

## **Litronic Headlight Retrofit with Automatic Dynamic Headlight Beam Adjustment (AHBA) System Porsche Boxster – 986**

There are several references on the Internet that provide instructions for the litronic retrofit. These do not include instructions for the AHBA system. However, they provide useful additional information and photos that will make the installation easier. I recommend that you become familiar with these:

[http://skylersrants.com/Porsche/Litronics/InstallingLights\\_Start.html](http://skylersrants.com/Porsche/Litronics/InstallingLights_Start.html)

Porsche TSB 9415, March 1999. This is available on Renntech to contributing members:  
<http://www.renntech.org/forums/tsbs/boxster/>

### **Parts**

In addition to the litronic headlights you will need the following parts:

Suspension sensors – these detect the relative position of the front and rear of the car and send signals to the control module.

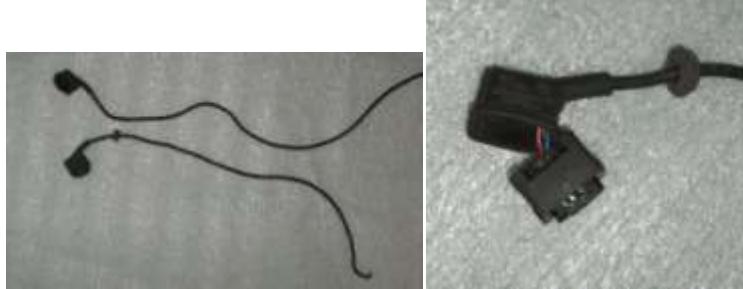
Front Sensor



Rear Sensor



Connectors for the suspension sensors



Note that the bracket for the front of the car is the same for both the Boxster and the Carrera. However, the rear bracket is different. The bracket for the Boxster is part number 986 331 611 03. The Carrera part is 996 355 503 04. I have put pictures of both brackets in Appendix 3.

## Control Module and Wire Harness

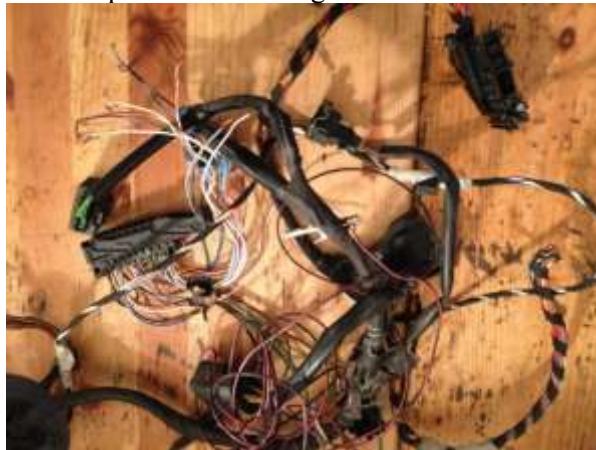


Note that there is an 18-pin connector that attaches to the control module with a sliding mechanism. Please refer to the information on Sklyer's web site ([http://skylersrants.com/Porsche/Litronics/InstallingLights\\_Start.html](http://skylersrants.com/Porsche/Litronics/InstallingLights_Start.html)) for information on mounting the control module and wiring for power, ground and high-beam turn on signal.

In regards to the following information, I am indebted to Renntech and Boxa.net user Duffy 3074 for his pioneering efforts in proving this can be done. You can see his posts on the subject here:  
<http://www.boxa.net/forum/index.php?showtopic=55572&page=16> and here:  
<http://www.renntech.org/forums/topic/44528-litronic-retrofit-question/page-3>

## Electrical Wiring

The additional wiring needed for the AHBA system is described below.  
Here's a picture of a wiring harness removed from a donor car.



You won't need everything shown here, but this gives you an idea of the material you will need to sort through. I think the most efficient way to explain this is to list each pin on the 18-pin connector and describe where the wiring goes and what it does. I also note the connections that are done during the installation of the Porsche retrofit. The retrofit covers only the high-beam rotation and not the AHBA function.

## Pin Assignment

Pins 1-8 - these pins control the [litronic](#) drives in the headlights. Skyler's web site and the TSB provide more detailed information. For some reason, the wire colors on the retrofit kit I installed are different from the OEM harness that I obtained from a donor car. For more information, see the Appendix 2. Four wires go to each headlight.

Pin 9 - Diagnostic (Blue/Orange) Not used because of the risk of throwing codes

Pin 10 - Signal on light (Gray) This tells the system that the lights are on. (Provide picture of connection point after installation.)

Pin 11 - ESO (Engine Speed Output) (White/Brown) This appears to run to CP (Connecting Point) 88. This is not used and does not appear necessary.

