

Alfa Romeo 147

On board instruments installation guide



Alfa Romeo 147

On board instruments installation guide

This guide is describing how I installed oil temperature and oil pressure gauges to my Alfa Romeo 147. I wanted to have them for a long time. I consider oil temp important as I want to know when I can start to drive “temperamentally” after startup and oil pressure reading can warn me if something is going wrong. And at last but not least.... I like the looks of the gauges in the car interior ☺

Step by step guide:

First step was obviously getting the gauges. I searched many websites, first I wanted to buy VDO gauges, but they were so expensive... At last I found gauges made by EQUUS. Unknown brand to me but they looked nice and came with the necessary sensors for about 40 EUR. I got them from www.conrad.sk, but they can be found in many countries where Conrad has distribution network (www.conrad.de, www.conrad.at, ...).



Gauges have very nice clean design, definitely nothing special, but they will match any interior and backlight can be switched between red or green. Needles have yellow backlight and this can not be changed.



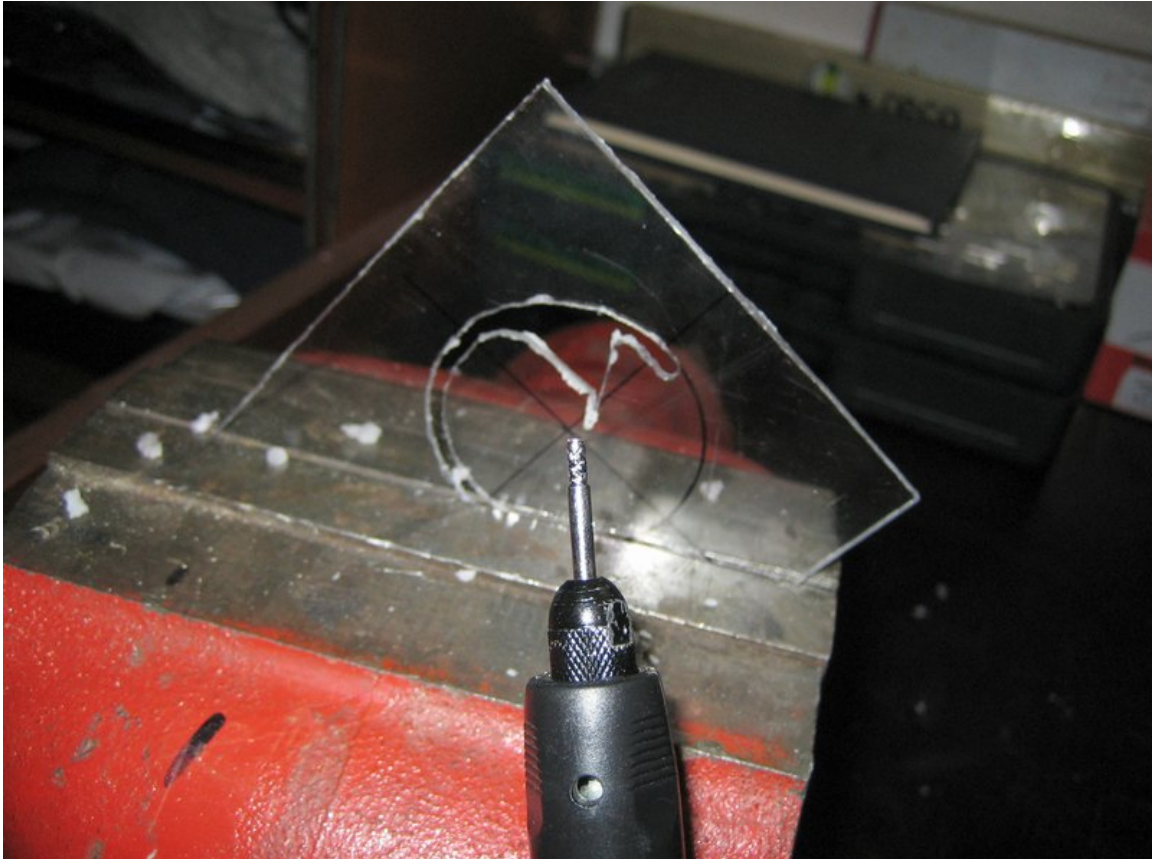
This is the complete set of equipment you get in the package. It includes temp and pressure gauges, temp sensor, pressure sensor, backlight bulbs with silicone caps to change the backlight color, screws, connectors to be crimped on the sensors and installation manuals. All you need to buy separately is the wire to connect the sensors and adaptors to install the sensors into the engine block.



