Audi Symphony I to Symphony II Install Guide

Version 3.0

Prepared By:

Symbol Glossary

A warning that should receive strict attention

Emphasizes a wiring connection to be made

Additional information on topic but not critical to the installation

Warning - Disclaimer

- **The installer shall indemnify the author and editors for any claims or liability arising from the vehicle modifications described in this document.**
- **To follow this guide requires alterations to the electrical system of the vehicle.**
- **Read and understand the entire document before beginning work.**
- **Armrest telephone handsets will be no longer be operational.**
- **Trunk mounted CD-based navigation systems will no longer be operational.**
- **Disconnect the negative battery terminal before altering vehicle electronics.**

Preface

I have completed the installation of a Symphony II headunit and OEM satellite radio tuner into my 2001 A6. This document will be of most use to owners of a 2000-2001 C5 A6 or B5 A4/S4/RS4 and involves the replacement of the original Symphony I headunit.

This document is prepared as a step-by-step guide and will follow the outline on the next page. No one step is particularly difficult, but as a whole it can seem overwhelming. The outline may reinforce that feeling at first glance. In this case, the reader is urged to read and understand each section individually. The work in each section can be performed independently of the other sections, except that the completion of Section 1 is a prerequisite to the work demonstrated in the remaining sections.

A complete installation of the Symphony II requires all steps in Section 1 to be performed. Do not install the headunit without connecting to CANbus or without having access to VAG-COM or other means to code the control module.

Note from the Author

Thanks to TeddyBGame for his original RNS-D nav installation posts (available for download from www.nsxjr.com) which include very good information about the differences between the Symphony I and Symphony II headunits. Ted has given me some good technical advice and has extensive knowledge of Audi audio and navigation systems.

Because of some past inquiries, I would like to say that donations are gladly accepted but not expected. Many hours of research and labor produced this document but I consider it to be freeware. If you paid money to gain access to this document, you were robbed.

If you have any questions or comments, big or small, please feel free to email me, lee@nsxjr.com

The most recent version of this document can be downloaded from the web at www.nsxjr.com

List of Appendices

Section 1 Symphony II Headunit

The installation of the Symphony II headunit into a 2000-2001 A6 is a multi-step process. The main hurdle to overcome for this installation is that the Symphony I radio is not CANbus (*Controller Area Network*) enabled. The vehicle has many CANbus systems, from engine management, to transmission control, to the one of interest here called "infotainment". These are all separate networks, and the "infotainment" communication network is the one that helps all the radio, telephone, navigation, telematics, etc in a vehicle communicate with one another in an efficient manner. All of these different items are connected to the CANbus like a computer network and they all communicate via two wires, CAN H and CAN L. The Symphony I radio shows CAN H and CAN L on the wiring label, but it is not wired to function via CANbus. The CANbus network is available in the vehicle if the clock in the tachometer dial is digital. If the vehicle has an analog clock then stop here, the wiring in this document will not apply to that vehicle.

If the CD-based navigation system is installed in the trunk, the CANbus wiring will be present. These wires will need to be removed and taped out of the way during the installation process.

Have all Radio Security Codes in hand before disconnecting the battery.
Eject the CD from the Symphony headunit before disconnecting the battery.
Do not turn the ignition switch on while the instrument cluster is removed.

1.1 Instrument Cluster - Connecting to CANbus

The first tasks to complete are behind the instrument cluster. Cover the top of the steering wheel column with a shop towel or painter's tape to prevent scratching when the cluster is removed.

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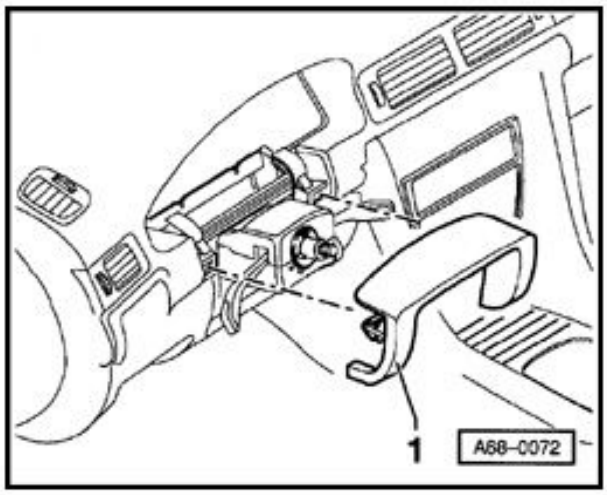
Updated: 12/27/2005

Remove the center trim piece (1) between the steering wheel column and instrument cluster by pulling straight out.



The picture shows the steering wheel removed. It is not necessary to remove the steering wheel for any part of this installation.

Remove the driver's side knee panel and set it out of the way. See the picture below.

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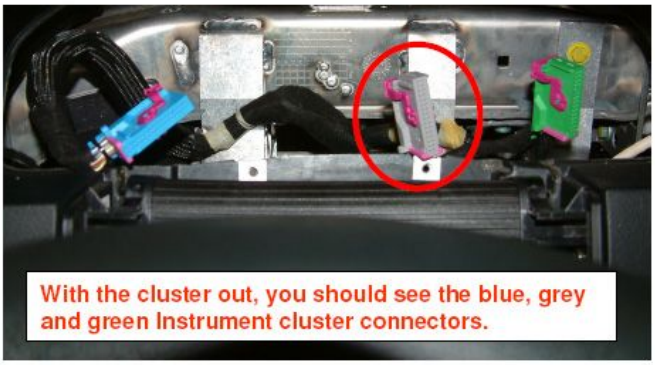
Remove the two Phillips screws holding the bottom of the instrument cluster. These are likely to be extremely tight. Use the proper size Phillips screwdriver. Reach up under the dash and push the instrument cluster out from the rear. When the cluster is loose, remove it by pulling the left side out first, unplugging the blue connector on the left rear, then the grey connector in the middle, then the green connector on the right end. Each of these plugs has a small purple clamp that holds it in place. Simply lift this purple clamp up and the plug will remove itself from the cluster. See next illustration.

Remove these two philips head screws. FYI - They are on tight, so make sure you have the correct size Phillips head; you don't want to strip that screw head or you'll need to drill them out. ☺

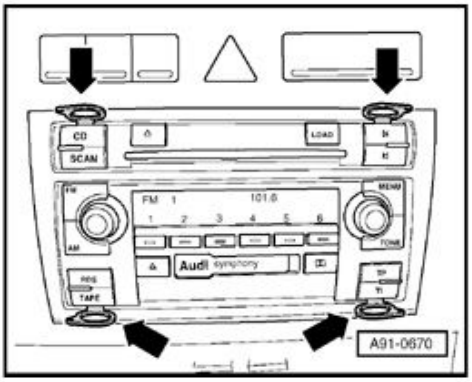


Updated: 12/27/2005

To remove the instrument cluster screws, try tightening the screw first just to break it loose. The screw has a very fine thread pitch meaning the screw will not actually tighten much by being turned clockwise. Also, use an offset screwdriver for better torque. This method has worked for me numerous times.

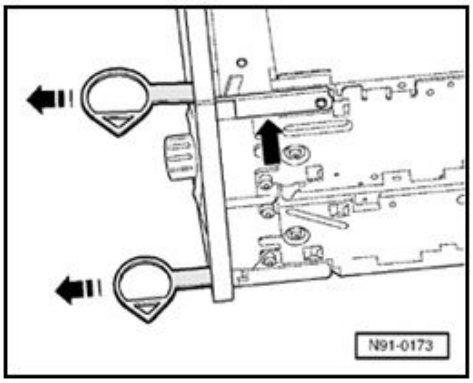
Remove the Symphony I headunit.

Insert the four radio removal tools as shown.
Cover the top of the climate control unit with painter's tape to prevent accidental scratches while removing and installing the radio.



Pull the headunit straight out without pulling on the radio removal tools. If necessary, push the radio out from behind by reaching around under the driver's side dash in the area revealed by removing the knee panel. Alternatively, place as many fingers as possible in the cassette slot, wiggle and pull.

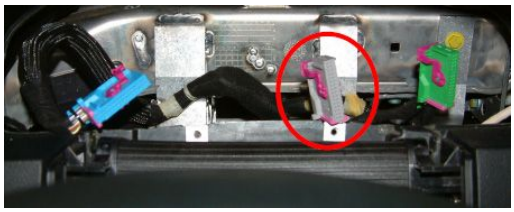
Once the radio is out, unplug the four wiring harnesses, the two antenna connectors, and the brown single wire connector. Remove the radio keys from the face by pressing in the locking tab and pulling the key straight out. This is illustrated in the picture to the right.
Set the Symphony I radio aside.



This step changes CLK and DATA wires that run from the cluster to the radio to CAN H and CAN L. This also accomplishes is the reassignment of the correct pins on the steering wheel control unit to be on the CAN network for proper operation. Refer to **Appendix D** for diagrams of the wiring changes outlined in Section 1.

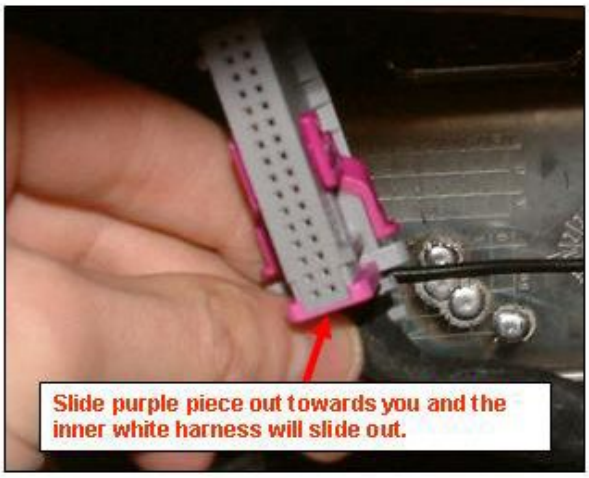
The steering wheel control module installation is covered in Section 3.
The existing control unit may be left in place with no ill-effects but will not be operational.

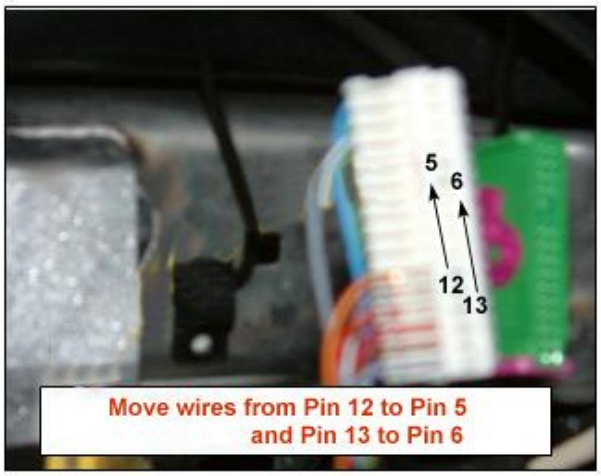
The grey instrument cluster connector must be dismantled to change the wiring. This connector is called T32c. Slide a little purple clamp off the bottom, remove the cable tie from the bottom and then slide the grey cover off the top of the connector. Rewire the pins as shown below.



- Remove the CLK wire from Pin 12 of T32c and reinstall into Pin 5 (CAN H) of T32c.
- Remove the DATA wire from Pin 13 of T32c and reinstall into Pin 6 (CAN L) of T32c.

Reinstall the grey cover, purple bottom clip and cable tie onto the connector T32c.





Updated: 7/19/2004

Reinstall all connectors onto the instrument cluster, making sure the purple clamps lock into place. Reinstall the instrument cluster buy gently pushing back into place and tightening the two screws. Reinstall the driver's side knee panel and the upper steering column trim.

If desired, the instrument cluster screws can be replaced with similarly threaded hex-head screws.
This type of screw will be easier to remove if the instrument cluster needs to be serviced in the future.

1.2 Headunit Installation

The subsections within this topic will describe how to complete the physical installation of the Symphony II headunit. To continue from this point, Section 1.1 must be complete.

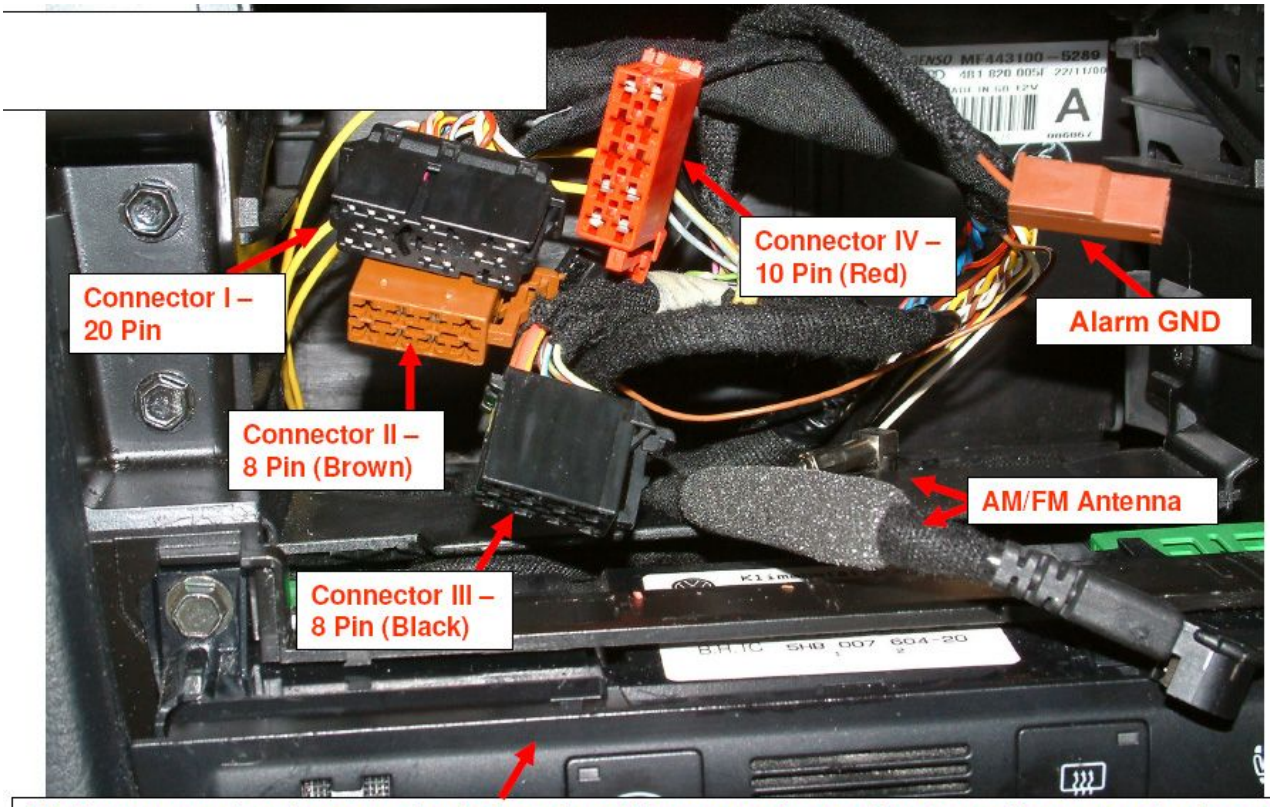
Before performing the work in this section, the original satin black climate control faceplate may be replaced with a faceplate from a 2002-2004 A6 to match the flat black color of the Symphony II. Since this step is not required, further information is located in **Appendix H**.

1.2.1 Rewiring the Connectors

Obtain terminal extractor tools to make this section a snap. http://forums.bostonaudi.org/viewtopic.php?t=3945

See the picture below to locate each connector visually. Each connector has a small bar installed through the middle that must be removed before any pins can be removed. Use a small blade or screwdriver to slide the pin out from the side.

- Remove the GA wire from Pin 1 of Connector III and tape back out of the way.
- Remove the MUTE wire from Pin 2 of Connector III (*if present*) and tape back out of the way.
- With a new wire terminal, connect Pin 2 of Connector III to the large brown single pin connector
- With a new wire terminal, connect Pin 1 of Connector III to chassis ground. *(Bose systems only)*
- Remove the CD GND wire from Pin 10 of Connector IV.



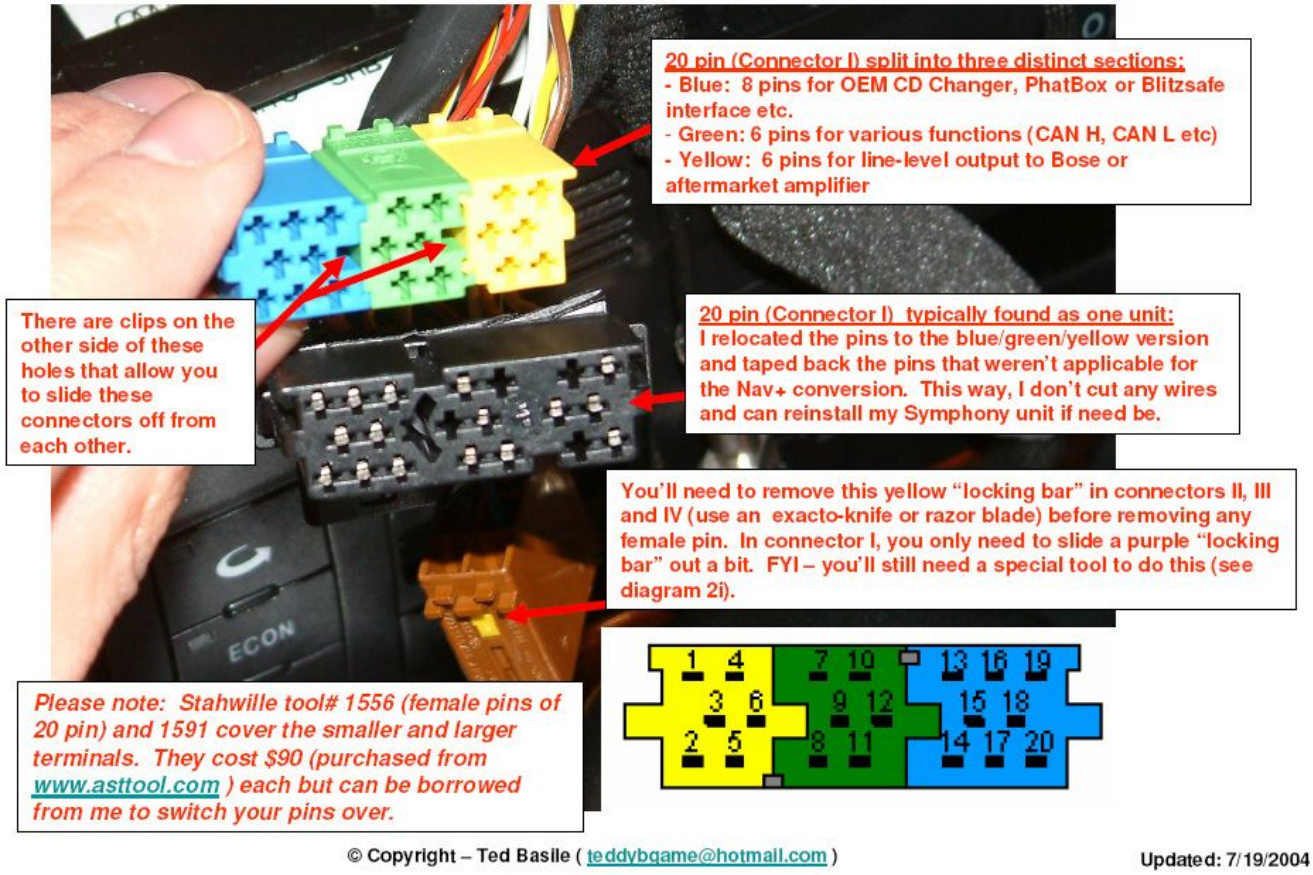
I highly recommend putting some electrical or painters' blue tape on the top edge of your climate control unit as you can easily "scuff" or mark it during Phase 2 of the installation.

