

MEGANE

3 Chassis

38C ANTI-LOCK BRAKING SYSTEM

BOSCH ABS 8.0

Vdiag No.: 0C, 0D, 0E, 0F

Fault finding - Introduction	38C - 2
Fault finding - System operation	38C - 7
Fault finding - Replacement of components	38C - 9
Fault finding - Configurations and programming	38C - 10
Fault finding - Fault summary table	38C - 11
Fault finding - Interpretation of faults	38C - 12
Fault finding - Conformity check	38C - 43
Fault finding - List of Statuses and parameters	38C - 44
Fault finding - Interpretation of statuses	38C - 45
Fault finding - Parameter procedures	38C - 47
Fault finding - Dealing with commands	38C - 48
Fault finding - Customer complaints	38C - 50
Diagnostic - Fault finding chart	38C - 51

1. SCOPE OF THIS DOCUMENT

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

Vehicle(s): **Mégane II, Scénic II**

Function concerned: **ABS**

Name of computer: **BOSCH ABS 8.0**

Vdiag No: **0C, 0D, 0E, 0F**

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 version.

Type of diagnostic tools

- **CLIP**

Special tooling required

Special tooling required	
Multimeter	
Elé. 1681	Universal bornier

3. RECAP

Procedure

To perform fault finding on the vehicle's computers, switch on the ignition in fault finding mode.

Proceed as follows:

- vehicle's card in reader;
- press and hold the Start button (longer than 5 seconds) with start-up conditions not present,
- connect the diagnostic tool and perform the required operations.

Note:

The left and right-hand discharge bulb computers are supplied when the dipped headlights are lit. Therefore fault finding can only be carried out on them after the ignition has been switched on in fault finding mode (forced + after ignition feed) and the dipped headlights have been switched on.

To **cut off + after ignition feed**, proceed as follows:

- disconnect the diagnostic tool,
- press the Start button twice briefly (less than 3 seconds),
- Ensure that the + after ignition feed has been cut off by checking that the computer indicator lights on the instrument panel have gone out.

Faults

Faults are declared as either present or stored (depending on whether they appeared in a certain context and have disappeared since, or whether they remain present but have not been diagnosed within the current context).

The **present** or **stored** status of faults should be taken into consideration when the diagnostic tool is switched on after the + after ignition feed (without any system components being active).

For a **present fault**, apply the procedure described in the **Interpretation of faults** section.

For a **stored fault**, note the faults displayed and apply the instructions in the **Notes** section.

If the fault is **confirmed** when the instructions in the Notes section are applied, the fault is present. Deal with the fault

If the fault is **not confirmed**, 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 split insulation, wear).

Conformity check

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

- carry out fault finding on faults that do not have a fault display, and 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 repairs.

This section gives the fault finding procedures for statuses and parameters and the conditions for checking them.

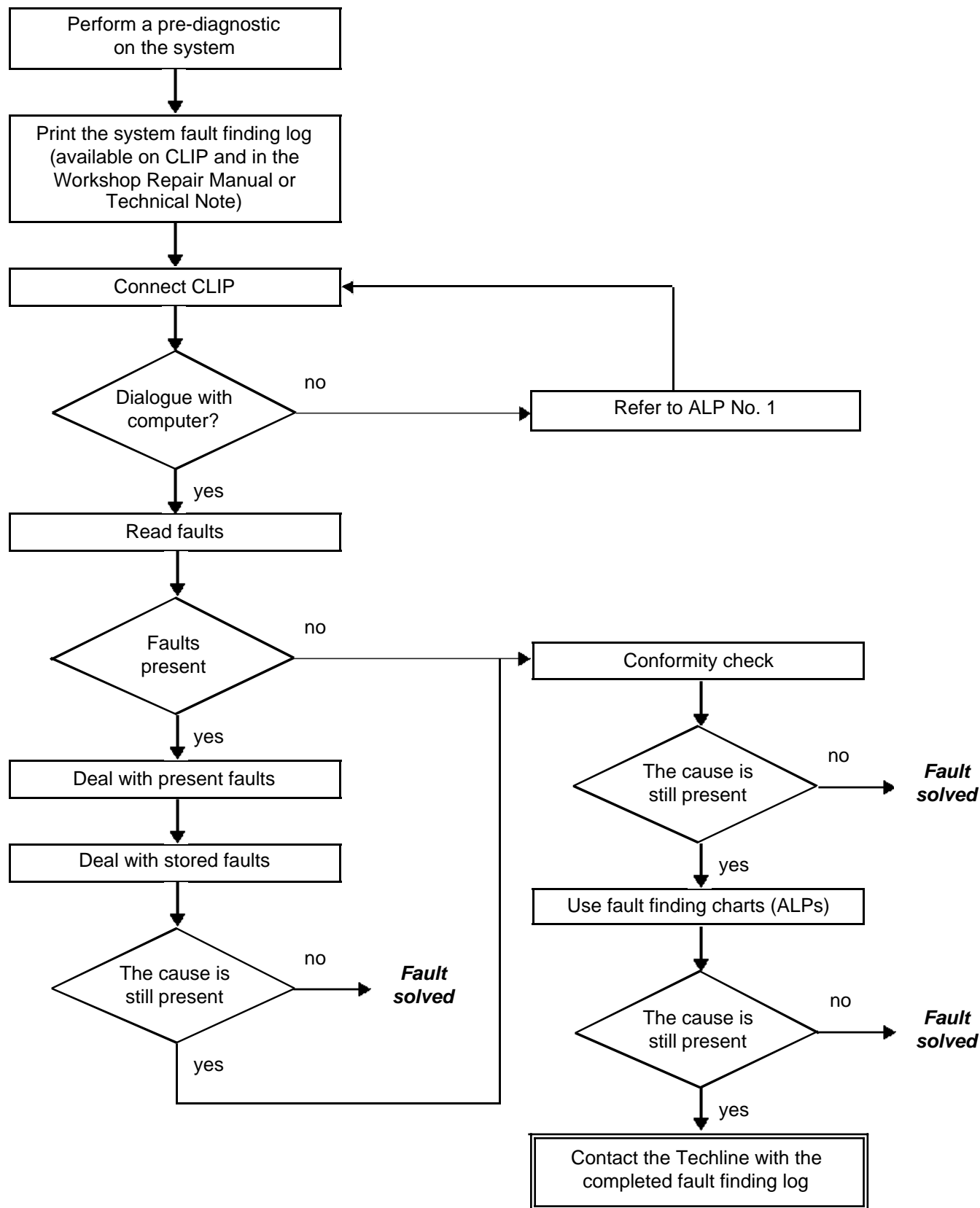
If a status is not behaving normally or a parameter is outside the permitted tolerance values, consult the corresponding fault finding page.

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 processed by **customer complaints**.

**A synopsis of the general procedure to follow is provided on the following page
in the form of a flow chart**

4. FAULT FINDING PROCEDURE



4. FAULT FINDING PROCEDURE (continued)

Wiring check

Fault finding problems

Disconnecting the connectors and/or manipulating the wiring harness may temporarily remove the cause of a fault. Electrical measurements of voltage, resistance and insulation are generally correct, especially if the fault is not present when the analysis is made (stored fault).

Visual inspection

Look for damage under the bonnet and in the passenger compartment.
Carefully check the fuses, insulators and wiring harness routing.
Look for signs of oxidation.

Tactile inspection

While manipulating the wiring harness, use the diagnostic tool to note any change in fault status from stored to present.
Make sure that the connectors are properly locked.
Apply light pressure to the connectors.
Twist the wiring harness.
If there is a change in status, try to locate the source of the fault.

Inspection of each component

Disconnect the connectors and check the appearance of the clips and tabs, as well as the crimping (no crimping on the insulating section).
Make sure that the clips and tabs are properly locked in the sockets.
Check that no clips or tabs have been dislodged during connection.
Check the clip contact pressure using an appropriate model of tab.

