

Fitting guide

Symphony II to RNS-E retrofit

Written by Ben Middleton



Tools required

- Audi Head Unit extraction keys (set of 4)
- Thin nosed pliers
- Torx bit screwdriver
- Small jeweller's screwdriver
- Wire cutters
- Fine toothed hacksaw
- VAG-COM capable of communicating with the Instrument Cluster and the RNS-E

Parts required

- 4Bo 035 192 P RNS-E for a European Audi A6 (they come up on eBay all the time for about £400)
- GPS antenna with single FAKRA connector (typically supplied with RNS-E)
- ISO to dual FAKRA antenna adapter
- Wiring harness appropriate for your vehicle (<http://www.kufatec.de> are one possible supplier of this and the FAKRA adapter)
- Cloth loom tape (available from <http://www.vagparts.com>)
- 2 metres of 0.5mm² stranded equipment wire (e.g. 16/0.2mm, 24AWG) (unless the wiring harness adaptor is provided with a suitable loose GALA wire)
- Inline electrotap splice suitable for 0.5mm² stranded equipment wire
- Strong double-sided tape or Velcro pads
- A mixed pack of wet and dry sand paper (with grades ranging between 200 grit and 1200 grit).

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Instructions

Retrofitting an RNS-E to a Symphony II involves a number of stages:

- Removing the Symphony II
- Building a wiring harness
- Installing the GALA speed wire
- Installing the GPS antenna
- Programming and testing the system
- Cutting the RNS-E Fascia
- Installing the RNS-E

Each of these stages is detailed in the following pages.

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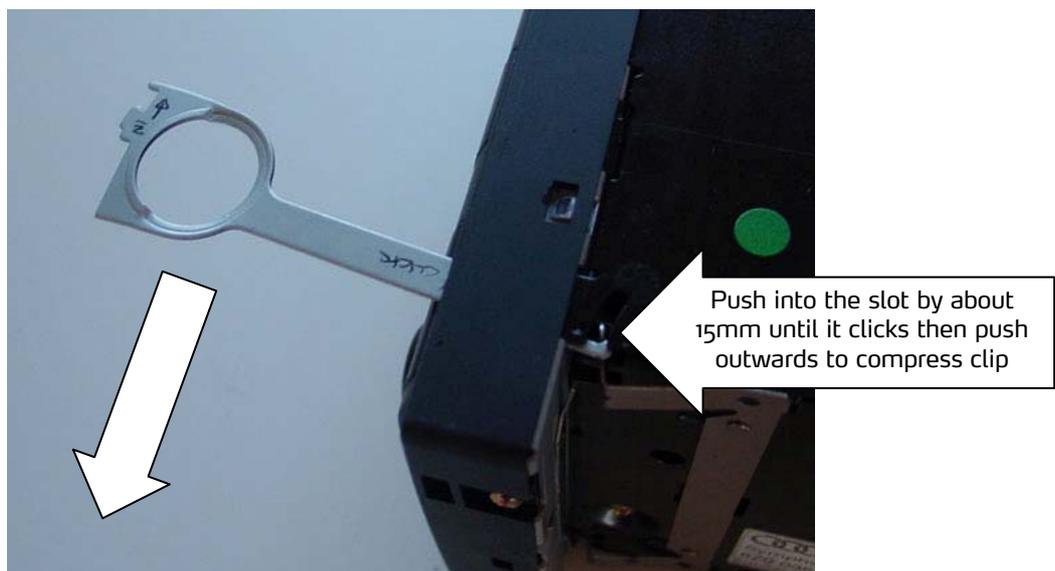
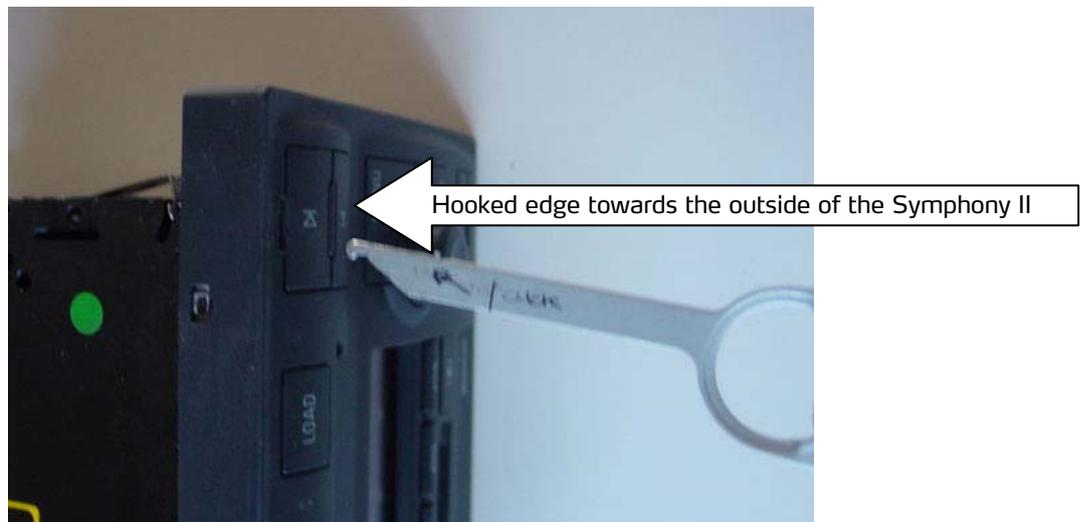
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Removing the Symphony II

- 1) Make sure you have ejected all your CDs from the Symphony III!
- 2) Disconnect the battery of the A2 for safety.
- 3) Put the car into fourth gear to maximise working space. It's advisable to place an old towel in the space between the gear lever and the console to protect it from scratches.
- 4) Insert the 4 radio removal keys into the Symphony II. The images below show the correct way to insert a radio removal key:



You'll notice that the keys in the image are marked up with instructions and locator devices.