 Updated: 7/19/2004

Locate the black (or multi-colored) 20-pin connector named Connector I. The pins in this connector are smaller than all the other connectors. The purple sliding locking bar does not completely come out of this connector, but it must slide out as far as it will go before moving any wires. The vehicle may have the three colored pieces that all snap together to form one instead of the black housing. See the picture below for comparison of both types.

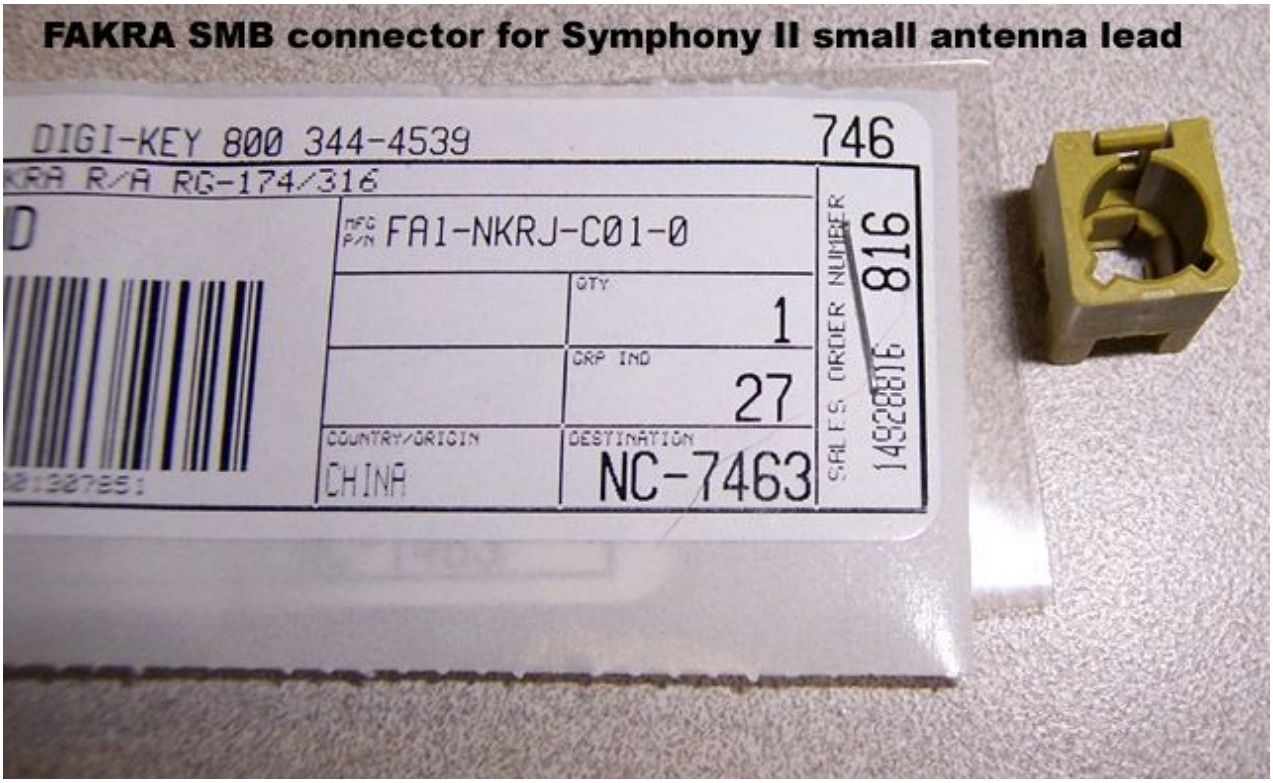
- Remove the CLK wire from Pin 8 of Connector I and reinstall into Pin 7 (CAN H) of Connector I.
- Remove the DATA wire from Pin 9 of Connector I and reinstall into Pin 12 (CAN L) of Connector I.
- Remove the ENA wire from Pin 10 of Connector I and tape back out of the way.
- With a new wire terminal, connect Pin 10 of Connector I to the CD GND wire from Connector IV.

Slide the purple locking bar back into its closed position.



1.2.2 Diversity "ZF" Antenna Connector

There are two radio antenna leads that must be connected to the headunit. The large (HF) and the small (ZF) are used for connection to the diversity antenna box. They must both be connected for the AM/FM stations to tune properly. The small antenna lead must be changed to a different retaining clip to plug into the Symphony II. Remove the old "SMB" style retaining clip and metal connector, and replace with a FAKRA SMB code "K" right angle connector and retaining clip. This connection is similar to making a Coax cable end for cable/satellite TV connections.



1.2.3 Completion

Do not continue without the Radio Security PIN Code available.

Plug in the four large connectors and the two antenna connectors, then slide the Symphony II into place until it's flush with the climate control unit. Reconnect the negative battery terminal. Start the vehicle. Once the engine is idling, turn the radio on and input the radio PIN code as described in the Symphony II owner's manual.

All the CANbus functions should be working fine including switched power, GALA, and illumination. The illumination of the buttons is concurrent with the light switch (on, off, dimming). The illumination of the main text display is controlled along with the instrument cluster trip computer and climate control's temp displays by a light sensor located just below the "0" on the speedometer. If the vehicle is not running, the main text display illumination is dimmed with a light sensor on the Symphony II itself just below the CD slot on the right side.

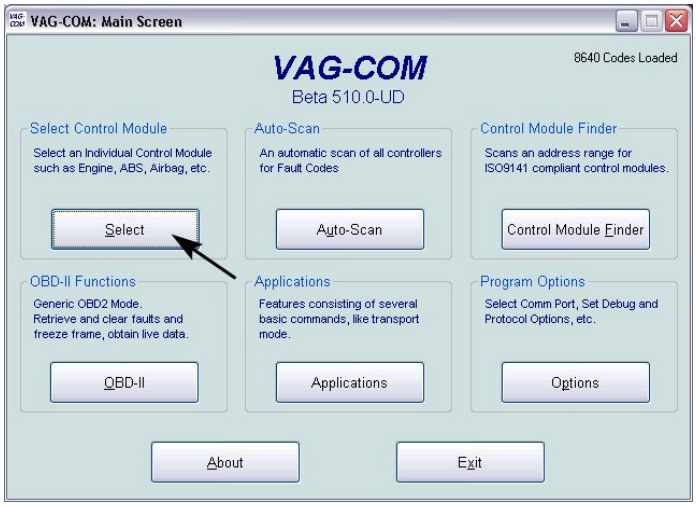
1.3 Control Module Coding (VAG-COM)

The Symphony II and instrument cluster must be coded with VAG-COM to ensure proper operation. Connect a diagnostic cable to the vehicle and start the VAG-COM software on the computer.

In leiu of using VAG-COM software, the vehicle can be coded at any Audi dealership. Expect to pay for this service.

VAG-COM Release 512 is recommended.

From the Main VAG-COM screen, press "Select" under the Select Control Module area.



Select "56-Radio" on the Select Control Module Screen.

The software is now connected to the Symphony in the "Open Controller" window. Note the Software Coding located just below the part number display. Check the chart on the next page to see what the coding means. If the coding is satisfactory, exit out of the VAG-COM software and skip the recoding instructions directly to the adaptation settings. If the control module needs to be recoded, continue with the steps below.

Control Module Coding Chart for Symphony II Headunit

7	Radio configuration 1		
	Diversity box	CD-Changer	Multi-function Steering Wheel
0	-	-	-
1	X	-	-
2	-	X	-
3	X	X	-
4	-	-	X
5	X	-	X
6	-	X	X
7	X	X	X
X = Component installed		- = not installed	

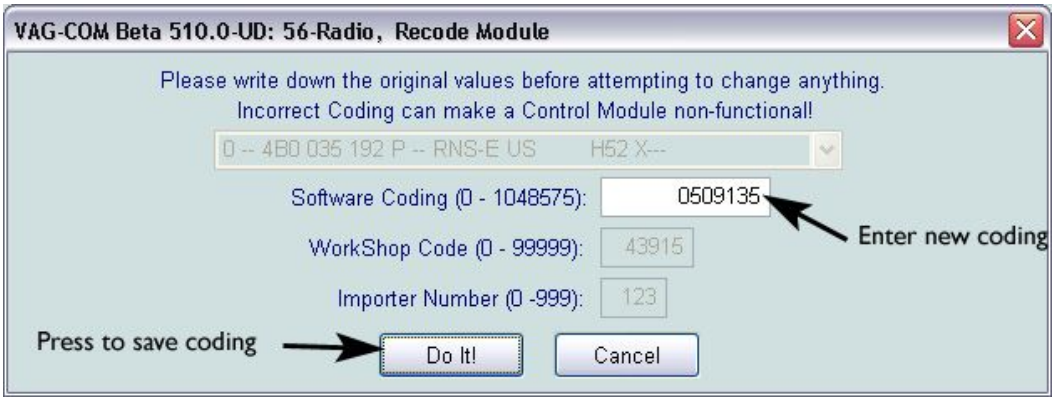
3	Radio configuration 2		
	Navigation	Telephone	SBS (Voice recognition)
0	-	-	-
1	X	-	-
2	-	X	-
3	X	X	-
4	-	-	X
5	X	-	X
6	-	X	X
7	X	X	X
X = Component installed		- = not installed	

6	Radio configuration 3		
	Fader deactivaed	BOSE-display activated	Amplifier switch-off w/incoming phone call
0	-	-	-
1	X	-	-
2	-	X	-
3	X	X	-
4	-	-	X
5	X	-	X
6	-	X	X
7	X	X	X
X = Component installed		- = not installed	

2	Radio configuration 4	
	0	A8
	1	A4 (from 2002)
	2	A6
	3	A4 Cabrio (from 2002)
	4	TT
	5	A2
0	Position 5 = 0	

To change the coding, press “Recode-07”

Enter the new coding desired in the “Software Coding” box.



Verify that the new coding was accepted in the “Open Controller” window.

Press “Close Controller, Go Back – 06” to return to the main VAG-COM screen when satisfied.

The last step is to get the instrument cluster adapted to recognize the radio data for use in the Driver's Information System (DIS). This is the small red display at the center of the instruments.

See the vehicle and radio owner's manuals for information on using the DIS once this installation is complete.

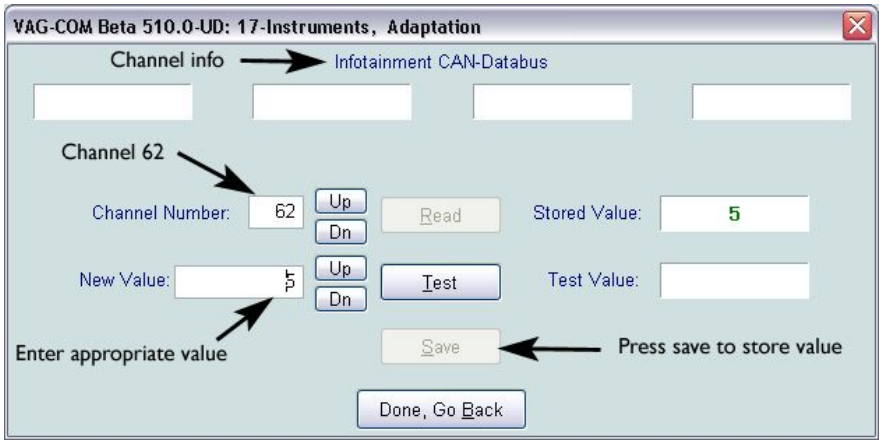
Select "17-Instruments" on the Control Module Screen.

To change the adaptation values, press "Adaptation-10"

Do not Recode the Instruments
It could cause a malfunction.

Enter number 62 in the Channel Number box and press "Read". Enter a value of "1" and press "Save". This value is valid to enable the display of Radio info.

See Section 4.3 for installations that include a telephone module.



Exit back out of VAG-COM completely and disconnect the cable from the diagnostics port.

This completes the installation of the Symphony headunit.

Section 2 Satellite Radio Module

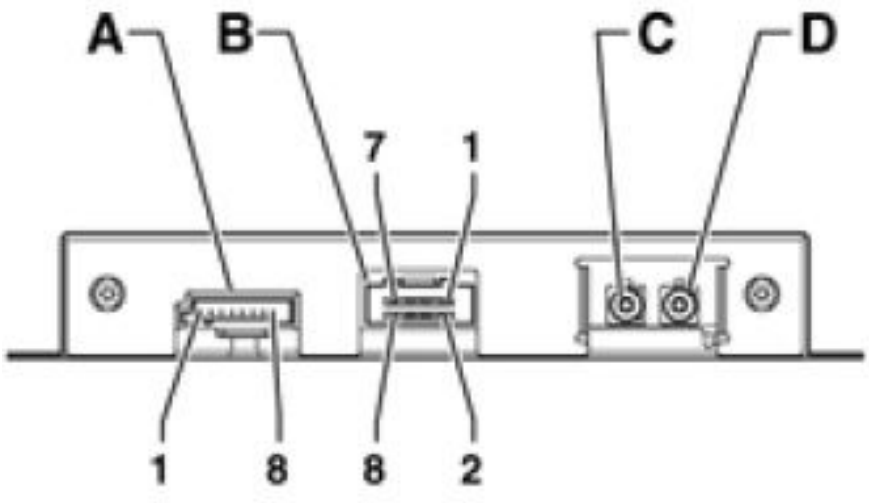
This section will describe how to install an OEM Audi satellite radio module in a vehicle that is not pre-wired for it from the factory. These instructions are specific to Audi vehicles with the CD Changer connection plug in the trunk. First, a note about this installation method. The SAT radio tuner uses the same wires to send audio signals to the headunit that the external CD changer (CDC) cable uses. If a phatbox or ipod adapter is plugged into the CDC port, the installation of the SAT module will require more work than is described here. There is a document on my website www.nsxjr.com that details how to install sat radio with a CDC or other device that uses the CDC port. The audio wires are the only potential conflict between the SAT module and the CDC port since they use separate connections for power and data.

To resolve the audio wire conflict, the SAT radio has a built-in audio pass through for other devices. Three wires called CD-In Left, CD-In Right, and CD-In GND. These work such that when the SAT module is on, it sends it's audio to the headunit and blocks out anything else. When it is turned off (i.e., switch to another source on the headunit), the SAT radio allows the signals from the audio inputs to pass through to the headunit. The Audio-IN pinouts can be seen on the SAT radio wiring diagram below. These audio inputs are where to connect the three audio wires (L, R, GND) from a Phatbox or iPod adapter. There's a schematic of the SAT and CDC connections together in **Appendix E**.

2.1 The Basics: SAT Radio Tuner Wiring Info

There are four categories of wires the SAT tuner requires:

- Power: Two wires in their own connector. Main source of power used to operate.
- Audio: Three wires: Left, Right, and Audio Ground. These send the audio to the headunit.
- Data: Two wires: CAN H and CAN L. For communication with the headunit of all other data.
- Antenna: Two wires: brown and green FAKRA terminals that the antenna connects to.



A: Audio and Data Connector
1. CAN L
2. CAN H
3. Audio In L
4. Audio In R
5. Audio Out GND
6. Audio Out L
7. Audio Out R
8. Audio In GND

B: Power Connector
1. Kl.31 (GND)
2. Kl.30 (battery power)
3-8. N.C.

C: TER Antenna Connector
D: SAT Antenna Connector

2.2 Power Wires

The SAT radio tuner will be located in the trunk and needs a power supply there. Luckily there is a good source of power from the correct fuse (#37) already in the trunk: a 2.5mm wire that carries the power from fuse #37 to the amp on the right side of the trunk.

Remove the trunk floor carpet and rear cross panel trim at the lip of the trunk. Remove the right side trunk trim, at least far enough to allow room to work with wiring at the amplifier. (See **Appendix F**)

The power wire to be tapped is HOT at all times. Disconnect the battery.

Do not use the power supply wires within the CDC harness for the SAT tuner module.

- Remove the wiring harness from the amplifier and splice into the +12V power wire. It is the large Red/Blue wire at Pin 13 of the Bose Amp connector. *For non-Bose amps, the wire is located in Pin 1.*

Reconnect the wiring harness to the amp and run a new wire, at least 18AWG in size, from the splice just made, across the rear of the trunk (under the cross panel trim), behind the left side trunk trim, into the hole where the SAT module will be installed. Reinstall all the trunk trim.

Alternative: connect a new power wire to the "30" connection on the power bank behind the fuse box and run to the trunk. An inline fuse between the SAT module and the power connection is required if this method is used.

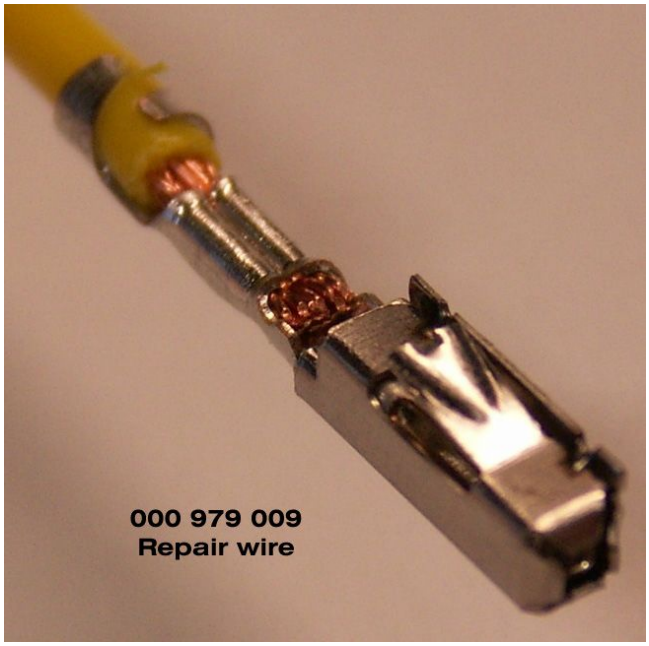
- Install a new wire terminal onto the end of the power wire and install into Pin 2 of T8r. T8r is a new wire terminal housing in the picture above. It is a small connector with wires arranged in two rows of four wires each. Install another new wire terminal into Pin 1 of T8r and connect to ground in a convenient location. Check for good ground by using a multimeter to check voltage using the new power wire in Pin 2 for positive voltage. The power on this wire is hot at all times if the battery is connected. Close the wing sides into the T8r connector, it is complete.

