How to transplant Satellite Navigation between Navigation and Non – Navigation Liberties

Disclaimer: I take NO RESPONSIBILITY for any damages caused to your car, sat nav, body, life, marriage or any other aspect which maybe included. This is for Informational Purposes only, if you are an incompetent fool or don't want to install or remove a Subaru Liberty Satellite Navigation Unit then don't bother reading anymore.

Removal of the factory navigation unit.

The factory sat nav consists of 7 parts, they are

1. Screen
2. Dash Surround
3. Antenna
4. DVD drive
5. Wiring harness 1 **(Din Cable and Antenna Cable.)**
6. Wiring harness 2 **(DVD Drive Power and Signal Cable)**
7. Wiring harness 3 **(Power and Signal Cable)**

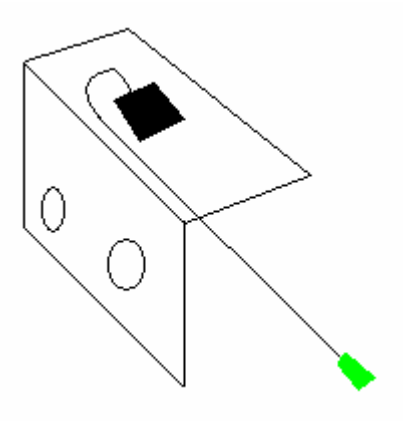
I wasn't around when the unit was removed from the car so the removal information is basic. It is mainly focused on what wiring needs to be removed.

Screen

The Screen is a Kenwood FGZ203MF2, it has been customised by Subaru to there specifications, E.G. Subaru start-up logo and so on.

Dash Surround

Pretty self explanatory, It is the part with the air vents and the 7 inch hole through the middle. You can't miss it.

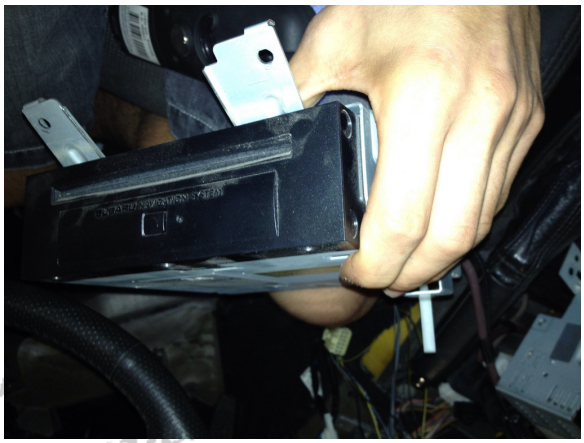


Antenna

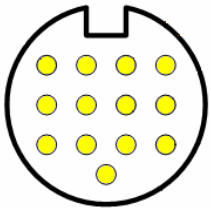
This is easy to miss, it's a small black box that is mounted on a right angle bracket. I believe it is behind the instrument cluster (Speedo panel).

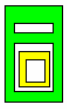
DVD Drive

Now because it's a FACTORY installed Sat Nav, The DVD drive is found in the Glove box. In the TOP INNER (Right) corner (passenger side) of the AUDM Liberty.



Wiring Harness 1 (Din Cable and Antenna Cable.)





This Wiring Harness consists of a round 13 pin din cable and a Coaxial cable with a square connector.

This cable DOES NOT require any modification and can be removed intact.

Wiring Harness 2 (DVD Drive Power and Signal Cable) - CN100

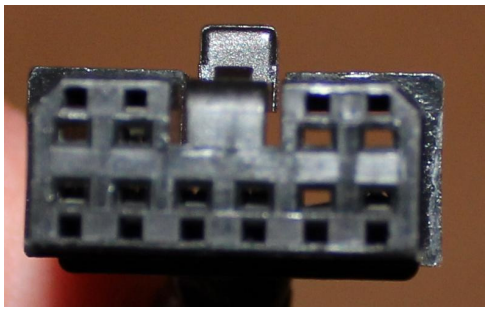
This is a single connector, that's supplies the power and relevant signals to the DVD Drive.

Wire Colour	Pin Number	Function
Yellow / Red	2	12V Accessory
Brown / Yellow	5	Reverse Light
Black / Yellow	6	Ground
Light Blue / Red	7	Illumination & Backup Light
Violet	8	Illumination
Grey *	9	Hand Brake Ground
Green / Black	10	ABS (Speed Sensor)

* Doesn't appear to exist although it is listed on the wiring diagram (from service manual).

As long as you have disconnected the battery, you can cut these wires off about 4-5 inches back from the plug, so that the future owner can make the transplant harness. Cut each wire individually if possible and make some longer and some shorter, then cover in lots of tape, individually then altogether.

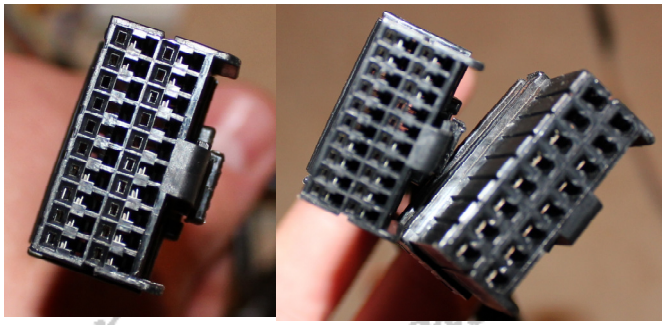
This Connector will be referred to as CN100



Wiring harness 3 (Screen Power and Screen / HU Signal Cable)

This harness can be removed but you will have to cut some wires.

