BRITPART

EASControl

for

Land Rover Discovery 3/LR3

2004-2009

By

GAP DIAGNOSTIC

User manual

Firmware/Document version: 2.14.06

Warnings

The EASControl allows changes to 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.

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

Disclaimers

Neither the distributor (Britpart -Border Holdings (UK) Ltd- and its resellers) nor the manufacturer (GAP Diagnostic, Inc.) accept any responsibility or liability for damages incurred through use of the EASControl. This includes all damages and/or personal injuries to the vehicle itself, vehicle systems, the user or other persons and property. The warranty is limited to the functionality of the EASControl itself (for further warranty details, please consult the last page of this document). This includes especially:

- damages incurred through improper use of the EASControl
- damages incurred through the use of the EASControl 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

The EASControl is a powerful diagnostic device that allows the 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 EASControl.
Read this instruction manual carefully!

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 mis-use 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 mis-use 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.

Table of Contents

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 the component of the air suspension system.

I. Getting Started

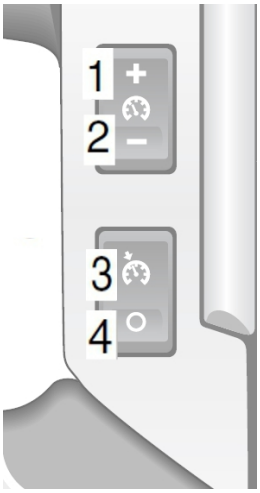
1. Introduction

EASControl stands for **Electronic Air Suspension Control**. In using the EASControl, the vehicle's controls and display are used to interface with the tool.

With the firmware version 2.14, the EASControl has full diagnostic functionality for the EAS system as well as calibration capabilities.

2. Controls

Your EASControl needs no additional cables or power supply.

The EASControl is controlled with the vehicle's cruise control switchgear. The functions are: 1. Speed + = Menu up / increase value 2. Speed - = Menu down / decrease value 3. Resume = Enter 4. On/Off = Back one level / Exit	

Information is displayed in the instrument cluster message center. Due to limited space, longer messages such as error codes are scrolled through automatically.

3. Activating the EASControl

The EASControl is VIN locked and must be activated for each vehicle it is used on. To activate the EASControl, you will need access to the exact vehicle it will be used on. Once your activation code is noted, you will need to have access to the internet to get your unlock code.

1. With the ignition key in the 'Off' position, plug the EASControl into the OBD connector and wait 10 sec.

The OBD connector is located at the bottom dash panel above and outside the brake pedal on the driver's side of the vehicle.

2. Ensure that the vehicle is in Park and in a safe environment.
   - If the vehicle is outside, start the engine.
   - If in a garage, turn the key to the ON position.
   - If you plan to use the device for more than 10 minutes with the engine not running, connect a battery charger to the vehicle battery.
3. Call up the EASControl by pushing the *resume* button for 2 seconds.
4. A message indicating that the tool is not activated will appear. Push *resume* again for the activation code.
5. Take note of the 10 character code, go to our website and follow the instructions to retrieve your unlock code.

http://www.GAP-diagnostic.com/support/unlock.html

6. Go back to the vehicle and follow steps 1. to 4. Press *resume* once more and enter the unlock code using the + and – buttons to change characters and *resume* to go to the next character. If you make a mistake, exit the EASControl menu with the cruise control *on/off* button and re-enter the menu with a 2 sec. push/hold of the *resume* button.

Once the unlock code is entered correctly, the Back Up done message will appear and the unit will enter the menu.

- You can use your EASControl on more than one up to 10 vehicles by purchasing additional VIN licenses from a Britpart retailer. Once you have your new license (s), connect the EASControl to a new vehicle and follow the procedure above to activate the EASControl for the new VIN. When you access the GAP Diagnostic website to receive your unlock code you will be asked to enter your new VIN license as well.
- The EASControl does an automatic backup of the vehicle's height settings when first used. For details about the backup procedure, please consult the Save/ Restore section of this manual.
- You can also unlock your EASControl for future vehicles before connecting the unit to these particular vehicles. Please consult the Save/Restore section of this manual.

