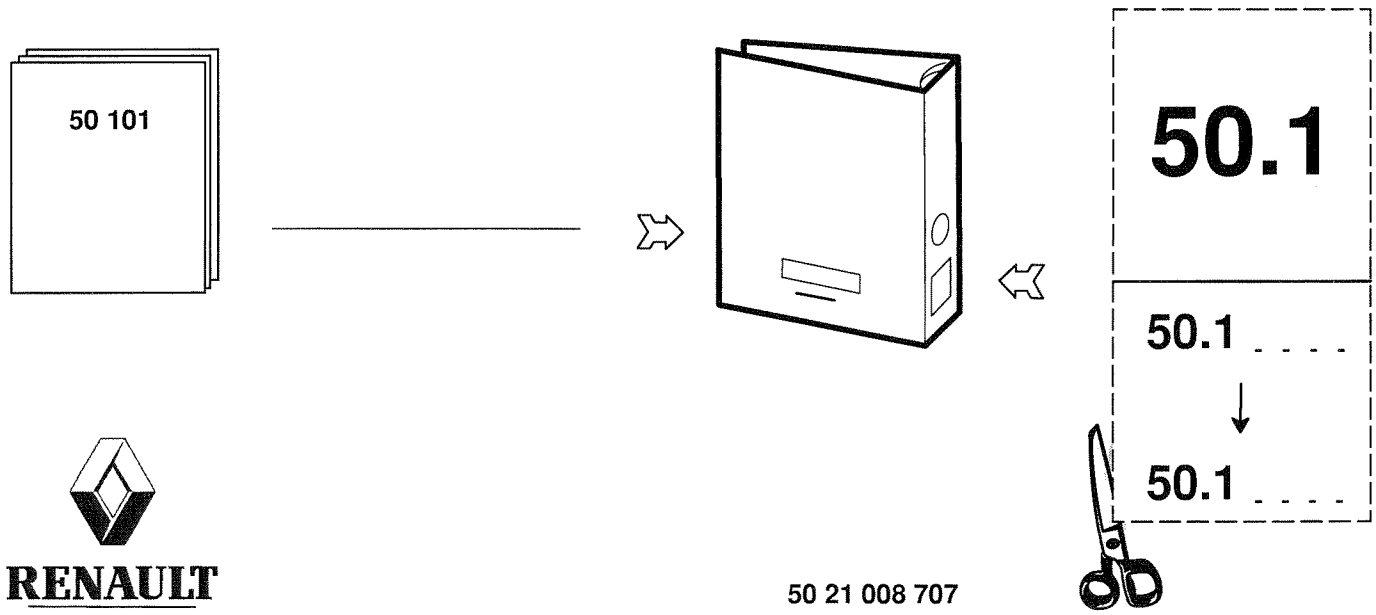
50 101 – AN – 08.2002

BRAKES

BRAKING	VEHICLE
ABS BOSCH 24	RENAULT PREMIUM 06/1999 ⇒ RENAULT KERAX 06/1999 ⇒ CIVIS – CRISTALIS Variante 24203 + 24301
ABS + ASR BOSCH EU12	RENAULT PREMIUM 04/2000 ⇒ AGORA 09/2001 ⇒ AGORA LINE 09/2001 ⇒ ARES – ILIADE 09/2001 ⇒ Variante 24203 + 24302/05



RENAULT

CONTENTS

PRESENTATION

The BOSCH 24 ABS and BOSCH EU12 ABS+ASR braking systems have evolved from the BOSCH ABS I8 braking system.

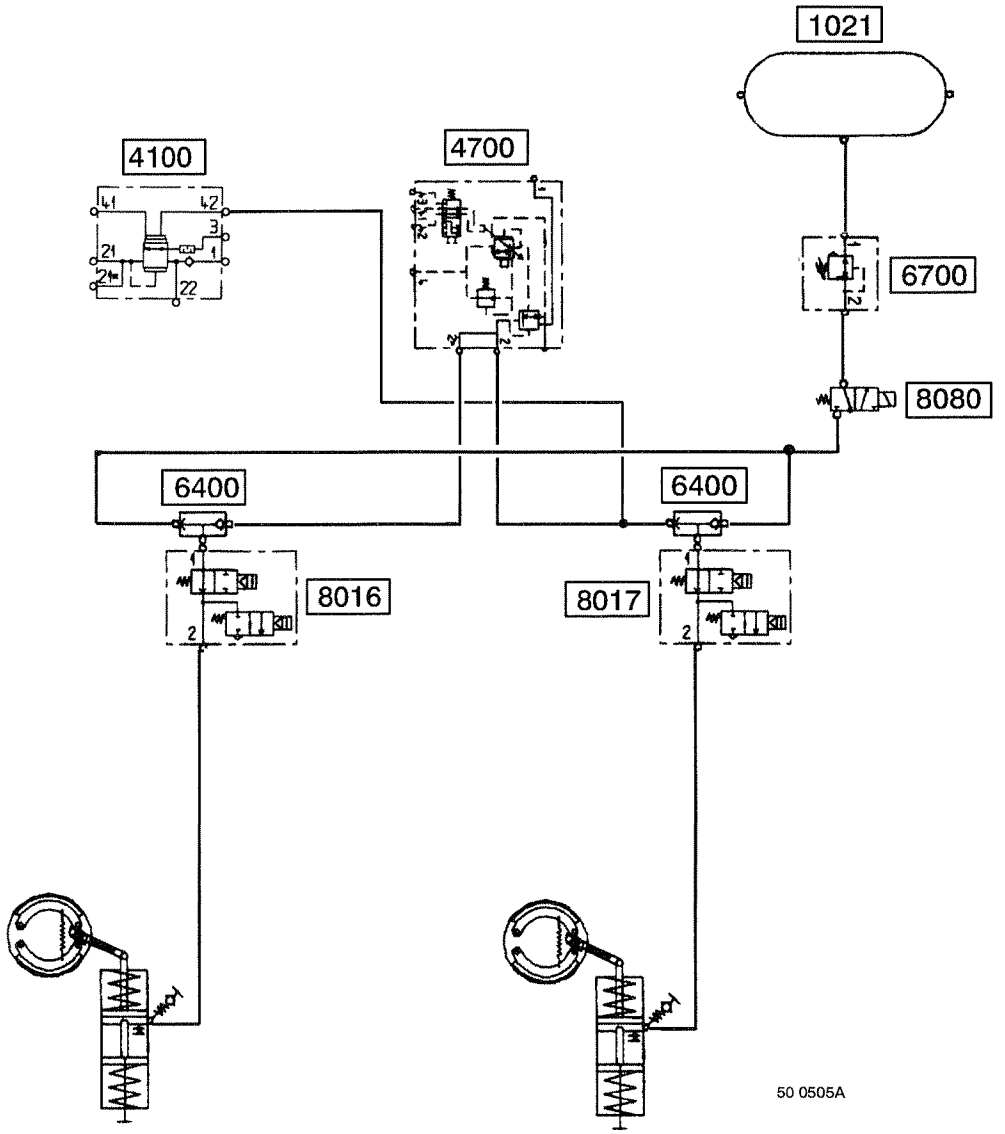
Special features of the EU12 ABS+ASR braking system

The system is provided with only 1 ASR electrovalve common to the right–hand and left–hand circuit supply. The ASR function is achieved by the combined action of the ABS valves and the ASR valve.

The braking function (+ ABS) takes priority over the ASR function. Whenever the ignition is switched on, the system tests the operation of braking information being taken into account and the ASR warning light (8020) comes on.
The test is validated and the ASR warning light (8020) goes out the first time the brake pedal is depressed.

PNEUMATIC DIAGRAMS

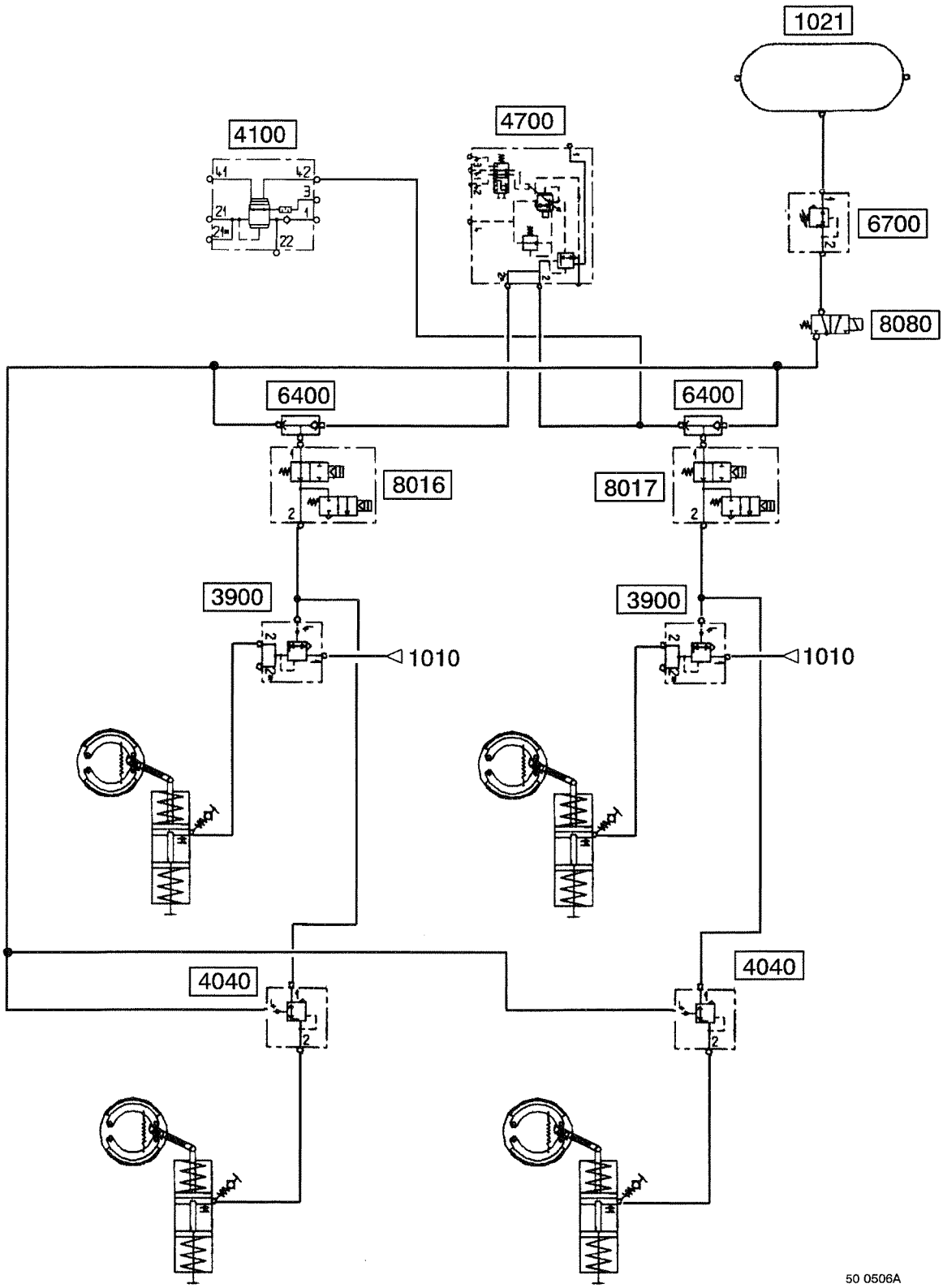
RENAULT KERAX – RENAULT PREMIUM 4x2 diagram



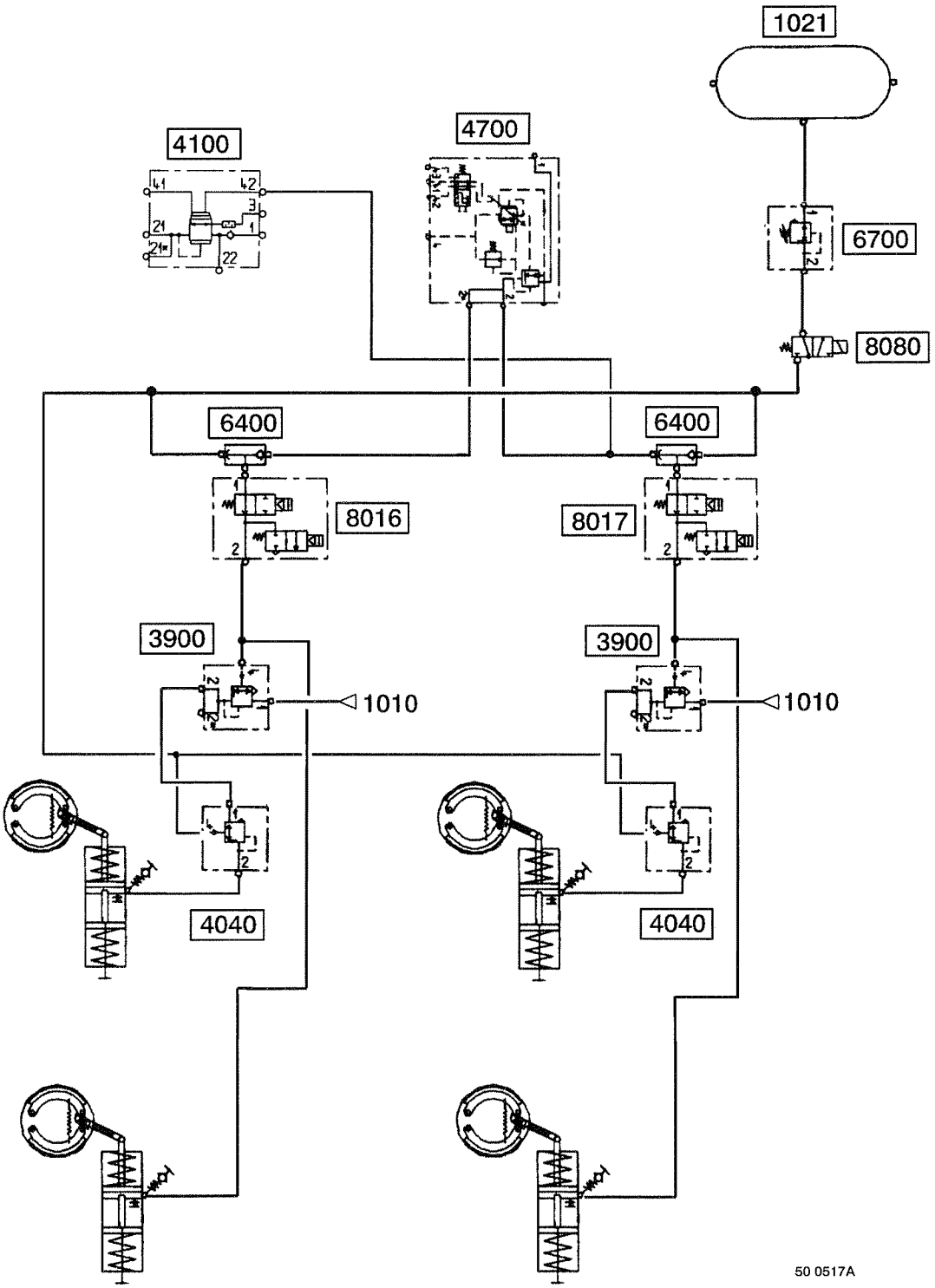
KEY TO PNEUMATIC DIAGRAMS

1021 – Trailer brake and brake air tank
3900 – Single relay governor valve
4040 – Inverse relay valve
4100 – Double relay valve
4700 – Load sensing valve
6400 – Double check valve
6700 – Overflow valve
8016 – LH rear roadwheel ABS electrovalve
8017 – RH rear roadwheel ABS electrovalve
8080 – ASR electrovalve

