FITTING OIL TEMP AND PRESSURE GUAGES

this guide is of reference to fitting an oil temp and pressure sender/ sensor into a sandwich plate- not the sump plug temp sensor (although it wouldn't be much different and just as easy to do the latter part)

ok first of all I really can't stress enough that you must have the right equipment and also the correct parts before you start.

ok let's start with what you should have in terms of parts to fit.

oil pressure gauge + sender
oil temp gauge + sensor
m20 sandwich plate with at least 2 ports (and bungs for the extra ports)
braided line - to extend the oil pressure sender to a more amicable place(very recommended after seeing how tight it is down there first hand!!)
pillar pod of some kind (OEM style or generic one)
(this lot cost me about £150 to get to this part)

replacement oil filter
engine oil
lots of appropriate wiring (when I say appropriate, I mean hopefully of good length, various colours, and a decent core (speaker wire is not advisable, just slightly thicker is fine though)

id estimate that I used about 10-12foot of wire to send signal from sensors from filter to gauge and you need 2x this length

so 2x12 foot
3x3-4foot of wires.

tools needed

jack(s)
axle stands
oil filter removal tool (various types available)
catch tray
various lengths positive and flathead screwdrivers
wire cutters
wire crimpers
wire stripping tools
wire joining tools (choc block, bullets, soldering, insulation tape... etc... however you are used to joining wires together for a good and strong signal)
cable ties
coat hanger (cut in half and straightened)
10mm socket or spanner

right then, first things first, make sure you have the right components and that everything fits ok... the gauges fit into their pods ok, trial test the gauges power and earth terminals and make sure they illuminate and so forth (the temp gauge will read lowest reading but the pressure will read the highest reading on trial test with no signal- make sure yours do this to check fully working gauges!!)

then make sure you have the correct sandwich plate and that the sensor and sender (or braided line- and so forth the sender into the braided line) fit into this ok...

here are some pics so far
gauges in pods, rotated to sit upright when on the A pillar

the sandwich plate with bungs in extra ports and oil temp sensor fitted and braided line. also make sure your plate has the m20 bolt in the middle for screwing into the block and the filter into it. (not in this picture however.)

(if you need to understand how the sandwich plate works in order to understand why all this is needed then read on. the sandwich plate goes in-between the block and the oil filter- hence the term sandwich. the oil flows through the middle hole of the plate and into the filter. on its return journey from the filter, it takes the outer crescent holes route, and thus makes contact with the sensor for temp and sender for pressure.)

the braided line and pressure sender

the reason why I recommend that you use a braided line is so that you simply have more room for it. it really is tight down there for space for the bulky pressure sender- it can be done, but to make it less hassle and tidier, I recommend the use of the braided line to simply extend the sender to a more appropriate place.

notice they have been fitted with a terminal to connect the signal wire to for readings. (the yellow part). the long 12foot wires will attach at these points (and crimped) when fitted to send the signal to the gauge (reading in temp and psi respectively).

make sure that these sensors, bungs and senders are all tight and fitted prior. various spanner sizes depending on the sensors or senders or braided line you have (mine varied from 8mm-13mm.)

ok so now on with the fitting.

jack the front end up, get it on axle stands. (I presume you know how to do this)
if you're like me and want to drop as less oil as possible, do it from a very cold engine (i.e. don't start the car or leave overnight or even days if you have done anyway), and jack it up from the front so that the engine is upend tilting backwards. no need to overdo this though as were not trying to get it as high as possible, just a slight slant so the oil is at the other end so to speak.

take off the guards on the bottom of the car, you should only need to remove the one from the driver's side, 4 plastic screws iirc, positive variety

so that now we can see the oil filter- at this point you will see just how little room there really is down there around the starter motor and manifold/downpipes. ok so we leave this for now and get to plumbing the wiring through the system.

ok so let's start with the 2x long signal wires. these wires need to go from the sender/ sensor in the engine bay- through the bulkhead and behind the dashboard over to the area behind the electric wing mirror switch. and wire up to the gauges. sounds complicated and daunting but let's take it step by step.

first of all, start in the engine bay (don't try and attach it to the sender/sensor at this point) looking for a grommet in the bulkhead to send the wires through. I found one in mine near the air con compressor/ wiper motor here....

twist the wires together and pop them through the grommet as much as you can, then get into the passenger foot well and you'll find them easily enough where they've come through. now we need to send them over to the driver's side however, this means going behind the centre console, pop them round the back and we can tidy this up in a minute. it may help to take the lower console out at this part, the stereo surround that held in by clips. be careful so as to not brake/snap the surround however.

then I recommend unscrewing the lower steering panel. this is the panel with the bonnet release on it... its only 4 screws to take this panel off... and
also get a very thin screwdriver into the electric windows panel and ease this out also.
ok so now with all of these panels removed... pop the 2x long wires around the back of the centre console and over towards the steering column.
now take the coat hanger, put it through the gap where the electric mirror panel was and find it by the pedals.
then tie the 2xlong wires to this and pull it up through the elec mirror gap.
I then fed the wires up and through where the hole where the A pillar was and am left with this...

