

Nova 20XE Conversion Guide

The nova 20XE conversion is outlined below. You need to consider all the points in the list, but the 20XE engine does bolt into the nova pretty simply.

1. Fuel

If you nova is a carb model, you need to install injection fuel lines, or at least think about how you are going to deal with the fueling of the 20XE. The fueling system for the 20XE requires two lines from the petrol tank, one supply, and one return. 1ltr novas do not have a return fuel line, and therefore you either need to braize a fitting into the petrol tank as a return, or you need to install a petrol tank with a return line in it.

The fuel pressure required for an injection engine is much more higher than that required for a carb model, and the fuel hose used in the carb models should not be used to carry the high pressure fuel required for the injectors. As a get around if you don't have time to install the injection fuel lines right down the car, you can mount the fuel pump in the engine bay. Now, as the pump sucks the petrol from the tank, this is not at pressure. Only the section after the pump, and before the regulator is high pressure. The return line can always be left as the std petrol line.

When using a carb tank, there is no swirl pot in the tank. The swirl pot holds a reserve of fuel if you like, and when you corner hard this reserve of fuel is still able to be put through the pump, even though the petrol in the tank is all being shoved out of the way of the supply line opening because of the cornering G.

So a swirl pot in a fuel injection tank is the best way forward.

The GTE / GSi / SRi fuel pumps are fine for the 20XE, as is of course a 20XE fuel pump, which is what I used. The Spi 1.4i (single injector) pump cannot flow enough fuel at a high enough pressure for the 20XE though, so you will need to replace this pump if it is the model you have.

2. Chassis

The engine conforms to Vauxhalls family 2 layout, and all the Nova mounting brackets will actually fit the 20XE engine and the F16/F20 gearbox. However, there are a few exceptions. The TD engine mounts are different because the lump is an isuzi made diesel, and the 1ltr front offside engine mount is different too.

The front offside mount must be changed from standard so that the engine sits approx 1-1.5" down from it's std position. This sits the engine straight, and also enables you to shut the bonnet without risk of the engine hitting the bonnet. To do this, you can use the standard nova mount, but cut the chassis bracket off, and re-weld it onto the chassis leg 1-1.5" further down the leg. The other mount that isn't right is the rear gearbox to chassis mount. This holds the gear linkage, etc. You can keep the nova gear



Flip the plastic universal joint around to give the nova linkage a longer reach.



However, the differential casing of the F20 and F16 are different to the F10/F13, etc small block gearboxes. You need to put spacers between the rear gearbox mount, and the gearbox differential so that the engine/gearbox is not twisted in the engine bay. This needs to be spaced by 10mm between the mount and the gearbox. You could also move the whole linkage across by 10mm by slotting the chassis mount screw holes so that the bracket sits right next to the diff. I don't know what effect that would have on the gear linkage gear selection though. It's bad enough trying to get it to line up as it is!! lol

On the 20XE inlet manifold there may be a lug on the part that comes around where the inlet runners meet, this comes into contact with the drivers side heater matrix hose, and needs to be ground off. As well as that, whether you have that lug or not, you still need to cut down the drivers side heater matrix hose by at least 10mm, but take off as much as you can to give that hose more room to bend down under the inlet manifold.



Inlet manifold gets in the way of the drivers side heater matrix pipe.

The inlet manifold also gets in the way of the clutch cable exit from the bulkhead. Insert an iron bar into the clutch hole in the bulkhead and make the hole point towards the front passenger side of the engine bay, towards the floor. This will let the clutch cable be free. Otherwise the clutch cable is pushed about by the inlet manifold, and it ends up snapping the clutch cable.



This is what happens when you don't modify the bulkhead. Make sure the clutch cable exits the bulkhead pointing towards the front passenger corner

The alternator pulley hits the chassis leg of the nova right by the drivers side suspension turret. This means you need to alter the chassis leg to avoid the alternator pulley. This mod needs to take the chassis leg in so that it's inline with the suspension turret to miss the alternator. You also need to alter the crank pulley. You must run the single-V alternator pulley, and not the poly-V one that came on later engines. You need to take off the outer V on the crank pulley, which is used for the PAS + Aircon pump belt on cavs, etc. You can machine it off, or grind it down with an angle grinder or similar. Make sure you try and keep it fairly balanced though, as it sits right on the crank.



There is no room for the alternator. The engine also moves about quite a bit, especially on standard rubber mounts, so make sure that there is plenty of room for it to move.

3. Suspension

Running standard uprated shocks + springs is not great, but it seems to work well enough to get you started. Seriously think about getting some proper rated bits for the conversion though, it makes a lot of difference.

