

Allison Transmission Removal Guide

By: Durallymax

This is a guide to removal and installation of your Allison transmission. This is on an 03 Extended cab short bed truck so some things may differ on your truck. Also this truck is a 4x4 model so many of these things will not apply to 2wd trucks. It is meant to be a guide that somebody that knows which was to loosen a bolt can use so if it seems dumbed down a bit at points I apologize.

However even though this guide may make it look easy, you do need to have some mechanical knowledge, things can go wrong and I know this write up will not be complete as there is so much to remember. But I will do my best for you. I apologize for not having perfect pictures or pictures for everything, but once you get in there you will be able to figure it out.

Tools you will need.

Car lift, or buddy with one, or some jack stands
Transmission jack of some sort
13mm and 15mm Deep and Shallow Socket
13mm and 15mm combo wrench
18mm socket and wrench
8mm wrench
7/8" socket
11mm socket
3/8 Ratchet and a couple extensions of different sizes
Impact wrench
A LOT OF Extensions for the impact wrench
1/2"-3/8" adapter
Small flat bladed screwdriver
Body clip removal tool, or your own method of removing them.
A BIG adjustable wrench
A Heat gun
Some brake lube (optional)
Some penetrating lube.

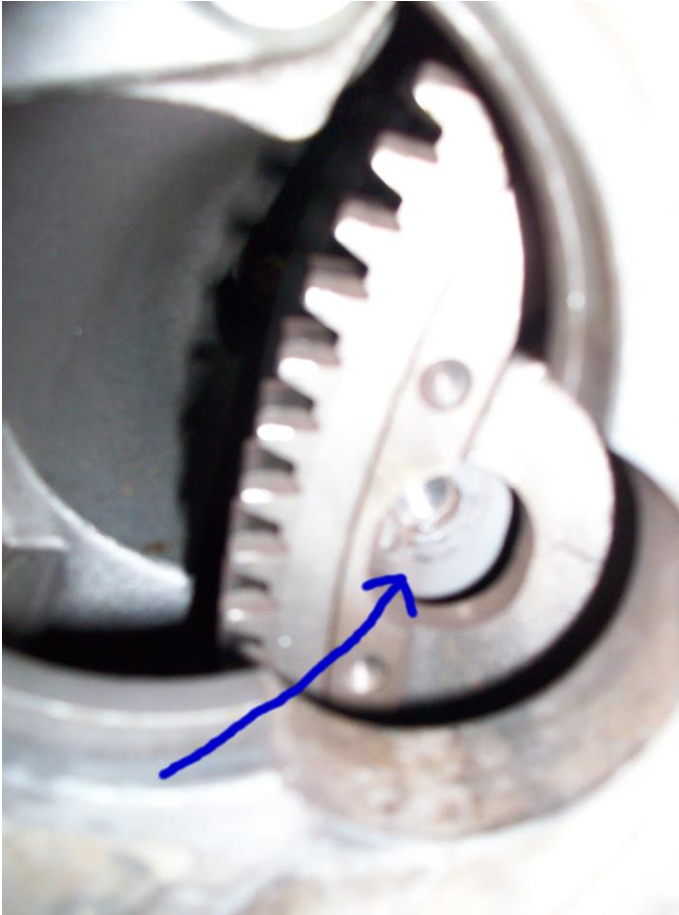
Now for the removal.

1. First things, first. You need to get your truck in the air. Use one of the methods above to get the truck off the ground so that you have enough room for your tranny jack to lower the tranny out and roll out from under the truck this isn't a tranny you just lift in and out on your belly. I am fortunate enough to have a car lift in my shop and used that. If you are a first time car lift user, the lift points on our truck are the front leaf spring shackles for the rear arm, and for the front arm use the frame. If using the style pads like mine use the big step in the rear with it angled in, and use the small step in the front angled to the rear of the truck. Now lift it in the air and make sure its sturdy. Also disconnect your batteries as well.

2. Now you need to gain access to the torque converter bolts. The only way to do this is to go through the starter motor housing on the passenger side of the engine. It is a PITA, but so is everything in life these days. To do this you must first remove the passenger side wheel with the 7/8" socket and impact wrench.
3. Next you need to remove the fender liner, which is where I recommend spending 50 bucks on a set of body clip removal tools they make it so easy. Otherwise you can pry up in both slots with two small screwdrivers and grab it with a needle nose. A PITA and you'll probably slip and cut your fingers a few times. Not all of the clips hold the liner on. You will see more but they are for the fender flare and do not need to be removed. Once you have all of those clips removed there will be a Christmas tree push in plastic thingy in the corner of the fender liner. It has a big head so you cant miss it. It too needs to be removed. Now some wiggling and the liner will be free but there are 3 wires that are fasted to the back. To remove these use the small flathead to release the clips.
4. Now you will see the starter and need to remove it, you can leave it lay against the frame rail but I choose to remove my exhaust front pipe and completely get the starter out of the way as it makes removal of the torque converter bolts. You will see two wires running onto one post of the starter, use a 13mm wrench to remove that nut. The other little wire you will need an 8mm but BE CAREFUL it is an odd design and can rip a chunk of the solenoid off with very little pressure. I know, mine did it. Now with the wires disconnected you will need to remove the two bolts that hold it on with the 15mm wrench. I choose to remove the bottom bolt first because leaving the top bolt in keeps pressure off of the bottom bolt so you can thread it out by hand. Otherwise it's a PITA because the oil pan extends out underneath the bolt and you have very little room to work. The top bolt can be removed with either the wrench or socket. Now the starter is free
5. If you choose to remove the starter completely you will need to remove the front pipe. However depending on your exhaust system your experience may differ. In my case I have a seal clamp where my front pipe connects to the exhaust, which makes for easy removal. On most trucks you will have a 4-bolt flange. Let this soak in penetrating lube for a while then carefully remove them. They like to break. Next you will see the V-Band clamp where the down pipe connects to the front pipe. This uses a 11mm deep well or a 7/16 if you don't have an 11. Simply loosen the nut so that it is nearly off of the threads. Then you will mostly likely need to work the three sections of the clamp off with a screwdriver. Now just push the threads back and the T-section will slide out of its holder. Now remove the front pipe and snake the starter through the opening.



