

Introduction

We hope that the installation of your new Novak adapter assembly goes very smoothly and that you achieve the improved results with your Jeep® that you intend. This kit is for adapting the Ford T18 or T19 transmission to the Jeep® Dana Models 18 & 20 transfer-cases, as found in 1946 to 1979 Jeep vehicles.

Despite whatever your experience with this type of work may be, we strongly advise you to read these instructions well and save them for future reference and parts numbers. Contained in these instructions are the requirements, tips, hints and tricks of years of performing these conversions, both in our own facility and information we've gained from discussing this swap with our customers. Put this information to good use.



About the T18 Transmission

The Ford & Jeep T18 four-speed was made by Borg-Warner from 1966 through 1986. It is a heavy-duty truck transmission designed for and used in such applications as 1/2, 3/4 and 1 ton trucks. It is the improved successor to the T98. The T18 is fully synchronized in the second through fourth gears. All gears are helically cut except first and reverse, which are spur gears. Very much identical to the T18 in appearance and build is the Ford T19. This four-speed transmission is different from the T18 and others in that it features taller gearing and a synchronized first gear. It is often found in diesel applications.

Identification

Part of the battle in doing a T18 or T19 conversion is making sure you have the right one, especially if you did not actually witness the transmission's removal from the donor vehicle. Jeep used fourteen different T18s, International used three and Ford used three as well. Though all of these transmissions share many common parts and characteristics, they are all different!

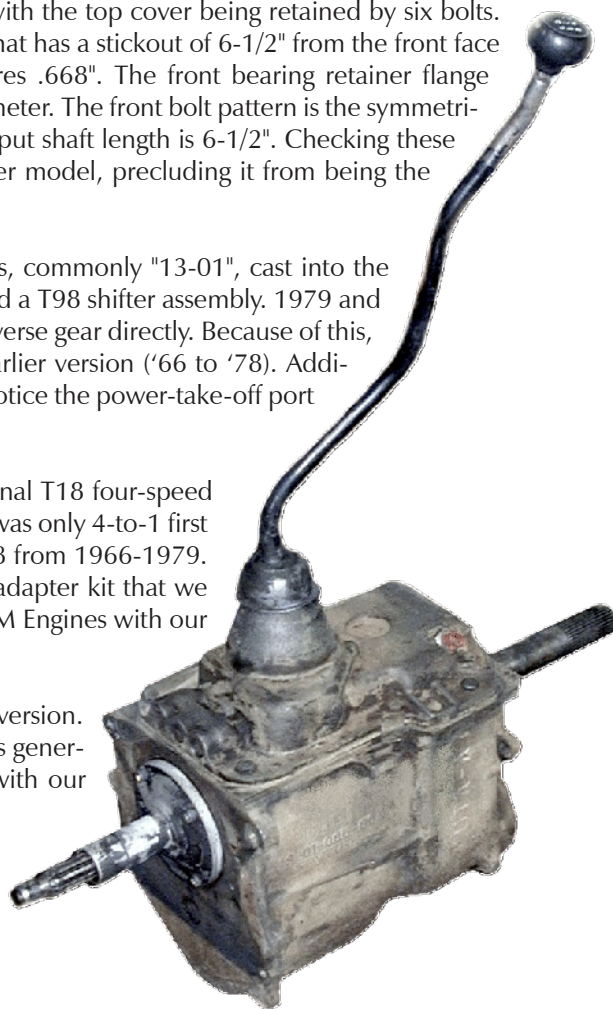
For the Ford T18, the case and top cover are both cast iron, with the top cover being retained by six bolts. The T18 & T19 has a 1-1/16" diameter, ten spline input shaft that has a stickout of 6-1/2" from the front face of the transmission. The pilot tip of the transmission measures .668". The front bearing retainer flange measures 4.850" and the bearing retainer tube is 1.432" in diameter. The front bolt pattern is the symmetrical Ford "butterfly" pattern; 8-1/2" wide by 6-5/16" tall. The input shaft length is 6-1/2". Checking these dimensions will verify that the transmission is a 1966 or newer model, precluding it from being the T98.

The transmission can also be identified by its casting numbers, commonly "13-01", cast into the driver's side of the case. From 1966 until 1978, many T18s used a T98 shifter assembly. 1979 and newer T18s used a three fork shift cover assembly that shifts reverse gear directly. Because of this, reverse location is on the opposite side of neutral than the earlier version ('66 to '78). Additionally, the T18 has three bronze synchro rings. You will also notice the power-take-off port at the right side of the case.