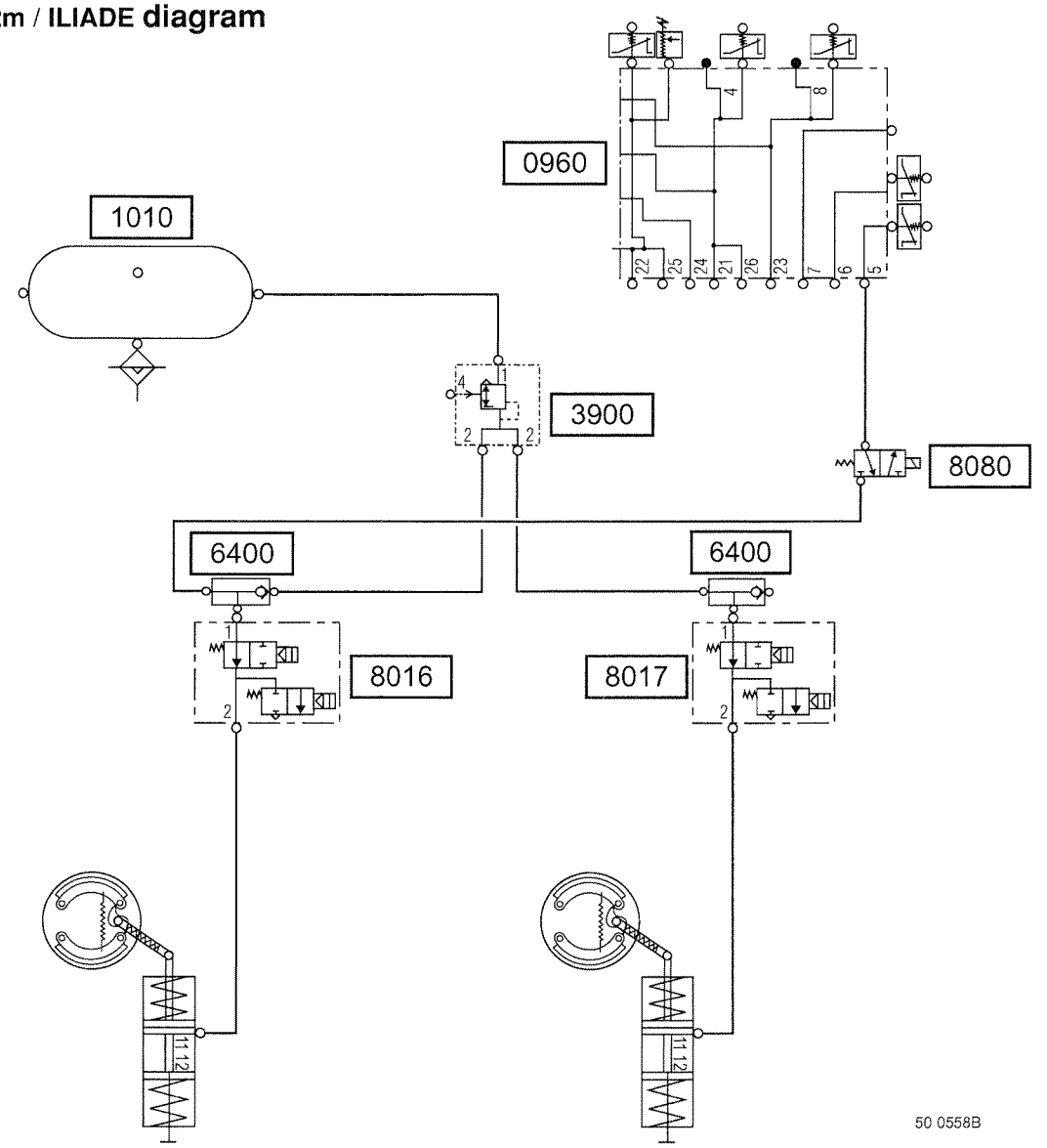
RENAULT PREMIUM 6x2 diagram



RENAULT PREMIUM 6x2/4 diagram



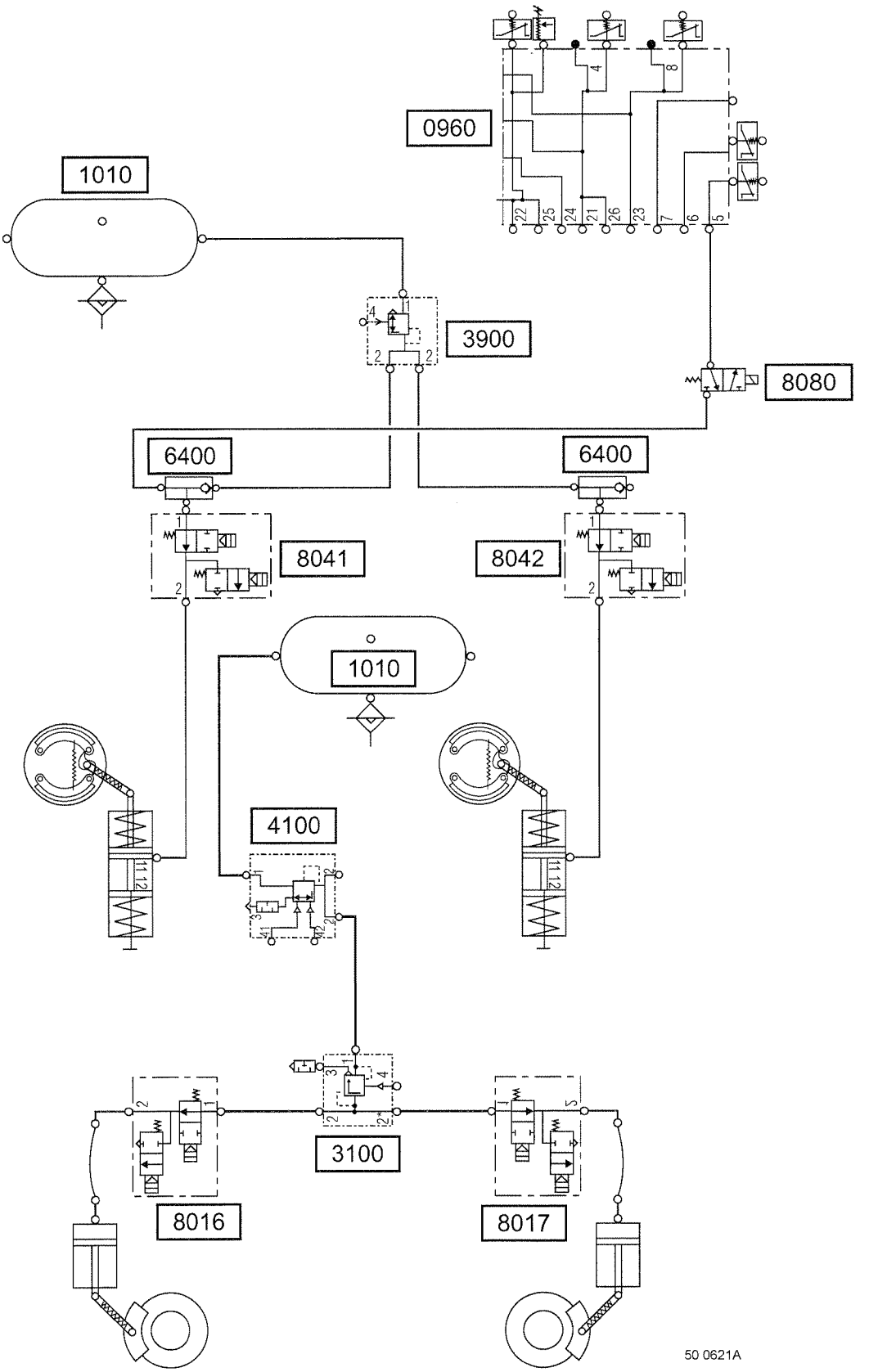
ARES 12m / ILIADE diagram



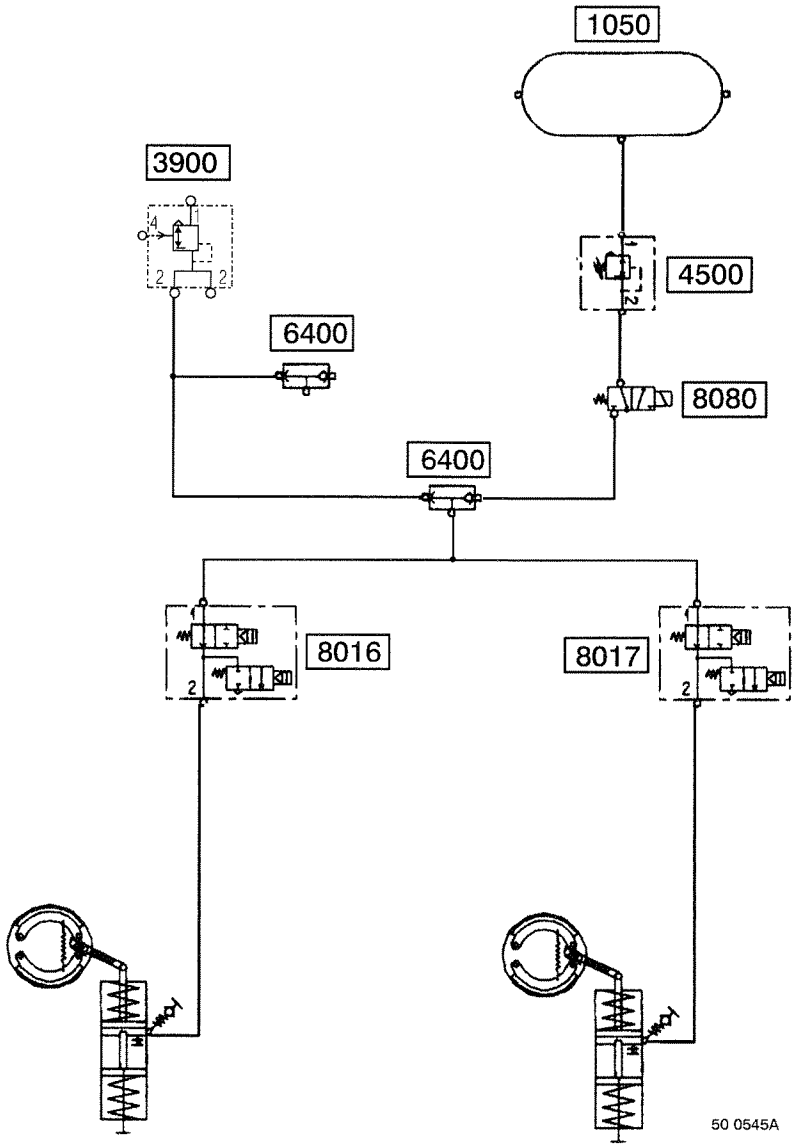
KEY TO PNEUMATIC DIAGRAMS

0960 – Connection block
1010 – Rear brake air tank
3100 – Pressure reduction valve
3900 – Single relay governor valve
4100 – Double relay valve
6400 – Double check valve
8016 – ABS LH rear roadwheel electrovalve
8017 – ABS RH rear roadwheel electrovalve
8041 – Middle axle LH side ABS electrovalve
8042 – Middle axle RH side ABS electrovalve
8080 – ASR electrovalve

ARES 15m diagram



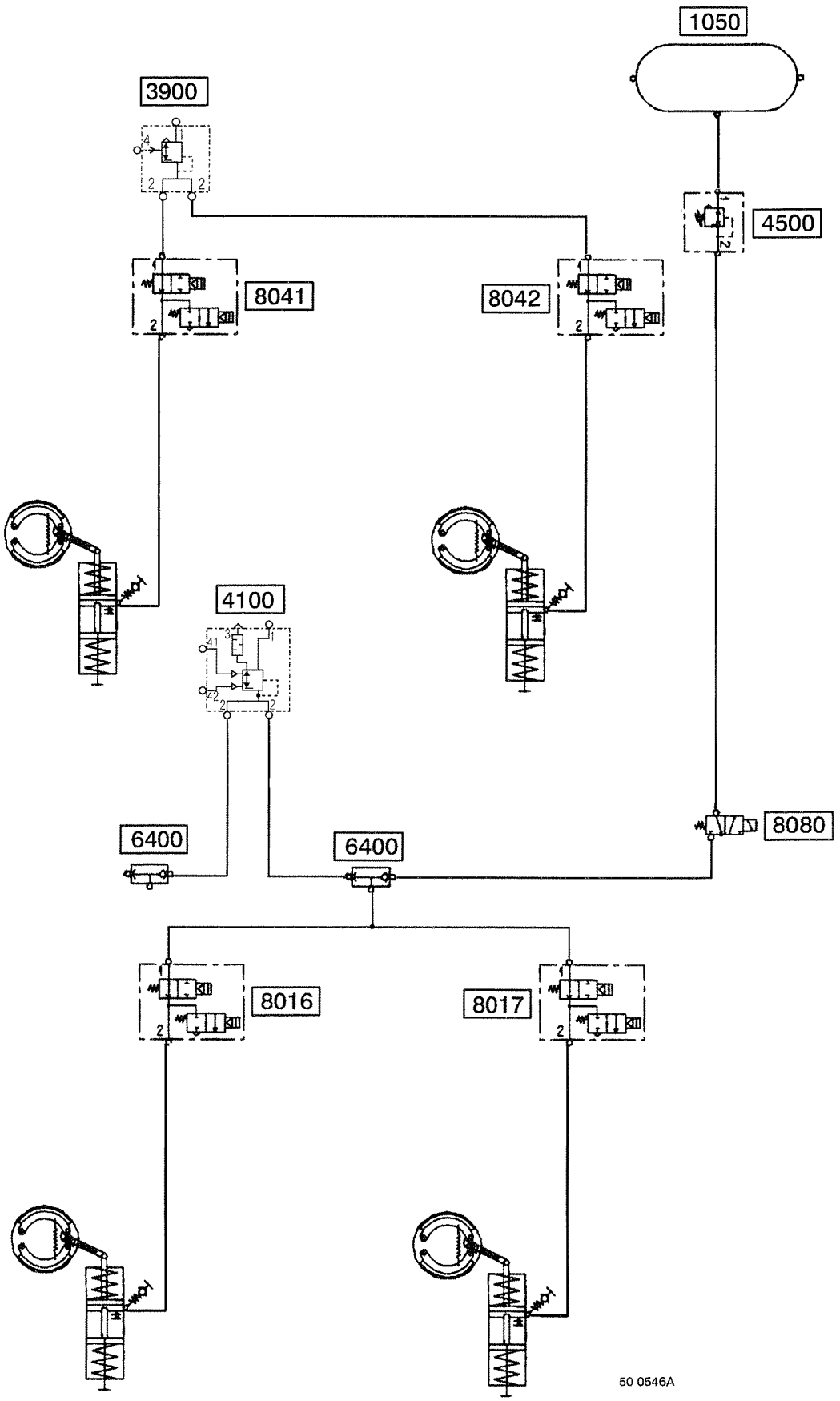
AGORA 12m / AGORA LINE diagram



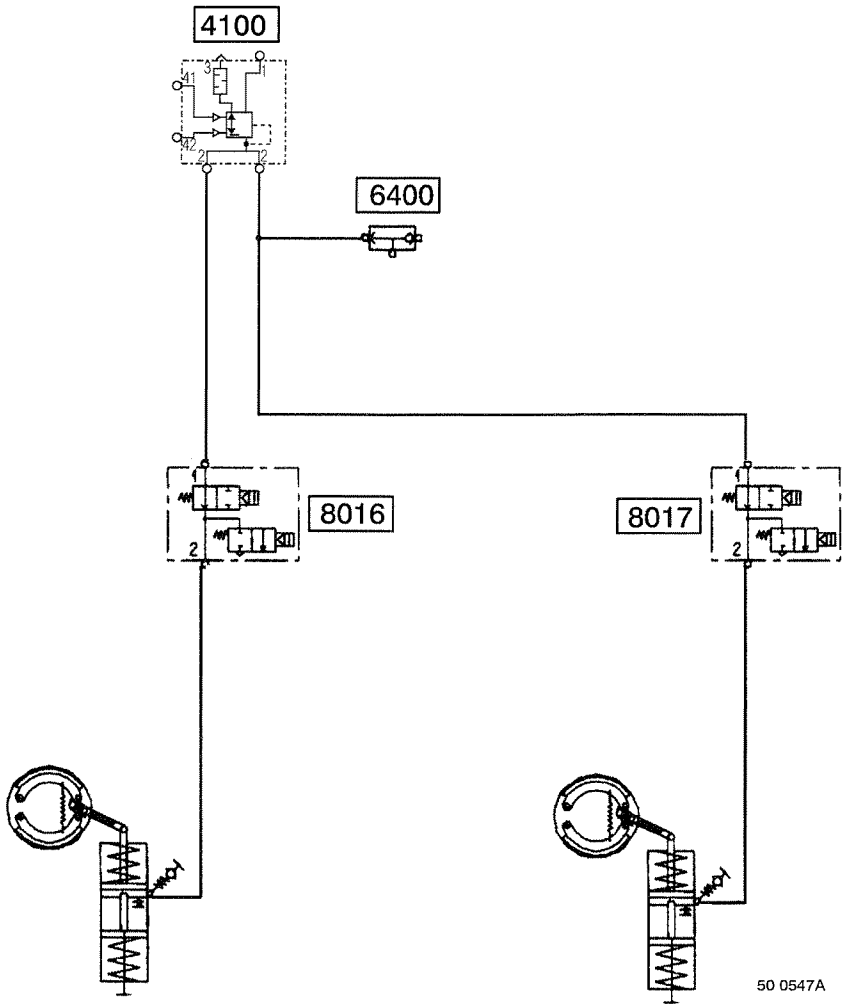
KEY TO PNEUMATIC DIAGRAMS

1050 – Auxiliary equipment air tank
3900 – Single relay governor valve
4100 – Double relay valve
4500 – Pressure reducing valve
6400 – Double check valve
8016 – LH rear roadwheel ABS electrovalve
8017 – RH rear roadwheel ABS electrovalve
8041 – Middle axle LH side ABS electrovalve
8042 – Middle axle RH side ABS electrovalve
8080 – ASR electrovalve

