

ADS-OBD

Assembly Guide



Rev 1.1 07nov2010

Partlist

<u>Part</u>	<u>Value</u>
<input type="radio"/> C1	1uf/50v
<input type="radio"/> C2	1uf/50v
<input type="radio"/> C3	1uf/50v
<input type="radio"/> C4	1uf/50v
<input type="radio"/> C5	22uf/50v
<input type="radio"/> C6	22uf/50v
<input type="radio"/> C7	100nf
<input type="radio"/> C8	100nf
<input type="radio"/> C9	100nf
<input type="radio"/> C10	100nf
<input type="radio"/> D1	1N4001 or better
<input type="radio"/> D2	P4KE18A
<input type="radio"/> D3	SA5.0
<input type="radio"/> D4	P4KE18A
<input type="radio"/> D5	BZX55_4v7
<input type="radio"/> IC1	MAX232
<input type="radio"/> IC2	GAL16V8 (programmed)
<input type="radio"/> IC3	7805
<input type="radio"/> IC4	SI9241
<input type="radio"/> IC5	SI9241
<input type="radio"/> R1	470
<input type="radio"/> R2	470
<input type="radio"/> R3	470
<input type="radio"/> R4	470
<input type="radio"/> R5	2.2k
<input type="radio"/> R6	10k
<input type="radio"/> R7	1k
<input type="radio"/> R8	1k
<input type="radio"/> R9	470
<input type="radio"/> R10	220

Step 1:

Every line represents a component that has to be installed on the circuit board. You can use the circles to check off the parts you have installed. When you are done every circle should be checked off.

Step 2:

Solder the 16 pin and 20 pin chip sockets in place. When placing the chip sockets note the position of the cut-out or notch, pointed at by the 2 red arrows. Insert the chip sockets and carefully turn the board solder side up on a flat **heat resistant** surface. Solder one corner pin of each chip socket. When cooled, inspect the chip sockets to make sure they are mounted flat against the board. If not, carefully push against the socket whilst heating the soldered pin. When the socket is properly aligned, go ahead and solder the remaining pins.

CHECK:

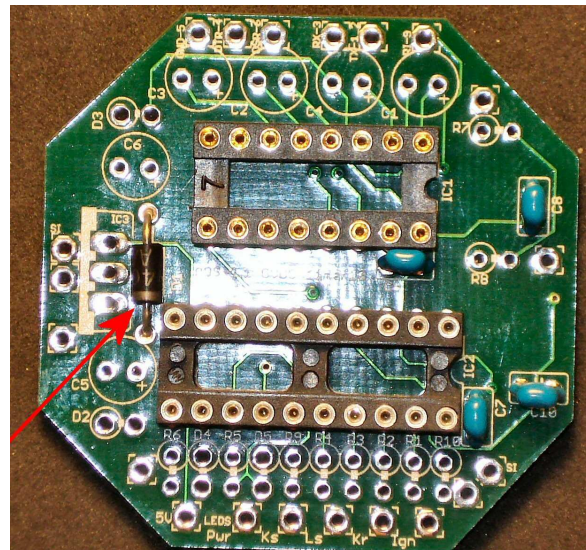
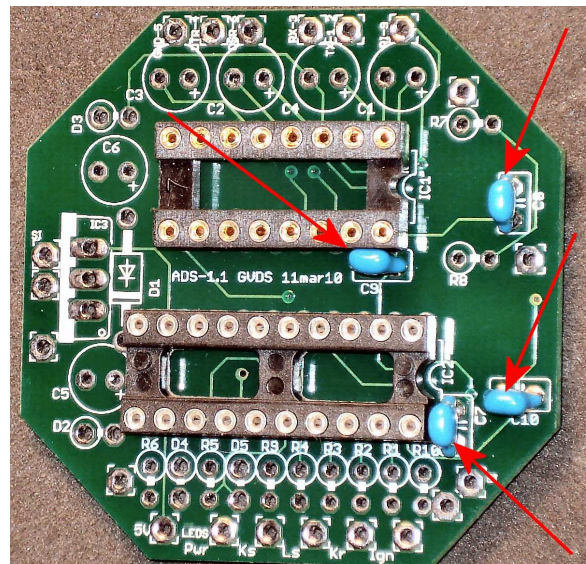
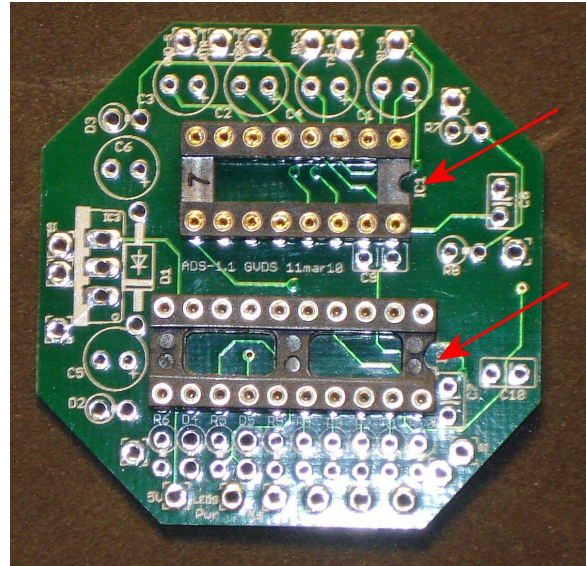
Are the sockets properly aligned?
Are all pins of the sockets soldered?
No shorts between the 5 volt and the ground on IC3?