There were a few later versions of these CJs that had an optional T18 four-speed transmission - although the version that Jeep used with the V6 was only 4-to-1 first gear ratio. Note there are 12 different versions of the Jeep T18 from 1966-1979. Some of these can be adapted to Chevy V8 by use of a T18 adapter kit that we manufacture, kit #1879. 1972-1975 Jeep CJ T18's adapt to GM Engines with our #1415 kit.

Some individuals ask about T18's & T19's other than the Ford version. Our advice concerning some Jeep and I.H. T18 & T19 swaps is generally to avoid them, especially the latter. They will not work with our adapter kits and have different bolt patterns front and rear.

We have designed our adapter to work with all three versions (2wd short and long shafts and the 4wd) Ford T18 & T19 because they are a more easily found, adapted and are often more affordable.



Compatibility

Interestingly, the bellhousing bolt pattern for the Ford T18 & T19 are the same as the Tremec 150 and the Tremec 176 transmissions, so no bellhousing modifications are needed. The Jeep T18 has one bolt hole different, the bolt near the clutch fork is higher on the Jeep version. A 1976 to 1979 Jeep clutch disk is required. Note that the SR4, T4, and T5 use a different bolt pattern from the Tremec series transmissions.

The Ford T18 has two extra undrilled ears cast into the front face of the transmission case. This is not crucial when fitting the transmission to a Ford or some AMC style bellhousings, but is important if you intend to run it behind a GM bellhousing using our "adapter-free" method. The transmission having these extra undrilled ears will greatly simplify its use with GM engines (read below). Note that the T19 does not have these ears. One excellent feature of the T18/T19 is that they are readily compatible with Jeep/AMC T150, T18 and T176 style bellhousings, common from 1976 to 1986. The Ford T18 four-speed can be used with 1972 and new AMC I6 or V8 engines using AMC parts. Three AMC bellhousings will accept the transmission, two as a direct bolt-up. These two are from a 1976 to 1979 CJ (I6 or V8; three-speed or four-speed) or a bellhousing from a 1980 to 1983 CJ that was factory equipped with a Tremec 170 series four-speed. A third bellhousing can be modified to work by drilling and tapping the Ford pattern into it. This bellhousing is from a 1980 to 1986 CJ that originally had an SR4, T4 or T5 transmission. For these bellhousings, the upper two holes should be TIG welded and remachined. The clutch release fork and release bearing from any of these three housings must also be used.

A 1976 to 1979 Jeep CJ clutch disc will match the Ford input spline. A special pilot bushing will be required to compensate for the slightly shorter length of the Ford transmission input shaft. We have supplied this bushing with your kits as per your order.

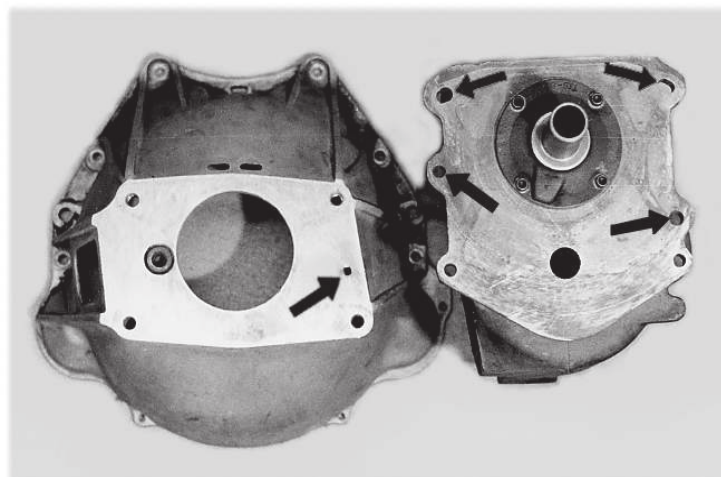
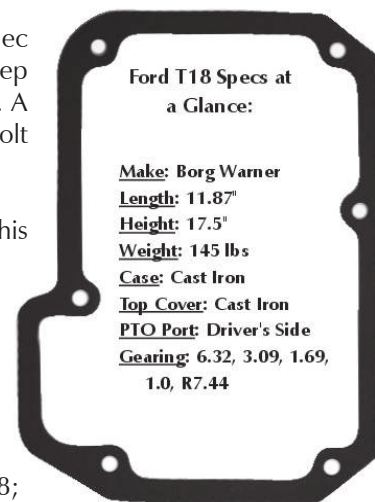
Adapting the T18 to GM Bellhousings

