S14/S14a/S15 SR20DET Engine and Gearbox Fitting Guide for UK & Euro S13 200sx

2008 Edition
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This document considers donor engines from the UK 200sx S13, S14 and the S15.

The initial document covers transplanting engines into a UK RHD 200sx. There is a supplement for transplanting engines into the LHD European 200sx – this is at the back.

Information is available on request for transplanting UK SR20 engines into late model Kouki 180sx S13s, and also for transplanting LHD euro SR20 engines into the LHD euro 200sx

It is assumed that 180sx SR20 engine harnesses are plug-and-play into UK S13s, so these are not mentioned.

It assumes you are experienced in engine removal and fitting, concentrating on the main (falsely) perceived difficulty – electrical wiring.

The air-pipe system is not considered in detail, as factory service manuals show this for you, and it is open to re-arranging/simplifying anyway (binning carbon canisters, and EGR pipes).

We take no responsibility for you blowing up your ECU/engine etc due to errors in this document, or your own cack-handedness. This is just a guide, read the service manuals if you're not sure (that's where most of this info from).

Read the guide through completely, as some issues are covered twice, but in more detail later on. If you still have questions, contact me and I'll help (and add them to the guide later.).

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Fitting Guide

Well here an overview of what's needed. I'm not going into every nut and bolt because if you have to worry about the tiny things then you should maybe consider getting some one else to do the swap for you.

Main parts you need:

SR20DET engine and gearbox ☺ (inc. alternator, starter and PAS pump).
SR20 engine harness and ECU.

Don't forget to get the Air-Flow Meter and the transistor pack from passenger suspension turret.
CA18 alternator/starter loom.
CA18 ECU harness to butcher and steal some plugs from.
CA18 dashboard water temperature sender, (single spade connector, bolted in by plenum).

Additionally for S14a (with NATS)

Driver or passenger key, NATS IMMU box (little black box above ECU) and halo from around ignition barrel. Warning LED from dashboard is optional, but looks nice.

Additionally for S15 SR20DET with 6-speed box:

S15 propshaft
If your S13 is pre-ABS, then get a rear diff with an ABS sensor (can be from any 200sx or Silvia with ABS).
A frequency converter board.
There is no transistor pack, so don't worry about looking for it (they're now built into coil packs)

Optional:

S14/S15 radiator and pipes.
S14/S15 metal outlet 'hot pipe' from turbo.
S13 accelerator cable bracket holder from plenum.
S14/S15 heater hoses.
S14/S15 brass restrictor from fuel return pipe (not sure how essential this is).
Carrier for SR20 ECU.
Consult plug from below driver's fuse box (+ 10cm of wire).

Try and get all the bits from the same car to avoid compatibility issues i.e. with. AFM, CAS. Particularly make sure you get the NATS parts from one car or it won't start.

Wiring:

Soldering Iron and solder
Wire strippers
Lots of electricians tape.
33kΩ resistor 1/8 or 1/4 watt
An LED and 1KΩ resistor, and a push to make switch are optional for fitting a diagnostics light.
A multimeter may come in handy for checking!

Installation

Before you do anything, fit the CA18 alternator/starter wiring loom onto the SR20 gearbox, it's much easier while it's out. Also slacken off the oil filter, either fit a new one before you put it all back in or replace once it's in - not worth skimping on an oil filter, now is it?

The removal of either engine is pretty straight forward - remove with gearbox as a complete unit. An engine crane can be hired for £15 a day, or buy one for around £150 from somewhere like Machine Mart. The combined weight of engines and gearboxes is around 220kg for SR20 and CA18, so a crane capable of ¼ tonne **on maximum arm extension** is up to the job. Don't forget to remove the gear stick (need circlip pliers). Ideally lift it all from a rope through the front, turbo-side slinger and the plenum Y-bracket support.

Remove plastic trims in passenger side footwell to gain access to ECU.
Remove glove box and metal trim behind.
I found it easier to remove the bolts holding in the fan and heater unit to give a little better access for pulling loom both in and out. You will struggle to remove it completely as there's one up on top under the dash, just slack enough to pull away from the bulkhead - should be enough.
Remove CA18 ECU and engine loom.
It's easier to loosen off the ABS bracket to help in access to the big plug that seals the loom at the bulkhead, more for refitting than removal.

Loosen of the engine mounts on the sub frame. They're on slots and slide up a little, which makes re-fitting the engine easier.

The SR will fit straight onto S13 or S14 engine mounts. It will fit the same as if you were putting the CA18 and box back in. With the engine mounts loose it should be easier to drop the engine onto them, driver side first then passenger, there is more room on passenger side.

Bolt everything up, the s13 gearbox cross-member and propshaft fit straight on for S14 and S14a SR20 gearboxes. S15 6-speed box has different output splines to the S13 propshaft, so get the front yoke of the S15 propshaft transferred over to the S13 (get the universal joints pressed out of both, the S15 yoke transferred and a new U.J. pressed it by a propshaft specialist (<£60).

Make sure you refit all earths, main earth to plenum, engine harness earths at rear of plenum, and small earth from rear of engine to bulkhead.

Swap over the temp sender on the SR for the for the CA one, same thread will fit straight in, if you don't you wont get a reading on the interior gauge, it's located down under the inlet to the plenum.

There was a little restrictor in the fuel return on the s14a parts I got, so I put it back in the fuel return on the SR20, it was right in the end of the **fuel return pipe coming off the FPR** – hint: make sure you get the fuel supply and return the correct way round!

On fitting the loom be careful not to strip any wires on the bulkhead, make sure you get interior wires above the interior brackets for the heater unit, they will tuck nicely up into the top left of the foot well along with relays.

You can make or adapt the following:

The S13 power steering pipe bolts onto the SR20 pump, although the pipe no longer fits in the locating bracket. Where the banjo hose bolts into to the pump, undo the large hex-head intake adaptor from the CA18 pump and swap it with the one on the SR20 pump. This will allow you to correctly fit the S13 banjo hose and bolt.

Make a carrier plate to bolt the s13 accelerator cable holder onto then bolt the lot onto the plenum.

SR20 ECU housing can be used to bolt the ECU into the same holes as the CA18 ECU - cut off the original brackets on the SR20 carrier, straighten the bent one, and bend the long one at the end, so they match the ones on the CA18 ECU. Weld them back onto SR20 ECU carrier.

SR20 heater hoses are bigger, but the CA18 ones can fit inside the SR20 ones which then fit lovely back onto the S13 heater pipes coming out of the bulkhead. I cut off about 2" and inserted them inside S14 ones with a little washing-up liquid.
S15 SR20 heater hoses fit the S13 bulkhead with just a little bit of waterproof tape to enlarge the outer diameter of the bulkhead pipes.

As a temporary measure I crossed over the original S13 WMIC pipes, which then were nearly a direct fit back onto the SR20. I only need alter the hot pipe from the SR20 to fit. This is only to get it running I wouldn't recommend extended use or high boost!

My S13 stainless exhaust was too short to refit my S14 SR20, so a new downpipe was required. You can combine the S14 downpipe and decat pipe with the S13 rear section, or just get a custom unit made up. For the S15 SR20 you can just get away with cutting, rotating and welding the downpipe flange.

Electrical Guide

Right, the wiring is actually rather simple for the SR20 conversion. We're talking about **less than 10 wires** in most cases to start the engine!

The SR20 comes with two wiring 'harnesses':

- **The gearbox harness** – to the alternator, starter and the speed, neutral and reverse sensors.
- **The ECU harness** - to the top of the engine (injectors, spark plugs, CAS), to the MAF, and then into the cabin (via the large rubber bung) where the ECU is plugged into it.

This guide will detail the attachment of both these harness over the next few pages. To summarise how simple it is, what you do is:

- Transfer the CA18 gearbox harness onto your SR20.
- Wire the SR20 engine harness its power, control of the fuel pump and the signals to dashboard/key barrel.