Pin 12 - Front sensor (Blue)

Pin 13 - Rear sensor (Blue)

Pin 14 - +5V power supply to both sensors (Red/White)

Pin 15 - Signal on high beam (White) – This is also described in the instructions for the retrofit kit

Pin 16 - Power (Red/Black) - This is also described in the instructions for the retrofit kit

Pin 17 - Ground to both sensors (Brown/Black)

Pin 18 - Ground (Brown) - This is also described in the instructions for the retrofit kit

## Installing the Suspension Sensors

Note that the sensors fit on the left side of the suspension. That is the driver's side in the U.S. and the passenger side in the UK. Duffy provided the following general guidance:

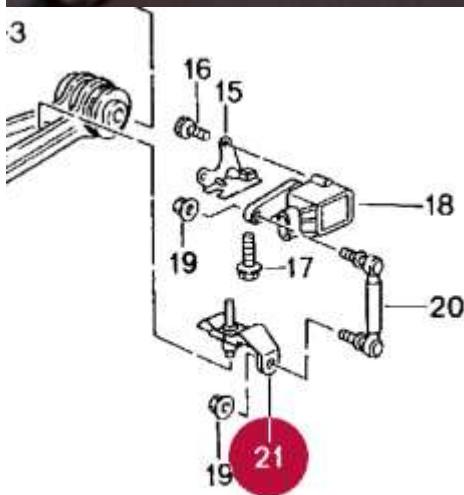
*I fitted both front and rear sensors (which are a straight bolt on to either front or rear cross members as required) and made up a loom using the original colours, 1cm soldered joints with 3 cm adhesive shrink wrap and 4mm wide cloth tape for that [OEM](#) look, and fitted the [litronic](#) control unit in the retrofit position (on the righthand inner wing in the trunk.)*

*The only variance from the factory wiring pattern was that I used the retrofit manner of providing the unit with a switched 12 volts (that's from the right hand heated washer feed.) I did not connect it to the [DME](#)/diagnostic system, essentially to prevent error codes being thrown up as the car goes 'WTF?' every time the lights are switched on. I've also retrofitted the [litronic](#) washer system, again very straightforward. Only thing that proved tricky until I worked out what was going on, was that the [litronic](#) control unit played dead until both headlamps and both*

sensors were wired in completely (I did a technology test on the bench before fitting it all and thought that a partial set up would be enough to see how things were) it obviously does a self diagnostic on start up.

This is Duffy's description of the installation procedure for the front sensor: *The sensor mounts onto the suspension arm through a plastic mount and peg that key into the arm, if you shop for arms it appears there are listings for cars with and without litronics, the practicality seems to be that they all have the pegs and holes as standard now. I had a bit of a wobble (a feeling of not being certain about something for U.S readers) when I saw that the mounting hole (the dimple on the inside) had no hole in it and I thought I was going to have to strip out the front subframe (again) and drill/tap a hole. I then realized that I was being a bit of a thick bar steward (I'm not exactly sure what that means, but I assume it describes muddled thinking or something similar) and could just drill the hole from the underside and only had to remove the plastic under tray.*

Here are pictures and a diagram of the front mounting area. The pictures show the appearance of the cross member both before and after mounting the sensor.



I used progressively larger drill bits until I had a hole big enough for the bolt.

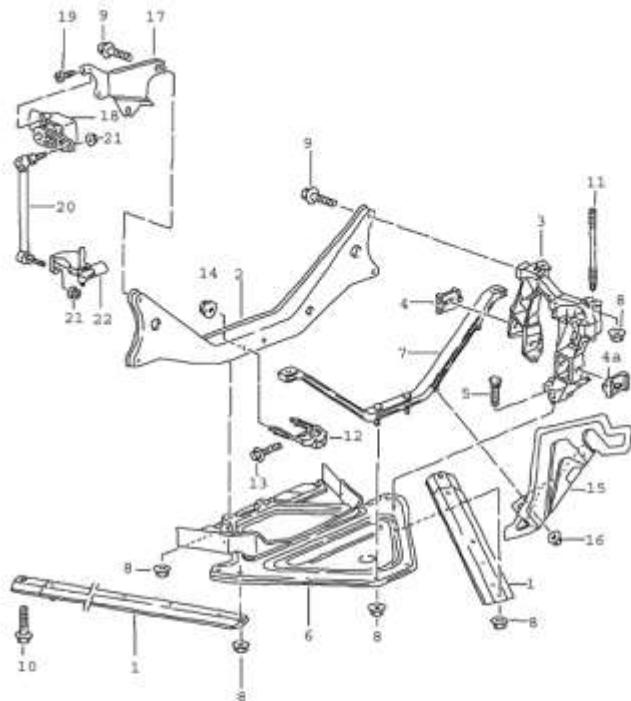
This is the structure to which the rear sensor is mounted. The black cross member is oriented towards the front of the car. If you were standing to the right of the bench in the picture and facing towards the left, the rear of the car would be in front of you. There are two 15 mm bolts on each side that go through the black cross member into the aluminum sub frame that goes over the driveshaft. To install the mount, remove the top bolt and put the arm of the bracket onto the coffin arm mount and you'll see where it sits easily enough.



