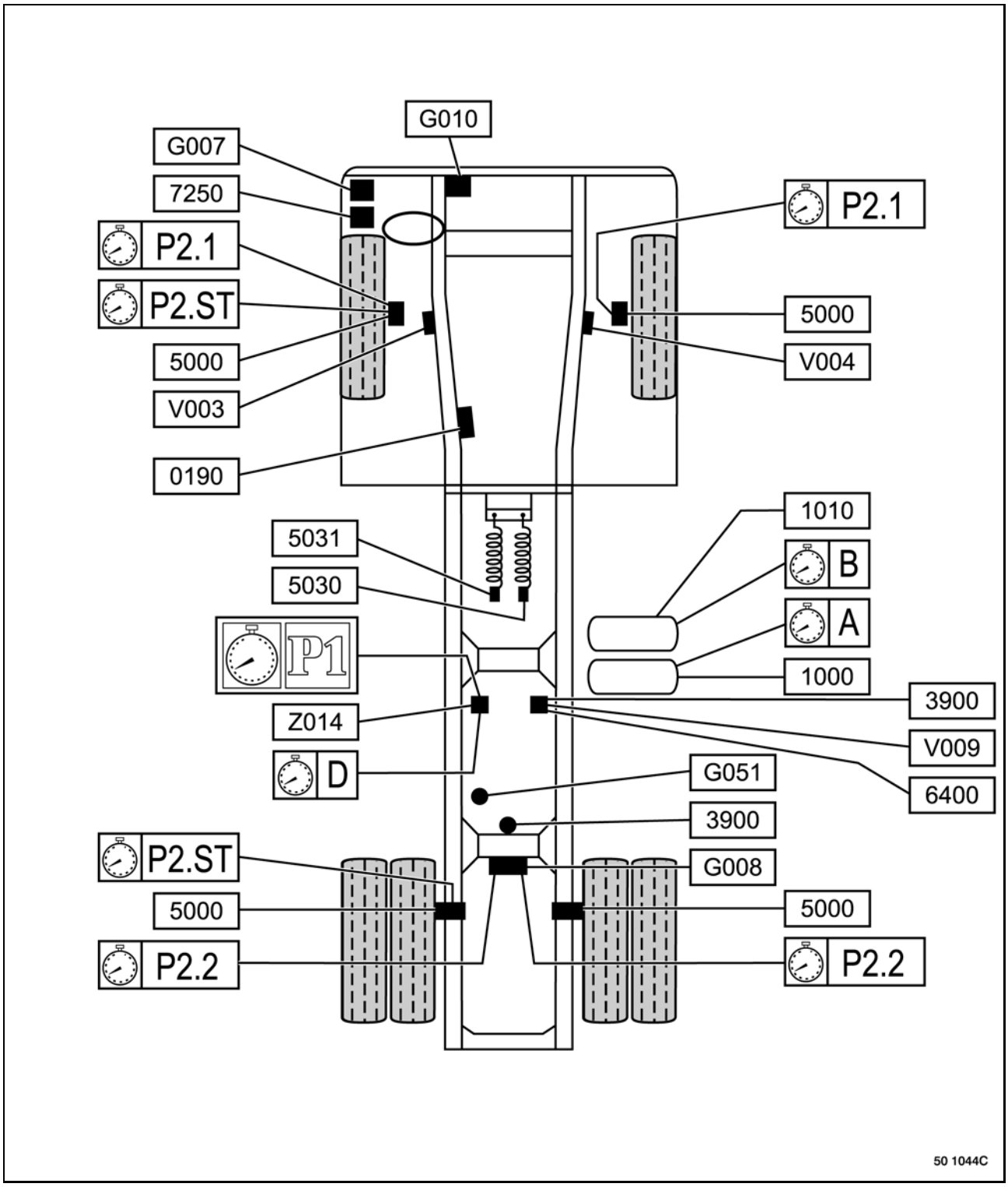
AV 612377G

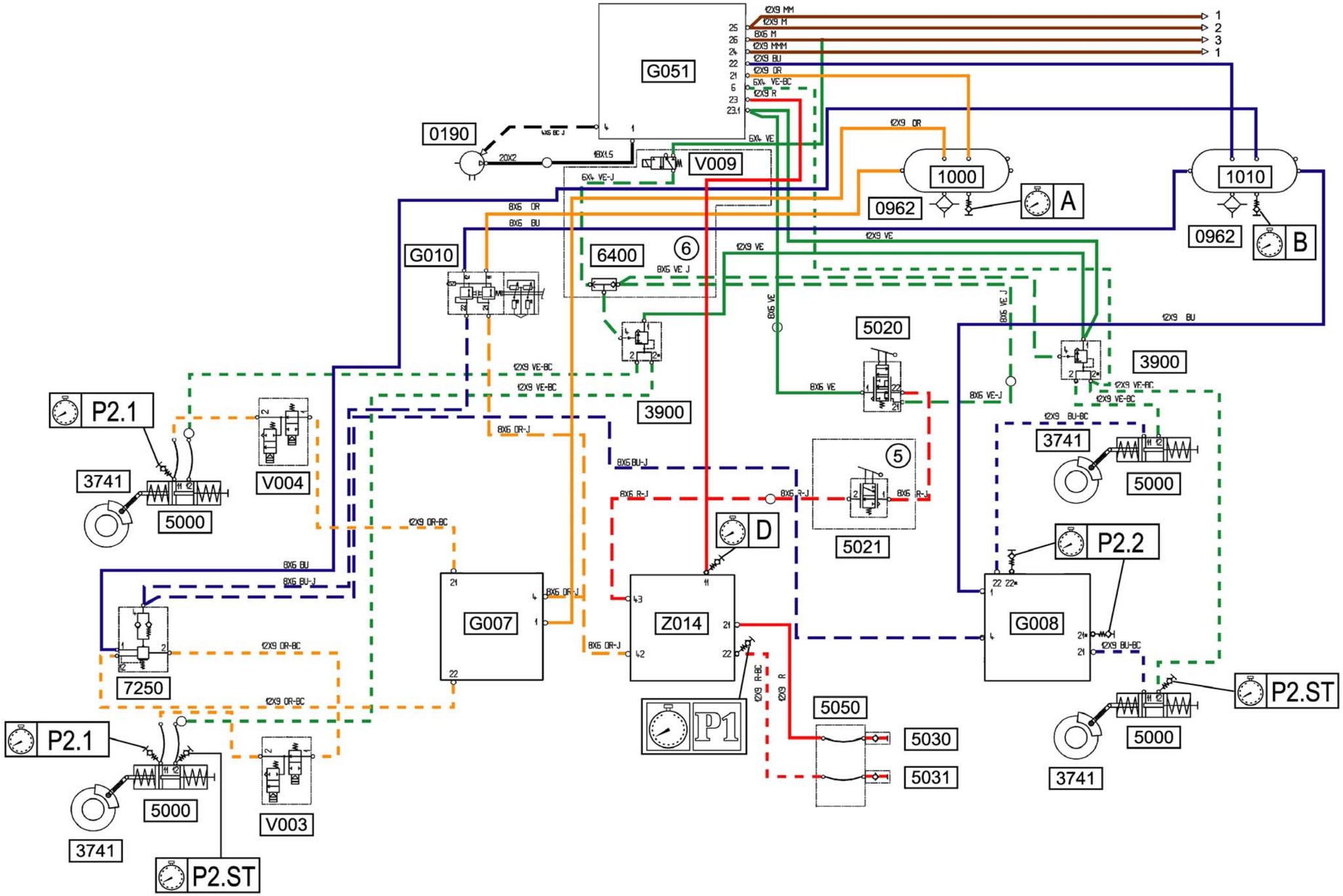
Pneumatic diagram

Location of appliances
LH drive **4X2** ≥ **60** tonnes tractor vehicle.



Location of appliances
LH drive **4X2** ≥ **60** tonnes tractor vehicle.
Wheelbase **3900**.

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24
22
21
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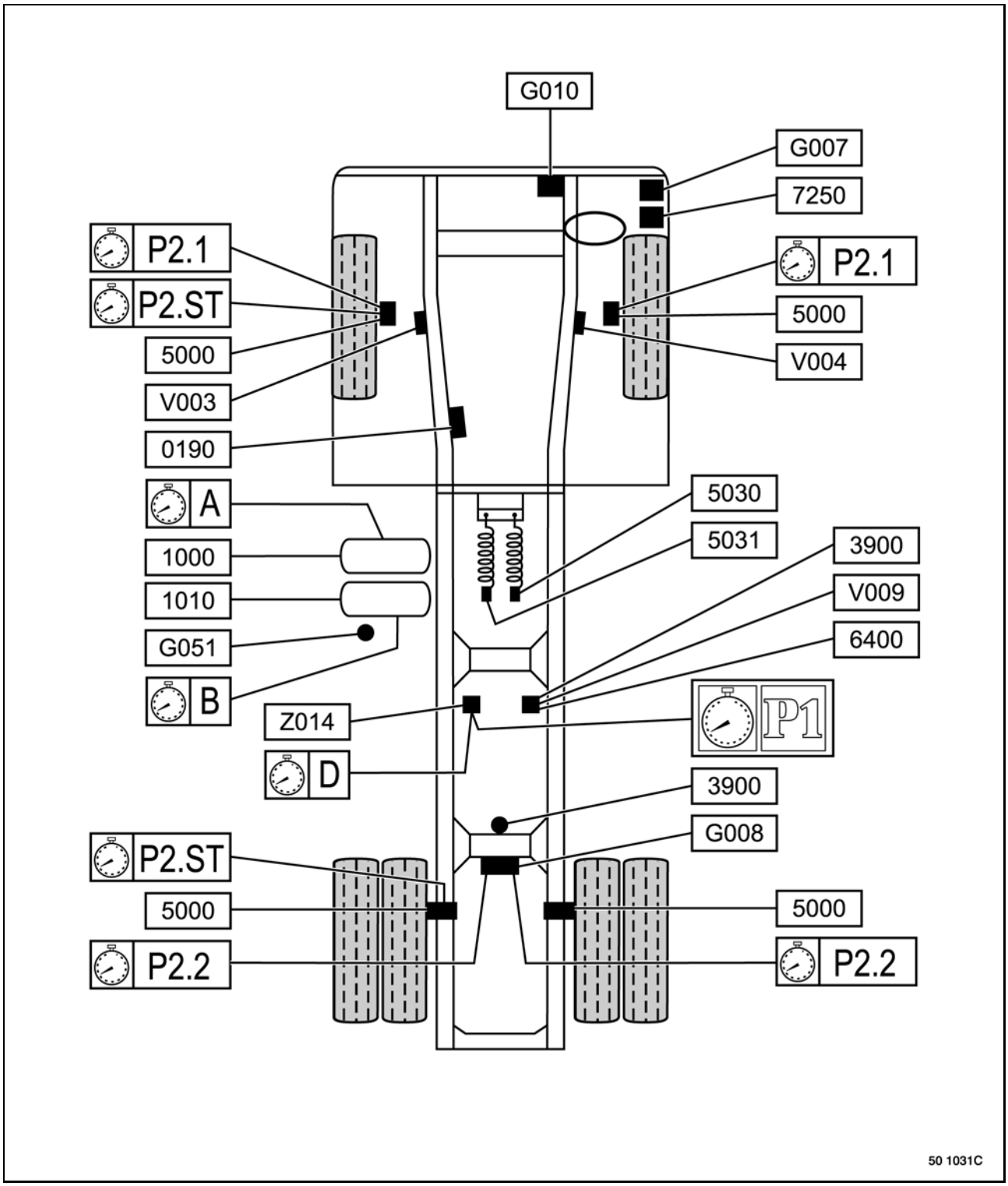
12X9 MM
12X9 M
8X6 M
12X9 MMM
12X9 BU
12X9 OR
5X4 VE-BC
12X9 R
1
2
3
1
0190
20X2
1BX1.5
5X4 VE
V009
5X4 VE-J
12X9 OR
1000
0962
A
1010
0962
B
8X6 OR
8X6 BU
G010
6400
6
8X6 VE J
12X9 VE
8X6 VE
8X6 VE-J
12X9 BU
5020
3900
12X9 VE-BC
12X9 VE-BC
8X6 OR-J
8X6 VE
12X9 VE-BC
12X9 BU-BC
3741
5000
8X6 BU-J
8X6 R-J
8X6 R-J
8X6 R-J
5
5021
D
12X9 OR-BC
P2.1
3741
5000
V004
8X6 BU
8X6 BU-J
G007
8X6 OR-J
Z014
8X6 OR-J
P2.2
G008
12X9 BU-BC
P2.ST
5000
3741
7250
12X9 OR-BC
12X9 OR-BC
P2.1
5000
3741
V003
P2.ST
P1
12X9 R-BC
12X9 R
5050
5030
5031

