

IIDTOOL PRO, IIDTOOL BT AND IIDTOOL



FOR ALL SUPPORTED VEHICLES

BY

GAP-DIAGNOSTIC

USER MANUAL VERSION 33
FIRMWARE V3.0



WARNING

For your safety and that of others, please read this manual before using the IIDTool. Failure to follow instructions could result in serious consequences.



WARNING

The IIDTool is a powerful diagnostic device that allows reading and clearing of logged faults as well as changing vehicle configuration and / or settings. It is designed for use by very well-informed individuals or professional automotive technicians. It is the sole responsibility of the user to make sure that he has the necessary skills and training required to use the IID-Tool.

Read this instruction manual carefully!

Disclaimers

Neither the distributors nor the manufacturer (GAP Diagnostic, Inc.) accept any responsibility or liability for damages incurred through use of the IIDTool. This includes all damages to the vehicle itself, vehicle systems or property. This also includes injuries to the user or other persons. The warranty is limited to the functionality of the IIDTool itself (for further warranty details, please consult the last page of this document). This includes especially:

- Damages incurred through improper use of the IIDTool
- Damages incurred through the use of the IIDTool to change vehicle configuration and / or settings
- Damages incurred by changing the height settings of the electronic air suspension. Changing the height settings either up or down can make the vehicle less stable. **Do not drive vehicles in an unstable condition!**
- Damages incurred through clearing faults without effecting proper repairs
- Damages incurred through usage of any third party products delivered by the IIDTool.



WARNING

The IIDTool is not designed to be left in place for long periods. Please unplug after use!

Terms and conditions

Do not copy or reverse engineer

While considerable effort has been made to make the information provided in this section as complete and accurate as possible, it does not and cannot cover all possible situations. The authors cannot accept any responsibility for any damages which may occur from the use or misuse of these procedures, nor can the authors accept any responsibility for any damages which may result from personal injury or property damage which allegedly may be caused by the use or misuse of these procedures. No responsibility is accepted for missing or incorrect information. Those who use these procedures shall accept all responsibility for performing the work which may be described below.

Specifications are subject to change without prior notice.

Suggestions

For convenience and even security purposes, it is suggested that the user keeps an updated version of this manual in PDF format on his or her mobile devices. Thus, accessibility to procedures will be possible anywhere and anytime. By the same token, the computerized version facilitate searching for a particular topic.

You can proceed to download the User's Manual on the manufacturer's website :

<https://www.gap-diagnostic.com/support/documents/IIDTool/>

The manual is updated regularly.

Table of content

1 Introduction.....	17
1.1 IIDTool objectives.....	17
1.2 Description of each IIDTool models	17
1.3 Connectors descriptions.....	18
1.4 Brief descriptions of offered Functions.....	19
1.4.1 Functions categorized by Objectives	19
1.4.2 Functions classification	20
1.4.3 Access levels to IIDTool Functions (licence)	21
1.5 Additional Licence	21
1.6 Supported vehicles/platforms	22
1.6.1 Model Year Identification.....	22
1.6.2 Model-Referent code of covered vehicles	23
1.7 Interfaces	24
1.7.1 Interfaces presentation	24
1.7.2 Availability of Interfaces for each tool	27
1.7.3 Characteristics of each Interface	28
1.7.4 Mobile App.....	29
1.7.5 Compatible mobile devices.....	29
1.7.6 App parameters.....	30
Available settings and description.....	31
1.8 Demonstration Mode (Android Only)	32
1.9 LogIn	33
1.10 Binding.....	34
2 Getting started	35
2.1 Before first usage	35
2.2 Create a user account on the website	36
2.3 Installing the Updater Software	37
2.4 Installing Interfaces	39
2.4.1 Intalling the PC-based interface*	39

2.4.2	Installing the Integrated Interface	39
2.4.3	Installing the Application (App) IIDControl	39
2.5	Updating the IIDTool firmware	40
2.5.1	Steps for updating the IIDTool.....	40
2.5.2	Update ECU files only (Pro)	41
2.5.3	Language	42
2.6	Synchronizing the Mobile Application (BT/Pro).....	43
2.7	Safety and tips	45
2.7.1	Safety	45
2.7.2	Tips to avoid battery drainage.....	46
2.8	General operation of the IIDTool.....	47
2.8.1	OBDII Port location	47
2.8.2	Connecting the IIDTool.....	49
2.8.3	Mobile Application, Navigation and Controls.....	50
Definition	50	
Integrated Interface replica.....	51	
Language.....	51	
2.8.4	Integrated Interface, Navigation and Commands	52
2.8.5	PC interface Navigation and Commands (discontinued).....	54
2.8.6	Disconnecting the IIDTool.....	56
2.9	Activation.....	57
2.9.1	App , Activation using the mobile App, online mode	58
2.9.2	App , Activation using the mobile App, offline mode	60
2.9.3	Activation using the Integrated (II) or PC Interface	62
2.9.4	Obtain the unlock code	63
2.9.5	Pro , Additional activation steps	65
Offline mode	65	
Online mode	65	
2.9.6	Obtain an additional licence	67
2.9.7	Transfer of ownership	69
2.9.8	Permissions.....	70
3	Diagnostic Keys.....	72
3.1	Fault Concept-1 st Key	72

3.1.1	Faults introduction	72
3.1.2	Faults Detection	72
3.1.3	Faults types, brief description.....	74
3.1.4	Faults definitions	75
3.2	Completing the Diagnosis-2 nd Key	75
3.2.1	Diagnostic procedure in the presence of a Cascade Effect	75
4	IIDTool Functions	76
4.1	Introduction to Functions	76
4.1.1	Directory of Functions.....	77
4.1.2	Definitions and examples of Functions usage.....	78
4.1.3	General Access to Functions.....	80
4.2	Function “Version”	80
4.2.1	Definition	80
4.2.2	Access	80
4.3	Function “Faults”	81
4.3.1	Sub-Function “Read Faults”	81
	Definition	81
	II Access	81
	App Access	82
4.3.2	Sub-Function “Clear Faults”	83
	II Access	83
	App Access	83
4.3.3	Faults decoding	84
	Structure of Fault codes provided by the IIDTool.....	84
	Code Elements.....	84
	Element “Definition”	86
	Additional information, freeze frames	87
	Decoding status bits (4 th element of the fault code).....	87
	Show All ECUs	91
4.3.4	Sub-Function “Advanced Read”	92
	Definition	92
	II Access	92
	App Access	93
4.4	Function “Height”	94

4.4.1 Definition	94
4.4.2 Sub-function definitions.....	95
4.4.3 Limits	95
4.4.4 App : Layout definition	97
Main screen layout	97
Changing a height setting.....	98
Additional height modes (L322-02 only).....	99
4.5 Function “ Height Control ” (App, L319-10, L320-10, L322-10, L405, L494)	102
4.5.1 Definition	102
4.5.2 Buttons description	102
4.6 Function “ Calibration ” of systems and components	103
4.6.1 Definition	103
4.6.2 Steering Angle Sensor (L322, L319, L320, L316*)	103
Steering angle sensor calibration	103
Steering angle sensor renew (L322-02, L322-06).....	103
4.6.3 Parking Brake (L322-06, L322-10, L319, L320)	103
Longitudinal Accelerometer Sensor Calibration	103
4.6.4 Anti-lock Braking System (ABS).....	104
Yaw Rate Sensor Calibration (ABS, L319-10, L320-10, L322-10)	104
4.6.5 Transfer Case (L319, L320, L322-06, L322-10, L405, L494)	104
Clutch Calibration.....	104
Position or Range Sensor Calibration	104
XY Sensor Calibration (gear position sensor, manual transaxles only).....	104
4.6.6 Engine (L316-12 with DSC)	105
Steering angle sensor calibration	105
4.6.7 Active Damping (L322-10)	105
4.6.8 Suspension.....	105
II Sensors calibration	106
App Sensors calibration	110
Original standard heights	112
4.6.9 Adaptive Cruise Control (L322-10)	113
4.6.10 Power Steering (L538)	113
Calibration	113
VIN learn	113
4.7 Function “ Service Test ”	114

4.7.1 Definition	114
4.7.2 Suspension.....	115
Test Valve.....	115
Re-Enable EAS.....	118
Deflate modes	118
Set tight / normal tolerance (All except L322-02).....	119
Transport Mode (L322-02) and Build Mode (All except L322-02)	119
4.7.3 Electronic Parking Brake	119
Unjam (L322-06, L322-10, L319-04, L320-05, L319-10, L320-10)	119
Normale or Service position (L405, L494, L538, L359 2013+).....	120
4.7.4 Engine	120
Clear Adaption Values (L316, Petrol : L322, L319, L320)	120
Fuel priming (petrol only, L319-04, L320-05).....	121
Fuel Lift Pump Reset (Diesel only, L319, L320, L322*, L316).....	121
Injector Replacement (L316).....	121
DPF Pressure Sensor Reset (L316-12)	121
DPF Replacement Reset (L316-12).....	122
Mass Air Flow Replacement Reset (L316-12).....	122
Reset Oil Counter (L316-12*, L359 2013+).....	122
Turbocharger Replacement Reset (L316-12).....	122
Renew security ID between 10AS and PCM (L316)	122
High PSI Pump Reset (L316-07)	123
Pilot Correction Learning (L316-07, L319-04 and L320-05).....	123
4.7.5 Fuel Burning/Auxiliary Heater (L322-10, L319, L320)	124
Fuel Priming	124
Check Operation	124
4.7.6 Instrument Pack	124
Service Interval Reset (All except L322-02, L359 2013+*, L538*)	124
4.7.7 Transmission.....	125
Adaption clear (L322-06, L322-10, L319, 6 speed)	125
4.7.8 Body Control/Processor.....	126
Key programming (VIN locked L319-04, L320-05)	126
Key Programming (VIN locked L322-06).....	127
Add a key (VIN Locked L322-10, L319-10, L320-10, L538, L359 2013+)	128
Check number of keys (L322-10, L319-10, L320-10, L538, L359 2013+, L494, L405) 128	
Battery Replacement (L322-10, L319-10, L320-10, L550)	129
Deactivate Valet Mode (L322-10, L319-10, L320-10)	129
Transport Mode activation, deactivation (L322-02, L322-06).....	129

ECU renew (L322-02, L322-06).....	129
Crash Status Reset (L359 up to 2012)	129
Driver/Passenger Door Glass Learn (L319-10, L320-10, L359, L322-10)	129
4.7.9 Airbag (L322-10, L319, L320, L538)	129
Set Normal Mode	129
4.7.10 HVAC Heat / Cool	129
Learn Actuator Limits (L322-10, L319-10, L320-10)	129
Stepper motor initialization (L319-10, L320-10, L405, L494).....	129
Set HVAC for AHCM (L322-10)	129
4.7.11 All ECUs	130
Vehicle Reset (L322-10, L319, L320)	130
4.7.12 10AS (L316)	130
Key programming (VIN locked)	130
Renew security ID between PCM and 10AS	130
4.7.13 Anti-lock Braking System (ABS).....	130
BT/Pro Brake bleeding (VIN locked, L319, L320, L322-06, L322-10)	130
4.7.14 Rain sensor	131
Initialization (L322-02, L322-06).....	131
4.7.15 Rear Differential (VIN locked, L319, L320, L322-06, L322-10).....	131
Self-Test.....	131
4.8 Function “Live Values” (LV)	132
4.8.1 Definition	132
4.8.2 II Viewing live values when using the integrated interface.....	132
4.8.3 App Viewing live values when using the mobile App.....	133
Live value selection and sampling rate	133
Basic controls	133
Graph view options	135
Using the My Favorite feature	138
Trigger feature.....	141
4.8.4 App Viewing and exporting logs	145
4.8.5 App Sharing Logs	146
Access	146
Sharing to friends	147
4.8.6 App Online Logs	148
Viewing logs.....	148
4.9 Function “Control Input / Output”	149

4.9.1 Definition	149
4.9.2 Electronic Parking Brake ECU.....	150
Select Normal or Service position (L322-06, L319-04, L320-05).....	150
4.10 Function “Car Configuration”	151
4.10.1 Definition	151
Car Configuration File	151
Configurations of the BCM and LCM (L322-02 L322-06).....	152
4.10.2 Uploading a configuration change.....	153
II BCM and LCM Configurations (L322-02, L322-06).....	153
II Car Configuration File	153
App BCM, LCM and CCF configurations	153
4.10.3 Configurations backup.....	154
4.10.4 II Recovery procedure	154
4.10.5 App Recovery procedure	155
4.10.6 Pro BT Editing Untested CCFs (available on request)	155
4.10.7 App Using the My Favorite Car Configuration feature	156
4.11 Function “ECU Flash”	159
4.11.1 Definition.....	159
4.11.2 Risk scale.....	161
4.11.3 Recovery method	162
General method	162
Body Control and Instrument Pack (L319-04, L320-05)	162
4.11.4 Available Re-Flash	163
Engine Remaps, EGR blanking and the likes.	163
Fast Lane Service	168
Suspension (L322-06, L322-10, L319, L320).....	169
Body Control (L319-04, L320-05).....	170
Instrument Pack (L319-04, L319-10, L320-05, L320-10).....	171
Bluetooth (English UK*, L322-2005, L322-06, L319-04, L320-05)	173
Bluetooth ECU (other languages, L322-2005, L322-06, L319-04)	175
Navigation (L322-2005, L322-06, L319-04, L320-05)	176
Transfer Case (L319-04, L320-05*)	183
Audio Control (L319-04, L320-05*)	183
Transmission (L319-10, L320-10, enabling flappy paddles**)... ..	183
4.12 Function “ECU Info”	184
4.13 Save / Restore	186

4.13.1 Definition	186
4.13.2 Save (except L359, L538)	186
4.13.3 Restore.....	186
Air Suspension (except L359, L538)	186
Car Configuration File CCF	186
Car Config (L322-02, L322-06)	186
4.14 IIDTool Config.....	187
4.14.1 Find ECUs.....	187
4.14.2 II Voltage displayed.....	187
4.14.3 Enter unlock code.....	187
Limited Warranty	188
Glossary	189
Appendix.....	190
Menu tree	191

Figure list

Figure 1.	Micro USB socket for USB cable used to connect the IIDTool to a computer	18
Figure 2.	OBDII connector allowing connection of the IIDTool to a vehicle	18
Figure 3.	App : Menu overview	25
Figure 4.	App : Integrated Interface replica overview	25
Figure 5.	II 3-lines display, L319-10, L320-10, L322-10	26
Figure 6.	II One line display, L319-04, L320-05, L322-02, L322-06	26
Figure 7.	PC Interface overview	26
Figure 8.	App : Parameters.....	30
Figure 9.	Settings definition	31
Figure 10.	App : Demonstration mode.....	32
Figure 11.	App : Example of live values, demonstration mode.....	32
Figure 12.	Login.....	33
Figure 13.	Tool Binding.....	34
Figure 14.	Register on the GAP Diagnostic website.....	36
Figure 15.	Updater software download.....	38
Figure 16.	Updater software overview.....	41
Figure 17.	Overview, “Program Flash File Only” button.....	41
Figure 18.	App : File download or synchronization.....	44
Figure 19.	OBDII Connector, L319, L320, L322 2007 onwards, L359, L538, L405, L494.....	47
Figure 20.	OBDII Connector L322 2002-2006.....	48
Figure 21.	OBDII Connector L316.....	48
Figure 22.	App : Mobile App representation	50
Figure 23.	App : Representation of the integrated interface	51
Figure 24.	Cruise control commands.....	52
Figure 25.	Audio commands, L319-10.....	53
Figure 26.	PC interface representation.....	54
Figure 27.	App : Activation -> tool selection.....	58
Figure 28.	App : Activation when connected to the internet.....	59
Figure 29.	App : Activation -> tool selection.....	60
Figure 30.	App : Activation when connected to the internet.....	61
Figure 31.	Steps to get an unlock code from the website.....	63
Figure 32.	Activation form	63
Figure 33.	Unlock code shown on the website	64
Figure 34.	Pro , additional activation steps, 1.....	65
Figure 35.	Pro , additional activation steps, 2.....	66
Figure 36.	Additional licence field on the website	67
Figure 37.	App : mobile device connected to the internet. Steps for pre-unlocking the tool..	68
Figure 38.	App : Viewing permission example.....	70
Figure 39.	App : Permissions, tool not activated.....	71
Figure 40.	App : Permissions, tool activated and connected on an unlocked vehicle	71

Figure 41.	App : Permissions, tool activated and connected on a vehicle not unlocked	71
Figure 42.	App : Faults by ECUs	82
Figure 43.	App : Show All Faults.....	82
Figure 44.	Decoding example, status bits.....	90
Figure 45.	App : Status bits.....	90
Figure 46.	App : ECU list	91
Figure 47.	App : Advanced Read, bit selection.....	93
Figure 48.	App : Height function layout.....	97
Figure 49.	App : Changing a height setting	98
Figure 50.	App : Current other height modes settings	99
Figure 51.	App : Accessing other height modes	100
Figure 52.	App : Editing other height modes	101
Figure 53.	Height Control.....	102
Figure 54.	Wheel measuring.....	107
Figure 55.	Wheel measuring.....	110
Figure 56.	App : Calibrations values	111
Figure 57.	App : Guided Calibration steps	111
Figure 58.	App : Test valve	117
Figure 59.	Regular IIDTool generation.....	127
Figure 60.	App : LV : Calling the top bar	133
Figure 61.	App : LV : Top bar options.....	133
Figure 62.	App : LV : Graph options.....	134
Figure 63.	App : LV : Axis displayed	135
Figure 64.	App : LV : Y axis displacement	136
Figure 65.	App : LV : Vertical zooming.....	136
Figure 66.	App : LV : Horizontal zooming	137
Figure 67.	App : LV : Return to the current time	137
Figure 68.	App : LV : New Favorite	138
Figure 69.	App : LV : Modify a Favorite list	138
Figure 70.	App : LV : Modify a live value name in a favorite list.....	139
Figure 71.	App : LV : Favorite live values selection	139
Figure 72.	App : LV : Favorite, Fast Add method. Adding a Live Value.	140
Figure 73.	App : LV : Favorite, Fast Add method. Selecting the list.....	140
Figure 74.	App : LV : Trigger, start stop	141
Figure 75.	App : LV : Trigger, event	141
Figure 76.	App : LV : Erasing trigger settings	141
Figure 77.	App : LV : Start time.....	142
Figure 78.	App : LV : Stop time	142
Figure 79.	App : LV : Target	142
Figure 80.	App : LV : Trigger when increasing and exceeding the threshold.....	142
Figure 81.	App : LV : Trigger when decreasing and crossing the threshold.....	142
Figure 82.	App : LV : Trigger when the value and target are equal.....	142

Figure 83.	App : LV : Trigger when the value and target are not equal.....	142
Figure 84.	App : LV : Trigger enabling	142
Figure 85.	App : LV : Buzzer usage example.....	143
Figure 86.	App : LV : Start stop example	143
Figure 87.	App : LV : Event usage example.....	144
Figure 88.	App : LV : Viewing and exporting logs	145
Figure 89.	DL : Log sharing	146
Figure 90.	DL : Log Sharing screen.....	147
Figure 91.	DL : Log Sharing screen.....	147
Figure 92.	DL : Viewing online logs	148
Figure 93.	App : CCF : Modify a Favorite list.....	156
Figure 94.	App : CCF : Modify a configuration name in a favorite list.....	156
Figure 95.	App : CCF : Define configuration values in a favorite list	157
Figure 96.	App : CCF : Favorite, Fast Add method. Adding a configuration.	157
Figure 97.	App : CCF : Favorite, Fast Add method. Selecting the list.	158
Figure 98.	Regular IIDTool generations.....	163
Figure 99.	IIDTool BT generations	164
Figure 100.	BT and regular, updating the IIDTool with a “Custom” firmware.....	164
Figure 101.	App : Backup copy of the original firmware (engine ECU)	165
Figure 102.	Upload of the engine ECU original firmware	165
Figure 103.	BT and regular, updating the IIDTool with a BAS file,	166
Figure 104.	Pro, BT, updating the IIDTool with an additional BAS file,	166
Figure 105.	Battery fuse holder location.....	170
Figure 106.	Fuses 15 and 16, Body Control ECU	170
Figure 107.	Regular IIDTool generations.....	173
Figure 108.	IIDTool BT generations	177
Figure 109.	BT : Navigation : updating the IIDTool firmware to, “special” V3.01 Build 2682, Nav On Move.....	177
Figure 110.	Regular IIDTool generations	178
Figure 111.	Diagnostic mode, Navigation	181
Figure 112.	Enter pin code for diagnostic mode, Navigation	181
Figure 113.	Diagnostic menu, Navigation	182
Figure 114.	“ Show MMM Information ”, Navigation	182
Figure 115.	“Main CPU Software/Bootloader Version”, Navigation	182
Figure 116.	App: ECU Info results	185

Table list

Table 1. Functions categorized by Objectives	19
Table 2. Functions categorized by Objectives (continuation)	20
Table 3. Functions classification	20
Table 4. Access levels to IIDTool Functions (licence)	21
Table 5. Additional licence	21
Table 6. Determining a vehicle Model Year using the VIN.....	22
Table 7. Model-Referent code of supported vehicles	23
Table 8. Interfaces presentation.....	24
Table 9. Availability of Interfaces for each tool.....	27
Table 10. Characteristics of each Interface.....	28
Table 11. Compatible mobile devices	29
Table 12. Abstract of operations to complete before first usage.....	35
Table 13. Troubleshooting, updater software.....	42
Table 14. Tips to avoid battery drainage.....	46
Table 15. App : Legend of controls for the Integrated Interface replica	51
Table 16. Legend of controls for the Integrated Interface replica	53
Table 17. Legend of controls for the PC-based interface	55
Table 18. Fault types, brief description	74
Table 19. Directory of Functions	77
Table 20. Definitions and examples of functions usage.....	79
Table 21. Structure of Fault codes provided by the IIDTool	84
Table 22. 2 nd element interpretation	85
Table 23. HEX and Binary.....	88
Table 24. Interpretation of each “status bit”	89
Table 25. Height sub-function definitions.....	95
Table 26. EAS Internal limits.....	95
Table 27. Example of current calibrations.....	95
Table 28. Possible adjustments for this example.....	96
Table 29. Required data, front left calibration	108
Table 30. Required data, rear left calibration.....	108
Table 31. Calculus, new left side calibration value	108
Table 32. Required data, front right calibration	109
Table 33. Required data, rear right calibration.....	109
Table 34. Calculus, new left side calibration value	109
Table 35. Original standard height.....	112
Table 36. Definition, risk scale	161
Table 37. Risk, Engine Remaps, EGR blanking and the likes	163
Table 38. Risk, fast lane service	168
Table 39. Risk, updating the suspension ECU.....	169
Table 40. Risk, updating the Body Control ECU.....	170

Table 41. Risk, updating the Instrument Pack ECU.....	171
Table 42. Risk, updating the Bluetooth ECU.....	173
Table 43. Risk, updating the Navigation ECU.....	176
Table 44. Risk, updating the transfer case ECU.....	183
Table 45. Risk, updating the Audio Control ECU	183
Table 46. Risk, updating the transmission ECU.....	183

1 Introduction

1.1 IIDTool objectives

The IIDTool was designed to achieve four objectives in order to meet the demands of Land Rover owners for autonomy in their efforts.

- Diagnose mechanical problems or malfunctions resulting from electrical / electronic problems
- Participate in the repair process to be more efficient and timely
- Customize certain vehicle components
- Administer ECUs of the vehicle, including updating

Note: *The IIDTool is not a repair tool, but can help identify the cause of a problem. Achieving the Objectives is done by using IIDTool functions (section 1.4 and section 4) in a defined sequence (see section 3).*

1.2 Description of each IIDTool models

IIDTool (regular)

Short for “Integrated Interface **D**iagnostic **T**ool”. A diagnostic tool using an integrated interface, soliciting vehicle components for display and control.

IIDTool **BT**

Diagnostic tool equipped with a Bluetooth Smart transceiver that can be used in conjunction with a mobile device such as a tablet or smartphone. The integrated interface can also be used as needed.

IIDTool **Pro**

Diagnostic tool designed for professionals. Also equipped with the Bluetooth transceiver. The integrated interface can also be used as needed.

Note : *To lighten the text of this manual, the term IIDTool will be used to designate the IIDTool “regular”, IIDTool **BT** and IIDTool **Pro** when no distinction apply.*

The following diminutives are used in this document to separate items that are either related to the integrated interface **II or exclusive to IIDTool **BT** or IIDTool **Pro**.**

II: The diminutive **II** indicates specific features associated with usage of the integrated interface (all tools).

BT : The diminutive **BT** indicates specific features associated with using an IIDTool **BT**.

Pro : The diminutive **Pro** indicates specific features associated with using an IIDTool **Pro**.

App : The diminutive **App** indicates specific features associated with usage of the mobile Application.

For additional definitions or descriptions of abbreviations used in this manual, refer to the [Glossary](#) located at the end of this manual.

The complete list of products and selected distributors contact information are available on the manufacturer's website www.gap-diagnostic.com

1.3 Connectors descriptions



Figure 1. Micro USB socket for USB cable used to connect the IIDTool to a computer



Figure 2. OBDII connector allowing connection of the IIDTool to a vehicle

1.4 Brief descriptions of offered Functions

The three IIDTool models offer a range of functions to achieve the four main objectives, categorized in the following table.

Note : Functions definitions, examples and operating procedures are found in [section 4](#) of this manual.

1.4.1 Functions categorized by Objectives

Diagnostic	Personnalisation	Repair process	Administer ECU
Faults Read/Clear Advanced Read	Height : Height modification, air suspension	Calibrations	ECU Information
Live values (surveillance)	Car Configuration	Service routines	Save/Restore
Control IO (Inputs/Outputs)			ECU update (Re-Flash)
Convenience			
Height Control			

Table 1. Functions categorized by Objectives

Note : Some functions can help achieve more than one goal; this is particularly the case for the “Fault” function and “Re-Flash” after a repair. Please consult Diagnostic Keys ([section 3](#)) for details.

Some functions refer to the IIDTool itself.

IIDTool settings
Version
IID Config

Table 2. Functions categorized by Objectives (continuation)

1.4.2 Functions classification

The functions are divided into two classes. This distinction affects the access level of IIDTool functions.

Full diagnostic capability	Advanced programming functions*
Reading and clearing fault codes	Systems and components calibrations
Live values	Height (air suspension)
Control IOs	Changing configurations or parameters of the vehicle (CCF)
Service routines	Changing configurations or parameters of individual ECUs (L322-02, L322-06 and L316)
Height control	Key programming
ECU info	ECU update, Re-Flash
	Engine re-mapping, EGR (exhaust gas recirculation) blanking, speed limit modification and more **
	Save/Restore (suspension and configurations)

Table 3. Functions classification

*Advanced programming functions are only accessible once the tool is activated ([section 2.2](#) and [section 2.9](#)).

**Sold separately by Bell Auto Services (BAS Remaps) and delivered by the IIDTool. Please visit <http://bellautoservices.co.uk/> for more details.

1.4.3 Access levels to IIDTool Functions (licence)

All IIDTools benefit from the full range of functions. However, with different access levels for each.

	Full diagnostic capability			Advanced programming functions		
	Access	Covered platform(s)	Number of vehicle(s)	Access	Covered platform(s)	Number of vehicle(s)
IIDTool	Activation not required	1*	Unlimited (one platform only)	Activation required	1*	1**
IIDTool BT	Activation not required	All	Unlimited	Activation required	All	1**
IIDTool Pro	Activation not required	All	Unlimited	Activation required***	All	Unlimited

Table 4. Access levels to IIDTool Functions (licence)

* Model-Referent, see [section 1.6](#)

**See [section 1.5](#)

***After completing the activation process, the tool is unlocked for all vehicles.

1.5 Additional Licence

An additional licence allows the IIDTool owner to access the Advanced Programming Functions on a vehicle other than his own (some restrictions apply as described in the following table).

	Included with the IID-Tool	Supported platform(s)	Number of allowed licences
IIDTool	1 (locked to the VIN)	1*	10
IIDTool BT	1 (locked to the VIN)	All	10

Table 5. Additional licence

Additional licences are available on the manufacturer's website:

<https://www.gap-diagnostic.com/shop/>

* Same as the original vehicle. For Model Referent of supported vehicles, see [section 1.6](#)

1.6 Supported vehicles/platforms

Covered vehicles are those for which the IIDTool, IIDTool **BT** and IIDTool **Pro** have been designed. This list is updated as required.

Instructions found In this manual will sometimes be detailed separately depending on the vehicle model and even the Model Year of covered vehicles (see definition below).

To lighten the text, electronically similar vehicles will be grouped as “Referent Model Code”. Land Rover platform codes are matched with a suffix representing a range of Model Years where specific features are presented.

To identify the referent model, please consult the table found on next page, having taken care to correctly identify previously, however, the Model Year.

1.6.1 Model Year Identification

The Model Year is an approximate description of the production time of a vehicle in terms of its specifications or design revisions.

Note : *The Model Year does not coincide systematically with the calendar year at which the vehicle was manufactured (listed on the driver door B pillar sticker or on the certificate of registration).*

You can confirm the model year of a vehicle by checking the 10th character of the Vehicle Identification Number (VIN). It is located at the bottom of the windshield, driver’s side and analyzed as follows:

10th Character of the VIN	Model Year	
	Years interval	Signification
Numbers, 1 to 9	2001-2009	“1” for 2001 ... 9 for 2009
Letters	2010 and up	“A” for 2010 “B” for 2011 ...

Table 6. Determining a vehicle Model Year using the VIN

1.6.2 Model-Referent code of covered vehicles

Covered Land Rover vehicles	Model years supported	Model-Referent Code	
		Platform code	Suffixe
Defender	2007–2015	L316	
Defender Puma 2.4 L	2007-2011	L316	-07
Defender Puma 2.2 L	2012-2015	L316	-12
Discovery 3/LR3 and Discovery 4/LR4	2004–2016	L319	
Discovery 3/LR3	2004–2009	L319	-04
Discovery 4/LR4	2010–2016	L319	-10
New Discovery (5)	2017+	L462	
Discovery Sport	2014 onwards	L550	
Freelander 2/LR2	2008–2015	L359	
Range Rover	2002–2012	L322	
Range Rover	2002–2005	L322	-02
Range Rover	2006–2009	L322	-06
Range Rover	2010-2012	L322	-10
Range Rover	2013 onwards	L405	
Range Rover Evoque	2011 onwards	L538	
Range Rover Sport	2005–2013	L320	
Range Rover Sport	2005-2009	L320	-05
Range Rover Sport	2010-2013	L320	-10
Range Rover Sport	2014 onwards	L494	

Table 7. Model-Referent code of supported vehicles

1.7 Interfaces

An interface is a connecting device which allows exchanges and interactions between the tool and the user. Three interfaces were developed by the manufacturer.

1.7.1 Interfaces presentation

	Mobile Application	Integrated Interface	PC Interface*
Physical Support	Mobile Device**	Vehicle	Computer running on Windows XP onwards
Display	Mobile device screen via the IIDControl Application <i>Figure 3, Figure 4</i>	Instrument cluster screen <i>Figure 5, Figure 6</i>	Computer screen via the "Controller" software <i>Figure 7</i>
Controls	Mobile device screen <i>section 2.8.3</i>	Cruise control buttons and Radio Buttons*** <i>section 2.8.4</i>	Keyboard or mouse <i>section 2.8.5</i>
Abbreviation	App	 	

Table 8. Interfaces presentation

*This interface is used to activate the buttons for cruise control and offers no advantages over the integrated or mobile interfaces.

** See compatible vehicles [section 1.7.5](#)

***Available on L319-10 and L320-10 only

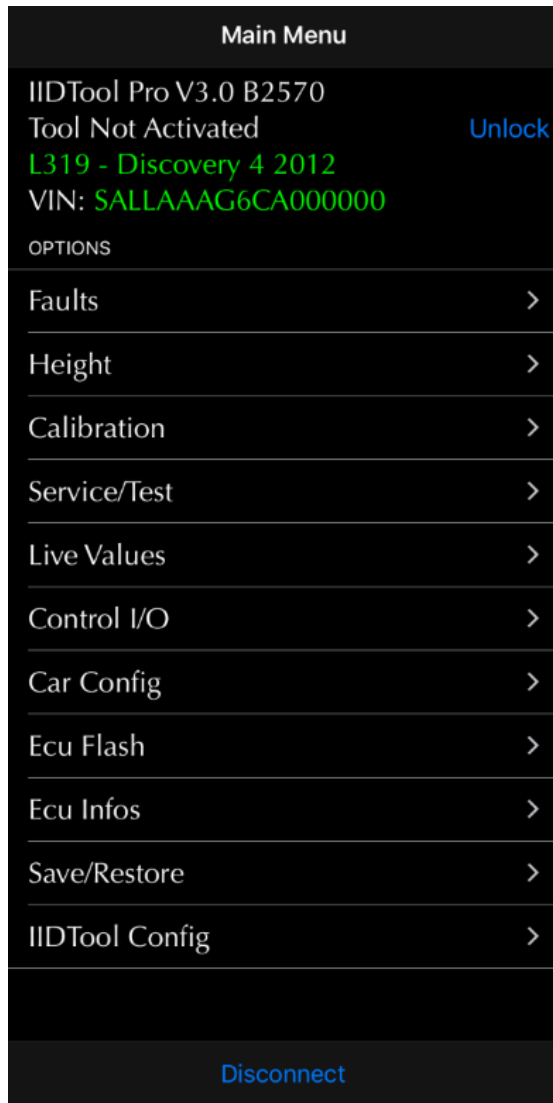


Figure 3. App : Menu overview

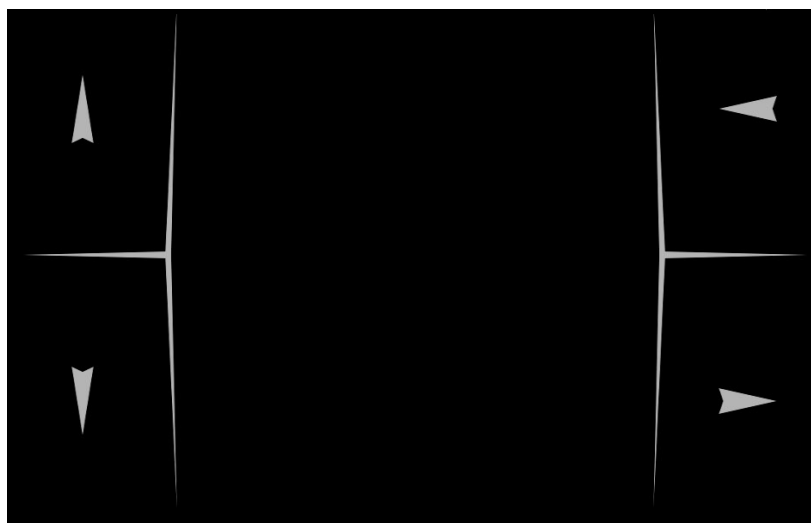


Figure 4. App : Integrated Interface replica overview



Figure 5. || 3-lines display, L319-10, L320-10, L322-10

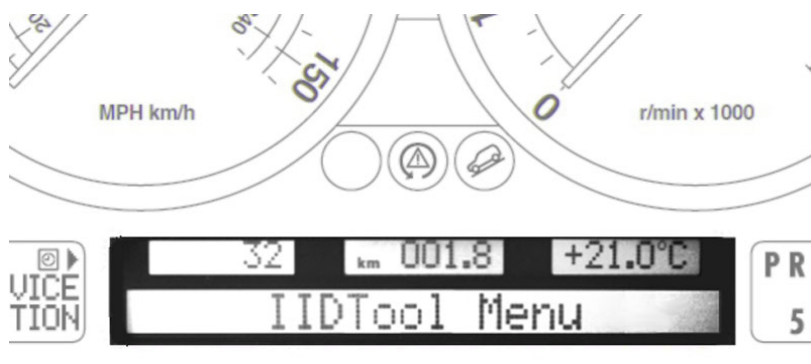


Figure 6. || One line display, L319-04, L320-05, L322-02, L322-06



Figure 7. PC Interface overview

1.7.2 Availability of Interfaces for each tool

The IIDTool, IIDTool **BT** and IIDTool **Pro** can be used with up to 3 interfaces depending on the product.

	Mobile App	Integrated Interface*	PC Interface**
IIDTool		√	√
IIDTool BT	√	√	√
IIDTool Pro	√	√	√

Table 9. Availability of Interfaces for each tool

***CAUTION** Some vehicles are not compatible (see [section 1.7.3](#)).

**This interface is typically used to activate the cruise control buttons and offers no advantage over the integrated or mobile interfaces.

1.7.3 Characteristics of each Interface

CAUTION Do not confuse characteristics of interfaces with available functions ([section 1.4](#))

Characteristics	Mobile App	Integrated Interface	PC Interface
Compatible vehicles	All	L322-02, L322-06, L319, L320, unstable on L322-10*	All
Friendliness	+++	+	--
Speed	+++	+	-
Number of visible characters on the screen	Unlimited	16, 20 or 26 characters**, dependent on vehicle model	26 characters**
Number of rows on the same page	Unlimited	1 to 3 rows, dependent on vehicle model	limited
Number of "live values" simultaneously displayed	8	1	1
Exportation of faults and other information via email	√		
Graphical representation of live values	√		
Graph exportation in PDF or CSV format via email	√		
Constant evolution of functionality	√		

Table 10. Characteristics of each Interface

*II L322-10, unstable in such vehicles as the function to write on the dashboard screen has not been completed by Land Rover. Can be used in emergencies.

**If a message is longer than the number of characters available (eg. fault descriptor), the message will scroll automatically.

As described previously, the IIDTool **BT** and IIDTool **Pro** tools have up to 3 interfaces depending on the vehicle model.

1.7.4 Mobile App

The application developed for mobile devices (see below for compatibility) can be downloaded free of charge from the Apple App Store or Google Play Store under the name IIDControl (installation instructions are detailed in [section 2.4.3](#)).

Note : The mobile application offers a more user-friendly interface and more features than the PC or Integrated Interfaces (see previous characteristics table)

1.7.5 Compatible mobile devices

The IIDTool **BT** and IIDTool **Pro** are compatible with the following devices :

Apple mobile devices*	Android mobile devices
iPad 3rd gen onwards	Fitted with a Bluetooth V4.0 and up transceiver and running on OS 4.3 onwards**
iPad Mini	
iPod Touch 5 onwards	
iPhone 4S, 5, 6 onwards	

Table 11. Compatible mobile devices

*iOS 8 and up. Using the latest release (non Beta) version of iOS is strongly recommended.

**Despite compliance with these requirements, because of a too large variety of Android devices on the market, compatibility cannot be guaranteed. For example, a user has reported a device manufactured by Doogee cannot be used with the tool.

1.7.6 App parameters

The App settings are available by pressing the cog wheel located on the login screen.

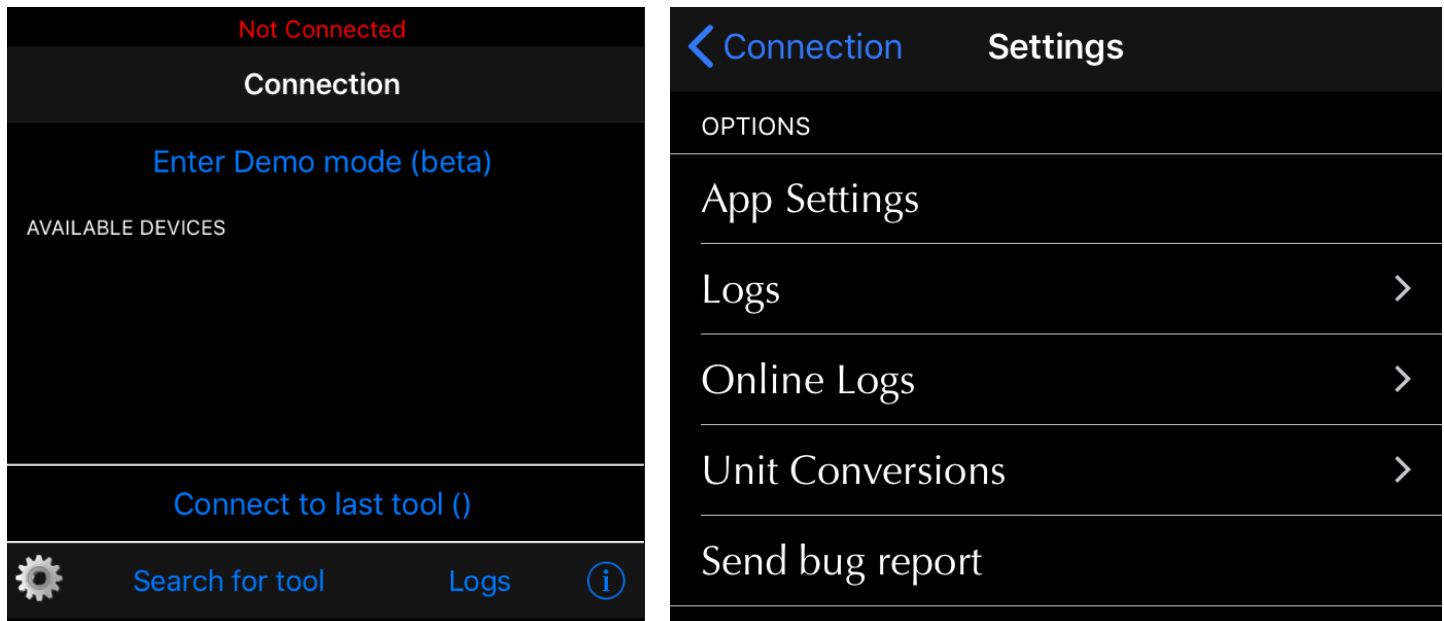


Figure 8. App : Parameters

- **App Settings:** This presents settings related to the general App functioning.
- **Logs:** This will allow access to data saved by the optional datalogger module.
- **Online Logs:** View records shared by Friends and yourself.
- **Send bug reports:** This should only be used when an issue is present and GAP Innovation requires additional data for analysis purposes.
- **Unit Conversion:** Allows selection of imperial or metric units. Some values will remain at their initial unit, boost pressure, for example, is only available in PSI.

Available settings and description

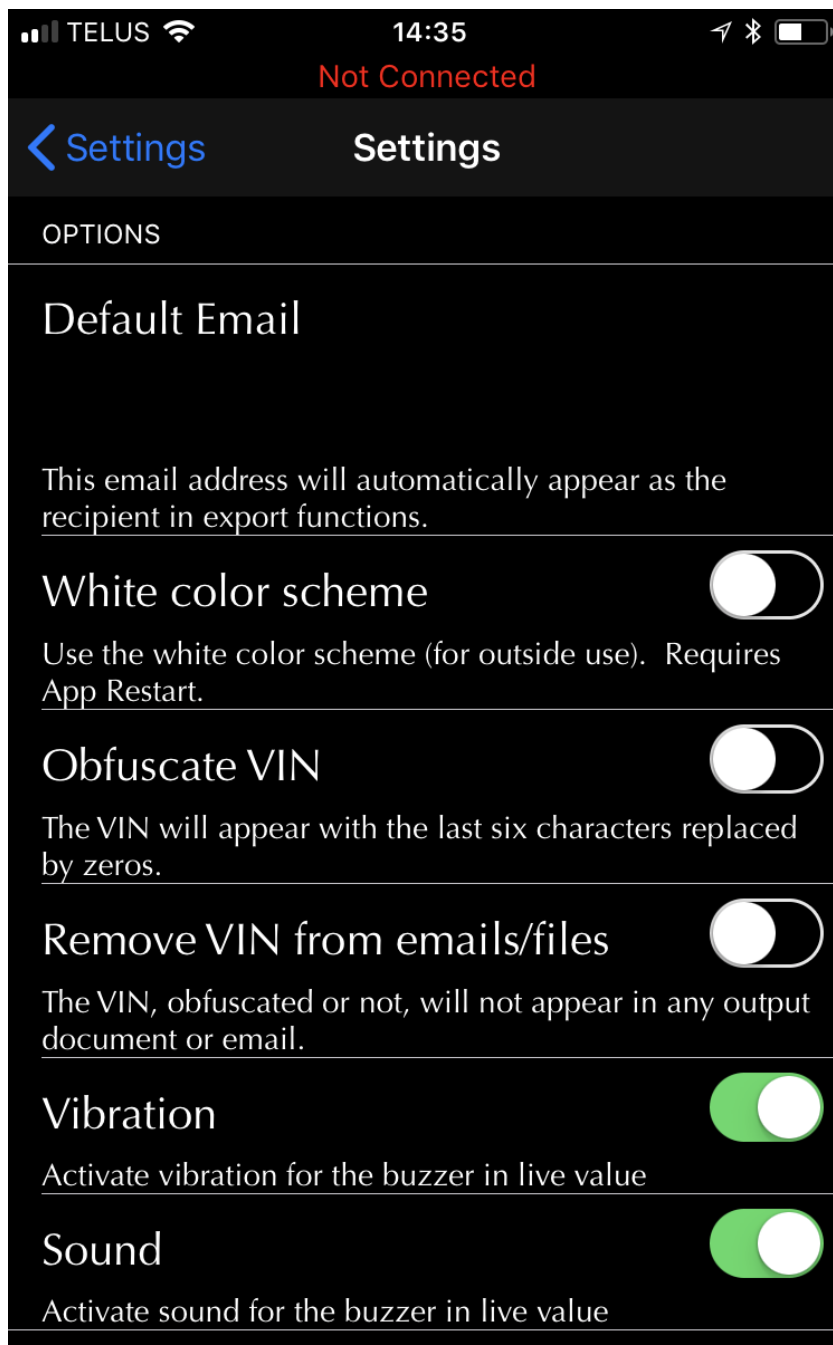


Figure 9. Settings definition

A description of each setting is defined under the setting name.

