Diagnostic tester ASCAN-10

Module ABS 9 GAZ

User Manual

1 Connecting to the vehicle

1.1 Connect the diagnostic cable ***ABS GAZ*** to the quick-disconnect connector of the tester.

1.2 Connect the diagnostic connector to the diagnostic terminal of the vehicle.

ATTENTION!!! Connection of the tester must be done when the ignition is switched off.

1.3 Switch on the ignition. The tester display lighting will switch on and a BIOS screen will appear for a short time, and then the tester main menu will be on.

2 Testing the control system

Run diagnostic module ***ABS 9 GAZ*** from ***BOSCH ABS*** *packet.*

A short module information screen will appear on display and then menu ***MODE*** will be on***.***

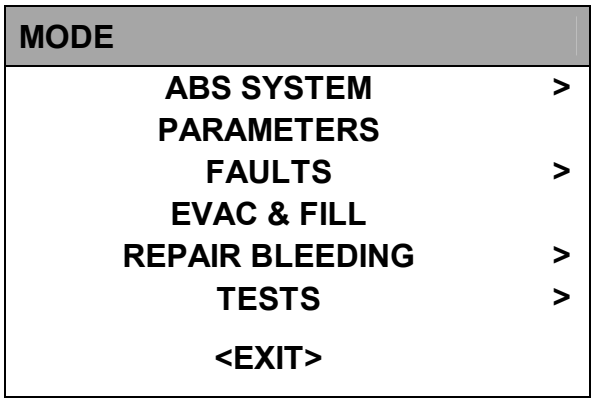

Fig. 1 Menu ***MODE***

When menu ***MODE*** appears the green led ***LINK*** must light.

If red led ***ERROR*** is lighting, check the diagnostic cable connection and circuit continuity between the diagnostic terminal and control unit.

In all modes contextual help is accessible with ***F1*** button.

Menu ***MODE*** Items***:***

ABS System:

- ABS ECU identification parameters,
- Setting the variant code value
- Setting the wheel circumference index,
- information about the diagnostic module;

Parameters – actual parameters of ABS system;

Faults:

- active faults;
- saved DTC (Diagnostic Trouble Codes),
- clear saved DTC,
- save DTC for further printing on PC

Evacuate and Fill – procedure of evacuation and filling of hydraulic module;

Repair bleeding – bleeding of ABS hydraulic circuit;

Tests – tests of ABS system:

- Wheel Speed Sensor Correlation Test **-** wheel speed sensor correlation and hydraulic valves operation test
- Dynamic ABS Test - test of dynamic ABS actuators work
- Wheel Speed Sensors Test **–** wheel speed sensors signal quality test

Exit – exit to the previous menu.

Extended description of the mode can be achieved by pressing ***F3*** key.

2.1 Menu ***ABS SYSTEM*** is given in fig. 2.

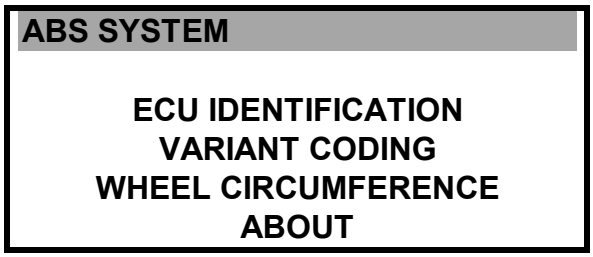

Fig. 2 Menu ***ABS SYSTEM***

ABS SYSTEM menu items**:**

2.1.1 ***IDENTIFICATION*** – shows identification parameters of the control unit:

Identification
Manufacturer ECU Hardware Number **00A63R42.3538020** Manufacturer Data Identifer **1** System Name/Engine Type **ABS9.0** ECU Hardware **02 65 80 51 74** ECU Software Number **91648** ECU Software Version **37.00.00.00** Variant Coding **1**

2.1.2 ***VARIANT CODING*** – Allows setting the current working model of the vehicle. To change the coding version select menu item and follow instructions on display.

2.1.3 ***WHEEL CIRCUMFERENCE INDEX*** – Allows entering the values of actual wheel circumference for correct data displaying on speedometer and odometer if the vehicle speed signal is used from ABS.