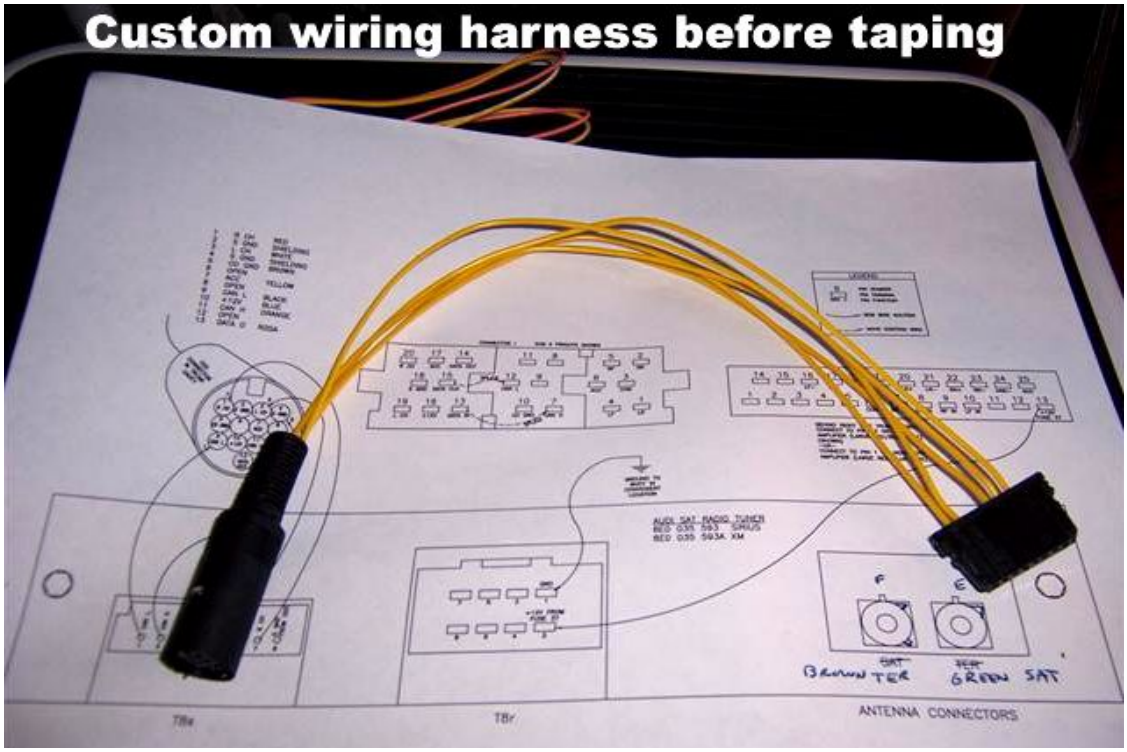
2.3 Audio Wires

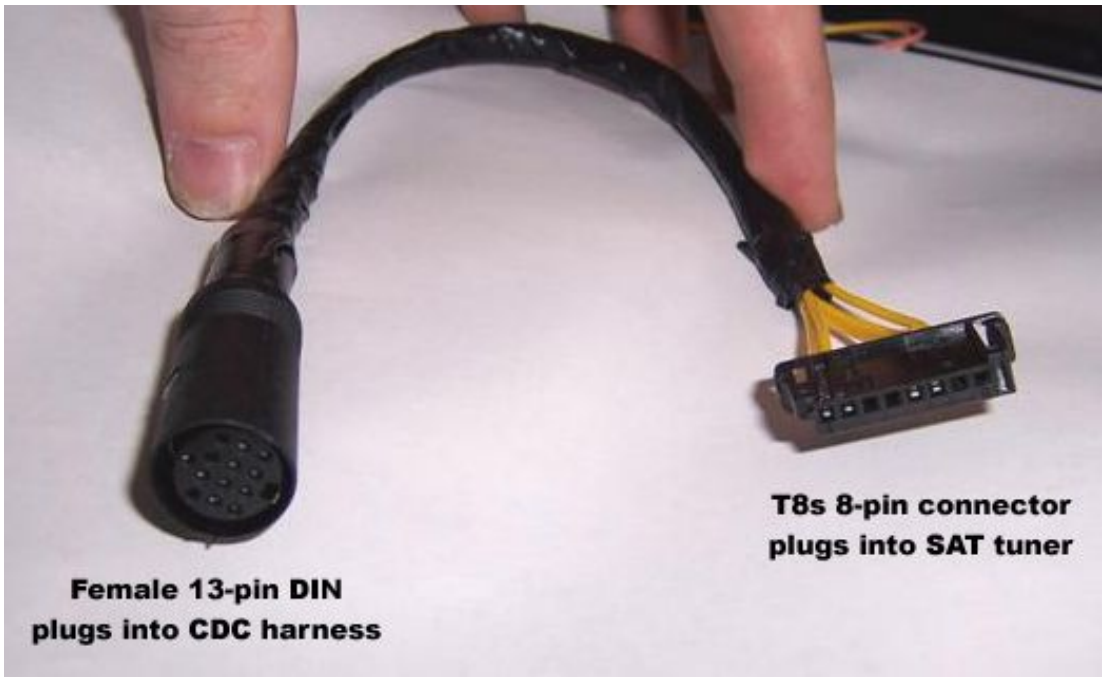
The existing CD changer harness already contains three wires that take audio signals from the trunk to the headunit. This installation will take advantage of them. The CDC plug is in the left side trunk panel kind of tucked up behind the tool kit. It is a large plug wrapped in grey foam. Pull it out and remove the foam cover. The custom wiring harness created in this step will have a female 13-pin DIN plug that mates to the CDC trunk plug. The other end of the custom harness will be the connector T8s. T8s is a small black 8-pin plug arranged in one row of 8 pins. This plug and new wire terminals can be purchased from Audi. Refer to the wiring diagrams for a visual description of the proper wiring pinouts described in this subsection. Prepare 3 lengths of wire with new wire terminals on one end only. Solder the loose ends of these 3 lengths to Pins 1,3,4 of the Female 13-pin plug. Slide the outside cover over the Female 13-pin plug. Connect the new wire terminal end of these 3 wires to the new wire housing T8s in this order:

- Female 13-pin DIN Pin 1 to Pin 7 of T8s (R CH sound)
- Female 13-pin DIN Pin 3 to Pin 6 of T8s (L CH sound)
- Female 13-pin DIN Pin 4 to Pin 5 of T8s (Spk GND)

Wrap the wires between the two ends of the harness with electrical tape. The custom wiring harness that plugs into the CDC plug is complete. Plug the round 13 pin connector end into the CDC plug in the trunk and wrap them with electrical tape to prevent them from separating. There are two more wires to connect to T8s in the next subsection.




Custom wiring harness before taping
ANTENNA CONNECTORS


T8s 8-pin connector
plugs into SAT tuner
Female 13-pin DIN
plugs into CDC harness

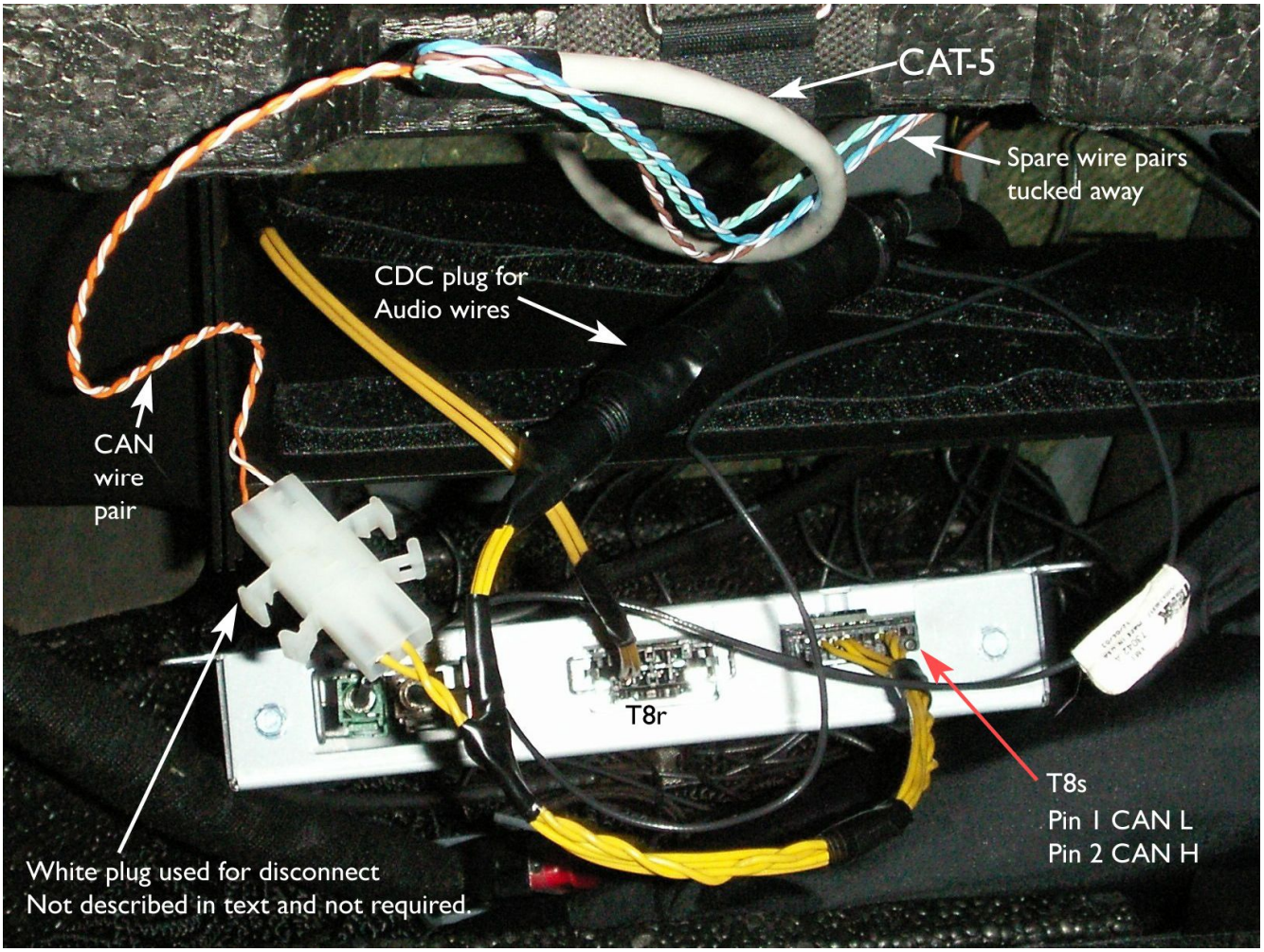
2.4 Data Wires

Run two new wires (24 AWG minimum) from the headunit to the trunk. I did this by running a CAT-5 ethernet cable. This type of cable has 4 pairs of wires. Each pair contains a solid and a striped colored wire that are twisted around each other a few times an inch. This twist is also a standard of the CAN network. Even though only one pair is needed for this installation, it is easy to run the whole CAT-5 cable. This will result in three extra pairs in the cable already run that may or may not be used for future projects. I chose to use the solid wire for CAN L and the striped wire for CAN H. This wire installation will require the removal of some door sill trims to tuck the wire away out of sight.

- Behind the headunit, splice the solid wire into the CAN L wire from Pin 12 of Connector I and splice the striped wire into the CAN H wire from Pin 7 of Connector I.
- At the trunk end of the wires, connect new wire terminals and plug the CAN L wire into pin 1 of SAT connector T8s, and the CAN H wire into pin 2 of T8s.

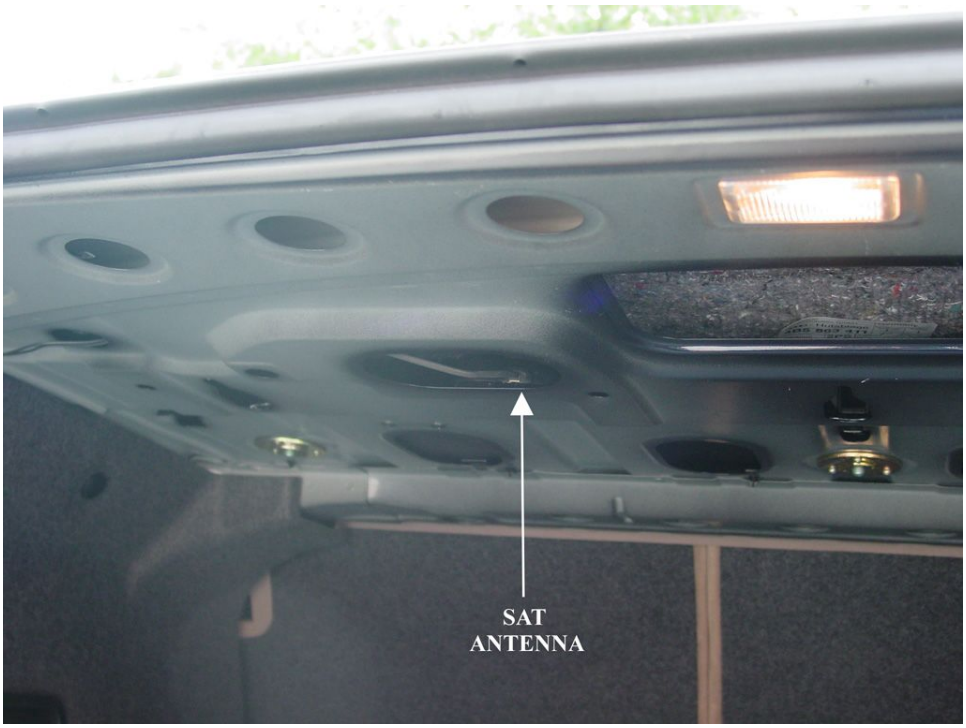
In the past I have used non-twisted wire pairs for my CANbus network with no problems.

In the picture below the orange twisted pair is used to connect to my small T8s connector on the tuner (after passing through the large white connector in the harness). The other twisted pairs are just pushed back out of the way and will sit dormant until used on future projects.



2.5 Antenna Wires

With all the other wiring completed, the last step is the SAT antenna. The right antenna must be purchased for the SAT radio service planned for installation. The OEM Audi antenna will work for both SAT radio services, but requires a drilled hole in the roof to mount and the purchase of antenna cables and more connectors. This may be of interest to Avant owners that don't have the mounting location of the sedans. This did not interest me, so I bought an antenna and installed it below my rear parcel shelf, on top of the metal frame that supports it. I bought a slim Terk antenna XM3 and it slides between the metal support and the top deck easily. As long as there is nothing metal between the antenna and the satellites it should work fine. A two lead antenna is required to plug into the SAT tuner. The newer antennas only have a single pink lead. This type of antenna must be installed with a splitter that will convert the single Pink lead to a dual green and brown lead. Once the antenna is installed, run the wires to the left side trunk panel where the SAT tuner module will be installed.



IMPORTANT NOTE ABOUT ANTENNAS

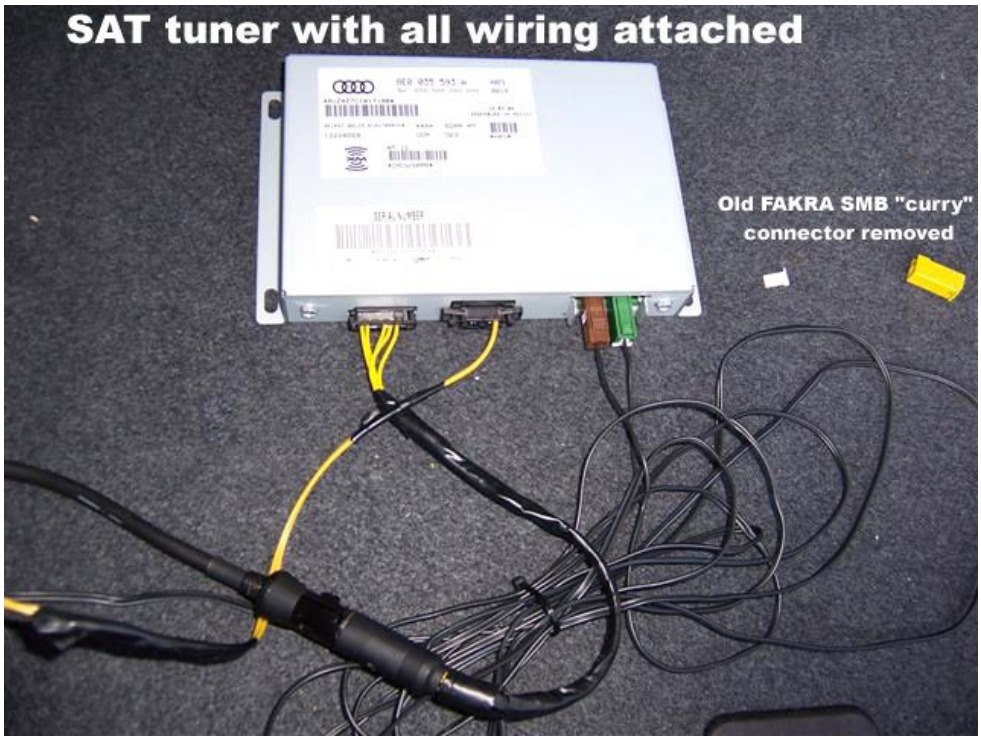
Audi is unique with the colors of their antenna leads. Most aftermarket antennas will have green (XM, white for Sirius) and "curry yellow" leads. The green (or white) is for terrestrial signals, the curry is for satellite signals. The connectors on the Audi OEM tuner are green and brown. For Audi, the green is for satellite signals, the brown is for terrestrial. These are FAKRA SMB type connectors and the colors correspond to the "key code" of the connector. The "key code" is just some tabs that keep some connectors from plugging into the wrong slot. Green is key code 'E', Curry is key code 'K', Brown is key code "F", and White is a universal connector that will plug into any color socket.

Terrestrial :	Audi Brown	XM Green	Sirius White
Satellite:	Audi Green	XM Curry	Sirius Curry

On the antenna leads, swap the green connector to where the curry connector was. Buy a new brown FAKRA connector and connect to the lead that was previously green. Now the antenna can be plugged into the SAT tuner. (The same can be done for Sirius, but the white connector will plug into the green Audi socket.) The good thing about Terk brand antennas is that they use Amphenol brand connectors, so the new brown connector purchased from www.digikey.com will fit perfectly.

2.6 Completion

In the 2001 Audi there is not a "factory" place to install the SAT tuner. A good location is the slot where the CDC goes, attached with a hefty dose of Velcro. A SAT radio mount kit is available, but it only consists of 4 screws and 4 plastic nuts that have no purpose if the vehicle doesn't have the "factory" mounting position. Mount the tuner and plug in the antenna connectors, power connector T8r, and audio connector T8s. All of these only plug in one way to prevent them from being incorrectly installed. With all the wires connected, ensure the SAT tuner module is well mounted and replace the trunk the access panel. The tuner can now be activated by pressing the "SAT" button on the headunit. Tune to channel 0 to display the radio serial number required for activation.



Section 3 Multifunction Steering Wheel

This section will describe how to change the multifunction steering wheel (MFSW) control unit to regain the use of the steering wheel controls with the Symphony II. These instructions are specific to vehicles with existing multifunction (audio/telephone) buttons on the steering wheel. The new installation of a MFSW into a vehicle with a regular steering wheel is far more complicated than the instructions given in this document.

The existing MFSW in the vehicle will work with the Symphony II, but the control unit must be changed. The MFSW uses an internal and external control unit. The internal unit (inside the steering wheel) reads in the actual button presses. It communicates the button data over a single data wire to the external control unit. The external module receives the data and relays it to the CANbus network. It also gathers data about interior illumination (for button lights), and ignition status (off or on) and relays that data over the same single data wire back to the internal control module for its use.