Resistance check

Check the continuity of entire lines, then section by section.
Look for a short circuit to earth, to + 12 V or to another wire.

If a fault is detected, repair or replace the wiring harness.

5. FAULT FINDING LOG



IMPORTANT!

IMPORTANT

Any fault on a complex system requires thorough fault finding 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 EACH TIME FAULT FINDING IS CARRIED OUT.

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,
- use the appropriate tools.
- **It is forbidden to carry out a road test with the diagnostic tool in dialogue with the ECU because the ABS and Electronic Brake Distribution functions are deactivated. Braking pressure is identical on both vehicle axles (risk of a spin under heavy braking).**

ANTI-LOCK BRAKING SYSTEM

Fault finding - System operation

38C

The main functions of **ABS** on this vehicle are the electronic balancing of front and rear braking by controlling rear wheel slip and preventing the brakes from locking by controlling the slipping of all four wheels. The system also supplies the other computers with information on the vehicle speed via a wire connection for the discharge bulbs, the radio and the electric sunroof, and via the multiplex network for the other computers. The **ABS** computer supplies the multiplex network with the odometry for the instrument panel and navigation system. If heavy braking produces very rapid deceleration, the **ABS** computer sends out a request to the **UCH** via the multiplex network to ask it to switch on the hazard warning lights (depending on the law in the relevant country).

Fault finding warning light illumination strategy for Mégane II ph1 and Scénic II ph 1

Instrument panel warning light				Instrument panel message		Meaning
				MEGANE II	SCENIC II	
Brake faults	ABS	SERVICE	STOP	No message	"Brake fault"	Electronic brake distribution and ABS functions inoperative.
	ABS	SERVICE		No message	Check the ABS	ABS function inoperative.
Brake faults flashing at 2 Hz	ABS flashing at 2 Hz			No message	No message	ABS computer is in fault finding mode.
	ABS flashing at 8 Hz			No message	No message	Tachometric index not programmed.

NOTE:

The **STOP** warning light is always accompanied by a single audible warning (1 beep).

ANTI-LOCK BRAKING SYSTEM

Fault finding - System operation

38C

Fault finding warning light illumination strategy for Mégane II ph 2 and Scénic II ph 2

Instrument panel warning light				Instrument panel message		Meaning
				MEGANE II PH2	SCENIC II PH2	
Brake faults	ABS	SERVICE	STOP	Braking fault		Electronic brake distribution and ABS functions inoperative.
	ABS	SERVICE		Check ABS		ABS function inoperative.
Brake faults flashing at 2 Hz	ABS flashing at 2 Hz			No message		ABS computer is in fault finding mode.
	ABS flashing at 8 Hz			No message		Tachometric index not programmed.
						Vehicle speed at initialisation not programmed.
						Tachometric index and vehicle speed at initialisation not programmed.
Brake faults	ABS flashing at 8 Hz		STOP	No message		Vehicle parameters not programmed.
						Vehicle parameters and tachometric index not programmed.
						Vehicle parameters and vehicle speed at initialisation not programmed.
						Vehicle parameters and tachometric index and vehicle speed at initialisation not programmed.

NOTE:

The **STOP** warning light is always accompanied by a single audible warning (1 beep).

Fault finding - Replacement of components

Replacing the computer

When replacing the computer, apply the following procedure:

- **switch off the ignition,**
- **replace the computer (see MR364 or MR370, Mechanical 38C, Anti-lock braking system, Hydraulic unit),**
- **enter the VIN using command VP001,**
- **configure the tachometric index using command VP007,**
- **enter the most recent After Sales operation date using command VP006;**
- **For Vdiag 0F: configure the vehicle parameters with command VP004 and configure the vehicle speed with command VP032;**
- **perform a road test followed by a fault reading to confirm that the system is operating correctly.**

Settings

VP001: Write VIN.

This command allows the **vehicle identification number** to be entered 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 left-hand side of the windscreen.

VP004: Vehicle parameters.

This command is used to configure the engine type + braking definition + body type. Select command **VP004** on the diagnostic tool (it is imperative to check that the variants selected correspond to the vehicle type).

VP006: Write date of the last After-Sales service.

Whenever the **ABS** system is worked on in the shop, the date must be entered.

Select command VP006 on the diagnostic tool.

Enter the operation date with the tool keyboard.

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 wheels turn.

The **BOSCH ABS 8.0** computer supplies the vehicle speed signal to all vehicle systems that use this information (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.

Note:

The vehicle speed is sent by wire (**track 23**) to the xenon bulb computer, radio and electric sunroof, and via the multiplex network to the other computers.

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

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

VP032: Vehicle speed at initialisation.

Vehicle speed transmitted via the multiplex network when the computer is initialised. Select "Type 1" or "Type 2" according to the information supplied by the tool.

Fault finding - Fault summary table

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
DF066	5180	No injection multiplex signal
DF090	5041	Front right-hand wheel target
DF091	5042	Front left-hand wheel target
DF092	5043	Rear right-hand wheel target
DF093	5044	Rear left-hand wheel target
DF152	50E6	Multiplex network
DF153	50C3	Multiplex network
DF186	5182	No instrument panel multiplex signal
DF188	50C6	Brake switch circuit
DF193	5180	Invalid injection multiplex signals

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

<p>DF001 PRESENT OR STORED</p>	<p>COMPUTER FEED 1.DEF: Below minimum threshold 2.DEF: Above maximum threshold 3.DEF: Abnormal voltage</p>
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<p>NOTES</p>	<p>Special notes: The fault is declared present during a road test at a speed of > 6 mph (10 km/h). The computer signals an external supply fault.</p>
	<p>Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure whether the fault is present or stored.</p>

Check the connections and the condition of the battery terminals.
Check the condition and position of the **ABS fuses** in the **engine fuse and relay box**.
Check the **50A** power fuse in position 5 on the power fuse board.
Check the **25A** fuse **F13** on the **UPC** and the correct locking of the **grey 4-track PPHI connector (Vdiag 44)** or **the 25A fuse F8** on the **UPC** and the correct locking of the **black 6-track CM connector (Vdiag 48)**.
Check the connection and condition of the **tab 1 red wire of the grey connector**.
Check the connections on the **26-track connector** of the ABS computer.
Check the **ABS earths on tracks 1 and 4** (attached under the ABS unit) and carry out an inspection of the entire ABS wiring.
Check the continuity between the fuses and **tracks 2 and 3** of the computer connector (+ **Before ignition present on the tracks**) and between the **UCH** and **track 18** of the computer (+ **After ignition present on the track**).

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

<p>AFTER REPAIR</p>	<p>Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.</p>
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C**DF006
PRESENT
OR
STORED****LEFT-HAND FRONT WHEEL SPEED SENSOR CIRCUIT**CO.0 : Open circuit or short circuit to earth
1.DEF: Magnetic/mechanical target fault**Vdiag No.: 0C, 0D****NOTES****Special notes:**The wheel speed sensors are fed with **+ 12 V APC** but this feed cannot be measured on **Vdiag 0C and 0D** (feed cut off 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)**.**CO.0****NOTES****None**

Check the connection and the condition of the sensor connectors.
Swap the two front wheel speed sensors over.
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"** becomes **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 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 2 tracks** —————> **Track 5** computer connectorSensor connector **the other track** —————> **Track 16** computer connector

Also check **the insulation** between these two connections.
Repair if necessary.

AFTER REPAIR

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

<p>DF006</p> <p>CONTINUED</p>	
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Vdiag No.: 0C, 0D

1.DEF	NOTES	None
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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 the quality of the mounting of the wheel speed sensor (correct clipping without excessive play).

Check the sensor/ target air gap over one revolution: 0.1 mm < Front wheel air gap < 1.2 mm.

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.

If the checks are correct:

- the computer fault memory has been cleared,
 - exit fault finding mode, switch off the ignition and carry out a road test.
- Replace the instrumented bearing if the fault recurs.

