# Adding  HKS CAMP 2 Electronic OBDII Gauges to an XK8/R

The HKS CAMP 2 (http://www.hksusa.com/info/?id=3474) is a permanent, installed, integrated alternative to aftermarket gauges. It is purely an electronic gauge system, it does not support code reading or resetting.



These are the only functions which work with the 2001 XKR over OBDII port:
    -Water temp
    -Intake air temp (pick-up is at MAF sensor just after airbox)
    -Intake manifold pressure (vacuum only, will not read full boost)
    -Battery Voltage (actually read directly from the power feed, not over OBDII)
    -Throttle position %
    -RPM
    -Speed
    -Ignition timing angle
    -A/F learning value (long term trim)
    -A/F correction factor (short term trim)
    -Intake air volume
Any other advertised OBDII functions in the HKS CAMP 2 literature are **not** supported on our vehicles.

Besides OBDII data, the HKS CAMP 2 will let you display these with external sensors:
    -Boost
    -Oil pressure
    -Fuel pressure
    -EGT
    -Intercooler water temperature
    -Oil temperature or transmission temperature (only one)

These functions use sensors that are added to a six-sensor interface unit under the hood at extra cost. Each of these functions requires a separate add on sensor, also extra cost.

The display for the HKS CAMP2 is a composite video signal which is fed to the car's navigation monitor through a composite to RGBS converter. It is controlled from a small optical remote control.
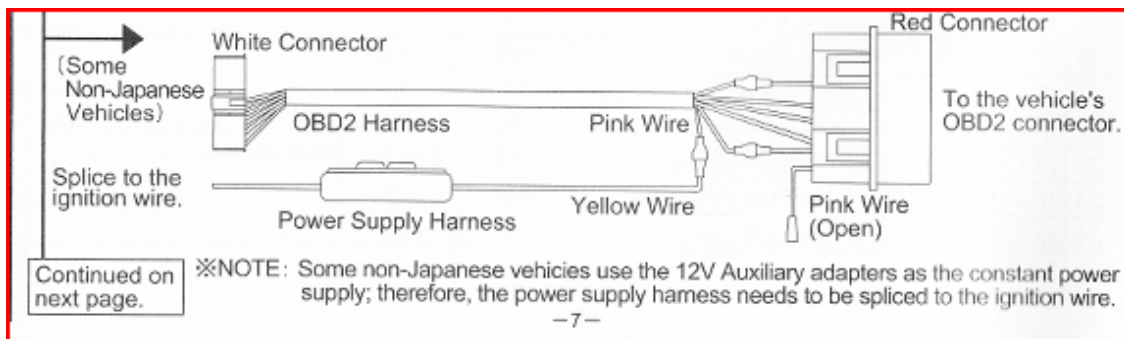
The unit also supports configurable limit (only one limit is allowed per gauge) visual and audible alarms only for gauges selected for viewing on the screen. It can graph data and also store peak values.

*Installation notes for the Main HKS CAMP 2 Unit (for OBDII functions only) in an XKR-*

MATERIALS LIST:
-HKS CAMP 2 (HKS pn 48001-AK001)
-Optional Amp and speaker such as Workman 715 (see text)
-Optional OBDII extension cable (see text)
-Heat shrink tubing (assorted sizes, but plenty of 3/8"-->3/16")
-Electronics grade solder (Eutectic)
-Electrical tape (I prefer fabric friction tape, it helps cushion potential rattles behind the dash)
-Plenty of ty-wraps (assorted sizes, but mostly 3"-4")
-Self adhesive Velcro

The wiring follows the "some non-Japanese vehicles" instructions on page 7 of the users manual. It is reproduced here:



(Some Non-Japanese Vehicles)

White Connector

Red Connector

To the vehicle's OBD2 connector.

OBD2 Harness

Pink Wire

Splice to the ignition wire.

Power Supply Harness

Yellow Wire

Pink Wire (Open)

Continued on next page.

※NOTE: Some non-Japanese vehicies use the 12V Auxiliary adapters as the constant power supply; therefore, the power supply harness needs to be spliced to the ignition wire.

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All you need to do is provide the power connection per these instructions, plug the connector into the OBDII port, plug in the remote sensor and plug the video output into the monitor. For appearance and durability, I recommend wrapping the red OBDII connector body and the first couple of inches of cable harness at the connector neatly with fabric type (friction) electrical type. Also wrap the fuses with tape to prevent rattling. The cable can be threaded in a small gap to the right of the connector and up behind the dash. There should be enough slack so that it still can be unplugged for diagnostic access. This should be done as neatly and unobtrusively as possible:

Note also in the photo the optical sensor for the remote to the right of the parking brake
release. The optical sensor should be mounting location is more of a personal preference,
but it should not face directly up and it should be roughly line of sight with your
hand when you operate the remote.

 (**Note:** For the power, I wired to the cigarette lighter ignition switched circuit, but I have
discovered that that runs about .5v-.8v  lower than the battery, due to voltage drops in the
vehicle. For the higher accuracy, run a dedicated power feed from the Jaguar's accessory
power circuit in the trunk near the battery. See my GVN-53 write-up for where to pick up
this circuit.)

