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LaRa-AS DIAGNOSIS SYSTEM

Connection to the diagnosis outlet and system start up

- Switch on the PC (A-**Fig.1**);
- connect the adapter (B-**Fig.1**) to the PC com port;
- turn the ignition key OFF;
- connect the adapter to the OBDII connector (**C-Fig.1**) in the car, located on the right of the steering column.
- turn the ignition key ON.

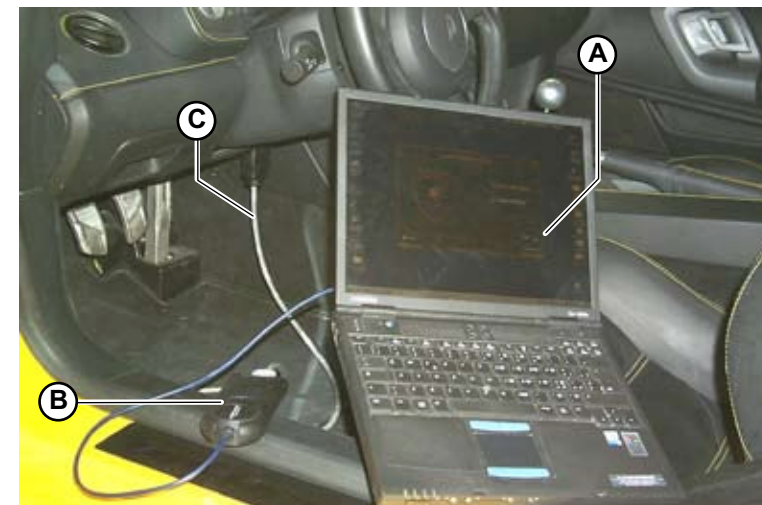


Fig.1


- start the LaRa-AS program by double clicking the  icon on the desktop.
- The system starts automatically, showing the last screen opened on the car's display (**Fig.2**).



Fig.2



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Note

The selected car may be changed by clicking on the arrow next to “**Gallardo MY09**” (**A-Fig.3**):

- Gallardo Coupé MY04-08
- Gallardo Spyder MY06-08
- Gallardo Coupé MY09
- Murcielago MY04-07
- Murcielago LP640 MY08
- Murcielago LP640 MY09

The Gallardo LaRa-AS system features the following function modes:

- **Automatic Mode (B-Fig.3)**: allows a series of tasks to be carried out automatically such as set up, VIN script, remote control resynchronisation, etc.; necessary to enable a few electronic devices (control units) after they have been replaced on the car.
- **Analysis mode (C-Fig.3)**: allows accurate control of every electronic device on board the car.



Fig.3



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ANALYSIS MODE

The LaRa-AS system analysis mode allows accurate control of every electronic device on board the car.

The following is possible for each device:

- display of identification data and function parameters
- display (and reset) of any errors stored in the control units.
- enablement of active tests (thanks to special files called 'measurement files') which monitor the desired parameters.

This mode is activated by pressing **"Analysis Mode"** on the LaRa-AS program start-up screen (Fig.16).



Fig.4

In analysis mode, the LaRa-AS program windows feature a series of permanently accessible icons and pull-down menus which mean the following (Fig.17):

- A. control bar for quickly accessing the "Analysis Mode" functions.
- B. combo box for selecting the type of task you would like to carry out on the selected ECU.
- C. combo box for selecting the ECU to be analyzed from those available.

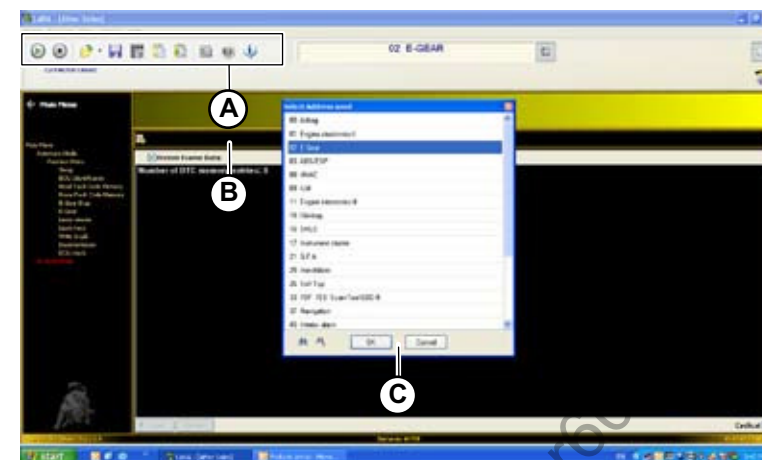


Fig.5



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Control bar icon:

START (A): after selecting the ECU and the function that must be checked, this green button starts communication.
(icon valid for all model versions).

STOP (B): this button ends communication.
Alternatively, communication may be interrupted by removing the keys from the control panel.
(icon valid for all model versions).

Folder save Files (C): this button shows where the LaRa-AS system automatically saves the information:

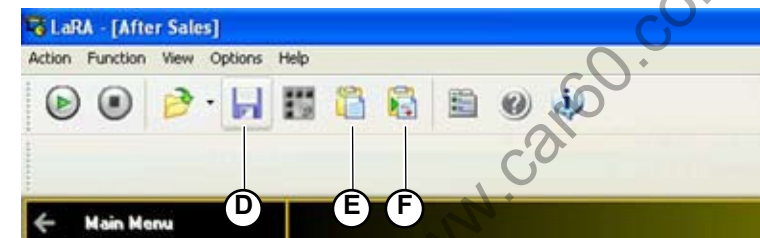
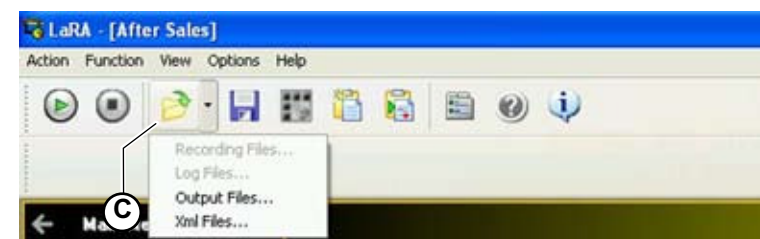
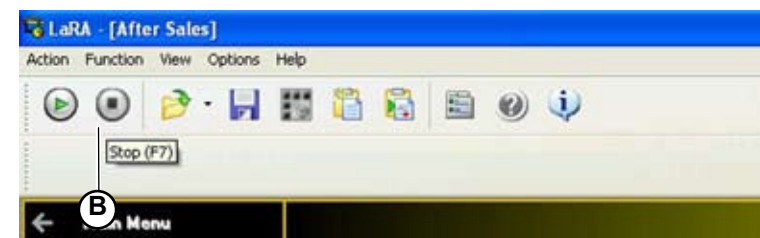
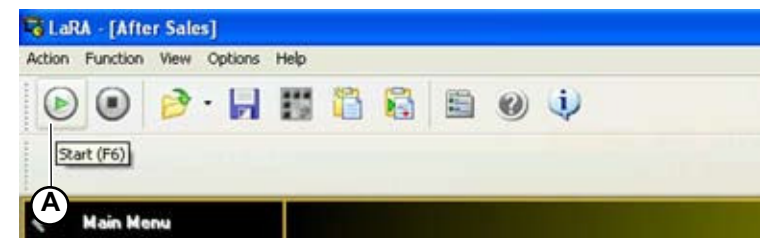
- recording files: function inactive
- log files: folder for saving LaRa-AS files, rewritten after each operation (e.g.: clutch writing or reading; the created report file must be saved with another name because when the system is closed, or following a new operation, it is automatically rewritten, deleting previous information.
- Output Files: function inactive
- xlm Files: folder where the system saves report files in xlm.

(icon valid for all model versions).

Save (D): inactive functions (not used by the system).
(icon not valid for all model versions).

Create measurement (E): inactive functions (not used by the system).
(icon not valid for all model versions).

Recording (F): inactive functions (not used by the system).
(icon not valid for all model versions).

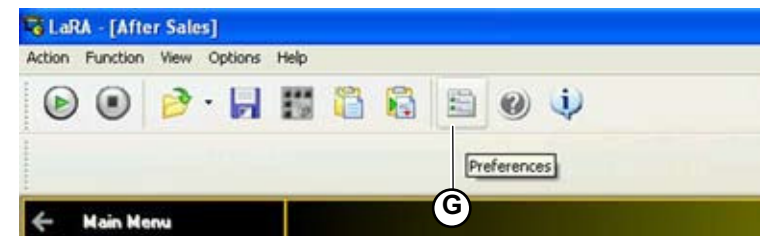




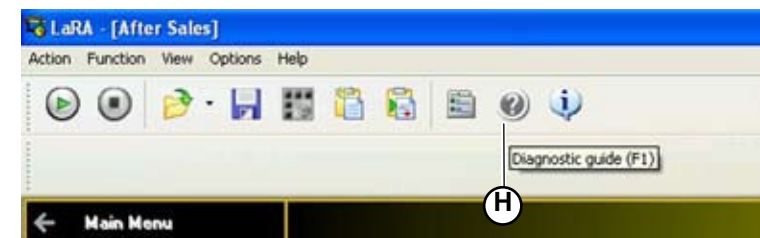
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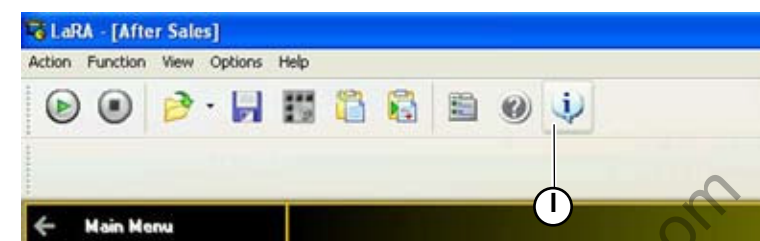
Preferences (G): this button displays the type of interface to be used for communication.
Read only.
(icon valid for all model versions).



Diagnostic guide (H): this button accesses documents created for diagnosis and the system's other functions within LaRa-AS.
Example:
if an ECU presents error codes, press the "Diagnostic guide" icon to view the codes without interrupting communication: the system will open an Acrobat document showing the relative error codes. Select a code to open the relative document which explains the problem, possible remedies and the tests that must be carried out (diagnosis tree).
(icon valid for all model versions).



Informations (I): this button provides read-only information, displaying the installed version of the LaRa-AS software and the owner of the license.
(icon valid for all model versions).



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The functions shown in the pull-down menu of operations change, or better yet increase, depending on the type of ECU selected.

To verify the possibilities provided by the system, after selecting the ECU and the function on the diagnosis document, click on the "Diagnostic guide" icon (?). The system supplies all of the information on settings corresponding to the selections. If nothing is displayed, these parameters may only be modified by Lamborghini and cannot be changed by dealers.

The following functions are possible (Fig.6):

01	ECU identification	indicates all the identification data of the selected control unit; for example, this function can be used to check whether the control unit is read correctly by the system, etc.)
02	DTC memory contents	display, save and reset present error codes
03	Actuator test	used only for specific ECUs
04	Basic setting	it activates the system Routines according to the control units selected
05	Erase DTC memory	currently not used
07	Parameter coding	codifies the control units in compliance with the documentation, allows a control unit to be programmed for various markets and different uses
08	Measurement values	on-line reading of control unit variables indicating the function correct or not depending on the values
10	Adjustment	specific settings for the various control units.
11	Coding 2	used to activate settings
16	Security Access	currently not used
17	Diagnostic Session	currently not used
18	Valve and pump test	currently not used
29	System adaptation	currently not used
30	Initial fuel filling	currently not used
32	Flash programming	reflash for e-gear and engine control unit
33	Standard Diagnostic	displays the engine parameters

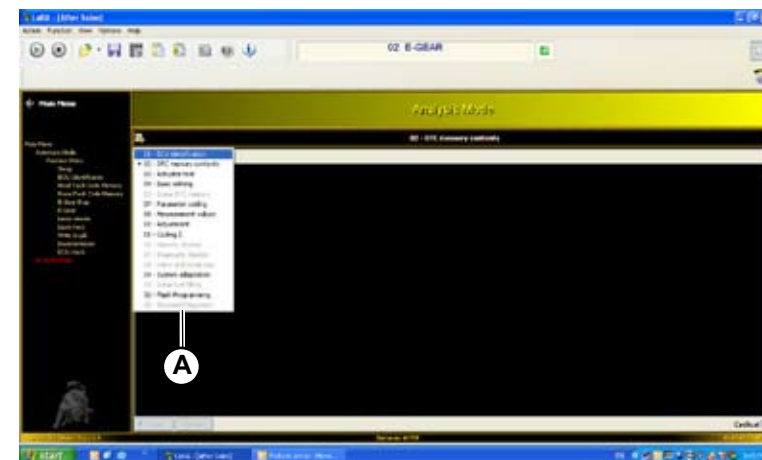


Fig.6



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04 Basic setting (per centralina E-GEAR)

The “Basic setting” function allows you to make the initial settings on the selected control unit (E-GEAR).
The settings are divided into 7 different block numbers (Routines).

Clutch Kiss Point Self tuning (Routine 1)



Note

Routine 1 is performed when:

- the clutch is replaced
- the E-gear control unit is replaced
- the gearbox is removed and reassembled

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 1 inside the block number (**A-Fig.9**).
- Start the engine and bring water temperature to > 60°C.
- Start the connection () and press the start push-button (**B-Fig.9**).

Routine 1 readapts the position of the clutch and calculates the correct Kiss Point value.

line 1	displays the operation result: 0 = positive result (Kiss Point successfully calculated) 255 = non-compliant result
line 2	displays the Kiss Point value at the end of the procedure
line 3	displays the engine speed, expressed in rpm
line 4	displays the clutch speed, expressed in rpm (the value ranges between 0 and 130); the speed at the time when the clutch starts to transmit the engine's motion. The system performs the approach operation 10 times in order to properly calibrate the Kiss Point value.

In order to store the Kiss Point value that has just been calculated in the system, turn the ignition key to OFF and wait about one minute to allow the control unit to turn itself off (check this value in MWB 10).

When the procedure is finished, the system always automatically restores the Kiss Point value every time the vehicle is started (when certain temperature and operating conditions are reached) to keep the pickup of the vehicle in optimum condition according to clutch wear.



Fig.9



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Grid Self tuning (Routine 2)



Note

Routine 2 is performed when:

- the clutch is replaced
- the E-gear control unit is replaced
- the gearbox is removed and reassembled

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 2 inside the block number (**A-Fig.10**).
- Start the connection () and press the start push-button (**B-Fig.10**).

Routine 2 lets you set the engagement /selection grid regarding the gears.

line 1

the values "1" and "2" indicating the odd and even gears, respectively, that are engaged are displayed intermittently during operation.

it displays the following values at the end of the operation:

14 = positive result (engagement /selection grid performed)

8 = non-compliant result (grid not performed due to electrical problems)

9 = non-compliant result (grid not performed because idle gears are not found)

line 2

displays the operation result:

0 = unacceptable grid

1 = acceptable grid

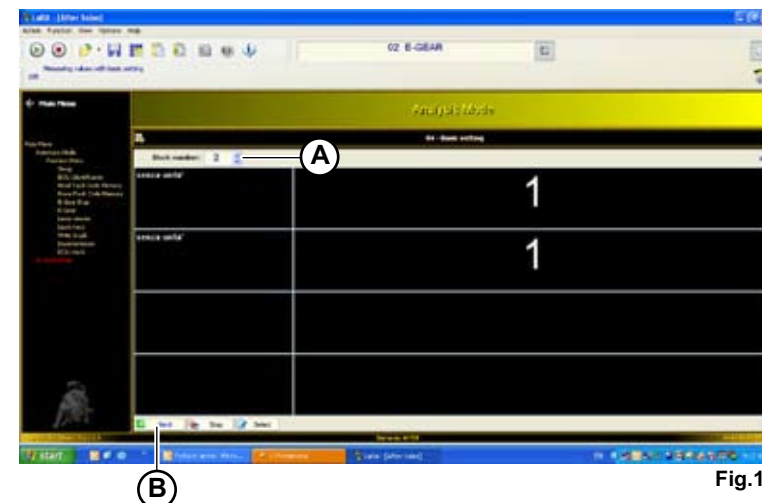


Fig.10

In order to store the grid value, turn the ignition key to OFF and wait for approx. 1 minute to allow the control unit to turn off (check this value in MWB 64).



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Clutch Characteristic Self tuning (Routine 3) (adaptation to degree of deterioration)



Note

Routine 3 is performed when:

- the clutch is replaced
- the E-gear control unit is replaced



Warning

Routine 3 is performed ONLY for clutch replacement. If performed in other conditions, you risk damaging the clutch.

When the clutch is replaced, Routine 3 must be the FIRST operation to perform with the basic setting.

- Turn the ignition key to OFF and wait about one minute to allow the control unit to turn itself off, then turn the key back to ON.
- Connect the computer to the diagnosis outlet OBDII.
- Select routine 3 inside the block number (A-Fig.11).
- Start the connection () and press the start push-button (B-Fig.11).

Routine 3 calculates the new degree of deterioration value and writes the new clutch.

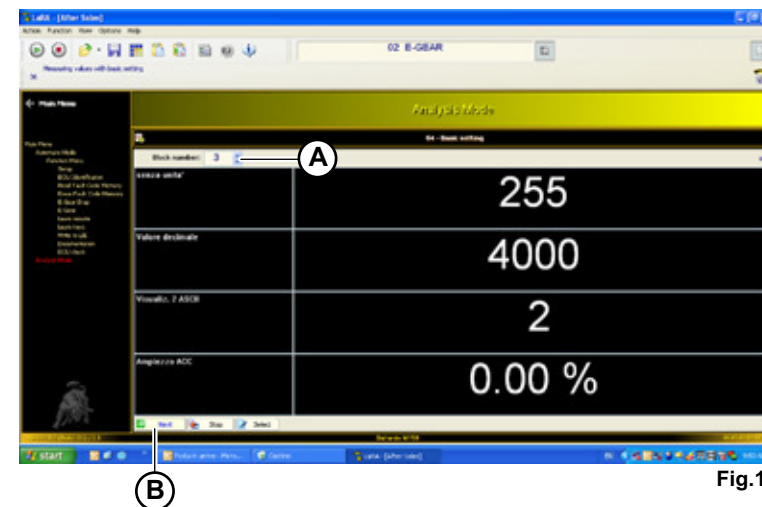


Fig.11

line 1	displays the operation result: 0 = positive result (wear index successfully calculated) 255 = non-compliant result
line 2	displays the degree of deterioration value (when the clutch is new, the value is 4000)
line 3	not used
line 4	not used

Once the new degree of deterioration is calculated, start the engine and run it until it reaches a temperature of about 60°C, and use the vehicle in town traffic for about 10 minutes in order to completely adapt the clutch and its degree of deterioration.



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Neutral Engagement (Routine 4)



Note

Routine 4 is performed when:

- the clutch is replaced
- the gearbox is removed and reassembled
- Turn the ignition key to OFF and wait about one minute to allow the control unit to turn itself off, then turn the key back to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 4 inside the block number (A-Fig.12).
- Start the connection () and press the start push-button (B-Fig.12).

Routine 4 checks if the position of the idle gear is correct (the condition is checked only if a correct gear engagement grid has been created – Routine 2 -).

riga 1 displays the operation result:
3 / 14 = gear in neutral
9 = idle gear not found

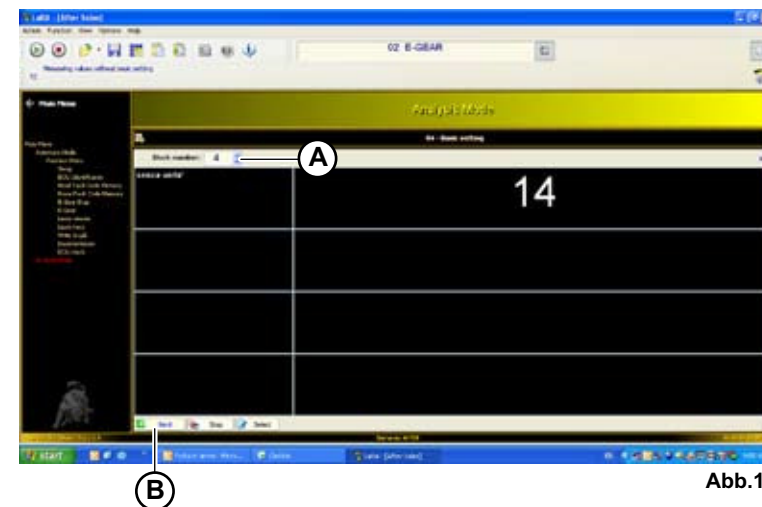


Abb.12



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Hydraulic circuit discharge (Routine 5)



Note

Routine 5 is performed when:

- the E-gear oil level is checked
- gearbox is replaced
- the E-gear kit is replaced

- Turn the ignition key to OFF and wait about one minute to allow the control unit to turn itself off, then turn the key back to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 5 inside the block number (A-Fig.13).
- Start the connection () and press the start push-button (B-Fig.13).

Routine 5 empties the pressure inside the E-gear circuit.

line 1	displays activation of the solenoid valve: 0 = not activated 1 = activated
line 2	displays the pressure value (during the pressure release phase, it continuously drops until it reaches value 0)
line 3	displays the clutch status: 1 = activated 0 = not activated
line 4	displays the status of the hydraulic circuit: 1 = activated 0 = not activated

When the pressure reaches 0 bar, you can work on the circuit without risking pressure leaks.



Note

Work on the circuit with the key OFF. If you turn the ignition key to ON, the system automatically brings pressure back inside the circuit.



Fig.13



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Hydraulic circuit bleeding (Routine 6)



Note

Routine 6 is performed when:

- the clutch circuit has to be bled (e.g. if the thrust bearing is replaced)
- Turn the ignition key to OFF and wait about one minute to allow the control unit to turn itself off, then turn the key back to ON.
- Connect the computer to the diagnosis outlet OBDII
- Connect the pipe to the gearbox bleeding point
- Select routine 6 inside the block number (**A-Fig.14**).
- Start the connection () and press the start push-button (**B-Fig.14**).

Routine 6 lets you bleed the clutch circuit.

line 1	displays the opening and closing of the bleed valve (opens/closes it 30 times) 0 = not activated 1 = activated
line 2	displays the pressure value
line 3	displays the clutch status: 1 = activated 0 = not activated
line 4	displays the status of the hydraulic circuit: 1 = activated 0 = not activated



Note

Every time the clutch is bled it is then necessary to repeat Routine 5 in order to re-establish the correct oil level.

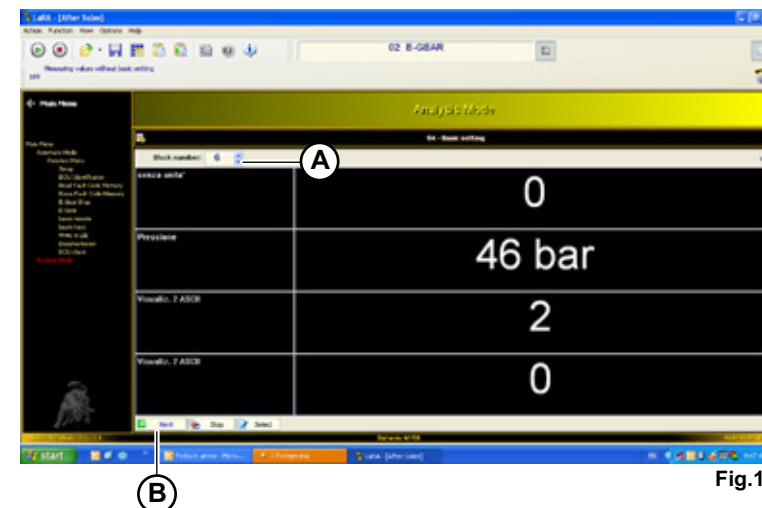


Fig.14



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08 Measurement values (E-GEAR)

The “Measurement values” function display information about the vehicle in real time:

Lever Communication			
MWB 01	Lever Communication Problem	Total of detected communication with the lever	
		Lever initialisation status	0 = not active , 1 = active
		disable lever status	0 = not active , 1 = active
		answer active information	0 = not active , 1 = active
MWB 02			
Distributed Function			
MWB 03	Anti Rolling Function	Key lock status	0 = not active , 1 = active
		engaged gear	1,2,3,4,5,6,R,N0,N1,N2,N3,N4
		Handbrake status	0 = not active , 1 = active
		KI 15 status	0 = not active , 1 = active
MWB 04	Gearbox not shifting	veriefied lever position	+, -, U,X,R
		engaged gear	1,2,3,4,5,6,R,N0,N1,N2,N3,N4
		brake satus	0 = not active , 1 = active
		software shift lock status	0 = not active , 1 = active
MWB 05	Gearbox not shifting	vehicle speed	km/h
		engine speed	rpm
		brake satus	0 = not active , 1 = active
		veriefied lever position	+, -, U,X,R
MWB 06	engine doesn't start	cranking release status	0 = not active , 1 = active
		KI50 (cranking request)	0 = not active , 1 = active
		engaged gear	1,2,3,4,5,6,R,N0,N1,N2,N3,N4
		brake status	0 = not active , 1 = active



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Scam Status			
MWB 07	hydraulic	DC Pump Commanded	0 = not active , 1 = active
		pump temperature	°C
		system pressure	bar
MWB 08	Valves	Shift valve status	0 = not active , 1 = active
		Gear 1 Valve current	A corrente assorbita
		gear 2 Valve current	A corrente assorbita
		Clutch current	A corrente assorbita
MWB 09	Valves		
		Gear 1 Valve dither magnitude	A corrente assorbita
		gear 2 Valve dither magnitude	A corrente assorbita
		Clutch valve current magnitude	A corrente assorbita
MWB 10	Clutch status	clutch wear index	default = 4000 , default max = 15000
		clutch kiss point	default = 480
		clutch closed position	default min = 1050 , default max = 2000
		clutch closed position (learned)	default min = 1050 , default max = 2000
MWB 11	Clutch status	Clutch Position normal value	>1000 Closed; < -200 Opened
		clutch kiss point	default = 480; 300 < Kiss Point < 800
		clutch reference position	bit
		Clutch temperature	°C
MWB 12	Adapatative Value for R	R - position gear (learned , valve not commanded)	default value : XGbGearTunOf_7 = 699
		R - position shift (learned)	default value : XGbGearShiftTun = 366
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor
MWB 13	Adapatative Value for N	N - position gear (learned , valve not commanded)	default value : XGbGearTunOf_0 = 409
		N - position shift (learned)	default value : XGbGearShiftTun = 366
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor



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MWB 14	Adapatative Value for 1	1 - position gear (learned , valve not commanded)	default value : XGbGearTunOf_1 = 325
		1 - position shift (learned)	default value : XGbGearShiftTun = 475
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor
MWB 15	Adapatative Value for 2	2 - position gear (learned , valve not commanded)	default value : XGbGearTunOf_2 = 696
		2 - position shift (learned)	default value : XGbGearShiftTun = 475
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor
MWB 16	Adapatative Value for 3	3 - position gear (learned , valve not commanded)	default value : XGbGearTunOf_3 = 328
		3 - position shift (learned)	default value : XGbGearShiftTun = 579
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor
MWB 17	Adapatative Value for 4	4 - position gear (learned , valve not commanded)	default value : XGbGearTunOf_4 = 692
		4 - position shift (learned)	default value : XGbGearShiftTun = 579
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor
MWB 18	Adapatative Value for 5	5 - position gear (learned , valve not commanded)	default value : XGbGearTunOf_5 = 328
		5 - position shift (learned)	default value : XGbGearShiftTun = 685
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor
MWB 19	Adapatative Value for 6	6 - position gear (learned , valve not commanded)	default value : XGbGearTunOf_6 = 691
		6 - position shift (learned)	default value : XGbGearShiftTun = 685
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor