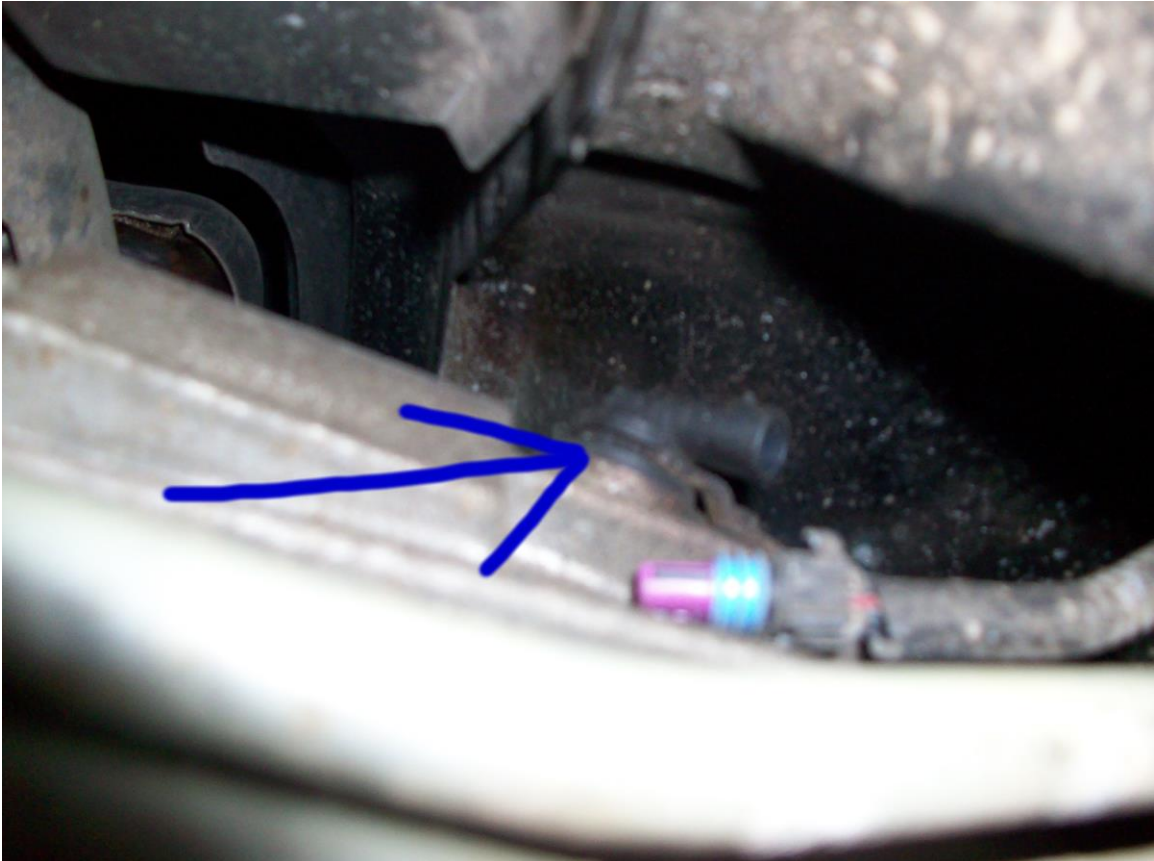
6. Now finally after all of this work you can see the flywheel. Now you need a buddy. You need him to rotate the motor. GM says to use an adjustable wrench on the main engine nut. But that's a PITA so I just put a 24mm on the alternator nut. Now get yourself a flashlight and watch the flywheel. Have your buddy slowly turn the motor as you watch for a hole. Once a hole gets close have him go slow as you can only turn the motor the one way. Try to get the hole centered in the little partial circle that extends out of the start hole. Once centered you can now remove that bolt. In the picture below the bolt is already removed, also note that the camera was cockeyed so the picture is far from straight. It will make sense when you get in there.. I use a 15mm deep well, a 3" extension and a 3/8" Fine tooth 8" handle ratchet. It just barely fits and works good. They are a PITA the break loose and you may need to revert to adding a lot of extensions up to the front of the motor where you can sneak a breaker bar up by the centerlink. Now repeat this process until all 6 bolts are removed. If you are installing an aftermarket converter your stock bolts will not be reused, however save them if in the event you loose one of your new bolts you can cut down a factory one to make it work (been there done that).



7. Well that was a lot of work. Now its time to work on getting everything out of the way for removal. At this time put a big drain pail under the drain plug and remove the drain plug with the 15mm on a factory pan. Let this drain as you do the next steps.
8. First thing to do is remove the rear driveshaft with the 11mm or 7/16. It may need some persuasion for the u-joint to pop out. Then just slide the slip yoke out and tape up the u joint and set it a side.
9. I like to remove the front driveshaft at this time as well. Same ordeal here, but I leave it connected to the transfer case.
10. Next remove that little skid plate with the 15mm just to get it out of the way if you have one.
11. Now reinstall the drain plug into the pan and move the drain pan over underneath the tranny cooler lines. Use a small flat bladed screwdriver to slide the little plastic rings off of them and slide them back. Now use your small flat blade to remove the little metal clip that holds each line in. You do not need to remove the big nut. Simply give each line a tug and let them drain. Then plug the holes with lint free cloths.