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- 5) Carefully remove the existing Symphony II radio and place face down onto the towel:



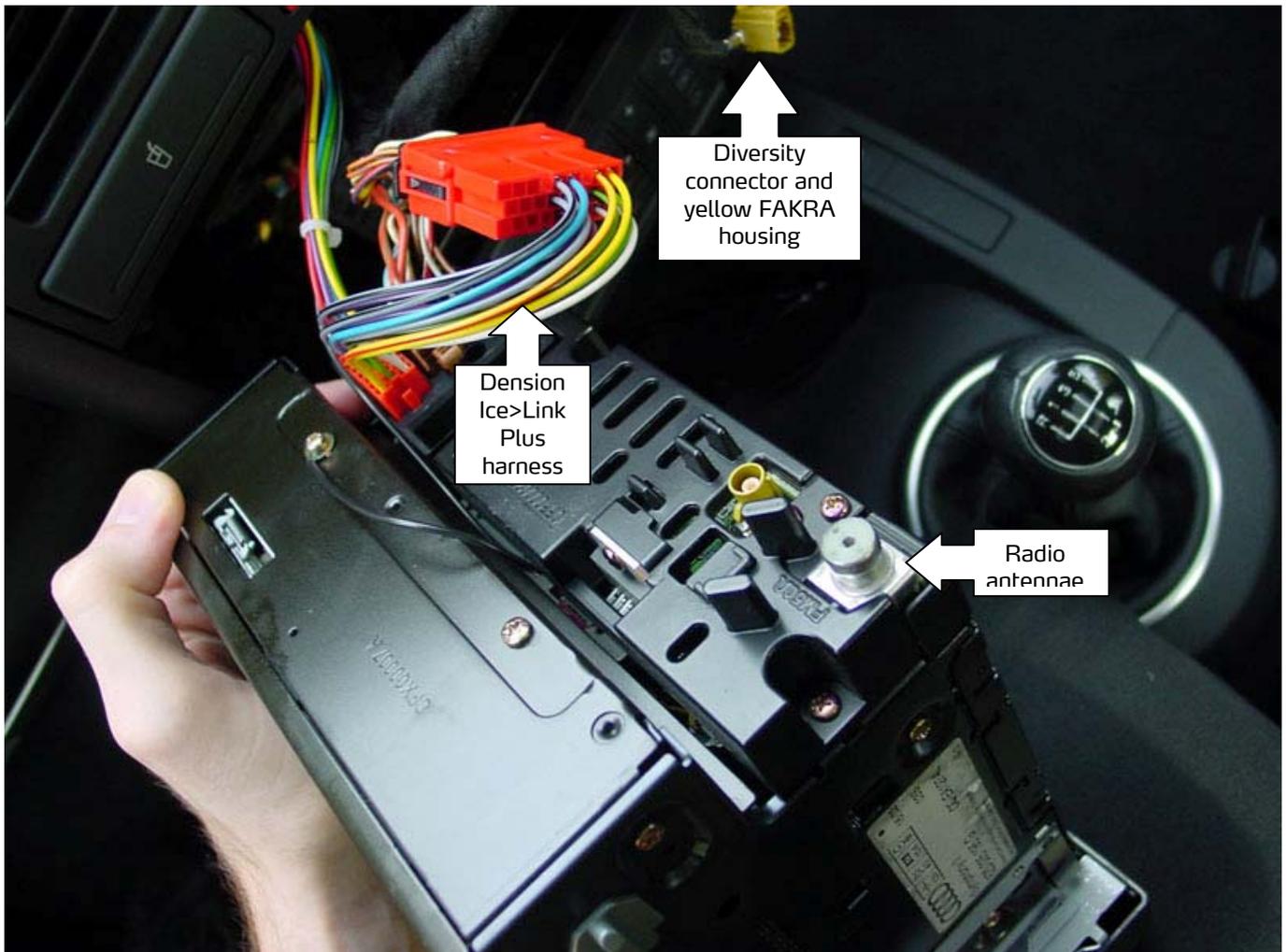
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- 6) Remove the black Radio antennae connector and the yellow FAKRA Diversity connector from the rear of the Symphony II:



- 7) Remove the 3 ISO connectors from the rear of the Symphony II. Note that the picture above shows a Dension Ice>Link Plus harness inline with the standard connectors.
- 8) Remove the Symphony II from the car for safe keeping.

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Building a wiring harness

The correct wiring harness for an RNS-E will be dependant on the features that you have installed in your A2 - such as whether you have BOSE, a telephone adaptor or a CD changer/Dension Ice>Link Plus.

