Clio

3 Chassis

38C ANTI-LOCK BRAKING SYSTEM

ABS BOSCH 8.1
Vdiag No.: 18

V1 **Edition Anglaise**

ANTI-LOCK BRAKING SYSTEM

Fault finding – Introduction

1. SCOPE OF THIS DOCUMENT

This document presents the fault finding method applicable to all computers with the following specifications:

Vehicle(s): **Thalia 2 / Symbol 2, Clio II F 6**	*Computer name*: **ABS BOSCH 8.1**
Function concerned: **ABS**	*VDIAG No.*: **18**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this document):
– Assisted fault finding (integrated into the **diagnostic tool**), Dialogys.

Wiring Diagrams:
– Visu-Schéma.

Type of diagnostic tools

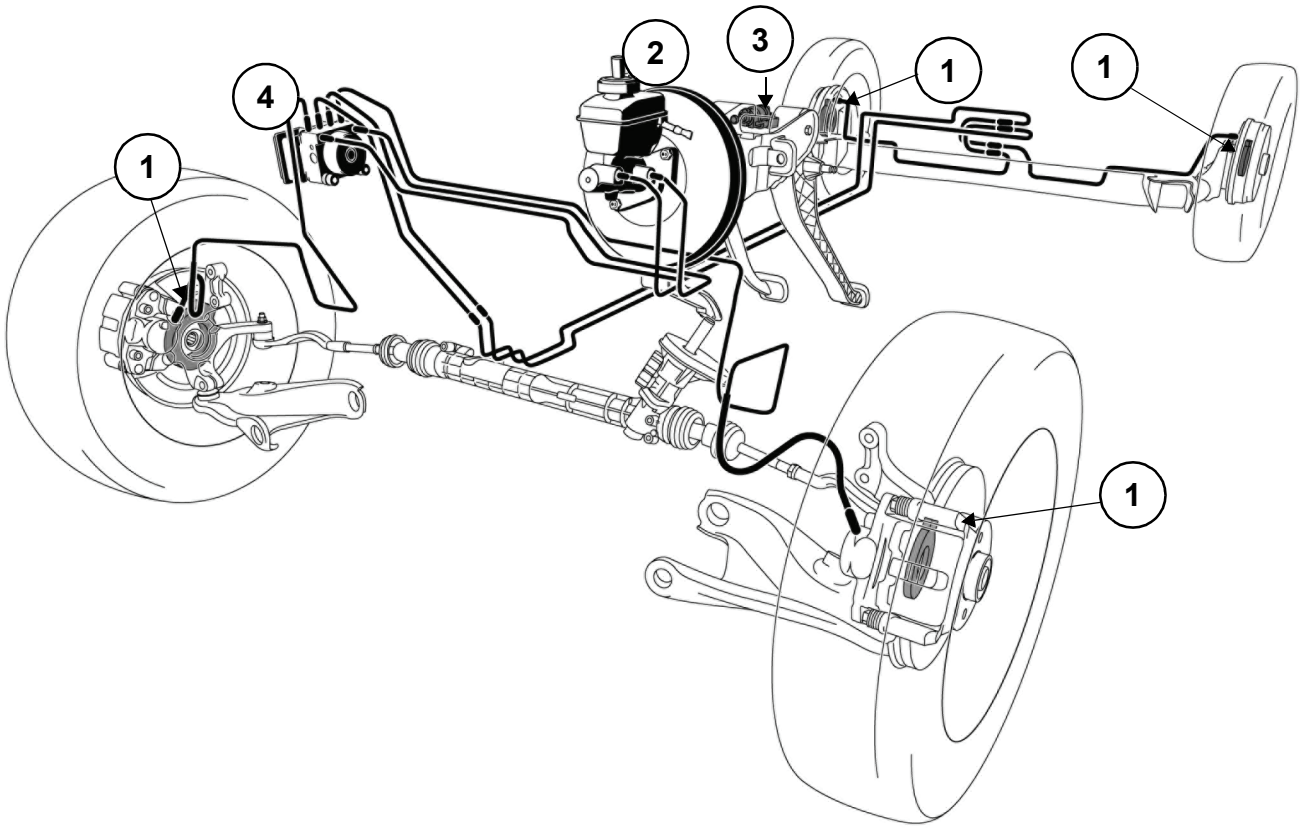
– CLIP

Special tooling required

Special tooling required:
Diagnostic tool
Multimeter

3. SAFETY INSTRUCTIONS

Safety rules must be observed during any work on a component to prevent any material damage or personal injury:
– check the battery voltage to avoid incorrect operation of computer functions,
– it is strictly forbidden to carry out a road test with the diagnostic tool communicating with the computer because the ABS (anti-lock braking system) and EBD (Electronic Braking Distribution) functions are deactivated. Braking pressure is identical on both vehicle axles (risk of a spin under heavy braking).



The anti-lock braking system consists of:
– four wheel speed sensors (1),
– a brake servo assembly (2),
– a brake pedal sensor (3),
– a pump assembly (4) consisting of:
  - a hydraulic pump,
  - a pressure modulation unit (eight solenoid valves),
  - a computer,
  - a pressure sensor.

