twingo

Kangoo

Clio

Technical Note 3973A

X06X - XCXX - XBXX

Fault finding

BOSCH ABS 8.0

COMPUTER TYPE: BOSCH 8.0 ABS
Vdiag No.: 18

This note cancels and replaces: 3719A

77 11 338 582 **Edition 3 - OCTOBER 2006** **Edition Anglaise**

Contents

1. SCOPE OF THIS DOCUMENT

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

Vehicle(s): **CLIO II, TWINGO, KANGOO II, KANGOO with multiplex network**. *Function concerned:* **ABS**	*Name of computer: BOSCH ABS* **8.0** *Vdiag No.:* **18**

2. PREREQUISITES FOR FAULT FINDING

Documentation type

Fault finding procedures (this manual):
– Assisted fault finding (integrated into the diagnostic tool), Dialogys.
Wiring Diagrams:
– Visu-Schéma (CD-ROM), paper.

Type of diagnostic tools

– CLIP

Special tooling required

Special tooling required
Multimeter
Universal bornier (Test pin kit)

3. RECAP

Faults:

Faults are declared to be either present or stored (appeared in a certain context and have disappeared since, or are still present but have not had fault finding applied to them in the current context). The present or stored status of the fault must be taken into consideration when the diagnostic tool is used after the + after ignition feed has been switched on (before any operation on the system components).

Present faults must be dealt with according to the procedure specified in the **Interpretation of faults** section.

Stored fault: note the faults displayed and follow the instructions in the **Notes** section.

If the fault is **confirmed** when the instructions in the Notes section are applied, the fault is present. In this case, deal with the fault.
If the fault is **not confirmed**, carry out basic checks. Check:
– the electrical lines which correspond to the fault,
– the connectors for these lines (for oxidation, bent pins, etc.),
– the resistance of the component detected as faulty,
– the condition of the wires (melted or cut insulation, wear).

Conformity check

The aim of the conformity check is to check data that does not produce a fault on the diagnostic tool when inconsistent. Therefore, this stage is used to:

run fault finding on faults which are not displayed but which may correspond to a customer complaint,
– check that the system is operating correctly, and that there is no risk of a fault recurring after repair,
– this section gives the fault finding procedures for statuses and parameters and the conditions for testing them.

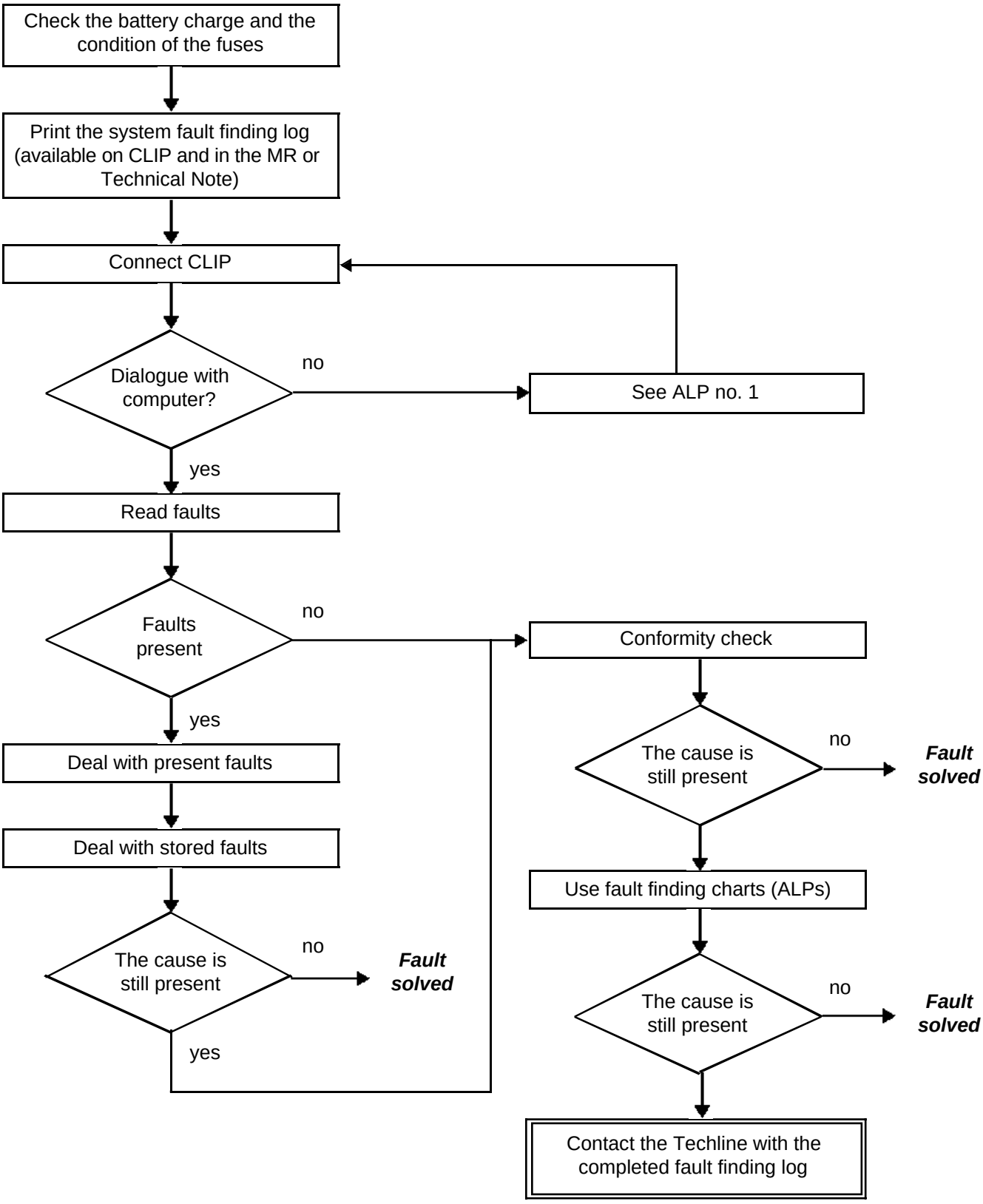
If a status is not behaving normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

Customer complaints - Fault finding chart

If the test with the diagnostic tool is OK but the customer complaint is still present, the fault should be treated by **Customer complaints**.