To get the Index for a specific Wheel Circumference the following formula must be used:

INDEX = ((WCcur - WCmin)*INDEX_MAX) / (WCmax - WCmin)
WCmax = Maximum possible WheelCircumference = 2316 mm
WCmin = Minimum possible WheelCircumference = 2061 mm
WCcur = Default Wheel Circumference currently = 2073 mm
INDEX_MAX = FFh = 255
INDEX = ((2073 - 2061)*255) / (2316 - 2061)=12

2.1.4 ***ABOUT*** – Information about program module (fig. 3).

ASCAN DIAGNOSTIC
VEHICLE **GAZ GAZelle Next** CONTROL SYSTEM **BOSCH ABS 9** MODULE ABS 9 v1.06 Eng <WWW.ABIT.SPB.RU>

Fig. 3 Menu ***ABOUT***

2.2 Menu ***PARAMETERS*** – shows complete list of parameters. The list is paginated. Upper line contains information about the name and number of the current page and number of pages. The view of parameter page is given in fig. 4.

SPEED		1/4
FL Whl.Speed	km/h	0.0
FR Whl.Speed	km/h	0.0
RL Whl.Speed	km/h	0.0
RR Whl.Speed	km/h	0.0
Veh. Speed	km/h	0.0
Wh.Circumf.Index		12

Fig. 4 Menu ***PARAMETERS***

Use buttons ← or → to traverse between the pages.

The extended parameter name is available by pressing ***F3*** button.

To view the parameter waveform choose the required parameter and press ***F2*** button.

In this mode it is possible to freeze the waveform in some particular point by pressing ***Enter*** button. Using buttons ↑ and ↓ allows traversing between the parameter waveforms of the page. To unfreeze the waveform, press button ***Enter*** once again.

Press **Esc** button to return to the parameters window.

To save the parameter page for further print out press ***Shift+F2*** (see ***Printout…***).

Module displays the following parameters:

Page	Display	Extended designation (F3)	Units
Speed	FL Whl.Speed	Wheel Speed Front Left	km/h
	FR Whl.Speed	Wheel Speed Front Right	km/h
	RL Whl.Speed	Wheel Speed Rear Left	km/h
	RR Whl.Speed	Wheel Speed Rear Right	km/h
	Veh.Speed	Vehicle Speed Output (VSO)	km/h
	Wh.Circumf.Index	Wheel Circumference Index	
Page 2	Battery Voltage	Battery Voltage	B
In/Out	Brake Light Switch	Brake Light Switch (BLS)	ON/OFF
	Valve Relay	Valve Relay Status	ACTIV /INACT

Page	Display	Extended designation (F3)	Units
Page 3 Status 1	FL Inlet Valve	Valve Actuation State: Inlet Valve Front Left (EVFL)	ACTIV /INACT
	FL Outlet Valve	Valve Actuation State: Outlet Valve Front Left (AVFL)	ACTIV /INACT
	FR Inlet Valve	Valve Actuation State: Inlet Valve Front Right (EVFR)	ACTIV /INACT
	FR Outlet Valve	Valve Actuation State: Outlet Valve Front Right (AVFR)	ACTIV /INACT
	RL Inlet Valve	Valve Actuation State: Inlet Valve Rear Left (EVRL)	ACTIV /INACT
	RL Outlet Valve	Valve Actuation State: Outlet Valve Rear Left (AVRL)	ACTIV /INACT
	Filling-in	Status Repair Bleeding: - OK – Filling-in complete and OK; - NOK – Filling-in complete and NOK; - INCOMP – Filling-in not complete; - BOSCH– BOSCH Delivery State	OK/NOK/INCOMP /BOSCH
Page 4 Status 2	RR Inlet Valve	Valve Actuation State: Inlet Valve Rear Right (EVRR)	ACTIV /INACT
	RR Outlet Valve	Valve Actuation State: Outlet Valve Rear Right (AVRR)	ACTIV /INACT
	Pump Motor	Pump Motor State	ACTIV /INACT
	EBD Controller	EBD Controller Status	INACT/ACTIV
	ABS Controller	ABS Controller Status	INACT/ACTIV

2.2 Menu ***FAULTS***

ABS control unit has built-in system of self diagnostics which includes both control unit itself and the majority of inlet and outlet signals of ABS system.

It is possible to look up active and saved faults, clear the faults, save the information about the faults for further printout through menu FAULTS. The view of window ***FAULTS*** is shown in fig. 5.