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Voltage			
MWB 20	Voltage	KI 15 status	0 = not active , 1 = active
		KI 30 voltage	V
		KI 50 status	0 = not active , 1 = active
		Sensor supply voltage	V
Engine Interface			
MWB 21	engine interface	driver wish torque	Nm
		engine generated torque	Nm
		gearbox wish torque	Nm
		gearpox protection torque	Nm
MWB 22	engine interface	engine speed	rpm
		targhet engine speed	rpm
		synchronisation time	s
		zwischenagas flag	0 = not active , 1 = active
MWB 23	Shift interface control	Shift active (hold value for 1 second)	0 = not active , 1 = active
		Status of desired torque (values sommed up)	0=no request; 1=reducing request; 2=increasing request
		enable torque request (hold value for 1 second)	0 = not active , 1 = active
		zwischenagas flag	0 = not active , 1 = active
MWB 24	spunto function	pick up active (hold value for 1 second)	0 = not active , 1 = active
		torque reference	Nm
		speed reference	rpm
		clutch torque	Nm
MWB 25	interface control	engine emergency off (hold until HI 15 off)	0 = not active , 1 = active
Inputs			
MWB 26	All inputs I	Clutch Speed	rpm
		Clutch Position	bit
		Engine speed (by wire)	rpm
		Engine speed (by CAN)	rpm



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MWB 27	All inputs II	Oil Pressure	35 bar < pressure < 55
		Door switch	bit
		KI50 status	0 = not active , 1 = active
		KI15 status	0 = not active , 1 = active
MWB 28	All inputs III	Gear Position sensor value	bit
		Shift Position sensor value	bit
		Brake switch	0 = not active , 1 = active
		Kickdown status	0 = not active , 1 = active
Customer Habits			
MWB 29	Customer habits I	% of system ON time in “manual e sport” mode	%
		% of system ON time in “corsa ” mode	%
		% of system ON time in “automatic” mode	%
		% of system ON time in “automatic-sportl” mode	%
MWB 30	Customer habits II	Lauch Control Counter (total number LC activated)	%
		Launch control status	%
		Total number of gearshift [value x 100]	%
Snapshot 1st DTC			
MWB 40	Snapshot 1	DTC decimal code	
		related failure type	
		KI 15 status	0 = not active , 1 = active
		time since power up or time since KI15 off	s
MWB 41	Snapshot 2	gas pedal value	%
		vehicle speed	Km/h
		engine rpm	rpm
		engine torque	Nm
MWB 42	Snapshot 3	engaged gear	1,2,3,4,5,6,R,N0,N1,N2,N3,N4
		verified lever position	+ , - , A , U , V , X , R
		DC pump commanded	active = 1 , not active = 0
		system pressure	bar



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MWB 43	Snapshot 4	door switch status	door open = 1 , door closed = 0
		KI 50 status	
		brake status	brake pressed = 1 , brake not pressed = 0
		cranking release status	cranking released = 1 , cranking not released = 0
MWB 44	Snapshot 5	pick up active	pick up active = 1 , pick up not active = 0
		torque reference	Nm
		speed reference	rpm
		clutch torque	Nm
MWB 45	Snapshot 6	shifting active	shifting active = 1 , shifting not active = 0
		status of desired torque	no request = 0 , reducing request = 1 , increasing request = 2 , error detected = 3
		Zwischengas flag	flag set = 1 , flag not set = 0
		clutch status	clutch open = 0 , clutch controlled = 1 , clutch closed = 2 , error detected = 3
MWB 46	Snapshot 7	gear 1 valve current	A
		gear 2 valve current	A
		shift valve current	valve active = 1 , valve not active = 0
		clutch valve current	A
MWB 47	Snapshot 8	clutch position	
		clutch kiss point	default = 480
		clutch wear index	default = 4000 , default max = 15000
		clutch temperature	°C
MWB 48	Snapshot 9	KI 30 voltage	V
		sensor supply voltage	V
		current gear position	reading by gear position sensor
		current shift position	reading by shift position sensor
MWB 49	Snapshot 10	target gear	1,2,3,4,5,6,R,N0,N1,N2,N3,N4
		last engaged gear	1,2,3,4,5,6,R,N0,N1,N2,N3,N4
		driving mode	A , A Sport , M , M Sport , N , R
		Kickdown status	shifting active = 1 , shifting not active = 0



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Fault Ids for DTC entries			
MWB 51	DTC 01	1° DTC decimal code	
		1° DTC failure type	
		2° DTC decimal code	
		2° DTC failure type	
MWB 52	DTC 02	3° DTC decimal code	
		3° DTC failure type	
		4° DTC decimal code	
		4° DTC failure type	
MWB 53	DTC 03	5° DTC decimal code	
		5° DTC failure type	
		6° DTC decimal code	
		6° DTC failure type	
Developer’s MBs			
MWB 60	TCU HW Information	MM Hw Version - HW version - Serial number	
MWB 61	TCU SW Information	Software Version - Boot Version	
MWB 62	Lever information		
MWB 63	(CAN-multiplex info from engine_2 message)	CAN version number	
		engine coding	
		transmission coding	
		max engine torque	



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MWB 64	Adaptation Status	information on Last grid learning	0= positive; 1: in progress; 255= negative
		qualification bit for grid data in EEPROM	0=Data in EEPROM old* or invalid or new TCU; 1= Data in EEPROM valid
		Clutch kiss point learning status	0= positive; 1: in progress; 255= negative
		clutch wear index status	0= positive; 1: in progress; 255= negative
MWB 65	Adaptation Status S-Cam	R-Position gear (learned, valve commanded)	bit
		N-Position gear (learned, valve commanded)	bit
		1-Position gear (learned, valve commanded)	bit
		2-Position gear (learned, valve commanded)	bit
MWB 66	Adaptation Status S-Cam	3-Position gear (learned, valve commanded)	bit
		4-Position gear (learned, valve commanded)	bit
		5-Position gear (learned, valve commanded)	bit
		6-Position gear (learned, valve commanded)	bit
MWB 67	(Result of plausibility check of grid self learning)	Plausibility result Display of two Bytes in binary format	
MWB 68	Variation of Gear-and Shiftpositions due to GridMovementAdaption	GearPos Variation Odd gears	
		GearPos Variation Even gears	
		ShiftPos Variation	
		Mileage at last requested successful GridSelfTuning	



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04 Basic setting (for engine injection control units)

The “Basic setting” function allows you to make the initial settings on the selected control unit (engine injection).

Default setting: throttle (throttle body) adaptation (Routine 60) (Setting)



Note

Routine 60 is performed when:

- the throttle is adapted

- Engine OFF (on both the MASTER “01” and SLAVE “11” control units).
- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 60 inside the block number (**A-Fig.15**).
- Start the connection () and press the start push-button (**B-Fig.15**).

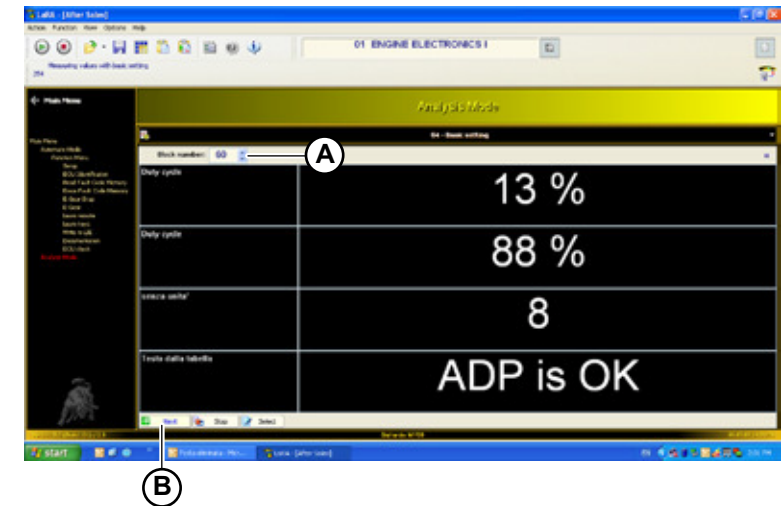
line 1 displays the throttle potentiometer 1 angle:
minimum 10%
maximum 20%

line 2 displays the throttle potentiometer 1 angle:
minimum 80%
maximum 90%

line 3 displays the step counter:
minimum 0
maximum 8

line 4 displays the operation result:
ADP is OK = adaptation is not necessary
ERROR = repeat adaptation
OK = successfully completed

MASTER



SLAVE

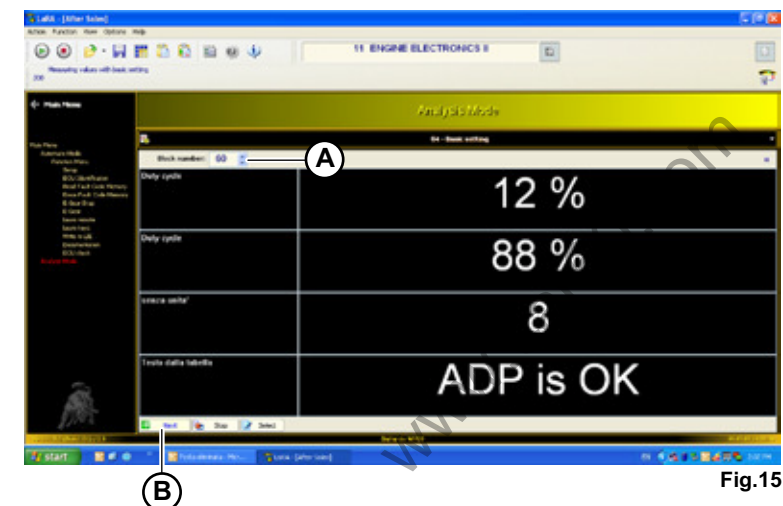


Fig.15



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Electric vacuum pump test (Routine 8) (Test)



Note

Routine 8 is performed when:

- the brake vacuum pump is tested.

- Engine OFF (on MASTER "01" control unit).
- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 8 inside the block number (**A-Fig.16**).
- Start the connection () and press the start push-button (**B-Fig.16**).
- Press the brake forcefully twice: "Test ON" appears in field 4 (you hear the pump start up).

line 1	displays the brake status: enabled not enabled
line 2	displays the pump status: pump ON pump OFF
line 3	displays the braking force amplifier pressure; the pressure drops with "Test ON"
line 4	Test ON Test OFF displays the operation result: Sys. OK = rated values successfully reached Sys. not OK = rated values not reached

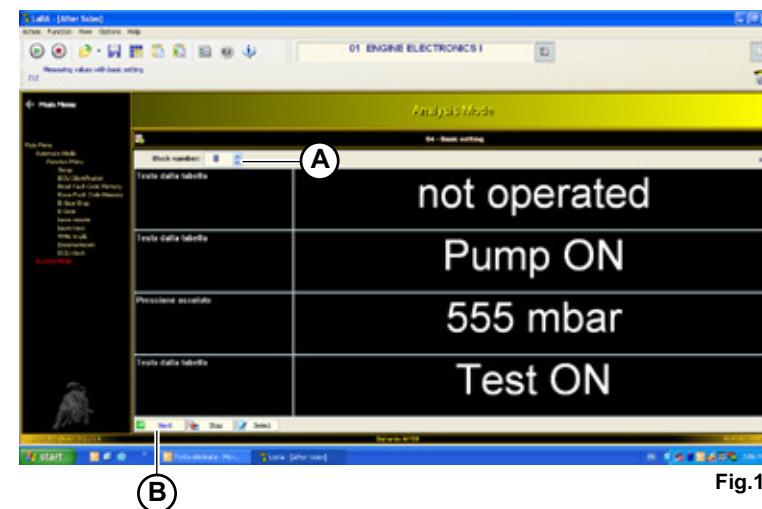


Fig.16



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Load control valve adaptation (Tumble) (Routine 142/144) (Setting)



Note

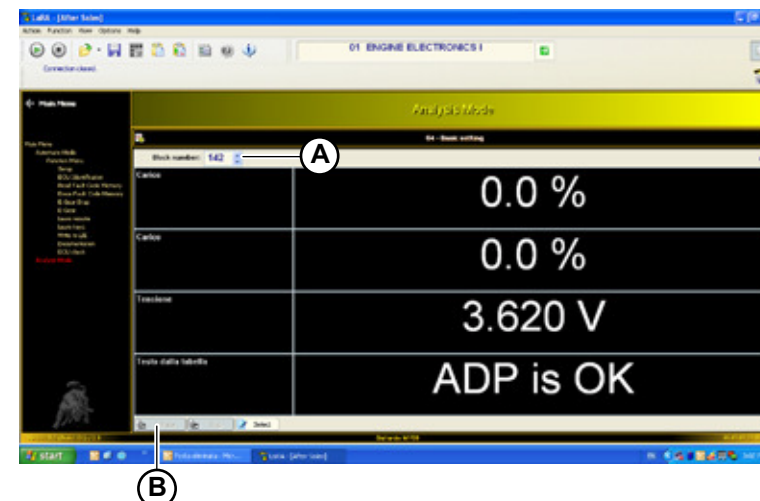
Routine 142/144 is performed when:

- the load control valve adaptation (tumble) status is checked.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 142 (load control valve adaptation MASTER "01") or 144 (load control valve adaptation SLAVE "11") inside the block number (**A-Fig.17**).
- Start the engine at idle speed.
- Start the connection () and press the start push-button (**B-Fig.17**)
- Once adaptation on the MASTER "01" control unit is complete, repeat the operation on the SLAVE "11" control unit.

line 1	displays the real LBK position, expressed as percentage
line 2	displays the theoretical LBK position, expressed as percentage
line 3	LBK adaptation offset
line 4	displays the operation result (cylinder bank adaptation status): ADP is OK = rated values successfully reached ERROR = rated values not reached

MASTER



SLAVE

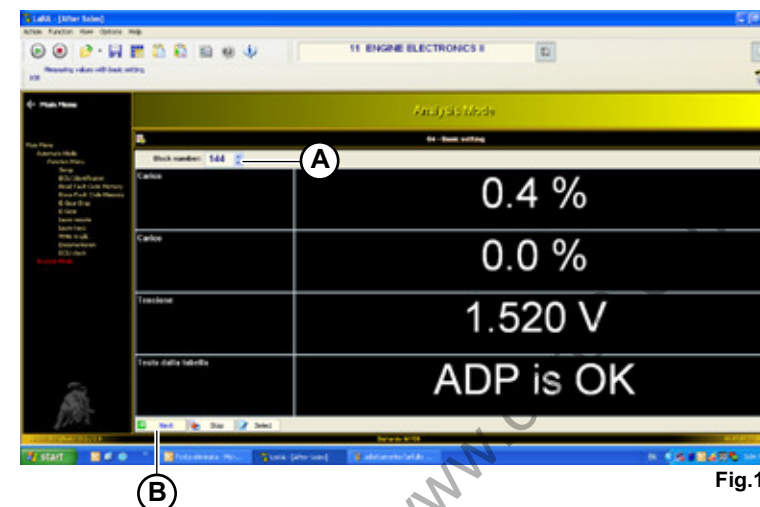


Fig.17



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Oxygen sensor thrust test (PRE) (Routine 199) (Setting + Test)



Note

Routine 199 is performed when:

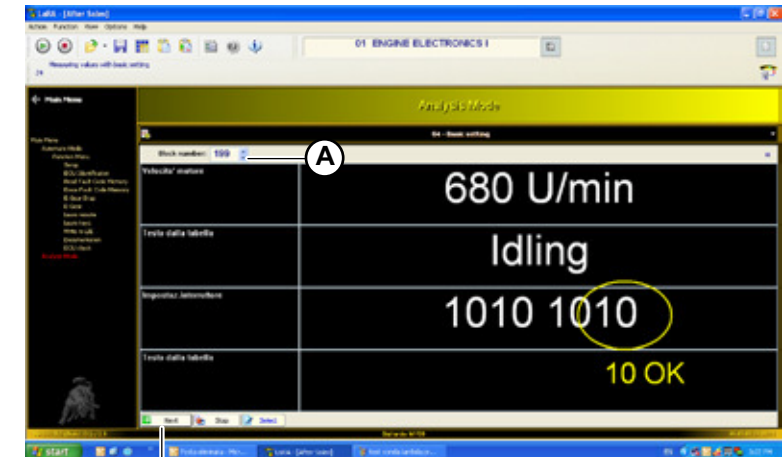
- the oxygen sensor thrust test is performed.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 199 inside the block number (**A-Fig.18**).
- Start the engine and take the water temperature to $\geq 80^{\circ}\text{C}$.
- Start the connection () and press the start push-button (**B-Fig.18**).
- Press the accelerator pedal down firmly and quickly > 5000 1/min to make the rpm drop down (*propulsion phase*)

line 1	displays the engine rpm
line 2	displays the operating status
line 3	displays the operation result: xxxxxx10 = rated values successfully reached ERROR = rated values not reached
line 4	not used

- Wait until the rated values are displayed in the 3rd field.
- Switch over to engine II electronics (control unit 2).
- Wait for the rated values to appear in the 3rd field; another quick, hard press down on the accelerator may be necessary.

MASTER



SLAVE

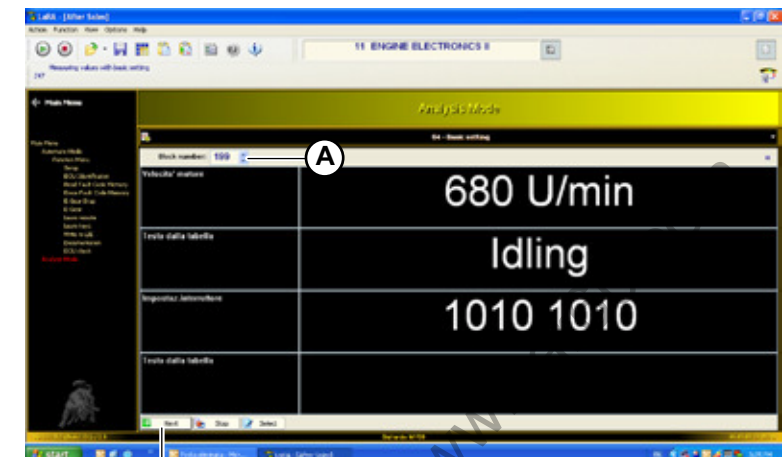


Fig.18



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Tank bleed valve diagnosis (Routine 190) (Test)



Note

Routine 190 is performed when:

- the tank bleed valve diagnosis is carried out.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 190 inside the block number (A-Fig.19).
- Start the engine at idle speed.
- Start the connection () and press the start push-button (B-Fig.19).

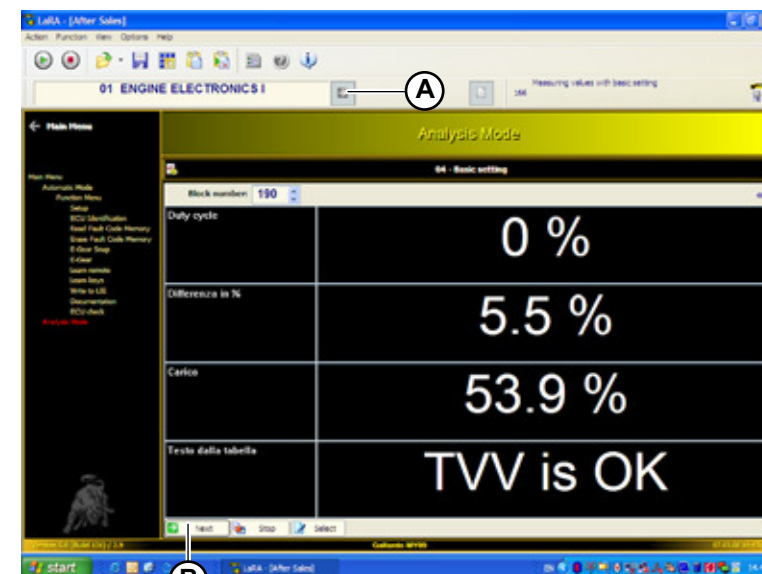
line 1	displays the TEV (pulsing rate) opening percentage
line 2	displays the oxygen sensor regulator average value percentage
line 3	displays the idle speed regulator percentage (diagnosis value with diagnosis enabled)
line 4	displays the result of the TEV test: TEV is OK = rated values successfully reached ERROR = rated values not reached



Note

The test runs automatically twice before the final result is displayed.

MASTER



SLAVE

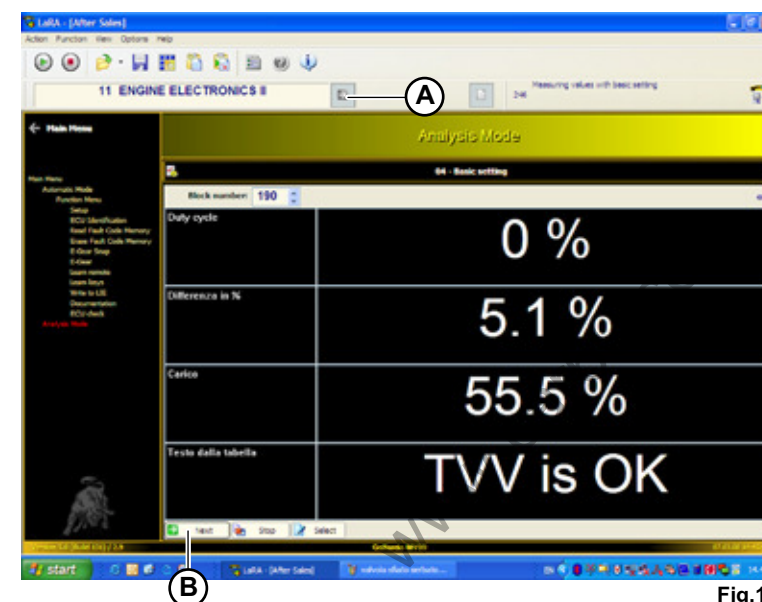


Fig.19



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Intake camshaft adjustment solenoid valves diagnosis (Routine 191) (Test)



Note

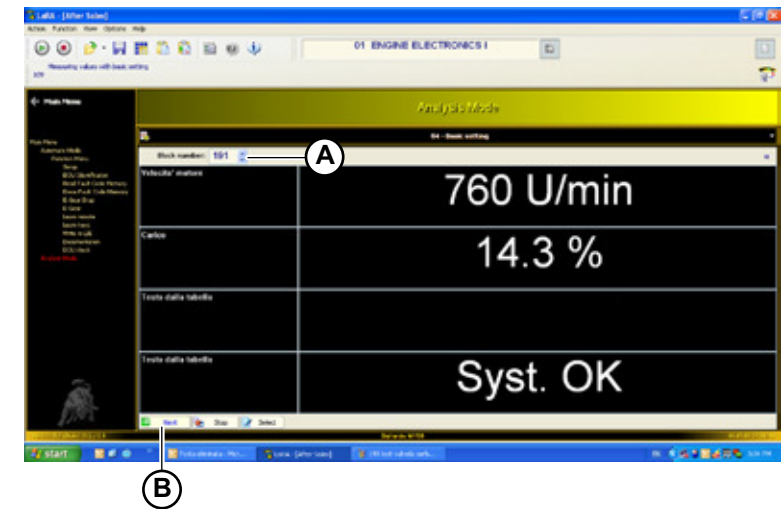
Routine 191 is performed when:

- the intake camshaft adjustment solenoid valves diagnosis is run.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 191 inside the block number (**A-Fig.20**) on the MASTER "01" control unit.
- Start the engine and bring it to 2200 rpm.
- Start the connection () and press the start push-button (**B-Fig.20**).
- Wait for the values to be reached and then repeat the procedure on the SLAVE "11" control unit.

line 1	displays the rpm
line 2	displays the load expressed as percentage
line 3	--
line 4	displays the result of the intake camshaft adjustment: Sys. OK = rated values successfully reached ERROR = rated values not reached

MASTER



SLAVE

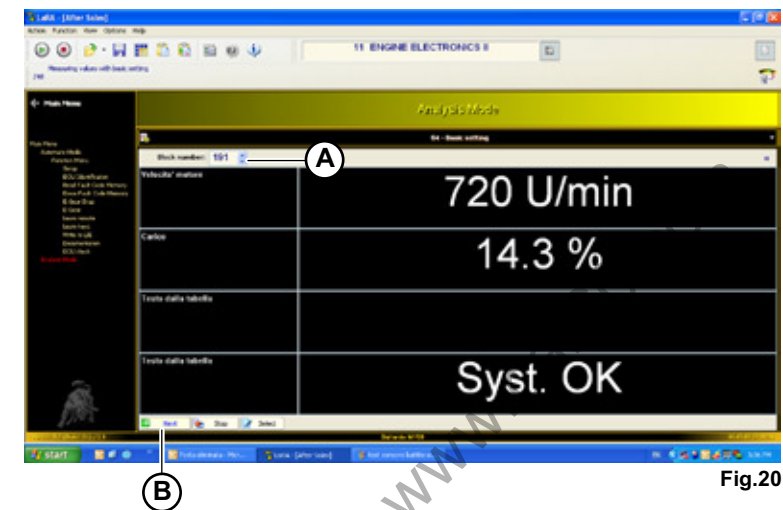


Fig.20



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Exhaust camshaft adjustment solenoid valves diagnosis (Routine 192) (Test)



Note

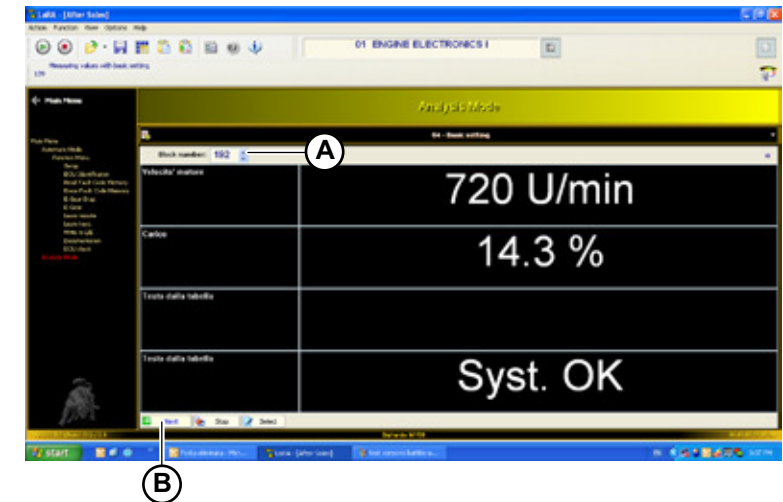
Routine 192 is performed when:

- the exhaust camshaft adjustment solenoid valves diagnosis is run.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 192 inside the block number (**A-Fig.21**) on the MASTER "01" control unit.
- Start the engine and bring it to 2200 rpm.
- Start the connection () and press the start push-button (**B-Fig.21**).
- Wait for the rated values to be reached and then repeat the procedure on the SLAVE "11" control unit.

line 1	displays the rpm
line 2	displays the load expressed as percentage
line 3	not used
line 4	displays the result of the exhaust camshaft adjustment: Sys. OK = rated values successfully reached ERROR = rated values not reached

MASTER



SLAVE

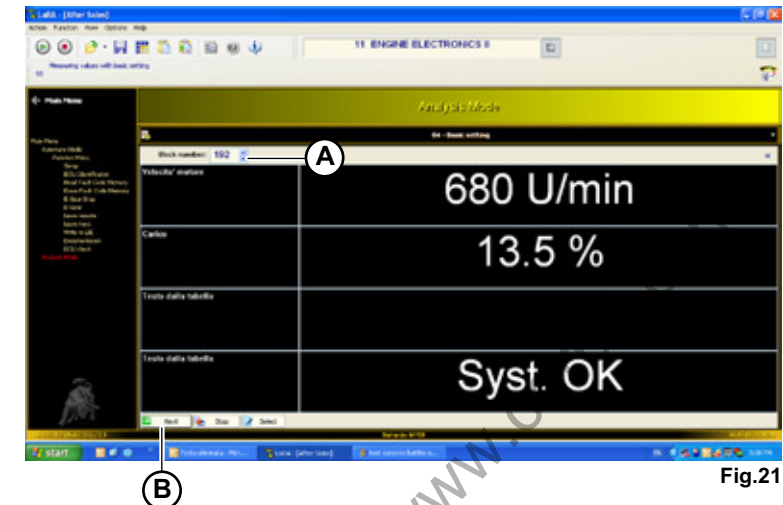


Fig.21



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Diagnosis of the exchange of oxygen sensors downstream of the catalytic converter and knock sensors (POST) (Routine 195) (Test)



