Auto to manual swap procedures for the MKIV TDI including bug.

Table of Contents.

Revised July 4, 2016. Some cleanup of page numbering and other clarifications.

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Introduction.

Compiled by Boertje.
http://forums.tdiclub.com/member.php?u=9310
Some of the pictures I took, and some are from the **"Project Kill Da Auto Wabbit!, Or how I learned to love the Manual Swap"** thread. Many thanks to alphaseinor for all he did as what I consider a pioneer and guru in this project. Also thanks to GdB, jimbote, spartan, A5INKY, and Matt-98AHU for their help and input in demystifying this whole process. Also thanks to josh8loop for his pictures as well as nosborn94 from vwvortex for his excellent pictures and que4dog for his bug pics. Thanks to Aaron at Boraparts http://shopping.boraparts.com/ for his contributions on the parts lists. He has been very helpful to me in sourcing most of parts that were not available with the earlier 6 speed kits.
Finally to Ryanp in the UK http://forums.tdiclub.com/member.php?u=79462 for all of the time he has spent with me to answer my questions and to make sure all was just the way it should be. If there were issues, Ryan took care of them immediately and, finally, that we even have these kits available to us here in North America!

I would highly recommend buying a Bentley manual. It is the best investment you can make. I have found this to be a most valuable resource. Remember, proceed at YOUR OWN RISK.

Here is a typical layout of all of the parts that will go into the auto to manual swap for the 6 speed.

Auto to manual swap procedures for the MKIV TDI including bug.

Section 1.

Loosen lugs and axle nut on the front while there is weight on the front end.

Raise the front high enough to be able to remove the transmission out through the bottom with the transmission sitting on a transmission jack, and place jack stands. I placed them where the manual specifies jack placement to change out a flat tire.
Remove front wheels and axle nuts.
Remove the belly pan and side shields.

Remove turbo heat shield. Its the plastic piece that protects the axle boot from turbo heat and is bolted to the engine block with 2 bolts.
Remove axle bolts at trans axle flange (screw in one or two lug bolts and use a screwdriver or a small punch in the rotor webbing to hold the axle from turning).

Remove the 3 bolts that hold the ball joint to the Control arm. Might be a good idea to spray some paint on the bolts to be able to position the bolts in exactly the same spot as before on reassembly. If you are thinking of doing a suspension update, now is the time to do it since you will have most of the stuff out of the way and easily accessible. The last 2 swaps I did, I also did suspension at the same time.
Pull the struts out of the way or remove them outright if you are doing a suspension update and remove the axles.
Remove the air box but be careful when removing vacuum line as not to break the plastic fitting on the box. Remove the MAF plug.
Remove the battery and battery box.
Remove inner left fender liner for ease of access for starter and such.
Remove wiring from starter.
Remove starter and neg cable from engine. Remember the position of the stud that the neg cable was attached to on the engine for re-installation.
Remove all trans wiring. We need the speed sensor wire plug intact so be careful. It is located towards the firewall side of the transmission. Also we need the 8 pin 6 wire oval plug. Need wires from this plug in the rewiring instructions for backup lights plug to transmission.

Bypass trans cooler as shown. Also an option would be to remove the trans cooler lines altogether and cap them instead (what josh8loop did).

Remove turbo down pipe from turbo and then remove down pipe with CAT from the car. There is a coupler as shown below that makes removal fairly easy.
Remove the 2 heat shields behind the engine and above the CAT to access the shifter assembly. Use a small bladed screw driver to open up the keeper's fingers that hold the heat shields to the studs.

Remove turbo to intercooler air line.
Remove the access grommet located between the passenger side axle flange and the engine block to access the 3 bolts that hold the torque converter to the “flywheel” plate, make sure you turn the engine clockwise looking at it from the belt side of the engine.

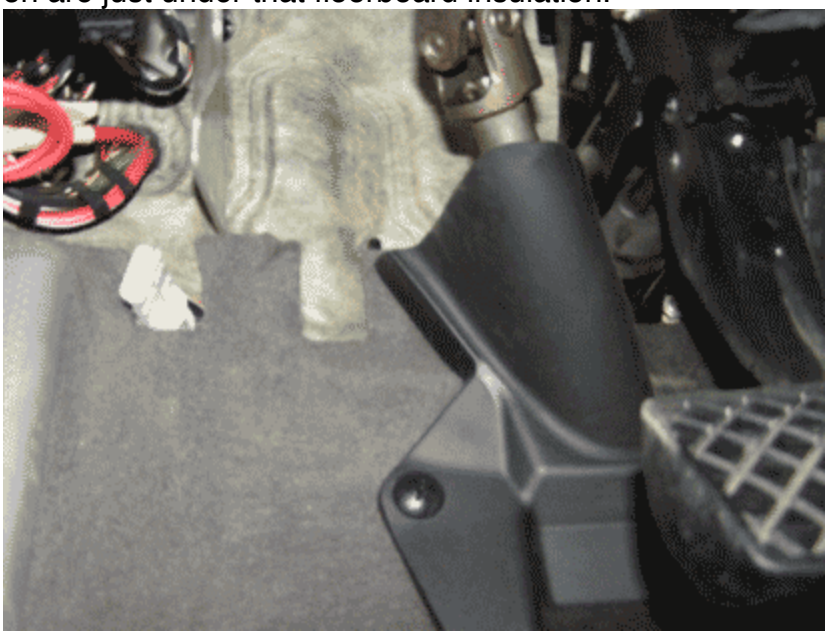
Remove the dog bone brace.

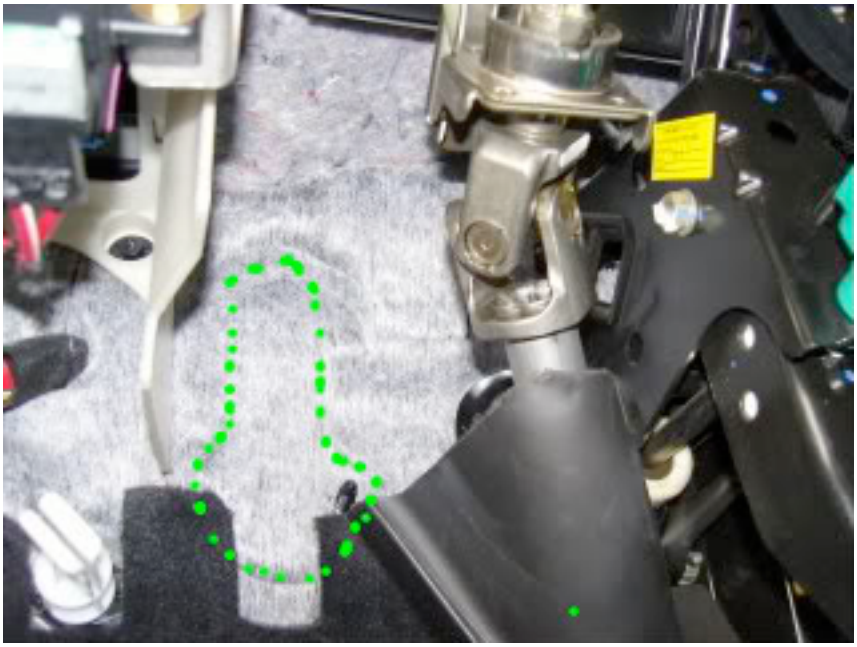
Support the engine from above. Harbor freight has inexpensive engine supports.
Support the transmission with a transmission jack or similar.
Remove bolts from trans to engine.
Remove bolts from trans to trans mount.
Remove bolts from trans mount to frame.
Separate trans from engine and lower. Might have to lower engine too a little in the process.
Make adjustments in engine height and trans to continue in the separation and lowering process until completely out.
Remove “flywheel” and all spacers on the crank hub. The spacers are not used in the manual transmission setup.
Remove dust tin. The auto dust tin is not used. Need to use the one that comes with the transmission you are using.

Inspect the rear main seal and replace as needed.