1.8 Demonstration Mode (Android Only)

The demo mode simulates the use of a IIDTool connected on a vehicle. Click on “Enter demo mode” followed by “Search for tool”. Select the tool and vehicle.

Notes :

- To use the tool normally, click on “Exit demo mode”
- The mobile device cannot be connected to an IIDTool when in demo mode
- Some functions are not implemented in the demonstration mode
- Delays associated when communicating with ECUs are eliminated
- Live values are simulated arbitrarily

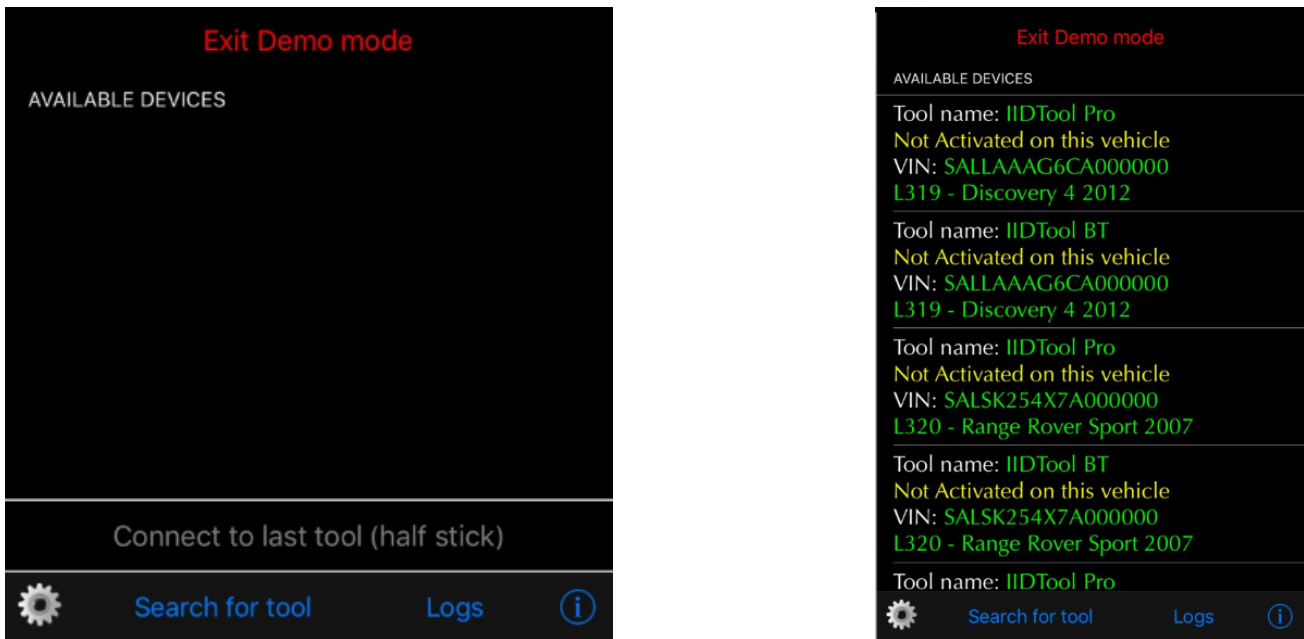


Figure 10. App : Demonstration mode

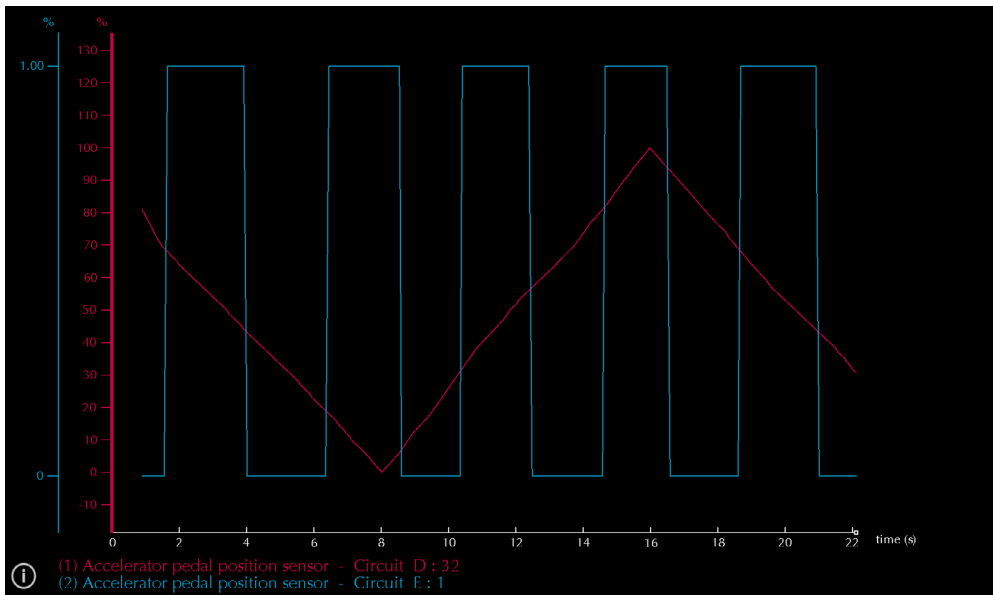


Figure 11. App : Example of live values, demonstration mode

1.9 Login

Definition

Login in allows the use of certain functions, including online logs and sharing, when not connected to the tool. This is the same account when already registered on the manufacturer's website, see [section 2.2](#) or when activated using the mobile App, [section 2.9](#).

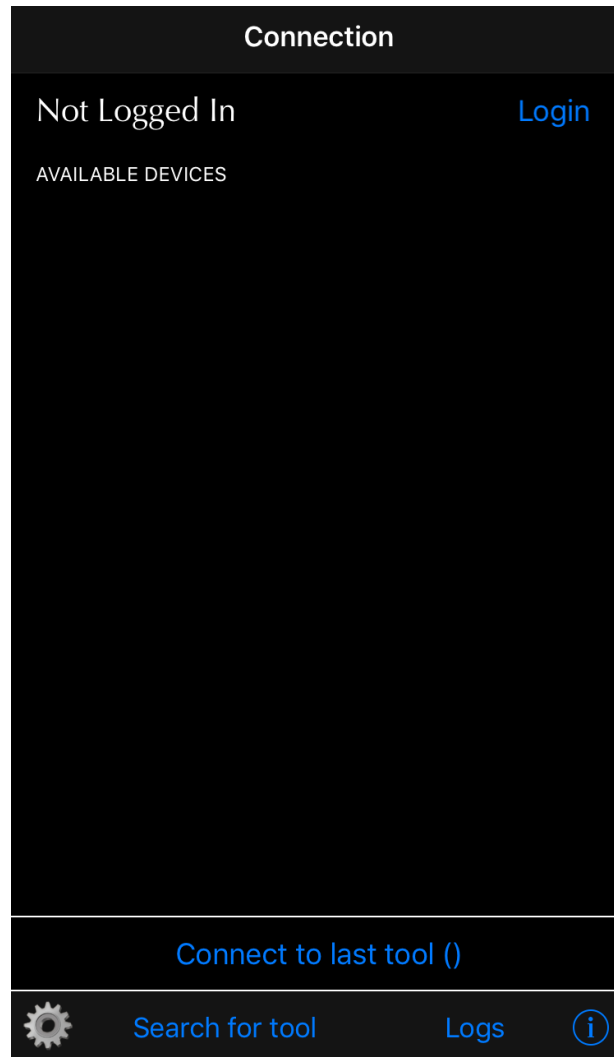


Figure 12. Login

1.10 Binding

Binding the tool will allow usage of certain functions including Online Logs and Sharing when not connected to the tool without the need to log in.

Locking the tool will prevent other users from connecting to the tool using another mobile device unless they enter the defined password. This can also be done later if needed.

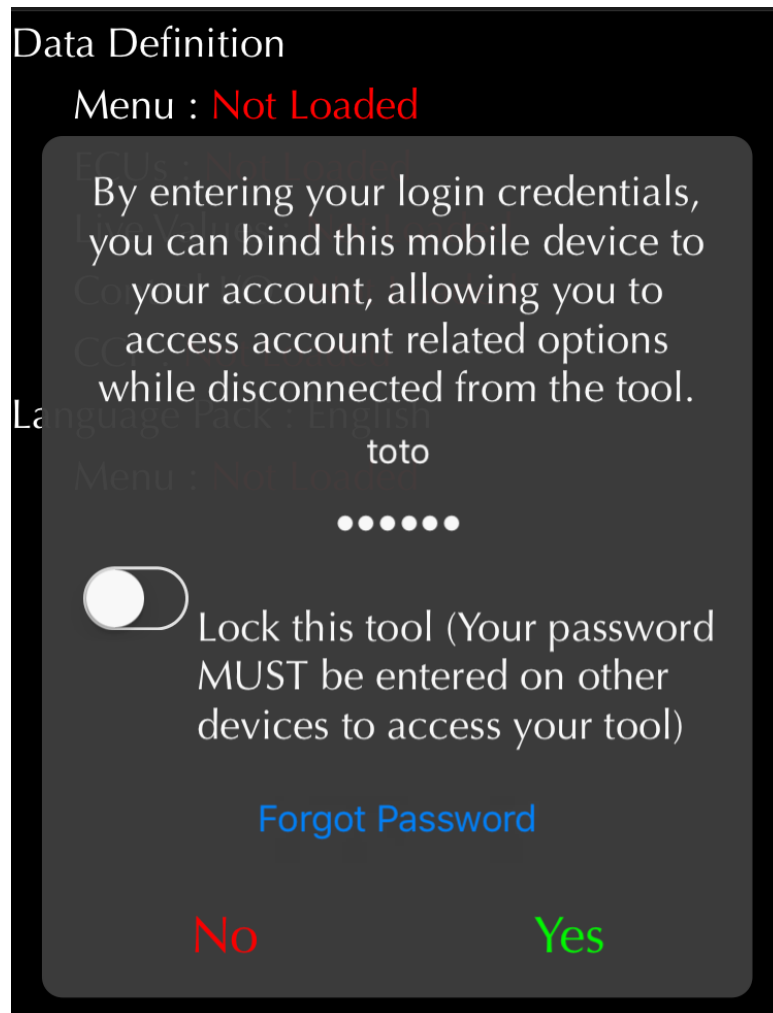


Figure 13. Tool Binding

2 Getting started

2.1 Before first usage

Here is a compendium of operations to be performed before first usage. Each of these operations is described in detail in the referenced section of this manual. This table can serve as a fulfillment check list prior to using the tool.

√	Steps	IIDTool	IIDTool BT and IIDTool Pro	Operations	Section
	1 st	•	•	Determination of the Vehicle's Model-Referent code.	section 1.6
	2 nd	•	•	Create a user account on the website	section 2.2
	3 rd	•	•	Installation of the updater software on a computer	section 2.3
	4 th	•	•	Installation of Interfaces : PC Interface* Mobile App	section 2.4
	5 th	•	•	Updating the IIDTool's firmware	section 2.5
	6 th		•	Synchronizing the Mobile Application, IIDTool BT and IIDTool Pro	section 2.6
	7 th	•	•	Consult safety and tips section	section 2.7
	8 th	•	•	Getting to know the tool : -Connecting to the vehicle's OBD connector -Navigation and Interfaces commands -Disconnection	section 2.8
	9 th	•	•	Activating the IIDTool	section 2.9

Table 12. Abstract of operations to complete before first usage

*When needed, discontinued.

2.2 Create a user account on the website

Purpose

Before first usage of the IIDTool, it is strongly recommended to update the tool. But first, the user must perform its free registration. To access the advanced programming features, it will be required to proceed with the activation process to obtain a licence for personal use.

Note : *If the IIDTool was purchased on the GAP diagnostic website, it is not required to create a new user account.*

Principle

Create your individual profile on the manufacturer's website; a proprietary link will be established between the tool and its user.

Note : *Registering, followed by updating and activation of the tool gives the user:*

- Exclusive access to advanced programming functions and data backup
- Faster access when connected to the vehicle

Registering steps

- 1- Access the manufacturer's website : www.gap-diagnostic.com.
- 2- Create your account by clicking "Register".
- 3- Fill up and submit the required fields
- 4- An email with a link to complete the registration will be sent. Check your spam box in case the email would be treated like so.

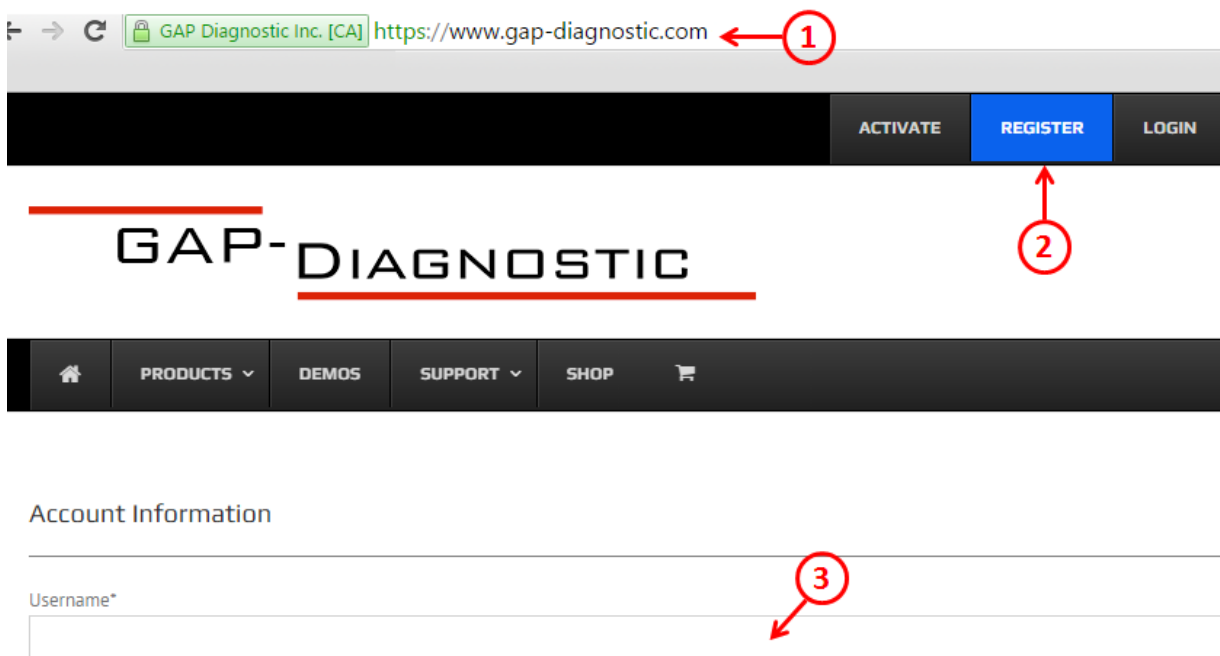


Figure 14. Register on the GAP Diagnostic website

The individual profile created during registration will now be accessible via the tab "My Account" after opening the session with "Login".

2.3 Installing the Updater Software

Purpose

Enjoy the full potential of the IIDTool through regular updates.

Principle

Install the free software specifically dedicated to updating the tool, named “IIDTool Updater” on Mac or PC type personal computer.

Note : *Installation of the updater software is required only once. If it turns out that an update is required, a message will pop up when launched with directions to follow.*

Prerequisites

- Having access to a PC type personal computer with Windows XP operating system or higher
- Or**
- A Mac personal computer
 - Have access to an internet service
 - Having completed the User Registration ([section 2.2](#))

Software Installation Steps

- 1- Log on to the website by “Login” and follow the instructions given by the following image (point A, B and C) to download the software.

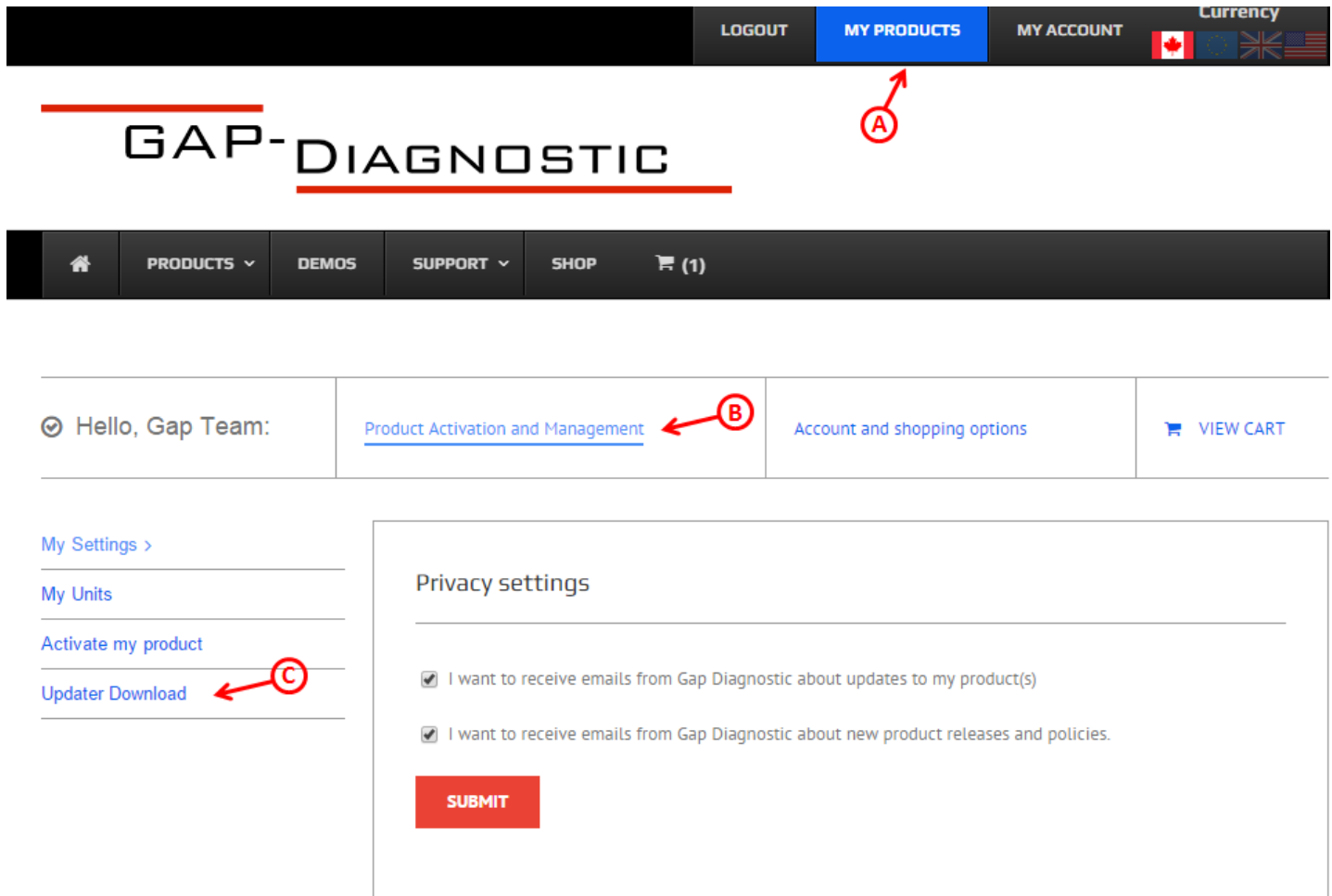


Figure 15. Updater software download

- 2- Once downloaded, click the file and follow instructions on screen to complete the installation. **For computers running Windows, click the right mouse button and select “run as administrator”.**

The update software's named IIDTool Updater.

2.4 Installing Interfaces

Purpose

Being able to interact with and control the IIDTool

Principle

Depending on the model of IIDTool or preference ([section 1.7](#)), proceed with installing the selected interface.

2.4.1 Installing the PC-based interface*

Takes place simultaneously during the installation of the updater software ("IIDTool Updater") on the PC. No additional action is required. The PC interface is called "Controller".

*Not available on Mac, discontinued on PC.

2.4.2 Installing the Integrated Interface

No installation operation is required. The interface will be accessible automatically when connecting the tool to the vehicles OBDII connector.

2.4.3 Installing the Application (App) IIDControl

The IIDControl App can be used with an IIDTool **BT** or IIDTool **Pro**

Prerequisites

- Own at least one supported mobile device (see [section 1.7.5](#))
- Have access to an internet service

Installing the mobile App

Download (free) the IIDControl App from Apple App Store or Google Play Store in each mobile device. Before using the App, the files will have to be synchronized with the current IIDTool firmware (see [section 2.6](#))

Note : Occasional updates are recommended. They will be announced by the Applications Manager. Please proceed with updating the IIDTool to the latest firmware when updating the mobile App [section 2.5](#).

2.5 Updating the IIDTool firmware

Purpose

Keep the IIDTool up to date.

Principle

Updates are made by reflashing the firmware.

Note : *The backed up data stored in memory will not be affected by the update.*

Benefits of updating the IIDTool

- Take advantage of bug fixes (if any)
- Take advantage of operational improvements such as execution speed... and more
- New additions in the tool and application

Prerequisites

- Having access to a PC or Mac type personal computer connected to an internet service
- Having registered on the website ([section 2.2](#))
- Having completed installation of the updater software ([section 2.3](#))
- **BT/Pro** Having completed the mobile App installation or update ([section 2.4](#))

2.5.1 Steps for updating the IIDTool

- 1- Connect the tool to the USB port of the computer using the supplied USB cable
- 2- Start the updater software previously installed in the computer
- 3- Click on "FIND DEVICE" and wait until pairing of the tool with the updater software is completed. Once paired, the user information, vehicle information and current firmware version of the tool will be displayed.
- 4- Select the desired version of the firmware in the right combo or radio box (if available).
- 5- Click on "PROGRAM FIRMWARE". The evolution of each data file is observable in succession on the progress bar.
- 6- For IIDTool **BT** or **Pro** : A subsequent window will appear with "ACTION NEEDED". The requested operation is synchronization of the mobile App with the tool. Keep the tool connected to the computer to complete this step described in section, [section 2.6](#). **Note:** Performing synchronization immediately after updating the tool or before first usage will prevent prolong file loading when connected to the vehicle due to a poor internet connection.



Figure 16. Updater software overview

2.5.2 Update ECU files only (Pro)

When new ECU files use by the ECU Flash function are available, you can download them to the IID-Tool **Pro** without updating the IIDTool firmware itself. This speeds up the process.

- 1- Connect the tool to the USB port of the computer using the USB cable
- 2- Start the updater software previously installed in the computer
- 3- Click on “FIND DEVICE” and wait for pairing of the tool with the updater software. Once paired, the user information, vehicle information and current firmware version of the tool will be displayed.
- 4- Click on “PROGRAM FLASH FILES ONLY”. The evolution of each data file is observable in succession on the progress bar.



Figure 17. Overview, “Program Flash File Only” button

Troubleshooting, updater software

Occasionally, some obstacles can arise when using the updater software. Here are tips to get around them.

Problems	Solutions
The updater software is not working properly or cannot connect to the internet.	Change software permission in Firewall Settings
The updater software is not working properly even after permission was granted in the firewall	Momentarily disable the computer's firewall
Unable to perform the update (rare)	Try again with : Another USB Port or; Another USB cable or; A different computer
The message "Device Not Found" is displayed after pressing "FIND DEVICE"	Check that the tool is recognized by Windows. See the FAQ located on the website for further details. https://www.gap-diagnostic.com/faq/

Table 13. Troubleshooting, updater software

If other difficulties arise during the firmware update, contact the manufacturer : support@GAP-Diagnostic.com

2.5.3 Language

You can choose between a firmware in French or English language in step 3, [section 2.5.1](#).

App: The language of the application is the same as that used by the mobile device. The firmware and the mobile device must be in the same language.

2.6 Synchronizing the Mobile Application (BT/Pro)

Purpose

Refresh files in the Mobile Application IIDControl to achieve consistency with the firmware of the newly updated tool ([section 2.5](#)) or prior to first usage.

Note: *Performing synchronization immediately after updating the tool or before first usage will prevent prolong file loading when connected to the vehicle due to a poor internet connection.*

Prerequisites

- Having access to a PC or Mac personal computer or a USB power source.
- Own a compatible mobile device ([section 1.7.5](#)) connected on the internet.
- The IIDControl App is installed and up-to-date ([section 2.4](#))
- The IIDTool firmware was updated ([section 2.5](#)) or a new mobile device is used with the tool for the first time.

Steps

- 1- If the tool has been updated with the “GAP IIDTool Updater” version 3.9 or less, disconnect the IIDTool **BT/Pro** from the USB port. Otherwise, leave it connected and go to step 3.
- 2- Connect the IIDTool **BT/Pro** on the USB port.
- 2- Launch the mobile Application IIDControl in the mobile device.
- 3- Click on “ Search for tool ”.
- 4- Select the tool in “Bootloader”. For the first synchronization, fill the required fields.
- 5- Wait while all data files are downloaded : the word “Loaded” indicates completion.
- 6- Exit the application by pressing “Disconnect”.
- 7- Repeat previous steps for each mobile devices that may be used with the tool.
- 8- Unplug the IIDTool from the computer or USB supply.

Data Definition
Menu : **Loaded**
ECUs : **Loaded**
Live Values : **Loaded**
Control I/O : **Loaded**
CCF : **Loading...**
Language Pack : English
Menu : **Not Loaded**

Figure 18. App : File download or synchronization

2.7 Safety and tips

2.7.1 Safety

Please read important safety messages and manufacturer discharges located at the beginning of this manual.

WARNING Failure to comply with safety rules could result in a product, vehicle or environmental damages and could have serious health consequences!

The IIDTool is operational only when :

- 1- It is inserted into the vehicle's OBDII connector
- 2- The engine is running
or
The ignition is ON (key to "II or ON" or start button pressed once without starting the engine)
- 3- **II** The vehicle is not moving

Note : The IIDTool is not designed to remain connected to the vehicle. Perform an adequate disconnection after use ([section 2.8.6](#)).

Engine starting is not essential to the fulfillment of several short tasks. Longer tasks should be done with the engine running and must therefore be done outside to avoid the risk of carbon monoxide poisoning!

! Ensure the vehicle is in a safe environment at all times !

For safety, it is important to ensure that the vehicle is stationary:

- Automatic transmission : In "Park"
- Manual transmission : In neutral position with the parking brake engaged (unless otherwise noted)

It is recommended to roll down at least one window in case of emergency (Reflash failure etc).



WARNING

By selecting certain functions, warning messages will be displayed. The first time these functions are used, the warning messages will be shown three times and cannot be ignored. In subsequent uses, warning messages can be avoided by pressing the Enter button.

By pressing the Enter button, the user confirms that he has read and understood the warning.

2.7.2 Tips to avoid battery drainage

Several tasks performed with the IIDTool can be done with the engine running (outside). There is no risk of discharging the battery in this case. However, if a task requires the engine to be stopped; the following message will appear:

For all vehicles 2010 and + “The engine will automatically shut down.”

For all other vehicles: “The engine is running, stop the engine and turn the ignition” (position II).

The IIDTool can be used for several operations without starting the engine. Thus some short tasks can be performed in an indoor environment such as a garage.

However, if the duration of the tasks performed without the possibility of starting the vehicle (that is to say in a closed environment), is estimated at more than 10 minutes *, there is a risk of discharging the car battery.

*(Indicative only and will vary according to the battery state).

Options to prevent battery discharge during longer tasks

Situation	Solution
External environment	Start the engine*
Closed environment (garage...)	Use a power supply connected to the vehicle's battery (type Midtronic PSC-550, CTEK or equivalent)

Table 14. Tips to avoid battery drainage

*Some features require the engine to be off. In this case, use a power supply.



CAUTION *Battery chargers are to be avoided due to poor line regulation.*



CAUTION

Some tasks cannot be performed with the engine running. When required, the following message will be displayed on screen "Start the engine".

These tasks should be carried out outside to avoid the risk of Carbon Monoxide poisoning!

2.8 General operation of the IIDTool

This section describes how to connect the IIDTool to the vehicle, various control interfaces for navigating through menus and finally proper disconnection of the tool.

2.8.1 OBDII Port location



**Discovery 3/LR3
Discovery 4/LR4
Freelander 2
Range Rover Evoque
Range Rover Sport
Range Rover 2007 onwards. Lower hinged cover to access the connector.**



The OBDII port is located near the pedals, close to the driver's door.

Figure 19. OBDII Connector, L319, L320, L322 2007 onwards, L359, L538, L405, L494



Range Rover 2002-2006

The OBDII port is located above the storage compartment under the driver side headlight switch. Lower hinged cover to access the connector.

Figure 20. OBDII Connector L322 2002-2006



Defender

The OBDII port is located in the driver side fuse block. The cover must be open to access the connector.

Figure 21. OBDII Connector L316

2.8.2 Connecting the IIDTool

Once the OBDII connector is located, the unit can now be connected.

Connection steps

- 1- Ensure compliance with safety instructions and tips to avoid battery drainage ([section 2.7](#))
- 2- Switch on the ignition or start the engine if outside respecting the safety instructions ([section 2.7.1](#))
- 3- Locate the OBDII connector (previous section)
- 4- Insert the IIDTool into the OBDII connector
- 5- Wait for about 30 seconds while the tool is scanning electronic communication buses. *
 - || The message “IIDTool Ready” will appear on the vehicle instrument pack display to indicate that communication has been successfully established.
 - If it turns out that communication with one of the buses is not possible, an error message will appear on the selected interface** and the current process will be interrupted. See the Frequently Asked Questions (FAQ) section on the manufacturer’s website for a solution to this problem: <https://www.gap-diagnostic.com/>.
- 6- Launch the IIDTool Interface of choice and navigate as described in the next segment.

***Pro** This waiting time is only present upon first connection of the tool on a new vehicle and following an update of the firmware of IIDTool. **BT** and regular. This waiting time is present when connecting to a vehicle on which the tool is unlocked or following an update.

****||** In some cases, a communication problem on one of the buses will prevent the tool from writing to the instrument cluster.

2.8.3 Mobile Application, Navigation and Controls

Definition

The App was developed by the manufacturer with user friendliness in mind. Details on installations and compatibility for each interface are available at the [section 1.7](#) and [section 2.4.3](#) of this manual.

Prerequisites

- Own an IIDTool **BT** or IIDTool **Pro**
- Have access to the vehicle on which the IIDTool will be used
- Ensuring that the vehicle is in a safe environment ([section 2.7.1](#))
- Having taken precautions to avoid battery drainage ([section 2.7.2](#))
- Own a compatible mobile device ([section 1.7.5](#)) on which the Bluetooth module is “activated” or “ON”?
- IIDControl App installed in the mobile device ([section 2.4.3](#)) and having synchronized it with the tool ([section 2.6](#))

Steps to navigate the Mobile Application

- 1- Proceed with connecting the IIDTool **BT** or IIDTool **Pro** as per [section 2.8.2](#) and wait until the “IIDTool Ready” message to be displayed on the instrument cluster screen* confirming that communication has been established successfully. For all connection problems, please consult the FAQ section of the manufacturer’s website : <https://www.gap-diagnostic.com/>.
- 2- Launch the IIDControl App
- 3- Click on “Search for tool” at the bottom of the screen
- 4- Select the desired tool available in the list (“available tools”).

Mobile App representation

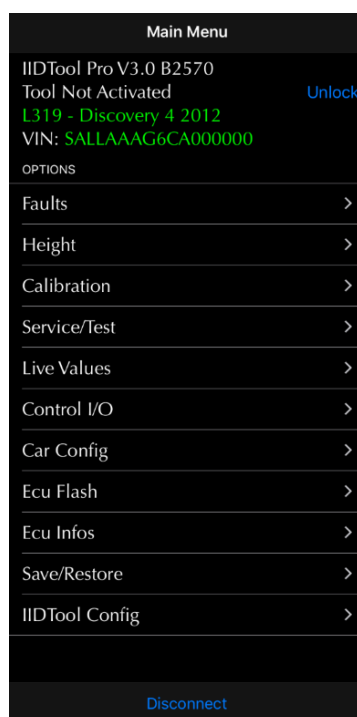


Figure 22. App : Mobile App representation

* Some vehicles only, see [section 1.7.3](#)

Note : It is not required to add the IIDTool in the device list on the mobile device or to perform pairing. The Application handles connectivity. Disconnect from any other Bluetooth device before using the IIDTool.

Integrated Interface replica

Some functions use a replica of the integrated interface. Controls are identical to those of the PC interface. See [section 2.8.5](#)

Representation



Figure 23. App : Representation of the integrated interface

Legend of controls for the Integrated Interface replica

Selectable icons on the screen	Navigation Role	Entering Role	Equivalent Action :
↑	Menu up	Increase the value	
↓	Menu down	Decrease the value	
←	Back or exit a menu	Cancel action	Escape
→	Scroll through the options available in a menu	Validate an action or Select	Enter

Table 15. App : Legend of controls for the Integrated Interface replica

Language

The application is available in French and English. It automatically adjusts to the language of the mobile device. It is recommended that the tool be updated to the same language [section 2.5](#). Thus, the application and content from the tool will be in the same language.

2.8.4 Integrated Interface, Navigation and Commands

The Integrated Interface (II) uses the buttons for cruise control on the steering wheel (and the buttons for the audio system L319-10 and L320-10) as keys. The control layout varies depending on vehicle models (Definition, Installation and Compatibility, [section 1.7](#)).

Prerequisites

- Have access to the vehicle on which the IIDTool will be used
- Ensuring that the vehicle is in a safe environment ([section 2.7.1](#))
- Having taken precautions to avoid battery drainage ([section 2.7.2](#))
- Becoming familiar with the *legend of controls* (next page)

Steps to navigate the Integrated Interface

- 1- Proceed with connecting the IIDTool as per [section 2.8.2](#) and wait until the “IIDTool Ready” message to be displayed on the instrument cluster screen confirming that communication has been established successfully. For all connection problems, please consult the FAQ section of the manufacturer’s website : <https://www.gap-diagnostic.com/>.
- 2- Launch the Integrated Interface by pressing on “Enter” (see *legend of controls*)
- 3- Navigate through the menus using the controls described below. The controls have a dual use either for navigation and entering (see *legends of controls*).

Positions of cruise control commands

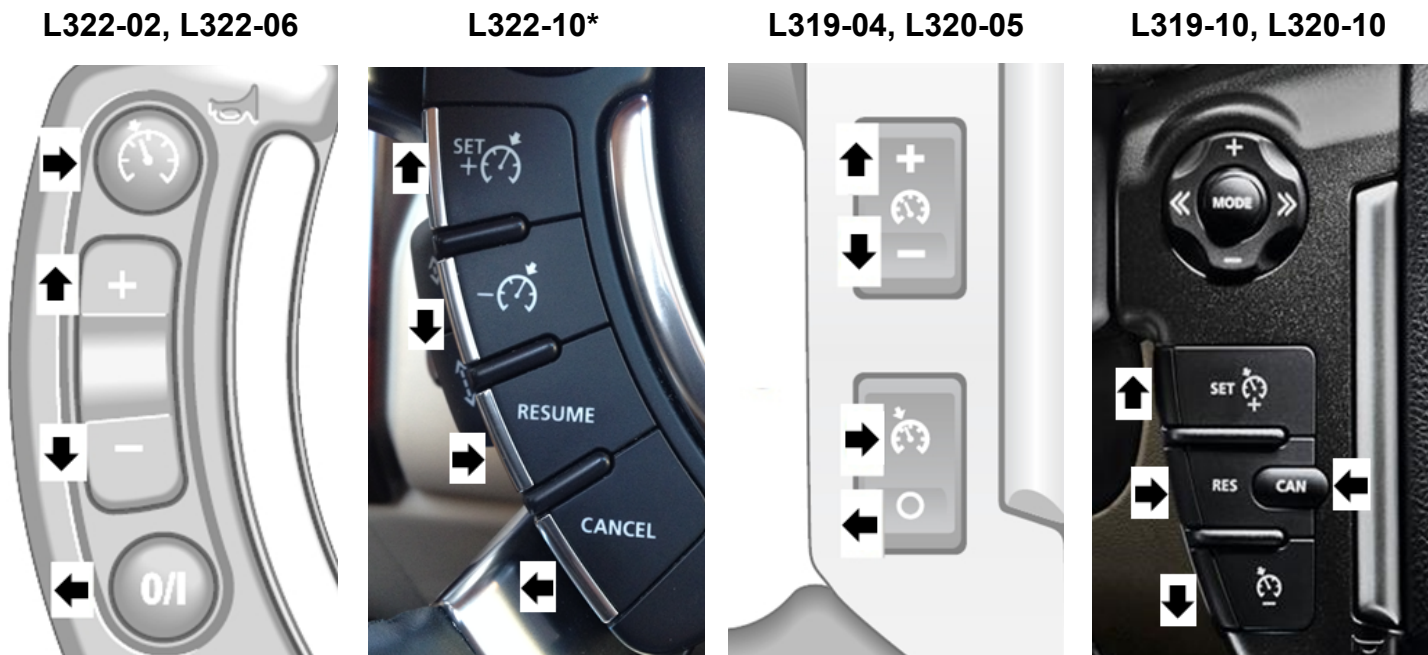


Figure 24. Cruise control commands

*Can be used if the mobile device (App) is unavailable. **Note:** unstable display ([section 1.7](#))

L319-10, L320-10 : Positions of Audio commands



Figure 25. Audio commands, L319-10

Legend of controls for the Integrated Interface

Selectable icons	Navigation Role	Entering Role	Equivalent Action :
↑	Menu up	Increase the value	
↓	Menu down	Decrease the value	
←	Back or exit a menu	Cancel action	Escape
→	Scroll through the options available in a menu	Validate an action or Select	Enter

Table 16. Legend of controls for the Integrated Interface replica

Integrated Interface display

The display is on the dashboard screen in all cases (images and compatibility, [section 1.7](#)).

Dashboard screens have a limit of visible characters. If a longer message needs to be displayed (eg. a fault descriptor), it will automatically scroll in order to allow full read.

L322-02 : If a reading difficulty related to missing pixels is present, it is possible, at specific locations, to scroll information from left to right (eg. Activation code) using the controls ↑ or ↓.

Note : When the <+> symbol appears, it means that the interface is on hold: press the corresponding command ↑ to allow resuming of the current process.

2.8.5 PC interface Navigation and Commands (discontinued)

This interface is available but discontinued. Technical support will not be provided.

The PC interface named controller software, used on a PC running Windows, is based on the Integrated Interface (details on compatibility and interfaces installation are at [section 1.7](#) and [section 2.4](#) of this manual).

Prerequisites

- Have access to the vehicle on which the IIDTool will be used
- Ensuring that the vehicle is in a safe environment ([section 2.7.1](#))
- Having taken precautions to avoid battery drainage ([section 2.7.2](#))
- Having access to a personal computer
- Updater software installed ([section 2.4](#))

Steps to connect the tool on both the vehicle and computer

- Connect the tool on the vehicle's OBDII Port ([section 2.8.2](#)) and wait until the "IIDTool Ready" message to be displayed on the instrument cluster screen confirming that communication has been established successfully. If the vehicle does not support the Integrated Interface ([section 1.7.3](#)), simply wait a few seconds.
- With the tool connected on the OBDII port, join the computer and IIDTool using a USB cable.

Steps to navigate the PC-based Interface

- 1- Launch the PC App : Launch the controller software in the computer and click on "Click here to connect your IIDTool". For all connection problems, please consult the FAQ section of the manufacturer's website : <https://www.gap-diagnostic.com/>.
- 2- Navigate through the menus using the commands described in the *legend of controls for the PC-based interface*. The controls have a dual use either for navigation and entering.

PC Interface representation



Figure 26. PC interface representation

Legend of controls for the PC-based interface





Selectable icons	Navigation Role	Entering Role	Equivalent Action :
	Menu up	Increase the value	
	Menu down	Decrease the value	
	Back or exit a menu	Cancel action	Escape
	Scroll through the options available in a menu	Validate an action or Select	Enter

Table 17. Legend of controls for the PC-based interface

Note : The mouse or the arrow keys can be used to select commands on the screen, however, the other keys are not functional.

This interface is available but discontinued. Technical support will not be provided.

PC Interface display

The PC-based interface has a limit of visible characters. If a message appears longer than the capacity (eg. a fault descriptor), it will automatically scroll in order to allow full read.



WARNING

By selecting certain functions, warning messages will be displayed. The first time these features are used, the warning messages will be shown three times and cannot be ignored. In subsequent uses, warning messages can be avoided by pressing the Enter button.

By pressing the Enter button, the user confirms that he has read and understood the warning.

2.8.6 Disconnecting the IIDTool

The IIDTool was not designed to remain permanently connected to the OBDII port of the vehicle. Disconnect the IIDTool after each use.

The IIDTool can be disconnected at any time except:

Warning! Do not disconnect IIDTool during an ECU flash, or when writing the Car Configuration File (CCF) as a breakdown or serious consequences could arise (descriptions of these functions and recovery methods are found in [section 4.10](#) and [section 4.11](#)).

|| The “Exit menu” message is displayed in the interface to confirm the end of a session and indicates the possibility of disconnection.

|| The tool will automatically terminate any task and exit if the vehicle is in motion except during live values viewing ([section 4.8](#)).

2.9 Activation

Purpose

Linking the vehicle to the IIDTool in addition to providing the user with exclusive access to Advanced Programming Functions ([section 1.4.2](#)), updates, data backup and faster access to functions when connecting the tool to the vehicle.

Principle

- Discover the unique Activation Code to each IIDTool. This is done on the vehicle, through the integrated interface, PC or mobile application.
- Obtain the Unlock Code on the manufacturer's website using the activation code. This code will be visible on the screen and transmitted by email within minutes.

Warning Activating the IIDTool takes only a few minutes. It requires that the vehicle ignition be turned ON (position "ON or II"), but starting the engine is not essential. If the user wants to explore the menu during this stage, starting the vehicle is needed (in safe environment) or provisions should be taken to avoid discharging the vehicle battery ([section 2.7](#)).

General Prerequisites

- Having carried out the User Registration ([section 2.2](#))
- Having updated the IIDTool firmware ([section 2.5](#))
- Have access to the vehicle in a safe environment ([section 2.7](#))
- Know where the OBDII connector is located ([section 2.8.1](#))
- Be familiar with the profile of the selected Interface Controls ([section 2.8.3](#), [section 2.8.4](#) and [section 2.8.5](#))



WARNING

The vehicle must be in a safe environment!

Ensure the vehicle is in park:

-Automatic transmission: In "Park"

-Manual transmission: In neutral position with the parking brake engaged.

II Prerequisites

- L319-10, L320-10 : The radio must be turned OFF
- L322-06 : The parking brake must be disengaged

2.9.1 App, Activation using the mobile App, online mode

Prerequisites

- The mobile device is connected to the internet
- Having completed the general prerequisites for activation mentioned on [section 2.9](#)
- Own a IIDTool **BT** or IIDTool **Pro**
- Own a compatible mobile device ([section 1.7.5](#)) with the Bluetooth module turned “ON”
- Having completed installation of the application in the mobile device ([section 2.4](#)) and have ensured that it is synchronized with the tool ([section 2.6](#))
- Be aware of warnings and particularities

Note : It is not required to add the IIDTool in the Bluetooth pairing screen of the mobile device to perform a pairing. The Application handles the connection. Disconnect from any other Bluetooth device before using the IIDTool.