Imagined/Known Difficulties

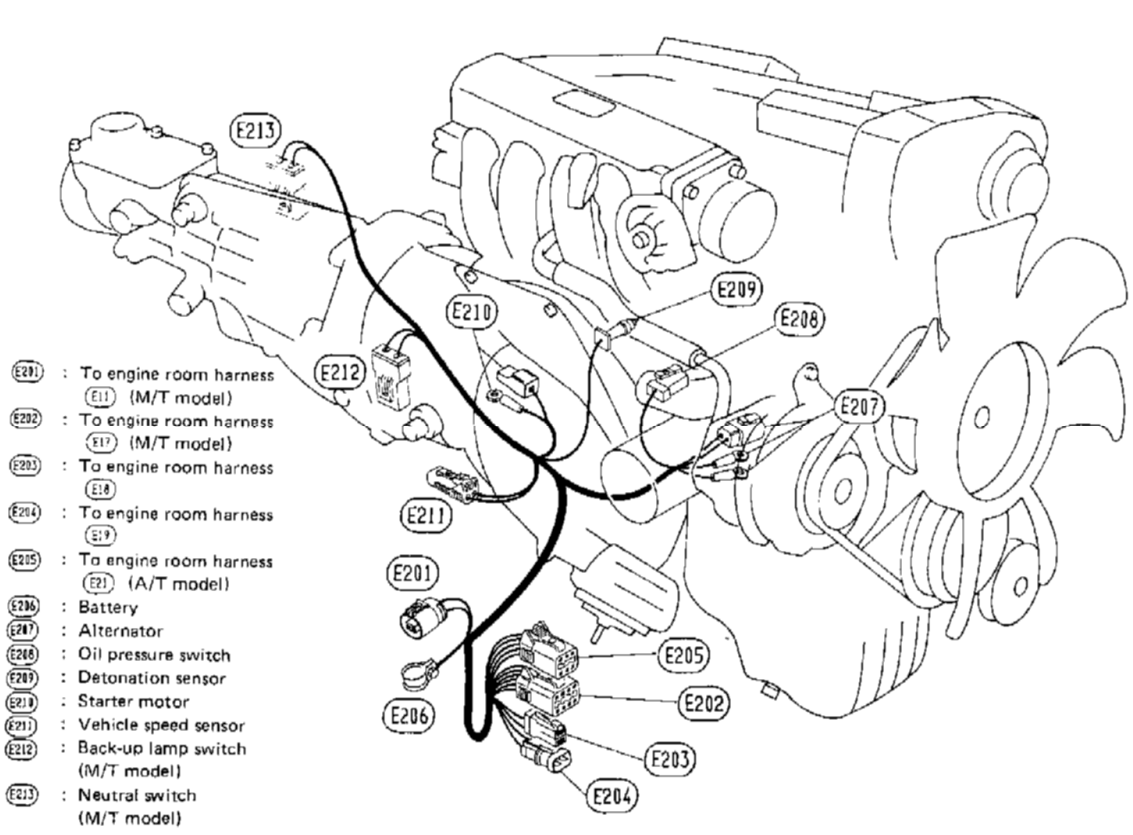
UK S14a ECUs have the NATS immobiliser built in, but provided you have all the bits, this really isn't anything to worry about (and is described here in detail too). Add another half an hour to the job!

S15 6-speed gearboxes do not have a speed sensor. You will need a circuit to tap into the rear ABS sensor to work out the speed (with a 3rd party frequency converter board). Add about £90 and a few hours onto the job for this. More detail is given later on.
(Despite what rubbish you may have read, there is no conventional speed sender anywhere on the S15 (not even the diff). Just like the 350z, the S15 works out the speed from its ABS sensors and the ABS computer then tells the dashboard.)

The Gearbox Harness

Your SR gearbox harness may be newer looking than the old CA one, but it doesn't plug into the S13 as they've changed the style of all the plugs, so instead altering and re-using your old CA gearbox loom on your new SR is a much simpler way. If your S13 loom is looking tatty, just remove the black tape (keep the plastic protection bits though), wash it in soapy water, dry and re-tape it with electrician's tape.
So:

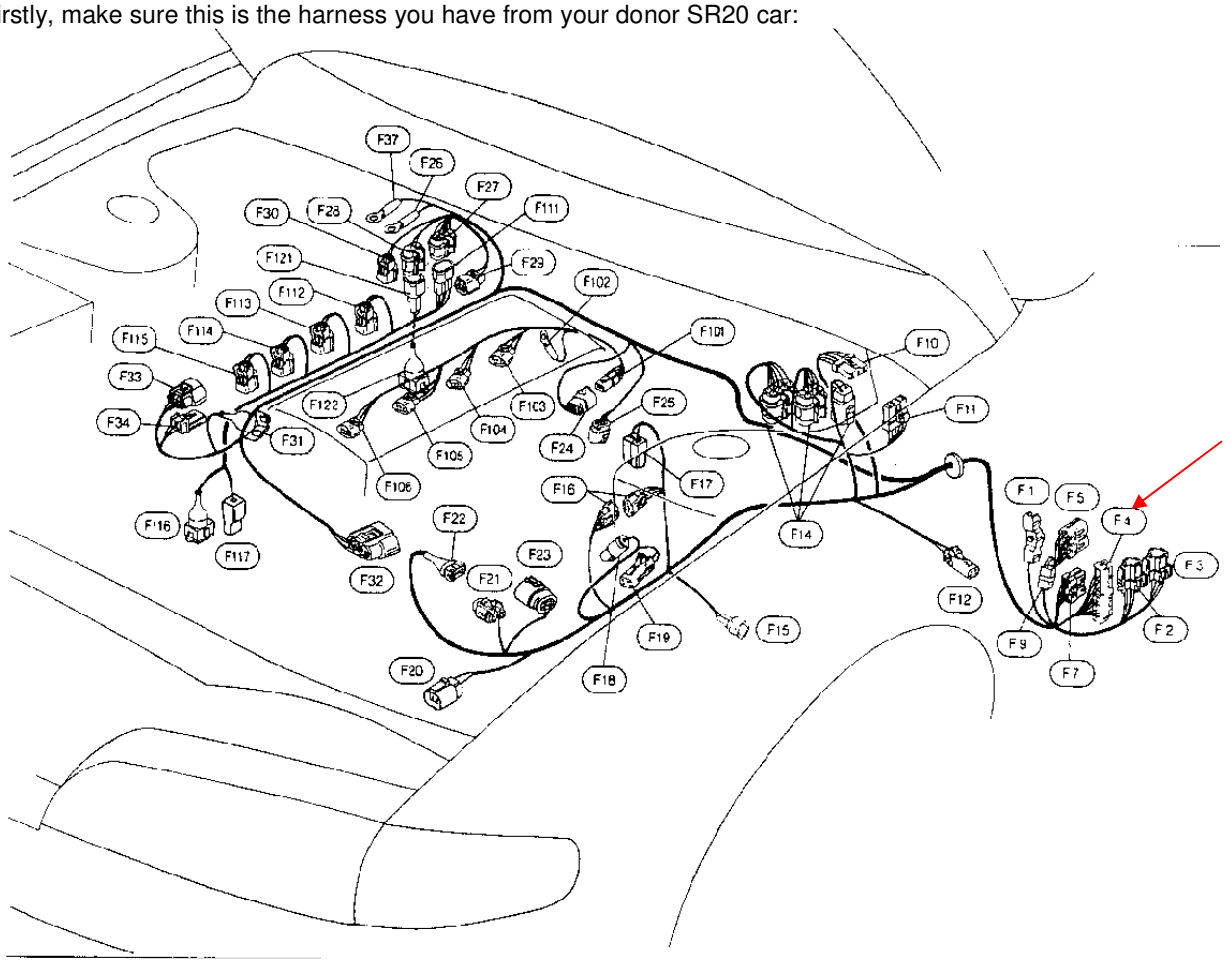
- Remove the starter/alternator harness from your CA18DET.
- Fit it to your SR20DET.
- All the starter/alternator/oil pressure plugs should be a straight fit, although you may need to enlarge the ring terminal for the alternator with a circular file.
- For S14/S14a, transfer over the CA18 speed sender (barrel-shaped unit at the back with 10mm bolt, twist and pull). Make sure speed sensor, reverse and neutral sensor plugs are fitted. If the SR20 box sensors have a different plug to what's on your CA18 harness, you will need to cut off the plugs from the SR20 harness and solder them onto the CA18 harness. All these sensors have 2 wires, so you can join them to the CA18 harness either way around, so no thought is required!