A summary of the overall procedure to follow is provided on the following page in the form of a flow chart.

4. FAULT FINDING PROCEDURE



5. FAULT FINDING LOG

IMPORTANT!

IMPORTANT
Any fault on a complex system requires a full fault finding procedure with the appropriate tools. The FAULT FINDING LOG, which should be completed during the procedure, enables you to keep track of the procedure which is carried out. It is an essential document when consulting the manufacturer.

IT IS THEREFORE MANDATORY TO FILL OUT A FAULT FINDING LOG FOR EACH FAULT FINDING PROCEDURE.

You will always be asked for this log:
- when requesting technical assistance from Techline,
- for approval requests when replacing parts for which approval is mandatory,
- to be attached to monitored parts for which reimbursement is requested. The log is needed for warranty reimbursement, and enables better analysis of the parts removed.

6. SAFETY ADVICE

Safety rules must be observed during any work on a component to prevent any damage or injury:

– make sure that the battery is properly charged to avoid damaging the computers with a low load,

– it is prohibited to carry out a road test with the diagnostic tool in dialogue with the computer because the ABS (anti-lock braking system) and EBD (Electronic Brake Distribution) functions are deactivated. Braking pressure is identical on both vehicle axles (risk of a spin under heavy braking).

FAULT FINDING LOG

System: anti-lock braking system and ESP (Electronic Stability program)

List of monitored parts: ***Computer***

● Administrative identification

Date	2 0
Log completed by	
VIN	
Engine	
Diagnostic tool	CLIP
Update version	

● Customer complaint

	1786	Anti-lock braking system not triggered		1787	Accidental triggering of anti-lock braking system		1790	Warning lights come on
	1788	ESP not triggered		1789	Accidental triggering of ESP			

Other — Your comments:

● Conditions under which the customer complaint occurs

	004	Intermittently		005	While driving		011	When ignition is switched on
	009	Sudden fault						

Other — Your comments:

● Documentation used in fault finding

Fault finding procedure used	
Type of diagnostic manual:	Workshop Repair Manual ❑ Technical Note ❑ Assisted fault finding ❑
Fault finding manual no:	
Wiring diagram used	
Wiring Diagram Technical Note No:	
Other documentation	
Title and/or part number:	

RENAULT

FD 02
Fault finding log

FAULT FINDING LOG

System: anti-lock braking system and ESP (Electronic Stability program)

● Computer identification and parts exchanged for the system

Part 1 part no.	
Part 2 part no.	
Part 3 part no.	
Part 4 part no.	
Part 5 part no.	

To be read with the diagnostic tool (Identification screen):

Computer part no.	
Supplier no.	
Program no.	
Software version	
Calibration number	
VDIAG	

● Faults found with the diagnostic tool

Fault no.	Present	Stored	Fault name	Specification

● Conditions under which fault occurs

Status or parameter no.	Parameter name	Value	Unit

● System-specific information

Description:

● Additional information

What factors led you to replace the computer? What other parts were replaced?	
Other defective functions?	
Your comments:	

RENAULT

FD 02
Fault finding log

The main functions of ABS on this vehicle are the electronic distribution of braking between the front and the rear through the regulation of rear wheelspin, and anti-lock braking through the regulation of skidding on all four wheels. The system also supplies the vehicle speed to the other computers through a wire connection (track 23).

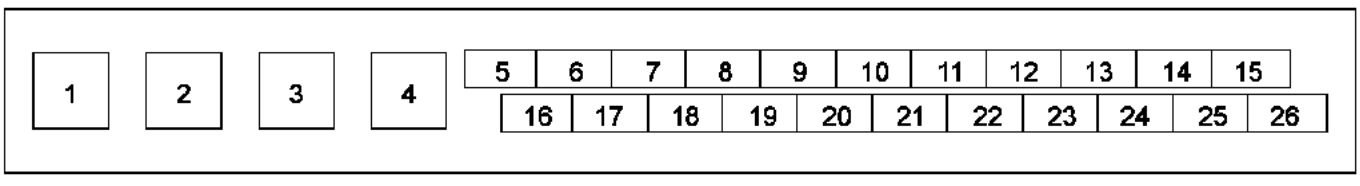
Fault finding warning lights programming

Instrument panel warning light				Meaning
Brake faults	ABS	SERVICE	STOP	Electronic braking regulation and ABS function not working
	ABS	SERVICE		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.

NOTE: The TWINGO instrument panel does not have the STOP and SERVICE warning lights.
The ABS warning light is an active warning light. Its extinction is controlled by the ABS computer.

ABS COMPUTER

Computer track	Allocation	Sensor track/actuator
1	Pump motor earth	
2	Engine pump power (+ before ignition feed)	ABS power fuse
3	Solenoid valve power (+ before ignition feed)	ABS power fuse
4	Solenoid valves and computer earth	
5	Left-hand front speed sensor signal	Track 1 front left-hand wheel sensor
6	Rear left-hand speed sensor supply	Track 2 rear left-hand wheel sensor
7	Not used	
8	Rear right-hand speed sensor supply	Track 2 rear right-hand wheel sensor
9	Front right-hand speed sensor supply	Track 2 front right-hand wheel sensor
10	Right-hand front speed sensor signal	Track 1 front right-hand wheel sensor
11	K line	Track 7 diagnostic socket
12	EBD warning light	
13	Not used	
14	Not used	
15	Not used	
16	Front left-hand speed sensor supply	Track 2 front left-hand wheel sensor
17	Rear left-hand speed sensor signal	Track 1 rear left-hand wheel sensor
18	12 V After ignition feed	Passenger compartment fuse box and relay
19	Right-hand rear speed sensor signal	Track 1 rear right-hand wheel sensor
20	Brake light switch	Brake light switch track A3
21	Not used	
22	ABS warning light	
23	Vehicle speed wire connection	
24	Not used	
25	Not used	
26	Not used	



Replacing the computer

When replacing a computer, carry out the following configurations:

- **Switch off the ignition.**
- **Replace the computer.**
- **Configure the vehicle parameter with command VP004.**
- **Enter the VIN using command VP001.**
- **Configure the tachometric index using command VP007.**
- **Perform a road test followed by a fault reading to confirm that the system is operating correctly.**

SETTINGS

VP001: Write 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 front right-hand door pillar and on the body panel under the bonnet.

