



Installing a Tremec TKO Overdrive Transmission into a Corvette Observations from the Trenches

For many good reasons installing a Tremec TKO 5-Speed overdrive transmission into a classic Corvette has become a very popular upgrade for the Corvette owner. With this in mind, Corvette owners who are enthusiastically considering this conversion for their cars may not be fully aware of exactly what is involved, or have been misinformed about the details of this installation. The following information will point out some of these often unmentioned or misunderstood details and will help you to better understand what is involved.

To provide some back ground Hurst Driveline Conversions sells complete Tremec 5-Speed conversion kits for various classic Chevy cars including Camaros, Chevelles, Nova's and of course Corvettes. We have earned an excellent reputation for providing straight forward, honest answers and letting our customers know about the potential challenges may be encountered with the Corvette/TKO installation before purchasing our kit. In preparation for the release of our Ultimate Fit Corvette TKO kits in 2005, we spent a full year researching this project and we have worked in close partnership with Red Roberts, owner of McLeod Industries, to develop the highest quality conversion kit possible. I personally own a 1968 Corvette and with the help of my CC5S business partners, Scott Lindquist and Jim Goodlad, have installed several TKO transmissions into it as we were designing our Corvette kits. Additionally, HDC has worked closely with several respected Corvette-only mechanics who have installed TKO's into numerous Corvettes.

As an owner-operated company we have been on the front lines every day for years talking with Corvette owners who have kindly shared their varying TKO installation experiences with us. These individuals have ranged from novice installers to seasoned Corvette specialists. We are sure that we have not heard it all but we have heard quite a bit. In the end, when taking on a projects for our personal cars, we are probably very similar to you in that we want to know the facts, we want to understand how easy or difficult the job will be, and lastly, what potential problems might be encountered.

Overall, we are very positive and enthusiastic about this conversion. With this in mind these are our observations.

Overview of the Installation

On a scale of 1-10 we would rate the difficulty of this project at a 8 or 9. It is not an overly technical job but rather it involves moving some heavy parts in some very restrictive spaces. There is also some important precision work in certain areas. On average this job will take anywhere from 10-15 hours to complete. If you were to have

your Corvette mechanic do this job for you we would anticipate a total labor charge of \$800-\$1000 not including any “surprises” that may crop up. In our view there are three basic methods for installing a TKO into a Corvette. All three methods need to contend with the same issues. These issues are:

- The lack of space within the Corvette tunnel.
- The weld-in, fixed position crossmember or x-frame found in most Corvettes.
- The larger size of the TKO when compared to the stock transmission.

Method 1 – Removing the motor & installing the transmission and motor separately.

The main benefits to this method are:

1. Dial indicating (aligning) your bellhousing is easier to properly do with the motor out of the car.
2. Installing your clutch and pressure plate is easier and more accurate.
3. You have plenty of room to work.
4. Generally speaking it is a safer bet to get everything done correctly and accurately.

The disadvantages of this method are:

1. It takes more time.
2. It requires more tools.
3. If you have a big block car with A/C and power everything, it will be more difficult.
4. It will be more expensive if you are hiring someone to do the work for you.

Method 2 – Removing the motor and re-installing the motor and transmission as a unit.

The benefits of this method are:

1. Dial indicating (aligning) your bellhousing is easier to properly do with the motor out.
2. Installing your clutch and pressure plate is easier.
3. Attaching the transmission to the motor outside of the car is easier than attaching them together while they are in the car.

The disadvantages are:

1. It takes more time.
2. It requires more tools.
3. If you have a big block car with A/C and power everything, it will be more difficult.
4. It will be more expensive if you are hiring someone to do the work for you.
5. You run the risk of damaging your car while maneuvering the engine transmission assembly.
6. In some cases you may not be able to achieve the angle needed to do the install this way.

Method 3 – Installing the TKO without removing the motor

The benefits of this method are:

1. It is possibly quicker to do it this way.
2. It may be less expensive if you are hiring someone to do the work for you and the mechanic is familiar with the techniques involved with this method. The techniques with this method are unique to the Corvette TKO install.

The disadvantages of this method are:

1. Dial indicating your bellhousing is more difficult with the motor in the car.
2. You need to use a creative/awkward method of angling the transmission and the motor and then raising them in concert with each other in order to mate them together. This is a “different” method that some mechanics or self installers may not be comfortable with.
3. Installing the clutch disc and pressure plate is somewhat awkward due to the limited space.