The Engine/ECU harness

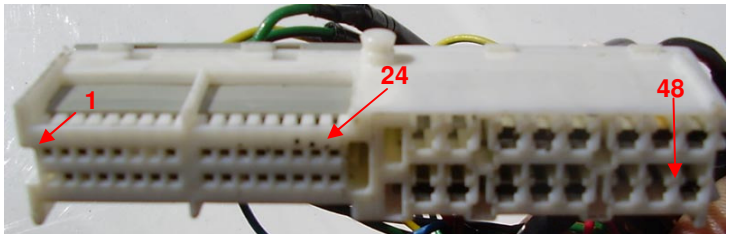
SR20 bits to extract

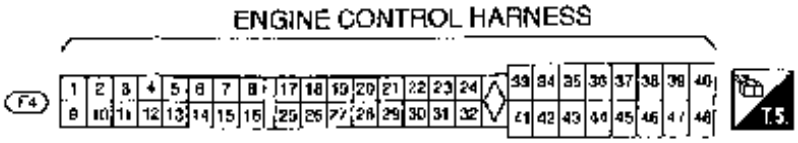
Firstly, make sure this is the harness you have from your donor SR20 car:



This above picture is from the S14, but it's pretty much the same for the S14a and S15 – the odd plug may differ, but you just need to make sure you have this main engine and ECU harness from your donor car.

If you look to the left of the picture, you will see a connector called F4.This is one of the connectors on the interior side of the harness, just next to the ECU. It looks like this:

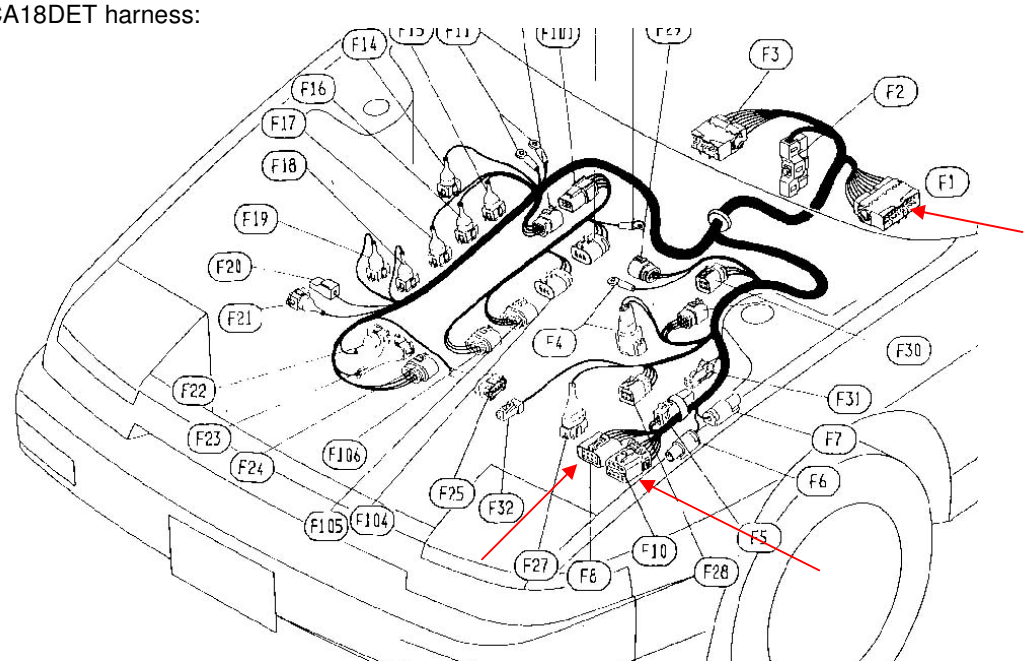




All connections from the SR20 engine/ECU harness to the rest of the car were made through this connector. It doesn't plug into the S13 (otherwise there'd be no need for this guide !), so we will be using is at the splicing point to the S13's electrics.

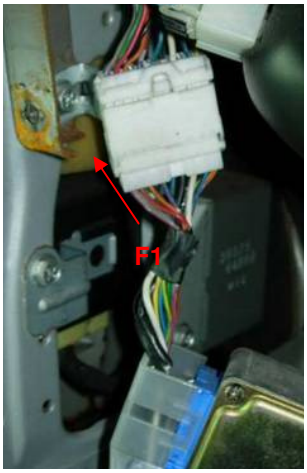
CA18 Bits to extract

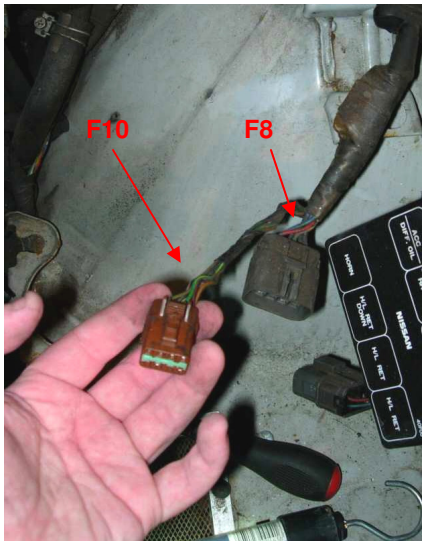
To run the engine, everything needed is already on the SR20 ECU/Engine harness, sensor-wise, BUT it needs to get power, access to the fuel pump and a few other signals to run, this is where we need to get bits from the old CA18DET harness:



We need to take 3 connectors from the S13 engine/ECU loom – F1, F8 and F10. These provided the CA18 loom with all the signals and power it needed, and we're going to join them to the SR20 loom (using the wires going to connector F4 shown on the previous page). This will then allow us to plug the SR20 loom into the S13 and run the engine.

F1 is found just next to the CA18 ECU. Cut it off with about 10 centimetres of wire to spare, as it makes it easier to solder onto the wires. Note that F1 is the plug on the ECU harness, not the mating connector in the car interior– don't cut that that off your S13, it would prove rather silly…





F8 and F10 go to sockets by the passenger headlight, under the airbox. Ideally extract them from the CA18 harness, with as much wire as you can, as they're got to go the same distance (from ECU in footwell to the same two connectors by the headlight) when you've joined them to the SR20 harness.
This may involve cutting off lots of tape though. Alternatively you could just cut the plugs off with a few cm of wire and join wire to extend them.
Don't cut any plugs until you've fully understood this guide, particularly as you might want to hang onto the passenger-side ABS plug and wires (F4 in the above diagram) – explained later.

Grounding Note. Don't forget to use two 10mm hex-head bolts through the ring terminal connectors on the SR20 loom to ground it to the plenum. The plenum and engine is then grounded by the thick ground strap to the battery tray. Make sure the contacts are clean. It is not necessary (or even beneficial) to add additional ground wires.

Ok, so what do you do?

On the next page you'll see what the wires on the 3 plugs you got from the S13 actually do. I've given them labels in bold red.
On the page after that you'll see a table. Look at each line that applies to your particular choice of donor SR20, and make the connection between the wire going to the pin F4 and wire described on the previous page. Strip the wire back where it goes to F4, wrap the wire to the S13 plug around it and solder up, then insulate with tape.

Donor ECU			Wire purpose	F4 pin	Colour	Connect to	Colour
S14	S14a	S15					
►	►		Fuel Pump	22	black/yellow	FUEL PUMP	black/pink

Example:

Donor ECU: The above ► arrows mean that you do this when fitting S14 and S14a harnesses. The arrows are in black and this means you must do this for the engine to run. Grey arrows indicate non-essential items for engine starting, or in the case of Consult, optional extras (albeit nice ones).

Wire Purpose: What the wire does on the SR20 (just a bit of background info)

F4 pin: Use the supplied diagram of the F4 connector to find this pin, then look at the wire joined to it, this wire will need to be stripped back and soldered on to. Make sure it has the colour shown (if in doubt, ask me). Black/yellow means a black wire with a yellow stripe. Blue/red is a blue wire with a red stripe.

Connect to: Select the wire from the extracted S13 plugs that I've labelled FUEL PUMP (see the diagrams on the next page) and join this wire to F4, pin 22. As you will see, this wire is on connector F10, and is a black wire with a pink stripe.

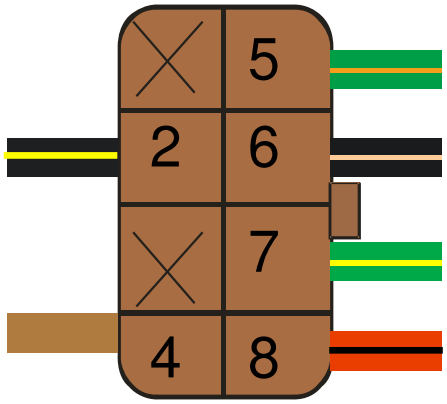
Oh and if you gave/sold/threw away your CA18 engine harness with your CA18… well, you can't nick the plugs off it now, can you…? You can still follow the guide for which wires to join, but you'll have to hard-wire the S14 harness into your S13 (which is not as slick, or removable!).