You only have to cut wires that go to the Power or Signal areas of the car. The cables that run to the head unit MUST REMAIN INTACT. On this cable the 20 pin plug is the link for the screen to stereo. The 16 pin plug is the signal and power into the screen.



McIntosh Plug Screen Plugs

The wires you will have to cut are

Wire Colour	Pin Number	Function
Black / White	3	Illumination Ground
Brown / Yellow	4	Reverse Light
Grey	5	Ignition Wire
Pink *	6	CAN-BUS +
Yellow / Red	7	12V Accessory
Light Blue / Red	8	Illumination & Backup Light
Violet	11	Illumination
Green / Black	12	ABS (Speed Sensor)
Grey	13	Hand Brake Ground
Violet *	14	CAN-BUS -
Black / Yellow	15 & (Looped to 16)	Ground

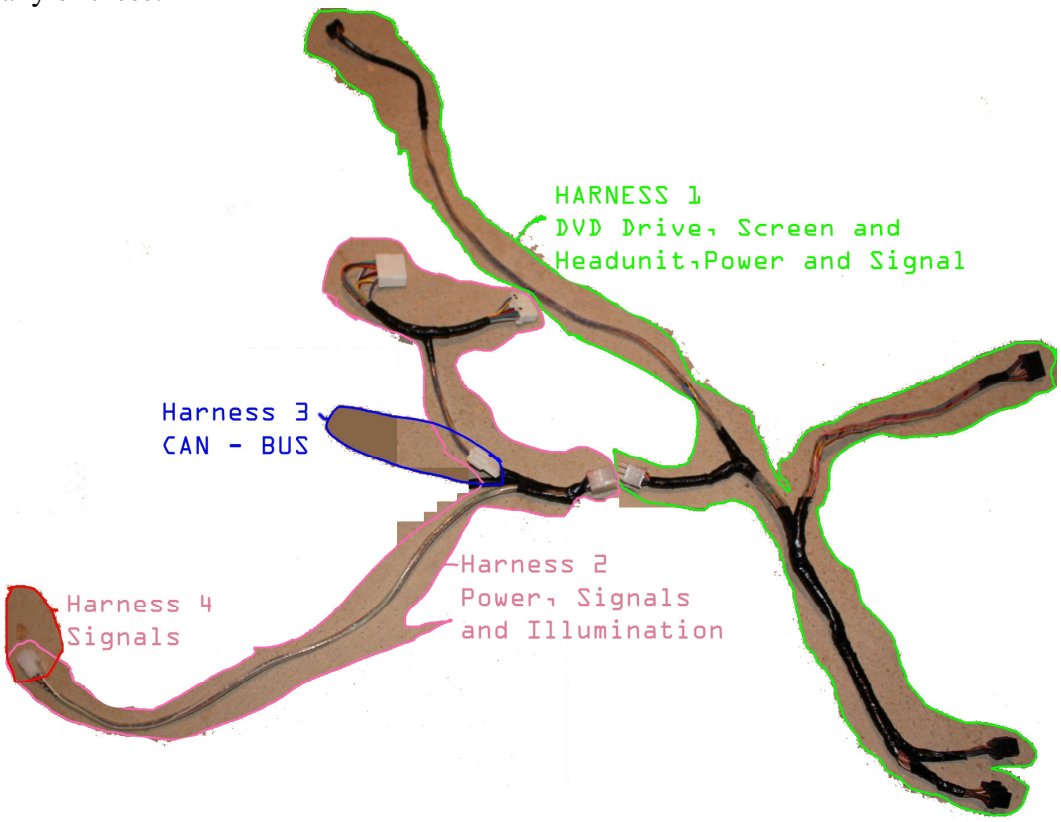
* These Two Wires are Twisted Together.
Leave as much wire as possible from the plug, so that the future owner can make the transplant harness. (You may be able to cut this near the stereo wiring harness)

You now have successfully removed the sat nav from a Subaru Liberty.

Installation of the factory navigation

Harness numbers are different in the following section.

This is where I was actually involved. Check the NON STANDARD MODIFICATIONS SECTION on page 12 to see if you would like to integrate any of these.



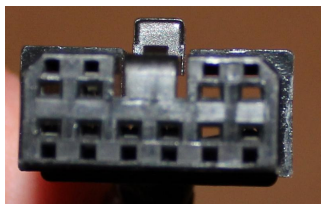
To install the factory sat nav I made 4 harnesses that connects everything up, therefore no soldering in the car and completely reversible if you decide it's not for you.

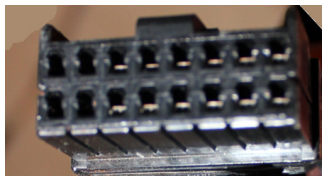
What you will need to make the harness

REQUIRED ITEMS	WHERE	APROX. PRICE
Heat shrink (CABAC 350pc heatshrink tubing pack)	DSE	$20
Metra 70-8901	Ebay	$2 + ($6 P&H)
Metra 71-8901	Ebay	$13+ ($9 P&H)
H0077AG000 - Norenwake Harness	Japan Parts	$20 + Shipping
12 pin plug & socket - Generic	Jaycar	$7
4 Pin Plug & socket - Generic	Jaycar	$4
2 pin plug & socket - Generic	Jaycar	$2.75
Spade connector	Jaycar	$2.50 / 2Pk
Fork Connectors	Jaycar	$2.75 / 8Pk
Spiral wrap or cable wrap.	Jaycar	$6.15 / 1.5M
Multiple colours of cable	Jaycar	$5 / 25M
Tape	Jaycar, Bunnings	$1.35, $2.10
Solder	Jaycar, DSE	$11, $15