Personally, we are in favor of method 1 or 2. Although these methods can take longer and removing the motor is not the most enjoyable thing to do we believe it is the safest and best way to make sure that the install is done correctly. The vast majority of Corvette mechanics that we consulted with use this method and would not consider installing a TKO into a Corvette without removing the motor. To make the “remove or not remove the motor” decision easier, some Corvette owners have decided to fabricate a removable crossmember allowing very easy removal and installation of the transmission. Making your crossmember removable involves cutting your existing crossmember.

The information that we provide with our Corvette kits includes step-by-step written instructions covering both installation methods (removing motor and not removing the motor) as well as a DVD informational video to help you as much as possible.

From a sales perspective as much as we would like all of these installations to be quick, easy, slam-dunk jobs that can be done in a few hours with no complications whatsoever, it simply is not the case sometimes. Granted some installs do go more smoothly than others, more often than not something usually comes up. If anyone is suggesting that this conversion is simple and 100% guaranteed to be completed without complication, you should be very skeptical. We suggest talking to fellow Corvette owners and Corvette mechanics that have completed this installation and ask them about their experiences so you can find out first hand.

Common installation challenges and solutions

While you are reading this information, please understand that these potential installation challenges are not specific to the Classic Chevy 5-Speed Corvette/TKO transmission kits. Rather they are universal issues that can effect

the installation of any TKO into a Corvette regardless of where it was purchased or what modifications may have done to it.

If you have not already experienced it personally any classic car enthusiast or mechanic will tell you that when you install non-stock parts of any type into your car it is possible, or even likely, that things will not go exactly as planned. Installing a TKO into a Corvette is not an exception to this rule. Because of slight variations on the production line when your car was built, past modifications to your car by previous owners that you are unaware of, past accidents that your car may have been involved in, and after 30+ years of time on the road, each car is slightly different or unique in its own way and each installation may have its own special challenge. Below are a few issues that, while not common, may be encountered during this installation.

While the majority of Corvette installations are completed without a tunnel clearance issue, in some instances when you first position the TKO into the tunnel and attach it to the motor and crossmember mount bracket the TKO may hit the bottom of the floorboard. There are no two ways about it, the TKO fits very tightly in the tunnel of a Corvette, particularly in the C1 and C2 models. In fact you should be prepared to remove, and not use, your stock tunnel insulation because of this. When installed properly it is typical to only have about 1/8" of clearance between the top of the transmission case and the bottom of the floorboard. The point where the transmission comes closest to the tunnel is between the right side of the TKO's mid-shifter cover plate and the body seam in the floorboard. If this is the case with your car it is most likely being caused by one of the following conditions occurring independently or in conjunction with one of the other conditions mentioned:

1. **Condition:** The stock body mounts are compressed due to age or excessive wear or shorter non-stock body mounts are being used. Worn body mounts or short body mounts will bring the body and the frame closer together causing a reduction in tunnel space.
Solution: This problem can sometimes be solved by installing new, stock-height, replacement body mounts. Installing new body mounts can be time consuming or expensive to have fixed. To avoid any surprises, check the condition of your mounts before starting this project.
2. **Condition:** The floorboard is sagging due to age or excessive wear. This condition is common, to some degree, in many Corvettes. 1968-1982 models have a bit more tunnel space and this is not likely to be a problem with these cars. To check for floorboard sag before starting your installation, measure the gap between the floorboard and the top of the crossmember at the outside edge of the crossmember near the frame rail and also towards the center of the crossmember just outside of the exhaust pipe holes. A floor that is not sagging will have a similar sized gap at the sides as well as near the exhaust pipe holes – approximately 7/8". If there is a noticeably smaller gap towards the center, then some degree of floor sag exists and depending on how severe it is you may need to correct this in order to allow the TKO to fit without hitting the tunnel. If you

have approximately 5/8" of clearance between the floorboard and crossmember just outside of the exhaust pipe holes, the TKO will likely fit without issue. Another way to check for adequate clearance in the 1963-67 models is to measure the distance from the top of the driver's side, upper crossmember mounting bracket tab to the bottom of the boot retainer ring on the underside of the floorboard. If there is 6 3/4" space between these two points, you should have adequate clearance for your TKO.