AGORA 18m diagram



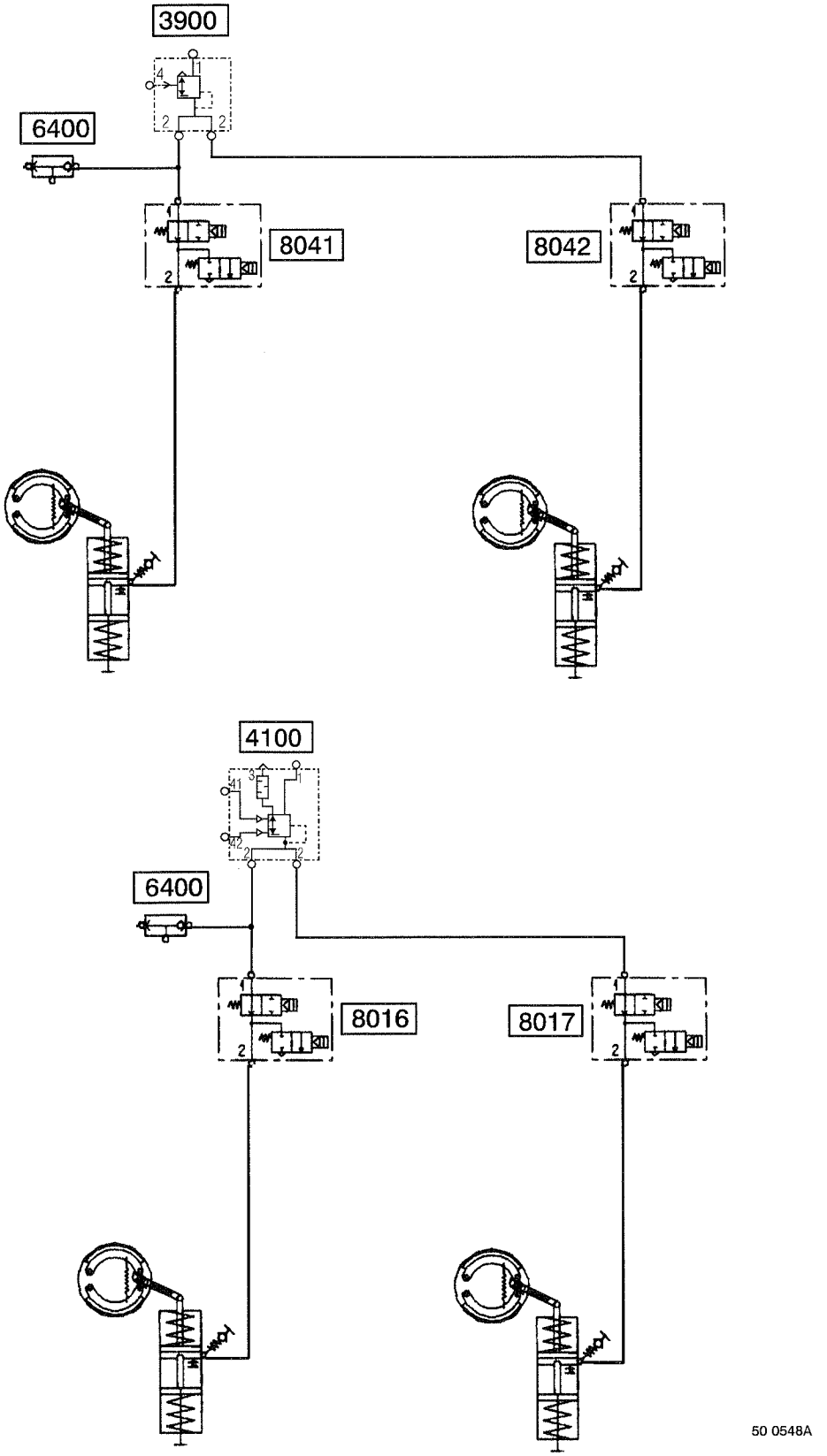
CIVIS/CRISTALIS 12m diagram



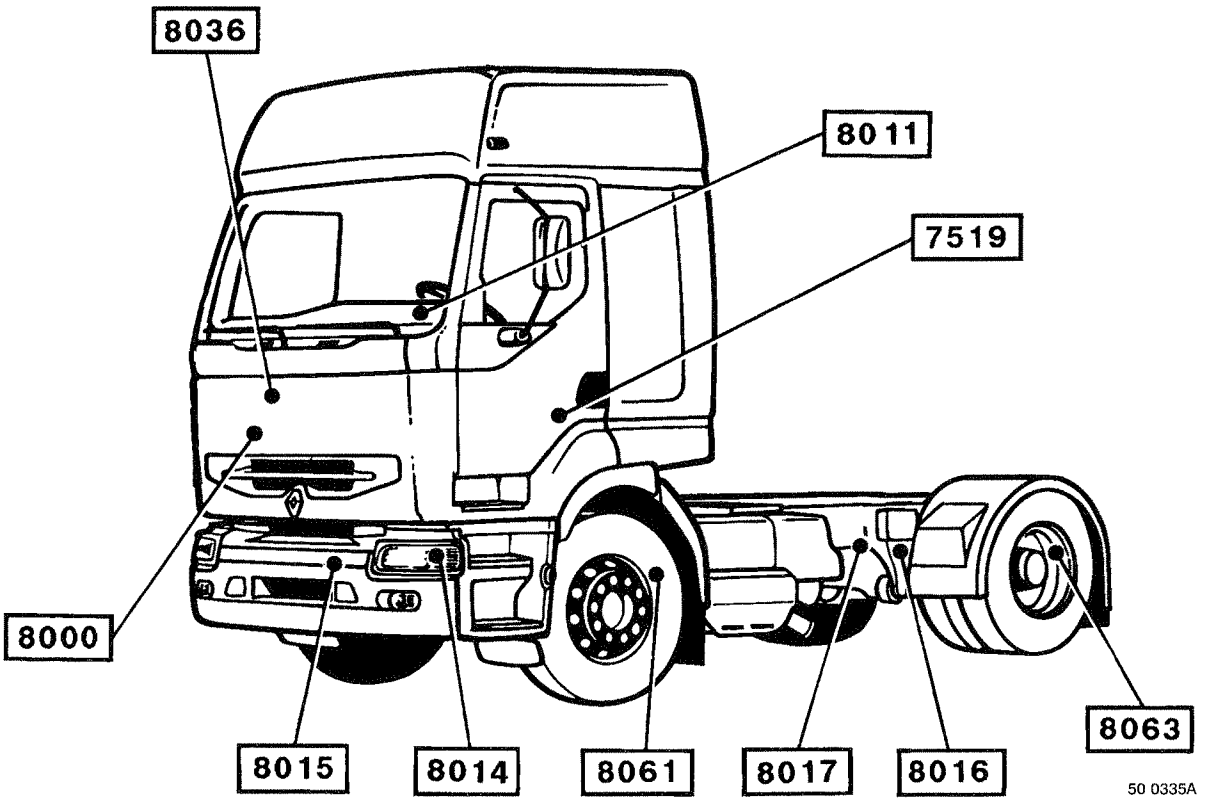
KEY TO PNEUMATIC DIAGRAMS

3900 – Single relay governor valve
4100 – Double relay valve
4500 – Pressure reducing valve
6400 – Double check valve
8016 – LH rear roadwheel ABS electrovalve
8017 – RH rear roadwheel ABS electrovalve
8041 – Middle axle LH side ABS electrovalve
8042 – Middle axle RH side ABS electrovalve
8080 – ASR electrovalve

CIVIS/CRISTALIS 18m diagram

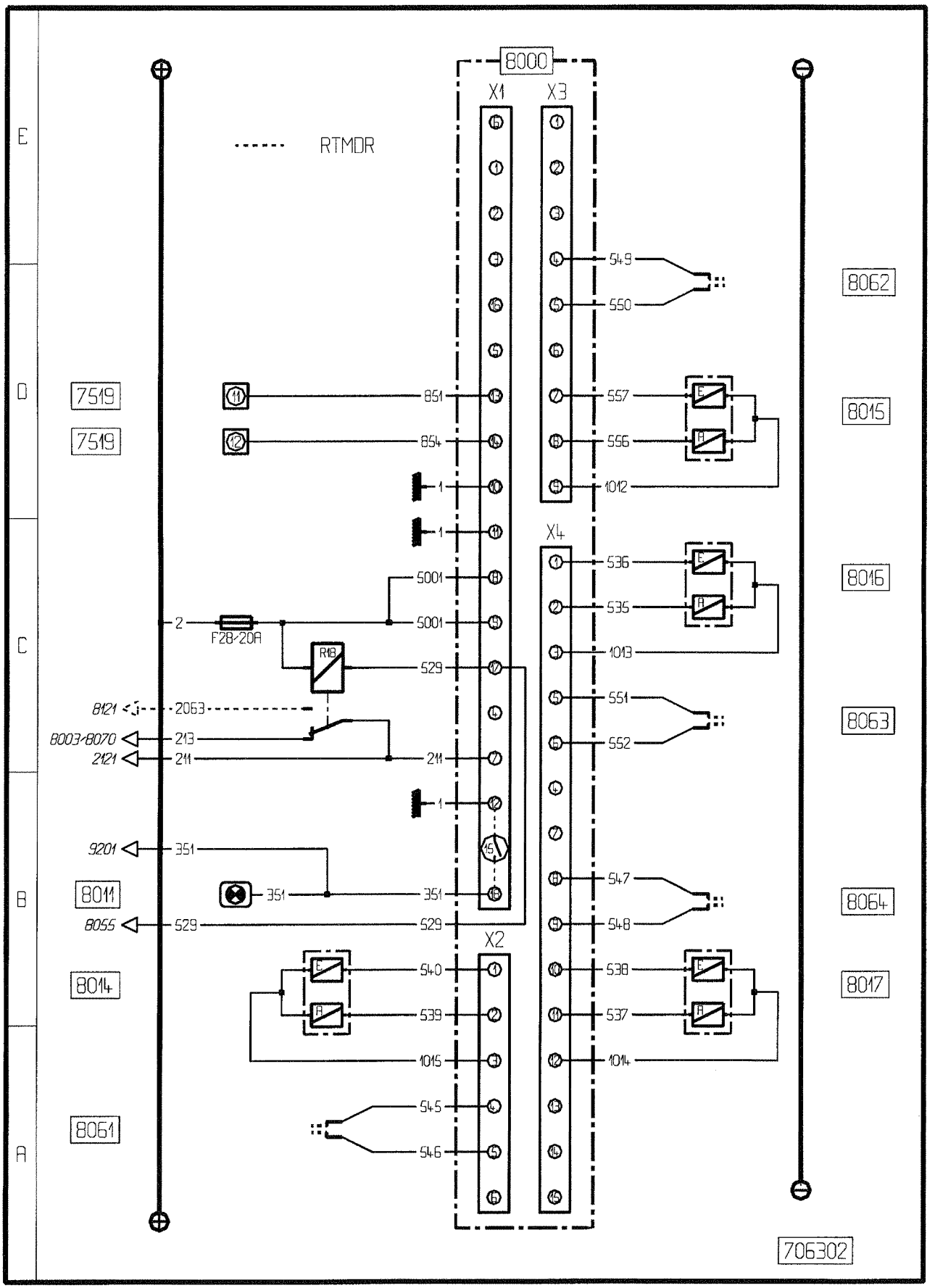


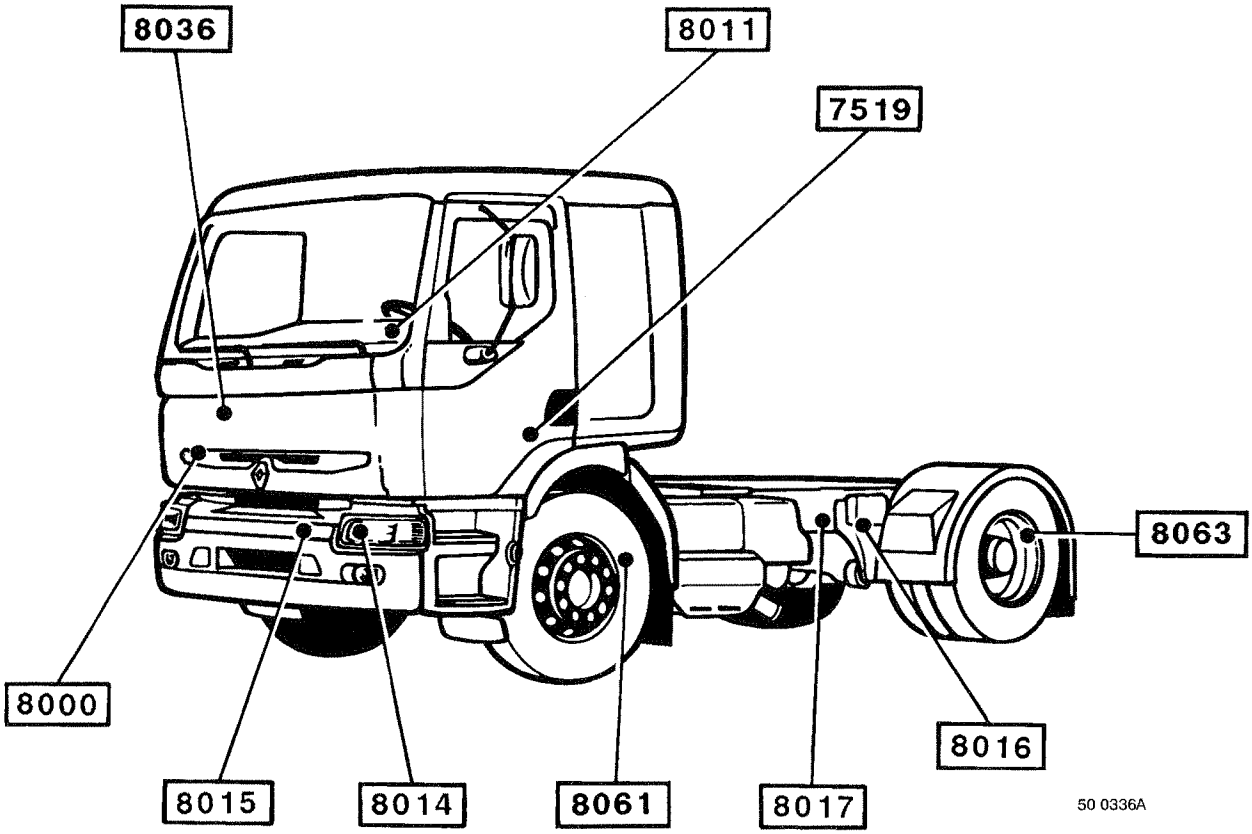
ELECTRICAL DIAGRAMS



RENAULT PREMIUM EURO2 ABS 24

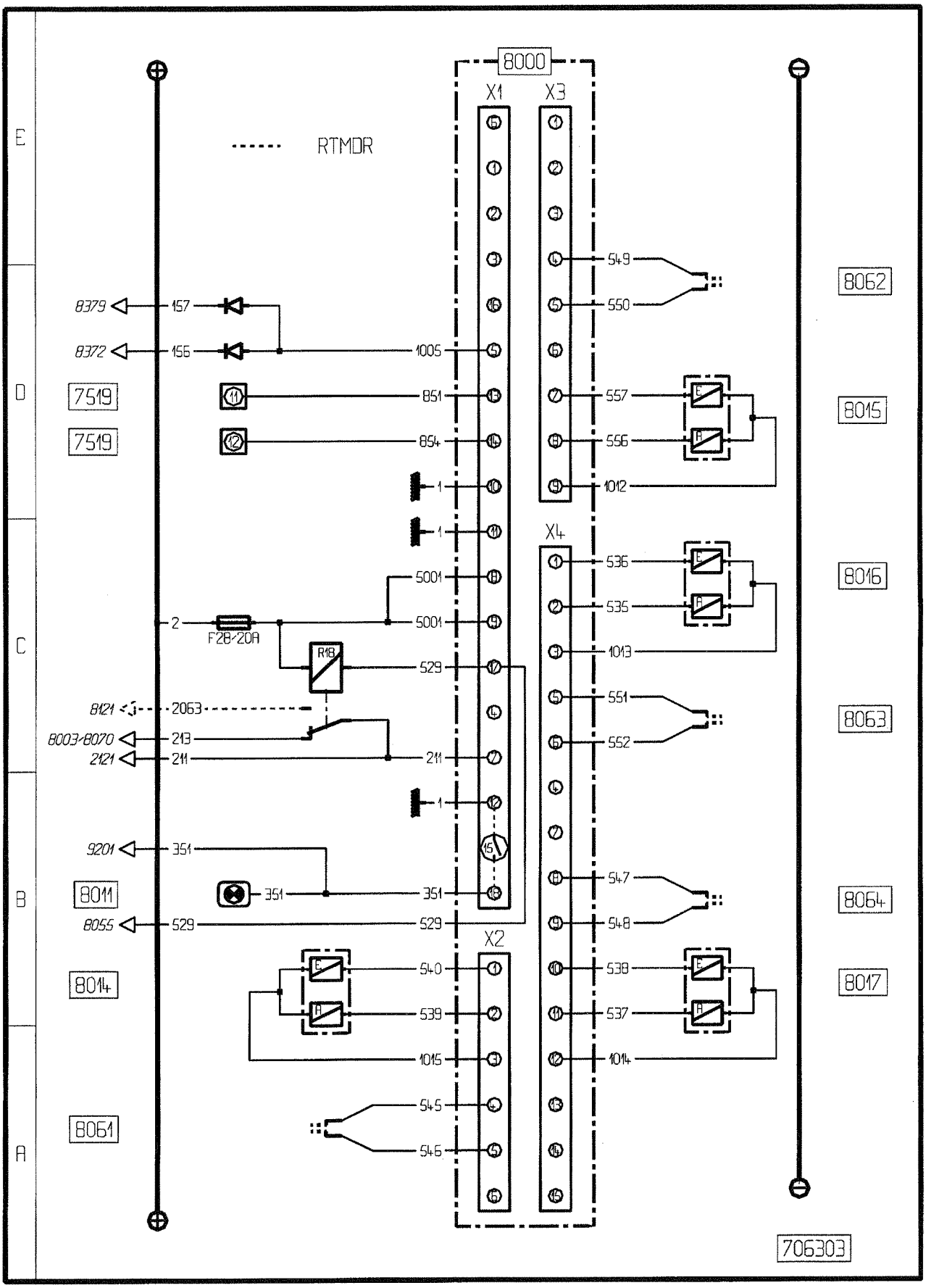
2121 – After ignition power supply relay
7519 – Diagnostics socket
8000 – "ABS" ECU
8003 – Hydraulic retarder ECU (with ZF retarder)
8011 – ABS warning lamp
8014 – ABS LH front roadwheel electrovalve
8015 – ABS RH front roadwheel electrovalve
8016 – ABS LH rear roadwheel electrovalve
8017 – ABS RH rear roadwheel electrovalve
8036 – Electric retarder cut–off relay
8055 – Hydraulic retarder cut–off relay
8061 – ABS LH front roadwheel sensor
8062 – ABS RH front roadwheel sensor
8063 – ABS LH rear roadwheel sensor
8064 – ABS RH rear roadwheel sensor
8070 – Electric retarder control
8121 – Exhaust brake cut–off electrovalve
9201 – Vehicle ECU "VECU"