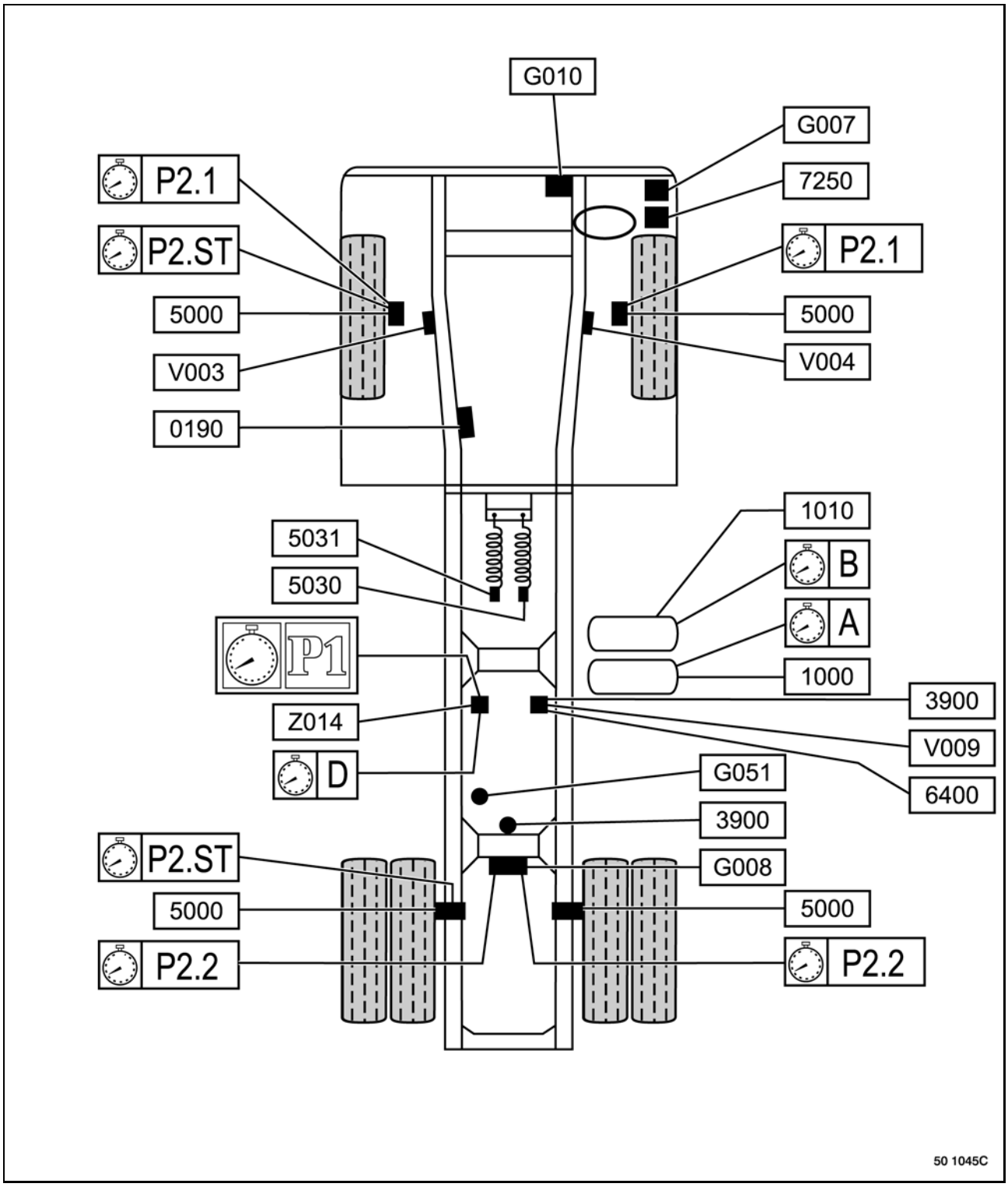
AV 588529H

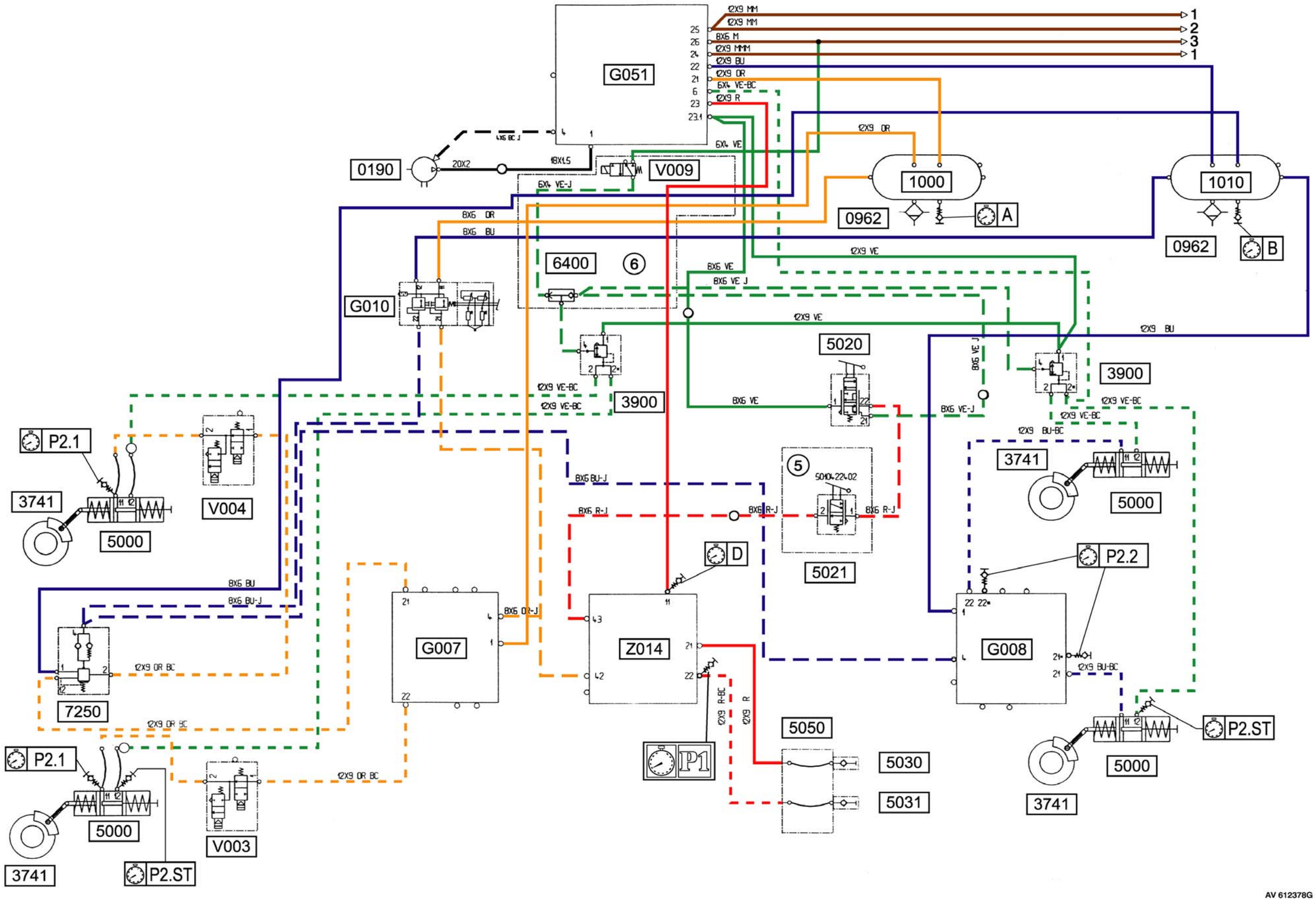
Pneumatic diagram

Location of appliances
LH drive **4X2** ≥ **60** tonnes tractor vehicle.



Location of appliances
LH drive **4X2** ≥ **60** tonnes tractor vehicle.
Wheelbase **3900**.

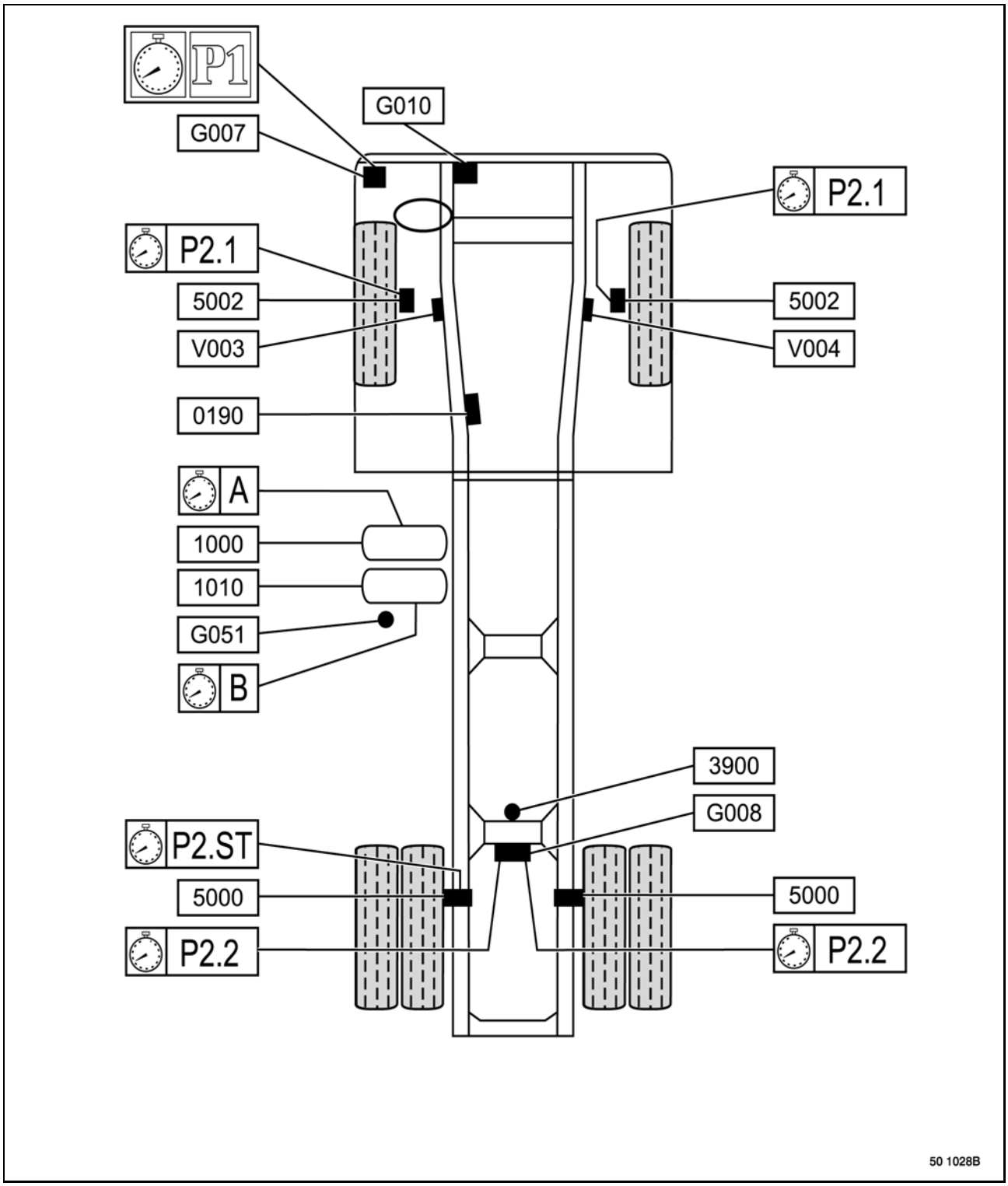



G051
25
26
24
22
21
6
23
23.1
12X9 MM
12X9 MM
8X6 M
12X9 MMM
12X9 BU
12X9 OR
6X4 VE-BC
12X9 R
1
2
3
1
0190
20X2
18X1.5
V009
6X4 VE
6X4 VE-J
12X9 OR
1000
0962
A
1010
0962
B
8X6 OR
8X6 BU
6400
6
8X6 VE
8X6 VE J
12X9 VE
G010
12X9 VE
12X9 BU
5020
8X6 VE J
3900
12X9 VE-BC
12X9 VE-BC
8X6 VE
8X6 VE-J
3900
12X9 VE-BC
12X9 VE-BC
12X9 BU-BC
P2.1
3741
5000
V004
8X6 BU-J
5
5010-224-02
8X6 R-J
8X6 R-J
8X6 R-J
3741
5000
5021
D
8X6 BU
8X6 BU-J
G007
8X6 OR-J
Z014
P2.2
G008
7250
12X9 OR BC
12X9 BU-BC
12X9 OR BC
12X9 R-BC
12X9 R
5050
P2.ST
P1
5030
5031
P2.1
5000
V003
12X9 OR BC
3741
P2.ST
5000
3741