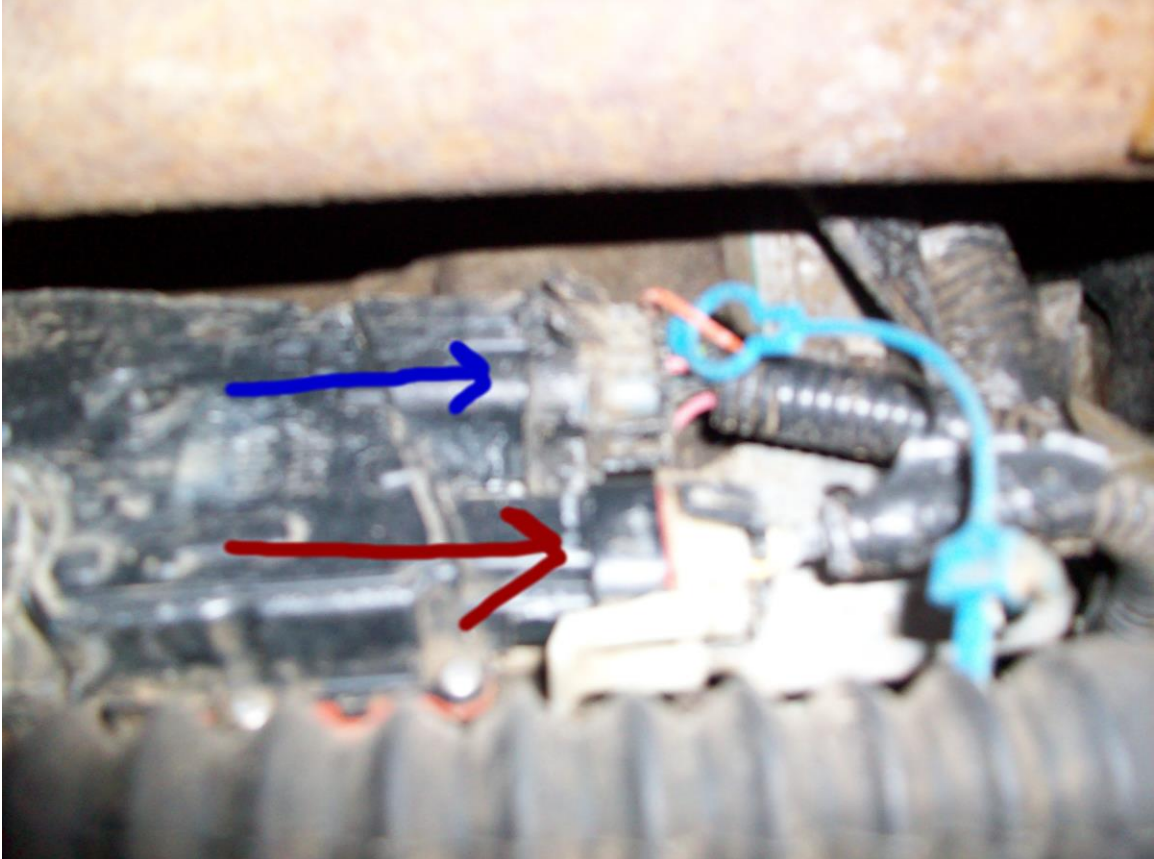
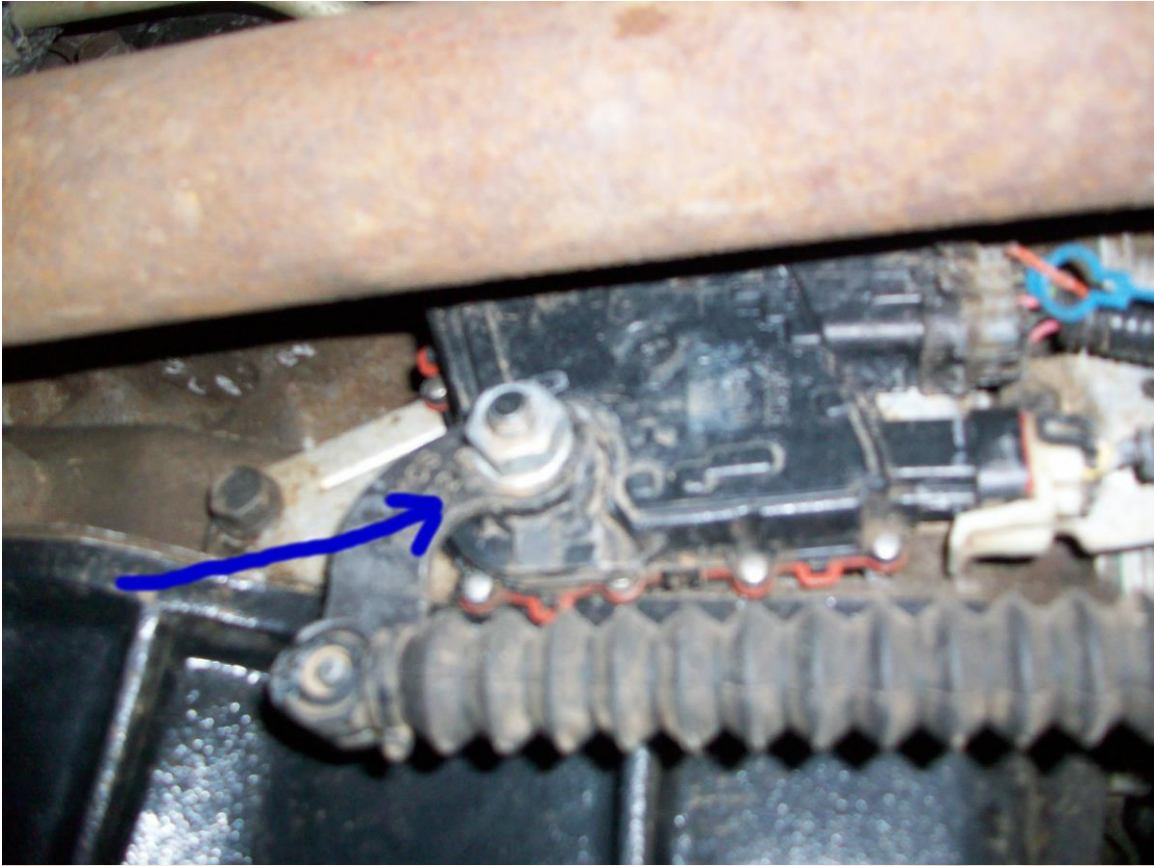
12. Now lets work on disconnecting the electrical hardware. First lets get the easy ones out of the way starting with the turbine speed sensor, which is on top of the bell housing slightly to the driver side. It is angled down and back a little bit too. It simply has a clip that you lift up and then slide the plug out. The next sensor is towards the middle of the transmission and has the same style plug.



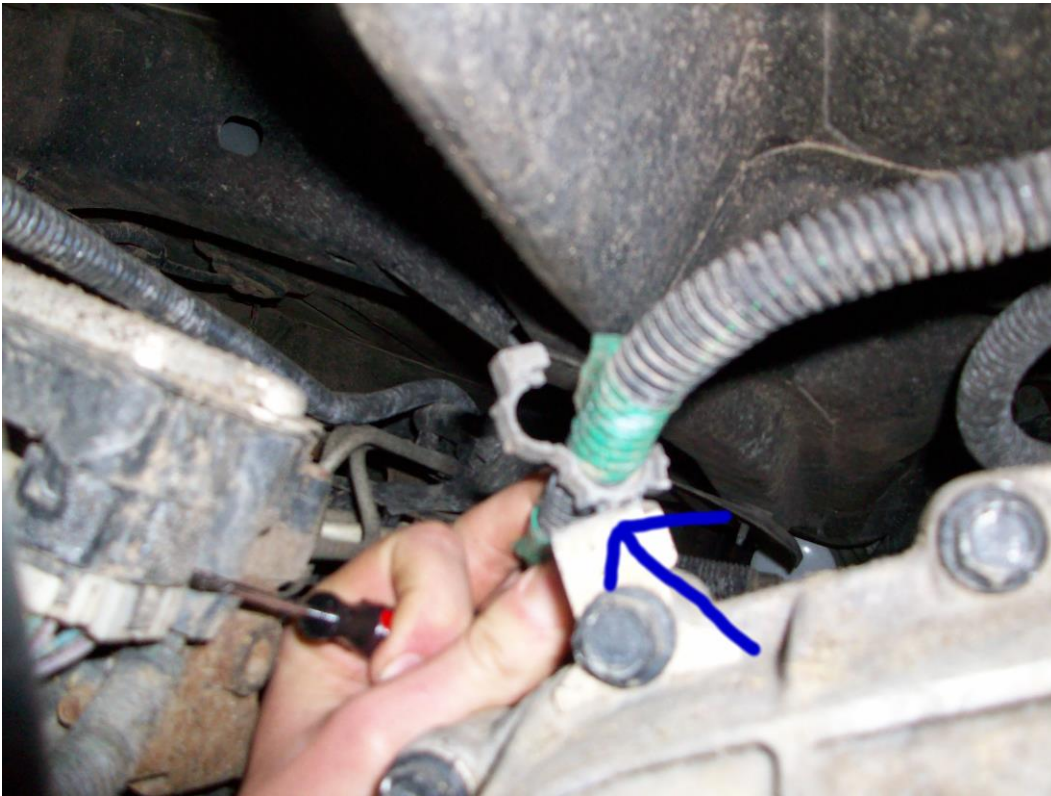
13. Now before moving on to the next step set your drain pan underneath the transfer case and use an 18mm wrench to remove the drain plug, it doesn't take long for it to drain.