I would recommend replacing it if the car is over 100K miles. Also now is a good time to inspect the oil pan and reseal if needed. I have had to do 2 of the 3 cars I did the swap on. It is much easier to do this when the trans is out than later with the trans installed. Oil pan and rear main seal bolt torque is 15Nm/11ft-lb. Consult Bentleys on the proper way to reseal the oil pan and the torquing sequence ensuring that the oil pan and engine block are perfectly aligned and flush so that it is ready for mating to the transmission.

Section 2. Now is the time to do the wiring. See wiring instructions section below. Do wiring before installing the clutch pedal for ease of access to the wiring. Install the clutch pedal and its switches and brackets. As shown below, the pedal goes here. You can just grab that patch and pull it out. The studs that the clutch pedal goes on are just under that floorboard insulation.

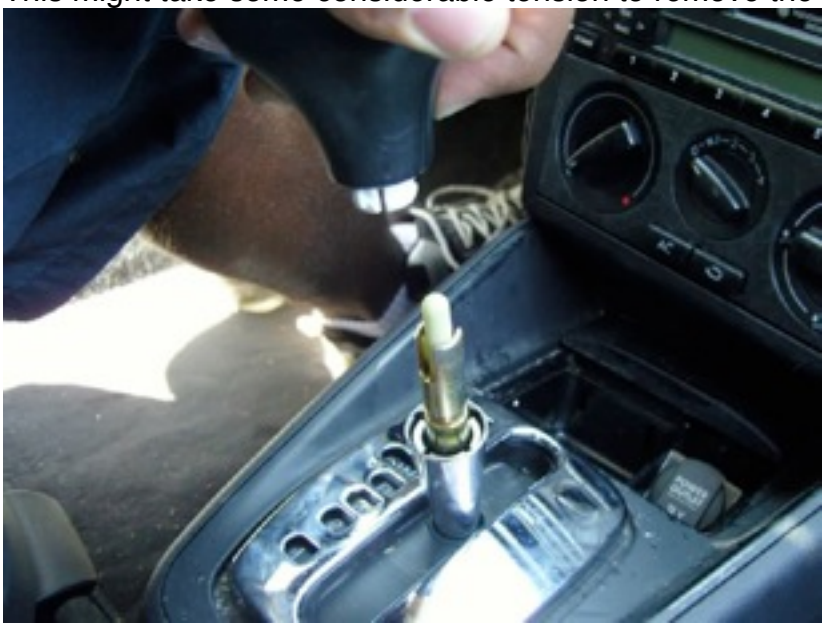




And here is what it looks like when installed. On my Jetta I cut the brake pedal down to the shape as they are in the stock manual configuration. On my Golf, I left it as shown below and have had no problems hitting the brake pedal by mistake.

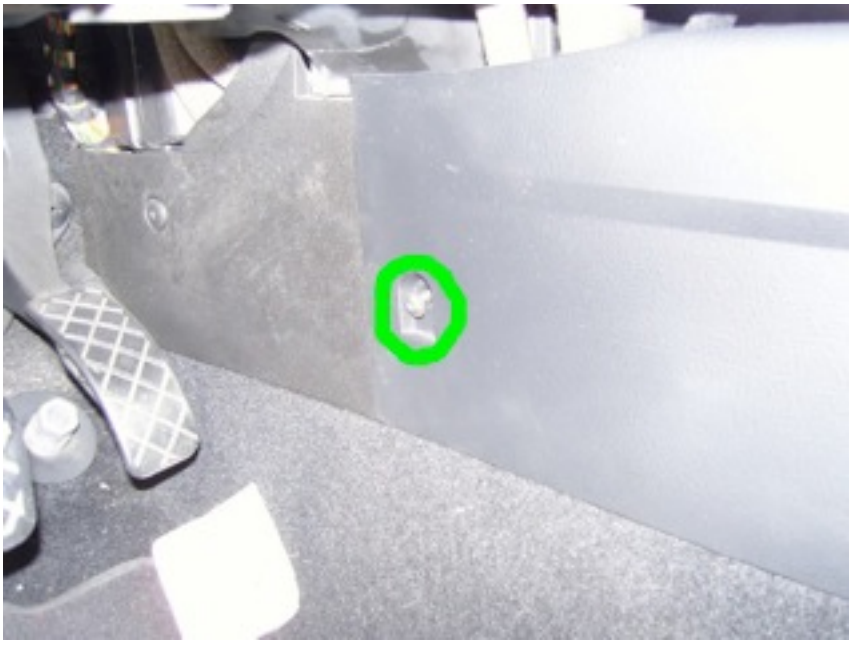
Run the clutch hydraulic line from the pedal towards the front of the car and attach it to the frame with the ryanp supplied plastic line to frame holder (if you are using the new hydraulic line for the 6 speed).

Section 3. Remove auto shifter and install the manual shifter. To remove the auto shifter, push down on the locking collar just below the shifter T and then pull up on the T. This might take some considerable tension to remove the “T”.



For the bug.

Remove the screw on either side of the center console and the 2 side screws that hold the shifter plastic housing in place just near the end of the hand break lever. They are usually covered with a round plastic cover.



For the bug.

Be very careful when removing the ashtray and remove the screw underneath the ashtray as not to break the brace that holds the ash tray in place.


AC
P
D

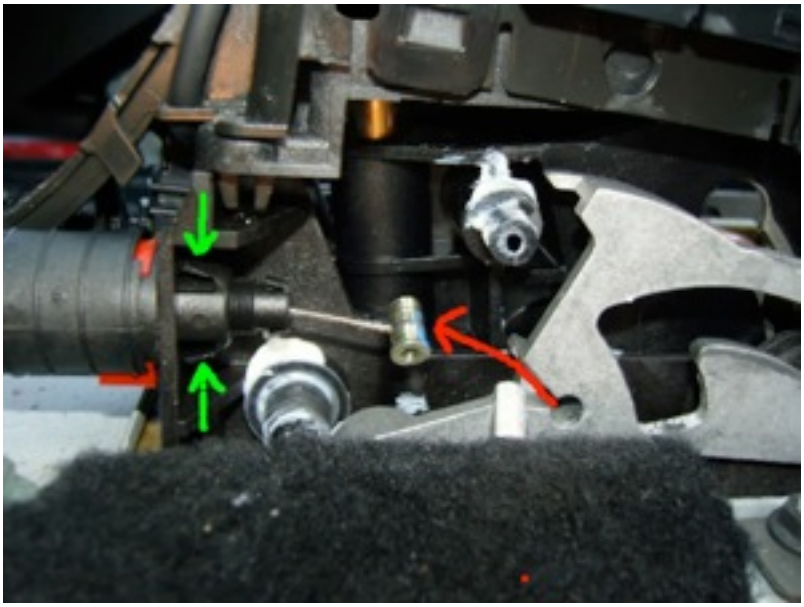

AC
R
N

Remove the small metal brace from the plastic housing **carefully** (Jetta/Golf...it snaps onto the plastic) and be careful not to break the plastic tangs (brittle!) that hold the brace in place (ask me how I know...)

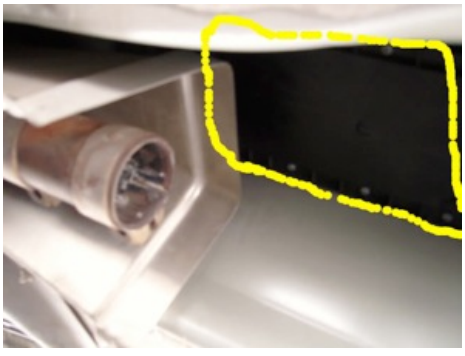
Auto to manual swap procedures for the MKIV TDI including bug.

For the bug.

Remove the wiring plugs from the shifter and the ignition lock out cable.



Shown is looking from underneath where the shifter is mounted with the heat shields and exhaust removed.



Bug automatic shifter installed looking up from the bottom with het shield removed.

When the manual shifter is installed, simply put the old wiring and the interlock cable that was attached to the auto shifter to the passenger side of the manual shifter and forget them. You might want to zip tie them together.

Shown is the routing of the shifter cables over the subframe.