Programming procedure:
– Connect the diagnostic tool.
– Consult the fault finding procedure for the BOSCH 8.0 ABS.
– Select parameter setting **VP001 "Write VIN"**.
– Enter the VIN.
– Clear the computer memory.
– Exit fault finding mode.
– Switch off the ignition.
– Wait for the end of power latch.
– Check that the code entered has been registered on the identification screen.

VP004: Vehicle parameters.
This command allows identification of the vehicle on which the computer is fitted (CLIO II, TWINGO, KANGOO and KANGOO PAMPA).

VP006: Enter last After-Sales operation date.
Whenever the ABS is operated on in the shop, the service date must be entered.
Select command VP006 on the diagnostic tool.
Enter the service date using the tool's keypad.

VP007: Tachometric index.
This command is used to program the computer memory with the index required to calculate vehicle speed depending on the tyre fittings.
The BOSCH ABS 8.0 computer with the tachometric function supplies the vehicle speed signal to all areas where this information is needed (instrument panel, engine management, etc.). This vehicle speed signal replaces the one supplied by the speed sensor located on the gearbox.
The ABS computer calculates the vehicle speed from the speed of the wheels and the circumference of the tyres fitted on the vehicle.
The tyre circumference must be programmed into the memory of a new computer. This consists of entering an index X using the VP007 TACHOMETRIC INDEX command on the diagnostic tool.

Once the index has been entered using command **VP007**, clear the computer memory and switch off the ignition. Check, using parameter **PR030**, that the index has been correctly recognised.

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
DF055	**50C3**	Vehicle parameter programming
DF063	**5046**	Wheel speed inconsistency
DF090	**500F**	Front right-hand wheel target
DF091	**501F**	Front left-hand wheel target
DF092	**502F**	Rear right-hand wheel target
DF093	**503F**	Rear left-hand wheel target
DF188	**50C6**	Brake switch circuit

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 speed of > **6 mph (10 km/h)**.
	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 connection of the battery terminals.
Check the condition and positioning of the **2 ABS/ESP fuses** in the **engine fuse and relay box**.

Check the continuity between the fuses and **tracks 2 and 3** of the computer connector (**+ before ignition feed present on the tracks**) and between the UCH and **track 18** of the computer (**+ after ignition present on the track**).
Check the tightness and the condition of the battery terminals.
Check the connections on the **26-track connector** of the ABS computer.
Check the **ABS earths on tracks 1 and 4** (screwed on **underneath** the **ABS unit** on **CLIO II and KANGOO** and to the wheel arch behind the right-hand headlight on **TWINGO**) and visually inspect all the ABS wiring.

Clear the computer fault memory. Switch off the ignition.
Switch on the ignition again and carry out a new check using the diagnostic tool.
If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF006 **PRESENT**	FRONT LEFT-HAND WHEEL SPEED SENSOR CIRCUIT CO.0 : open circuit or short circuit to earth

NOTES	**Special notes:** The wheel speed sensors are supplied by a **+ 12 V after ignition feed**, but this supply cannot be measured (power is cut when the sensor is faulty).

CLIO II, KANGOO

Check the connection and the condition of the sensor connectors.
Swap over the two front wheel speed sensors.
Clear the computer fault memory.
Carry out a road test followed by another check with the diagnostic tool.

– If the fault initially declared **DF006 Front left-hand wheel speed sensor circuit** has become **DF026 Front right-hand wheel speed sensor circuit**, replace the wheel speed sensor.
– If the fault remains on the same side, the wiring between the computer and the sensor is faulty.

Check the continuity, insulation and absence of interference resistance on the following connections:

Sensor connector **one of the two tracks** → **Track 5** of the computer connector
Sensor connector **the other track** → **Track 16** of the computer connector

Also check the insulation between these 2 connections. Repair if necessary.
If the checks reveal no faults, replace the wheel speed sensor.

TWINGO

Check the connection and the condition of the sensor connectors.
Swap over the two front wheel speed sensors.
Clear the computer fault memory.
Carry out a road test followed by another check with the diagnostic tool.

– If the fault initially declared **DF006 Front left-hand wheel speed sensor circuit** has become **DF026 Front right-hand wheel speed sensor circuit**, replace the wheel speed sensor.
– If the fault remains on the same side, the wiring between the computer and the sensor is faulty.

Check the continuity, insulation and absence of interference resistance on the following connections:

Sensor connector **one of the two tracks** → **Track 5** of the computer connector
Sensor connector **the other track** → **Track 16** of the computer connector

Also check the insulation between these 2 connections.
If the checks reveal no faults, replace the wheel speed sensor.

If the connections are faulty, perform the checks described on the next page:

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF006 **CONTINUED**	

Check the condition and connection of the intermediate **6-track black R309** connector (located on the wheel arch behind the right-hand headlight).

Check the continuity, insulation and absence of interference resistance between:

Computer connector **track 5** → **Track A2** of the intermediate connector
Computer connector **track 16** → **Track A1** of the intermediate connector

Repair or replace the wiring if necessary.

Check the continuity, insulation and absence of interference resistance between:

Sensor connector **one of the two tracks** → **Track A1** of the intermediate connector
Computer connector **other track** → **Track A2** of the intermediate connector

Repair or replace the wiring if necessary.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF007 **PRESENT**	REAR LEFT-HAND WHEEL SPEED SENSOR CIRCUIT CO.0 : open circuit or short circuit to earth

NOTES	**Special notes:** The wheel speed sensors are supplied by a **+ 12 V after ignition feed**, but this supply cannot be measured (power is cut when the sensor is faulty).