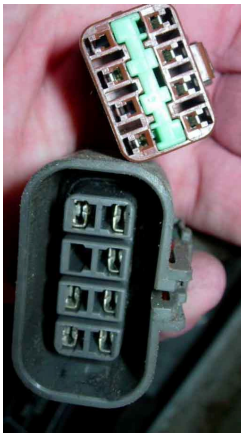
The S13 connectors

This is how they would look with the mating face facing you, note the side notch. An X denotes no pin present.

Connector F10

1: *N/C*
2: *12-14V when Fuel Pump activated*
3: *N/C*
4: **IGNITION 10A** *12-14V when ign on/start (via 10A fuse)*
5: **NEUTRAL** *Neutral switch signal from gearbox*
6: **FUEL PUMP** *Signal wire for S13 fuel pump relay*
7: *Signal wire to enable air-con Relay*
8: *Signal wire to enable ECCS relay*

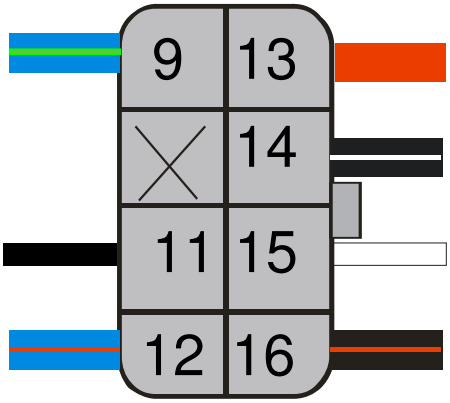




F8 and F10, arranged as in diagrams.

Connector F8

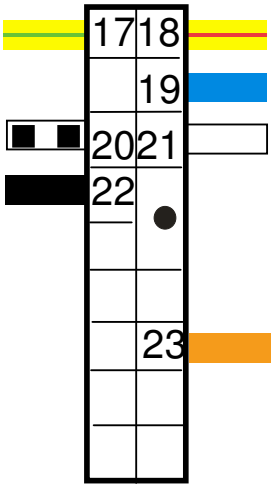
9: *12V when air-con is activated*
10: *N/C*
11: *Knock sensor shield*
12: *IGN coil 12V supply*
13: **BATTERY** *12-14V from battery*
14: ECU power (from ECCS relay)
15: Knock sensor
16: **IGNITION 30A** *12-14V when IGN on/start*



Connector F1

17: **SPEEDO** *Output from speedometer*
18: **TACHO** *Tachometer*
19: **WATER** *Dashboard water temp gauge*
20: **ABS 1** *ABS LH sensor signal .*
21: **ABS 2** *ABS LH sensor signal.*
22: **ABS 3** *ABS cable shield ground*
23: **START** *12-14V signal when cranking starter.*

Remaining wires not important



Wiring Table for S14 and S14a

Donor		Wire purpose	F4 pin	Colour		Connect to	Colour
S14	S14a						
►	►	ECCS Relay in	32	red		BATTERY	red
►	►	AAC	31	black/yellow		BATTERY	red
►	►	IGN coil relay	40	black/red		IGNITION 30A	black/red
►	►	Start	30	Orange/blue		START	orange
►	►	Tacho output	3	Blue/black		TACHO + Res*	yellow/red
►	►	Speed input	5	yellow/green		SPEEDO	yellow/green
►	►	Gearbox neutral	12	green/orange		NEUTRAL	green/orange
►	►	VTC, WG, Lambda power	29	brown		IGNITION 10A	brown
►	►	Fuel Pump	22	black/yellow		FUEL PUMP	black/pink
►	►	Water Gauge	4	yellow		WATER	blue
►		IGN ON	48	brown		IGNITION 10A	brown
►		CAS	35	black/white		F4, pin 36	black/ white
	►	NATS	7,27			See NATS section	
►	►	Diag Lamp	28	orange		Bulb/LED to IGNITION 10A	
►	►	Check	19	green/red		Button to IGNITION 10A	
►	►	Consult RX	8	green/black		See Consult section	
►	►	Consult TX	18	green		See Consult section	
►	►	Consult Clock	15	green/white		See Consult section	

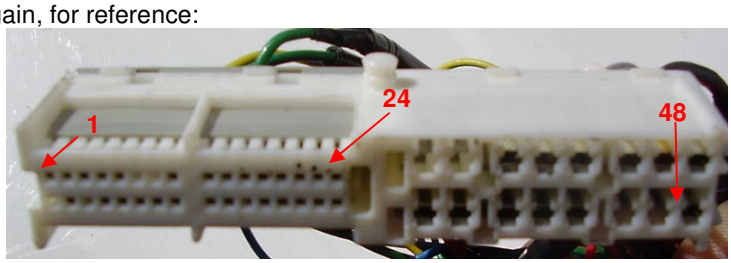
Res:** **additionally attach a 33k ohm resistor between this wire splice and IGNITION 10A for operation with S13 tachometer.

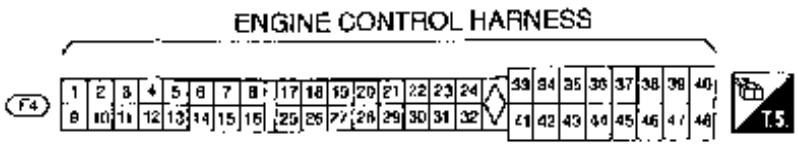
► = essential for engine to turn

► = not essential. Absent speedo and neutral signals may affect operation slightly.

S14 EGR and boost sensor not shown. You'd need to splice off existing plugs and solder on new lengths of wire back to F4. More info available on request.

Here is connector F4 again, for reference:





ABS: **Do not cut ABS wires**. Leave wires from F1 to left-hand side ABS sensor intact and fit back into S13 as part of modified harness.

Wiring Table for S15

Wire purpose	F4 pin	Colour		Connect to	Colour
Battery	41	white		BATTERY	red
ECCS Relay in	2	white/black		BATTERY	red
AAC VTC, WG, Lambda power	10	brown		IGNITION 10A	brown
IGN ON / INJ	9	Black/red		IGNITION 10A	brown
Start	1	orange/blue		START	orange
Gearbox neutral	8	green/orange		NEUTRAL	green/orange
Fuel Pump	15	black/pink		FUEL PUMP	black/pink
Water Gauge	4?	Yellow?		WATER	blue
Speedo input	14	white/purple		SPEEDO	yellow/green
Tacho out	5	yellow/green		TACHO + Res*	yellow/red
Diag Lamp	11	orange		Bulb/LED to IGNITION 10A	
Check	12	green/red		Button to IGNITION 10A	
Consult RX	13	brown/yellow		See Consult section	
Consult TX	4	?		See Consult section	

***Res:** **additionally attach a 33k ohm resistor between this wire splice and IGNITION 10A for operation with S13 tachometer.**

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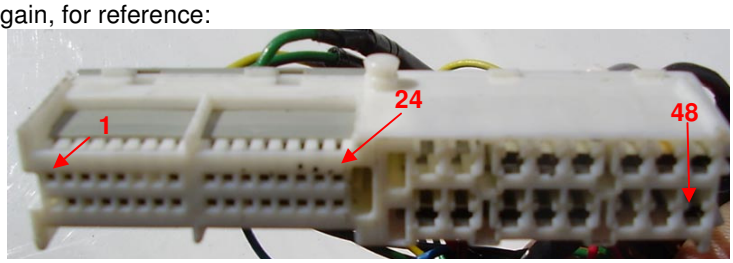
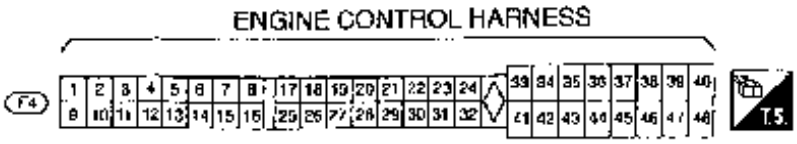


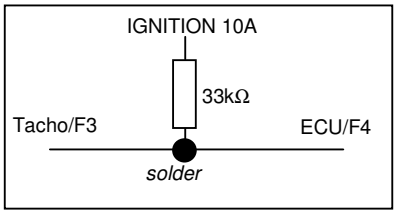


ABS: Do not cut ABS wires. Leave wires from F1 to left-hand side ABS sensor intact and fit back into S13 as part of modified harness.

Notes and extras

CAS (S14 engine):
Make sure you have followed the instruction to join the wires going to pins 35 and 36 of connector F4 (both black wires with white stripe). In the UK Nissan routed the power to the CAS out of F4, round the interior to an immobilizer (not a concern here ☺) and then back out F4. If you don't join these wires together the engine will not spark, inject or start.