After the manual shifter install, reinstall the heat shields previously removed to access the shifter. Use a pair of pliers to flatten out the fingers of the keepers so that they will grab and hold the shields to the studs as before. Also install the plastic housing and its ash tray that the shifter rests in but before you do this, remove the rubber and its retainer (4 screws from underneath) that held in the auto shifter cover plate so that the manual shifter boot can properly snap in place. Do not install the boot and knob yet.

Section 4. Transmission installation.

Install the dust tin for your new manual transmission.

Install the new flywheel 60Nm/44ft-lb +1/4 turn.

Make sure that whether you have a new or used flywheel, clutch, and pressure plate that you use a brake cleaner to clean any grease or other stuff before it is put into use.

Install pressure plate using clutch alignment tool. Torque to 13Nm/10ft-lb for dual mass flywheel and 20Nm/15ft-lb for single mass flywheel and follow bentleys manual on the torquing sequence.

At this point, you might want to degrease the transmission acquired including any and all parts that are purchased used. Inspect all seals to see that they are intact and leak free.

Install the release bearing into the transmission. 12Nm/9ft-lb torque. Also install the plastic bleeder piece to the release bearing inlet.

Inspect the axles as well and see that the boots are in good order. Replace boots as needed.

As far as the used starter, I would take it down and clean and lub as required and at the same time inspect the brushes to see how much wear you have left.

Lube the trans input shaft **very lightly** with some grease.

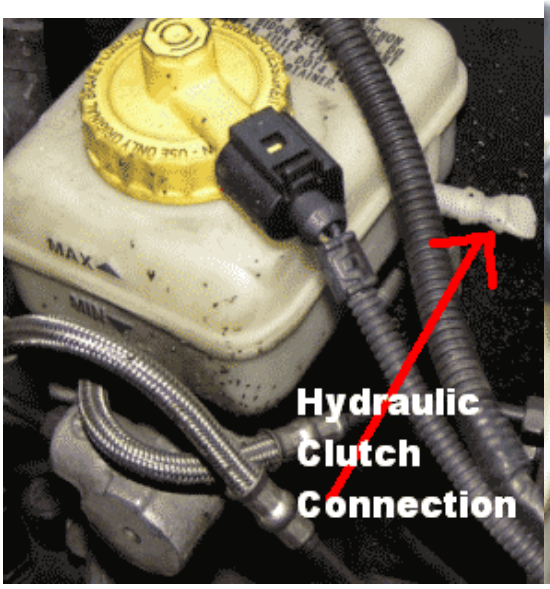
Now comes the fun part...install that heavy trans. Removal of the passenger side flange is most helpful for clearance but is optional. A helper is most helpful. The last one I did,

I did all by my self...probably not the brightest move, but then again, I want it done yesterday so I did it anyway and pulled it off.
You might have to lower or raise the engine to mate the 2 together. Also positioning the engine as far forward as possible will also ease the mating of the engine and the transmission (use a block of wood or something along those lines).


With the bug, it is a good idea to raise the trans with the axle flange end of the transmission in the up position and then rotate 90 degrees towards the firewall after the sub frame is cleared. Line up the guides or dowel sleeves from the engine block to trans and start the bolts when the dowels have engaged.
Ryanp's kit will contain new bolts where stretch bolts are used. I would not recommend reusing stretch bolts.
When the engine and trans are bolted together, install the trans mount to trans and torque 50Nm/37ft-lb + 1/4 turn. Bolt trans mount to frame mount without the trans weight on the mounts yet with the surfaces that are to be bolted together mated properly. Must be supported by the trans jack for proper torque. Torque mount bolts 100Nm/74ft-lb. Torque engine to trans bolts. The large diameter bolts (M12) into engine block are 80Nm/59ft-lb. One of the bolts has a long smaller diameter stud and is used in the top hole closest to the firewall and is used to hold the shifter cable bracket. The smaller bolts (M10) into the oil pan are 40Nm/30ft-lb for the 2 short bolts on the bottom and for the bolt below the starter it is 60Nm/43ft-lb. Be careful with the later bolt. It might be a bit too short and not engage all of the threads so go easy here or replace with a longer bolt from an auto parts store.
Install dog bone and torque. The smaller bolts to frame are 25Nm/18ft-lb and the larger bolts to transmission are 50Nm/37ft-lb.
Install the inspection plate that came with the new dust tin.
Install the down pipe with CAT. The downpipe flange to turbo is 25Nm/18ft-lb.
Attach the clutch hydraulic line as per the 5 or 6 speed you are installing.

Attach the brake master to clutch master line as shown.

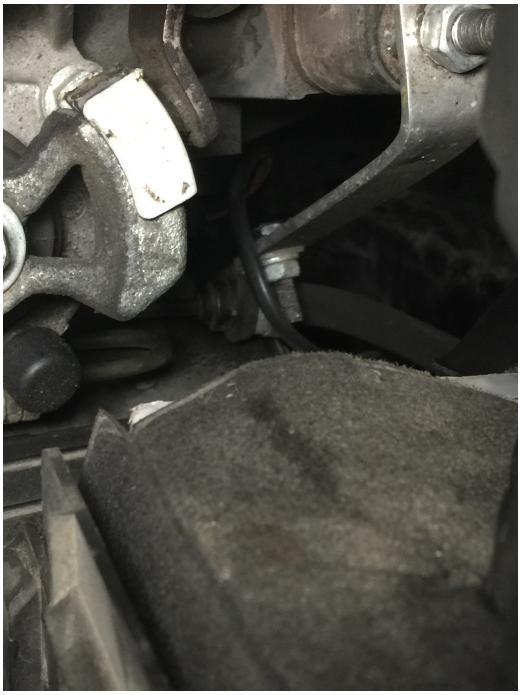
Be careful when cutting this fitting as it could be brittle. I used a fine hack saw to cut it. Also make sure you are ready to attach the clutch master line to the brake at this time since the master cylinder reservoir will leak a great deal when cut.



For the 6 speed, attach the power steering line (auto to manual swap) as shown routing it over the top of the clutch hydraulic line so that they do not rub together. You might

have to tweak this line just a little to make it fit. You can take the old rubber clamp that is on the line and give it a twist as shown to hold the line and bolt it to the trans mount with the stud.

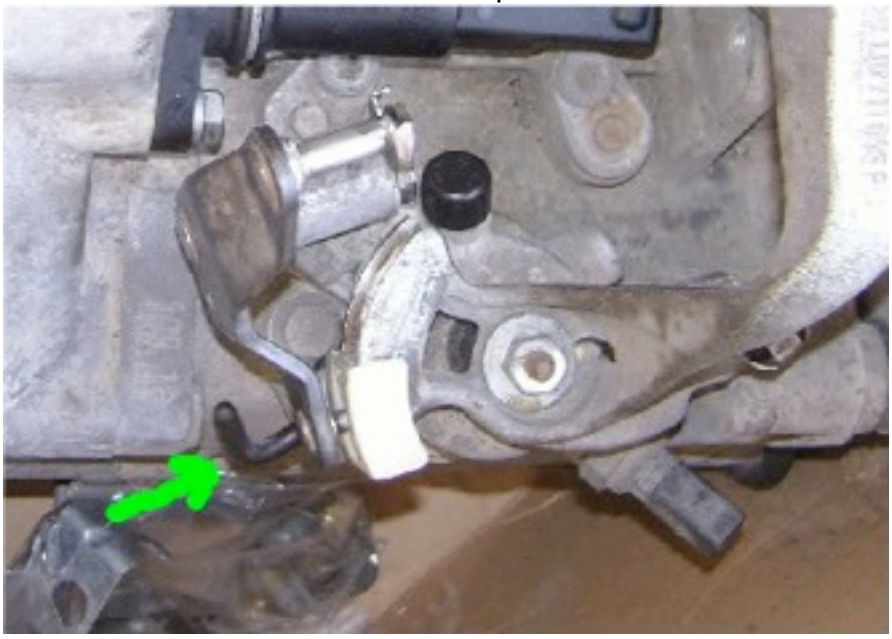
Place the shifter cable bracket and secure onto the transmission to engine bolt with the



long smaller diameter stud and 2 bolts to the transmission.
Attach shift cables in through the bracket (the longer cable is closer to the engine) with the retaining U clamps and “lock” the trans and also lock the shifter assembly using a

number 8 drill (or 0.199) bit. Consult the Bentley manual for this procedure or search tdiclub.com. Lube the shifter as needed.