Note

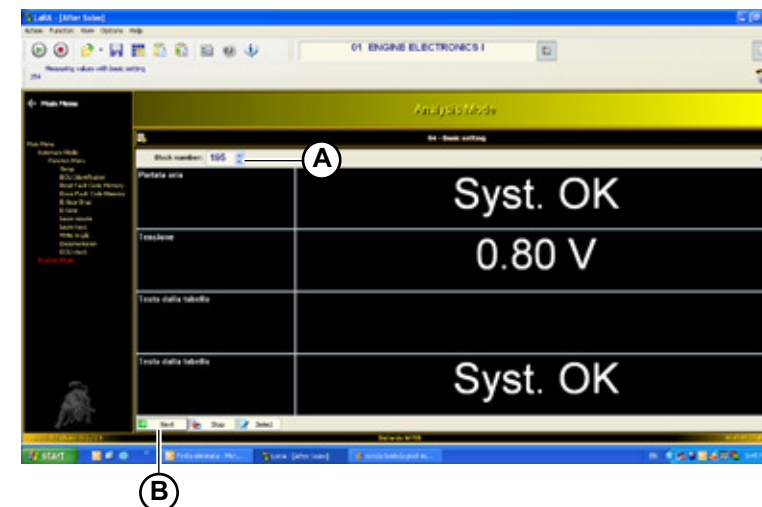
Routine 195 is performed when:

- the diagnosis of the exchange of oxygen sensors downstream of the catalytic converter and knock sensors is performed.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 195 inside the block number (A-Fig.22).
- Start the engine and bring it to 2550 rpm.
- Start the connection () and press the start push-button (B-Fig.22).
- Wait until the values are reached.

line 1	displays the combustion shock sensor test result: Sys. OK = rated values successfully reached ERROR = rated values not reached
line 2	displays the cylinder bank 1 sensor voltage, sensor 2
line 3	non utilizzato
line 4	displays the operation result: Sys. OK = rated values successfully reached ERROR = rated values not reached

MASTER



SLAVE

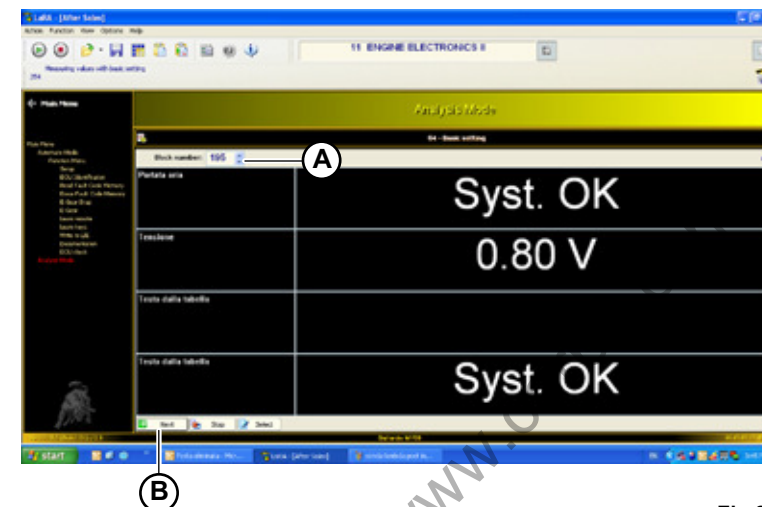


Fig.22



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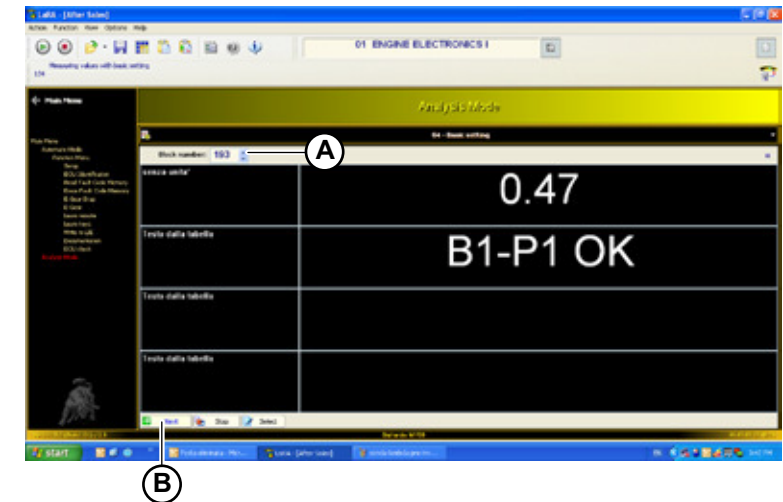
Diagnosis of the oxygen sensor upstream of the catalytic converter / aging (PRE) (Routine 193) (Test)

- Note**
- Routine 193 is performed when:
- the diagnosis of the oxygen sensors upstream of the catalytic converter / aging is performed.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 193 inside the block number (A-Fig.23).
- Switch over to engine electronics (MASTER "01").
- Start the engine and bring it to 2200 rpm.
- Start the connection () and press the start push-button (B-Fig.23).
- Wait until the rated values are reached and switch over to engine II electronics (SLAVE "11").

line 1	displays the dynamic factor
line 2	displays the operation result: B1-P1 OK = rated values successfully reached (cylinder bank 1) B2-P1 OK = rated values successfully reached (cylinder bank 2) ERROR = rated values not reached
line 3	not used
line 4	not used

MASTER



SLAVE

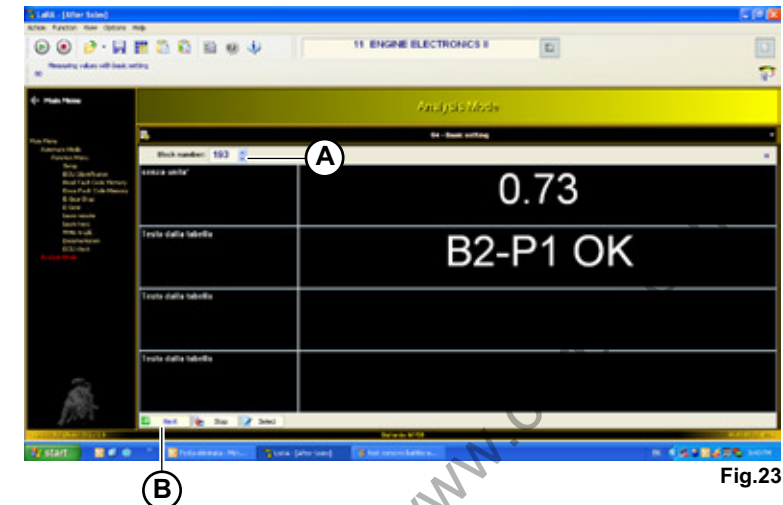


Fig.23



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Checking the oxygen sensors downstream of the catalytic converter / ready operation status (POST) (Routine 194) (Test)



Note

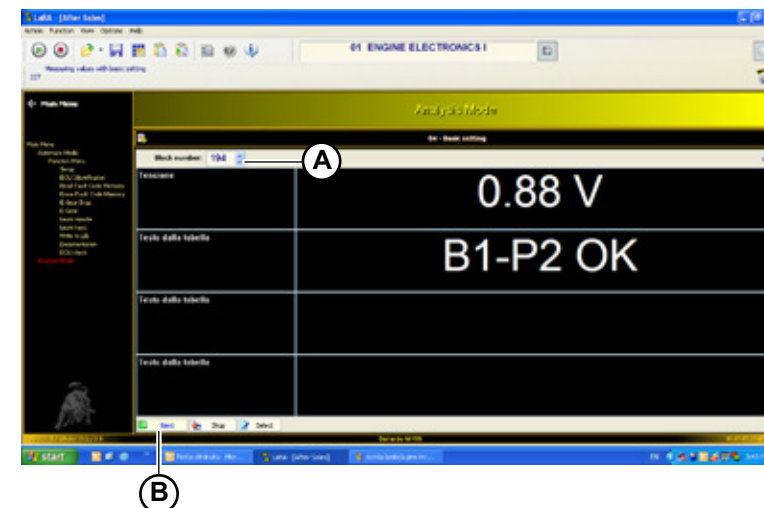
Routine 194 is performed when:

- the oxygen sensors downstream of the catalytic converter / ready operation status are checked.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 194 inside the block number (**A-Fig.24**).
- Switch over to engine electronics (MASTER "01").
- Start the engine at idle speed.
- Start the connection () and press the start push-button (**B-Fig.24**).
- Wait until the rated values are reached and switch over to engine II electronics (SLAVE "11").

line 1	displays sensor 2 voltage
line 2	displays the operation result: B1-S2 OK = rated values successfully reached (cylinder bank 1) B2-S2 OK = rated values successfully reached (cylinder bank 2) ERROR = rated values not reached
line 3	not used
line 4	not used

MASTER



SLAVE

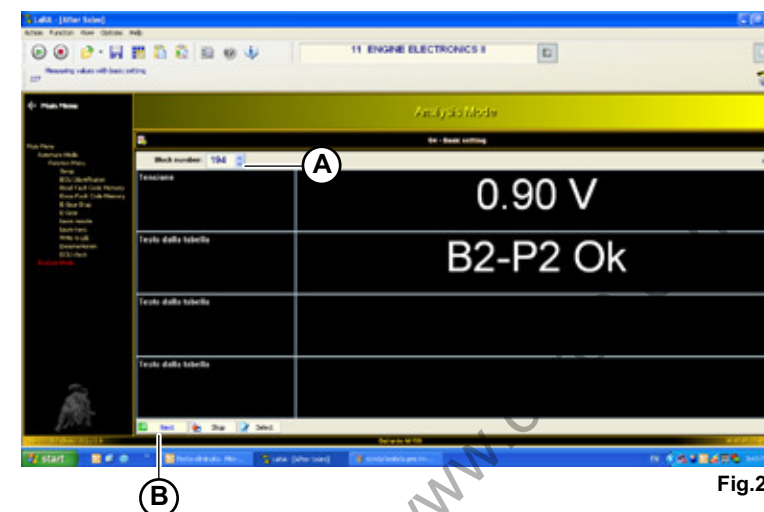


Fig.24



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Diagnosis of the tank seal (LDP) (only for USA) / Secondary air system (SL) (Routine 198) (Test)



Note

Routine 198 is performed when:

- diagnosis of the tank seal (LDP) (only for USA) / Secondary air system (SL) is performed.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 198 inside the block number (A-Fig.25).
- Switch over to engine electronics (MASTER "01").
- Start the engine at idle speed.
- Start the connection () and press the start push-button (B-Fig.25).
- Wait until the rated values are reached and switch over to engine II electronics (SLAVE "11").



Note

The secondary air pump (and relevant diagnosis) goes into operation only once every time the engine is started, so RESTART THE ENGINE BEFORE REPEATING THE TEST.

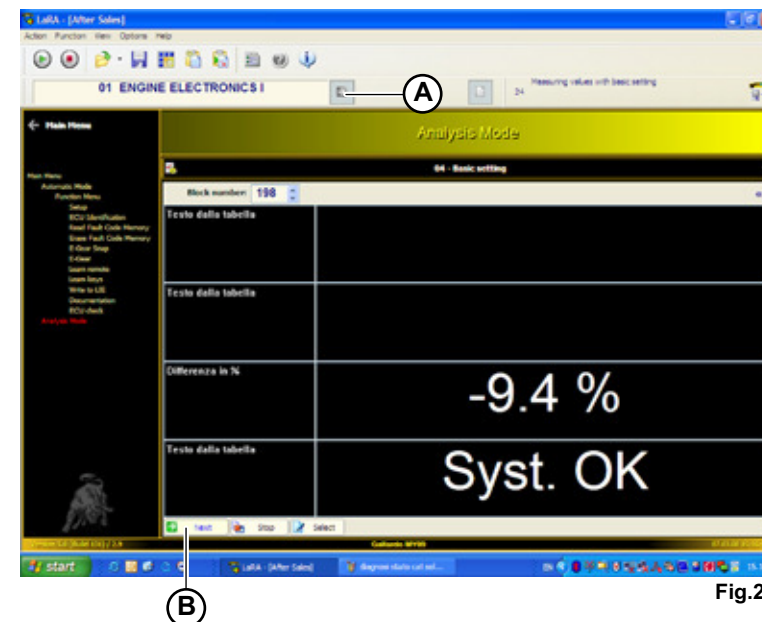


Fig.25

line 1	displays the result of the tank seal (ONLY USA VERSION): Sys. OK = rated values successfully reached ERROR = rated values not reached
line 2	not used
line 3	displays the relevant secondary air flow expressed as percentage
line 4	displays the operation result: Sys. OK = rated values successfully reached ERROR = rated values not reached



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Detection of irregular engine ignition (Routine 14) (Test)



Note

Routine 14 is performed when:

- engine ignition is checked.

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select routine 14 inside the block number (**A-Fig.26**) on the SLAVE "11" control unit.
- Start the engine at idle speed.
- Start the connection () and press the start push-button (**B-Fig.26**).



Note

Perform the test for at least 5 seconds.

line 1	displays the engine rpm at idle
line 2	displays the load expressed as percentage
line 3	Total counter of irregular ignitions (value ≤ 5)
line 4	displays the operation result: enabled = rated values successfully reached blocked = rated values not reached

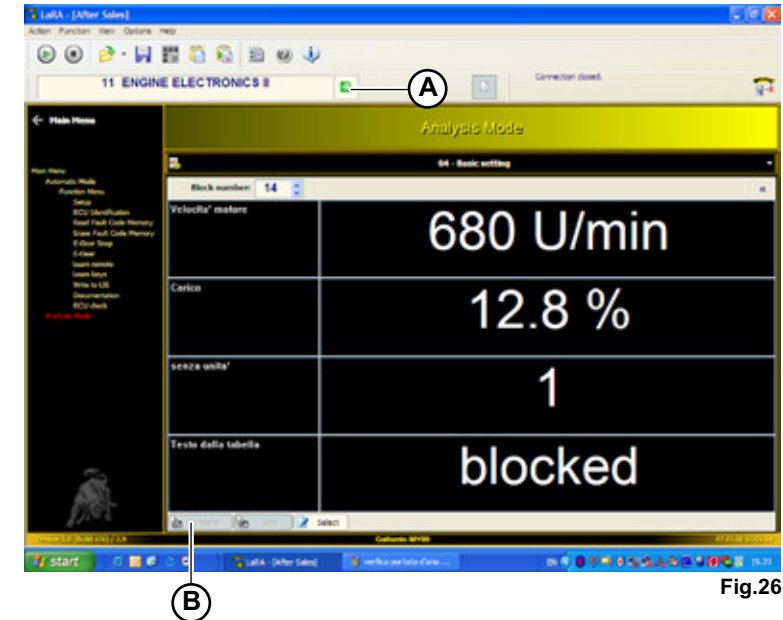


Fig.26



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08 Measurement values (engine injection control unit)

The “Measurement values” function display information about the vehicle in real time:

001 General			
Engine speed nmot, 1	Coolant temperature tmotlin, 80	Oxygen sensor adjustment value Cylinder bank 1 / Cylinder bank 3 fr_w, 28	Oxygen sensor adjustment value Cylinder bank 2 / Cylinder bank 4 fr2_w, 29
[1/min]	[°C]	[%]	[%]
min: 500 max: 7200	min: 80 max: 115	min: -15 max: 15	min: -15 max: 15
002 General			
Engine speed nmot, 1	Load rl, 2	Injection time ti_l, 595	Air mass mshfm_w, 10
[1/min]	[%]	[ms]	[g/s]
min: 500 max: 7200 Idle values: min: 500 max: 800	min: 7 max: 100 Idle values: min: 12 max: 23	min: 0.5 max: 6.5 Idle values: min: 0.5 max: 1.5	min: 1.5 max: 400 Idle values: min: 1.5 max: 3.5
003 General			
Engine speed nmot, 1	Air mass mshfm_w, 10	Throttle angle (potentiometer) wdkba, 7	Ignition timing (real value) zwout, 9
[1/min]	[g/s]	[%]	[°v.OT]
	min: 500		
min: 500 max: 7200 Idle values: min: 500 max: 800	min: 1.5 max: Idle values: min: 1.5 max: 3.5	min: 0 max: 100 Idle values: min: 0 max: 3	min: -10 max: 50 Idle values: min: -5 max: 20
004 General			
Engine speed nmot, 1	Battery voltage wub_w, 81	Coolant temperature tmotlin, 80	Intake air temperature tanslin, 85
[1/min]	[V]	[°C]	[°C]
min: 500 max: 7200	min: 12 max: 15	min: 80 max: 115	min: Outside temperature max: 115



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005 General			
Engine speed nmot, 1	Load rl, 2	Speed vfil_w, 86	Speed 87
[1/min]	[%]	[km/h]	Text
min: 500 max: 7200	min: 7 max: 100	min: 0 max: 250	Minimum Partial load Full load Release Enrichment
006 General			
Engine speed nmot, 1	Load rl, 2	Intake air temperature tanslin, 85	Altitude correction fho, 68
[1/min]	[%]	[°C]	[%]
min: 500 max: 7200	min: 7 max: 100	min: Outside temperature max: 115	min: -50 max: 20
007 Direct injection mode			
Engine speed nmot, 1	Load rl, 2	Coolant temperature tmotlin, 80	Direct injection mode bdemod_w, 503
[1/min]	[%]	[°C]	0 homog., oxy. sens.=1 1 homogeneous, poor 2 homogeneous / layer 3 Layer 4 Layer / cat. Conv. Heat. 5 Free 6 Free 7 Combustion shock protection
008 Electric vacuum pump, short trip, display in Master only			
<ul style="list-style-type: none"> - Control conditions: engine off; ignition enabled, automatic gearshift in "P" or "N" - Start the short trip with the "Activation" button - Press the brake forcefully twice: "Test ON" appears in field 4 - Wait until "Syst. OK" is displayed in field 4 			
Brake activation recognised B_br2k, 600	Pump command B_bkvep, 601	BKV absolute pressure pbkv_w, 602	Result 603
Text	Text	[mbar]	Text
Not enabled Enabled	Pump OFF Pump ON		Test OFF Test ON Syst. OK Syst. not OK



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009 WIV (Time between maintenance operations extended)			
Oil level olfst1_w, 1138	Oil alarm threshold swolfst, 1139	Fuel consumption signal kvakbi_w, 922	Equivalent consumption aeqkv_w, 921
[mm]	[mm]	[-]	[-]
Turning it on			
010 Turning it on			
Engine speed nmot, 1	Load rl, 2	Throttle angle (potentiometer) wdkba, 7	Ignition timing (real value) zwout, 9
[1/min]	[%]	[%]	[°v.OT]
min: 500 max: 7200 Idle values: min: 500 max: 800	min: 7 max: 100 Idle values: min: 12 max: 23	min: 0 max: 100 Idle values: min: 0 max: 3	min: -10 max: 50 Idle values: min: -5 max: 20
011 Turning it on			
Engine speed nmot, 1	Coolant temperature tmotlin, 80	Intake air temperature tanslin, 85	Ignition timing (real value) zwout, 9
[1/min]	[°C]	[°C]	[°v.OT]
min: 500 max: 7200	min: 80 max: 115	min: Outside temperature max: 115	min: -10 max: 50
014 Switch recognition			
Engine speed nmot, 1	Load rl, 2	Cumulative switch counter fzabgs_w, 101	Switch recognition status, 232
[1/min]	[%]	[]	Text
min: 500 max: 7200	min: 7 max: 100	0	enabled locked
015 Switch recognition, display in Slave only			
Counter cyl. 1 Fzabgzyl_w_0, 224	Counter cyl. 2 fzabgzyl_w_4,228	Counter cyl. 3 fzabgzyl_w_6, 230	Switch recognition status, 232
[]	[]	[]	Text
0	0	0	enabled locked



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016 Switch recognition, display in Slave only			
Counter cyl. 4 Fzabgzyl_w_8, 556	Counter cyl. 5 fzabgzyl_w_2, 226	Counter cyl. 6 fzabgzyl_w_1, 225	Switch recognition status, 232
[]	[]	[]	Text
0	0	0	enabled locked
017 Switch recognition, display in Slave only			
Counter cyl. 7 fzabgzyl_w_5, 229	Counter cyl. 8 fzabgzyl_w_7, 231	Counter cyl. 9 fzabgzyl_w_9, 557	Switch recognition status, 232
[]	[]	[]	Text
0	0	0	enabled locked
018 Load/speed for switch recognition window (if switches =>0 are not detected), display in Slave only			
Lower speed ref. value afnmn, 96	Upper speed ref. value afnmn, 97	Lower load ref. value afnmn, 98	Upper load ref. value afnmn, 99
[1/min]	[1/min]	[%]	[%]
min: 500 max: 7200	min: 500 max: 7200	min: 7 max: 100	min: 7 max: 100
019 Switch recognition, display in Slave only			
Counter cyl. 10 fzabgzyl_w_3, 227			Switch recognition status, 232
[]			Text
0			enabled locked
Combustion shock adjustment			
020 Combustion shock adjustment			
Call-up of ignition timing cyl. 1 / 6 dwkrz_0, 88	Call-up of ignition timing cyl. 2 / 7 dwkrz_2, 90	Call-up of ignition timing cyl. 3 / 8 dwkrz_3, 91	Call-up of ignition timing cyl. 4 / 9 dwkrz_4, 92
[°KW]	[°KW]	[°KW]	[°KW]
min: 0 max: 12	min: 0 max: 12	min: 0 max: 12	min: 0 max: 12



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021 Combustion shock adjustment			
Call-up of ignition timing cyl. 5 / 10 dwkrz_1, 89			
[°KW]			
min: 0 max: 12			
022 Combustion shock adjustment			
Engine speed nmot, 1	Load rl, 2	Call-up of ignition timing cyl. 1 / 6 dwkrz_0, 88	Call-up of ignition timing cyl. 2 / 7 dwkrz_2, 90
[1/min]	%	[°KW]	[°KW]
min: 500 max: 7200	min: 7 max: 100	min: 0 max: 12	min: 0 max: 12
023 Combustion shock adjustment			
Engine speed nmot, 1	Load rl, 2	Call-up of ignition timing cyl. 3 / 8 dwkrz_3, 91	Call-up of ignition timing cyl. 4 / 9 dwkrz_4, 92
[1/min]	[%]	[°KW]	[°KW]
min: 500 max: 7200	min: 7 max: 100	min: 0 max: 12	min: 0 max: 12
024 Combustion shock adjustment			
Engine speed nmot, 1	Load rl, 2	Call-up of ignition timing cyl. 5 / 10 dwkrz_1, 89	
[1/min]	[%]	[°KW]	
min: 500 max: 7200	min: 7 max: 100	min: 0 max: 12	
026 Combustion shock adjustment, combustion shock sensor voltages			
cyl. 1 / 6 rkrn_w_0, 52	cyl. 2 / 7 rkrn_w_2, 56	cyl. 3 / 8 rkrn_w_3, 58	cyl. 4 / 9 rkrn_w_4, 60
[V]	[V]	[V]	[V]
min: 0 max: 15	min: 0 max: 15	min: 0 max: 15	min: 0 max: 15
027 Combustion shock adjustment, combustion shock sensor voltages			
cyl. 5 / 10 rkrn_w_1, 54			
[V]			
min: 0 max: 15			



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028 Combustion shock sensor control, short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: the speed is automatically set at 2200 rpm → "Test ON" - Wait until "Syst. OK" is displayed in field 4 			
Engine speed nmot, 1	Load rl, 2	Coolant temp. tmotlin, 80	Result 165
[1/min]	[%]	[°C]	Text
^a 2200	min: 7 max: 100	min: 80 max: 115	Test ON Test OFF Syst. OK Syst. not OK
030 Oxygen sensor, status			
Cylinder bank 1 / 3, sensor 1 47	Cylinder bank 1 / 3, sensor 2 48	Cylinder bank 2 / 4, sensor 1 49	Cylinder bank 2 / 4, sensor 2 50
0 adjustment enabled B_lr 1 sensor ready for use B_sbbvk 2 sensor heating on B_hspe 3 cat. conv. obstruction removal enabled B_lrka 4 free	0 adjustment enabled B_lrhk 1 sensor ready for use B_sbbhk 2 sensor heating on B_hshe 3 adjustment enabled B_lrhkp	0 adjustment enabled B_lr 2 1 sensor ready for use B_sbbvk 2 2 sensor heating on B_hspe 2 3 cat. conv. obstruction removal enabled B_lrka 2 4 free	0 adjustment enabled B_lrhk 2 1 sensor ready for use B_sbbhk 2 2 sensor heating on B_hshe 2 3 adjustment enabled B_lrhkp 2
031 Oxygen sensor voltages			
Cylinder bank 1 / 3, sensor 1 Real oxygen sensor value lamsoni_w, 45	Cylinder bank 1 / 3, sensor 1 Real oxygen sensor value lamsbg_w, 43	Cylinder bank 2 / 4, sensor 1 Real oxygen sensor value lamsoni2_w, 46	Cylinder bank 2 / 4, sensor 1 Rated oxygen sensor value lamsbg2_w, 44
[]	[]	[]	[]
min: 0.7 max: 2	min: 0.7 max: 2	min: 0.7 max: 2	min: 0.7 max: 1
032 Mixture adaptation values detected			
Cylinder bank 1 / 3, sensor 1, minimum ora_w, 31	Cylinder bank 1 / 3, sensor 1, partial load fra_w, 33	Cylinder bank 2 / 4, sensor 1, minimum ora2_w, 32	Cylinder bank 2 / 4, sensor 1, partial load fra2_w, 34
[%]	[%]	[%]	[%]
min: - 4 max: 4	min: - 15 max: 15	min: - 4 max: 4	min: - 15 max: 15



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033 Oxygen sensor adjustment value			
Cylinder bank 1 / 3, adjustment value fr_w, 28	Cylinder bank 1 / 3, oxygen sensor upstream of cat. conv. voltage uulsuv_w, 418	Cylinder bank 2 / 4, adjustment value fr2_w, 29	Cylinder bank 2 / 4, oxygen sensor upstream of cat. conv. voltage uulsuv2_w, 492
[%]	[V]	[%]	[V]
min: - 15 max: 15	min: 0 max: 5	min: - 15 max: 15	min: 0 max: 5
034 Checking the aging of cylinder bank 1 / 3 oxygen sensors upstream of cat. conv., short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON" - Wait until "B1-S1 ok" is displayed in field 4 			
Engine speed nmot, 1	Cylinder bank 1 / 3 exhaust gas temperature tabgm, 308	Cylinder bank 1 / 3 dynamic value dynlsu_w, 823	Result 951
[1/min]	[°C]	[]	Text
^a 2200		min: 0.3	Test ON Test OFF B1-S1 ok B1-S1 not ok
035 Checking the aging of cylinder bank 2 / 4 oxygen sensors upstream of cat. conv., short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON" - Wait until "B2-S1 ok" is displayed in field 4 			
Engine speed nmot, 1	Cylinder bank 2 / 4 exhaust gas temperature- tabgm2, 309	Cylinder bank 2 / 4 dynamic value dynlsu2_w, 824	Result 1022
[1/min]	[°C]	[]	Text
^a 2200		min: 0.3	Test ON Test OFF B2-S1 ok B2-S1 not ok



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036 Oxygen sensor ready operation after cat. conv., short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON" - Wait until "B1/B2-S1 ok" is displayed in fields 2 and 4 			
Cylinder bank 1 / 3 sensor voltage, sensor 2 ushk, 39	Result 113	Cylinder bank 2 / 4 sensor voltage, sensor 2 ushk2, 40	Result 114
[V]	Text	[V]	Text
min: 0 max: 1	Test ON Test OFF B1-S2 ok B1-S2 not ok	min: 0 max: 1	Test ON Test OFF B2-S2 ok B2-S2 not ok
037 Cylinder bank 1 / 3 oxygen sensors, Δ-oxygen sensor, short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON" - Wait until "B1-S1 ok" is displayed in field 4 			
Load rl, s	Cylinder bank 1 / 3 sensor voltage, sensor 2 ushk, 39	Δ-oxygen sensor cylinder bank 1 / 3 dlatrmo_w, 1727	Result 976
[%]	[V]	[]	Text
min: 7 max: 100	min: 0 max: 1	min: - 0.03 max: 0.03	Test ON Test OFF B1-S1 ok B1-S1 not ok
038 Cylinder bank 2 / 4 oxygen sensors, Δ-oxygen sensor, short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON" - Wait until "B2-S1 ok" is displayed in field 4 			
Load rl, s	Cylinder bank 2 / 4 sensor voltage, sensor 2 ushk2, 40	Δ-oxygen sensor cylinder bank 2 / 4 dlatrmo2_w, 1728	Result 976
[%]	[V]	[]	Text
min: 7 max: 100	min: 0 max: 1	min: - 0.03 max: 0.03	Test ON Test OFF B2-S1 ok B2-S1 not ok