Step 3:

Solder capacitors C7, C8, C9 and C10 in place. These are marked with a red arrow in the picture. The capacitors are marked with the numbers 104.

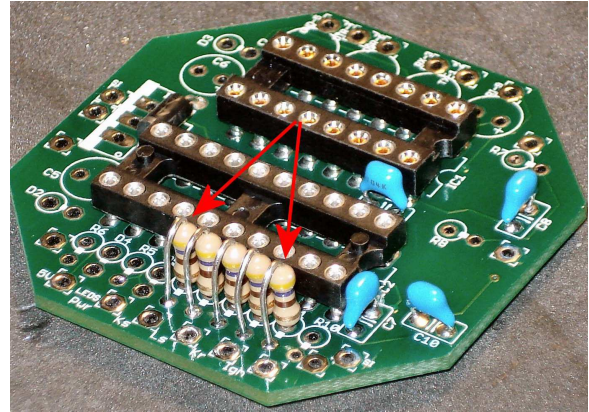
Step 4:

Solder diode D1 in place. The diode is marked "1N4001" or "1N4004". The diode is also marked with a silver band. This is the cathode. The diode is mounted with the silver band towards the 20 pin chip socket. This is marked by the red arrow in the picture.



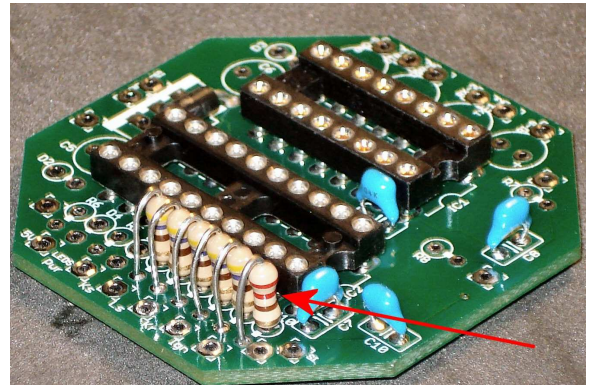
Step 5:

Solder resistors R1, R2, R3, R4 and R9 in place. These resistors are 470 ohms and are marked with 4 colored bands: Yellow, Purple, Brown and Gold. Note that R10 is left open.



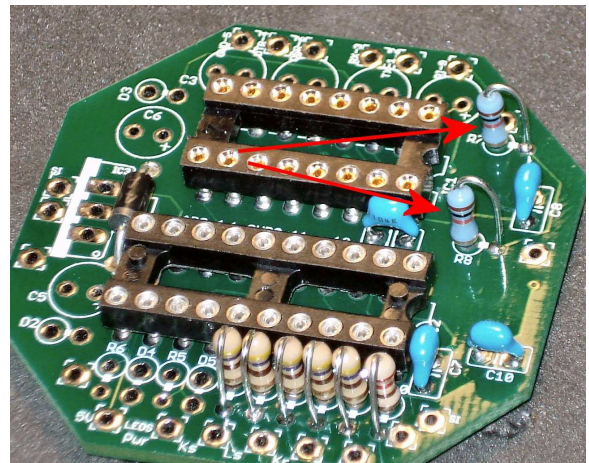
Step 6:

Now solder R10. This resistor is 220 ohms and has the colors Red, Red, Brown and Gold.



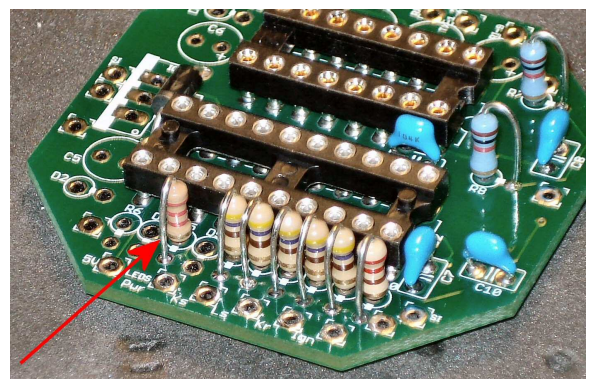
Step 7:

Solder in place R7 and R8. These resistors are 1 Kilo-ohm and have the colors Brown, Black, Red and Gold.



Step 8:

Solder in place R5. This resistor is 2.2Kilo-ohms and has the colors Red, Red, Red and Gold. R5 is placed in-between the spots for diodes D4 and D5. Verify you have inserted R5 in the correct spot before soldering R5.



Step 9:

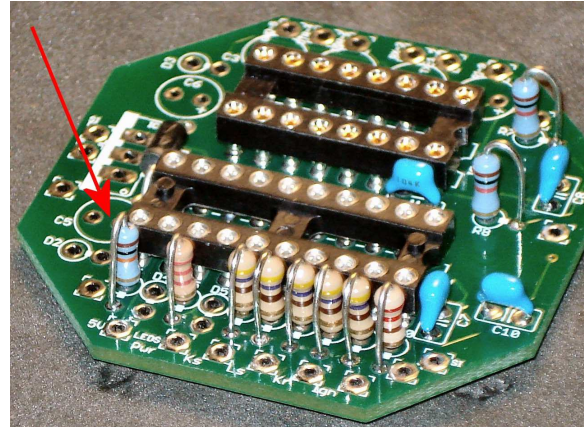
Next, solder R6. This resistor is 10 Kilo-ohms and has the colors Brown, Black, Orange, and Gold.