Here is a photo of the aluminum flat that I used to re use the old 5 speed clutch Hydraulic line for the six speed. Major tweaking is required to get it to form just right but it can be done. Alternatively, buy the line for the 6 speed if you are in doubt.
Shown below is the lock for the 5 speed.



Attach shift cable ends and then remove the locks and check the shift pattern.
Now you can install the knob and boot. Orient the knob onto the shaft and push the shifter knob down on the shifter as far as you can. Pull up on the boot and take a small zip tie strap and put it around the white plastic that holds the knob to the shifter shaft. Its right at the bottom and easy to see. Tighten as much as possible and cut off any access zip tie as close as possible.
Now make sure no coolant lines are touching or rubbing on anything or any linkage and make adjustments to the coolant lines as necessary. I had to pull up on the metal coolant line **slightly** and bend it ever so **slightly** as not to rub on the shifter transmission bracket that holds the cables coming from the shifter.

Section 5.

*****The Transmission from Ryanp comes with a tag stating that there is no oil in the transmission. In the case of the 02M transmission, it is recommended to use the OEM fluid G 052 171 A2. You will need 3 litres of which you will use roughly 2.5 litres. Replace the Transmission Sealing washer too for the fill and drain plugs, part number N0438092.**
ECS tuning has both of these parts in stock. Their part numbers are for the 3 liter kit of oil ES#2142900 and for the sealing washers ES#7618.
With that said, some gear boxes, due to wear, may have weak synchros that can "crunch" when shifting gears. What I have found is that using Pennzoil "Synchromesh" or the GM equivalent has solved a number of this worn synchro grinding thereby extending the time greatly before synchro replacement would be necessary. Jimbote was the one who initially recommended this to me and has great experience with it. I concur.
****

Section 6.
Now another fun part...bleed the hydraulic clutch setup. You need a helper here and be prepared to have a litre of Dot 4 brake fluid on hand. It gets messy and you will wonder if there will ever be an end to it. Purge ALL air from the line until the pedal functions normally.
A5INKY of TDI club found an interesting alternative to the bleeding process.
“A few weeks ago while installing an 02M six speed I came upon the standard difficulty bleeding the clutch slave cylinder. Found a technique in another forum that is worth sharing. Made the process much faster and easier. I just used it on a 02J conversion and worked great on that too.
Connect a hose from the driver front brake caliper to the slave cylinder bleed port, open both and simply pump the brakes slowly. The air will be pushed right into the brake/ clutch fluid reservoir closed-loop style. Top up the reservoir as needed, but you will only loose equivalent to the volume of air coming out of the clutch system. Finish bleeding with the standard vacuum pump technique and good to go.”

Next.
Install the starter. Torque bolts to 80Nm/59ft-lb.
Install the axles and reinstall the ball joints (3 bolts at 20Nm/15ft-lb using the paint marks made at removal as a guide) to the Control Arm and torque axles at the trans flanges (pre-tighten diagonally to 10Nm/7.5ft-lb then 70Nm/52ft-lb) using the same method as the removal.
Install Axle nuts at the hub...torque later.
Install turbo/axle boot heat shield to engine block. Make sure shield does not touch axle.
Attach speedo cable.
Attach backup plug as per wiring instruction from the wiring section.
Attach negative cable back to block to the same location as before.
Attach the plastic tray that holds the wire loom over the starter.
Attach positive cable to starter, attach the plastic cap over the starter positive stud terminal and then attach start wire plug.26
Re-position wire loom over starter in its plastic tray.
Re-install battery box and battery.
If you stuffed a paper towel into the intake, make sure you remove it before attaching the air box hose back to the intake.
Install air box, clamp air line to intake and attach the MAF plug and vacuum line.
Install all air lines such as the turbo to intercooler and check to see that all is attached and that all clamps are properly seated and that all is clear.
Put the wheels back on and tighten lugs.
Lower the car and tighten lugs to 120Nm/89ft-lb.

See Section 8 on page 32 for VCDS settings.

Now that the engine is running correctly and the weight is on its wheels, torque the axle nut at the hub on each side of the car to 200Nm/148ft-lb and then loosen 1/2 turn. Roll the car 1/2 rotation of the wheel and tighten to 50Nm/37ft-lb plus 1/6 of a turn.
Drive the car.

Check the transmission oil level one more time and add as necessary.

Re-install the belly pan and side skirts after you are convinced that there are no issues such as leaks and other possible complications.

Now, enjoy cruising the freeways in 6th gear

Section 7.

WIRING INSTRUCTIONS for the TDI.

This is the GdB wiring instructions that I used for the auto to 6 speed swap. Wiring colors were different and the backup light instructions were wrong for my 2000 Golf and 2002 Jetta TDI wagon. Changes from his original are in blue.
Remember, this is how it was on my TDI *2000 Golf and 2002 JETTA wagon*.

GdB SWAP WIRING VERSION ELECTRICAL NOTES I suggest doing this all before installing the clutch pedal, it is a tight spot to work in.

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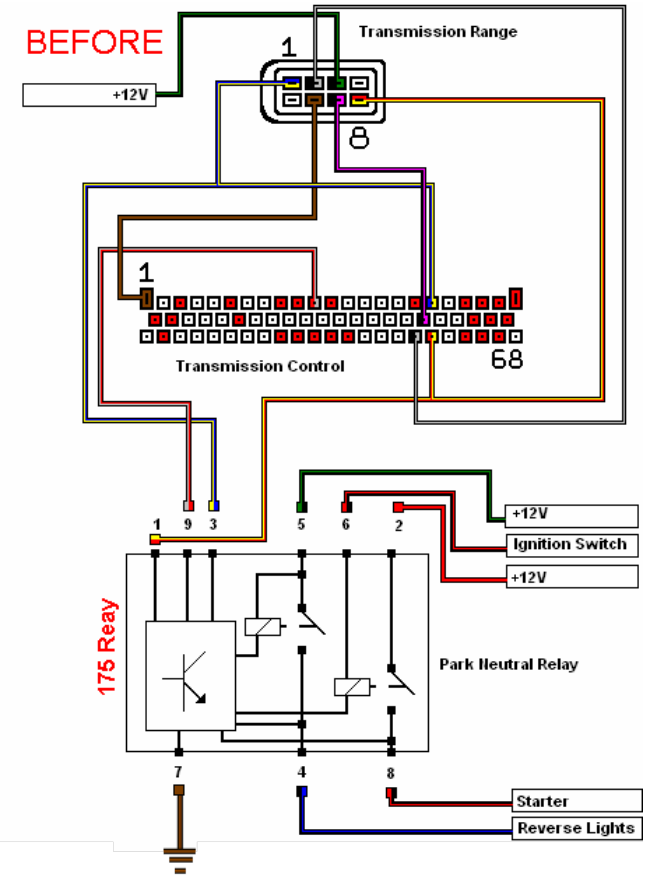