Steps to activate the IIDTool using the App

- 1- Turn ignition ON without starting the engine (turning the key to “ON, II” or press the “start engine” button without simultaneously pressing the brake pedal).
- 2- Insert the IIDTool in the vehicle’s OBDII connector
- 3- Wait 30 seconds until the “IIDTool Ready” message is displayed on the instrument pack screen. This delay is caused by the scan process that detects which ECUs are present.
- 4- Launch the Mobile Application IIDControl already installed on your compatible mobile device
- 5- Press “Search for tool” at the bottom of the screen
- 6- Select the desired tool available in the list (“Available Devices”). If only one device is discovered, the App will automatically connect to it.

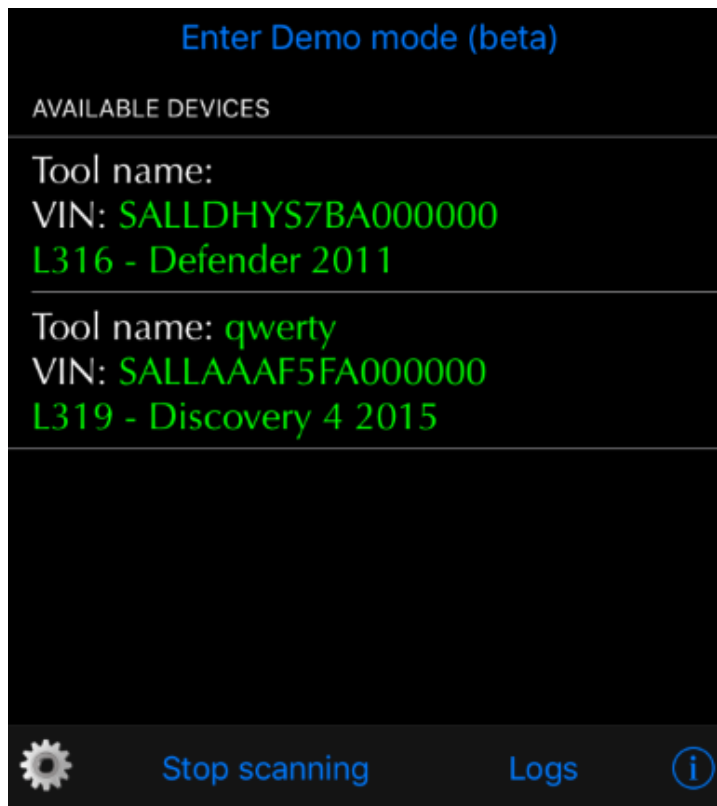


Figure 27. App : Activation -> tool selection

- 7- Click on “Activate” (right of vehicle information) to display the activation page.

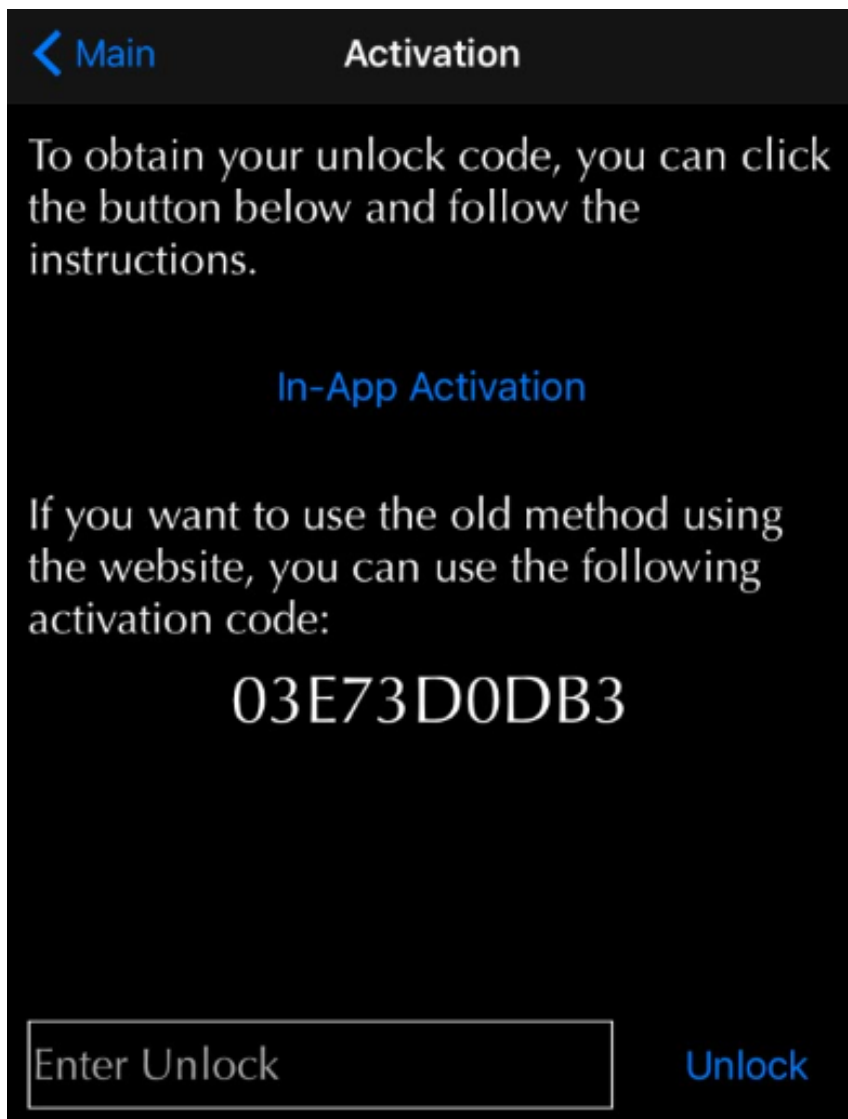


Figure 28. App : Activation when connected to the internet

- 8- Click on “Activate in the App”.
 - 9- If registration on our website was completed ([section 2.2](#)), Click on “Log In”.
- Or**
- If registration had not been completed, click on “Register”.
- 10- Follow the instructions to activate the tool.

Note; Once completed, it is not necessary to proceed with further steps. The tool is now ready for usage.

2.9.2 App, Activation using the mobile App, offline mode

Prerequisites

- The mobile device is not connected to the internet
- Having completed the general prerequisites for activation mentioned on [section 2.9](#)
- Own a IIDTool **BT** or IIDTool **Pro**
- Own a compatible mobile device ([section 1.7.5](#)) with the Bluetooth module turned “ON”
- Having completed installation of the application in the mobile device ([section 2.4](#)) and have ensured that it is synchronized with the tool ([section 2.6](#))
- Be aware of warnings and particularities

Note : It is not required to add the IIDTool in the Bluetooth pairing screen of the mobile device to perform a pairing. The Application handles the connection. Disconnect from any other Bluetooth device before using the IIDTool.

Steps to activate the IIDTool using the App

- 1- Turn ignition ON without starting the engine (turning the key to “ON, II” or press the “start engine” button without simultaneously pressing the brake pedal).
- 2- Insert the IIDTool in the vehicle’s OBDII connector
- 3- Wait 30 seconds until the “IIDTool Ready” message is displayed on the instrument pack screen. This delay is caused by the scan process that detects which ECUs are present.
- 4- Launch the Mobile Application IIDControl already installed on your compatible mobile device
- 5- Press “Search for tool” at the bottom of the screen
- 6- Select the desired tool available in the list (“Available Devices”). If only one device is discovered, the App will automatically connect to it.

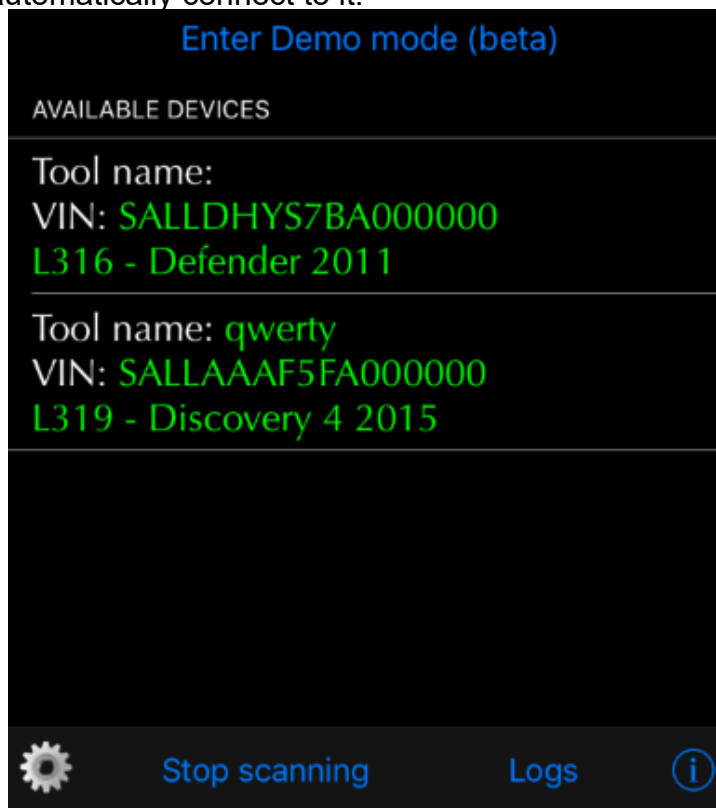


Figure 29. App : Activation -> tool selection

- 7- Click on “Activate” (right of vehicle information) to display the activation page.

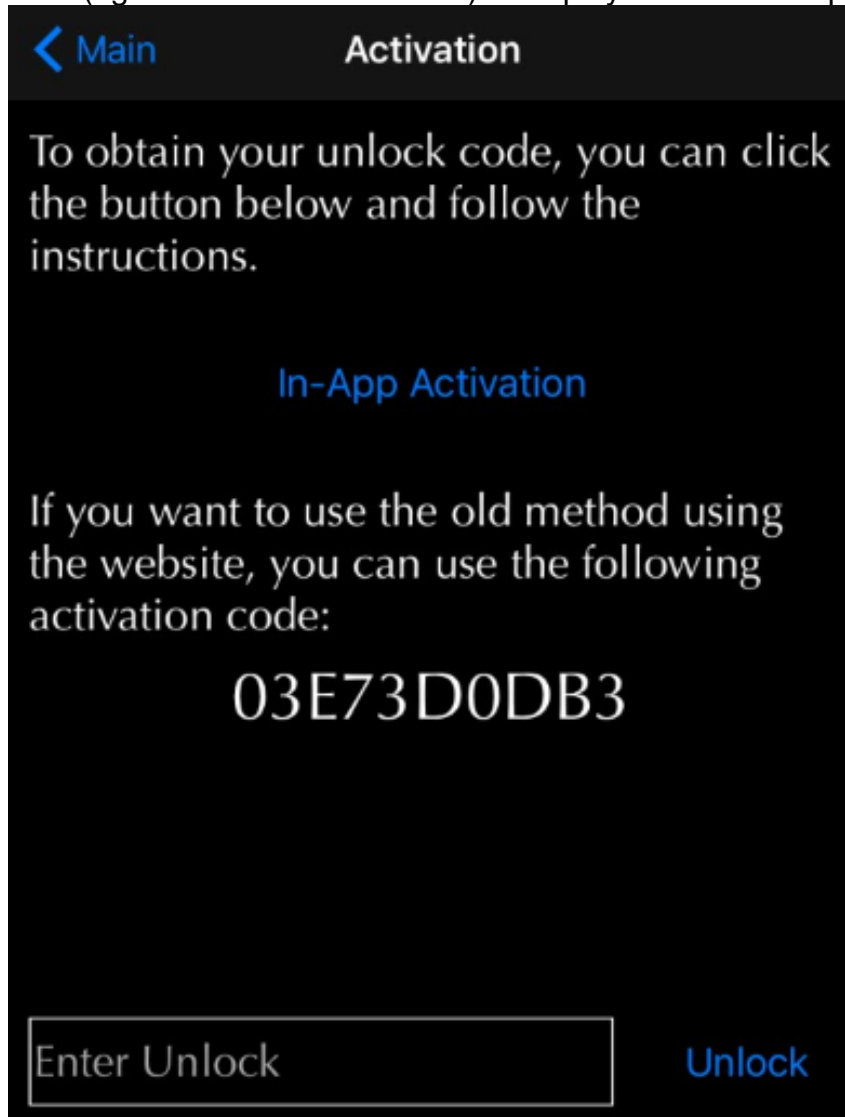


Figure 30. App : Activation when connected to the internet

- 8- Since the mobile device is not connected to the Internet, note the 10 character activation code and follow steps in [section 2.9.4](#)
- 9- Following receipt of the unlock code, press the box “Enter Unlock” at the bottom of the page and enter the code. Then press on “Unlock”.
- 10- Once the unlock code is entered correctly, the IIDTool will backup the suspension calibration and Car Configuration File (CCF). A confirmation of the execution will be displayed.
- 11- **Pro** : Repeat steps 1 to 7 and send us the activation code at support@GAP-Diagnostic.com. A second unlocking code will be sent. It must be entered in the same vehicle the activation code was taken from (steps 9 and 10). The IIDTool **Pro** will now be fully unlocked.





The user now has access to advanced functions and data backup.

2.9.3 Activation using the Integrated (II) or PC Interface

Prerequisites

- Having completed the general prerequisites for activation mentioned before
- Be aware of warnings and particularities
- Having the necessary tools to note the activation code
- Have access to a personal computer with an internet service (for one of the stages)

Steps to activate the IIDTool using the Intergrated (II) or PC Interface.

- 1- Turn ignition ON without starting the engine (turning the key to “ON, II” or press the “start engine” button without simultaneously pressing the brake pedal).
- 2- Connect the IIDTool on the OBDII connector
- 3- Wait 30 seconds until the “IIDTool Ready” message is displayed on the instrument pack screen. This delay is caused by the scan process which detects which ECUs are present.
- 4- Lunch the Integrated Interface by pressing on the  button ([section 2.8.3](#)). If the PC interface is used ([section 2.8.5](#)), once connected to the tool click on .
- 5- Reach the activation code by browsing through the menus as follows : Menu -> IIDTool Config -> Unlock Code
- 6- Note the 10 character activation code.
Note : It is possible to scroll the code from left to right if required with the  and  buttons.
- 7- Obtain the unlock code ([section 2.9.4](#))
- 8- Once the unlock code is received, return to the vehicle, repeat steps 1 to 5
- 9- Enter the Unlock Code using the corresponding commands ([section 2.8.3](#), [section 2.8.4](#) and [section 2.8.5](#))
- 10- Once the unlock code is entered correctly, the IIDTool will backup the suspension calibration and Car Configuration File (CCF). A confirmation of execution will be displayed.

The user has now access to advanced programming functions and data backup.

2.9.4 Obtain the unlock code

- 1- Log onto the website (“Login”) and follow instructions given by the following image (A, B and C) to reach the activation form.

Note : If registering had not been made, press “Register” rather than on “Login”.

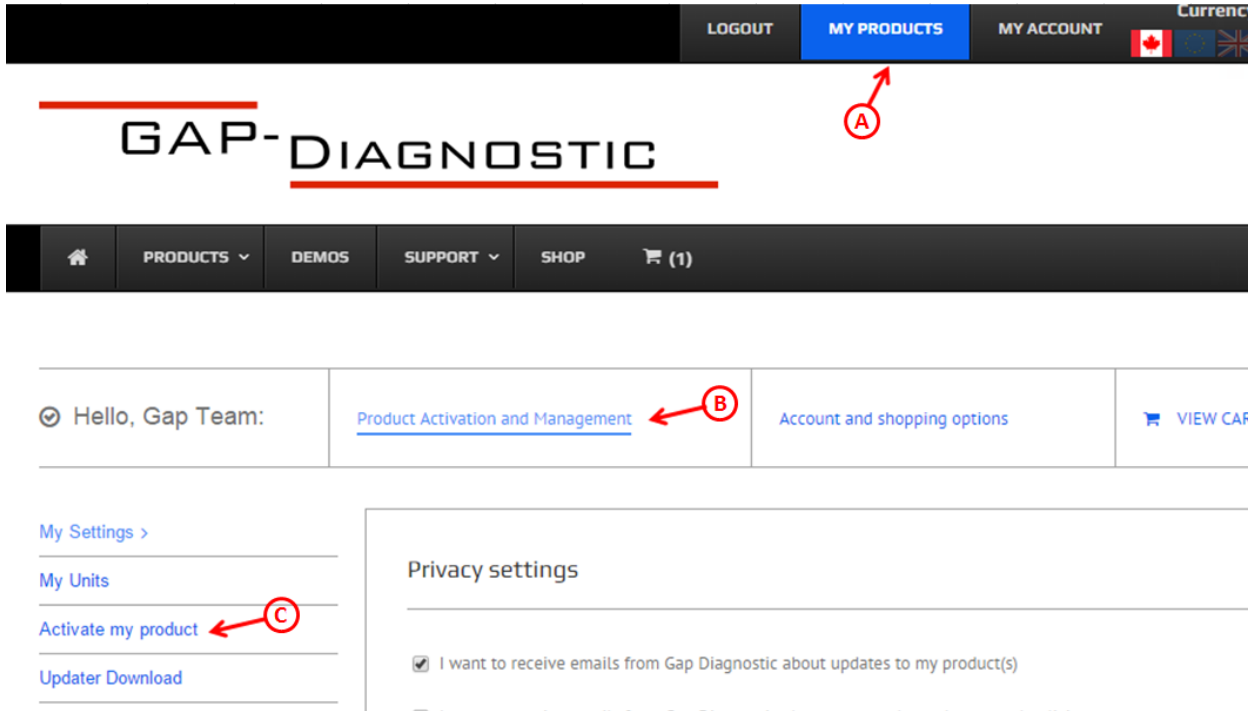


Figure 31. Steps to get an unlock code from the website

- 2- Complete the form and click “Submit”

Product and Car Information (Mandatory)

Product*
IIDTool BT

Model*
L319 - Discovery 3 / LR3

Year*
2004

Engine*
Diesel

Product Origin*
Island 4x4

Activation Information

Activation Code* **Code D'activation**
1123456789

VIN License
Enter only if you have bought a license for additional unlocks on your unit.

SUBMIT

*This is mandatory.

Figure 32. Activation form

3- The code is displayed on the screen and an Email will be sent.

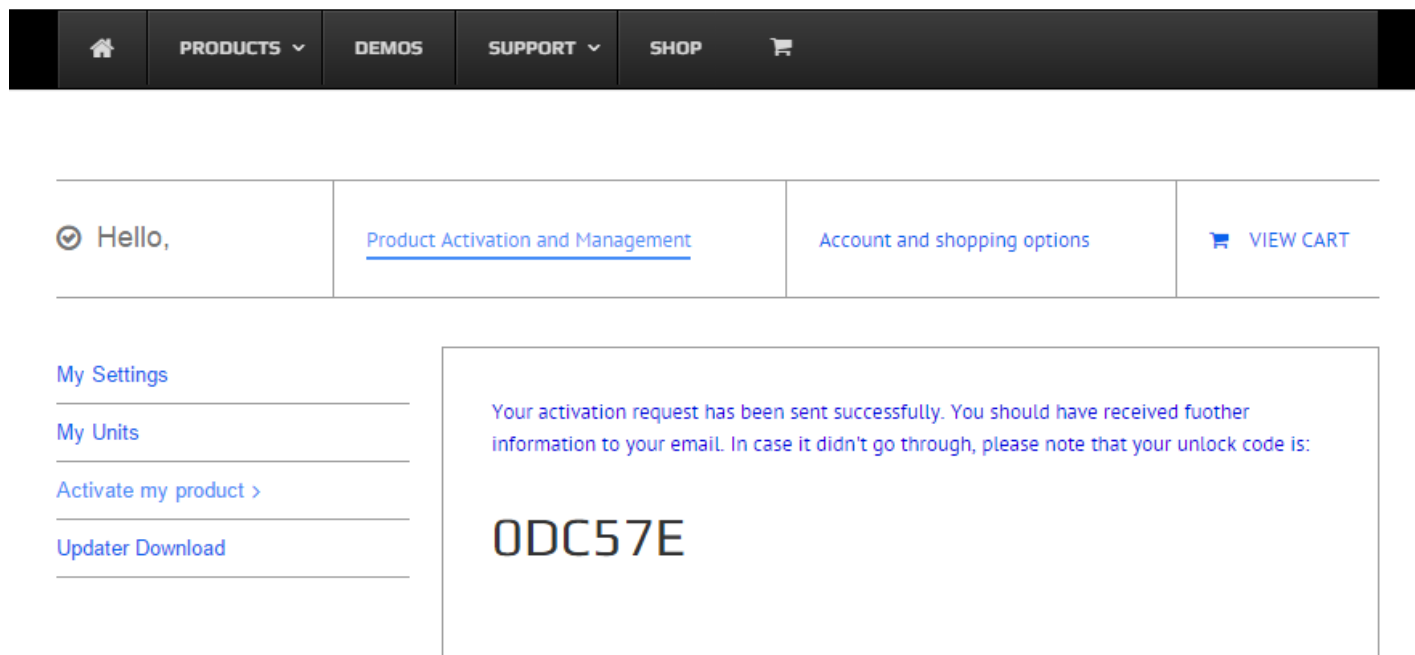


Figure 33. Unlock code shown on the website

4- Return to [section 2.9.2](#) or [section 2.9.3](#) to complete the activation process.

2.9.5 Pro, Additional activation steps

Offline mode

Repeat steps 1 to 7 of [section 2.9.1](#) or [section 2.9.2](#) and send us the activation code at support@GAP-Diagnostic.com. A second unlocking code will be sent. It must be entered in the same vehicle the activation code was taken from. The IIDTool **Pro** will now be fully unlocked.

Online mode

- 1- Click on Unlock

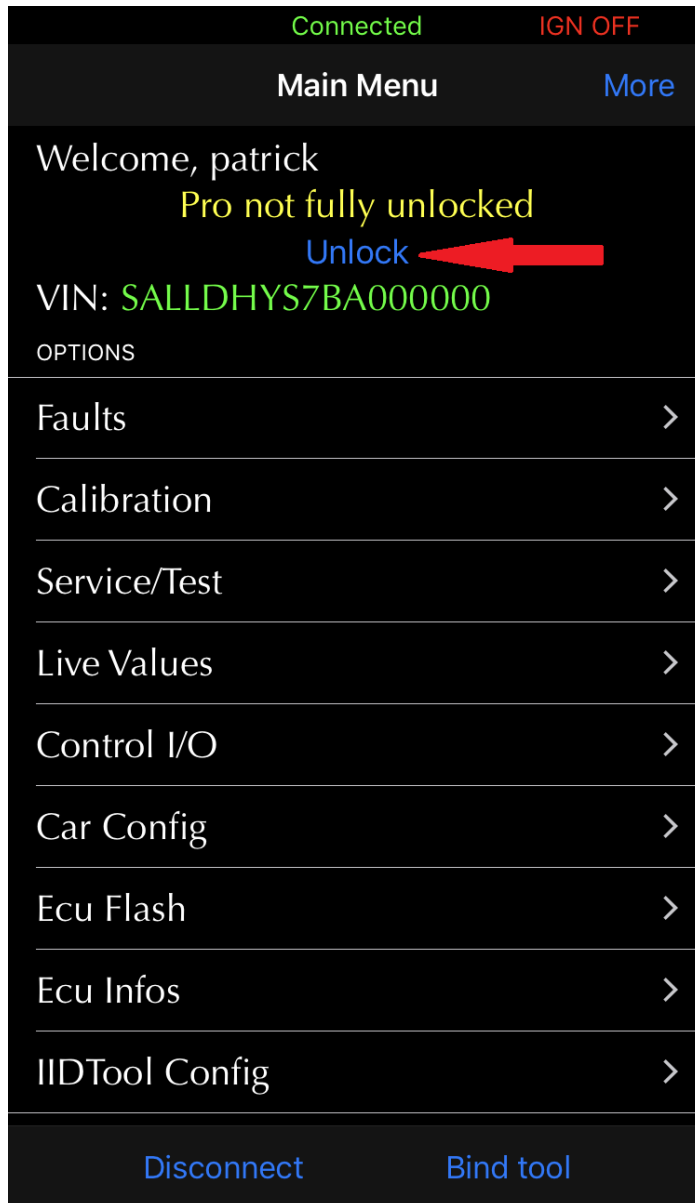


Figure 34. Pro, additional activation steps, 1

- 2- Click on Send email

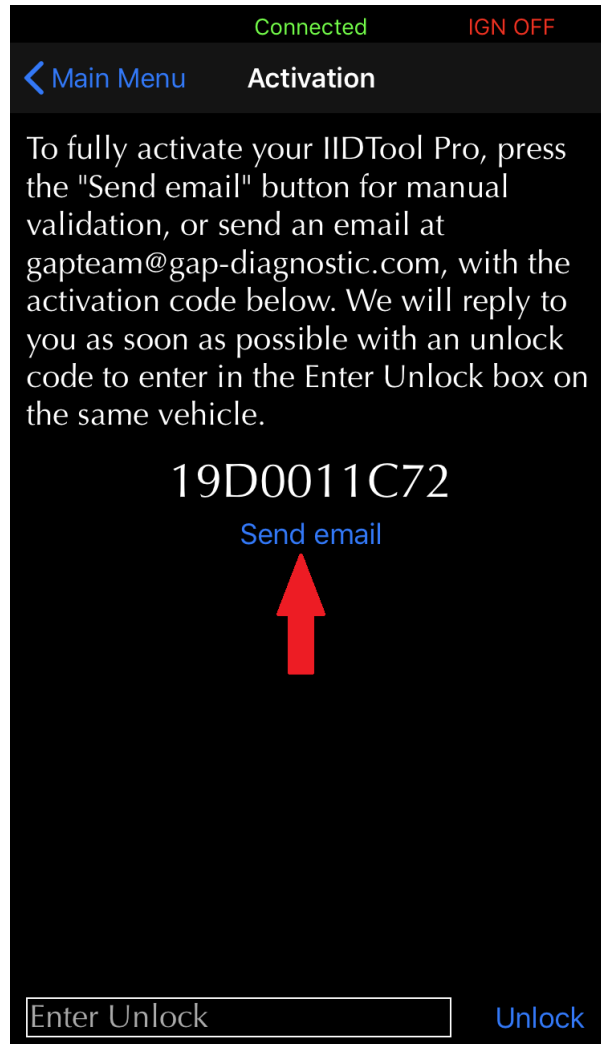


Figure 35. Pro, additional activation steps, 2

- 3- A second unlocking code will be sent. It must be entered in the same vehicle the activation code was taken from. The IIDTool **Pro** will now be fully unlocked.

2.9.6 Obtain an additional licence

Purpose

Allow the owner of the IIDTool to access the advanced functions on a vehicle other than his own (some restrictions apply, see [section 1.4.2](#)).

Prerequisites

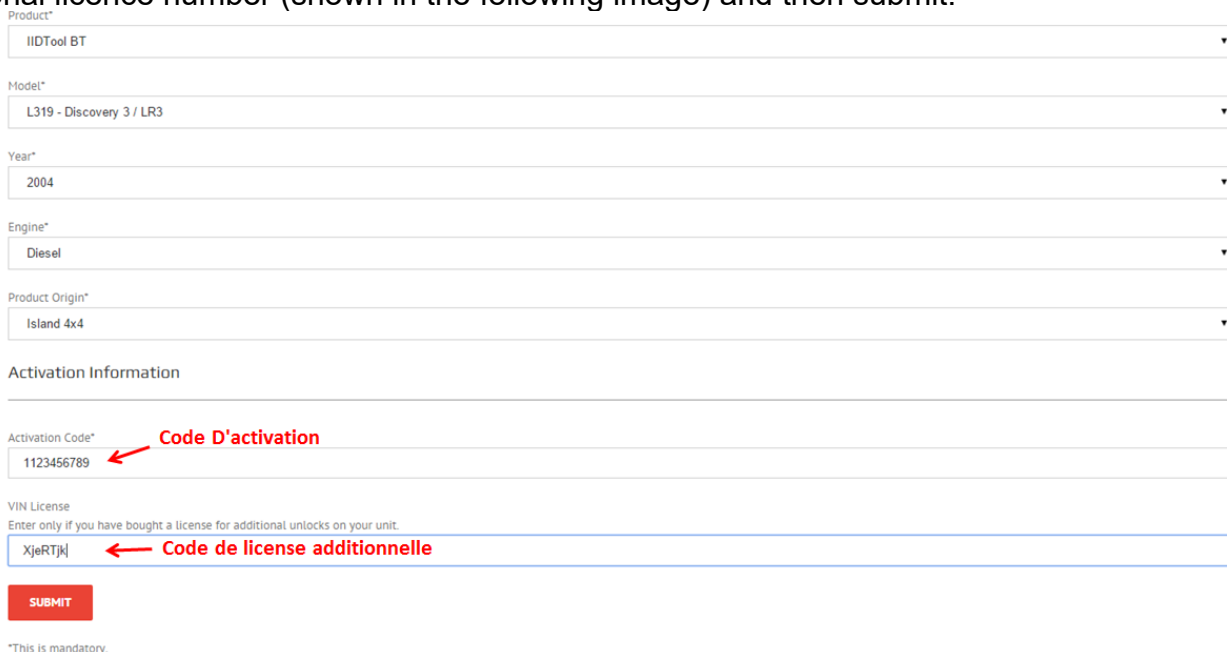
- Own an IIDTool or IIDTool **BT**
- Having consulted or be aware of applicable restrictions to the use of additional licences ([section 1.5](#))
- Having procured an additional licence from the GAP-Diagnostic website.
<https://www.gap-diagnostic.com/shop/extra-vin-license-for-iidtool-and-eascontrol/>

Note : It is possible to perform a “pre-activation”; when the IIDTool is in the presence of the vehicle for which the additional licence was acquired, it can be unlocked by going to Menu-> IIDTool Config-> Unlock Code.

Steps for adding a licence or pre-unlocking the tool: II and App with mobile device not connected to the internet.

- 1- Connect the IIDTool on the OBDII connector
- 2- Discover the unlock code by returning through all stages of activation with the chosen interface ([section 2.9.2](#) or [section 2.9.3](#)).

Particularity : In the activation form on the manufacturer’s website, enter the Activation code and the additional licence number (shown in the following image) and then submit.



Product*

IIDTool BT

Model*

L319 - Discovery 3 / LR3

Year*

2004

Engine*

Diesel

Product Origin*

Island 4x4

Activation Information

Activation Code* **Code D'activation**

1123456789

VIN License

Enter only if you have bought a license for additional unlocks on your unit.

XjeRTjk **Code de license additionnelle**

SUBMIT

*This is mandatory.

Figure 36. Additional licence field on the website

The user now has access to advanced programming functions, to updates and save/restore functions for another vehicle. Automatic backups of air suspension settings (if applicable) and the Car Configuration File (CCF) will be performed once connected to the vehicle on which the new unlock will be

applied.

Steps for pre-unlocking the tool: App with mobile device connected to the internet only

- 1- Connect the IIDTool on the OBDII connector
- 2- Navigate to Menu->IIDTool Config->Pre Unlock Tool
- 3- Click on “In-App Activation”
- 4- Enter the licence code (red arrow), select tool origin, read and agree to the terms and conditions then click on activate.

The tool is now pre-activated for another vehicle.

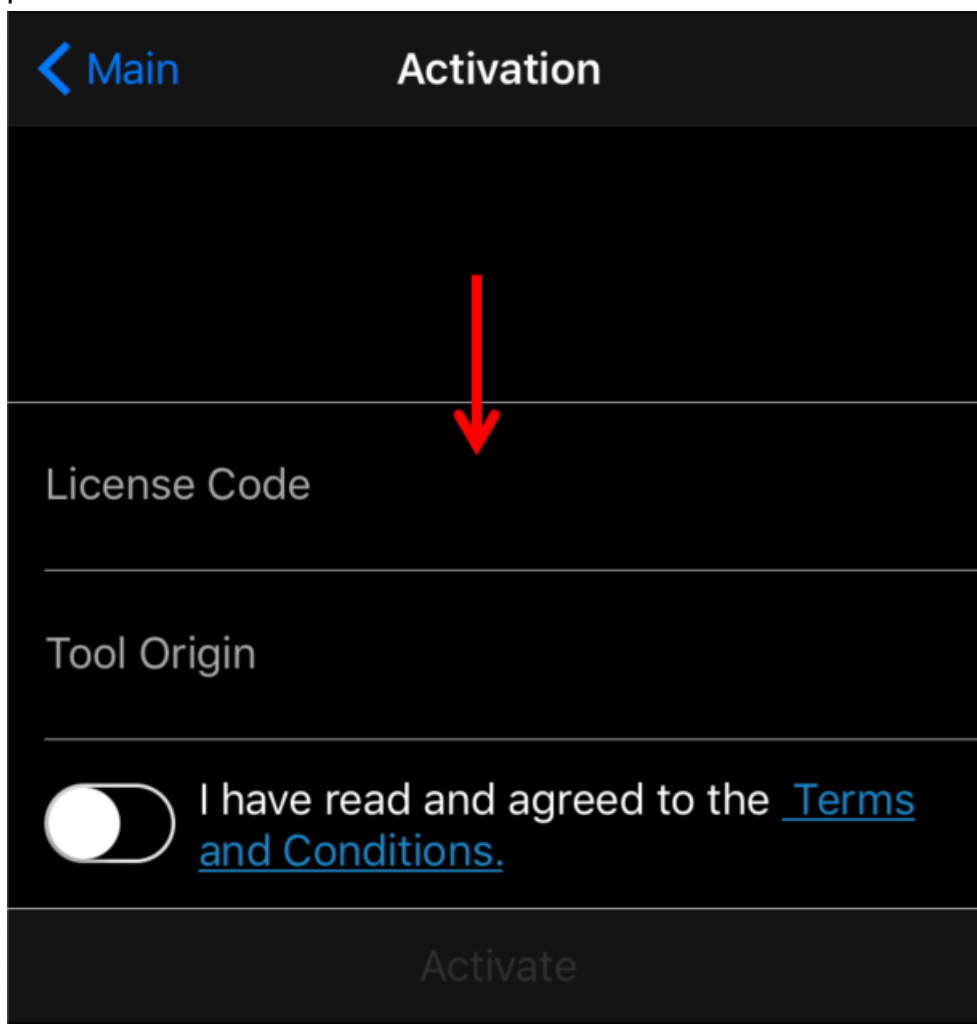


Figure 37. App : mobile device connected to the internet. Steps for pre-unlocking the tool

2.9.7 Transfer of ownership

Purpose

Allow the new owner of the IIDTool to access the advanced functions on a vehicle (some restrictions apply, see [section 1.4.2](#)).

Prerequisites

- Having purchased a used IIDTool or IIDTool **BT**
- Having consulted or be aware of applicable restrictions to the use of all licences ([section 1.5](#))

Note : Transferring a unit will remove advanced programming functions capability from the previous vehicle and have the unit registered under your name.

Steps for transferring an IIDTool:

- 1- Proceed with purchasing a transfert of ownership from the manufacturer website:
<https://www.gap-diagnostic.com/shop/>
- 2- Discover the activation code with the chosen interface
II: [section 2.9.2](#) steps 1 to 6
App: [section 2.9.3](#) steps 1 to 7
- 3- Send the activation code to this e-mail address:
support@GAP-Diagnostic.com
- 4- Once a reply is received with the unlock code, simply proceed with the appropriate steps:
II: [section 2.9.2](#) steps 8 to 10
App: [section 2.9.3](#) steps 9 to 10

The user now has access to advanced programming functions, to updates and save/restore functions for his vehicle. Automatic backups of air suspension settings (if applicable) and the Car Configuration File (CCF) will be performed once connected to the vehicle on which the new unlock will be applied.

2.9.8 Permissions

Purpose

Indicates which permissions are available when a tool is connected to a specific vehicle. Click on the [More](#) button located on the top bar to show permissions.

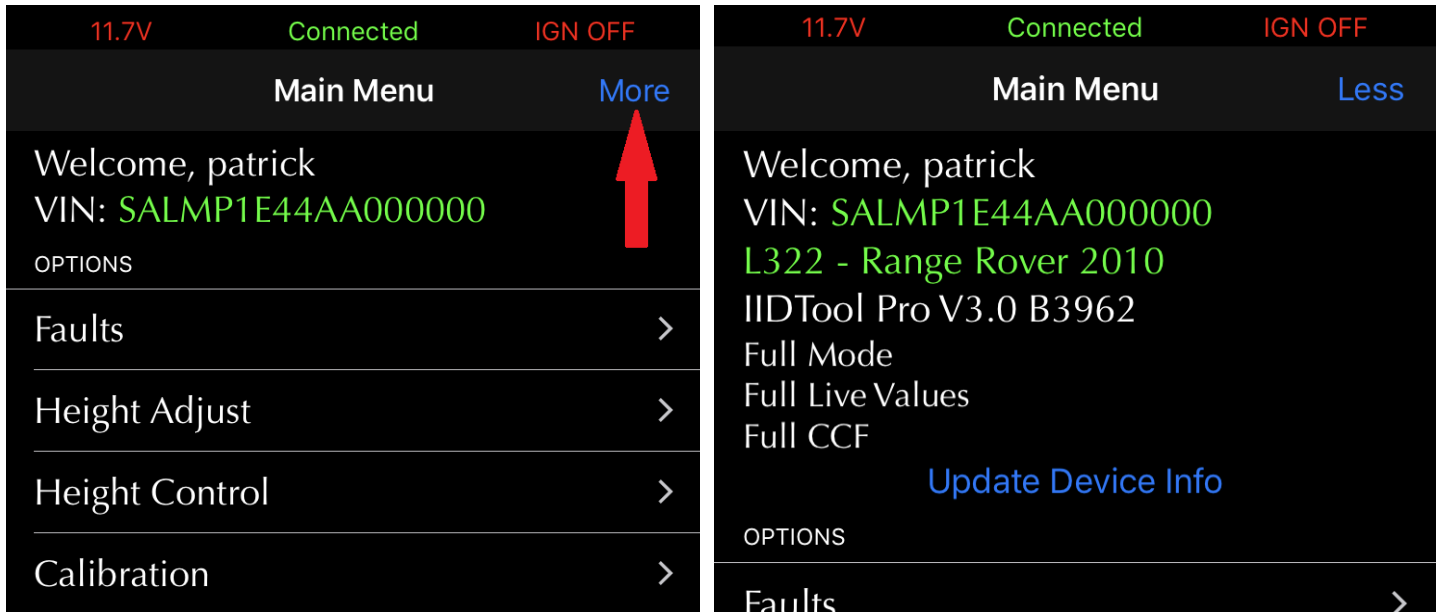


Figure 38. [App](#) : Viewing permission example

Definitions

- **Limited Mode/Full Mode:** Limited Mode gives access to Diagnostic functions while Full Mode also allows usage of Advanced programming functions, see [section 1.4.2](#).
- **Full Live Values:** This allows viewing tested and untested live values, [section 4.8](#)
- **Full CCF:** This allows viewing and editing of tested and untested CCF settings, [section 4.10](#)

Updating permission

- **From Limited Mode to Full Mode:** This requires the tool to be activated as per [section 2.9](#) or an additional licence to be added for a specific car [section 2.9.5](#).
- **Full Live Values:** This is available without any intervention. The tool may not offer Full Live Values for all supported vehicles. In which case, the Untested list will be empty,
- **Full CCF:** This is available upon request. The tool may not offer Full CCF for all supported vehicles. In which case, the Untested list will be empty.

If changes were made, simply click on the [Update Device Info](#) button.

Scenarios

- **Tool not activated**, only the Limited Mode will be available.

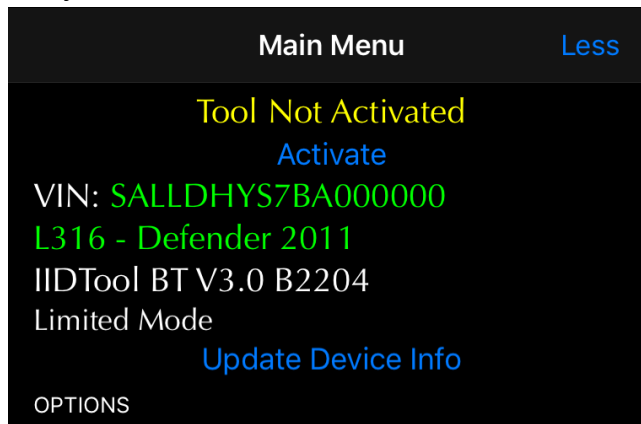


Figure 39. App : Permissions, tool not activated

- **Tool activated and connected to the vehicle for which it was unlocked**, Full Mode, Full Live Values and Full CCF (if requested) will be available.

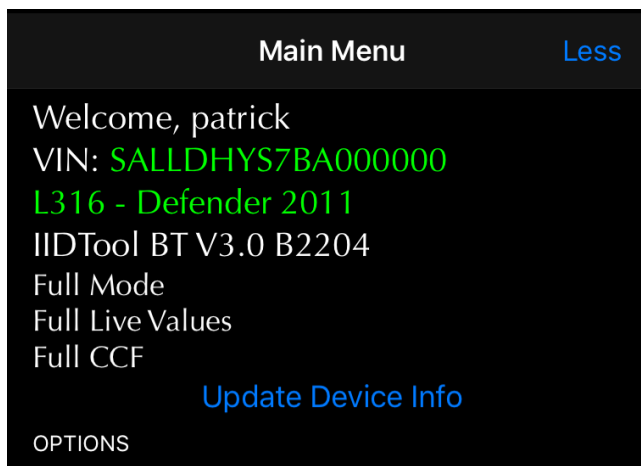


Figure 40. App : Permissions, tool activated and connected on an unlocked vehicle

- **Tool activated and connected to a vehicle for which it was not unlocked**, Limited Mode and Full Live Values will be available.

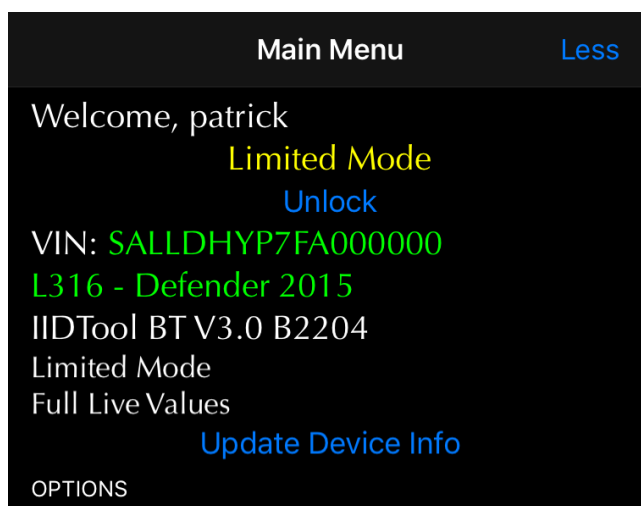


Figure 41. App : Permissions, tool activated and connected on a vehicle not unlocked

3 Diagnostic Keys

Purpose

Succeeding at a reliable diagnosis and contribute to a successful repair.

Principle

Explore the complex diagnostic notions and extract the maximum out of the IIDTool.

1st Key : Understanding the concept of faults and its subtleties ([section 3.1](#))

2nd Key : Completing the Diagnosis ([section 3.2](#))

3.1 Fault Concept-1st Key

3.1.1 Faults introduction

A fault (or “Diagnostic Trouble Code” (DTC)) indicates the presence of an abnormal situation on the electrical system or the vehicle electronics and can reveal the source of trouble. A fault can also indicate the presence of a mechanical problem.

Consultation of faults present on systems is the initial phase of the diagnosis process.

Faults are expressed in the form of codes that can be viewed and interpreted using the IIDTool ([section 4.3](#))

3.1.2 Faults Detection

Each vehicle system is equipped with an ECU responsible for monitoring its power supply as well as analysis, monitoring and management of incoming and outgoing signals from this system.

ECUs use algorithms for monitoring faults. Each refers to an anomaly in a vehicle system or related systems (see cascading effect, [section 3.2.1](#)).

Monitoring type

- Continuous monitoring
- Cyclic monitoring of systems (specific requirements for their actuation)

Detection process

To accomplish all stages of fault detection, a driving cycle may be required according to the implemented algorithm. This is particularly true for systems that only use cyclical monitoring.

Drive cycle

Period and conditions allowing ECUs to complete the test or sequence of tests required to detect all types of faults on their systems revealing the presence or absence of a potential anomaly.

The test cycle consists of an engine starting, driving the vehicle and stopping the engine (with increase in temperature of cooling liquid and lubricants).

It is advisable that the different types of driving (urban and motorway) be part of the same drive cycle. For confirmation, some require at least two drive cycles. To ensure confirmation of a fault, in general, it is suggested to use the vehicle normally (including drive cycles) over a period of one week.