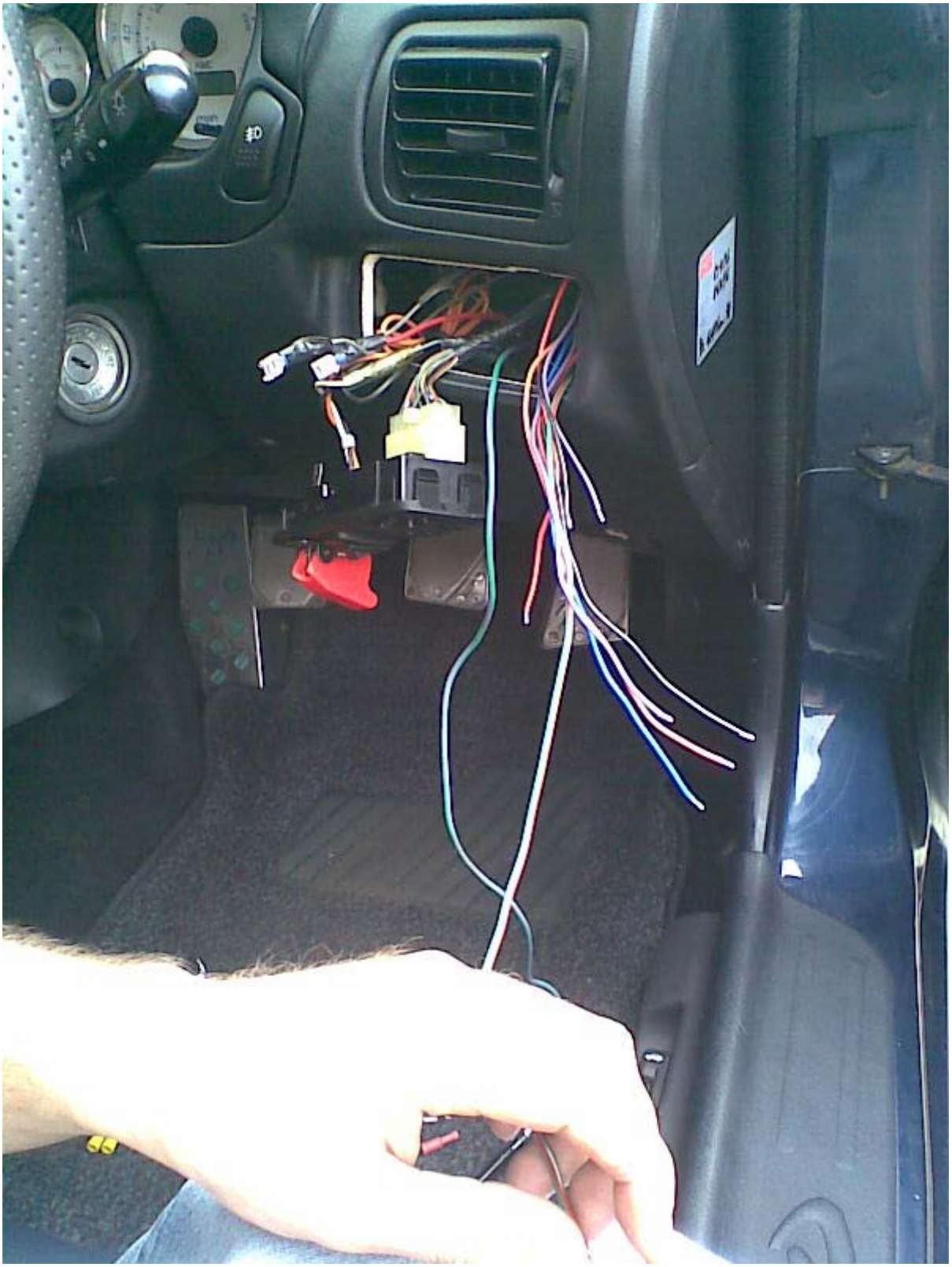
now you have plumbed in the 2x long wires for sending signal from the sensor/sender to the gauge itself. that is the hardest part over. relax. lol

now is the easy part.