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041 Heating Oxygen sensors cylinder bank 1 / 3			
Resistor inside cylinder bank 1 / 3, sensor 1 rinsu_w, 633	Pulsing rate cylinder bank 1/3, sensor 1 669	Resistor inside cylinder bank 1 / 3, sensor 2 rinh_w, 120	Status 123
[Ohm]	[%]	[kOhm]	Text
min: 0 max: 500	min: max:	min: 0 max: 0.5	Heat.nC ON Heat.nC OFF
042 Heating Oxygen sensors cylinder bank 2 / 4			
Resistor inside cylinder bank 2 / 4, sensor 1 rinsu2_w, 776	Pulsing rate cylinder bank 2/4, sensor 1 780	Resistor inside cylinder bank 2 / 4, sensor 2 rinh2_w, 121	Status 125
[Ohm]	[%]	[kOhm]	Text
min: 0 max: 500	min: max:	min: 0 max: 0.5	Heat.nC ON Heat.nC OFF
043 Aging of oxygen sensors after Cat Master, short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON" - Wait until "B1-S2 ok" is displayed in field 4 			
Engine speed nmot, 1	Cylinder bank 1 / 3 cat. conv. temperature katm, 106	Cylinder bank 1 / 3 sensor voltage, sensor 2 ushk, 39	Result 378
[1/min]	[°C]	[V]	Text
≈ 2200	min: 200 max: 600	min: 0 max: 1	Test ON Test OFF B1-S2 ok B1-S2 not ok
044 Aging of oxygen sensors after cylinder bank 2 / 4 cat. conv., short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON" - Wait until "B1-S2 ok" is displayed in field 4 			
Engine speed nmot, 1	Cylinder bank 2 / 4 cat. conv. temperature tkatm2, 117	Cylinder bank 2 / 4 sensor voltage, sensor 2 ushk2, 40	Result 379
[1/min]	[°C]	[V]	Text
≈ 2200	min: 200 max: 600	min: 0 max: 1	Test ON Test OFF B1-S2 ok B1-S2 not ok



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046 Checking cylinder bank 1 / 3 cat. conv. conversion, short trip

- The short trips in blocks 034 / 035 / 036 / 037 / 038 / 039 / 043 / 044 must be completed with "ok"
- Function **04** (default setting)
- Start the short trip with the "Activation" button
- Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON"
- Wait until "**KatB1 ok**" is displayed in field 4

Engine speed nmot, 1	Cylinder bank 1 / 3 cat. conv. temperature tkihkm_w, 521	Cylinder bank 1 / 3 cat. conv. conver- sion value measured oscdktf_w, 650	Result 486
[1/min]	[°C]	[-]	Text
≈ 2200	min: 300	min: 1	Test ON Test OFF KatB1 ok KatB1 not ok

047 Checking cylinder bank 2 / 4 cat. conv. conversion, short trip

- The short trips in blocks 034 / 035 / 036 / 037 / 038 / 039 / 043 / 044 must be completed with "ok"
- Function **04** (default setting)
- Enable the short trip with button "4" (Test ON)
- Press the brake pedal and at the same time press the accelerator pedal to the floor: automatic speed adjustment → "Test ON"
- Wait until "**KatB2 ok**" is displayed in field 4

Engine speed nmot, 1	Cylinder bank 2 / 4 cat. conv. temperature tkihkm2_w, 863	Cylinder bank 2 / 4 cat. conv. conver- sion value measured oscdktf2_w, 1103	Result 487
[1/min]	[°C]	[-]	Text
^a 2200	min: 300	min: 1	Test ON Test OFF KatB2 ok KatB2 not ok

rpm adjustment

050 rpm increase

Real rpm nmotll, 14	Theoretical rpm nsol, 15	Air conditioning availability B_nac, 131	Air conditioner compressor B_koe, 132
[1/min]	[1/min]	Text	Text
min: 500 max: 2550 Idle values: min: 500 max: 800	min: 500 max: 2550 Idle values: min: 500 max: 800	A/C-High A/C-Low	Compr. ON Compr. OFF



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051 rpm, switchover operations			
Real rpm nmotll, 14	Theoretical rpm nsol, 15	Gear notch (Automatic) gangi, 130	Battery voltage wub_w, 81
[1/min]	[1/min]	[0-7]	[V]
min: 500 max: 2550	min: 500 max: 2550	P,N = 0 gear = 1-6 R = 7	min: 12 max: 15
052 rpm increase, generator load			
Real rpm nmotll, 14	Theoretical rpm nsol, 15	Air conditioning availability B_sacc, 1545	Windscreen/rear window heating B_sfsc v B_sksc, 666
[1/min]	[1/min]	Text	[%]
min: 500 max: 2550	min: 500 max: 2550	on off	on off
053 rpm increase, generator load			
Real rpm nmotll, 14	Theoretical rpm nsol, 15	Battery voltage wub_w, 81	Generator torque mdgenc, 1426
[1/min]	[1/min]	[V]	[Nm , W , %]
min: 500 max: 2550	min: 500 max: 2550	min: 12 max: 15	min: max:
054 Idle speed regulator/switch in systems having electronic accelerator			
Real rpm nmotll, 14	Speed 87	Pedal value indicator angle (potentiometer) wped_w, 8	Throttle angle (potentiometer) wdkba, 7
[1/min]	Text	[%]	[%]
min: 500 max: 2550	Minimum Partial load Full load Release Enrichment	min: 0 max: 100	min: 0 max: 100
055 Stabilization of idle speed			
Real rpm nmotll, 14	Idle speed regulator Torque change dmlri_w, 135	Idle speed regulator Dissipated torque adaptation dmvad_w, 19	Operating conditions 20
[1/min]	[%]	[%]	0 Air con. compressor B_koe 1 Gear notch engaged B_fs 2 Air cond. available B_nac 3 Rear window heating B_sksc 4 free 5 Windscreen heating B_sfsc
min: 500 max: 2550	min: - 3 max: 5	min: - 3 max: 3	



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056 Stabilization of idle speed			
Real rpm nmotll, 14	Theoretical rpm nsol, 15	Idle speed regulator Torque change dmliri_w, 135	Compressor load signal 20
[1/min]	[1/min]	[%]	0 Air con. compressor B_koe 1 Gear notch engaged B_fs 2 Air cond. available B_nac 3 Rear window heating B_sksc 4 free 5 Windscreen heating B_sfsc
min: 500 max: 2550	min: 500 max: 2550	min: - 3 max: 5	
057 Stabilization of idle speed, air conditioning compressor pressure signal			
Real rpm nmotll, 14	Theoretical rpm nsol, 15	Air conditioning compressor B_koe, 132	Compressor load signal mkolsc, 632
[1/min]	[1/min]	Text	[Nm]
min: 500 max: 2550	min: 500 max: 2550	Compr. ON Compr. OFF	min: 0 max: 40
058 Engine support			
Engine speed nmot, 1	Load rl, 2	Engine support B_mola, 458	
[1/min]	[%]	Text	
min: 500 max: 2550	min: 7 max: 100	on off	
Throttle control			
060 Throttle adaptation, short trip			
- Function 04 (default setting) - Start the short trip with the "Activation" button - Wait until " ADP ok " is displayed in field 4			
Throttle angle (potentio- meter 1) udkp1_w, 154	Throttle angle (potentio- meter 2) udkp2_w, 155	DVE adaptation status lrnstat, 697	Operating condition lrnstat, 698
[%]	[%]	[]	Text
min: 3 max: 93	min: 3 max: 97	min: 0 max: 8	ADP in progress ADP ok ERROR



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061 Electronic accelerator			
Engine speed nmot, 1	Battery voltage wub_w, 81	Throttle angle wdkba, 7	Operating conditions 20
[1/min]	[V]	[%]	
min: 500 max: 7200	min: 12 max: 15	min: 0 max: 100	0 Air con. compressor B_koe 1 Gear notch engaged B_fs 2 Air cond. available B_nac 3 Rear window heating B_sksc 4 free 5 Windscreen heating B_sfsc
062 Electronic accelerator, potentiometer voltages			
Throttle angle (potentiometer 1) udkp1_w, 154	Throttle angle (potentiometer 2) udkp2_w, 155	Pedal value indicator angle (potentiometer 1) upwg1_w, 156	Pedal value indicator angle (potentiometer 2) upwg2_w, 157
[%]	[%]	[%]	[%]
min: 3 max: 93	min: 3 max: 97	min: 8 max: 97	min: 3 max: 49
063 Kick-down adaptation, short trip (not D3), display in Master only			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Upon request, press the accelerator pedal to the floor - Wait until "ADP ok" is displayed in field 4 			
Pedal value indicator angle (potentiometer 1) upwg1_w, 156	Kick-down point detected (potentiometer 1) upwkd_w, 465	Kick-down 284	Result zlkd (B_autget), 285
[%]	[%]	Text	Text
min: 12 max: 97	min: 0 max: 5	- Not enabled Kick-down	Enable ADP. in progress ADP. ok ERROR
064 Throttle potentiometer adaptation values			
Potentiometer 1 lower adaptation udkp1asr_w, 472	Potentiometer 2 lower adaptation udkp2asr_w, 473	Potentiometer 1 gap udknlp1r, 474	Potentiometer 2 gap udknlp2r, 475
[V]	[V]	[V]	[V]
min: 0.2 max: 0.9	min: 4.1 max: 4.9	min: 0.55 max: 0.59	min: 4.05 max: 4.45



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066 Speed adjustment system (GRA), display in Master only			
Real speed vfil_w, 86	Switch positions 193	Theoretical speed vziel_w, 192	Switch positions 194
[km/h]			
min: 0 max: 250	0 Stop light switch B_bl 1 Brake pedal switch B_br 2 Clutch switch B_kuppl 3 GRA released B_fgtrtet 4 ACC-SG available B_acc 5 Main switch touched CWGGFGRH 6 GRA status for CAN CAN Statgra(0 7 GRA status for CAN CAN Statgra(1	min: 0 max: 250	0 GRA on (CAN) B_fgrhsc 1 Set (GRA on) B_fgratc 2 Delay B_fgtrtdc 3 Acceleration B_fgtrtuc 4 Setting B_fgrsec 5 Pickup B_fgrwac 6 Free 7 GRA on S_fgrhs
068 Gearbox status			
Engine speed nmot, 1	Load rl, 2	Gear notch (automatic gearshift) gangi, 130	Converter clutch B_wkauf, B_wk, B_wkr, 1500
[1/min]	[%]	[0-7]	Text
min: 500 max: 7200	min: 7 max: 100	P,N = 0 Gear = 1-6 R = 7	clutch on clutch off clutch adj. ERROR
Reduction of emissions			
070 Purge check, short trip, display in Master only			
- Function 04 (default setting) - Start the short trip with the "Activation" button - Wait until " TEV ok " is displayed in field 4			
Purge percentage opening (pulsing rate) tateout, 170	Mean oxygen sensor variator value ikakdiff_w, 359	Idle speed regulator, diagnosis value for enabled diagnosis rmstevuf_w, 358	Result 195
[%]	[%]	[%]	Text
min: 0 max: 100			Test ON Test OFF TEV ok TEV not ok



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071 Tank seal test – leak diagnosis pump (LDP), short trip, display in Master only in the US version			
<div>- Function 04 (default setting)</div> <div>- Start the short trip with the “Activation” button</div> <div>- Wait until “Syst. ok” is displayed in field 4</div>			
Reed contact status 235	Error message 236	Result 238	
Text	Text	Text	
Reed open Reed closed	- Small leak Considerable leak Breakage	Test ON Test OFF Syst. ok Syst. not ok	
072 Activated charcoal tank cutoff valve check (AAV), short trip, display in Master only in the US version, D3 only			
<div>- Function 04 (default setting)</div> <div>- Start the short trip with the “Activation” button</div> <div>- Wait until “Syst. ok” is displayed in field 4</div>			
Reed contact status 1461	Error message 1462	Test status 1463	Result 1464
Text	Text	Text	Text
Reed open Reed closed	- Breakage	- Syst. test Measurement END measurem.	Test ON Test OFF Syst. ok Syst. not ok
077 Checking cylinder bank 1 / 3 secondary air system, short trip			
<div>- short trips in blocks 034/035 must end with “ok”</div> <div>- Function 04 (default setting)</div> <div>- Start the short trip with the “Activation” button</div> <div>- Press the brake pedal and at the same time press the accelerator pedal to the floor: the rpm is automatically set at 1400 rpm → “Test ON”</div> <div>- Wait until “Syst. ok” is displayed in field 4</div> <div>- Short trip can be executed only once with every engine ignition</div>			
Engine speed nmot, 1	Air mass mshfm_w, 10	Cylinder bank 1 / 3 secondary air mass rmsl, 240	Result 239
[1/min]	[g/s]	[%]	Text
^a 1400			Test ON Test OFF Syst. ok Syst. not ok Breakage



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078 Checking cylinder bank 2 / 4 secondary air system, short trip

- short trips in blocks 034/035 must end with "ok"
- Function **04** (default setting)
- Start the short trip with the "Activation" button
- Press the brake pedal and at the same time press the accelerator pedal to the floor: the rpm is automatically set at 1400 rpm → "Test ON"
- Wait until "Syst. OK" is displayed in field 4
- Short trip can be executed only once with every engine ignition

Engine speed nmot, 1	Air mass mshfm_w, 10	Cylinder bank 2 / 4 secondary air mass rmsl2, 241	Result 239
[1/min]	[g/s]	[%]	Text
^a 1400			Test ON Test OFF Syst. ok Syst. not ok Breakage

079 Exhaust gas valve, display in Master only, D3 only

Engine speed nmot, 1	Load rl, 2	Exhaust gas valve B_abkl, 825	
[1/min]	[%]	Text	
min: 500 max: 7200	min: 7 max: 100	on off	

Special blocks

085 IUMPR (Diagnosis frequency statistics) (only in the US version)

Default setting	iump2tk1_w, 1517	iump2tk2_w, 1518	iump2tk3_w, 1519	iump2tk4_w, 1520
inactive	Mileage	IUMPR record number	General Denominator	Ignition Cycle Counter
active	IUMPR record number	corresponding CDT	Numerator	Denominator

086 Ready bit and cycle

Ready bit, 172 1=not ended 0=ended	Cycle flag, 173 1=not ended 0=ended	Cycle flag, 175 1=not ended 0=ended	Cycle flag, 176 1=not ended 0=ended
---	--	--	--



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0 Catalytic converter B_katrdy 1 Free 2 AKF system B_tesrdy 3 SL System B_slrdy 4 Free 5 λ- B_lsrdy 6 Sensor λ heating B_hsrdy 7 Free	0 Cyl.bank 1 cat.conv. Z_kat 1 Cyl.bank 2 cat.conv. Z_kat 2 2 LDP Z_lpd 3 TEV Z_tes 4 Heating B1-S1 Z_hsv 5 Heating B2-S2 Z_hsh 6 Heating B2-S1 Z_hsv2 7 Heating B2-S2 Z_hsh2	0 B1-S1 el. Z_lsv 1 B1-S2 el. Z_lsh 2 B1-S1 Z_pllsu 3 B1-S2 Z_lash 4 B1-S1 Z_dylsu 5 SLS B1 Z_sls 6 SLS B2 Z_sls2 7 Free	0 B2-S1 el. Z_lsv2 1 B2-S2 el. Z_lsh2 2 B2-S1 Z_pllsu2 3 B2-S2 Z_lash2 4 B2-S1 Z_dylsu 5 Free 6 Free 7 Free
087 Ready and Error Flags			
Ready bit, 172 1=not ended 0=ended	Error flag, 174 1=not ended 0=ended	Error flag, 177 1=not ended 0=ended	Error flag, 178 1=not ended 0=ended
0 Catalytic converter B_katrdy 1 Free 2 AKF system B_tesrdy 3 SL System B_slrdy 4 Free 5 λ- B_lsrdy 6 Sensor λ heating B_hsrdy 7 Free -d	0 Cyl.bank 1 cat.conv. Z_kat 1 Cyl.bank 2 cat.conv. Z_kat 2 2 LDP Z_lpd 3 TEV Z_tes 4 Heating B1-S1 Z_hsv 5 Heating B2-S2 Z_hsh 6 Heating B2-S1 Z_hsv2 7 Heating B2-S2 Z_hsh2	0 B1-S1 el. Z_lsv 1 B1-S2 el. Z_lsh 2 B1-S1 Z_pllsu 3 B1-S2 Z_lash 4 B1-S1 Z_dylsu 5 SLS B1 Z_sls 6 SLS B2 Z_sls2 7 Free	0 B2-S1 el. Z_lsv2 1 B2-S2 el. Z_lsh2 2 B2-S1 Z_pllsu2 3 B2-S2 Z_lash2 4 B2-S1 Z_dylsu 5 Free 6 Free 7 Free
088 Cycle flag for additional OnBoard diagnoses			
Cycle flag, 138 1=not ended 0=ended	Cycle flag, 138 1=not ended 0=ended	Cycle flag, 139 1=not ended 0=ended	
0 Cyl. bank 2 exhaust DN Z_anws2 1 Cyl. bank 1 exhaust DN Z_anws 2 Cyl. bank 2 intake DN Z_enws2 3 Cyl. bank 1 intake DN Z_enws 4 Combustion shock sensor 4 Z_ks4 5 Combustion shock sensor 3 Z_ks3 6 Combustion shock sensor 2 Z_ks2 7 Combustion shock sensor 1 Z_ks1	0 Stop light switch Z_brems 1 Clutch switch Z_kuppl 2 LL adjustment Z_llr 3 Speed signal Z_vfz 4 LL switch - 5 Tmot sensor Z_tm 6 Throttle potentiometer Z_dk 7 Air mass meter Z_lm	0 Free 1 Free 2 Free 3 Thermostat Z_thm 4 Free 5 GRA control lever Z_grbh 6 B2 oxygen sensor adaptation Z_frau2 7 B1 oxygen sensor adaptation Z_frau	



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089 OBD, Display in Master only			
km travelled with MIL kmstmil, 353 Nessuna visualizzazione nella versione US	Tank level B_tal, 372		
[km]	Text		
min: 0 max: 65535	ok too low		
Power increase			
090 Exhaust timing, Master, display in Master only			
Engine speed nmot, 1	Master pulsing rate tanwraa_w, 604	Master theoretical speed adjustment, wnwsa_w, 767	Master real speed adjustment, wnwa_w, 765
[1/min]	[%]	[°KW]	[°KW]
min: 500 max: 7200	min: 0 max: 100	min: - 22 max: 15	min: - 25 max: 18
091 Master intake timing, display in Master only			
Engine speed nmot, 1	Master pulsing rate tanwree_w, 569	Master theoretical speed adjustment wnwse_w, 763	Master real speed adjustment, wnwe_w, 761
[1/min]	[%]	[°KW]	[°KW]
min: 500 max: 7200	min: 0 max: 100	min: - 18 max: 20	min: - 21 max: 23
092 Slave intake timing, display in Slave only			
Engine speed nmot, 1	Slave pulsing rate tanwree_w, 569	Slave theoretical speed adjustment wnwse_w, 763	Slave real speed adjustment wnwe_w, 761
[1/min]	[%]	[°KW]	[°KW]
min: 500 max: 7200	min: 0 max: 100	min: - 18 max: 20	min: - 21 max: 23
093 Timing, adaptation values			
Master intake DN phase position dwnwspe_w, 181 Display in Master only	Slave intake DN phase position dwnwspe_w, 181 Display in Slave only	Master exhaust DN phase position dwnwspe_w, 733 Display in Master only	Slave exhaust DN phase position dwnwspe_w, 733 Display in Slave only
[°KW]	[°KW]	[°KW]	[°KW]
min: -7 max: 7	min: -7 max: 7	min: -7 max: 7	min: -7 max: 7



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094 Intake timing, short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: the rpm is automatically set at 2200 rpm → "Test ON" - Wait until "Syst. OK" is displayed in fields 3 and 4 			
Master real speed adjustment wnwe_w, 761 Display in Master only	Slave real speed adjustment wnwe_w, 761 Display in Slave only	Master result 140 Display in Master only	Slave result 140 Display in Slave only
[°KW]	[°KW]	Text	Text
min: -21 max: 23	min: -21 max: 23	Test ON Test OFF Syst. ok Syst. not ok	Test ON Test OFF Syst. ok Syst. not ok
095 Intake line switchover, Display in Master only			
Engine speed nmot, 1	Load rl, 2	Coolant temperature tmotlin, 80	Power supply line status B_su, 144
[1/min]	[%]	[°C]	Text
min: 500 max: 7200	min: 7 max: 100	min: 80 max: 115	SU-V OFF SU-V ON
096 Exhaust timing, short trip			
<ul style="list-style-type: none"> - Function 04 (default setting) - Start the short trip with the "Activation" button - Press the brake pedal and at the same time press the accelerator pedal to the floor: the rpm is automatically set at 2200 rpm → "Test ON" - Wait until "Syst. ok" is displayed in fields 3 and 4 			
Master real speed adjustment wnwa_w, 765 Display in Master only	Slave real speed adjustment wnwa_w, 765 Display in Slave only	Master result 619 Display in Master only	Slave result 619 Display in Slave only
[°KW]	[°KW]	Text	Text
min: -25 max: 18	min: -25 max: 18	Test ON Test OFF Syst. ok Syst. not ok	Test ON Test OFF Syst. ok Syst. not ok
097 Intake line / snow valve switchover, display in Master only, D3 only			
Engine speed nmot, 1	Load rl, 2	Coolant temperature tmotlin, 80	Switchover valve status B_lukl, 695
[1/min]	[%]	[°C]	Text
min: 500 max: 7200	min: 7 max: 100	min: 80 max: 115	on off



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098 Exhaust timing, Slave, display in Slave only			
Engine speed nmot, 1	Slave pulsing rate tanwraa_w, 604	Slave theoretical speed adjustment wnwsa_w, 767	Slave real speed adjustment wnwa_w, 765
[1/min]	[%]	[°KW]	[°KW]
min: 500 max: 7200	min: 0 max: 100	min: - 22 max: 15	min: - 25 max: 18
Compatibility blocks			
099 λ adjustment interruption (by default setting)			
Engine speed nmot, 1	Coolant temperature tmotlin, 80	Cylinder bank 1 / 3 oxygen sensor variator fr_w, 28	Cylinder bank 1 / 3 oxygen sensor varia- tor B_lr, 212
[1/min]	[°C]	[%]	Text
min: 500 max: 7200	min: 80 max: 115	min: - 15 max: 15	Reg. λ OFF Reg. λ ON
100 Readiness code			
Ready bit, 172 1=not ended 0=ended	Engine Temperature: tmotlin, 80	Time from engine start tnse_w, 1027	OBD status 142
0 Catalytic converter B_katrdy 1 Free 2 AKF system B_tesrdy 3 SL System B_slrdy 4 Free 5 Sensor λ aging B_lsrdy 6 Sensor λ heating B_hsrdy 7 Free	min: 80 max: 115	min: 0 max: 6528	0 No warm-up-cycle detected B_nowuc 1 Warm-up-cycle detected B_wuc 2 Free 3 Free 4 At least 1 error detected 5 Trip completed B_trip 6 Driving Cycle detected B_dcy 7 MIL on B_mil
Fuel injection			
101 Injection			
Engine speed nmot, 1	Load rl, 2	Injection time ti_l, 595	Air mass mshfm_w, 10
[1/min]	[%]	[ms]	[g/s]
min: 500 max: 7200 Idle values: min: 500 max: 800	min: 7 max: 100 Idle values: min: 12 max: 23	min: 0.5 max: 6.5 Idle values: min: 0.5 max: 1.5	min: 1.5 max: 400 Idle values: min: 1.5 max: 3.5



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102 Injection			
Engine speed nmot, 1	Coolant temperature tmotlin, 80	Intake air temperature tanslin, 85	Injection time ti_l, 595
[1/min]	[°C]	[°C]	[ms]
min: 500 max: 7200	min: 80 max: 115	min: Outside temperature max: 115	min: 0.5 max: 6.5
103 Fuel pump adjusted as needed, display in Master only			
- Function 04 (default setting) - Start the short trip with the "Activation" button - Wait until " ADP ok " is displayed in field 4			
Real fuel pressure pbkist_w, 1011	Fuel pressure regulator I pbksia_w, 1010	EKP adaptation value pbksadg_w, 1016	Fuel pump status 1021
[mbar]			Text
min: 4800 max: 6700			Test OFF ADP in progress ADP ok ERROR
104 Cranking adaptation values			
Engine cranking temperature tmst, 442	Cold cranking enrichment sector 0 ksta0, 432	Cold cranking enrichment sector 1 ksta1, 433	Cold cranking enrichment sector 2 ksta2, 434
[°C]	[%]	[%]	[%]
min: -48 max: 143	min: 0 max: 16	min: 0 max: 16	min: 0 max: 16
106 Fuel pumps, display in Master only			
Fuel Rail pressure prist_w, 500	EKP pulsing rate lepwnbks_w, 1690		Run-down time tabst_w, 892
[bar]	[%]		[s]
min: 20 max: 120			min: 0 max: 8160



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107 Fuel delivery system, short trip			
- Function 04 (default setting) - Start the short trip with the "Activation" button - Wait until " Syst. ok " is displayed in field 4			
Engine speed nmot, 1	Mean value cylinder bank 1 / 3 oxygen sensor regulator frm_w, 256	Mean value cylinder bank 2 / 4 oxygen sensor regulator frm2_w, 257	Result text, 213
[1/min]	[%]	[%]	Text
min: 500 max: 7200	min: -15 max: 15	min: -15 max: 15	Test ON Test OFF Syst. ok Syst. not ok
110 Load, full load enrichment			
Engine speed nmot, 1	Coolant temperature tmotlin, 80	Injection time ti_l, 595	Throttle angle (potentiometer) wdkba, 7
[1/min]	[°C]	[ms]	[%]
min: 500 max: 7200	min: 80 max: 115	min: 0.5 max: 6.5	min: 0 max: 100
112 Multi-cylinder bank system exhaust gas temperature			
Cylinder bank 1 exhaust gas temp. tabgm, 308	Cylinder bank 1 sensor enrichment factor frm_w, 256	Cylinder bank 2 exhaust gas temp. tabgm2, 309	Cylinder bank 2 sensor enrichment factor frm2_w, 257
[°C]	[%]	[°C]	[%]
113 Load			
Engine speed nmot, 1	Load rl, 2	Throttle angle (potentiometer) wdkba, 7	Ambient pressure pus_w, 151
[1/min]	[%]	[%]	[mbar]
min: 500 max: 7200	min: 7 max: 100	min: 0 max: 100	min: 500 max: 7200
Blocks of communication between the ECUs			
120 ASR / FDR			
Engine speed nmot, 1	ASR/FDR rated torque $mi\ n(miasrl_w, miasrs_w) * MDNORM$, 146	Engine torque $(miist-mdverl) * MDNORM$, 147	Status 148
[1/min]	[Nm]	[Nm]	Text
min: 500 max: 7200	min: 0 max: 700	min: 0 max: 540	ASR active ASR n.active