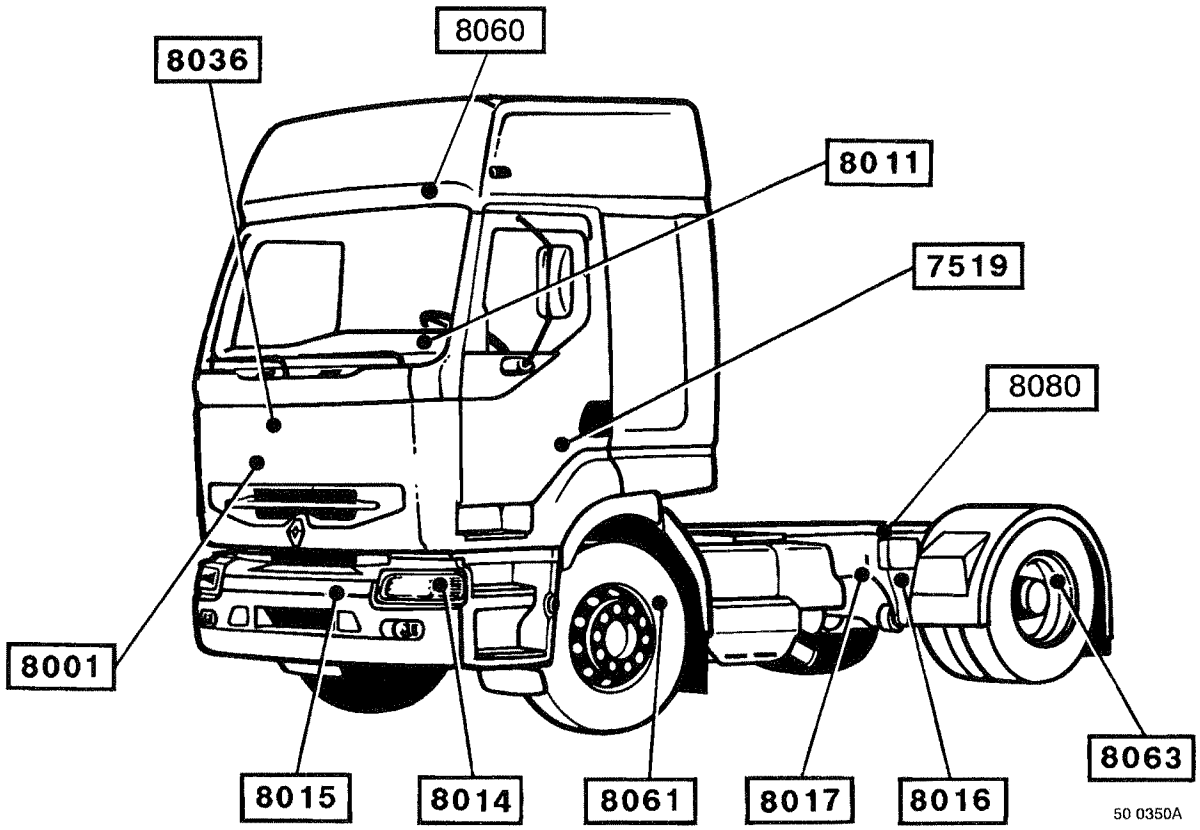

8000
X1
X3
X4
X2
RTMDR
E
D
C
B
A
7519
7519
8011
8014
8061
8062
8015
8016
8063
8064
8017
706302
851
854
1
1
5001
5001
2
F28-20A
R18
529
2063
213
211
211
1
351
351
351
529
549
550
557
556
1012
536
535
1013
551
552
547
548
538
537
1014
540
539
1015
545
546
9201
8121
8003-8070
2121
8055



RENAULT KERAX EURO2 ABS 24

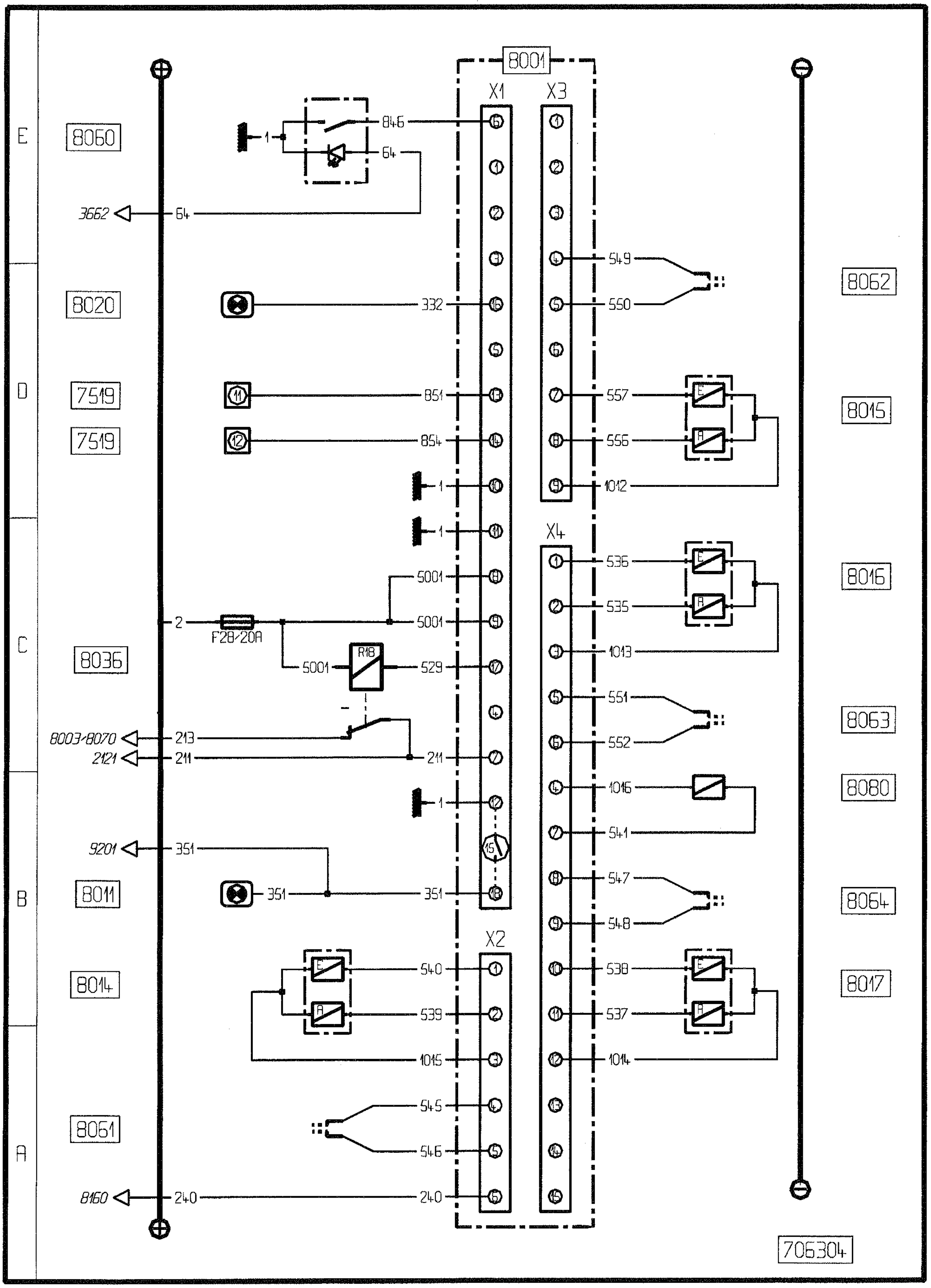
2121 – After ignition power supply relay
7519 – Diagnostics socket
8000 – "ABS" ECU
8003 – Hydraulic retarder ECU (with ZF retarder)
8011 – ABS warning lamp
8014 – ABS LH front roadwheel electrovalve
8015 – ABS RH front roadwheel electrovalve
8016 – ABS LH rear roadwheel electrovalve
8017 – ABS RH rear roadwheel electrovalve
8036 – Electric retarder cut–off relay
8055 – Hydraulic retarder cut–off relay (with Voith retarder)
8061 – ABS LH front roadwheel sensor
8062 – ABS RH front roadwheel sensor
8063 – ABS LH rear roadwheel sensor
8064 – ABS RH rear roadwheel sensor
8070 – Electric retarder control
8121 – Exhaust brake cut–off electrovalve
8372 – Transfer box differential lock switch
8379 – Front drive axle inter–wheel differential lock switch
9201 – Vehicle ECU "VECU"

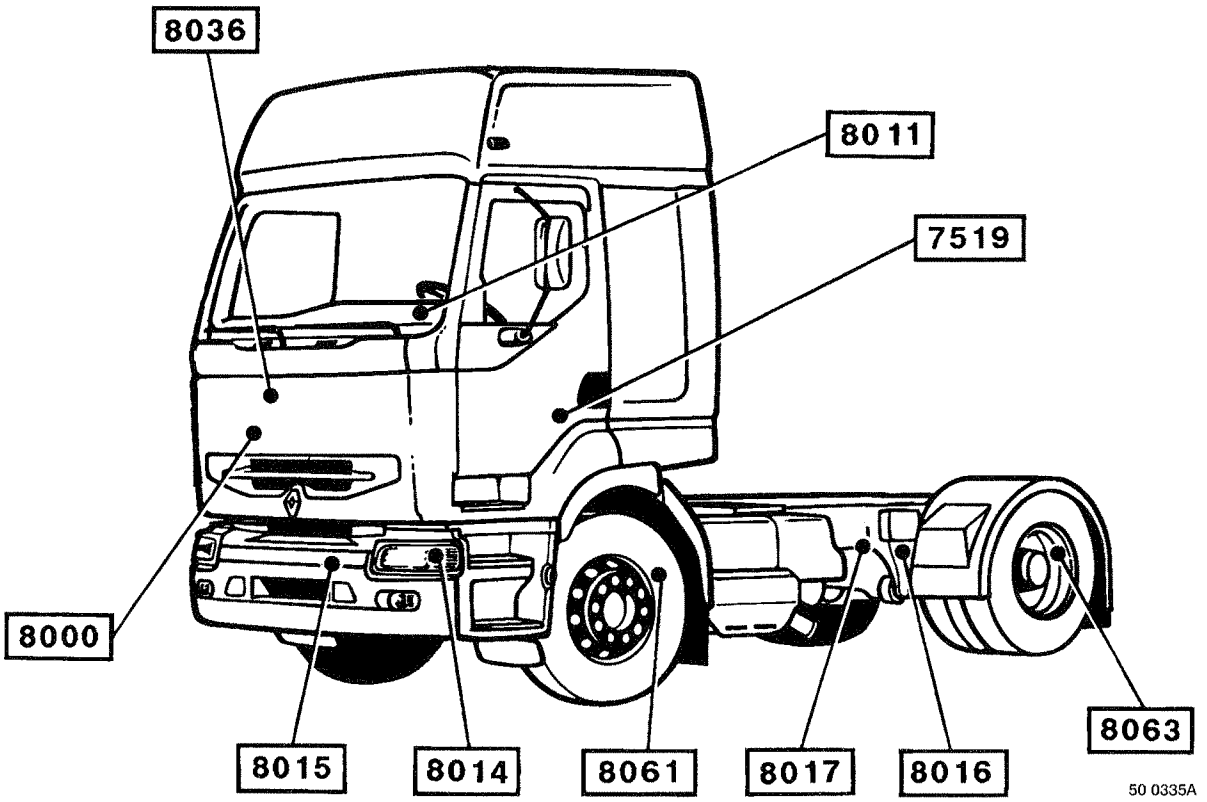

8000
X1
X3
X4
X2
RTMDR
8379
8372
157
156
1005
7519
7519
851
854
1
1
5001
5001
2
F28/20A
R18
529
8121
2063
8003/8070
2121
213
211
211
1
9201
351
8011
351
351
8055
529
529
8014
8061
540
539
1015
545
546
549
550
8062
557
556
1012
8015
536
535
1013
8016
551
552
8063
547
548
8064
538
537
1014
8017
706303



RENAULT PREMIUM EURO2 ABS + ASR EU12

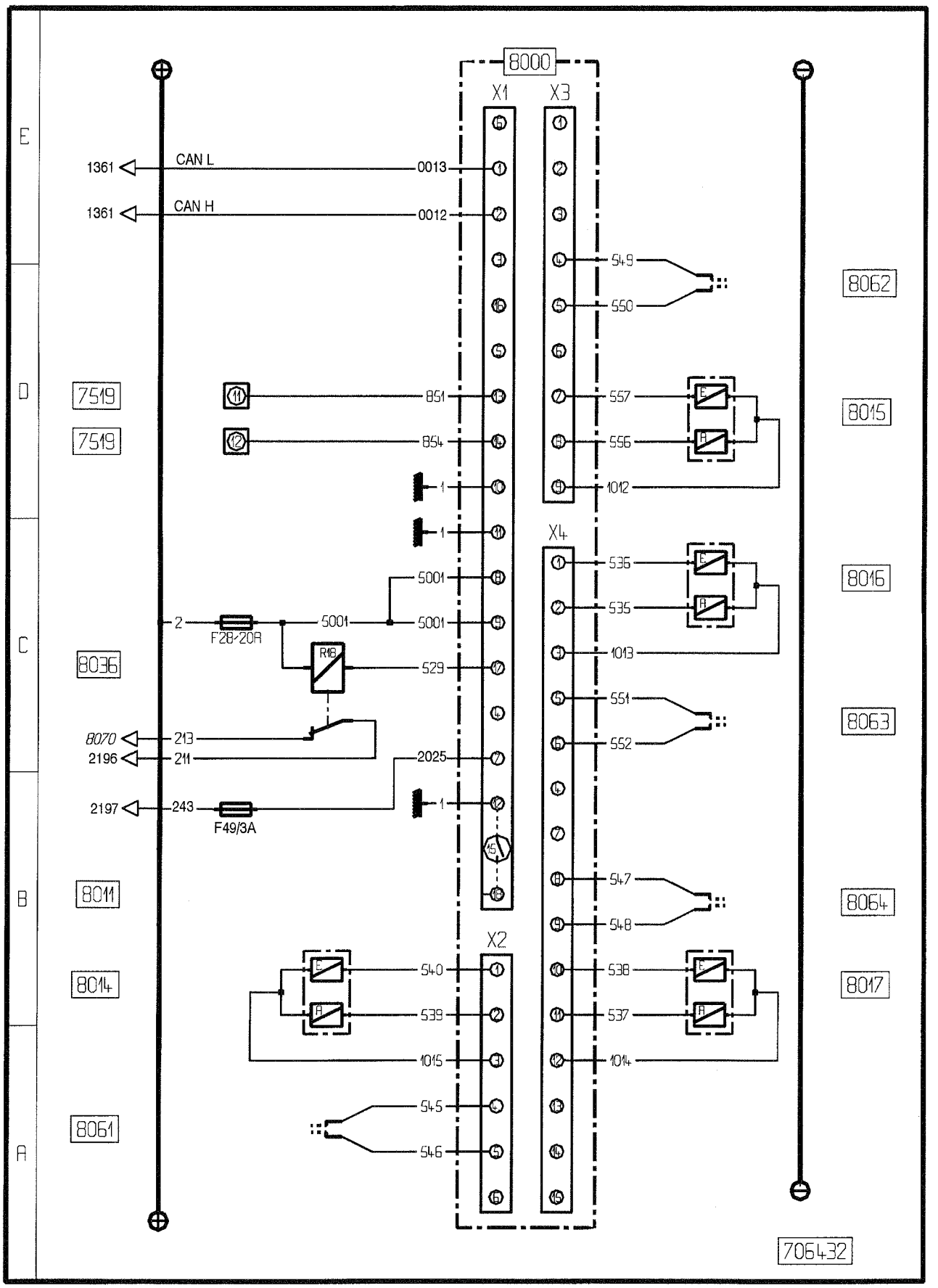
2121 – After ignition power supply relay
3662 – Lighting relay
7519 – Diagnostics socket
8001 – ABS + ASR ECU
8003 – Hydraulic retarder ECU (with ZF retarder)
8011 – ABS warning lamp
8014 – ABS LH front roadwheel electrovalve
8015 – ABS RH front roadwheel electrovalve
8016 – ABS LH rear roadwheel electrovalve
8017 – ABS RH rear roadwheel electrovalve
8020 – ASR warning light
8036 – Electric retarder cut–off relay
8060 – "ASR" control
8061 – ABS LH front roadwheel sensor
8062 – ABS RH front roadwheel sensor
8063 – ABS LH rear roadwheel sensor
8064 – ABS RH rear roadwheel sensor
8070 – Electric retarder control
8080 – ASR electrovalve
8121 – Exhaust brake cut–off electrovalve
8160 – Stop lights switch
9201 – Vehicle ECU "VECU"

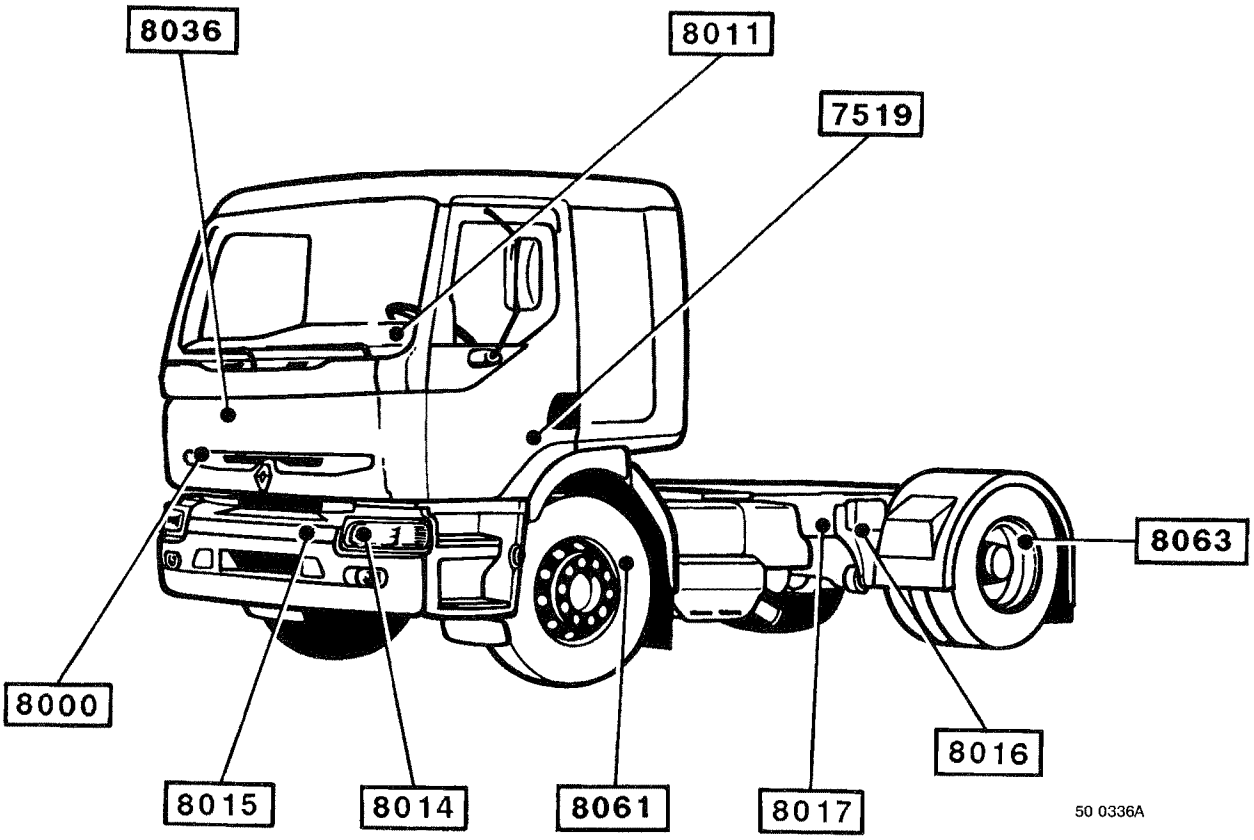

E
D
C
B
A
8060
8020
7519
7519
8036
8011
8014
8061
3662
64
8003-8070
213
2121
211
9201
351
8160
240
2
F28-20A
5001
R18
529
846
332
851
854
8001
X1
X3
X4
X2
549
550
557
556
1012
536
535
1013
551
552
1016
541
547
548
538
537
1014
540
539
1015
545
546
8062
8015
8016
8063
8080
8064
8017
706304