Note : *The ideal drive cycle varies depending on the vehicle, the driving conditions and the anomaly to be detected.*

3.1.3 Faults types, brief description

	Definition	Warning message or light on Instrument Pack	IIDTool function used
Confirmed Fault	Fault permanently present (and implicitly confirmed)	Possible	Faults
Pending fault	Fault detected, but requiring more testing before being considered confirmed	On rare occasions only	Advanced Read
Consecutive or Cascading Fault	Fault derived from the result of a cascading effect (appearance of a confirmed fault on a ECU which generates one or more other faults on this or other ECUs)	Most probably	Faults

Table 18. Fault types, brief description

3.1.4 Faults definitions

The IIDTool provides a definition of faults observed. Fault codes structure is described in [section 4.3](#).

3.2 Completing the Diagnosis-2nd Key

It is possible to make a reliable diagnosis and ensure the success of a repair using IIDTool functions in a few steps.

Steps to complete a diagnosis

- 1- Take notice of faults present on ECUs of the vehicle using the Fault function ([section 4.3](#))
- 2- Note all displayed faults indicating a possible malfunction and compare these faults with symptoms.
- 3- Decode (if necessary) fault codes starting with the letters P, B or C ([section 4.3.3](#))
- 4- If necessary, correct issues reported by faults codes. In order of priority, the faults P, B and C should be addressed.
- 5- After a repair, clear the fault codes using the Clear Faults function ([section 4.3.2](#))
- 6- Calibrate or use a service routine if required ([section 4](#))
- 7- If required, proceed with some [Drive cycle](#)
- 8- Ensuring absence of the same fault by checking again the list of faults.

Summary

Read Fault -> Repair -> Calibrate or use a Service Routine (when needed) -> Clear faults

Note : *The presence of numerous faults can signal a Cascade Effect. Follow these steps to complete the diagnosis.*

3.2.1 Diagnostic procedure in the presence of a Cascade Effect

A cascading effect may be suspected when there are many warning lights and the presence of a fault code beginning with the letter U referring to another system ([section 4.3.3](#)).

Steps for diagnosis of a cascading effect

- 1- Follow each steps to complete a diagnosis and correct the defects for each Fault beginning with the letter P, B or C
- 2- Verify that U-type faults are absent.
- 3- If present, correct the U-type faults referring to a part of the system (not communication related faults).

Note : *U-type communication fault presence without symptoms is normal.*

4 IIDTool Functions

4.1 Introduction to Functions

Each function meets one or more roles in achieving the following objectives (as defined in [section 1.4](#)):

- Diagnose a problem resulting from a disorder of the electrical / vehicle electronic or mechanical systems
- Personalize certain vehicle behaviours by changing settings
- Contribute to the success of a repair
- Administer ECUs
- IIDTool settings

Note : The classification of functions offered by each models of IIDTool and their access levels are defined in [section 1.4.3](#). Definitions, roles and usage of each function are available on the following page. The Menu Trees for integrated interface users are located in [Appendix](#).

4.1.1 Directory of Functions

Most functions are available for all vehicles covered ([section 1.6](#)) according to their requirements and configurations (the level of access to functions and their limitations are discussed in [section 1.4](#)).

Function name	Sub Function	Function Role	Manual Section
Version		IIDTool Configuration	section 4.2
Faults		Diagnostic and Repair	section 4.3
	Read	Diagnostic and Repair	section 4.3.1
	Clear	Diagnostic and Repair	section 4.3.2
	Advanced Read	Diagnostic and Repair	section 4.3.4
Height		Personalization	section 4.4
Height Control		Convenience	section 4.5
Calibration	See section	Repair	section 4.6
Service Test	See section	Repair, maintenance and other	section 4.7
Live Values		Diagnostic	section 4.8
Control IO		Diagnostic	section 4.9
Car Configuration	See section	Personalization	section 4.10
ECU Flash	See section	Administration of ECUs, repair and personalization	section 4.11
ECU Info		Administration of ECUs	section 4.12
Save and Restore	See section	Administration of ECUs, repair and personalization	section 4.13
IIDTool Config		IIDTool configuration	section 4.14

Table 19. Directory of Functions

4.1.2 Definitions and examples of Functions usage

Here's a brief definition of offered functions as well as a small sample of possible usage. Usage procedures of Functions and Sub Functions are available in referenced sections. The Integrated Interface (II) Menu Trees are in [Appendix](#).

Function Name	Definition	Example of usage	Manual Section
Version	Allows viewing the current firmware version of the IIDTool	Version 3.0 Build 2006	section 4.2
Read Faults	Reading faults indicates the possible presence of an electrical or mechanical problem.	Understand why a warning light is displayed on the instrument pack.	section 4.3.1
Clear Faults	Erasing faults registered by ECUs	ex : Clear a Fault indicating an undetected tire valve	section 4.3.2
Advanced Read	Further Faults analysis to check the level of completion of faults detection tests	Check if specific faults are still under test	section 4.3.4
Height	Change the height of the air suspension	ex : Raise the standard height by 10 mm	section 4.4
Height Control	Change the current height mode (Normal, off-road or Access). Lower the rear axle down to the bump stops.	Change height mode from outside the vehicle for easier loading.	section 4.5
Calibration	Calibration of sensors which have undergone replacement or repair	ex : Steering angle sensor	section 4.6
Service Test	Complementary action for the diagnosis, repair and others	Resetting the oil counter	section 4.7
Live Values	Monitoring and visualization of sensor or actuator status	Allows identifying conditions present when diagnosis is performed	section 4.8
Control IO	Sensors and actuators control for testing system components	ex : Simulate temperature to verify the system response	section 4.9
Car Configuration	Modify the configuration file of the vehicle to customize a behaviour.	Activate the rear-view screen after installing a rear-view camera.	section 4.10
ECU Flash	Updating ECU firmwares	Update the Bluetooth ECU (phone) to fix some pairing problems	section 4.11
ECU Info	Visualization of information for each ECU detected	Verify if the ECU firmware is up to date	section 4.12
Save and Restore	Save and recall suspension calibration. Restore configuration values.	ex : Reset configurations as they were when using the tool for the first time.	section 4.13

IIDTool Configuration	Functions that are specific to the tool itself.	Register and activate a licence for a second vehicle	<i>section 4.14</i>
-----------------------	---	--	---------------------





Table 20. Definitions and examples of functions usage

4.1.3 General Access to Functions

General Prerequisites for all Interfaces

- Having access to the vehicle in a safe environment ([section 2.7.1](#)).
- Taking precautions to avoid battery drainage ([section 2.7.2](#)).
- Having connected the tool to the OBDII connector ([section 2.8.2](#)).
- Know the controls of the selected Interface ([section 2.8.3](#), [section 2.8.4](#) or [section 2.8.5](#)).

II Steps to access Functions

- 1- Fulfill the general prerequisites defined above.
- 2- Launch the IIDTool by pressing on .
- 3- Navigate using the  and  buttons.
- 4- Select the desired function with the  command .

App

Prerequisites :

- Own a IIDTool **BT** or IIDTool **Pro**.
- Having access to a compatible mobile device ([section 1.7.5](#)) with the IIDControl App installed ([section 2.4.3](#)) and synchronized with the IIDTool ([section 2.6](#)).

Steps to access Functions

- 1- Fulfill the general and App prerequisites defined above.
- 2- Follow instructions found in [section 2.8.3](#) to access the menu.
- 3- Select the desired function.


4.2 Function “Version”

4.2.1 Definition

This function displays the current firmware version of the IIDTool being used.

4.2.2 Access

II

- 1- Perform the initial stages of general access to functions ([section 4.1.3](#)).
- 2- Navigate to Read Faults and press  to view the version. Do not enter the Read Fault function.

App

The IIDTool **BT** or IIDTool **Pro** current version is displayed on the main menu screen (Build WXYZ).

Note : The IIDTool firmware version is also visible when pairing with the Updater Software (Updater software installation, [section 2.3](#) and Updating the IIDTool firmware [section 2.5](#))

4.3 Function “Faults”

This function is split into 3 sub functions; “Read Faults”, “Clear Faults” and “Advanced Read”.

4.3.1 Sub-Function “Read Faults”

Definition



This diagnostic function gives access to the list of currently stored faults in covered ECUs. It helps, following the reading, to identify the source of the problem.

Important : **||** Only “Confirmed” faults are shown by this function (Fault notion [section 3.1](#)).

App. The app allows changing and saving the type of faults displayed by default. See [section 4.3.4](#) for more details.

|| Access

The IIDTool offers two reading options:

Individually interrogate an ECU to view its fault list.	Or	See the list of all ECUs having at least one fault stored.
The “Select ECU” option 1-Perform the initial stages of general access to functions (section 4.1.3) 2-Select “Read Faults” 3-Select the “Select ECU” option 4-Navigate through ECUs available using commands 5-Select the desired ECU with  command 6-Wait while reading faults occurs. If no fault is detected for the selected ECU, the message “No Fault Stored” appears and it will automatically return to the menu “Select (ECU).”		The “Scan ECUs” option 1-Perform the initial stages of general access to functions (section 4.1.3) 2-Select “Read Faults” 3-Select the “Scan and filter” option 4-Wait while the scan is performed. Only ECUs having at least one fault appear in the resulting list. 5-Navigate through ECUs available using commands 6-Select the desired ECU with  command

App Access

Simply click on Faults. The IIDTool will automatically proceed with scanning all ECUs to detect the presence of faults. Following the scan, you can either view the complete list of faults or the list of ECUs with at least one fault stored in memory.

The “Faults By ECUs” tab. Click on a ECU to view it’s faults.

The “Show All Faults” tab will show all faults

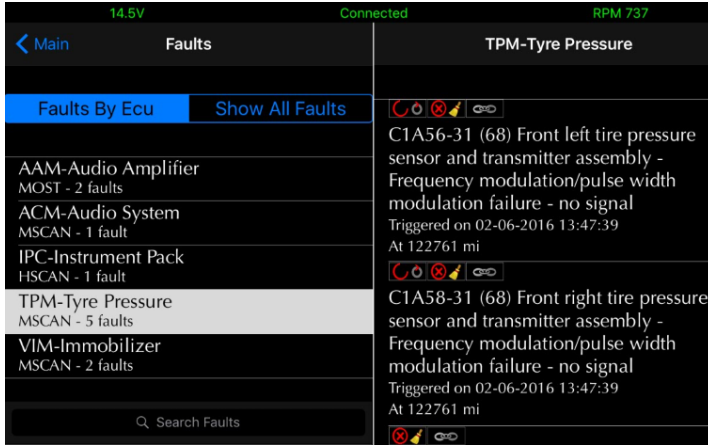


Figure 42. App : Faults by ECUs

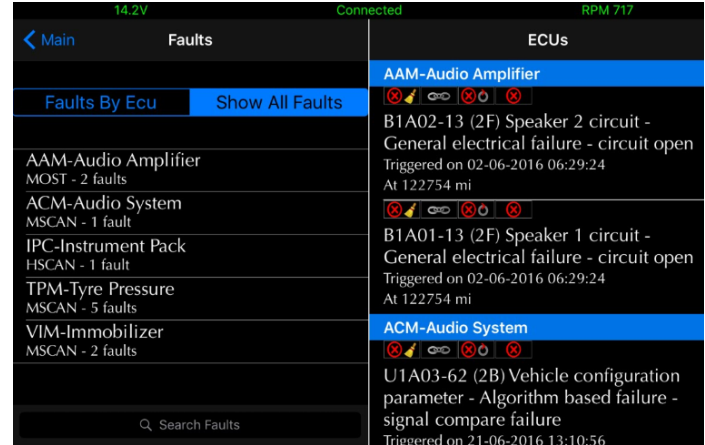
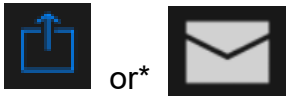


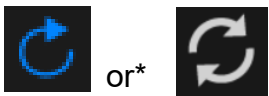
Figure 43. App : Show All Faults

Buttons :

Definition :



This button will export the list of faults.



When this button is pressed, the IIDTool will scan ECUs (“refresh”).



This button clears all faults



This button will clear faults from one ECU only.

*Apple or Android

4.3.2 Sub-Function “Clear Faults”

II Access

The IIDTool offers two clearing options:

Clear faults of a single ECU	Or	Clear faults on all ECUs
<p>The “Select ECU” option</p> <ol style="list-style-type: none">1-Perform the initial stages of general access to functions (section 4.1.3)2-Select “Clear Faults”3-Select the “Select ECU” option4-Navigate through ECUs available using commands5-Sélectionner le calculateur (ECU) désiré avec la commande ➡		<p>The “Clear All” option</p> <ol style="list-style-type: none">1-Perform the initial stages of general access to functions (section 4.1.3)2-Select “Clear”3-Select the “Clear All” option4-Wait until clearing is complete

App Access

See “Read Faults” sub-function , [section 4.3.1](#)

4.3.3 Faults decoding

Fault codes shown by the IIDTool are based in part on the list of DTC Fault codes (Data Trouble Code) from the ISO 15031 standard specification*. These standardized codes are complemented by Land Rover’s manufacturer specific codes. The IIDTool decodes fault codes and provides the description. Here’s the structure:

*L322-02, L322-06 and L316, some ECUs do not respect this standard.

Structure of Fault codes provided by the IIDTool

The code consists of four (4) distinct elements sometimes followed by a textual definition referring to one of the elements (Def):

Code Structure	x/x	– Axxxx	– xx	– (xx)	abcdef	– abcdef
Code Element	1 st	2 nd	3 rd	4 th	Definition of 2 nd	Definition of 3 rd
Example	2/5	C1A27	11	58	Compressor Circuit	General electrical failure, short to ground

Table 21. Structure of Fault codes provided by the IIDTool



Note : L322-02, L322-06 and L316, some ECUs do not follow this nomenclature.

Code Elements

1st Element : Prefix, displayed only when the Integrated Interface II is used, indicating the fault number and total number of faults in memory of a given ECU.

Note : A total number of faults higher than 9 is indicated by a +.

2nd Element : Alphanumeric code of 5 characters, standardized DTC (Data Trouble Code).

Definition

The textual definition of the second element is located after the 4th element of the fault code provided by the IIDTool.

Structure of the 2nd element (Example : A xxxx)

- 1st character : Letter indicating the system on which the fault relates to (see table on next page)
- 2nd character : Fault code origin (optional information), 0=from the ISO standard, 1=manufacturer specific
- 3rd character : Subset showing the fault subsystem (see table on next page, code P only)
- 4th at 5th character : Defective component and nature of the fault

2nd element

2 nd Fault Code Element	1 st character. Systems on which the fault is present.	3 rd character. Subsystem*
Pxxxx	P for Powertrain	1= Air/Fuel ratio 2= Fuel injection 3= Ignition and misfire 4= Emission control 5= Engine speed and idle speed 6= ECU and output circuits 7, 8 and 9= Transmission A,B and C=Hybrid system
Cxxxx	C for Chassis	
Bxxxx	B for Body or Accessories	
Uxxxx	U for Communication network	

Table 22. 2nd element interpretation

*Some manufacturer specific codes do not follow this nomenclature.

Conclusions on the interpretation of the 2nd fault code element

When the 2nd element begins with a P,C or B = generally precise information pointing directly to the origin of the appearance of the fault.

When the 2nd element begins with a U = typically occurs as a result of the appearance of faults on another system (starting with P, C, B). May indicate a “consecutive” fault causing a “cascading effect”. Generated by a loss of communication or reception of invalid data sent by the ECU creating the cascade.

Note that the interpretation of consecutive type faults obtained as a result of a cascade effect can be challenging (diagnostic procedure in case of cascading effect [section 3.2.1](#)).

If faults with a “lost communication with ...” definition are still present and that there are no other symptoms observed, they can be ignored. These faults are recorded from time to time for no apparent reason. If faults with the U prefix and unrelated to a communication error are, simply correct the issues

and use the clear fault function.

3rd Element

Further information on the possible origin of the problem thus providing the specific failure mode (if required).

Note : *The textual definition of the third element is at the end of the code provided by the IIDTool. It is not always supplied by the ECU.*

4th Element

2 characters suffix in parentheses used to specify the fault status bits.

II The read faults function only provides a list of Confirmed faults (see [section 3.1](#)). It is possible to perform further analysis of faults by choosing the Advanced Read option described in [section 4.3.4](#) thus decoding the non confirmed faults.

Note : *Not implemented by Land Rover on L322-02*

Element “ Definition ”

Textual definition of the 2nd and 3rd elements

If a fault code encountered offers no description, please contact the manufacturer for a description: support@GAP-Diagnostic.com.

Additional information, freeze frames

Certain ECUs provide extra information on the conditions present when the fault was confirmed. These freeze frames can help identify the factors involved in the establishment of the fault.

Note : *Not available on all faults and ECUs. Not implemented by the manufacturer Land Rover on L322-02.*

II Information obtained :

The distance* travelled by the vehicle when the fault became confirmed (kilometres or miles).

II Access :

Press on the  button while viewing a fault (Information, if available, will be displayed for 3 seconds).

App Information obtained :

The date and distance* travelled by the vehicle when the fault became confirmed (kilometres or miles).

* This value can sometimes be an approximation.

Decoding status bits (4th element of the fault code)

II

To detect the status (ON or equal to 1) of bits, simply analyze the 4th element.

Decoding steps :

- 1- Locate the fourth element of the fault code. Expressed by a 2 character suffix in parentheses, in hex (0 to 9 and A to F) is the result of an automatic conversion of the code generated by the ECU which is in binary format.
- 2- Convert the suffix found in binary code to obtain a byte (8 characters) using the table found on next page.

1 hexadecimal character (HEX) = 4 binary characters named “**status bits**”

1 suffix of 2 hexadecimal characters = 8 binary characters = 8 “status bits” = 1 byte

HEX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Binary	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111

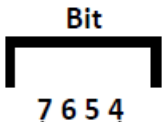
Table 23. HEX and Binary

Examples of hexadecimal suffix converted to binary characters:



3- Interpret each “status bit”

A code in binary system is composed of a series of 0s and 1s only. Each status bit is assigned to a corresponding byte Position Number:



Each position in the byte is associated with a predetermined condition and each bit indicates the state of this condition:

0= Logic value “False” therefore the condition does not apply

1= Logic value “True” therefore the condition does apply

The interpretation of each “status bit” is performed using the following table.

		Interpretation of status bits according to their state	
Position Status bit	Condition	If status bit = 1	If status bit = 0
7	MIL Requested (warning lamp)	A request was made to turn the warning lamp ON.	No requests were made in regards to warning lamps.
6	Test not completed in this cycle	Test or test sequence not completed for this fault during this cycle*	Test or test sequence completed for this fault during this cycle*
5	Test failed since last clear	Test or test sequence for this fault has failed at least once since the last fault clear.	Test or test sequence for this fault has not failed since the last fault clear.
4	Test not completed	The sequence of tests for this fault has not been completed.	The sequence of tests for this fault was completed.
3	Confirmed	The fault presence is confirmed at the time of reading.	The fault presence is not confirmed at the time of reading.
2	Pending	The test(s) for this fault has failed in current or previous cycle, however, other tests will be recorded.	There are no results pending.
1	Test failed this cycle*	The test(s) failed during this cycle. Note that it is not confirmed.	The test did not fail.
0	Test failed	Test(s) failed in this or previous cycle(s).	Test(s) did not failed in this or previous cycle(s).

Table 24. Interpretation of each “status bit”

*1 cycle = for example, starting and stopping the engine. Varies depending on the fault.

Note : Be aware that a failed test is not necessarily a fault confirmation, because some faults are programmed to be confirmed if the test fails a number of times (eg. 5 tests). Then a fault is “intermittent”. The 8 bits do not necessarily apply to all ECUs and faults due to their vocation. In these cases, Status Bits “not applicable” will be set at any time to “1” and can bring confusion when interpreting faults. For this reason, applying a filter is recommended. (see [section 4.3.2](#)).

Decoding example

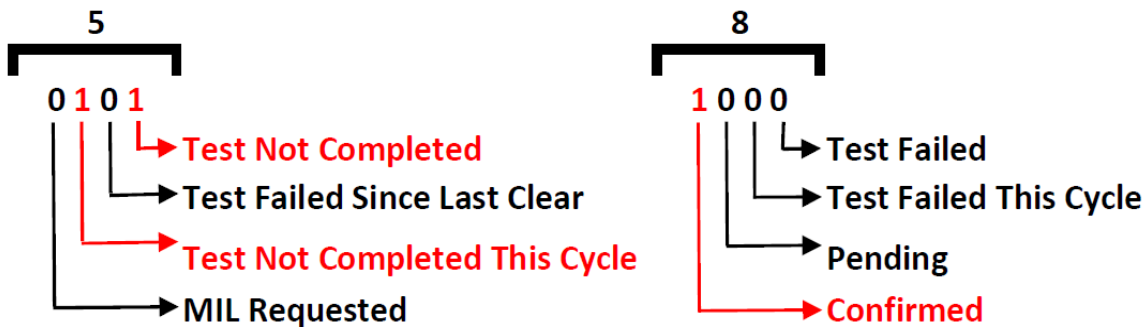


Figure 44. Decoding example, status bits

Status bit at positions 3,4 and 6 are set or = 1

App

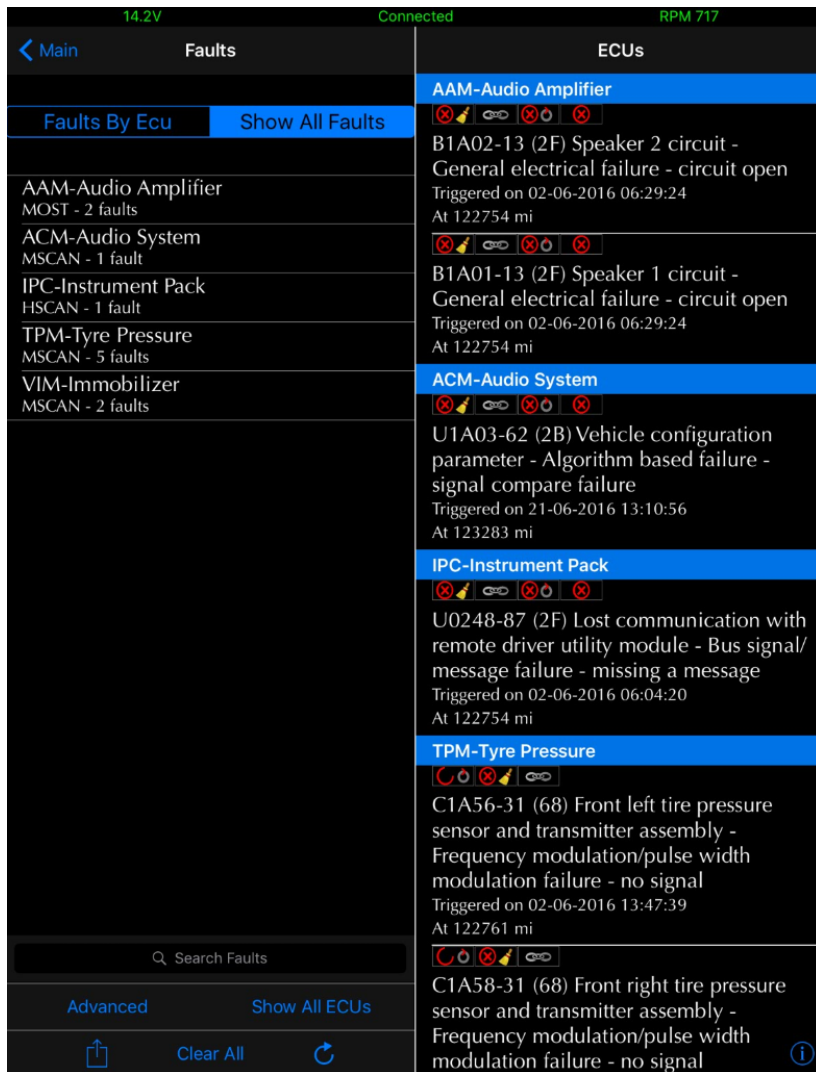
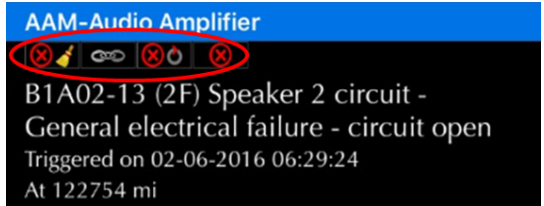
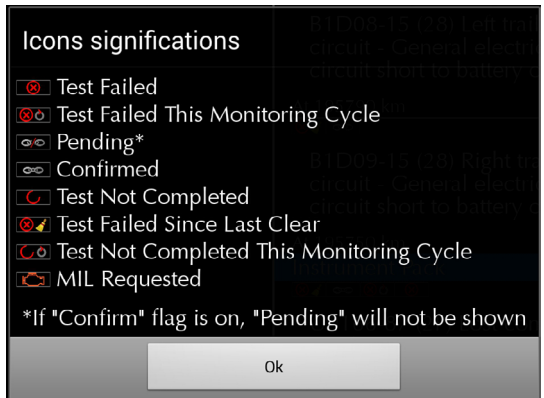


Figure 45. App : Status bits

Icons representing the status bits are located above the description of each faults.



The definitions can be found by clicking on the i button (bottom right).



Note : In some cases, faults will have the **confirmed** and **pending** bits set to 1. As the confirmed bit prevails, only this icon will be displayed.

Show All ECUs

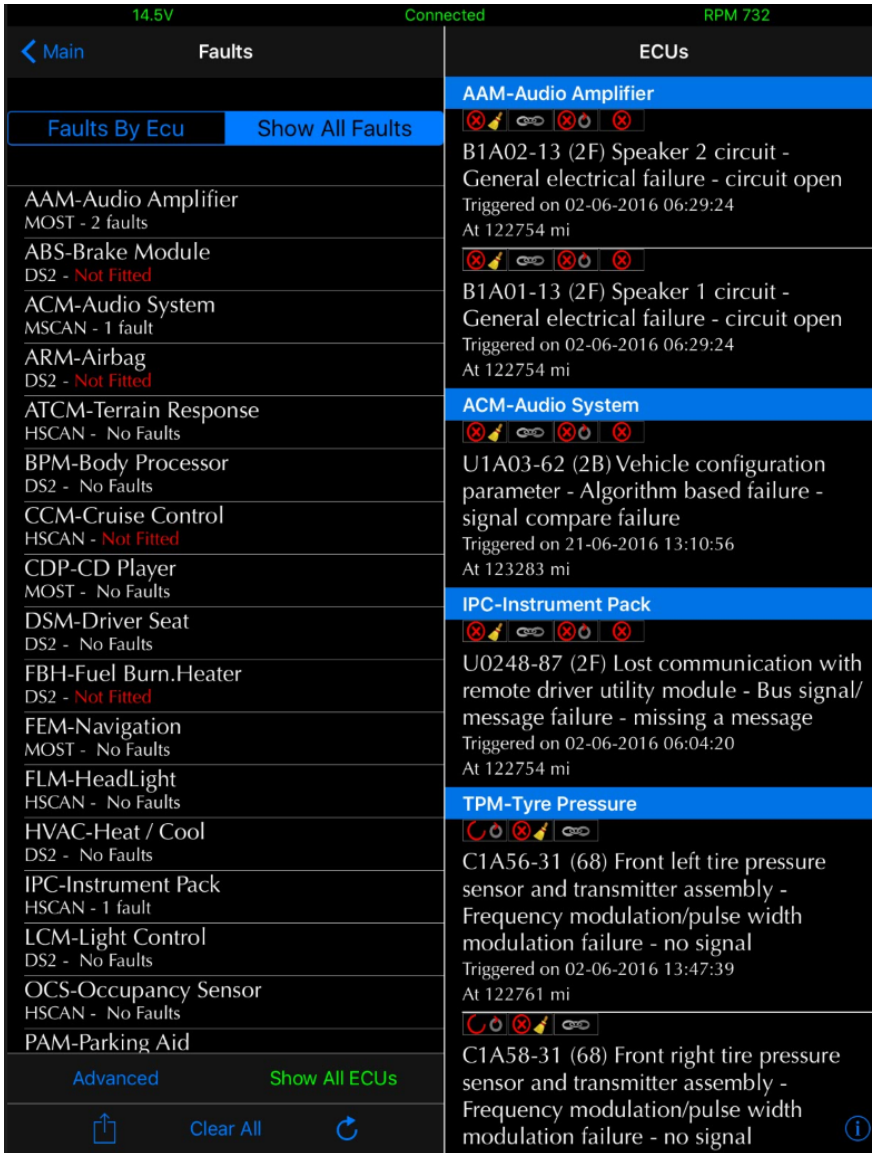


Figure 46. App : ECU list

Allows seeing all the ECUs present and the number of faults in memory for each of them. ECUs not present are indicated by the words, “ Not Fitted ”.

When an ECU is added (retrofitted), communication is established by clicking on this computer. If the tool receives a response, it will be added to the list of ECUs present.

4.3.4 Sub-Function “Advanced Read”

Definition

Advanced function helping to achieve further diagnosis in more complex scenarios.

Purpose :

This function allows setting the filter to indicate which status bit to consider when reading faults. **||** The regular Read Fault function will only display confirmed faults.

Usage :

- Analyze the conditions that could have contributed to triggering the confirmed fault.
- Check if tests are completed following a clear fault (repair) and after performing drive cycles (if applicable).
- Especially interesting in the presence of intermittent problems.

Principle :

Create a filter to guide and impose verifications on a specific system.





CAUTION

The Advanced Read function should be used only by knowledgeable people or professional automotive technicians. It is a complement to assist in the diagnosis of more complex problems.

|| Access

To access the “Advanced Read” sub-function using the Integrated or PC Interfaces, it is required to select the “Read Fault” function first (see Menu Tree [Appendix](#)).

The user can decide for each status bit, in order, if it must be considered (equal to 1) during the fault reading. Press the  button to select the bit and  to ignore it. Once completed, the IIDTool will proceed with scanning each ECU to see if there are faults stored in memory having at least one active status bits (1 or “ON”). Consult [section 4.3.3](#) for more details on status bits definitions.

Example: If bit 0, *Test Failed* and Bit 2 *Pending* are selected, all faults that have at least one of these bits equal to 1 will appear in the fault list.

App Access

To access the “Advanced Read” function and change the filter in the app, it is necessary to select the fault function first. Then press Advanced and select the desired bits.

Apply This button will apply bits and mail preferences for the current session. The faults will be re-scanned automatically.

Save This button will save bits and mail preferences for this and future sessions. The faults will be re-scanned automatically.

Figure 47. App : Advanced Read, bit selection

Example: If bit 0, *Test Failed* and Bit 2 *Pending* are selected, all faults that have at least one of these bits equal to 1 will appear in the fault list.

4.4 Function “Height”

4.4.1 Definition

For height changes, the function allows changing either front, rear, or all corners simultaneously. These changes will also affect the other modes as the standard height is the reference point. For example, if the standard mode is lowered by 10 mm, access mode, motorway, and off-road heights will also be 10 mm lower.

On **L322-02**, the off-road, motorway and access modes can also be changed.



WARNING

The IIDTool allows changing of vehicle settings to a state outside of the original manufacturer specification. It is the sole responsibility of the user to choose secure settings for the applicable use of the vehicle.

Notes :

- *If values for the standard height are set too low (**L322-02** without raising the values for access and motorway heights) the vehicle may reach the bump stops in access mode:
 - All except L322-02** In this case the EAS ECU registers a bottomed out condition and enters ‘Extended Mode’ automatically raising the vehicle (to allow the vehicle to drive out of the bottomed out condition).
 - L322-02** If the height indicator light continues blinking after the vehicle was switched off, this can cause a battery drain.*
- *The height values are given in millimetres. This does NOT correspond exactly to changes in height at the wheel. Measure all values to be sure.*
- *If the values for the standard height are set too high (and/or Off-Road height on a **L322-02**) the suspension can reach a fully extended condition in off-road mode. In this condition, there is no upward suspension travel. **There is a severe risk of damaging components and the vehicle can become uncontrollable in this state!** GAP Diagnostics assumes no liability for damages or injuries incurred during use or resulting from the use of the IIDTool.*
- *Changes in height are instantaneous in the EAS ECU but the ECU won’t apply these changes immediately. The EAS ECU will adjust a corner when it’s +/- 10 mm or higher than the desired height. For example, if the corner is at +9 mm, it will not adjust the height.*

4.4.2 Sub-function definitions

Sub-function	Affected axle	Availability
Adjust All	Front and Rear	All*
Adjust Front	Front Only	All*
Adjust Rear	Rear Only	All*
Adjust Access	Front and Rear	L322-02
Adjust Off-Road	Front and Rear independently	L322-02
Adjust Motorway	Front and Rear	L322-02

Table 25. Height sub-function definitions

For these vehicles, normal or standard height is adjusted. As the normal height is the reference, access and off-road heights will also be affected.

Note : *If two subsequent modifications of -10 mm are performed, the vehicle will be 20 mm lower than the initial height.*

4.4.3 Limits

The EAS ECU accepts a defined range of values that limit the amount of change possible. These limits are related to sensor calibration.

Note : *Each sensor calibration (section 4.6.7) represents electrical arbitrary values associated with height sensors. They take into account the mechanical mounting position of each sensor and should only be changed in case of sensor replacement or removal.*

The limits are :

Limit	Value (mm)		
	L322-02	L322-06	All others
Upper Front	200	205	250
Upper Rear	200	250	250
Lower	No Limit	150	150

Table 26. EAS Internal limits

Example, if the calibrations are as following (L322-02)

Sensor	Calibration example, L322-02
Front Left	157
Front Right	138
Rear Left	180
Rear Right	166

Table 27. Example of current calibrations

Possible adjustments for this example :

Sensor	Raising	Lowering
Front Left	$200 - 157 = 43$	No limit
Front Right	$200 - 138 = 62$	No limit
Rear Left	$200 - 180 = 20$	No limit
Rear Right	$200 - 66 = 34$	No limit

Table 28. Possible adjustments for this example

Using Adjust Front sub-function

The front axle can be raised by a maximum of $200 - 157 = 43$ mm. The front axle can be lowered without a maximum limit in this case.

Using Adjust Rear sub-function

The rear axle can be raised by a maximum of $200 - 180 = 20$ mm. The rear axle can be lowered without a maximum limit.

Using Adjust All sub-function

The smallest of the limitations applies. The height of the two axles can be increased simultaneously to a maximum of $200 - 180 = 20$ mm. Both axles can be lowered without maximum limits.

The IIDTool automatically calculates these values and allows only changes within these parameters.

4.4.4 App : Layout definition

Main screen layout

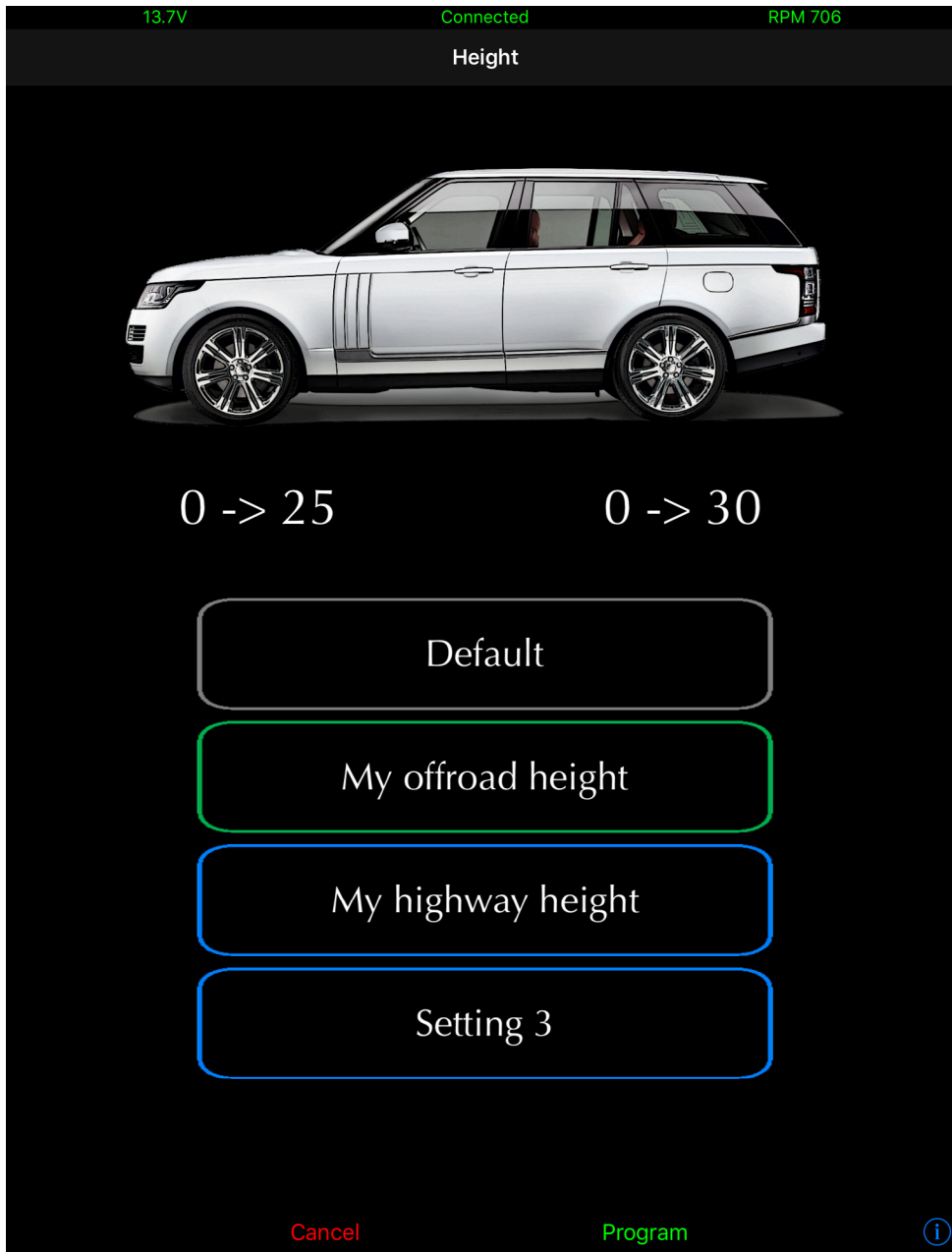


Figure 48. App : Height function layout

Front Axle, 0->25: current height, 0 mm, or default in this example is shown on the left while the selected height setting (My offroad height in this example) is shown right, + 25 mm.

Rear Axle, 0->30: current height, 0 mm, or default in this example is shown on the left while the selected height setting (My offroad height in this example) is shown right, + 30 mm.

Press and hold on the height setting to edit it. The Default value is the original backup up value upon first connection of the tool to a vehicle and cannot be edited. **L322-02** Other height modes are also

restored.

Choose a height setting and press on Program to write it to the suspension ECU.

All changes are relative to the original standard height.

Changing a height setting

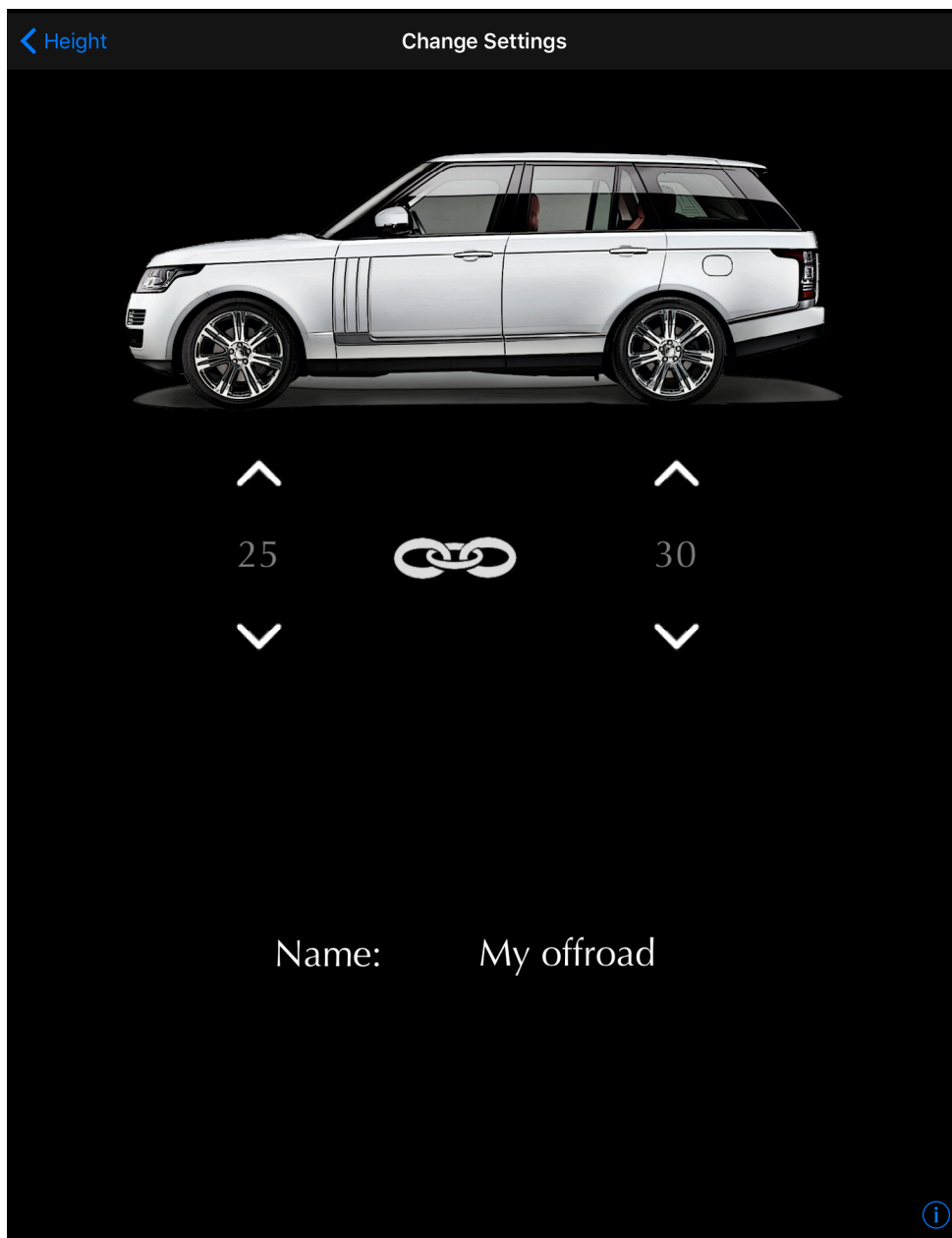


Figure 49. App : Changing a height setting

Use the arrows to increase or decrease the height.



Indicates that one does not want to change the height of both axles. Click to change the state.



Indicates that one wants to change the height of both axles.

Additional height modes (L322-02 only)

Click on the vehicle to see the current values for Offroad, Motorway and Access.