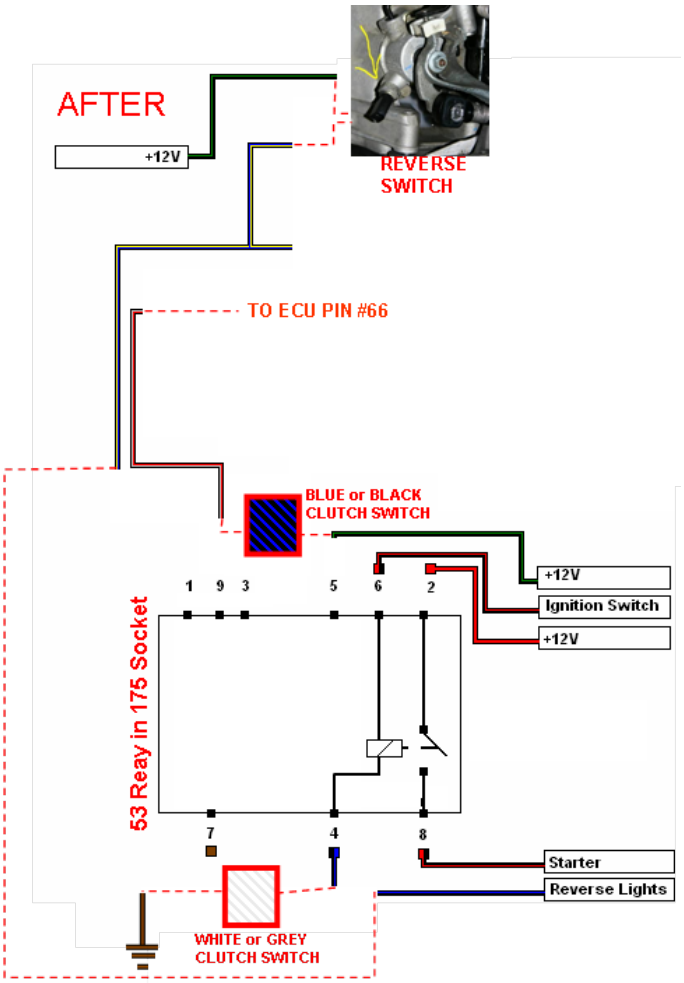

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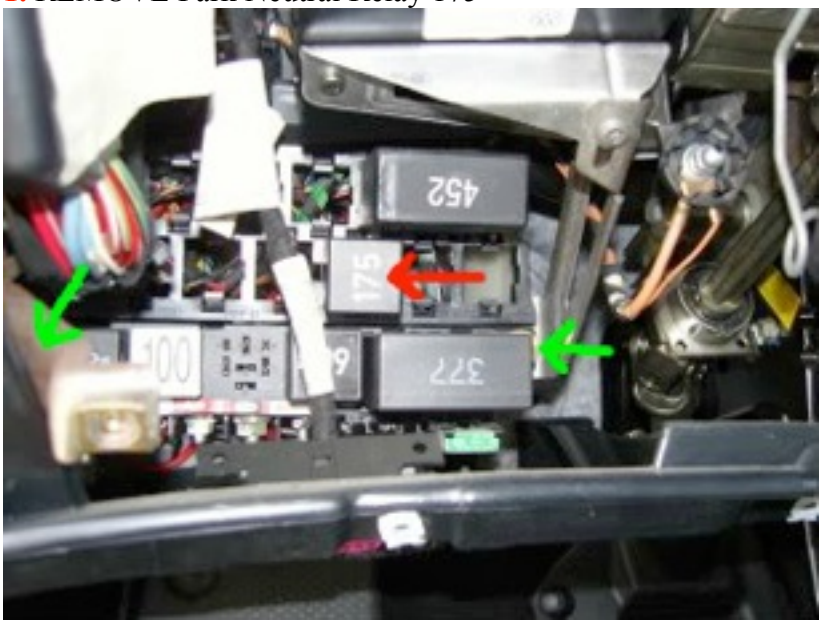
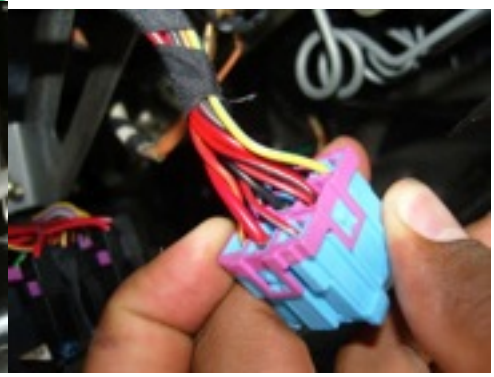
1. REMOVE Park Neutral Relay 175



2. Pull out the socket for the 175 to get access to the wires


CRUISE CONTROL HOOKUP portion

3. Cut the BLACK/GREEN wire (pin #5) close to the 175 socket and connect to the blue or black clutch pedal switch (closest to the driver seat)

4. Cut the *YELLOW/BLUE* wire (pin #9) close to the 175 socket and connect to the other wire on the same blue or black clutch pedal switch

5. Remove the TCU and disconnect the plugs from the ECU. **See page 36 for pictures.**

6. Find (continuity check...) and CUT the same *YELLOW/BLUE* wire at the TCU connector.

6a. Find a YELLOW/RED wire on the TCU connector that also has continuity with ECU pin #19 YELLOW/ RED wire. Cut it at the TCU side and connect it to the *YELLOW/BLUE* wire.

(1st check for unwanted continuity with any ECU pins)

7. Remove ECU pin #19 and pin #66 and put the pin #19 with YELLOW/RED wire attached into empty hole #66 (98 and 99 beetle it is pin #46 so please check before you

throw 12v to the wrong pin). This does not apply fully to the 2000+ beetle. In this case, simply run a wire from the yellow/blue wire at the TCU as noted above to the ECU and attach to pin 66. Leave whatever wire that is at pin 19 in place. There is no yellow/red wire at the TCU that goes to pin 19 of the ECU.

See Page 40 for a picture of the plug with pins marked.

REVERSE LIGHTS

8. Cut the BLACK/BLUE wire (pin #4) AWAY FROM the 175 socket. Leave at least a 2 inch pig tail from the socket. This pig tail is used in the starter interlock step below.

9. Cut the RED/YELLOW wire (pin #1) AWAY FROM the 175 socket although pin one is not used.

10. Connect the harness side wires only from the last two steps taking the Black/Blue wire and connecting it to the Red/Yellow wire.

(1st check for unwanted continuity with any ECU pins)

11. Find (continuity check...), cut and connect the RED/YELLOW wire at the 8 pin (6 wire) TR plug (PIN#8) and connect to the reverse switch on the tranny

12. Cut the BLACK/GREEN wire at the 8 pin (6 wire) TR plug and connect to the reverse switch on the tranny

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---------- STARTER INTERLOCK aka Starter Inhibitor Switch

13. Cut the BROWN wire (pin #7) close to the 175 socket and connect to the white or grey clutch pedal switch (closest to the firewall)
14. Connect the other wire on the white or grey clutch pedal switch to the BLACK/BLUE wire (pin #4) at the 175 socket

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---------- FINISH

15. Replace the 175 relay with a 53 relay 141-951-253-B $9.16 at http://www.worldimpex.com/parts/german-relay-horn--ac_5728.html

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BEW WIRING INSTRUCTIONS.

The section below is what I was able to glean from various threads concerning the BEW and Tiptronics Trans.

Alphaseinor apparently has this procedure down.

Originally Posted by **alphaseinor**
As for the Tiptronic transmissions:

— — — — —-
By Alphaseinor: From http://forums.tdiclub.com/showpost.php?p=4218233&postcount=2127

A27 bus is a wire between Pin 52 (big connector) at the ECU and pin 3 on the blue connector at the instrument cluster. This should fix your cruise and ABS issue

Make sure you have pin 43 with voltage going to it, should be +12v. if you don't have the voltage, then it's not going to work... (also if it's not in pin 43 it's not going to work)

pin 70 and 71 at the ECU are for the glowplug pre heaters and you can put a a 1k resistor in line with each (or a pair of relays that control the glow plugs) powered by the same fuse that runs the cruise control pedal. that will get rid of your codes. Those codes won't throw a CEL.

Instrument cluster will most likely still have a missing message from TCU message.

ABS coding will get rid of missing message from TCU

Engine coding will get rid of missing message from TCU if it's set to manual mode, this is not the same coding as an ALH.

— — — — —
By Alphaseinor: http://dspauto.com/node/33

5 speed automatics require more wiring than on the 4 speed. All connectors in engine compartment are different.

Cruise control on the Diesel engine is pin 43 on the large connector of the ECU, this should be a switched positive (normally closed with the pedal up)

A27 Bus may not be present causing a fault for VSS, On Diesel engines the A27 bus is a connection between pin 3 on the blue connector of the instrument cluster to pin 52 on the large ECU connector.