The external control unit is the one that must be replaced. This is because the existing control unit that operates with the Symphony I radio does not communicate via the CANbus language.

Section 1 must be completed for this installation to operate properly.

Look for a separate document to be available in the future on www.nsxjr.com covering the topic of retrofitting a MFSW into vehicles originally equipped regular steering wheels.

3.1 MFSW Control Unit Installation

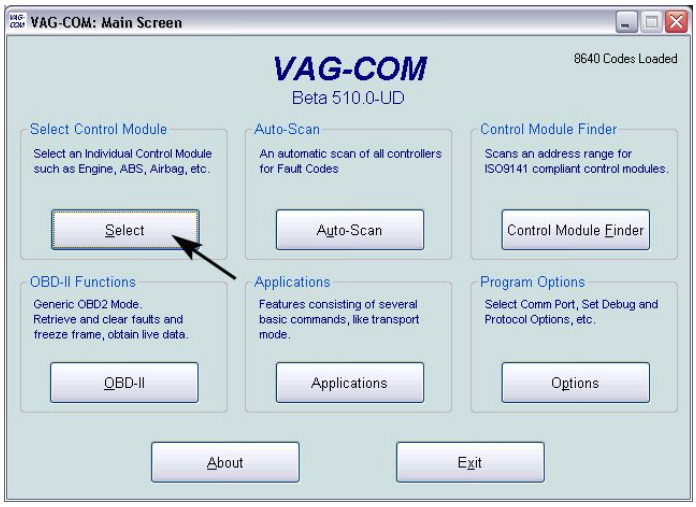
Remove the driver's side knee panel as discussed in Section 1.1. Look up into the foot well behind the fuse box and find the control unit, probably with the number 608 on the top. It will be on the middle row, far left side. Pull the 608 unit out and install the new 616 unit in its place. There is no rewiring to be done because the correct pins in the relay socket have been properly reassigned to the CANbus network based on the wiring already performed in Section 1. Reinstall the knee panel.

Special thanks to Eric C. of Boston for donating his 616 control unit for my installation.

3.2 Control Module Coding (VAG-COM)

The new MFSW control unit must be coded with VAG-COM to ensure proper operation.

From the Main VAG-COM screen, press "Select" under the Select Control Module area.

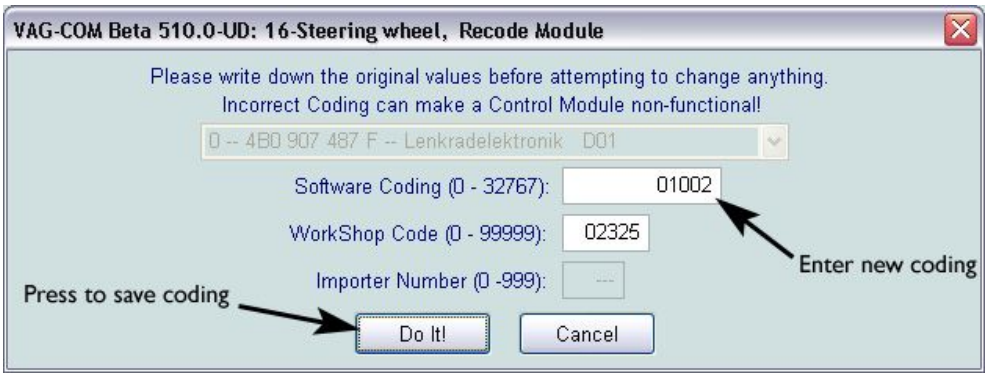


Select "16-Steering Wheel" on the Control Module Screen

The software is now connected to the new MFSW control unit in the "Open Controller" window. Note the Software Coding located just below the part number display. Check the chart on the next page to see what the coding means. If the coding is satisfactory, exit out of the VAG-COM software and skip the remainder of this section. If the control module needs to be recoded, continue with the steps below.

To change the coding, press “Recode-07”

Enter the new coding desired in the “Software Coding” box.



Verify that the new coding was accepted in the “Open Controller” window.

Exit VAG-COM.

Control module suffix "F" & "H"

X	X	X	X	X	**Coding**
X					**Standard**
0					always 0
	X				**Radio on CAN-Bus**
	1				always 1 (Radio on CAN)
		X	X		**Tiptronic**
		0	0		without Tiptronic **"F"**
		0	1		with Tiptronic **"H"**
				X	**Steering wheel functions**
				1	Radio & telephone operation
				2	Radio operation
				5	Radio, telephone & voice recognition/operation operation

Section 4 Bluetooth Telephone Module

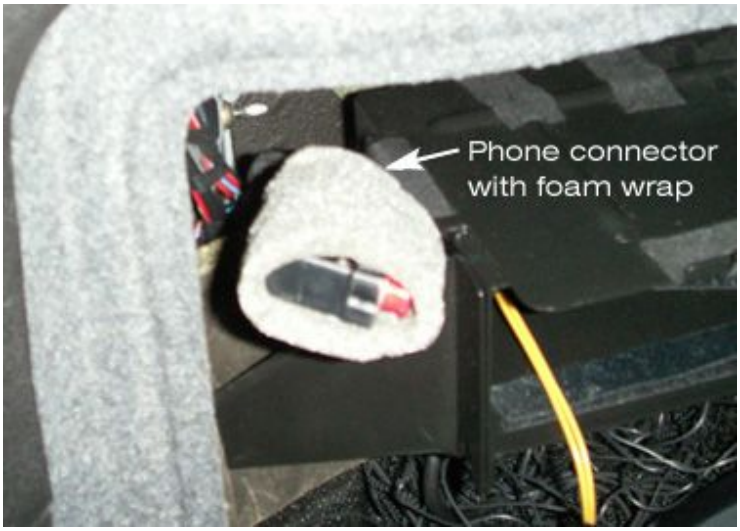
This section will describe how to install an OEM Audi Bluetooth telephone module in vehicles that are equipped with analog telephone preparation wiring. This analog telephone preparation consists of the handsfree microphone near the sunroof dial, and the wiring harness that ends in the trunk with a DB25 female connector. If the vehicle is equipped with the BOSE audio system, there will also be a small telephone audio speaker in the middle portion of the B-pillar trim. If the vehicle is actually equipped with the full analog telephone kit, there will also be a handset in the armrest and a telephone transceiver in the trunk. These two items can be removed from the vehicle if present.

This installation requires the presence of a multifunction steering wheel. Section 3 must be completed for this installation to operate properly.

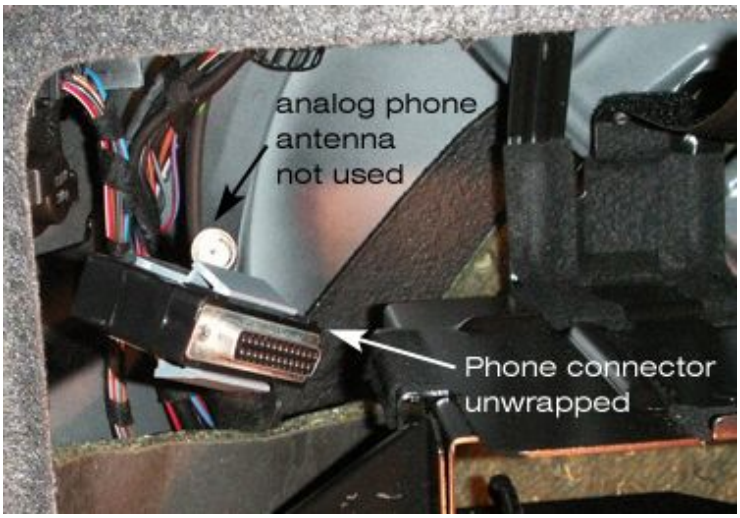
Reminder: this document is specific to vehicles originally equipped with Symphony I radios. Vehicles with Symphony II radios were equipped with newer telephone transceiver modules located under the passenger's seat instead of in the trunk. This type of module uses a 42-pin connector instead of a DB25 connector. The wiring in this section does not apply to vehicles equipped with the newer telephone transceiver modules.

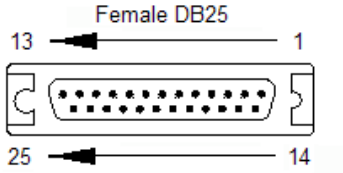
4.1 Custom Wiring Harness

Almost every connection required of the new BT telephone module is already present in the female DB25 connector in the trunk. In this subsection, a custom wiring harness will be made to allow the new BT module to plug into this connector.

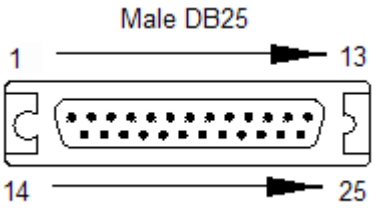


The DB25 connector is tucked up behind the toolkit on the left side of the trunk, similar to the location of the CD changer plug. If the analog transceiver box was installed in the vehicle, the DB25 connector will be liberated once the existing transceiver is removed. There will also be an antenna connection bundled with this connector. This antenna will not be used in this installation.





Next, construct the custom wiring harness using the wiring connections shown in the chart below. The wire gauges are listed for information only. This is to prove that the wires supplied in the 25-pin telephone harness are of sufficient size when compared to the required size listed for the BT module. The parts required to make this cable are the 54-pin plug , 5 repair wires, and a DB25 (D-sub) male terminal with hood. These parts are shown in the surrounding pictures.

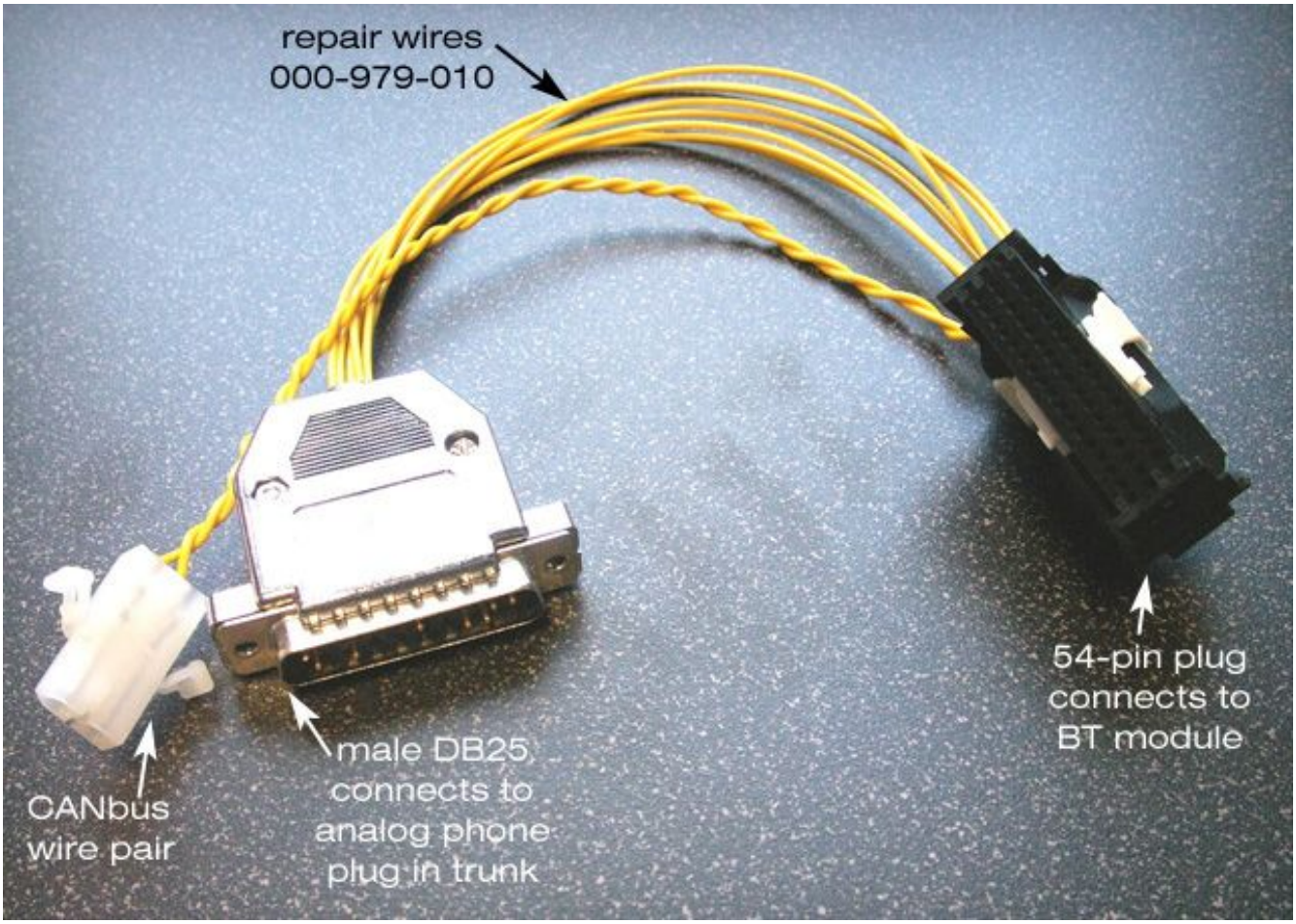


Custom Harness wiring chart for DB25 Analog Phone to 54-pin Bluetooth Phone

BT Tel module (54-pin)			Connection	Existing TEL connector (DB25)		
notes	gauge	pin		pin	gauge	notes
Power +12V	0.5	1	KL.30	4	0.5	
Ground	0.5	2	KL.31	3	1.0	
Tel audio out to HU	0.5	8	NF OUT+	19	0.5	
Tel audio out to HU	0.5	9	NF OUT-	25	0.5	
Microphone input	0.35	11	MIC IN+	15	0.35	
Microphone input	0.35	12	MIC IN-	14	0.35	
Diagnostics	0.35	15	K-line	12	0.35	See Section 4.2
Tel Mute trigger to HU	0.5	16	Mute	10	0.5	
infotainment bus	0.35	17	CAN H	N.C.		CAT5 wire to CANbus
infotainment bus	0.35	18	CAN L	N.C.		CAT5 wire to CANbus

To make the harness, snip each repair wire in half. The pin terminal end will be inserted into the 54-pin connector. The bare end can then be stripped of insulation and crimped into the small pins supplied with the male DB25 connector. These small pins may simply be snapped into the correct openings (based on the wiring chart) in the male DB25 connector. Once all the connections are made, the 54-pin connector can be assembled by sliding the blue inner portion into the black outer shell. The DB25 connector may also be assembled by attaching the connector hood to protect the wire-to-pin connections. The final product is shown in the picture below. Also notice below that the CANbus wires do not connect to the DB25 connector. These two wires must be connected to the CANbus in your vehicle. As described in Section 2 of this document, there are CANbus wire pairs already available in the trunk if the satellite radio tuner was installed. CANbus is not available within the DB25 telephone connector already installed. For this installation, a spare CANbus pair was used from the CAT5 cable that is connected to the CANbus distribution panel (see separate install guide on www.nsxjr.com) in the vehicle. Another option is to splice into the CAN H and CAN L wires that supply that satellite radio tuner if installed. If neither of these options are available, please follow the instructions in section 2.4 of this document to install a new CANbus wire pair into the trunk.

The picture below shows a two pin white Molex disconnect plug installed onto the CANbus wire pair. This step is not required, but does facilitate quick connection and disconnection of the entire custom wiring harness. To install without this plug, simply connect the CANbus wires from the vehicle to the correct pins on the 54-pin connector.



The Bluetooth module is shown below fully connected to the vehicle. The final mounting location is not shown, but a convenient location is on top of the satellite radio tuner, attached with Velcro.

When mounting the BT module, ensure that the location is secure and that the antenna will not be susceptible to movement or actions that may cause damage.

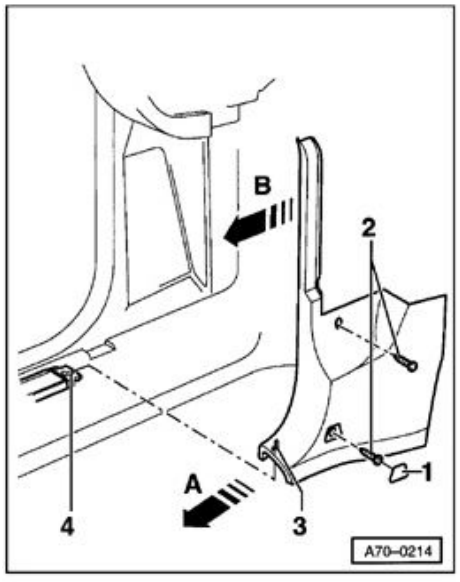
4.2 Connecting the K-line

The K-line is an important connection for the BT telephone module because this is how it communicates with VAG-COM or other diagnostic software. Without this, the BT module will not be able to be coded to ensure proper operation in the next section. There is no K-line connection in the original DB25 phone connector in the trunk. However, there is a simple way to connect this without having to run new wires into the trunk.

The DB25 phone connector harness includes other wires not listed in the chart in the previous section. In particular, there are three wires that connected the trunk to the multifunction steering wheel control unit. These are data wires that the old analog phone system used for communication. These wires are not needed for the new Bluetooth phone module because it uses CANbus for communication. This section will describe how to "hijack" one of these dormant data lines to take the K-line connection into the trunk.

The DB25 phone connector is connected to the front of the car by passing through the left side A-pillar station. This location is also conveniently close to the VAG diagnostic connector under the dash. By making one simple connection, the K-line can be connected to the proper pin at this station.

Remove the driver's side knee panel (see section 1.1) and left side lower A-pillar trim.