No adapter for the GM engine bellhousing to the Ford transmission is required. With a few simple and cost-saving modifications, T18 transmissions can be used with most GM bellhousings, including full-circle or open-bottom types. Using this method will also allow you in the future to remove the transmission without having to remove the bellhousing like you would with some GM applications. Here is the method:

For the first step the services of a machinist may be recommended. The front bearing retainer from the Ford transmission is removed and simply machined down around the large diameter to where it will slip-fit into the bearing retainer hole in the back of the GM bellhousing. Take an accurate measurement (and with the proper tools -- calipers work best) from the hole in the bellhousing before doing this. The small diameter of the Ford bearing retainer is also machined down so it will slip-fit the GM clutch release bearing. Next, the retainer is then shortened by 7/16". Following this is some fairly straightforward work on the Ford transmission case.

On the front face 1966 and newer Ford four-speed transmissions, the upper two mounting holes are each about 1/4 of a bolt hole off from the upper two holes in a GM bellhousing. If the holes in the Ford transmission ears are slightly elongated, they will match up with their mountings to the GM bellhousing. It may be recommended at this point that you test fit the transmission to the detached bellhousing, which will facilitate the next step.

On the lower front face of the Ford transmission are two ears that, if stock, are undrilled. The lower left ear can be drilled to easily match the hole in the lower left of the GM bellhousing. The right ear can then be drilled. It will not meet up with any hole in the GM bellhousing, so it is necessary that you drill and tap one to match. Use the same size bolt as you do for the other three. If you are



not equipped with the tapping tools or the disposition to tap a good, clean set of threads, you may take this to a machinist as well.

For the clutch disk, use a Ford unit of the same diameter as the GM pressure plate. This ensures that the splines on the input shaft of the transmission match the disc. The Ford input shaft is 6-1/2" long which is nearly the same as the GM input shaft would be.

This procedure may seem complex and involved, but it is actually quite simple and intuitive. The results are very worthwhile and the cost savings over a special bellhousing or bellhousing adapter is significant.

Installing the Pilot Bushing

Before installing the transmission to the engine, the special pilot bushing (supplied if required) must be installed in the GM or AMC crankshaft. A piece of broomstick makes a good drift punch to install the pilot bushing. Never hammer directly on the bushing as it is quite soft, and it will surely be damaged by such a technique. If the tolerances are tight between the crank and bushing, you may wish to set the pilot bushing in the freezer for an hour and then very lightly heat the end of the crank with a torch before assembly. This facilitates some installations and provides for a secure fit. It is not usually necessary to remove the old AMC crank pilot bushing if you do not wish to.

Disassembling the Transmission

Shift Cover Removal

Begin by removing the transmission shifter stick by pressing downward and rotating counter-clockwise the domed bezel. The bezel will release and allow the shifter to be removed. Now unbolt the top cover bolts and remove the top cover assembly. It may require a few firm blows with a soft-faced mallet to break the gasket's hold. If you must pry with a screwdriver, keep it out towards the edge so as not to mar the gasket sealing surfaces.

Tailhousing Removal

Lock the transmission in first and fourth by sliding the first to second clutch sleeve rearward, and the third to fourth sleeve forward. This will allow you to remove the yoke nut (2wd models) or gear nut (4wd models) from the rear of the original mainshaft. On 2wd models, a large crescent or pipe wrench works well to hold the yoke. Now slide the gear hubs back into neutral position and remove the rear tailhousing or adapter. On pre-1979 Ford and all Jeep versions of the T18, reverse is actuated by a case-mounted pivot arm. The pivot can be removed by driving the taper pin rearward. On some T18 and T19 models, a snap ring or locking washer is used. Follow by removing the tailhousing.

Bearing Removal

Move to the front of the transmission and remove the input bearing retainer. Using a good set of snap ring pliers, remove the snap ring on the input shaft. You would be wise to wear safety goggles during this and every use of snap ring pliers. Then remove the input bearing o.d. snap ring. Using a bearing puller locked into the slot of the input bearing, pull the front bearing off the input shaft. Note here that all Jeep and pre-1979 Ford T18's used a thinner front bearing. Do not mix it up with the rear bearing. Later versions have the same width bearing. Now, remove the large bearing washer. Next, remove the pilot rollers spacer from the hub.