Here the best pictures I can find of the position for the rear sensor, but they show the sensor detached from its mounting point. The large hole in the bracket that you can see at the right top of the picture on the left holds the bracket in place.



Here's a diagram of the rear sensor mounting.



Note that you need to orient the arm on the sensor correctly and then push the black plastic arm into a hole in the support below. The hole was already there in my car. I also used a wire tie to hold this part in place.

The wiring from the sensors to the control module should be installed on the left side of the car to join the wiring at the back of the left headlamp. To run the wires from the rear sensor, I used wire ties to secure it at several points in the rear wheel arch to keep it from rubbing against any moving parts. There are several cables and pipes that need to follow the same route and the path is obvious once you look at it. After you have cleared the rear suspension area, unfasten the nuts from the outside portion of the black plastic under tray and run the wire up to the front of the car

Once there install the wires into the loom there with the feeds to that headlamp and into the shell through the large grommet that this all runs through. A metal coat hanger, gaffer tape and silicon spray are your friends when it comes to getting the new wires through without cutting the grommet.

Here are some pictures of the wiring. Note the white plastic wire ties keeping the sensor wires in place in the wheel well and under the car. I wrapped the three wires in vinyl electrical tape.



Just follow the existing wiring and it will lead you to a good route. You can remove a few fasteners from the plastic under tray and wheel lining to make room.

Here's the wiring in the front trunk. Again, look at the wire ties to follow my routing.



# Appendix 1

## Headlight Washers

In the UK and some if not all EU countries, headlight washers are required by law when you use High Intensity Discharge (HID) headlights such as the litronics. If you need or want to install the washers, here are Duffy's instructions:

*I've also fitted the litronic washer bottle, which is huge compared to the original. If you are thinking about this, you need the bottle, the second pump, 3 meters of the appropriate piping ( I used this stuff <http://www.ebay.co.u...984.m1439.l2649>) 6 hose clips, a plastic T piece and the two washers themselves (about £103 a piece from Porsche) along with the appropriate amber/clear headlamp in fills or corner trim.*

*The bottle is a straight swap for the original, only point of note is that the rear mounting washers will come off with the old bottle, but need to go back into the shell mounting holes before the new bottle goes back in. Some silicon spray on the rubbers helps a lot.*

*Electrically you need to wire the second motor in, I'm tapping into the live feed to the windscreen washer pump for the live, and will feed this, via the pump, into a relay that will only switch to earth when the headlamps are on, thereby giving the correct logic to the pump. If anybody can suggest a simpler way, I'm all ears.*

# Appendix 2

## Pin Assignments and Wire Colors for Headlight Control – Retrofit vs. Factory Installed

As noted above pins 1-8 control the [litronic](#) drives in the headlights. For some reason, the wire colors on the retrofit kit I installed are different from the OEM harness that I obtained from a donor car.

In the OEM installation, the wire colors and pin assignments are:

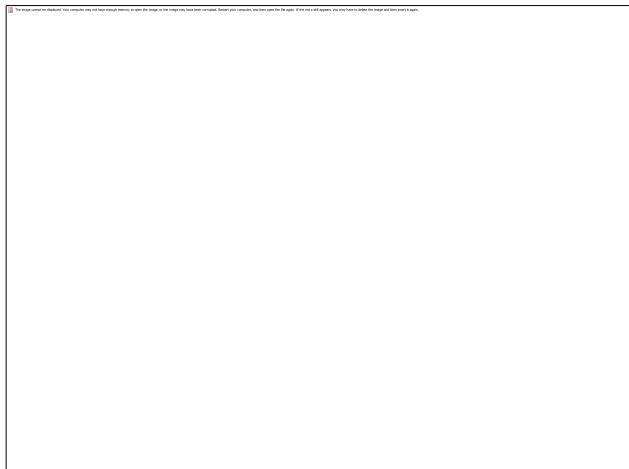
Pin Number - At 8-Pin Control Module Plug	Wire Color	Pin Number – At 4-pin Headlight Plug
1	White/Black Stripe	Left 3
2	White/Blue Stripe	Left 4
3	White/Red Stripe	Left 1
4	White/Yellow Stripe	Left 2
5	Green/Black Stripe	Right 3
6	Green/Blue Stripe	Right 4
7	Green/Red Stripe	Right 1
8	Green/Yellow Stripe	Right 2

In the retrofit installation, the wire colors and pin assignments are:

<b>Pin Number - At 8-Pin Control Module Plug</b>	<b>Wire Color</b>	<b>Pin Number – At 4-pin Headlight Plug</b>
1	Gray	Left 3
2	Violet	Left 4
3	Pink	Left 1
4	Green	Left 2
5	Gray	Right 3
6	Violet	Right 4
7	Pink	Right 1
8	Green	Right 2

## Appendix 3

### Rear Sensor Support Brackets



Boxster – 986 331 611 03



Boxster – 986 331 611 03



Carrera – 996 355 503 04