Clio II

Check the connection and condition of the sensor and computer connectors.
Check the connections (**Tracks A and D with no COSLAD and tracks 2 and 3 with COSLAD**) of the **4-track black R101 or 10-track black R112** underbody intermediate connection (located under the rear left-hand reinforcement of the engine sub-frame).
Repair if necessary.

Check and ensure the continuity of the following connections:

Sensor connector **one of the two tracks** → **Track 6** of the computer connector
Computer connector **other track** → **Track 17** of the computer connector

Also check the insulation between these 2 connections.

If the connections are faulty, carry out the following checks:
Check the condition and connection of the intermediate connector **R101 or R112**.

Check the continuity, insulation and for the absence of interference resistance between:

Computer connector **track 6** → **Track D or 3** of the intermediate connector
Computer connector **track 17** → **Track A or 2** of the intermediate connector

Repair or replace the wiring if necessary.

Check the continuity, insulation and for the absence of interference resistance between:

Sensor connector **one of the two tracks** → **Track D or 3** of the intermediate connector
Computer connector **other track** → **Track A or 2** of the intermediate connector

Repair or replace the wiring if necessary.

If the checks reveal no faults, replace the wheel speed sensor.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF007 **CONTINUED 1**	

TWINGO

Check the connection and condition of the sensor and computer connectors.
Check the connections (**Tracks B1 and B2**) of the **6-track black R309** underbody intermediate connection (located in the wheel arch behind the front right-hand headlight).
Repair if necessary.

Check and ensure the continuity of the following connections:

Sensor connector **one of the two tracks** → **Track 6** Computer connector
Sensor connector **the other track** → **Track 17** Computer connector

Also check the insulation between these 2 connections.

If the connections are faulty, carry out the following checks:
Check the condition and connection of intermediate connector **R309**.

Check the continuity, insulation and for the absence of interference resistance between:

Computer connector **track 6** → **Track B1** of the intermediate connector
Computer connector **track 17** → **Track B2** of the intermediate connector

Repair or replace the wiring if necessary.

Check the continuity, insulation and for the absence of interference resistance between:

Sensor connector **one of the two tracks** → **Track B1** of the intermediate connector
Computer connector **other track** → **Track B2** of the intermediate connector

Repair or replace the wiring if necessary.

If the checks reveal no faults, replace the wheel speed sensor.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF007 **CONTINUED 2**	

KANGOO

Check the connection and condition of the sensor and computer connectors.
Check the connections (**track A and B**) of the **black R101** underbody intermediate connection (located under the rear left-hand reinforcement of the engine sub-frame).
Repair if necessary.

Check and ensure the continuity of the following connections:

Sensor connector **one of the two tracks** → **Track 6** Computer connector
Computer connector **other track** → **Track 17** Computer connector

Also check the insulation between these 2 connections.

If the connections are faulty, carry out the following checks:
Check the condition and connection of the intermediate connector **R101**.

Check the continuity, insulation and for the absence of interference resistance between:

Computer connector **track 6** → **Track B** of the intermediate connector
Computer connector **track 17** → **Track A** of the intermediate connector

Repair or replace the wiring if necessary.

Check the continuity, insulation and for the absence of interference resistance between:

Sensor connector **one of the two tracks** → **Track A** of the intermediate connector
Computer connector **other track** → **Track B** of the intermediate connector

Repair or replace the wiring if necessary.

If the checks reveal no faults, replace the wheel speed sensor.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF017 PRESENT OR STORED	COMPUTER 1.DEF: power feed or internal electronic fault

NOTES	**Special notes:** **The voltage displayed in parameters (PR005) is the + after ignition feed supply voltage of the computer and not the hydraulic unit power supply.**
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present following a road test at a speed of **> 36 mph (60 km/h)**.

Check the condition and connection of the battery terminals.
Check the condition and position of the two **ABS power fuses** in the engine compartment connection unit.
Check the continuity between the fuses and **tracks 2 and 3** of the computer connector (**+ before ignition feed present** on the **tracks**) and between the **UCH** and **track 18** of the computer (**+ after ignition feed present on the track**).
Check the tightness and the condition of the battery terminals.
Check the connections on the **26-track connector** of the ABS computer.
Check the **ABS earths on track 1 and 4** (screwed on **underneath** the **ABS unit in CLIO II and KANGOO** and to the wheel arch behind the right-hand headlight in **TWINGO**) and visually inspect all the ABS wiring.
Repair if necessary.

Clear the computer fault memory. Switch off the ignition.
Switch on the ignition again and carry out a new check using the diagnostic tool.
If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF020 **PRESENT**	TACHOMETRIC INDEX PROGRAMMING

NOTES	**Special notes:** None.

The **BOSCH ABS 8.0** computer with the tachometric function supplies the vehicle speed signal to all areas where this information is needed (instrument panel, engine management, etc.).
This vehicle speed signal replaces the one supplied by the speed sensor located on the gearbox. The ABS computer calculates the vehicle speed from the speed of the wheels and the circumference of the tyres fitted on the vehicle.

The tyre circumference must be programmed into the memory of a new computer. This consists of entering an index X using the VP007 TACHOMETRIC INDEX command on the diagnostic tool.

Once the index has been entered using the **VP007** command, clear the computer fault memory and then switch off the ignition. Use the **PR030** parameter to check that the index has been stored correctly.

If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF026 **PRESENT**	FRONT RIGHT-HAND WHEEL SPEED SENSOR CIRCUIT CO.0 : open circuit or short circuit to earth

NOTES	**Special notes:** The wheel speed sensors are supplied by a **+ 12 V after ignition feed**, but this supply cannot be measured (power is cut when the sensor is faulty).

CLIO II, KANGOO, TWINGO

Check the connection and the condition of the sensor connectors.
Swap over the two front wheel speed sensors.
Clear the computer fault memory.
Carry out a road test followed by another check with the diagnostic tool.

– If the **DF026 Front right-hand wheel speed sensor circuit** fault initially declared changes to **DF006 Front left-hand wheel speed sensor circuit present**, replace the wheel speed sensor.

– If the fault remains on the same side, the wiring between the computer and the sensor is faulty.

Check the connection and the condition of the computer connectors.
Repair if necessary.