DVD Drive, Screen and Head unit, Power and Signal Harness - First Harness

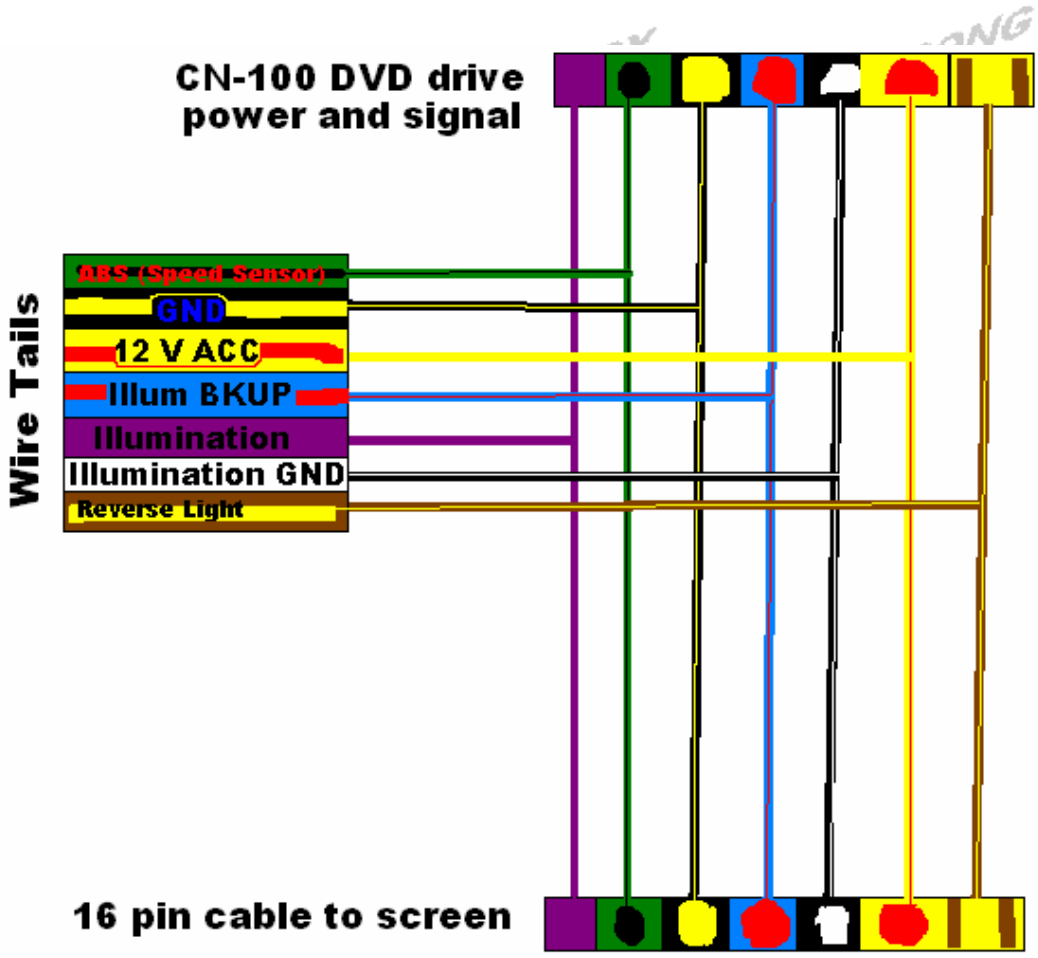
With your navigation unit, you should of received the power and signal plug for the DVD drive or the CN100 Plug with a small tail of wire.
Because Subaru have good standards they keep wire colours consistent. This is good news for us.
You need to join the following wires individually in a T-Joint


CN- 100 Plug


16 Pin Cable to Screen

Wire Colour	Function
Yellow / Red	12V Accessory
Brown / Yellow	Reverse Light
Black / Yellow	Ground
Light Blue / Red	Illumination & Backup Light
Violet	Illumination
Grey *	Hand Brake Ground
Green / Black	ABS (Speed Sensor)

*Doesn't appear to exist on my DVD drive

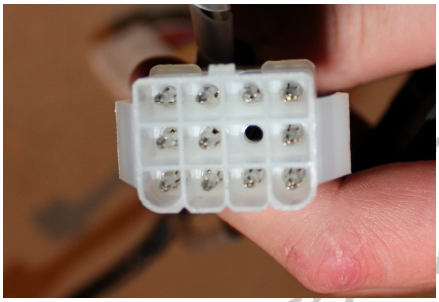


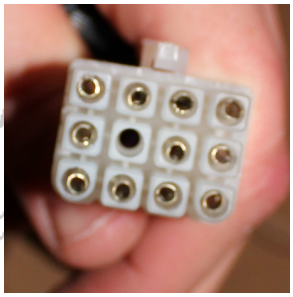
You should have tails for the following wires.

Wire Colour	Function
Black / White	Illumination Ground
Black / Yellow	Ground
Brown / Yellow	Reverse Light
Green / Black	ABS (Speed Sensor)
Green / Yellow	Ignition
Grey	Hand Brake Ground
Light Blue / Red	Illumination & Backup Light
Pink *	CAN-BUS +
Violet	Illumination
Violet *	CAN-BUS -
Yellow / Red	12V Accessory

* These wires are twisted together.