CHECK:

Check all solder connections for shorts.

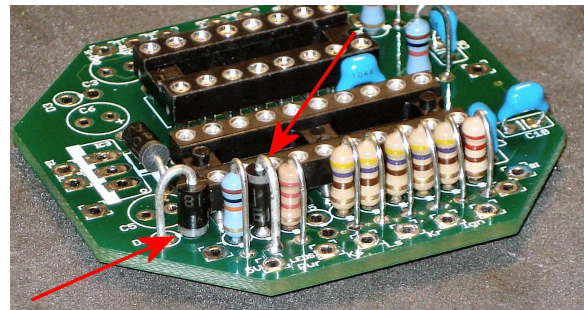
Check IC3 for shorts between the 5 volt pin and the ground pin.

Compare the resistors with the previous pictures to make sure you have the correct resistors installed.



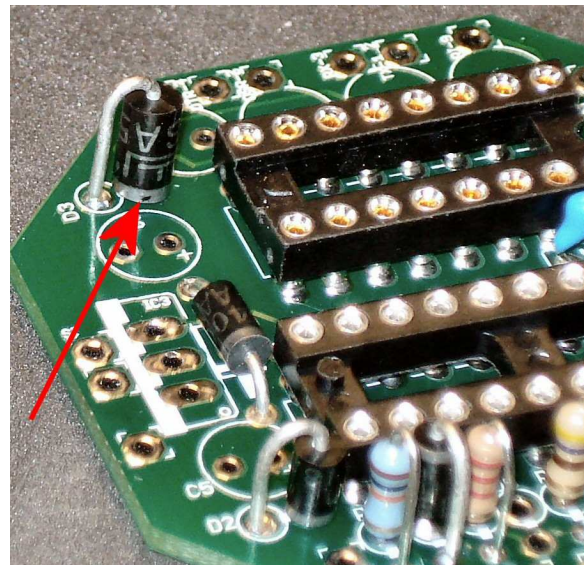
Step 10:

Install diodes D2 and D4. These are marked P4KE18A. Observe the position of the silver band closely in the picture below. D2 is mounted with the silver band near the circuit board; D4 is mounted with the silver band pointing up. In the picture D2 is the left diode and D4 is the right diode which is mounted between the two resistors.



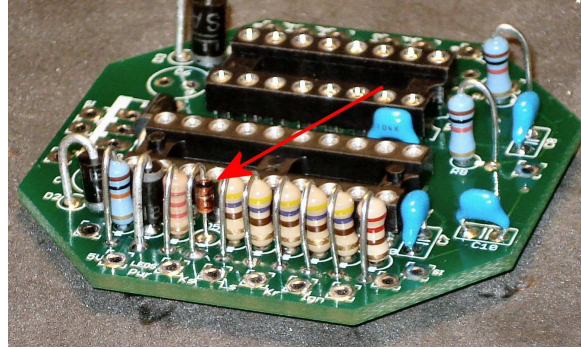
Step 11:

Install diode D3. This diode is marked SA5.0 and is mounted with the silver band towards the board. Please study the picture for the correct positioning of D3.



Step 12:

Install diode D5. This diode is marked “BZX55 4V7”. D5 is marked with a black stripe. This is the cathode of the diode. This black stripe is mounted pointing up. Again, closely inspect the picture for the correct position of diode D5.

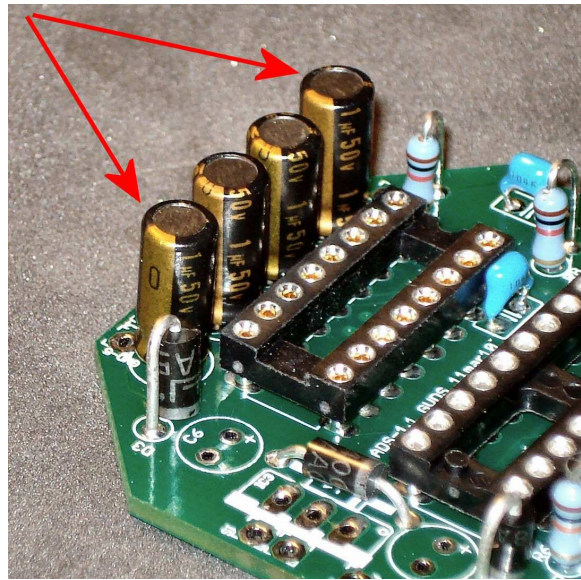


CHECK:

Check all solder joints for shorts, etc.
Check the correct position of all silver and black bands in accordance with the pictures.
Check IC3 for shorts between the 5 volt pin and the ground pin.