**IMPORTANT:** There is an undocumented modification to the HKS CAMP 2 cable harness needed for what appears to be 2002 and earlier Jaguar vehicles or the OBDII interface on the HKS CAMP 2 will not work. I had to figure this out, no thanks to HKS support ☹.

Pin 15 on the OBDII connector is a wake-up signal only used in early vintage OBDII interfaces that Jaguar used through 2002. This pin 15 connection is highlighted below on the circuit diagram (see JTIS vehicle multiplex systems page) for a 2001. If it is present on your vehicle, your must do the modification described here.
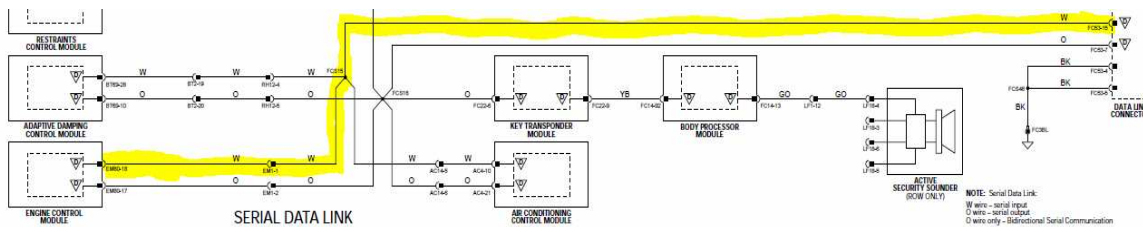


The pins on the OBDII connector are shown here:
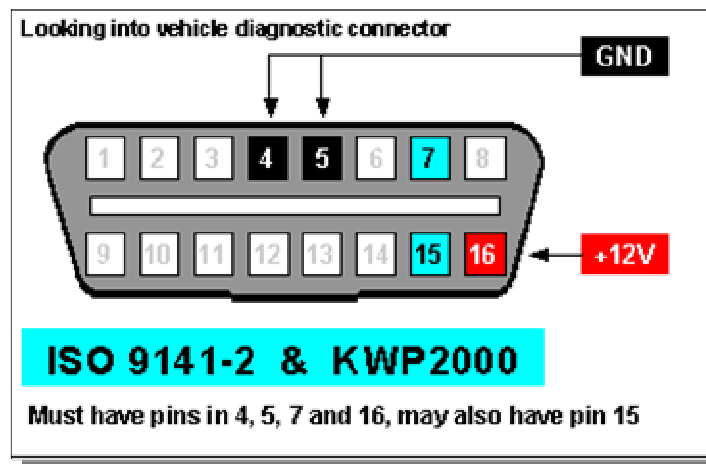


The same wake-up information is also carried on pin 7, the main data signal. All you have to do is connect pin 15 to pin 7 on the HKS CAMP 2 OBDII harness to make it work. The problem is the HKS CAMP OBDII 2 connector does not contain pin 15.

There are a couple of ways to solve this. Pin 8 on the HKS CAMP 2 OBDII connector contains a pink wire which is not used in this application. You can extract this pin and relocate it to pin 15. This is what I did. These pins are not easy to extract. I used a 1/16 inch drill bit and a jeweler's screwdriver to drill out the plastic tab holding the pin in and then remove the remaining material. Alternatively, you can buy an OBDII extension cable on ebay, and either open it up and make the pin 7-15 connection or cut off one end and remake the harness.

I found a convenient place to mount the HKS CAMP 2 is behind the lower left dash, below the gas and trunk release buttons and to the left of the eyeglass drawer.  The unit can be fastened in place with Velcro.  The photo below shows the final wiring leading to the CAMP 2 on the left (which is not itself visible).  Be sure to strain relief all cables to the HKS unit with ty-wraps, although I did not have a problem with them, they look particularly fine gauge and somewhat fragile.



Once everything is plugged together and powered up, on the setup page, the correct interface to select is 'BMW1'.

Also, fine tune the screen position of the video per the manual.  The picture size is not adjustable, so the rounded corners of the navigation display will hide some non-essential bits in the display corners….unfortunately this is a slight cosmetic anomaly I do not see a workaround for.

The HKS CAMP 2 also has an audio feature with announced remote key-presses and audible alarms.  If you wish to use this feature, you need to either wire the unit into the Jag sound system, or add an auxiliary amp and speaker. I chose the latter, since I wanted to keep the only remaining aux. audio input in my car (the phone input circuit) free for a possible Bluetooth add on in the future. I also had the unused miniature speaker available that comes along with the GVN-53 navigation unit.

I purchased a small, cheap $10 car audio amp from ebay (shipped from Hong Kong, as sound quality is not an issue here) and the small speaker I had on hand, all mounted behind the dash. Another approach is to use an inexpensive amplified CB radio speaker such as this:
http://www.starelectronicsandcommunications.com/workman715amplifiedexternalcbspeaker.aspx .