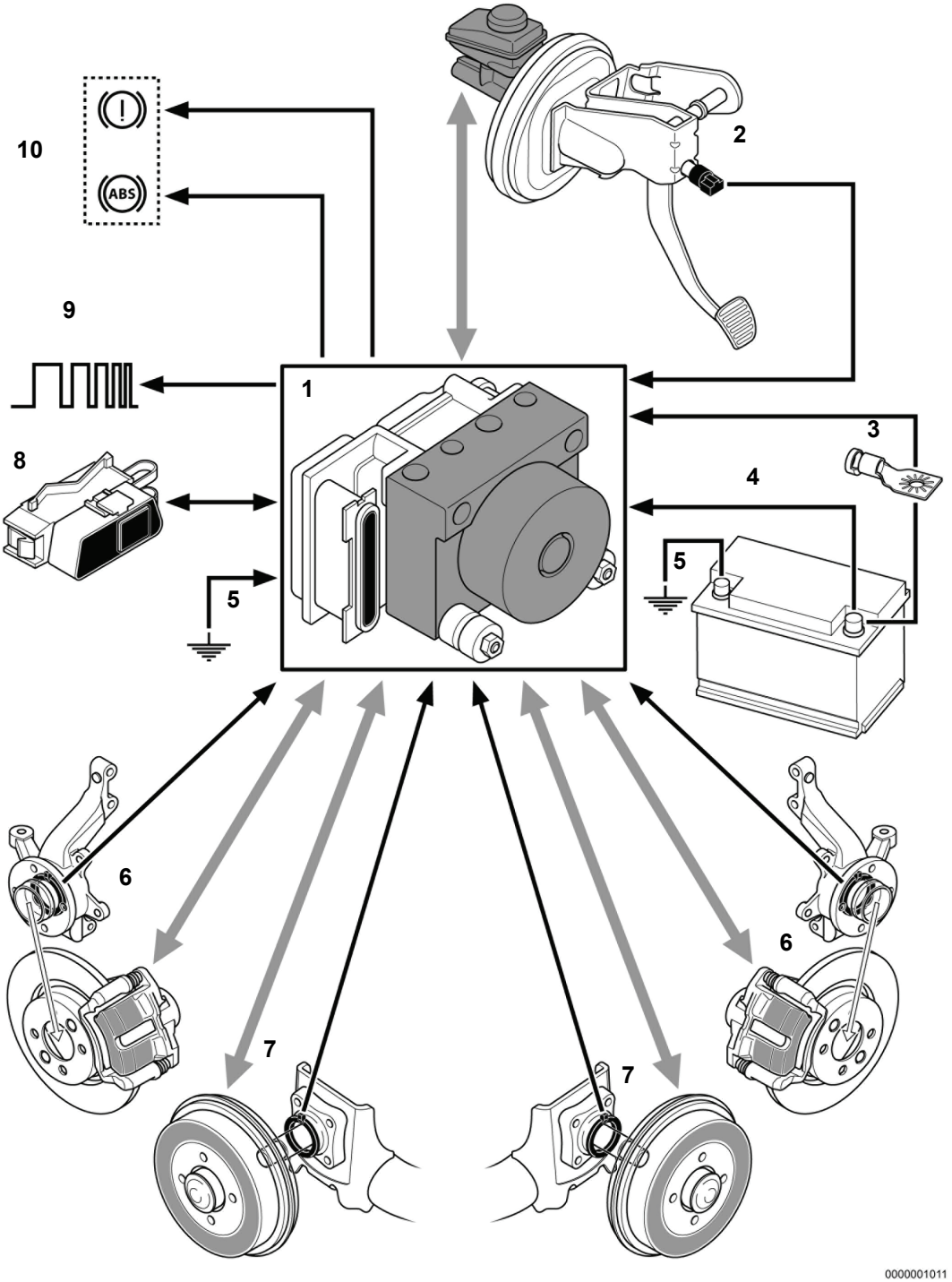
Wheel speed sensor:

Gives the speed of each of the vehicle's wheels.
Analysis of the speeds of the right-hand and left-hand wheel allows the turning direction of the vehicle to be deduced.

Brake lights switch:

Visual indication of the brake pedal position.
It indicates whether the driver is depressing the brake pedal.

ABS system flowchart



1	ABS computer	6	Front wheel speed sensor
2	Brake switch	7	Rear wheel speed sensor
3	After ignition supply	8	Diagnostic socket
4	Permanent supply	9	Vehicle speed signal
5	Earth	10	Fault warning lights on the instrument panel
→	Electric circuit	⇒	Hydraulic circuit

On this vehicle, the main functions of the ABS are as follows:
- electronic distribution of braking between front and rear by controlling skidding of the rear wheels,
- keeping the wheels from locking by controlling skidding of the four wheels.

The **ABS** prevents the wheels from locking when braking. This function allows the vehicle to be steered under braking and ensures vehicle stability under braking.

EBD (electronic braking distribution):

The electronic braking distribution unit optimises the brakeforce distribution between the front and rear axles. This function ensures vehicle stability under braking.

Fault finding warning lights programming

Instrument panel warning light		Meaning
-	ABS	ABS function inoperative.
Brake faults	ABS	Electronic braking regulation and ABS function not working
Brake faults flashing at **2 Hz**	ABS flashing at **2 Hz**	ABS computer is in fault finding mode.
-	ABS flashing at **8 Hz**	Tachometer index or vehicle configuration not programmed.

SETTINGS

VP001: Enter VIN.

This command permits manual entry of the vehicle's VIN into the computer.
Use this command each time the computer is replaced.
The VIN number (VF...) can be found on the manufacturer's plate on the door pillar and on the body panel under the bonnet.