Check and ensure the continuity of the following connections:

Sensor connector **one of the two tracks** → **Track 9** Computer connector
Computer connector **other track** → **Track 10** Computer connector

Also check the insulation between these 2 connections.
Repair if necessary.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF027 **PRESENT**	REAR RIGHT-HAND WHEEL SPEED SENSOR CIRCUIT CO.0 : open circuit or short circuit to earth

NOTES	**Special notes:** The wheel speed sensors are supplied by a **+ 12 V after ignition feed**, but this supply cannot be measured (power is cut when the sensor is faulty).

CLIO II

Check the connection and condition of the sensor and computer connectors.
Check the connections (**Tracks B and C with no COSLAD and tracks 1 and 4 with COSLAD**) of the **4-track black R101 or 10-track black R112** underbody intermediate connection (located under the rear left-hand reinforcement of the engine sub-frame).
Repair if necessary.

Check and ensure the continuity of the following connections:

Sensor connector **one of the two tracks** → **Track 8** Computer connector
Computer connector **other track** → **Track 19** Computer connector

Also check the insulation between these 2 connections.

If the connections are faulty, carry out the following checks:
Check the condition and connection of the intermediate connector **R101 or R112**.

Check the continuity, insulation and for the absence of interference resistance between:

Computer connector **track 8** → **Track B or 1** of the intermediate connector
Computer connector **track 19** → **Track C or 4** of the intermediate connector

Repair or replace the wiring if necessary.

Check the continuity, insulation and for the absence of interference resistance between:

Sensor connector **one of the two tracks** → **Track B or 1** of the intermediate connector
Computer connector **other track** → **Track C or 4** of the intermediate connector

Repair or replace the wiring if necessary.

If the checks reveal no faults, replace the wheel speed sensor.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF027 **CONTINUED 1**	

TWINGO

Check the connection and condition of the sensor and computer connectors.
Check the connections (**Tracks C1 and C2**) of the **6-track black R309** wheel arch intermediate connection (located on the wheel arch behind the front right-hand headlight).
Repair if necessary.

Check and ensure the continuity of the following connections:

Sensor connector **one of the two tracks** → **Track 8** Computer connector
Computer connector **other track** → **Track 19** Computer connector

Also check the insulation between these 2 connections.

If the connections are faulty, carry out the following checks:
Check the condition and connection of intermediate connector **R309**.

Check the continuity, insulation and for the absence of interference resistance between:

Computer connector **track 8** → **Track C1** of the intermediate connector
Computer connector **track 19** → **Track C2** of the intermediate connector

Repair or replace the wiring if necessary.

Check the continuity, insulation and for the absence of interference resistance between:

Sensor connector **one of the two tracks** → **Track C1** of the intermediate connector
Computer connector **other track** → **Track C2** of the intermediate connector

Repair or replace the wiring if necessary.

If the checks reveal no faults, replace the wheel speed sensor.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF027 **CONTINUED 2**	

KANGOO

Check the connection and condition of the sensor and computer connectors.
Check the connections (**Tracks C and D**) of the **black R101** underbody intermediate connection (located under the rear left-hand reinforcement of the engine sub-frame).
Repair if necessary.

Check and ensure the continuity of the following connections:

Sensor connector **one of the two tracks** → **Track 8** Computer connector
Computer connector **other track** → **Track 19** Computer connector

Also check the insulation between these 2 connections.

If the connections are faulty, carry out the following checks:
Check the condition and connection of intermediate connector **R101**.

Check the continuity, insulation and for the absence of interference resistance between:

Computer connector **track 8** → **Track D** of the intermediate connector
Computer connector **track 19** → **Track C** of the intermediate connector

Repair or replace the wiring if necessary.

Check the continuity, insulation and for the absence of interference resistance between:

Sensor connector **one of the two tracks** → **Track C** of the intermediate connector
Computer connector **other track** → **Track D** of the intermediate connector

Repair or replace the wiring if necessary.

If the checks reveal no faults, replace the wheel speed sensor.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF055 PRESENT	VEHICLE PARAMETER PROGRAMMING

NOTES	**Special notes:** None.

Use command **VP004 Vehicle parameters** on the diagnostic tool to define the appropriate vehicle type variant. **You must select the version that corresponds to the vehicle type.**

Check that the vehicle parameter has been stored using command **LC003 Vehicle parameters**.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF063 PRESENT OR STORED	WHEEL SPEED CONSISTENCY CC.1 : short circuit to **+ 12 V** 1.DEF : interference

NOTES	**Special notes:** This fault indicates that the wheel speeds are inconsistent with each other. The computer does not know how to determine which one is faulty.
	Priorities when dealing with a number of faults: Deal with faults **DF006, DF007, DF026 and DF027** first, even if stored.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present during a road test at a vehicle speed of **> 36 mph (60 km/h)**.

CC.1	***NOTES***	**Special notes:** None.

Carry out a visual check on the connection and condition of the sensor and computer connectors.
Check the wiring and condition of the connections of the intermediate connection depending on the type of vehicle as described below.

Intermediate connection	**R101** (4 tracks) without COSLAD		**R112** (10 tracks) COSLAD		**R309** (6 tracks)			**R101** Black	
wheel sensor	Rear right-hand	Rear left-hand	Rear right-hand	Rear left-hand	Rear right-hand	Rear left-hand	Front left-hand	Rear right-hand	Rear left-hand
Clio II	**B, C**	**A, D**	**1, 4**	**2, 3**					
TWINGO					**C1, C2**	**B1, B2**	**A1, A2**		
KANGOO								**C, D**	**A, B**

With:
- **R101** black 4-track **without COSLAD** and **R112** black 10-track **with COSLAD** located under the rear left-hand reinforcement of the engine sub-frame.
- **R309** 6-track black located on the wheel arch behind the right-hand headlight.
- black **R101** located under the rear left-hand reinforcement of the engine sub-frame.

Repair if necessary.