AFTER REPAIR	<p>Clear the computer fault memory.</p> <p>Carry out a road test followed by another check with the diagnostic tool.</p>
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DF006
PRESENT
OR
STOREDLEFT-HAND FRONT WHEEL SPEED SENSOR CIRCUIT

CO.0 : Open circuit or short circuit to earth

1.DEF: Magnetic/mechanical target fault

2.DEF: Open circuit or short circuit

Vdiag No.: 0E, 0F

NOTES

None

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).

CO.0
2.DEF**NOTES****Special notes:**

You must use command AC013 once only.

Check the connection and the condition of the sensor connectors.

Disconnect the sensor, run command **AC013 Test wheel speed sensor supply** and check that voltage **pulses** of about **12 V are detected** by a multimeter at the sensor connector terminals on the computer side.**Have you found voltage pulses?****YES**

The wiring between the computer and the sensor, as well the supply via the computer, is OK. Left-hand front wheel speed sensor fault - replace the sensor.

NOCheck 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 2 tracks** —————> **Track 5** computer connectorSensor connector **the other track** —————> **Track 16** computer connectorAlso check **the insulation** between these two connections.

If all the checks are in order, contact Techline.

AFTER REPAIR

Clear the computer fault memory.

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF006
CONTINUED

Vdiag No.: 0E, 0F

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 the quality of the mounting of the wheel speed sensor (correct clipping without excessive play).

Check the sensor/ target air gap over one revolution: 0.1 mm < Front wheel air gap < 1.2 mm.

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.

If the checks are correct:

- the computer fault memory has been cleared,
 - exit fault finding mode, switch off the ignition and carry out a road test.
- Replace the instrumented bearing if the fault recurs.

AFTER REPAIR

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C**DF007
PRESENT
OR
STORED****LEFT-HAND REAR WHEEL SPEED SENSOR CIRCUIT**CO.0 : Open circuit or short circuit to earth
1.DEF: Magnetic/mechanical target fault**Vdiag No.: 0C, 0D****NOTES****Special notes:**The wheel speed sensors are fed with **+ 12 V APC** but this feed cannot be measured on **Vdiag 0C and 0D** (feed cut off 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)**.**CO.0****NOTES****None**

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

If the fault initially declared **DF007 "Rear left-hand wheel speed sensor circuit"** becomes **DF027 "Rear 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 connection and the condition of the computer connectors. Repair if necessary.
Check the connections (**Track 31 and 32**) at the **R2 black 52-track** intermediate connection beneath the front left-hand seat. Repair if necessary.
Check and ensure **the continuity** of the following connections:

Sensor connector **one of the 2 tracks** —————> **Track 6** computer connectorSensor connector **the other track** —————> **Track 17** computer connector

Also check **the insulation** between these two connections.
If the connections are faulty, carry out the following checks:
Check **the insulation, continuity and absence of interference resistance** between:

Computer connector **track 6** —————> **Track 32** on the intermediate connectorComputer connector **track 17** —————> **Track 31** on the intermediate connector**AFTER REPAIR**

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C**DF007**
CONTINUED**Vdiag No.: 0C, 0D**

Also check **the insulation** between the following two connections. Repair or replace the wiring if necessary.
Check **the insulation, continuity and absence of interference resistance** between:

Sensor connector **one of the 2 tracks** —————> **Track 31** on the intermediate connector

Sensor connector **the other track** —————> **Track 32** on the intermediate connector

Also check **the insulation** between these two connections. Repair or replace the wiring if necessary.

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 sensor/target air gap through one wheel revolution: **0.1 mm < Rear wheel air gap < 1.2 mm.**

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.

If the checks are correct:

- the computer fault memory has been cleared,
- exit fault finding mode, switch off the ignition and carry out a road test.
- Replace the rear left-hand "disc-hub-bearing" assembly (see **MR364** or **MR370 Mechanical, 33A, Rear axle components, Bearing: Removal - Refitting**) if the fault reappears.

AFTER REPAIR

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

DF007
PRESENT
OR
STOREDLEFT-HAND REAR WHEEL SPEED SENSOR CIRCUIT

CO.0 : Open circuit or short circuit to earth

1.DEF: Magnetic/mechanical target fault

2.DEF: Open circuit or short circuit

Vdiag No.: 0E, 0F

NOTES

None

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)**.CO.0
2.DEF**NOTES****Special notes:**You must use command **AC013** once only.

Check the connection and the condition of the sensor connectors.

Disconnect the sensor, use command **AC013 "Test wheel speed sensor supply"** and check that **pulses** of voltage of about **12 V are detected** by a multimeter at the sensor connector terminals on the computer side.**Have you found voltage pulses?****YES**

The wiring between the computer and the sensor, as well the supply via the computer, is OK. Rear left-hand wheel speed sensor fault - replace the sensor.

NOCheck the connection and the condition of the computer connectors. Repair if necessary. Check the connections (**Track 31 and 32**) at the **R2 black 52-track** intermediate connection beneath the front left-hand seat. Repair if necessary. Check and ensure **the continuity** of the following connections:Sensor connector **one of the 2 tracks** —————> **Track 6** computer connectorSensor connector **the other track** —————> **Track 17** computer connector**AFTER REPAIR**

Clear the computer fault memory.

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C**DF007**
CONTINUED**Vdiag No.: 0E, 0F**

Also check **the insulation** between these two connections.
If the connections are faulty, carry out the following checks:
Check **the insulation, continuity and absence of interference resistance** between:

Computer connector **track 6** —————> **Track 32** on the intermediate connector

Computer connector **track 17** —————> **Track 31** on the intermediate connector

Also check **the insulation** between these two connections.
Check **the insulation, continuity and absence of interference resistance** between:

Sensor connector **one of the 2 tracks** —————> **Track 31** on the intermediate connector

Sensor connector **the other track** —————> **Track 32** on the intermediate connector

Also check **the insulation** between these two connections.
If all the checks are in order, contact Techline.

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 sensor/target air gap over one wheel revolution: **0.1 mm < Rear wheel gap < 1.2 mm**.

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.

If the checks are correct:

- the computer fault memory has been cleared,
- exit fault finding mode, switch off the ignition and carry out a road test.
- Replace the rear left-hand "disc-hub-bearing" assembly (see **MR364** or **MR370 Mechanical, 33A, Rear axle components, Bearing: Removal - Refitting**) if the fault reappears.

AFTER REPAIR

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF017 PRESENT OR STORED	COMPUTER 1.DEF: Feed fault or internal electronic fault 2.DEF: Programming / initialisation invalid
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NOTES	Special notes: The voltage displayed in the parameter (PR005) is the + after ignition feed voltage of the computer and not the hydraulic unit power feed.
	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 connections and the condition of the battery terminals.
 Check the condition and position of the **ABS fuses** in the **engine fuse and relay box**.
 Check the **50A** power fuse in position 5 on the power fuse board.
 Check the **25A** fuse **F13** on the **UPC** and the correct locking of the **grey 4-track PPHI connector (Vdiag 44)** or test the **25A** fuse **F8** on the **UPC** and the correct locking of the **black 6-track CM connector (Vdiag 48)**.
 Check the connection and condition of the **tab 1 red wire of the grey connector**.
 Check the connections on the **26-track connector** of the ABS computer.
 Check the **ABS earths on tracks 1 and 4** (attached under the ABS unit) and carry out an inspection of the entire ABS wiring.
 Check the continuity between the fuses and **tracks 2 and 3** of the computer connector (**+ Before ignition present on the tracks**) and between the **UCH** and **track 18** of the computer (**+ After ignition present on the track**).

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

2.DEF	NOTES	Special notes: No programming for PR020 Vehicle speed at initialisation. ABS warning light flashing at 8 Hz outside fault finding conditions.
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Run command **VP032** and select "Type 1" or "Type 2" according to the information supplied by the diagnostic tool.
 Clear the computer fault memory, switch the ignition off and carry out a road test. 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 .
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DF020 PRESENT	<u>TACHOMETRIC INDEX PROGRAMMING</u>
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NOTES	Special notes: ABS warning light flashing at 8 Hz outside fault finding conditions.
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The **BOSCH ABS 8.0** computer supplies the vehicle speed signal to all vehicle systems that use this information (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.