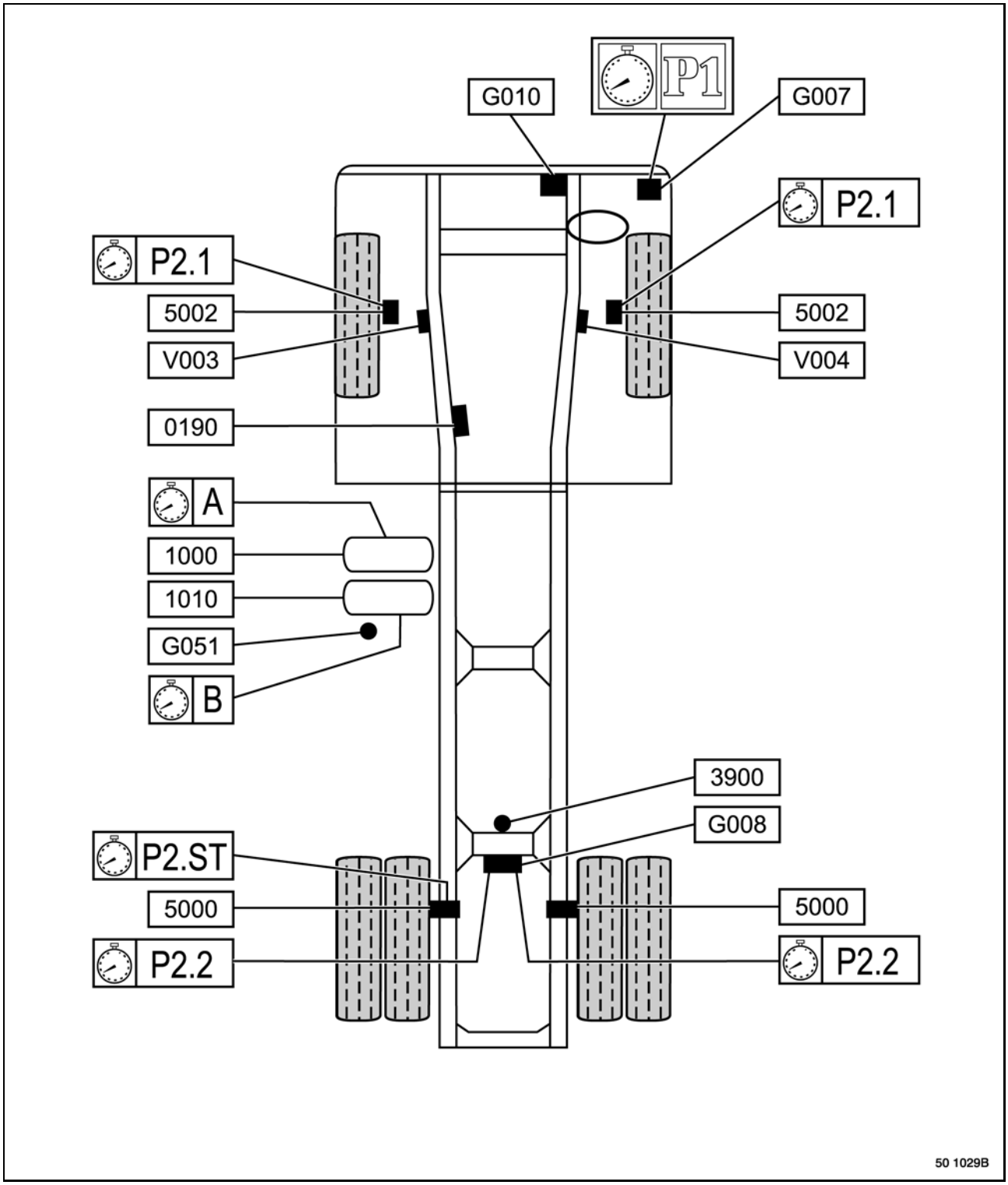
AV 612378G

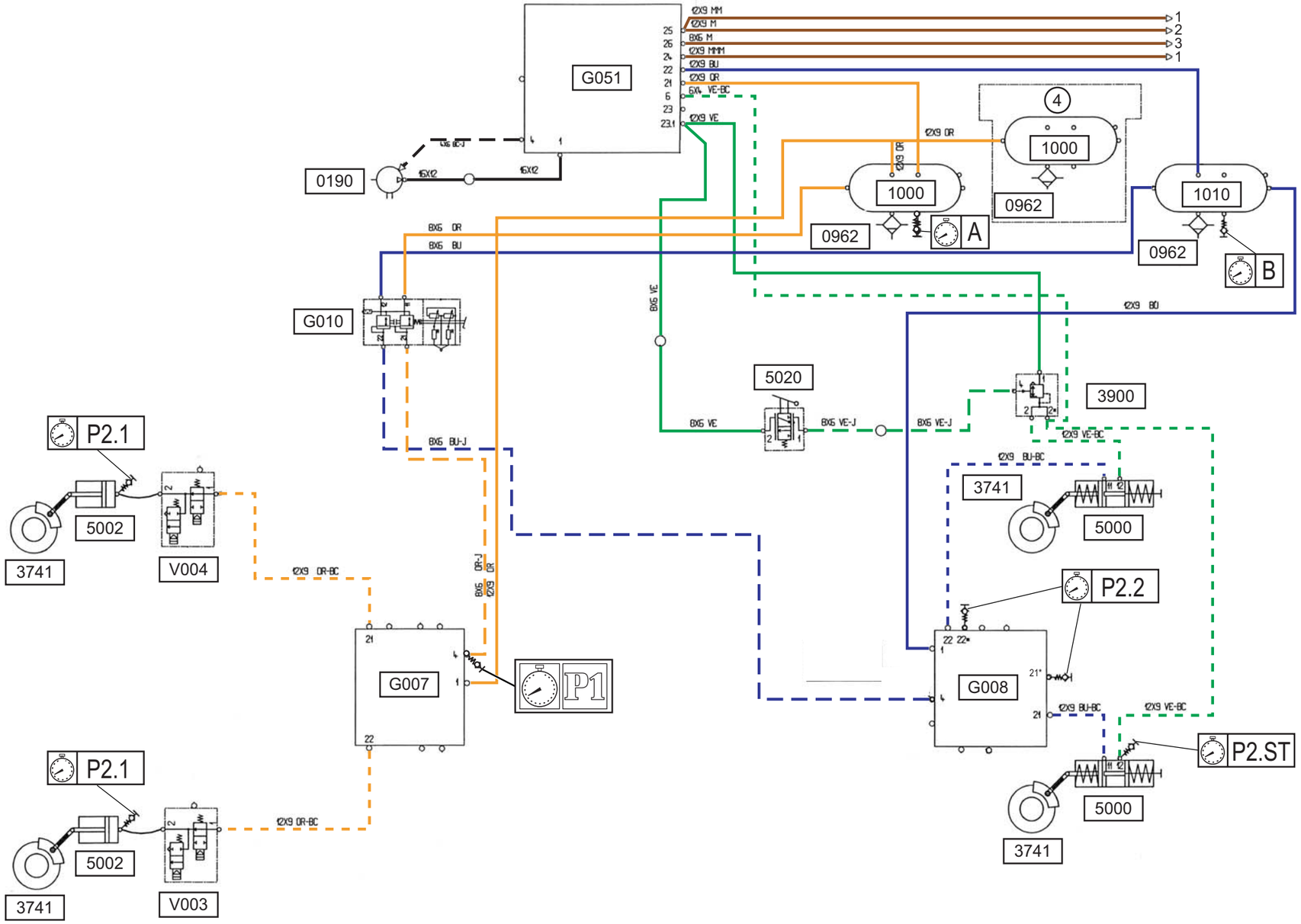
Pneumatic diagram

Location of appliances
LH drive **4X2** solo rigid vehicle.



Location of appliances
RH drive **4X2** solo rigid vehicle.




G051
ØX9 MM
ØX9 M
BX6 M
ØX9 MMM
ØX9 BU
ØX9 OR
6X4 VE-BC
ØX9 VE
25
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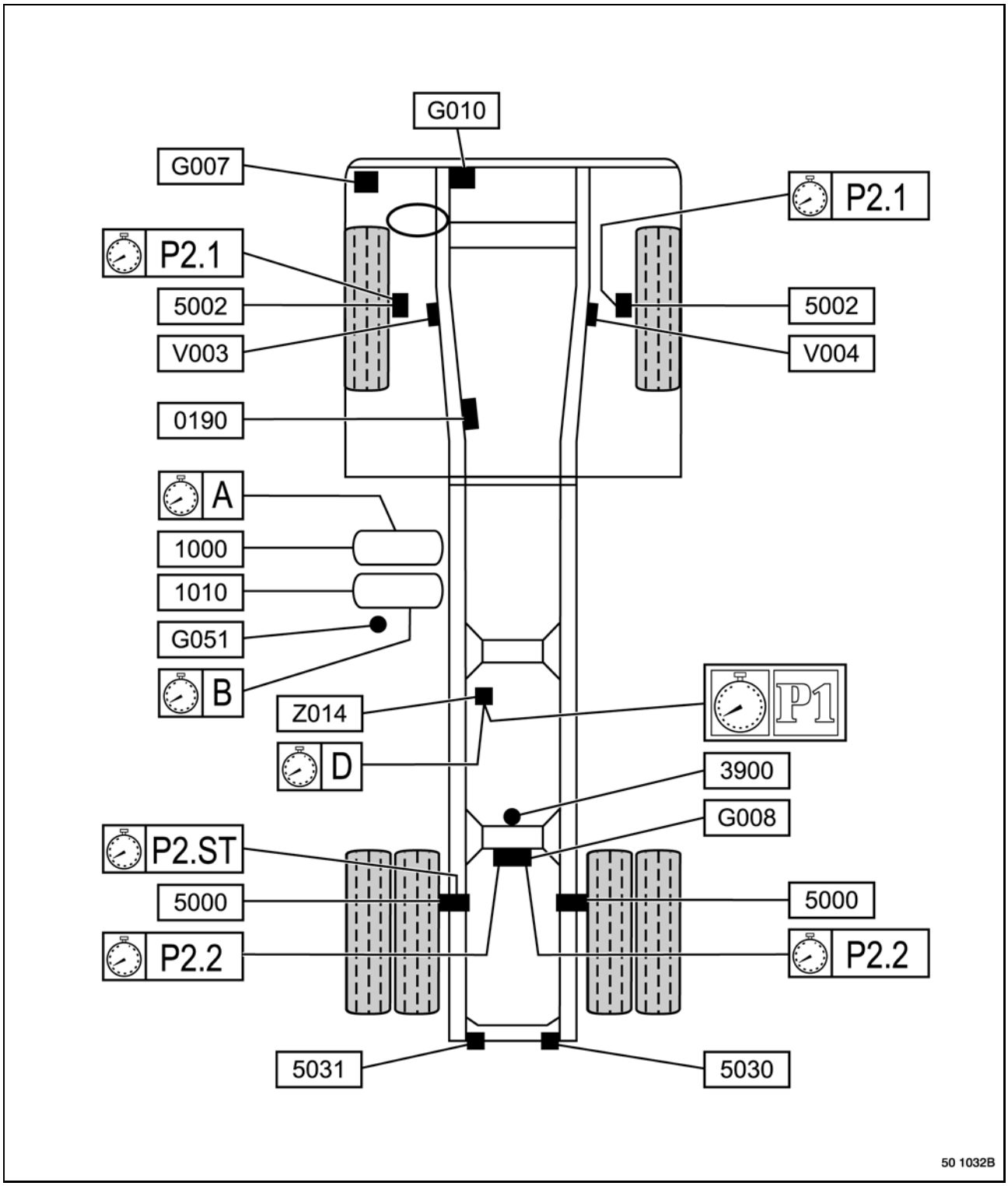
24
22
21
6
23
23.1
1
2
3
1
0190
15X2
15X2
4
1000
0962
ØX9 OR
1000
0962
A
1010
0962
B
BX6 OR
BX6 BU
G010
BX6 VE
ØX9 BU
5020
BX6 VE
BX6 VE-J
BX6 VE-J
3900
ØX9 VE-BC
ØX9 BU-BC
3741
5000
P2.1
5002
3741
V004
ØX9 OR-BC
BX6 BU-J
BX6 OR-J
BX6 ØX9 OR
G007
P1
P2.2
G008
22 22*
21*
21
ØX9 BU-BC
ØX9 VE-BC
P2.ST
5000
3741
P2.1
5002
3741
V003
ØX9 OR-BC