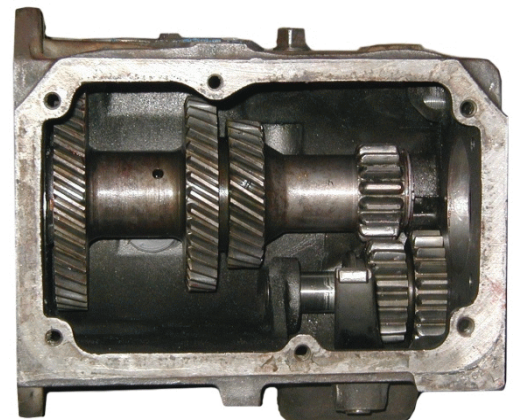
Now, repeat the bearing removal process using the same methods on the rear of the mainshaft. You may need to tap the mainshaft rearward to expose the groove of the outer race.

Mainshaft & Input Shaft Removal

With both bearings now removed, pull the third-to-fourth clutch sleeve rearward to separate the input and mainshaft assemblies. Do this slowly, so as to not drop the mainshaft pilot roller bearings. Once separated, you may now remove the mainshaft assembly by tilting its nose upward and pulling it from the case. The input shaft will now easily be removed from the case. In the event they didn't all fall into the bottom of the transmission case, take out the pilot rollers from the input shaft bore.

Mainshaft Disassembly

You are now ready to disassemble the mainshaft assembly. Remove the pilot rollers spacer from pilot tip of the mainshaft. Remove the third-to-fourth hub front snap ring (goggles, again). The hub assembly now slips off the shaft. We should mention here that it is a very good idea, especially for the uninitiated transmission builder, to place all components in their proper order and orientation on a secluded (and clean) section of the workbench. This will assist in making reassembly easier.

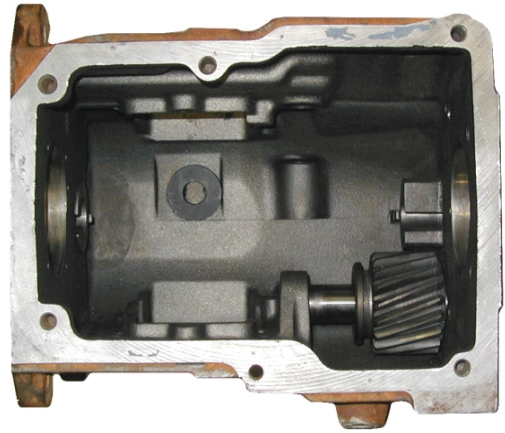


Moving to the back of the shaft, remove first-to-second gear hub snap ring. If working with the T19, you may have to press first gear off rearward with a press. Remove second gear snap ring, washer and second gear. Note here that it is advisable to be careful if removing the first gear from the synchronizer hub. The detent balls and springs will fly out and into the next dimension if you let the hub slide too far off the gear. You may wrap them in a rag to prevent this if you are going to disassemble them.

Countershaft Removal

The countershaft is a press fit into the front and rear bores of the case. However, the shaft is larger at the rear than the front. As such, drive the countershaft toward the rear (!) of the case using a brass or aluminum drift. You will need an arbor tool just undersized of the countershaft to hold the bearings, spacers and sleeves together during reassembly.

Once the shaft is out, you will be able to easily lift the cluster gear straight up out of the case for inspection.



This T19 case has been cleaned to perfection. Notice the difference in the reverse idler gear from the t18, above.

Reverse Idler Shaft

After removing the lockplate, the reverse idler should be driven rearward with the assistance of a drift. This is tricky, but the shaft is usually not too tight in the case bore. Inspect the reverse idler and its bushing. This constitutes the end of the main disassembly process. You will now reassemble in reverse manner.

Inspection Tips

Inspect all parts for discoloration, warpage, brinelling, breakage and wear. We get several questions as to whether gears should be replaced if nicked or otherwise damaged. As a general rule, if the gear tooth can be reasonably smoothed back to its proper shape with a stone or fine file, it can usually be reused. Gear breakage, excessive rust (pitting) and other damage that extends to the pressure faces of the gear teeth themselves are grounds for replacement. Should you need such components, call us. We keep on hand (or can quickly special order) any T18 parts, new or used. Detent springs should be checked for collapse or damage.

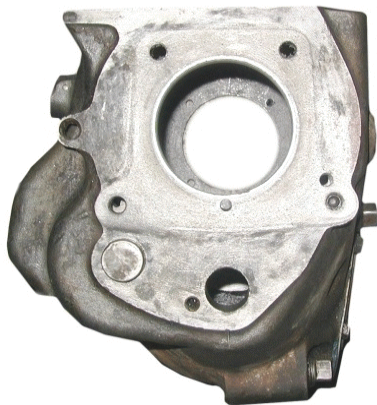
It is difficult to judge the real condition of synchros. Again, as with other components in the transmission, replace them since you are into it this deep. Note that the sharpness of the teeth and the integrity of the striations on the cone side.