Programming procedure:

– connect the **diagnostic tool**,
– refer to the **BOSCH 8.1 ABS** fault finding,
– select parameter **VP001**,
– enter the VIN,
– clear the computer memory using command **RZ001 Fault memory**,
– exit fault finding mode,
– switch off the ignition,
– wait for the end of powerlatch,
– on the identification screen, using **ID010 V.I.N. code**, check that the code being entered has been correctly recognised.

VP004: Vehicle parameters.

This command allows you to identify the vehicle on which the computer is installed.

Using **PR063 Vehicle parameters**, check that the parameters have been correctly recognised.

VP006: Enter last APV* operation date.

Whenever the ABS system is worked on in the shop, the date must be entered.
Select command VP006 on the diagnostic tool.
Enter the service date using the **diagnostic tool** keypad.
Using **ID020 Read last After-Sales operation date**, check that the date has been entered.

VP007: Tachometric index.

This command is used to program the computer memory with the index required to calculate vehicle speed from the speed at which the tyres fitted on the vehicle turn.

Command VP007 is only used to stop the ABS warning light flashing after the computer has been replaced.

Using **PR030 Tachometric index**, check that the index has been entered correctly.

APV*: After-Sales

Replacing the computer

When replacing the computer, apply the following procedure:

- **switch off the ignition,**
- **disconnect the battery,**
- **replace the computer,**
- **configure the vehicle parameters with command VP004 "Vehicle parameters",**
- **enter the VIN using command VP001 Write VIN,**
- **configure the tachometric index with command VP007 "Tachometric index",**
- **perform a road test followed by a fault reading to confirm that the system is operating correctly.**

Tool fault	Associated DTC	Diagnostic tool title
DF001	50CC	Computer supply
DF006	501F	Front left-hand wheel speed sensor circuit
DF007	503F	Rear left-hand wheel speed sensor circuit
DF017	50C3	Computer
DF020	50C3	Tachometric index programming
DF026	500F	Front right-hand wheel speed sensor circuit
DF027	502F	Rear right-hand wheel speed sensor circuit
DF063	5046	Wheel speed inconsistency

DF001 PRESENT OR STORED	COMPUTER SUPPLY VOLTAGE 1.DEF: Below minimum threshold 2.DEF: Above maximum threshold 3.DEF: Abnormal voltage

NOTES	**Special notes:** The fault is declared **present** during a road test at a vehicle speed **> 6 mph (10 km/h)**.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure if the fault is **present** or **stored**.
	Use **Wiring Diagrams Technical Note for Thalia 2 / Symbol 2, Clio II F 6**.

Check the condition and position of the ABS fuses, **F01 (50A)** and **F10 (25A)** in the engine fuse and relay box, component code **710** (see **MR 423, Mechanical, 81C, Fuses, Fuses: List and location of components**).
Check the condition and position of the ABS fuse **F24 (10 A)** in the passenger compartment fuse box, component code **1016** (see **MR 423** or **430, Mechanical, 81C, Fuses, Fuses: List and location of components**).
Check the **continuity** between fuses **F01** and **F10** and connections **BP14** and **BP8** of the ABS computer connector, component code **721 (for BURSA) or 118 (for MERCOSUR)** (presence of **+ before ignition feed** on the connections).
Check the **continuity** between the passenger compartment fuse **F24** and connection **AP5** of the ABS computer, component code **721 (for BURSA) or 118 (for MERCOSUR)** (presence of **+ after ignition feed** on the connection).
If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.
Check that the battery terminals are in good condition and properly tightened, component code **107**.
Check the connections on the ABS computer connector, component code **721 (for BURSA) or 118 (for MERCOSUR).**
If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Check the **earths** on connections **MAH** of the ABS computer, component code **721 (for BURSA) or 118 (for MERCOSUR)**.
If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF001 CONTINUED	

Clear the computer memory using command **RZ001 Fault memory**, exit fault finding and switch off the ignition. Carry out a new check using the **diagnostic tool**.
If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF006 PRESENT OR STORED	FRONT LEFT-HAND WHEEL SPEED SENSOR CIRCUIT CO.0: Open circuit or short circuit to earth 1.DEF: Magnetic/mechanical target fault

NOTES	**Special notes:** The fault is declared **present** during a road test at a vehicle speed **> 6 mph (10 km/h)**.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure if the fault is **present** or **stored**.
	Use **Wiring Diagrams Technical Note for Thalia 2 / Symbol 2, Clio II F 6**.

CO.0	***NOTES***	**Special notes:** Command **AC013 Wheel speed sensor supply test**, must be used only once.

Check the connection and condition of the connections of the front left-hand wheel speed sensor, component code **153**.
If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Disconnect the sensor, use command **AC013 Wheel speed sensor supply test** and check that pulses of voltage of approximately **12 V** are detected by a multimeter at the sensor connector terminals on the computer side.
Are the pulses present?

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF006 CONTINUED 1	

YES	If pulses are detected, the front left-hand wheel speed sensor is defective, replace the sensor.
NO	Check the connection and condition of the ABS computer connections, component code **721 (for BURSA) or 118 (for MERCOSUR)**. If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. Check and ensure **the continuity** of the following connections: – **4E** between components **153** and **721 (for BURSA) or 118 (for MERCOSUR)**, – **4C** between components **153** and **721 (for BURSA) or 118 (for MERCOSUR)**. Also check **the insulation** between these two connections. If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF006 CONTINUED 2	

1.DEF	***NOTES***	None.