Lower A-pillar trim, removing and installing

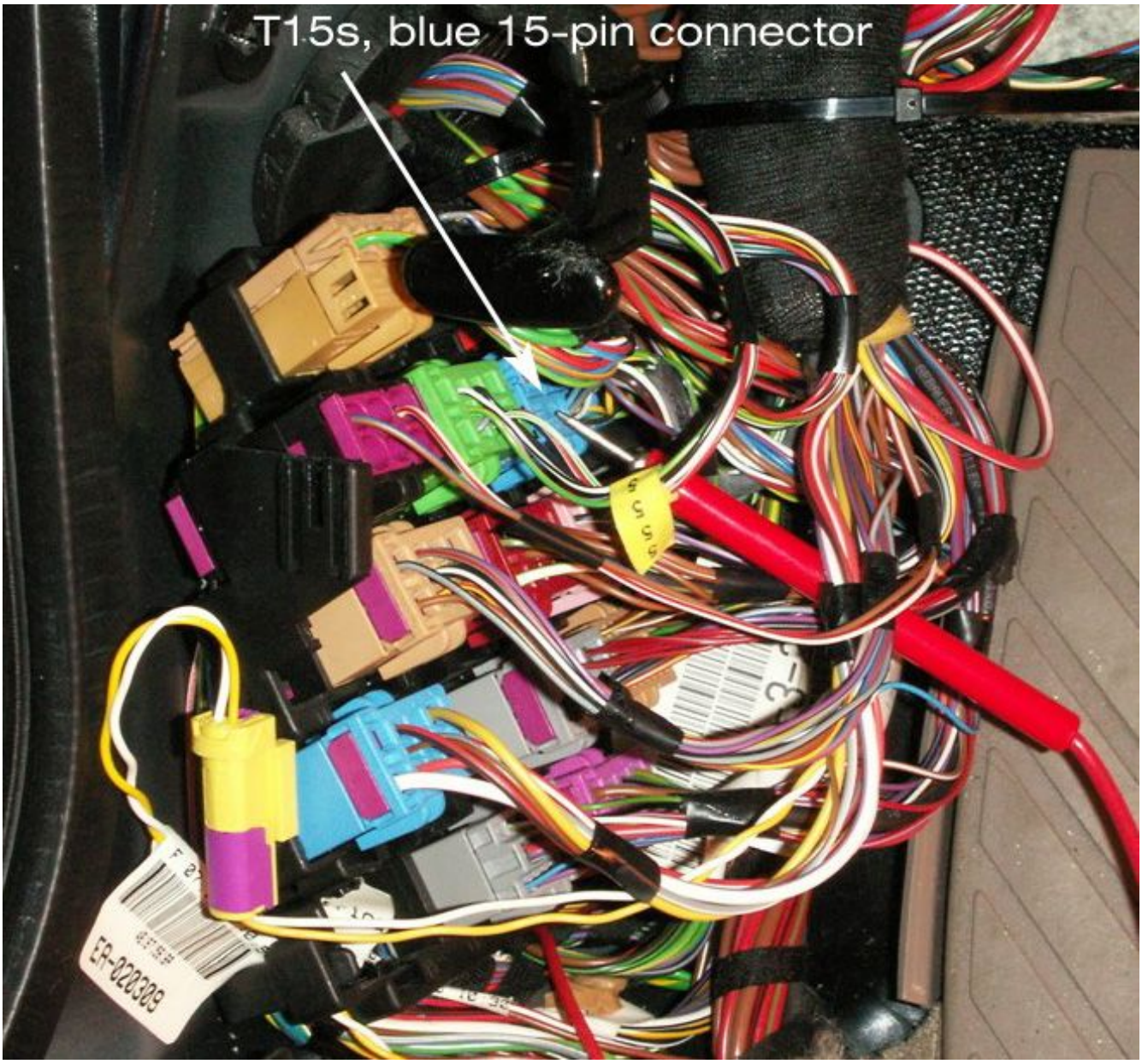
- Pry out cover **- 1 -** .

- Remove screws **- 2 -** (2x). Tightening torque: 2.5 Nm (22 in lb)

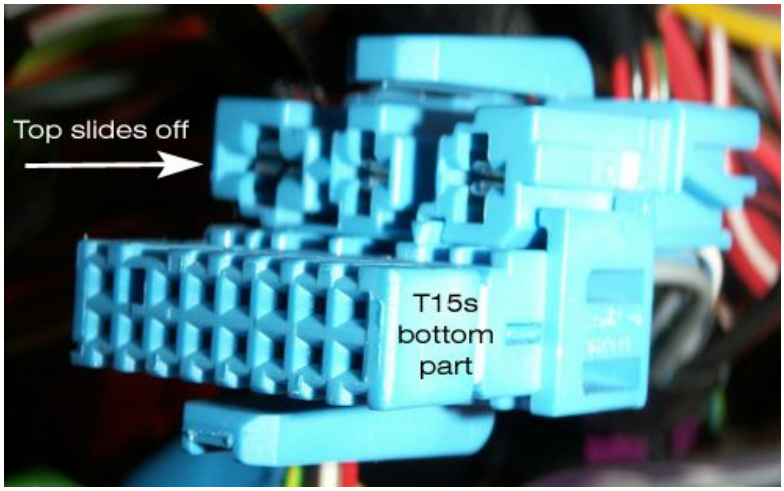
- Pull lower A-pillar trim in direction of arrow **- A -** until pin **- 3 -** can be detached from groove **- 4 -** .

- Pull extension of lower A-pillar trim in direction of arrow **- B -** out of retainers (2x).

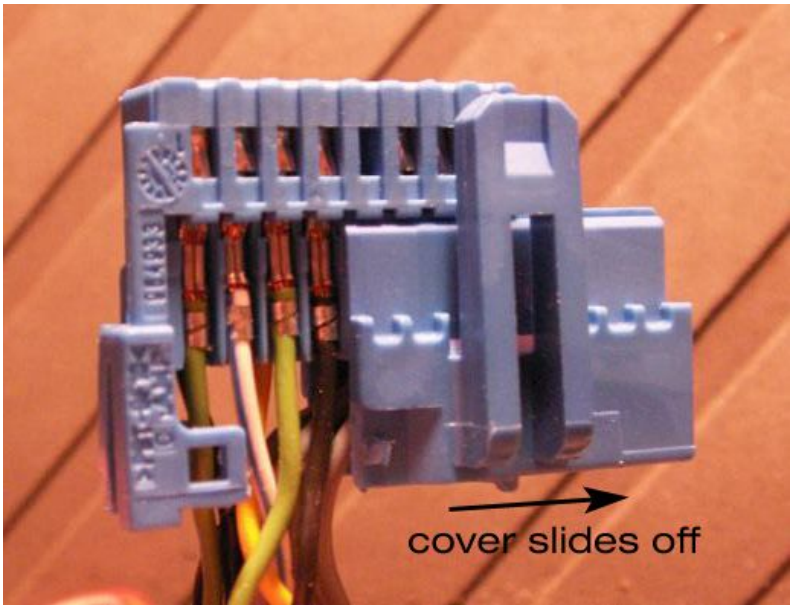
Locate Connector T15s, the blue 15-pin connector near the top in this connection station. Pull this connector out to give enough room to disassemble the housing and change the wiring inside.



Once unplugged, the top portion can be removed by sliding off as shown.



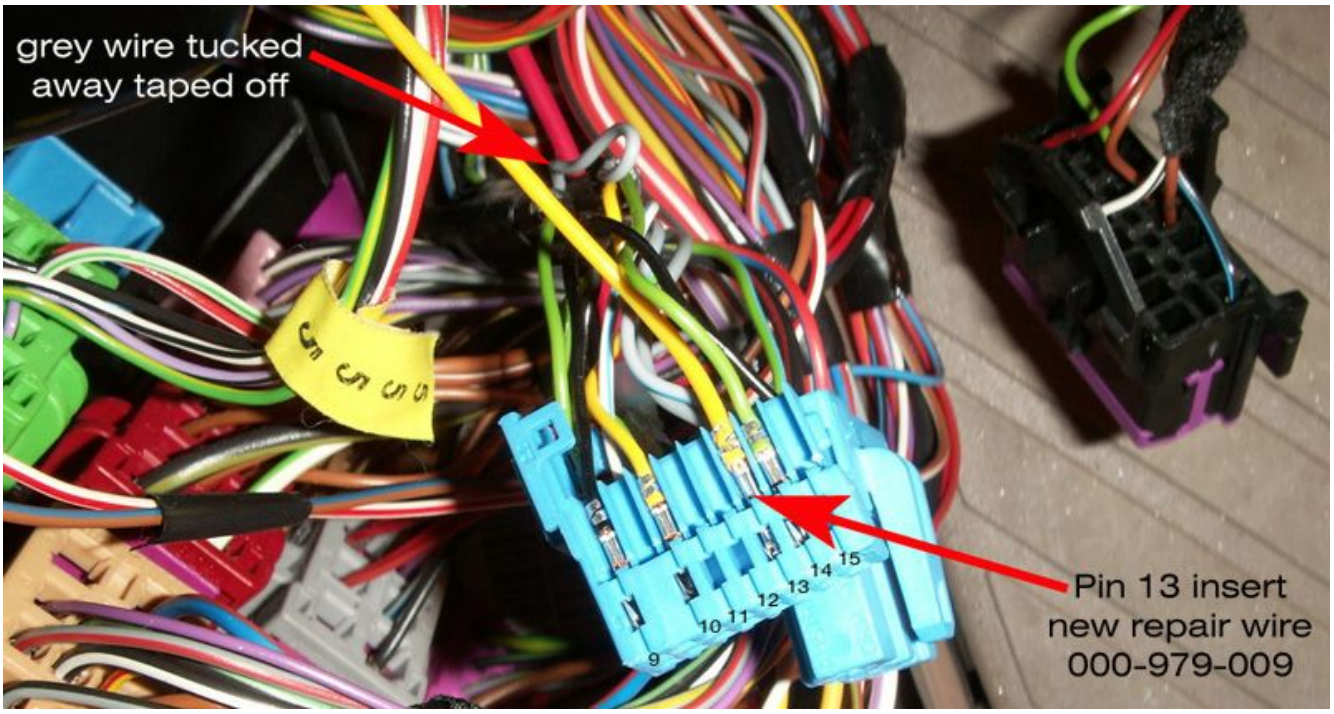
Now the cover can be removed from the bottom section to reveal and unlock the wiring pins inside.



Pin 13 in this connector is a small grey wire to be replaced. Simply use a small screwdriver or knife blade to disengage the locking tab on the grey wire and gently pull out from the rear. This will be very similar to the wiring in section 1.1.1 of this document to remove the pins from the 32-pin instrument cluster plug. Once the grey wire is removed from pin 13, tape the contact end off and tuck away into the wiring harness. This pin will not be used and is not connected to anything, but there's no reason to cut it off completely.

- Insert a new repair wire (000-979-009) into pin 13 of the connector T15s.

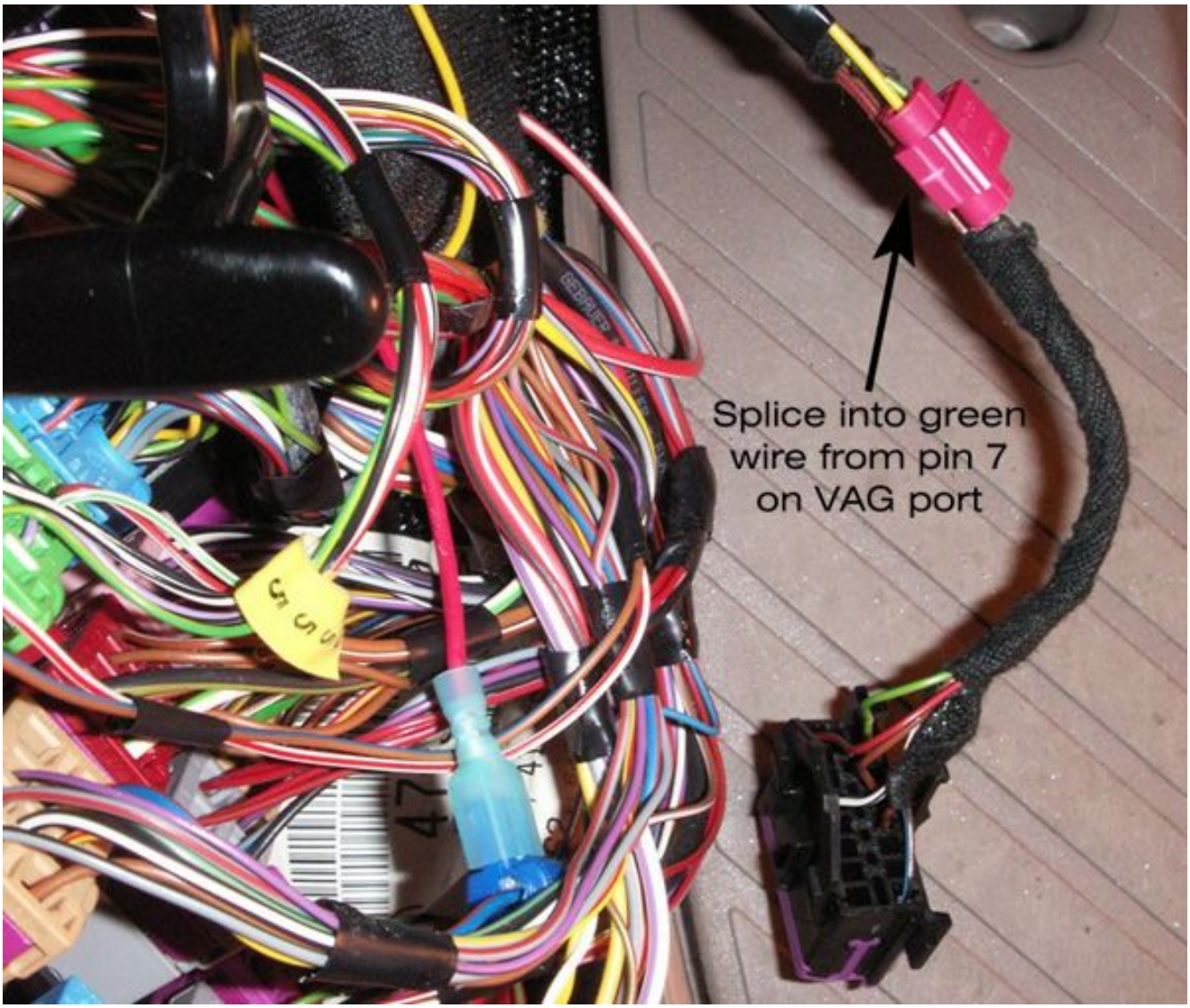
Re-assemble the blue wire housing plug by sliding the cover back on then sliding the top portion back on with the three larger wire pins. Plug the connector back into its position in the connector station. This wire is now connected to pin 12 in the DB25 connector in the trunk which connects to pin 15 at the Bluetooth module through the custom harness assembled in the previous subsection.



The final step of this section is to splice the other end of the repair wire into the K-line. The K-line is the small green wire that connects to pin 7 in the VAG diagnostic connector. In the picture below, a small section of the wire tape was removed a few inches back from the connector end. The small green wire was spliced using a red (18-22AWG) wire splice tap. Secure the repair wire by taping off to other wiring harnesses or by using cable ties. Using fabric tape, wrap the section of the VAG connector wiring harness that was just spliced to hide the work and protect the connection.

Reinstall the left side lower A-pillar trim and driver's side knee panel.

The physical installation of the Bluetooth telephone module is complete.



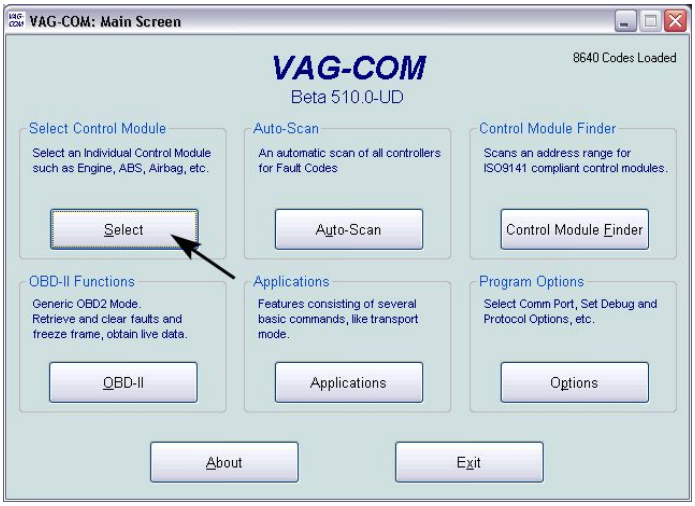
4.3 Control Module Coding (VAG-COM)

The BT module, instrument cluster, and MFSW must be coded to ensure proper operation. Connect a diagnostic cable to the vehicle and start the VAG-COM software on the computer.

In leiu of using VAG-COM software, the vehicle can be coded at any Audi dealership. Expect to pay for this service.

VAG-COM Release 512 is recommended.

From the Main VAG-COM screen, press "Select" under the Select Control Module area.



Select the "Electronics 1" tab at the top of the list, then select "77-Telephone" on the Control Module Screen.

The software is now connected to the TEL module in the "Open Controller" window. Note the Software Coding located just below the part number display. Check the chart on the next page to see what the coding means. If the coding is satisfactory, skip the next two pages (recoding) directly to the adaptation settings. If the control module needs to be recoded, continue with the steps below.

Control Module Coding Chart for Bluetooth Telephone Module

00?xxxx: *type (car)*

0 - with CAN-bus (A2, A3, TT)
1 - D3/C6 High-System
2 - C6 Standard-System Not used with US-Spec Bluetooth Module

00x?xxx: *type (Steering wheel)*

0 - non multifunction steering wheel
1 - standard steering wheel
2 - modular steering wheel Not used with US-Spec Bluetooth Module

00xx?xx: *installed components*

1 - none * WARNING: Do Not Use, this will immediately disconnect your K-line *
2 - MFSW * WARNING: Do Not Use, this will immediately disconnect your K-line *
3 – Headunit * WARNING: Do Not Use, this will immediately disconnect your K-line *
4 - MFSW and Headunit * WARNING: Do Not Use, this will immediately disconnect your K-line *
5 - K-line
6 - MFSW and K-line
7 - Headunit and K-line "Headunit" is only for RNS-E Navigation systems.
8 - MFSW, Headunit and K-line "Headunit" is only for RNS-E Navigation systems.

00xxx?x: *language for voice control*

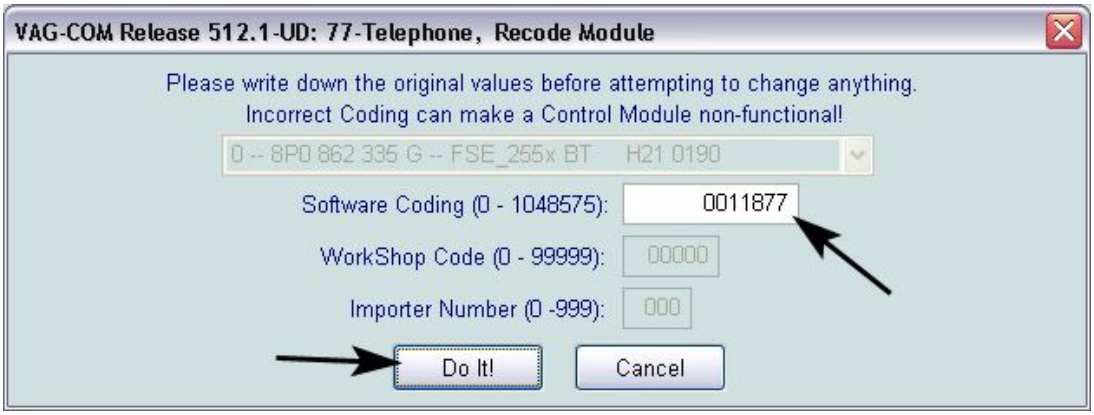
0 - voice control off
1 - German Not used with US-Spec Bluetooth Module
2 - English (UK) Not used with US-Spec Bluetooth Module
3 - French Not used with US-Spec Bluetooth Module
4 - Italian Not used with US-Spec Bluetooth Module
5 - Spanish Not used with US-Spec Bluetooth Module
7 - English (US)
8 - Voice control from external device (i.e. RNS-E)

00xxxx?: *Language for DIS*

0 - no DIS display
1 - German Not used with US-Spec Bluetooth Module
2 - English (UK) Not used with US-Spec Bluetooth Module
3 - French Not used with US-Spec Bluetooth Module
4 - Italian Not used with US-Spec Bluetooth Module
5 - Spanish Not used with US-Spec Bluetooth Module
7 - English (US)

To change the coding, press “Recode-07”

Enter the new coding desired in the “Software Coding” box.