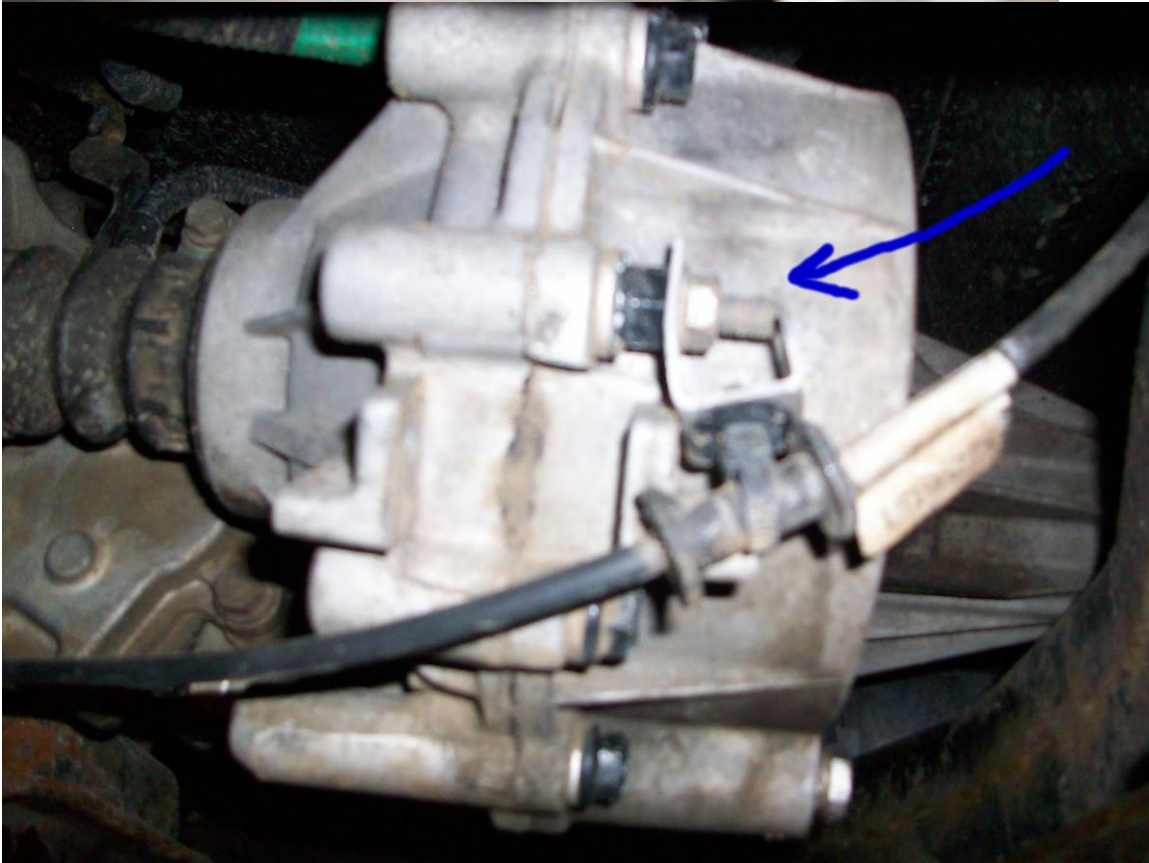


14. Next its time to remove the NSBU switch wires and shift linkage. First the easy part, using a 15mm wrench remove the nut on the shift selector post the remove the shift linkage. Next swing the driveshaft out of the way and using the heat gun heat up on of the two connectors. The bottom one that is white with the red boot is easier to get out so if you want a sense of accomplishment do that one first. I should explain why you need the heat gun. Inside there is a typing of resin that holds the two connectors in place. If you do not use a heat gun you will NEVER get those connectors out. I learned the hard way fighting them for 2 and a half hours before getting a hold of somebody with an answer. Be careful with your heat, use common sense. It is plastic after all so use quick movements to warm it up. For me these two connectors are the biggest PITA of the entire install.



15. By now your T case will be drained so install the drain plug and get your drain pan out of the way as you will not need it anymore. On top of the T case there is a rubber hose that connects to a barbed elbow. Simply pull it off the elbow and leave it lay up there as it is connect to a bracket that you will remove later. Now remove the Speed sensor, which is the same 2-wire plug as the other two sensors on the tranny. You will next need to remove the big wiring harness for the transfer case which has the little clip that you push down on and the pull apart. Now that those are done, go through a remove the wires from the various attachment points. They are all help on by the little round grey clips, except one actually slides into a clip up top. Don't know how to explain it; you'll get it fingered out. You will also need to remove the shift linkage from the driver side of the t case.