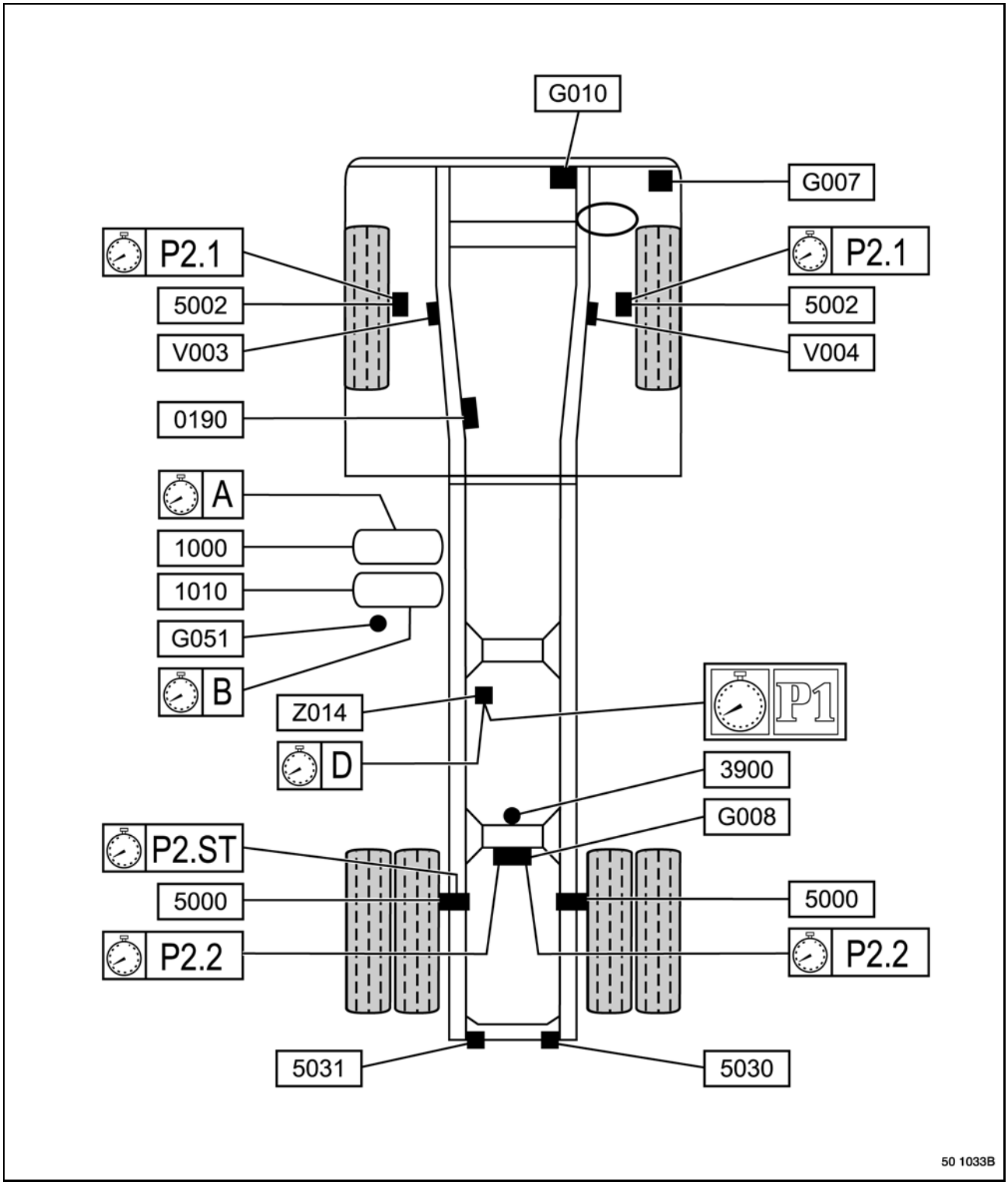
AV 569833F

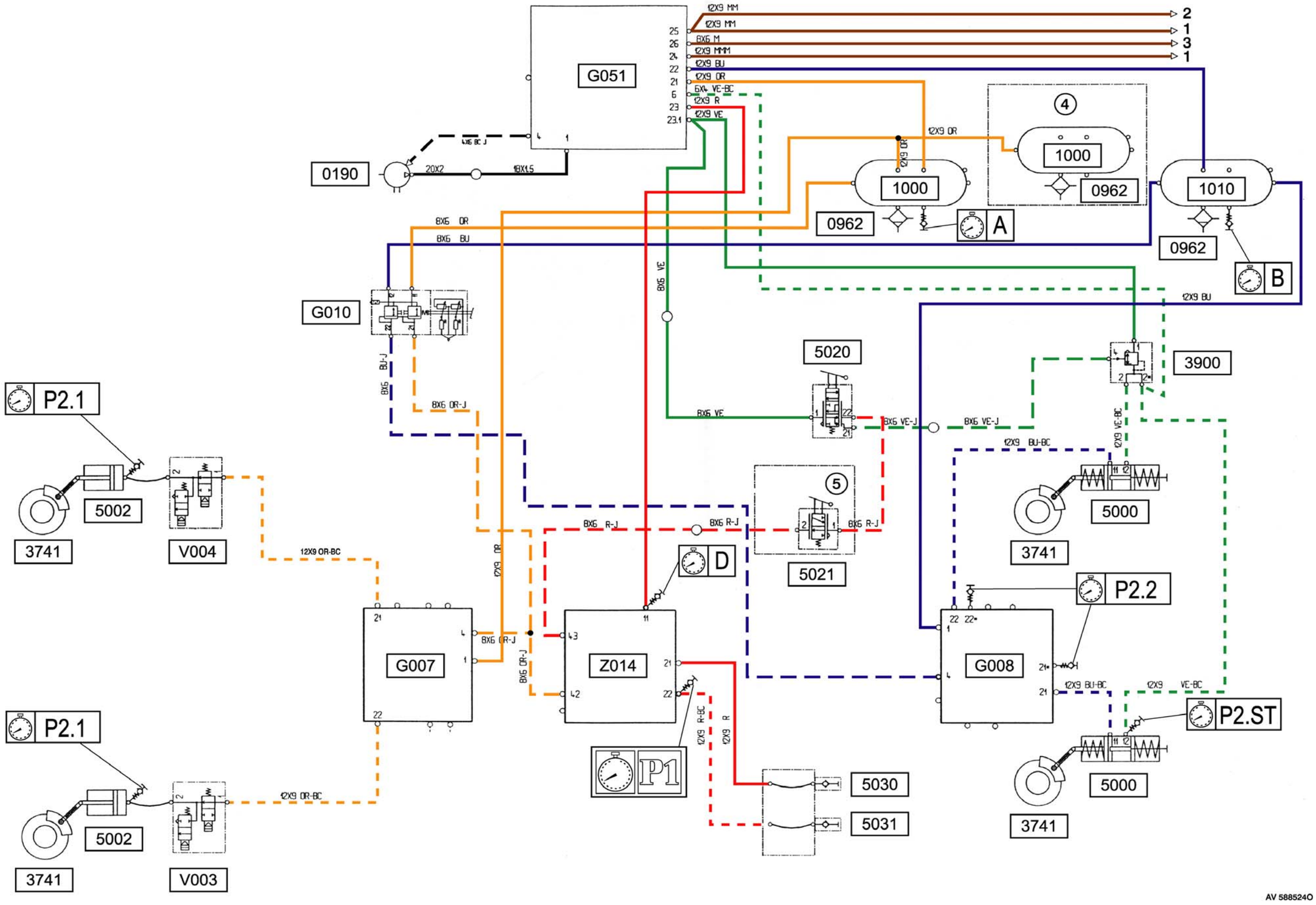
Pneumatic diagram

Location of appliances
LH drive **4X2** ≤ **60** tonnes drawbar rigid vehicle.



Location of appliances
RH drive **4X2** ≤ **60** tonnes drawbar rigid vehicle.

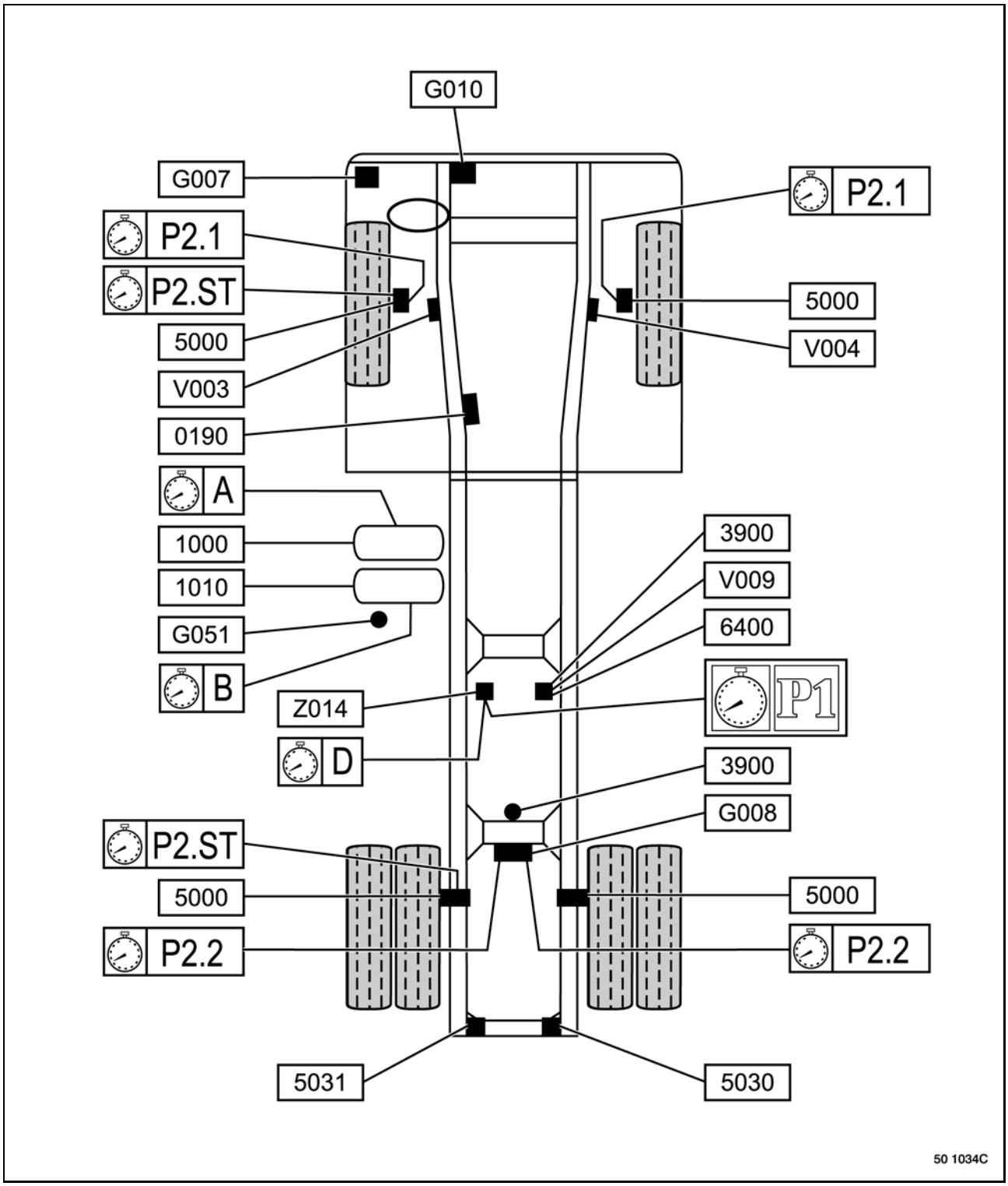



G051
12X9 MM
12X9 MM
BX6 M
12X9 MMM
12X9 BU
12X9 OR
BX4 VE-BC
12X9 R
12X9 VE
25
26
24
22
21
6
23
23.1
2
1
3
1
0190
4X6 BC J
20X2
18X1.5
4
1000
0962
1000
0962
1010
0962
12X9 OR
A
B
8X6 OR
8X6 BU
G010
BU-J
BX6
BX6 OR-J
BX6 VE
12X9 BU
5020
3900
BX6 VE-J
BX6 VE-J
12X9 BU-BC
12X9 VE-BC
5
5021
BX6 R-J
BX6 R-J
BX6 R-J
D
5000
3741
P2.1
5002
3741
V004
12X9 OR-BC
12X9 OR
G007
BX6 OR-J
BX6 OR-J
Z014
P1
12X9 R-BC
12X9 R
5030
5031
G008
P2.2
12X9 BU-BC
12X9 VE-BC
P2.ST
5000
3741
P2.1
5002
3741
V003
12X9 OR-BC