II. Using the EASControl

Use

1. With the ignition key in the 'Off' position, plug the EASControl into the OBD con nector and wait 10 sec.
2. Ensure that the vehicle is in Park and in a safe environment.
   - If the vehicle is outside, start the engine.
   - If in a garage, turn the key to the ON position.
   - If you plan to use the device for more than 10 minutes with the engine not running, connect a battery charger to the vehicle battery.
3. Call up the EASControl by pushing the *resume* button for 2 seconds.
4. Navigate the menu by using the *resume* button to enter, the cruise control *On/ Off* button to exit or go back, and the + and – buttons to navigate up or down or change values.
5. To exit the EASControl menu use the *On/Off* button to navigate to the top level menu and press *On/Off* once more or shift the vehicle out of park.

Remove the EASControl from the OBD connector when done!

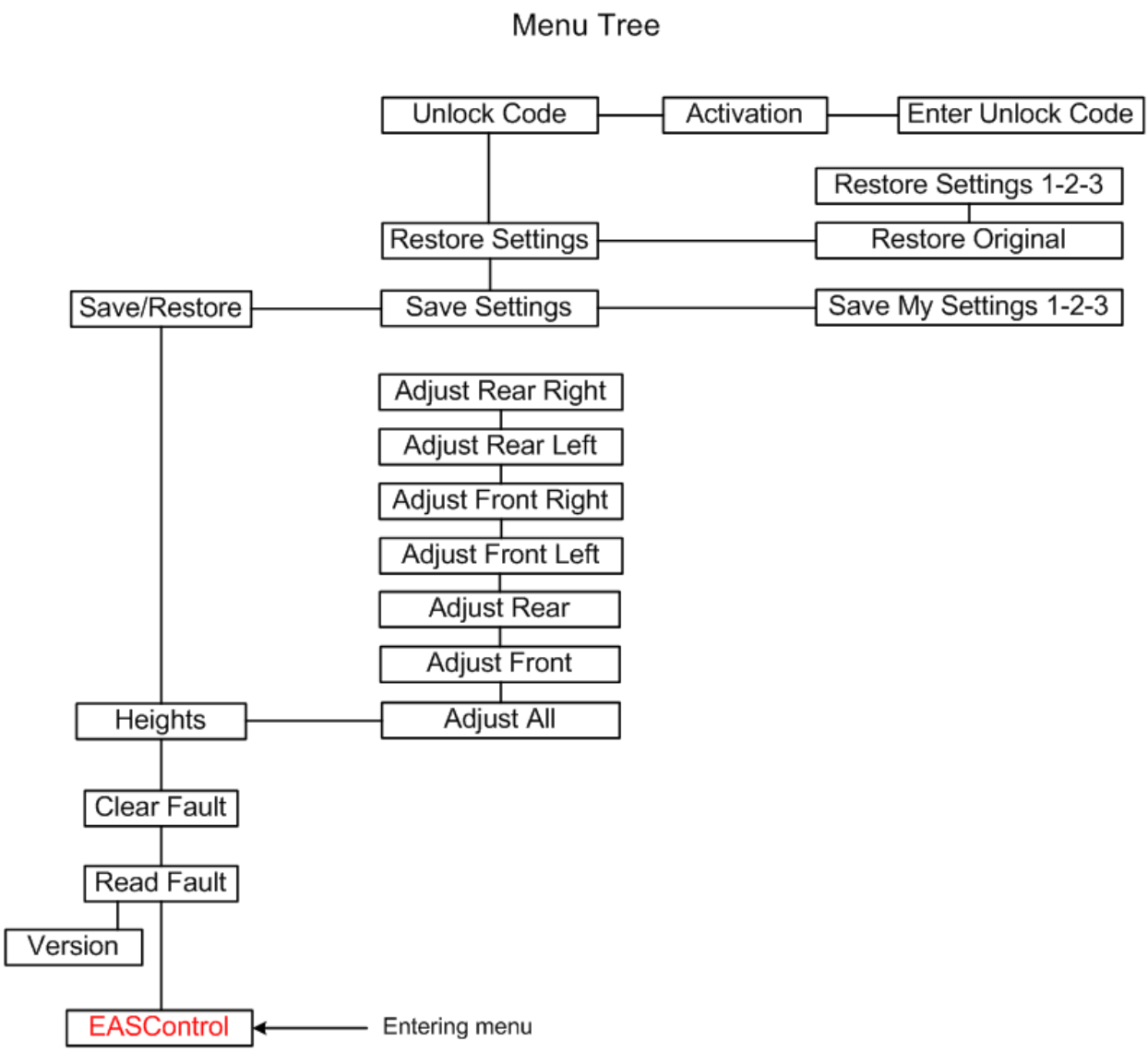
Additional Information

Warnings

Upon first use, some functions will display warning messages. The first time these functions are used the warnings messages will be displayed 3 times and can not be skipped. When these functions are used again later, a press of the *resume* button cancels the warning message.

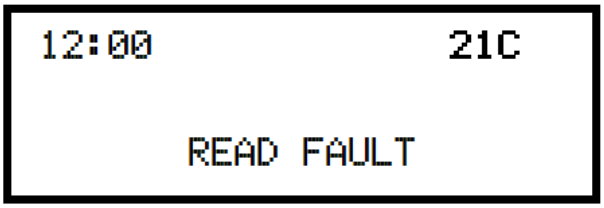
By Pressing the resume button, the user acknowledge that he has read and understood the warnings.