RENAULT PREMIUM EURO3 ABS 24

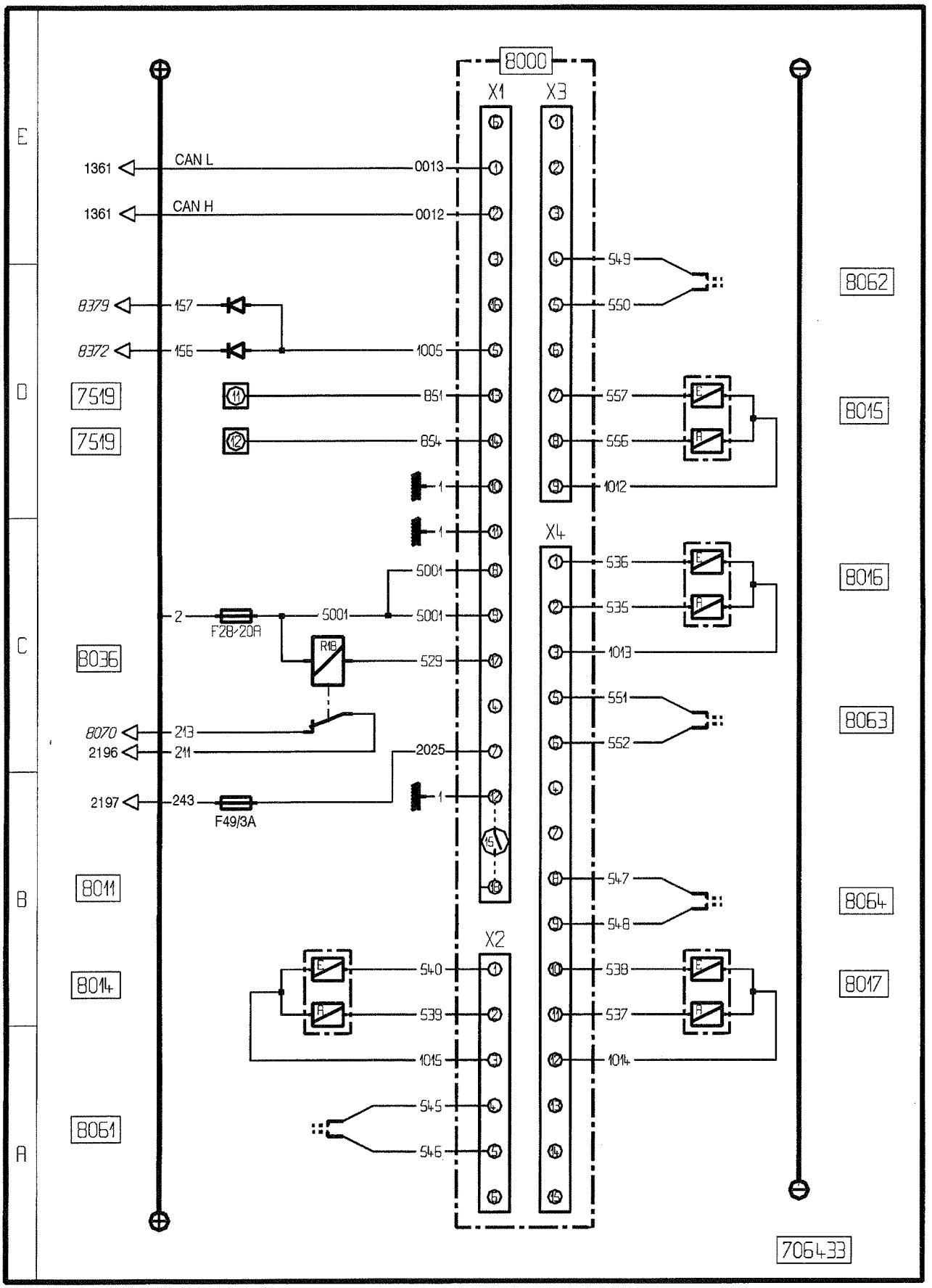
1361 – Connecting terminal plate
2196 – After ignition relay N° 1
2197 – After ignition relay N° 2
7519 – Diagnostics socket
8000 – "ABS" ECU
8014 – ABS LH front roadwheel electrovalve
8015 – ABS RH front roadwheel electrovalve
8016 – ABS LH rear roadwheel electrovalve
8017 – ABS RH rear roadwheel electrovalve
8036 – Electric retarder cut–off relay
8061 – ABS LH front roadwheel sensor
8062 – ABS RH front roadwheel sensor
8063 – ABS LH rear roadwheel sensor
8064 – ABS RH rear roadwheel sensor
8070 – Electric retarder control


8000
X1
X3
X4
X2
CAN L
CAN H
1361
1361
0013
0012
549
550
8062
7519
7519
851
854
557
556
1012
8015
1
1
5001
5001
5001
2
F28-20A
R18
529
536
535
1013
8016
551
552
8063
8036
B070
213
2196
211
2025
2197
243
F49/3A
547
548
8064
8011
8014
540
539
1015
538
537
1014
8017
545
546
8061
706432



RENAULT KERAX EURO3 ABS 24

1361 – Connecting terminal plate
2196 – After ignition relay N° 1
2197 – After ignition relay N° 2
7519 – Diagnostics socket
8000 – "ABS" ECU
8014 – ABS LH front roadwheel electrovalve
8015 – ABS RH front roadwheel electrovalve
8016 – ABS LH rear roadwheel electrovalve
8017 – ABS RH rear roadwheel electrovalve
8036 – Electric retarder cut–off relay
8061 – ABS LH front roadwheel sensor
8062 – ABS RH front roadwheel sensor
8063 – ABS LH rear roadwheel sensor
8064 – ABS RH rear roadwheel sensor
8070 – Electric retarder control
8372 – Transfer box differential lock switch
8379 – Front drive axle differential lock switch


8000
X1
X3
X4
X2
CAN L
CAN H
1361
0013
0012
8379
8372
157
156
1005
7519
851
854
5001
529
2
F28/20A
R18
8036
8070
213
2196
211
2025
2197
243
F49/3A
8011
8014
8061
549
550
557
556
1012
536
535
1013
551
552
547
548
540
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1015
538
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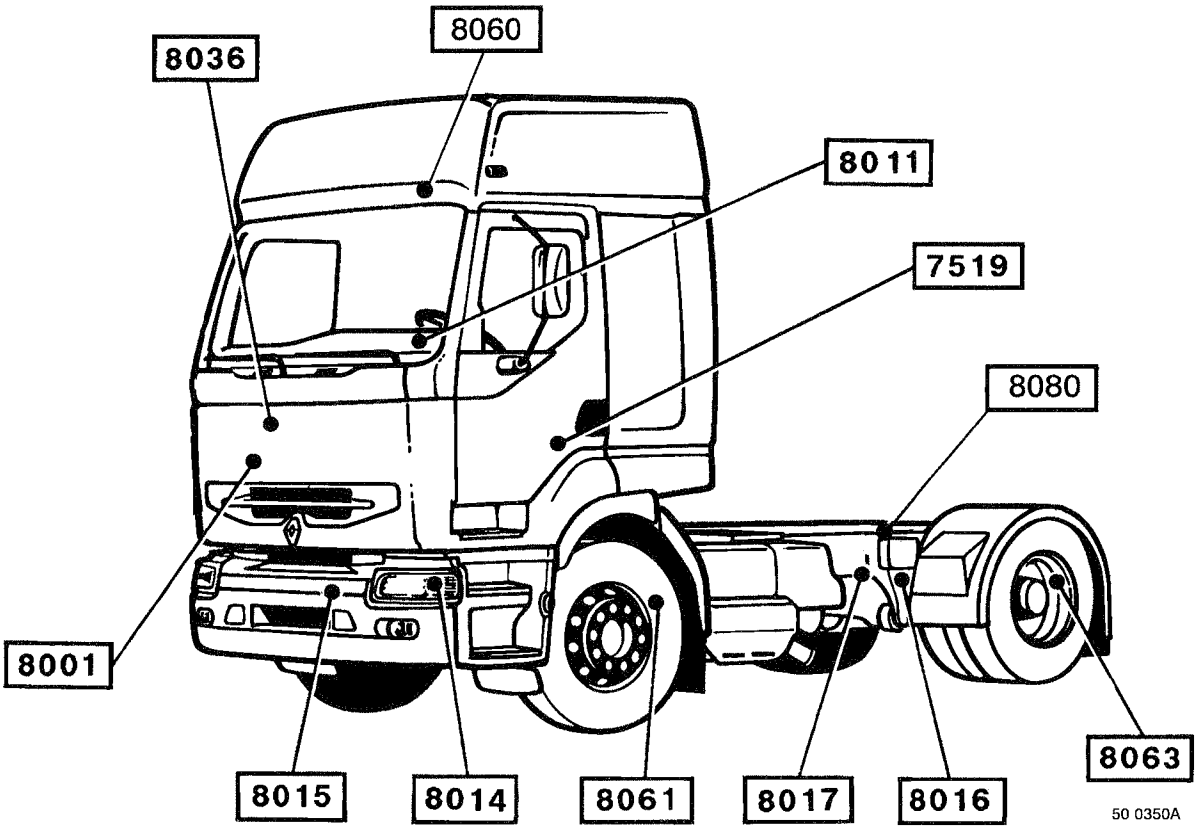
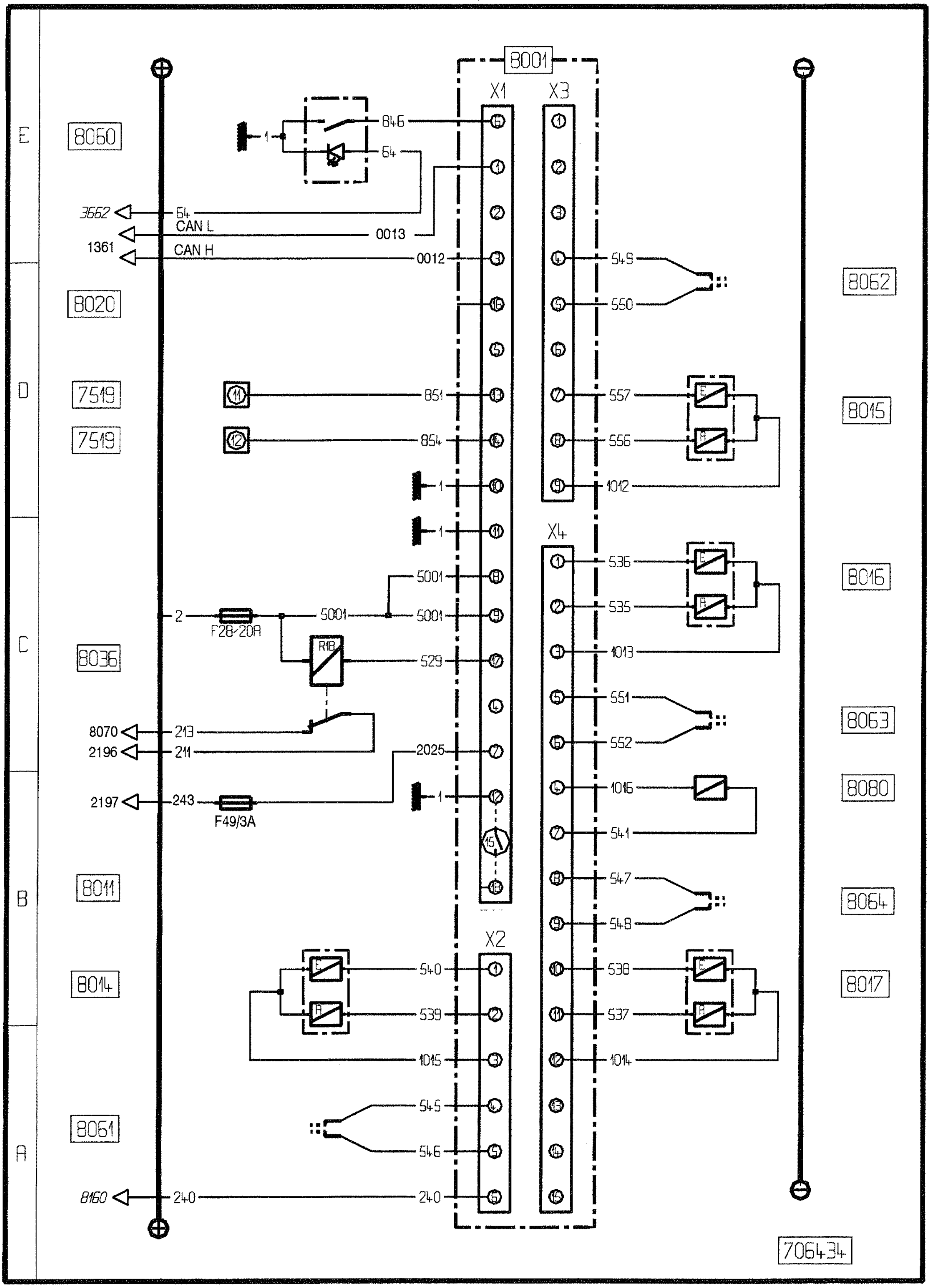
1014
545
546
8062
8015
8016
8063
8064
8017
706433



RENAULT PREMIUM EURO3 ABS + ASR EU12

1361 – Connecting terminal plate
2196 – After–ignition relay N° 1
2197 – After–ignition relay N° 2
3662 – Lighting relay
7519 – Diagnostics socket
8001 – ABS + ASR ECU
8014 – ABS LH front roadwheel electrovalve
8015 – ABS RH front roadwheel electrovalve
8016 – ABS LH rear roadwheel electrovalve
8017 – ABS RH rear roadwheel electrovalve
8036 – Electric retarder cut–off relay
8060 – ASR control
8061 – ABS LH front roadwheel sensor
8062 – ABS RH front roadwheel sensor
8063 – ABS LH rear roadwheel sensor
8064 – ABS RH rear roadwheel sensor
8070 – Electric retarder control
8080 – ASR electrovalve


8001
X1
X3
X4
X2
8060
8020
7519
7519
8036
8011
8014
8061
8062
8015
8016
8063
8080
8064
8017
3662
64
CAN L
0013
1361
CAN H
0012
846
64
549
550
851
854
557
556
1012
5001
5001
5001
2
F28/20A
R18
529
536
535
1013
8070
213
2196
211
2025
551
552
2197
243
F49/3A
1016
541
547
548
540
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1015
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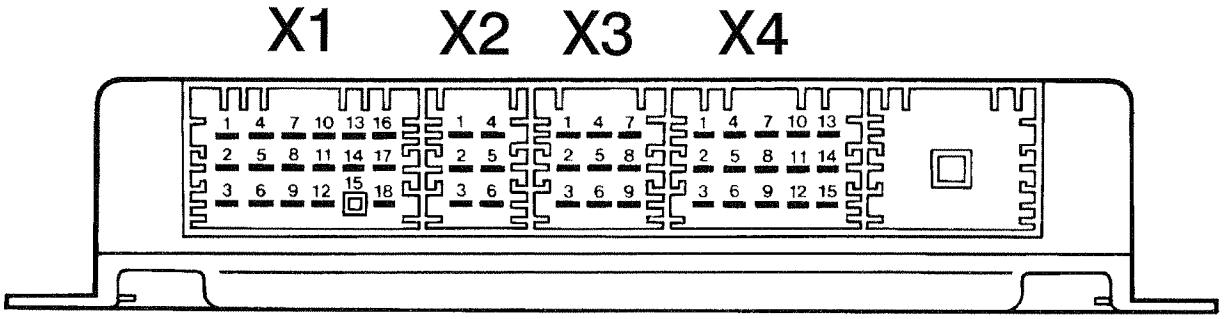
1014
545
546
8160
240
240
706434
E
D
C
B
A


X1
X2
X3
X4
1 4 7 10 13 16
2 5 8 11 14 17
3 6 9 12 15 18
1 4
2 5
3 6
1 4 7
2 5 8
3 6 9
1 4 7 10 13
2 5 8 11 14
3 6 9 12 15