Solution: If you have floor sag that requires attention, this condition can sometimes be addressed by carefully raising the sagging floorboard using a floor jack & wooden blocks and then installing two rubber spacers on either side of the tunnel between the crossmember and floorboard where the floorboard is sagging (typically just outboard of the exhaust pipe holes). The goal is to create just enough space as is necessary, typically at least 1/8", between the top of the crossmember and the bottom of the floorboard.

- 3. Condition:** You do not have floor sag and your body mounts are new but the TKO still does not fit without hitting the tunnel. The possible culprit in this situation may be due to your car only having needed the minimum number of body frame shims installed when the car was built by GM. In other words, your body and frame were in good alignment naturally, and the body guys on the assembly line didn't need to add many shims to get the body to sit properly on the frame. The result is that your particular body may be sitting slightly lower on the frame than in most other Corvettes that required more shimming at the factory.

Solution: As with the sagging floorboard solution this problem can sometimes be addressed by carefully raising the sagging floorboard using a floor jack & wooden blocks and then installing two rubber spacers on either side of the tunnel between the crossmember and floorboard where the floorboard is sagging (typically just outboard of the exhaust pipe holes). The goal is to create just enough space as is necessary, typically at least 5/8" between the top of the crossmember and the bottom of the floorboard. Another possible solution is to re-shim your body to gain the necessary height. Re-shimming your Corvette can be time consuming or expensive to have fixed.

Occasionally, with the TKO installed in the tunnel, questions sometimes arise about whether or not their driveline/u-joints are properly aligned. As discussed above, assuming you are using the correct height crossmember bracket, you do not have a floor sag issue, and your body mounts are the correct height, your TKO will be properly positioned in your tunnel when there is about 1/8" clearance between the top edge of the TKO case and the bottom of floorboard. With the TKO in this position you will have an acceptable driveshaft angle. While it may not be perfect according to your factory GM service manual it should be within the allowable tolerance and you should not experience any problems. If you have your transmission installed and you have excess room between the bottom of the tunnel and the top of the transmission you can raise the

transmission by putting shims between the crossmember bracket and the transmission mount. By doing this you will achieve a bit better driveline angle. Under perfect world conditions your ujoints would probably be expected to last for 20 years or so. With a less than optimal driveline angle you could reasonably cut the ujoint life expectancy in half to 10 years. In all likelihood you will probably never need to replace your ujoints as long as you own your car.

If you run into one of these issues during your installation the vast majority of the time it can be satisfactorily solved. However, in rare instances, it is possible that these solutions will not correct the problem to your level of satisfaction. This concept is true with any car modification you may undertake. At the end of the day only you can determine what is acceptable and not acceptable for you and your Corvette. With this information I think most Corvette owners who are considering this conversion can confidently move forward and, when all is said and done, be very happy that they did.

As a side note each of the installations that we were personally involved with went smoothly and did not have any problems - everything went according to plan. It is our belief that when the proper TKO conversion kit is selected this will be the case for most Corvette/TKO installations. This information has been brought to your attention to inform you of the facts, to eliminate any surprises, and help you to enjoy this process as much as possible. We firmly believe that the benefits of having an overdrive transmission in your Corvette will greatly overshadow any challenges you may encounter during the installation.

In closing, following are a few suggestions to help you select the right company to buy the best Corvette TKO conversion kit from.

1. Do your homework. Ask your friends about their TKO installation experiences, check with your mechanic for his input, or visit the Corvette internet message boards to see what others have to say about their experiences.
2. Most Corvette/TKO kit parts are similar from one company to the next. A Tremec TKO is a Tremec TKO, a speedometer cable is a speedometer cable, etc. From a parts perspective the biggest differences from one company to the next are found in the shifter mechanism design and the tailshaft modifications that are done. Insist on seeing how the shifter is designed and understanding exactly what modifications are done and why.
3. Consider the price of the kit, the level of service, and what parts are included. Remember, you usually get what you pay for.
4. Select a company that has knowledgeable technical people that are actually available to help you both before and after the sale. Chances are you will need to make a call or two.
5. Use your common sense. If something sounds too good to be true it probably is...avoid the sales pitch and focus on the facts.

We hope this information was helpful. Feel free to call us at 760-438-2244 with any questions or comments you may have.

Sincerely,
The Hurst Driveline Conversion Team