VSS harness is not present and must be wired in manually: This requires a 10a fused positive connection (usually fuse 7 bus B163) to pin1 , ground to pin 3, and a wire from pin 2 to the instrument cluster blue connector pin 28

Faults for glow plug heater circuits can be solved by connecting two 1k resistor from the black green wire for the cruise control pedal connection to each pins 70 and 71 in the large connector of the ECU (one resistor per connector), you can also wire up two relays for the same effect.

Spartan had this input for the BEW series.

2005 Jetta Wagon TDI 5 speed swap wiring

Followed instructions for starter interlock and reverse wiring from Boertje's Auto to 6 speed swap write up.

Cruise control was followed except for the following differences.

I followed the yellow/blue wire from the 175 relay to the TCU- T19/68 (continuity check). Found Blue/Violet wire at TCU- T63/68 that had continuity with ECU- T90/94. I moved the ECU side of this wire to ECU- T43/94. I then connected the TCU sides of the Blue/Violet to the Yellow/Blue.

VSS Wiring- I found continuity from the blue cluster connector (need to remove instrument cluster), green wire T28/32 to a Blue/Violet wire on TCU- T56/68. I then ran a length of wire from the Blue/Violet at the TCU through the plenum and then into the engine bay with the group of wires on the driver's side plenum. I continued this wire to the T2/3 (middle) connection on the VSS.

For the power I used the Green/Black on the TR (transmission range) connector in the engine bay (this wire is also used for the power on the reverse connector). For the ground I used the brown wire on the TR connector.

Wire from instrument cluster to ECU- Diagrams call for a wire from the T3/32 of the blue instrument cluster to T90/94 of the ECU. ~~To accomplish this I found the Gray/White wire at T5/32a (cluster green connector) and added a section of wire and inserted it into the T3/32 of the cluster blue connector (after removing the existing wire in T3/32 as I could not find continuity in either the TCU or ECU). I then found continuity with the same Gray/White wire at T72/94 of the ECU, I moved the ECU end of this wire to T90/94.~~ Do not do this!! Vag-Com will not connect

with engine as the gray wire is for that communication. Need to add wire that will go from T3/32 to T90/94. I purchased some spare ECU and cluster wire connectors from the junk yard to pull pins from.

I don't know if this will work for anyone else, and there very well may be better ways of accomplishing this. All I know is that I don't have and CEL's, my speedometer works, my reverse lights work and my cruise control works!

———————-

!!!!!!!!!!THIS IS FOR JUNE 2005+ DSG TRANSMISSION ONLY!!!!!!!!!!!!

As in 2006 bug with DSG.

From alphaseinor as found on TDI club http://forums.tdiclub.com/showpost.php?p=4740955&postcount=2326

This is looking at bentley only... so your miles may vary... I won't be held responsible if you blow something up. report back if you don't blow anything up.

should be relay "126" for starter interlock, keep the same relay, a 53 will only fry stuff
Pin Colors should be:
2: Red/Black (from Ignition switch 2.5mm wire)
4: Red/Black (from Ignition switch 1.5mm wire)
6: Purple (To mechatronics unit Pin 17, this one should be connected to clutch pedal switch on TOP, the other side just gets connected to ground under the steering column with an eyelet)
8: Red (to starter)

At the mechatronics unit: for reverse lights
Pin Colors:
12:Purple (.5mm wire) connect this to one side of your reverse switch
19: Brown (1.0mm wire) connect this to the other side of the reverse switch

At ECU: for cruise
pin:
T94/43: no wire should be there (.35mm wire, switched from bottom pedal to ign/ switched and fused +12v)
T94/90: no wire should be there (.35mm wire, A97 Bus to instrument cluster pin T32/3 blue connector)

at instrument cluster (kombi)
pin:
T32/3 (.35mm, A97 bus to ECU pin T94/90 blue connector, for VSS signal)

Section 8.

VCDS settings.

Use vag-com and turn the key on. Go to **01-Engine** and change the soft coding from 0001 to 0002. Keyswitch to the off position immediately after. Clear all the fault codes, after running the engine, no faults should return.

Next for the 6 speed go to instrument and click on recode and change the last digit from a 2 to a 4 to set the proper pulse rate for the 6 speed transmission. Save and Exit and cycle the key. The purpose is to set the pulse rate properly for the speedometer and the 6 speed transmission.

On MY 2001 and earlier, go to CAN-bus gateway>coding and change the 7 to a 6 to remove the automatic transmission feature.
Look at the last digit in the coding. Add the values for the options together to get the correct coding.

0 - No available equipment
+1 - Automatic Transmission
+2 - ABS Brakes
+4 - Airbags

So, if you want to support Automatic Transmission, ABS Brakes, and Airbags, (add 1+2+4 = 7) = 00007. Note: 2002+ models do not need to be coded separately for automatic transmission, so a 2002 with Automatic Transmission, ABS Brakes, and Airbags, (add 2+4 = 6) = 00006. In my Golf, the coding was 7 so I changed it to 6 which subtracted the automatic.

Not necessary on MY 2002 and later. However, It has been discovered that some 2002 and later cars are having TCU communications error codes even though the wiring and coding was done correctly. If the 19-CAN Gateway is checked with these cars, the value is 6 as it should be. What is interesting (thanks to "**the*rogue**" for this one) is that if the value is changed to a 6, which it already is, and saved, it forces the ECU to rescan the devices and finding no TCU, it is now happy and the codes do not reappear.
Make sure you cycle the key after each change and then check for fault codes.

Trouble shooting a rough running engine after recode.

Now start the engine. It might run rough but in vag-com, go to engine>login (12233)>adaptation>block 1 and see what the IQ is. You will probably see something like 0.5 +-. You will want to do the hammer mod (see tdiclub.com how to section) to bring this number to something like 4-5 as it was before the recoding.

Section 9.

Trouble shooting for cruise control by Matt-98AHU:
Login to the engine computer using VCDS, goto measuring block 006. Field 2 should be "brake pedal monitoring." There will be 3 digits. With you touching no pedals, all 3 digits should read 0. The first digit is for clutch/cruise control monitoring. The second two are for the brake pedal.

If that first digit reads 1 while you're not touching any pedals, that's a problem. It could be you have the switches installed in the wrong locations or that particular switch just needs to be re-adjusted. If it's a bad switch, you can always just run with it unplugged (just be mindful to not use the clutch pedal to cancel cruise... The engine will rev up before the ECU cuts it back to idle if you DO depress the clutch pedal to cancel cruise in this instance).

For the record, the bottom switch should be for cruise control (should be blue or black in color, depending on which version you've got).

Also, did you move the wire from the #19 ECU pin to #66? Are you SURE those are the correct pin locations for your particular ECU? It should be if it's 2000 or later... Did you also splice the two wires together at the transmission computer connector? Transmission computer should be unplugged as well. The ECU pins are pretty delicate, you should always give the wire a little tug after swapping it just to be sure it's locked into place.

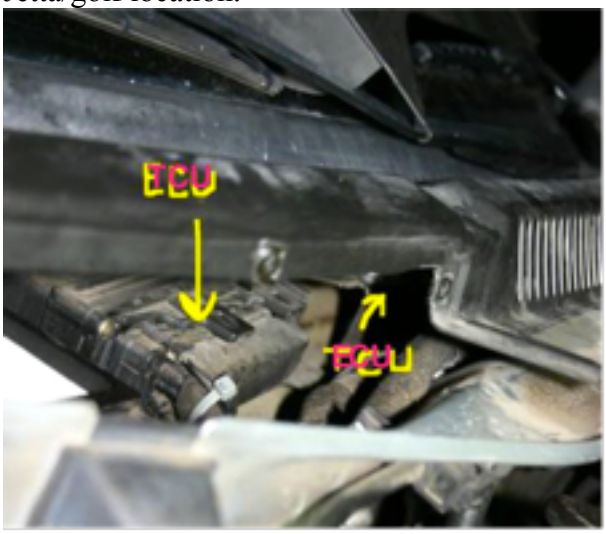
For the record, the blue switch is adjusted by merely turning it counter clockwise to remove it. If its adjusting collar isn't broken, it will reset itself. It will readjust as you reinstall it and the collar locks back into place from turning it clockwise (it only goes maybe 45 degrees before locking). I have seen a couple of these with broken collars before. The black switch is the old style, you can just pull on the plunger to adjust it out, depress the clutch pedal while installing, once locked into place, let the pedal back up, it will automatically adjust.