Note:

The vehicle speed is sent by wire (**track 23**) to the xenon bulb computer, radio and electric sunroof, and via the multiplex network to the other computers.

The tyre circumference must be programmed into the memory of a new computer. This consists of entering a number 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 parameter **PR030** to check that the index entered 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 .
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C**DF026
PRESENT
OR
STORED****RIGHT-HAND FRONT WHEEL SPEED SENSOR CIRCUIT**CO.0 : Open circuit or short circuit to earth
1.DEF: Magnetic/mechanical target fault**Vdiag No.: 0C, 0D****NOTES****Special notes:**The wheel speed sensors are fed with **+ 12 V APC** but this feed cannot be measured on **Vdiag 0C and 0D** (feed cut off 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)**.**CO.0****NOTES****None**

Check the connection and the condition of the sensor connectors.
Swap the two front wheel speed sensors over.
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 2 tracks** —————> **Track 9** computer connectorSensor connector **the other track** —————> **Track 10** computer connector

Also check **the insulation** between these two connections.
Repair if necessary.

AFTER REPAIR

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF026
CONTINUED

Vdiag No.: 0C, 0D

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 the quality of the mounting of the wheel speed sensor (correct clipping without excessive play).

Check the sensor/target air gap over one wheel revolution: **0.1 mm < front wheel air gap < 1.2 mm.**

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth.**

If the checks are correct:

- the computer fault memory has been cleared,
 - exit fault finding mode, switch off the ignition and carry out a road test.
- Replace the instrumented bearing if the fault recurs.

AFTER REPAIR

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

DF026
PRESENT
OR
STOREDRIGHT-HAND FRONT WHEEL SPEED SENSOR CIRCUIT

CO.0 : Open circuit or short circuit to earth

1.DEF: Magnetic/mechanical target fault

2.DEF: Open circuit or short circuit

Vdiag No.: 0E, 0F

NOTES

None

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).

CO.0
2.DEF**NOTES****Special notes:**

You must use command AC013 once only.

Check the connection and the condition of the sensor connectors.

Disconnect the sensor, run command **AC013 Test wheel speed sensor supply** and check that voltage **pulses** of about **12 V are detected** by a multimeter at the sensor connector terminals on the computer side.**Have you found voltage pulses?****YES**

The wiring between the computer and the sensor, as well the supply via the computer, is OK. Front right-hand wheel speed sensor fault - replace the sensor.

NOCheck 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 2 tracks** —————> **Track 9** computer connectorSensor connector **the other track** —————> **Track 10** computer connectorAlso check **the insulation** between these two connections.

If all the checks are in order, contact Techline.

AFTER REPAIR

Clear the computer fault memory.

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF026
CONTINUED

Vdiag No.: 0E, 0F

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 the quality of the mounting of the wheel speed sensor (correct clipping without excessive play).

Check the sensor/target air gap over one wheel revolution: **0.1 mm < front wheel air gap < 1.2 mm.**

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth.**

If the checks are correct:

- the computer fault memory has been cleared,
 - exit fault finding mode, switch off the ignition and carry out a road test.
- Replace the instrumented bearing if the fault recurs.

AFTER REPAIR

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C**DF027
PRESENT
OR
STORED****RIGHT-HAND REAR WHEEL SPEED SENSOR CIRCUIT**CO.0 : Open circuit or short circuit to earth
1.DEF: Magnetic/mechanical target fault**Vdiag No.: 0C, 0D****NOTES****Special notes:**The wheel speed sensors are fed with **+ 12 V APC** but this feed cannot be measured on **Vdiag 0C and 0D** (feed cut off 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)**.**CO.0****NOTES****None**

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

If the fault initially declared **DF027 "Rear left-hand wheel speed sensor circuit"** becomes **DF007 "Rear 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 connection and the condition of the computer connectors. Repair if necessary.
Check the connections (**Track 33 and 34**) at the **R2 black 52-track** intermediate connection beneath the front left-hand seat. Repair if necessary.
Check and ensure **the continuity** of the following connections:

Sensor connector **one of the 2 tracks** —————> **Track 8** computer connectorSensor connector **the other track** —————> **Track 19** computer connectorAlso check **the insulation** between these two connections.

If the connections are faulty, carry out the following checks:

Check **the insulation, continuity and absence of interference resistance** between:Computer connector **track 8** —————> **Track 34** on the intermediate connectorComputer connector **track 19** —————> **Track 33** on the intermediate connector**AFTER REPAIR**

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

ANTI-LOCK BRAKING SYSTEM
Fault finding - Interpretation of faults

38C

DF027
CONTINUED

Also check **the insulation** between these two connections.

Repair or replace the wiring if necessary.

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

Sensor connector **one of the 2 tracks** —————> **Track 33** on the intermediate connector

Sensor connector **the other track** —————> **Track 34** on the intermediate connector

Also check **the insulation** between these two connections. Repair or replace the wiring if necessary.

Vdiag No.: 0C, 0D

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 the quality of the mounting of the wheel speed sensor (correct clipping without excessive play).

Check the sensor/target air gap through one wheel revolution: **0.1 mm < Rear wheel air gap < 1.2 mm.**

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.

If the checks are correct:

- the computer fault memory has been cleared,
- exit fault finding mode, switch off the ignition and carry out a road test.
- Replace the rear right-hand "disc-hub-bearing" assembly (see **MR364** or **MR370 Mechanical, 33A, Rear axle components, Bearing: Removal - Refitting**) if the fault reappears.

AFTER REPAIR

Clear the computer fault memory.

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

DF027
PRESENT
OR
STOREDRIGHT-HAND REAR WHEEL SPEED SENSOR CIRCUIT

CO.0 : Open circuit or short circuit to earth

1.DEF: Magnetic/mechanical target fault

2.DEF: Open circuit or short circuit

Vdiag No.: 0E, 0F

NOTES

None

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)**.CO.0
2.DEF**NOTES****Special notes:**You must use command **AC013** once only.

Check the connection and the condition of the sensor connectors.

Disconnect the sensor, use command **AC013 "Test wheel speed sensor supply"** and check that **pulses** of voltage of about **12 V are detected** by a multimeter at the sensor connector terminals on the computer side.**Have you found voltage pulses?****YES**

The wiring between the computer and the sensor, as well the supply via the computer, is OK. Rear right-hand wheel speed sensor fault - replace the sensor.

NOCheck the connection and the condition of the computer connectors. Repair if necessary. Check the connections (**Track 33 and 34**) at the **R2 black 52-track** intermediate connection beneath the front left-hand seat. Repair if necessary. Check and ensure **the continuity** of the following connections:Sensor connector **one of the 2 tracks** → **Track 8** computer connectorSensor connector **the other track** → **Track 19** computer connector**AFTER REPAIR**

Clear the computer fault memory.

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C**DF027**
CONTINUED**Vdiag No.: 0E, 0F**

Also check **the insulation** between these two connections.
If the connections are faulty, carry out the following checks:
Check **the insulation, continuity and absence of interference resistance** between:

Computer connector **track 8** —————→ **Track 34** on the intermediate connector

Computer connector **track 19** —————→ **Track 33** on the intermediate connector

Also check **the insulation** between these two connections.
Check **the insulation, continuity and absence of interference resistance** between:

Sensor connector **one of the 2 tracks** —————→ **Track 33** on the intermediate connector

Sensor connector **the other track** —————→ **Track 34** on the intermediate connector

Also check **the insulation** between these two connections.
If all the checks are in order, contact Techline.

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 sensor/target air gap through one wheel revolution: **0.1 mm < Rear wheel air gap < 1.2 mm.**

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.