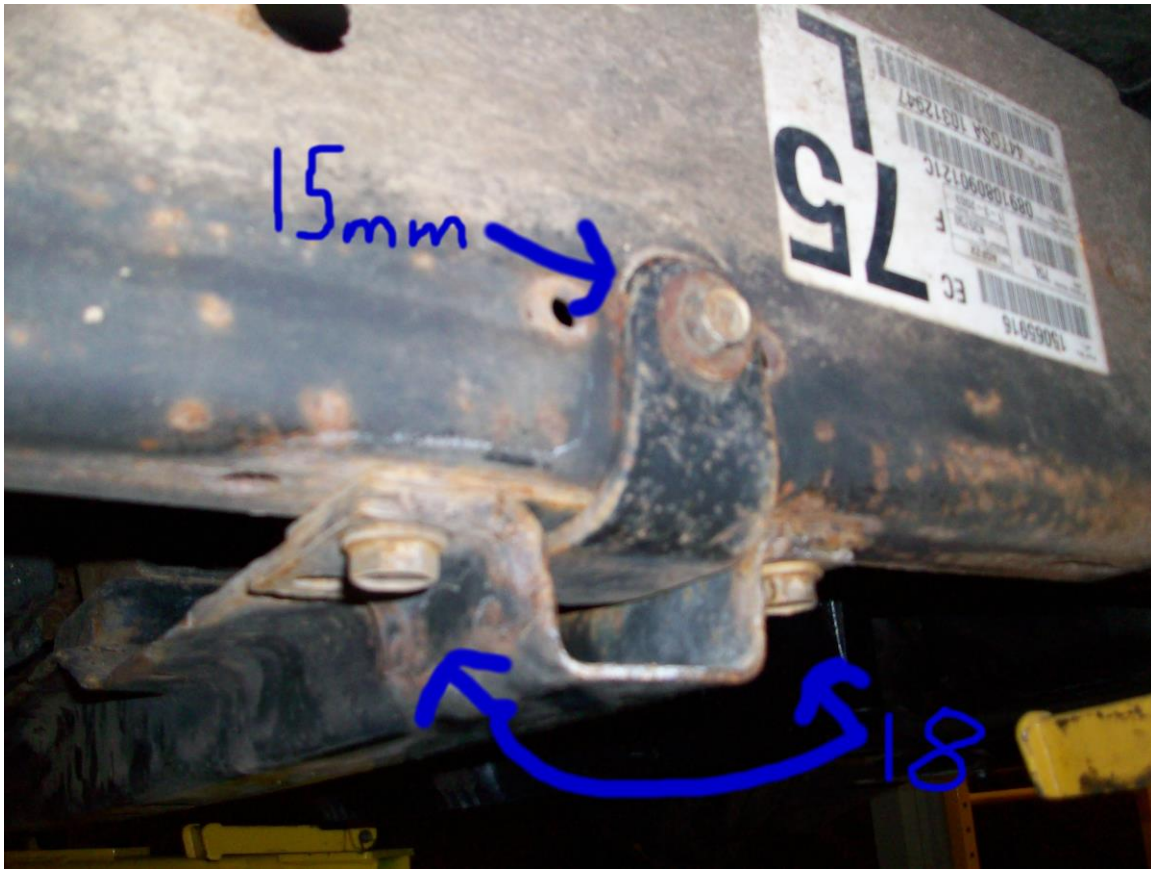


16. Now we need to remove all of the wiring harnesses and fuel line brackets from the transmission. Along the driver side there are 2 brackets for the fuel lines that

can be removed with a 13mm socket. Toward the rear of the tranny where the fuel lines make a bend I like to just pop the two Christmas tree plugs through the bracket and leave that bracket on the tranny. There will also be a few of those round grey harness clips mounted to the fuel line brackets that will need to be released. Don't worry about the ones toward the bottom of the tranny; we will get those in a minute.

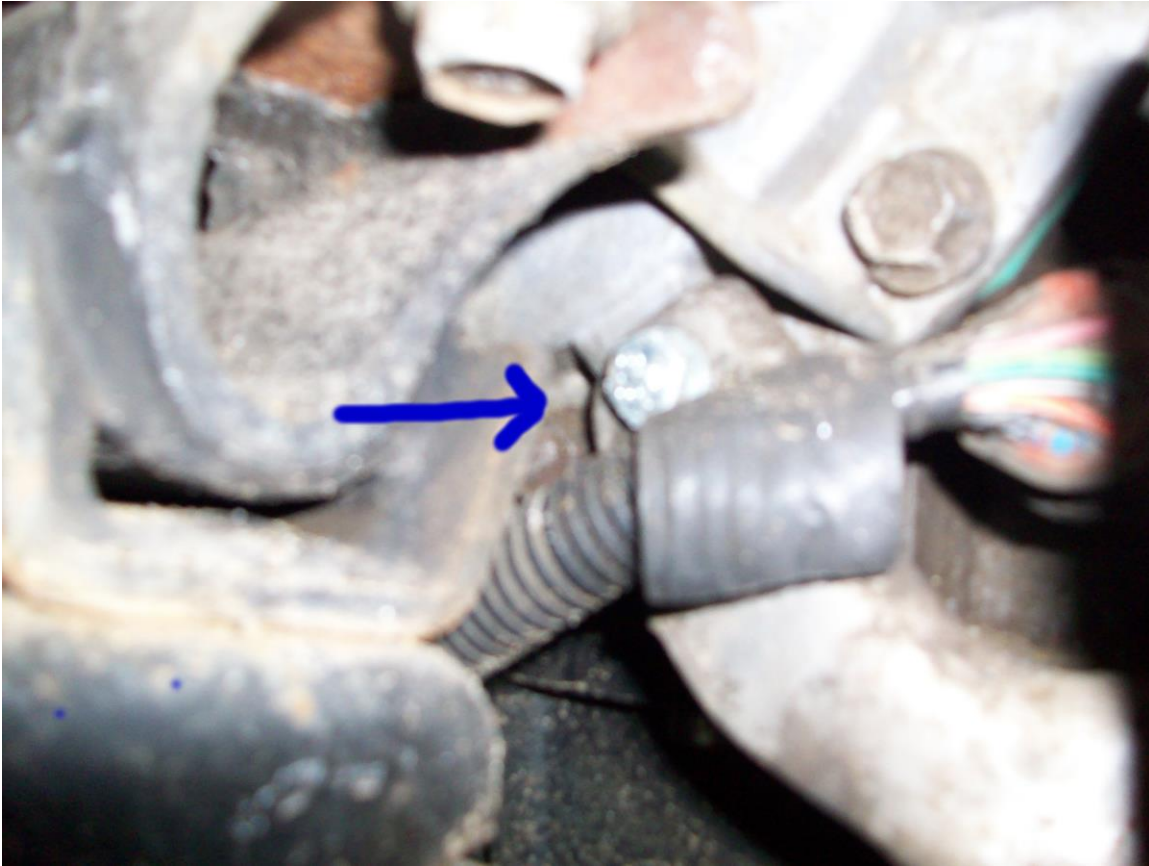


17. With all of this stuff out of the way its time to get your tranny jack in position. Get the jack all set up and in position with the tranny strapped down. Now put a little bit of pressure on the tranny, just enough so that you know the jack is supporting it. Using your 15mm deep well and an extension reach up through the two access holes and remove the two nuts that hold the transmission to the cross member. Then jack the transmission up some more so that the studs will be out of the way for removing the cross member.
18. Now using the 18mm wrench and 18mm socket and impact, remove the 4 bolts that hold the cross member one. There are two on each side. They are lock nuts so they turn hard the whole way, which is why I use the impact. Don't worry about the cross member falling, the two little tabs hold it on.