III. Menu tree Land Rover Discovery 3/LR3 2004-2009



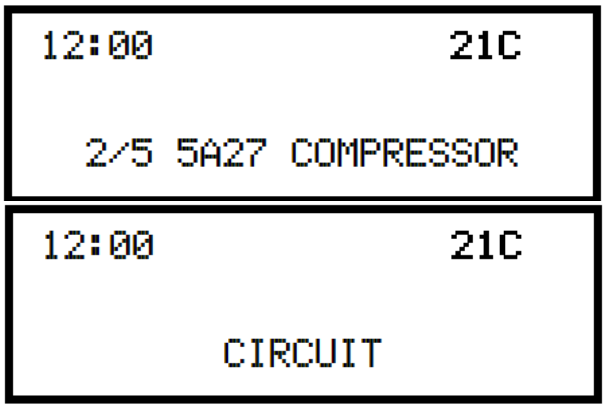
IV. Top Level Menu Options

1. Read fault
To view faults currently stored in the EAS ECU, select the Read Fault option in the top level menu and press the *resume* button to enter.



Faults (DTC – Diagnostic Trouble Codes) will be displayed with their alphanumeric code and the plain English descriptor.
Should a fault be displayed without the plain English descriptor, please contact us at **support@GAP-Diagnostic.com** . We will provide the corresponding descriptor.

Reading the fault output



Displayed fault in the example above: **2/5 5A27: Compressor circuit**

As the display does not have enough characters, the message is scrolled through.

2/5: Faults are displayed with the prefix showing the fault number of the total number of faults stored in the EAS ECU. In the example the display is showing fault number two of five total faults stored. If the third character is a + there are more than 10 faults stored. Scroll through the fault list using the +/- buttons.
5A27: Numeric DTC diagnostic trouble code designation.
Compressor circuit: Plain English fault descriptor. This particular fault indicates a possible defect in the electric circuit supplying the EAS compressor.

2. Version
The EASControl enters the top level menu at *'Read Fault'* and displays the firmware version of the EASControl when the minus button is pressed.