If the checks are correct:

- the computer fault memory has been cleared,
- exit fault finding mode, switch off the ignition and carry out a road test.
- Replace the rear right-hand "disc-hub-bearing" assembly (see **MR364** or **MR370 Mechanical, 33A, Rear axle components, Bearing: Removal - Refitting**) if the fault reappears.

AFTER REPAIR

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

ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

<p>DF055 PRESENT</p>	<p><u>VEHICLE PARAMETER PROGRAMMING</u> 1.DEF: No vehicle parameter programming 2.DEF: Programming invalid</p>
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<p>NOTES</p>	<p>Special notes: No programming for PR063 Vehicle parameters. ABS warning light flashing at 8 Hz outside fault finding conditions.</p>
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Read **PR063 Vehicle parameters**, use command **VP004 Vehicle parameters** to define the appropriate vehicle type variant.
It is essential to select the parameters that correspond to the vehicle undergoing fault finding.
If the fault is still present, contact the Techline.

<p>AFTER REPAIR</p>	<p>Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.</p>
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF063 PRESENT OR STORED	<u>CONSISTENT WHEEL SPEEDS</u> CC.1 : Short circuit to + 12 V 1.DEF: Interference
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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 they are stored.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present after a road test at a speed of over 36 mph (60 km/h) on a winding road.

<p>Check the condition of the axles (impacts, damage, etc.) and the conformity and good condition of the tyres. Ensure that the braking system is in good condition (condition of the linings, tightness, grip, bleeding, bearing play, lubricant on the targets, etc.).</p> <p>Check the quality of the mounting of the wheel speed sensors (correct clipping without excessive play).</p> <p>Check the sensor/target air gap over one wheel revolution: 0.1 mm < wheel air gap < 1.2 mm.</p> <p>Check the conformity of the target (condition, number of teeth = 48) using the specific command SC001 Check target teeth.</p> <p>Repair if necessary.</p>
<p>Carry out a visual check on the connection and condition of the sensor and computer connectors</p> <p>Check the connection and condition of the connections (tracks 31, 32, 33 and 34) of the R2 black 52-track intermediate connection under the front left seat.</p> <p>Repair if necessary.</p>
<p>If all the checks are correct, clear the computer's fault memory.</p> <p>Exit the fault finding procedure and carry out a road test.</p> <p>If the fault is still present, contact the Techline.</p>

AFTER REPAIR	<p>Clear the computer fault memory.</p> <p>Carry out a road test followed by another check with the diagnostic tool.</p>
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

<p>DF066 PRESENT OR STORED</p>	<p><u>INJECTION MULTIPLEX SIGNAL ABSENT</u> 1.DEF: Carry out the multiplex network fault finding procedure</p>
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<p>NOTES</p>	<p>Special notes: Although stored in the computer, the fault is not due to ABS components but injection components. Run fault finding on the injection system. Note: The injection computer does not always store these transient faults as quickly as the ABS computer. If no fault is stored in the injection computer, start the engine; if there is no fault present, contact the Techline. After solving the injection system problem, erase the faults from the ABS computer memory. The multiplex injection signal is sent to the ABS system via the Protection and Switching Unit.</p>
	<p>Priorities when dealing with a number of faults: Deal with faults DF152 and DF153 first, whether they are present or stored.</p>
	<p>Conditions for applying the fault finding procedure to stored faults: The fault is declared present when the engine is started up.</p>

<p>Check the condition and correct locking of the blue PEH connector on the UPC (Vdiag 44) or the grey CT1 connector of the UPC (Vdiag 48). Carry out a multiplex network test and check the injection system with the diagnostic tool. If the fault is still present, contact the Techline.</p>

<p>AFTER REPAIR</p>	<p>Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.</p>
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF090 PRESENT OR STORED	<u>RIGHT-HAND FRONT WHEEL TARGET</u>
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NOTES	Special notes: This fault means that some magnetic poles of the target are not detected by the sensor.
	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 for play in the bearing.
 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 the quality of the mounting of the wheel speed sensor (correct clipping without excessive play).
 Check the sensor/target air gap over one wheel revolution: **0.1 mm < front wheel air gap < 1.2 mm**.
 Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.
 Replace the instrumented bearing if the number of teeth is incorrect.

If all the checks are correct, reconnect the computer and the wheel speed sensor.
 Clear the computer fault memory.
 Exit fault finding mode, switch off the ignition and carry out a road test.
 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 .
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DF091 STORED	<u>LEFT-HAND FRONT WHEEL TARGET</u>
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NOTES	Special notes: This fault means that some magnetic poles of the target are not detected by the sensor.
	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 for play in the bearing.
 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 the quality of the mounting of the wheel speed sensor (correct clipping without excessive play).
 Check the sensor/target air gap over one wheel revolution: **0.1 mm < front wheel air gap < 1.2 mm**.
 Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.
 Replace the instrumented bearing if the number of teeth is incorrect.

If all the checks are correct, reconnect the computer and the wheel speed sensor.
 Clear the computer fault memory.
 Exit fault finding mode, switch off the ignition and carry out a road test.
 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 .
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF092 STORED	<u>RIGHT-HAND REAR WHEEL TARGET</u>
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NOTES	Special notes: This fault means that some of the target teeth are not seen by the sensor.
	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) .

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 sensor / target air gap over one wheel rotation: **0.1 mm < Rear wheel air gap < 1.2 mm**.

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth**.

Replace the rear right-hand "disc-hub-bearing" assembly (see **MR364** or **MR370 Mechanical, 33A, Rear axle components, Bearing: Removal - Refitting**) if the number of teeth is incorrect.

If all the checks are correct, reconnect the computer and the wheel speed sensor.

Clear the computer fault memory.

Exit fault finding mode, switch off the ignition and carry out a road test.

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 .
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF093 STORED	<u>LEFT-HAND REAR WHEEL TARGET.</u>
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NOTES	Special notes: This fault means that some of the target teeth are not seen by the sensor.
	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) .

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 sensor/target air gap over one wheel rotation: **0.1 mm < Rear wheel air gap < 1.2 mm.**

Check the conformity of the target (condition, number of teeth = 48) using the specific command **SC001 Check target teeth.**

Replace the rear left-hand "disc-hub-bearing" assembly (see **MR364** or **MR370 Mechanical, 33A, Rear axle components, Bearing: Removal - Refitting**) if the number of teeth is incorrect.

If all the checks are correct, reconnect the computer and the wheel speed sensor.

Clear the computer fault memory.

Exit fault finding mode, switch off the ignition and carry out a road test.

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 .
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF152 STORED	MULTIPLEX NETWORK (BUS OFF) 1.DEF: Carry out the multiplex network fault finding procedure
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NOTES	Special notes: If several computers are affected by a similar multiplex network fault, contact the Techline to check the cases previously noted first.
	Conditions for applying the fault finding procedure to stored faults: Apply the fault finding procedure as below.

If no other computer has detected a multiplex network fault but only the absence of ABS frames, carry out the following checks:

- check the connection and condition (corrosion, bent terminal, crimping, etc.) of the computer connections (**tracks 15 and 26**). Repair if necessary.

Check the connection (locking) and condition (corrosion, bent terminals, crimping, etc.) of the **blue PEH connector on the UPC (Vdiag 44) or the grey CT1 connector of the UPC (Vdiag 48)**.

Repair if necessary.

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

Computer connector track 15	————→	Track 7 of the blue PEH connector of the Vdiag 44 UPC Track 2 of the grey CT1 connector of the Vdiag 48 UPC
Computer connector track 26	————→	Track 11 of the blue PEH connector of the Vdiag 44 UPC Track 3 of the blue CT1 connector of the Vdiag 48 UPC

Also check **the insulation** between these two connections. Repair or replace the wiring if necessary.

If the problem is still present, run fault finding on the multiplex network.

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

Fault finding - Interpretation of faults

38C

DF153 STORED	<u>MULTIPLEX NETWORK</u>
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NOTES	None
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If no other computer has reported a multiplex network fault, it is an **ABS** multiplex line electronic problem; contact the Techline.
Otherwise, run the multiplex network fault finding procedure.