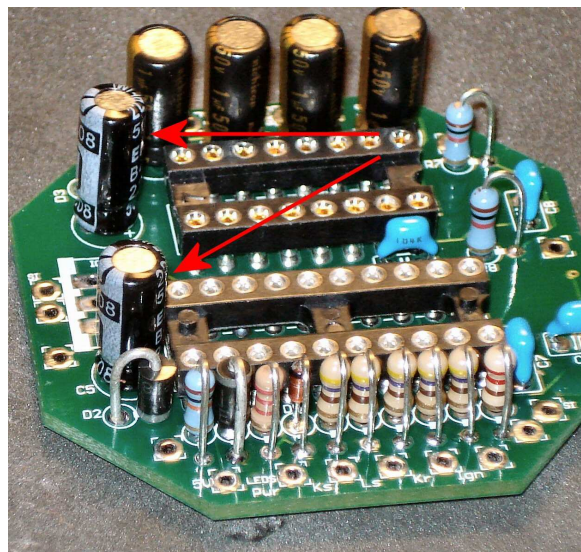
Step 13:

Install capacitors C1, C2, C3 and C4. These capacitors are marked 1uf/50V and have a stripe indicating the minus side (-). Also, the leads have different lengths; the short lead is the negative lead. Observe the proper polarity when inserting and soldering the capacitors. The negative side for each of the capacitors is pointing towards the left bottom corner in the picture.



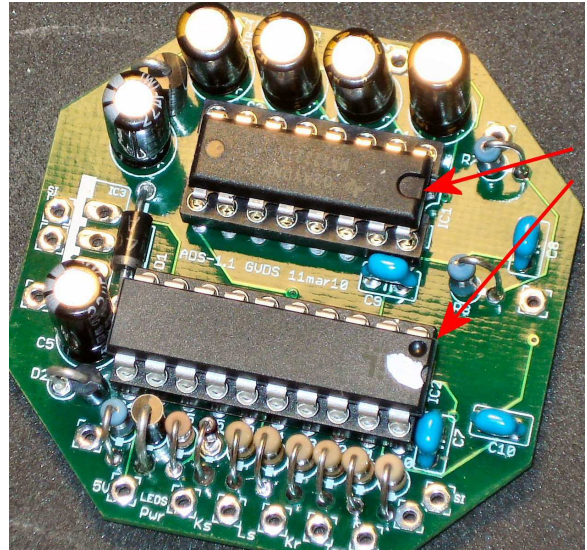
Step 14:

Install capacitors C5 and C6. These capacitors are marked 22uf/50v and have a stripe indicating the minus side (-). Also, the leads have different lengths; the short lead is the negative lead. Observe the proper polarity when inserting and soldering the capacitors. The negative side for each of the capacitors is pointing towards the left in the picture.



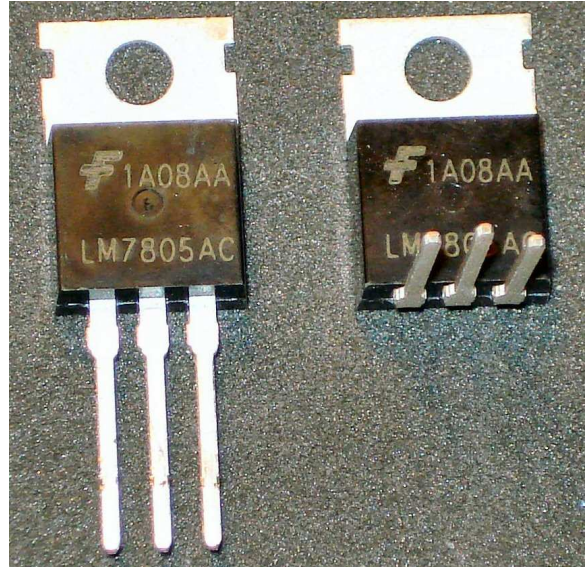
Step 15:

Temporary install IC 1 (MAX232) and IC 2 (GAL16V8). Verify the correct position of the chips. The red arrows in the picture show the notches on the chip. The notches align up with the notches in the chip sockets. Although it is a temporary install, it is a good practice to install them correctly. You never know, you might forget to take them out again before powering up.



Step 16:

Take IC 3 (7805) and bend the 3 legs as shown in the pictures. Check one last time for shorts between the 5 volt pin and the ground pin before soldering IC 3 in place.

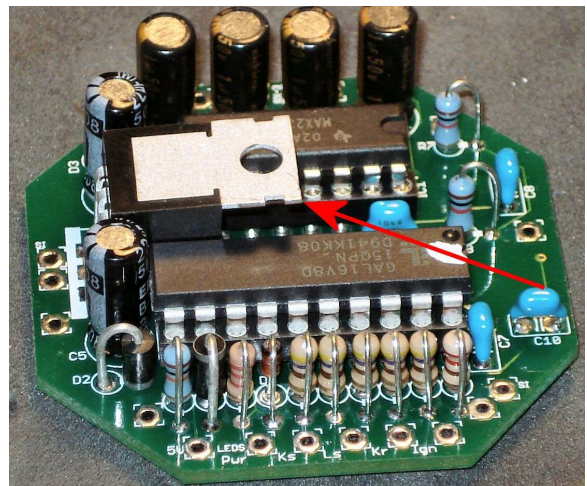


Insert IC 3 so that the body is just resting on the top of IC 1 and 2. Solder IC 3 in place.

CHECK:

Once more carefully inspect your soldering work.

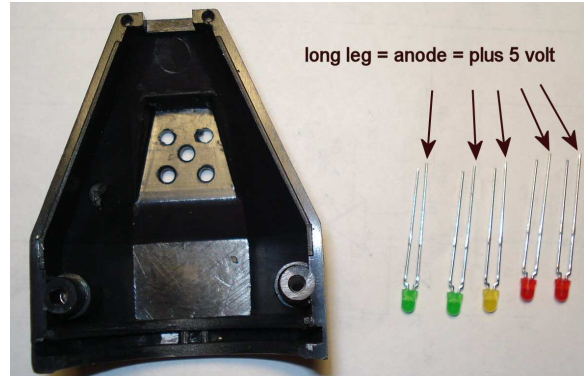
You have now finished soldering all components and your board should resemble the one in the picture.