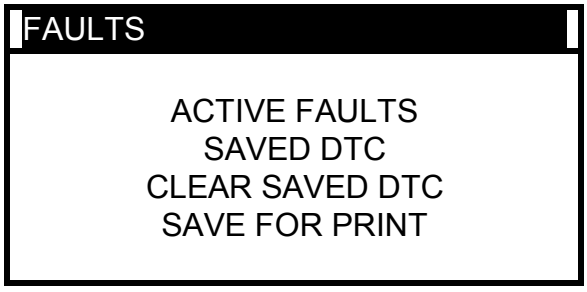

Fig. 5 Menu ***FAULTS***

2.2.1 ***ACTIVE FAULTS.*** Allows reading the active faults from the control unit and performing their decoding. ***ACTIVE FAULTS*** window is shown in fig. 6.

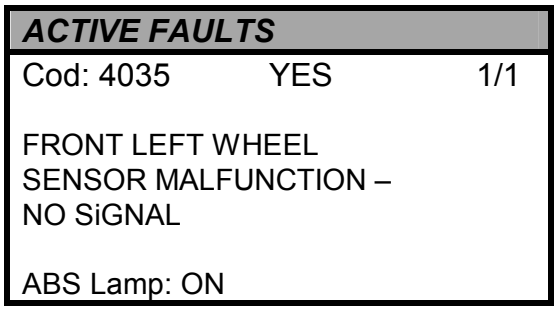

Fig. 6 Menu ***ACTIVE FAULTS***

The upper line below the title of the window consists of

- ***CODE*** – digital code of the fault;
- ***1/1*** – the ordinal number of the fault/ total number of faults in the system.

In the next lines the fault description is displayed.

The faults can be cleared by pressing ***F3*** button.

The faults can be saved for further printout by pressing buttons ***Shift+F2***.

Tester supports the following faults:

DTC	Status	Error text
4035	4	FL Wheel Sensor malfunction - No signal
4035	8	FL Wheel Sensor malfunction - Invalid signal
4040	4	FR Wheel Sensor malfunction - No signal
4040	8	FR Wheel Sensor malfunction - Invalid signal
4045	4	RL Wheel Sensor malfunction - No signal
4045	8	RL Wheel Sensor malfunction - Invalid signal
4050	4	RR Wheel Sensor malfunction - No signal
4050	8	RR Wheel Sensor malfunction - Invalid signal
4060	0	FL Inlet Valve electrical failure - No symptom
4065	0	FL Outlet Valve electrical failure - No symptom
4070	0	FR Inlet Valve electrical failure - No symptom
4075	0	FR Outlet Valve electrical failure - No symptom
4080	0	RL Inlet Valve electrical failure - No symptom
4085	0	R L Outlet Valve electrical failure - No symptom
4090	0	RR Inlet Valve electrical failure - No symptom
4095	0	RR Outlet Valve electrical failure - No symptom
4110	8	Pump Motor circuit malfunction - Invalid signal
4110	4	Pump Motor circuit malfunction - No signal
4121	0	Valve relay circuit malfunction - No symptom
4245	8	Wheel Speed signals generic failure - Invalid signal
4550	0	ECU malfunction - No symptom
4640	8	Incorrect programming of Tire information in EEProm
4800	2	Under voltage Fault
4800	1	Over voltage Fault

Status:

0 No symptom
1 above maximum
2 below minimum
4 no signal
8 invalid signal

2.2.2 ***SAVED DTC.*** Allows reading the saved in the control unit memory faults and decoding them. Window ***SAVED DTC*** is similar to window ***ACTIVE FAULTS***.

The faults can be cleared by pressing button ***F3***.

The faults can be saved for further printing by pressing buttons ***Shift+F2***.

2.2.3 ***CLEAR SAVED DTC*** – clearing of saved fault codes.

2.2.4 ***SAVE FOR PRINT…*** – tester allows saving faults for their further printout. For this purpose select menu item ***PRINTOUT*** and press ***Enter***.

2.3 Menu ***EVAC & FILL***

Procedure of hydraulic circuit evacuation and filling.

The test is carried out on stationary vehicle with connection of special vacuum bleeding unit.

The test is performed in two modes:

- Only evacuation (***START***)- after pressing F2 key;
- Evacuation and filling (***with RFP***) – after pressing F3 key;

Window ***EVACUATE AND FILL*** is shown in fig. 7.