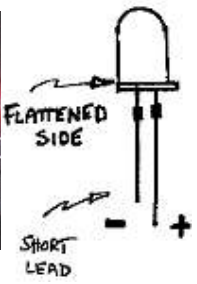
Tachometer:
The signal to the tachometer needs a pull-up resistor to make it work. 33kΩ seems to work well, but don't worry about a few kΩ variation. A small 1/4 or 1/8 watt resistor for about £0.02 will do – you don't need chunky power resistors!!! If you happen to have a 240sx tachometer (I do, on my digi-dash), contact me as these can be made to work with CA18 and SR20 engines with a few mods to their PCBs.



Speedometer:
Make sure you have fitted the CA18 speed sensor to your SR20 gearbox, or the speedo won't work.

For S15 6-speed:
Due to the lack of a speed sender (conventionally the S15 ABS computer derived speed from the wheel sensors and told the ECU), the S15 6-spd gearbox owners need an aftermarket converter unit (or the S15 gauge cluster and ABS computer (part of ECU loom)) to get a speed signal. A diff with an ABS sensor (from any ABS 200sx/silvia) is therefore also needed.
Dakota Digital supply frequency converters for this sort of purpose (e.g. model SGI-5). Please contact me if you need advice.

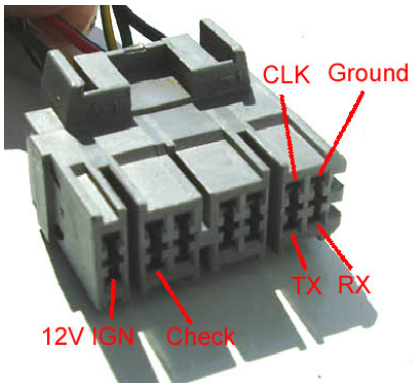
Diagnostics lamp:
There is a transistor in the ECU do operate a bulb to indicate electronic faults. Wire this to a spare bulb on the dash if you wish (one pin goes to the ECU, the other to 12V IGN signal). An LED could be used instead, with a 1k ohm resistor in series.



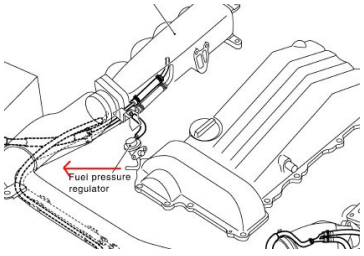
To use an LED attach the shorter LED lead (-) to wire the diagnostics pin on F4. Attach the longer lead to one side of a 1KΩ resistor (a little 1/8 watt will do), with the other side of the resistor to IGNITION 10A.
To put the light into diagnostics mode, wire a switch between 12V IGN and F4 (see tables). Shorting the pin to 12-14V for 2 seconds puts the LED into diagnostics mode.

Consult:
Pulling the consult connector out of the donor car and wiring it into connector F4, allows for insertion of commercial Consult diagnostic devices.

Alternatively, hard-wire an aftermarket consult-to-PC converter board to the pins on F4, listed in the pinout tables (S15 does not need a clock connection). Ground the converter board at the car body, and use an IGN 12-14V supply to power it (eg. The IGNITION 10A wire)

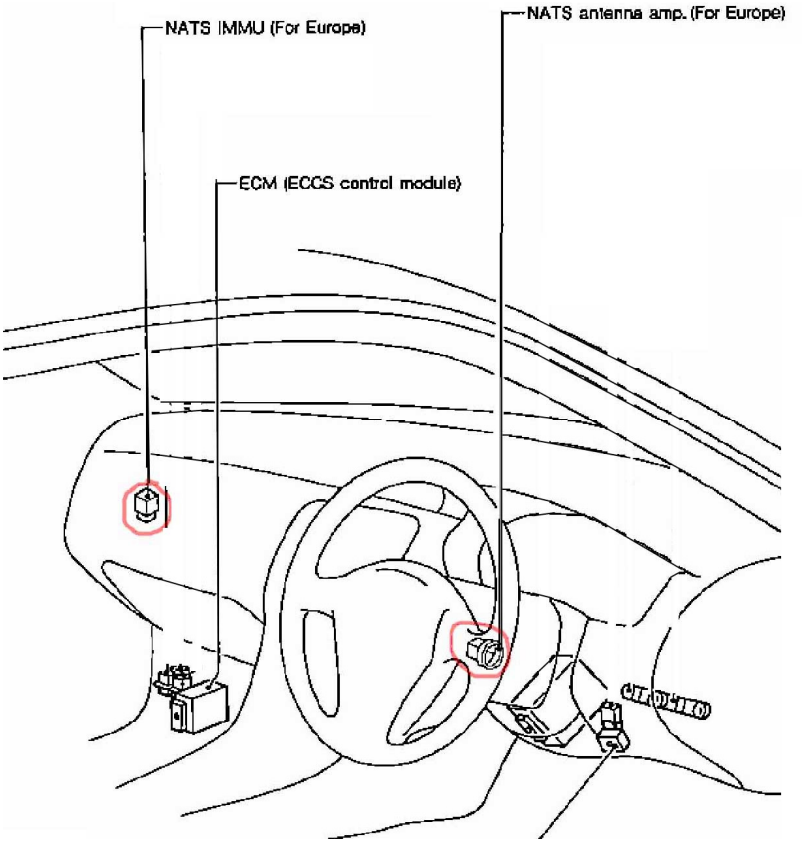


Fuel Pipes:
IMPORTANT. Check you have the fuel pipes on the correct way. The intake pipe (the one from the filter) should go to the hard pipe that passes under the plenum and straight into the injector rail. **The return pipe should go to the** hard pipe that passes under the plenum and goes to the **fuel pressure regulator.**



NATS (S14a Europe)

A misconception is that the S14a ECU should be avoided because of the NATS system. Provided you remember to get all the required parts, it is actually a simple job to wire in.



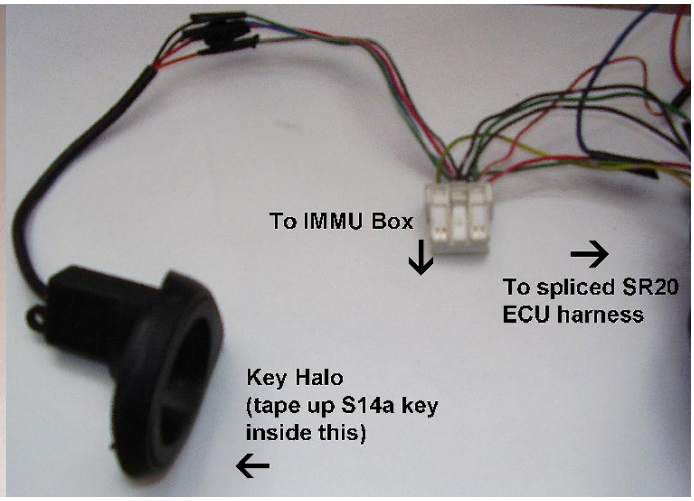
As well as the ECU, you need:

- **The key** from the S14a.
- **The 'antenna amp'** (the plastic halo that goes around the S14a key barrel). You don't need the plug, just slice the wires with about 10cm to spare (to solder on to).
- **The NATS IMMU box**. This is a little black box, with a Siemens sticker on it, and it is located behind the dashboard trim on the passenger side, where the door would meet the dashboard (obviously the car needs stripping to get at it). Cut the plug off going into it, with about 10cm of wire to spare (we will solder onto this)

That's it! No need for any of the sounder-alarm bit, that's not linked to the ECU at all.
Optionally, you can get the warning light from the dashboard too, or just wire in your own LED.

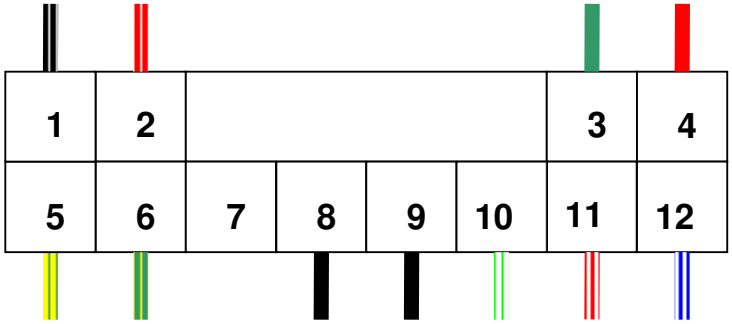
The wiring:

Basically you solder all the above units together and onto connector F4 (to access the ECU), and stick the key in the halo. Bung the whole lot somewhere in the passenger footwell. You can even use the key as an free immobilizer!