Installing the LED's

Step 1:

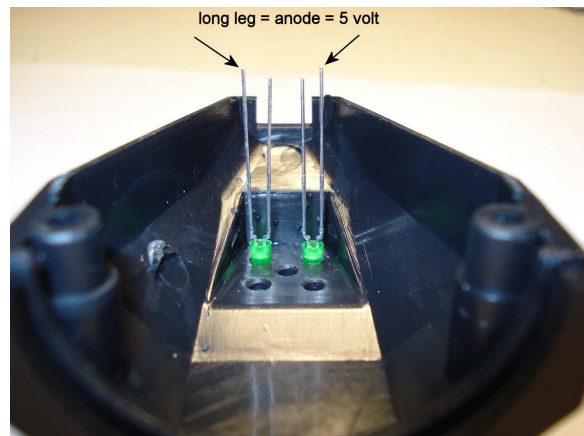
You will need the 5 LED's and the black shell with 5 holes in it. The holes measure approximately 3 mm each. You should have 2 red, 1 yellow and 2 green LED's. The LED's have a short leg and a long leg. The long legs of each LED will be connected together to form a common connection for the 5 Volts from the board.



Step 2:

Mount the 2 green LED's as is show in the picture. Mount the green LED's so the long leg is towards the outside of the shell.

Note that the LED's may be a press fit. It is not necessary to push the led's all the way in at this point. Some have suggested placing the black shell on a wooden board and drilling the hole pattern into the board so as to have better access during the soldering process.



Step 3:

Install the 2 red LED's in a similar way. Mount the yellow LED in such way that the long leg is towards the big opening. In the picture the long leg is towards the bottom of the picture.

CHECK:

Check the orientation of the LED's once more to ensure the long leg of the green and red LED's are pointing out and the long leg of the yellow LED is pointing down.



Step 4:

Bend the long legs in such way that you can now solder them together.



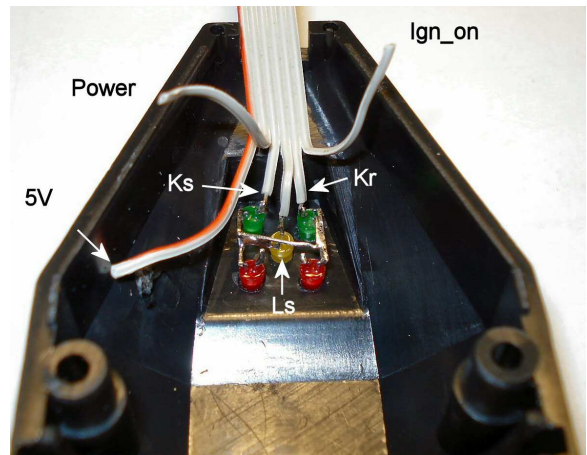
Step 5:

Cut off the short legs so there is approximately 3/16" of leg remaining. Study the picture before cutting the short legs to have an idea how long to leave the legs. In the next steps you will be soldering flat cable to the remainder of the short legs.



Step 6:

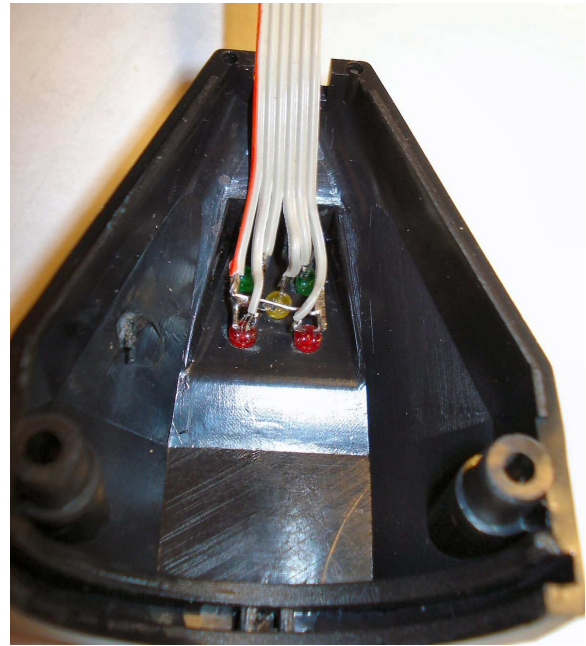
Take a piece of 6 conductor flat cable and split off the end. You can use individual wires if you like but in this guide I will be using flat cable. Split the flat cable into individual wires over approximately 1 to 1.5 inch. The wires are referenced left to right with wire #1 with the red stripe at the left and wire #6 at the right in the picture. The wires will be connected to the short legs from step 5.



Solder wire #3 to the left green LED (Ks), wire #4 to the yellow LED (Ls) and wire 5 to the right green LED (Kr). Doing it this way will make the flat cable align up with the circuit board holes. This way you will not have to cross wires later.

Step 7:

Solder wire #2 to the left red LED and wire #6 to the right red LED. Finally, solder the wire 1 with the red strip to the common connection between the LED's. Your assembly should now look like the picture.