It is easiest to get a wiring harness pre-made to cater for all current and future needs from one of the various internet suppliers. Kufatec are one such supplier:

http://shop.kufatec.de/product_info.php/info/p199_RNS-E-Adapter.html

These harnesses can be customised at a later date using standard Audi parts (pins and wires).

Before testing the wiring harness with your setup, it is recommended that you double-check all of the connections on the harness. The following site is a valuable resource for checking this information:

<http://www.nsxjr.com/docs/RNSToSym2.pdf>

Alternatively, check the Knowledge Base & Quick Links at the NavPlus Audi Navigation Forum:

<http://www.navplus.us> for similar references.

I had to modify my Kufatec harness as it neglected to connect the DWA-GND connector on the RNS-E to the Alarm GND connector in the factory harness. The harness was also missing the loose GALA speed wire. I determined the appropriate Audi Part numbers for the additional pins and wires that I needed using the following chart:

<http://www.nsxjr.com/Audipins.html>

If you have many additional pins to connect – it's worth investing in an 'Uninsulated Crimping Tool'. J&S products produce two models at a reasonable price (HT202B/ HT230C). This will enable you to produce correctly crimped connectors:

http://www.jandsproducts.co.uk/_jspdfs/handtools/47.pdf

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Installing the GALA speed wire

The RNS-E needs to get its speed details via the CAN bus. Later model A2s do not provide this information in a suitable format and hence it is necessary to run a separate wire to the Instrument Cluster and tap-into the blue connector at the back. It's also possible to install a switch in-line with the loose GALA wire if you are later planning on connecting a TV module to the RNS-E and require TV-in-Motion.

- 9) Pull out the steering wheel with the adjuster as far as it will go and pull downwards.
- 10) Using the appropriate Torx bit, remove the two retaining screws on the instrument cowl:



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- 11) Carefully remove the instrument cowl upwards. Note the location of the clips:



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- 12) There are two screws at the base of the instrument cluster that need to be removed. In order to access these screws, you need to remove the soft leather dash panel insert. Pull up the top edge of the insert:



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- 13) To remove the insert completely, you need to release the two plastic side struts from their bottom-rear locators. The simplest way to do this is to run your finger down the inner edge of the strut and push it down and backwards (towards the foot well). Eventually the bottom edge should push down. (Note that I originally spent a good half hour trying to remove this. The workshop manual doesn't give any clues. In the end I gave Skipton01 a call. He gave me clear instructions on the correct removal procedure. Within 30 seconds I had it removed!):



- 14) Repeat this procedure on the other plastic side strut.
- 15) Pull the entire soft leather dash panel insert towards you. This will expose the two instrument cluster screws.

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16) Using an appropriate Torx bit, remove the two lower instrument cluster screws:



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- 17) Remove the remaining Torx screw from the top of the instrument cluster:



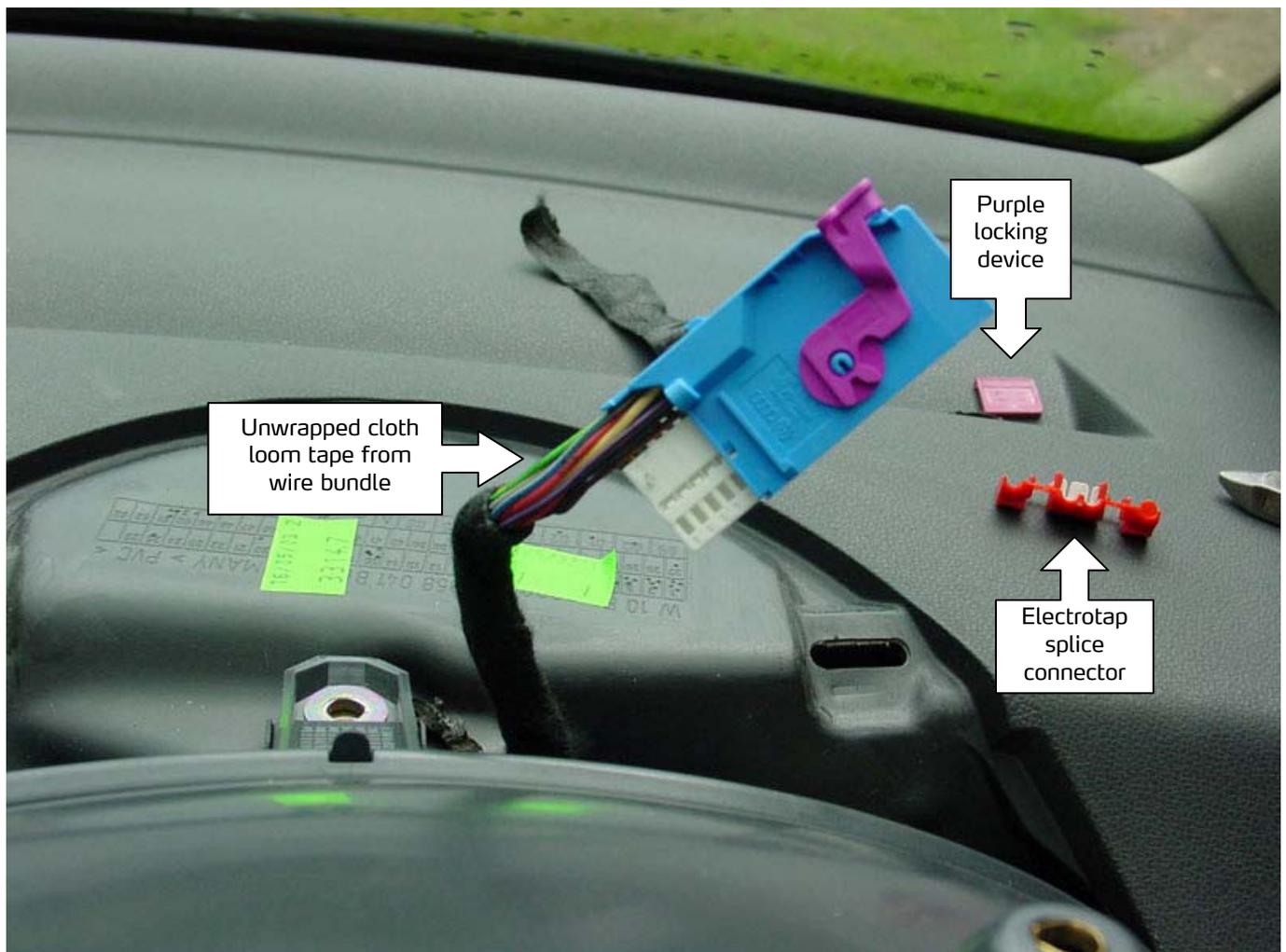
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- 18) Lift out the instrument cluster and carefully remove the blue connector from the back.
- 19) Using a small jeweller's screwdriver, slide off the rectangular purple locking device.
- 20) Slide the blue plastic cover off enough to expose the base of the cloth loom tape.
- 21) Carefully unwrap the cloth loom tape so that about 2 inches of the wire bundle is exposed:



- 22) Install a suitable inline electrotap splice connector (illustrated above) along the light blue wire (which is connected to pin 3 in the blue connector). Connect one end of the loose GALA wire into the other part of the electrotap splice connector and close using a strong pair of pliers.
- 23) Apply some new cloth loom tape around the wire bundle, the newly attached splice connector and along the existing wire bundle and the loose GALA wire.
- 24) Reassemble the blue connector and its purple locking device and reconnect to the rear of the instrument cluster. Do not screw the instrument cluster back into the dashboard at this stage.

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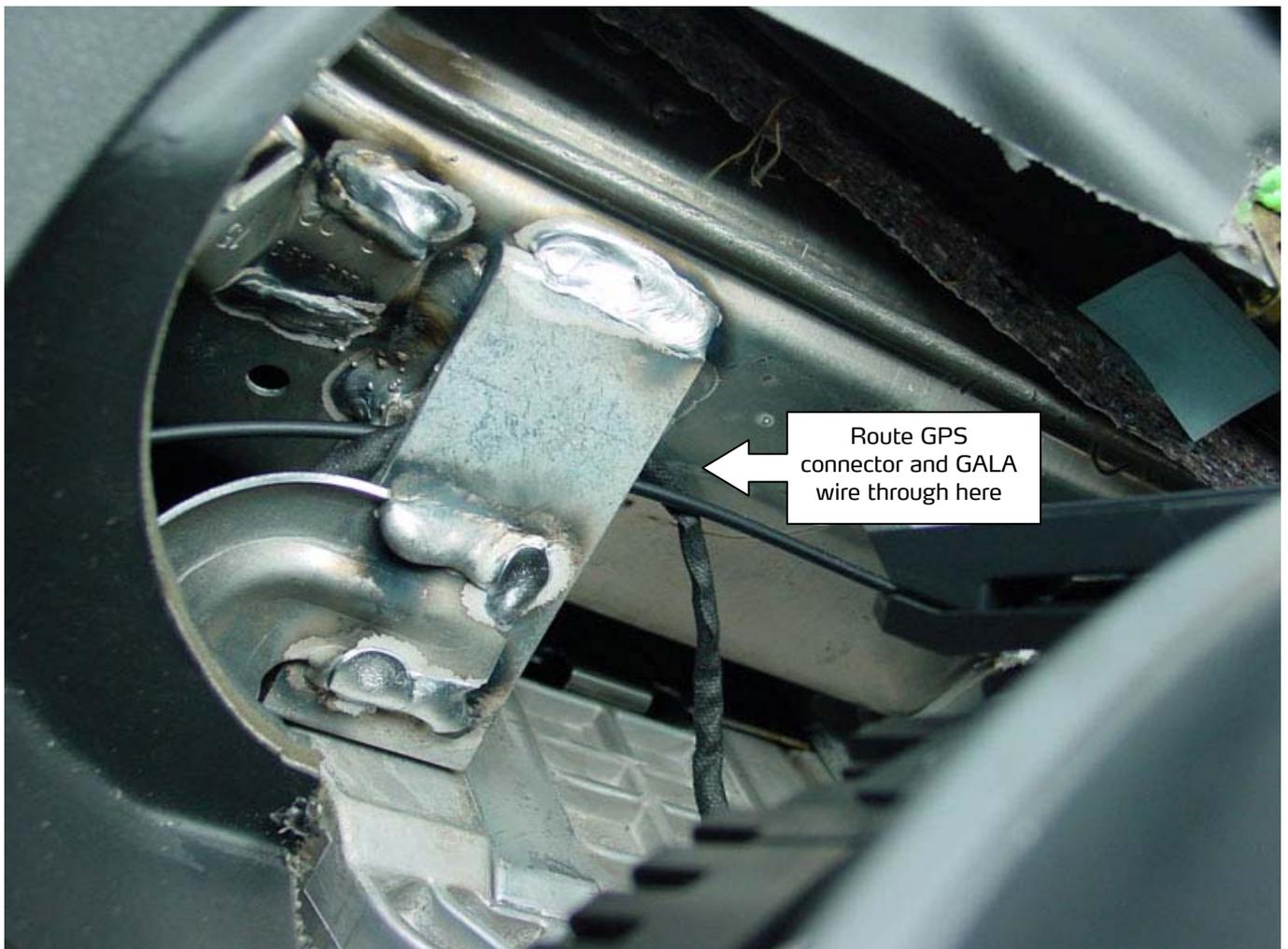
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Installing the GPS antenna