I put a 12 pin plug I purchased from Jaycar on these to complete this part of the harness. It helps make it modular.



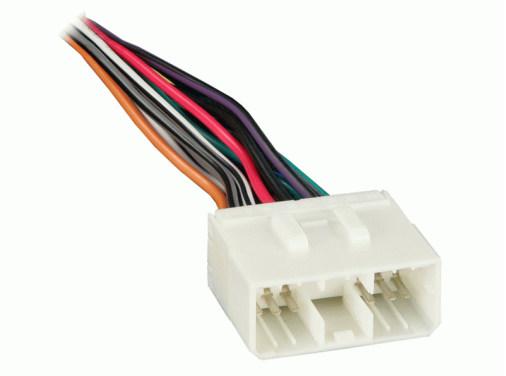


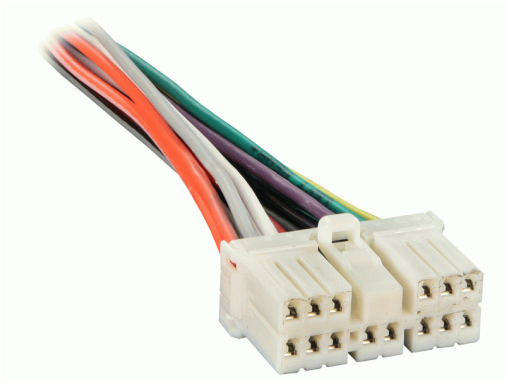
This should complete the harness which plugs into the DVD Drive, Screen, Head Unit to a 12 Pin plug. This is the DVD Drive, Screen and Head unit, Power and Signal Harness.

Power, signals and illumination – Second Harness

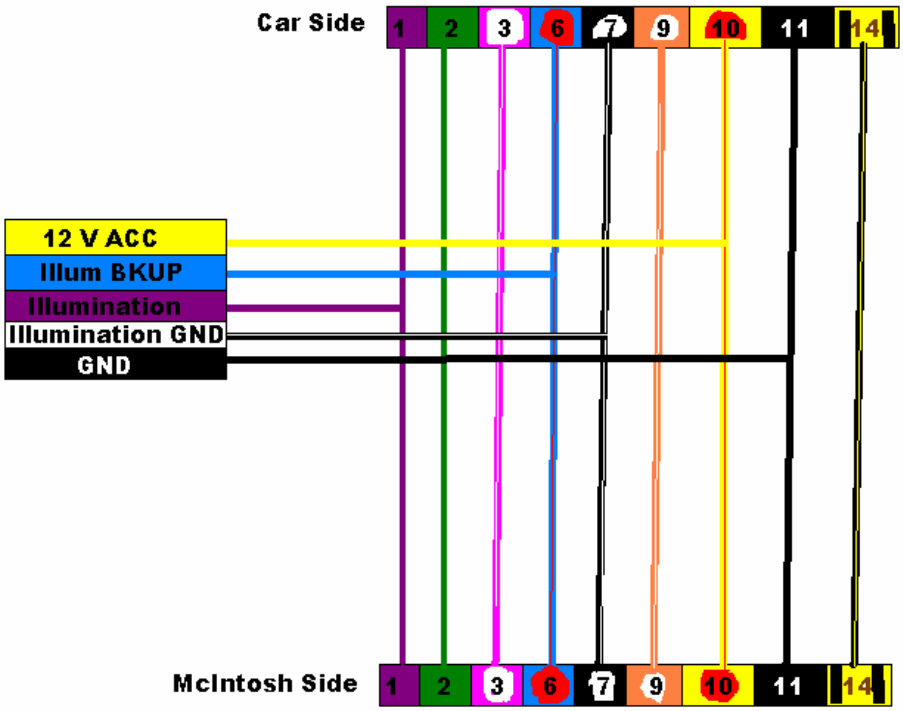
I purchased a male and female stereo wiring harness and made what I call a tapping harness.

They are Metra 70-8901 (Socket) and Metra 71-8901 (Plug)



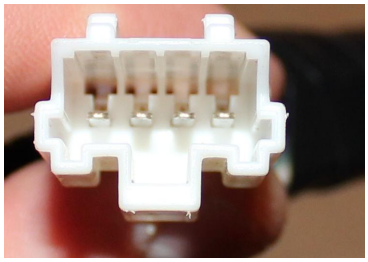


A little trick is if you use a precision / jewellers flathead screwdriver (1.3mm) you can remove the pins which you don't need. This is really good if you have the McIntosh Stereo.
You simply look down the socket / plug and you will see a small white clip on top of the silver contact, lift it with the screwdriver, and pull the wire tail.
I have the McIntosh stereo so I made this tapping Harness. (Will be different for Kenwood Stereo)



I put these wires on the corresponding pins of the 12 pin plug I installed.
That is how I got 5 of the 11 wires, leaving 6 remaining. 2 of them are the CAN – BUS. The other 4 can come from the OP Connector (OPtions Connector) a.k.a B228 (reference to this is found in harness four.)