Preparing the Transmission Case

To install this adapter on the transmission, it will be necessary to drill and tap an additional hole in the rear face of the transmission case. A drill press, 13/32" and 5/16" drills and 3/8"-16 tap will be required. This method makes the resulting transfer case clocking angle markedly higher than that offered by the competition's adapter. This increased clearance offered by the Novak conversion offers greater clearance under the Jeep.

Use the following method to locate the position of the new hole that must be drilled and tapped in the case. Do not attempt to use this kit without drilling and tapping this hole as the three adapter bolts will not stay tight. The transmission should have all the gears removed except the reverse idler gear and shaft. Place the transmission case on its face and put the rear mainshaft bearing in its bore.

The external snap ring will keep it from falling through. Put the gasket on, followed by the adapter and install and lightly tighten the three 1/2" socket head bolts.



The T18, drilled, tapped and plugged.



If available, the use of a transfer punch will help start a precise bore.

The drilling should be done in a drill press if possible. It could be done with a drill motor if extreme care is taken to maintain hole alignment parallel to the centerline of the mainshaft. Follow this procedure closely: Use a 13/32" drill to "spot" the hole location using the adapter plate as a drill jig. This drilling is only used to establish the center of the hole and provide a chamfer for the tap so don't drill any deeper than the point size of the 13/32" drill. Using a 5/16" bit, drill through the transmission case. Chuck a 3/8-16 tap in the drill press chuck, put the tap in the hole, and turning the chuck by hand tap the hole through the case — Don't even think of trying this with power! With a

reasonably sharp tap, cast iron is normally tapped dry without lubricant. Now remove the socket head bolts, adapter, gasket and bearing from the case.

The original lower right hand hole in the rear of the Ford T18 case will have to be plugged to prevent oil loss if it went through into the case (as the castings vary). This can be plugged by running a 1/4" pipe tap about three-quarters of its thread length into this hole. This will remove the existing threads and must be deep enough so a flush head pipe plug tightens up below the gasket surface. If the case is recessed behind this hole (doesn't go into the case) or if you are adapting a T19 disregard the plugging info.

Reassembly

During the assembly process, be sure to grease all the components and their mating parts. This is crucial during initial spin of the rebuild. Be especially generous with coating each gear and their journals. Use sticky grease or petroleum jelly to retain loose rollers while reassembling. This is a great aid.

Install new roller bearings along with their spacers into the cluster gear using a sticky lubricant as mentioned earlier. The last needle will snap in firmly. If the grease is sticky enough you can skip using an arbor or dummy shaft while the countershaft is being driven into the cluster gear. Remember the new thrust washers, and to stick them to the machined faces of the lower case bores. Tap the cluster shaft in with care. Once in place, spin the gear assembly and verify its proper functionality.

Follow up with the reverse counter and its idler shaft.

Mainshaft Assembly

Assemble the mainshaft in reverse order that you disassembled it. Note here that the latest versions of the T18 used a shouldered mainshaft. If you are replacing such a shaft with a Novak conversion unit, you will need to install a snap ring and special thrust washer. We have these available and ready for shipment for the rare instances where they may be required. The step bore of this thrust washer faces forward and encompasses the snap ring.

As you are installing the gears and synchro hubs, make sure they fit well and spin on their journals without resistance. While installing the snap rings, make sure they don't provide a source of resistance. Once the sliders are installed, make sure they slide without hitch. Note that on the third gear hub, the chamfered side faces frontwards.

Input Shaft Assembly

Place the new needle rollers included in the small parts kit into the bore of the input gear. Again, think sticky grease. Place the new synchro onto the cone of the input shaft and insert it nose first through the front bore of the transmission. It will rest there.

Final Assembly

With the mainshaft now together insert it, tail end first, into the transmission case. With both shafts tilted upward, gently install the pilot tip of the mainshaft into the packed bearings while lowering the shafts together. Be careful that no needles dislodge. This would ruin the mainshaft pilot during initial spin-up. Watch the 4th gear synchro also, that the keys and slots line up.

Place the roller bearings on both the input and output shafts. Note now that pre-'80 T18's had a thinner front bearing than rear. Don't mix them up. Later versions use the same bearing front and rear. With the bearings square on the shafts, place the transmission on end in a press and with the appropriate plates, tubes or other jigs, press the two bearings on simultaneously. There is a really swell chance of screwing up here. Don't let the synchros and keys get crooked or misaligned. The press will bring their service days to an unhappy end. When the transmission comes out of the press, the shafts should spin with minimal resistance.