50 0334A

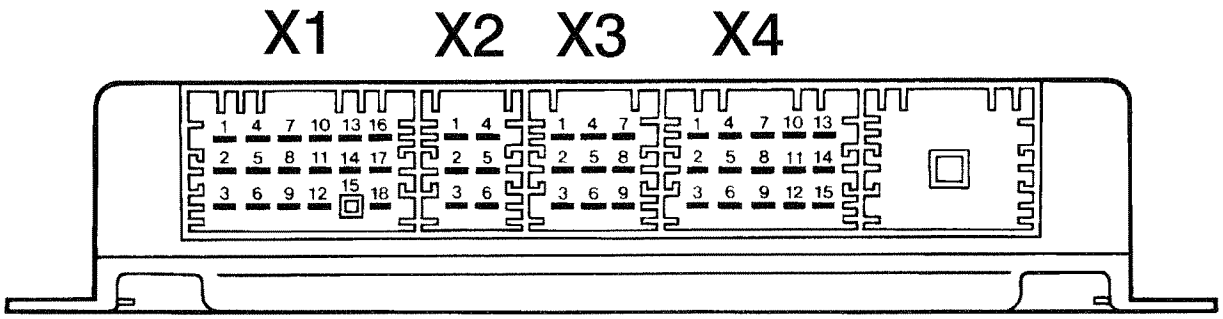
Identification of electronic control unit (ECU) pin arrangement (Euro 2 vehicle)

Connector X1
1 – Not used
2 – Not used
3 – Not used
4 – Not used
5 – Differential control information (RENAULT KERAX)
6 – ASR control information (EU12)
7 – After ignition positive
8 – Battery power supply
9 – Battery power supply
10 – ECU earth
11 – ECU earth
12 – ECU earth
13 – Diagnostics line K
14 – Diagnostics line L
15 – Disconnection detection system
16 – ASR test light information (EU12)
17 – Information to retarder(s)
18 – ABS test light information

Connector X2
1 – LH front wheel exhaust electrovalve information
2 – LH front wheel supply electrovalve information
3 – LH front wheel electrovalve earth
4 – LH front wheel speed sensor information
5 – LH front wheel speed sensor information
6 – Stop lights information (EU12)

Connector X3
1 – Not used
2 – Not used
3 – Not used
4 – RH front wheel speed sensor information
5 – RH front wheel speed sensor information
6 – Not used
7 – RH front wheel exhaust electrovalve information
8 – RH front wheel supply electrovalve information
9 – RH front wheel speed earth

Connector X4
1 – LH rear wheel exhaust electrovalve information
2 – LH rear wheel supply electrovalve information
3 – LH rear wheel earth4 – ASR electrovalve information (EU12)
4 – ASR electrovalve earth (EU12)
5 – LH rear wheel speed sensor information
6 – LH rear wheel speed sensor information
7 – ASR electrovalve information (EU12)
8 – RH rear wheel sensor information
9 – RH rear wheel sensor information
10 – RH rear wheel exhaust electrovalve information
11 – RH rear wheel supply electrovalve information
12 – RH rear wheel earth
13 – Not used
14 – Not used
15 – Not used


X1
X2
X3
X4
1 4 7 10 13 16
2 5 8 11 14 17
3 6 9 12 15 18
1 4
2 5
3 6
1 4 7
2 5 8
3 6 9
1 4 7 10 13
2 5 8 11 14
3 6 9 12 15

50 0334A

Identification of electronic control unit (ECU) pin arrangement (Euro 3 vehicle)

Connector X1

1 – Communication with vehicle CAN (low)
2 – Communication with vehicle CAN earth
3 – Communication with vehicle CAN (high)
4 – Not used
5 – Differential control information (RENAULT KERAX)
6 – ASR control information (EU12)
7 – After ignition positive
8 – Battery power supply
9 – Battery power supply
10 – ECU earth
11 – ECU earth
12 – ECU earth
13 – Diagnostics line K
14 – Diagnostics line L
15 – Disconnection detection system
16 – Not used
17 – Information to retarder(s)
18 – Not used

Connector X2

1 – LH front wheel exhaust electrovalve information
2 – LH front wheel supply electrovalve information
3 – LH front wheel electrovalve earth
4 – LH front wheel speed sensor information
5 – LH front wheel speed sensor information
6 – Stop lights information (EU12)

Connector X3

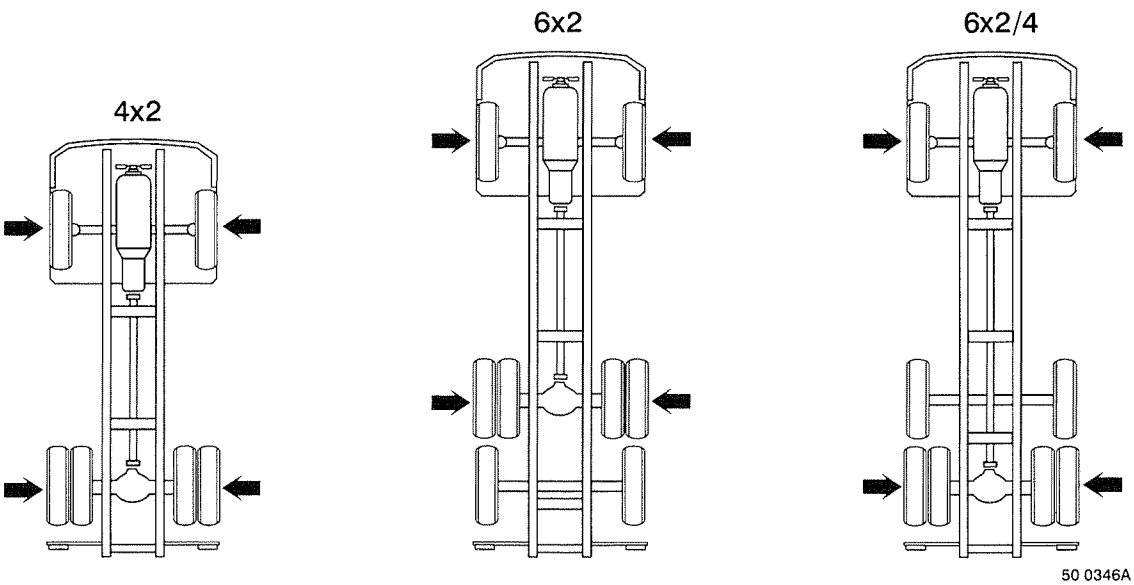
1 – Not used
2 – Not used
3 – Not used
4 – RH front wheel speed sensor information
5 – RH front wheel speed sensor information
6 – Not used
7 – RH front wheel exhaust electrovalve information
8 – RH front wheel supply electrovalve information
9 – RH front wheel speed earth

Connector X4

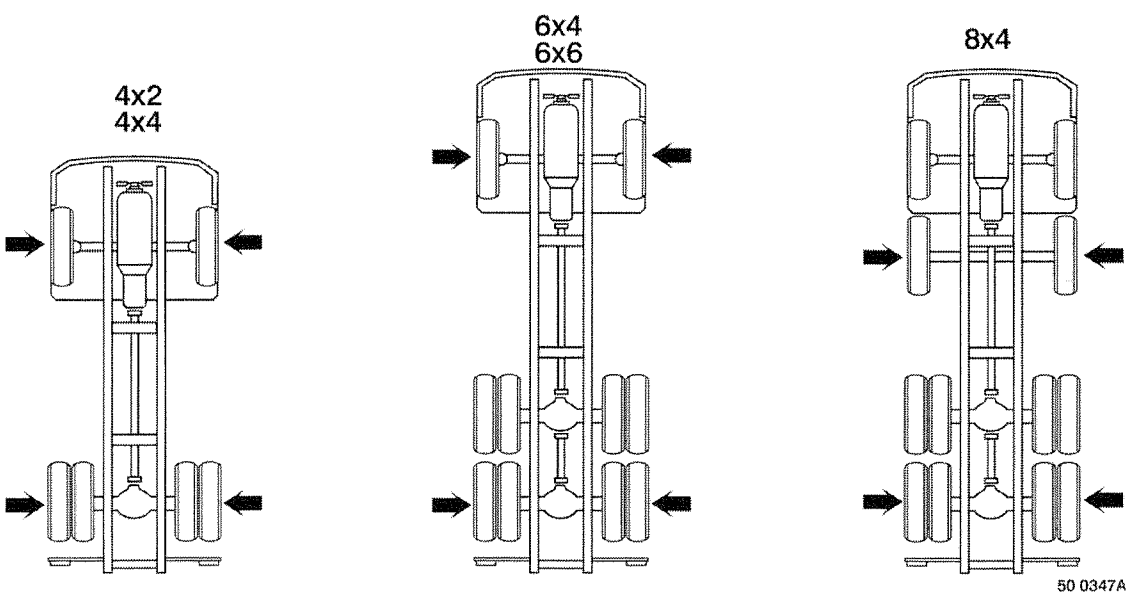
1 – LH rear wheel exhaust electrovalve information
2 – LH rear wheel supply electrovalve information
3 – LH rear wheel earth4 – ASR electrovalve information (EU12)
4 – ASR electrovalve earth (EU12)
5 – LH rear wheel speed sensor information
6 – LH rear wheel speed sensor information
7 – ASR electrovalve information (EU12)
8 – RH rear wheel sensor information
9 – RH rear wheel sensor information
10 – RH rear wheel exhaust electrovalve information
11 – RH rear wheel supply electrovalve information
12 – RH rear wheel earth
13 – Not used
14 – Not used
15 – Not used

Layout of speed sensors

PREMIUM



KERAX



ELECTRICAL DIAGRAM FOR COACHES - BUSES: REFER TO "ELECTRICS" WORKSHOP MANUAL

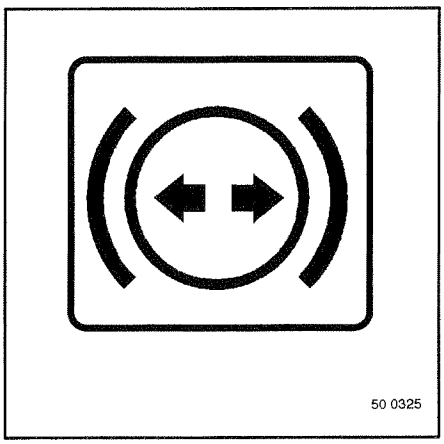
DIAGNOSTICS AND DEFECT CODE NUMBERS

Tests using the TEST light (If the DIAGNOSTICA tool is not on hand)

Switch on the ignition.

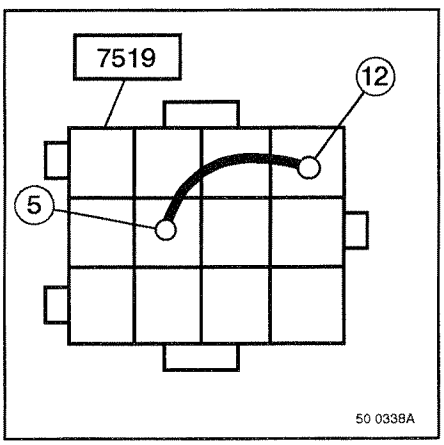
Defect test light on: present defect(s).

Defect test light off: no present defect but memorized defect(s) possible.

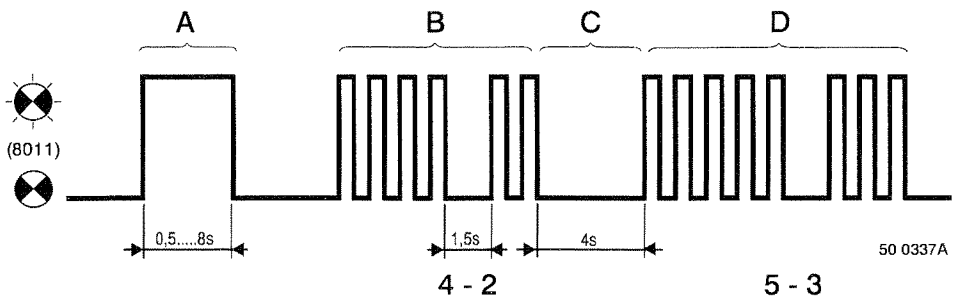


HOW TO READ DEFECT CODE NUMBERS

The system first of all displays present defects, then memorized defects.
Procedure:
Switch on the ignition.
Shunt terminals (5 & 12) on the diagnostics socket (7519) for a period of 0.5 to 8 seconds.
The test light (8011) will emit a series of flashes corresponding to the defect code numbers.
Each defect code number is defined by two series of short flashes.
Each defect code number is separated from the next number by the test light being extinguished for 4 seconds.
The defect code number is displayed only once. To read the code number again, remake the shunt on the diagnostics socket (7519).



A – Shunt on diagnostics socket (7519)
B – First defect code number (e.g. 4–2)
C – 4 second break between each code number
D – Second defect code number (e.g. 5–3)
(16 messages maximum)



To erase defects

Only memorized defects can be erased.

Procedure :
Switch off the ignition.
Shunt terminals (12 & 5) on the diagnostics socket (7519).
Switch on the ignition.
Remove the shunt.

If the defect is a sensor problem, it will be necessary to run the vehicle at a speed of more than 20 km/h after repair to extinguish the warning light.

CONFIGURING THE SYSTEM

Whenever the vehicle configuration is modified (retarder) or the VECU is replaced, it is necessary to proceed with configuring the system. To do this, it is absolutely essential to use the RENAULT V.I. diagnostics tool "DIAGNOSTICA". It is nevertheless possible to read certain parameters by deciphering the blink codes displayed by the test light (8011).

Procedure for triggering off read–out of the configuration :
Switch on the ignition.
Shunt the diagnostics socket (7519) twice in succession (terminals 12 & 5) without exceeding a period of 1 second between the two actions.
The shunt time should be between 0.5 and 8 seconds.
The test light (8011) will emit a series of flashes corresponding to the system configuration.
Each configuration is represented by four sets of flashes.

List of configuration code numbers :

2–2 – 1–2	System 4S4M – Without retarder relay – Without ASR
2–2 – 1–5	System 4S4M – Without retarder relay – With ASR
2–2 – 3–2	System 4S4M – With retarder relay – Without ASR
2–2 – 3–5	System 4S4M – With retarder relay – With ASR
2–15 – 1–2	Configuration invalid – Without retarder relay – Without ASR
2–15 – 1–5	Configuration invalid – Without retarder relay – With ASR
2–15 – 3–2	Configuration invalid – With retarder relay – Without ASR
2–15 – 3–5	Configuration invalid – With retarder relay – With ASR

LIST OF DEFECT CODE NUMBERS

Defect code N°	Component in question	Cause	Remedy
1.1	LH front wheel speed sensor	No defect	
2.1		Air gap too great	Check air gap < 0.2 mm or < 15 km/h with DIAGNOSTICA tool
2.2		Absence of signal for a time > 5 secs whereas a speed > 18 km/h is detected on the other sensors	Check air gap Check sensor resistance 950 < R < 1930Ω
2.3		Toothed wheel problem ABS regulation > 60 secs	Check cleanliness of toothed wheel Check tooth wheel buckle < 0.3 mm Check compatibility of toothed wheel (number of teeth)
2.4		Speed signal inconsistent for a time > 20 secs	
2.5		Loss of speed signal	Check insulation of wiring harness in relation to +24V and earth Check sensor resistance 950 < R < 1930Ω
2.6		Short–circuit or open–circuit	
2.7		Internal defect	Check sensor resistance 950 < R < 1930Ω Check voltage between coil and earth < 3V If the defect persists, inform central after–sales Replace ECU
2.8		Configuration problem	
3.1	RH front wheel speed sensor	Air gap too great	Check air gap < 0.2 mm or < 15 km/h using DIAGNOSTICA tool
3.2		Absence of signal for a time > 5 secs whereas a speed > 18 km/h is detected on the other sensors	Check air gap Check sensor resistance 950 < R < 1930Ω
3.3		Toothed wheel problem ABS regulation > 60 secs	Check cleanliness of toothed wheel Check tooth wheel buckle < 0.3 mm Check compatibility of toothed wheel (number of teeth)
3.4		Speed signal inconsistent for a time > 20 secs	
3.5		Loss of speed signal	Check insulation of wiring harness in relation to +24V and earth Check sensor resistance 950 < R < 1930Ω
3.6		Short–circuit or open–circuit	
3.7		Internal defect	Check sensor resistance 950 < R < 1930Ω Check voltage between coil and earth < 3V If the defect persists, inform central after–sales Replace ECU
3.8		Configuration problem	

Defect code N°	Component in question	Cause	Remedy
4.1	LH rear wheel speed sensor	Air gap too great	Check air gap < 0.2 mm or < 15 km/h using DIAGNOSTICA tool
4.2		Absence of signal for a time > 5 secs whereas a speed > 18 km/h is detected on the other sensors	Check air gap Check sensor resistance 950 < R < 1930Ω
4.3		Toothed wheel problem ABS regulation > 60 secs	Check cleanliness of toothed wheel Check tooth wheel buckle < 0.3 mm Check compatibility of toothed wheel (number of teeth)
4.4		Speed signal inconsistent for a time > 20 secs	
4.5		Loss of speed signal	Check continuity and insulation of wiring harness in relation to +24V and earth Check sensor resistance 950 < R < 1930Ω
4.6		Short–circuit or open–circuit	
4.7		Internal defect	Check sensor resistance 950 < R < 1930Ω Check voltage between coil and earth < 3V If the defect persists, inform central after–sales Replace ECU
4.8		Configuration problem	
5.1	RH rear wheel speed sensor	Air gap too great	Check air gap < 0.2 mm or < 15 km/h using DIAGNOSTICA tool
5.2		Absence of signal for a time > 5 secs whereas a speed > 18 km/h is detected on the other sensors	Check air gap Check sensor resistance 950 < R < 1930Ω
5.3		Toothed wheel problem ABS regulation > 60 secs	Check continuity and insulation of wiring harness in relation to +24V and earth Check sensor resistance 950 < R < 1930 Ω
5.4		Speed signal inconsistent for a time > 20 secs	
5.5		Loss of speed signal	Check continuity and insulation of wiring harness in relation to +24V and earth Check sensor resistance 950 < R < 1930 Ω
5.6		Short–circuit or open–circuit	
5.7		Internal defect	Check sensor resistance 950 < R < 1930 Ω Check voltage between coil and earth < 3V If the defect persists, inform central after–sales Replace ECU
5.8		Configuration problem	

