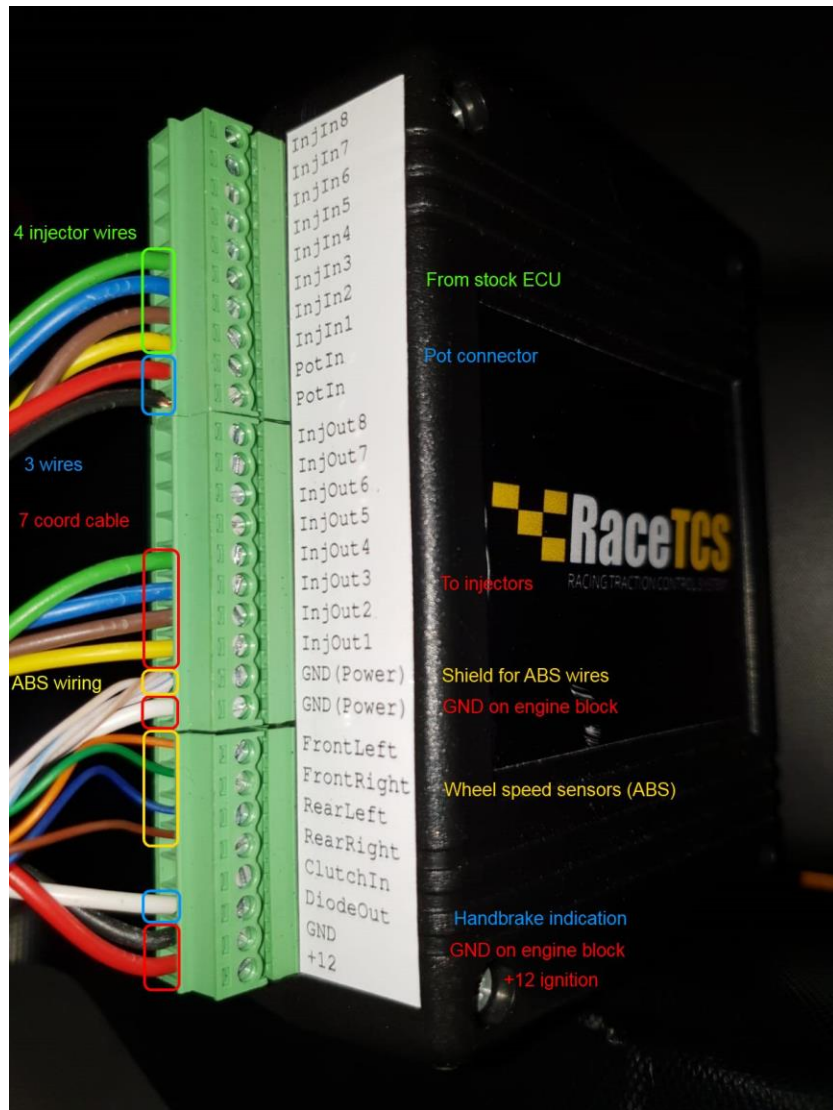


This guide is a common effort of all people from VX220.org.uk that took part in group buy.

Race TCS DIY guide for VX220.

Target situation is to have device attached to firewall (or a carpet) behind passenger seat with ABS sensors connected, 4 injectors signal routed through RaceTCS, potentiometer mounted in handbrake cover under handbrake and RaceTCS indication attached to handbrake light on the dash. Finished installation from RaceTCS perspective:



### Materials needed for installation

1. Ethernet stranded cable (4 twisted pair). Make sure it is stranded, not solid, as solid will break. Need around 4metres



2. 7 cord cable 0.75mm<sup>2</sup> used for trailers 2 x 3metres. One piece will need to be gutted, as only 4 wires are used for injectors, the other 3 are used for potentiometer and indication on handbrake



3. Ground crimp connector for M8 bolt



4. 2 scotch crimp connectors (one to +12V, one to handbrake indication)