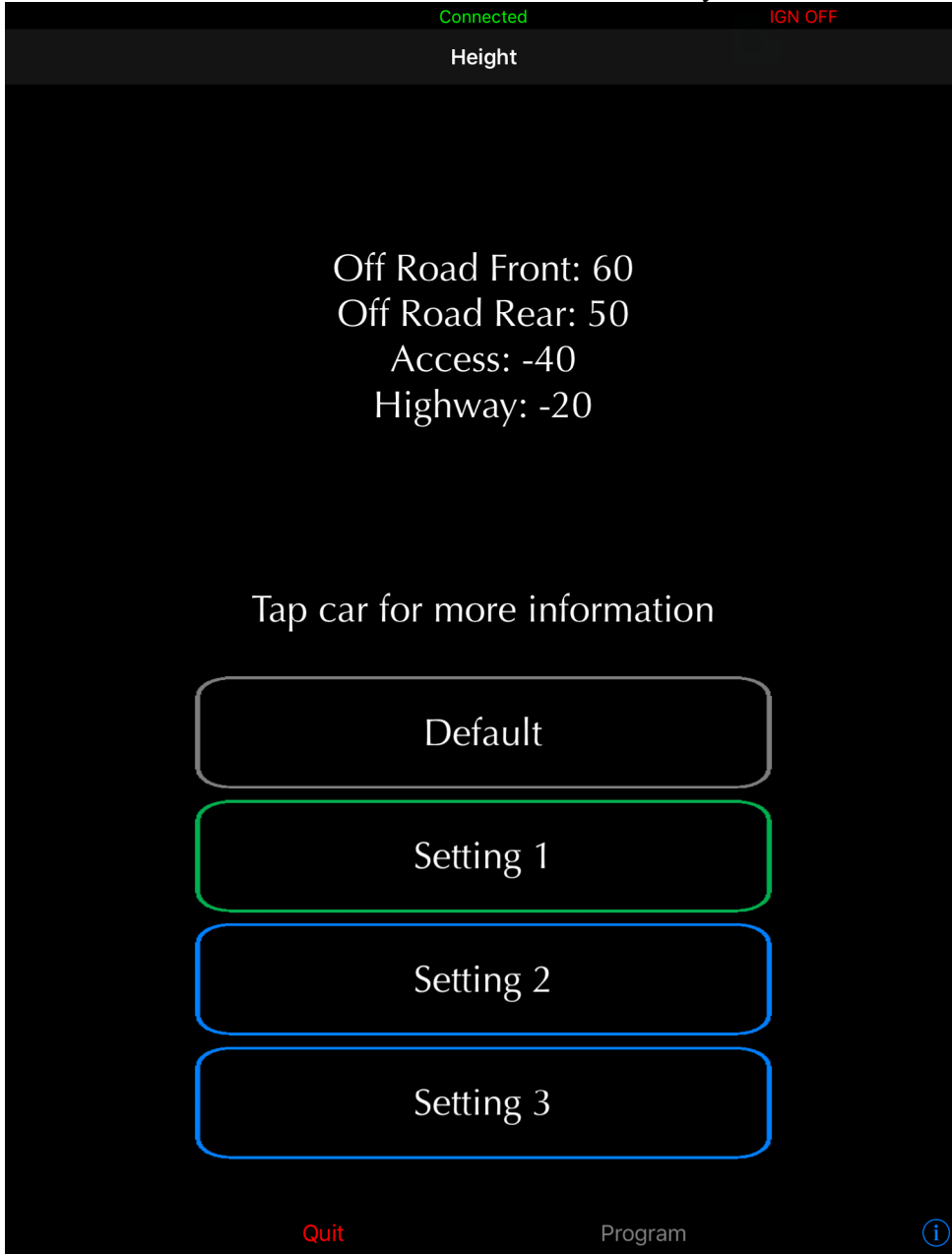


Figure 50. App : Current other height modes settings

Select a setting and click on **other** to access the Off-Road, Access and Motorway settings.

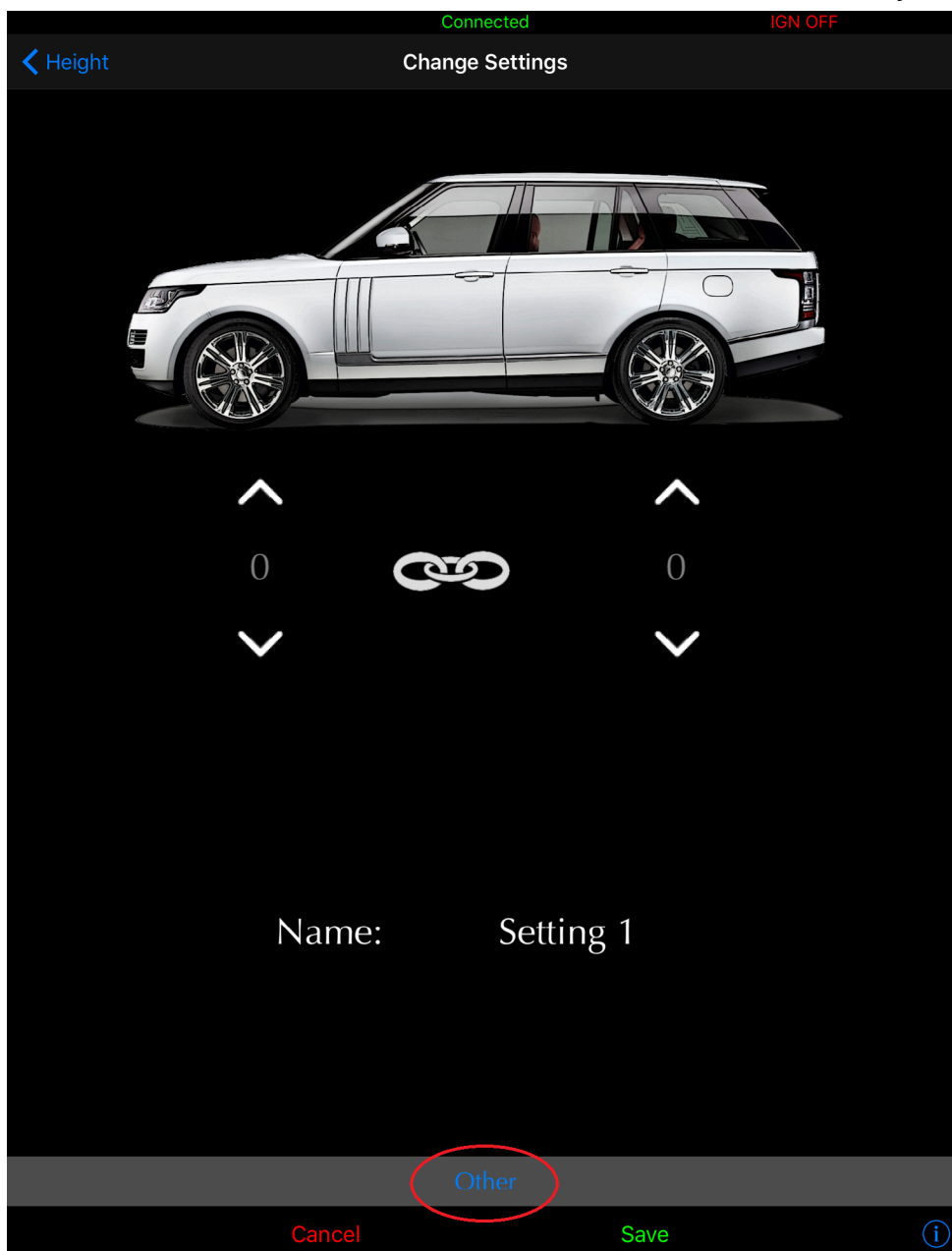


Figure 51. App : Accessing other height modes

You can change these height modes to your liking for each of the three height settings.

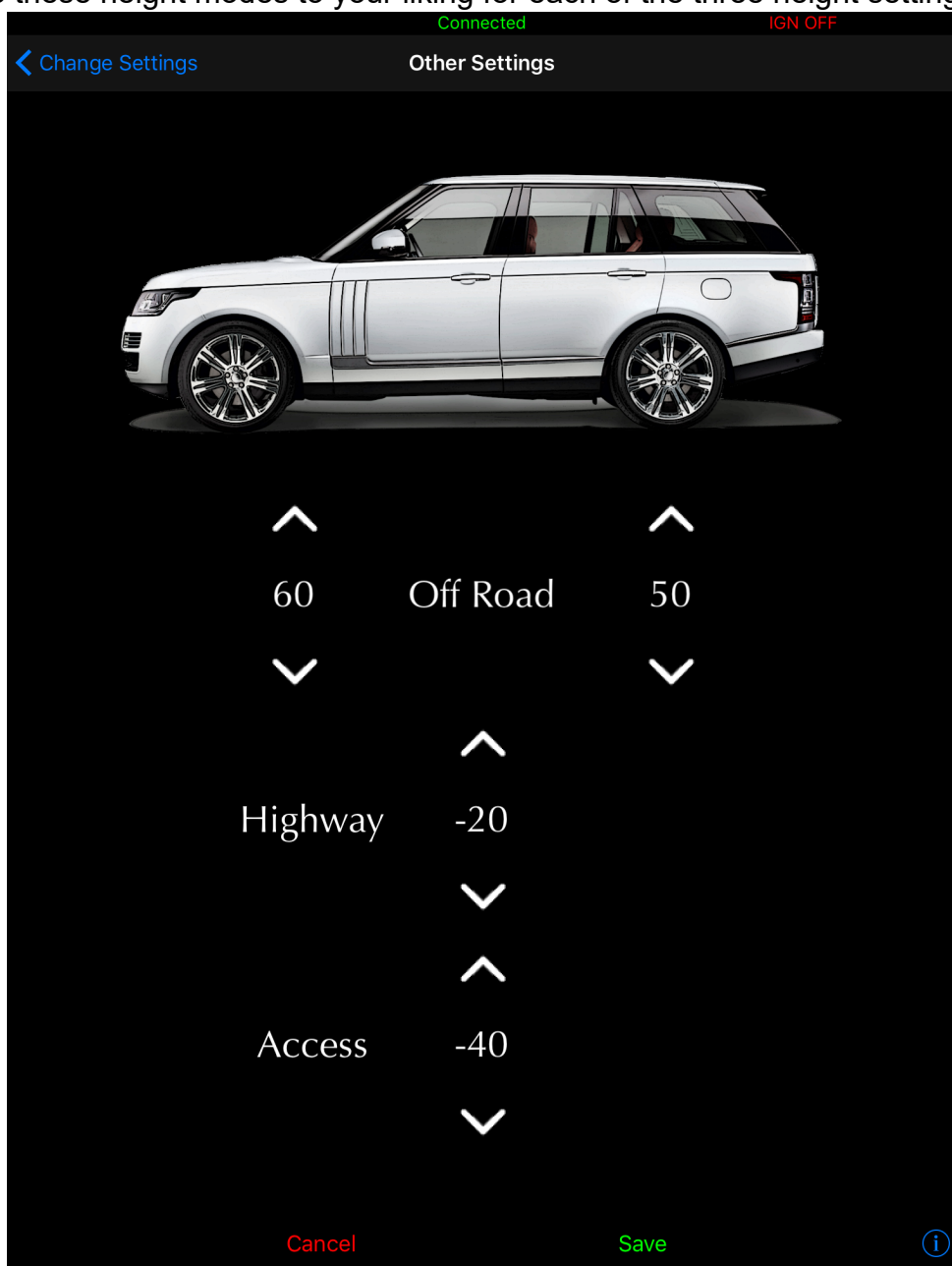


Figure 52. App : Editing other height modes

4.5 Function “Height Control” (App, L319-10, L320-10, L322-10, L405, L494)

4.5.1 Definition

This function changes the current height mode (Normal, Off-Road or Access). An additional option for lowering the rear axle down to the bump stops is also available.

4.5.2 Buttons description

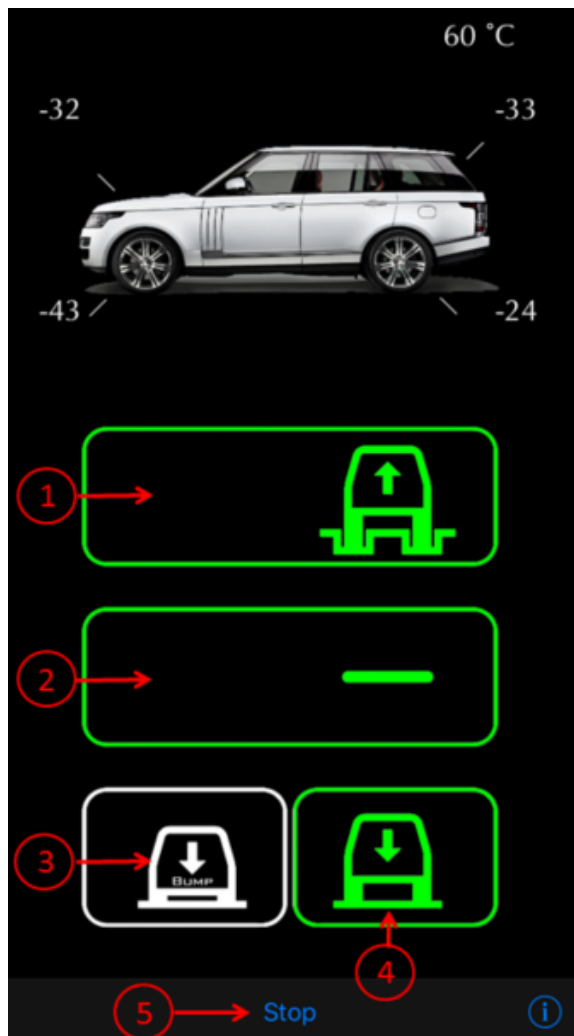


Figure 53. Height Control

Buttons :

- 1- Off-Road Height
- 2- Normal Height
- 3- Lower both axles to the bump stops
- 4- Access Height
- 5- Stop/Exit the function

Colours :

- White -> Current position
- Green -> Possible positions
- Flashing White and Red -> Height change in progress
- Red -> Overheat condition (see below)

Current heights: are displayed on each wheels around the vehicle.

Compressor temperature: indicated at top right

When the compressor is overheating, the selected mode will be red. Once the compressor cools down, the system will resume service to complete the current operation. The compressor temperature is shown at top right.

WARNING: If the vehicle is fitted with non-standard wheels and/or tires (or tyres), using the lowering to bump function may cause a clearance issue. Tires may come in contact with wheel arch or other. Make sure no object are present under the car.

4.6 Function “ Calibration ” of systems and components

4.6.1 Definition

A calibration is used to corroborate a physical quantity associated with a signal or value provided by a sensor.

Access

- 1- Perform the initial stages of access ([section 4.1.3](#))
- 2- Select “ Calibration ”
- 3- Navigate through the ECU using commands
- 4- Select the desired ECU
- 5- Select the required calibration

4.6.2 Steering Angle Sensor (L322, L319, L320, L316*)

Steering angle sensor calibration

This routine will calibrate the steering angle sensor centre position.

*See engine for L316 2012.

Preparations

- Place the vehicle on a flat and level surface.
- Ensure that your front wheels and steering wheel are straight before proceeding.

Usages

This function is used when:

- The steering angle sensor is replaced.
- A wheel alignment is performed on the vehicle.
- It may be required if parts of the steering system have been replaced or removed.

Steering angle sensor renew (L322-02, L322-06)

This routine is used when the steering angle sensor is replaced.

4.6.3 Parking Brake (L322-06, L322-10, L319, L320)

Longitudinal Accelerometer Sensor Calibration

This routine is used when the EPB ECU is replaced.

Preparations

- Place the vehicle on a flat and level surface.
- The vehicle should stay stationary for the duration of the routine.
- The EPB ECU must be fastened securely and the parking brake must be applied.
- Make sure the brake pedal is released.

4.6.4 Anti-lock Braking System (ABS)

Yaw Rate Sensor Calibration (ABS, L319-10, L320-10, L322-10)

This routine is used when a new ABS ECU or yaw sensor is fitted. The yaw sensor measures a vehicle's angular velocity around its vertical axis.

4.6.5 Transfer Case (L319, L320, L322-06, L322-10, L405, L494)

Clutch Calibration

This routine will calibrate the transfer case clutch.

Preparations

- Turn engine OFF
- Select neutral, depress and hold brake pedal
- Start the routine and follow the instructions on screen

Usages

This function is used when:

- The switch is replaced
- The transfer box ECU is replaced or re-flashed
- The range position sensor is replaced
- The transfer box motor is replaced
- The transfer box is replaced or repaired

Position or Range Sensor Calibration

This routine will allow the TCCM ECU to learn the sensors characteristics.

Preparations

- Turn engine OFF
- Select neutral, depress and hold brake pedal
- Start the routine and follow the instructions on screen

Usages

This function is used when:

- The transfer box ECU is replaced or re-flashed
- The range position sensor is replaced
- The transfer box is replaced or repaired

Notes: Both calibrations should be performed outside since starting the engine is required at one point. It is normal for warning lights to turn ON and error messages to be displayed during these calibrations.

XY Sensor Calibration (gear position sensor, manual transaxles only)

This routine will calibrate the XY sensor positioned on the transmission.

Preparations

- Turn engine OFF
- Select neutral, depress and hold brake pedal
- Start the routine and follow instructions on screen

Usages

This function is used when:

- The sensor is replaced
- The transfer box ECU is replaced or re-flashed

4.6.6 Engine (L316-12 with DSC)

Steering angle sensor calibration

This routine will calibrate the steering angle sensor centre position.

Preparations

- Place the vehicle on a flat and level surface.
- Ensure that your front wheels and steering wheel are straight before proceeding.

Usages

This function is used when:

- The steering angle sensor is replaced.
- A wheel alignment is performed on the vehicle.
- It may be required if parts of the steering system have been replaced or removed.

4.6.7 Active Damping (L322-10)

Needed when the active damping ECU is replaced or updated.

4.6.8 Suspension

For baseline calibration, the standard function allows changes to each corner individually, Front Left, Front Right, Rear Left and Rear Right.

This is only required when height sensors, linkages or any parts related to height measuring are replaced or reinstalled. It may also be needed after a wheel alignment. For height changes, raising or lowering the vehicle, please refer to the Height function ([section 4.4](#)).



WARNING

Calibration of individual sensors should only be attempted by experienced users. Read this section very carefully and only undertake a calibration when the procedure is fully understood.

Serious damages can occur if the procedure is performed improperly! GAP Diagnostics assumes no liability for damages or injuries incurred during use or resulting from the use of the IIDTool.

Notes :

- *Different calibration values for each corner are normal – they do NOT need to be set to the same value! These values represent arbitrary electrical constants relative to the height sensors mechanical positioning. Correlating these values to the measured height of each corner is part of the calibration procedure.*
- *Changes in calibration are instantaneous in the EAS ECU but the ECU may not apply these changes immediately. The EAS ECU will adjust a corner when it's +/- 10 mm or higher than the desired height. For example, if the corner is at +9 mm, it will not adjust the corner height.*
- *The settings and changes are given in millimetres but this does not correspond exactly to changes at the wheel. Each change in height must be measured from the bottom of the wheel arch to the centre of the wheel.*
- *A metric measuring tape is recommended for proper calibration.*

II Sensors calibration

Steps:

1. **Preparation:** go to <https://www.gap-diagnostic.com/support/documents/IIDTool/>, download and print the **EAS Calibration Aid** and **Sample EAS Calibration Calculation**. Make sure the air pressure in each tire (or tyre...) are within specification and that no heavy objects are in the vehicle. Place the vehicle **on a flat, levelled surface** in standard mode with wheels straight. While small surface irregularities may not reduce calibration accuracy, large irregularities can make the calibration harder to verify. The calibration must be done outside with the engine running as the air suspension will not rise when the engine's not running. Study these instructions and the **Sample EAS Calibration Calculation** before proceeding.
2. The vehicle must first be brought to a steady state in standard height mode. To do this, change the height to off-road using the switch on the console. Once at off-road height (off-road LED not flashing), return to standard height and again wait for the LED to stop flashing. Move the vehicle forward 5 metres and back to its original position.

3. Use the IIDTool to take note of the actual calibration. Go to menu item 'Live Values->Suspension ECU->Calibration'. Note down values in the **EAS Calibration Aid**.
4. Navigate the IIDTool to 'Live Values->Suspension->Current Height'. The driver's weight affects the current height values therefore they must be noted from outside the vehicle. Open the driver's window, exit the vehicle and close the door. After a few seconds, open the door slightly. This will prevent the EAS ECU from making adjustments while measuring. Leave the IIDTool in 'Live Values->Suspension->Current Height' mode for the following steps.

5. Measure the height in millimetres of each corner from the bottom of the wheel arch to the centre of the wheel. For each corner take note of the current height displayed on the cluster LCD (from outside) just before or after taking the measurement.

Make sure the measurement of each corner is noted at the corresponding spot.

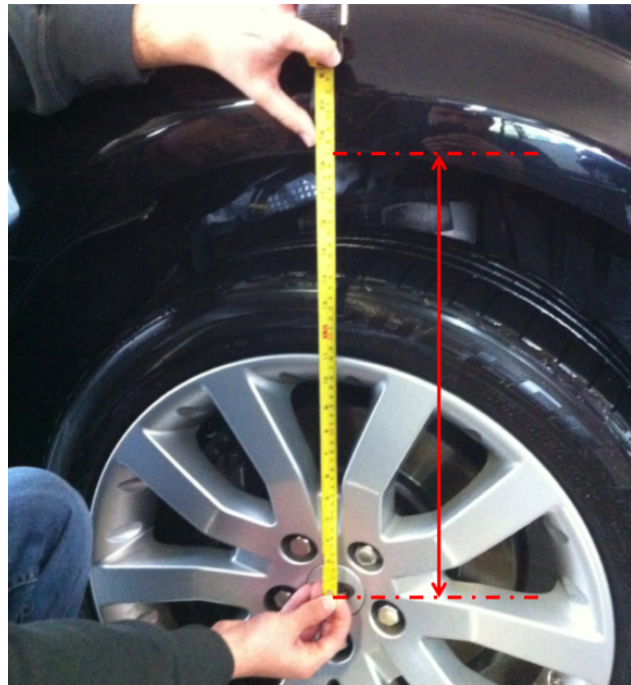


Figure 54. Wheel measuring

Option 1 : Calibrating the left sensor and using the right side as reference.

6. The correct calibration is achieved by adjusting only the left side of the vehicle to match the right. Calculate the new calibration value for the left side using the formula below. To do the calculation, fill in the table below or on the **EAS Calibration Aid** with the values noted for front corners and repeat for rear corners.

All values are in millimetres

Front

	Current Calibration Values	Current Height Values	Measured Heights
Front Left	X=	A=	C=
Front Right		B=	D=

Table 29. Required data, front left calibration

Rear

Rear Left	X=	A=	C=
Rear Right		B=	D=

Table 30. Required data, rear left calibration

Calibration Formula for left-hand adjustment

All values are in millimetres

New Calibration Value Front Left	=	Old Calibration Value Left X	+	Current Height A	-	Current Height B	-	Measured height C	+	Measured height D
	=		+		-		-		+	
<hr/>										
New Calibration Value Rear Left	=	Old Calibration Value Left X	+	Current Height A	-	Current Height B	-	Measured height C	+	Measured height D
	=		+		-		-		+	
<hr/>										

Table 31. Calculus, new left side calibration value

*Please remember: when a value minus a negative value, the minus in the equation becomes a plus (subtracting a negative number = adding a positive number). For example, 3 - -3 = 6

Option 2 : Calibrating the right sensor and using the left side as reference.

6. The correct calibration is achieved by adjusting only the right side of the vehicle to match the left. Calculate the new calibration value for the right side using the formula below. To make the calculation, fill in the table below or on the **EAS Calibration Aid** with the values noted for front corners and repeat for rear corners.

All values are in millimetres

Front

	Current Calibration Values	Current Height Values	Measured Heights
Front Right	X=	A=	C=
Front Left		B=	D=

Table 32. Required data, front right calibration

Rear

Rear Right	X=	A=	C=
Rear Left		B=	D=

Table 33. Required data, rear right calibration

Calibration Formula for right-hand adjustment

All values are in millimetres

New Calibration Value Front Right	=	Old Calibration Value Right X	+	Current Height A	-	Current Height B	-	Measured height C	+	Measured height D
	=		+		-		-		+	
<hr/>										
New Calibration Value Rear Right	=	Old Calibration Value Right X	+	Current Height A	-	Current Height B	-	Measured height C	+	Measured height D
	=		+		-		-		+	
<hr/>										

Table 34. Calculus, new left side calibration value

*Please remember: when a value minus a negative value, the minus in the equation becomes a plus (subtracting a negative number = adding a positive number). For example, $3 - -3 = 6$

Step 7 is an example for a left side (option 1) adjustment. If a right side adjustment is performed, simply replace the left for right in the following text.

7. If the “new calibration value left” varies less than 3mm from the old calibration value, it can be considered good. Otherwise navigate the IIDTool to “Calibration->Suspension->Adjust Front Left” or “Calibration->Suspension->Adjust Rear Left” and use the *Speed + / Menu up* and *Speed - / Menu down* buttons to adjust the value to the “new calibration value left”.

Repeat the process to verify the calibration.

8. Once calibration is done, the vehicle baseline height can be adjusted to the user requirements. Navigate to ‘Height’->Adjust Front’, ‘Height->Adjust Rear’ or ‘Height->Adjust All’ and use the *Speed + / Menu up* and *Speed - / Menu down* buttons to adjust the value.

App Sensors calibration

Manual Calibration

Simply follow instructions for *II Sensors calibration using the integrated interface*

Guided Calibration

This calibrating method will allow calibration of each individual height sensors to the original standard height using a simpler approach. No calculations are required **and only one iteration is necessary**. Upon entering, instructions will be displayed.

Notes:

- *Measurements of each corner are made from the bottom of the wheel arch to the centre of the wheel. They can be made in metric or imperial.*

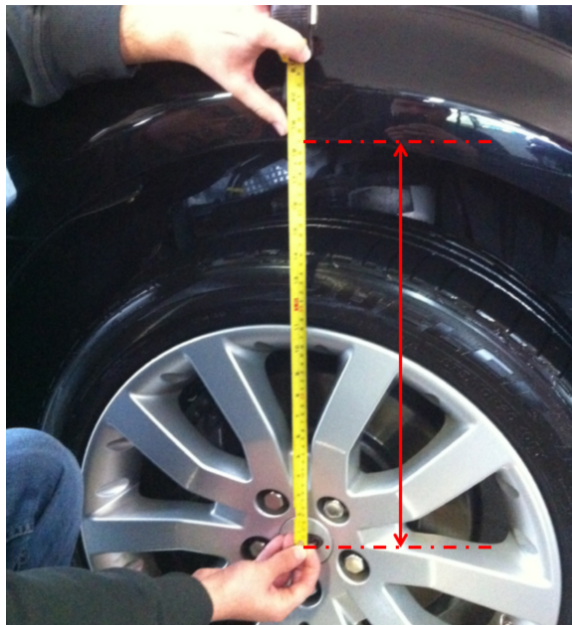


Figure 55. Wheel measuring

- The current (top) and new calibrations (bottom) of each sensor is shown here. It is an arbitrary constant and does not refer to the height measurement. This new calibration value will only change when the send button is pressed. The current height value is shown in the middle.



Figure 56. App : Calibrations values

Steps:

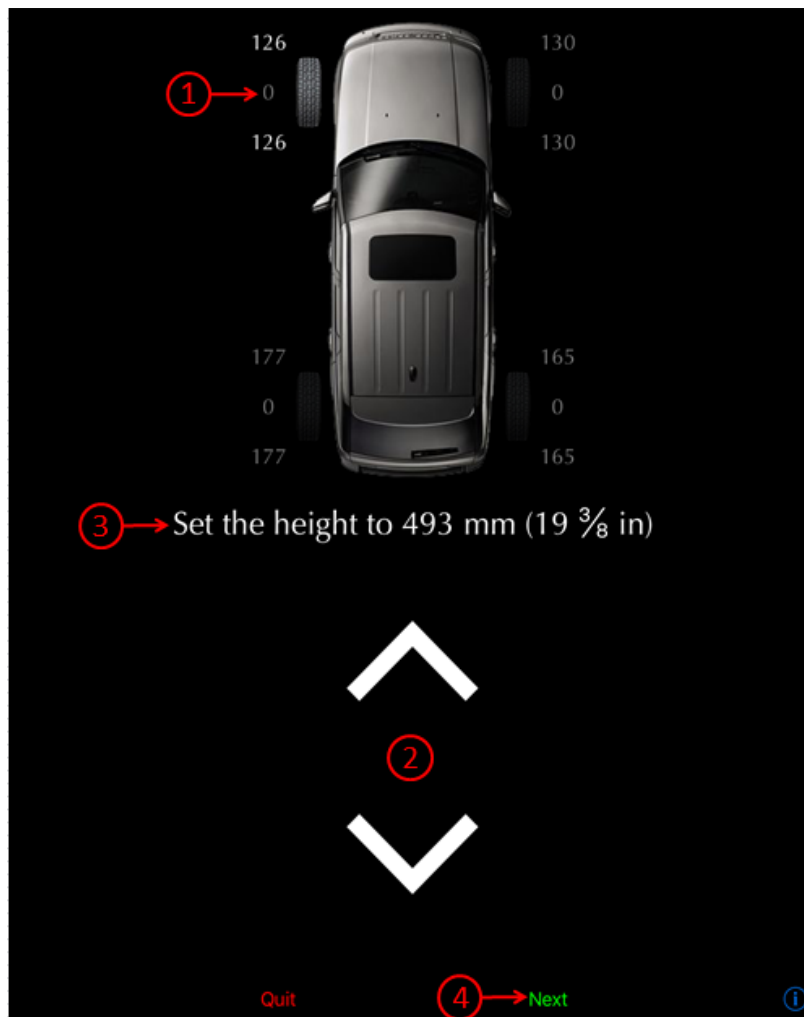


Figure 57. App : Guided Calibration steps

- The first corner to be calibrated is the front left corner (1).
- Place your measuring tape as instructed and use the up and down arrows (2) to reach the required height (3).

- Once completed, click on Send (4). The next corner to be calibrated will now be highlighted.
- Repeat the previous steps for all corners.

Notes:

- *It is normal for the opposite corner to move when adjusting the height of a corner. This does not affect in any way negatively the calibration.*
- *It is normal for the vehicle to be crooked during calibration. Once the process is completed, the suspension will adjust the vehicle accordingly.*
- *Using a fabric tape measure taped to the centre of the wheel will allow operation of the App while measuring and ensure more consistent measures.*
- *Depending on the vehicle and axle, it is easier to control either the up or down motion. Use the less precise as the starting point then adjust more precisely.*
- *Marking the centre of the wheel does help with consistent measures*
- **Calibration of all corners is done in one iteration. Once a corner is calibrated, its calibration will no longer be affected by movements induced by other corners being calibrated.**

Once calibration is done, the vehicle baseline height can be adjusted to the user requirements. Navigate to the Height function and adjust accordingly (see [section 4.4.4](#)).

Original standard heights

These are the original baseline heights for your vehicle. Tire size has no effect when measuring from the centre of the wheel.

Original Standard height values Wheel Centre to lower edge of wheel arch	Front (mm)	Rear (mm)
Range Rover L322	493	483
Discovery 3-4/LR3-4 L319	466	485
Range Rover Sport L320	461	465
Range Rover L405 and L494	471	468

Table 35. Original standard height

4.6.9 Adaptive Cruise Control (L322-10)

This calibration is required after updating the ECU or when retrofitting the adaptive cruise control system..

Notes:

- The service alignment process measures the path of stationary targets such as streetlamps, railings, road signs parked vehicles etc., and uses this data to correct for radar misalignment.
- Alignment will complete more quickly if more suitable targets are seen.
- The speed must be above 30mph (48kph).
- Choose a road with plenty of obstacles.
- Choose an inside or outside lane.
- Following vehicles too closely will obscure the stationary targets from the radar, a time gap of 2 seconds is recommended.
- A straighter road will produce a quicker and better result, although the process will still operate on a curved road.
- The time the module takes to align will vary, depending on the route, speed, number of targets, and individual module.
- When the flashing 'follow icon' lamp extinguishes, the system is correctly aligned.
- To be fully functional the following process needs to be carried out:
- Stop the vehicle at the next available opportunity.
- Turn the ignition off and wait 15 seconds.
- Start the engine, once 15 seconds have elapsed.
- The adaptive speed system should now be fully functional and the user can now set a desired speed, allowing the adaptive speed control to operate as normal.

4.6.10 Power Steering (L538)

Calibration

This triggers a process where the calibration selection being transmitted over CAN as part of central car configuration is learned and stored in flash memory.

Usages

This function is used when the steering rack is replaced

VIN learn

The power steering ECU will learn the vehicle's VIN.

Usages

This function is used when the steering rack is replaced

4.7 Function “Service Test”

4.7.1 Definition

This section gives access to service routines available for a system or ECU. For example, the suspension deflation functions are service routines.

Access

- 1- Perform the initial stages of access ([section 4.1.3](#))
- 2- Select “Service Test” function
- 3- Navigate through ECUs using commands
- 4- Select the desired ECU
- 5- Select the required routine



WARNING

Service Routines should only be performed by qualified users with appropriate mechanical and electrical knowledge. Make sure no objects or people are near any components or systems related to the service routine.

Serious damage or injury can occur if the procedure is performed improperly! GAP Diagnostics assumes no liability for damages or injuries incurred during use or resulting from the use of the IIDTool.

Notes :

- *While executing service routines, it is normal to see warning light(s) turning ON or error messages to be displayed on the instrument cluster screen. Everything will be back to normal when the procedure is completed and the various systems have shut down.*
- *While not mandatory, we strongly suggest clearing faults of all ECU's before and after performing a service routine. If you have faults currently stored that you would like to note, perform a read fault prior to clearing. **BT/Pro** Fault lists can be sent via Email. Please consult the read fault section for more details.*
- *Some service routines will not work if faults are stored in the ECU.*



CAUTION

It is considered good practice to connect a power supply (Midtronic's PSC-550, CTEK MXS 25 or equivalent) to the battery when performing service routines. This will ensure that the battery voltage is sufficient.

Note: Battery chargers are not suitable due to poor line regulation.

4.7.2 Suspension

Test Valve

This menu contains routines to allow manual control over valves of the EAS. Used for raising or lowering one vehicle corner or section at a time in order to diagnose problems with the suspension.



WARNING

Care should be taken when using test valve routines. Make sure no objects or people are under the vehicle or near any suspension components. Keep all doors closed. Do not try to raise the suspension higher than its maximum travel.

Serious damage or injury can occur if a procedure is performed improperly! GAP Diagnostics assumes no liability for damages or injuries incurred during or resulting from usage of the IID-Tool.

If the vehicle is fitted with non-standard wheels and/or tires (or tyres), lowering the vehicle may cause a clearance issue. Tires may come in contact with wheel arch or other.

Options for manual inflation (+) or deflation (-) are:

- All four corners together
- Front, both sides together
- Rear, both sides together
- Front left corner
- Front right corner
- Rear left corner
- Rear right corner


L322-02. When a section is inflated, the appropriate corner valve(s) is open along with the reservoir valve. The suspension starts rising from the reservoir and automatically switches to the compressor after a few seconds. There should be a noticeable decrease in the rate at which the suspension rises at this point.

All except L322-02. When a section is inflated, the appropriate corner(s) and reservoir valves are open. The compressor is also activated. The speed at which corners inflate will decrease as the reservoir pressure equalizes.

All When a section is deflated, the appropriate corner valve(s) are open along with the exhaust valve.

II

The inflation / deflation continues as long as the button is held. The display shows the current height (relative to the standard height) while valves are activated in order to help see the height change and also confirm the behaviour of height sensors.

The suspension can be returned to normal operations by choosing 'EXIT&LEAVE TEST MODE' or pressing the  button.

All except L322-02. The EAS ECU will also return to normal operations when the vehicle is driven or by using the raise or lower switch (centre console) of the air suspension to change height mode.

L322-02. If the option 'EXIT&KEEP TEST MODE' was chosen, normal EAS operations must be re-enabled using the 'Re-Enable EAS' function (see below).



Figure 58. App : Test valve

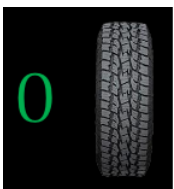


Indicates that one does not wish to control height of this axle.



Indicates that one wants to control height of this axle.

Press the desired axle to select it. Press centre of the vehicle to select both axles.



To manually control a single wheel, click on it. The current height display of the selected wheel will then change to green and the wheel will be highlighted indicating that only this wheel is selected.

Press the up arrow to move corner(s) upwards and down to lower. Press Exit to return to normal operations.

Note: It is preferable to adjust each axle separately avoiding air transfer from the front axle to the rear. Please refer to the manufacturer's FAQ located on the website for more details.

Re-Enable EAS

This routine allows normal operation of the EAS to be resumed following a Deflate routine. **L322-02** This also allows normal operation of the EAS to be resumed following the use and exiting of the 'Test Valves' function using 'EXIT&KEEP TEST MODE'.

Deflate modes

These routines deflate the entire air suspension system, air springs, and/or reservoir completely.



WARNING

Be sure deflation can be safely performed before starting the procedure! Make sure no objects or people are under the vehicle or near any suspension components. Keep all doors closed.

If the vehicle is fitted with non-standard wheels and/or tires (or tyres), lowering the vehicle may cause a clearance issue. Tires may come in contact with wheel arch or other.

Deflation allows safe removal of air suspension components. Three deflation modes are available.

- Deflate Corners (all 4 air springs)
- Deflate Reservoir
- Deflate All

Note: Use the Re-Enable EAS function to return to normal operations.



CAUTION

Care should be taken when attempting to remove any air suspension parts as there may be some residual pressure left in the system. When removing a hose or a component, open connectors slowly and wait until the sound of escaping air ceases. Defective parts can prevent deflation resulting in damage or personal injury.

Set tight / normal tolerance (All except L322-02)



CAUTION

The tight tolerance mode should only be used when a wheel alignment is performed. Leaving the EAS ECU permanently in this mode can lead to premature failing of components.

This will set the EAS ECU into tight or normal tolerance mode. In normal tolerance mode, the EAS ECU will adjust a corner when it's +/- 10 mm or higher than the desired height. For example, if the corner is at +9 mm, it will not correct the height. If the corner is at +11 mm, the EAS ECU will make adjustments. In tight tolerance mode, a tolerance of +/- 3 mm is used.

Transport Mode (L322-02) and Build Mode (All except L322-02)

This routine will activate or deactivate the Transport/Build Mode of the air suspension.

Usage

Use this routine when the suspension needs to be deactivated for maintenance purposes.

Note: *This function may cause error messages to appear on the instrument cluster display. It may also affect other vehicle systems. Upon exiting, the error will disappear. Use the same function to reactivate the air suspension. L322-02 Use this routine to transport the vehicle. The suspension will be locked at a defined height but not disabled.*

4.7.3 Electronic Parking Brake

Unjam (L322-06, L322-10, L319-04, L320-05, L319-10, L320-10)

This routine will start the unjamming procedure of the parking brake.

Usage

This routine should be used when an abnormal sound is heard while applying the parking brake or when the rear brakes drag while the vehicle is moving.

Preparation

The ignition must be turned ON (position II) without the engine running.

Notes: *If the task completes successfully, the parking brake cables will drive out to the mounting position. When servicing is done, use the "Drive Parking Brake To Latching Position" in the Control I/O menu of your IIDTool and verify the parking brake functionality.*

Normale or Service position (L405, L494, L538, L359 2013+)

This routine will allow servicing the parking brake by moving the shoes. For L319-04 and L322-06, the positions are set in the Control IO function.

Usage

Select Service position when servicing rear brakes and Normal when finished.

Preparation

- Disengage the parking break
- The ignition must be turned ON without the engine running.

4.7.4 Engine

Note : For the service reminder reset routine, see Instrument Pack ECU (except for L316-12 and L359 2013+).

Clear Adaption Values (L316, Petrol : L322, L319, L320)

This routine resets the adaption statistics back to factory default. In other words, after the engine adaptations are cleared, the engine ECU will have to “learn” the different sensors behaviours and compensate accordingly.

Usage

The clear adaption routine is necessary when, for example but not limited to, one of these components is replaced:

- *Idle speed control valve.* Over a period of time, the engine ECU adapts the position it sets the idle speed control valve relative to the engine temperature, load and idle speed control valve itself.
- *Throttle position sensor.* The engine ECU “learns” the closed position voltage delivered by the throttle position sensor.
- *Heated oxygen sensors and airflow sensor.* The engine ECU will monitor and compensate for deterioration of the Oxygen, MAF (Mass Air Flow) and other sensors over a period of time. It will also monitor the current correction associated with these sensors.
- *Crankshaft position sensor.* Due to small variations between different flywheels and different sensors, the ECU performs an adaption of the crankshaft position sensor. This in turn allows for misfire detection.
- Etc.



CAUTION

The adaption reset procedure may cause the engine to behave erratically over a period of time in cases where important sensors corrections are needed. It will need a few drive cycles to get back to normal.

Fuel priming (petrol only, L319-04, L320-05)

This routine will activate the fuel pump and injectors for a defined period of time. Air will be removed from the system and replaced by fuel.

Note: *The idle speed may be increased for a short period of time when the engine is started.*

Fuel Lift Pump Reset (Diesel only, L319, L320, L322*, L316)

Usage

This routine is required and automatically called when the engine ECU firmware is updated or remapped. If the learning is not successful or if the pump is replaced, the function should also be used.

Steps

- Start the routine
- Upon completion, turn the key to the off position for 20 seconds
- Start the engine and let it run for a few minutes

**3.6L Engine only*

Injector Replacement (L316)

Usage

This routine is used when at least one fuel injector is replaced. Each injector code is entered manually relative to its position.

Preparation

Each injector code is located on top of the injector. It is recommended to read and note the code(s) prior to installing the new injector(s).

DPF Pressure Sensor Reset (L316-12)

Usage

This routine is required when:

- The Diesel Particulate Filter is replaced
- The differential pressure sensor is replaced
- The Engine ECU is replaced

DPF Replacement Reset (L316-12)

Usage

This routine is required when the Diesel Particulate Filter is replaced.

This routine should only be used after the Diesel Particulate Filter is replaced.

Mass Air Flow Replacement Reset (L316-12)

Usage

This routine is required when the MAF sensor is replaced.

Reset Oil Counter (L316-12*, L359 2013+)

Usage

This will reset the oil counter and remove the service reminder warning displayed on the instrument cluster.



CAUTION

For vehicles equipped with a diesel particulate filter, the reset function affects the regeneration process. Therefore, an oil change should be made at the same time as reset. Not changing the oil can cause serious engine damage.

*See the instrument pack ECU for other vehicles.

Turbocharger Replacement Reset (L316-12)

Usage

This routine is required when the turbocharger is replaced.

Renew security ID between 10AS and PCM (L316)

Usage

This routine is required when the engine ECU is replaced.

High PSI Pump Reset (L316-07)

Usage

This routine is required when:

- The volumetric control valve (VCV) is replaced
- The Engine ECU firmware is updated (or remapped)
- It can help to solve fuel delivery issues

Preparation

Make sure the vehicle is in a well-ventilated area, preferably outside. Start the engine.

Do not use this function unless necessary. Low quality VCVs may prevent the ECU from completing the learning process.

Pilot Correction Learning (L316-07, L319-04 and L320-05)

Usage

This routine will start the real time learning of sensors and actuators behaviours by the engine ECU. The learning process takes 6 minutes.

This routine is required when:

- The volumetric control valve (VCV) is replaced
- The engine ECU firmware is updated (or remapped)
- The engine ECU is replaced
- New injectors are fitted
- It can help to solve fuel delivery issues

Preparation

Make sure the vehicle is in a well-ventilated area, preferably outside. Start the engine and let it run for the duration of the procedure.

Do not use this function unless necessary.

4.7.5 Fuel Burning/Auxiliary Heater (L322-10, L319, L320)

Fuel Priming

This routine will remove air from the system (if present) replacing it with fuel.

Check Operation

This routine will activate the fuel burning/auxiliary heater regardless of the ambient and engine temperatures. This routine will begin by clearing faults stored in the ECU. If the routine fails, proceed with a read fault and fix the issue.

Note: Use the Set HVAC for AHCM (L322-10) prior to using the Fuel Priming or Check Operation routines on a L322-10.

Usage

These functions are useful to get the system up and running after a long period of inactivity, when replacing the unit or simply to diagnose a problem.

Preparation (for both functions)

- Turn the key to the ON (position II) or press the start button without starting the engine.
- Turn off the HVAC system.

4.7.6 Instrument Pack

Service Interval Reset (All except L322-02, L359 2013+*, L538*)

This resets the service reminder displayed on the instrument cluster.

Note: Please perform the appropriate maintenance prior to resetting. This procedure requires the engine to be turned OFF. The ignition must be turned ON.

*The reset can be done without using a diagnostic tool.

L316: The reset routine is found in the engine ECU



CAUTION

For vehicles equipped with a diesel particulate filter, the reset function affects the regeneration process. Therefore, an oil change should be made at the same time as reset. Not changing the oil can cause serious engine damage.

4.7.7 Transmission

Adaption clear (L322-06, L322-10, L319, 6 speed)

Gear shifting time tends to increase as internal components of a transmission wear out. This has a negative effect on the brake clutches. The transmission ECU will adapt to counteract the effects of wear and improve shifting.

This routine resets the adaption statistics back to factory default. After adaptations are cleared, the transmission ECU will analyze shifting behaviours using various sensor readings and compensate accordingly.

Usage

The adaption reset routine is necessary when at least one of the following components is replaced:

- Transmission oil.
- Any component inside the transmission.
- The transmission ECU.
- Prior to updating the transmission ECU firmware.

The clear adaption routine may cause the transmission to behave erratically over a period of time. It will need a few drive cycles to get back to normal. Drive the vehicle normally and make sure that the transmission shifts all gears.