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

Fault finding - Interpretation of faults

38C

DF186 PRESENT OR STORED	<u>NO INSTRUMENT PANEL MULTIPLEX SIGNAL</u>
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NOTES	Special notes: Even though it is stored in the computer, this fault does not cause the warning lights to come on or a fault message. Using the diagnostic tool, run fault finding on the instrument panel. Note: Once the fault in the instrument panel system has been repaired, clear the ABS computer fault memory. The multiplex signal from the instrument panel is sent to the ABS via the Protection and Switching Unit.
	Priorities when dealing with a number of faults: Deal with faults DF152 and DF153 first, whether they are present or stored.
	Conditions for applying the fault finding procedure to stored faults: The fault is declared present when the engine is started up.

Check the condition and correct locking of the **blue PEH connector on the UPC (Vdiag 44)** or the **grey CT1 connector of the UPC (Vdiag 48)**.
Carry out a multiplex network test.
If the fault is still present, perform fault finding on the instrument panel and repair accordingly.
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 .
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF188 PRESENT OR STORED	<u>BRAKE LIGHT SWITCH CIRCUIT</u>
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NOTES	Special notes: This fault does not cause illumination of any warning lights, nor does it generate any fault message.
	Conditions for applying the fault finding procedure to stored faults: Clear the stored fault, carry out a road test at a speed of > 37 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** displays the pressed and released positions of the brake pedal correctly.
 If the correct pedal position is not displayed, use 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 .
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Interpretation of faults

38C

DF193 PRESENT OR STORED	<u>INVALID INJECTION MULTIPLEX SIGNALS</u>
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NOTES	<p>Special notes: Although it is stored in the computer, the ABS system is not faulty. The ABS is deactivated due to unusable information from the injection system. Perform fault finding on the injection system using the diagnostic tool.</p> <p>Note: The injection computer does not always store these transient faults as quickly as the ABS computer. If no fault is stored in the injection computer, start the engine; if there is no fault present, contact the Techline. After solving the injection system fault, clear the ABS computer fault memory.</p>
	<p>Conditions for applying the fault finding procedure to stored faults: The fault is declared present after starting the engine.</p>

Carry out a multiplex network test and check the injection system with the diagnostic tool.
If the fault is still present, contact the Techline.

AFTER REPAIR	<p>Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool.</p>
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ANTI-LOCK BRAKING SYSTEM

Fault finding - Conformity check

38C

NOTES	Only carry out this conformity check after a complete check using the diagnostic tool.
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Order	Function	Parameter or Status checked or Action	Display and Notes	Fault finding
1	Diagnostic tool dialogue		BOSCH ABS 8.0	Apply Fault Finding Chart 1
2	Computer configuration	PR030: Tachometric index	Make sure the index entered matches the vehicle's tyres (see Replacing components)	None
3	Vehicle parameter reading	PR063: Vehicle parameters	Ensure that the parameters correspond to the vehicle undergoing fault finding.	See Configurations and Programming (VP004)
4	Brake pedal not depressed detection	ET017: Brake pedal	Released status confirmed, brake pedal not depressed	In the event of a fault, apply interpretation of ET017.
5	Depressed brake pedal detection	ET017: Brake pedal	"Depressed" status confirmed; brake pedal fully depressed	In the event of a fault, apply interpretation of ET017.
6	Vehicle speed at initialisation	PR020: Vehicle speed at initialisation	Check that the value is correct according to the information in the Help section	In the event of a fault, apply parameter VP032 Vehicle speed at initialisation.

Tool status	Diagnostic tool title
ET017	Brake pedal

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
PR020	Vehicle speed at initialisation
PR030	Tachometric index
PR038	Vehicle speed
PR063	Vehicle parameters

ET017	<u>BRAKE PEDAL</u>
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NOTES	Special notes: Carry out the checks only if the "pressed" and "released" statuses are not consistent with the pedal position.
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STATUS IS "RELEASED" WITH BRAKE PEDAL PRESSED.

If brake lights operate:

- Check the continuity of the connection between **track 1** 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 brake lights fuse.
- Remove the brake light switch and check that it is operating correctly:

	Continuity between tracks	Insulation between tracks
Switch pressed (Brake pedal released)	3 and 4	1 and 2
Switch released (Brake pedal depressed)	1 and 2	3 and 4

Replace the switch if necessary.

Check for **+ after ignition feed** on tracks **2 and 4** on the brake light switch connector.

AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool .
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ET017
CONTINUED

Status is "pressed" with 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 pressed (Brake pedal released)	3 and 4	1 and 2
Switch released (Brake pedal depressed)	1 and 2	3 and 4

- Replace the switch if necessary.
- Check and ensure insulation against 12 V on the connection between **track 1** of the brake switch connector and **track 20** of the computer connector.

AFTER REPAIR

Clear the computer fault memory.
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 shows the computer's **+ after ignition** feed voltage in **volts**.
- PR020:** Vehicle speed at initialisation
This parameter shows the vehicle speed sent to the multiplex network when the computer is initialised.
(vdiag 0F)
- 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**) correctly matches the vehicle being tested.
(vdiag 0F)

CLEARING

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

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 permit a check on the hydraulics of each wheel.
Position the vehicle on a 2-post lift so that the free rotation of the wheels can be checked.
Keep the brake pedal depressed enough to prevent the wheel being tested from being turned by hand (do not brake so hard that the anti-lock function operates).

Select and confirm the command for the wheel in question (e.g. Left-hand front wheel solenoid valve, etc.).

Turn the wheel concerned by hand: 5 braking/releasing cycles should be detected.

AC013: Wheel speed sensor supply test.
This command is used to check that voltage **pulses** of approximately **12 V are detected** on the faulty sensor by a multimeter at the terminals of the sensor connector on the computer side.

You must use command AC013 once only.

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

AC195: Vehicle speed signal.
This command serves to generate a speed other than **0 mph** at the computer's vehicle speed wire output (**Track 23**) for users of that signal (xenon bulbs, radio, sunroof).

Note:
This command has no visible effect on the dashboard speedometer needle.

- **Xenon headlights:** Switch on the dipped headlights and run command **AC195**. Check for slight variation in the height of the headlight beam while the command is running (the height of the beam is adjusted to improve visibility according to vehicle speed).
- **Radio:** Turn on the radio and make sure that the Adjust volume as a function of speed function is active. Run command **AC195**. Check that the volume of the sound increases and then decreases while the command is running.
- **Sunroof:** This command has no visible effect on the sunroof. This command changes the activation threshold of the anti-pinch system (the pressure exerted by the sunroof varies with vehicle speed due to aerodynamic factors).

AC196: Request to switch on hazard warning lights.
This command sends the **UCH** a request to switch on the hazard warning lights to test their operation during emergency braking (depending on **UCH** configuration).

SPECIAL COMMANDS

SC001: Check target teeth.

This command tests the condition of the teeth on each wheel.

Select command **SC001 Check target teeth**. The test result should indicate **48 sprockets**.

SC006: Bleed the hydraulic unit and brake circuits.

This command must be used only if abnormally long brake pedal travel is noted during a road test with **ABS** control (the system must have been bled beforehand by the usual method).

Select the **SC006 "Bleed hydraulic unit and brake circuit"** command and follow the instructions given by the diagnostic tool.