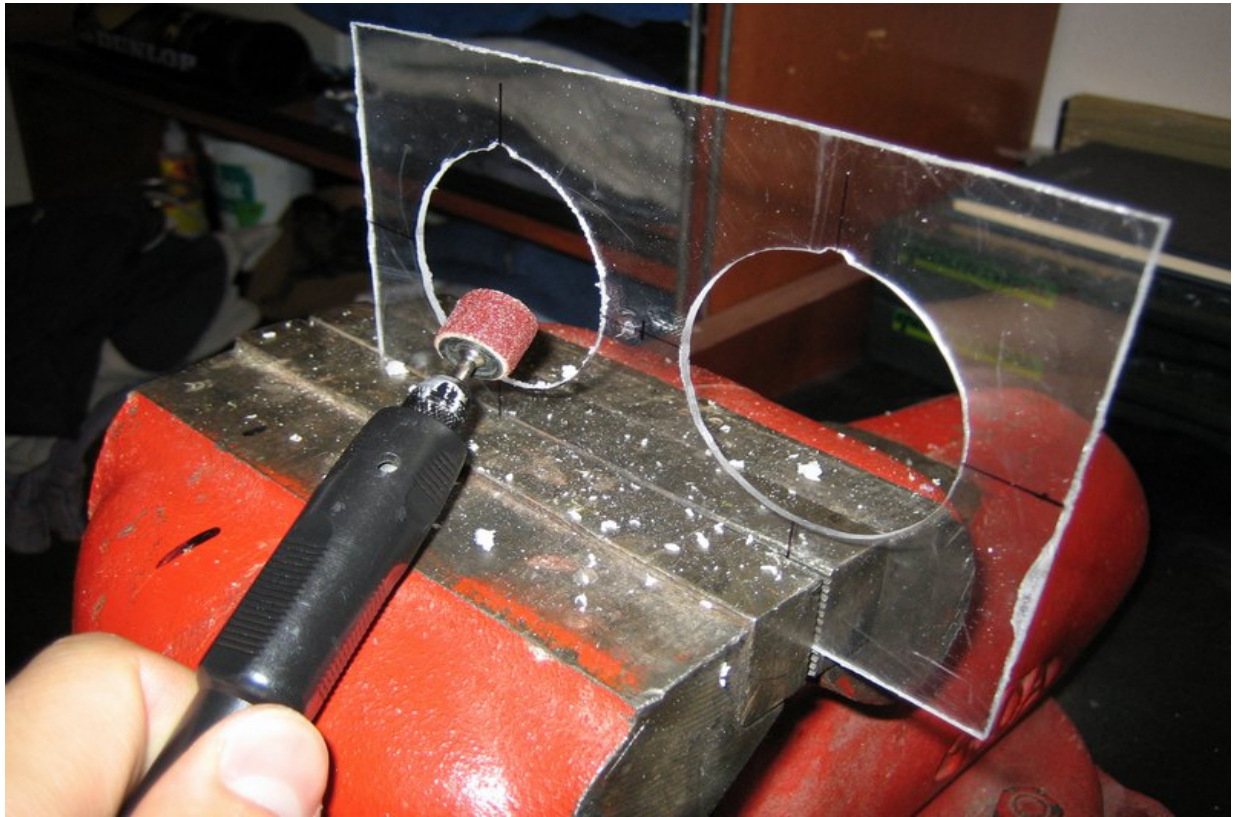
I decided to install the gauges in the empty space in front of gear lever and below the A/C. This way I am loosing some place in the car to hold my CDs for example and I am loosing the cigarette lighter (I will find a new place for it later) and ashtray (no big loss, I never ever used it).