CAUTION *Clearing adaptations shall only be performed following an oil change, firmware flash or transmission repair. Clearing adaptations for no reasons on a transmission that is working correctly may worsen its behaviour. In fact any non-needed work made on a transmission that is working correctly may worsen its behaviour.*

4.7.8 Body Control/Processor

Key programming (VIN locked L319-04, L320-05)

Preparations

- Have all keys on hand including new keys
- Unlock the doors
- Close all doors including the tailgate

Instructions

A previously programmed key is required to start the process. **II** When calling the function, the IIDTool will start displaying messages to guide you:

- **“Each key is programmed at position 1 (accessory) <+>”**
- **“When completed turn last key at position 2 (ignition) <+>”**
- **“Reprogram all keys including new ones? <+> Yes, <-> No”**, Press on the Speed + / Menu Up button to continue.
- If the engine's not running, the following message will be displayed: **“Start Engine”**
- Followed by **“Turn Key to Pos. 1”**, this will turn OFF the engine and the vehicle will remain in accessory mode.
- The LED on the IIDTool will flash once to indicate key number one is being programmed. It will turn solid to indicate completion.
- Remove the first key. The LED will flash to indicate it is waiting for the second key.
- Insert the second key and turn it to position 1.
- The LED on the tool will flash twice to indicate key number two is being programmed. It will turn solid to indicate completion.
- Repeat until all keys are programmed.
- When the last key is programmed (LED ON), turn the key to position II.
- If successful, the message **“Operation succeed <+>”** will be displayed. Key programming is now complete.

Note : **II** *Once the key is in position I, the IIDTool LED is used instead of the dashboard to indicate status or completion stage*

App : Simply follow instructions on screen.

Key Programming (VIN locked L322-06)



CAUTION

It is considered good practice to connect a power supply (Midtronic's PSC-550, CTEK MXS 25 or equivalent) to the battery when performing key programming. This will ensure that the battery voltage is sufficient.

Note: Battery chargers are not suitable due to poor line regulation.

Regular non-Bluetooth IIDTool, **second hardware version** and **BT / Pro** only.



Figure 59. Regular IIDTool generation

Preparation

- Ensure all keys to be programmed are available.
- Ensure the vehicle is unlocked
- All the doors, including the boot, must be closed.
- It is recommended to sit inside the vehicle with all the doors closed whilst this procedure is performed.
- **Regular non-Bluetooth IIDTool, second hardware version:** Usage of the PC-based controller is mandatory. The IIDTool must be connected to the computer until the process is completed. The option will be displayed on your computer screen. Please consult [section 2.8.5](#) of this user manual for more details on the PC-based interface. If using a laptop, make sure the battery charger is connected. Close all programs, disable all automatic updates and screen saver. The computer does not need to be connected to the internet.

Instructions

Follow the instructions shown on screen to program the transponders. Once completed, the key fobs (lock/unlock) will be programmed by following these instructions. When prompted by the tool:

- Switch the ignition on and then off again within 5 seconds
- Remove key from the ignition
- Ensure all doors are closed

Note : The following steps need to be completed within 30 seconds. Do not turn on the ignition until all

keys are programmed. If this occurs, the sequence will have to be restarted from the beginning. When prompted by the IIDTool:

- Press and hold the Unlock button on the first key to be programmed. Whilst the button is being pressed, press the lock button 3 times within 10 seconds.
- Release both buttons simultaneously.
- Repeat steps 1 and 2 for all other available keys.

Add a key (VIN Locked L322-10, L319-10, L320-10, L538, L359 2013+)

BT / Pro only

This routine is used to add one (1) new key to the vehicle. It will not remove previously programmed keys.

Instructions

An already programmed key is needed to begin the procedure. Instructions will be displayed on screen. When prompted, press and hold the unlock button of the remote. Pressing the unlock button will be done a few times in a row to complete all programming steps. The horn will be activated during the procedure.

Note :

- A used key can be programmed to a vehicle. Once programmed, it will no longer work on the previous vehicle. The emergency start (dead remote battery) will not work on the new vehicle.
- Both key models (slim and bigger one) can be programmed on any model and year.
- Later L494 and L405 in certain regions have been locked and key programming cannot have a key added. The KVM needs to be replaced at a Land Rover dealer.
- If upon programming the process fails with **Error E7**, please contact us for assistance. This will occur on certain KVM firmware version. Keys can be programmed but the process requires us to provide a file to reflash the KVM.

Check number of keys (L322-10, L319-10, L320-10, L538, L359 2013+, L494, L405)

This routine will indicate how many keys are programmed on a specific vehicle.

Usage

This function is useful to prevent vehicle theft. For example, if one leaves the vehicle at a detailer, user can verify if someone programmed a new key for malicious usage afterwards. The function will return two results, the number of programmed key(s) currently in the vehicle vicinity and the total number of key(s) programmed.

Battery Replacement (L322-10, L319-10, L320-10, L550)

This routine will reset the stored battery monitoring data.

Usage

This routine is required after the battery is replaced.

Deactivate Valet Mode (L322-10, L319-10, L320-10)

This routine will return the vehicle from valet to normal mode. This is useful when the PIN is unknown and the vehicle is in valet mode.

Transport Mode activation, deactivation (L322-02, L322-06)

This routine will allow activation or deactivation of the transport mode for both the BPM Body Processor and LCM Light Control ECU's.

ECU renew (L322-02, L322-06)

This routine is used when replacing the Body Processor ECU or to fix corrupted coding data.

Crash Status Reset (L359 up to 2012)

This routine is used following a crash.

Driver/Passenger Door Glass Learn (L319-10, L320-10, L359, L322-10)

This routine is required when the Driver and / or Passenger door ECU is updated.

4.7.9 Airbag (L322-10, L319, L320, L538)**Set Normal Mode**

This routine is used when the Airbag ECU is replaced following a crash (crash logs cannot be erased). It will initialize the ECU and set it to normal mode.

4.7.10 HVAC Heat / Cool**Learn Actuator Limits (L322-10, L319-10, L320-10)**

This routine is used when an actuator is removed or replaced. It is also required when the HVAC ECU is replaced.

Stepper motor initialization (L319-10, L320-10, L405, L494)

This routine is used when a stepper motor is removed or replaced. It is also required when the HVAC ECU is replaced.

Set HVAC for AHCM (L322-10)

This routine is required in order to use the AHCM Auxiliary Heater routines on these vehicles. It only needs to be performed once.

4.7.11 All ECUs

Vehicle Reset (L322-10, L319, L320)

This routine will send a reset or reboot command to all ECU's. It is equivalent to a soft reset.

Usage

On L319-04, it should be used to restore the clock on the instrument pack ECU (--:-- displayed). It can also be used to solve other unusual issues.

Note : This function will return all user settings (radio station etc) to factory default.

4.7.12 10AS (L316)

Key programming (VIN locked)

Preparation

- Ensure all keys to be programmed are available.
- Ensure the vehicle is unlocked.
- All the doors, including the boot, must be closed.
- It is recommended to sit inside the vehicle with all the doors closed whilst this procedure is performed.

Instructions

- Select New for 2013+ vehicles.
- Select Old for 2007 to 2012 vehicles.

Follow instructions on screen.

Renew security ID between PCM and 10AS

Usage

This operation is used when the 10AS ECU is replaced.

4.7.13 Anti-lock Braking System (ABS)

BT/Pro Brake bleeding (VIN locked, L319, L320, L322-06, L322-10)

This routine is used to eliminate air from the hydraulic system. It is required when the master cylinder or any other component containing hydraulic fluid is removed or replaced.

Preparation

- Gain access to bleeding screws located on calipers of each wheel.
- Make sure the battery is fully charged else use a battery maintainer.
- Two people are required for this operation. One to pump the brake pedal and one to work on the calipers.

Instructions

Follow instructions on screen.

Note : *This routine will take a few minutes. We recommend using a battery maintainer. Significant vibrations and noises are normal when the pump gets activated.*

4.7.14 Rain sensor

Initialization (L322-02, L322-06)

This routine is required when replacing the rain sensor.

4.7.15 Rear Differential (VIN locked, L319, L320, L322-06, L322-10)

Self-Test

Usage

This routine is required when one of the following components is replaced:

- Rear differential
- ECU
- Rear differential motor
- Position sensor
- Temperature sensor

Preparation

- The vehicle must remain stationary
- The differential temperature must be less than 140 degrees Celsius.

Instructions

Follow instructions on screen

4.8 Function “Live Values” (LV)

4.8.1 Definition

This function allows viewing of current values or status of a sensor or actuator. For a complete list of available values for your vehicle, please consult the list of features on the [IIDTool webpage](#).

Access

- 1- Perform the initial stages of access ([section 4.1.3](#))
- 2- Select “Live Values” function
- 3- Navigate through the ECU using commands
- 4- Select the desired ECU
- 5- Consult [section 4.8.2](#) or [section 4.8.3](#) for live value selecting and viewing.



WARNING

The driver should never observe a live value while driving. For safety reasons, only the passenger should read a live value while the vehicle is on the move.

Before viewing live values, please read the following notes.

Notes:

- *It is normal to see warning light(s) turning on when viewing live values.*
- *When broadcasting live values, some ECUs will stop sending messages on the networks. As a result, other ECUs will interpret this as a communication error. While not mandatory, we strongly suggest performing a clear fault of all ECUs after viewing live values. If you have faults currently stored that you would like to note, perform a read fault prior to viewing live values and clearing.*
- **II L322-02** *While viewing a live value, selecting another will require the Speed + / Menu Up and Speed - / Menu Down buttons to be pressed a little longer than usual.*
- **II** *Only the name of the live value will first be displayed and scrolled if necessary. After a few seconds, the value or status will appear on the right with its associated unit in the metric system.*

4.8.2 II Viewing live values when using the integrated interface

To allow viewing of live values by the **passenger**, the value selected prior to driving the vehicle will stay displayed while the vehicle is on the move. For safety reasons, the IIDTool will not respond to any commands from the cruise control buttons while on the move. When the vehicle comes to a halt, the cruise control commands will become operative and navigation can resume.

4.8.3 App Viewing live values when using the mobile App

Live value selection and sampling rate

You can select up to 8 live values in the graph and numeric display modes. All 8 values can be viewed simultaneously. The maximum sampling rate of each live value is divided by the number of live values selected. For example, if one live value is selected, the maximum sampling rate will be 16 per second / 1 live values = 16 samples per second. If four values are selected, 16/4 = 4 samples per second for each live values. The absolute maximum sampling rate of each live value is determined by the ECU.

BT/Pro, All except L322 2002 to 2004. User can choose between tested and untested live values. Untested live values will not work (N/A) on every vehicle and configurations. They may also be dependent on the firmware version of the ECU.

|| Untested live values are not available.

Basic controls

Press in the yellow area to make the top option bar appear.

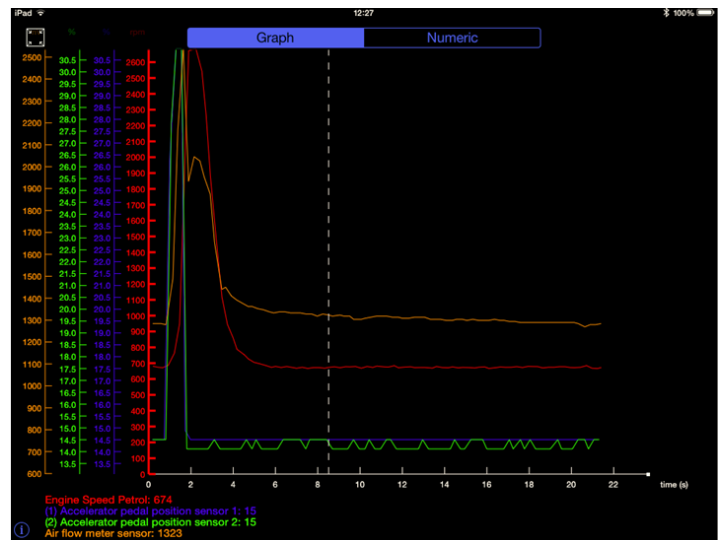
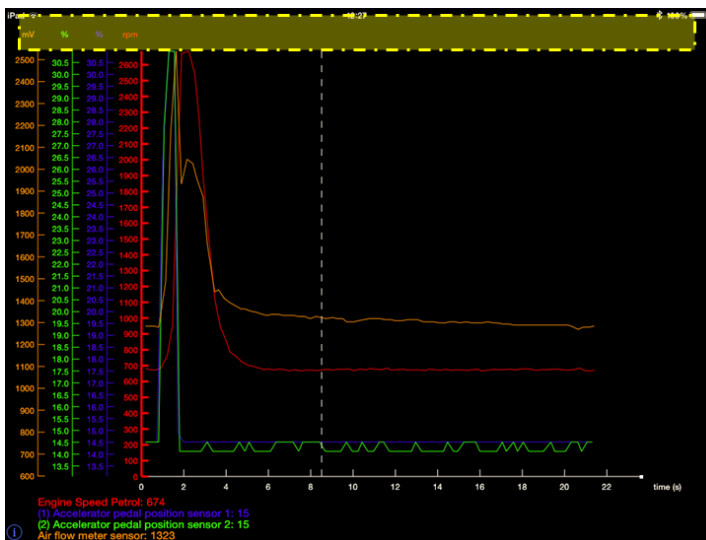


Figure 60. App : LV : Calling the top bar

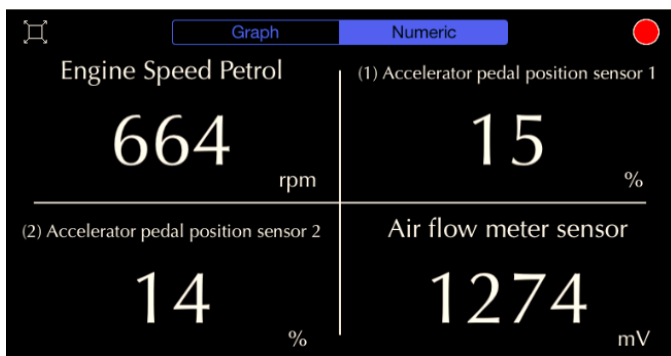


Figure 61. App : LV : Top bar options



Full screen / split screen button



This button begins recording data. Once pressed, the stop button (same location) will allow the user to stop, save and name the recording (log) if required. Saved logs can be accessed by selecting “Logs” in the Live Values or login screen (off-line mode allowed). See [section 4.8.4](#)

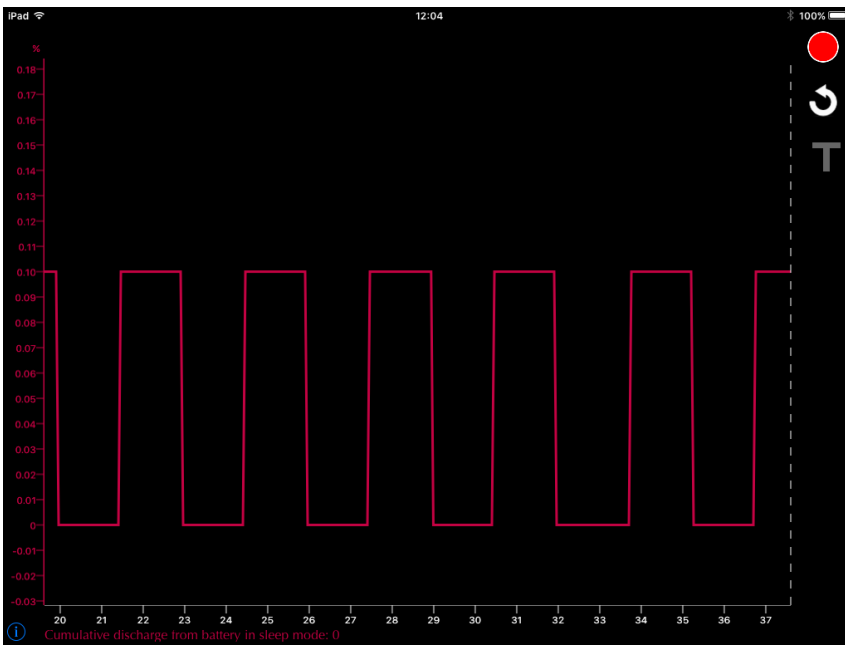



Figure 62. App : LV : Graph options

 This button will reset the time (x) axis back to 0 seconds.

The T symbol is used to enable or disable the triggers. More details on the triggers can be found here: [Trigger feature](#).

To highlight a curve, simply click on the live value Y axis.

The cursor (far right dotted line) can be moved by swiping a finger over it. The live values data will be relative to its X axis position.

Graph view options

Press in the yellow area to select how many live values Y axis and names are displayed. All the data will remain visible on the graph. This was implemented to maximize available graph area.

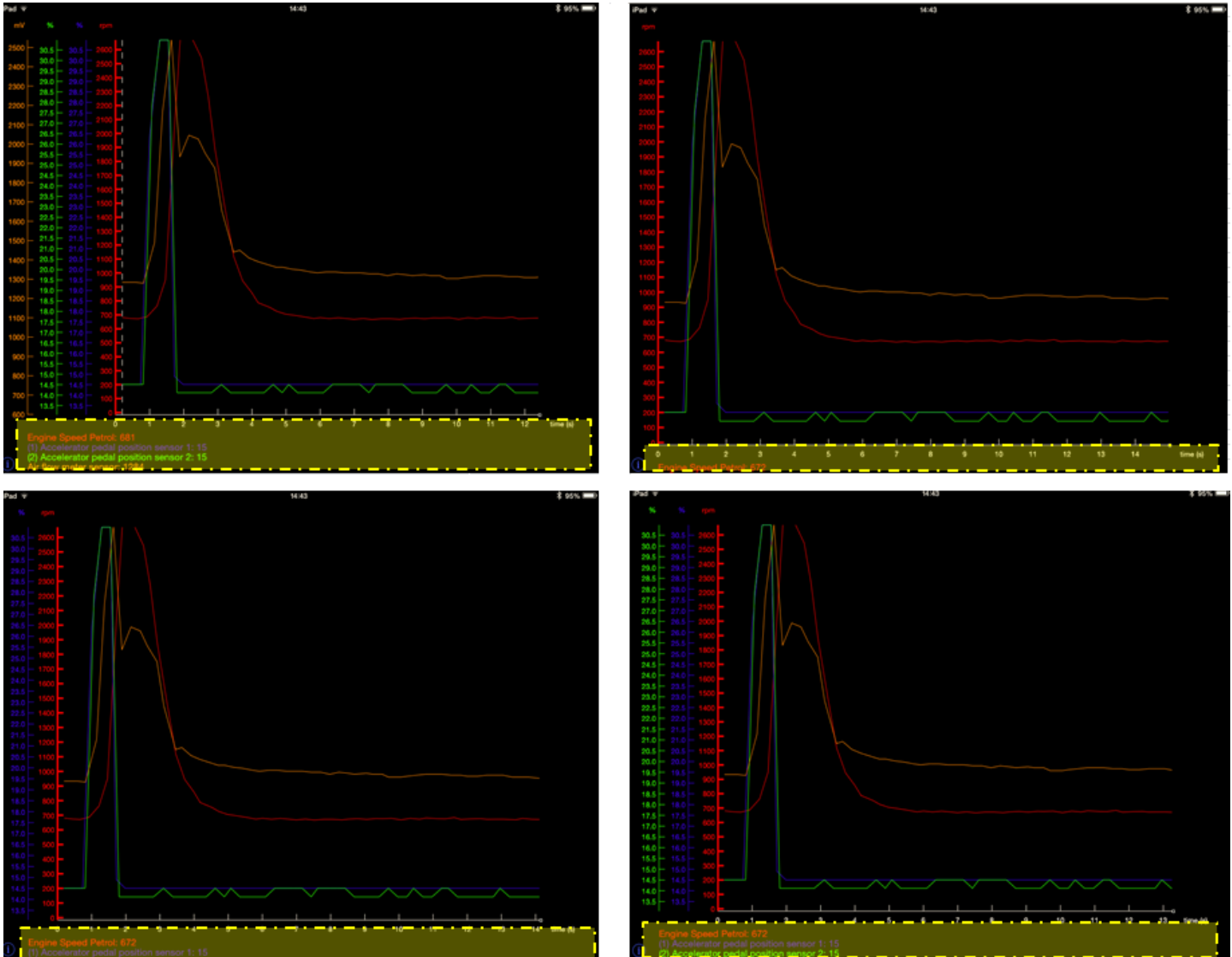


Figure 63. App : LV : Axis displayed

User can interchange any Y axis position. Press and hold on the desired axis and move it to the new position.

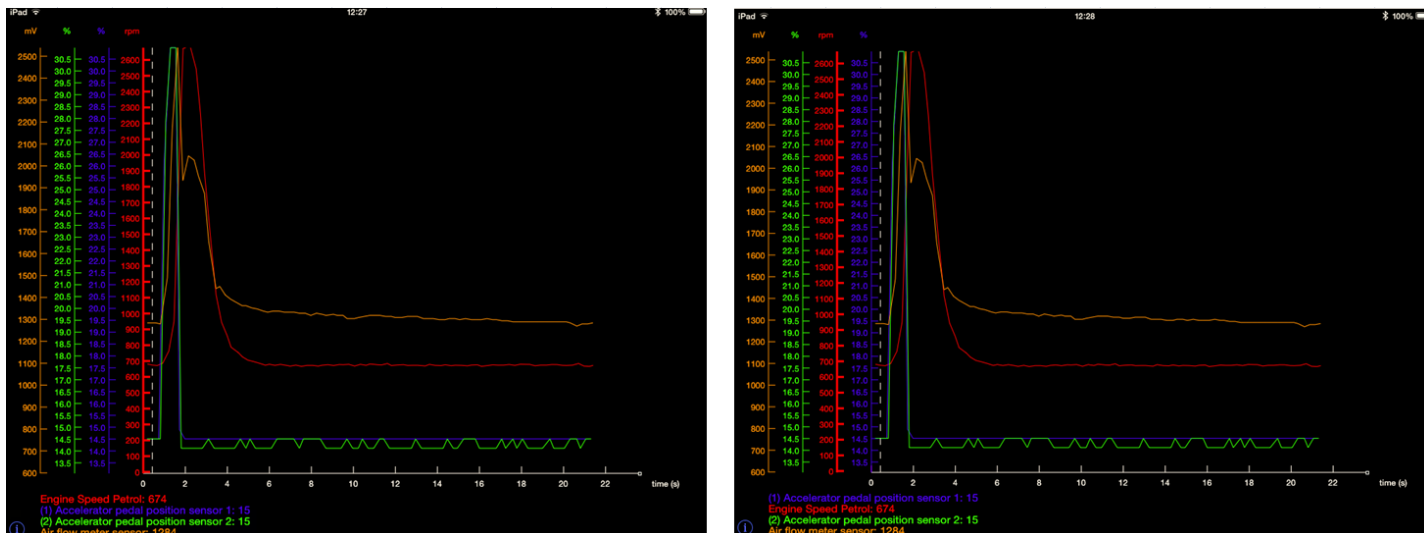


Figure 64. App : LV : Y axis displacement

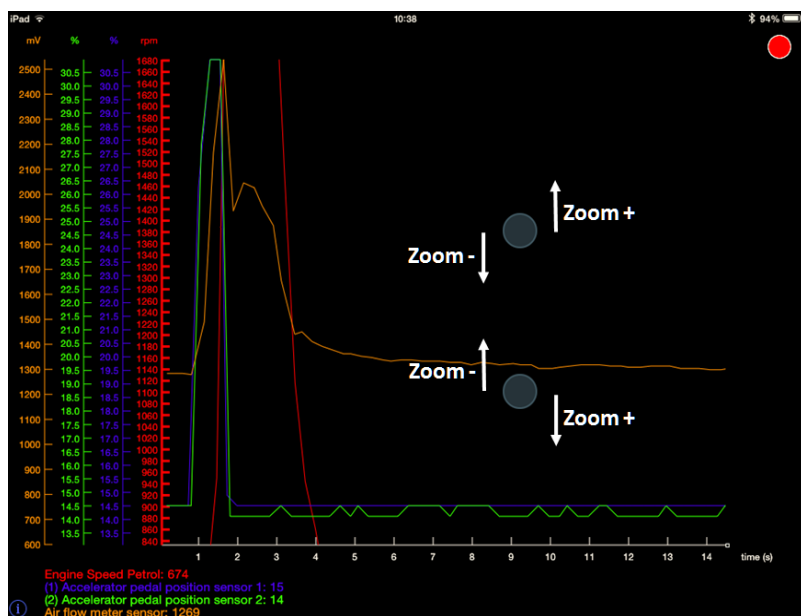


Figure 65. App : LV : Vertical zooming

Vertical zooming is done on each Y axis separately.

- Select the desired Y axis / live value
- Touch and hold anywhere in the screen with 2 fingers and swipe vertically in opposite directions.

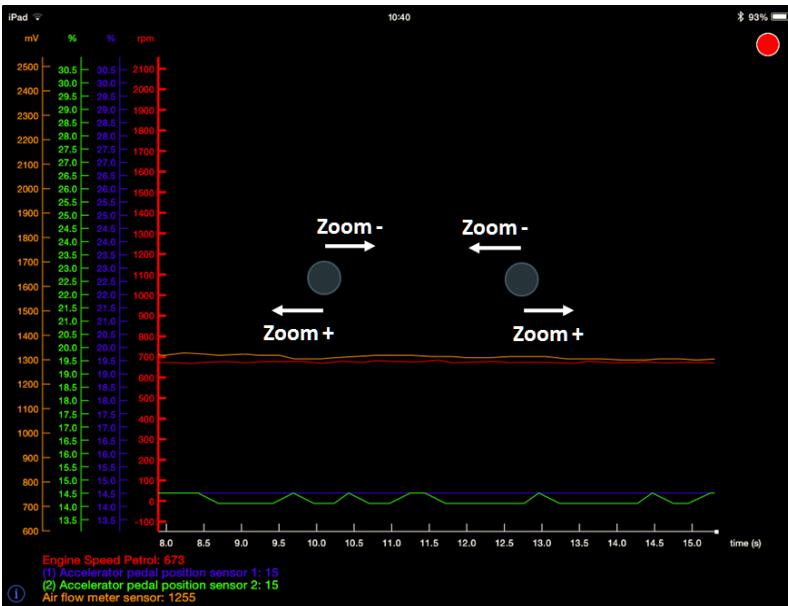


Figure 66. App : LV : Horizontal zooming

To zoom horizontally, press the screen with 2 fingers and swipe horizontally in opposite directions.

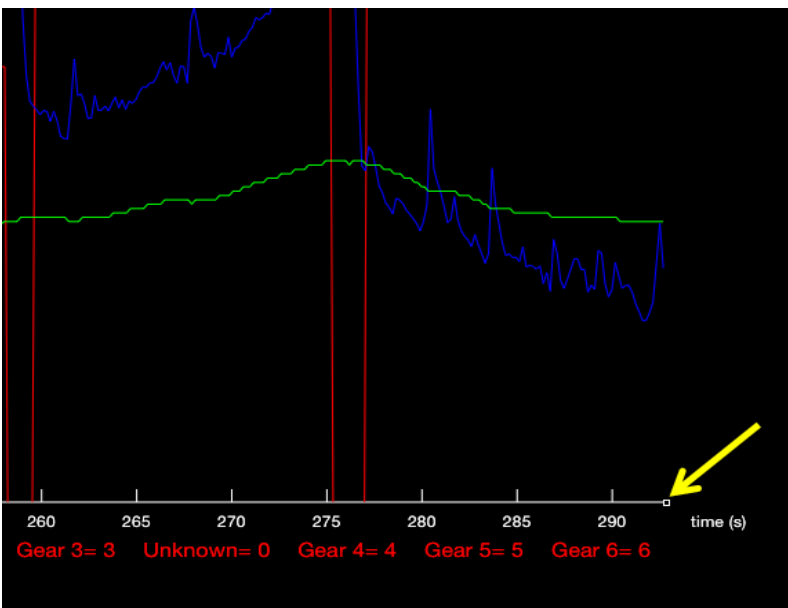


Figure 67. App : LV : Return to the current time

To return to the current time after zooming or panning horizontally on the X axis, simply press on the white square on the edge of the axis.

The Pan function for both axis is done using only one finger and sliding it in the desired direction.

To re-initialize the graph view, touch the screen twice at one of the following locations:

- On the currently selected Y axis to reinitialize this live value axis only.
- On the X axis to reinitialize the time axis only.
- In the middle of the graph screen to reinitialize all axis simultaneously.

Using the My Favorite feature

This tool allows faster access to favorite live values by creating custom lists.

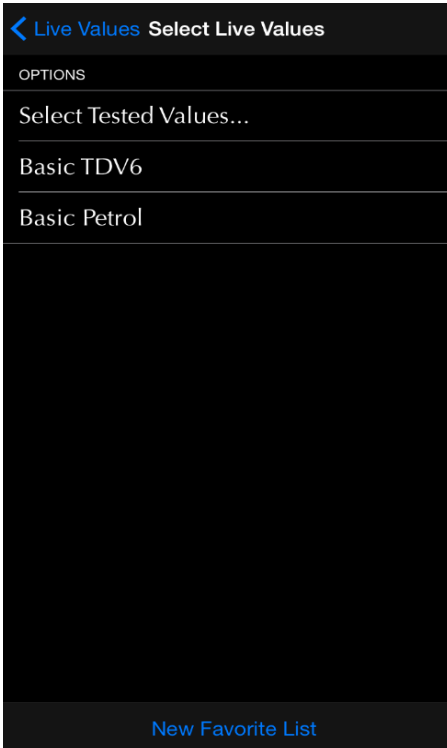


Figure 68. App : LV : New Favorite

To create a list, press New Favorite and name the list.

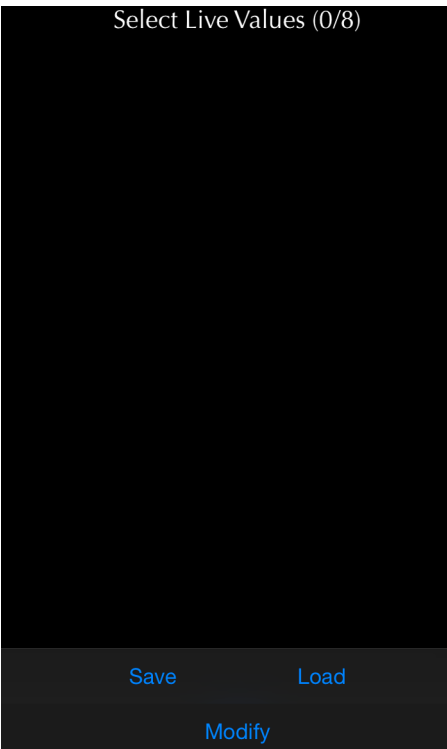


Figure 69. App : LV : Modify a Favorite list

The modify button is used to add or remove live values from the list. The list can also be deleted in this menu.

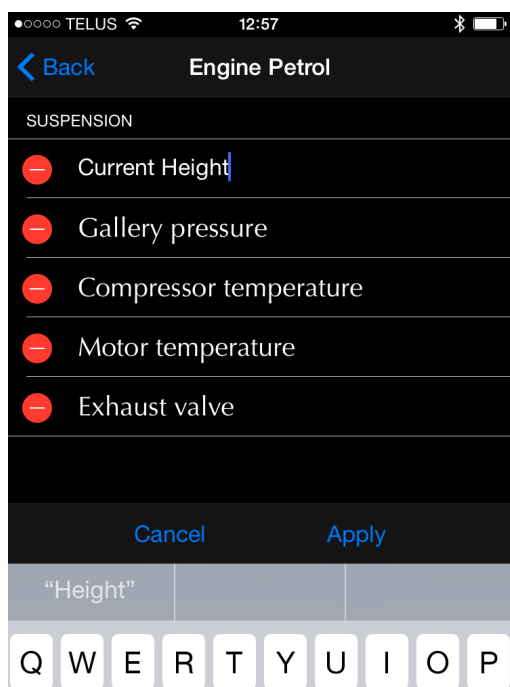


Figure 70. App : LV : Modify a live value name in a favorite list.

Click on the live value name to change it.

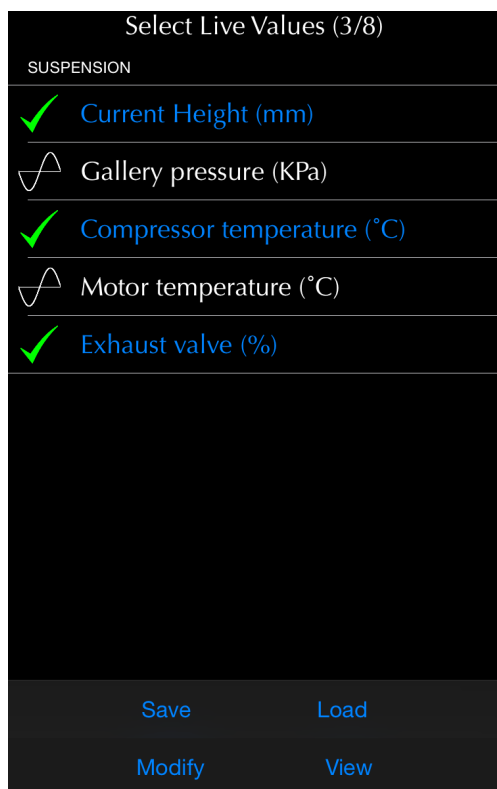


Figure 71. App : LV : Favorite live values selection

The Save button is used to save the current live value selection. In this example, 3 live values are selected.

The Load button is used to recall the last saved selection from the list. All 3 live values will be selected at once.

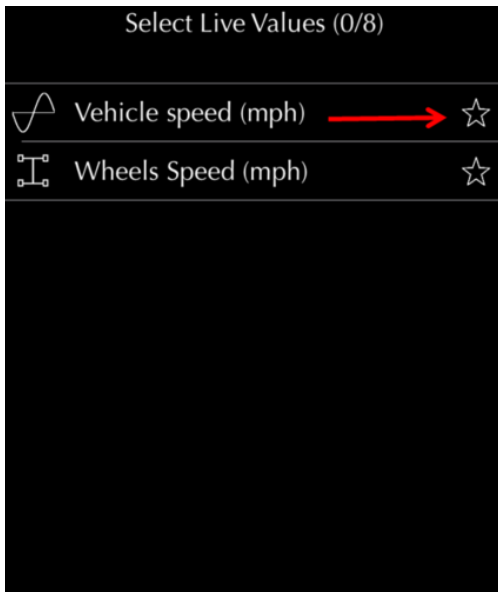


Figure 72. App : LV : Favorite, Fast Add method. Adding a Live Value.

Click on the star when viewing an ECU live values

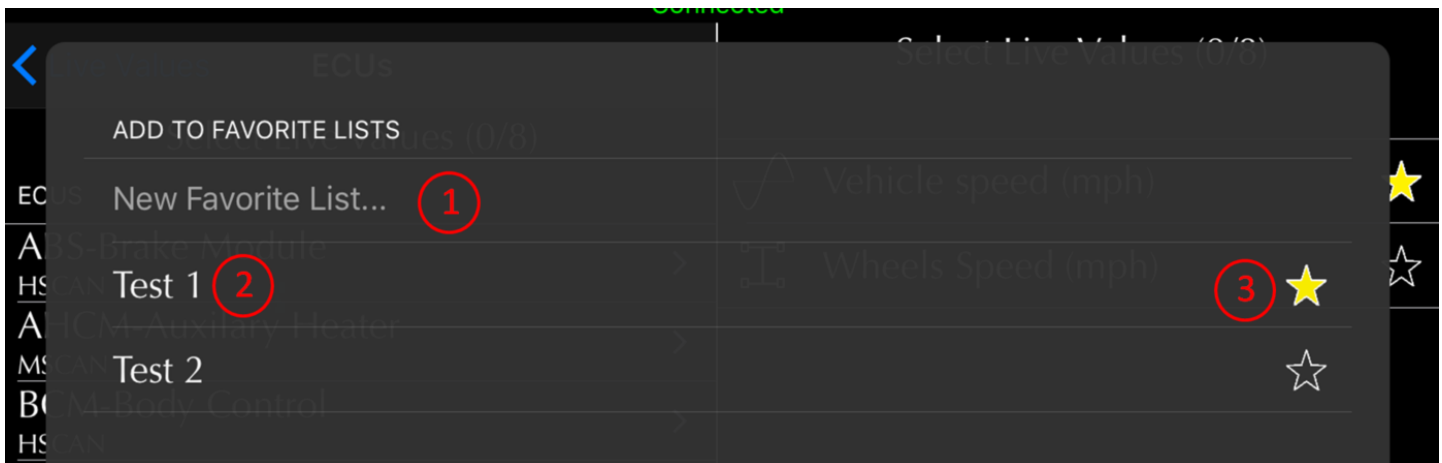


Figure 73. App : LV : Favorite, Fast Add method. Selecting the list.

- 1- Click here to create a new list
- 2- Current favorite lists are shown here
- 3- Click on the star to add the live value to this favorite list

Trigger feature

This feature allows automatic controlling of live data recording, start and stop, by comparing live values relative to defined target values. The mobile device buzzer (sounder) and/or vibration can also be activated when a target is reached.

The trigger button will become visible once a live value is selected. Only one trigger type (start/stop or event) can be selected per live value.

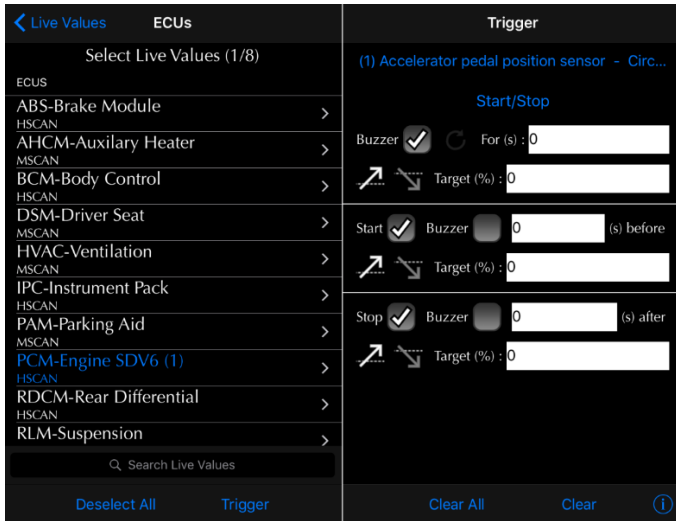


Figure 74. App : LV : Trigger, start stop

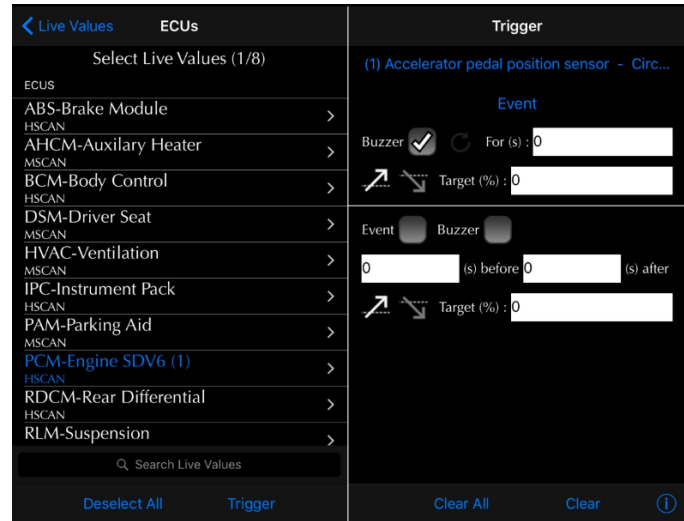


Figure 75. App : LV : Trigger, event

Start and stop controlled

This mode allows setting both start and stop target conditions independently. The start and stop events are independent meaning that live value A can be used to start the log while value B is used to stop the recording.

Event

This mode is used to pinpoint a specific event. Both the start and stop conditions are equal thus occurring at the same time.



Figure 76. App : LV : Erasing trigger settings

Use the clear all button to erase all triggers. The clear button will erase only the one currently viewed. The icons significations can be viewed by clicking on the i button (bottom right).



Figure 77. App : LV : Start time
The record will contain all data for all values received X seconds before the start trigger.

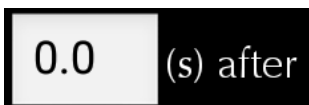


Figure 78. App : LV : Stop time
The record will contain all data for all values received X seconds after the stop trigger.

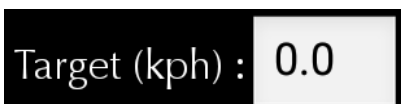


Figure 79. App : LV : Target



Figure 80. App : LV : Trigger when increasing and exceeding the threshold.
This symbol indicates that the trigger will be in effect when the observed live value increases and crosses the defined target. For example, if the target value is set at 0, a change from -1 to 0 will fulfill the condition. Available for analog live values.



Figure 81. App : LV : Trigger when decreasing and crossing the threshold.
This symbol indicates that the trigger will be in effect when the observed live value decreases and crosses the defined target. For example, if the target value is set at 0, a change from 1 to 0 will fulfill the condition. Available for analog live values.

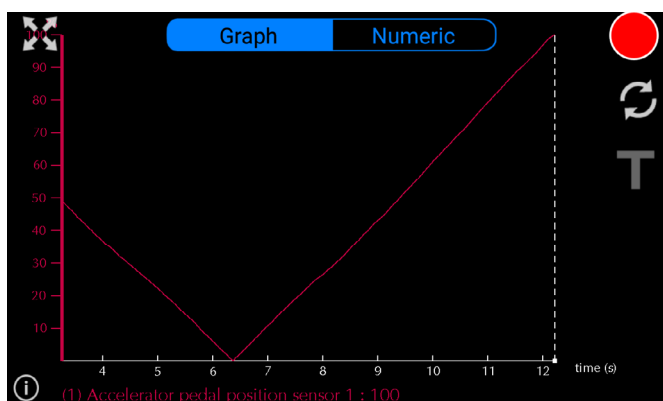


Figure 82. App : LV : Trigger when the value and target are equal.
This symbol indicates that the trigger will be in effect when the observed live value changes and becomes the defined threshold point. For example, if the threshold value is set at 0, a change from -1 to 0 (or 1 to 0) will fulfill the condition. Available for state live values.



Figure 83. App : LV : Trigger when the value and target are not equal.
This symbol indicates that the trigger will be in effect when the observed live value changes from being equal to the target value to not equal. For example, if the threshold value is set at 1, a change from 1 to 0 will fulfill the condition. Available for state live values.

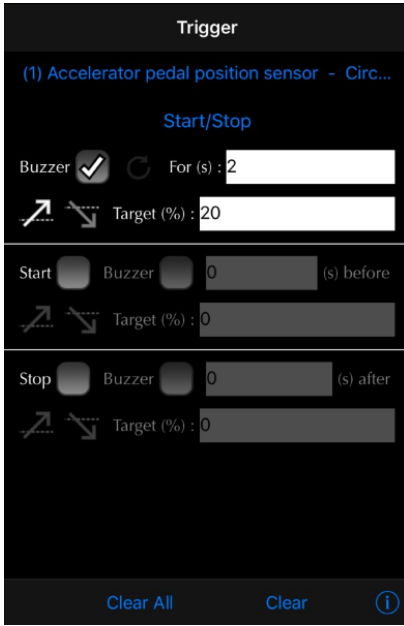
Trigger enabling



Click on the T symbol to enable or disable the triggers. Once a recording as begun automatically, it can be stopped like a regular recording by clicking on the stop button.

Figure 84. App : LV : Trigger enabling

Buzzer usage example



The buzzer will be heard when the live value increases and passes 20 %. The loop mode is activated in this case therefore the sound will be heard at a 2 seconds interval for as long as the condition is met.

Note: The buzzer and vibration settings are in the preference menu (cog wheel). The App automatically detects if a device is fitted with a vibrating motor. The buzzer will not be heard if the device volume is low or muted.