Step 8:

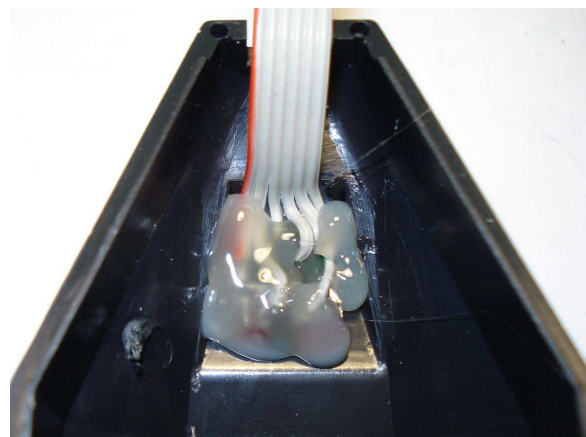
Carefully push the LED's all the way through the holes till they bottom out. When you turn the shell over the dome of the LED's will just stick out from the shell.



Step 9:

Optional: Secure the flat cable and LED's by covering them with glue. I have used a hot glue gun with good success. Hot glue will stick and secure but can be removed if necessary later.

Put the shell aside for now and continue on with the other half of the shell...

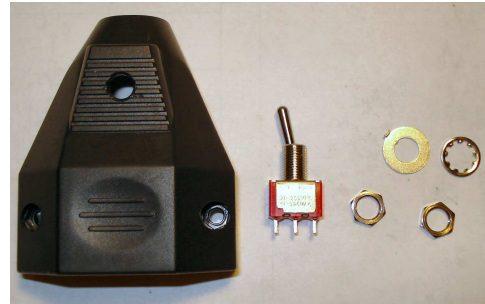


Installing the Service Interval Reset Switch



Step 1:

Take the switch and install the nut, locking washer and tab washer.



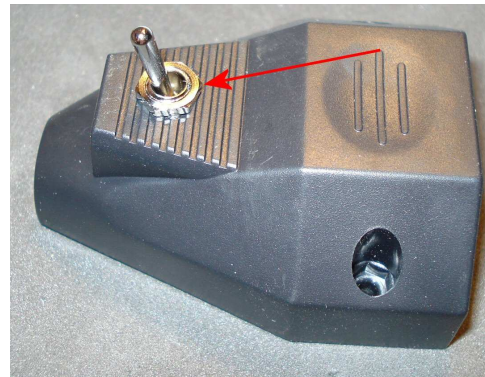
Step 2:

Install the switch through the shell with the lever pointing upwards.



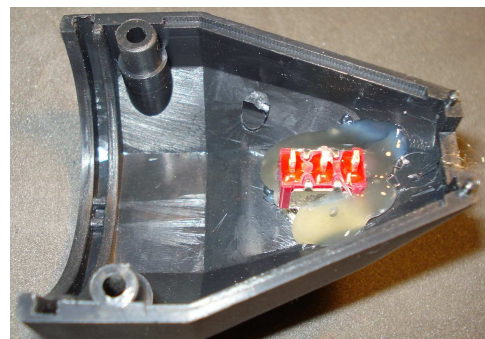
Step 3:

Install the nut on the outside of the shell



Step 4:

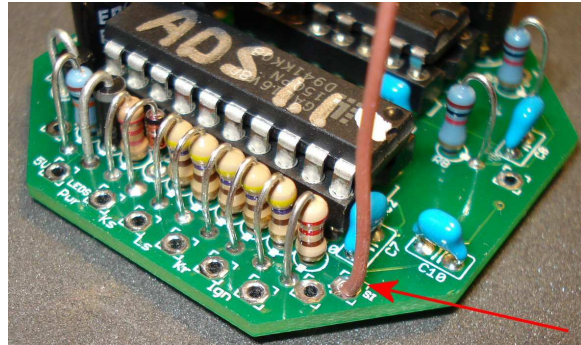
Optional, secure the switch by applying hot glue around the switch, this will prevent the switch from turning should the nut on the outside come loose.



Installing the wires for the Service Interval switch to the board

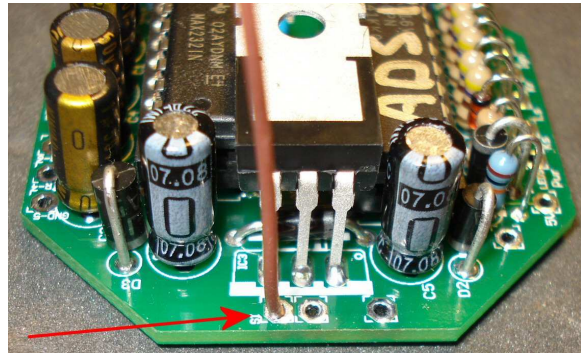
Step 1:

Solder a wire into the hole marked "SI" next to R10. This is marked with a red arrow in the picture. This wire will go to the UPPER lug if the switch is mounted per instructions.



Step 2:

Solder a wire into the hole marked "SI" next to IC 3. This is marked with an arrow in the picture. This wire will go to the CENTER lug on the switch.



20 pin plug assembly

Step 1:

Take the plug and write down the colors and the pins the colors are connected to. This will be your reference.