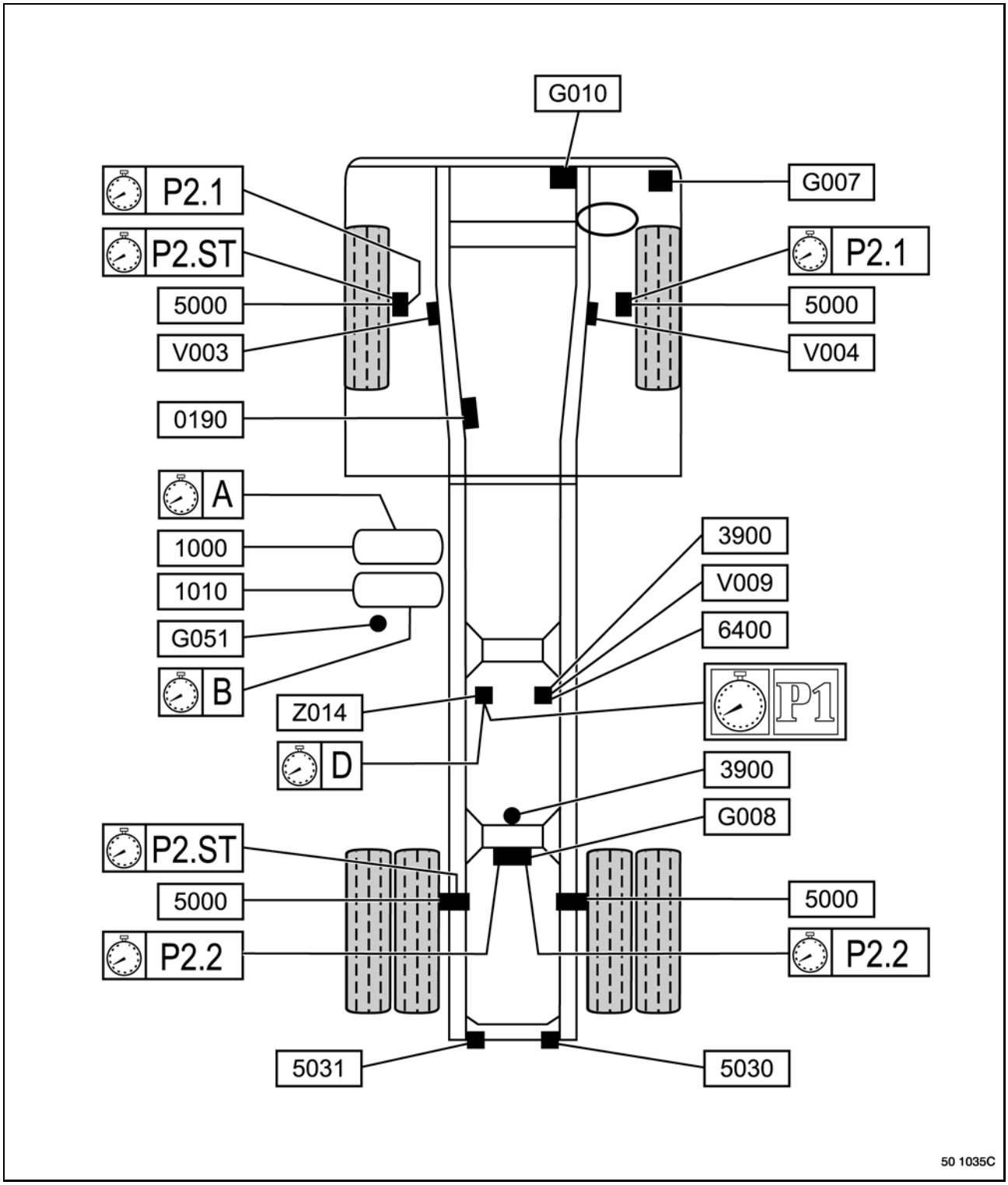
AV 588524O

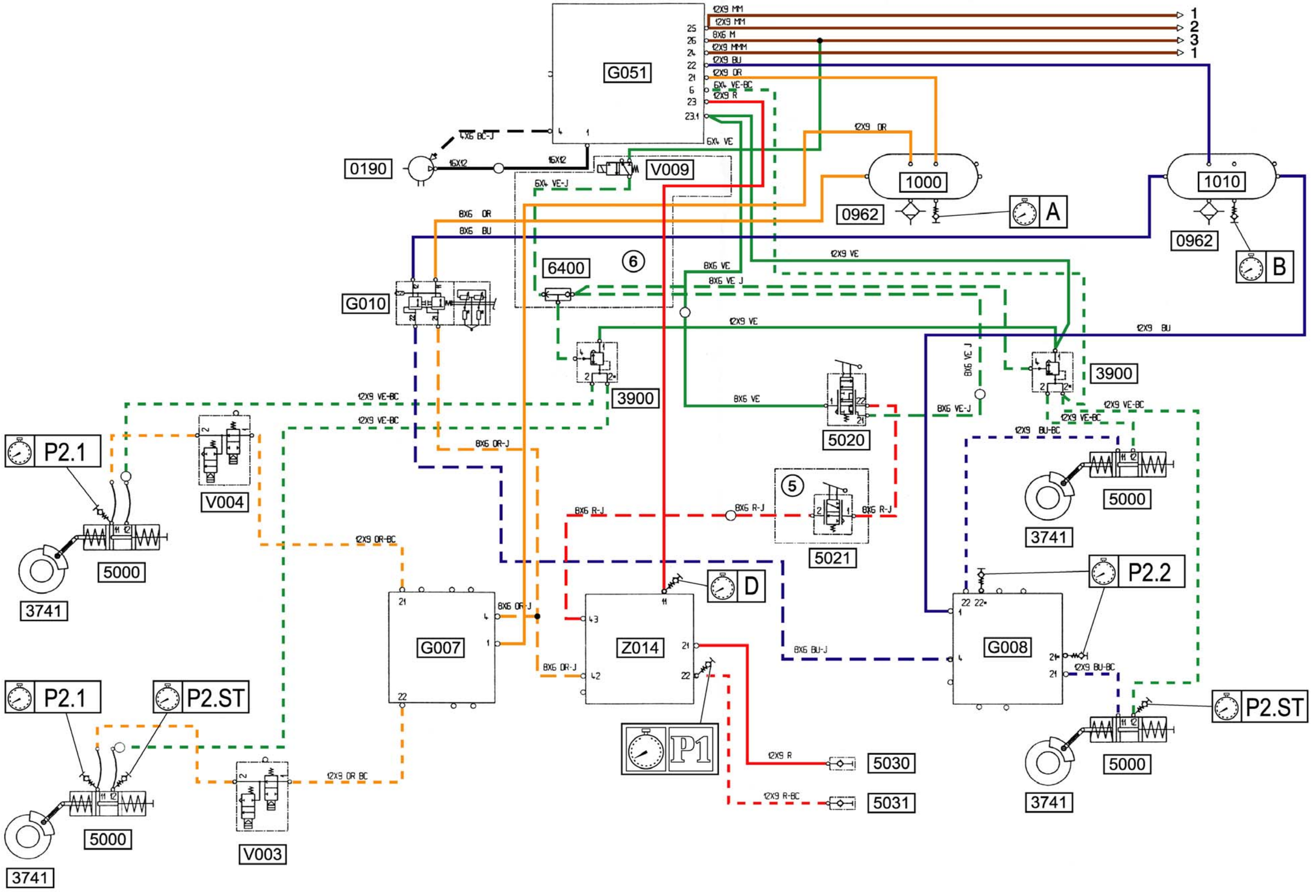
Pneumatic diagram

Location of appliances
LH drive **4X2** ≥ **60** tonnes drawbar rigid vehicle.



Location of appliances
RH drive **4X2** ≥ **60** tonnes drawbar rigid vehicle.

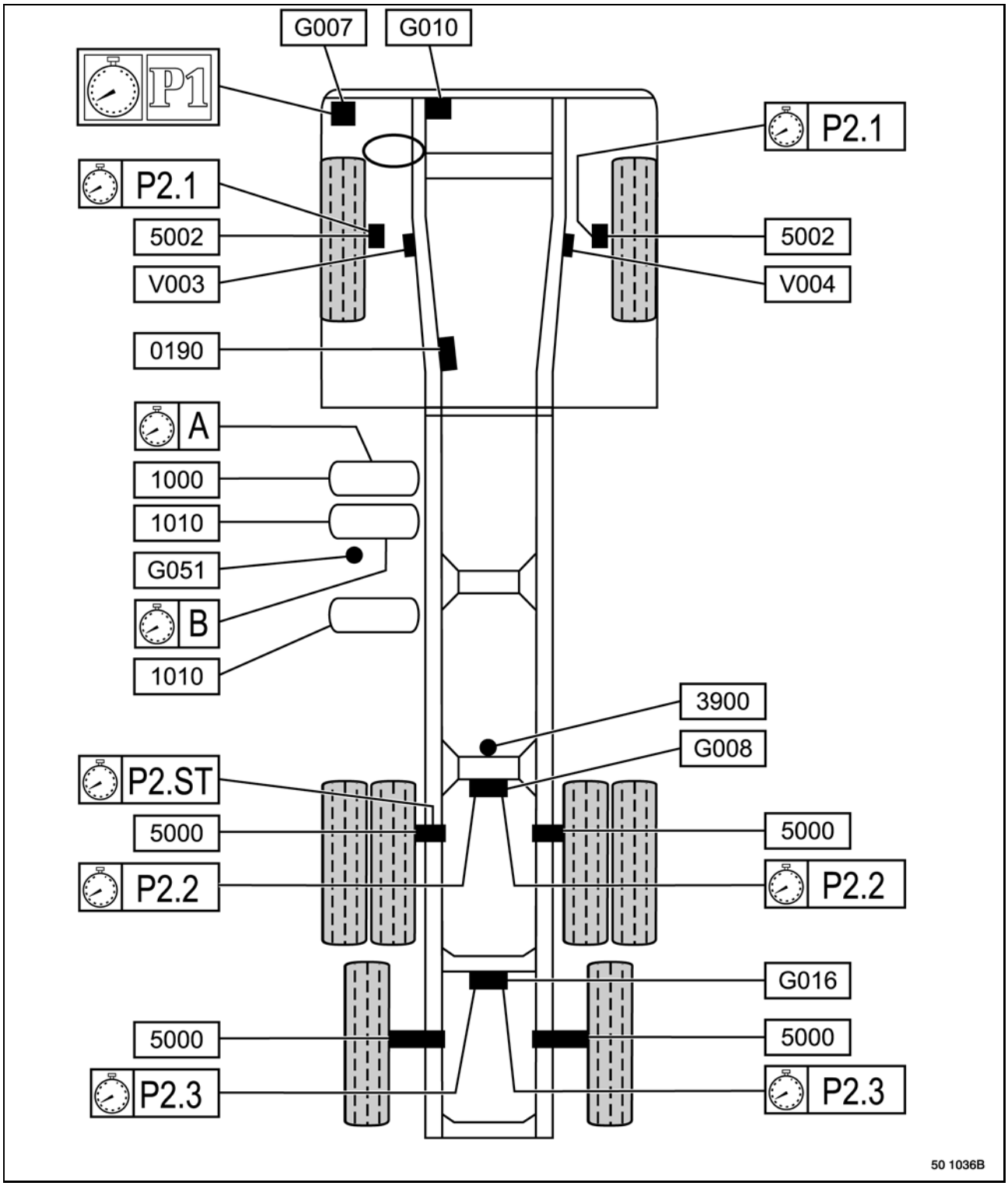



G051
25
26
24
22
21
5
23
23.1
12X9 MM1
12X9 MM1
8X6 M
12X9 MMM
12X9 BU
12X9 OR
6X4 VE-BC
12X9 R
1
2
3
1
6X4 BC-J
6X12
6X12
0190
V009
6X4 VE
6X4 VE-J
12X9 OR
1000
0962
A
1010
0962
B
8X6 OR
8X6 BU
6400
6
8X6 VE
8X6 VE J
12X9 VE
G010
12X9 VE
12X9 BU
3900
3900
12X9 VE-BC
12X9 VE-BC
8X6 VE
8X6 VE-J
5020
12X9 VE-BC
12X9 BU-BC
8X6 OR-J
5000
3741
8X6 R-J
8X6 R-J
8X6 R-J
5
5021
12X9 OR-BC
P2.1
V004
5000
3741
D
P2.2
G007
Z014
G008
8X6 OR-J
8X6 OR-J
8X6 BU-J
22 22
21
12X9 BU-BC
P2.1
P2.ST
P1
12X9 R
5030
12X9 R-BC
5031
P2.ST
5000
3741
12X9 OR BC
V003
5000
3741