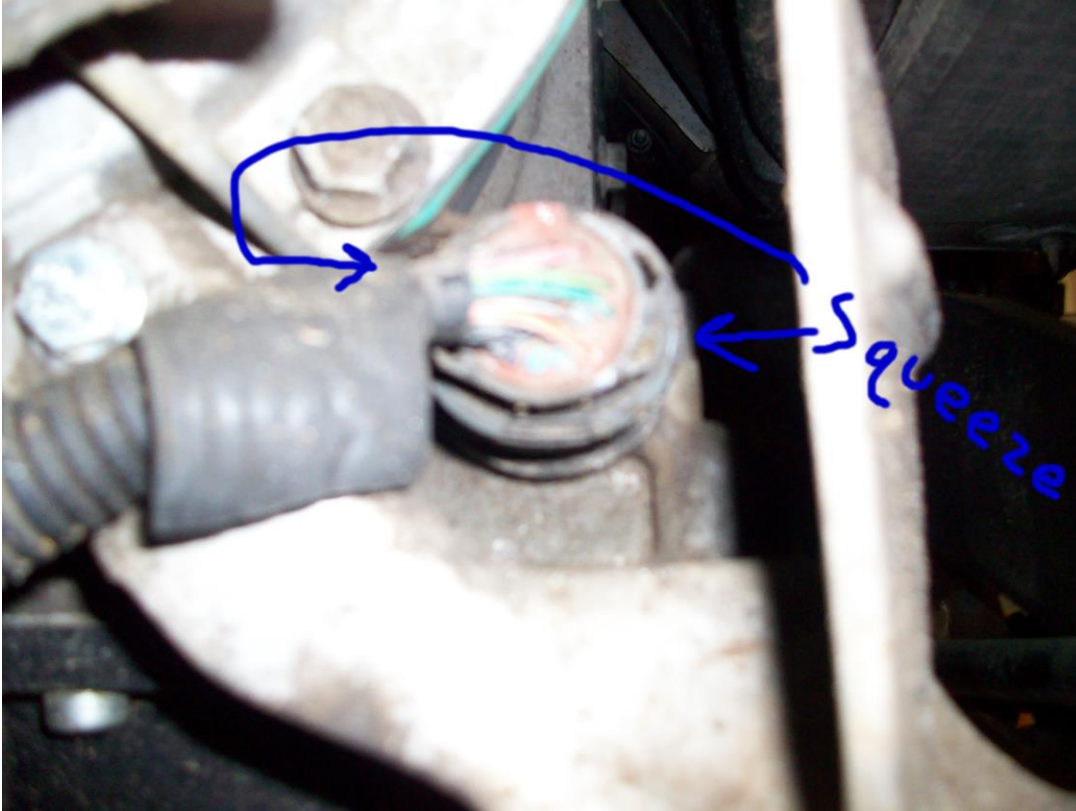


19. Now using the 15mm socket and remove the 15mm bolts from one of the sides on the cross member. It doesn't really matter which side, take your pick. Support its weight with your hand, it's not heavy. Then with the tab removed slide the cross member out of the other tab and set it aside.
20. Now using the 15mm remove the transmission mount from the transmission and set it aside. At this time I also like to remove the exhaust hanger from the tranny. You will need your 13mm deep well for this.

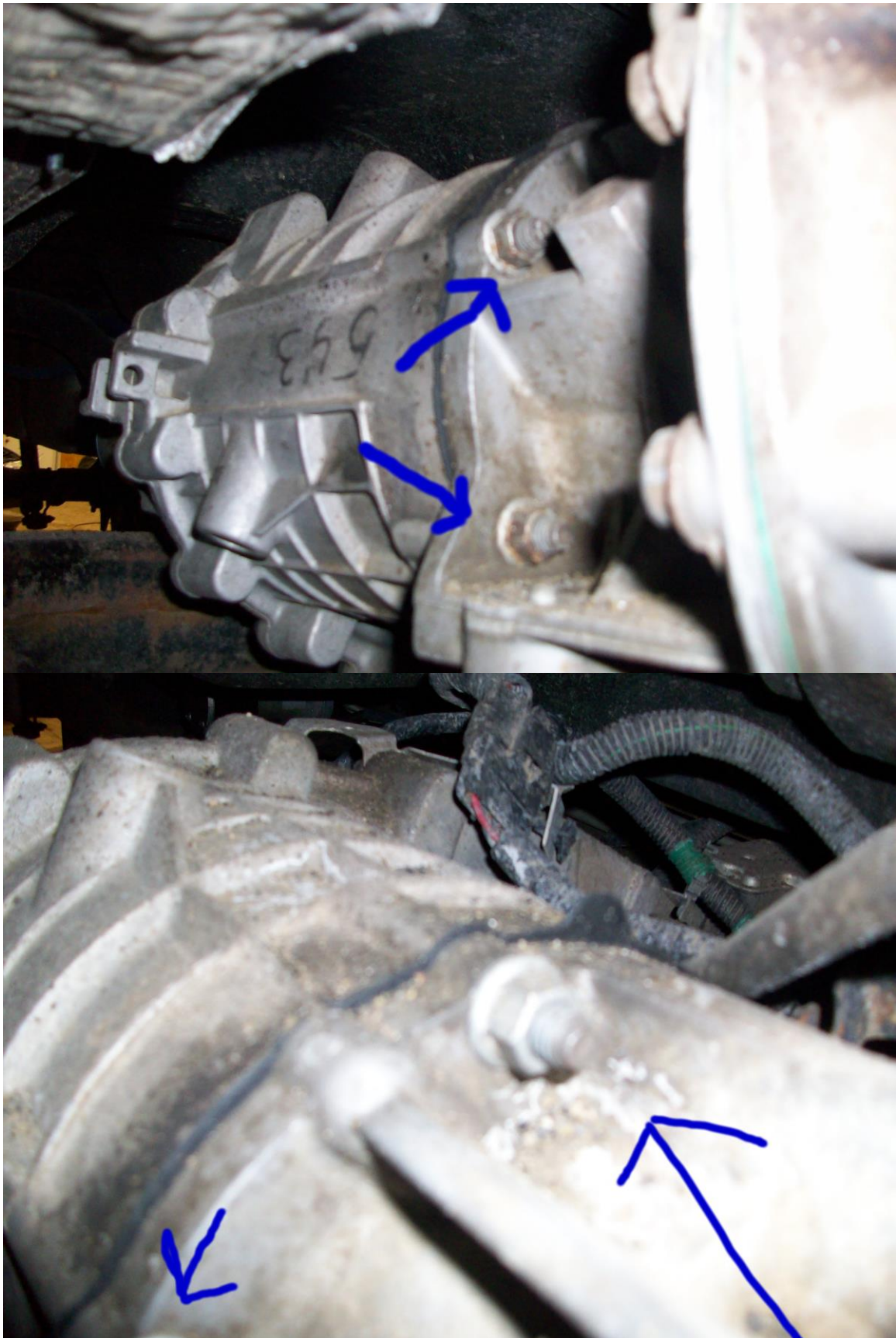




21. Now you have access to the ---- wiring harness which can be removed with the GM/Allison special tool or you can gently squeeze both sides of it and wiggle it out. It doesn't take much pressure but you will most likely need a channel lock. Now release the two clips that hold it to the bracket on the rear of the tranny.