Install the front bearing retainer and its pre-lube its new seal.

Adapter Installation



The T19 makes it even easier. The plug is usually not necessary due to the shape of the casting.



Do not install the adapter without a gasket. Gasket thickness is part of bearing bore depth. The adapter will not sit flat on the case if a gasket is not used. Apply sealer to the threads of the three 1/2" and one 3/8" socket head bolts, install and tighten to 45 and 35 ft. lbs, respectively. The adapter was shipped with the oil seal properly installed. If the oil seal is replaced, be sure it is installed in the same direction as the original.

Lube the seal lip and seal sleeve and put the seal sleeve on the shaft. The snap ring and backup ring used at the back of the rear mainshaft bearing will not be used with this kit. The seal-sleeve, transfer case drive gear, nut and washer, do the job of the snap ring and backup ring.

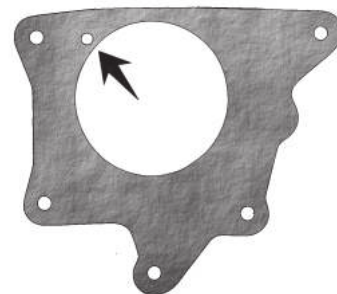
Check Your Work

Check the shafts for end play with a magnetic dial gauge. You should have .008"-.015" and the shafts should turn freely in neutral and all gears. If end play needs to be adjusted, a t18 small parts kit contains snap rings of varying thicknesses which you may use to adjust this number. It is tedious to pull the bearings off and try again, but it is far more tedious to have the transmission break down prematurely. Fill the transmission with a good gear oil, usually 85W-140 for most climates. Valvoline® and others make good para-synthetic blends that are worthy of a good rebuild. We like to fill through the top cover, as it's a good opportunity to douse the gears and shafts, not to mention the speed to fill.

Put the top cover on, making sure to line up the shifters with their sliders.

Installing the Transfer Case

Some Model 18 & 20 transfer cases feature a hole at the location shown in the diagram. The gasket provided with this kit will seal this hole up to prevent oil loss.

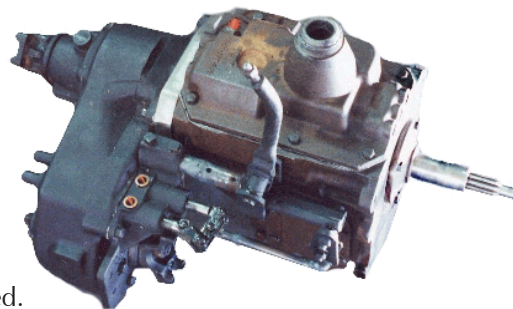


The adapter has 2 clocking options. One stock, and the other rotates the front driveline 7.5° down. Clocking down can allow for easier clearing of the transmissions body by the shifting mechanisms.

The transfer case is now ready to install. For a Model 20 transfer case, install the input gear, washer, nut, gasket and transfer case. For a model 18 transfer case, install gasket, transfer case, input gear, washer, nut, gasket and rear cover. A Warn overdrive can be used with this adapter and Model 18 transfer case. Torque the mainshaft nut to 125 foot pounds for either model transfer case.

Transfer Case Shifters

Some T18 cases have a large boss (or lug) on the upper rear of the passenger side. This may interfere with the shifter on some transfer cases. This boss may be hack sawed or ground off. If the boss has a bolt hole going into the transmission case it can be plugged by tapping 1/4" pipe thread and using a flush head 1/4" pipe plug or using a 3/8" bolt with nut and lock washer inside the case or tap the case 3/8-16 and screw a short bolt in from the outside using gasket sealer.



Transfer case shifters will vary greatly between the various configurations of Jeep and Scout transfer cases. In many CJ's and FSJ's, the mounting tube should be lengthened. When replacing the T150, you will need to lengthen the shifter mounting tube 3.5", as well as the shifter linkages. This is simple work if you have a welder on hand, or if you take it to a professional. Reconnect the linkages as per stock and the shifter will retain its original position through the floor of your Jeep. Other combinations require similar methods.

Mounting the Drivetrain Assembly

If you are installing your T18 into a 1976 to 1979 CJ, replacing the T150, you will notice that the skid plate can be moved back one set of holes so that the plateau mounting area will match up in-line with the mount on our adapter. This will facilitate the mounting of the gear train. You will need to drill two holes for the rear mount unit. For stock and mildly lifted Jeeps, 3.5" of drive shaft length change is required.