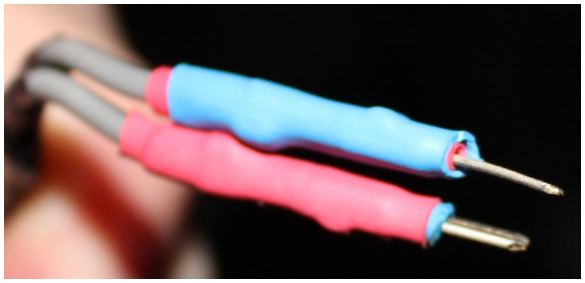
CAN-BUS – Third Harness

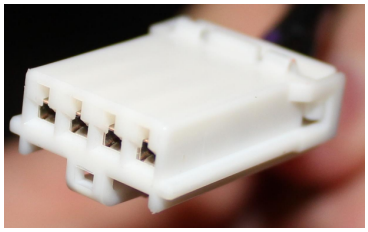


I decided to separate the CAN- BUS to its own plug, I soldered a plug I had, onto the transplant harness side (Violet and Pink twisted wires)
With the other side of the connector, there are two options.

Option 1

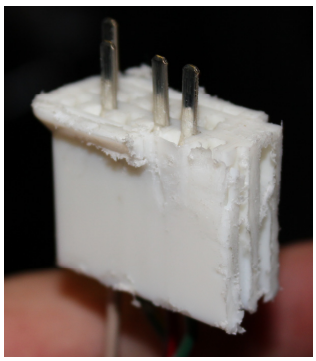
You can use two of the spare pins removed from the Metra wiring harness and connect them to the 4 pin I103 Connector (only 2 wires are used.) then taped them in place so the new connector is the only accessible one.

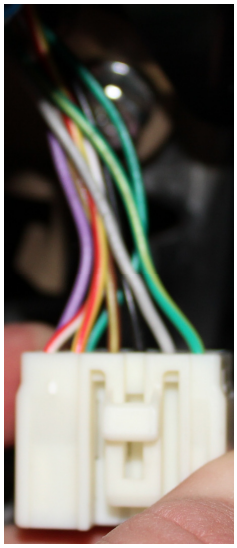




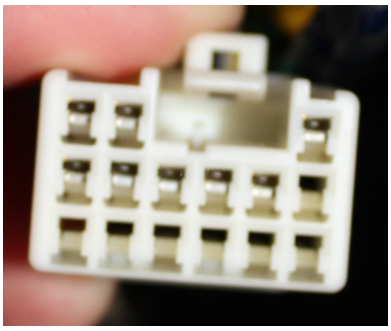
Option 2

If you are lucky enough to have a spare plug with pins around then you can cut the solid plastic shroud off and then mount only the pins you need. (Similar to option 2 in the OP connector section)
(Pin Positions in this Picture are NOT for CAN – BUS)





Signals – Fourth Harness



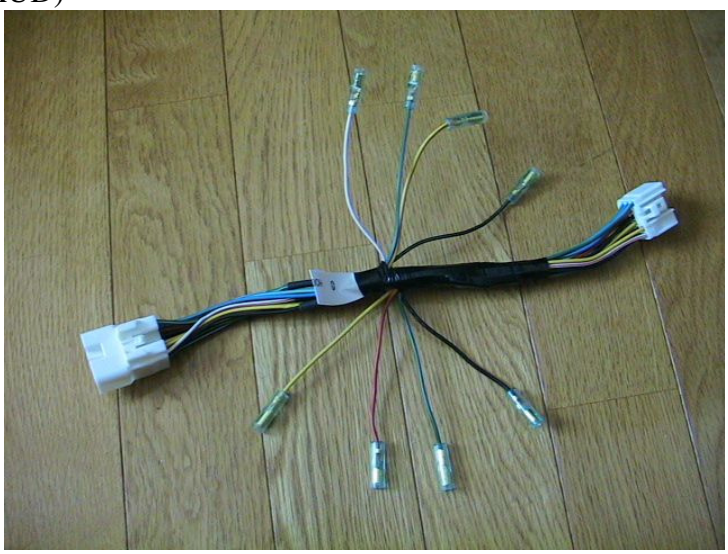
The OP Plug (OPtions Plug) or B228 exists in the MY08 GT Spec B AUDM Liberty. It is tucked up behind the fuse box near the accelerator, and by tucked up I mean like half way up the back of the fuse box. It is rolled up and taped with pink electrical tape. *(Don't get confused with the other two connectors taped a bit lower and easier to access; they are not the ones you need.)*

Wire Colour	Pin Number	Function
Green / Yellow	3	Ignition
Green / Black	5	ABS (Speed Sensor)
Brown / Yellow	6	Reverse Lights
Grey	8	Park Brake Switch

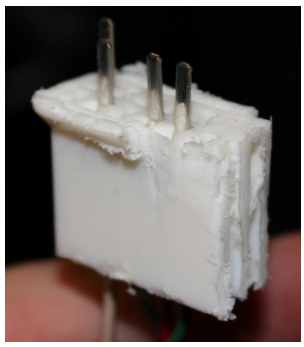
I put a 4 pin plug on the transplant harness, to aid in the modular construction. Then the other side of the four pin plug you have options, they are

Option 1

I recommend buying a H0077AG000 – Norenwake Harness – from (Japan Parts)
(Around $20 AUD)