Check the connection and condition of the connections of the front left-hand wheel speed sensor, component code **153**.
If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Visually inspect the condition of the target and sensor (for dirt, metallic contamination, bearing grease, etc.), and clean using compressed air if necessary.
If there is a lot of grease on the target, contact the Techline.
Check that the wheel speed sensor mounting is in good condition (correct clipping).
Check the conformity of the target (condition, number of teeth **= 48** or **44** depending on the version) with the specific command **SC001 Check target teeth**.

If the checks are correct:
– clear the computer fault memory using the command **RZ001 Fault memory**,
– exit fault finding mode, switch off the ignition and carry out a road test.
Replace the instrumented bearing if the fault recurs.
If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF007 PRESENT OR STORED	REAR LEFT-HAND WHEEL SPEED SENSOR CIRCUIT CO.0: Open circuit or short circuit to earth 1.DEF: Magnetic/mechanical target fault

NOTES	**Special notes:** The fault is declared **present** during a road test at a vehicle speed **> 6 mph (10 km/h)**.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure if the fault is **present** or **stored**.
	Use **Wiring Diagrams Technical Note for Thalia 2 / Symbol 2, Clio II F 6**.

CO.0	***NOTES***	**Special notes:** Command **AC013 Wheel speed sensor supply test**, must be used only once.

Check the connection and condition of the connections of the rear left-hand wheel speed sensor, component code **151**.
If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Disconnect the sensor, use command **AC013 Wheel speed sensor supply test** and check that pulses of voltage of approximately **12 V** are detected by a multimeter at the sensor connector terminals on the computer side.
Are the pulses present?

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF007 CONTINUED 1	

YES	If pulses are detected, the rear left-hand wheel speed sensor is defective, replace the sensor.
NO	Check the connection and condition of the ABS computer connections, component code **721 (for BURSA) or 118 (for MERCOSUR)**. If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. Check the **continuity** and **insulation**, and the **absence of interference resistance** on the following connections: – **4G** between components **151** and **721 (for BURSA) or 118 (for MERCOSUR)**, – **4H** between components **151** and **721 (for BURSA) or 118 (for MERCOSUR)**. If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF007 CONTINUED 2	

1.DEF	*NOTES*	None.

Visually inspect the condition of the target and sensor (for dirt, metallic contamination, bearing grease, etc.), and clean using compressed air if necessary.
If there is a lot of grease on the target, contact the Techline.
Check that the wheel speed sensor mounting is in good condition.
Check the conformity of the target (condition, number of teeth = **48** or **44** depending on the version) with the specific command **SC001 Check target teeth**.

If the checks are correct:
– clear the computer fault memory using the command **RZ001 Fault memory**,
– exit fault finding mode, switch off the ignition and carry out a road test.
Replace the instrumented bearing if the fault recurs.
If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF017 PRESENT OR STORED	COMPUTER 1.DEF: Supply fault or internal electrical fault 2.DEF: Invalid programming / initialisation

NOTES	**Special notes:** The fault is **present** when the ignition is switched on.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure if the fault is **present** or **stored**.
	Use **Wiring Diagrams Technical Note for Thalia 2 / Symbol 2, Clio II F 6**.

1.DEF	***NOTES***	None.
		Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure whether the fault is **present** or **stored**

Check the condition and position of ABS power fuses **F01 (50 A)** and **F10 (25 A)**, in the engine compartment connection unit, component code **710** (see **MR 423** or **430, Mechanical, 81C, Fuses, Fuses: List and location of components**).
Check the **continuity** between fuses **F01** and **F10** and connections **BP14** and **BP8** of the computer connector, component code **721 (for BURSA) or 118 (for MERCOSUR)** (presence of **+ before ignition feed** on the connections).
Check that the battery terminals are in good condition and properly tightened, component code **107**.
Check the connections on the ABS computer connector, component code **721 (for BURSA) or 118 (for MERCOSUR).**
If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Check the **earths** on connections **MAH** of component **721 (for BURSA) or 118 (for MERCOSUR)**.
If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF017 CONTINUED	

Clear the computer memory using command **RZ001 Fault memory**, exit fault finding and switch off the ignition. Carry out a new check using the **diagnostic tool**.
If the fault is still present, contact the Techline.

2.DEF	***NOTES***	None.

Use command **VP004 Vehicle parameters** on the **fault finding tool** to define the appropriate version for the vehicle type. **You must select the version that corresponds to the vehicle type.** Check that the vehicle parameters are included in the parameter **PR063 Vehicle parameters**.
If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF020 PRESENT	TACHOMETRIC INDEX PROGRAMMING

NOTES	None.

The **ABS BOSCH 8.1** computer with "tachometric function" must have an index value in order to calculate the vehicle speed from the speed at which the tyres turn. Use command **VP007 Tachometric index** and check that it has been taken into account using parameter **PR030 Tachometric index**.
If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF026 PRESENT OR STORED	FRONT RIGHT-HAND WHEEL SPEED SENSOR CIRCUIT CO.0: Open circuit or short circuit to earth 1.DEF: Magnetic/mechanical target fault

NOTES	**Special notes:** The fault is declared **present** during a road test at a vehicle speed **> 6 mph (10 km/h)**.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure if the fault is **present** or **stored**.
	Use **Wiring Diagrams Technical Note for Thalia 2 / Symbol 2, Clio II F 6**.

CO.0	***NOTES***	**Special notes:** Command **AC013 Wheel speed sensor supply test**, must be used only once.

Check the connection and the condition of the connections of the front right-hand wheel speed sensor, component code **152**. If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Disconnect the sensor, use command **AC013 Wheel speed sensor supply test** and check that pulses of voltage of approximately **12 V** are detected by a multimeter at the sensor connector terminals on the computer side.
Are the pulses present?