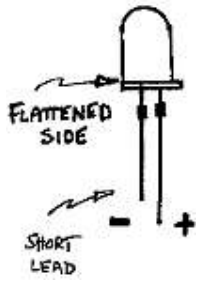


Wire it all up, as in this table:

Viewing the connector to the IMMU box from the mating side (pins facing you):



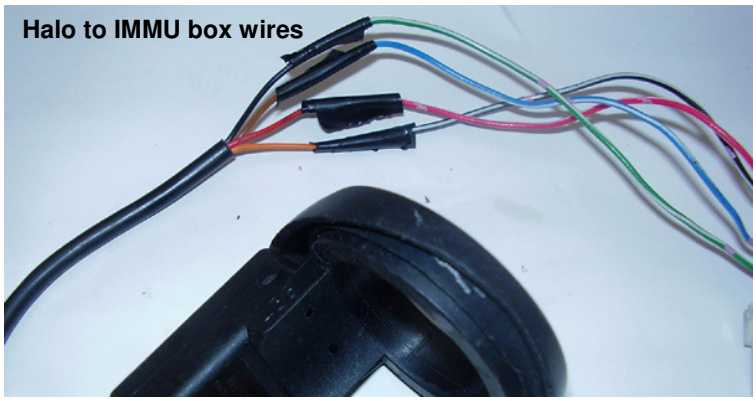
Wire number	Colour	Destination
1	Black/white	Key halo, orange wire
2	Red/White	Key halo, red wire
3	Green	IGNITION 10A
4	Red	BATTERY
5	Yellow/Green	F4, Pin 7 (yellow/green)
6	Green/Yellow	F4, Pin 27 (green/yellow)
7	-	-
8	Black	F4, Pin 11 (black)
9	Black	F4, Pin 11 (black)
10	Green/White	Key halo, black wire
11	White/Red	LED. See below
12	Blue/White	Key halo, brown wire



To use an LED (optional), attach the shorter LED lead (-) to wire 11 above.
Attach the longer lead to one side of a 1KΩ resistor (a little 1/8 watt will do), with the other side of the resistor to IGNITION 10A.

Note: You must have the IMMU box, ECU and key from the same S14a. They are all synchronized, so the car will not run with a unit from a different car (well, it will run for about 1 second, then cut out).
It is possible to re-synchronise any random key, IMMU box and ECU, by sending a series of codes down the ECU consult connector. For security reasons, please contact me for more advice/ information!

Halo to IMMU box wires



Testing / my car won't start!

First of all, have you double checked the notes section for anything obvious (e.g. S14 CAS, fuel pipes)?

The starter motor will turn, irrespective of what you've soldered up, so that's not a sign that you've done the wiring correctly! You don't even need an ECU present to turn the engine on the starter.

If you have an S14a harness and the car runs for 1 second then cuts out, it's most likely the NATS wiring.

If there's no spark, have you remembered to transfer over the transistor pack on the suspension turret?

You can double-check your wiring by using the ECU diagrams in the appendix. Use a multimeter between the ECU harness pin shown and where you're supposed to have joined it to on the S13 connectors, to make sure you've made the correct splice. You can check all sensors back to the ECU with a multimeter, although this could prove laborious, so leave it until you've checked everything else (seeing as we never actually tampered with any of them when wiring up anyway).

You can test all relays – Remove the ECU. Refer to the appropriate ECU pinout in the appendix. Put the multimeter on the *current* setting, put one probe on the body ground, and with the aid of a pin/needle, short-circuit any ECU connector pins that operate relays to ground. You should hear a click from wherever the relay is (or a whirring noise for the fuel-pump relay pin). The current may be up to 1 amp. The ignition may have to be on for this to work, depending on which relay we're testing. You can check injectors with this method too, but leave this for troubleshooting if the engine refuses to start, as it's unlikely they'll not work as you shouldn't have touched them when splicing looms. If you want to fire a coil pack manually, you need to (briefly!) short the wire at the ECU harness end to a 12V wire.

Was there an aftermarket immobilizer you have fitted? Is it stopping the fuel-pump or ignition power from operating?.

Check continuity between ECU ground pins and ground in the cabin.

You know an ECU is alive when you turn the key to IGN, and the ECU clicks on its ECU relay. If connected, the warning lamp (see previous page) will come on as a test, then go off when the key is turned to start.

Air leaks are a common problem when fitting pipes. Check everything is plugged on properly or blocked up. With the engine off, blowing cigarette smoke into the plenum, via the turbo actuator pipe, and watching carefully for it leaking out is one way to spot leaks. Better still, remove the Air Flow Meter and block up the large pipe (use a bean-can or something large). With the pipe blocked up, there should be no air leaks, and you should struggle to blow air into the engine (via any pipe to the plenum) as you will be pressurising it.

Future issues

Any mistakes, confusing issues, or improvement suggestions, please tell me.

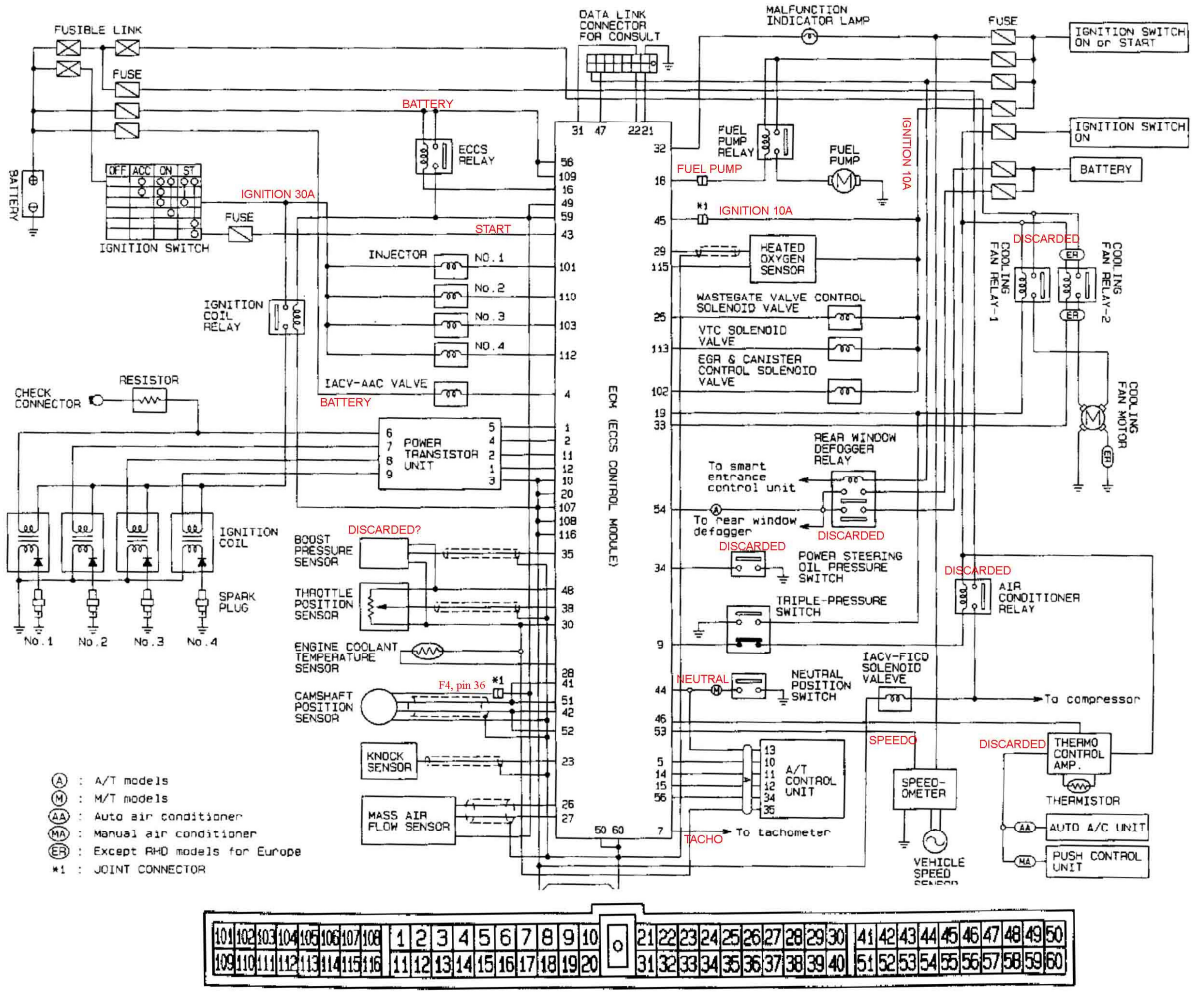
Air Conditioning. No plans to do this as I never had it anyway, and it's just extra weight. If you really want it to work, contact me and I'll have a think.