You need to tap off wires 3, 5, 6 and 8



Option 2

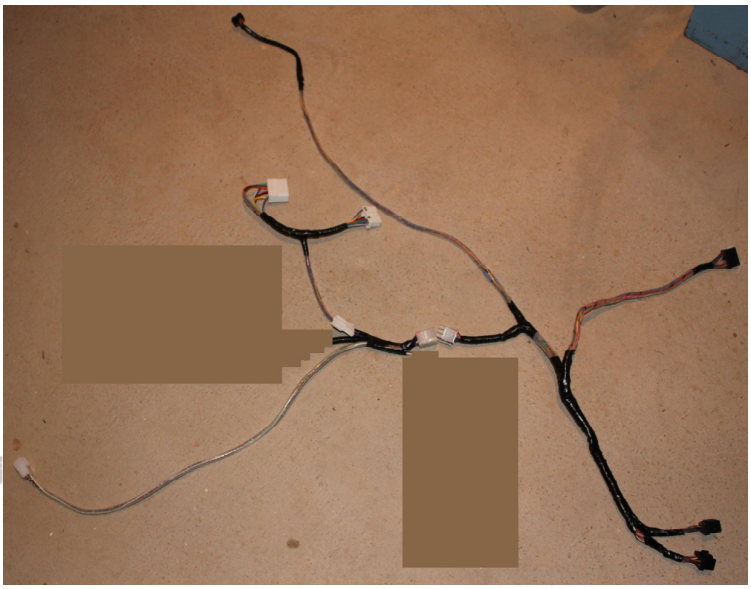
If you are lucky enough to have a spare plug with pins around then you can cut the solid plastic shroud off and then mount only the pins you need. (Similar to Option 2 of the CAN-BUS section)

Option 3

If you don't want to buy the harness, and don't have a spare plug, then the pins that you removed from the Metra stereo harness slot in perfectly to the OP Connector.
This should complete Parts 2, 3 and 4 of the wiring harness.

Checking your harness is correct.

Now your harness should be complete with plugs on all ends. You should check the continuity of the cables before you plug it into the car, saves troubleshooting it when you have it in the dash.



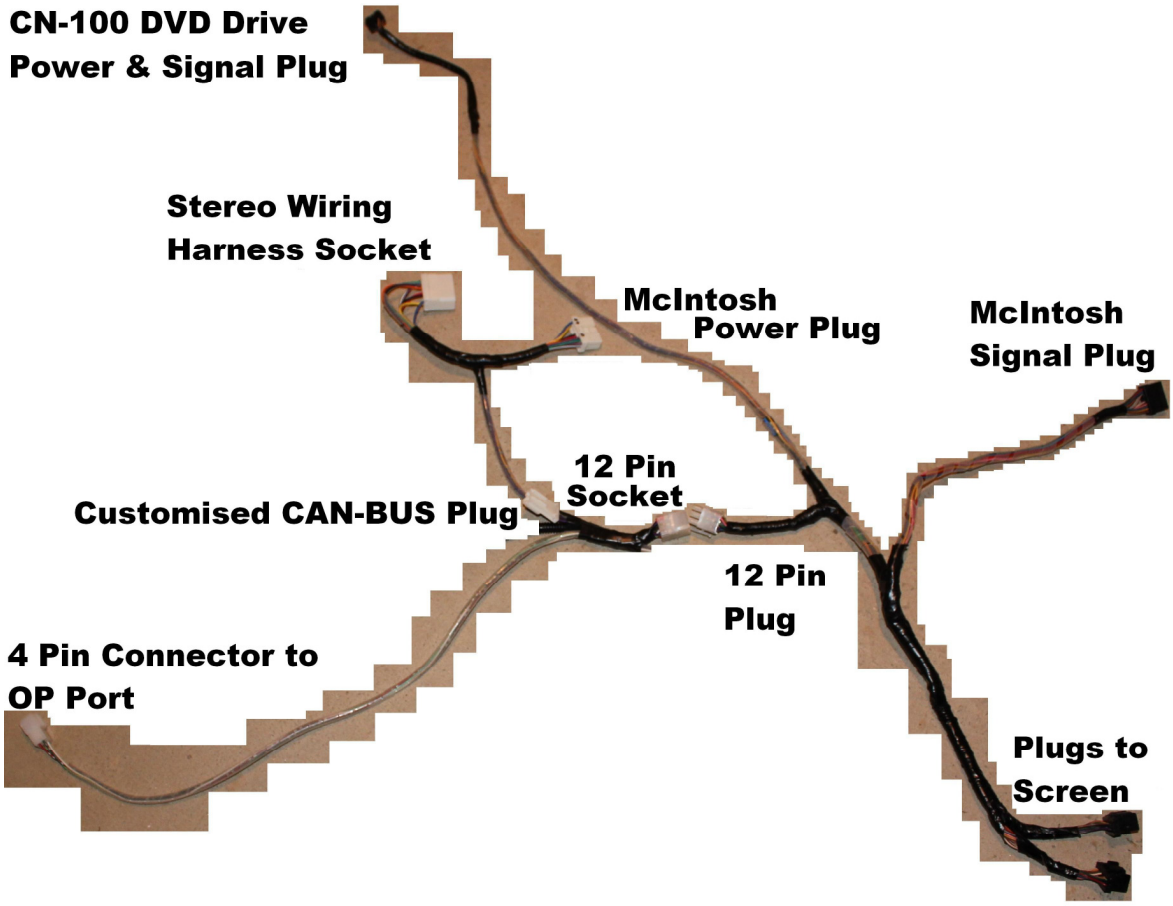
Continuity Checklist

Wire Colour	12 Pin Plug Pin Number	CN -100 Pin Number	Screen Plug Pin Number	Function
Violet	1	8	11	Illumination
Light Blue / Red	2	7	8	Illumination & Backup Light
Green / Yellow	3	N/A	5	Ignition Wire
Yellow / Red	4	2	7	12V Accessory
Green / Black	5	10	12	ABS (Speed Sensor)
Grey	7	9*	13	Hand Brake Switch
Brown / Yellow	8	5	4	Reverse Light
Pink (Twisted)	9	N/A	6	CAN-BUS +
Violet (Twisted)	10	N/A	14	CAN-BUS -
Black / Yellow	11	6	15 & 16	Ground
Black / White	12	N/A	3	Illumination Ground

*Doesn't appear to exist on my DVD drive

Connecting up your Completed Harnesses

This part is quite easy because it's simply plugging it together into the respective spots.