The GPS antenna needs to be located somewhere flat so that it has line-of-sight to the sky with as few metal objects in the way as possible. An ideal location in the A2 is in the space on the dashboard behind the instrument cluster.

- 25) Remove the single blue FAKRA housing from the end of the GPS antennae connector (you'll first need to remove the purple locking device using a small jeweller's screwdriver).
- 26) Route the GPS connector and wire and the loose GALA wire down behind the aluminium frame behind the instrument cluster and towards the space behind the RNS-E location. You'll need to lift the cluster forward to see it:



- 27) Apply some cloth loom tape around these two wires where necessary to prevent the wires from rubbing against any sharp edges.
- 28) Attach one half of a self-adhesive Velcro pad to the base of the GPS antenna body.

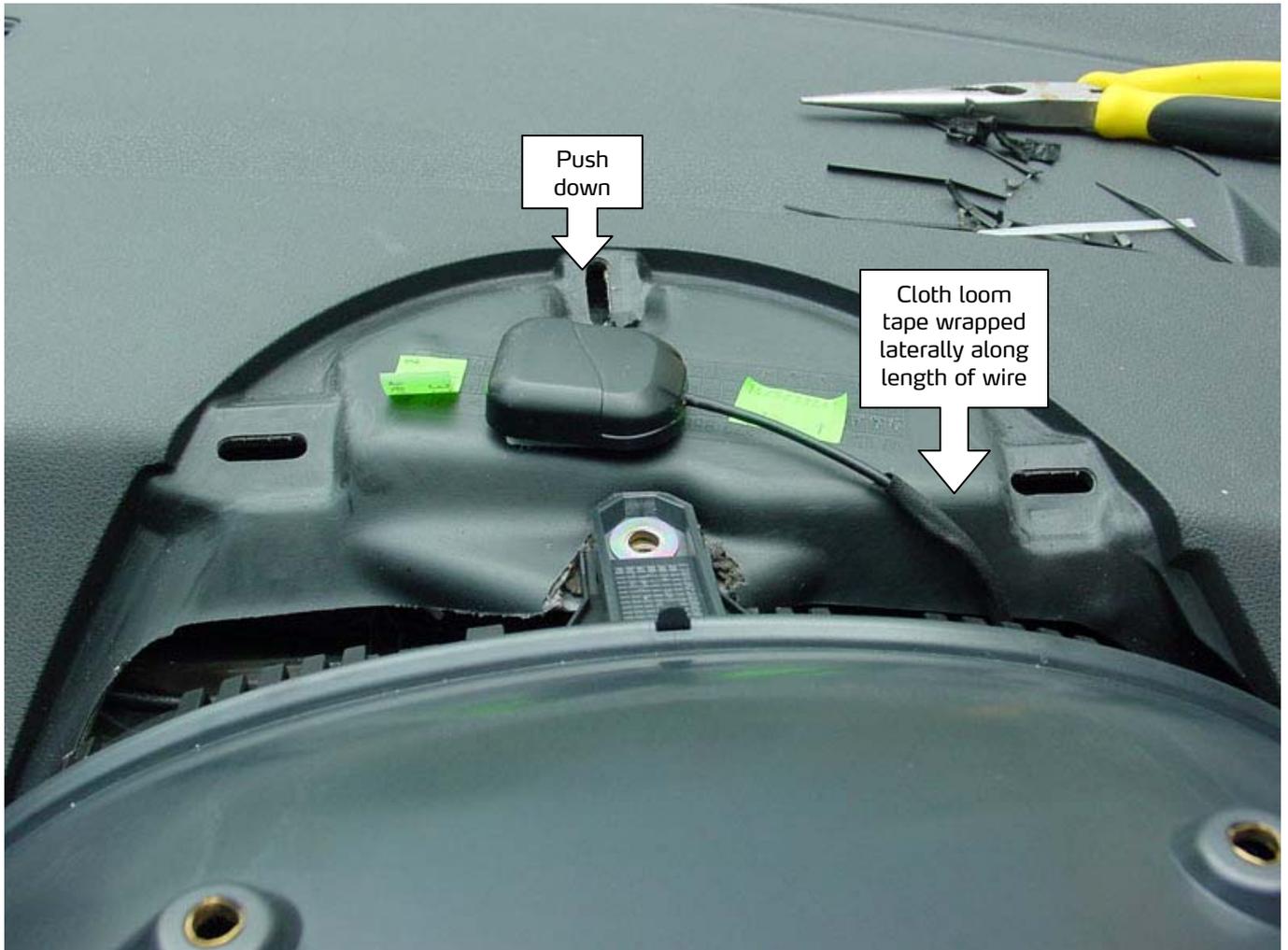
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- 29) Clean the mounting location with a small amount of lighter fuel or white spirit to remove any greasy residues from the dash surface. Allow to dry and attach the other half of the self-adhesive Velcro pad to the dashboard. Push the GPS antenna body down firmly:



- 30) Screw the instrument cluster back to the dash using the 3 Torx screws.

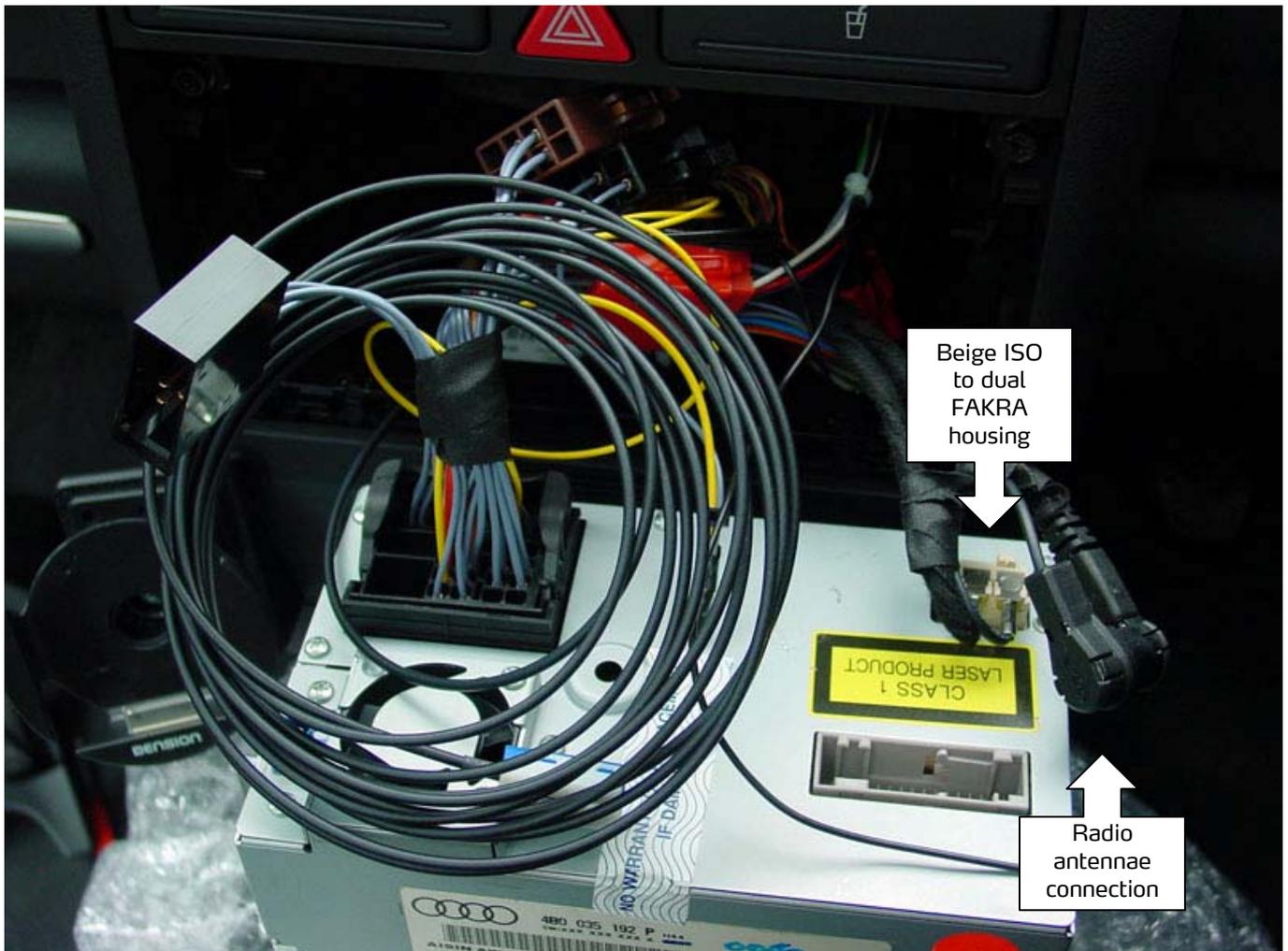
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- 31) Gently loop any excess GPS antennae wire so that it can be fitted into the space behind the RNS-E location:



- 32) Reconnect the GPS antennae adaptor into the single blue FAKRA housing and close the purple locking device.
- 33) Carefully remove the locking device from the single yellow FAKRA housing and prise out the Diversity connector.
- 34) Assemble the beige ISO to dual FAKRA antenna adaptor using the Diversity connector removed from the yellow housing (see image above).
- 35) Connect the existing Radio antennae to the corresponding connector on the ISO to dual FAKRA adaptor (see image above).
- 36) Connect all connectors and adaptors to the RNS-E and reconnect the battery.