3. Clear Fault
Clears all faults stored in the EAS ECU and exit the EASControl.

4. Calibration
WARNING: The EASControl allows changes to 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:

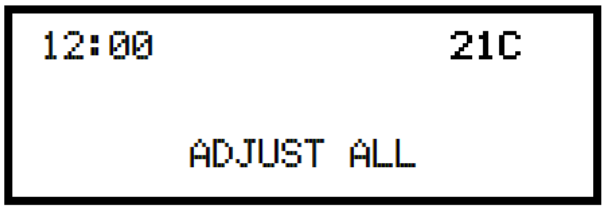
- ***Different calibration values for each corner are normal*** *– they do NOT need to be set to the same value! These values represent arbitrary electrical values provided by the height sensors. Correlating these values to the measured height of each corner is part of the calibration procedure.*
- *If the values for the standard height are set too low the vehicle may reach the bump stops in access mode. 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).*
- *The height values are given in millimetres. This does NOT correspond exactly to changes in height at the wheel, though. Measure all values to be sure.*
- *If the values for standard height are set too high (without lowering the offroad height or with increased offroad heights) the suspension can reach a fully extended condition in off road mode. In this condition, there is no suspension travel.* ***There is severe risk of damage and the vehicle can become uncontrollable in this state!*** *GAP Diagnostic assumes no liability for damages occurred in using the EASControl.*

For baseline calibration the standard function allows height changes to each corner individually; for height changes it allows changes to either front, rear, or all.

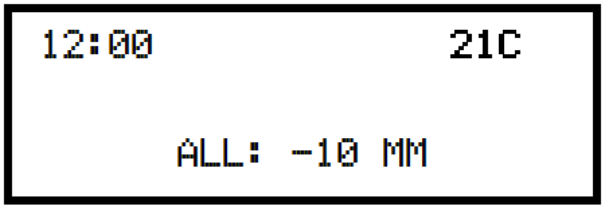
Adjust All

This allows changes to the height of the whole vehicle from its current calibration - all four corners simultaneously - at standard height. It also affects the other modes as the standard mode is the reference point. For example, if standard mode is lowered by 10mm, access mode, motorway, and off-road height will also be 10mm lower.

Values are changed up or down with the + / - buttons.



If two subsequent changes of -10mm are made, the vehicle will be -20mm (20mm lower) than the original height.



Front

Changes the height of only the front axle in all modes. +10mm means the front will be 10mm higher than the rear in all modes.

Rear

Changes the height of only the rear axle in all modes. -10mm means the rear will be 10mm lower than the front in all modes.

Limits

The EAS ECU has internal absolute limits that limit the extent of possible height changes.

For example, if the current calibration is

Sensor	Calibration height value (mm)
Front Left	205
Front Right	200
Rear Left	195
Rear Right	183

And the limits of the EAS ECU are

Limit	Value (mm)
Upper Front	250
Upper Rear	250
Lower	150

The front can be raised by a maximum of 250 - 205 = 45 mm.The front can be lowered by a maximum of 200 - 150 = 50 mm.

The rear can be raised by a maximum of 250 - 195 = 55 mm.The rear can be lowered by a maximum of 183 - 150 = 33 mm.

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

Front Left, Front Right, Rear Left and Rear Right.

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. The EASControl allows calibration of individual sensors but it is strongly recommended that it be performed using an IIDTool.*

Serious damage can result if the procedure is performed improperly!

Note: *The values entered into the ECU vary according to sensor tolerances and settings. It is highly unlikely that all 4 corner values will be the same. This is normal!*

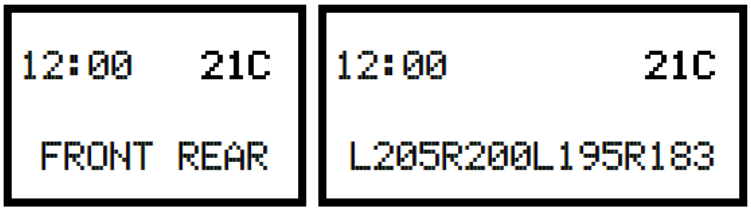
The settings and changes are given in millimeters but this does not correspond exactly to changes at the wheel. Each change in height must be measured between the upper rim of the wheel and the wheel arch (as explained on the next page).