The Anti-Roll bar hits the 2ltr tubular exhaust manifold. This can be got around in two ways. You can either remove the anti roll bar all together, and run without one, or you can modify the tie bar brackets to lower them on the front cross member. With so much more weight at the front of the car with the 20XE engine in, running without the ARB isn't as daft as it sounds. It helps in a way because you tend to get more understeer with the heavier engine anyway. Most people prefer the handling with the ARB removed. It's wise to use a strut brace with the 2ltr conversion IMO.

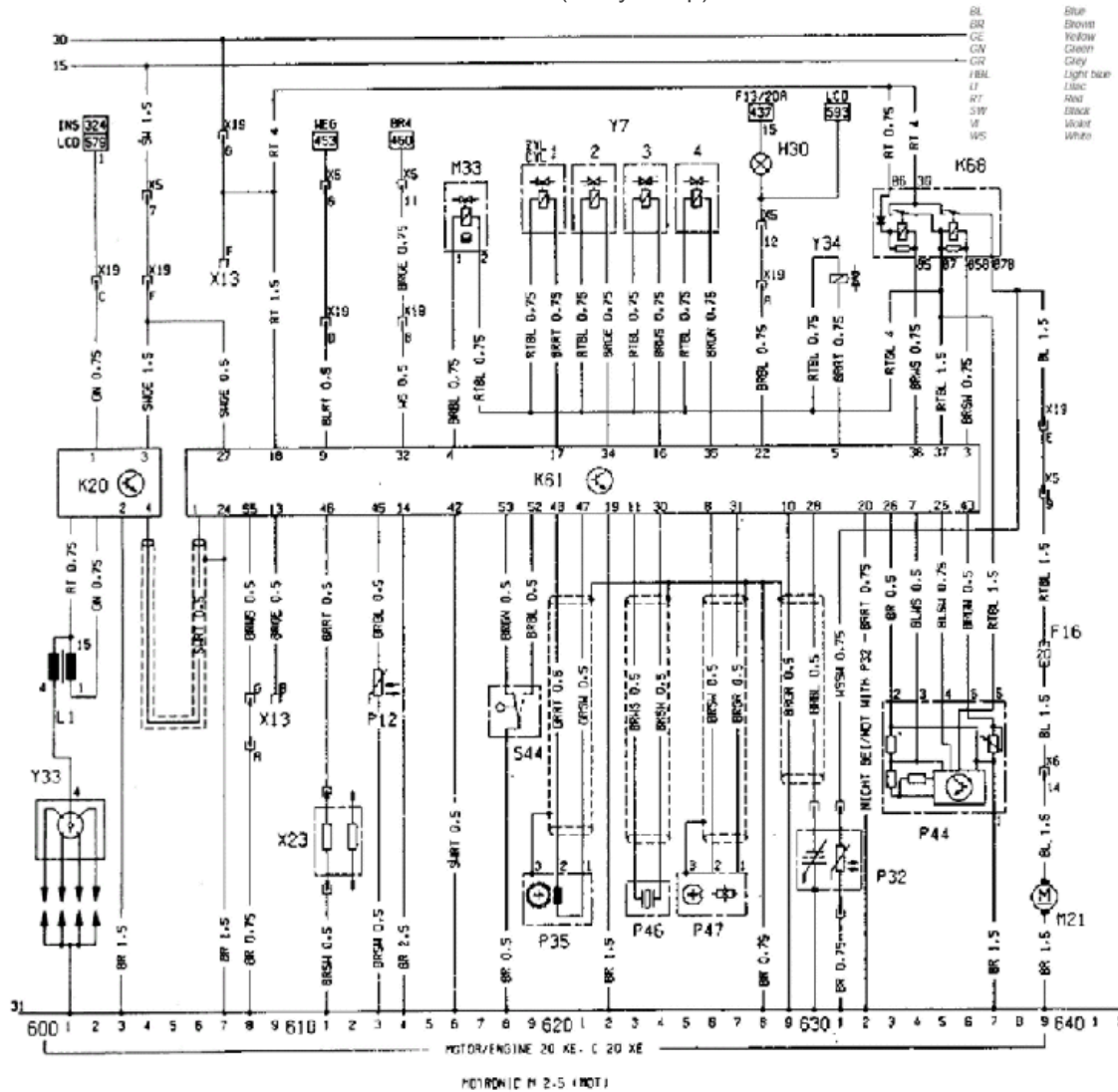
4. Driveshafts

For ages people were having to buy expensive custom driveshafts. Whereas it turns out you can just use Nova GTE driveshafts, and put Cavalier Mk2 (late) 1600cc inner CV joints. These fit in the F16/F20 gearboxes fine