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF026 CONTINUED 1	

YES	If pulses are detected, the front right-hand wheel speed sensor is defective, replace the sensor.
NO	Check the connection and condition of the ABS computer connections, component code **721 (for BURSA) or 118 (for MERCOSUR)**. If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. Check and ensure the continuity of the following connections: – **4M** between components **152** and **721 (for BURSA) or 118 (for MERCOSUR)**, – **4N** between components **152** and **721 (for BURSA) or 118 (for MERCOSUR)**. Also check the insulation between these two connections. If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it. If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF026 CONTINUED 2	

1.DEF	*NOTES*	None.

Visually inspect the condition of the target and sensor (for dirt, metallic contamination, bearing grease, etc.), and clean using compressed air if necessary.
If there is a lot of grease on the target, contact the Techline.
Check that the wheel speed sensor mounting is in good condition (correct clipping).
Check the conformity of the target (condition, number of teeth = **48** or **44** depending on the version) with the specific command **SC001 Check target teeth**.

If the checks are correct:
– clear the computer fault memory using the command **RZ001 Fault memory**,
– exit fault finding mode, switch off the ignition and carry out a road test.
Replace the instrumented bearing if the fault recurs.

If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF027 PRESENT OR STORED	REAR RIGHT-HAND WHEEL SPEED SENSOR CIRCUIT CO.0: Open circuit or short circuit to earth 1.DEF: Magnetic/mechanical target fault

NOTES	**Special notes:** The fault is declared **present** during a road test at a vehicle speed **> 6 mph (10 km/h)**.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure if the fault is **present** or **stored**.
	Use **Wiring Diagrams Technical Note for Thalia 2 / Symbol 2, Clio II F 6**.

CO.0	***NOTES***	**Special notes:** Command **AC013 Wheel speed sensor supply test**, must be used only once.

Check the connection and the condition of the connections of the rear right-hand wheel speed sensor, component code **150**.
If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Disconnect the sensor, use command **AC013** Wheel speed sensor supply test and check that pulses of voltage of approximately **12 V** are detected by a multimeter at the sensor connector terminals on the computer side.
Are the pulses present?

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF027 CONTINUED 1	

YES	If pulses are detected, the rear right-hand wheel speed sensor is defective, replace the sensor.
NO	Check the connection and condition of the ABS computer connections, component code **721 (for BURSA) or 118 (for MERCOSUR)**. If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring. Check and ensure the continuity of the following connections: – **4S** between components **150** and **721 (for BURSA) or 118 (for MERCOSUR)**, – **4T** between components **150** and **721 (for BURSA) or 118 (for MERCOSUR)**. Also check the insulation between these two connections. If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.
	If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF027 CONTINUED 2	

1.DEF	***NOTES***	None.

Visually inspect the condition of the target and sensor (for dirt, metallic contamination, bearing grease, etc.), and clean using compressed air if necessary.
If there is a lot of grease on the target, contact the Techline.
Check that the wheel speed sensor mounting is in good condition.
Check the conformity of the target (condition, number of teeth = **48** or **44** depending on the version) with the specific command **SC001 Check target teeth**.

If the checks are correct:
– clear the computer fault memory using the command **RZ001 Fault memory**,
– exit fault finding mode, switch off the ignition and carry out a road test.
Replace the instrumented bearing if the fault recurs.

If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

DF063 PRESENT OR STORED	WHEEL SPEED CONSISTENCY 1.DEF: Interference

NOTES	**Priorities when dealing with a number of faults:** Deal with faults **DF006 Front left-hand wheel speed sensor circuit**, **DF007 Rear left-hand wheel speed sensor circuit**, **DF026 Front right-hand wheel speed sensor circuit** and **DF027 Rear right-hand wheel speed sensor circuit** first even if they are **stored**.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared **present** during a road test.

Check the condition of the braking system (condition of linings, sealing, grating, bleed, etc.).
Check the condition of the axles and the conformity and good condition of the tyre mountings.
Check how well the wheel speed sensors are fitted (correct clipping).
Repair if necessary.

If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

NOTES	Only carry out a conformity check after a **complete check** with the **diagnostic tool**.

Function	Parameter or Status Check or Action		Display and notes	Fault finding
Diagnostic tool dialogue			ABS BOSCH 8.1	See the interpretation of **ALP1 No dialogue with the ABS computer**
Vehicle parameters	**PR063:**	Vehicle parameters	Check that the parameters are consistent with the vehicle on which fault finding is being run.	VP004 Vehicle parameters
Brake pedal not depressed detection	**ET017:**	Brake pedal	**Released** status confirmed, brake pedal not depressed	**In the event of a fault**, apply the interpretation of status **ET017**
Depressed brake pedal detection	**ET017:**	Brake pedal	**Depressed** status, brake pedal depressed	
Computer supply	**PR005:**	Computer feed voltage	Ensure that the battery voltage is correct (check the charge circuit if necessary)	**In the event of a fault**, apply the interpretation of fault **DF001 Computer supply voltage**.
Vehicle speed	**PR038:**	Vehicle speed	Ensure that the vehicle speed is consistent	**In the event of a fault**, apply the interpretation of fault **DF063 Wheel speed consistency**

NOTES	Only carry out a conformity check after a **complete check** with the **diagnostic tool**.