7 = _____

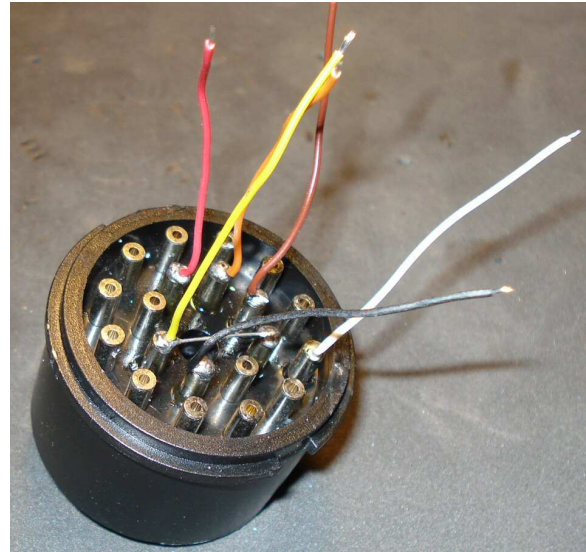
14 = _____

15 = _____

16 = _____

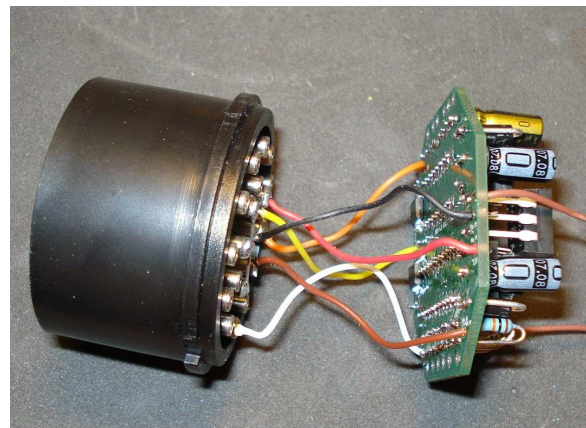
17/20 = _____

19 = _____



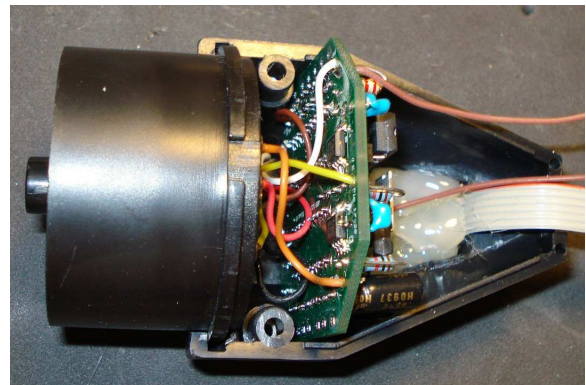
Step 2:

Solder the wires into their corresponding holes in the circuit board. Before soldering verify you have the wire in the correct hole. When you are done your assembly should resemble the picture.



Step 3:

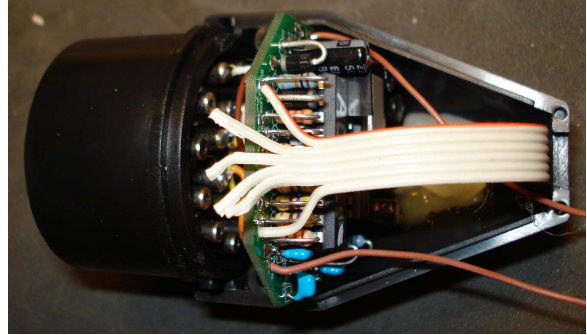
Temporarily mount the board and the plug into the shell half that has the LED's. Install the board with IC 3 under the LED's. This is the recommended installation of the board.



Connect the LED's and the serial cable to the board.

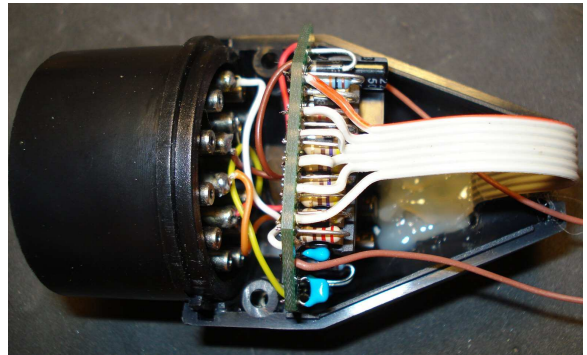
Step 1:

Turn the board till the holes for the LED's are pointing up. Split the end of the flat cable into 6 individual wires about $\frac{3}{4}$ inch long and strip the ends about $\frac{3}{16}$ ". Insert the wire with the red stripe into the hole marked 5V, this is wire #1. Solder the wire in place. Now connect wire #6, the last wire, in the hole marked "Ign". Reference the picture for correct insertion.



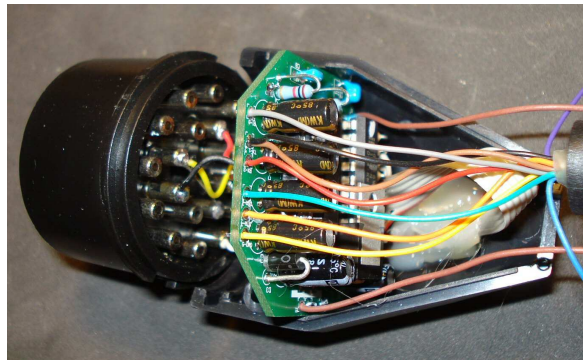
Step 2:

Solder the remaining wires in the holes. These are starting at the left: "Pwr", "Ks", "Ls" and "Kr".