take the A pillar with gauges fitted, and tape up the end of the wires with some insulation tape. (wrap up the ends of all the wires from both of the gauges, and attach to the 2xlong wires you've just pulled through. this is so that we can now pull the wiring from the gauges through to the elec mirror panel to continue the rest of the wiring)
pull the 2x long wires through (you should be able to see them inside the elec mirror panel gap, and it'll also bring with them the rest of the wiring from the gauges) whilst at the same time fitting the A pillar in its original place.

important : Make sure you know which sensor is where, i.e., mine are both mirror finished and you can't see the dials or faces without power, so make a note if the pressure or temp is at the top, as you'll need to wire the appropriate wire to the correct gauge to get a reading!!!

ok so now you should have something that looks like this..



ok so now we can start connecting wires and plumbing in the power and earth etc.

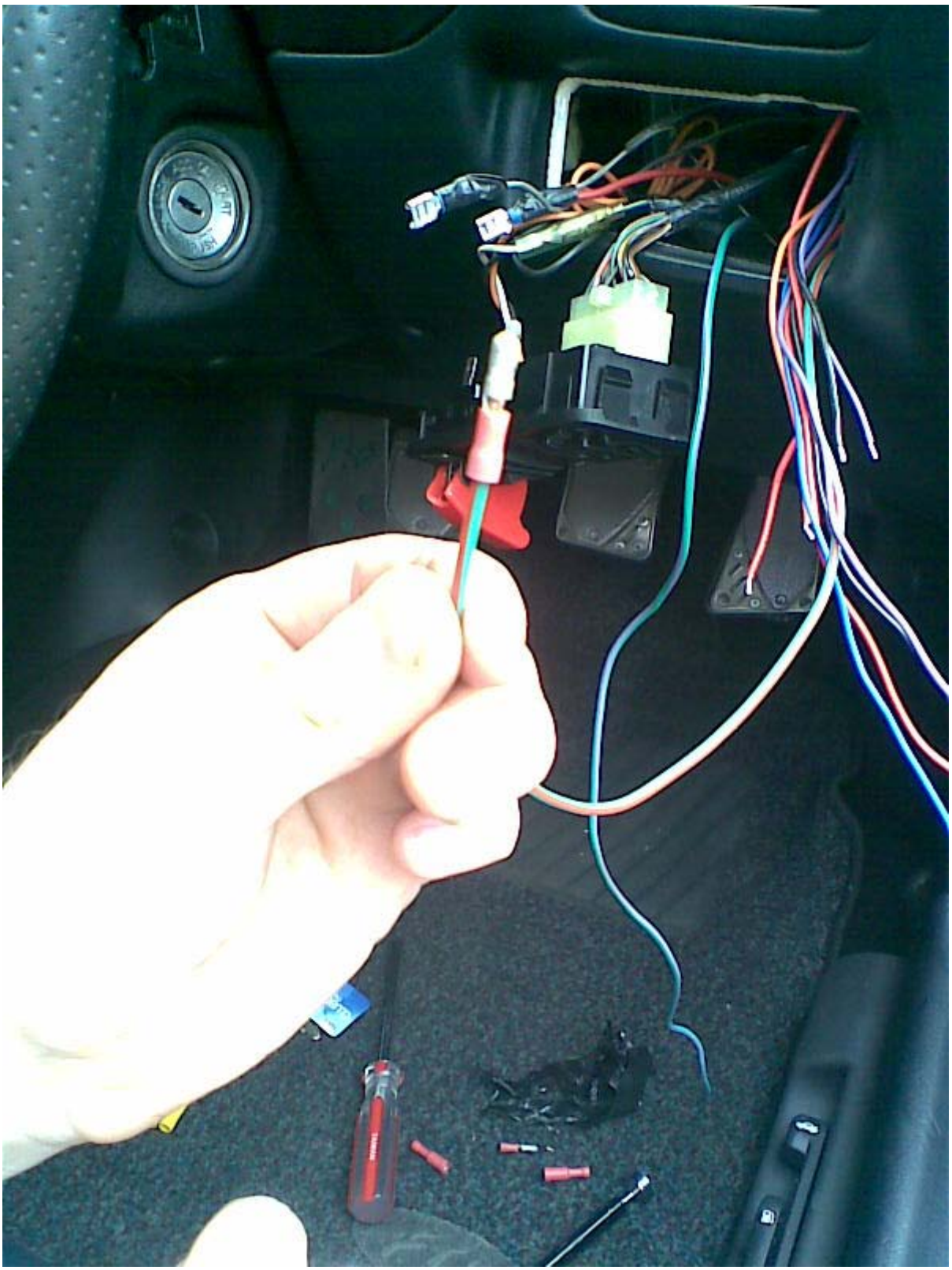
n.b now I don't know about everyone else's gauges, but mine came with 2x purple wires for illumination- to wire up to the lights so that they illuminate when the lights are on- but I want mine on permanently (being a mirror finish I can't see them otherwise!!) so therefore we need to take the purple wires and earth them rather than leaving them unused.