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122 Gearbox			
Engine speed nmot, 1	Rated gearbox torque migs_w, 145	Engine torque (miist mdverl)*MDNORM, 147	Status 149
[1/min]	[Nm]	[Nm]	Text
min: 500 max: 7200	min: 0 max: 700	min: 0 max: 540	Engine contr. interv. No contr. interv.
125 CAN-Bus messages			
Gearbox 219	ABS 218	Instrument panel 430	Air conditioning 548
Connections info	Connections info	Connections info	Connections info
- Gearbox 0 Gearbox 1	- ABS 0 ABS 1	- Panel 0 Panel 1	- Air conditioner 0 Air conditioner 1
126 CAN-Bus messages			
Distance 220	Steering angle sensor 221	Airbags 453	Elec. central unit 750
Connections info	Connections info	Connections info	Connections info
- Distance 0 Distance 1	- St. angle 0 St. angle 1	- Airbags 0 Airbags 1	- El. CU 0 El. CU 1
127 CAN-Bus messages			
		Steering wheel 760	
		Connections info	
		- Steering wheel 0 Steering wheel 1	
128 CAN-Bus messages			
Electric ignition switch 813			Engine control unit 827
Connections info			Connections info
- El. ign. sw. 0 El. ign. sw. 1			- Engine 1 Engine 0 Slave_Eins 1 Slave_Eins 0



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129 CAN-Bus messages			
Battery/energy manager 1164	TOG sensor (WIV) 1163	Gateway 1465	
Connections info	Connections info	Connections info	
- E-Manager 0 E-Manager 1	- Oil level 0 Oil level 1	- Gateway 0 Gateway 1	
Cooling			
130 Cooling according to typical diagram, display in Master only			
Coolant temperature tmotlin, 80		Thermostat pulsing rate tvkmtr, 478	
[°C]		[°C]	
min: 80 max: 115		min: Outside temperature max: 115	
131 Cooling according to typical diagram, display in Master only			
Coolant temperature tmotlin, 80	Rated speed coolant temperature tmotsoll, 479		Thermostat pulsing rate tvkmtr, 478
[°C]	[°C]		[%]
min: 80 max: 115	min: 80 max: 115		min: 0 max: 100
132 Cooling, display in Master only			
		Heating potentiometer uhepoti, 597	Cooling status 598
		[%]	0 No error in system B_kmtre 1 Thermostat control active tvkmtr 2 Fan control active tvlues1 3 Adjusted deviation dkmts>0 4 Fan 2 level active B_lues2 5 Fan 1 level active B_lues1 6 Free 7 Coded B_hlon



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134 Temperatures			
Oil temperature instrument panel tolc, 554	Ambient temperature instrument panel tumc, 555	Intake air temperature: tanslin, 85	Coolant temperature tmotlin, 80
[°C]	[°C]	[°C]	[°C]
min: 0 max: 150	min: - 40 max: 60	min: Outside temperature max: 115	min: 80 max: 115
135 Fan control, display in Master only			
	Fan 1 control pulsing rate tvlues1, 476	Fan 2 control pulsing rate tvlues2, 477	
	[%]	[%]	
	min: 0 max: 100	min: 0 max: 100	
136 Fan control relays			
		Extra water pump B_zwp, 629 Display in Master only	Fan coasting B_nlscls, 481 Display in Master only
		[Text]	[Text]
		Pump ON Pump OFF	On Off
137 Air conditioning requirements			
Air conditioning availability B_nac, 131	Air conditioner compressor B_koe, 132	Air conditioning system pressure pkodrc, 417	Air conditioning system fan request tvluessc, 630
Text	Text	[bar]	[%]
A/C-Low A/C-High	Compr. ON compr: OFF	min: 0 max: 40	min: 0 max: 100
138 Thermostat diagnosis (short trip cannot be made) (Display in US version only)			
Engine cranking temperature tmst, 442	Mean engine air mass mlmdthm, 1049	Mean engine speed vfmtdthm, 1050	Result 1053
[°C]	[g/s]	[km/h]	Text
			Test ON Test OFF Syst. ok Syst. not ok Breakage



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139 Thermostat diagnosis (short trip cannot be made) (Display in US version only)			
Engine temperature when diagnosed m6wthm_w, 1064	Real air mass integral dimlezthm, 1066	Rated air mass integral simlezthm, 1065	Result 1053
[°C]	[kg]	[kg]	Text
			Test ON Test OFF Syst. ok Syst. not ok Breakage
Direct injection			
140 Flow control valve (MSV) high-pressure injection pump			
Using the function "04" , the delivery control valve is disabled and the Rail pressure is lowered to a low pressure level (for repairs on the fuel system)			
Flow control valve closing angle dwmsvs_w, 1005	Rated Rail pressure prsol_w, 501	Real Rail pressure prist, 500	Flow control valve status B_msvoff, 1689
[°KW]	[bar]	[bar]	
min: 0 max: 220	min: 25 max: 110 Idle value: 25	min: 25 max: 120	deactivated B_msvoff active B_msvact
141 Fuel delivery system			
High pressure system adaptation prdr_w, 516	Rail pressure regulator hdrrrf_w, 517		Rail pressure system status dkvbde_s, 519
[bar]	[mm²]		
142 Load handling valve (LBK), short trip adaptation, cylinder bank 1 / Master			
<ul style="list-style-type: none"> - Engine at idle conditions - Function 04 (default setting) - Start the short trip with the "Activation" button - Wait until "ADP ok" is displayed in field 4 			
Real position load handling valve, Master lbkistr_w, 1765	Theoretical position load handling valve lbksol_w, 513	Potentiometer voltage offset value, Master ulbkoffs_w, 511	Adaptation status, Master 514
[%]	[%]	[V]	Text
min: 0 max: 100	min: 0 max: 100	min: 0.3 max: 1.5	- ERROR locked ADP. ok ADP. in progress



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143 Direct injection mode			
			Direct injection mode bdemod_w,503
			0 homog., oxy. sensor = 1 1 homogeneous, pour 2 homogeneous / layer 3 Layer 4 Layer / cat. Conv. Heat. 5 Free 6 Free 7 Combustion shock protection
144 Load handling valve (LBK), short trip adaptation, cylinder bank 2 / Slave			
<ul style="list-style-type: none"> - Engine at idle conditions - Function 04 (default setting) - Start the short trip with the "Activation" button - Wait until "ADP ok" is displayed in field 4 			
Real position load handling valve - Cylinder bank 2 lbkistr2_w, 1766	Theoretical position load handling valve lbksol_w, 513	Potentiometer voltage offset value, cylinder bank 2 ulbkofs2_w, 1764	Adaptation status 1710
[%]	[%]	[V]	Text
min: 0 max: 100	min: 0 max: 100	min: 3.5 max: 4.7	- ERROR locked ADP. ok ADP. in progress
Starter control			
170 Starter control, display in Master only			
Starter request terminal 50 B_kl50pl, 1422	Complementary measurement line cl. 50 R B_kl50r, 1425	Starter relay 1 B_stst1, 1423	Starter relay 2 B_stst2, 1424
Text	Text	Text	Text
off on	off on	off on	off on
171 Starter control, display in Master only			
	Interlock switch S_pnkp, 1427		
	Text		
	off on		



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33 Standard diagnostic

The “Standard diagnostic” function is used for the engine injection control units only:

- 01 MASTER
- 11 SLAVE

To access the function, follow these directions:

- Turn the ignition key to ON.
- Connect the computer to the diagnosis outlet OBDII
- Select the control unit to be checked “Engine electronics I” (A-Fig.27) and start the connection ().

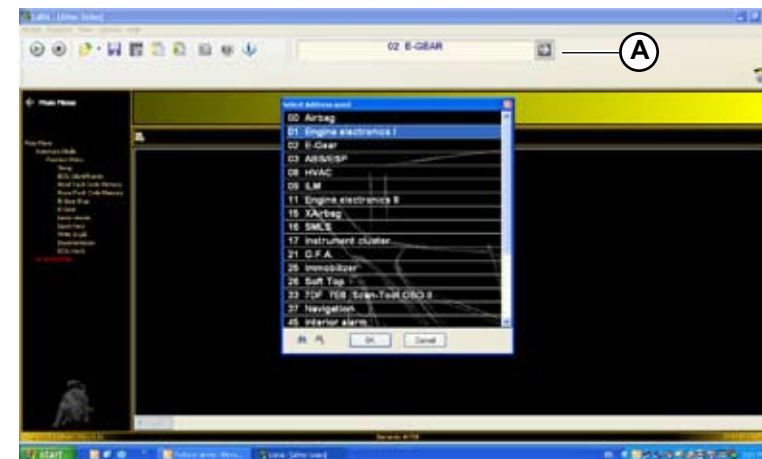


Fig.27

- Select “33 Standard diagnostic” (A-Fig.28).

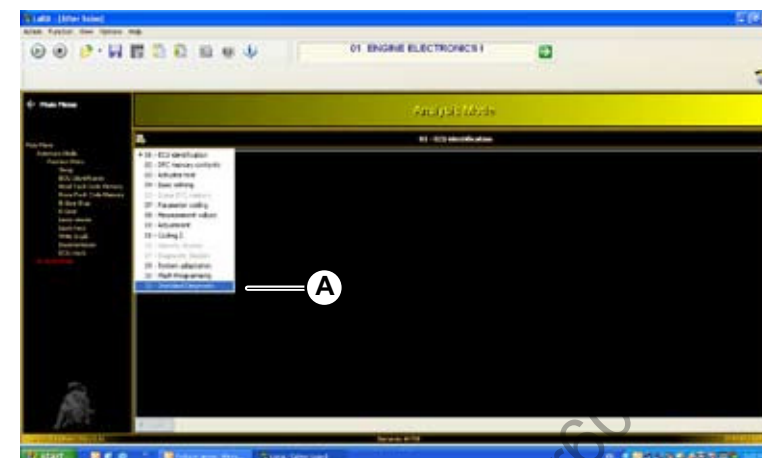


Fig.28



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The “Standard diagnostic” function displays any error codes, the software version and its value ranges (**Fig.29**).

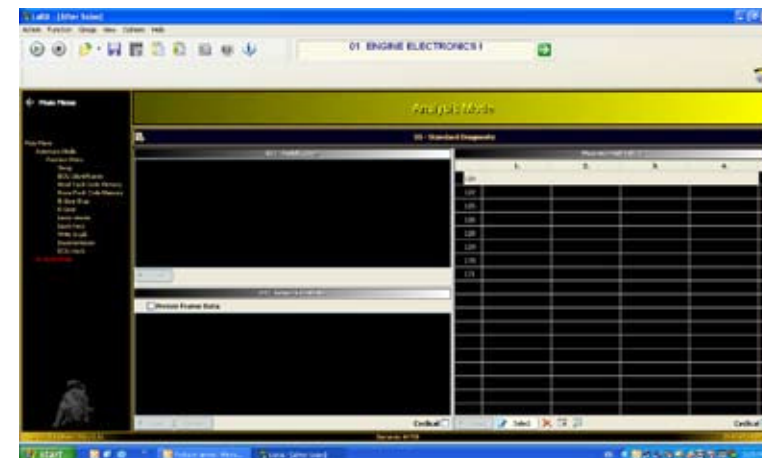


Fig.29

The value ranges can be displayed in detail (**A-Fig.30**) by selecting the various specific groups (**B-Fig.30**):

2. General
3. Misfire
4. Knocking sensor
5. Lambda oxygen sensor
6. rpm adjustment
7. Throttle body control
8. Exhaust noise reduction valve
9. Special MWB
10. Variable valve timing
11. Compatibility
12. Direct Fuel injection IDS
13. Torque request
14. CAN communication
15. Cooling
16. Starter control

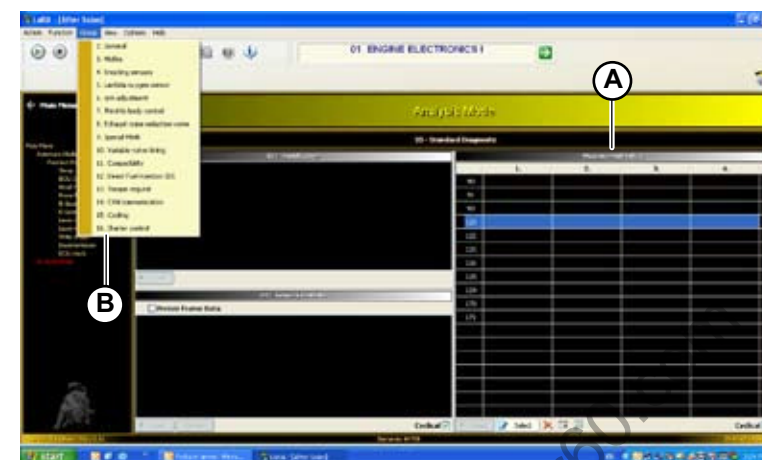


Fig.30



Note

The displays are divided on the specific cylinder bank: It is therefore NOT possible to check both control units at the same time (each has its inputs and specific values). Therefore, simultaneous display is NO longer possible today.



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“2 General”

Group “2 General” (**Fig.31**) displays various parameters: from mbw 1 to 9 with the precise specification and their exact correspondence.



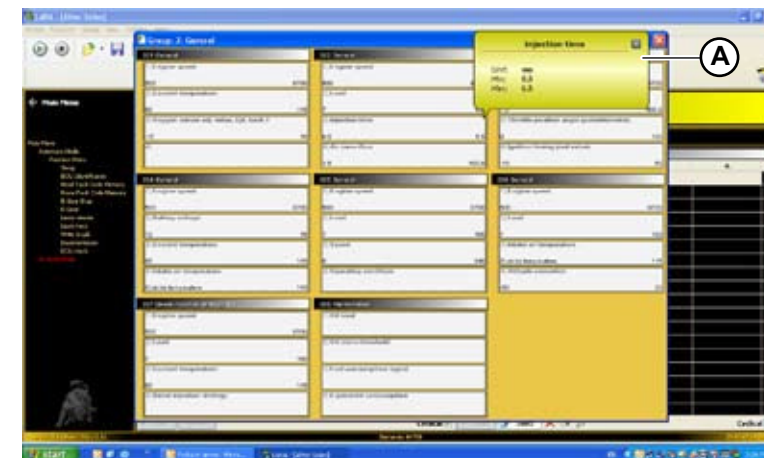
Note

Additional information can be seen when the specific box is selected: measurement unit, operation range...

(A-Fig.31)

This feature is enables for all windows of the groups.

MASTER



SLAVE

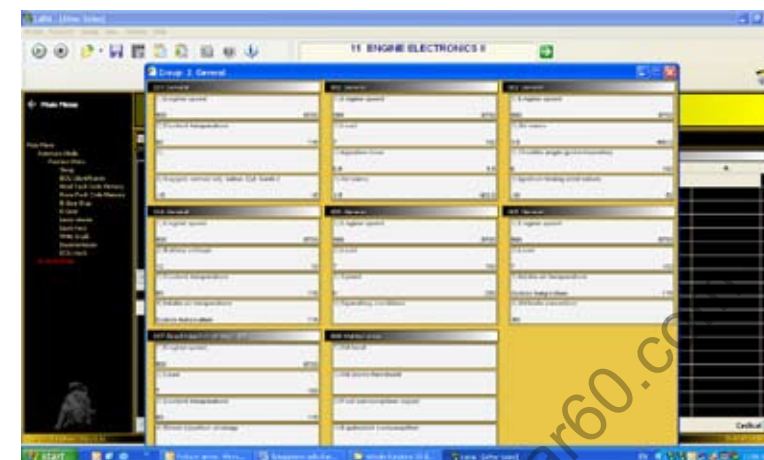


Fig.31



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“3 Misfire”

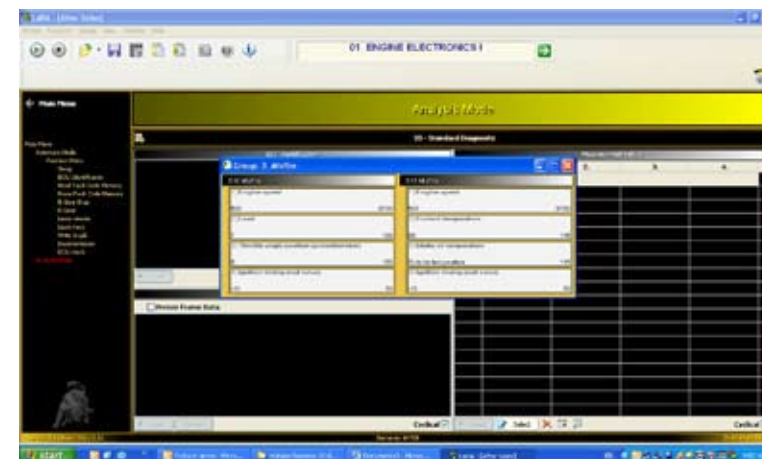
The “3 Misfire” group (**Fig.32**) displays the misfiring counters and relevant connected parameters.



Note

This function is enabled only for the SLAVE control unit, whereas the parameters of the “2 General” group are displayed for the MASTER control unit.

MASTER



SLAVE

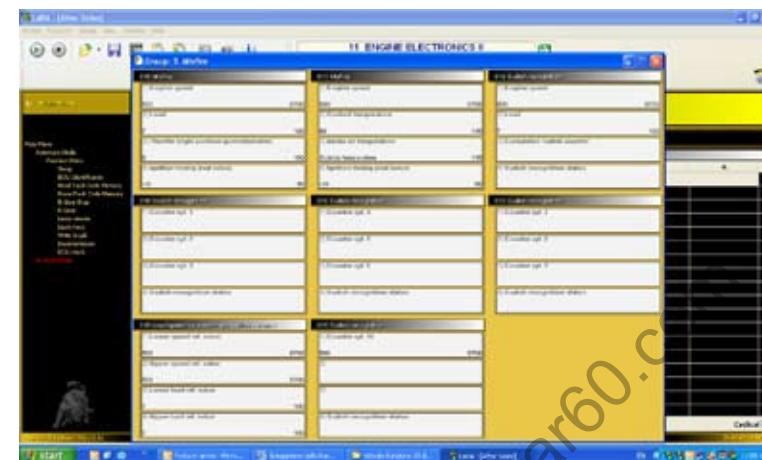


Fig.32



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“4 Knocking sensor”

The “4 Knocking sensor” group (**Fig.33**) displays the parameters of the mb values regarding the knocking sensors and various counters.

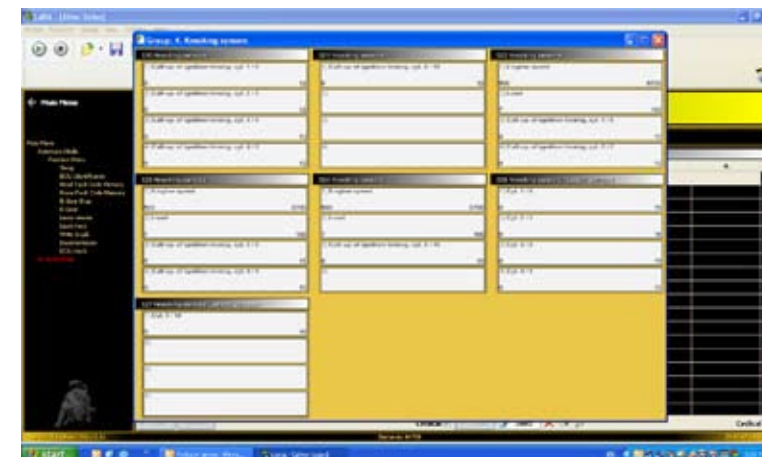


Note

The parameters displayed in this group are activated during engine running, and if an anomalous knocking occurs.

In the case of error, it is therefore necessary to check the parameters in this special window.

MASTER



SLAVE

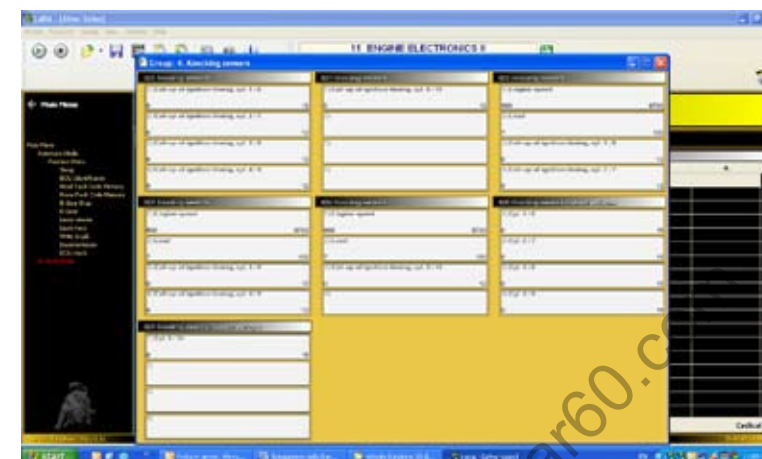


Fig.33



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“5 Lambda oxygen sensor”

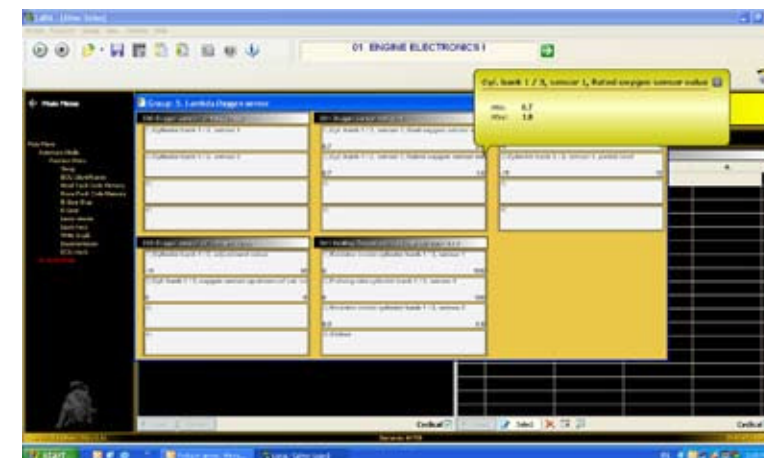
The “5 Lambda oxygen sensor” group (**Fig.34**) displays all mb values regarding the pre and post-catalyst oxygen sensors.



Note

If there are oxygen sensor failures, use this special window.

MASTER



SLAVE

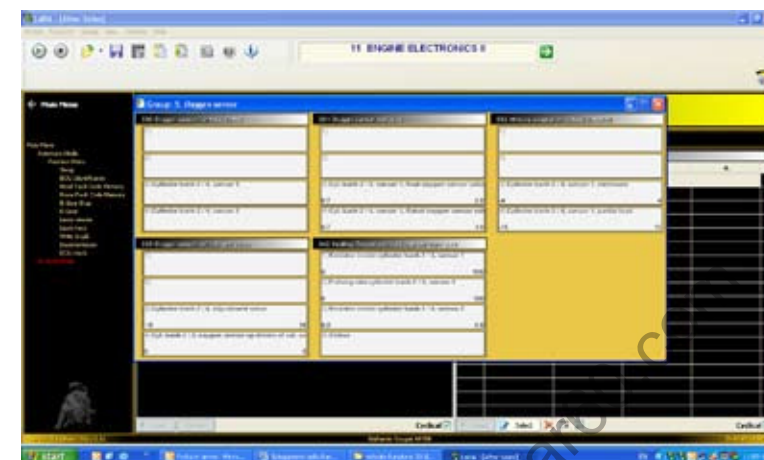


Fig.34



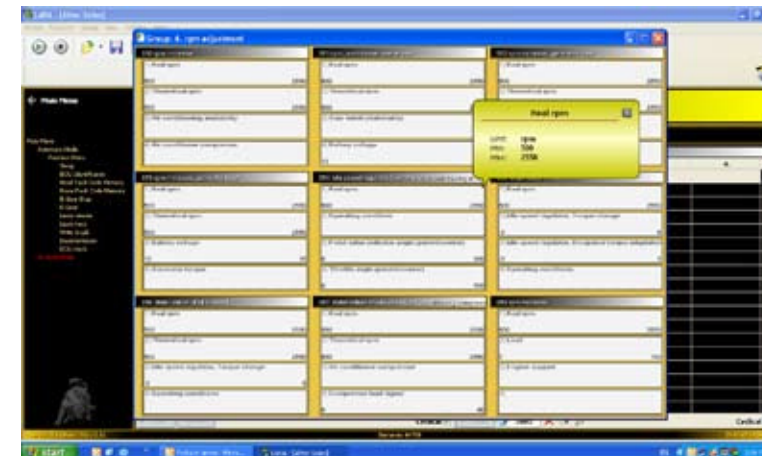
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“6 rpm adjustment”

The “6 rpm adjustment” group (**Fig.35**) displays the mb values concerning engine rpm and spark advance adjustment if accessories are activated.

MASTER



SLAVE

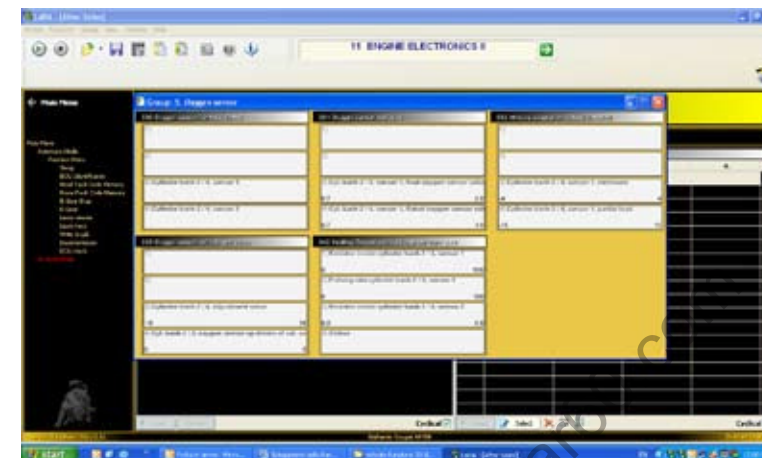


Fig.35



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“7 Throttle body control”

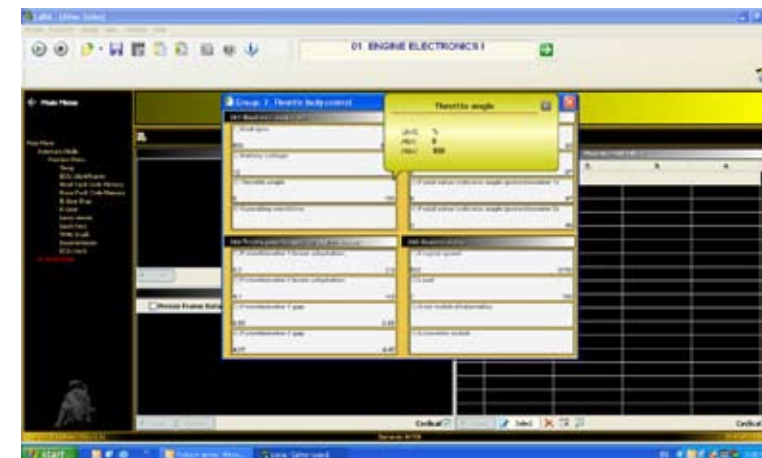
The “7 Throttle body control” group (**Fig.36**) displays the specific parameters of the throttle bodies and the adjustments required by the potentiometer of the accelerator pedal.



Note

Consult this specific window for any errors associated with the throttle bodies.

MASTER



SLAVE

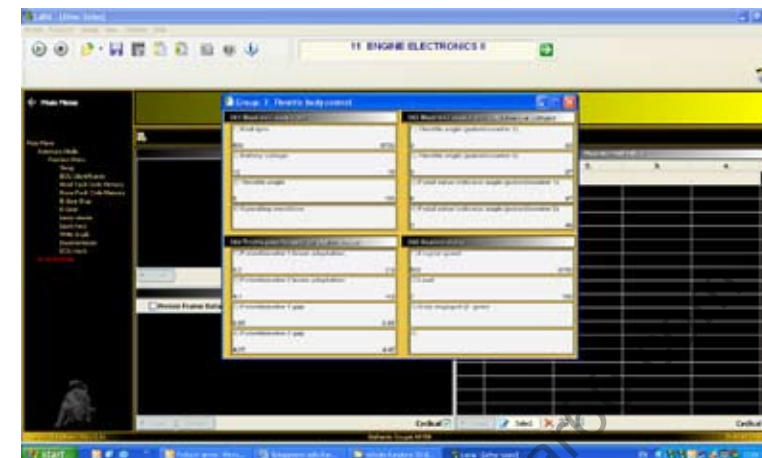


Fig.36



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“8 Exhaust noise reduction valve”

The “8 Exhaust noise reduction valve” group (**Fig.37**) displays the condition of the exhaust valve and the engine torque and rpm.



Note

This function is only active on the MASTER control unit.
Consult this specific window for any exhaust valve problems.