The T18 is a different height than most Jeep three speeds. When used with Model 18 transfer case, the Jeep rear mount (part #1370910) may require a spacer between the cross member and mount cushion to get the side mount spacing to come out right. Some installations may require the cross member or skid pan to be spaced down from the Jeep frame 1" for floorboard clearance. It may also be necessary to weld a rearward extension to the cross member on pre-1976 cross members. On short wheelbase Jeeps like the CJ2A, CJ3A, CJ5, etc., the cross member could be spaced down from the frame one inch to reduce the rear U-joint angle. The bottom of the adapter is drilled for a Novak #RMU (urethane), which is an improved version of the Borg-Warner #31-2268 rear mount cushion. This is a common rear mount used on a number of Jeep applications, some of which are the 1976 to 1986 CJ models. All installations must use the rear cushion insulator. Do not attempt to mount the adapter directly to the Jeep.

Driveshafts

Although some installations will allow the transfer case to remain in the stock location, any changes in driveshaft length must be determined after the engine and transmission have been mounted. The Jeep must be sitting on the ground with its full weight on the wheels to make the best determination. If a shackle reversal has been or will be performed on the Jeep, it is crucial that you calculate the suspension geometry's effects on the front driveshaft. Shafts that are too long or do not have enough play will cause the driveshaft to ram your transfer case, causing damage to your axle, driveshaft, transfer case, adapter or transmission. For reference purposes, the total length of the transmission / adapter assembly is 13".

However, there are multiple ways to install a conversion engine (often used with this transmission) and the following will be of note:

It is seldom a good idea to allow the driveshafts to make the decisions as to where the powertrain will be placed. Some of our customers, fearful at the perceived expense of new or modified driveshafts, attempt to let the existing driveshafts dictate engine, transmission and transfer case location, sometimes to the detriment of the project. Driveshaft modifications are usually inexpensive when performed by driveline, RV or tractor implement specialists. New driveshafts are an option but seldom a requirement in regards to the actual successful conversion. Jeeps that require extensive travel or specialty-built driveshafts have this option available through several fabricators across the nation.

Finish mounting the transmission and engine and have the weight of the Jeep on the wheels when measuring the length to modify the drive shafts. Any changes in driveshaft length must be determined after the engine and transmission have been mounted. The Jeep must be sitting on the ground with its full weight on the wheels to make the best determination. If a shackle reversal has been or will be performed on the Jeep, it is crucial that you calculate the suspension geometry's effects on the front driveshaft. Shafts that are too long or do not have enough play will cause the driveshaft to ram your transfer case, causing damage to your axle, driveshaft, transfer case, adapter or transmission. Our experience has shown that some stock Jeep drive shafts are not quite the correct length from the factory to begin with. This can be corrected if the driveshafts are modified.

Transmission Shifter

The Jeep floorboard piece can be modified to clear the transmission top cover. The top cover should be on the transmission when installed. This will prevent having to make a large cut in the driver's side of the body. The driver's side of the body will only require a notch approximately 1/4 inch wide and 3-1/2 inches long to make sure the side of the shift tower does not touch the body.

A Hurst® (part #114-7494) or Spark-O-Matic® large boot works very well for this application. (Spark-O-Matic is an import copy of the Hurst boot and sells at most discount auto parts stores for about half the price of the Hurst.)

Some Conclusions

While reading through these instructions, and especially while performing the transmission swap, it is often recognized that it is not the swap itself that provides the greatest difficulty, but in the ancillary things like linkages, mounts, clearances, and the like. Any good installation should consider all the points in this article and also allow for time, energy and funds for the dozens of variations in drivetrain conversions that cannot be anticipated.

We strongly suggest that you keep these instructions and the following, associated parts list for future reference. For questions concerning your conversion, contact the 4wd retailer or technician you bought the kit from, or if you bought your conversion kit directly from us, contact us and we'll be happy to answer your questions.

About Your Novak Adapter

The Novak #188 adapter kit is built to high Standards of design, materials and build. The adapter housing is billet 6061 aluminum for remarkable strength. Our adapter shaft is machined of a triple-alloy gear steel, specially hardened and precision ground for strength and longevity. Your adapter kit has been shipped fully assembled with seals and bearings installed and lubricated for initial spin-up.

The design of this adapter is such that it precludes the need to buy a special transfer case front output yoke.

Novak warrants your adapter and shaft against defects of workmanship and materials for the life of the vehicle. This warranty is non-transferable and requires a copy of your invoice as documentation.