ok so each gauge has 4 wires- black, red, purple, and the signal wire (one was orange and one was blue on each gauge)

so red= power
black= earth

purple= illumination (in this case though earth)
orange/blue= signal wire

so first of all we'll connect the signal wires that we've just plumbed through the engine bay to the appropriate wires from the gauge (assuming you've remembered which colour wire is which from each gauge (orange was from pressure, blue was from temperature)). this is easy for anyone who is even slightly electrically competent.



I used bullet connectors as you can see... wire up the 2x long signal wires and then you can pull them through from the engine bay to take up the slack.

now all is left to do is to wire up the power and 2x separate earths.

I recommend you take the power from the cig lighter, and the 2x separate earths can also be taken from the inner stereo surround- simply from the screws on the stereo frame (this is a good earth).

ok so now we need to take the 2x power (red wires) from the gauges and wire them to power.. so connect them to one of the 3-4foot wires (yes that right, 2x gauges will be running off one single cable from the cig lighter). connect the other end of this 3-4 foot wire to the back of the cig lighter itself.. make sure you feed the cable around the back of the centre console and get your arm in the front of it to find the cable and pull it through and connect it up.

now the same to take the earth's from the gauges to the stereo cage. wire the 2x black wires to one of the 3-4foot wires and feed it through the same way, - back of centre console and pull it through from the front. take one of the screws out of the stereo cage and attach it to this earth.

and finally the same with the 2x illumination wires (if your gauges have this) mine were purple and if not being used for illumination need to be earthed, so attach them both to the last 3-4foot wire, feed it through the back of the centre console again and pull it through and attach this in the same was as before to a DIFFERENT screw on the stereo cage. it should not be earthed to the same point.

ok so well done your almost finished now... it's all provisionally plumbed so stick the keys in the ignition and turn one click and they should light up now. if not check the power and black earth connections. if it lights up ok, then well done you've plumbed the power and earth in well. ok so now were done in the drivers foot well with wiring and so forth so now time to tidy the wires up... I recommend cable tieing up any slack and then putting them behind the bonnet release panel and screwing back into position. you can also replace the elec mirror switch panel and ofc make sure the A pillar is still fitted ok. also put back the stereo surround and centre tidy up that section.

now we can turn our attention to the engine bay and tidily arrange the 2xsignal wires around the bay so that they're relatively out of sight. I decided to follow the bulkhead along to the driver's side, over and behind the brake servo, and then following the aircon pipes around to the front of the bay stopping at the headlight. using cable ties to keep them in place and tidy up slack.

now we need to feed the sandwich plate down the back of the rad in-between the manifold down to the filter area. this will leave the pressure sender (if used braided line) up the top, where I fitted it to one of the fan screws for securing it in one place. follow the braided line down in-between the fans and secure the line in-between the fans in the recess for the aircon rail. now everything is in place to finally take off the oil filter and attach the sandwich plate.

before we do this though, connect the signal wire from the temp gauge to the sensor, crimp it in position. doing this after the plate is fitted will be slightly more awkward to get the best fit of the wire.
ok so with oil filter removal tool and catch tray in position, get the filter off, and get the sandwich plate in position as quickly as possible whilst screwing back in the new filter. once this is done then it's almost job done.

all is left now (once you've cleaned yourself up) is to tidy up the wire that you brought down to the sensor. I recommend fixing it to the braided line that will follow the same route and will protect the wire somewhat. then connect the final signal wire for pressure into the pressure gauge at the top by the headlight, crimp it tight and all should be ready to go now. job complete!!!


0 10 20 30 40 50 60 70 80 90 100
PSI
140 175 210 250
50 300
Temp