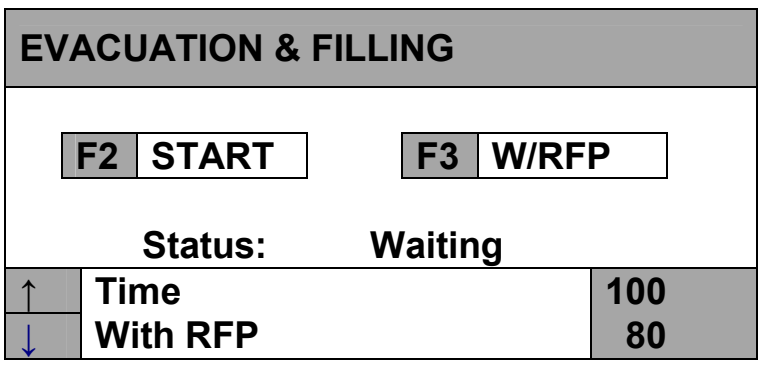

Fig. 7 Window ***EVAC & FILL***

In line ***Status*** the current state of the test is displayed.

The following test properties can be adjusted:

- execution time in seconds ***Time*** (not more than 150 s) can be set by pressing of key ***Ω;***
- Time of start of filling ***With RFP*** for operation mode with filling can be set by pressing of key ***Ʊ***.

Changing of preset time with 1 second step can be done by pressing buttons ***Ω*** and ***Ʊ,*** *with 10 seconds step* by pressing buttons ***PgUp*** and ***PgDn***.

2.4. Menu ***Repair Bleeding*** allows performing bleeding of ABS hydraulic circuit. Bleeding is carried out in 4 steps – bleeding of left rear wheel, bleeding of left front wheel, bleeding of right front wheel, bleeding of right rear wheel. Bleeding is performed on the stationary vehicle.

Attention!!! Before start of repair bleeding procedure it needs to perform the breaking system ordinary bleeding. During bleeding process open the corresponding bleeding screw and slowly press and release the brake pedal.

To perform bleeding enter menu ***Repair Bleeding*** (fig.8) and select the menu items in the following sequence:

- rear left wheel bleeding,
- front left wheel bleeding,
- front right wheel bleeding,
- rear right wheel bleeding.

>>Repair Bleeding	**V**
Rear Left Wheel Bleeding	
Front Left Wheel Bleeding	
Front Right Wheel Bleeding	
Rear Right Wheel Bleeding	

Fig. 8 Menu ***Repair Bleeding***

Select the menu item, press ***Enter.*** The window of the current state of the test will be displayed (fig. 9)

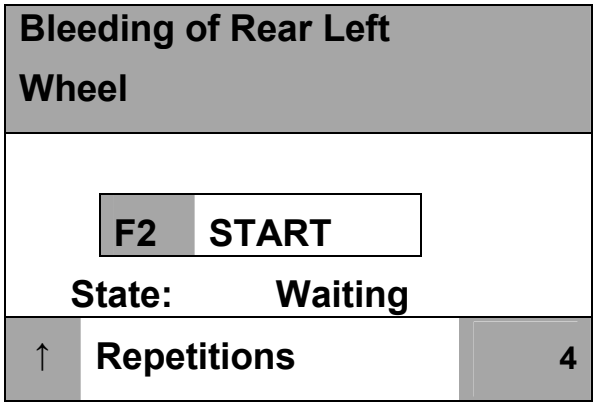

Fig. 9 **Current state of test**

To start bleeding procedure press ***F2***.

After successful completion of the bleeding process with the help of ***ASCAN-10*** tester, the following message is displayed (fig.10):

Attention!!! Continue bleeding using the pedal till the brake fluid is free of air!

After completion of the bleeding process with the help of pedal press ***Enter.*** Status will change to ***Complete***.

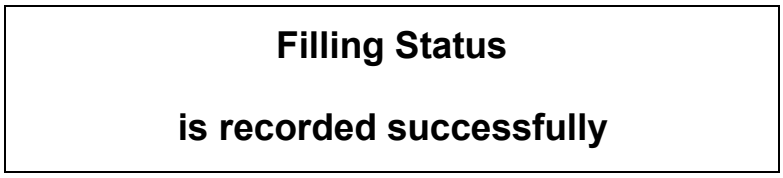

Fig. 10 **Successful completion of the test**

2.5 Menu ***TESTS*** allows the following:

- ***Wheel Speed Sensor Correlation Test -*** checking of correct connection of the pipelines and operability of hydraulic unit valves;
- ***Dynamic ABS Test -*** testing of ABS actuators operation dynamics;
- ***Wheel Speed Sensor Test -*** checking of speed sensors signals quality.