First I had to make a frame for the gauges. On the following pictures can you see my first version that I made from thin plastic. I realized soon that it had been too thin and fragile and I had to make a second one from thicker plastic. I would recommend 2,5 - 4 mm thick plastic, whatever you can get.

After having the plastic plate in the right shape I drilled a hole and than cut out the circles for the gauges by means of small mill.



I grinded the edges to be smooth and to have the shape of nice circles big enough for the gauges (53mm diameter in my case).



I decided to cover the frame with black leather. It is much nicer finish than simple paint, looks elegant and in black color suits any interior trim. I put thin layer of plastic foam on the frame under the leather to make it softer for the touch.



I glued the leather onto the frame and let it dry out.



I cut the hole for the gauges with sharp scalpel.....



....and installed the gauges.



I prepared the installation place in the car. I took out the ashtray door and cigarette lighter. My lighter was stuck in some way, I disconnected the connector at the bottom and I had to take it out by breaking it with pliers and pulling out. For this you have to put away the gear lever leather gaiter by gently squeezing the chrome plastic trim and taking it out.



At this point, I am missing the pictures as I accidentally deleted them ☹.

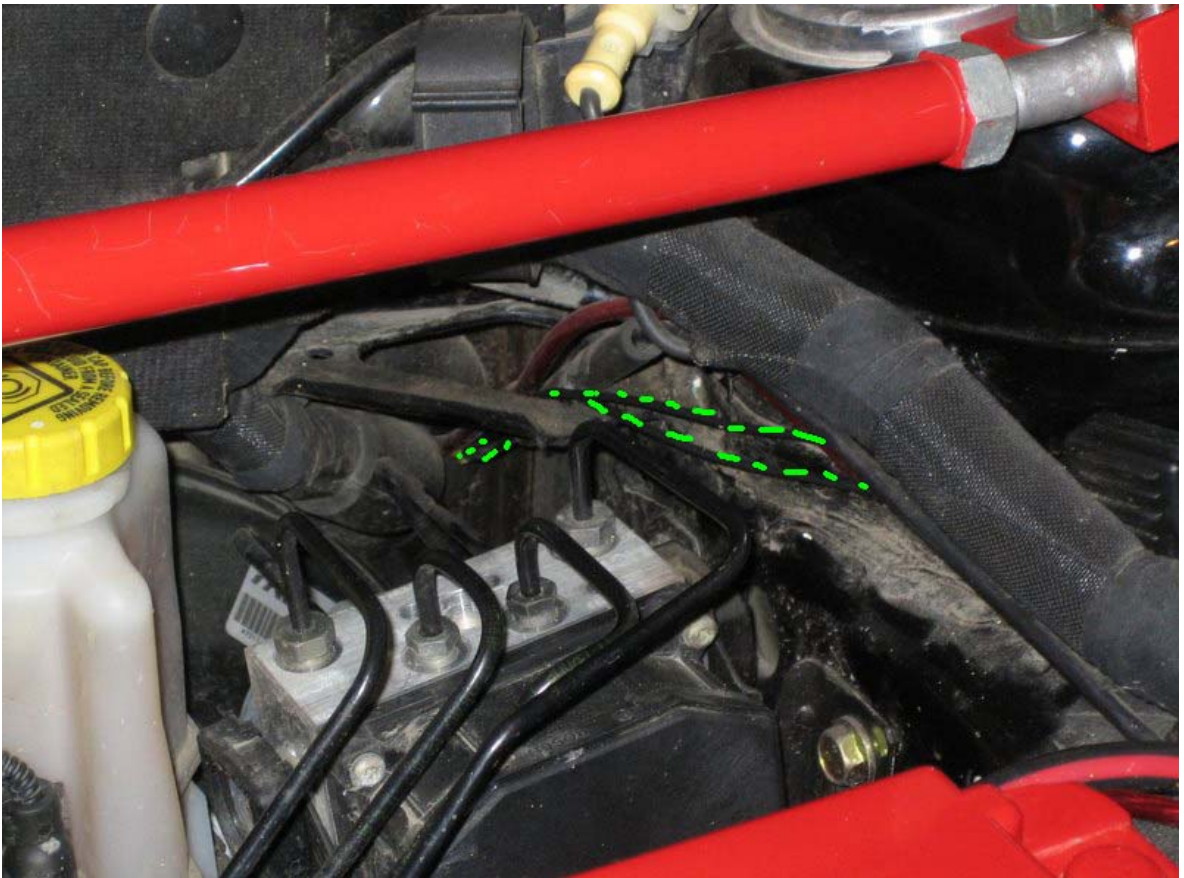
I followed by electrical connection. First I connected longer cables to old cigarette lighter leads. It includes all I need. +12V, Ground and dashboard light switched 12V. Wiring the gauges is not difficult. Both gauges have to be connected to +12V. Both have to have ground connection. Gauges backlight bulbs obviously need ground and dashboard switched +12V as well. The difficult thing is to wire the sensor cables. I have soldered them to the gauges, run through ashtray hole, under the fuse box through the rubber seal into the engine compartment. To pass them through, I used sharpened wire that I stuck through the rubber seal from engine compartment into the interior.