5. Insulating tape
6. Wrapping tape
7. Heat shrink

**Recommended tools:**

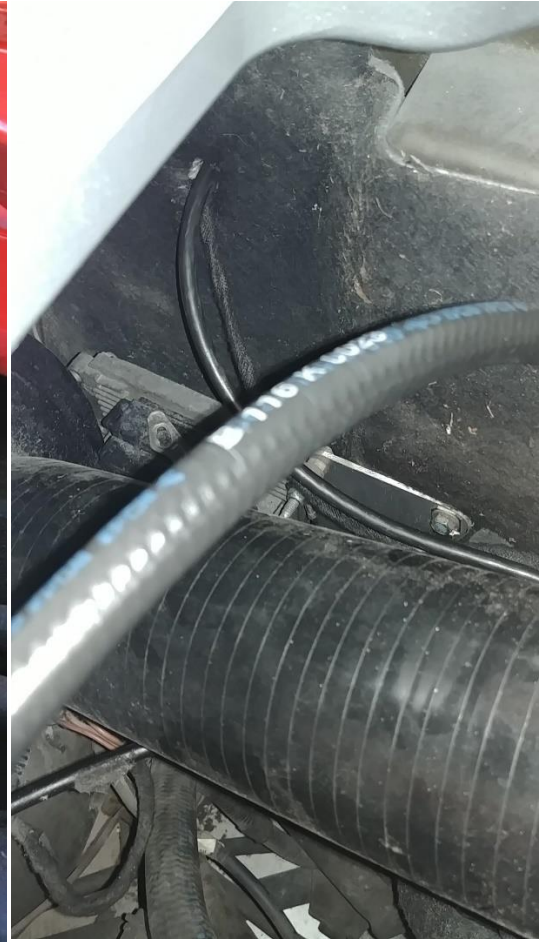
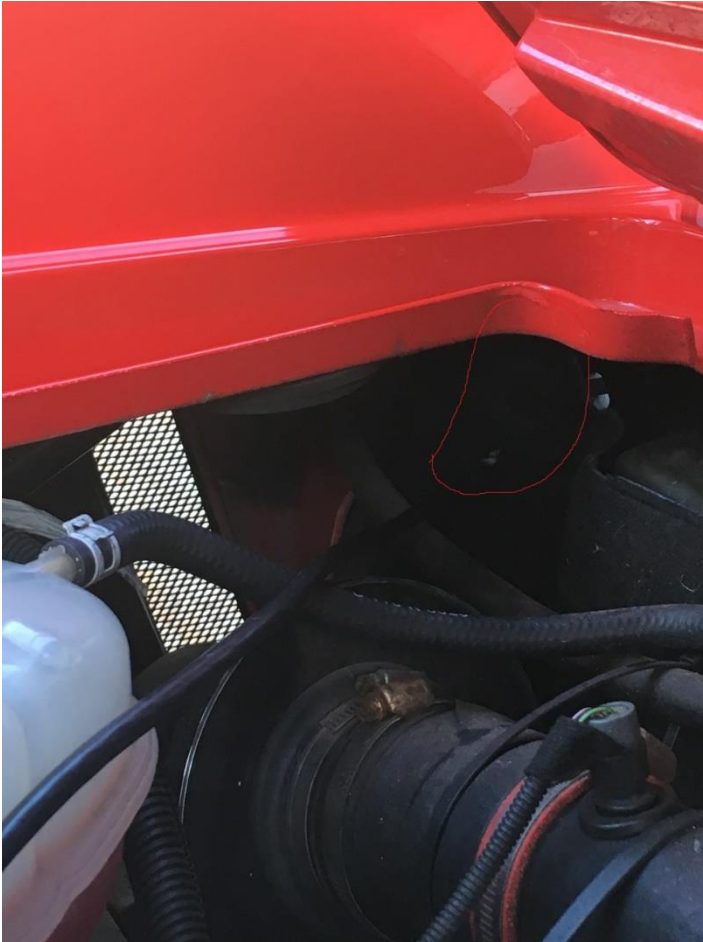
1. Wire cutter
2. Insulation stripper (can be used to expose wire without cutting)



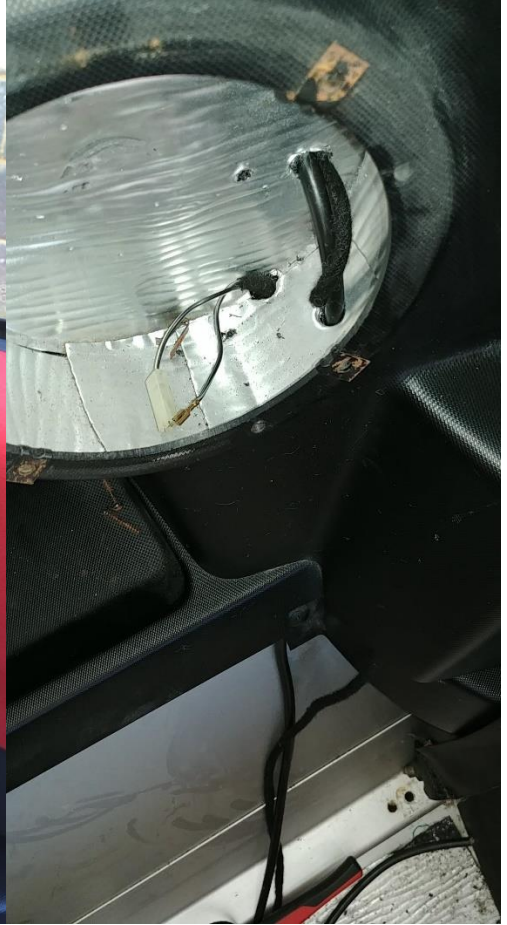
3. Knife
4. Coat hanger wire
5. Lighter (for heat shrink)
6. Small flat screwdriver to tighten wires in RaceTCS connectors

### Steps to install RaceTCS in VX220

1. Remove passenger seat
2. Remove handbrake cover. (to remove the aluminium handbrake grip there are two allen key bolts on the underside approx 3mm).
3. Remove passenger side rear speaker
4. Drill two 10 mm holes as pictured through the speaker bulkhead, through the insulation foam. This then gives access to fit the 2 x wires which are then fed through to the engine compartment and then to the injector loom. Drilling through insulation is hard, as it binds to the drill. Drill from the cabin towards engine bay, when you feel the drill stretching the insulation, make an incision with a knife where the drill is and then work with knife/screwdriver to make the hole big enough