2.5.1 ***Wheel Speed Sensor Correlation Test*** is carried out in 4 steps (fig. 11):

- ***Front Left Line Check;***
- ***Front Right Line Check;***
- ***Rear Left Line Check;***

- ***Rear Right Line Check.***

>>Pipeline Test	V
Front Left Line Check	
Front Right Line Check	
Rear Left Line Check	
Rear Right Line Check	

Fig. 11 ***Wheel Speed Sensor Correlation Test***

Attention!!! Place the corresponding axle on the test rig, switch it on and apply breaks till the end of the selected wheel test, follow instructions on the tester display. Simultaneously during the test the pump motor will cut in, shut-off valve will close, and the release valve of the selected wheel hydraulic unit will open. Execution brake force of the testing wheel is to be decreased! This shows the correct connection of the pipelines.

The release valve will cut off in 250 ms, having recorded the decrease of brake force in the brake gear.

After the next 400 ms, the shut-off valve will cut off, and that should cause recovery of the previous value of the brake force. After the next 2000 ms the pump electric motor should cut off.

Test the other wheel of the axle being checked. Test the other axle of the vehicle in the similar way.

In case the test was not a success the relevant information will appear in menu ***Faults***.

2.5.2 *Dynamic ABS Test*

Attention!!! Use a test rig to run this test. Driving with the test run may cause an accident!

The test of ABS operation dynamics is carried out in the test rig which has 4 separate rolls. Initial window of the test is shown in fig. 12.

DYNAMIC
Press: Enter – start the test (speed less than 10 km/h), F3 – time setup, Esc – exit

Fig. 12 ***Dynamic ABS Test***

Before starting the test press ***F3*** key and set the execution time of separate stages of the test.

Changing of execution time of step 10 ms can be done with the help of buttons 🡅 and 🡇, execution time of step 100 ms - with the help of buttons ***PgUp*** and ***PgDn***.

To start the test, press ***Enter*** key. The speed of wheels movement must not exceed 10km/h (fig.13).

DYNAMIC		
Set the speed at 100 to 120 km/h, then press and keep constant the brake pedal		
FL Whl.Speed	**km/h**	**0.0**
FL Whl.Speed	**km/h**	**0.0**

Fig. 13 **Test of ABS operation dynamics**

According to the instructions of the tester display, set the required speed (Bosch recommends the speed of 100-120 km/h).

To switch over display of the speeds of front/rear wheels use buttons 🡅 и 🡇.

Test will start automatically after pressing the brake pedal.

When the test is finished the relevant message will be displayed.

After completion of the test the results will be inquired from the control unit. In case of error or internal delay and unavailability of the data, the message will be displayed with proposal to repeat the inquiry (fig.14).

Results
RESULT NOT READY OR ERROR OCCURRED. F2 or F3 - TRY AGAIN

Fig. 14 **Test of ABS operation dynamics**

If reading of the test results is successful, the speed differential of the wheels will be displayed (fig.15).

Results
Speed difference Front left 0.00m/s Front right 0.00m/s Rear left 0.00 m/s Rear right 0.00 m/s

Fig. 15 **Test of ABS operation dynamics**

2.6 ***Wheel Speed Sensor Test*** **-** allows checking the quality of speed sensors signal.

Attention!!! Place the corresponding axle on the test rig and switch it on!

Select the test and start it by pressing ***F2***. The current state of the test will be shown in the status line (fig. 16).

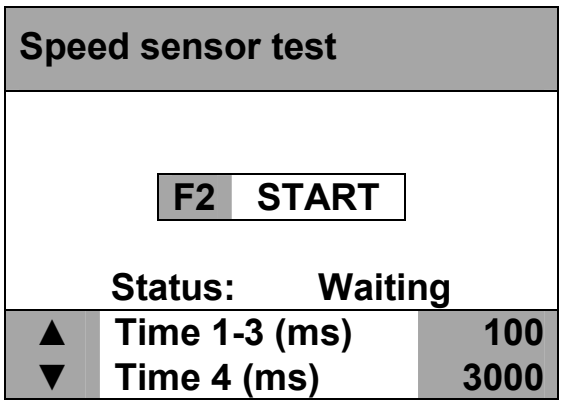

Fig. 16 **Speed Sensor Test**

When the test is finished the minimum and maximum speed measured by speed sensors of all wheels will be displayed. Use ▲ ▼ buttons to see all results.