Step 3:

Verify which color belongs to what pin in the serial cable. At the time of the writing of this manual the colors were as shown in the picture. Remove about $\frac{3}{16}$ " insulation of the wires. Turn the circuit board so that the holes for the serial cable are pointing up.



Insert the GRAY wire in the hole marked **RI-9** you did verify that GRAY is pin 9?

The next hole is marked **TX-1-2** and will receive 2 wires. Twist the wires from pin 1 and pin 2 (black and brown) together and solder into place.

The next hole is marked **RX-3** and receives the wire from pin 3 (red).

The next hole is marked **DSR-6** and received the wire from pin 6 (green).

The next hole is marked **DTR-4** and receives the wire from pin 4 (orange).

The last hole is marked **GND-5** and receives the wire from pin 5 (yellow".

Cut the remaining 2 wires, blue and purple, as close as possible to the serial cable and strain relief. These wires connect to pins 7 and 8 and will not be used.

Error Checking

Remove the 2 chips if they are installed,
Apply 12 volt.
Measure on pin 15 and 16 of the MAX232 and pin 10 and 20
of the GAL, you should have 5 volts.

Connect pin 10 of the GAL chip socket with pins 16, 17 18
and 19 of the GAL chip socket, one at the time, this
should make the LED's light up, the schematic will tell you
which LED.

Connect pin 10 of the gal socket to pin 12. Short the K
line input to ground, Measure pin 4 of the gal chip
socket, The voltage (0 - 5v) should follow what you do on the K line input

Connect pin 10 of the gal chip socket to pin 12 again.
Connect a voltmeter to the K line, jumper pin 12 of the MAX232
socket alternately to pin 15 and 16 of the MAX232 socket, the K
line should fluctuate between 12 and 0 volt.

Connect pin 10 of the gal chip socket to pin 13 of the gal
socket, measure now on the L line, jumper pin 12 of the MAX232
socket alternately to pin 15 and 16 of the MAX232 socket,
the L line should fluctuate between 12 and 0 volt.

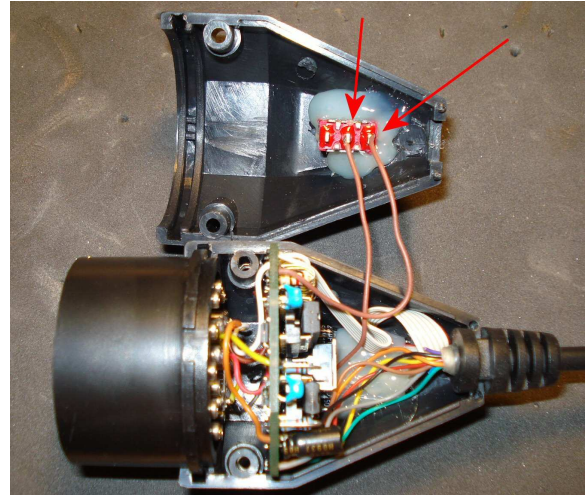
disconnect power, install the chips

connect 12 volt, connect lgn_on signal (pin 16) to 12 volt, the
lgn_ON led should light up.

Final assembly

Step 1:

Solder the wires for the Service Interval switch to the switch in the plastic shell. Use the center tab and the rightmost tab as shown by the red arrows in the picture.



Step 2:

Carefully close the shell halves together verifying that no wires are pinched. Insert the two screws and tighten them.



Congratulations, you now have an ADS interface, ready to be used with DIS, INPA, EDIABA or whatever flavor your program is.

IMPORTANT

The interface can be used for both ADS and OBD interface operations. However, it is important that you choose the correct interface setting before starting your diagnostics software.

To use the interface in ADS mode:

Change the line EDIABS.INI to read INTERFACE = ADS
Set the switch on the interface in the UP position.

To use the interface in OBD mode:

Change the line EDIABS.INI to read INTERFACE = OBD
Set the switch on the interface in the MIDDLE position

You may have to run, at least for the first time, the setup files such as ADSSETUP (most likely located in C:\EDIABAS\Hardware\ADS\ADS32) and/or OBDSETUP (most likely located in C:\EDIABAS\Hardware\OBD). You will also have to add the location of the \ediabas\bin directory to your path environmental variable.

The **ADS mode only** works with a real serial port which is set for address 0x3F8 and IRQ 4. These are the settings for the legacy comm1 port. This is a condition set by BMW and cannot be changed. It is unlikely that you will find a USB adapter that will work in the above referenced address space. The OBD mode has been shown to work with USB to serial converters.

The interface has 5 LEDs

K send   K receive

L send 

Power   Ignition ON

Ksend will flash when the computer is sending data to the car in both ADS and OBD mode

Kreceive will flash when the car sends data to the computer in both ADS and OBD mode

Lsend will flash when the computer is sending data to the car, but ONLY in ADS mode.

Power indicates the diagnostics interface has a 12 volt supply

Ignition ON indicates the ignition switch has been turned into the run position.

To use the SI reset you must push down and hold the switch for a number of seconds. On most cars holding down the button for 4 seconds will reset the Oil Service timer and holding down the switch for 10 seconds will reset the Inspection Service timer.