If the fault is still present, carry out the checks described on the next page.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF063 **CONTINUED**	

Check the condition of the axles (impacts, deformations, etc.) and the conformity and condition of the tyre fitting.
Ensure that the braking system is in good condition (condition of the linings, tightness, grip, bleeding, bearing play, lubricant on the targets, etc.).
Check that the wheel speed sensor mountings are in good condition.
Visually inspect the condition of the target (dirt, metallic contamination, etc.) and clean with compressed air if necessary.

Check the sensor/target air gap over one wheel revolution:
- **CLIO II, TWINGO, KANGOO:** **0.15 mm < front wheel air gap < 1.85 mm**
- **CLIO II:** **0.15 mm < rear wheel air gap < 1.5 mm***

Note:
The air gap cannot be checked around the entire circumference of the hub on vehicles equipped with drums at the rear. Therefore, perform a visual inspection after removing the drums.
Repair if necessary.

If all the checks are correct, clear the computer's fault memory.
Exit the fault finding procedure and carry out a road test.
If the fault is still present, check the continuity, insulation and absence of interference resistance on the wiring of the four sensors.

1.DEF	***NOTES***	**Special notes:** None.

Check the condition of the axles (impacts, deformations, etc.) and the conformity and condition of the tyre fitting.
Ensure that the braking system is in good condition (condition of the linings, tightness, grip, bleeding, bearing play, lubricant on the targets, etc.).
Check that the wheel speed sensor mountings are in good condition.
Visually inspect the condition of the target (dirt, metallic contamination, etc.) and clean with compressed air if necessary.

Check the sensor/target air gap over one wheel revolution:
- **CLIO II, TWINGO, KANGOO:** **0.15 mm < front wheel air gap < 1.85 mm**
- **CLIO II:** **0.15 mm < rear wheel air gap < 1.5 mm***

Note:
The air gap cannot be checked around the entire circumference of the target on vehicles equipped with rear drums. Therefore, perform a visual inspection after removing the drums.
Repair if necessary.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF090 **STORED**	FRONT RIGHT-HAND WHEEL TARGET

NOTES	**Special notes:** The wheel speed sensors are supplied by a **+ 12 V after ignition feed**, but this supply cannot be measured (power is cut when the sensor is faulty).
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present following a road test at a speed of **> 36 mph (60 km/h)**.

Check the condition of the axles (impacts, deformations, etc.) and the conformity and condition of the tyre fitting.
Check that the braking system is in good condition (condition of the linings, sealing, grip, bleeding, bearing play, lubricant on the targets, etc.).
Check that the wheel speed sensor mounting is in good condition.
Visually inspect the condition of the target (dirt, metallic contamination, etc.) and clean with compressed air if necessary.

Check the sensor/target air gap over one wheel revolution:

– **CLIO II, TWINGO, KANGOO: 0.15 mm < front wheel air gap < 1.85 mm**

Repair if necessary.

If all the checks are correct, clear the computer's fault memory.
Exit the fault finding procedure and carry out a road test.

If the fault is still present, replace the front right-hand wheel target.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF091 **STORED**	FRONT LEFT-HAND WHEEL TARGET

NOTES	**Special notes:** The wheel speed sensors are supplied by a **+ 12 V after ignition feed**, but this supply cannot be measured (power is cut when the sensor is faulty).
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present following a road test at a speed of **> 36 mph (60 km/h)**.

Check the condition of the axles (impacts, deformations, etc.) and the conformity and condition of the tyre fitting.
Check that the braking system is in good condition (condition of the linings, sealing, grip, bleeding, bearing play, lubricant on the targets, etc.).
Check that the wheel speed sensor mounting is in good condition.
Visually inspect the condition of the target (dirt, metallic contamination, etc.) and clean with compressed air if necessary.

Check the sensor/target air gap over one wheel revolution:

– **CLIO II, TWINGO, KANGOO: 0.15 mm < front wheel air gap < 1.85 mm**

Repair if necessary.

If all the checks are correct, clear the computer's fault memory.
Exit the fault finding procedure and carry out a road test.

If the fault is still present, replace the front left-hand wheel target.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF092 **STORED**	REAR RIGHT-HAND WHEEL TARGET

NOTES	**Special notes:** The wheel speed sensors are supplied by a **+ 12 V after ignition feed**, but this supply cannot be measured (power is cut when the sensor is faulty).
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present following a road test at a speed of **> 36 mph (60 km/h)**.

Check the condition of the axles (impacts, deformations, etc.) and the conformity and condition of the tyre fitting.
Ensure that the braking system is in good condition (condition of the linings, tightness, grip, bleeding, bearing play, lubricant on the targets, etc.).
Check that the wheel speed sensor mounting is in good condition.
Visually inspect the condition of the target (dirt, metallic contamination, etc.) and clean with compressed air if necessary.

Check the sensor/target air gap over one wheel revolution:

- **CLIO II: 0.15 mm < rear wheel air gap < 1.5 mm**

Note:
The air gap cannot be checked around the entire circumference of the hub on vehicles equipped with drums at the rear. Therefore, perform a visual inspection after removing the drums.
Repair if necessary.

If all the checks are correct, clear the computer's fault memory.
Exit the fault finding procedure and carry out a road test.

If the fault is still present, replace the rear right-hand wheel target.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF093 **STORED**	REAR LEFT-HAND WHEEL TARGET.

NOTES	**Special notes:** The wheel speed sensors are supplied by a **+ 12 V after ignition feed**, but this supply cannot be measured (power is cut when the sensor is faulty).
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present following a road test at a speed of **> 36 mph (60 km/h)**.

Check the condition of the axles (impacts, deformations, etc.) and the conformity and condition of the tyre fitting.
Ensure that the braking system is in good condition (condition of the linings, tightness, grip, bleeding, bearing play, lubricant on the targets, etc.).
Check that the wheel speed sensor mountings are in good condition.
Visually inspect the condition of the target (dirt, metallic contamination, etc.) and clean with compressed air if necessary.

Check the sensor/target air gap over one wheel revolution:

- **CLIO II: 0.15 mm < rear wheel air gap < 1.5 mm**

Note:
The air gap cannot be checked around the entire circumference of the hub on vehicles equipped with drums at the rear. Therefore, perform a visual inspection after removing the drums.
Repair if necessary.