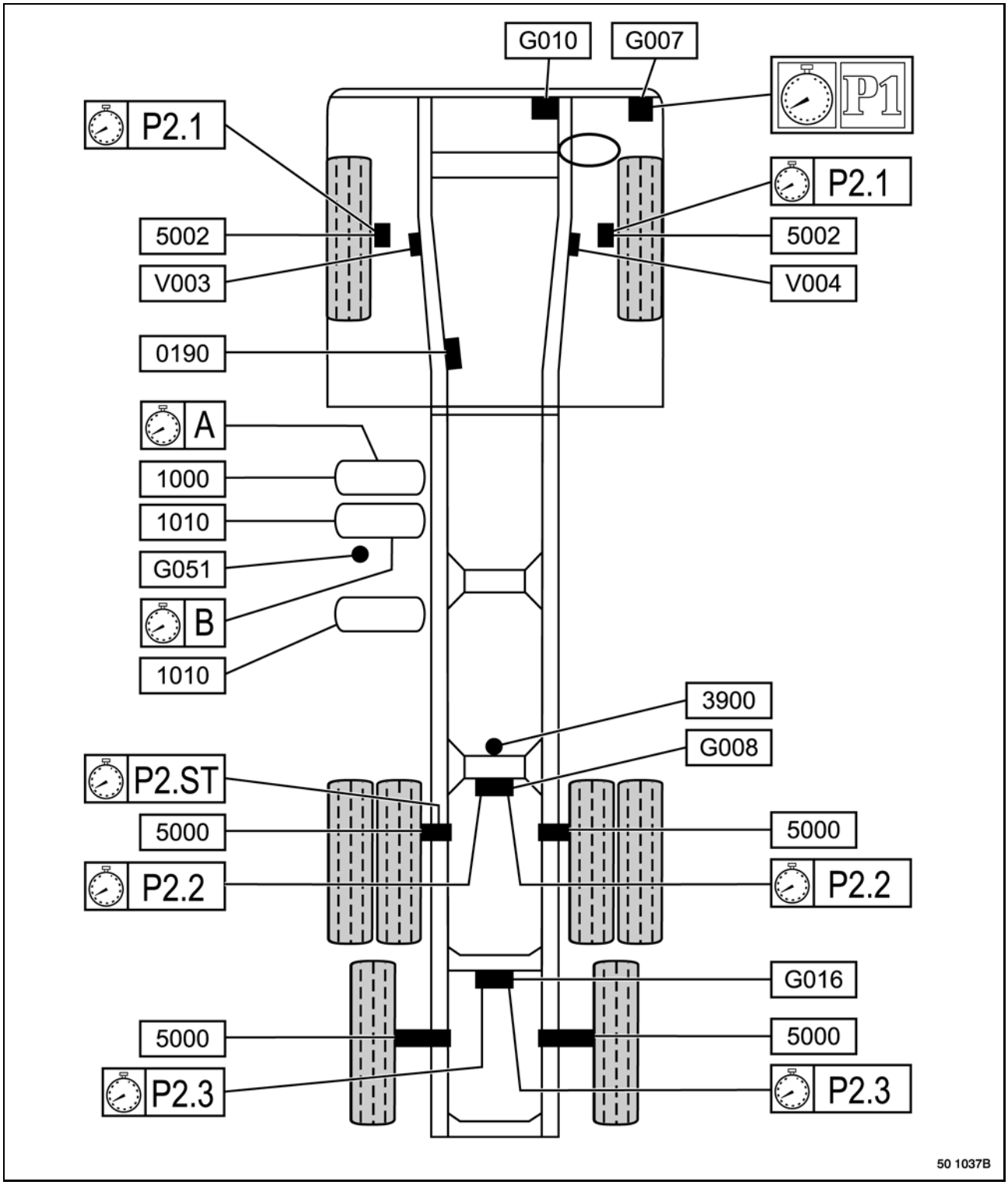
AV 588566I

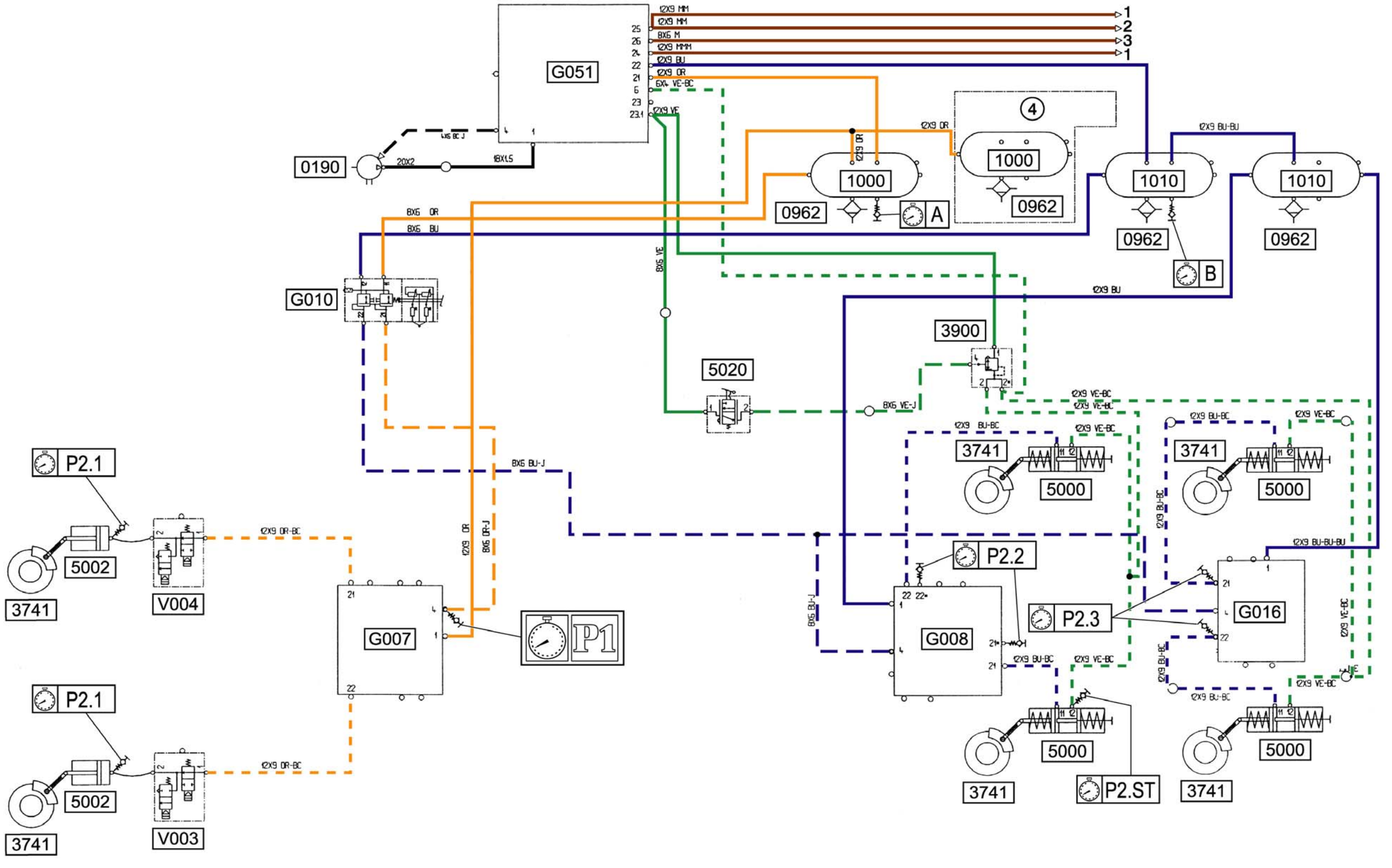
Pneumatic diagram

Location of appliances
LH drive **6X2** solo rigid vehicle.



Location of appliances
RH drive **6X2** solo rigid vehicle.

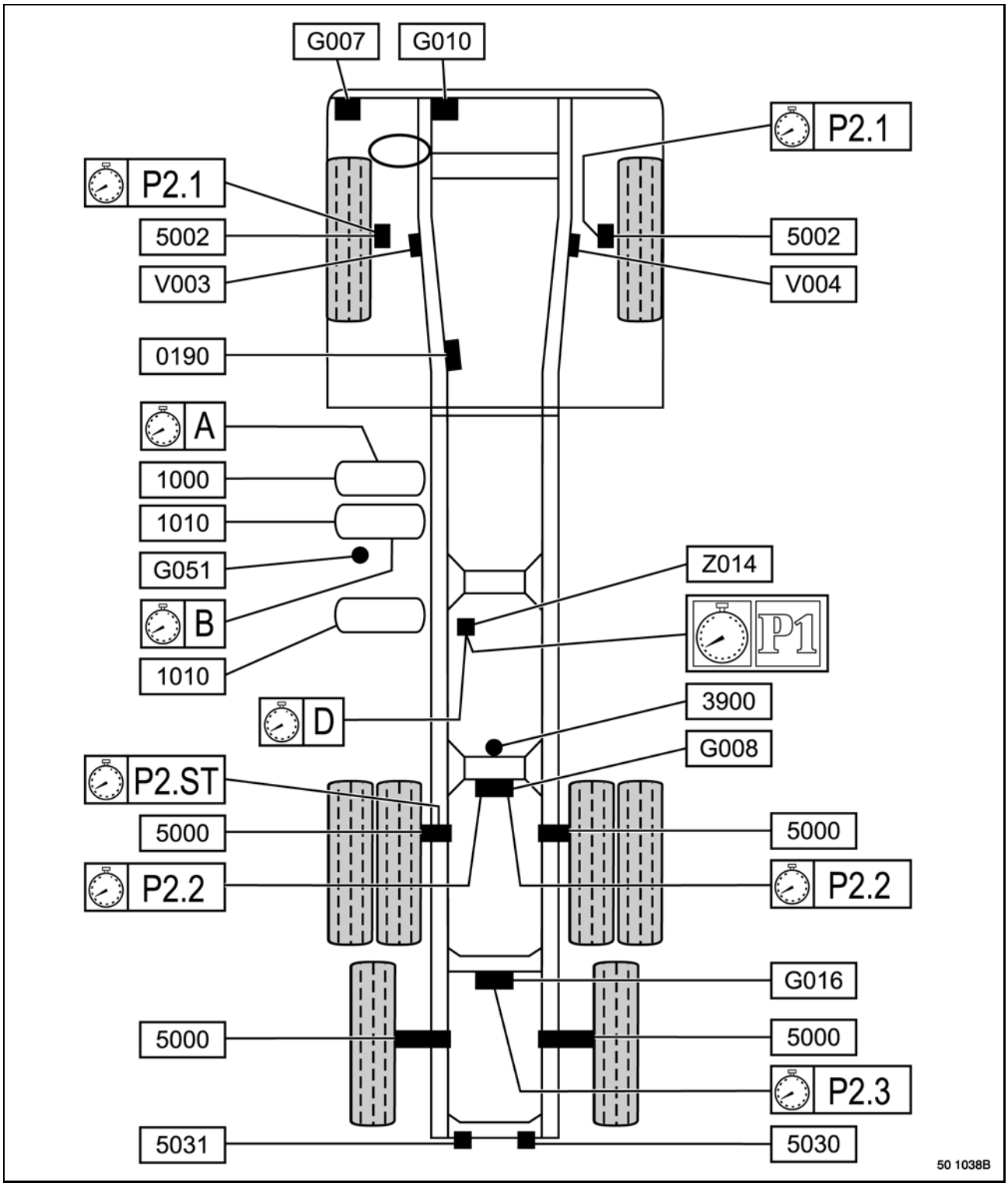



G051
12X9 MM
12X9 MM
8X6 M
12X9 MMM
12X9 BU
12X9 OR
6X4 VE-BC
12X9 VE
25
26
24
22
21
6
23
23.1
1
2
3
1
0190
20X2
18X1.5
12X9 OR
1000
0962
A
4
1000
0962
12X9 BU-BU
1010
0962
B
1010
0962
8X6 OR
8X6 BU
8X6 VE
G010
12X9 BU
3900
5020
BX6 VE-J
12X9 VE-BC
12X9 VE-BC
3741
5000
12X9 BU-BC
12X9 VE-BC
3741
5000
12X9 BU-BC
P2.1
5002
3741
V004
12X9 OR-BC
BX6 BU-J
12X9 OR
BX6 OR-J
G007
P1
P2.2
G008
P2.3
G016
12X9 BU-BU-BU
12X9 VE-BC
12X9 BU-BC
12X9 VE-BC
5000
3741
P2.ST
12X9 BU-BC
12X9 VE-BC
5000
3741
P2.1
5002
3741
V003
12X9 OR-BC
BX6 BU-J