Load wires: give ECU additional feedback for regulating revs when defogger and headlights are on. Not hard to do, but it involves tapping into other interior connectors.

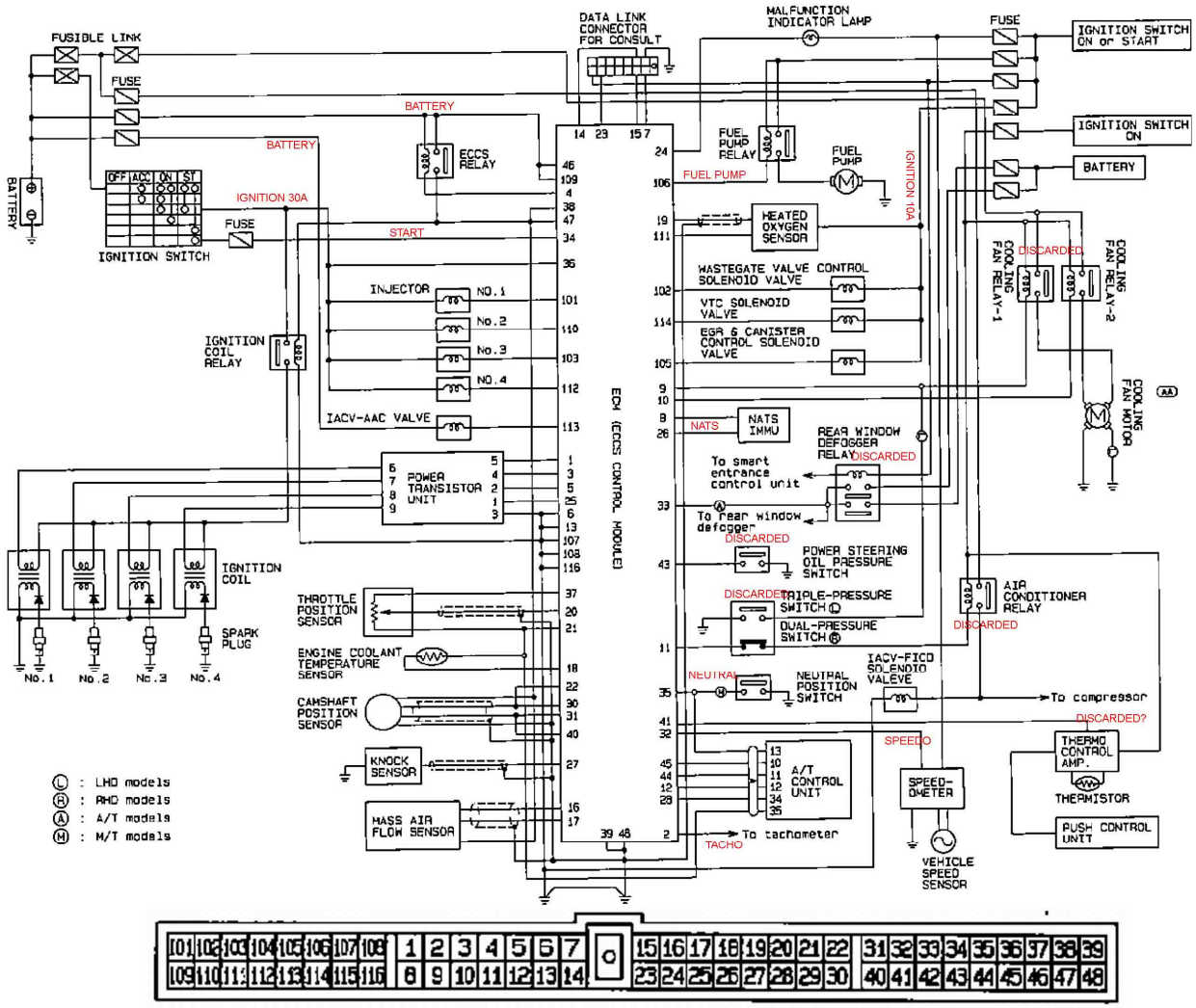
Loom Stripping: It is possible to remove a fair proportion of the wires from the engine harness. You will notice a fair amount of spare plugs once everything necessary has been attached to the transplanted engine.
There is a connector near the ECU that appears unused. This is the ABS interface connector for an S14 or S15 ABS controller unit. On the engine bay side of the loom, again you will see a bundle of unused connectors. These are mostly for the ABS but there is also plugs for the windscreen wiper motor and timer unit.
Why are these here? - Well, for models after the S13 they integrated the ABS wires and the wiper wires into the ECU harness. However as the S13 ABS and light wires are already present, and if you have no (ambitious!) plans to upgrade to the more compact S14/S15 ABS system, all this lot can be stripped out of the loom.