Figure 85. App : LV : Buzzer usage example

Start Stop example

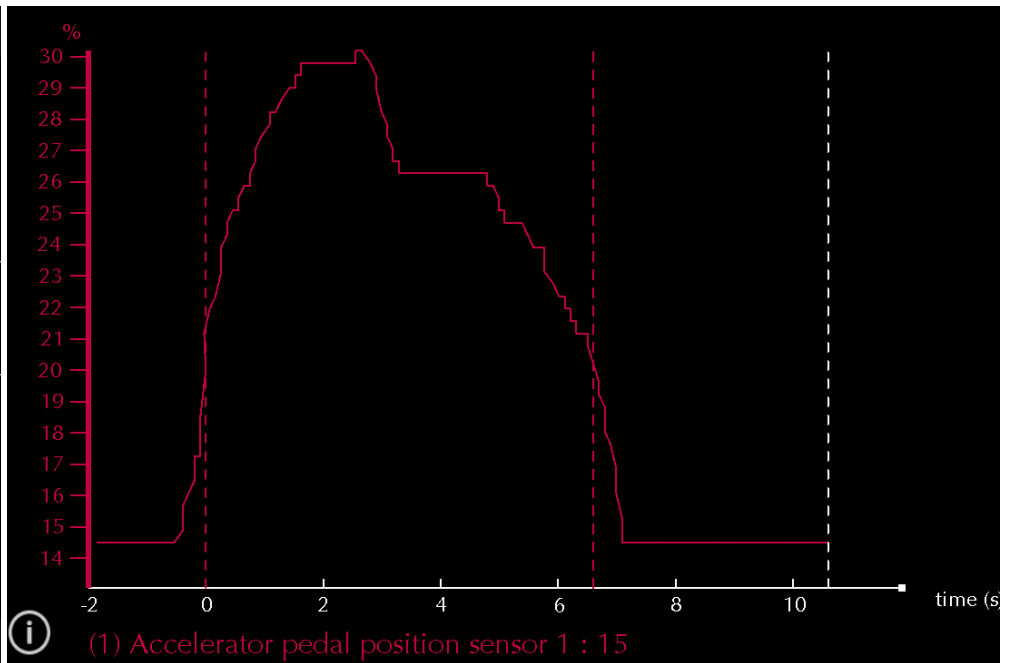
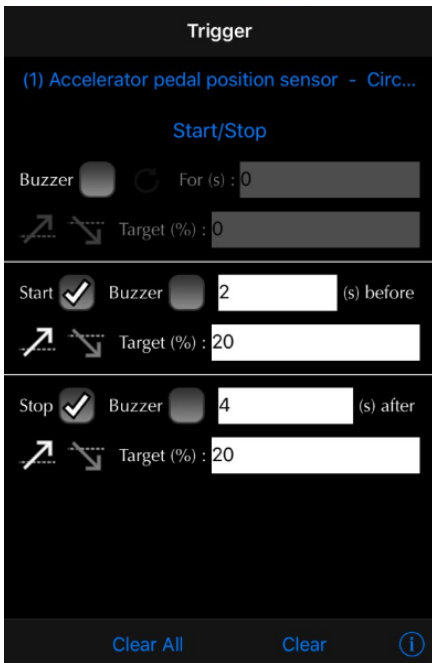


Figure 86. App : LV : Start stop example

- The live value increases and passes the Start target of 20 %.
- Recording begins and the previous data is kept (2 seconds).
- The Stop condition is met at around 6.5 seconds, hence the trigger indicator (red dotted lines).
- Recording continues for 4 seconds.

Event usage example

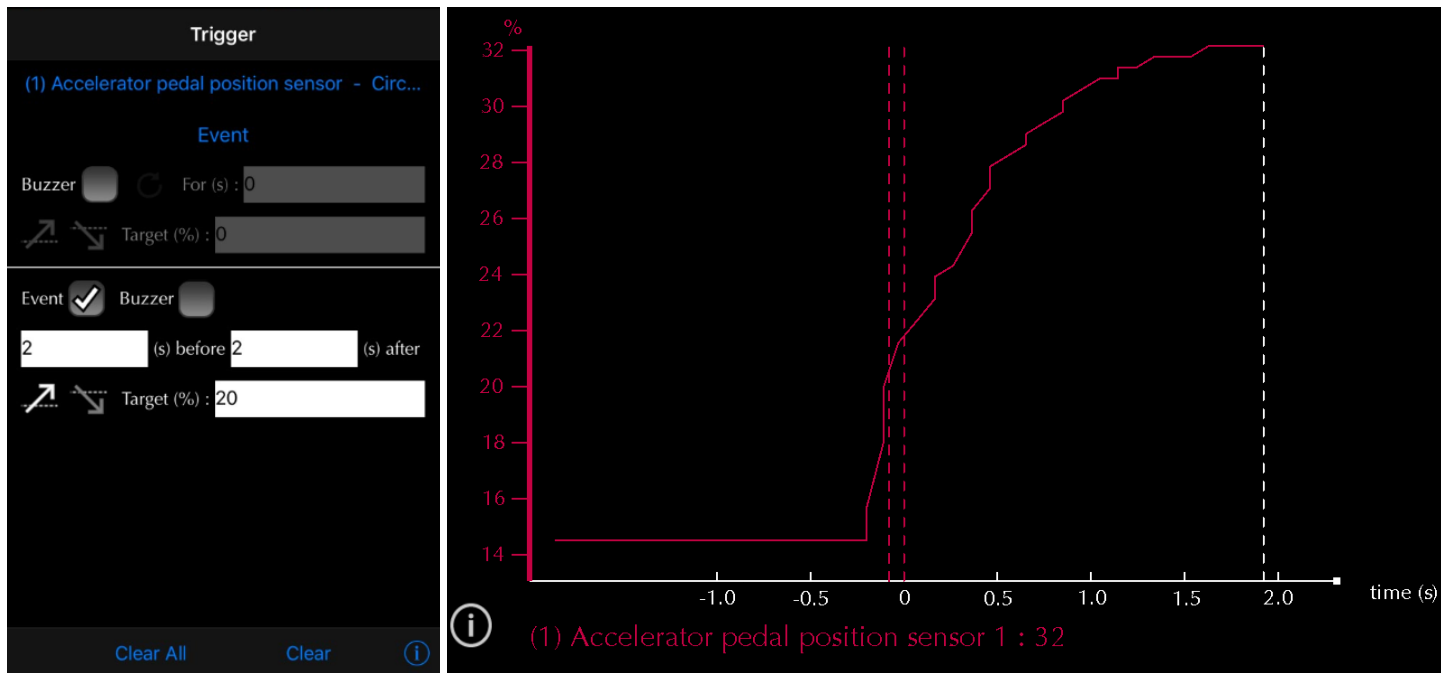


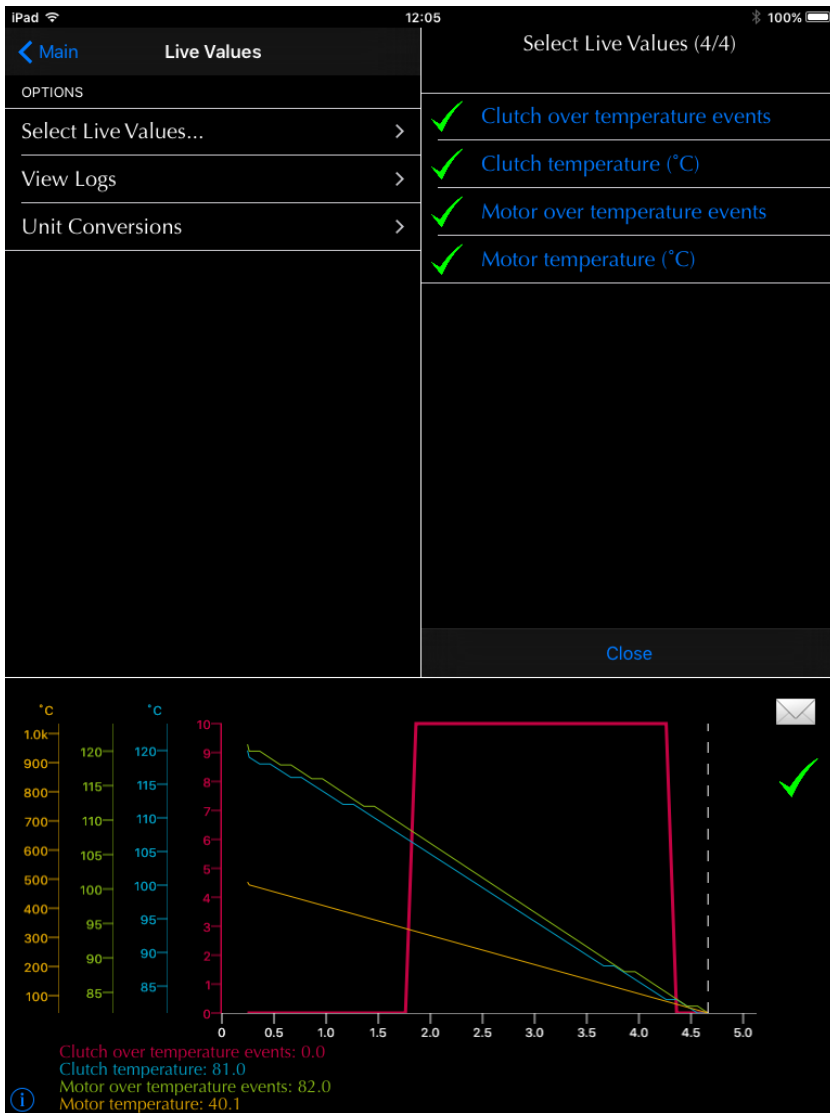
Figure 87. App : LV : Event usage example

- The live value increases and passes the Event target of 20 %.
- Recording begins and the previous data is kept (2 seconds).
- Recording continues for 2 seconds.

4.8.4 App Viewing and exporting logs

Logs can be viewed in the live values function or offline. [section 1.7.6](#).

To view previously saved logs, click on View Logs in the Live Value function. Select the log and click on view. Logs can be manipulated (zoom, pan...) and exported in PDF, or CSV format. They can also be Air Printed.



Export button



This button selects the values to display and export.

Figure 88. App : LV : Viewing and exporting logs

4.8.5 App Sharing Logs

Logs can be shared between users.

Access

In the log section, select one or multiple logs and click on Share or Upload. Once completed, a copy of the log will be available online for consulting on another mobile device or by your friends using the Online Log function [section 1.7.6](#).

○ Date: Oct 11, 2017 at 4:42 PM -- 7s
Number of LV: 1

Enregistrement #4

VIN: 4UF17SNW2HT000000

✓ Date: Oct 11, 2017 at 4:26 PM -- 0s
Number of LV: 11

Enregistrement #3

VIN: 4UF17SNW2HT000000

○ Date: Oct 11, 2017 at 4:26 PM -- 8s
Number of LV: 11

Enregistrement #2

VIN: 4UF17SNW2HT000000

○ Date: Oct 11, 2017 at 4:26 PM -- 9s
Number of LV: 11

Enregistrement #1

Delete Share



This symbol indicates that you are the owner of this log therefore it can be shared at will with friends.



This symbol indicates that it is already on the server.

The Share button will prompt the sharing screen.

Enregistrement #6

VIN: 4UF17SNW2HT000000

✓ Date: Oct 12, 2017 at 9:41 AM -- 21s
Number of LV: 10

Enregistrement #5

VIN: 4UF17SNW2HT000000

○ Date: Oct 11, 2017 at 4:42 PM -- 7s
Number of LV: 1

Enregistrement #1

Delete Upload



This symbol indicates that you are not the owner of this log therefore it can only be uploaded on the server and then viewed by the owner only.

The upload button will upload the log which will be available only to the owner.

Figure 89. DL : Log sharing

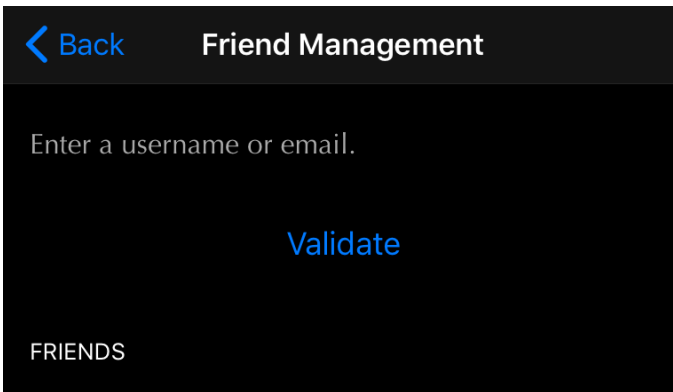
Sharing to friends



Select the friends you wish to share the log with and click on share.

Click on Manage Friends to add or remove friends from your list. See below.

Figure 90. DL : Log Sharing screen



Enter a user name, same as the one used to register the tool, or e-mail and click on Validate. If a match is found, it will be added to the list.

Figure 91. DL : Log Sharing screen

4.8.6 App Online Logs

The Online Log function allows visualization of logs stored on the server. Logs from the owner and friends which were shared will be visible even when not connected on the IIDTool.

Viewing logs

The online logs function is part of the App Parameter menu, [section 1.7.6](#). User must either be connected on the IIDTool or logged in ([section 1.9](#)).

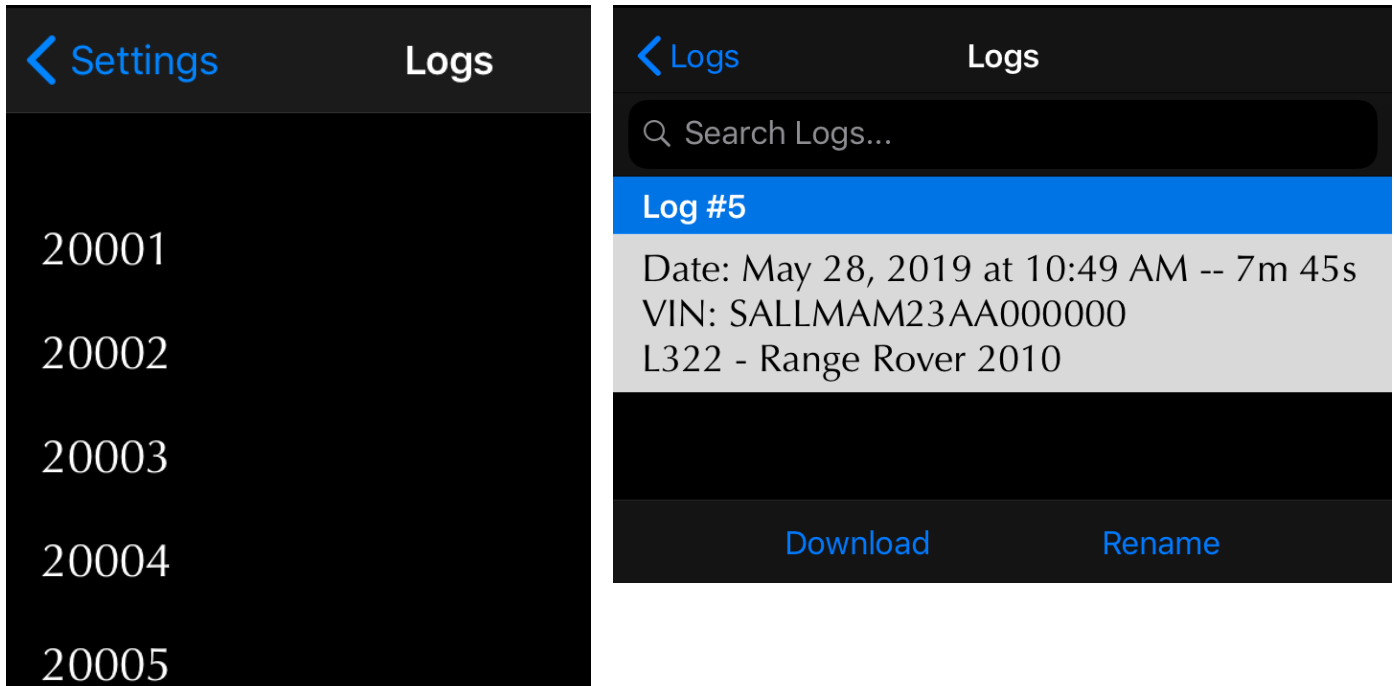


Figure 92. DL : Viewing online logs

Click on Download to view the Log and Rename to change the log name. The name will be changed on the server thus for all other people who can view it.

4.9 Function “Control Input / Output”

4.9.1 Definition

The Control Input and Output function allows testing individual components of a system. For a complete list of available control I/Os for your vehicle, please consult the functionality list on the IIDTool’s webpage. The Parking Brake Control IOs are explained on next page. For example:

- Output: Activating a suspension valve.
- Input: Simulating an input value coming from the cabin temperature sensor to verify part of the HVAC system functionality.

Note: *Not all ECUs allow input and/or output controlling.*

Access

- 1- Perform the initial stages of access ([section 4.1.3](#))
- 2- Select “Control IO ” function
- 3- Navigate through the ECU using commands
- 4- Select the desired ECU
- 5- Select the desired Control IO
- 6- See [Control Input / Output types](#) for more details



WARNING

Care should be taken when using the control I/O function. Make sure no objects or people are near any components or systems that will be activated.

Serious damage or injury can occur if the procedure is performed improperly! GAP Diagnostics assumes no liability for damages or injuries incurred during or resulting from the use of the IIDTool.

Notes:

- **II** Only the name of the value will first be displayed and scrolled if necessary. After a few seconds, the value or status will appear on the right.
- It is normal to see warning light(s) turning ON when controlling an input / output.

Control Input / Output types

There are two input / output control value types:

- Toggle value: **II** Pressing the Resume / Enter button will change the current output or input state to the next available one. For example, pressing Resume / Enter while controlling a LED will either turn it ON or OFF depending on its current state.
- Variable value: **II** The messages “Select Value +/-” followed by the current value will be displayed. Select the desired value using the buttons and to apply. For example, a ventilation motor can be activated at different speeds from 0 to 100%.

BT/Pro All self-explanatory when using the mobile App.

4.9.2 Electronic Parking Brake ECU

Select Normal or Service position (L322-06, L319-04, L320-05)

This routine will allow servicing the rear brakes. For L405, L494, L538 and L359 2013+, the function is located in the service test menu, [section 4.7.3](#)

Usage

Select Service position when servicing the brakes and Normal when finished.

Preparation

- Disengage the parking break
- The ignition must be turned ON without the engine running.

Note: On vehicles using the old nomenclature, Latching position is the equivalent of Normal position while Mounting is the Service position.

4.10 Function “Car Configuration”



WARNING

The IIDTool allows changing of vehicle settings to a state outside of the original manufacturer specification. It is the sole responsibility of the user to choose secure settings for the applicable use of the vehicle.

As with any diagnostic tool, there is always a risk of failure when writing data on an ECU. Writing the CCF should only be done when the vehicle is not needed immediately afterwards. Access to the internet in case support is needed is highly recommended. If the CCF update fails and your IIDTool can no longer be used, please consult the recovery instructions.

4.10.1 Definition

The car configuration menu allows users to make changes, improve or upgrade software functions supported by the vehicle. Please consult the functionality list on the IIDTool’s webpage to know which configurations are available for your vehicle. For example:

- Installing a rear-view camera will require a configuration change in order for the image to appear on the navigation display.
- Activate the day time running light options (DRL).

Note : Only a limited number of systems allow configuration changes. For a complete list, check out the functionality list on the IIDTool webpage <https://www.gap-diagnostic.com/support/documents/IIDTool/>.

On vehicles converted to Liquid Propane Gas or LPG, the system must be deactivated (switched to Petrol) before attempting to change the CCF, else the IIDTool will not be able to read the CCF.

Accès

- 1- Perform the initial stages of access ([section 4.1.3](#))
- 2- Select “Car Config” function
- 3- Navigate through the ECUs using commands
- 4- Select the desired ECU
- 5- Select and modify desired settings
- 6- Follow instructions to upload changes to the vehicle.

Car Configuration File

The **Car Configuration File**, or CCF, contains configurations needed by all systems or ECUs present on the CAN networks. An ECU (vehicle dependent) broadcasts the content of the CCF at regular intervals on the CAN networks. Each ECU knows its configurations and configurations of other ECUs if needed. Other ECUs have a backup of the CCF stored in their memory and may be used by the vehicle when one copy is corrupted. All vehicles except the L322 2002 to 2004 use this method.

There are two different types of CCF settings:

- Tested settings are available for all IIDTools.
- Untested settings give access to the whole CCF which includes tested and untested settings. This is available upon request for IIDTool **BT** and **Pro** users only. **Changing critical settings may prevent the vehicle or subsystems from functioning normally. Do not change setting(s) unless required and with full knowledge of possible consequences.**

Configurations of the BCM and LCM (L322-02 L322-06)

For these vehicles, configurations are also saved to these ECUs and used only by themselves. When a configuration is changed, it is programmed into the corresponding ECU.

Notes :

Changing a configuration may not be sufficient for a feature to work:

- *If the required hardware is not or still present in the vehicle.*
- *If the software or hardware version of a particular system does not support the functionality. For example, on **L319-04** and **L320-05**, the 3-turn flash feature is enabled in the Car Configuration File (CCF). In order to work on 2005-2006 vehicles, the BCM Body Control ECU software will have to be updated.*
- *If the feature cannot be changed.*

*Some features may not work immediately after they are changed and will require the vehicle electronics to shut down. **L322-02**, on diesel equipped vehicles, the park heating function may take up to one week before it becomes available on your monitor when activated.*

Changes should only be made when needed and with the full knowledge of risks and consequences these changes may imply.



CAUTION

When using the IIDTool, it is considered good practice to connect a power supply (Midtronic's PSC-550, CTEK MXS 25 or equivalent) to the battery, especially when writing the Car Configuration File or Re-Flashing an ECU. This will ensure that the battery voltage is sufficient.

Note: *Battery chargers are not suitable due to poor line regulation.*

Instructions

When entering this menu, the IIDTool will proceed with reading the CCF and individual ECU settings (LCM and BPM, L322-02 and L322-06). The ECU list will be displayed next. **II** Some configurations have a longer status definition, simply wait a few seconds and it will be scrolled on the display.




WARNING


User should not alter any safety features. User should inform himself of the applicable regulations or laws before making any changes susceptible of being part of a law or regulation.

4.10.2 Uploading a configuration change

II BCM and LCM Configurations (L322-02, L322-06)

If a configuration change is made, it will take effect when the user returns to the list of ECUs or when the configuration is changed. When the button  is pressed or when certain settings are changed, the message “ Configurations changed, apply to the vehicle? + to continue, - to cancel ” will be displayed. If no changes were made, the IIDTool returns to the ECUs list.

II Car Configuration File



If a modification of the CCF has been made, it will be applied to the vehicle when the user exits the configuration menu. By pressing the  button the user can decide to update the CCF with the changes. The following message appears: “ Configurations changed, apply to the vehicle? + to continue, - to cancel ”. If no changes were made, the IIDTool return to the menu.

App BCM, LCM and CCF configurations

Simply select “Upload Changes” and follow instructions on screen.

Steps

When updating the CCF, the IIDTool will prompt you with instructions to follow:

- If the engine’s running, the following message will be displayed: “Engine running. Turn OFF engine turn ignition ON (position II)”. **L322-10, L319-10, L320-10, L405, L494, L538, L359 2013 onwards**, the IIDTool will turn the engine off automatically.
- The IIDTool will verify that the voltage is higher than 11.5 V. If not, the operation will be aborted.
- The message “Display will turn off XY seconds, keep key ON at all time, <+>” will be displayed.
II Pressing any button will start the CCF write. During this phase, do not turn off ignition or disconnect the IIDTool.
- **All pre-2010 and L359 up to 2012 vehicles:** Once the display turns ON again, you will be asked to turn the ignition OFF and back ON (position II), once done, press the  button.
All 2010+ and L359 2013+ vehicles: Once the display turns ON again, the “Clearing Fault” and “Upload Success” messages will appear. Turn OFF the ignition for at least one minute.
- The “Clearing Fault” and “Upload Success” messages will appear, **II** press the  button to quit.
- **All 2010+ and L359 2013+ vehicles:** Turn ON the ignition for 30 seconds then start the engine. If error messages are still present, use the Clear All function of the IIDTool.

Notes : *During or after a configuration programming you may experience one or more of the following:*

- *It is normal to see warning lights appear on the display.*
- *Writing the CCF will disable the one touch window operation. To enable the one touch operation,*

close the window completely, release the switch, pull up and hold the switch for one second. Repeat the procedure on each window.

- The date and time will be reset.
- Once completed, it may take a few starting cycles for error messages on the instrument cluster to disappear.
- You may hear a chime coming from the instrument cluster.
- If the key was turned to the OFF position too quickly after updating the CCF, the engine may not start. Turn the key to the ON position for more than 15 seconds to allow the immobilization system to synchronize before starting the engine.
- The navigation screen will turn off during CCF programming. The radio memory may be erased. On **2010 and up vehicles**, a low battery message may be displayed. Simply ignore it. The radio memory and trip computer will be erased.
- On **L359 up to 2012**, the engine will only start after the electronics have shut down. To do so, lock the doors and wait a few minutes.
- The viscous fan will stay engaged if the vehicle electronics are not allowed to shut down after a CCF write was performed.
- The intelligent start and stop system (eco) will be disabled. It will reactivate automatically after a few kilometers or engine starts.

Changing a configuration using any other diagnostic tool may alter previous changes made to configurations using the IIDTool.

4.10.3 Configurations backup

When connected for the first time, the IIDTool made a backup of the configuration file (CCF) **L322-02 and L322-06** and a backup of configurations stored inside the BPM (Body Processor) and LCM (light control). **L322-02 and L322-06** If the initial backup of one ECU failed, it will not be present in the list. This will not affect the other ECUs whose configurations were successfully saved. **Pro** : The backups are made when entering the Car Configuration File menu.

4.10.4 II Recovery procedure

If updating the CCF failed and using of the integrated interface is required (mobile device or PC interface not used), the IIDTool will be temporarily unable to write on the instrument cluster screen. The engine will not start, error messages will be displayed on the instrument cluster and a dot will be present on the odometer display.

The following steps will allow restoring the Car Configuration File when using the integrated interface.

- Disconnect your IIDTool and turn the ignition OFF.
- Turn the ignition ON and connect your IIDTool.
- Wait until all error messages on the instrument pack have cleared. The Voltage is now displayed.
- You can now enter the IIDTool menu.
- Select IIDTool Menu->Save/Restore->Restore Settings->Car CCF or Car CCF PCM (**L322-06**)
- Once the small dot has disappeared on the odometer screen, turn key to the OFF position.
- **L322-02 and L322-06** : Wait until the LED on the left radio button goes off

You can now use your vehicle normally.

If the recovery procedure was not successful, please contact us for support : support@GAP-Diagnostic.com

4.10.5 App Recovery procedure

If the Car Configuration File update fails, simply restart the process by either clicking on the upload button or use the Restore CCF function located in the Save Restore Menu. ([section 4.13](#))

4.10.6 Pro BT Editing Untested CCFs (available on request)

This menu will give access to the full Car Configuration File. This includes tested and untested configurations.

The CCF was implemented when Land Rover was under Ford management therefore it contains configurations related to both Ford and Land Rover vehicles. Around 20 % of the CCF content is relevant and used by Land Rover. It is therefore not surprising for configuration changes to have no effect on the vehicle.

Note: *Changing an untested setting may affect vehicle usability and in some severe cases, incapacitate (brick) the vehicle.*



WARNING

User should not alter any safety features. The user should inform himself of the applicable regulations or laws before making any changes susceptible of being part of a law or regulation. Careless changing of these settings could prevent the car from starting or present a safety hazard.

It is the sole responsibility of the user to choose secure settings for the applicable use of the vehicle.

4.10.7 App Using the My Favorite Car Configuration feature

This tool allows faster access to preferred configurations by creating custom lists. To create a list, press New Favorite.

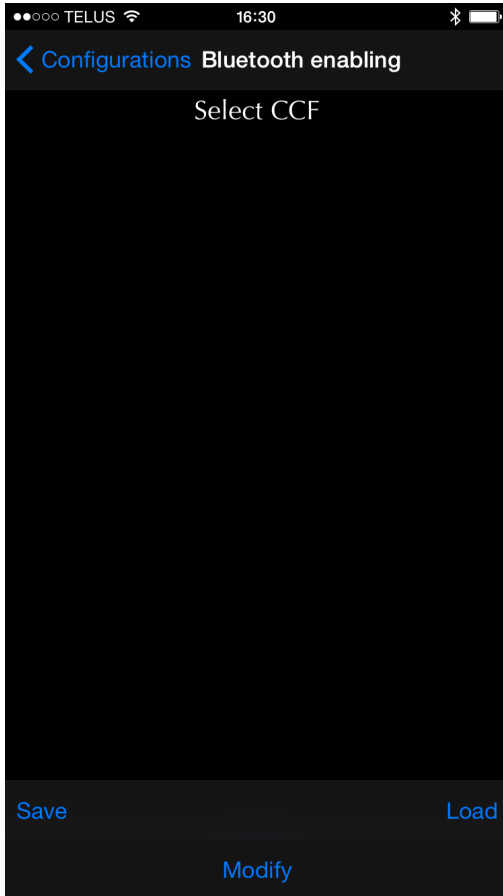


Figure 93. App : CCF : Modify a Favorite list

The modify button is used to add or remove configurations from the list. The list can also be deleted in this menu.

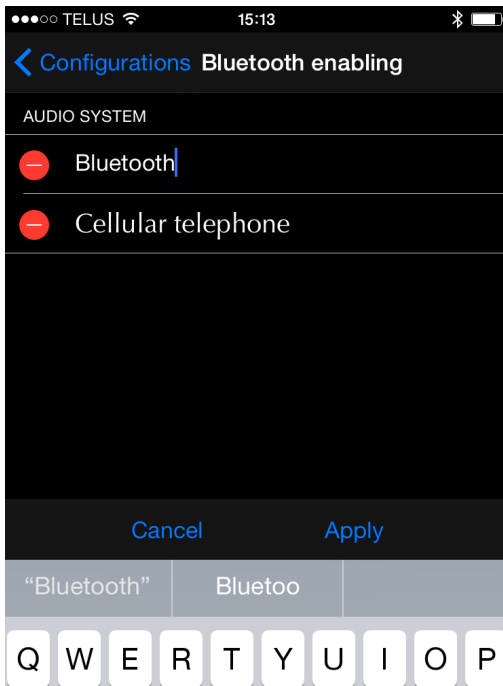


Figure 94. App : CCF : Modify a configuration name in a favorite list.

Click on the configuration name to change it.

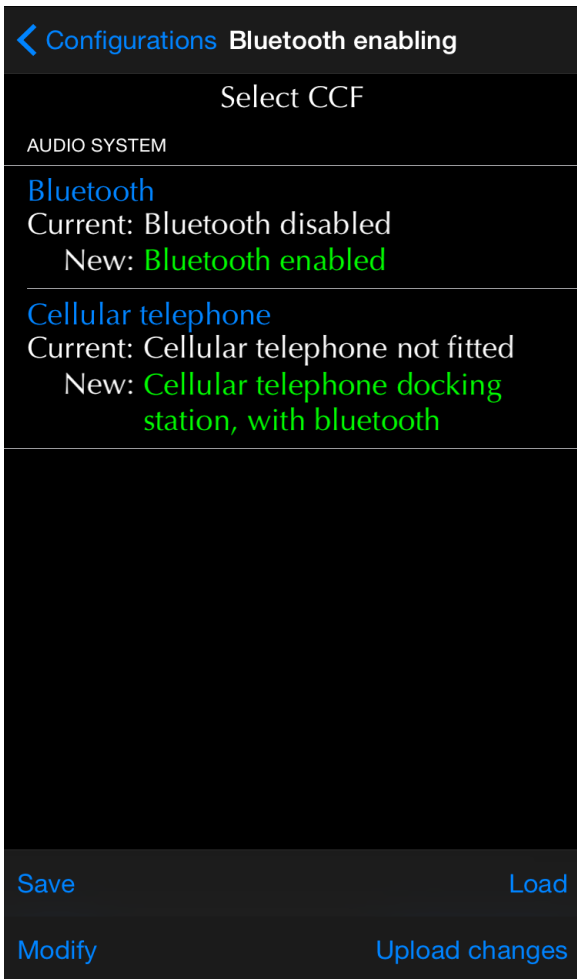


Figure 95. App : CCF : Define configuration values in a favorite list

After adding configurations, the user can set the preferred or default value for each configuration.

The Save button is used to save the desired value of all configurations in this list. In this example, the configurations allowing for a Bluetooth activation L319-04 and L320-05 are recorded.

The load button will recall those configuration values.

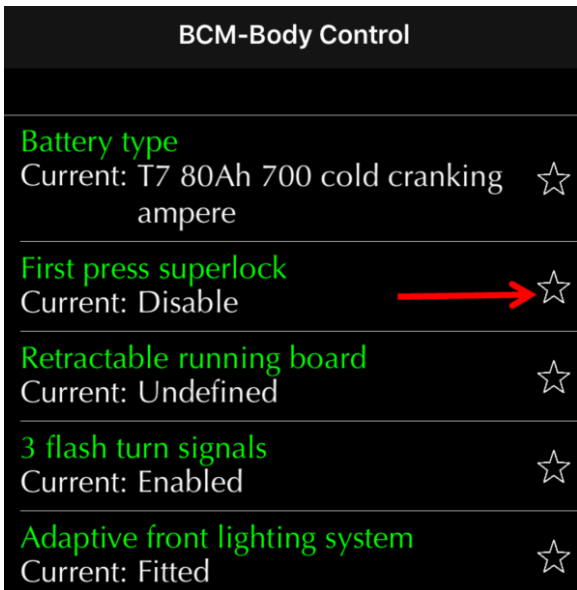


Figure 96. App : CCF : Favorite, Fast Add method. Adding a configuration.

Click on the star when viewing a configuration



Figure 97. App : CCF : Favorite, Fast Add method. Selecting the list.

- 1- Click here to create a new list
- 2- Current favorite lists are shown here
- 3- Click on the star to add the live value to this favorite list

4.11 Function “ECU Flash”

4.11.1 Definition

This function allows updating an ECU software to the latest available version. Software updates generally include bug fixes and/or enhancements and/or new features. Engine Remaps, EGR blanking and more, are available and provided by [Bell Auto Services](#). The GAP Diagnostic fast lane service is now available when a specific ECU re-flash is required and not supported or embedded in the tool.

Access

- 1- Perform the initial stages of access ([section 4.1.3](#))
- 2- Select the “ECUFlash” function
- 3- Navigate through the ECU using commands
- 4- Select the desired ECU
- 5- If available, choose the required version

Notes :

- *Not all ECU's have software updates available.*
- *Software updates should only be made when needed and with full knowledge of risks and consequences this may imply.*
- *Make sure the battery is in good condition and well charged. It is best to proceed after the vehicle was driven for a while. This ensures that the battery is fully charged.*
- *During re-flashing, the instrument cluster may turn OFF and lights may come ON. Once the instrument cluster comes back ON, follow instructions on screen.*
- *The navigation screen may turn OFF and a message indicating a low battery may be displayed. Simply ignore it.*
- *It may take a few starting cycle for error messages on the instrument cluster to disappear after re-flashing.*
- *Re-flashing an ECU will reset data including but not limited to the clock and trip computer.*
- **App :** *If using a mobile App, it can be left in the background, foreground or closed. If the mobile device is disconnected from the IIDTool, the re-flash will not be interrupted and the App will show the current status (progress...) automatically once reconnected to the IIDTool.*
- *The intelligent start and stop system (Start Stop) will be disabled. It will reactivate automatically after a few kilometers or engine starts.*
- *The IIDTool will verify that the voltage is high enough. If not, the operation will be aborted.*
- *The message “Flashing Started” will be displayed and the instrument cluster will turn OFF. The IIDTool LED will start flashing rapidly. **Do not disconnect the IIDTool or do anything else to the vehicle.** The message “ Wait for completion message and keep IIDTool connected <+> ” will be displayed.*
- *The dashboard will illuminate and a message asking to cycle the ignition will appear. The messages “Clearing Faults” and “Download successful <+>” will be then be shown,*

Post flashing Notes :

- *Flashing an ECU will disable the one touch window operation. To enable the one touch operation, close the window completely, release the switch, pull up and hold the switch for one second. Repeat the procedure on each window.*
- *The date and time will be reset.*
- *Once completed, it may take a few starting cycles for error messages on the instrument cluster to disappear.*
- *You may hear a chime coming from the instrument cluster.*
- *The navigation screen will turn off during a flash. The radio memory may be erased. On **2010 and up vehicles**, a low battery message may be displayed. Simply ignore it. The radio memory and trip computer will be erased.*
- *On **L359 up to 2012**, the engine will only start after the electronics have shut down. To do so, lock the doors and wait a few minutes.*
- *The viscous fan will stay engaged if the vehicle electronics are not allowed to shut down after a flash was performed.*
- *The intelligent start and stop system (eco) will be disabled. It will reactivate automatically after a few kilometers or engine starts.*

Hard Reset:

After a software update was performed, a hard reset may be needed in order for all systems to return to normal. Here's how to proceed.

- Disconnect both the positive and negative cable from the vehicle's battery.
- Wait 10 minutes and short both cables together.
- Reconnect the cables to the vehicle's battery.
- played.



CAUTION

As with any diagnostic tool, there is always a risk of failure when re-flashing an ECU. It should only be done when the vehicle is not needed immediately afterwards. Access to the internet is highly recommended in case support is needed. GAP Diagnostics assumes no liability for damages or injuries incurred during or resulting from the use of the IIDTool. Do not do anything to the vehicle or disconnect the IIDTool until the firmware update is finished. Read the recovery instructions prior to updating an ECU.

When using the IIDTool, it is considered good practice to connect a power supply (Midtronic's PSC-550, CTEK MXS 25 or equivalent) to the battery. This will ensure that the battery voltage is sufficient.

Note: Battery chargers are not suitable due to poor line regulation.

4.11.2 Risk scale



Each update is classified according to the following risk levels. In case of failure, consequences and recovery methods are defined generally for all ECUs and specifically when required.

Risk Level	Consequences	Recovery Method	Precautions
● High	Vehicle unusable and more	Follow instructions	Mandatory
● Moderate	Vehicle unusable or limited	Follow instructions	May be required
● Low	Limited to the specific system	Standard Re-flashing procedure	May be required

Table 36. Definition, risk scale

Instructions

The list of ECUs that can be updated will be displayed. According to the ECU selected, more than one option can be offered. Select the appropriate option for the vehicle and application.

II When the following symbol is displayed <+>, the IIDTool will continue the process once the  button is pressed. You can exit the function anytime prior to the re-flashing itself by pressing the  button once. When completed, wait a few seconds with the key in the ON position before starting the engine.

When updating ECUs, the IIDTool will prompt you with instructions to follow:

For each step and message,

BT/Pro, click on *Continue* or *Cancel*

II Press on  to continue or  to cancel.

- If the engine's running, the following message will be displayed: "Engine running. Turn OFF engine turn ignition ON" (position II). On **L319-10**, the IIDTool will shut the engine OFF and turn ON the ignition.
- Read the warning messages,
- The IIDTool asks the user to confirm the requested task. For example "Upload suspension? <+> Yes <-> No "

4.11.3 Recovery method

General method

The firmware of the IIDTool has an algorithm to recover an ECU following a failed update. This is particularly useful when the ECU no longer answers diagnostic commands. In such cases, the IIDTool detects this condition and will activate the recovery method. Just follow the instructions on screen and when the message "Toggle Fuse" is displayed, disconnect and reconnect the fuse that powers the ECU. The tool detects the fuse insertion and starts the update automatically.

Body Control and Instrument Pack (L319-04, L320-05)

Please consult the recovery instructions for these ECUs.

Notes App : *Once started, the re-flashing process is independent from the App and is only handled by the IIDTool. The App is only used to display the current status and can be left in the background, foreground or closed. If the mobile device gets disconnected from the IIDTool, the App will recover automatically once reconnected to the IIDTool.*

Vehicle Reset (L319, L320):

In some cases, a soft reset may be sufficient in order for all systems to return to normal. The routine is found in the service test menu ([section 4.7.11](#)).

4.11.4 Available Re-Flash

Engine Remaps, EGR blanking and the likes.

All IIDTools are now capable of transporting products designed and sold by the good people of BAS Remaps (Bell Auto Services). For more details, please visit their website at:

<http://bellautoservices.co.uk/>

or send them an e-mail at tech.bas2@gmail.com


Risk Level	Consequences	Recovery Method	Precautions
 Moderate	Engine will not start	Repeat reflashing procedure	None

Table 37. Risk, Engine Remaps, EGR blanking and the likes

Prerequisites

- Have access to a Mac or PC computer connected to the internet
- Having installed the updater software ([section 2.3](#))
- Ensure that the updater software installed is at version 4.6 (PC), 4.1 (Mac) or higher.
- **Pro** Ensure the firmware of IIDTool is at least the compiled version in 2454. Else, simply proceed with updating the IIDTool **Pro**. See [section 2.5](#).

Step 1: Providing BAS with the required information

In order to build a personalised file, BAS Remaps will need to know the current ECU information and vehicle identification number (VIN). After initial contact with BAS, retrieve the ECU information (IIDTool Menu->ECU Info->Engine) and send them to BAS Remaps at tech.bas2@gmail.com. Make sure your vehicle identification number (VIN) is visible in the email header or subject line (**BT/Pro** not hidden or obfuscated).

Step 2: Providing BAS with the engine ECU firmware backup

This is not possible on regular non-Bluetooth IIDTool, **first hardware version**. In which case, skip this step and proceed with Step 3.



Figure 98. Regular IIDTool generations

Note: IIDTool **Pro** and **BT** , go to point 2



Figure 99. IIDTool BT generations

1. Once Bell Auto Services has given you access to the custom PCM Backup firmware, proceed with updating your IIDTool to the “custom” firmware. See [section 2.5](#).



Figure 100. BT and regular, updating the IIDTool with a “Custom” firmware.

2. Use the PCM Engine ECU backup function to save an original copy of the ECU firmware in the IIDTool's memory: **IIDTool Menu->ECU Flash->Backup PCM Flash** and wait until completion. Once done, disconnect the IIDTool from the vehicle.

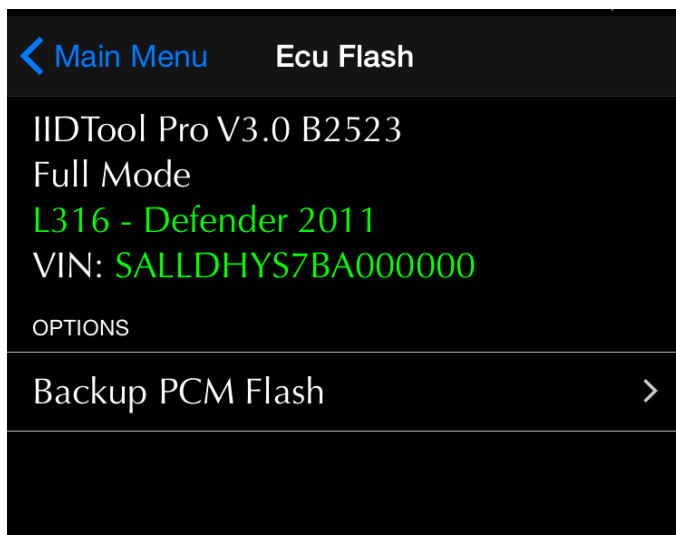


Figure 101. App : Backup copy of the original firmware (engine ECU)

3. Start the update software, connect the IIDTool to the computer's USB Port and click Find Device. The *Upload ECU Backup To Server* button will appear. Click this button to upload the file saved to the server. It can thus be analyzed by Bell Auto Services.



Figure 102. Upload of the engine ECU original firmware

Step 3: Updating your IIDTool with the custom remap, EGR blank or other

Once BAS Remaps confirms that a personalised file is ready, simply proceed with the following:

1. Connect the IIDTool on your computer and start the updater software.
2. Click on "Find Device" and wait until the updater software finds the IIDTool.

IIDTool BT G2 and regular



Figure 103. BT and regular, updating the IIDTool with a BAS file,

3. Select "Custom"
4. Click on "Program Firmware" and wait until completion.
5. **As instructed by the updater software upon completion, proceed with automated file loading/update on your mobile devices. See [section 2.6](#).**
6. On first connection to the vehicle following the update of the tool, the contact must be turned on (ON) without starting the engine and the last connection of the tool. The IIDTool conducts a scan to determine which ECUs are present on the communication bus.

IIDTool Pro and BT G3 or BT G2 and regular (BT G2 and regular currently fitted with a custom firmware and a second (or third...) file as been made available):



Figure 104. Pro, BT, updating the IIDTool with an additional BAS file,

3. Click on "Program Flash File Only" and wait until the update is completed.

Step 4: In the vehicle

Simply navigate to IIDTool Menu->ECU Flash and select the correct file. Make sure to follow the general re-flashing precautions. **BT** and regular IIDTool: Revert back the IIDTool firmware to the latest release version once re-flashing is completed.

Notes:

- *This will not affect the re-flash counter which limits how many times an engine ECU can be updated.*
- *In some instances, the process may require two consecutive Engine ECU Re-Flash. The first one would be to update the ECU to the latest firmware while the second one would be the modified version. Bell Auto Services will provide additional details if needed.*

Fast Lane Service

The re-flash module allows the tools to reflash any ECU with updates. The GAP Fast Lane Service ensures that the correct update file for the current software level, hardware, mechanical components, and geographic market is chosen. There is a 25 GBP per ECU administrative charge for non-Pro units to cover the file selection process. This service is free of charge since covered by the annual IIDTool **Pro** subscription. GAP Fast Lane Service ensures that customers receive the most up-to-date ECU files for their vehicle configuration within hours (excluding weekends and holidays). ECU updates already covered in the present IIDTool services (EAS electronic air suspension for example) remain free of charge.