Function	Parameter or Status Check or Action	Display and notes	Fault finding
Wheel speed	**PR001:** Front right-hand wheel speed	Ensure that the wheel speed is consistent	**In the event of a fault**, refer to the interpretation of fault **DF026 Front right-hand wheel speed sensor circuit**
	PR002: Front left-hand wheel speed	Ensure that the wheel speed is consistent	**In the event of a fault**, refer to the interpretation of fault **DF006 Front left-hand wheel speed sensor circuit**
	PR003: Rear right-hand wheel speed	Ensure that the wheel speed is consistent	**In the event of a fault**, refer to the interpretation of fault **DF027 Rear right-hand wheel speed sensor circuit**
	PR004: Rear left-hand wheel speed	Ensure that the wheel speed is consistent	**In the event of a fault**, refer to the interpretation of fault **DF007 Rear left-hand wheel speed sensor circuit**

Tool status	Diagnostic tool title
ET017	Brake pedal

ET017	BRAKE PEDAL

NOTES	**Special notes:** Carry out the checks only if the **depressed** and **released** statuses are not consistent with the pedal position.
	Use **Wiring Diagrams Technical Note for Thalia 2 / Symbol 2, Clio II F 6**.

STATUS "Released" Brake pedal depressed.

If the brake lights are working:

– Check and ensure the continuity of connection 65A between the connector of the brake light switch, component code **160** and the connector of the ABS computer, component code **721 (for BURSA) or 118 (for MERCOSUR)**.

If the connection is faulty and if there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

If the brake lights are not working:

– Check the condition and fitting of the brake light switch and fuse **F4 (15A)** of the brake lights.

– Remove and test the operation of the brake light switch:

	Continuity **between the following connections:**	**Insulation** between the following connections:
Switch pressed (Brake pedal released)	**5A** and **AP10**	**65A** and **AP10**
Switch released (Brake pedal depressed)	**65A** and **AP10**	**5A** and **AP10**

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ET017 CONTINUED 1	

If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

– Replace the switch if necessary.
– Check and ensure the presence of **+ after ignition feed** on connection **AP10** on the brake light switch connector, component code **160**.

If the connection is faulty and if there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ET017 CONTINUED 2	

Depressed STATUS: Brake pedal released.

– Check the condition and fitting of the brake light switch and fuse **F4 (15A)** of the brake lights.

– Remove and test the operation of the brake light switch:

	Continuity **between the following connections:**	**Insulation** between the following connections:
Switch depressed(Brake pedal released)	**5A** and **AP10**	**65A** and **AP10**
Switch released (Brake pedal depressed)	**65A** and **AP10**	**5A** and **AP10**

If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

Check and ensure the **insulation to + 12V** of connection **65A** between the connector of the brake light switch, component code **160** and the connector of the ABS computer, component code **721 (for BURSA) or 118 (for MERCOSUR)**.

If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

Tool Parameter	Diagnostic tool title	Comments
PR001	Front right-hand wheel speed	These parameters indicate the speed in **mph (km/h)** of each wheel on the vehicle.
PR002	Front left-hand wheel speed	
PR003	Rear right-hand wheel speed	
PR004	Rear left-hand wheel speed	
PR005	Computer feed voltage	This parameter indicates the computer supply voltage in **volts**.
PR030	Tachometric index	This parameter specifies the tachometric index entered in the computer for the tyres fitted to the vehicle.
PR038	Vehicle speed	This parameter indicates the vehicle speed in **mph (km/h)**.
PR063	Vehicle parameters	This parameter shows whether the configuration (**VP004 Vehicle parameters**) matches the vehicle undergoing fault finding

Tool command	Diagnostic tool title	Comments
RZ001	Fault memory	This command is used to clear the faults **stored** in the computer.
AC003	Front left-hand wheel solenoid valves	See interpretation of command **AC003**.
AC004	Front right-hand wheel solenoid valves	See interpretation of command **AC004**.
AC005	Rear left-hand wheel solenoid valves	See interpretation of command **AC005**.
AC006	Rear right-hand wheel solenoid valves	See interpretation of command **AC006**.
AC013	Wheel speed sensor supply test	See interpretation of command **AC013**.
AC016	Pump motor test	See interpretation of command **AC016**.

Tool command	Diagnostic tool title	Comments
SC001	Check target teeth	This command tests the condition of the teeth on each wheel. Select the command **SC001** and follow the instructions. The test result should be equal to **48** or **44 teeth** depending on the version.
SC006	Bleed the hydraulic unit and brake circuits.	This command must be used only in the event of abnormal lengthening of brake pedal travel during a road test with ABS regulation (the vehicle must have already been bled using the conventional procedure). Select command **SC006** and follow the instructions given by **the diagnostic tool**.

AC003 **AC004** **AC005** **AC006**	FRONT LEFT-HAND WHEEL SOLENOID VALVES FRONT RIGHT-HAND WHEEL SOLENOID VALVES REAR LEFT-HAND WHEEL SOLENOID VALVES REAR RIGHT-HAND WHEEL SOLENOID VALVES

NOTES	**Conditions of use of the command:** Ignition on, engine stopped and vehicle speed zero.
	Before running the commands, check that the battery is properly charged (see **80A, Battery, Battery: Customer complaints**).