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Programming and testing the system

It is essential that you program and test the system BEFORE you cut the RNS-E fascia down to fit an A2 dashboard. If you find that you have a faulty RNS-E, then you should be able to return it to the supplier as supplied.

Programming the various control modules within the A2 requires the use of VAG-COM. It's recommended that you use the following document as a guide to programming:

<http://www.navplus.us/forum/viewtopic.php?t=73>

The important thing to confirm is that the RNS-E is coded as an A6 - i.e. STG 56 -> Coding -> Function 07 -> 5 - Audi A6. Only when the RNS-E is coded as an A6 will it get its speed information via the loose GALA wire.

In the UK, it's typically necessary to code the Voice commands to come from the right hand speaker. Contrary to what is documented in the above link, you can only select RHD (USA) - i.e. STG 56 -> Adaptation -> Function 10 -> Channel 136 -> 00013 - RHD (USA).

Similarly, the GALA coding (STG 56 -> Adaptation -> Function 10 -> Channel 02) will not accept Self calibration. However, the unit auto-calibrates automatically during use - so don't worry about the value currently stored.

Finally, check that your tyre size is correctly coded (STG 56 -> Adaptation -> Function 10 -> Channel 01).

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Testing the system is simply a matter of temporarily pushing the RNS-E into its housing, switching it on and entering the appropriate Unlock code (this should have been supplied on a card with the RNS-E unit):



The simplest way to test its navigation facilities is by going for a drive. Don't forget to take a passenger with you to hold the RNS-E in place during the test!

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Cutting the RNS-E Fascia

Cutting the RNS-E fascia to size requires time, care and attention. You only get one chance to get it right. Make sure you have a clear work area, good lighting, plenty of time on your hands and no distractions!

- 37) Remove the 2 rubber dust strips from the side of the RNS-E unit. These can optionally be reattached to the trimmed RNS-E at a later stage using double sided tape.
- 38) Place the existing Symphony II on top of the RNS-E unit to familiarise yourself with how much of the fascia needs to be removed. It should be clear that to achieve the correct size you will need to remove the protruding ears from the left, right and bottom of the RNS-E:



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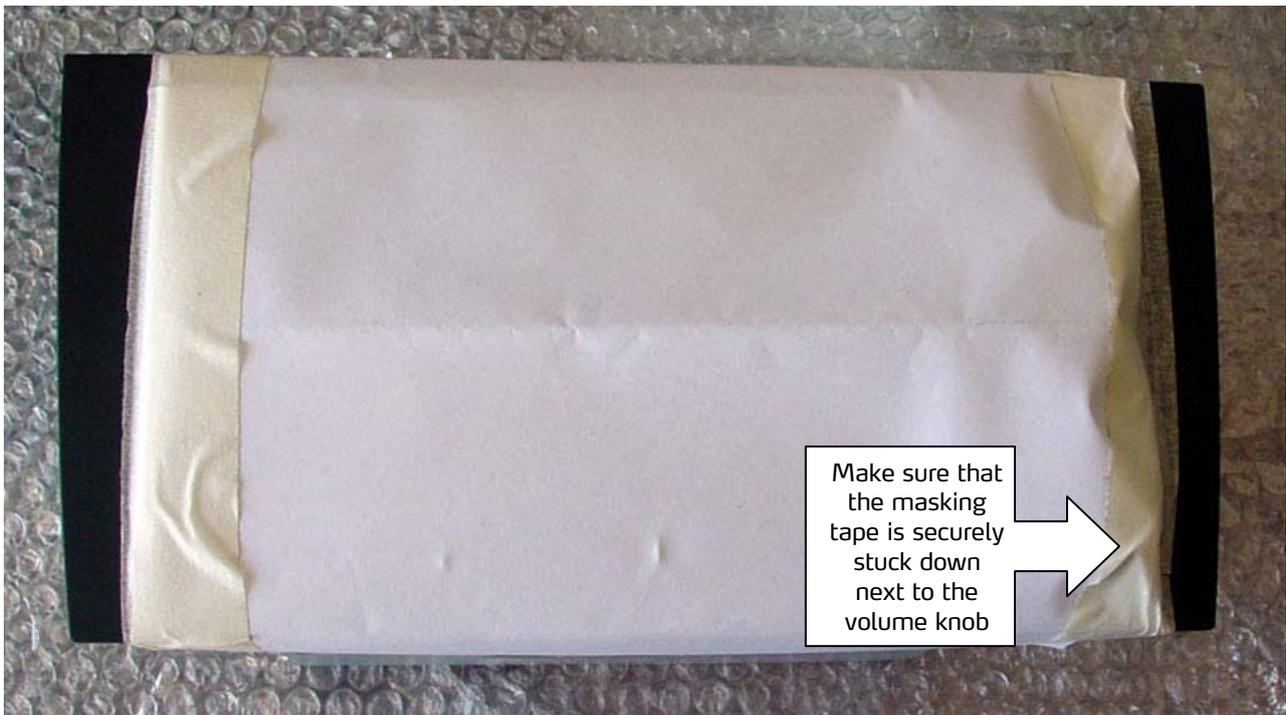
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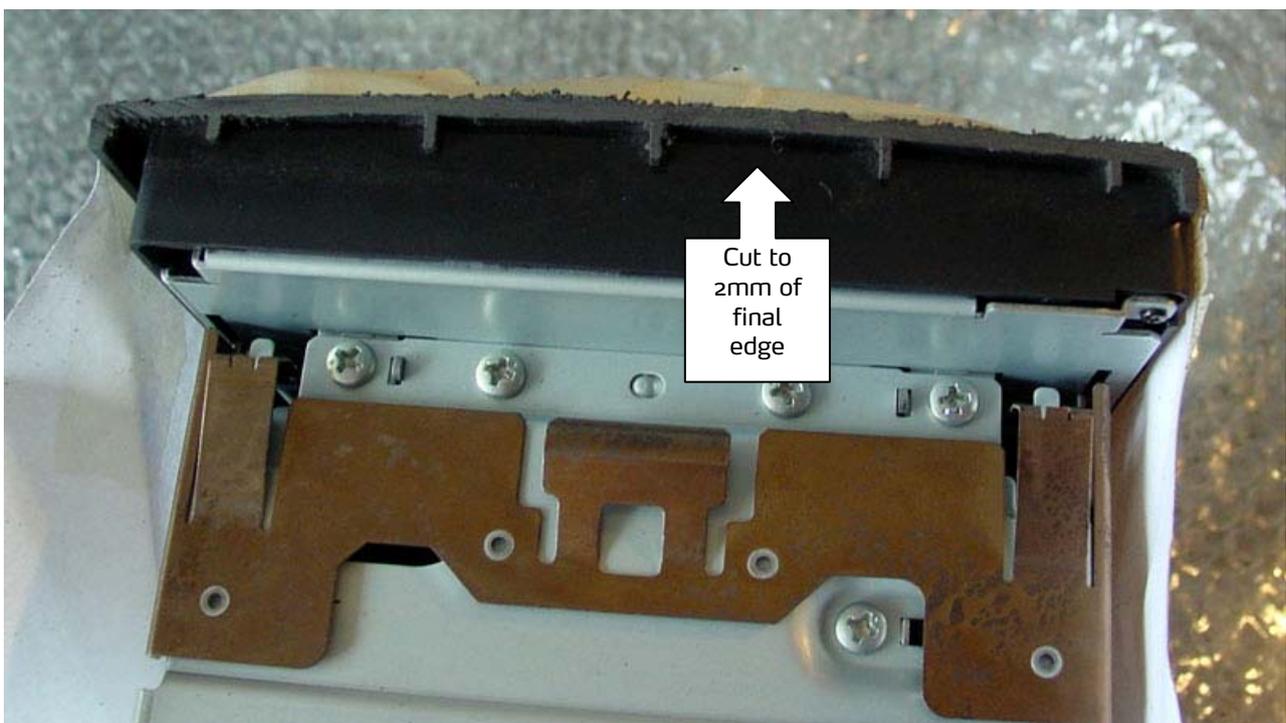
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- 39) Mask the front and sides of the RNS-E using paper and masking tape. Cutting the fascia will create a large amount of fine dust and it's essential that none of it gets inside the RNS-E:



- 40) Using a fine-toothed hacksaw, carefully remove each of the left and right ears. Cut to about 2mm from the final location (masking and tape in image has been removed for clarity):



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- 41) Using progressively fine wet and dry paper (starting off at 200 grit, then moving up to 1000 grit in stages) carefully sand down the protruding ears until the final edge is reached. Wrap the sand paper around a long, solid, flat object to maintain a flat edge (such as a foot long piece of planed 2" x 1" timber). Finish off each ear with the finest grade wet and dry paper (masking and tape in image has been removed for clarity):



- 42) Repeat on the other ear.

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Perform the hacksaw/sanding procedure on the bottom ear. Pay particular care when cutting the ear. Ideally use a hacksaw that is longer than the width of RNS-E unit:



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Installing the RNS-E

The final stage in the Symphony II to RNS-E retrofit procedure is to install the RNS-E into the dash.

- 43) Carefully connect all of the connectors to the rear of the RNS-E.
- 44) Gently push the wires in and downward towards the gap at the rear of the Climate Control unit.
- 45) Carefully push the RNS-E into the dash. If the RNS-E unit seems too tight to push in, you can remove the 2 rubber stays at the top of the DIN cage. You'll have to cut through them using a sharp blade.
- 46) Push the RNS-E into the cage until it clicks.
- 47) Enjoy your RNS-E!



Figure 1 - iPod connected via Denison Ice>Link Plus

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Figure 2 – Radio

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Figure 3 - Navigation Map