Defect code N°	Component in question	Cause	Remedy
8.1	LH front electrovalve (exhaust)	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance 14 < R < 21 Ω Check voltage between coil and earth < 3V
8.2		Short–circuit to earth	Check insulation of wiring harness Check coil resistance14 < R < 21 Ω
8.3		Open–circuit	Check insulation of wiring harness Check coil resistance14 < R < 21 Ω Check coil power supply
8.4	LH front electrovalve	Open–circuit to coils common earth	Check continuity of wiring harness Check coil resistance14 < R < 21 Ω
8.5	LH front electrovalve (inlet)	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance 14 < R < 21 Ω Check voltage between coil and earth < 3V
8.6		Short–circuit to earth	Check insulation of wiring harness Check coil resistance14 < R < 21 Ω
8.7		Open–circuit	Check insulation of wiring harness Check coil resistance 14 < R < 21 Ω Check coil power supply
8.8	LH front electrovalve	LH front ABS valve non–conformity	Check configuration using DIAGNOSTICA tool
9.1	RH front electrovalve (exhaust)	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω Check voltage between coil and earth < 3V
9.2		Short–circuit to earth	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω
9.3		Open–circuit	Check insulation of wiring harness Check coil resistance14 < R < 21Ω Check coil power supply
9.4	RH front electrovalve	Open–circuit to coils common earth	Check continuity of wiring harness Check coil resistance14 < R < 21Ω
9.5	RH front electrovalve (inlet)	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω Check voltage between coil and earth < 3V
9.6		Short–circuit to earth	Check insulation of wiring harness Check coil resistance14 < R < 21Ω

Defect code N°	Component in question	Cause	Remedy
9.7	RH front electrovalve (inlet)	Open–circuit	Check insulation of wiring harness Check coil resistance14 < R < 21Ω Check coil power supply
9.8	RH front electrovalve	RH front ABS valve non–conformity	Check configuration using DIAGNOSTICA tool
10.1	LH rear electrovalve (exhaust)	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω Check voltage between coil and earth < 3V
10.2		Short–circuit to earth	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω
10.3		Open–circuit	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω Check coil power supply
10.4	LH rear electrovalve	Open–circuit to coils common earth	Check continuity of wiring harness Check coil resistance 14 < R < 21Ω
10.5	LH rear electrovalve (inlet)	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance 14 < R < 21 Ω Check voltage between coil and earth < 3V
10.6		Short–circuit to earth	Check insulation of wiring harness Check coil resistance14 < R < 21Ω
10.7		Open–circuit	Check insulation of wiring harness Check coil resistance14 < R < 21Ω Check coil power supply
10.8	LH rear electrovalve	LH rear ABS valve non–conformity	Check configuration using DIAGNOSTICA tool
10.10	ECU	Open–circuit on one of terminals X3.9 X4.3 X4.12 X2.3	Check insulation of wiring harness in relation to +24V and earth Check resistance between terminal X1.12 and battery earth R < 0.5Ω
10.11			
11.1	LH rear electrovalve (exhaust)	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance14 < R < 21Ω Check voltage between coil and earth < 3V
11.2		Short–circuit to earth	Check insulation of wiring harnessCheck coil resistance14 < R < 21Ω
11.3		Open–circuit	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω Check coil power supply
11.4	RH rear electrovalve	Open–circuit to coils common earth	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω

Defect code N°	Component in question	Cause	Remedy
11.5	RH rear electrovalve (inlet)	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω Check voltage between coil and earth < 3V
11.6		Short–circuit to earth	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω
11.7		Open–circuit	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω Check coil power supply
11.8	RH rear electrovalve	RH rear ABS valve non–conformity	Check configuration using DIAGNOSTICA tool
11.10	Wiring harness	Short–circuit on ECU (terminals X3.9 X4.3 X4.12 X2.3)	Check insulation of wiring harness in relation to +24V and earth Check resistance between battery earth and ECU terminal X1.12 and battery earth R < 0.5Ω Check resistance between battery earth and ECU terminal X1.11 and battery earth R < 0.5Ω If defect persists, contact central after–sales
11.11			
14.5	ASR electrovalve	Short–circuit to +24V	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω Check voltage between coil and earth < 3V
14.6		Short–circuit to earth	Check insulation of wiring harness Check coil resistance 14 < R < 21Ω
14.7		Open–circuit	Check insulation of wiring harness Check coil resistance 14 < R < 21 Ω Check coil power supply
14.8		Configuration defect	Check configuration using DIAGNOSTICA tool
15.1	ASR electrovalve	Internal defect	Replace ECU
15.2			
15.3			
15.4			
15.5			
15.6			
15.7			
15.9			
15.10			
15.11			
15.12			

Defect code N°	Component in question	Cause	Remedy
16.1	Battery	Overvoltage > 33V	Check battery and charging circuit
16.2		Undervoltage 6V< U <20V	
16.2		Undervoltage during ABS regulation 6V< U <17V	
16.3	Power supply wiring	After master switch + power supply lacking	Check voltage after master switch Check continuity between battery + and terminal X1.8
16.4		ECU power supply (terminals X1.7, X1.10) different from electrovalves power supply (terminals X1.9, X1.12)	Check voltage at battery terminals Check voltage after master switch Check voltage at terminals X1.9, X1.12 Check voltage at terminals X1.7, X1.10
16.5	Battery	Overvoltage > 33V	Check battery and charging circuit
16.6		Undervoltage 6V < U < 17V	
16.7	Power supply wiring	After master switch + power supply lacking	Check voltage after master switch Check continuity between battery + and terminal X1.8
16.8		ECU power supply (terminals X1.7, X1.10) different from electrovalves power supply (terminals X1.8, X1.11)	Check voltage at battery terminals Check voltage after master switch Check voltage at terminals X1.8, X1.11 Check voltage at terminals X1.7, X1.10
16.9	After ignition power supply	Overvoltage > 33V	Check voltage at battery terminals Check voltage after master switch Check voltage at terminals X1.8, X1.11
16.10		Undervoltage during ABS regulation 6V < U < 17V	
16.10			
16.11	Power supply wiring	ECU power supply (terminals X1.7, X1.10) different from electrovalves power supply (terminals X1.9, X1.12)	Check voltage at battery terminals Check voltage after master switch Replace ECU
17.1	Retarder relay	Short–circuit to + 24V	Check insulation of wiring harness in relation to +24V
17.2		Short–circuit to earth or open–circuit	Check continuity and insulation of wiring harness in relation to earth
17.3	System	CAN BUS communication problem	Check CAN BUS links
17.4			
17.6	Tyres	Tyre size outside standard range	Check tyre sizes and inflation pressures
17.7	ECU	ASR warning light still on because brake pedal not depressed	No defect
17.8		Off–road ASR mode activated	

Defect code N°	Component in question	Cause	Remedy
17.10	Tractor braking defect test light	Short–circuit or open–circuit	Check continuity and insulation of wiring harness in relation to +24V and earth
17.12	ECU	Fleeting failure detected by one or several sensors	Check connection arrangement and detectors wiring
17.13		Inversion between sensors	Check sensors wiring

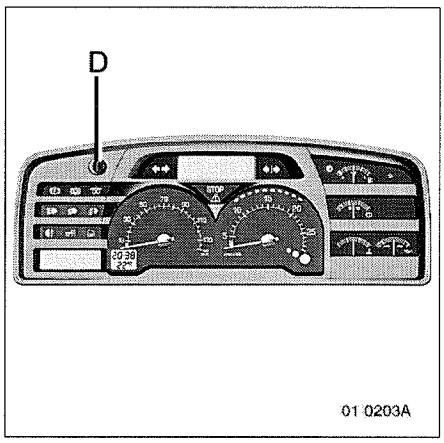
Diagnostics using the instrument panel display (If the DIAGNOSTICA tool is not on hand)

NOTE :
To erase memorized defects, the "DIAGNOSTICA" tool is essential.

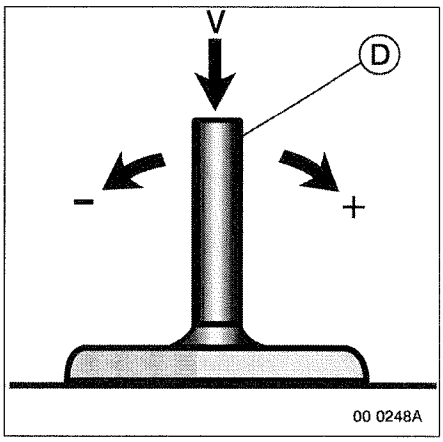
After the ignition is switched on.
In the event of incident on the ABS or ABS+ASR system, warning pictogram **G6** or **G7** or **G8** is displayed, a message is displayed and the "SERVICE" tell–tale light comes on (see handbook).

To discover the system defect, press instrument panel button **D**.

NOTE :
It is advised to use this button while the vehicle is stationary and parked correctly.

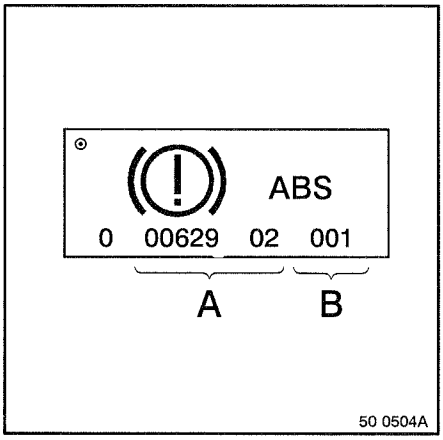


Push towards (+) or (–) to gain access to the different menus and sub–menus.
– Choose the "DIAGNOSTICS" menu.
– Then the "PRESENT DEFECT" menu.
– Give a short pulse (**V**) on the button to validate



The warning pictogram G6 and the defective function are displayed and a series of figures are displayed.

A : defect number
B : number of appearances of defect



LIST OF DEFECT CODE NUMBERS

DEFECT CODE	DEFECT TYPE	REPAIR RECOMMENDATION	MESSAGE	LIGHT
00512 09	Engine retarder presence message time–out	Check whether engine ECU sends message on CAN Check continuity and insulation of CAN bus wires	RISK OF SLIPPING	Service
00575 31	Inter–axle or inter–wheel differential lock engaged	Not a defect	ABS INACTIVE	Service
00611 14	Speed sensor reversal on axle 1, 2 or 3	Check consistency of speed sensor connections	ABS DEFECT	Service
00627 02	Battery voltage levels different between diagonals power supplies	Check different voltage levels	ABS DEFECT	Service
00627 03	Battery / after–ignition voltage too high	Check batteries voltage and charging circuit	ABS DEFECT	Service
00627 04	Battery / after ignition voltage too low	Check batteries voltage and charging circuit	ABS DEFECT	Service
00627 05	Open–circuit on ECU power supply	Check continuity of ECU power supply wiring harnesses	ABS DEFECT	Service
00629 02 **00629 09** **00629 11** **00629 12** **00629 13** **00630 02** **00630 12**	ECU internal defect	Replace the ECU	ABS DEFECT	Service
00630 13	Front / rear toothed wheels different Tyre sizes incompatible with ECU	Check consistency of front / rear toothed wheels (number of teeth) Check tyre sizes and inflation pressures	ABS DEFECT	Service
00639 02	Propeller shaft retarder presence message time–out	Check whether retarder ECU sends message on CAN bus Check continuity and insulation of CAN bus wires	ABS DEFECT	Service
00639 12	CAN link loss	Check continuity of CAN bus arriving at ABS ECU	ABS DEFECT	Service
00789 01	Static air gap too great on LH front sensor	Check LH front sensor air gap = 0.2 mm	ABS DEFECT	Service

DEFECT CODE	DEFECT TYPE	REPAIR RECOMMENDATION	MESSAGE	LIGHT
00789 02	Short–circuit or open–circuit on LH front sensor	Check continuity and insulation of LH front wiring harness Check sensor resistance 950 < R < 1930 Ω	ABS DEFECT	Service
00789 07	Dynamic air gap too great on LH front sensor	Check LH front sensor air gap = 0.2 mm Check toothed wheel cleanliness and buckle < 0.3 mm	ABS DEFECT	Service
00789 08	Loss of or poor speed signal on LH front sensor	Check continuity and insulation of LH front wiring harness Check sensor resistance 950 < R < 1930 Ω Check condition of LH front toothed wheel If defect persists, replace sensor	ABS DEFECT	Service
00789 10	Defect on LH front toothed wheel	Check conformity of toothed wheel (number of teeth) Check toothed wheel cleanliness and buckle < 0.3 mm	ABS DEFECT	Service
00789 12	ECU internal defect	Replace ECU	ABS DEFECT	Service
00790 01	Static air gap too great on RH front sensor	Check RH front sensor air gap = 0.2 mm	ABS DEFECT	Service
00790 02	Short–circuit or open–circuit on RH front sensor	Check continuity and insulation of RH front wiring harness Check sensor resistance 950 < R < 1930 Ω	ABS DEFECT	Service
00790 07	Dynamic air gap too great on RH front sensor	Check LH front sensor air gap = 0.2 mm Check toothed wheel cleanliness and buckle < 0.3 mm	ABS DEFECT	Service
00790 08	Loss of or poor speed signal on LH front sensor	Check continuity and insulation of RH front wiring harness Check sensor resistance 950 < R < 1930 Ω Check condition of LH front toothed wheel If defect persists, replace sensor	ABS DEFECT	Service
00790 10	Defect on RH front toothed wheel	Check conformity of toothed wheel (number of teeth) Check toothed wheel cleanliness and buckle < 0.3 mm	ABS DEFECT	Service

DEFECT CODE	DEFECT TYPE	REPAIR RECOMMENDATION	MESSAGE	LIGHT
00790 12	ECU internal defect	Replace ECU	ABS DEFECT	Service
00791 01	Static air gap too great on LH rear sensor	Check LH rear sensor air gap = 0.2 mm	ABS DEFECT	Service
00791 02	Short–circuit or open–circuit on LH rear sensor	Check continuity and insulation of LH rear wiring harness Check sensor resistance 950 < R < 1930 Ω	ABS DEFECT	Service
00791 07	Dynamic air gap too great on LH rear sensor	Check LH rear sensor air gap = 0.2 mm Check toothed wheel cleanliness and buckle < 0.3 mm	ABS DEFECT	Service
00791 08	Loss of or poor speed signal on LH rear sensor	Check continuity and insulation of LH rear wiring harness Check sensor resistance 950 < R < 1930 Ω Check condition of LH rear toothed wheel If defect persists, replace sensor	ABS DEFECT	Service
00791 10	Defect on LH rear toothed wheel	Check conformity of toothed wheel (number of teeth) Check toothed wheel cleanliness and buckle < 0.3 mm	ABS DEFECT	Service
00791 12	ECU internal defect	Replace ECU	ABS DEFECT	Service
00792 01	Static air gap too great on RH rear sensor	Check RH rear sensor air gap = 0.2 mm	ABS DEFECT	Service
00792 02	Short–circuit or open–circuit on RH rear sensor	Check continuity and insulation of RH rear wiring harness Check sensor resistance 950 < R < 1930 Ω	ABS DEFECT	Service
00792 07	Dynamic air gap too great on RH rear sensor	Check RH rear sensor air gap = 0.2 mm Check toothed wheel cleanliness and buckle < 0.3 mm	ABS DEFECT	Service
00792 08	Loss of or poor speed signal on RH rear sensor	Check continuity and insulation of RH rear wiring harness Check sensor resistance 950 < R < 1930 Ω Check condition of RH rear toothed wheel If defect persists, replace sensor	ABS DEFECT	Service

DEFECT CODE	DEFECT TYPE	REPAIR RECOMMENDATION	MESSAGE	LIGHT
00792 10	Defect on RH rear toothed wheel	Check conformity of toothed wheel (number of teeth) Check toothed wheel cleanliness and buckle < 0.3 mm	ABS DEFECT	Service
00792 12	ECU internal defect	Replace ECU	ABS DEFECT	Service
00795 02	LH front ABS valve non–conforming	Check conformity of LH front ABS valve using DIAGNOSTICA	ABS DEFECT	Service
00795 03	Short–circuit on LH front ABS valve inlet and exhaust electrovalves +	Check insulation of LH front ABS valve power supply wiring harness Check resistance of coils 14 < R < 21 Ω	ABS DEFECT	Service
00795 04	Short–circuit on LH front ABS valve inlet and exhaust electrovalves earth	Check insulation of LH front ABS valve power supply wiring harness Check resistance of coils 14 < R < 21 Ω	ABS DEFECT	Service
00795 05	Open–circuit on LH front ABS valve power supply	Check continuity of LH front ABS valve power supply wiring harness	ABS DEFECT	Service
00796 02	RH front ABS valve non–conforming	Check conformity of RH front ABS valve using DIAGNOSTICA	ABS DEFECT	Service
00796 03	Short–circuit on RH front ABS valve inlet and exhaust electrovalves +	Check insulation of RH front ABS valve power supply wiring harness Check resistance of coils 14 < R < 21 Ω	ABS DEFECT	Service
00796 04	Short–circuit on RH front ABS valve inlet and exhaust electrovalves earth	Check insulation of RH front ABS valve power supply wiring harness Check resistance of coils 14 < R < 21 Ω	ABS DEFECT	Service
00796 05	Open–circuit on RH front ABS valve power supply	Check continuity of RH front ABS valve power supply wiring harness	ABS DEFECT	Service
00797 02	LH rear ABS valve non–conforming	Check conformity of RH front ABS valve using DIAGNOSTICA	ABS DEFECT	Service
00797 03	Short–circuit on LH rear ABS valve inlet and exhaust electrovalves +	Check insulation of LH rear ABS valve power supply wiring harness Check resistance of coils 14 < R < 21 Ω	ABS DEFECT	Service