MASTER

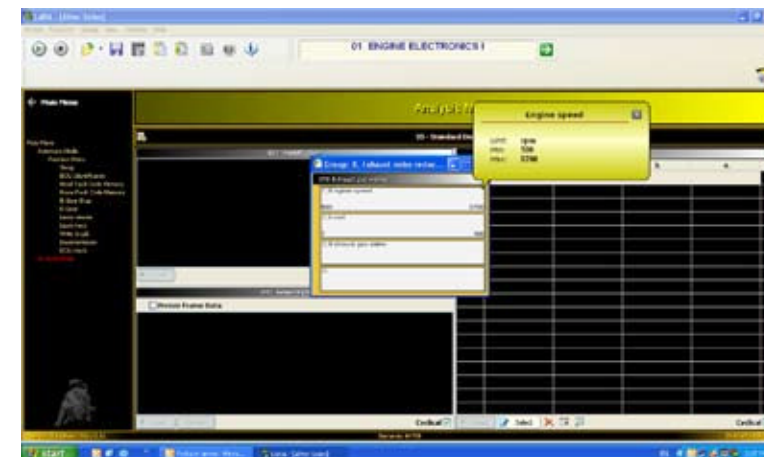


Fig.37



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“9 Special MWB”

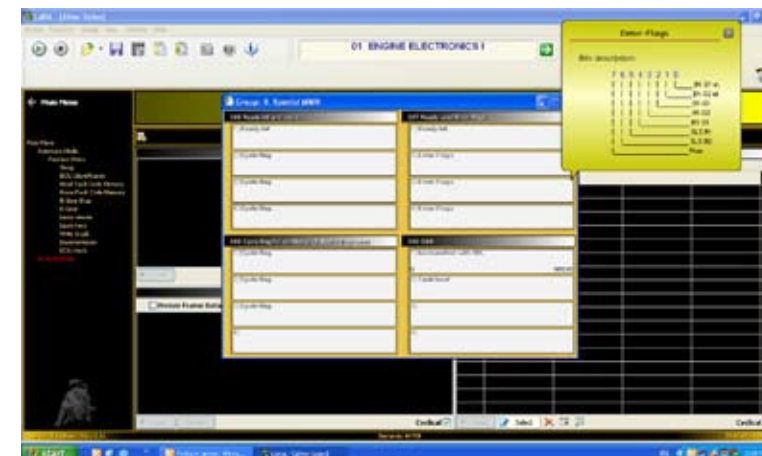
The “9 Special MWB” group (**Fig.38**) displays specific mb values with bit reading.



Note

These parameters can be requested by Lamborghini and analyzed in-house in special cases. They are of NO use during routine maintenance.

MASTER



SLAVE

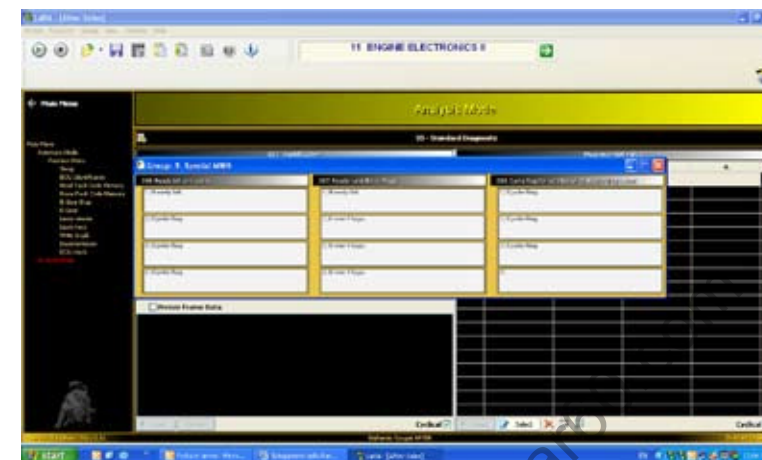


Fig.38



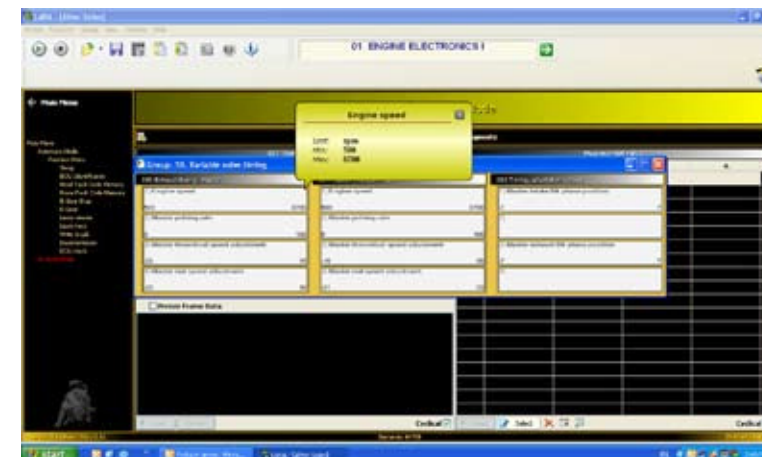
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“10 Variable valve timing”

The “10 Variable valve timing” group (**Fig.39**) indicates the parameters regarding the valve timing and its range of operation.

MASTER



SLAVE

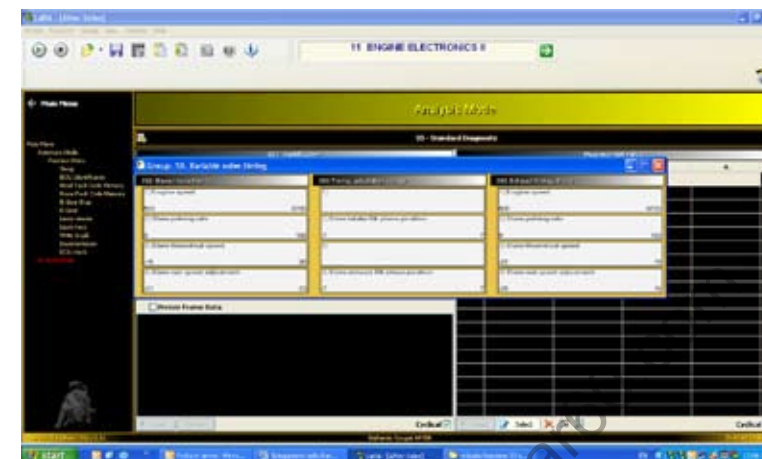


Fig.39



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“11 Compatibility”

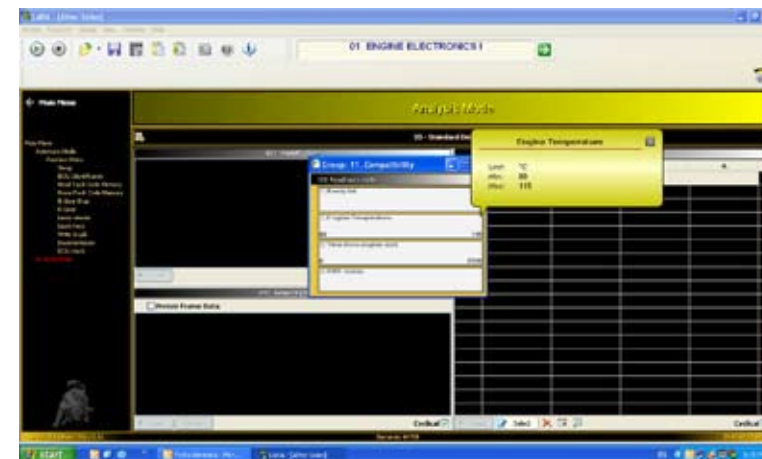
The “11 Compatibility” group (**Fig.40**) displays specific channels for internal Lamborghini use.



Note

These parameters can be requested by Lamborghini and analyzed in-house in special cases. They are of NO use during routine maintenance.

MASTER



SLAVE

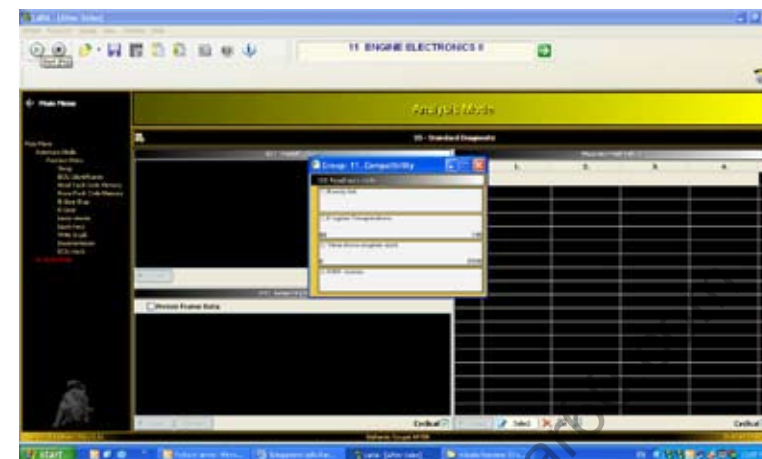


Fig.40



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“12 Direct Fuel injection IDS”

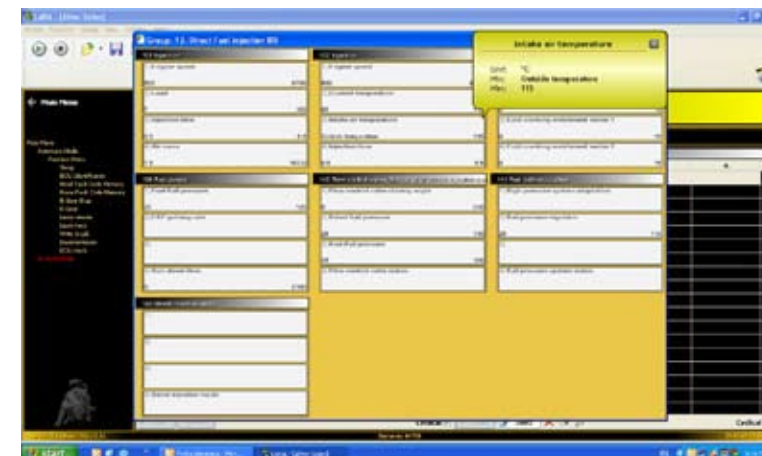
The “12 Direct Fuel Injection DIS” group (**Fig.41**) indicates the parameters regarding the injection system and the high and low pressure system.



Note

For any problems with the high and low pressure system, consult this specific window.

MASTER



SLAVE

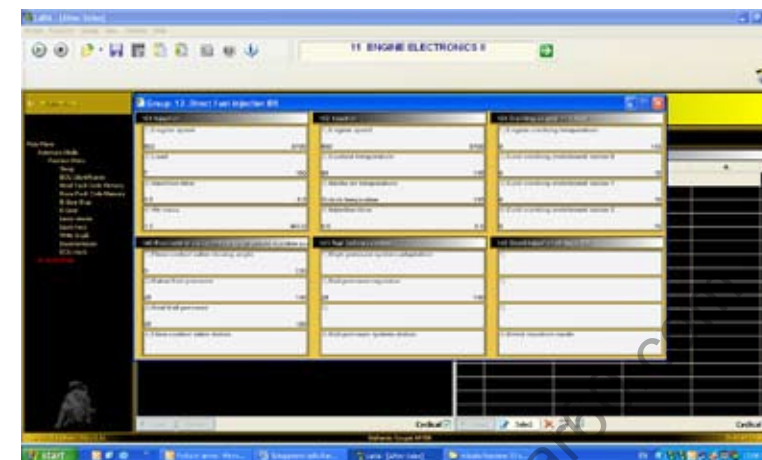


Fig.41



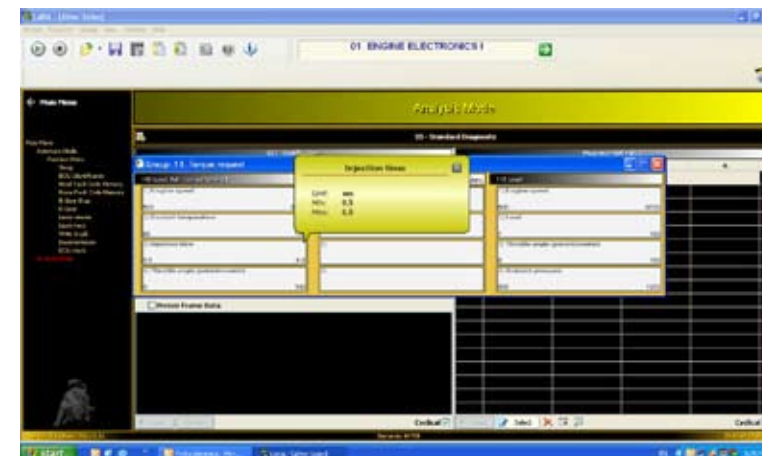
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“13 Torque request”

The “13 Torque request” group (**Fig.42**) indicates the injection times and displays the parameters associated with them so they can be changed.

MASTER



SLAVE

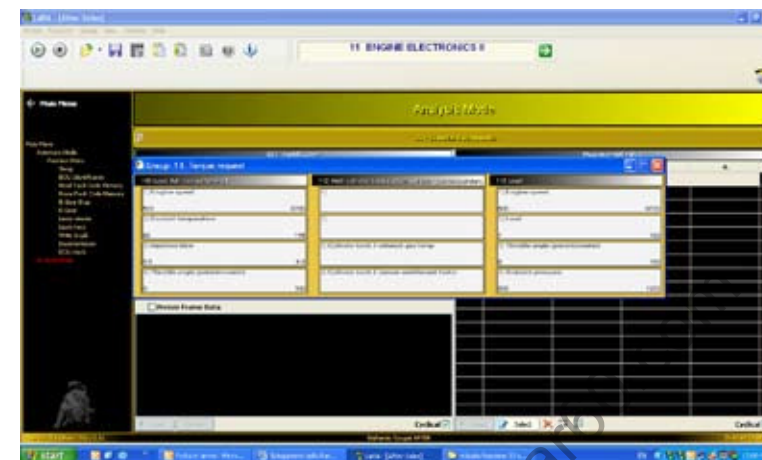


Fig.42

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The “14 CAN communication” group (**Fig.43**) indicates the statuses of the various control units and their can lines that interact with the engine injection control units.

Note

Consult this specific window for any problems associated with the CAN.

Fig.43



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“15 Cooling”

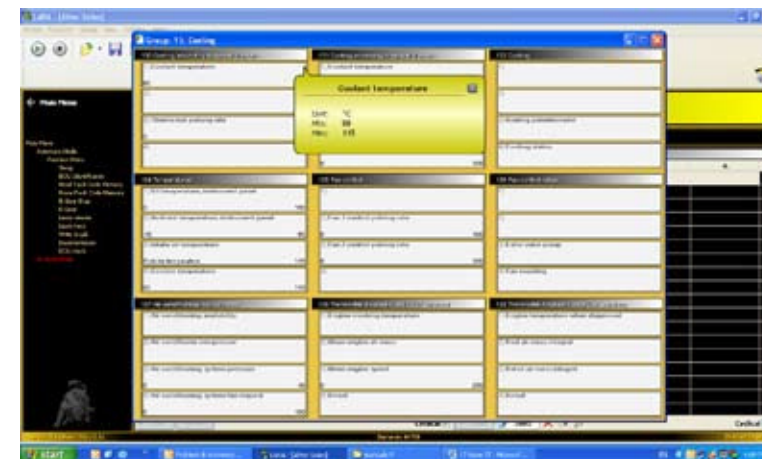
The “15 Cooling” group (**Fig.44**) displays the parameters of the fans with the various temperatures.



Note

For any problems connected to water temperature, air conditioning system and fan operation, consult this specific window.

MASTER



SLAVE

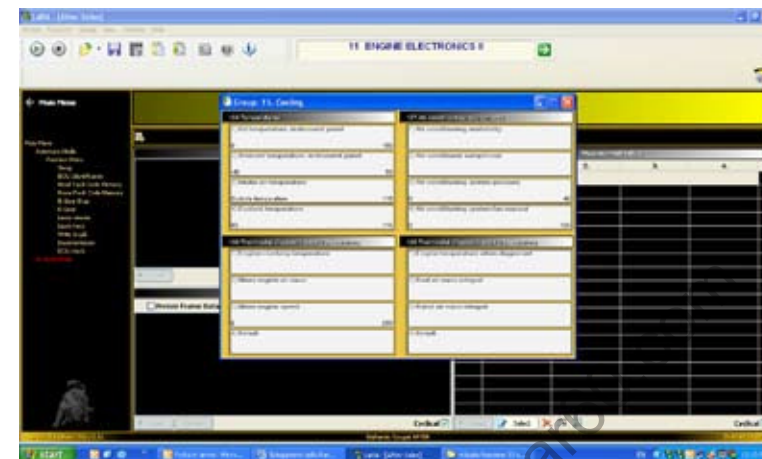


Fig.44



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“16 Starter control”

The “16 Starter control” group (**Fig.45**) indicates the activation conditions of the various relays concerning engine startup.



Note

This function is only active on the MASTER control unit.

MASTER

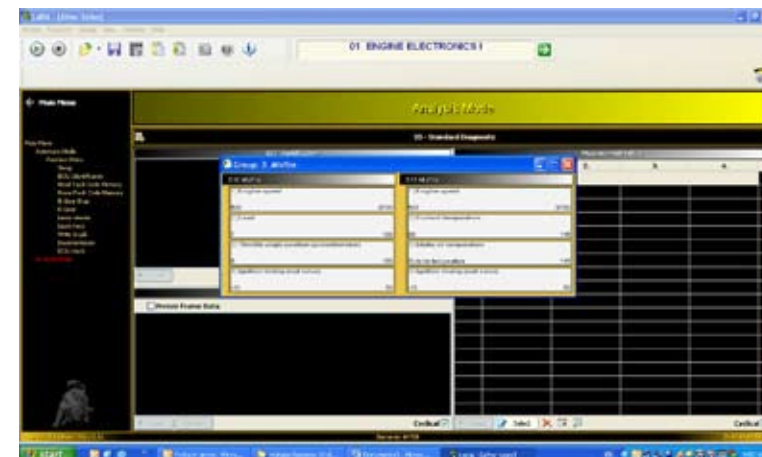


Fig.45



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AUTOMATIC MODE

To gain access to the “Automatic mode” function, the software has to read the VIN written on the Combi instrument cluster.



Note

If the Combi instrument cluster is new, the VIN has to be written no longer by means of the LaRa-AS, but through the VAS-PC software (**109200**).

- Select the “Gallardo Coupè MY09” vehicle (**Fig.46**).
- Turn the key ON

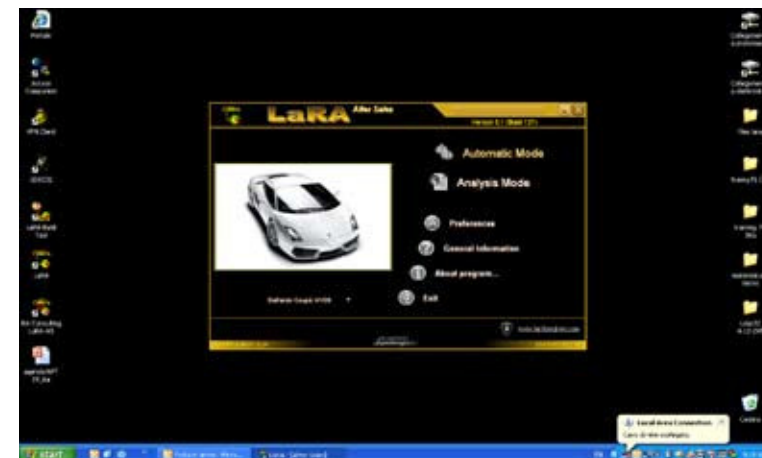


Fig.46

- Select “Automatic mode” (**Fig.47**)



Fig.47



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- In automatic mode, the system automatically reads the vehicle's VIN that is displayed in the field (A-Fig.48)
- click NEXT (B-Fig.48) to gain access to the automatic setting functions.



Fig.48

Menu functions

The following functions are enabled in the “Menu functions” window (Fig.49):

Setup	a window appears from where it is possible to automatically program replaced control units with the original vehicle data. This function needs to be enabled by the zip file.	DISABLED
ECU identification	identifies the software, year of production and the Coding (country of destination of the car) for every control unit on board the vehicle	ENABLED
E.Gear Snap	the E-gear parameters can be read in automatic mode	ENABLED
ECU Check	checks the hardware and software of the ECUs against the Lamborghini database	DISABLED
Read Fault code Memory	used while checks are being run on the vehicle to verify and print any errors found	ENABLED
Learn remote	allows automatic synchronisation of replaced remote controls	ENABLED
Erase Fault Code Memory	automatically deletes errors in the memory	ENABLED
Documentation	automatically compiles a vehicle file when the vehicle arrives at the dealer and then receives the correct vehicle file with all of the automatic functions enabled	ENABLED

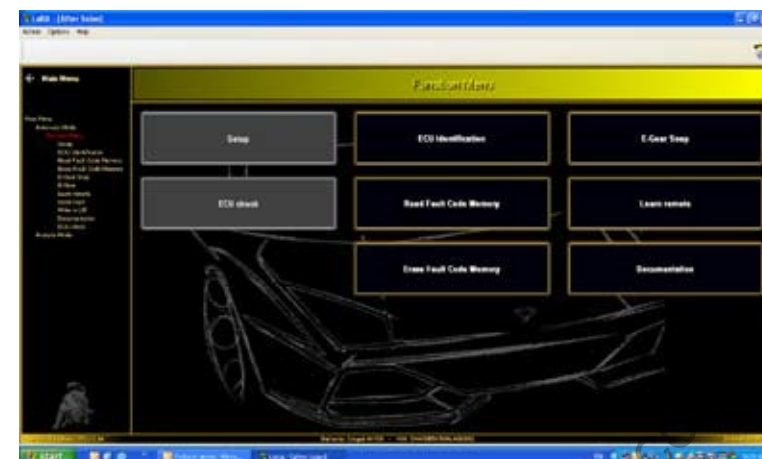


Fig.49



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The disabled SETUP and ECU CHECK windows (highlighted in grey) will become enabled only after the "Documentation" function is completed; click "Documentation" (**A-Fig.50**).

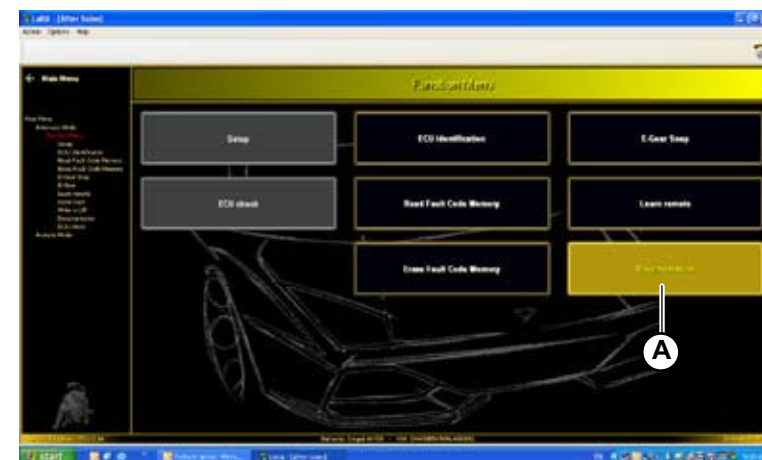


Fig.50

Wait for the system to complete the ECU reading procedure (**Fig.51**).



Fig.51



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When the reading is finished, the system requests authorisation to connect to the Lamborghini website via Internet connection (**Fig.52**).



Note

Connection can be made later by clicking “No” (**A-Fig.52**).

It is important to remember that the file created in any case remains valid for two days, whereas the one received has a seven-day validity (with vehicle specifications).



Fig.52

If the connection is not accepted, you can gain access later by clicking “Action” (**A-Fig.53**) and then selecting “Upload” (**B-Fig.53**). The system connects to the Lamborghini website and the software is opened even if the vehicle is disconnected.



Fig.53



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To establish a connection with the Lamborghini site, an enabled token is necessary, without which the system will not work.



Note

Uploading can only be done via Internet, in observance of the system's minimum requirements recommended by Lamborghini, and provided that this information is sent in time, no later than two days after the file is created.

After connecting to the Lamborghini site, the token's "Username" and "Password" must be entered (**A-Fig.54**).

Press "OK" (**B-Fig.54**) to start uploading the zip file.



Fig.54

When uploading of the correct vehicle file has finished, click "Close" (**A-Fig.55**) to disconnect from the Internet.

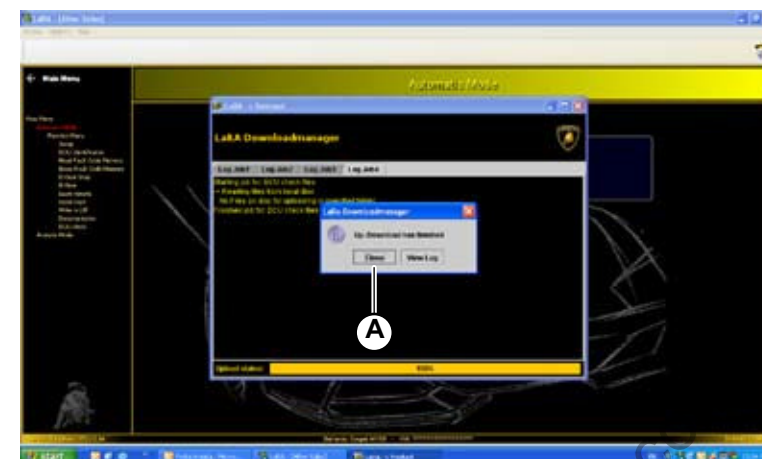


Fig.55



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The system will automatically unzip the file received and all the windows are enabled when the program is reopened (**Fig.56**) (they stay enabled for seven days).

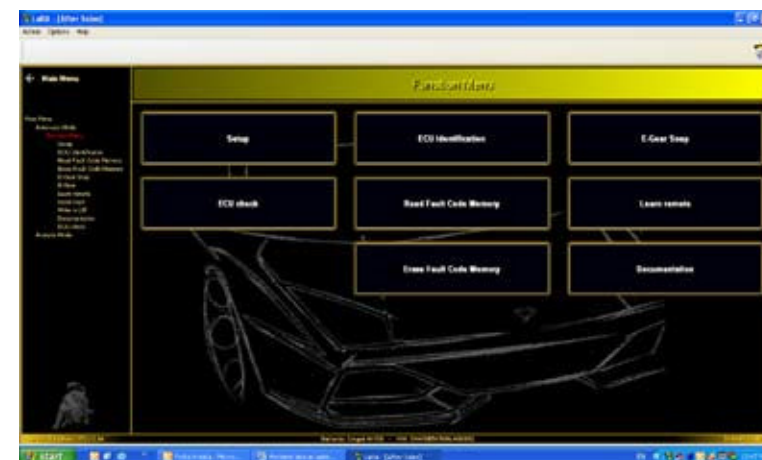


Fig.56

Set Up

The automatic setup system is enabled only after the zip file for the vehicle being tested becomes available. The zip file makes it possible to automatically write coding and carry out basic control unit settings in case of replacement.

The screen shows the list of ECUs in the vehicle (to be set when they are replaced).

To set up the AIR BAG control unit, select the relative field and click **“Set Up” (A-Fig.57)**; the control unit will be programmed automatically.



A

Fig.57

www.car60.com



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When setup has been completed, the green tick **(A-Fig.58)** indicates that the operation has been carried out successfully.

To set up the ENGINE control units (if one or both are replaced), select the relative fields and click “**Set Up**” **(A-Fig.59)**; the control unit will be programmed automatically, writing the coding that identifies the type of gearbox (e-gear or manual).



Note

The engine control units can be setup at the same time or individually.



Fig.58



Fig.59



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When setup has been completed, the green tick (A-Fig.60) indicates that the operation has been carried out successfully.



Fig.60

To set up the E-GEAR control units, select the relative field and click “Set Up” (A-Fig.61); the control unit will be programmed automatically, writing the country of use coding for OBDII codes.