22. Next we need to finish getting the shift linkage out of the way. First we need to slide the linkage out of the bracket on the rear of the tranny. To do this it slides to the rear of the truck and then out towards the driver's side I believe. Make sure you have all of this tucked out of the way as best as possible.
23. Now we need to get that transfer case out of there. Don't worry its not heavy, id guess it between 40-50lbs. However do not it is a bit awkward in weight. First remove all of the 6 15mm nuts that hold it to the transmission extension housing the picture shows 3 of them. This is easier if you lower the transmission so that the transfer case is just above the torsion bar cross member. With the nuts remove raise the tranny back up and slide the T-Case back off of the studs. Be careful here, as it will want to nosedive. Slide it back as far as you can then kinda pivot it down and to the driver side. Everybody's style is different here but basically be gentle and finesse it out of there and set it to the side.

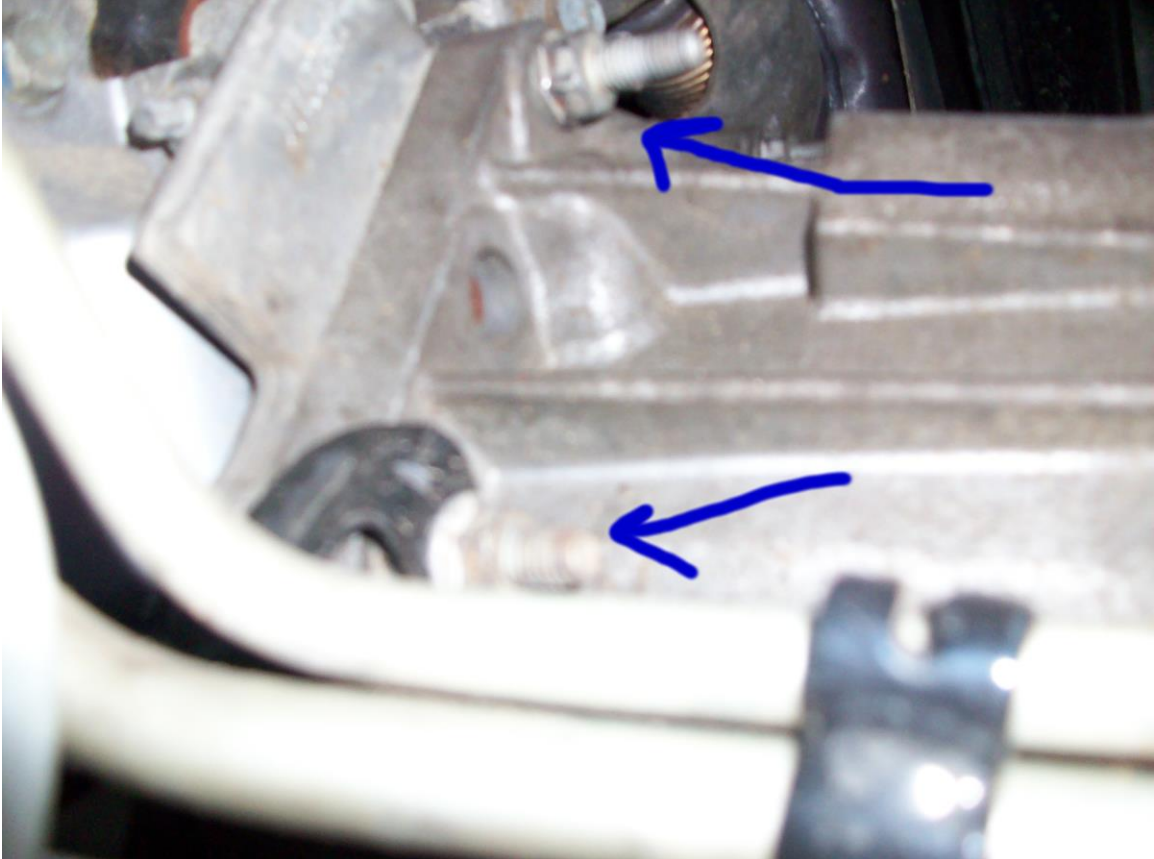
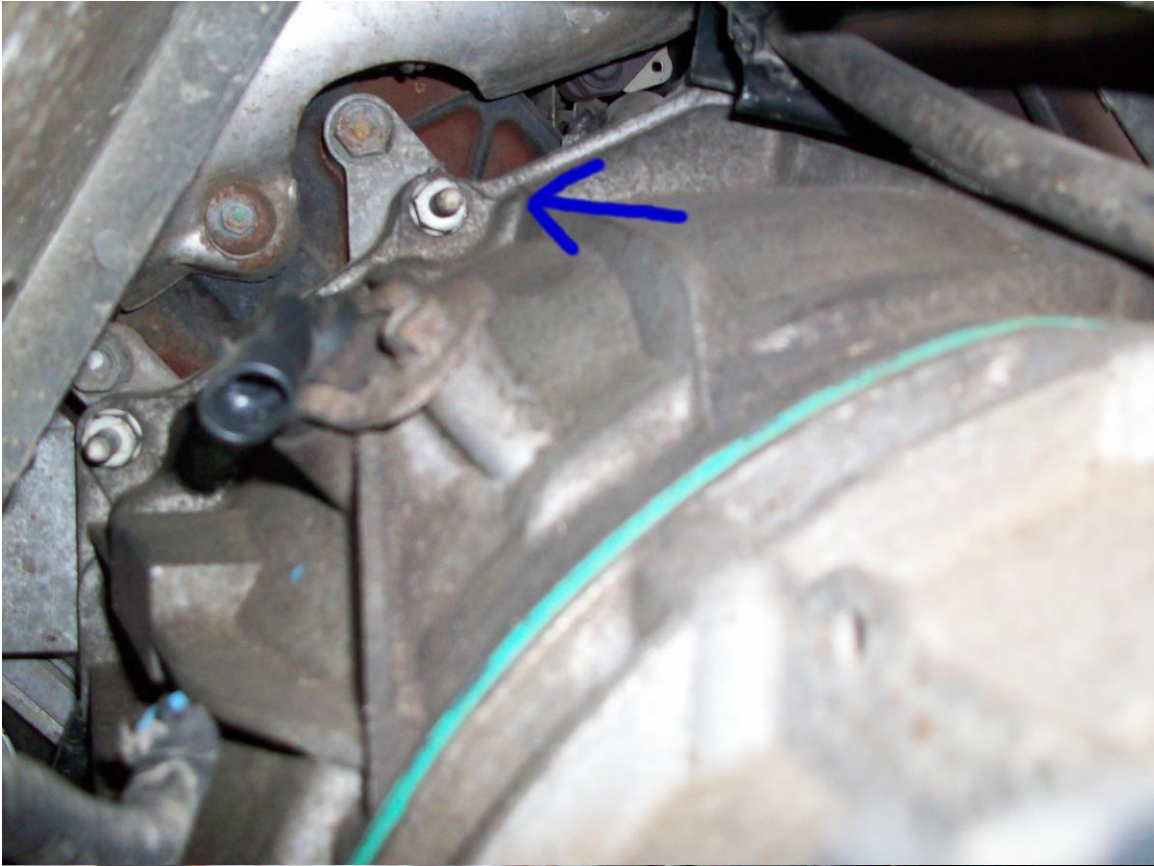