If all the checks are correct, clear the computer's fault memory.
Exit the fault finding procedure and carry out a road test.

If the fault is still present, replace the rear left-hand wheel target.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

DF188 PRESENT OR STORED	BRAKE LIGHT SWITCH CIRCUIT

NOTES	**Special notes:** None.
	Conditions for applying the fault finding procedure to stored faults: Clear the stored fault, carry out a road test at a speed of **> 36 mph (60 km/h)** and test the brakes using ABS.

Check the conformity of the brake light bulbs.
Using the diagnostic tool, check on the statuses screen that **ET017 Brake pedal** correctly recognises the depressed and released positions of the brake pedal.
If the pedal position is not recognised, apply the interpretation of **ET017**.

If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

NOTES	Only run the conformity check after a complete check using the diagnostic tool.

Order	Function	Parameter or Status checked or Action	Display and notes	Fault finding
1	Diagnostic tool dialogue		**BOSCH ABS 8.0**	**ALP1**
2	Computer configuration	**PR030:** Tachometric index	Check that the index entered corresponds to the tyres fitted on the vehicle (refer to the help section on the diagnostic tool)	**NONE**
3	Configuration reading	**LC003:** Vehicle parameters	Make sure the vehicle parameter matches the vehicle on which fault finding is being run	**VP004**
4	Brake pedal not depressed detection	**ET017:** Brake pedal	**Released** status confirmed, brake pedal not depressed	**ET017**
5	Depressed brake pedal detection	**ET017:** Brake pedal	**Depressed** status confirmed, depressed brake pedal	**ET017**
6	Computer supply	**PR005:** Computer feed voltage	Ensure that the battery voltage is correct (check the charge circuit if necessary)	**NONE**
7	Vehicle speed	**PR038:** Vehicle speed	Ensure that the vehicle speed is consistent	**NONE**
8	Wheel speed	**PR001:** Front right-hand wheel speed	Ensure that the wheel speed is consistent	**NONE**
		PR002: Front left-hand wheel speed	Ensure that the wheel speed is consistent	**NONE**
		PR003: Rear right-hand wheel speed	Ensure that the wheel speed is consistent	**NONE**
		PR004: Rear left-hand wheel speed	Ensure that the wheel speed is consistent	**NONE**

ABS STATUS SUMMARY TABLE

Tool status	Diagnostic tool title
ET017	Brake pedal

ABS PARAMETER SUMMARY TABLE:

Tool parameter	Diagnostic tool title
PR001	Front right-hand wheel speed
PR002	Front left-hand wheel speed
PR003	Rear right-hand wheel speed
PR004	Rear left-hand wheel speed
PR005	Computer feed voltage
PR030	Tachometric index
PR038	Vehicle speed

ET017	BRAKE PEDAL

NOTES	**Special notes:** Carry out the checks only if the **depressed** and **released** statuses are not consistent with the pedal position.

Released STATUS Brake pedal depressed.

If brake lights operate:
– Check the continuity of the connection between **track A3** of the brake light switch connector and **track 20** of the computer connector.
If the brake lights do not operate:
– Check the condition and fitting of the brake light switch, and the brake lights fuse and bulb conformity.
– Remove the brake light switch and check that it is operating correctly:

	Continuity between tracks	Insulation between tracks
Switch depressed (Brake pedal released)	**A1 and B3**	**A3 and B1**
Switch released (Brake pedal depressed)	**A3 and B1**	**A1 and B3**

– Replace the switch if necessary.
– Check for **+ after ignition feed** on **tracks A1 and B1** and on the brake light switch connector.

AFTER REPAIR	Carry out a road test followed by another check with the diagnostic tool.

ET017 **CONTINUED**	

Depressed STATUS brake pedal released.

– Check the condition and fitting of the brake light switch, the brake lights fuse and the conformity of the bulbs.
– Remove the brake light switch and check that it is operating correctly:

	Continuity between tracks	Insulation between tracks
Switch depressed (Brake pedal released)	**A1 and B3**	**A3 and B1**
Switch released (Brake pedal depressed)	**A3 and B1**	**A1 and B3**

– Replace the switch if necessary.
– Check the insulation to **12 V** of the connection between **track A3** of the brake light switch connector and **track 20** of the computer connector.

AFTER REPAIR	Carry out a road test followed by another check with the diagnostic tool.

PARAMETERS

PR001: Front right-hand wheel speed.

PR002: Front left-hand wheel speed.

PR003: Rear right-hand wheel speed.

PR004: Rear left-hand wheel speed
These parameters show the speed of each wheel of the vehicle in mph.

PR005: Computer supply.
This parameter indicates the computer supply voltage in volts **and not the hydraulic unit power supply**.

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)**.

CLEARING

RZ001: Fault memory.
This command is used for clearing the faults stored by the computer.

ACTIVATION

AC003: Front left-hand wheel solenoid valves.

AC004: Front right-hand wheel solenoid valves.

AC005: Rear left-hand wheel solenoid valves.

AC006: Rear right-hand wheel solenoid valves.
These commands are used to test the solenoid valves and the hydraulic allocation on each wheel.

Controlling the wheel solenoid valves to check the hydraulic system

Raise the vehicle in order to be able to rotate the wheels, and check that they rotate freely.
Keep the brake pedal depressed to prevent the wheel being tested from being turned by hand (do not brake so firmly that full brake power is reached).
Select and confirm the command of the wheel being examined (e.g. Front left-hand wheel solenoid valves, etc.)
Rotate the wheel concerned by hand; you should see 5 unlocking/locking cycles on the wheel.

AC016: Pump motor test.
This command is used to test the pump motor control circuit.
Select command **AC016 Pump Motor Test**.
The motor should operate for 5 seconds (aural test).

SPECIAL COMMANDS

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 Bleed hydraulic unit and brake circuits** and follow the instructions given by the diagnostic tool.