These menu items allow the calibration of the absolute value (in mm) of each height sensor. This is necessary when height sensors or linkages are replaced or reinstalled. At a minimum, calibration can be done on either axle, front or rear, but it is recommended that all four corners be calibrated simultaneously.

Steps:

1. **Preparation**: Place the vehicle on **a flat, level surface** in standard mode. While small surface irregularities may not reduce the accuracy of a calibration significantly, 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 is not running.

2. Use the EASControl to take note of the actual calibration.



3. To prepare the vehicle for height measurements, 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 in the console. Once at off-road height (off-road LED has stopped flashing), return to standard height and again wait for the LED to stop flashing. Move the vehicle forward 5 meters and back to its original position.

4. Measure the height of each corner from the top of the wheel rim to the bottom of the wheel arch.

5. Go to the calibration menu and change the calibration of the replaced sensor by the new calculated value (see example on the following page).
   Repeat as needed*.

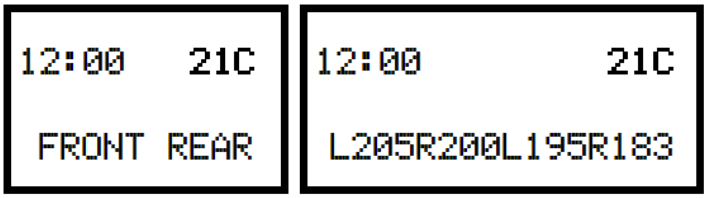
6. Once the calibration is done, the vehicle baseline height can be adjusted to the user requirements. Navigate to *Calibration > Adjust Front* or *Calibration > Adjust Rear* and use the + / - buttons to adjust the value.

Calculation example

In this case, calibration of the front right sensor is performed.

Sensor	Measured height (mm)
Front Left	155 mm
Front Right	150 mm

In order to calibrate the front right sensor properly, you have to add 5 mm to the calibration value of the front right sensor. By doing so, the ECU will raise this wheel and you will have 155 mm on both sides.



The new front right calibration value is : 205 = 200 + 5

*Please note that the sensors are not perfectly linear. After you are done calibrating the sensor, redo the procedure to verify that the vehicle is properly calibrated.

A correct calibration is achieved when the measured values are equal on each side.

5. Save Restore

Upon activation, the EASControl makes a backup of the original calibrations values. There are also 3 memory slots to save calibration settings for a vehicle. These can be used, for example to save the calibration settings for larger tires, normal tires, etc. The EASControl can save and restore these values for a maximum of 20 vehicles.

Save Settings

The EASControl allows you to save three height settings that may be recalled when needed. Simply set the height required in the calibration menu and then go to the select save settings and choose to save it to MySettings 1 to 3.

Restore Settings

Restore Original - will allow you to recall your original settings (the original back-up values). The back-up values are the calibration values that were stored in the ECU when the EASControl was activated (if the vehicles calibration was not accurate prior to activating the EASControl, these values will not be good).

Restore Settings 1-3 - will allow an immediate restore to the settings saved in memory slots 1 to 3. This option only appears if settings have been saved.

Enter unlock code

You can unlock your EASControl for future uses on other vehicles by entering an unlock code here. First, enter the unlock code menu. You will see a ten hexadecimal characters activation code. If you already have an unlock code for more than one vehicle, press resume and enter your code.

If you don't have an unlock code or need a new one for adding one or more vehicle, please contact your Britpart reseller to buy additional VIN's license(s). With your activation code and VIN license(s), you will be able to retrieve your unlock code on our website at:

http://www.GAP-diagnostic.com/support/unlock.html

After entering your unlock code, when connecting to another vehicle that's never been unlocked, you will be asked if you want your EASControl 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 EASControl 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 EASControl safely.

The user must return the EASControl to Britpart to have the warranty honored. 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 EASControl 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