These components are not warranted against damage or defects resulting from improper installation, including misalignment, improper assembly, improper mounting, or incorrect driveshaft lengths, and miscalculated driveshaft geometry on shackle reversal setups. Because we have no control over how the parts are handled or installed, we are not liable for any problems or failures of this product unless it is a defect of design, materials or workmanship. Determination of this warranty is at the fair discretion of Novak, Inc.

Should you have any questions concerning this conversion or these components, we welcome you to contact us.



Kit contents:

- 1x Billet 188-198 adapter
- 1x Main Transmission Shaft
- 1x Stud, 3/8-16 x 1.5
- 1x Bolt, 1/2-13 x 1
- 3x Bolt, 1/2-13 x 1.25
- 1x Bolt, 3/8-16 x 1.25
- 1x Washer 7/8"
- 2x Washer, Lock, 3/8"
- 1x Nut, 3/8-16
- 1x Nut, 7/8-16 Nylock
- 1x Gasket Dana 18/20
- 1x Gasket T18/19
- 1x Oil Seal
- 1x Seal Spacer Sleeve
- 1x Threadlocker

Air pollution laws vary from state to state. Changing an engine or transmission in your vehicle may change its pollution status. It is the customer's responsibility to determine that their vehicle conforms to whatever state and Federal regulations that may apply to their vehicle. Neither Novak, Inc. nor its directors are responsible for any changes made to your vehicle, nor the injury to the individual, or damage to property. Always exercise care and good judgement when installing this, or any other component on your vehicle.



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1.877.602.1500

Legend to the Diagram

- | | | |
|--|--|--|
| 1. Mainshaft pilot bearing roller spacer | 26. Countershaft gear thrust washer (rear, steel) | 51. Countershaft reverse idler shaft lockplate |
| 2. Third to fourth synchro ring | 27. Countershaft gear thrust washer (bronze, rear) | 52. Reverse idler gear shaft |
| 3. Third to fourth retaining ring | 28. Countershaft gear bearing washer | 53. Countershaft |
| 4. Third to fourth synchro snap ring | 29. Countershaft gear bearing rollers (88) | 54. Adapter plate gasket |
| 5. Third to fourth shifting plate (3) | 30. Countershaft gear bearing spacer | 55. Adapter plate seal (spring faces transmission) |
| 6. Third to fourth clutch hub | 31. Countershaft gear | 56. Speedometer gear spacer |
| 7. Third to fourth retaining ring | 32. Countershaft gear thrust washer, front | 57. Rear bearing locating snap ring |
| 8. Third to fourth clutch sleeve | 33. Reverse shifting arm | 58. Rear bearing |
| 9. Third to fourth synchro ring | 34. Reverse shifting arm shoe | 59. Reverse shifting arm pivot pin |
| 10. Third to fourth gear synchronizer assembly | 35. Filler plug | 60. Reverse shifting arm pivot |
| 11. Third gear | 36. Drain plug | 61. Reverse shifting arm pivot o-ring |
| 12. Mainshaft snap ring (see instructions) | 37. Lockwasher | 62. Washers (6) |
| 13. Second gear thrust washer (see instructions) | 38. Transmission to bellhousing bolt | 63. PTO port cover bolts (6) |
| 14. Second gear | 39. C-clip | 64. PTO port cover |
| 15. Mainshaft | 40. Reverse idler gear snap ring | 65. Transmission case |
| 16. Second gear synchro ring | 41. Reverse idler gear thrust washer | 66. Mainshaft pilot bearing rollers (22) |
| 17. Mainshaft snap ring | 42. Reverse idler shaft sleeve | 67. Clutch shaft |
| 18. First to second clutch hub | 43. Reverse idler gear bearing rollers (74) | 68. Front bearing retainer washer |
| 19. First to second shifting plates (3) | 44. Reverse idler gear bearing washer | 69. Front bearing |
| 20. Poppet balls (3) | 45. Reverse idler gear | 70. Front bearing locating snap ring |
| 21. Poppet springs (3) | 46. Lockwasher (6) | 71. Front bearing lock ring |
| 22. First to second insert spring | 47. Adapter plate bolts (6) | 72. Front bearing retainer gasket |
| 23. Mainshaft snap ring | 48. Drive gear locknut | 73. Front bearing retainer |
| 24. First to second clutch sleeve | 49. Washer | 74. Front bearing retainer bolts (4) |
| 25. Second gear synchronizer assembly | 50. Adapter plate | 75. Lockwashers (4) |