5. In Turbo cars, detach breather hose, removed plastic cover from the injector cover as pictured. Injector wires are brown with a stripe – yellow/green/blue/red. Ignition +12V is white-red stripe (a bit thicker than injector wires). It is best to trace injector wires to each injector plug to be sure correct wires will be cut. Cut injector wires, put heat shrink insulation, strip around 5mm of each end, and solder the wiring. Wires that go FROM stock ECU go as INPUT in RaceTCS. Wires that go to injectors go as OUTPUT in RaceTCS. If you have 7 cord cable as we did, use that as Injector Out, +12V and ground.



In case of NA cars, you can attach to injectors near the ECU. With ECU relocated (most supercharged cars) it is best to cut in as shown in the picture. Wire colors are the same as in Turbo.





6. In NA cars, +12 ignition is taken from coil power supply

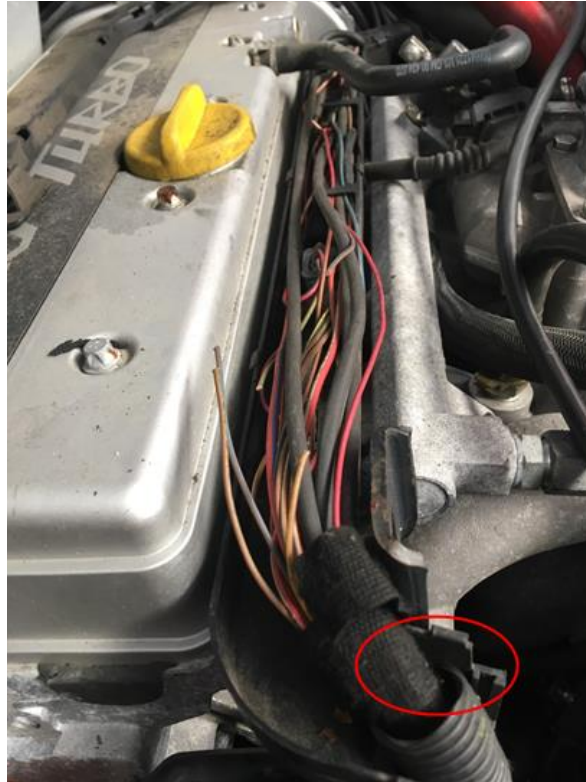


8. From the 7 cord cable, 4 are used for injectors, red is used for +12 ignition, black and white is used for ground with ground connector for M8 bolt. Ground connector is put under this bolt in NA cars





And somewhere around here in Turbo cars



9. To connect wheel speed sensors near ABS, you need to route the cable through grommet under windshield on passenger side (left). You punch the hole with a screwdriver, make a small incision with a knife near where you punched it and then push Ethernet cable through. This might be easier if you tape the cable to a screwdriver and then push it through. Then the wire goes through front tunnel part. If front tunnel cover is not removed, then use coat hanger wire, push it through the tunnel, tape Ethernet wire to it and pull.
  
10. Near ABS pump you need to unplug the connector, take the cap off, expose the wires and find RED (pin 9), GRAY (pin 11), YELLOW (pin 14), PURPLE (pin 22). Take off some insulation with a knife. Ethernet cable consists of 4 twisted pairs – one wire is colored, the other is white. Near ABS pump white wires can be cut off, we only need colored ones. Solder them as in the picture below (blue to purple, green to gray, orange to yellow, brown to red). If you have abs switch , then solder to wire before the switch (so that the switch only breaks the signal to ABS plug, not RaceTCS).



Then insulate with the tape, wrap with wrapping tape and connect to ABS pump. Using cable tie to secure Ethernet wire to ABS wiring harness (before using wrapping tape) might be useful. When finished it should look like this (don't forget about ABS plug cap!).





On RaceTCS side, wires from ABS are connected as Wheel speed inputs and white wires are twisted together, soldered and connected to GND (power) input. This will work as a screen for ABS wires to avoid any noise interfering with RaceTCS or ABS. Refer to picture in the 1<sup>st</sup> page.

11. The leftover wires (red, black) are used to connect the pot via solder. Drill a hole in handbrake cover , put a pot through, put a washer and tighten a nut. The plastic knob can be pressed on to the metal shaft
12. Handbrake indication is made by connecting white wire to one of the wires in handbrake switch. You need to identify which of the 2 wires triggers the lamp. To find the one, turn ignition on and pinch each wire a bit, then connect it to ground with a wire. The one that triggers handbrake lamp is crimped to white wire with scotch crimp, then connected to Diode out in RaceTCS.

When finished, it should look similar to this ☺



You can test RaceTCS by checking, if handbrake lamp blinks when you turn the pot (ignition has to be on, handbrake off). If it blinks, then start the car and see if engine works as before. If it shakes and misfires, check all injector connectors. **GOOD LUCK**