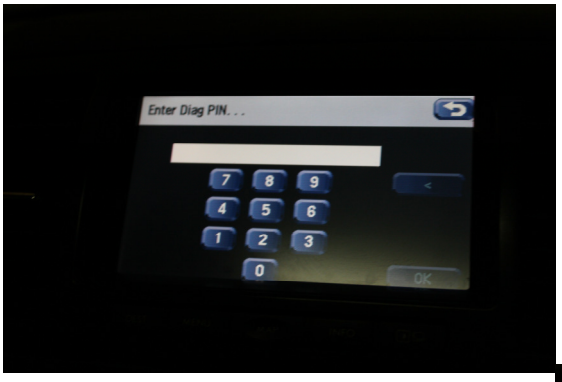


Completing the install

Once you have everything tested and installed. "Ask yourself have I done it correctly?" If you believe the answer is yes, then AT YOUR OWN RISK, take the punt and turn that key.

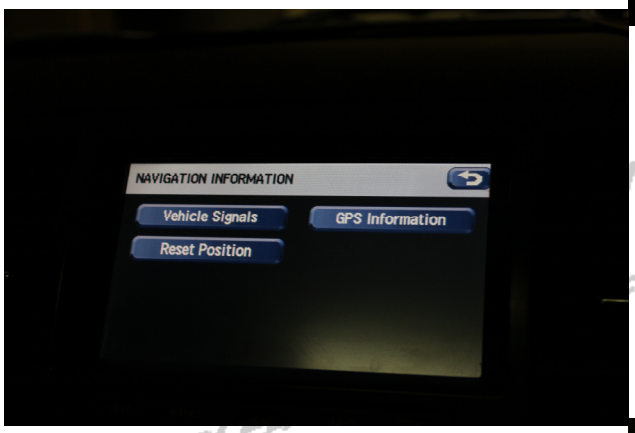
You should see a nice looking SUBARU logo. That's a good start.
You may notice that the McIntosh just turned off. Push the FM button. It should come back on.
Now that your sat nav is on, insert the "GENUINE SUBARU MAPS DISC" into the Navigation drive. It should mess around a bit and then bring up the map within a couple of minutes; you will need to set the date.

Now push the "MENU" button, then imagine there is a button on the touch screen in the middle at the top. Touch there and hold it until a keypad prompt comes up.



The classified, super top secret, code which you can't tell anyone is "014220".

Now you are in the diagnostics menu,



if you click "Navigation info"

Then "Vehicle Signals" you can see if the sat nav detects that you're in reverse, hand brake is on or illumination is enabled. (These signals are from the DVD Drive Connector)

Press the "Info" button and see if it has the trip meter information and fuel usage information.

Take it for a test drive, STRICTLY BEFORE DRIVING, Press "MENU" then go to "NAVIGATION SETUP" then select "NAVIGATION INFORMATION" then select "VEHICLE SIGNAL". Notice on the right it says "SPD". Now you can drive and it will tell you the speed.

Your Satellite navigation should now be completely installed and fully functional.

NON STANDARD MODIFICATIONS

Due to Australian Law, It is illegal to program a sat nav whilst the car is in motion, and it is also illegal to have a video entertainment screen available to the driver, whilst the car is in motion.

Park Brake Lockout Removal

For Screen (AUX)

To remove the park brake lock for the screen, you need to make the screen think the handbrake is on. To complete this on the transplant harness, you need to ground pin 13 on the screen connector. This is the grey wire. The easiest method is instead of putting it into the 4 pin connector which would attach to the op port, attach it to a piece of wire with a spade connector on one end and a fork or ring connector on the other, put the ring under a chassis screw for a permanent ground. And put the spade connector on the removed pin and cover with heat shrink.

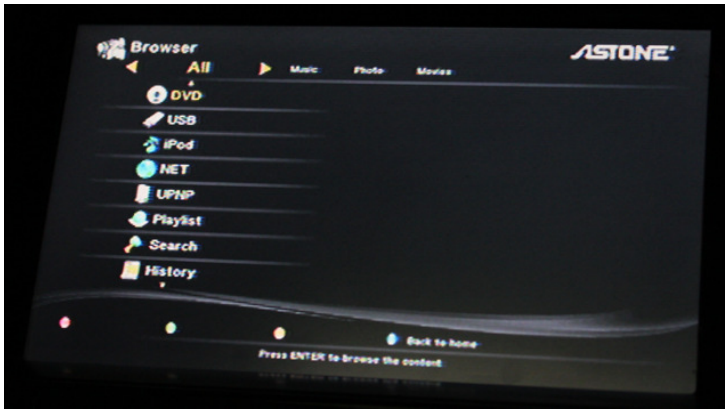
For DVD Drive

So your "passenger" can change the destination whilst in motion, you have to make the DVD drive think that the handbrake is on. This is achieved by making pin 9 on the CN-100 plug go to ground. You could use an old lug which you may have to cut up a little to make fit in the connector then put a fork lug on the other end and terminated it under a easily accessible screw under the end panel of the dash, which is in the metal frame, so if the need comes to reverse the process you don't need to pull the entire car apart again. (Or use a double throw switch)

AUX input (NTSC)

You will notice that there is a yellow RCA input on the rear of the screen. To use this whilst in motion, you must have completed the Screen Park Brake Lockout Removal.
If you have not completed this hack you must have the hand brake on to use AUX.
Simply plug an RCA lead into the plug on the back of the monitor and run the other end where ever you want to for easy access.