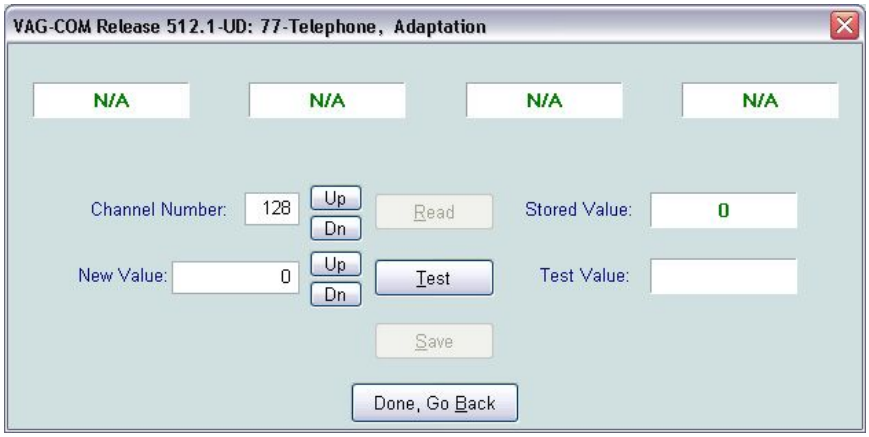


Verify that the new coding was accepted in the “Open Controller” window.

To change the adaptation values, press "Adaptation-10"

Scroll through each adaptation channel that is listed in the chart below. Enter the correct value based on the vehicle charateristics. When finished, press "Done, Go Back".

Exit back to the main VAG-COM screen when finished.



No adaptation values were altered for my installation. My speaker and microphone volumes require no correction.

Control Module Adaptation Chart for Bluetooth Telephone Module

-› **Channel 128** (Base Volume)
000 - 0dB (no increase/decrease)
001 - +1dB increase
003 - +3dB increase
006 - +6dB increase
128 - -1dB decrease
130 - -3dB decrease
133 - -6dB decrease

-› **Channel 129** time after ignition off
000 - 30 Seconds
001 - 5 Minutes
002 - 10 Minutes
240 - 20 Hours

-› **Channel 133** (BT)
BT activate/deactivate.

-› **Channel 134** (handsfree)
0 - handsfree over BT
1 - handsfree only with mobile in cradle

-› **Channel 131** (Microphone Sensitivity)
000 - 0dB (no increase/decrease)
001 - +1dB increase
002 - +2dB increase
003 - +3dB increase
004 - +4dB increase
005 - +5dB increase
006 - +6dB increase
128 - -1dB decrease
129 - -2dB decrease
130 - -3dB decrease
131 - -4dB decrease
132 - -5dB decrease
133 - -6dB decrease

-› **Channel 135** (Bluetooth PIN)
default: 1234

This step will adapt the instrument cluster to recognize the telephone data for use in the Driver's Information System (DIS). This is the small red display at the center of the instruments.

See the vehicle and radio owner's manuals for information on using the DIS once this installation is complete.

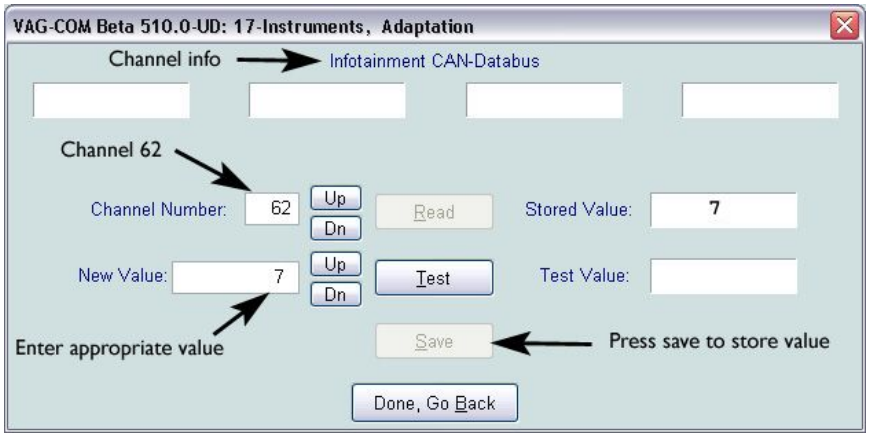
Select "17-Instruments" on the Control Module Screen.

To change the adaptation values, press "Adaptation-10"

Do not Recode the Instruments
It could cause a malfunction.

Enter number 62 in the Channel Number box and press "Read". Enter a value of 3 and press "Save". This value is valid to enable the display of Radio, and Telephone info.

Exit back to the main VAG-COM screen when finished.



This last step will recode the MFSW control unit to enable telephone and voice activation operation.

Select "16-Steering Wheel" on the Control Module Screen

The software is now connected to the new MFSW control unit in the "Open Controller" window. Note the Software Coding located just below the part number display. Check the chart below to see what the coding means. If the coding is satisfactory, exit out of the VAG-COM software and skip the remainder of this section. If the control module needs to be recoded, continue with the steps below.

Control module suffix "F" & "H"

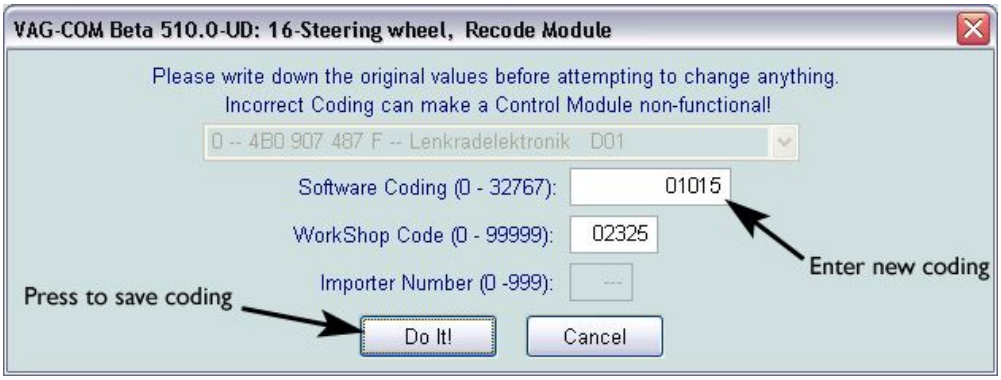
X	X	X	X	X	Coding
X					**Standard**
0					always 0
	X				**Radio on CAN-Bus**
	1				always 1 (Radio on CAN)
		X	X		**Tiptronic**
		0	0		without Tiptronic **"F"**
		0	1		with Tiptronic **"H"**
				X	**Steering wheel functions**
				1	Radio & telephone operation
				2	Radio operation
				5	Radio, telephone & voice recognition/operation operation

The last digit of the software coding is the only one to be changed in this step. To enable radio and telephone buttons only, a value of "1" should be used. To also enable voice recognition, a value of "5" should be used.

Voice recognition allows the driver to press the  *button to activate the mode. The driver can then speak commands to redial, dial digits, or voice dial with saved voice tags. See* **Appendix J** *for more information.*

To change the coding, press “Recode-07”

Enter the new coding desired in the “Software Coding” box.



Verify that the new coding was accepted in the “Open Controller” window.

Exit back out of VAG-COM completely and disconnect the cable from the diagnostics port.

This completes the installation of the Bluetooth Telephone Module.

Appendix A Parts List

Part Number	Description	Qty
	Section 1	
4B0 035 195N	Symphony II Radio with "SAT" button	1
000 979 133	Wire Terminal for Connector III and IV	1
FA1-NKRJ-C01-0	FAKRA SMB connector, right angle, "K"(ZF ant.) www.digikey.com	1
	Radio removal tools	4
	Section 2	
8E0 035 593E	OEM XM Satellite Radio Tuner	1
XM3	Terk XM antenna	1
3D0 972 708	Wire terminal housing for SAT T8s	1
3B0 972 724	Wire terminal housing for SAT T8r	1
000 979 009	wire terminal for SAT T8s	3
000 979 131	wire terminal for SAT T8r	1
SD-130J	Female 13-pin DIN plug (mates to CDC harness) www.digikey.com	1
FA1-NFSJ-C01-0	FAKRA SMB connector, straight, "F"(SAT brown) www.digikey.com	1
	15' of CAT-5 cable	
	A few feet of 18 AWG wire, wire taps and connectors	
	Section 3	
4B0 907 487F	MFSW control unit CANbus – w/o tiptronic controls "616"	1
	-OR-	
4B0 907 487H	MFSW control unit CANbus – with tiptronic controls "618"	1
	Section 4	
8P0 862 335 G	OEM Bluetooth Tel Module	1
4E0 972 144	54-pin connector	1
000 979 010	Repair wire for 54-pin connector	5
000 979 009	Repair wire for T15s blue connector at A-pillar station, left	1
8P0 035 503E	OEM Bluetooth Antenna	1
	DB25 D-Sub male connector with crimp terminals and cover	1

Satellite Tuner Reference List

Part Number	Works with…	SAT provider
8E0 035 593	All Symphony & Concert units with SAT button, excl. vehicles w/TPMS	Sirius
8E0 035 593A	All Symphony & Concert units with SAT button, excl. vehicles w/TPMS	XM
8E0 035 593D	RNS-E, also all Symphony & Concert units with SAT button	Sirius
8E0 035 593E	RNS-E, also all Symphony & Concert units with SAT button	XM
4E0 035 593	C6 ('05+ A6) and D3 ('04+ A8) only (w/MOST audio network)	Sirius
4E0 035 593A	C6 ('05+ A6) and D3 ('04+ A8) only (w/MOST audio network)	XM

The middle portion of the SAT tuner part number may be "057" to indicate an "accessory" part instead of factory installed "035".

Amphenol RF "FAKRA" SMB Connectors

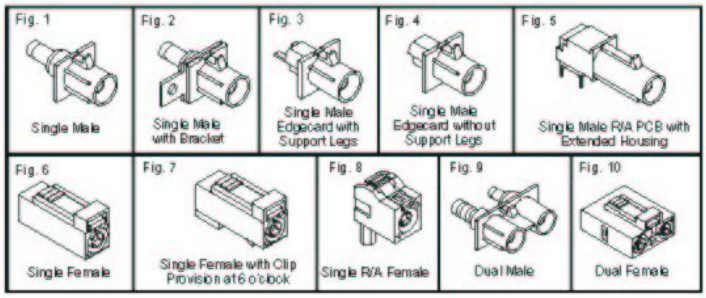
With recent advancements in communications technology and increased consumer demand for a diverse array of on-board telematics services, RF communications systems have become indispensable components of the modern automobile. To keep RF interconnection costs low and ensure high levels of electrical and mechanical performance the German and American automotive industries have standardized a high-performing, cost-effective RF connector based on the FAKRA and USCAR standards.

Utilizing a standard metal SMB connector embedded within a plastic housing that can be designed with multiple colored codes for easy identification, FAKRA connectors are designed to perform up to 4 GHz and meet the particular mechanical and environmental requirements of the automobile industry.

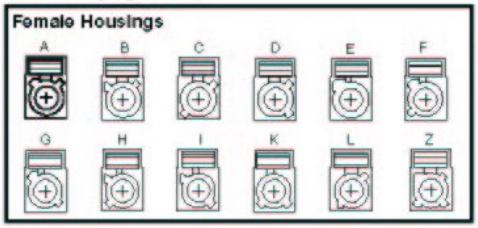
FEATURES: Electrical: Impedance: 50Ω. Frequency Range: DC-4GHz. Performance Spec: SAE/USCAR-17. Insulation Resistance: 1000MΩ min. Center Contact Resistance: center contact <20 mΩ; outer contact <10 mΩ. Dielectric Withstanding Voltage (sea level): >1000VRMS.

Mechanical: Durability (matings): 100 min. Plastic Housing Engagement Force: ≤ 20 N. Plastic Housing Disengagement Force: ≥ 25 N. Coding: 13 mechanical and colored codings. Operating Temperature Range: -40°C to 115°C.

Materials: Plastic Housing: PBT with 15% Glass Fiber. Secondary Locking Clip: PBT with 15% Glass Fiber. Center Contact (female): Beryllium Copper; (male): Brass. Body: Brass. Barrel: Brass. Retainer Ring: Beryllium Copper. Ferrule: Copper. Insulator: TFE. Center Contact Plating: Gold. Body, Barrel and Ferrule Plating: Nickel.



FAKRA Keying Codes



Mechanical and Color Coding

Coding	Rib Combination	Color	Similar RAL No.
A	A - B1	Deep Black	9005
B	A - B2	Signal White	9003
C	A - C	Signal Blue	5005
D	A - D	Bordeaux Violet	4004
E	B1 - B2	Leaf Green	6002
F	B1 - C	Brown	8011
G	B1 - D	Blue Grey	7031
H	B2 - C	Heather Violet	4003
I	B2 - D	Beige	1001
K	C - D	Curry Yellow	1027
L	A - E	Dahlia Yellow	1033
Z	Neutral Coding	Water Blue	5021

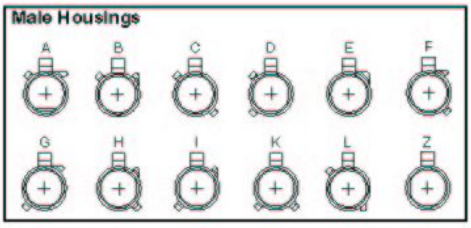


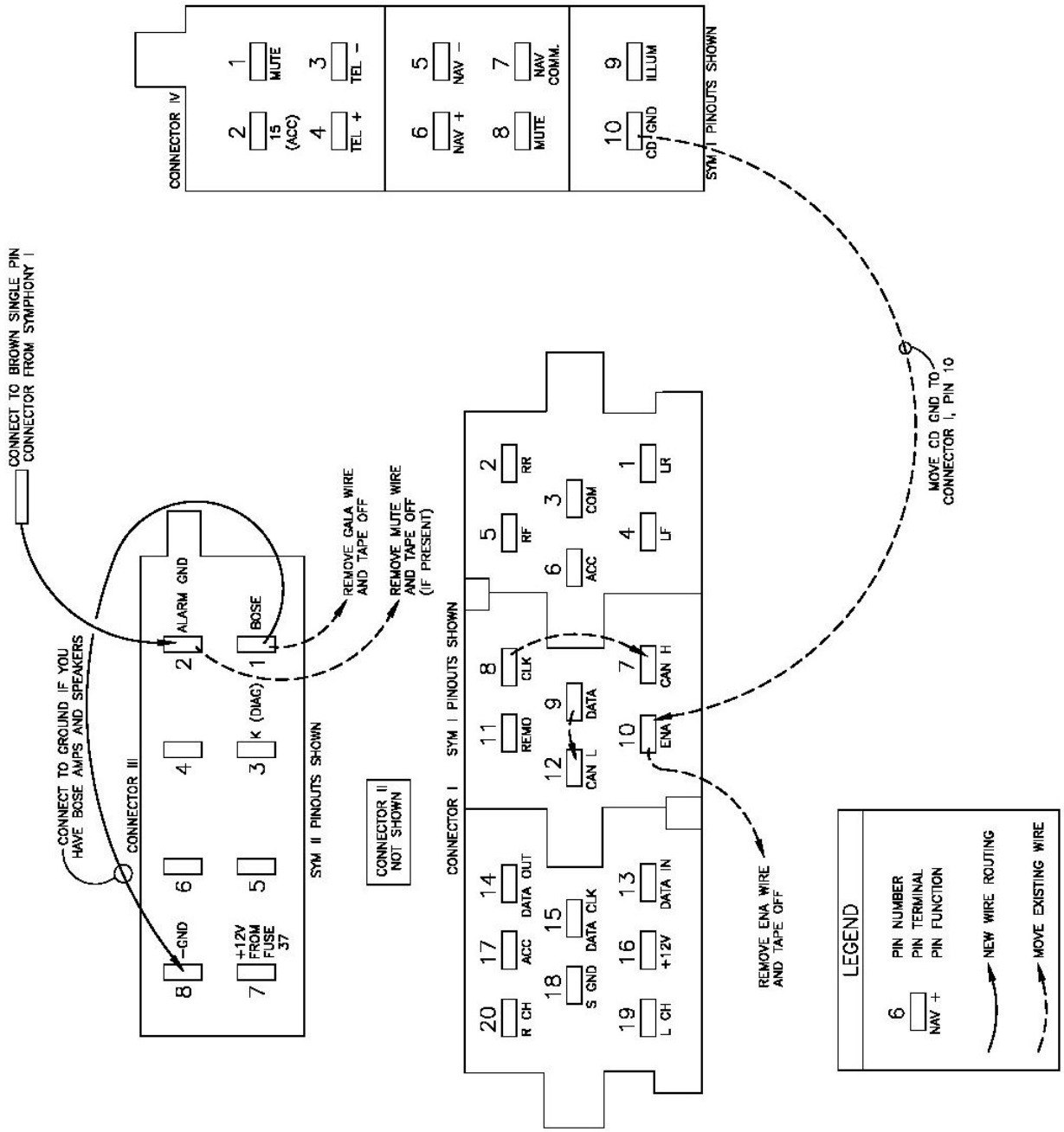
Fig.	Cable Group RG/U	Digi-Key Part No.	Price Each 1	10	25	100	Amphenol Part No.
FAKRA Coding "A" (Deep Black)							
1	RG-174, 188, 316	ARF1253-ND	3.27	2.73	1.77	1.64	FA1-NASP-C01-1
	RG-58, 141	ARF1255-ND	3.38	2.82	1.83	1.70	FA1-NASP-C04-1
2	.5RG-174, 188, 316	ARF1252-ND	3.48	2.91	1.88	1.75	FA1-NASP-C01-0
	RG-58, 141	ARF1254-ND	3.62	3.02	1.96	1.82	FA1-NASP-C04-0
3	—	ARF1256-ND	3.26	2.74	1.77	1.64	FA1-NASP-PCB-0
4	—	ARF1257-ND	3.35	2.79	1.81	1.68	FA1-NASP-PCB-1
5	—	ARF1274-ND	2.73	2.28	1.47	1.37	FA1-NARP-PCB-9
6	Cables with .057 OD	ARF1250-ND	4.11	3.43	2.22	2.06	FA1-NASJ-C09-0
	RG-178, .071 OD Cables	ARF1251-ND	4.11	3.43	2.22	2.06	FA1-NASJ-C10-0
	RG-174, 188, 316	ARF1266-ND	3.59	2.99	1.94	1.80	FA1-NASJ-C01-0
	RG-58, 141	ARF1268-ND	3.69	3.08	1.99	1.85	FA1-NASJ-C04-0
7	RG-174, 188, 316	ARF1267-ND	3.69	3.08	1.99	1.85	FA1-NASJ-C01-6
	RG-58, 141	ARF1269-ND	3.80	3.17	2.05	1.90	FA1-NASJ-C04-6
8	RG-174, 188, 316	ARF1272-ND	4.11	3.43	2.22	2.06	FA1-NARJ-C01-0
	RG-58, 141	ARF1273-ND	4.31	3.60	2.33	2.16	FA1-NARJ-C04-0
FAKRA Coding "B" (Signal White)							
1	RG-174, 188, 316	ARF1278-ND	3.27	2.73	1.77	1.64	FA1-NBSP-C01-1
	RG-58, 141	ARF1280-ND	3.38	2.82	1.83	1.70	FA1-NBSP-C04-1
2	RG-174, 188, 316	ARF1277-ND	3.48	2.91	1.88	1.75	FA1-NBSP-C01-0
3	—	ARF1281-ND	3.26	2.74	1.77	1.64	FA1-NBSP-PCB-0
4	—	ARF1282-ND	3.35	2.79	1.81	1.68	FA1-NBSP-PCB-1
5	—	ARF1286-ND	2.73	2.28	1.47	1.37	FA1-NBRP-PCB-9
6	RG-174, 188, 316	ARF1287-ND	3.59	2.99	1.94	1.80	FA1-NBSJ-C01-0
	RG-58, 141	ARF1289-ND	3.69	3.08	1.99	1.85	FA1-NBSJ-C04-0
	RG-178, .071 OD Cables	ARF1292-ND	4.11	3.43	2.22	2.06	FA1-NBSJ-C10-0
7	RG-174, 188, 316	ARF1288-ND	3.69	3.08	1.99	1.85	FA1-NBSJ-C01-6
	RG-58, 141	ARF1290-ND	3.80	3.17	2.05	1.90	FA1-NBSJ-C04-6
8	RG-174, 188, 316	ARF1275-ND	4.11	3.43	2.22	2.06	FA1-NBRJ-C01-0
	RG-58, 141	ARF1276-ND	4.31	3.60	2.33	2.16	FA1-NBRJ-C04-0
9	RG-58/RG-174 Combo Design	ARF1297-ND	6.87	5.73	3.70	3.44	FA2-NBSP-C00-9
FAKRA Coding "C" (Signal Blue)							
1	RG-174, 188, 316	ARF1316-ND	3.27	2.73	1.77	1.64	FA1-NCSP-C01-1
	RG-58, 141	ARF1317-ND	3.38	2.82	1.83	1.70	FA1-NCSP-C04-1
2	RG-174, 188, 316	ARF1300-ND	3.48	2.91	1.88	1.75	FA1-NCSP-C01-0
	RG-58, 141	ARF1301-ND	3.62	3.02	1.96	1.82	FA1-NCSP-C04-0
3	—	ARF1302-ND	3.26	2.74	1.77	1.64	FA1-NCSP-PCB-0
4	—	ARF1303-ND	3.35	2.79	1.81	1.68	FA1-NCSP-PCB-1
5	—	ARF1309-ND	2.73	2.28	1.47	1.37	FA1-NCRP-PCB-9
6	RG-174, 188, 316	ARF1310-ND	3.59	2.99	1.94	1.80	FA1-NCSJ-C01-0
	RG-58, 141	ARF1312-ND	3.69	3.08	1.99	1.85	FA1-NCSJ-C04-0
	RG-178, .071 OD Cables	ARF1315-ND	4.11	3.43	2.22	2.06	FA1-NCSJ-C10-0
7	RG-174, 188, 316	ARF1311-ND	3.69	3.08	1.99	1.85	FA1-NCSJ-C01-6
	RG-58, 141	ARF1313-ND	3.80	3.17	2.05	1.90	FA1-NCSJ-C04-6
8	RG-174, 188, 316	ARF1307-ND	4.11	3.43	2.22	2.06	FA1-NCRJ-C01-0
	RG-58, 141	ARF1306-ND	4.31	3.60	2.33	2.16	FA1-NCRJ-C04-0
9	RG-174, 188, 316	ARF1323-ND	6.73	5.61	3.63	3.37	FA2-NCSP-C01-9
10	RG-174, 188, 316	ARF1318-ND	7.76	6.47	4.18	3.89	FA2-NCSJ-C01-0
FAKRA Coding "D" (Bordeaux Violet)							
1	RG-174, 188, 316	ARF1343-ND	3.27	2.73	1.77	1.64	FA1-NDSP-C01-1
	RG-58, 141	ARF1344-ND	3.38	2.82	1.83	1.70	FA1-NDSP-C04-1
2	RG-174, 188, 316	ARF1331-ND	3.48	2.91	1.88	1.75	FA1-NDSP-C01-0
3	—	ARF1333-ND	3.26	2.74	1.77	1.64	FA1-NDSP-PCB-0
5	—	ARF1328-ND	2.73	2.28	1.47	1.37	FA1-NDRP-PCB-9
6	RG-178, .071 OD Cables	ARF1330-ND	4.11	3.43	2.22	2.06	FA1-NDSJ-C10-0
	RG-174, 188, 316	ARF1339-ND	3.59	2.99	1.94	1.80	FA1-NDSJ-C01-0
	RG-58, 141	ARF1341-ND	3.69	3.08	1.99	1.85	FA1-NDSJ-C04-0
7	RG-174, 188, 316	ARF1340-ND	3.69	3.08	1.99	1.85	FA1-NDSJ-C01-6
	RG-58, 141	ARF1342-ND	3.80	3.17	2.05	1.90	FA1-NDSJ-C04-6
8	RG-174, 188, 316	ARF1337-ND	4.11	3.43	2.22	2.06	FA1-NDRJ-C01-0
	RG-58, 141	ARF1338-ND	4.31	3.60	2.33	2.16	FA1-NDRJ-C04-0
FAKRA Coding "E" (Leaf Green)							
1	RG-174, 188, 316	ARF1356-ND	3.21	2.68	1.73	1.61	FA1-NESP-C01-1
	RG-58, 141	ARF1358-ND	3.38	2.82	1.83	1.70	FA1-NESP-C04-1