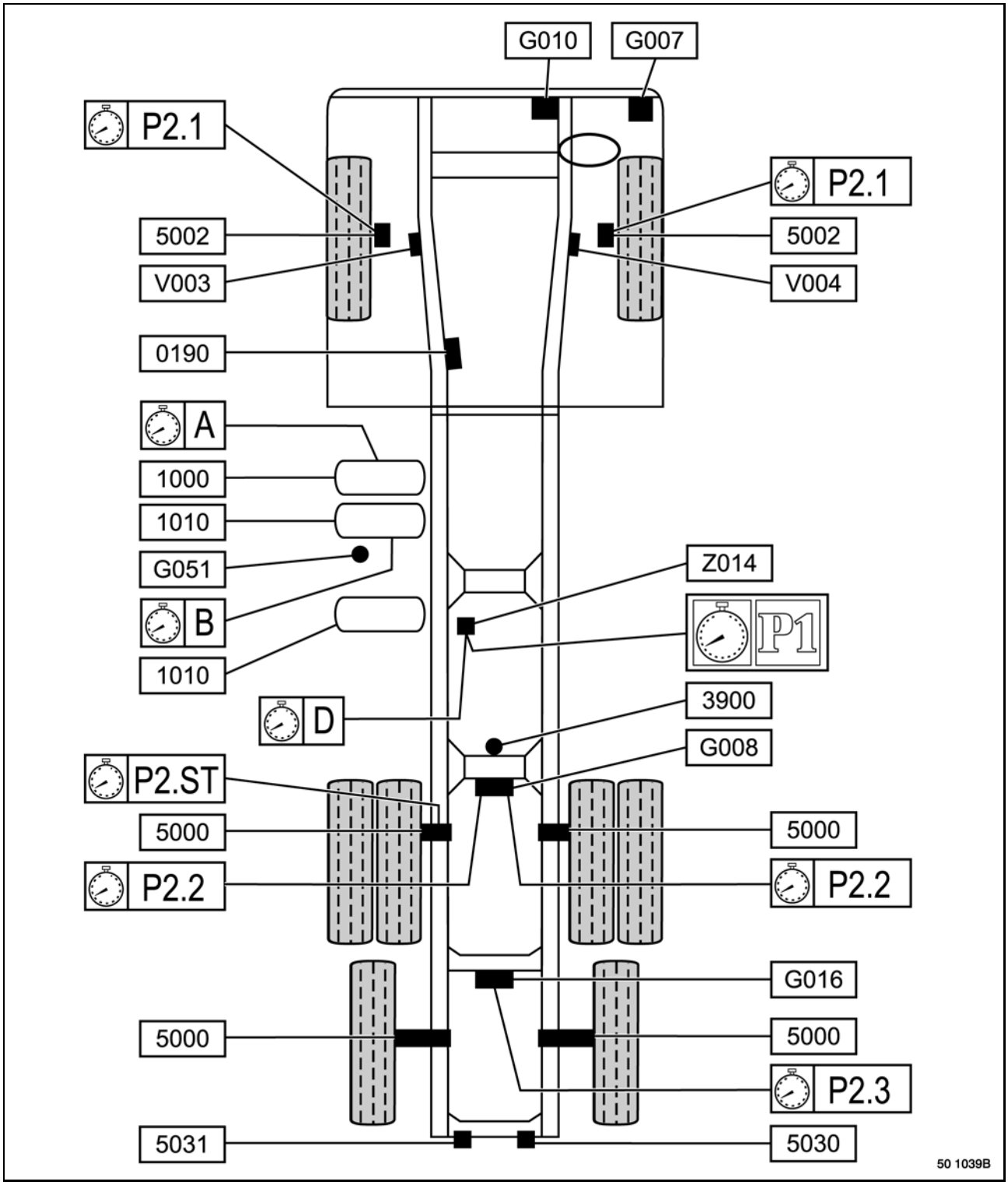
AV 588531C

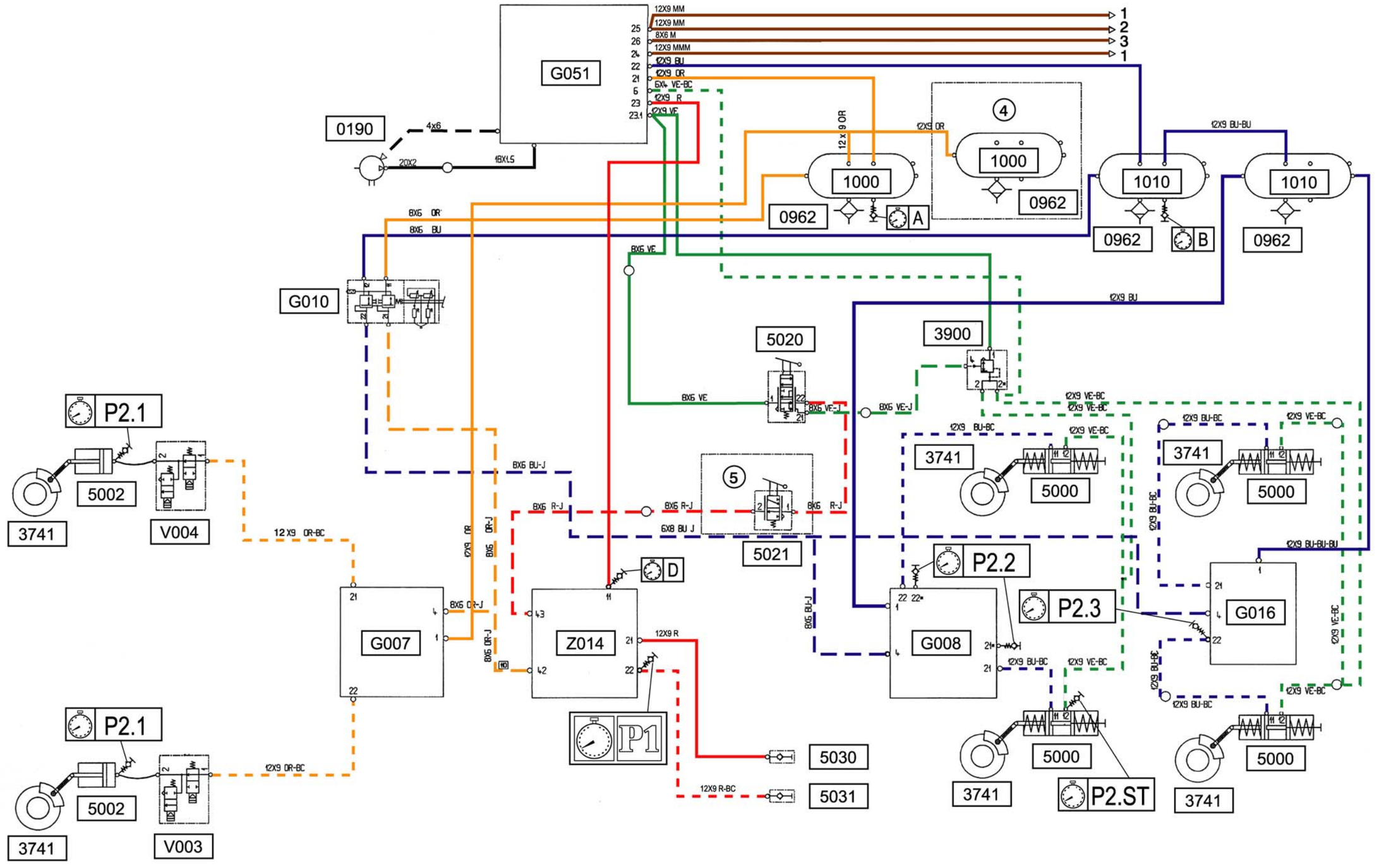
Pneumatic diagram

Location of appliances
LH drive **6X2** drawbar rigid vehicle.



Location of appliances
RH drive **6X2** drawbar rigid vehicle.