These commands test the solenoid valves on each wheel.
Controlling the wheel solenoid valves to check the hydraulic system
Lift the vehicle in order to be able to check that the wheels turn freely. Keep the brake pedal depressed to prevent the wheel being tested from being turned by hand (do not brake so firmly that full braking power is reached).
Select and confirm the command of the wheel being examined (e.g. Front left-hand wheel solenoid valves, etc.).
Turn the wheel concerned by hand; you should see it go through the locking/unlocking cycles.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

AC013	WHEEL SPEED SENSOR SUPPLY TEST

NOTES	**Conditions of use of the command:** Ignition on, engine stopped and vehicle speed zero.
	Before running the command, check that the battery is properly charged (see **80A, Battery, Battery: Customer complaints**). You must use command **AC013** once only.

This command is used to check that voltage pulses of approximately **12 V** are detected on the faulty sensor by a **multimeter** on the connector terminals on the computer side, component codes **150**, **151**, **152**, and **153**.
Select the command **AC013**.

Note:
To restart an **AC013 command**, restart then stop the vehicle engine and ensure that the battery is properly charged.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

AC016	PUMP MOTOR TEST

NOTES	**Conditions of use of the command:** Ignition on, engine stopped and vehicle speed zero.
	Before running the command, check that the battery is properly charged (see **80A, Battery, Battery: Customer complaints**).

This command is used to test the pump motor control circuit.
Select the command **AC016**.
The motor must run for **5 seconds**.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

SC001	CHECK THE TARGET TEETH

NOTES	**Conditions of use of the command:** Ignition on, engine stopped and vehicle speed zero.
	Before running the command, check that the battery is properly charged (see **80A, Battery, Battery: Customer complaints**).

This command is used to check the number of teeth on the target.
Select the command **SC001**.
The test result should be equal to **48** or **44 teeth** depending on the version.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

SC006	BLEEDING THE HYDRAULIC UNIT AND BRAKE CIRCUITS

NOTES	**Conditions of use of the command:** Ignition on, engine stopped and vehicle speed zero.
	Before running the command, check that the battery is properly charged (see **80A, Battery, Battery: Customer complaints**).

This command must be used only in the event of abnormal lengthening of brake pedal travel during a road test with ABS regulation (the vehicle must have already been bled using the conventional procedure).
Select command **SC006** and follow the instructions given by **the diagnostic tool**.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

NOTES	Only consult these customer complaints after a **complete check** with **the diagnostic tool**.

FAULTS DETECTED WHEN BRAKING WITH ABS CONTROL

Locking of one or more wheels	**ALP2**
Pull	**ALP3**
Drift	**ALP4**
Unexpected ABS operation at low speed and with slight pedal pressure	**ALP5**
Unexpected ABS system intervention on a poor road surface	**ALP6**
Unexpected ABS operation when using special equipment (car phone, CB.)	**ALP7**
Extension of brake pedal travel following a regulation phase (with an irregular pedal when entering regulation).	**ALP8**
Spongy pedal	**ALP9**
Brake pedal vibration	**ALP10**
Noise from the pump, pipes or hydraulic unit	**ALP11**

OTHER CASES

No dialogue with the ABS computer	**ALP1**

ALP1	No dialogue with the ABS computer

NOTES	Use **Wiring Diagrams Technical Note for Thalia 2 / Symbol 2, Clio II F 6**.

Try to establish dialogue with a computer on another vehicle to check that **the diagnostic tool** is not faulty. If the tool is not causing the fault and dialogue cannot be established with any other computer on the same vehicle, it may be that a faulty computer is disrupting fault finding line **HK**.
Use a process of successive disconnections to locate this computer.
Check the battery voltage and carry out the necessary operations to obtain a correct voltage between **9.8 V < X < 16.7 V**.

Check the presence and condition of the ABS fuses on the passenger compartment fuse box, component code **1016, F24 (10A)** and in the engine fuse box, component code **710, F01 (50A)** and **F10 (25A)**, (see **MR 423 Mechanical, 81C, Fuses, Fuses: List and location of components**).
Check the connection of the ABS computer connector, component code **721 (for BURSA) or 118 (for MERCOSUR)** and the condition of its connections.
If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Check the **earths** on connections **MAH** of component **721 (for BURSA) or 118 (for MERCOSUR)** (quality, oxidation, tightness of the earth bolt on top of the ABS unit).
Check that the supply to the computer is correct:
– **Earth** on connections **MAH** of component **721 (for BURSA) or 118 (for MERCOSUR)**,
– **+ before ignition feed** on connections **BP14** and **BP8** of component **721 (for BURSA) or 118 (for MERCOSUR)**,
– **+ after ignition feed** on connection **AP5** of component **721 (for BURSA) or 118 (for MERCOSUR).**

If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.
Check the connection of the diagnostic socket connector, component code **225** and the condition of its connections.
Check the **continuity** of connection **HL and HK** between the computer and the diagnostic socket**.**
If the connection is faulty and if there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP1 CONTINUED	

A

Check that the diagnostic socket, component code **225** is correctly supplied:
– **+ before ignition feed** on connection **BP10** of component **225**.
– **+ after ignition feed** on connection **AP10** of component **225.**
– **Earth** on connections **M** and **N** of component **225**

If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

If dialogue has still not been established after these checks, contact the techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP2	Locking of one or more wheels

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

Reminder:
Locking of the wheels on a vehicle fitted with ABS or squealing of tyres, interpreted by the customer as locking, could be related to a normal reaction of the system and should not automatically be assumed to be a fault (braking with ABS regulation on a very bad road causes considerable squealing).