	Risk Level	Consequences	Recovery Method	Precautions
●	Moderate	Varies	Repeat reflashing procedure	Usual precautions shall be taken

Table 38. Risk, fast lane service

Prerequisites

- Have access to a Mac or PC computer connected to the internet
- Having installed the updater software ([section 2.3](#))
- Ensure that the updater software installed is at version 4.6 (PC), 4.1 (Mac) or higher.
- **Pro** Ensure the firmware of the IIDTool is at least on build 2454.
BT, on build 2080 or higher.
Else, simply proceed with updating the IIDTool **Pro**. See [section 2.5](#).

Providing GAP Diagnostic with the required information

- The vehicle identification number (VIN) and information on the current firmware are required.
- Retrieve ECU information (ECU) ECU using the information function ([section 4.12](#)), and send them to GAPTeam@GAP-Diagnostic.com. Ensure the vehicle identification number (VIN) is visible in the header or email subject line (not concealed or hidden).

Updating your IIDTool with the custom firmware and re-flashing the ECU

Once you have received confirmation that the file is ready, simply follow the instructions found on [Step 3: Updating your IIDTool with the custom remap, EGR blank or other](#) and onwards.

Suspension (L322-06, L322-10, L319, L320)

User can choose between the Hitachi and AMK (introduced in 2012 as the new replacement part) compressor firmware. The firmware for vehicles fitted with the Hitachi compressor contains modifications on the compressor logic and temperature thresholds to increase its longevity. Re-flashing the suspension ECU takes around one minute.

Identify firmware: This function will return which firmware is currently in the Suspension ECU (Hitachi or AMK).

Risk Level	Consequences	Recovery Method	Precautions
● Moderate	Suspension system non functioning. The vehicle should only be driven for a short distance	Repeat reflashing procedure	None

Table 39. Risk, updating the suspension ECU

On L319-04 vehicles fitted with an earlier RLM firmware version, the suspension warning lamp may turn ON after the IPC firmware is updated. Proceed with updating the RLM Suspension ECU to fix this issue.

Body Control (L319-04, L320-05)

Updating the BCM Body Control ECU adds the 3 turn flash feature. To work, it will also have to be enabled in the Car Configuration File (CCF).

Risk Level	Consequences	Recovery Method	Precautions
● High	Vehicle unusable, damage to rear latch or other possible	Instructions below	Mandatory

Table 40. Risk, updating the Body Control ECU

- Re-flashing the Body Control ECU takes around 2.5 minutes.
- Good electrical connections at the OBD connector and high enough battery voltage are both critical to the success of the BCM re-flash.
- If you do not have access to a power supply (Midtronic's PSC-550, CTEK MXS 25 or equivalent), use jump cables and another vehicle with the engine running to supply current to the battery.
- Do not use a regular battery charger.
- Make sure you have plenty of time ahead before proceeding.
- if re-flashing fails on the first attempt, fuses 15 and 16 of the engine fuse box will have to be removed quickly to prevent damages to latches or other devices controlled by the BCM. We strongly recommend loosening the fuses using pliers before updating the BCM. This way, it will be easier to remove both of them quickly in case of a failure.

Recovery Method

If a failure occurred and a second attempt is needed, select the function to re-flash the BCM and when the message "Toggle Fuse" is displayed, reconnect fuse 15. The re-flash will start automatically and once completed, reconnect fuse 16. If it failed on the second attempt also with only fuse 15 installed, try again with fuse 16 only.

If the recovery method was not successful, please contact the manufacturer for additional support : support@GAP-Diagnostic.com.



Figure 105. Battery fuse holder location

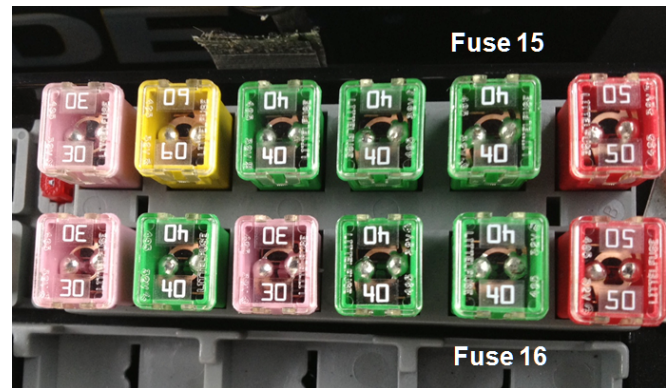


Figure 106. Fuses 15 and 16, Body Control ECU

Instrument Pack (L319-04, L319-10, L320-05, L320-10)

	Risk Level	Consequences	Recovery Method	Precautions	
II	●	Moderate	Vehicle unusable	Instructions on next page	None
BT/Pro	●	Moderate	Vehicle unusable	Repeat re-flashing procedure	None

Table 41. Risk, updating the Instrument Pack ECU

L319-04 and L320-05 : User can choose between three firmware:

- **IPC MY07+:** This firmware will add the clock display on 2005-2006 vehicles. When turning ON the headlamps on a 2005-2006 vehicle after the IPC was updated with this firmware, the AHCM (auxiliary heater, fitted on diesel vehicles) indicator light will turn ON. On 2007 and up vehicles, the logo for this particular lamp changed for the “headlamps ON” one. On 2005-2006 Petrol vehicles only, the amber “parking brake” indicator light replaces the “check engine” light.
- **IPC MY07+ for pre MY07:** This modified firmware version will also add the clock display on 2005-2006 vehicles but without any of the disadvantages found in the non-modified version described above (**IPC MY07+**).
- **IPC pre-MY07:** This is the original firmware version found on 2005-2006 vehicles.

*Model year, see [section 1.6.1](#)

Before updating this ECU, please read the following:

- Re-flashing the Instrument Pack ECU takes around one minute.
- Once re-flashing is completed, turn key to the OFF position for at least 3 minutes before starting the engine.
- On MY07+ firmwares, the low coolant warning lamp may come on after updating because the later firmware will react differently to the sensor input. This may be due to the coolant level being too low or a known problem with the expansion tank float/sensor becoming less buoyant. We strongly recommend fixing the issue but it is also possible to revert back to the earlier firmware version.
- The clock on dash is displayed in the 24-hour format only. The 12-hour format was not implemented by Land Rover.

Note : For **L319-04 for L320-05.** On vehicles fitted with an earlier RLM firmware version, the suspension warning lamp may turn ON after the IPC firmware is updated. Proceed with updating the RLM Suspension ECU to fix this issue.

L319-10 and L320-10 : On 2010 and 2011 vehicles, this function will allow updating the instrument pack ECU software to the latest version (2012 look). Re-flashing the Instrument Pack ECU takes around 60 to 90 seconds.

Recovery method

II If the instrument pack software update fails and usage of the integrated interface is required (not using a mobile device or the PC-based interface), the IIDTool will no longer be able to write on the instrument cluster screen. Also, the engine won't start. The following steps will allow retrying the software update without having access to the IIDTool's menu.

- Disconnect your IIDTool and turn the key to the OFF position.
- Turn the key to the ON position and connect your IIDTool.
- Wait until the IIDTool LED turns and stays ON.
- Press the down/lower button of the suspension height selector on the centre console. Hold the button until the LED turns OFF (approximately 12 seconds).
- After a few seconds, the software update will begin and the LED will start flashing. The process takes around one minute. When finished, the Instrument Pack will turn ON.
- Once the instrument pack turns ON, wait a few seconds and cycle the key from the OFF to the ON position.

App Simply repeat the reflashing steps.

You can now use your IIDTool and vehicle normally.

If the recovery method was not successful, please contact the manufacturer for additional support : support@GAP-Diagnostic.com.

Bluetooth (English UK*, L322-2005, L322-06, L319-04, L320-05)

Updating the Bluetooth ECU on earlier vehicles will improve pairing on more recent mobile devices. It will also allow phone book access on the radio or navigation screen. It is not necessary to proceed with this update if these features are already working properly.

Note: This update will only work on units with pairing code 2121. The dealer fitted kits (pairing code 0000) cannot be updated.

*Instructions for other voice languages can be found at the end of this section.

Risk Level	Consequences	Recovery Method	Precautions
● Low	Entertainment system non functioning	Repeat re-flashing procedure	The entertainment system, especially the MOST ring must be in working order

Table 42. Risk, updating the Bluetooth ECU

Instructions

IIDTool BT and Pro: the function is embedded in the IIDTool **Pro** and **BT** firmware. It requires the use of a mobile device.

Notes on mobile App usage: Once started, the re-flashing process is independent from the App and is only handled by the IIDTool. The App is only used to display the current status and can be left in the background, foreground or closed. If the mobile device gets disconnected from the IIDTool, voluntarily or not, the App will recover automatically once reconnected to the IIDTool.

Regular non-Bluetooth IIDTool hardwares:



Figure 107. Regular IIDTool generations

Regular non-Bluetooth IIDTool, first hardware version: Usage of the PC-based controller is mandatory. The IIDTool must be connected to the computer until the process is completed. The option will be displayed on your computer screen (re-flash menu). Please consult [section 2.8.5](#) of this user manual for more details on the PC-based interface. If using a laptop, make sure the battery charger is connected. Close all programs, disable all automatic updates and screen saver. The computer does not need to be connected to the internet.

Regular non-Bluetooth IIDTool, second hardware version: The function is embedded in the IIDTool firmware. User can choose between the regular Integrated Interface or PC-based interface. When using a laptop, make sure the battery charger is connected. Close all programs, disable all automatic updates and screen saver. The computer does not need to be connected to the internet.

Steps, IIDTool BT, Pro and regular IIDTool first hardware version

L322-2005 and L322-06

- Select the Bluetooth re-flash and follow the instructions on screen.
- The process is done with the key to the Accessory position (I). Make sure that the headlights are turned off and that any unnecessary lights or accessory are turned off also.
- Upon completion, turn the key to the ON position (II) and follow the instructions on screen.

L319-04 and L320-05

- Select the Bluetooth re-flash and follow the instructions on screen.
- The process is started with the key to Ignition, position II. Once re-flashing has begun (indicated on the Navigation screen), the key can be removed. It can also be left in position II in which case the user should keep an eye on the vehicle and wait until completion (the instrument pack will wake up). Failure to turn the key to the OFF position after the procedure is completed (or if a failure occurred) will lead to a battery drain if not connected to a power supply.
- Upon completion, turn the key to the ON position (II) and follow the instructions on screen.

Steps, regular IIDTool second hardware version

- Select the Bluetooth re-flash and follow the instructions on screen.
- The process is started with the key to Ignition, position II. Once re-flashing has begun (indicated on the Navigation screen), the key can be removed. It can also be left in position II in which case the user should keep an eye on the vehicle and wait until completion (the instrument pack will wake up). Failure to turn the key to the OFF position after the procedure is completed (or if a failure occurred) will lead to a battery drain if the vehicle's battery is not connected to a power supply.
- Upon completion, turn the key to the ON position (II) and follow the instructions on screen.

Keep an eye on the vehicle and wait until completion (the instrument pack will wake up). Failure to remove the key from the ignition after the procedure is completed (or if a failure occurred) will lead to a battery drain if not connected on a power supply.

Bluetooth ECU (other languages, L322-2005, L322-06, L319-04)

User can choose between French, Spanish, German, Italian and English US voice languages.

Note: *This update will only work on units with pairing code 2121. The dealer fitted kits (pairing code 0000) cannot be updated.*

Use

IIDTool Pro: all versions are embedded in the IIDTool **Pro** firmware. Usage of a mobile device is required.

Regular IIDTool, all versions and IIDTool BT: Available upon request only.

Steps:

L322-2005 and L322-06

- Select the Bluetooth re-flash and follow the instructions on screen.
- The process is done with the key to the Accessory position (I). Make sure that the headlights are turned off and that any unnecessary lights or accessory are turned off also.
- Upon completion, turn the key to the ON position (II) and follow the instructions on screen.

L319-04

- Select the Bluetooth re-flash and follow the instructions on screen.
- The process is started with the key to Ignition, position II. Once re-flashing has begun (indicated on the Navigation screen), the key can be removed. It can also be left in position II in which case the user should keep an eye on the vehicle and wait until completion (the instrument pack will wake up). Failure to turn the key to the OFF position after the procedure is completed (or if a failure occurred) will lead to a battery drain if not connected to a power supply.
- Upon completion, turn the key to the ON position (II) and follow the instructions on screen.

Navigation (L322-2005, L322-06, L319-04, L320-05)

1- Definition

The Nav On Move enabling procedure consists of 3 separate steps. User can choose to proceed with each step separately, **in order**, and with no time constraints between each step. Nonetheless, it is good practice not to make any changes to the vehicle or CCF after step 1 is done and until steps 2 and 3 are completed. Use the “Whole Process” option to automatically call each step one after the other.

Risk Level	Consequences	Recovery Method	Precautions
● Low	Entertainment system non functioning	Repeat re-flashing procedure	The entertainment system, especially the MOST ring must be in working order

Table 43. Risk, updating the Navigation ECU

Notes :

- This will not update the map files since this is done by replacing the DVD with a newer version.
- **The Nav On Move will only work if the Multimedia Module (MMM, which reads the map files on a DVD) is at version 1040 or higher.** This ECU cannot be updated by the IIDTool since it is not connected on any network accessible at the diagnostic port. To know which software version the MMM is currently at and how to update it, please consult the [5- MMM firmware version](#) in the following pages.
- After completion, the GPS almanac and ephemeris will have to be acquired. This in turn increases the “fix” time on first usage.

2- Steps

Caution User should read all details regarding this re-flash including the following pages before proceeding. *The steps must be done in order.*

Step 1: The tool will proceed with an automatic CCF change to enable the Nav On Move settings. It will read the CCF, make the required changes and write the CCF. **Disabling the Nav On Move in the CCF will require redoing the whole process (steps 1 to 3). Using the Restore CCF function will not disable the Nav On Move.**

Step 2: The tool will re-flash a special firmware that will take into account the CCF setting (unlike the normal firmware) and write it in the Nav unit memory.

Step 3: The tool will write the latest navigation firmware. Since the Nav On Move enabling was set in memory by the firmware written in step 2, this firmware will act accordingly.

Each re-flash takes 38 minutes and the CCF write takes a few seconds. The total time for all 3 steps combined is around 78 minutes.

3- Instructions

IIDTool BT generations



Figure 108. IIDTool BT generations

IIDTool Pro and BT G3: The function is embedded in the IIDTool Pro and BT G3 firmware. We recommend using a mobile device and App.

IIDTool BT G2: Updating the tool to the Nav On Move “Special” firmware (V3.01 Build xyz) is needed. This firmware is used for this purpose only and won’t allow any other diagnostic tasks to be performed. We recommend using a mobile device and App. **Once the procedure is completed, simply revert to the latest released version (V3.00...).**



Figure 109. BT : Navigation : updating the IIDTool firmware to, “special” V3.01 Build 2682, Nav On Move

Notes App : Once started, the re-flashing process is independent from the App and is only handled by the IIDTool. The App is only used to display the current status and can be left in the background, foreground or closed. If the mobile device is disconnected from the IIDTool, voluntarily or not, the App will recover automatically once reconnected to the IIDTool.

Regular IIDTool generations



Figure 110. Regular IIDTool generations

Regular non-Bluetooth IIDTool, first hardware version: Usage of the PC-based controller is mandatory. The IIDTool must be connected to the computer until the process is completed. The option will be displayed on your computer screen (re-flash menu). Please consult [section 2.8.5](#) of this manual for more details on the PC-based interface. If using a laptop, make sure the battery charger is connected. Close all programs, disable all automatic updates and screen saver. The computer does not need to be connected to the internet.

Regular non-Bluetooth IIDTool, second hardware version: updating the tool to the Nav On Move “Special” firmware (V3.01 Build xyz) (see [section 2.5](#)) is needed. This firmware is used for this purpose only and won’t allow any other diagnostic tasks to be performed. **Once the procedure is completed, simply revert back to the latest released version.** User can choose between the regular Integrated [section 2.8.4](#) or PC-based interface [section 2.8.5](#). When using a laptop, make sure the battery charger is connected. Close all programs, disable all automatic updates and screen saver. The computer does not need to be connected to the internet.



CAUTION

Since the time required is significant, it is recommended to connect an additional power supply (Midtronic PSC-550, CTEK or equivalent) to the vehicle battery. If the battery is in good condition and fully charged, the steps may be performed one at a time, without additional power supply. It will then be required to charge the battery between each step. Another vehicle having the engine can also be used to maintain tension using booster cables.

4- Updating

How to proceed without a power supply

L322-2005 and L322-06: It is not recommended to choose the “whole process” without using an additional power supply connected to the battery. **II** The regular Integrated Interface cannot be used unless a power supply is connected to the vehicle’s battery.

L319-04 and L320-05: It is not recommended to use the “whole process” feature without using a battery maintainer.

Each Step Separately:

L322-2005 and L322-06

- Complete step 1 and start step 2 with the key to the Accessory position (I).
- Remove the key from the ignition when the first re-flash (step 2) has begun.
- Before starting step 3, turn key to the Accessory position (I).
- If using a mobile device, connect to the tool and wait 30 seconds.
- If using a PC, wait 30 seconds also.
- The Radio will turn ON, shut down and turn ON again, step 3 can now begin.
- Start step 3 and remove key from ignition once re-flashing has begun.
- Once step 3 is completed, turn key to the ON position (II) and connect the mobile device (if using an IIDTool **BT** or **Pro**). Follow the instructions on screen.

There is no time constraint between steps 2 and 3 or after step 3 is completed since the key is out of the ignition preventing a battery drain.

L319-04

- Complete step 1 and start step 2 with the key to the ON position (II).
- Remove key from ignition when the first re-flash (step 2) has begun.
- Before starting step 3, turn key to the ON position (II), connect on the mobile device and wait 30 seconds.
- If using a PC, wait 30 seconds also.
- The Radio will turn ON, shut down and turn ON again, step 3 can now begin.
- Start step 3 and remove key from ignition once re-flashing has begun.
- Once step 3 is completed, turn key to the ON position (II) and connect the mobile device (if using an IIDTool **BT** or **Pro**)

There is no time constraint between steps 2 and 3 or after step 3 is completed since the key is out of the ignition preventing a battery drain.

How to proceed with a battery maintainer.

Turn the key to Ignition, position II, and simply select “whole process” or each step separately. The key can be left in the ON position (II) until the selected step or process is completed.

5- MMM firmware version

To verify which version is currently in the MMM ECU, simply proceed with the following:

- Select home screen.
- Press and hold the location indicated (number 1) for 5 seconds and release. Immediately press the Nav button (number 2) and hold it until the keypad appears.

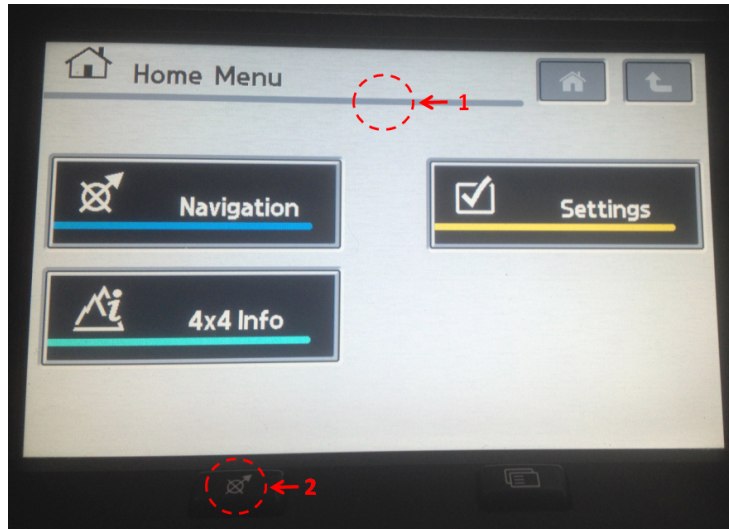


Figure 111. Diagnostic mode, Navigation

- Release the Nav button and enter pin code 7-5-3, press OK

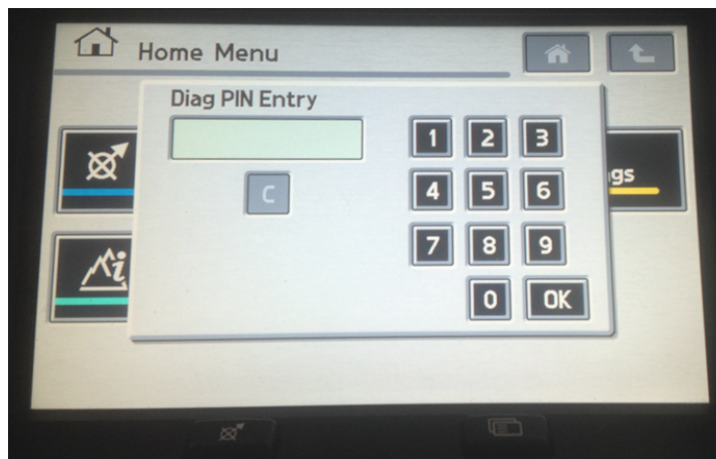


Figure 112. Enter pin code for diagnostic mode, Navigation

- Select “Configurations”

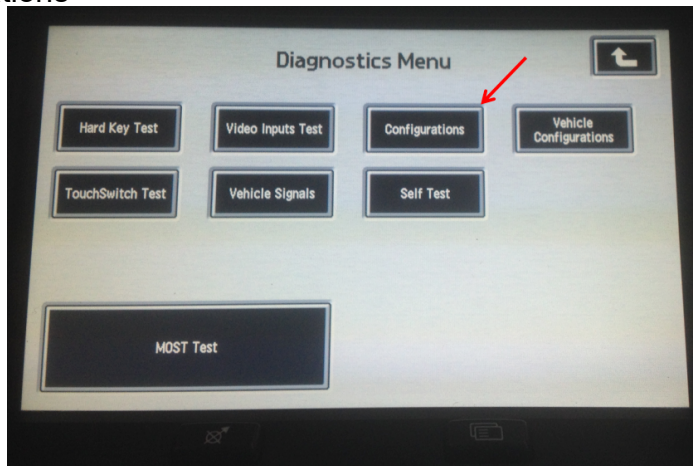


Figure 113. Diagnostic menu, Navigation

- Press on “Show MMM Information”

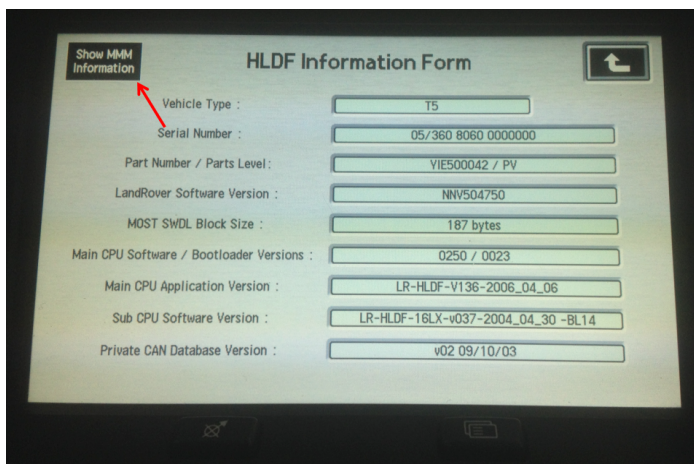


Figure 114. “ Show MMM Information ”, Navigation

- See “Main CPU Software/Bootloader Version”

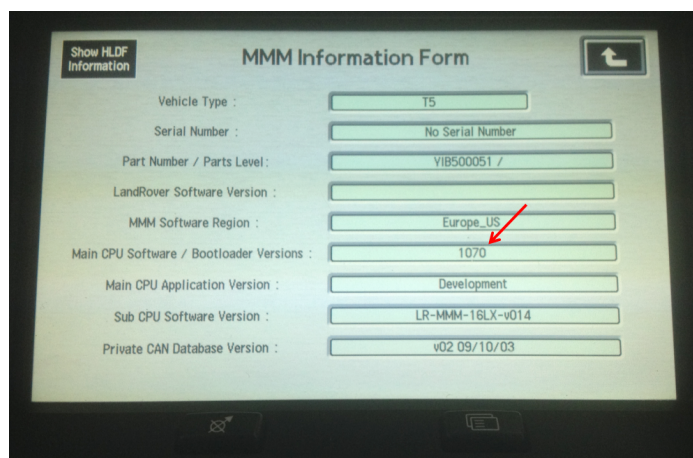


Figure 115. “ Main CPU Software/Bootloader Version ”, Navigation

If your MMM firmware is at version 1030 or lower, replace your DVD with a newer version (2007 and up) or borrow one to update the unit. Unfortunately, GAP Diagnostic cannot supply this DVD.

Transfer Case (L319-04, L320-05*)

	Risk Level	Consequences	Recovery Method	Precautions
●	Low	Range changing cannot be performed	Repeat re-flashing procedure	None

Table 44. Risk, updating the transfer case ECU

Usage

This re-flash is needed when a new ECU is fitted to the vehicle or simply to update the firmware to the latest version.

Note: The Clutch and Position or Range Sensor calibrations need to be performed following a re-flash to the transfer case ECU. Please consult [section 4.6.5](#) of this user manual for more details.

Audio Control (L319-04, L320-05*)

	Risk Level	Consequences	Recovery Method	Precautions
●	Low	Entertainment system non functioning	Repeat re-flashing procedure	The entertainment system, especially the MOST ring must be in working order

Table 45. Risk, updating the Audio Control ECU

Usage

This re-flash is needed when a new ECU is fitted to the vehicle or simply to update the firmware to the latest version.

Transmission (L319-10, L320-10, enabling flappy paddles)**

	Risk Level	Consequences	Recovery Method	Precautions
●	Moderate	The vehicle cannot be moved	Repeat re-flashing procedure	None

Table 46. Risk, updating the transmission ECU

Usage

This modified firmware will allow usage of flappy paddles (or paddle shifts) on Discovery 4s with a 6-speed transmission attached to a TDV6 3.0 L, SDV6 3.0 L or Petrol engine. The associated CCF setting also needs to be changed. **The transmission clear adaptation routine must be called prior to re-flashing the ECU. See [section 4.7.7](#).**

*Available via GAP fast lane service only for IIDTool **BT**. Embedded in the IIDTool **Pro**.

4.12 Function “ECU Info”

Definition


|| This function allows viewing the following information of the selected ECU:

- Hardware
- Assembly
- Strategy
- Calibration
- ECU Serial number

Access

- 1- Perform the initial stages of access ([section 4.1.3](#))
- 2- Select the “ECU Info” function

||

- 3- Navigate through the ECUs using commands
- 4- Select the desired ECU
- 5- The first file info will be displayed. Press the  button to see the next file information for this ECU.

App

- 3- Wait until the IIDTool finishes with interrogating ECUs
- 4- The resulting list will be displayed and can be send by e-mail.



Ecu Infos		ACM-Audio System
		Current Info
AAM-Audio Amplifier <i>Cannot be updated</i>		Assembly (F112) VUX500480 = 7H42-18C815-AC
ACM-Audio System <i>Update available</i>		Calibration (F126) HTFB
ATCM-Terrain Response <i>Latest Version</i>		Hardware (F191) NNN500910 = 7H42-14C230-AB
BPM-Body Processor <i>Cannot be updated</i>		PBL (F180) NNN500910 = 7H42-14C230-AB
CDP-CD Player <i>No assembly exists</i>		Serial 0700557780000000
DSM-Driver Seat <i>Cannot be updated</i>		Strategy (F188) NNV507220 = 7H42-14C044-AC
FEM-Navigation <i>Update available</i>		VIN SALM
FLM-HeadLight <i>No assembly exists</i>		Assembly to reflash
HVAC-Heat / Cool <i>Cannot be updated</i>		Assembly (F112) Current: 7H42-18C815-AC New: Up-to-date
IPC-Instrument Pack <i>Latest Version</i>		Strategy (F188) Current: 7H42-14C044-AC New: 7H42-14C044-AF
LCM-Light Control <i>Cannot be updated</i>		
OCS-Occupancy Sensor		
  View Logs		

Figure 116. App: ECU Info results

Click on an ECU to see it's specific files and possible updates.

Note: Please consult [section 4.11](#) for available reflashes. Additional reflash are available via the fast lane service [section 4.11.4](#).

4.13 Save / Restore

4.13.1 Definition

Upon activation, the IIDTool makes a backup of the original EAS calibrations and ECU configurations. Both of these can be recalled if needed. There are also 3 memory slots to save EAS calibration settings per vehicle. These can be used, for example to save the calibration settings for larger tires, normal tires, etc. None of the vehicle information and backups will be affected when the tool firmware is updated.

The IIDTool can save and restore these values for a maximum of 10 vehicles (except for the IIDTool **Pro** which has no limit).

4.13.2 Save (except L359, L538)

To save a height setting, simply set the height required in the Height function and choose to save it to MySettings 1 to 3.

4.13.3 Restore


Air Suspension (except L359, L538)

Restore Original - will allow you to recall your original settings (the original backed-up values). These values were stored in the ECU when the IIDTool was activated. **Pro** : the values are saved upon first connection to a vehicle.

Restore Settings 1 to 3 - will allow an immediate restore to the settings saved in memory slots 1 to 3. **II** This option only appears if settings have been saved.

Note **BT / Pro** : Use the Height function, [section 4.4](#).

Car Configuration File CCF

Allows you to restore the original settings of the CCF saved in the IIDTool. **II** The IIDTool will proceed with writing the CCF when the  button is pressed. The procedure is identical to regular CCF writing. See "Upload changes" of [section 4.10](#) for more details. **L322-06**, select the PCM option to use the copy stored in the engine ECU and save it in the instrument cluster instead of using the tools backup.

Car Config (L322-02, L322-06)

This function will restore the original configurations of the BPM (Body Processor) and LCM (Light Control) ECUs. Please consult [section 4.10](#) of this manual for more details on backup information.

4.14 IIDTool Config


4.14.1 Find ECUs

Upon first use (read or clear fault), the IIDTool will scan the communication buses and note which ECUs are responding. When scanning is complete, the number of ECU found will be displayed. The resulting list is stored in the IIDTool memory for up to 10 vehicles (except for the IIDTool **Pro** which has no limit). If a new ECU is installed or removed from the vehicle, the Find ECU function shall be used to add or remove the ECU from the list.

4.14.2 II Voltage displayed

When this feature is enabled, the IIDTool is connected and the user has not called up the IIDTool menu, the battery voltage will be displayed.

4.14.3 Enter unlock code

You can unlock the advanced programming functions on your IIDTool for future uses on other vehicles by entering an unlock code here. First, enter the unlock code menu, you will see a ten hexadecimal character activation code. **II** If you already have an unlock code, press the  button once more and enter the code.

If you don't have an unlock code or need a new one for adding one or more vehicles, please contact us or visit our website to buy additional VIN's license(s). With your activation code and VIN licence(s), you will be able to retrieve your unlock code on our website ([section 2.9](#)).

After entering your unlock code, when connecting to another vehicle that's never been unlocked, you will be asked if you want your IIDTool to be unlocked for this particular vehicle.

Limited Warranty

GAP Diagnostic warranties this product for 2 full years after the date of purchase. The warranty covers only the IIDTool of the original purchaser (non-transferable). It covers manufacturing and workmanship defects for the duration defined above. The warranty is limited to the functionality of the system and the system itself. It is the user's responsibility to use the IIDTool safely.

The user must return the IIDTool to GAP Diagnostic to have the warranty honoured. The user must provide a proof of purchase.

The warranty is void if:

- The product has been damaged or altered in any way
- The product is damaged by water, fire, accident or other condition beyond the control of GAP Diagnostic
- The product has been improperly installed or misused

The warranty does not cover:

- Shipping and handling.
- Any material damages other than the IIDTool itself.

Under no circumstances will GAP Diagnostic be liable whatsoever for incidental or consequential damages. The warranty is limited to the value of the product.

Contact:

GAP Diagnostic

support@GAP-Diagnostic.com

Glossary

ECU : Electronic Control Unit. An ECU is an embedded system that controls one or more systems or subsystems present in a motor vehicle.

EAS : Electronic Air Suspension. This defines all components of the air suspension system including the electronic control unit or ECU.

CAN : For Controller Area Network, is a communication protocol which connects ECU's via a two wires interface.

Vehicle control module software updates (Re-Flashing) : The action of programming an ECU firmware. The term flashing comes from the fact that microcontrollers used in ECU's are made with flash memory.

VIN : Vehicle Identification Number. It's a unique code which includes information about the vehicle's configuration and its serial number.

DTC : For Diagnostic Trouble Code or fault code.

II: The diminutive **II** indicates specific features associated with usage of the integrated interface (all tools).

BT : The diminutive **BT** indicates specific features associated with using an IIDTool **BT** regardless of the hardware generation.

BT G2 : The diminutive **BT G2** indicates specific features associated with using an IIDTool **BT second** generation hardware.

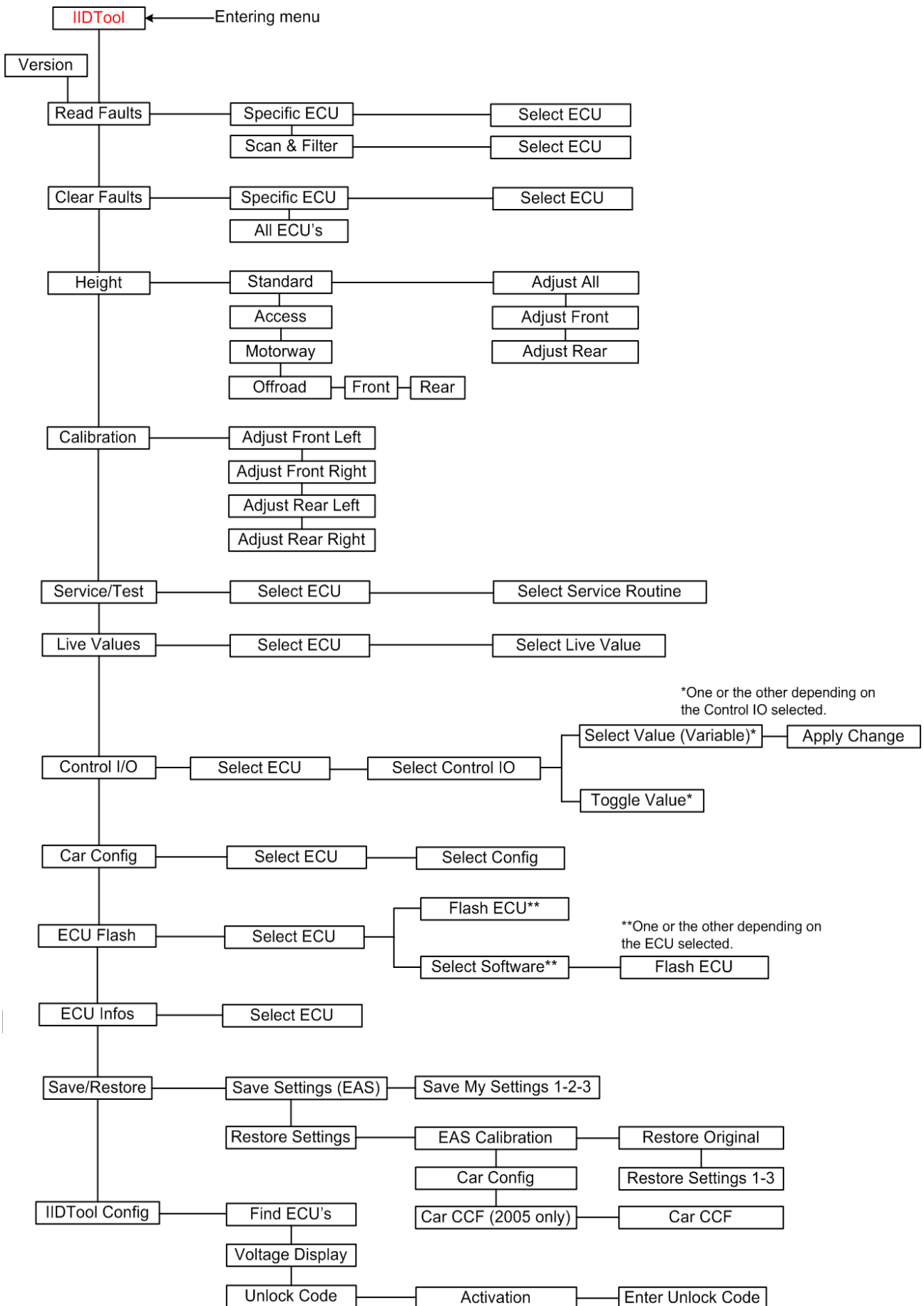
BT G3 : The diminutive **BT G3** indicates specific features associated with using an IIDTool **BT third** generation hardware.

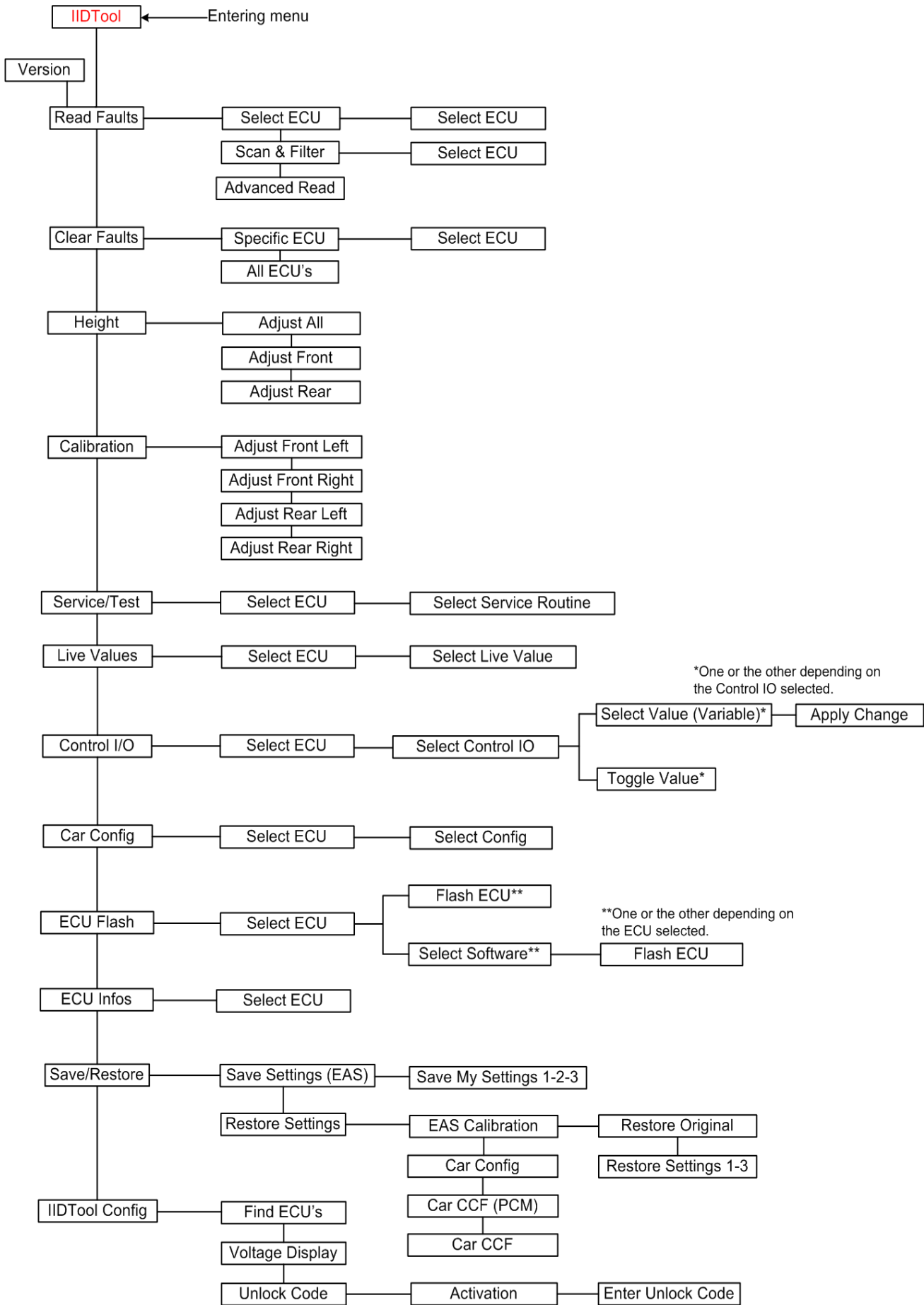
Pro : The diminutive **Pro** indicates specific features associated with using an IIDTool **Pro**.

App : The diminutive **App** indicates specific features associated with usage of the mobile Application.

Appendix

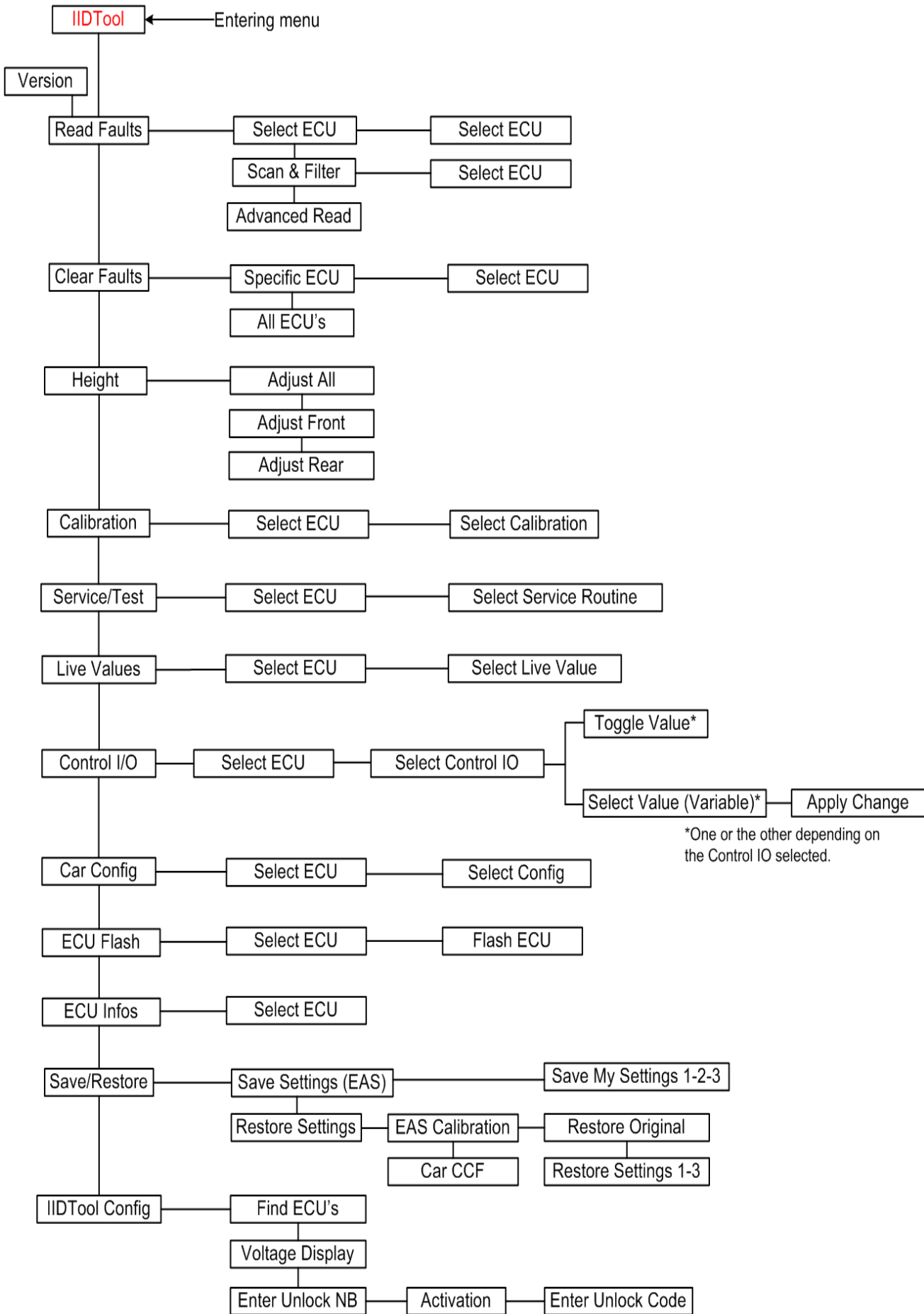
Menu tree





*One or the other depending on the Control IO selected.

**One or the other depending on the ECU selected.



*One or the other depending on the Control IO selected.

Since these vehicles cannot be controlled using the integrated interface, the menu tree is not relevant. The tree can be seen on the main menu of the App.