When all the wires are connected I fitted the gauges into the interior. I screwed two pieces of metal bended in 90 degree "L" shape onto the central console and I stuck in the gauges plate by means of double sided tape. The tape is more than enough to hold the gauges and the gauges plate has so tight fit it holds in place almost alone.





This is where I passed the sensor cables from engine bay into the interior.



The wires pass along the battery, go down around fuse box and follow to the front until they reach the harness that goes from under the headlight to above the radiator.



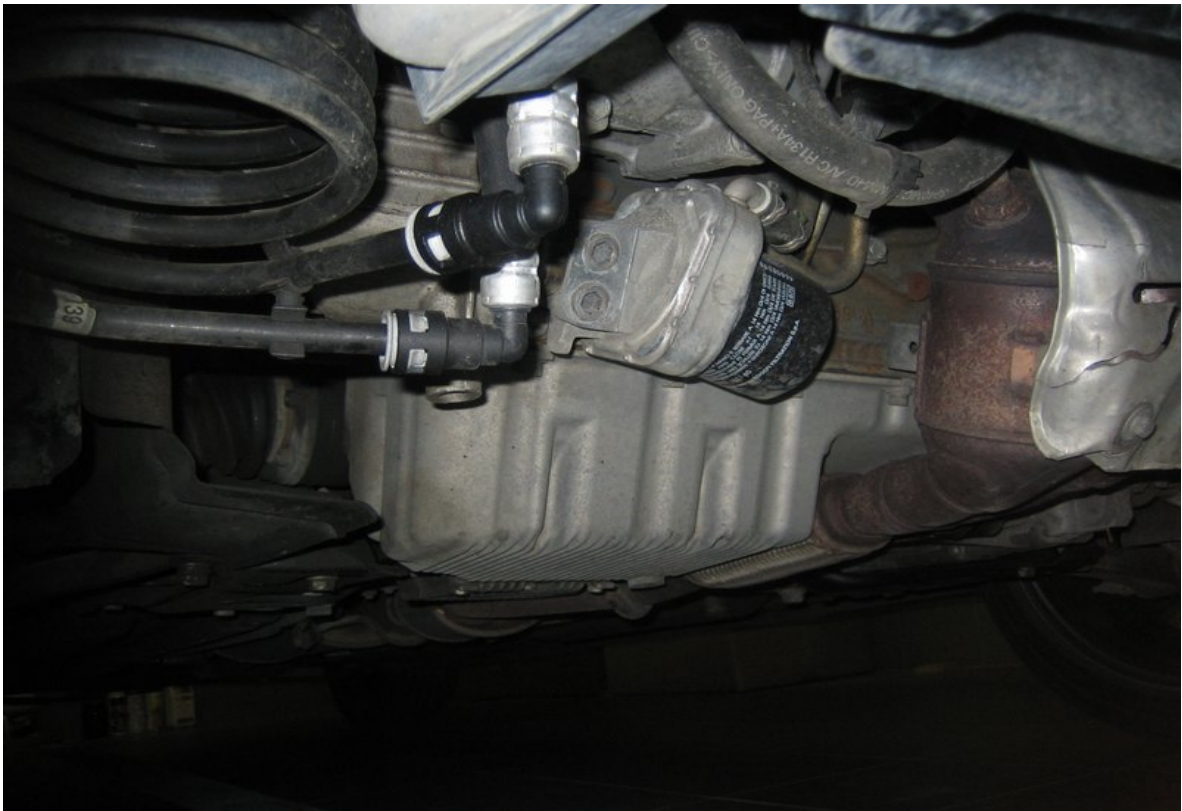
I connected the cables with the harness passing just above the radiator and by the front right light I turned them down to get to the oil filter.