ANTI-LOCK BRAKING SYSTEM

Fault finding - Customer complaints

38C

NOTES

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

FAULTS DETECTED ON BRAKING WITH ABS/BRAKING REGULATION

LOCKING OF ONE OR MORE WHEELS	ALP2
PULLING	ALP3
DRIFT	ALP4
UNEXPECTED ABS OPERATION AT LOW SPEEDS AND SLIGHT PEDAL PRESSURE	ALP5
UNEXPECTED ABS OPERATION ON A POOR ROAD SURFACE	ALP6
UNEXPECTED ABS OPERATION WHEN USING SPECIAL EQUIPMENT (RADIO TELEPHONE, CB, etc.)	ALP7
LENGTHENING OF BRAKE PEDAL TRAVEL FOLLOWING A REGULATION PHASE (WITH PEDAL RECEDING WHEN ENTERING THE REGULATION PHASE)	ALP8
SPONGY PEDAL	ALP9
BRAKE PEDAL VIBRATION	ALP10
NOISES FROM THE PUMP, PIPES OR HYDRAULIC UNIT	ALP11

OTHER CASES

NO DIALOGUE WITH THE ABS COMPUTER	ALP1
"ABS COMPUTER NOT DETECTED" DURING MULTIPLEX NETWORK TEST ON CLIP	ALP12
INTERMITTENT ILLUMINATION OF THE BRAKE, ABS, SERVICE AND STOP FAULT WARNING LIGHTS AND THE MESSAGE "BRAKE FAILURE" ON THE INSTRUMENT PANEL WITH NO FAULT CODES IN THE COMPUTER	ALP13

ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP1	No dialogue with the ABS computer
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NOTES	<p>Special notes: To run fault finding on the vehicle's computers, switch on the ignition in fault finding mode (forced + after ignition feed). Proceed as follows: – with the vehicle card in the card reader, press the Start button for more than 5 seconds outside of starting conditions. Check that the CLIP diagnostic tool is equipped with the latest update available.</p>
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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 at fault, and dialogue cannot be established with any other computer on the same vehicle, the cause could be a faulty computer interfering on the multiplex network. Check the battery voltage and carry out the necessary work to obtain the correct voltage (**9.5 V < battery voltage < 17.5 V**).

Carry out a fault finding procedure on the multiplex network using the diagnostic tool.

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 screw 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.**

Check that the power supply to the diagnostic socket is correct:

- **+ before ignition feed on track 16.**
- **+ after ignition feed on track 1.**
- **Earth on tracks 4 and 5.**

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

AFTER REPAIR	<p>Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool.</p>
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP2	Locking of one or more wheels
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.
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Reminder: locking of wheels on a vehicle equipped with **ABS** or screeching of tyres, perceived by the customer as locking, may be related to normal operation of the system and should not automatically be assumed to be a fault: Braking with ABS system regulation on very **poor roads** (significant grating).

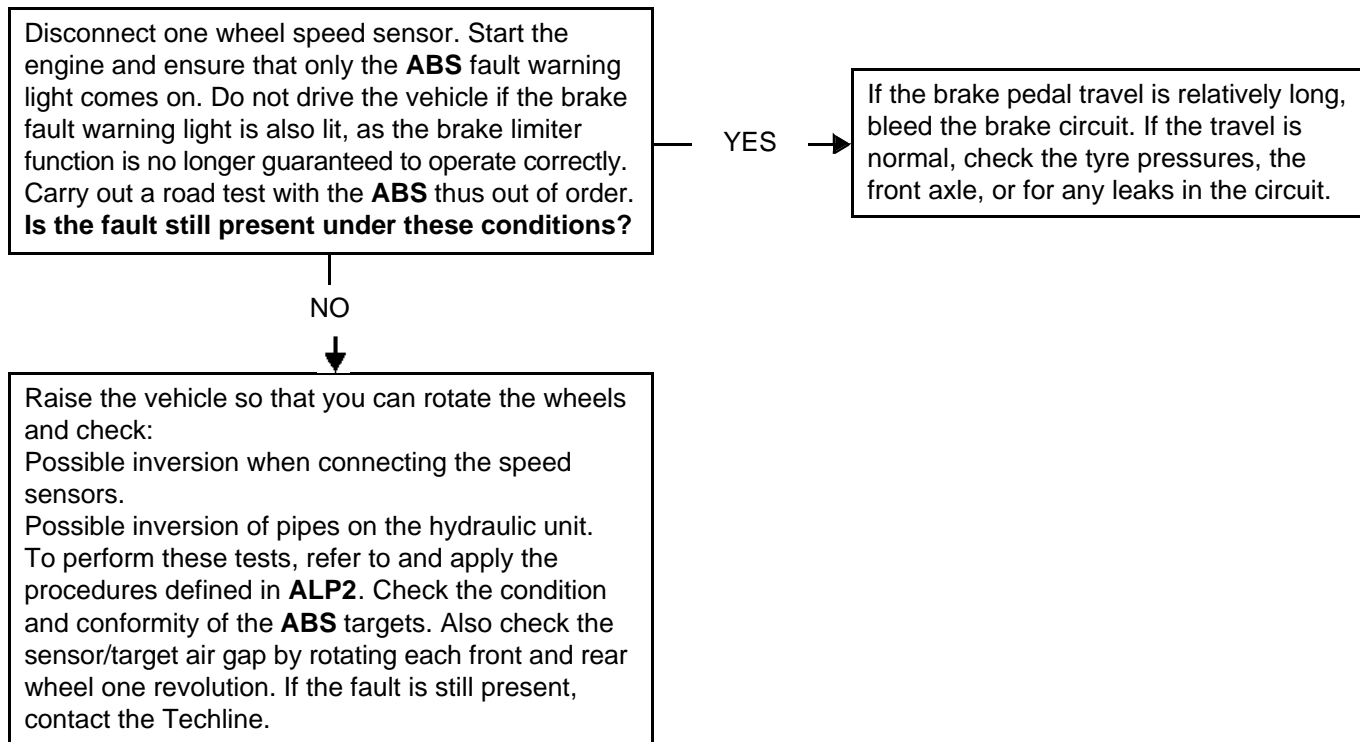
However, if the wheels are actually locking, lift the vehicle in order to be able to turn the wheels and check: Possible inversion when connecting the speed sensors.
Using parameters **PR001, PR002, PR003 and PR004**, rotate the wheels slowly and check the consistency of the results obtained.
If the 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 **Dealing with commands**)
If the 5 cycles do not occur on the wheel tested (wheel remains locked), check whether they occur on another wheel to confirm transposed 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 that the wheel speed sensor mounting is in good condition.
Check the conformity of the targets using special command **SC001 "Check target teeth"**: condition, **number of teeth = 48**.
If the fault is still present after these checks, contact the Techline.

AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ALP3	Pull
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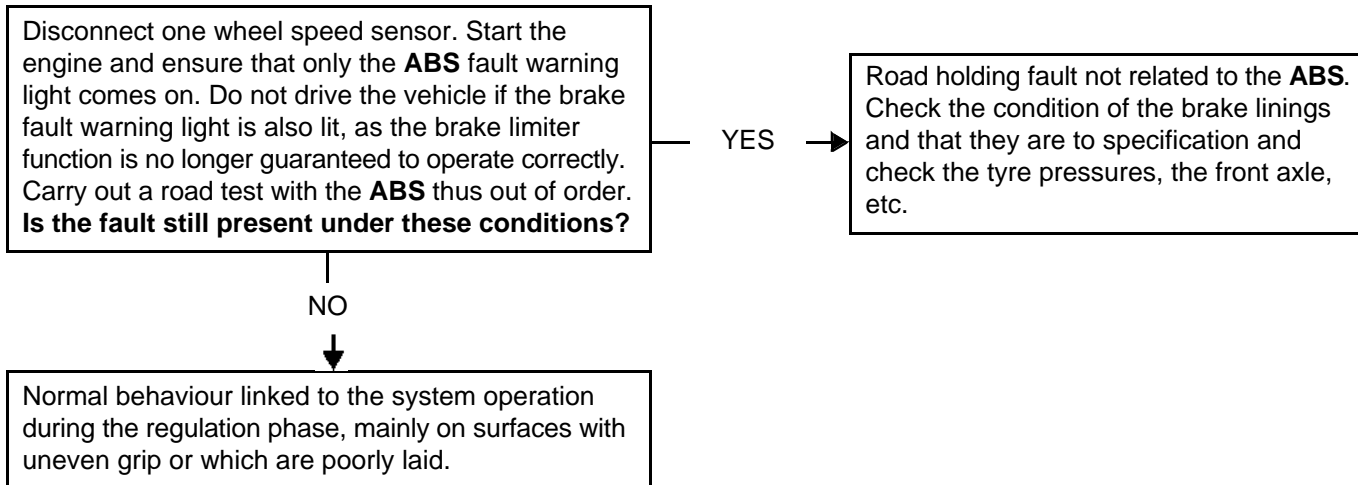
NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.
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AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ALP4	Drift
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.
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AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP5	Unexpected ABS operation at low speeds and slight pedal pressure
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool. Warning: the ABS is sensitive on slippery surfaces (ice, wet tiles, etc.).
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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) as well as the air gaps.

AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP6	Unexpected ABS system intervention on a poor road surface
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.
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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 this should be considered normal.

AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP7	Unexpected ABS operation when using special equipment (car phone, CB, etc.)
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.
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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, in particular, that of the **ABS** (connections to **earth and + after ignition/before ignition feed of the ABS** are not permitted).

AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP8	Lengthening of the brake pedal travel following a regulation phase (with an irregular pedal when entering the regulation phase)
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool .
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Air transit from the hydraulic unit regulation channels to the brake circuits.
Bleed the circuits, following the procedure using the diagnostic tool commands (see **Dealing with commands**).
After the operation, carry out a road test with **ABS** regulation.

If the fault is still present, carry out the above operation again **once or twice**.
If the customer complaint is particularly pronounced, and the bleeding procedures have not rectified it, contact the Techline.

AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP9	Spongy pedal
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.
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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.

AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP10	Brake pedal vibration
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool.
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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 memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP11	Noise from the pump, pipes or hydraulic unit
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool .
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Vibration of the unit: check the presence and the condition of the unit bracket insulating rubber mounting bushes.
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 determine where the noise is coming from, run the solenoid valve actuation commands **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** while depressing the brake pedal.

AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP12	ABS computer not detected during the multiplex network test on CLIP
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NOTES	Only consult this customer complaint after a complete check with the diagnostic tool . Check that the CLIP diagnostic tool is equipped with the latest update available.
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After the multiplex network test on the **CLIP**, if the **ABS** computer is not detected, carry out the following operations:

- return to the home menu of the CLIP screen,
- switch off the ignition,
- switch on the ignition again,
- test the computers against **without making the automatic VIN code acquisition**.

If the fault is still present, follow **ALP 1**.

AFTER REPAIR	Clear the computer memory. Carry out a road test followed by another check with the diagnostic tool .
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ANTI-LOCK BRAKING SYSTEM

Diagnostic - Fault finding chart

38C

ALP 13

Intermittent illumination of the brake, ABS, SERVICE and STOP fault warning lights and the message "brake failure" on the instrument panel with no fault codes in the computer

NOTES

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

Check the condition and connection of the battery terminals.
Is the battery in good condition?

NO

Clean the battery terminals.

YES

Check the **50A** power fuse in position 5 on the power fuse board. Check **fuse F13 (25A) on the UPC** and the correct locking of the grey 4-track PPH1 connector (Vdiag 44) or **the 25A fuse F8 on the UPC** and the correct locking of the black 6-track CM connector (Vdiag 48 or higher).
Are the fuses and connectors correct?

NO

If the connector is faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.
Replace any faulty fuses. Switch on the ignition again.
Is the replaced fuse or fuses correct?

NO

Check the connection and condition of the tab 1 red wire of the grey connector.
Is the connector correct?

Check the **insulation to earth** between:
– fuse **50A** and **track 2** of the computer
– fuse **25A** and **track 3** of the computer
Are the connections correct?

YES

Contact the Techline.

NO

If the connection(s) are faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

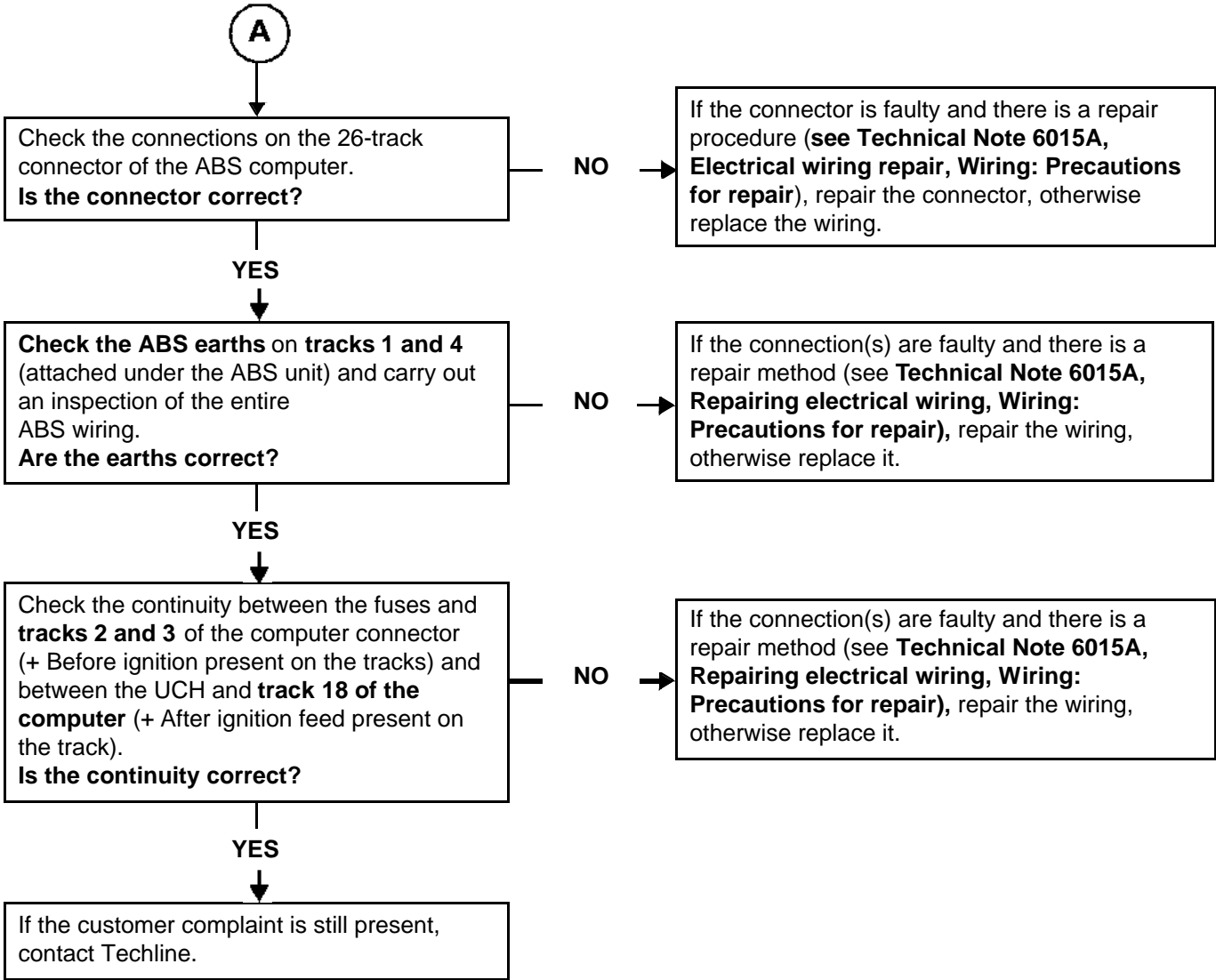
If the connector is faulty and there is a repair method (see **Technical Note 6015A, Repairing electrical wiring, Wiring: Precautions for repair**), repair the connector, otherwise replace the wiring.

A

AFTER REPAIR

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

ALP 13 CONTINUED	
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AFTER REPAIR	Clear the computer fault memory. Carry out a road test followed by another check with the diagnostic tool .
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