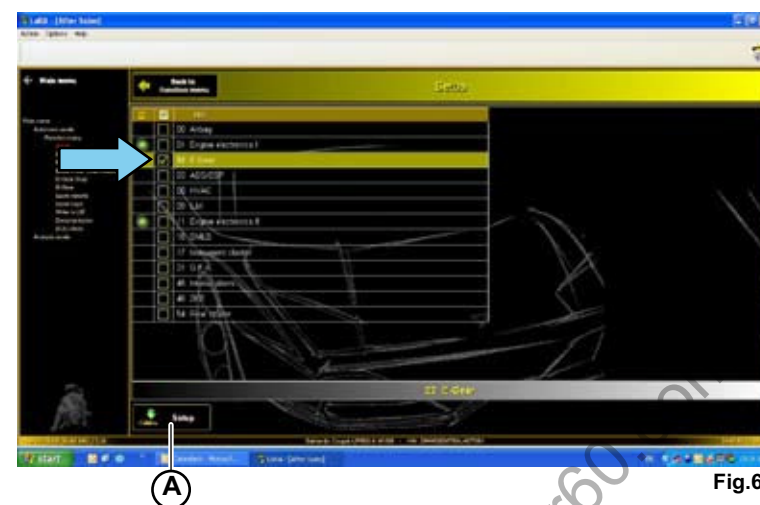


Fig.61



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When setup has been completed, the green tick (A-Fig.62) indicates that the operation has been carried out successfully.



Fig.62

To set up the ABS/ESP control units, select the relative field and click “Set Up” (A-Fig.63); the control unit setup includes writing the coding to identify the type of gearbox (manual or automatic) and the type of brakes (steel or carboceramic), as well as the basic settings for the steering sensor on the SMLS control unit and the yaw rate sensor (YRATE).

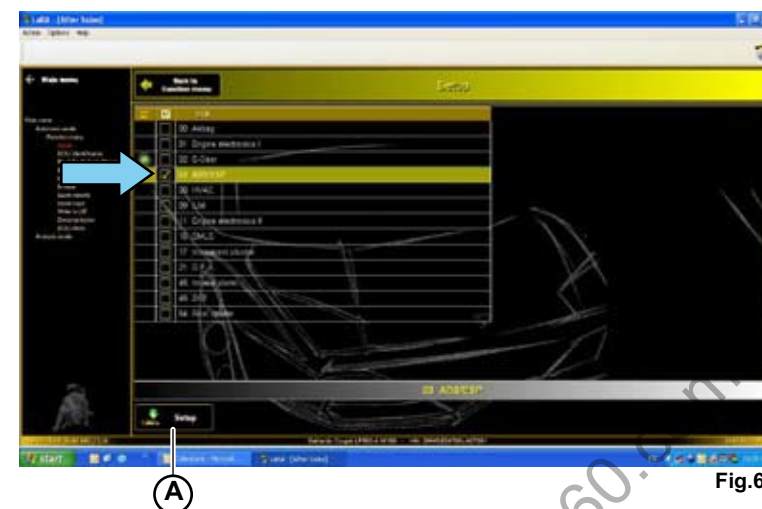


Fig.63



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The setup wizard for the ABS/ESP control units is the following:

- Turn the steering wheel 90° right and left, then press OK (**A-Fig.64**).

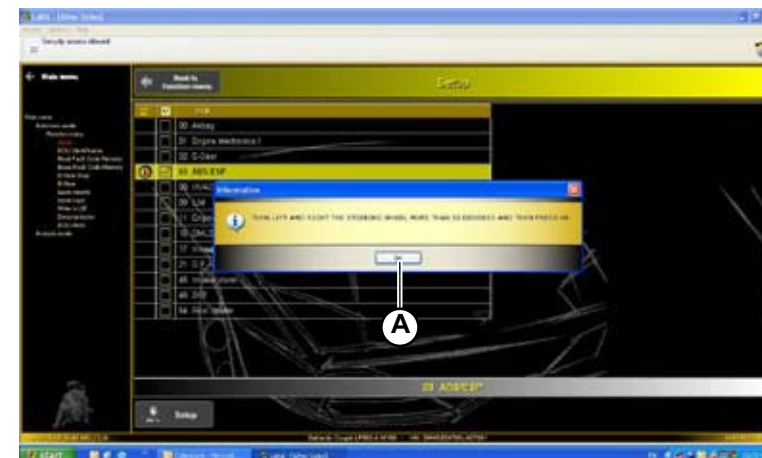


Fig.64

- Wait for the system to process the subsequent screen. Do not press anything (**Fig.65**).

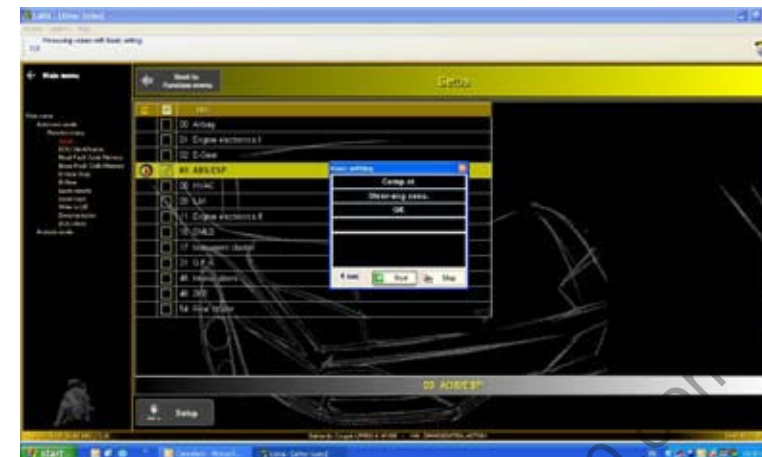


Fig.65



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- Press YES (**C-Fig.66**) to continue.

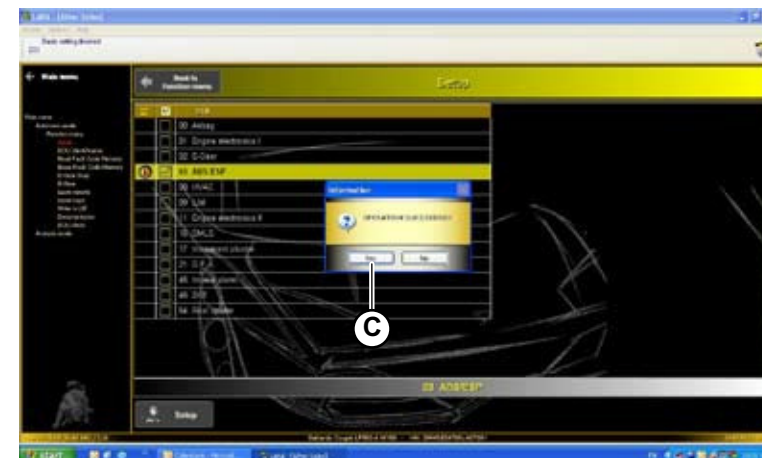


Fig.66

- Check the vehicle is horizontal and press OK (**D-Fig.67**) to continue.

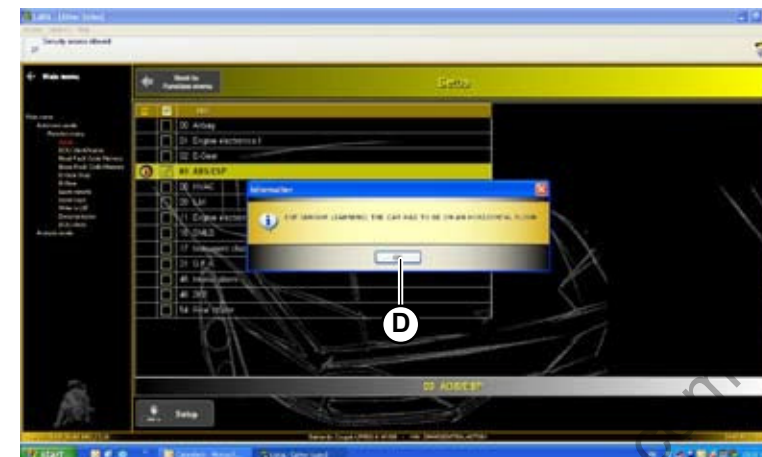


Fig.67



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- Wait for the system to process the subsequent screen. Do not press anything (**Fig.68**).

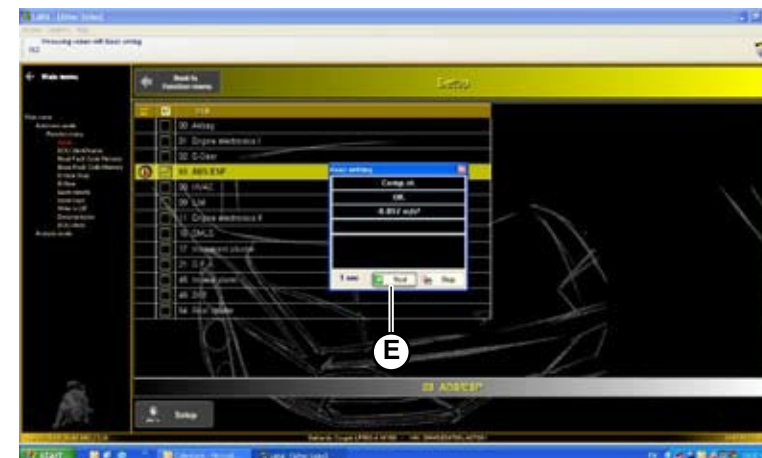


Fig.68

- Press YES (**F-Fig.69**) to end the setup procedure: The green tick indicates that the operation has been carried out successfully.

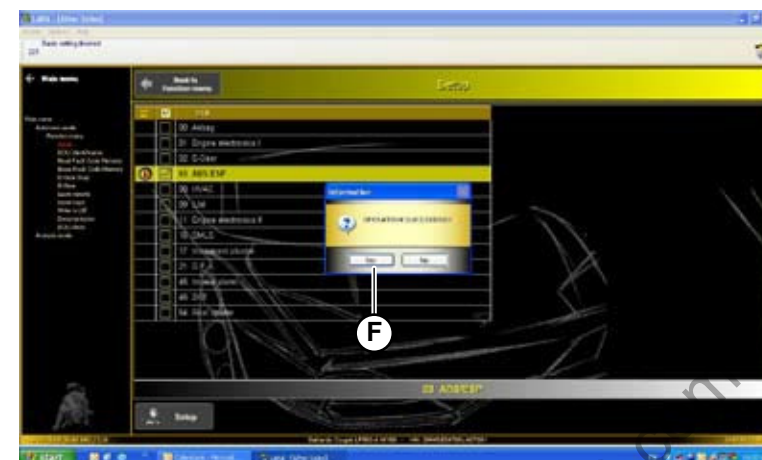


Fig.69



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To set up the AIR CONDITIONER control unit, select the relative field and click **“Set Up” (A-Fig.70)**.



Fig.70

Press OK (A-Fig.71) when requested, the control unit setup will start automatically, writing the coding and basic flap settings.

When setup has been completed, the green tick indicates that the operation has been carried out successfully.

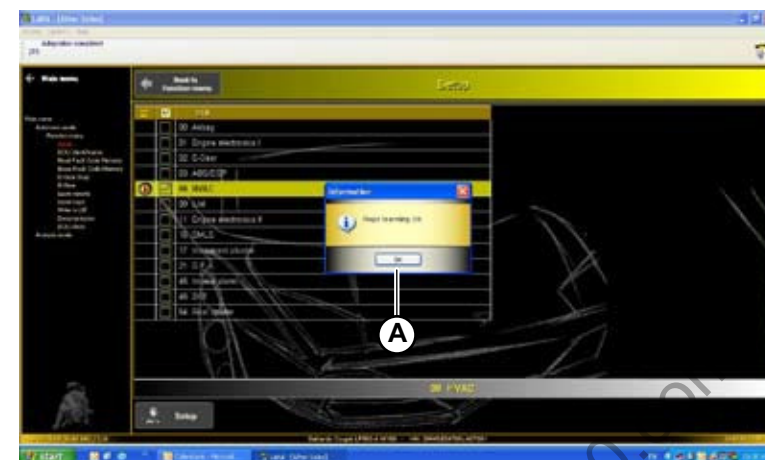


Fig.71



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To set up the ILM control unit, select the relative field and click **“Set Up” (A-Fig.72)**.

The control unit setup will start automatically, writing the coding for the country of use in terms of the use of the lights.



A

Fig.72

When setup has been completed, the green tick (A-Fig.73) indicates that the operation has been carried out successfully.



A

Fig.73

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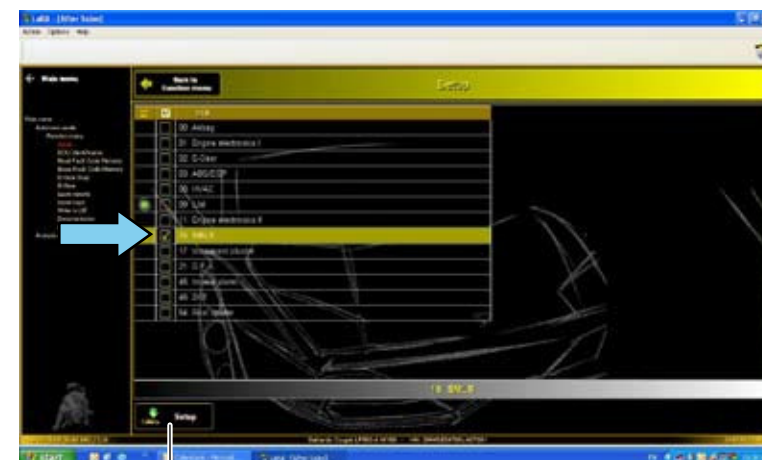


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To set up the SMLS control unit, select the relative field and click **“Set Up” (A-Fig.74)**.

The control unit setup will start automatically, writing the coding for indicator switch to identify the gearbox (automatic or manual).



(A)

Fig.74

When setup has been completed, the green tick (A-Fig.75) indicates that the operation has been carried out successfully.



(A)

Fig.75

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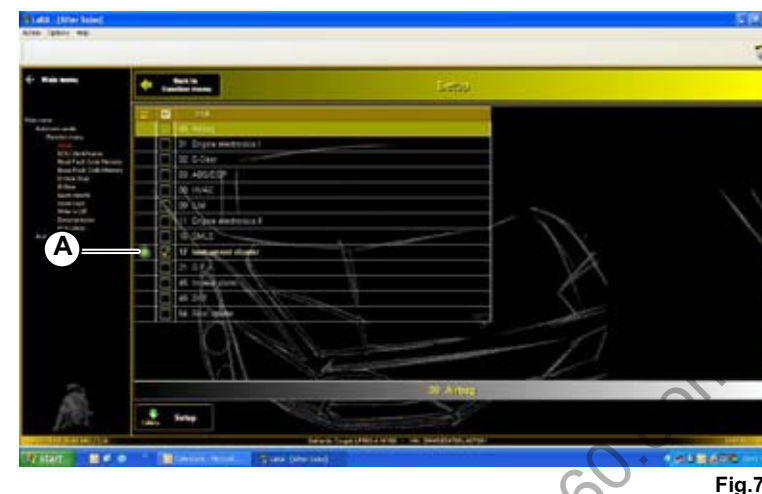
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To set up the INSTRUMENT CLUSTER control unit, select the relative field and click **“Set Up” (A-Fig.76)**.

The control unit setup will start automatically, writing the coding for the instrument cluster in terms of onboard accessories (computer, navigation system, etc.) depending on the country of destination and the type of gearbox.



When setup has been completed, the green tick (A-Fig.77) indicates that the operation has been carried out successfully.





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To set up the GFA control unit, select the relative field and click **“Set Up” (A-Fig.78)**.

The control unit setup will start automatically; the writing of the coding will depend on the presence of the lifting system.

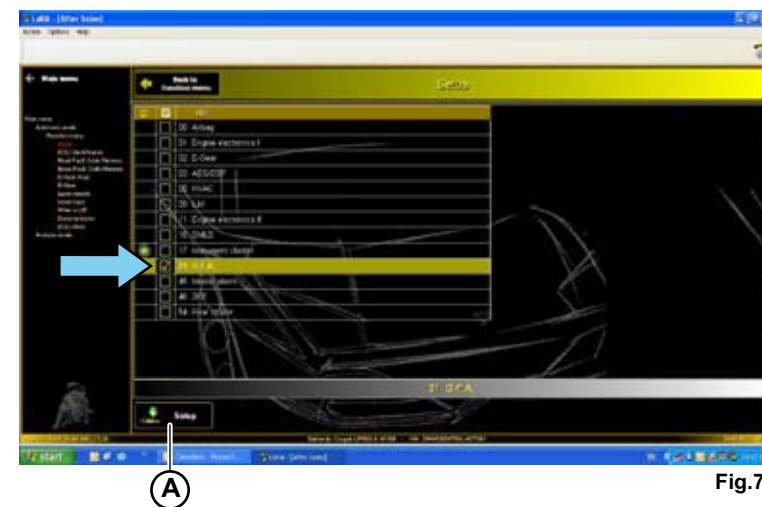


Fig.78

When setup has been completed, the green tick (A-Fig.79) indicates that the operation has been carried out successfully.



Fig.79

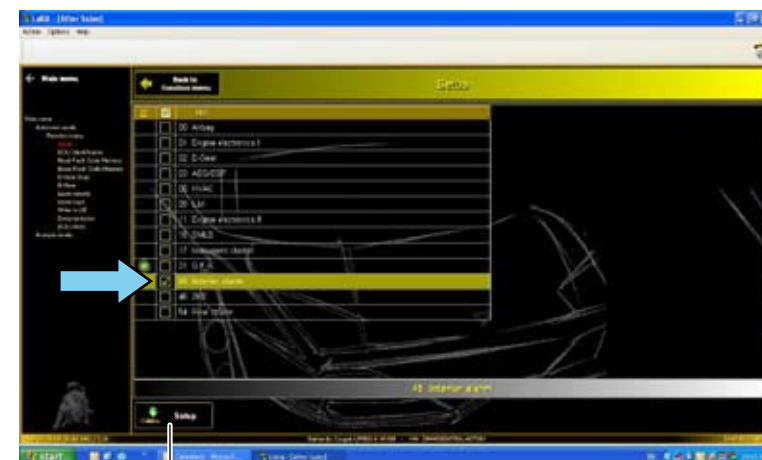


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To set up the INTERIOR ALARM control unit, select the relative field and click “**Set Up**” (A-Fig.80).

The control unit setup will start automatically, writing the coding for the alarm system, the frequencies required by each country of destination and the relative settings.



A

Fig.80

When setup has been completed, the green tick (A-Fig.81) indicates that the operation has been carried out successfully.



A

Fig.81

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To set up the ZKE control unit, select the relative field and click **“Set Up” (A-Fig.82)**.

To codify the ZKE control unit, carry out the basic settings on the frequencies used in the country of destination and the keys featuring the remote control to open and close the doors.

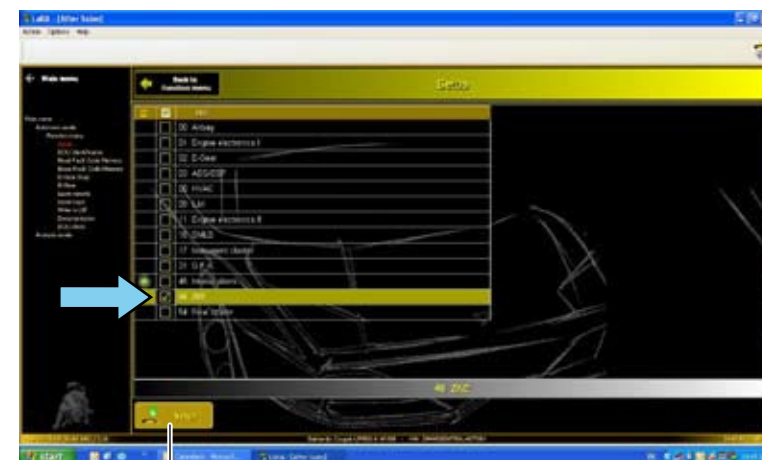


Fig.82

The setup wizard for the ZKE control unit is the following:

- Press **“OK”** to start (A-Fig.83).

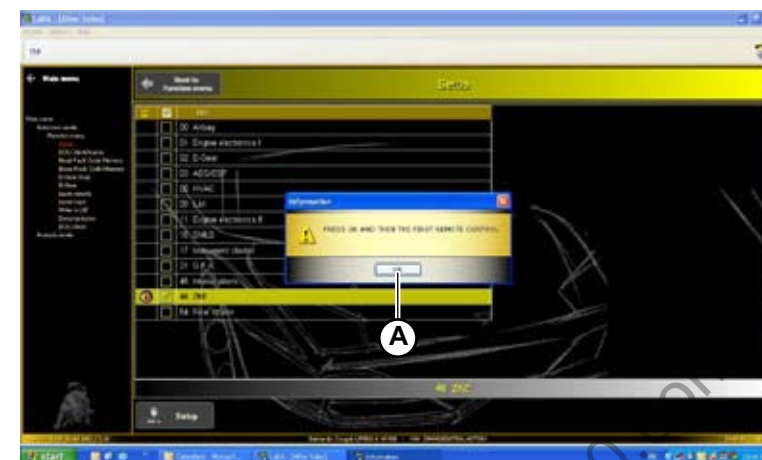


Fig.83



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- Press OK (**B-Fig.84**) to confirm the code of key 1.

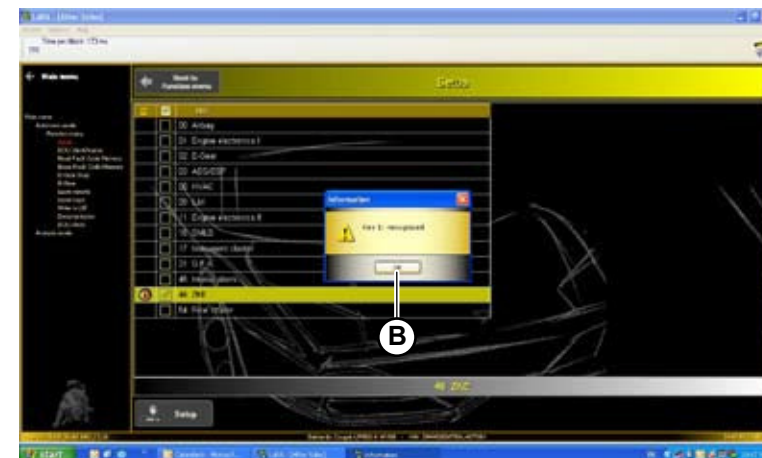


Fig.84

- When setup has been completed, the green tick (**C-Fig.85**) indicates that the operation has been carried out successfully.



Fig.85



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To set up the SPOILER control unit, select the relative field and click **“Set Up” (A-Fig.86)**.

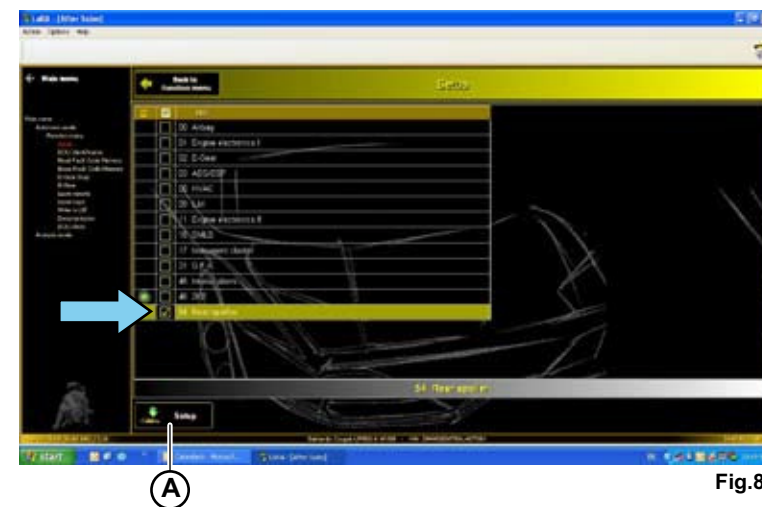


Fig.86

When setup has been completed, the green tick (A-Fig.87) indicates that the operation has been carried out successfully.



Fig.87



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Saving engine data

The engine data can be saved in the “**Analysis mode**” by selecting the “Start from list...” command in the top bar (A-Fig.88).



Note

The program, which is used for saving, is independent from the selection of the control unit in the centre bar.

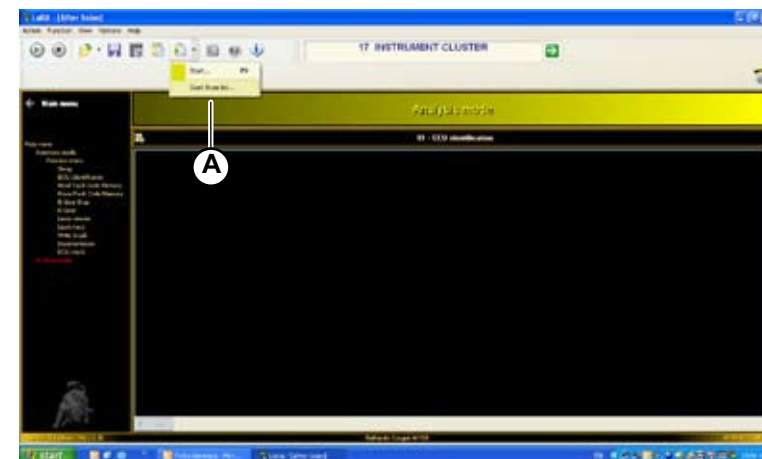


Fig.88

Start the program by clicking on “OK” (A-Fig.89).

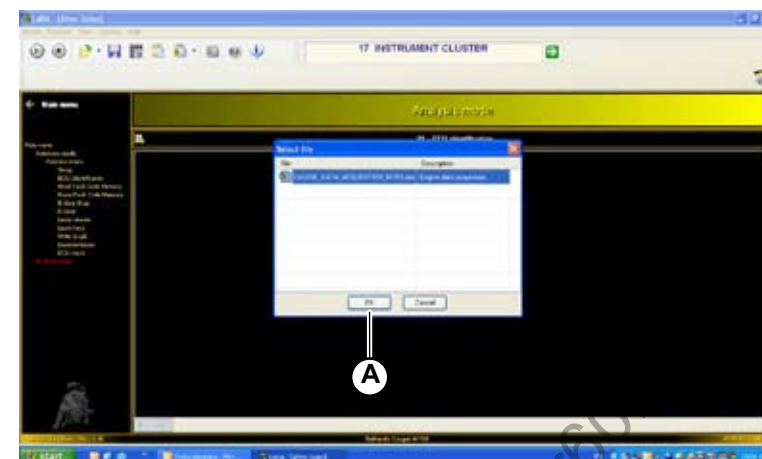


Fig.89

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These data are used by Automobili Lamborghini technicians for requests for help, warranty works, etc.

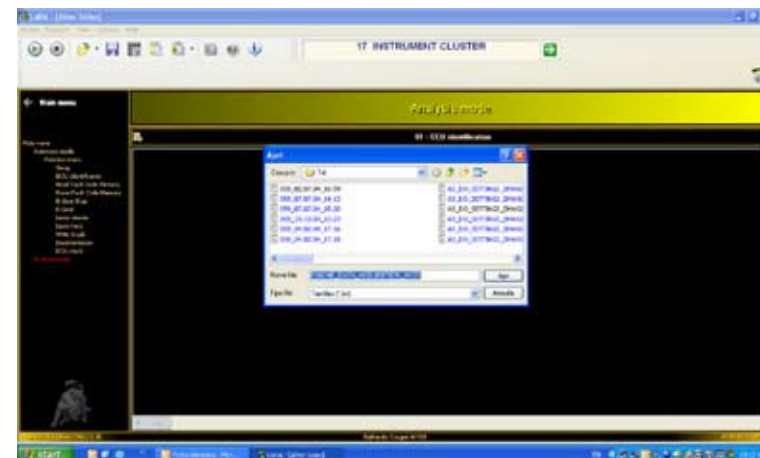


Fig.95



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Ecu identification

Use the “ECU identification” screen (**Fig.96**) to create files in .xlm format featuring the control unit PN, software status and identification codes.



Fig.96

Read Fault Code Memory

Use the “Read Fault Code Memory” screen (**Fig.97**) to display every error code of the control units on the vehicle and create an .xlm file.