APPENDIX

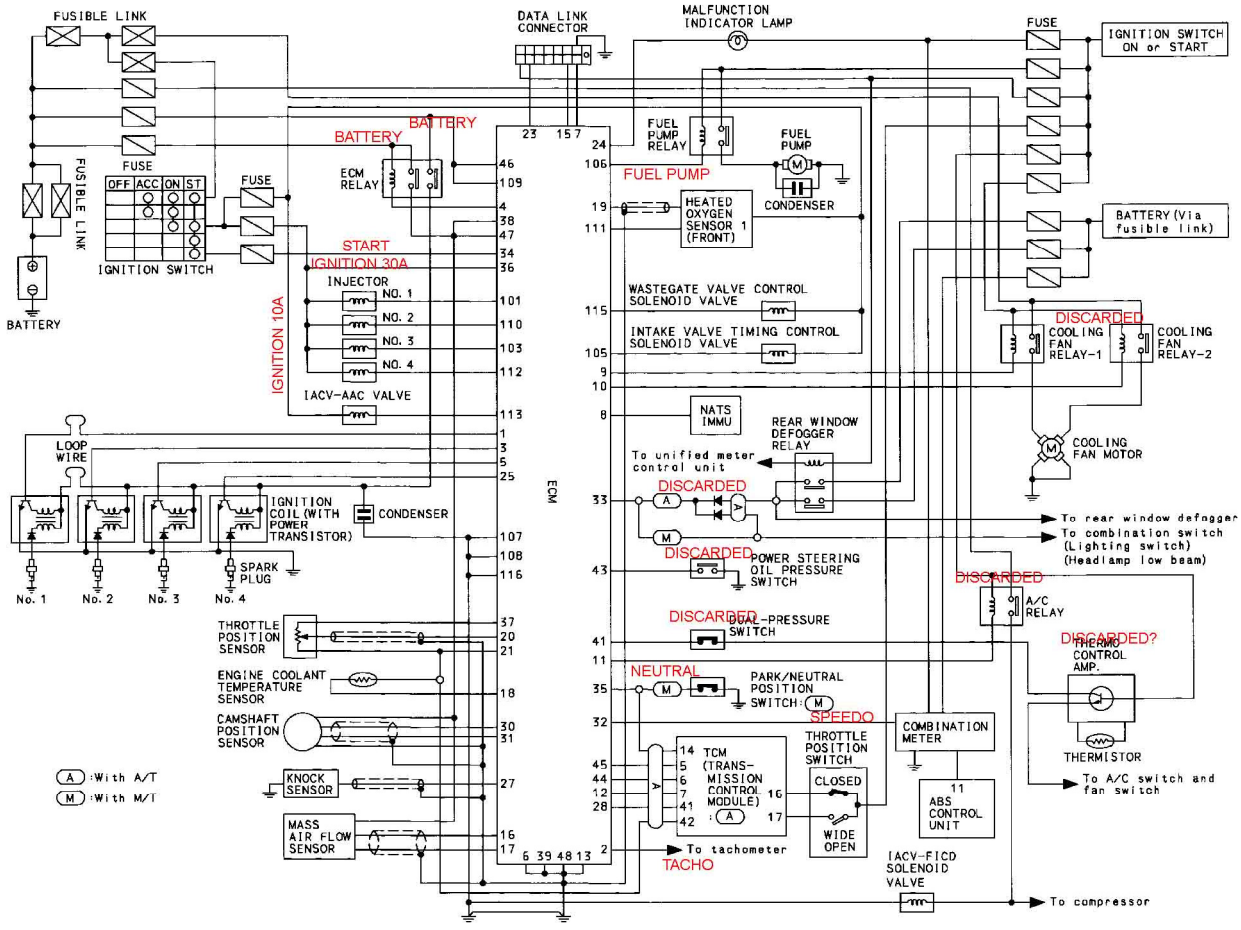
S14 ECU Harness

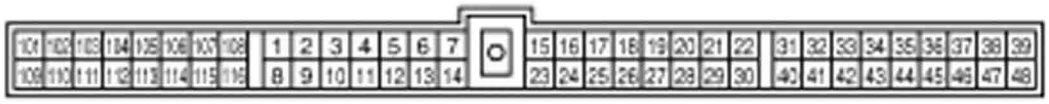


S14a ECU Harness



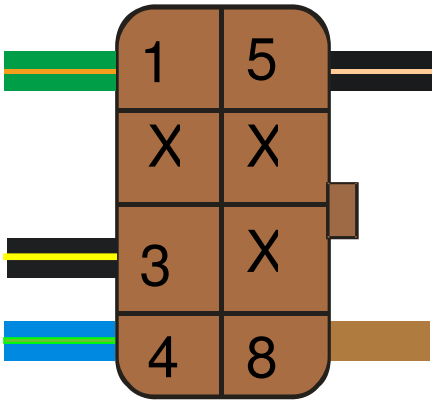
S15 ECU Harness



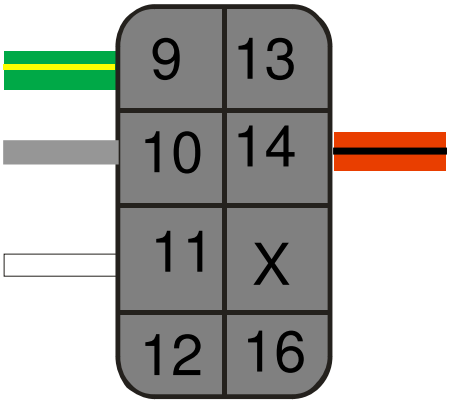


Left Hand Drive S13 supplement .

Use this section, rather than the earlier RHD diagrams, if your S13 is LHD.
This is how they would look with the mating face facing you, note the side notch. An X denotes no pin present.



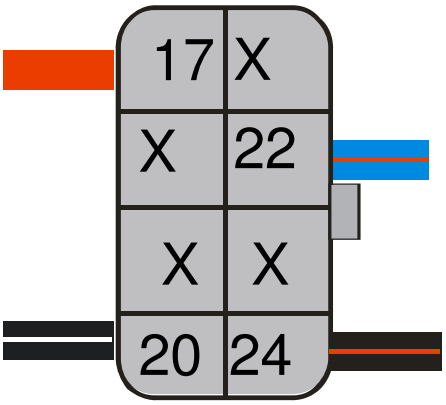
Connector F10
1: **NEUTRAL** *Neutral switch signal from gearbox* 1: *N/C*
2: N/C
3: *12-14V when Fuel Pump activated N/C*
4: *12V when aircon is activated*
5: **FUEL PUMP** *Signal wire for S13 fuel pump relay*
6: N/C
7: N/C
8: **IGNITION 10A** *12-14V when ign on/start (via 10A fuse)*

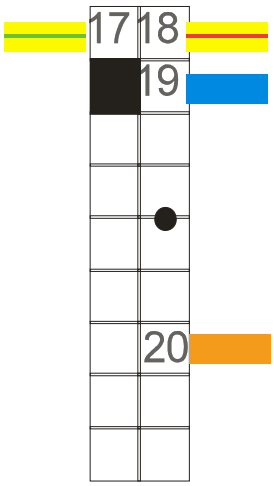


Connector F9

9 Signal wire to enable air-con Relay
10: Knock sensor shield
11: Knock sensor
12:N/C
13: N/C
14: Signal wire to enable ECCS relay
15: N/C
16: N/C

Connector F8
17: **BATTERY** *12-14V from battery*
18 N/C
19 N/C
20: ECU power (from ECCS relay)
21: N/C
22: *IGN coil 12V supply*
23: N/C
24: **IGNITION 30A** *12-14V when IGN on/start*



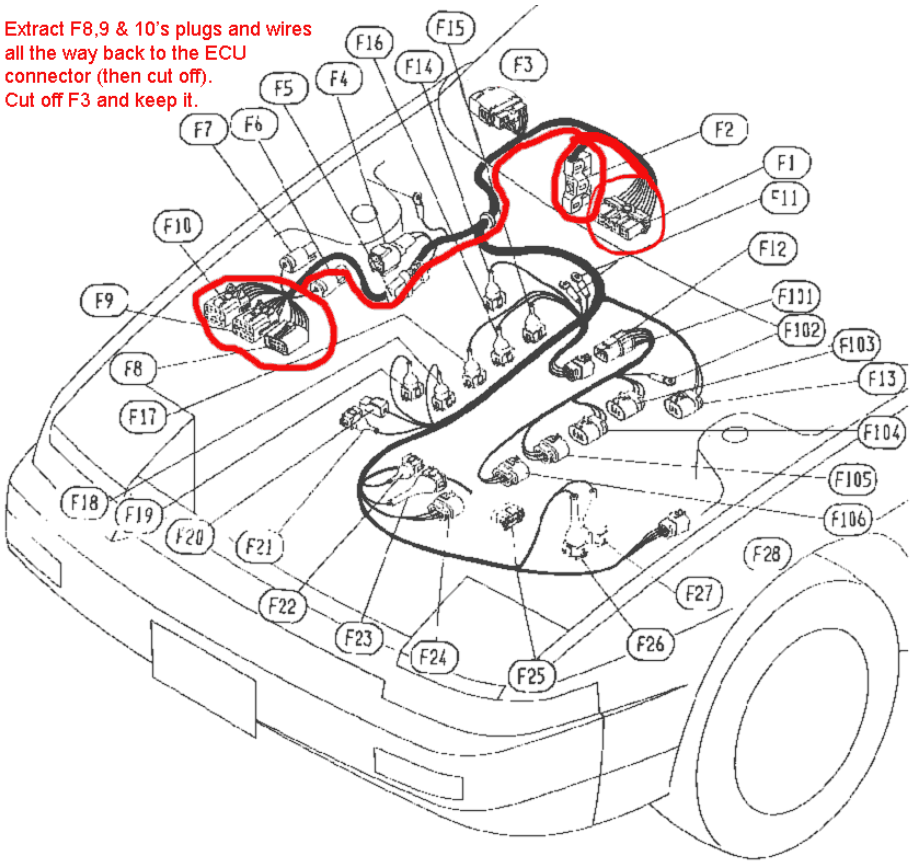


Connector F1

17: **SPEEDO** *Output from speedometer*
18: **TACHO** *Tachometer*
19: **WATER** *Dashboard water temp gauge*
20: **START** *12-14V signal when cranking starter.*

Remaining wires not important

Extract F8,9 & 10's plugs and wires all the way back to the ECU connector (then cut off).
Cut off F3 and keep it.



(F1) : To main harness (53)
(F2) : E.C.C.S. control unit
(F3) : To engine room harness (E11E)
(F4) : Front brake skid sensor R.H.
(F5) : Resistor
(F6) : Check connector
(F7) : Check connector
(F8) : To engine room harness (E6) (White)
(F9) : To engine room harness (E9) (Gray)
(F10) : To engine room harness (E10) (Brown)
(F11) : Engine ground
(F12) : To ignition coil sub-harness (F10)
(F13) : Exhaust gas sensor (For model with catalyzer)
(F14) : E.G.C.D. solenoid valve
(F15) : Injector-4
(F16) : Injector-3
(F17) : Injector-2
(F18) : Injector-1
(F19) : A.A.C. solenoid valve
(F20) : Thermal transmitter
(F21) : Engine temperature sensor
(F22) : Air regulator
(F23) : Throttle valve switch
(F24) : Throttle sensor
(F25) : Crank angle sensor
(F26) : Air flow meter (For model with catalyzer)
(F27) : Air flow meter (Except for model with catalyzer)
(F28) : Dropping resistor
(F31) : To E.F.I. harness (F12)
(F32) : Engine ground
(F113) : Ignition coil-4
(F34) : Ignition coil-3
(F115) : Ignition coil-2
(F36) : Ignition coil-1