Section 10.

Pics.
If you look on the backside of the connector (where the wires are), the wiring is labeled in the plastic...
Ok, just for clarification to the writeup for adding the clutch switch pin to the ECU connector:

alphaseinor’s pictures below.

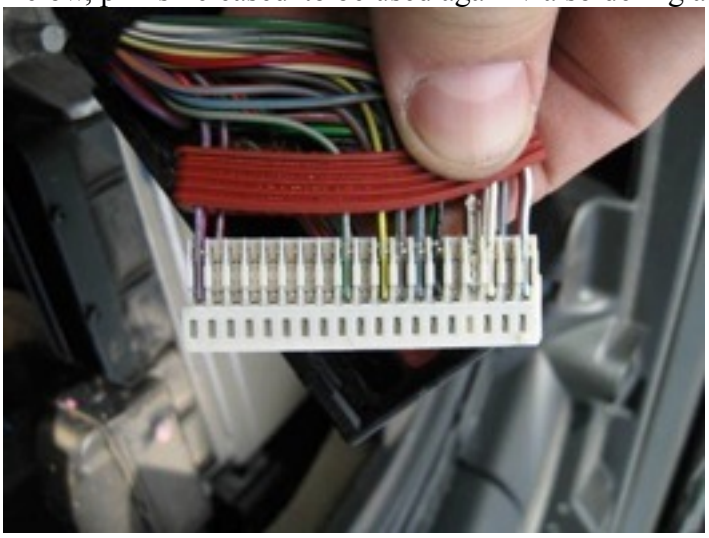
Jetta/golf location.



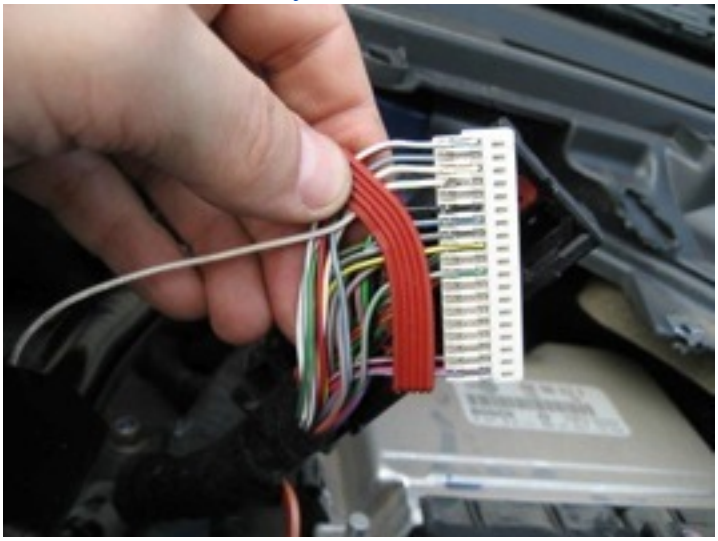
Here are some pics for the bug's ECU and TCU location. It is assumed that you know how to replace the cabin air filter. The TCU is located to the left of the cabin air filter as shown.

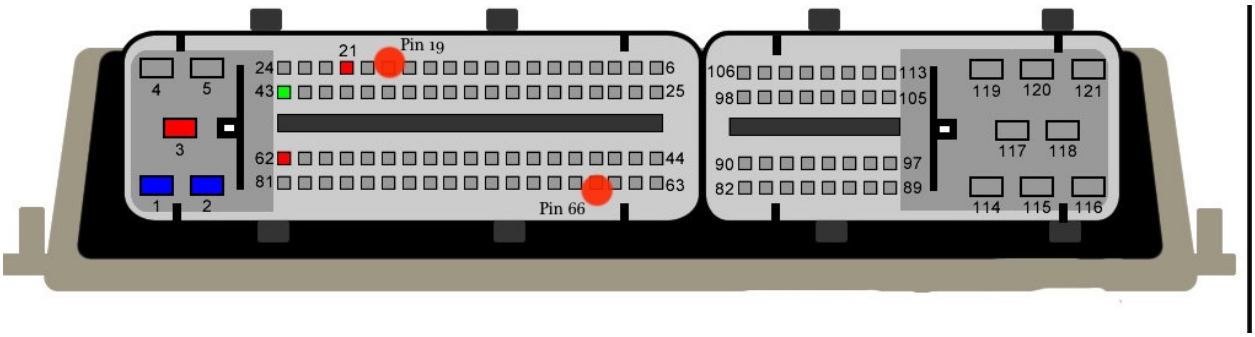
Here is where the ECU is located under the left side dash panel.

Below, pin is 'released' to be used again via soldering a wire on it.



This ^^^is a 2000NB connector and may not be the same as yours.
It is for illustration only.





Here is a picture of the ECU connector with pins 19 and 66 marked by a red circle.

jimbote
just a few weeks ago I added the wire to my ecm so I could have cruise with the manual coding.....my car is a Y2K bug....I converted to manual about three months ago....but used the auto coding for cruise until I got the nerve to dissect the ecm connector and add the all important wire....on my car it's pin number 66....supposed to be a white/red wire....on the 98 and 99 beetle it is pin 46 so please check before you throw 12v to the wrong pin....the connector while its looks formidable is not that complicated

first detach from the ecm

cut the zip tie

remove black plastic cover

remove the pink hold down under the cover (just pulls right off)

then take a knife or something very sharp and carefully slide the pink sub-connector lock from the main connector
(its shaped like a long U)

then tug the wires on the sub connector you want to remove and the entire white sub connector with the orange silicone dust shield with come out of the main connector

now you need a donor wire/pin, you can remove one from the tcm harness as you won't be needing this anymore
to de-pin the wire from the sub-connector use a sharp knife to push back the "lock" on the pin (there is a small window that allows access to the lock) carefully tug on the wire as you push back on the "lock" this will release the wire
I was lucky enough to have an extra ECM connector so a robbed the correct color wire from that

you have your sub connector separated from the main connector

.carefully slide the orange silicone dust shield up the wires until you have enough room to slide the appropriate pin into the white connector

first insert the loose end of your "donor" wire through the appropriate hole in the orange silicone shield and pull it through until the pin can be inserted into the white sub connector

make sure the the pin is in the correct orientation so the "lock" will engage

now carefully slide the pin into the correct slot in the sub connector, you will hear a tiny "click"

give the wire a slight tug to make sure it is seated

slide the silicone dust shield back down the wires and reinsert the sub-connector into the main

make sure it is all the way down

reinsert the pink "U" shaped sub-connector lock

reinstall the pink sub-connector hold down
and snap on the connector cover making sure not to pinch any wires

install a new zip tie and your through with the hard part

now this wire needs a 12V signal

this comes from the clutch vacuum vent valve switch (its blue on my car)

and is the lower of the two switches actuated by the clutch pedal

the circuit on my car is as follows

blue/yellow (spliced in from the brake light switch)
to blue/yellow on the CVVV (clutch vacuum vent valve)

white red on the CVVV to the wire you just added to the ecm

when the clutch pedal is depressed this breaks the circuit, ECM detects no voltage on pin 66 and the cruise turns off

One note on the CVVV
this switch is adjustable when in the "unlocked" or uninstalled position by pulling out or pushing in on the "plunger" you will feel and hear a clicking sound while performing this adjustment you'll have to play with it to get the correct adjustment so that it "opens" when the clutch is depressed about an one inch

use a digital multi meter check for switch opening while you push on the clutch pedal
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Section 11.