I joined the wires to the pipes in place to hold them firm. I tried to avoid the pipes that get too hot or too cold.



Here is the place where the sensors will be installed. Those two screws on the side of oil filter will be replaced by the sensors.



Oil temp sensor already in place. I unscrewed the blank screw from the block (get the right size tool, the screw is really tight fit) and installed the sensor. The installation hole is 18mm so you will probably need the right size adaptor for your sensor.



Oil pressure sensor is the same job. There is not much space, so you might have problems installing sensors so close. 1 or 2 mm more in diameter and I would have serious problems with the installation. I had to bend the temp sensor lead a bit not to short-circuit it with pressure sensor.



View from the side. You can see how much I had to bend the temp sensor to get a safe fit.



Here can you see how much oil I lost during the installation of both sensors. Almost nothing. As the oil circuit is not under pressure, only few drops from oil filter will come out. I had the screw out for maybe one second. With one hand I unscrewed the plug and with second hand immediately screwed in the sensor. Few seconds job.



Sensor installation is finished. I wrapped the pressure sensor in rubber insulation tape to avoid accidental contact with temp sensor. I connected the sensor wires and turned the engine on for 1 minute to check for leaks. Than I made a 10 km drive to see if the gauges work and checked for leaks again. On the next day, I made a long trip of about 200km and checked for leaks again to be completely sure. Everything seems ok so far.



Daily use experience:

So far I was able to see the readings only during nice summer temperatures 22-32⁰C. I don't know yet what the temperature and pressure will be in freezing weather.

As I expected, oil temperature starts to rise up much slower than engine/water temperature. My water temperature gauge is almost reaching the normal 90⁰C when the oil temp only starts rising from 50⁰C. It takes 10-13km city driving in warm weather for oil to reach 90⁰C and 3km more to reach 100. Once warmed up, oil temperature varies from 100-115 degrees, depending on outside temp, driving conditions, speed, revs... Once I hit 120⁰C, but I was trashing the car a lot.

Regarding the oil pressure, after the cold start it rises to about 5,5bar at idle and can go up to 6bar when driving the car with cold engine. I think in winter after starting the engine at -15⁰C I will see even 6-6,5bar after startup. As the oil is warming up the pressure goes down. With hot oil, the pressure at idle is about 2bar and during driving usually 4-4,5bar. Under heavy load it goes up to 5bar and with minimal load it can fall to 3bar.

Note: due to sensor installation place, the temp reading shows temperature of oil going from the sump through the oil pump and oil filter. This way the oil cools down a little. Oil in the engine block or cylinder head coming back to the sump has higher temperature; I guess at least 10-15 degrees.



Disclaimer:

Permission to reproduce this document on a non-profit basis is granted. You can use and reproduce this guide and photos it contains freely in any non-profit way you consider useful for any Alfa-owner. You can make it available on any Alfa-Romeo dedicated website, provided that this disclaimer is included in full and you inform me about it.

This guide describes how I did the job. It may not be complete or some steps might not be described detailed enough. Use it for your inspiration, not as step by step guide.

If you decide to install the gauges, follow my steps at your own risk. Please only attempt to do it if you feel you are competent. I'm not responsible for any damage you might cause on the material or on your car.

Always use common sense not excessive force. Don't blame me or this guide if you break or damage something. It was your choice to try this.

Contact: quadri_foglio_verde@yahoo.it