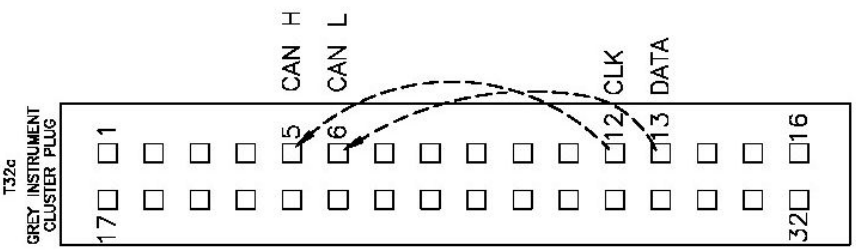
Fig.	Cable Group RG/U	Digi-Key Part No.	Price Each 1	10	25	100	Amphenol Part No.
2	RG-174, 188, 316	ARF1355-ND	3.48	2.91	1.88	1.75	FA1-NESP-C01-0
	RG-58, 141	ARF1357-ND	3.62	3.02	1.96	1.82	FA1-NESP-C04-0
5	—	ARF1371-ND	2.73	2.28	1.47	1.37	FA1-NERP-PCB-9
6	RG-174, 188, 316	ARF1372-ND	3.59	2.99	1.94	1.80	FA1-NESJ-C01-0
	RG-58, 141	ARF1374-ND	3.69	3.08	1.99	1.85	FA1-NESJ-C04-0
	Cables with .057 OD	ARF1376-ND	4.11	3.43	2.22	2.06	FA1-NESJ-C09-0
	RG-178, .071 OD Cables	ARF1377-ND	4.11	3.43	2.22	2.06	FA1-NESJ-C10-0
7	RG-174, 188, 316	ARF1373-ND	3.69	3.08	1.99	1.85	FA1-NESJ-C01-6
	RG-58, 141	ARF1375-ND	3.80	3.17	2.05	1.90	FA1-NESJ-C04-6
9	RG-174, 188, 316	ARF1368-ND	6.73	5.61	3.63	3.37	FA2-NESP-C01-9
10	RG-174, 188, 316	ARF1361-ND	7.76	6.47	4.18	3.89	FA2-NESJ-C01-0
FAKRA Coding "F" (Brown)							
2	RG-174, 188, 316	ARF1383-ND	3.48	2.91	1.88	1.75	FA1-NFSP-C01-0
5	—	ARF1380-ND	2.73	2.28	1.47	1.37	FA1-NFRP-PCB-9
6	RG-174, 188, 316	ARF1399-ND	3.59	2.99	1.94	1.80	FA1-NFSJ-C01-0
9	RG-174, 188, 316	ARF1396-ND	6.73	5.61	3.63	3.37	FA2-NFSP-C01-9
10	RG-174, 188, 316	ARF1389-ND	7.76	6.47	4.18	3.89	FA2-NFSJ-C01-0
FAKRA Coding "G" (Blue Grey)							
1	RG-174, 188, 316	ARF1406-ND	3.21	2.68	1.73	1.61	FA1-NGSP-C01-1
5	—	ARF1405-ND	2.73	2.28	1.47	1.37	FA1-NGRP-PCB-9
6	RG-174, 188, 316	ARF1413-ND	3.59	2.99	1.94	1.80	FA1-NGSJ-C01-0
	RG-58, 141	ARF1415-ND	3.69	3.08	1.99	1.85	FA1-NGSJ-C04-0
8	RG-174, 188, 316	ARF1403-ND	4.11	3.43	2.22	2.06	FA1-NGRJ-C01-0
FAKRA Coding "H" (Heather Violet)							
5	—	ARF1420-ND	2.73	2.28	1.47	1.37	FA1-NHRP-PCB-9
	Cables with .057 OD	ARF1421-ND	4.11	3.43	2.22	2.06	FA1-NHSJ-C09-0
6	RG-174, 188, 316	ARF1426-ND	3.59	2.99	1.94	1.80	FA1-NHSJ-C01-0
FAKRA Coding "I" (Beige)							
3	—	ARF1442-ND	3.26	2.74	1.77	1.64	FA1-NISP-PCB-0
5	—	ARF1435-ND	2.73	2.28	1.47	1.37	FA1-NIRP-PCB-9
6	Cables with .057 OD	ARF1436-ND	4.11	3.43	2.22	2.06	FA1-NISJ-C09-0
	RG-178, .071 OD Cables	ARF1437-ND	4.11	3.43	2.22	2.06	FA1-NISJ-C10-0
	RG-174, 188, 316	ARF1444-ND	3.59	2.99	1.94	1.80	FA1-NISJ-C01-0
7	RG-174, 188, 316	ARF1445-ND	3.69	3.08	1.99	1.85	FA1-NISJ-C01-6
	RG-58, 141	ARF1447-ND	3.80	3.17	2.05	1.90	FA1-NISJ-C04-6
FAKRA Coding "K" (Curry Yellow)							
1	RG-174, 188, 316	ARF1481-ND	3.27	2.73	1.77	1.64	FA1-NKSP-C01-1
	RG-58, 141	ARF1483-ND	3.38	2.82	1.83	1.70	FA1-NKSP-C04-1
2	RG-174, 188, 316	ARF1480-ND	3.48	2.91	1.88	1.75	FA1-NKSP-C01-0
	RG-58, 141	ARF1482-ND	3.62	3.02	1.96	1.82	FA1-NKSP-C04-0
3	—	ARF1484-ND	3.26	2.74	1.77	1.64	FA1-NKSP-PCB-0
5	—	ARF1486-ND	3.42	2.85	1.85	1.71	FA1-NKRP-PCB-9
6	RG-174, 188, 316	ARF1487-ND	3.59	2.99	1.94	1.80	FA1-NKSJ-C01-0
	RG-58, 141	ARF1489-ND	3.69	3.08	1.99	1.85	FA1-NKSJ-C04-0
	Cables with .057 OD	ARF1491-ND	4.11	3.43	2.22	2.06	FA1-NKSJ-C09-0
	RG-178, .071 OD Cables	ARF1492-ND	4.11	3.43	2.22	2.06	FA1-NKSJ-C10-0
7	RG-174, 188, 316	ARF1488-ND	3.69	3.08	1.99	1.85	FA1-NKSJ-C01-6
	RG-58, 141	ARF1490-ND	3.80	3.17	2.05	1.90	FA1-NKSJ-C04-6
8	RG-174, 188, 316	ARF1478-ND	4.11	3.43	2.22	2.06	FA1-NKRJ-C01-0
FAKRA Coding "L" (Dahlia Yellow)							
8	RG-174, 188, 316	ARF1493-ND	4.11	3.43	2.22	2.06	FA1-NLRJ-C01-0
	RG-58, 141	ARF1494-ND	4.31	3.60	2.33	2.16	FA1-NLRJ-C04-0
FAKRA Coding "Z" (Water Blue)							
1	RG-174, 188, 316	ARF1533-ND	3.27	2.73	1.77	1.64	FA1-NZSP-C01-1
	RG-58, 141	ARF1535-ND	3.38	2.82	1.83	1.70	FA1-NZSP-C04-1
2	RG-174, 188, 316	ARF1532-ND	3.48	2.91	1.88	1.75	FA1-NZSP-C01-0
3	—	ARF1536-ND	3.26	2.74	1.77	1.64	FA1-NZSP-PCB-0
4	—	ARF1537-ND	3.35	2.79	1.81	1.68	FA1-NZSP-PCB-1
5	—	ARF1525-ND	2.73	2.28	1.47	1.37	FA1-NZRP-PCB-9
6	RG-174, 188, 316	ARF1526-ND	3.59	2.99	1.94	1.80	FA1-NZSJ-C01-0
	RG-58, 141	ARF1528-ND	3.69	3.08	1.99	1.85	FA1-NZSJ-C04-0
	RG-178, .071 OD Cables	ARF1531-ND	4.11	3.43	2.22	2.06	FA1-NZSJ-C10-0
7	RG-174, 188, 316	ARF1527-ND	3.69	3.08	1.99	1.85	FA1-NZSJ-C01-6
8	RG-174, 188, 316	ARF1523-ND	4.11	3.43	2.22	2.06	FA1-NZRJ-C01-0
	RG-58, 141	ARF1524-ND	4.31	3.60	2.33	2.16	FA1-NZRJ-C04-0

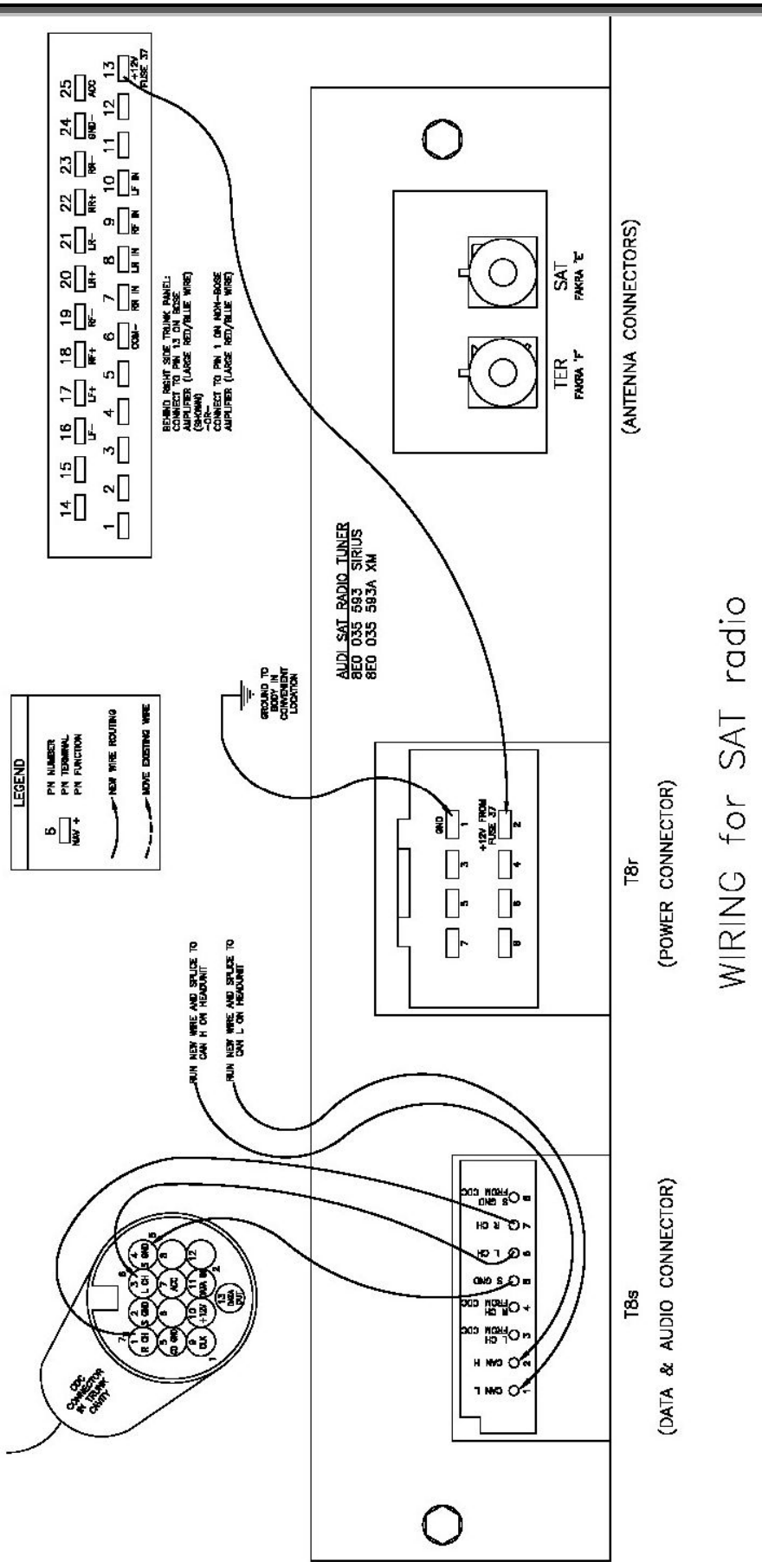
Appendix C SAT Radio Diagnostics

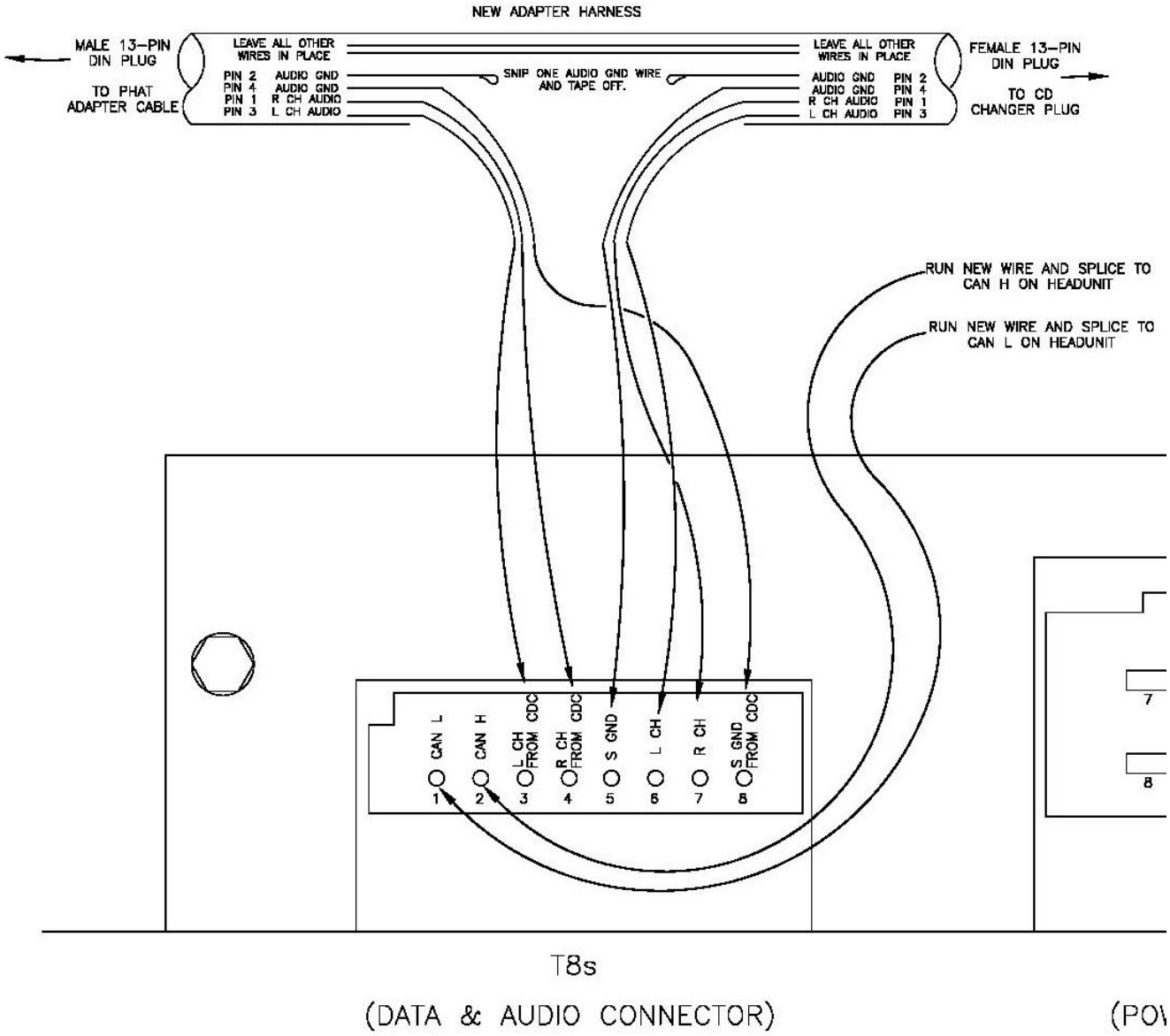
Hold down the "SAT" button and turn the Symphony II unit on. Use the right side control knob to scroll through the diagnostic codes. This screen is full of values that describe the operation of the SAT tuner. SAT1, SAT2, and TERR are the "addresses" of the signals it is receiving. SAT1BER, SAT2BER, and TERRBER are the Bit Error Rate of the signals it is receiving. This number is a HEX value that represents a percentage of bits that are received in error. Therefore, a "0000" means that it has zero percent error, or perfect signal. If it has a "270A" for any BER value (equals 99.99% error) that means it is not receiving any signal from that source. The SAT1 or SAT2 BER should be under 3% (012C) and the TERRBER should be under 6% (0258) to ensure a good listening experience. To exit diagnostic display, turn the radio off.