Click on the specific control unit to display the codes and relative descriptions



Fig.97



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Erase Fault Code Memory

Use the “Erase Fault Code Memory” screen (**Fig.98**) to delete automatically the errors present in every control unit; once the procedure has been completed, the system creates an .xlm file, which is stored in a specific folder.



Fig.98

E-gear Snap

Use the “E-gear Snap” screen (**Fig.99**) to store the e-gear system data. The system consults the gearbox control unit and creates an .xlm file.

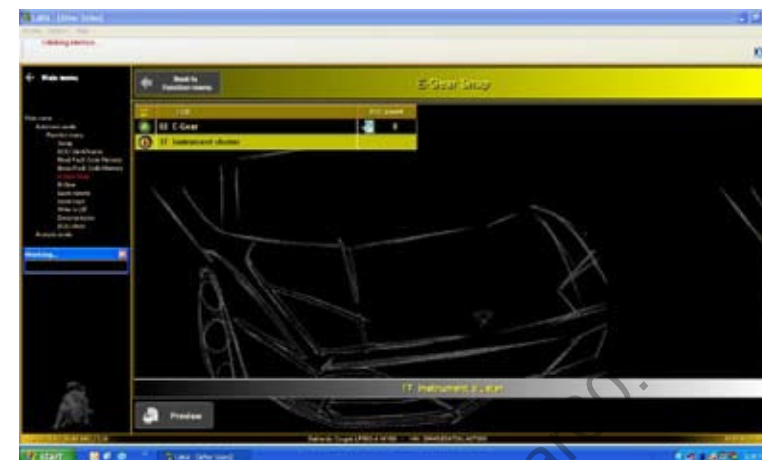


Fig.99

www.cai



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The .xlm file can be sent to Lamborghini for diagnosis or troubleshooting (**Fig.100**).

This file is also stored automatically in the .xlm folder.

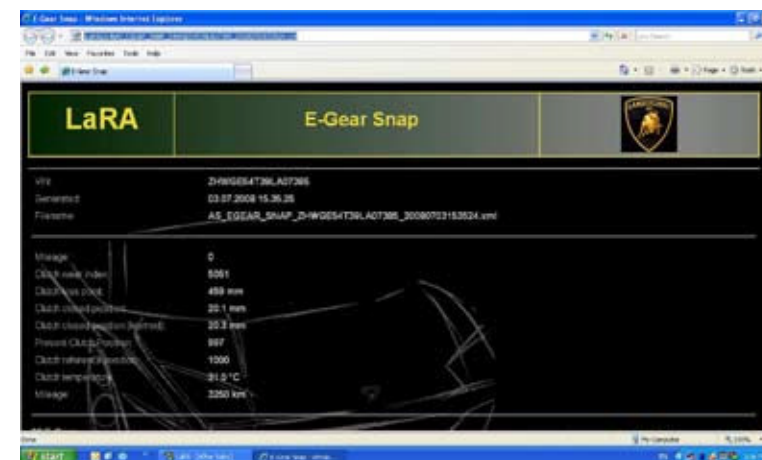


Fig.100

Learn remote

Use the “Learn Remote” screen (**Fig.101**) to set the remote controls; if the remote controls are replaced, the system will ask how many remote controls you want to program (the number ranges from a minimum of 1 to a maximum of 5).

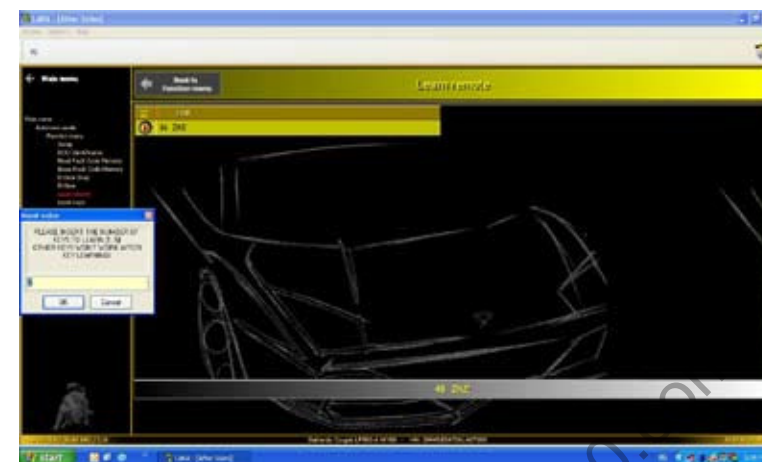


Fig.101



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While following the procedure, the system will ask you to activate the remote controls in sequence (**Fig.102**) if they are recognised it will give the OK, otherwise programming will be denied.

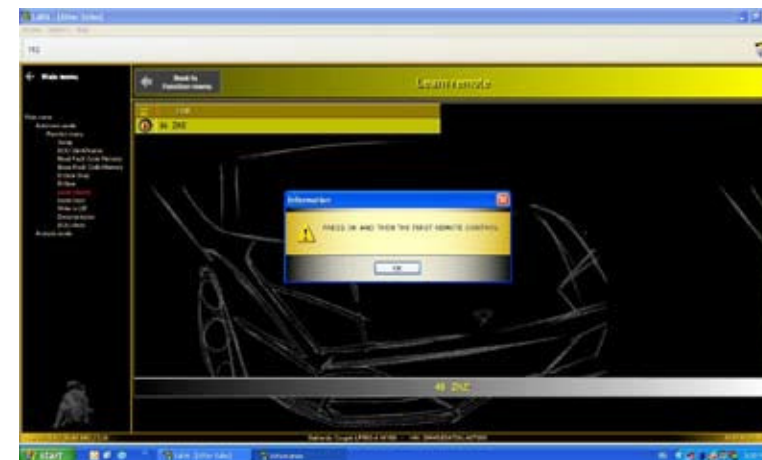


Fig.102



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SOFTWARE UPDATING



Note

As well as the coding, the zip file also contains the software updates for the engine, GFA and E-gear control units.

Engine control unit (ECU) updates

The engine control units are updated using the following procedure:

1. Select "ECU check" (**Fig.103**) from the "Menu Functions" screen (Automatic mode).

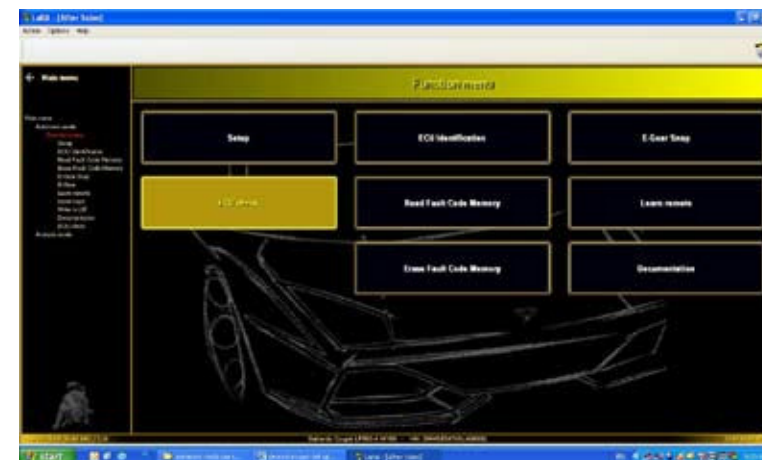


Fig.103

2. Select the 2 engine control units and start the control unit check up (**Fig.104**).

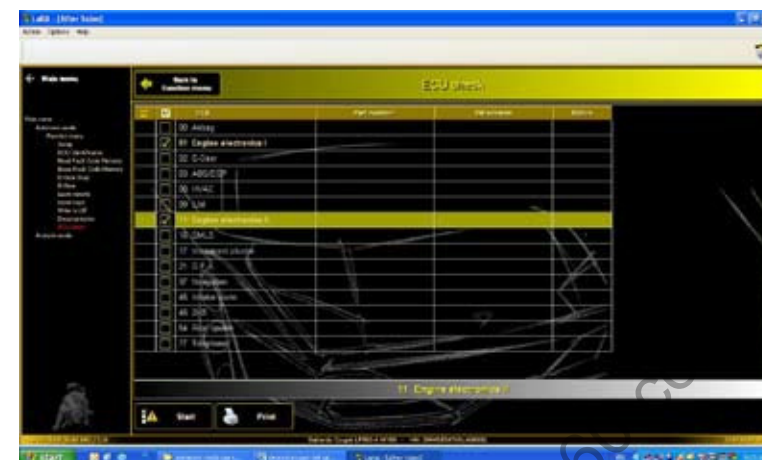


Fig.104



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3. If the result is “OK”, the engine control units have been updated (**Fig.105**).

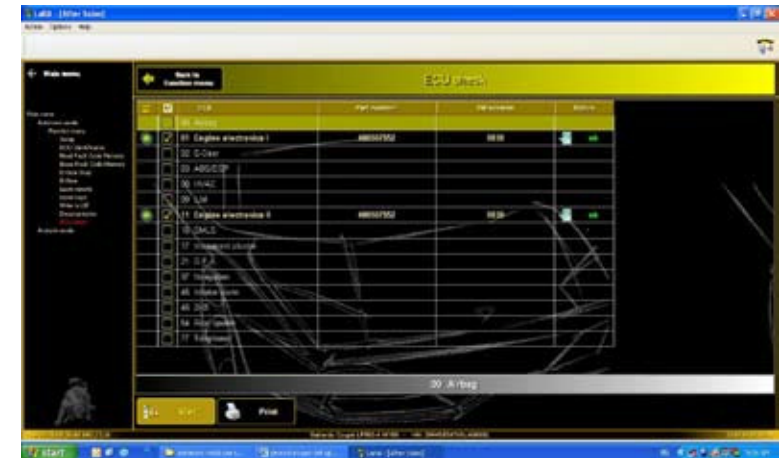


Fig.105

4. If the result is “NOK”, you will return to LaRa-AS in “Analysis Mode”. Select one control unit at a time and start the “32 flash programming” (**Fig.106**).

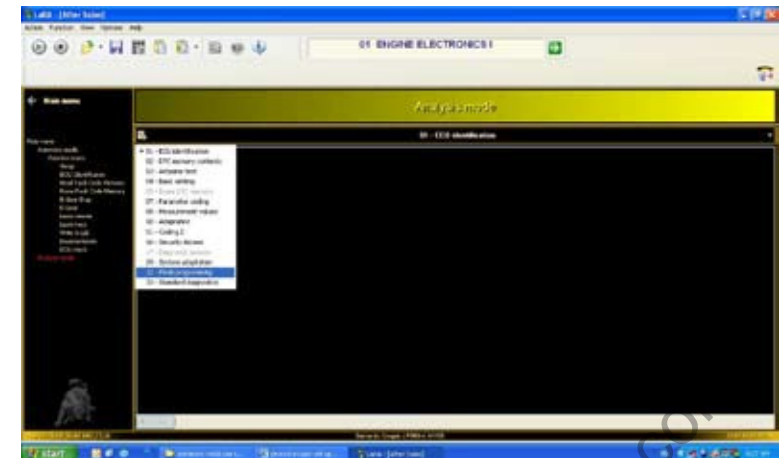


Fig.106



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5. Select the type of file (**Fig.107**).

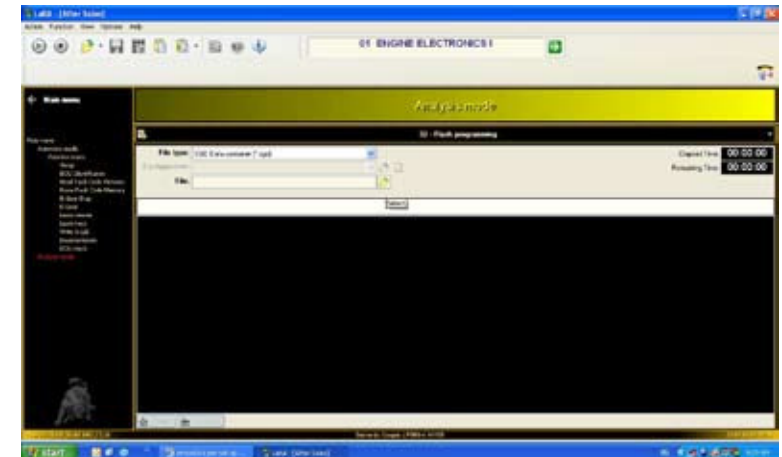


Fig.107

6. The system accesses the zip file folder (**Fig.108**).

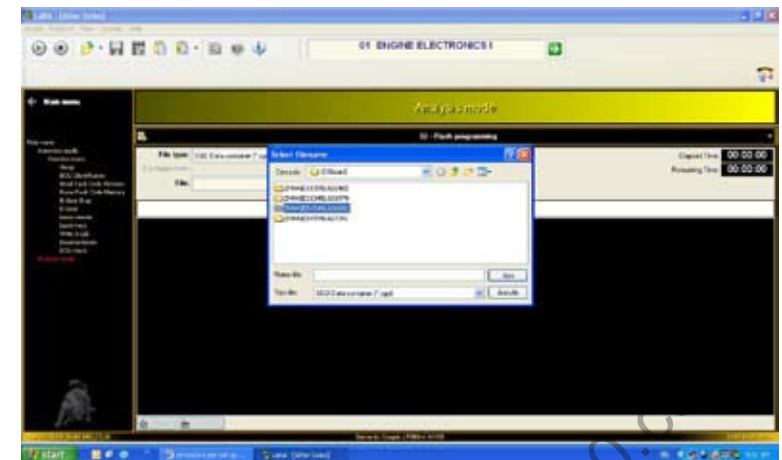


Fig.108

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- [illegible]

8. Press “Start” to launch the link (**Fig.110**) and wait about 18 minutes until you receive feedback about the outcome of the MASTER control unit update.
If the update is incorrect, repeat the procedure.
9. Once the MASTER control unit has been updated, repeat the procedure for the SLAVE control unit.

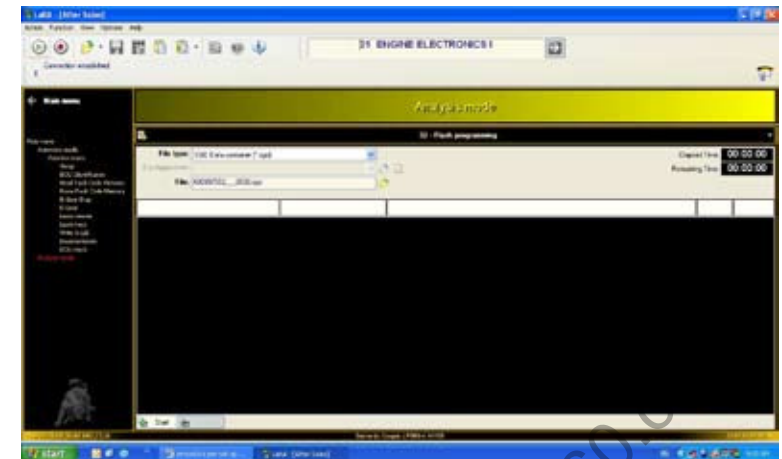


Fig.110



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GFA control unit update

The GFA control unit is updated using the following procedure:

1. Select "ECU check" (**Fig.111**) from the "Menu Functions" screen (Automatic mode).

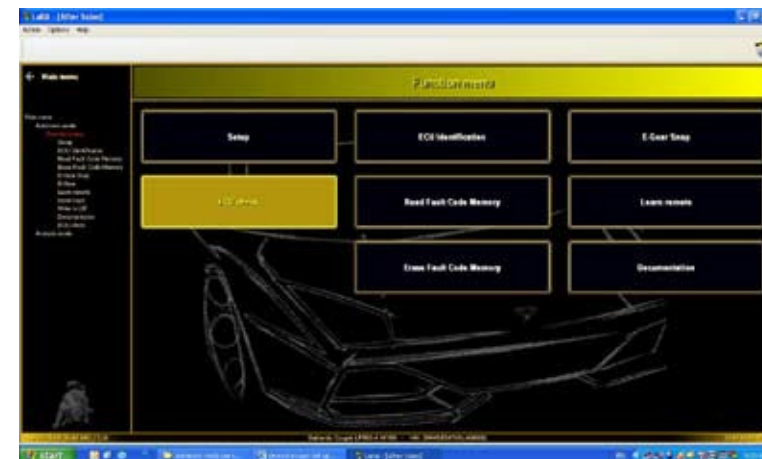


Fig.111

2. The system will start to control the automatic software update of the GFA control unit (**Fig.112**).

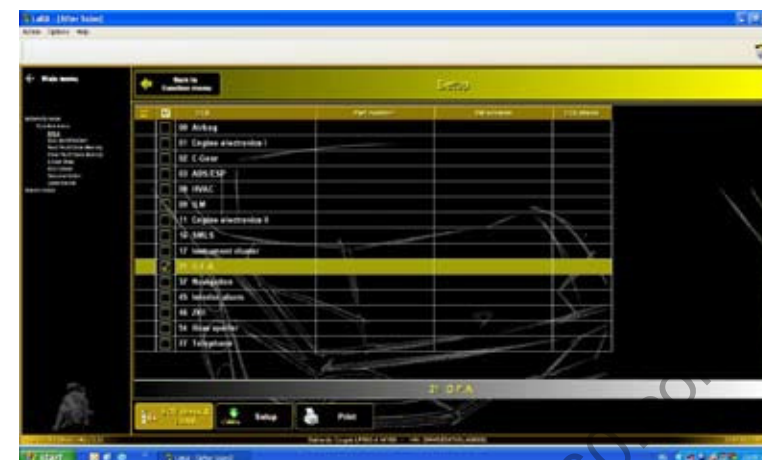


Fig.112



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- Once the check has finished, regardless of the outcome, the system will ask you whether you want to carry out the update; select "YES" (**Fig.113**) to carry out the update.

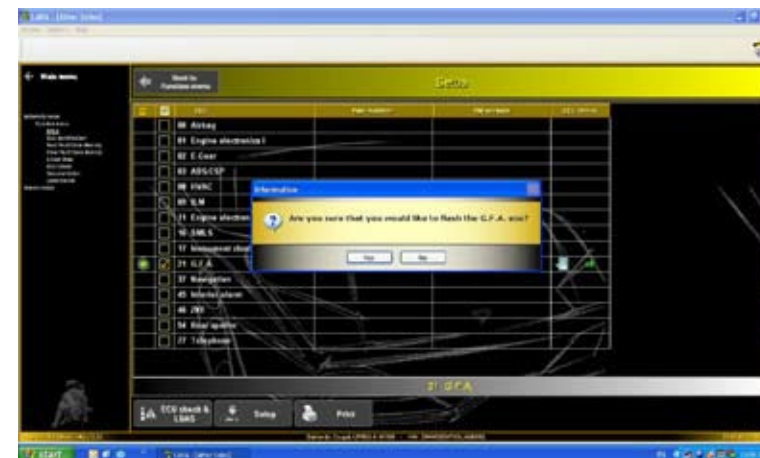


Fig.113

- The system opens LDAS automatically, which will also update the GFA control unit automatically (**Fig.114**).



Note

This procedure is similar to the former MYs, the only difference being that now, it is possible to select just the GFA, excluding the LIEs.

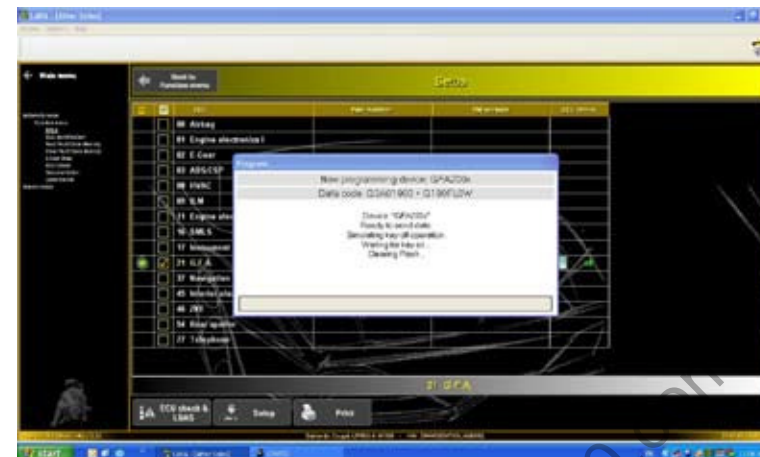


Fig.114



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E-Gear control unit update

The E-Gear control unit is updated using the following procedure:

1. Select "ECU check" (Fig.115) from the "Menu Functions" screen (Automatic mode).

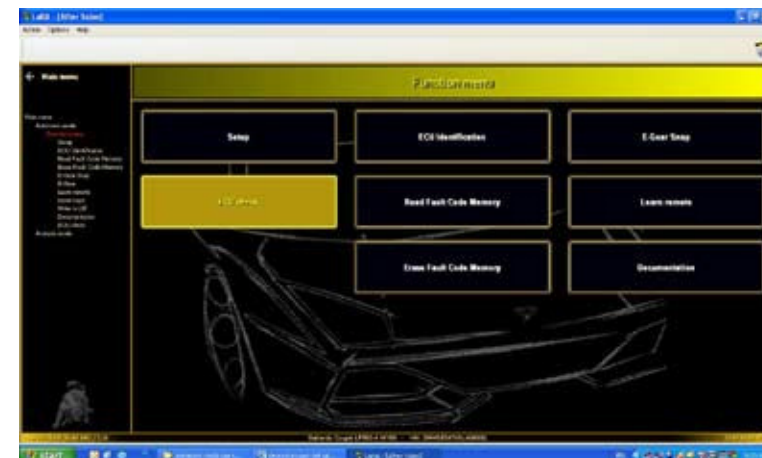


Fig.115

2. Select the E-Gear control unit and start the control unit check up (Fig.116).



Fig.116



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3. If the result is “OK”, the E-Gear control unit has been updated (**Fig.117**).



Fig.117

4. If the result is “NOK”, you will return to LaRa-AS in “Analysis Mode”. Select the E-Gear control unit and start the “32 flash programming” (**Fig.106**).

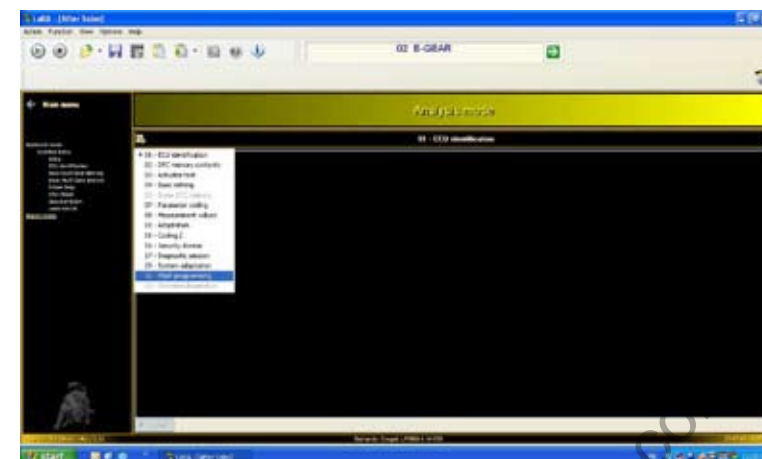


Fig.118



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5. Select the type of file (Fig.119).

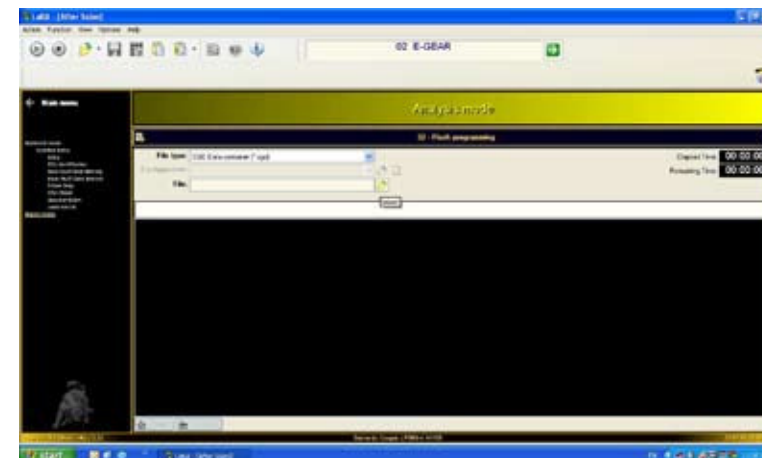


Fig.119

6. The system will make two software files available, which are already loaded in the system (Fig.120):

- EUROPE
- USA

Select the corresponding area and go ahead with the writing as for the former MYs.

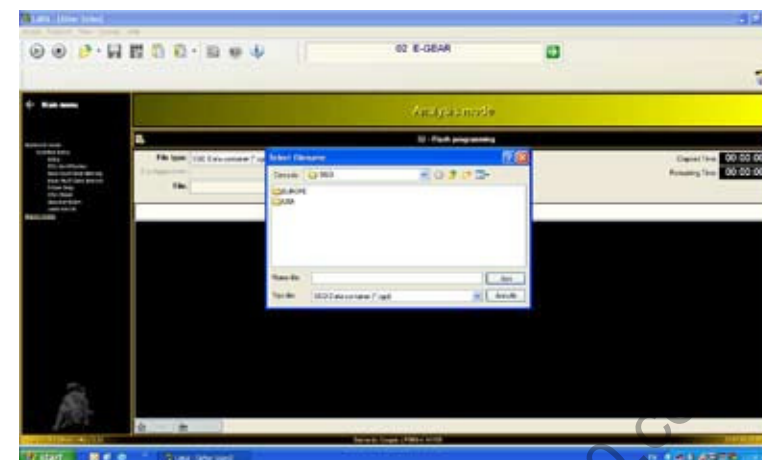


Fig.120



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7. Select the software (Europe or USA) on which you wish to reflash the vehicle (**Fig.121**).

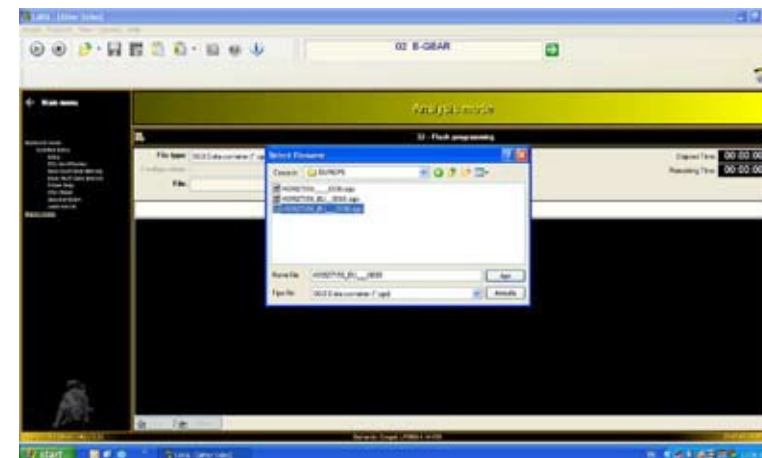


Fig.121

8. Press "Start" to launch the link (**Fig.122**); at the end, you will receive feedback about the outcome of the E-Gear control unit update.
If the update is incorrect, repeat the procedure.

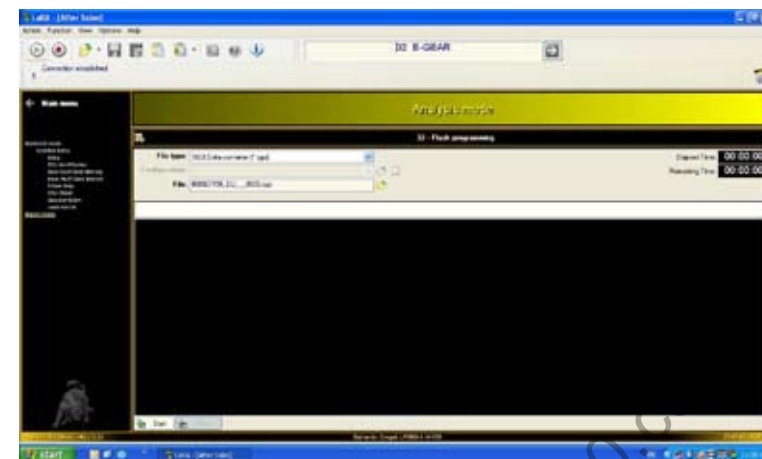


Fig.122