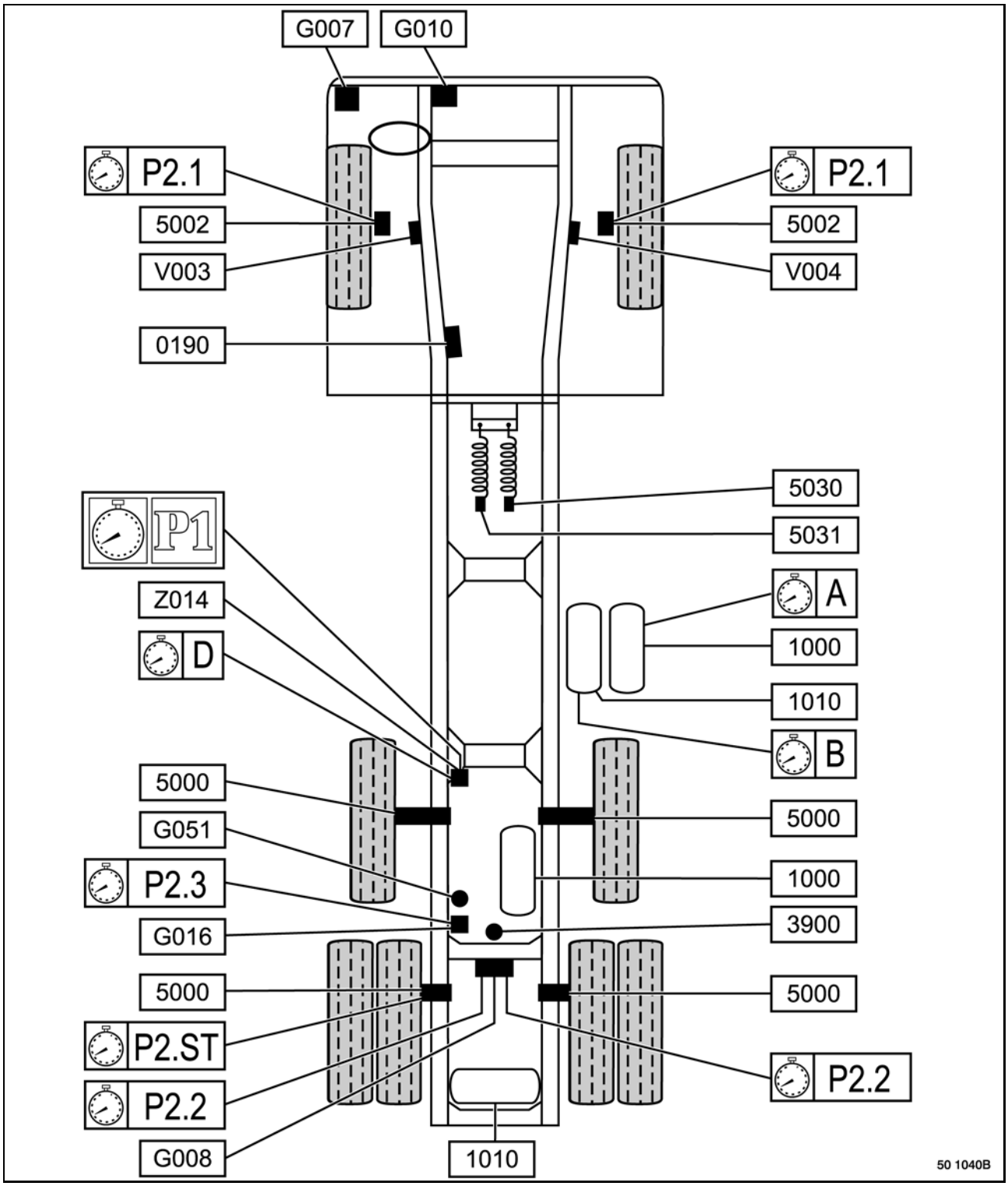



G051
12X9 MM
12X9 MM
8X6 M
12X9 MMM
12X9 BU
12X9 OR
6X4 VE-BC
12X9 R
12X9 VE
25
26
24
22
21
5
23
23.1
1
2
3
1
0190
4x6
20X2
1BX1.5
12 x 9 OR
12X9 OR
4
1000
0962
A
1000
0962
12X9 BU-BU
1010
0962
B
1010
0962
8X6 OR
8X6 BU
8X6 VE
G010
12X9 BU
5020
3900
8X6 VE
8X6 VE-J
12X9 VE-BC
12X9 VE-BC
12X9 BU-BC
12X9 VE-BC
3741
5000
12X9 BU-BC
12X9 VE-BC
3741
5000
P2.1
5002
3741
V004
12 X9 OR-BC
8X6 BU-J
8X6 R-J
8X6 R-J
8X6 BU J
5
5021
12X9 OR
8X6 OR-J
8X6 OR-J
D
P2.2
P2.3
12X9 BU-BU-BU
G007
Z014
G008
G016
12X9 R
12X9 BU-BC
12X9 VE-BC
12X9 VE-BC
12X9 BU-BC
P2.1
5002
3741
V003
12X9 OR-BC
P1
5030
5031
12X9 R-BC
3741
5000
P2.ST
3741
5000

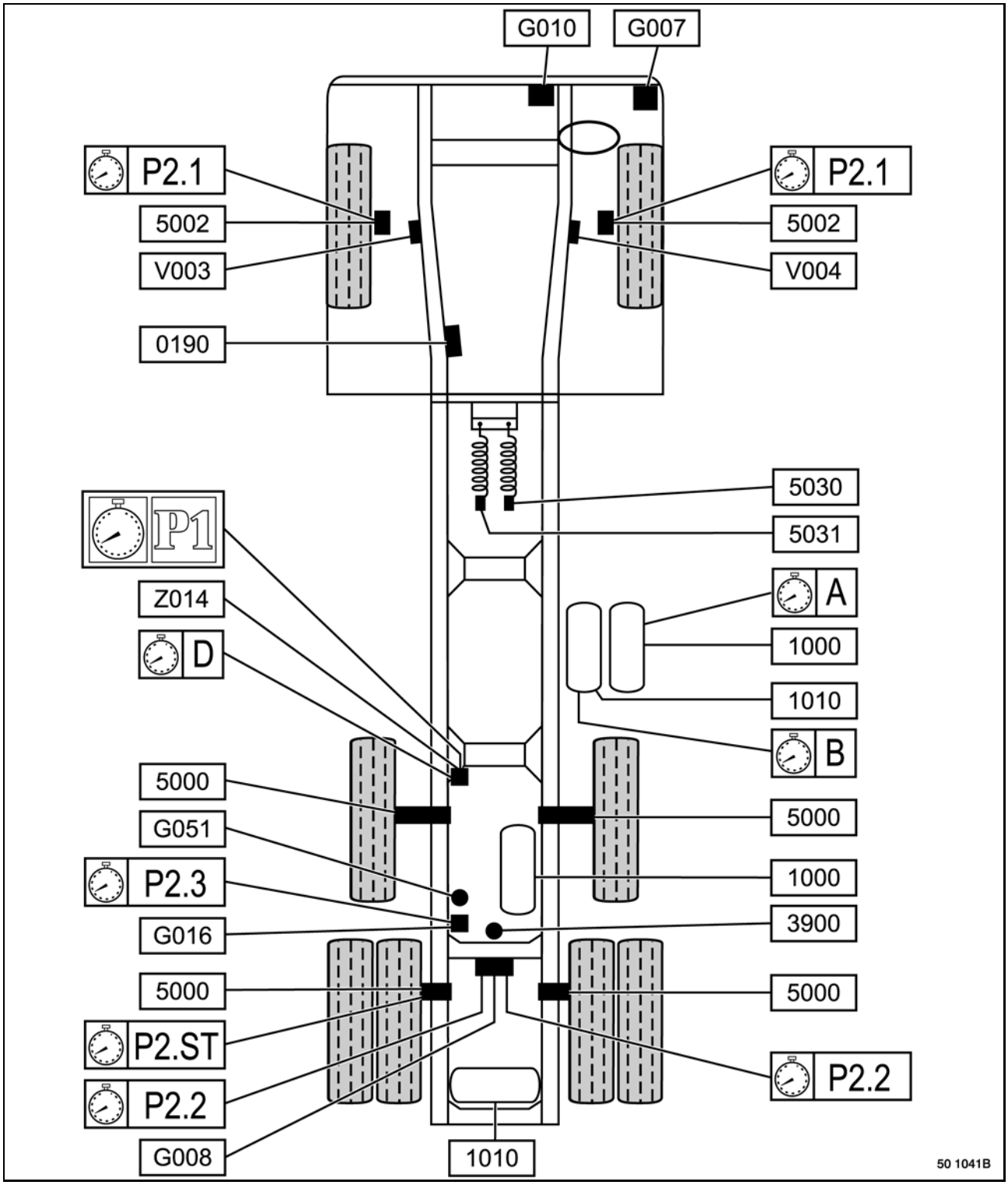
AV 588565M

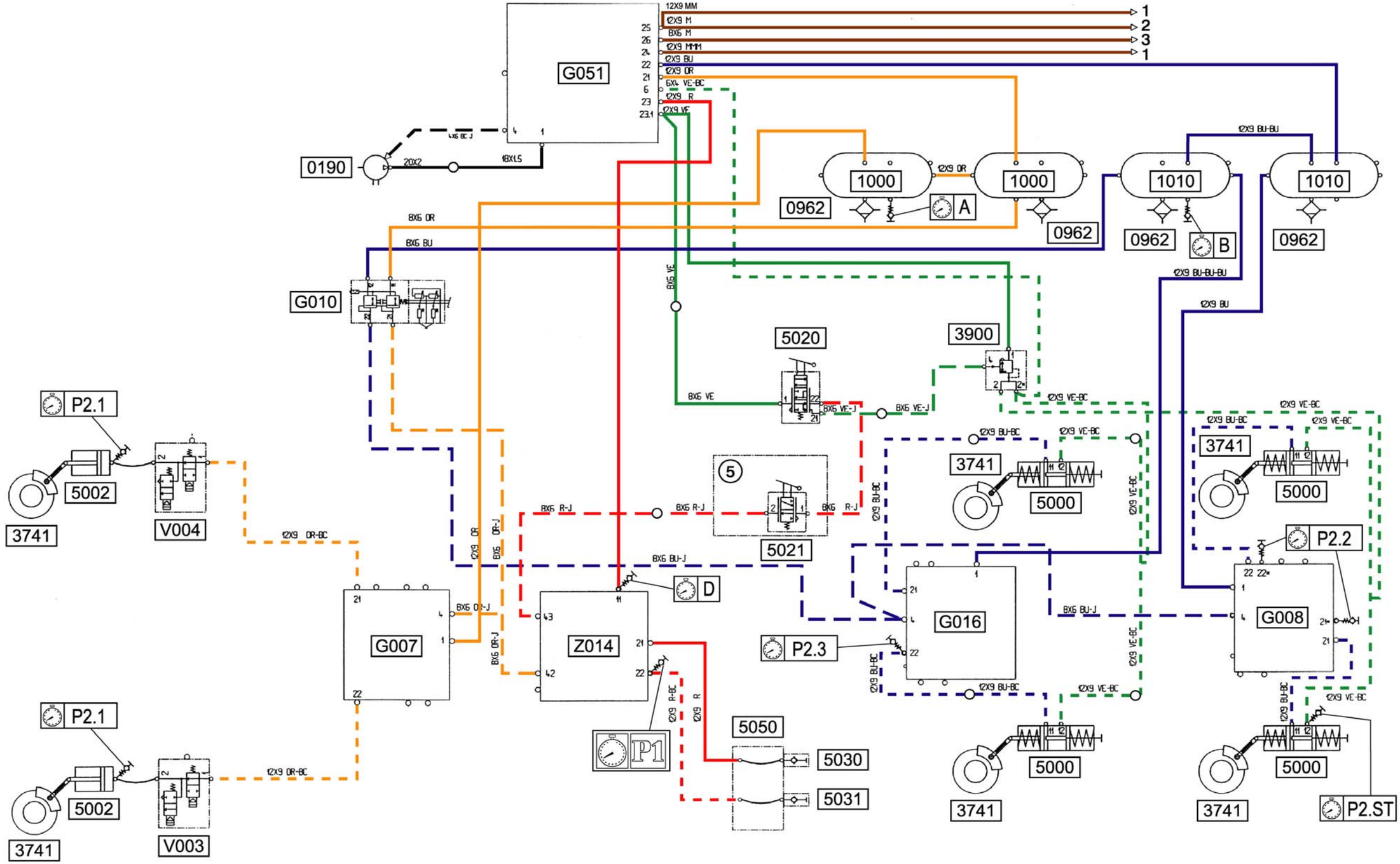
Pneumatic diagram

Location of appliances
LH drive **6X2 Pusher** tractor vehicle.



Location of appliances
RH drive **6X2 Pusher** tractor vehicle.




G051
12X9 MM
12X9 M
BX6 M
12X9 MM
12X9 BU
12X9 OR
6X4 VE-BC
12X9 R
12X9 VE
25
26
24
22
21
6
23
23.1
1
2
3
1
0190
20X2
18X1.5
1000
12X9 OR
1000
0962
A
1010
12X9 BU-BU
1010
0962
0962
B
0962
BX6 OR
BX6 BU
G010
BX6 VE
5020
3900
BX6 VE
BX6 VE-J
BX6 VE-J
12X9 VE-BC
12X9 BU-BC
12X9 VE-BC
12X9 VE-BC
12X9 BU-BU
12X9 BU
P2.1
5002
3741
V004
12X9 OR-BC
BX6 R-J
BX6 R-J
5
5021
BX6 R-J
12X9 OR
BX6 OR-J
BX6 BU-J
D
G007
BX6 OR-J
Z014
G016
P2.3
12X9 BU-BC
12X9 VE-BC
12X9 BU-BC
12X9 VE-BC
3741
5000
3741
5000
P2.2
G008
BX6 BU-J
12X9 VE-BC
12X9 BU-BC
12X9 VE-BC
12X9 R-BC
12X9 R
P1
5050
5030
5031
P2.1
5002
3741
V003
12X9 OR-BC
5000
3741
5000
3741
P2.ST

AV 633023B

Key

Key to appliances

G007	Front axle braking assistance modulator unit
G008	Drive axle braking assistance modulator unit
G010	Footbrake control 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
V009	60-tonne vehicle safety solenoid valve
Z014	Trailer brake control EBS modulator unit
0190	Air compressor
0962	Manual bleed 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
6400	Double check valve
7250	Valve backup

Key to cross-references

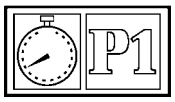
1 – To gearbox auxiliary equipment circuit
2 – To air suspensions
3 – To other auxiliary equipment.
4 – With front air suspension (variant **20704/11/18**)
5 – With trailer brake valve (variant **70302**)
6 – Except integral mechanical suspension

Air circuit test points

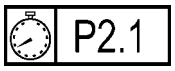
Front service brake air tank pressure.

Rear service brake air tank pressure.

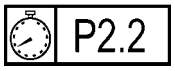
Trailer control brake modulator air supply pressure (port **11**).



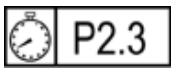
Braking reference point (priority circuit).
Port **4** for brake modulators and port **22** for trailer control brake modulator.



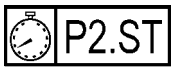
Pressure delivered to front axle cylinders.



Pressure delivered to rear axle cylinders (port **21 – 22**).



Pressure delivered to rear axle cylinders (port **21 – 22**).



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

*An inflation valve is available at port **24** of the air production management unit **(APM)**.*