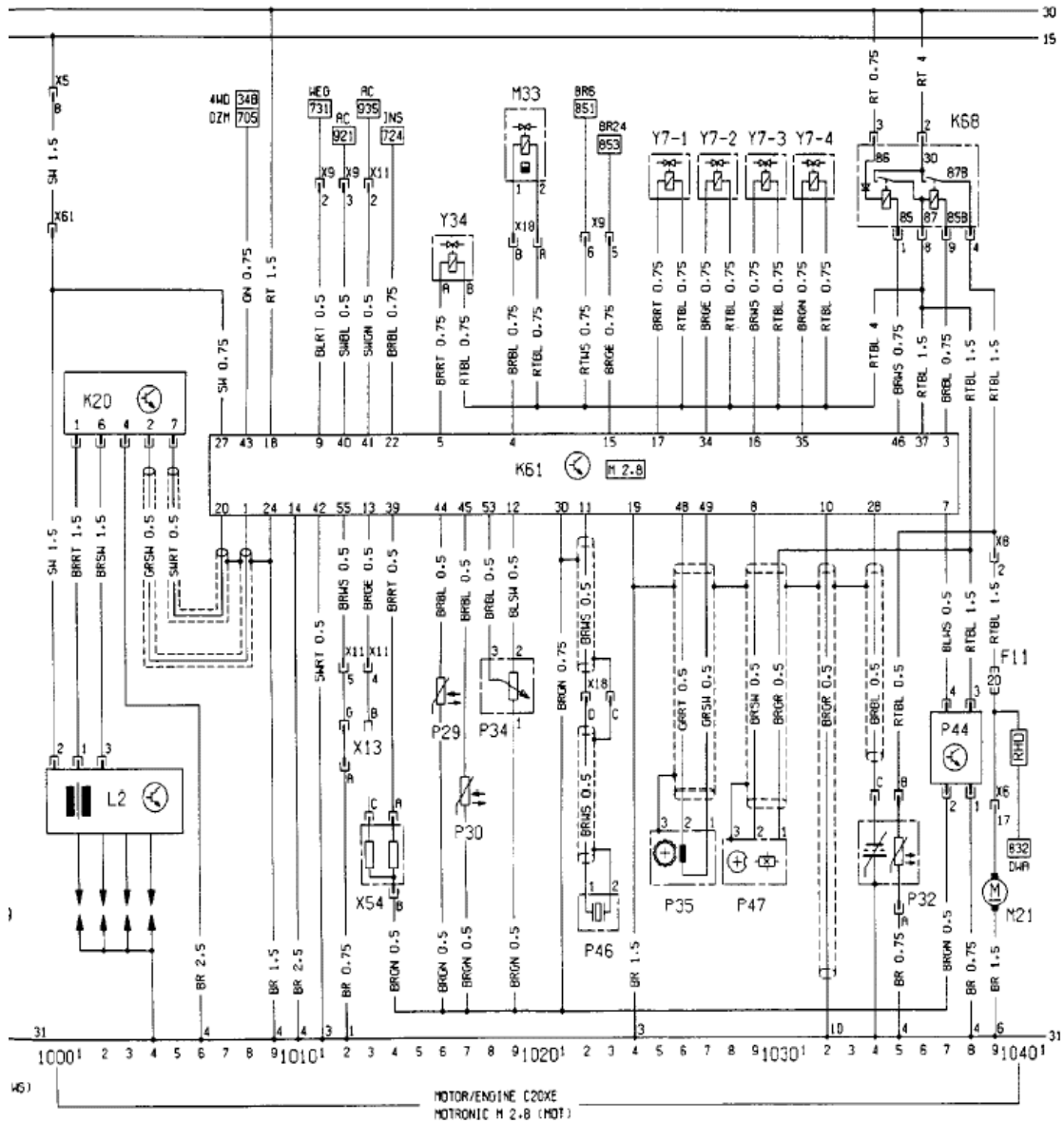
5. Wiring

Wiring is easy, the motronic looms are whole looms in their own right. All you need to link between the nova and the motronic loom is a permanent live (large red), Switched live (Black), and an earth (Brown) for the engine to start. Then just connect the dash wires to the relevant places. Most of the dash wires are brought to the ECU part of the loom, where they normally connect across to the dash. If you have the large circular connector in the loom for your 20XE, it contains 90% of the dash signals you need. Here are the motronic M2.5(<93) with dizzy, and M2.8 (93>) dizzyless wiring diagrams:

Motronic 2.5 (Dizzy setup)



Motronic 2.8 (Dizzyless)



N. Notes

Use a nova clutch cable Use an Astra / Cav accelerator cable. Mine needed adjusting on the accelerator pedal to give full throttle.

Checklist:

- Alternator - chassis clearance + bottom pulley to chassis
- Front offside engine mount bracket
- Gearbox diff spacing
- Gearbox linkage
- Gearbox bottom lug
- Anti-roll bar + tie bar lowering
- Driveshafts – Use 1.6 Big block inner CV joints. Make sure you get nova driveshafts with 22 splines on the inner CV side.
- Heater matrix driver side needs to be cut down + lug on inlet manifold
- Clutch bulkhead exit needs to be bent over towards passenger side
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