To engage the AUX input, turn the ignition to “ON” not “ACC” then push “INFO” twice. Your screen will go black if nothing is plugged in or you will see whatever is plugged in. Your signal must be NTSC, in Australia we use PAL, these days most devices are capable of NTSC, a media player such as the ASTONE AP-110 is perfect because it is 12 volts, supports NTSC and they are well priced.



Reversing Camera (Not Confirmed)

You will have noticed that there is a four pin plug on the back of the screen. This is a reversing camera input.
You can purchase a premade adaptor for this to connect a reversing camera up
Or the pinouts are as follows

Pin Number	Function
1	Rear Video
2	Video GND
3	Guide
4	Rear DET

Voice Commands (Not Confirmed)

It appears that the DVD drive has a 5 pin plug on the back. This is for a microphone to do voice commands, I am unsure if this actually works however seeing the fact that it has a microphone volume level option and reads push button to start in the menu, it possibly could. You would most likely need to purchase a Kenwood KNA-VC300.

Reference Section

Subaru Service Manual - Reference Drawings.

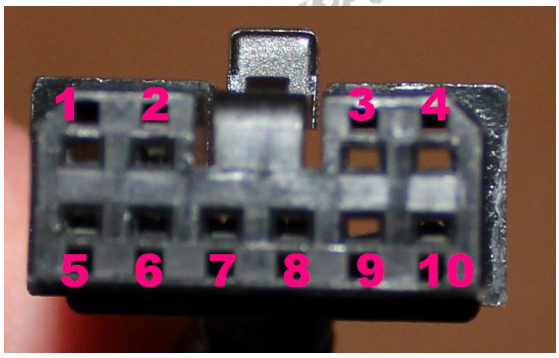
I used drawings from the Subaru Legacy 2004 service manual
I can't remember where I got them from but Google search for it.
They were

- AUDIO(RM)-01 - RHD MODEL WITH MCINTOSH
- NAVI(R)-01/02 – NAVIGATION SYSTEM
- AUDIO(RWS)-02 - AUDIO SYSTEM (ONLY FOR STEERING CONTROLS)
- BACK/L(R)-01 – BACK-UP LIGHT SYSTEM
- ILLUMI(R)-04 – CLEARANCE LIGHT AND ILLUMINATION LIGHT SYSTEM

Also had a look at Kenwood FGZ000UF2 service manual and Kenwood KNA-3100/3200 service manual. (Note, both were North American)

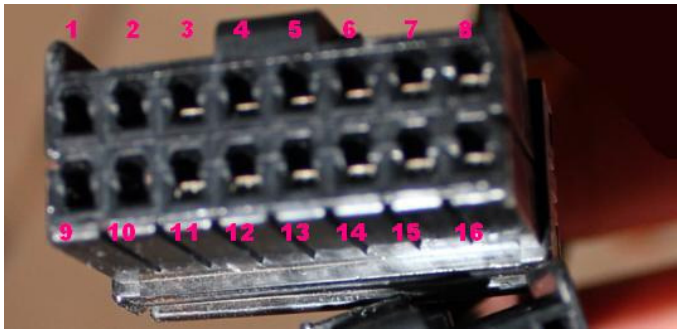
Pinouts

CN – 100 – DVD Drive Power & Signal Connector



Wire Colour	Pin Number	Function
Yellow / Red	2	12V Accessory
Brown / Yellow	5	Reverse Light
Black / Yellow	6	Ground
Light Blue / Red	7	Illumination & Backup Light
Violet	8	Illumination
Grey	9	Hand Brake Switch
Green / Black	10	ABS (Speed Sensor)

16 Pin Power and Signal Cable



Wire Colour	Pin Number	Function
Black / White	3	Illumination Ground
Brown / Yellow	4	Reverse
Green / Yellow	5	Ignition
Pink (Twisted)	6	CAN – BUS +
Yellow / Red	7	12V Accessory
Light Blue / Red	8	Illumination & Backup
Violet	11	Illumination
Green / Black	12	ABS (Speed Sensor)
Grey	13	Hand Brake Switch
Violet (Twisted)	14	CAN – BUS -
Black / Yellow	15 & 16	Ground

McIntosh Radio Pinouts

Socket - Aftermarket

6	5	4			3	2	1
14	13	12	11	10	9	8	7

Plug - Factory Harness

1	2	3			4	5	6
7	8	9	10	11	12	13	14

Wire Colour	Pin Number	Function
Violet	1	Illumination
Green	2	??????????????????????????
Violet / White	3	Steering Wheel Controls +
Light Blue / Red	6	Illumination & Backup Lights
Black / White	7	Illumination GND
Orange / White	9	Steering Wheel Controls -
Yellow / Red	10	12V Accessory
Black	11	Ground
Yellow / Black	14	Antenna Amplifier