DEFECT CODE	DEFECT TYPE	REPAIR RECOMMENDATION	MESSAGE	LIGHT
00797 04	Short–circuit on LH rear ABS valve inlet and exhaust electrovalves earth	Check insulation of LH rear ABS valve power supply wiring harness Check resistance of coils 14 < R < 21 Ω	ABS DEFECT	Service
00797 05	Open–circuit on LH rear ABS valve power supply	Check continuity of LH rear ABS valve power supply wiring harness	ABS DEFECT	Service
00798 02	RH rear ABS valve non–conforming	Check conformity of RH rear ABS valve using DIAGNOSTICA	ABS DEFECT	Service
00798 03	Short–circuit on RH rear ABS valve inlet and exhaust electrovalves +	Check insulation of RH rear ABS valve power supply wiring harness Check resistance of coils 14 < R < 21 Ω	ABS DEFECT	Service
00798 04	Short–circuit on RH rear ABS valve inlet and exhaust electrovalves earth	Check insulation of RH rear ABS valve power supply wiring harness Check resistance of coils 14 < R < 21 Ω	ABS DEFECT	Service
00798 05	Open–circuit on RH rear ABS valve power supply	Check continuity of RH rear ABS valve power supply wiring harness	ABS DEFECT	Service
00801 03	Short–circuit on retarder cut–off relay power supply wiring harness + or open–circuit	Check continuity and insulation of relay power supply wiring harness	RISK OF LOCKING	Service
00801 04	Short–circuit on retarder cut–off relay power supply wiring harness earth	Check continuity and insulation of relay power supply wiring harness	RISK OF LOCKING	Service
00802 02	Open–circuit on diagonal 1 earth or voltage difference between diagonal 1 and after–ignition + too great	Check continuity and insulation of diagonal 1 earth wiring harness	ABS DEFECT	Service
00802 03	Short–circuit on ABS ECU battery earth +	Check insulation of ABS ECU earth wiring harness	ABS DEFECT	Service
00802 04	Short–circuit on ABS ECU battery earth –or ABS ECU internal deficiency	Check continuity and insulation of ABS ECU earth wiring harness If defect persists, replace ECU	ABS DEFECT	Service

DEFECT CODE	DEFECT TYPE	REPAIR RECOMMENDATION	MESSAGE	LIGHT
00802 03	Short–circuit on diagonal 1 earth + (ABS+ASR assembly)	Check insulation of diagonal 1 earth wiring harness	ABS DEFECT	Service
00802 04	Short–circuit on diagonal 1 earth – (ABS+ASR assembly)	Check insulation of diagonal 1 earth wiring harness	ABS DEFECT	Service
00802 12	ECU internal defect	Replace ECU	ABS DEFECT	Service
00803 02	Open–circuit on diagonal 1 earth or voltage difference between diagonal 2 earth and after–ignition + too great	Check continuity and insulation of diagonal 2 earth wiring harness	ABS DEFECT	Service
00803 03	Short–circuit on diagonal 2 earth + (ABS+ASR assembly)	Check insulation of diagonal 2 earth wiring harness	ABS DEFECT	Service
00803 04	Short–circuit on diagonal 2 earth – (ABS+ASR assembly)	Check insulation of diagonal 2 earth wiring harness	ABS DEFECT	Service
00806 02	ASR valve non–conforming	Check conformity of valve using DIAGNOSTICA	RISK OF SLIPPING	Service
00806 03	Short–circuit on ASR valve power supply +	Check insulation of ASR valve wiring harness	RISK OF SLIPPING	Service
00806 04	Short–circuit on ASR valve power supply –	Check insulation of ASR valve wiring harness	RISK OF SLIPPING	Service
00806 05	Open–circuit on ASR valve power supply wiring harness	Check continuity of ASR valve wiring harness	RISK OF SLIPPING	Service
00810 07	Speed sensor defect appearing since last time ignition switched on	Check for presence of a memorized defect Repair if applicable, then run vehicle at a speed > 20 km/h	TEST... RUN!	Service
00818 12	ECU internal defect	Replace ECU	ABS DEFECT	Service
01045 07	CAN communication problem with VECU, no reception of stop brake switch message	Check whether VECU sends message to CAN Check continuity and insulation of CAN bus wires	RISK OF SLIPPING	Service

TESTING

TESTING USING THE RENAULT TRUCKS "DIAGNOSTICA" TOOL

1 Implementation

– Plug in the extensions.
– Close the master switch.
– Switch on the ignition.
– Move the **DIAGNOSTICA** switch to the "**ON**" position.

2 Procedure

A Reading memorized defects

– These defects are not necessarily present.
– Read–out may give several defects per diagonal.
– By continuing the process, the defects are erased.
– To check for the absence of other memorized defects, make a road test.

B Automatic relay test

Only relay **8023** is not tested (see 'Electrical Equipment' workshop manual diagrams).

C Reading present defects

Read–out may give several present defects.

D Workshop diagnostics

The screen proposes the following test through the "**DIAGNOSTICA**" menu:

– Speed sensors test; turn the roadwheels. The TOOL gives the result.
– Warning lamps test.
– ABS electrovalves test; the TOOL pilot–controls the electrovalves. Read the result on the pressure gauges.
– ASR electrovalves test; the TOOL pilot–controls the electrovalve through the ABS electrovalves. Read the result on the pressure gauges.
– Speed limiter, or electric accelerator, or VECU links test.

E Diagnostics on brake–testing bench

This method makes simultaneous use of "**DIAGNOSTICA**" and the brake–testing bench, allowing a full diagnostic check on the braking systems.

1 – Braking systems efficiency and harmonization test.
2 – Anti–lock braking test.

Since these two functions are closely connected with vehicle behaviour, this method is only to be used with **RENAULT TRUCKS** officially approved brake–testing benches.

NOTE :

To carry out operations D or E, the vehicle must be at compressed air governing pressure.
Use pneumatic test case N° **2423**.
Connect a 10–bar pressure gauge to each of the four brake cylinder pressure take–offs (coupling N° **7049** and flexible pipe N° **7096**).

IMPORTANT

If the vehicle has to be tested on a power bench and it is equipped with the ASR braking system, it is ESSENTIAL to disconnect the ASR electrovalve before offering up the vehicle on the bench.
To do this, it is necessary to:
– Open the master switch.
– Disconnect the ASR electrovalve.
– Re–close the master switch.

When the vehicle has left the bench, reconnect the ASR electrovalve.

On account of this operation, a memorized defect will be created.
To delete this memorized defect, use "DIAGNOSTICA".

DIAGNOSTICS

Follow the instructions given by "DIAGNOSTICA".

1 – Sensors test

This test serves to check out:
- Possible crossover of RH/LH or front/rear wiring harnesses.
- Operation and correct adjustment of sensors (air gap).
- Toothed wheel buckle or toothed wheel mechanical defect.

IMPORTANT

Since the sensors insulation test is not performed by "DIAGNOSTICA", it is VITAL to carry out this test using a digital display device.
– R must be > 1 MΩ

2 – ABS electrovalves test

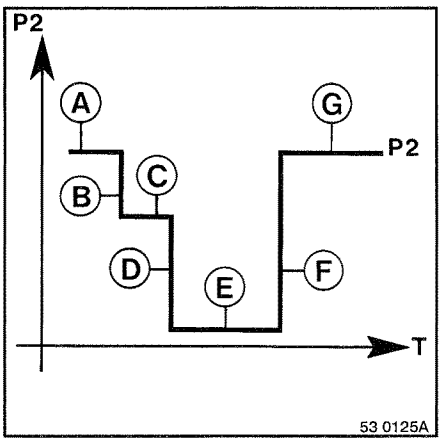
This test serves to check out not only possible inversion of wiring harnesses but also guide diagnostic checking through the graphic data supplied by the TOOL.

Graphic visualization of curves

Each of the curves is represented after stabilization of the brake pedal in a stationary position.

Key to curves

P2 : Pressure delivered to brake cylinder
F : Braking force developed at the roadwheel
T : Cycle time (≃ 8 seconds)



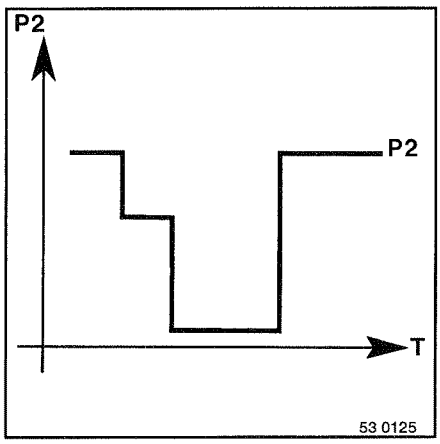
Normal graph

Evolution of pressure at brake cylinder (P2)

A – Rest (inlet open / exhaust closed)
B – Exhaust open / inlet closed
C – Exhaust closed / inlet open
D – Exhaust open / inlet closed
E – Inlet closed / exhaust open
F – Inlet open / exhaust closed
G – Rest

ELECTRICAL DEFECTS

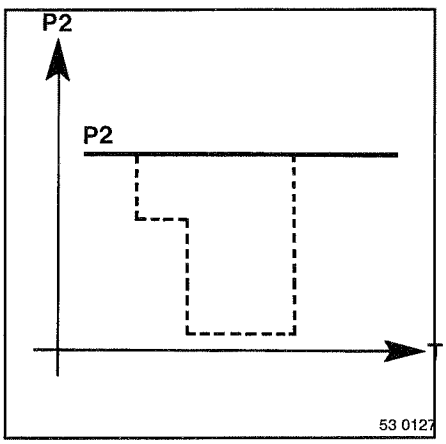
Normal cycle



Defect

Open–circuit or electrovalve inoperative (to be replaced)

14 Ω < R electrovalve < 21 Ω

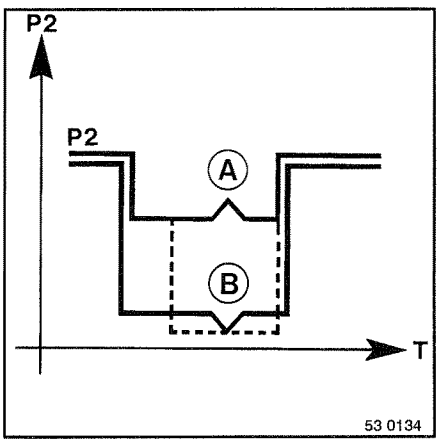


Defect

Terminals 2 and 3 electrical inversion (exhaust / inlet) on the RH front electrovalve

A – LH front roadwheel

B – RH front roadwheel

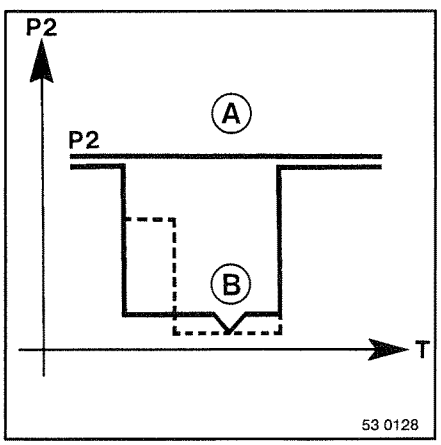


Defect

Terminals 2 and 3 electrical inversion (exhaust / inlet) on the RH rear electrovalve

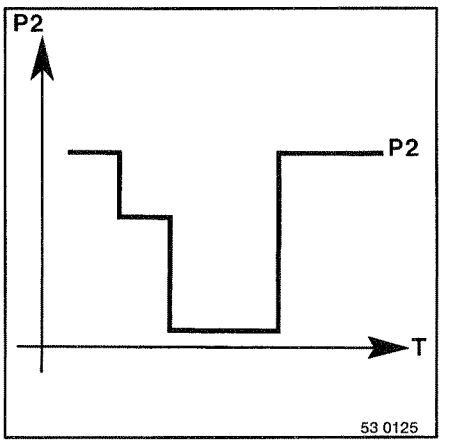
A – LH rear roadwheel

B – RH rear roadwheel



PNEUMATIC DEFECTS

Normal cycle

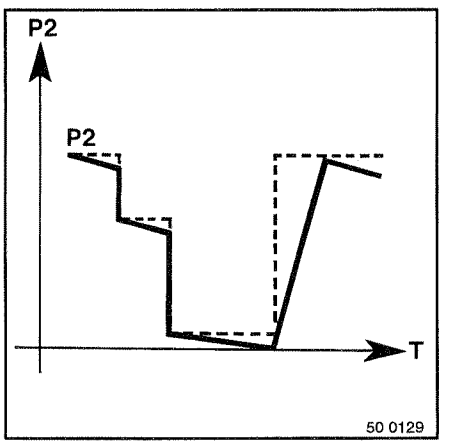


Defect

Electrovalve exhaust valve not tightly sealed

NOTE :

The evolution of the slope depends on the extent of the leak.

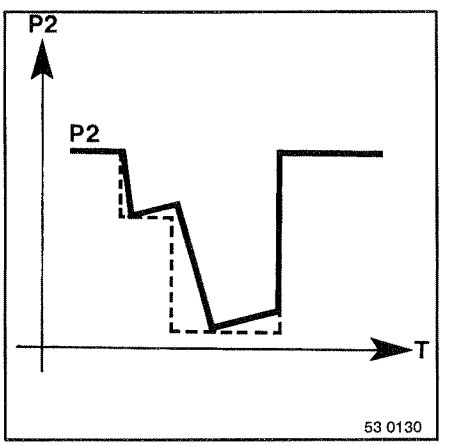


Defect

Electrovalve inlet valve not tightly sealed

NOTE :

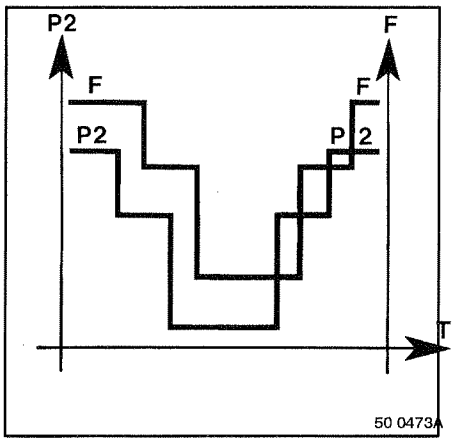
The evolution of the slope depends on the extent of the leak.



MECHANICAL DEFECTS

Normal cycle

The off–set between curves **P2** and **F** depends on the pull–back force of the brake mechanism (springs).

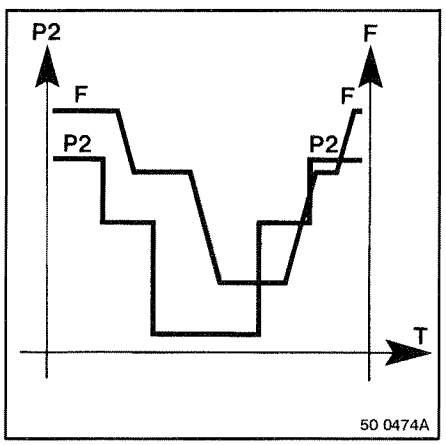


Defect

Seizing at brake back plate

NOTE :

The evolution of the slope of the curve **F** depends on the extent of the seizing.

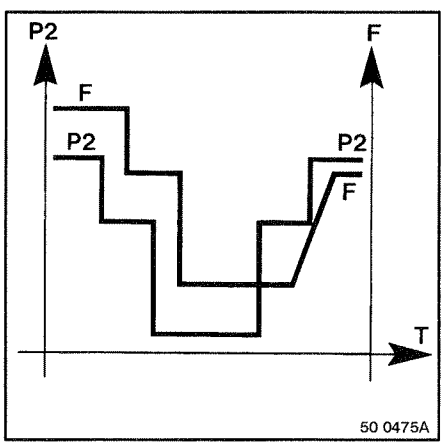


Defect

Brake shoe pull–off spring too hard

NOTE :

The evolution of the slope of the curve **F** depends on the hardness of the pull–off spring(s).



3 – ASR electrovalve test

This test serves to check out correct operation of the electrovalve.

With the brake pedal released, the braking pressure and force should change rapidly both in the inlet phase and in the exhaust phase.

4 – AID TO DIAGNOSTICS

A Reminder of operation

– Ignition switched on.
– Excitation of the two electrovalve power supply relays (8021 – 8022).
– Excitation of the safety relay (8023).
The job of this relay is to command the ABS information light in the event of absence of ECU power supply. (See 'Electrical Equipment' workshop manual electrical diagram).
– The retarder cut–off relay (8036) is excited (cut–off of retarder control power supply) when the system is in operation.
– The electrovalves are controlled by the ECU according to the indications supplied by the speed sensors.

B Precautions to be taken at the time of repair

To have an ABS/ASR system that operates correctly, repairs must be carried out vigilantly and faulty parts be replaced by parts with the same characteristics, especially:

– ECU with the same reference number as the original.

– ABS and ASR electrovalves with the same characteristics and from the same source.

– Speed sensors with the same characteristics and from the same source.

When replacing a speed sensor, it is recommended to change the flexible bush at the same time.

Push the sensor, without excessive force, until it makes contact with the toothed wheel. It is not necessary to adjust the air gap – this will be formed during the first revolutions of the wheel.

IMPORTANT

Each time after work has been carried out on the brakes (replacement of linings, grinding), upon re–assembly: **WITHOUT FAIL, PUSH BACK THE SENSOR to take support on the toothed wheel.**

Check the toothed wheel for buckle:

- Maximum buckle : 0.3 mm

WELDING ON VEHICLE

IMPORTANT PRECAUTIONS

The ECU must be protected from voltage surges before carrying out any electric welding operations. It is necessary to make an equipotential link by disconnecting the two (+) and (–) cables from the batteries and connecting them to earth. The master switch is to remain engaged (circuit closed).

TOOLS

RENAULT TRUCKS divide tools into 3 categories :

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

- **Special tools :** Specially created tools, distributed by the RENAULT TRUCKS spare parts division.

- **Locally manufactured tools :** these tools are classified differently according to their degree of sophistication :

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

  . **50 00 26 .... reference number** (possibility of purchasing through the RENAULT TRUCKS Spare Parts department) : a certain skill is needed to make these tools.

Three levels (or echelons) determine their assignment :

- **LEVEL1 :** Tools for servicing and minor tasks.

- **LEVEL 2 :** Tools for major repairs.

- **LEVEL 3 :** Tools for refurbishment.

Special tools				
Ref. RENAULT TRUCKS	**Description**	**Category**	**Quantity**	**Page**
50 00 26 7200	Diagnostica	1	1	E1 → E8
50 00 262423	Test case n° 0882	1	1	E1 → E8
50 00 267096	Coupling n° 7096	1	4	E1 → E8
50 00 267049	Flexible pipe n° 7049	1	4	E1 → E8