NOTES	**Only refer to these customer complaints after performing a complete check with the diagnostic tool.**

FAULTS DETECTED ON BRAKING WITH ABS/BRAKING REGULATION

OTHER CASES

ALP1	No dialogue with the ABS computer

NOTES	None

Check that the diagnostic tool is not causing the fault by trying to establish dialogue with a computer on another vehicle. 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 the fault finding line **K**.
Proceed by successive disconnections to locate this computer.
Check the battery voltage and carry out the operations necessary to obtain the correct voltage (**9.5 V < battery voltage < 17.5 V**).

Check the presence and the condition of the ABS fuses on the passenger compartment fuse board and in the engine fuse box.
Check that the computer connector is properly connected and check the condition of its connections.
Check the ABS earths (good condition, not corroded, tightness of the earth bolt above the ABS assembly).
Check that the supply to the computer is correct:

- **Earth on tracks 1 and 4** of the 26-track connector.
- **+ before ignition feed on tracks 2 and 3** of the 26-track connector.
- **+ after ignition feed on track 18** of the 26-track connector.

Ensure that the supply to the diagnostic socket is correct:

- **+ before ignition feed on track 16.**
- **+ after ignition feed on track 1.**
- **Earth on track 5**.

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

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

ALP2	Locking of one or more wheels

NOTES	Only consult 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 in order to be able to rotate the wheels and check:

– Possible inversion when connecting the speed sensors.
Using parameters **PR001, PR002, PR003 and PR004**, rotate the wheels slowly and check 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 5 locking/unlocking cycles on the wheel concerned (see the **Command modes processing** section) If the 5 cycles do not occur on the wheel tested (wheel remains locked), check whether they occur on another wheel to confirm an inversion of pipes.

If the 5 cycles are not detected on a wheel and the pipes have not been subject to inversion, replace the hydraulic unit.

Check the condition of the axles (impacts, deformations, etc.) and the conformity and condition of the tyre fitting.
Ensure that the braking system is in good condition (condition of the linings, tightness, grip, bleeding, bearing play, lubricant on the targets, etc.).
Check that the wheel speed sensor mountings are in good condition.
Visually inspect the condition of the target (dirt, metallic contamination, etc.) and clean with compressed air if necessary.

Check the sensor/target air gap over one wheel revolution:
- **CLIO II, TWINGO, KANGOO: 0.15 mm < front wheel air gap < 1.85 mm**
- **CLIO II: 0.15 mm < rear wheel air gap < 1.5 mm**

Note:
The air gap cannot be checked around the entire circumference of the hub on vehicles equipped with drums at the rear. Therefore, perform a visual inspection after removing the drums.
If the fault is still present, contact the Techline.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

ALP3	**Pull**

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

Disconnect one wheel speed sensor.
Start the engine and check that only the ABS fault warning light comes on. Do not drive the vehicle if the brake fault warning light is also lit, as the brake limiter function is no longer guaranteed to operate correctly.
Carry out a road test with the ABS deactivated.

Is the fault still present under these conditions?

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.

NO ↓

Raise the vehicle so that you can rotate the wheels and check:
– Possible inversion of the speed sensor connection.
– Possible inversion of pipes on the hydraulic unit.
For these two tests, consult and apply the procedures defined in **ALP2**.
Check the condition of the ABS targets and their conformity.
Also check the sensor/target air gap over one front wheel + rear wheel revolution.
If the fault is still present, contact the Techline.
Note:
The air gap cannot be checked around the entire circumference of the target on vehicles equipped with rear drums. Therefore, perform a visual inspection after removing the drums.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

ALP4	Drift

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

Disconnect one wheel speed sensor.
Start the engine and check that only the ABS fault warning light comes on. Do not drive the vehicle if the brake fault warning light is also lit, as the brake limiter function is no longer guaranteed to operate correctly.
Carry out a road test with the ABS deactivated.

Is the fault still present under these conditions?

YES → Road handling fault not connected with the ABS.
Check the condition and conformity of the brake linings, check the tyre pressure, the front axle, etc.

NO ↓

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

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

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

NOTES	Only consult this customer complaint after a complete check with the diagnostic tool. Important: ABS regulation is sensitive to poor traction (icy roads, cobblestones, etc.).

It is possible to feel brake pedal vibrations, which are due to the reaction of the system in particular circumstances:

- Crossing speed bumps.
- 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) as well as the air gaps.
Note:
The air gap cannot be checked around the entire circumference of the target on vehicles equipped with rear drums. Therefore, perform a visual inspection after removing the drums.

AFTER REPAIR	Clear the computer 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 consult this customer complaint after a complete check with the diagnostic tool.

On poor road surfaces it is normal to feel bucking and vibration of the pedal as well as more significant tyre squealing than on good surfaces.
This gives the impression of a variation in efficiency, but should be considered normal.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

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

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

Check that the equipment causing the fault when used is approved.
Check that this equipment has been correctly installed with no alteration to the original wiring, in particular that of the ABS (unauthorised connections from the ABS to earth and **+ After ignition feed/Before ignition feed)**.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

ALP8	Lengthening of the brake pedal travel due to regulation phase (with pedal receding at the start of regulation)

NOTES	Only consult 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 circuits in accordance with the procedure recommended in the Workshop Repair Manual (use the command modes on the diagnostic tool).
Following the operation, carry out a road test with ABS regulation.

If the fault is still present, carry out the above operation 1 or 2 times more.
If the customer complaint is particularly severe, and bleeding has not rectified it, contact the Techline.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

ALP9	Spongy pedal

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

Air in the brake circuits.
Bleed the circuits in the conventional way starting with the rear right-hand brake, followed by rear left, front left and finally front right. Repeat the operation if necessary.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.

ALP10	Brake pedal vibration

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

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

AFTER REPAIR	Clear the computer 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 consult this customer complaint after a complete check with the diagnostic tool.

– Vibration of the unit: Check that the unit's supporting insulation rubber mountings are in place and in good condition.
– Vibration of pipes: check that all pipes are correctly clipped into their mounting clips and that there is no contact between pipes or between pipes and bodywork.

To determine where the noise is coming from, use the Front left-hand wheel solenoid valves, Front right-hand wheel solenoid valves, Rear left-hand wheel solenoid valves and Rear right-hand wheel solenoid valves control commands while depressing the brake pedal.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.