However, if the wheel(s) is/are actually locking, lift the vehicle so that you can turn the wheels and check for:

– Possible inversion when connecting the speed sensors.
  Use parameters **PR001 Front right-hand wheel speed, PR002 Front left-hand wheel speed, PR003 Rear right-hand wheel speed** and **PR004 Rear left-hand wheel speed** by turning the relevant wheels and checking the consistency of the results obtained.
  If the value measured is zero, rotate the other wheels to confirm an electrical inversion of the sensors and repair the wiring harness.
– Possible inversion of pipes on the hydraulic unit.
  Use commands **AC003 Front left-hand wheel solenoid valves, AC004 Front right-hand wheel solenoid valves, AC005 Rear left-hand wheel solenoid valves** and **AC006 Rear right-hand wheel solenoid valves** while depressing the brake pedal and check for the occurrence of locking/unlocking cycles on the wheel concerned (see **Command summary table).** If the cycles do not occur on the wheel tested (wheel remains locked), check whether they occur on another wheel to confirm reversed pipes.

If the cycles do not occur on one wheel and the pipes have not been inverted, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP2 CONTINUED	

Check that the wheel speed sensor mounting is in good condition (clipping).
Visually inspect the condition of the target (clogging, metallic contamination, etc.) and clean with compressed air if necessary.
Check the condition of the braking system (condition of linings, sealing, grating, bleed, etc.).
Check the condition of the axles and the conformity and good condition of the tyre mountings.
If the fault is still present after these checks, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP3	Pull

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

Disconnect one wheel speed sensor.
Start the engine and ensure that only the ABS fault warning light comes on. Do not drive the vehicle if the brake fault warning light is also illuminated because the "braking compensator" function is no longer guaranteed.
Carry out a road test with the ABS thus out of order.
Is the fault still present under these conditions?

NO

Raise the vehicle so that you can rotate the wheels and check:
– whether the speed sensors have been incorrectly connected,
– whether the pipes on the hydraulic unit have been inverted.
For these two tests, consult and apply the procedures defined in **ALP2 Locking of one or several wheels**.
Check the condition and conformity of the ABS targets.
If the fault is still present, contact the Techline.

YES

If the brake pedal travel is relatively long, bleed the brake circuit.
If the travel is normal, check the tyre pressures, the front axle, or for any leaks in the circuit.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP4	Drift

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

Disconnect one wheel speed sensor.
Start the engine and ensure that only the ABS fault warning light comes on. Do not drive the vehicle if the brake fault warning light is also illuminated because the "braking compensator" function is no longer guaranteed.
Carry out a road test with the ABS thus out of order.
Is the fault still present under these conditions?

NO

Normal behaviour linked to the system operation during the regulation phase, mainly on surfaces with uneven grip or which are poorly laid.

YES

Road holding fault not related to the ABS.
Check the condition of the brake linings and that they are to specification and check the tyre pressures, the front axle, etc.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP5	**Unexpected ABS operation at low speed and slight pedal pressure**

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**. Warning: ABS control is sensitive to poor traction (icy roads, wet cobblestones, etc.).

It is possible to feel brake pedal vibrations which are associated with the reaction of the system in particular circumstances, such as:
– crossing rumble strips,
– tight cornering with lifting of the inside rear wheel.
These vibrations may be linked to simple brake limiter activation, when the pressure on the rear axle is limited.
If the fault is different, check the speed sensor connectors (micro-breaks).

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP6	**Unexpected ABS system intervention on a poor road surface**

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

On poor road surfaces it is normal to feel hesitation and vibrations of the pedal as well grating which is more significant than on good surfaces.
This gives the impression of a variation in efficiency, but this should be considered normal.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP7	**Unexpected ABS operation when using special equipment (car phone, CB, etc.)**

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

Check that the equipment which is causing the fault is approved.
Check that this equipment has been correctly installed without modification to the original wiring, particularly that of the ABS (unauthorised earth and **+ after ignition feed** connections on the ABS).

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP8	**Extension of brake pedal travel following a regulation phase (with an irregular pedal when entering regulation).**

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

Air transit from the hydraulic unit regulation channels to the brake circuits.
Bleed the systems following the recommended procedure in **MR 423** or **430, Mechanical, 30 A, General information, Brake circuit: Bleeding** (use of **diagnostic tool** command modes).
After the operation, carry out a road test with ABS regulation.

If the fault persists, carry out the above operation again once or twice.
If the customer complaint is particularly pronounced, and the bleeds have not rectified it, contact the Techline.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP9	**Spongy pedal**

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

Air in the brake circuits.
Carry out a conventional circuit bleed starting with the right-hand rear brake, then the left-hand rear, left-hand front and right-hand front brakes. Repeat the operation if necessary.
Check the play of the front and rear bearings.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP10	**Brake pedal vibration**

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

Normal reaction of the brake pedal during an ABS regulation phase or pressure limitation on the rear axle (brake limiter function).

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.

ALP11	**Noise from the pump, pipes or hydraulic unit**

NOTES	Only address this customer complaint after a **complete check** with **the diagnostic tool**.

– Vibration of the unit: check the presence and the condition of the unit support insulating rubber mountings.
– Vibration of pipes: check that all the pipes are securely clipped in their retaining clips and that there is no contact between pipes or between pipes and bodywork.

To identify the origin of the noise, use the solenoid valve control commands **AC003 Front left-hand wheel solenoid valves**, **AC004 Front right-hand wheel solenoid valves**, **AC005 Rear left-hand wheel solenoid valves** and **AC006 Rear right-hand wheel solenoid valves** while depressing the brake pedal.

AFTER REPAIR	Clear the computer memory using command **RZ001 Fault memory**. Carry out a road test followed by another check with the **diagnostic tool**.