Here is a list of the bolts and part numbers required to do the 02M swap as per Ryan.
M12X1.5X65 Rubber frame mount to trans mount (2) N10209605
M8X45 dogbone to subframe (2) N10268304
M10X30-SW dogbone front (1) N10653503 (for 5 and 6 speed) or N10246610 also a M10X30 sw16 bolt for all transmissions.
M10X70-SW dogbone middle (1) N90597005 (for automatics and 5 speed) N10241508 (for the 6 speed). Seems to be the same M10X70X32 bolt for both.

For mount to trans on 6 speed.
M10x70/M8x20 Box Mount bolt N 90707602
M10x70 Box Mount bolt (2) N 90597002

M12x105x45 Front trans to engine just below starter (1) N10242102
M12x55/M8x40 Box to engine + Linkage mount (1) N90884601
M12x55/M8x10 Box to engine + Earth or ground (1) N90701604
M12x70 Rear engine to box (1) N90870301
M10x50 Lower box to engine (2) N90870401
Pressure Plate Bolts (6) N90320701
Flywheel Bolts (6) N90665001
M12x165/M8x16 Starter motor bolts (2) N90827101
30mm Driveshaft 12pt Nut (2) N90587602
M8x32 Linkage mount (2) N10106905

Section 12.

The parts list below is for reference only to give an idea on how involved this project can be and is by no means complete but can be useful to help fill in the blanks if something is missing.

02M 301 115 B x1 Plug for inspection hole on top of bell housing for 6 speed.

Driveshafts - should come come from a MKIV car with a 02M transmission - auto axles are too long
1J0 407 271 GC x1 left drive shaft* (1JO 407 451 PX) Löbro 304351 GKN (EKG 923769, Spidan 23769)
1J0 407 272 GD x1 right drive shaft* (1J0 407 452 QX) Löbro 303927 GKN (EKG 922267, Spidan 22267)
CV joints outer left and right 1JO 498 099 E Löbro 303551 GKN (EKG 921522, Spidan 21522)
CV joint gear box side 1JO 498 103 E Löbro 302464 GKN (EKG 922902, Spidan 22902)
Boot outer 3B0 498 203 E Löbro 303552 GKN (EKG 921524, Spidan 21524)

Boot inner 1JO 498 201 E Löbro 304113 GKN (EKG 923176, Spidan 23176)

qty 12 N90097202 M10x48x26
1K0 407 357 D x6 driveshaft bolt retainers*

Clutch Kit inc DMF for the PD150. Sachs 2289 601 001 (without release bearing)
02M 141 671 A x1 release bearing – hydraulic - may come with a clutch kit

Starter
02M starter - Look for a diesel specific starter which should be 2.0kW.
02M 911 023 (also -A and -F)
Actual Bosch:0-001-125-018, 0-001-125-019, 0-001-125-048, 0-001-125-049
2kW
Various other part numbers for the starter for the 02M 6 speed.
BOSCH: 0001125018
12V 2.0KW 10T CCW
VOLKSWAGEN GOLF, JETTA L4 V6 1.8L, 2.8L, 3.2L
LESTER 17820
BOSCH 0-001-125-019
BOSCH 0-001-125-048
BOSCH 0-001-125-049
BOSCH SR0433X
VW-AUDI 02M-911-023A
VW-AUDI 02M-911-023F
VW-AUDI 02M-911-023R
WAI 2-2341-BO

VW 02M-911-023C
Valeo D7SR50
Valeo D7SR150

Clutch Pedal - look for one as complete as you can - most of these parts should be included - I copied most of these numbers off bleachedbora's thread - I just got a complete used clutch pedal with all the swtiches, brackets, mounting nuts and pigtails for around $70.00.
Replacement parts for the clutch pedal assembly are below.
1J1 721 059 Clutch pedal assembly complete?
1J1 721 319 x1 clutch pedal
1J0 721 174 A x1 cap for clutch pedal
N 010 369 1 x1 pivot bolt
N 900 744 04 x1 nut for pivot bolt
1J0 721 153 x2 pivot bushing
WHT 000 671 x1 fulcrum pin
1J1 721 423 909 x1 overcenter spring seat
1J1 721 403 G x1 overcenter spring
1J1 721 232 AB41 x1 clutch pedal stop
1J0 721 381 x1 buffer for stop
1H0 721 357 x1 spring that retains clutch fork to pivot ball

Clutch Pedal Electrical
1J0 927 189 E x1 cruise switch for clutch pedal – blue
1J0 927 189 C x1 starter switch for clutch pedal – grey
x1 bracket for starter (upper) switch,
Bracket for Starter (Upper) Switch 1J0 907 330 B

Clutch Pedal Mounting
1J1 721 379 B x1 v-plate between clutch and brake pedal
N 902 264 04 x5 M8 nuts for clutch pedal - three studs on firewall and one for each end of v-plate
1J1 721 410 x1 clutch pedal firewall gasket

Some of these parts may come with the clutch pedal or clutch line
7M0 721 431 x1 small clip on master cylinder
7M0 721 431 x 2 small clip on bleeder at slave cylinder
02F 141 143 A x2 o-ring for master cylinder and slave cylinder
857 721 453 x1 350mm hose to hydraulic tank 1/8" ID
N 101 969 01 x1 clip for hydraulic hose to master cylinder - may come with master cylinder if you get it used
1J1 721 388 A x1 master cylinder
N 908 470 01 x3 hexagon head bolt c/w shoulder M7X25 for release bearing

1J0 721 468 C x1 bleeder - may come with clutch line
1J1 721 465 AJ x1 (new part number is 1J1 721 465 BC) slave cylinder hose (clutch line for 6 speed - it's different from the 5 speed one)
1J0 721 491 A x1 hose clip or
701 713 849 x1 clip that attaches hard part of clutch line to stud on body of car - not sure if these two are actually different or the same

Dust Tin
06A 103 645 C x1 dust cover
038 103 648 B x1 inspection cover
N 010 208 5 x1 bolt for inspection cover
N 012 226 5 x1 washer for Inspection Cover

Shifter - my transmission came with everything so I didn't need to order the individual parts x1 shifter box and linkage for 6-speed. If you need individual replacement parts for the shifter, then what follows might help.

1J0 711 286 F x1 selector cable 6-speed manual gearbox
1J0 711 265 F x1 shift cable 6-speed manual gearbox
1J0 711 781 D x1 abutment/bracket for shifter cables - different from some other brackets - the right most bolt hole is vertical to attach to one of the tranny-engine bolts - make sure yours has the sleeve/spacers in each of the positions
1J0 711 113 ?? x1 shifter boot/knob
N 908 159 03 x3 locking washer/clips for cable ends

N 909 083 01 x1 shouldered hex nut, self locking
1J0 711 067 L x2 bushing
1J0 711 202 J x1 relay lever
1J0 711 280 B x1 lock washer - I'm not sure where this would go
N 101 069 03 x1 hex head bolt (combi) M8x32 - I'm not sure which bolt this is unless it's the one attaching the bracket for the cables to the transmission in which case you'll actually need 2

Exhaust
N 902 002 01 x3 copper pinch nut
3A0 253 115 x1 exhaust downpipe gasket

Electrical Parts
141 951 253 B x1 starter interlock relay 53, can be 8K0 951 253 relay 643 which is a more recent iteration
1J0 972 702 x1 connector for neutral safety switch
6N0 972 704 D x1 connector for clutch switch
1J0 973 702 x1 reverse switch connector
000 979 131 x1 wire for reverse switch connector or 000-979-019-E
000 979 133 x2 repair wire for clutch switches
handful of pink 18-22 gauge heat shrink butt connectors
02K-945-415-K transmission mounted reverse light switch

Fluids
brake fluid - Dot 4 is OK. 1L if just bleeding clutch, 2L if also flushing brakes
G 052 171 A2 x3 L transmission fluid for the 6 speed
N 043 809 2 x2 sealing washer for fill/drain plug - get a few extras for future fluid changes

Miscellaneous Parts
x1 5/8” coolant coupler
G 000 100 grease/moly-lube/spline lube
x2 ball joint nut if you need to pull that to get your axles out

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END