This information is for XM and I can neither confirm nor deny its existence or relevance to Sirius.


CONNECTOR IV
1 MUTE
2 15 (ACC)
3 TEL –
4 TEL +
5 NAV –
6 NAV +
7 NAV COMM.
8 MUTE
9 ILLUM
10 CD GND
SYM I PINOUTS SHOWN
CONNECT TO BROWN SINGLE PIN CONNECTOR FROM SYMPHONY I
CONNECT TO GROUND IF YOU HAVE BOSE AMPS AND SPEAKERS
CONNECTOR III
SYM II PINOUTS SHOWN
ALARM GND
BOSE
K (DIAG)
+12V FROM FUSE 37
GND
REMOVE GALA WIRE AND TAPE OFF
REMOVE MUTE WIRE AND TAPE OFF (IF PRESENT)
CONNECTOR II NOT SHOWN
CONNECTOR I SYM I PINOUTS SHOWN
LR
RR
LF
RF
COM
ACC
CLK
DATA
CAN H
CAN L
REMO
ENA
DATA IN
DATA OUT
DATA CLK
+12V
S GND
ACC
L CH
R CH
MOVE CD GND TO CONNECTOR I, PIN 10
REMOVE ENA WIRE AND TAPE OFF
LEGEND
PIN NUMBER
PIN TERMINAL
PIN FUNCTION
NAV +
NEW WIRE ROUTING
MOVE EXISTING WIRE

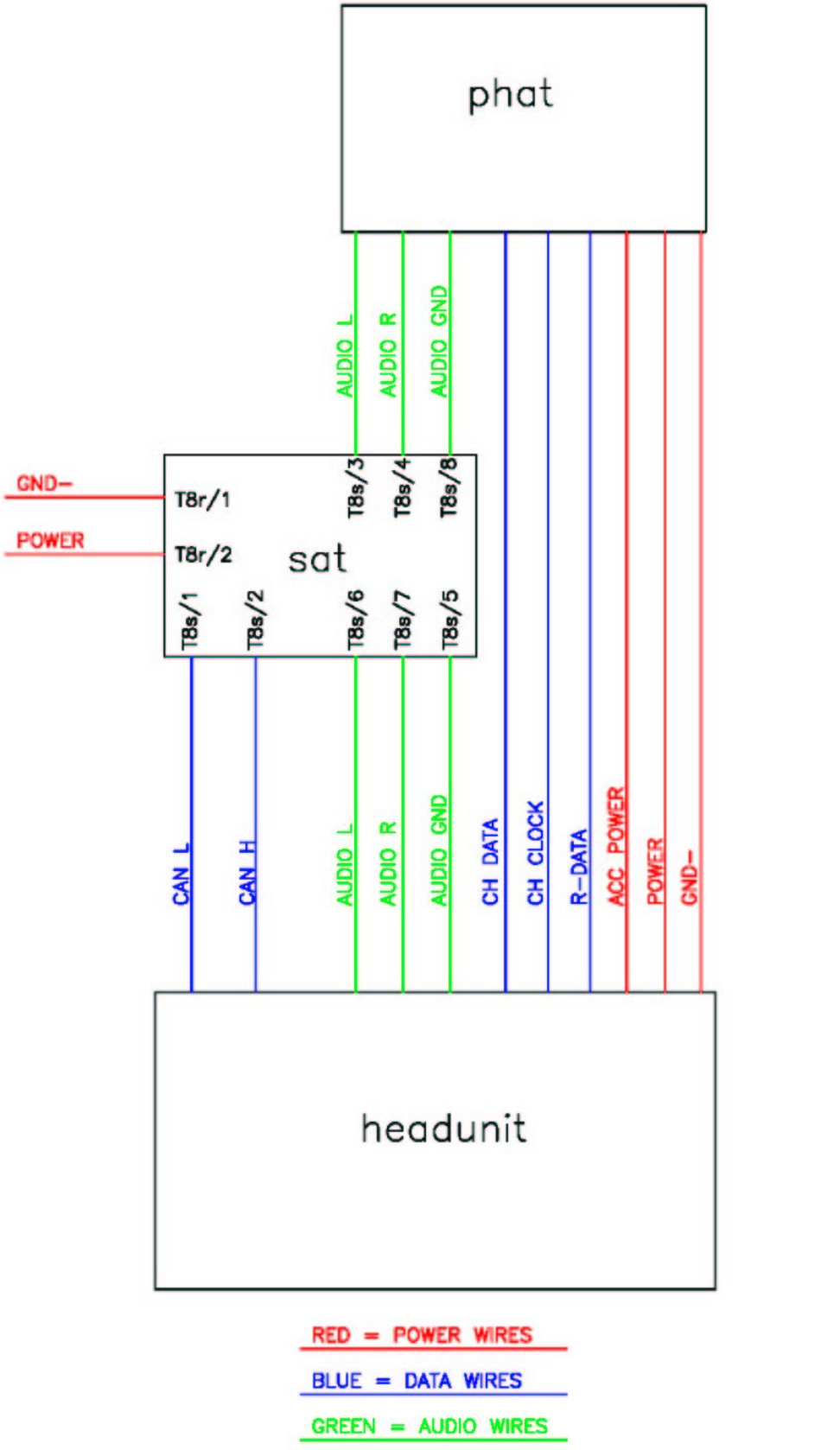

T32c
GREY INSTRUMENT CLUSTER PLUG
17
1
32
16
CAN H
CAN L
CLK
DATA
5
6
12
13


WIRING for SAT radio
AUDI SAT RADIO TUNER
8E0 035 593 SIRIUS
8E0 035 593A XM
LEGEND
P/N NUMBER
P/N TERMINAL
P/N FUNCTION
NAV +
NEW WIRE ROUTING
MOVE EXISTING WIRE
GROUND TO BODY IN CONVENIENT LOCATION
REMIND RIGHT SIDE TRUNK PANEL: CONNECT TO PIN 13 ON BOSE AMPLIFIER (LARGE RED/BLUE WIRE) (SKYHAWK) -OR- CONNECT TO PIN 1 ON NON-BOSE AMPLIFIER (LARGE RED/BLUE WIRE)
+12V FROM FUSE 37
GND
TER
FANTA 'F'
SAT
FANTA 'E'
(ANTENNA CONNECTORS)
T8r
(POWER CONNECTOR)
T8s
(DATA & AUDIO CONNECTOR)
RUN NEW WIRE AND SPLICE TO CAN H ON HEADUNIT
RUN NEW WIRE AND SPLICE TO CAN L ON HEADUNIT
CAN L
CAN H
SPEED SIG FROM CGC
L CH FROM CGC
R CH FROM CGC
S GND
L CH
R CH
S GND FROM CGC
OBD CONNECTOR IN TRUNK CAVITY



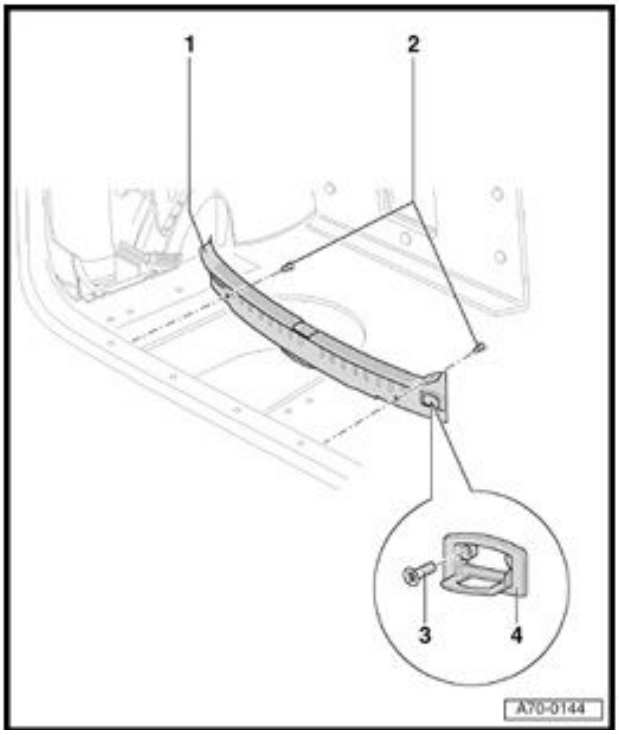
WIRING for SAT & PHAT together

for cars with CD changer harness in trunk



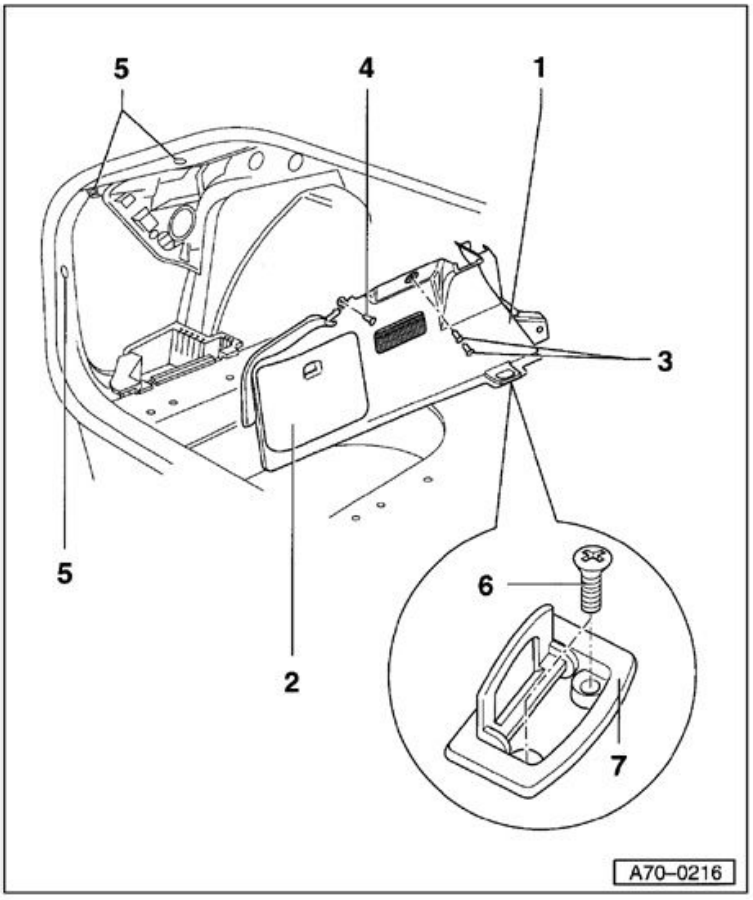
Schematic of SAT & PHAT together

Rear Cross Panel Trim

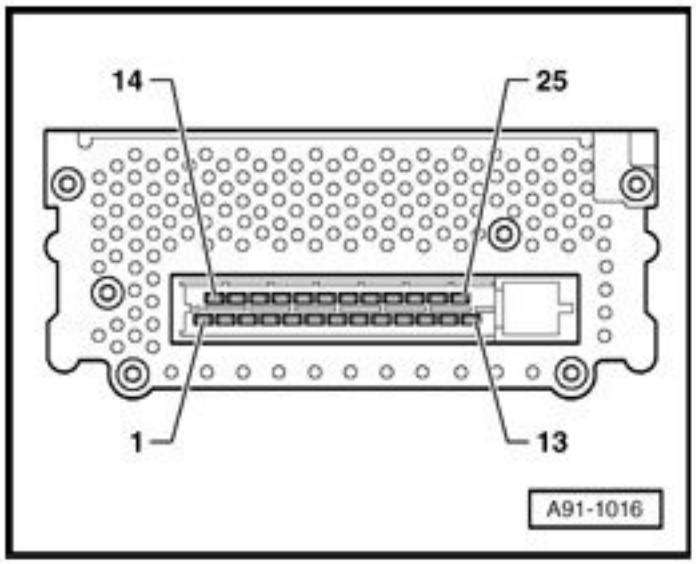


- Remove trunk light from cross panel trim -1-
- Remove screws -2- (2X)
- Remove screws -3- (4X) from fastening rings -4- on left and right.
- Unclip rear cross panel trim -1- upward.
- Guide trunk light through opening.
- After installing make sure seal is correctly seated.

Luggage compartment side trim



- Remove luggage compartment floor covering.
- Remove rear cross panel trim.
- Remove screws -6- (2X) for fastening rings -7-.
- Unclip clip -3-.
- Unfasten clip -4-.
- Unclip clip -2-.
- Unclip luggage compartment trim -1- at rear from mounts -5- (3X).
- Pull trim forward to disengage from latch pin.



6 – Line Output – GND (from headunit)
7 – Line Output – Right Rear (from headunit)
8 – Line Output – Left Rear (from headunit)
9 – Line Output – Right Front (from headunit)
10 – Line Output – Left Front (from headunit)
13 – Battery B+ (terminal 30)
16 – Loudspeaker (-) Left Front
17 – Loudspeaker (+) Left Front
18 – Loudspeaker (+) Right Front
19 – Loudspeaker (-) Right Front
20 – Loudspeaker (+) Left Rear
21 – Loudspeaker (-) Left Rear
22 – Loudspeaker (+) Right Rear
23 – Loudspeaker (-) Right Rear
24 – Main Ground (terminal 31)
25 – Switched positive (from headunit)

Appendix H Climate Control Faceplate

It is the opinion of the author that the climate control faceplate does not need to be replaced when the Symphony II is installed. The color difference is not noticeable except in flash photography or in other very bright light. Below is a picture of a 2001 faceplate with a RNS-E in natural lighting for reference.

To replace the climate control faceplate, remove the two screws at the top corners of the climate control unit. Open the ashtray. With a small screwdriver, push the two tabs on the bottom of the unit while pushing the unit out from behind. Unplug the five wire connector housings and completely remove the unit from the car. With a small Philips screwdriver remove all screws from the rear of the unit. Remove the outer housing from the unit. Now inside the unit, remove the faceplate from the circuit board by removing all small Philips screws. Remove the "OFF" button from the faceplate by pushing it out from the back.

Remove the newer faceplate from the new climate control unit. Some newer A6 climate controls are built with small Torx screws instead of Philips head screws. Once the new faceplate is free from the circuit board, remove the auto-recirculation button by pushing it out from the back. This is the button with the letter "A" inside the recirculation arrow. Install the original "OFF" button in its place. Install the new faceplate onto the original climate control unit. Reinstall the re-faced climate control unit into the vehicle. Installation is reverse of the removal process.

Do not install the 2002-2004 climate control unit. It will not function properly.

Prerequisite: Multifunction steering wheel, coded for radio, telephone, and voice recognition operation.

The Basics

- Press the  button to activate voice commands. "SPEAK" is displayed in the DIS.

- Press the  button to display your telephone contacts list in the DIS.

  Scroll through the contacts with the  and  buttons on the steering wheel. The contact information will alternate between the contact name and the contact phone number every few seconds. If you have multiple numbers for one contact, they will be listed as a separate entry that you can scroll to. For this reason, it is helpful to wait until the actual contact phone number is displayed to verify it is the right number you wish to dial (mobile, home, work, etc.)

- Press the  button to dial the contact currently shown in the DIS. The contact's name will be displayed in the DIS while the call is active.

- Press the  button to end the current phone call.

If you speak “Help”, the BT lady will speak a list of possible commands.

Voice Recognition Operation

Once in the voice recognition mode, you may dial numbers by speaking the digits, redial the previous number, or voice dial contacts stored in the car's phonebook. This phonebook is specific to the car, and are stored in the BT module's memory. You can store up to 50 numbers in the phonebook by voice and then recall them later to voice dial.

- To dial number by digits, speak "Dial Number", and then speak each digit. The BT lady will repeat them back to you. If correct, speak "dial". The BT lady will confirm by saying "the number is being dialed".

- To redial the previous number, speak "Redial". The BT lady will confirm by saying "the number is being dialed".

- To store a number for voice dialing, speak "Store Name". The BT lady will guide you through the correct actions. You speak the name twice then speak the digits to be stored. This is very similar to the older cell phone voice dialing tags that you had to manually store. If successful, the voice tag will be saved to the BT module phonebook.

- To hear your phonebook, speak "Phonebook". The phonebook name entries will be played in sequence to remind you what you have stored.

- To voice dial an entry in your BT module phonebook, speak "Name". The BT lady will confirm by saying "Say the Name". Speak the name exactly as you have stored it in your BT phonebook. The BT module will repeat the entry for confirmation. Speak "Dial" and the BT lady will confirm by saying "the number is being dialed".

Other Notes

- At any time during a call, the  button may be pressed to end the call, no matter how it was originated (steering wheel or voice).

- The contact name for the active phone call is displayed in the DIS if that number is stored in your phone's contact list, no matter how the call was originated (dialed or received call).

- If you have an entry in your phone's contact list for your voicemail number that includes pause characters and PIN, these will be dialed correctly.