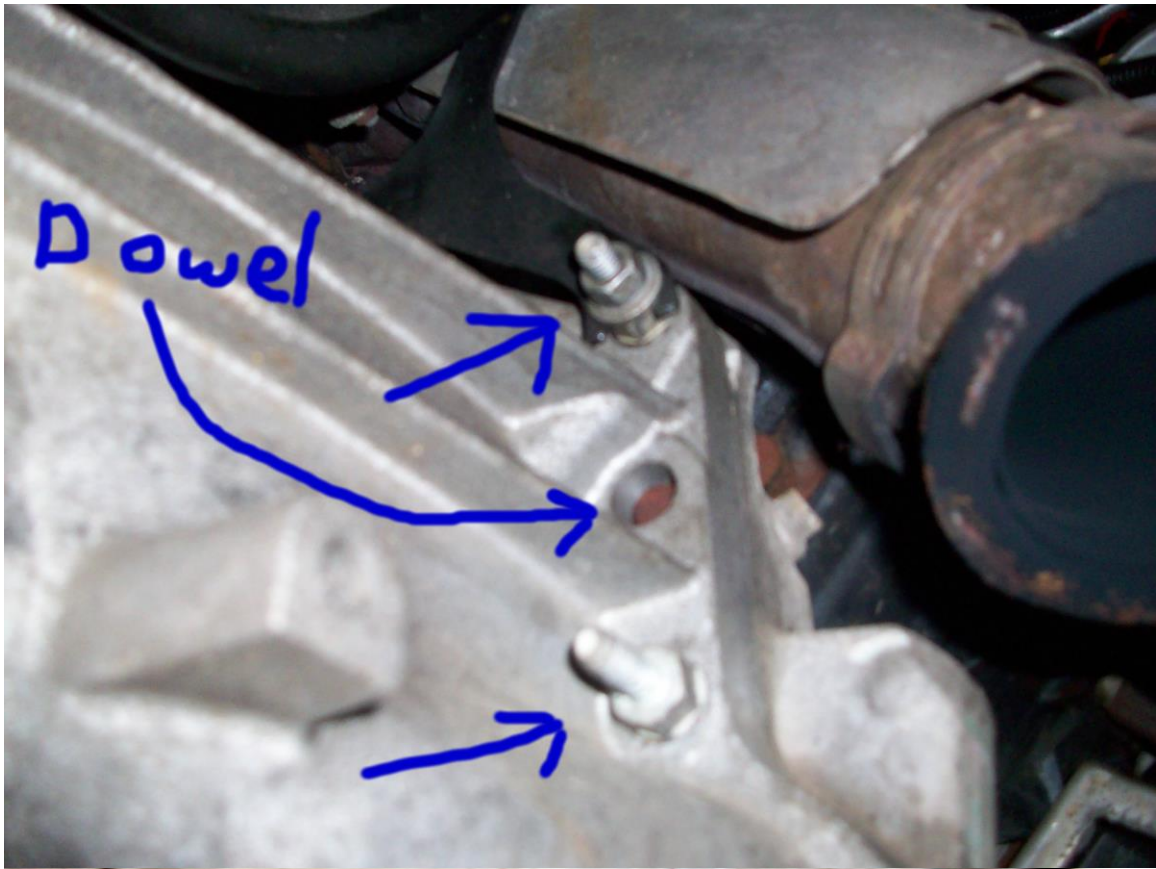
24. Now the fun part, We need to remove the tranny from the motor but first we have to remove all of the accessories, and to make this easier lower the tranny so that it is leaning back a lot, this will give you more room. First lets do the easy one, the dipstick tube. TO remove this, slide your 13mm onto one of the nuts, then add extensions until your impact wrench can reach it, then zip it off but don't loose it, lots of extensions flop around a lot. Next move to the next nut that holds the tube on and remove that. Now we will go to the driver side of the tranny and remove the nut that holds the fuel line bracket to the bell housing. Its kind of hiding but you'll get it, once removed slide the bracket back and try to twist it up or down out of the way. The last accessory is the T-Case Vent tube up top on the tranny at the very top bolt its hard to get to but you will get it. With that nut off remove the vent tube and get it out of the way.





25. Now grab your 15mm deep well and let's remove all 7 of the studs and the 2 bolts. But first spray some penetrating lube in on the dowels so they can soak. I have no specific order for removing these bolts so sets just start at the top. It may be easier to have a buddy run the impact and have you get the socket started on the bolt/stud. There is a stud at the very top, one down a little bit on each side of the top bolt. Then on each side of the tranny there are two that are in line with each other vertically and then there are the two bolts at the bottom. Now on the passenger side you will want to lift the dipstick tube up and out of the way so you can get on those two studs.





26. Now everything is disconnected, or at least should be, you may want to double check. Now you will need to finesse the tranny away from the motor. TO do this you can spread it somewhat through the little hole they give you at the bottom of the bell housing, but don't get too bull with it, its only aluminum. To get it out all the way I like to just stand up behind the torsion bar cross member, grab onto the rear of the tranny and pull and wiggle and pull and wiggle which somebody raises and lowers the tranny. Eventually all of this moving around will hit a sweet spot and it will come.



27. Now that you have it free of the motor you can start lowering it down. It helps to have a buddy, as a lot of things will try to snag. Things to watch for are tranny cooler lines, and wires. Lower it slowly until it's free of obstructions. Also pay close attention to the torque converter, as there is a chance it will slide off.

And there you have it. You have no successfully removed you Allison from your truck. It's a PITA at times but overall not too difficult with the right tools. And don't worry it gets easier the next time and the time after that, but hope you don't have to do that.

I will be adding an installation guide next, which is pretty much all of this in reverse but a few things are different. Hopefully I can get a Suncoast Stage IV kit installation guide made up to, but I'm working on finding a tranny to do it to.

Hopefully this helps and if you have any additions or corrections let me know. I did this all off the top of my head sitting at school. Didn't have my truck or my pictures to look at so I'm sure I will need to alter some things. It may have some small little things that need to be corrected. Please let me know as I plan on revising this in the future.

Any other questions, comments or even donations :D PM me.

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Good Luck Guys. You just saved yourself hundreds of dollars.