

Introduction

We hope that your engine to transmission conversion goes very well, and that the installation of your Novak adapter works as smoothly as it is designed to. This kit is for adapting most GM standard shift bell housings to the Jeep Borg Warner T18 four-speed transmission used in CJ5 and CJ7 from 1976 through 1979. We strongly recommend that you read these instructions no matter how much experience you have had with this kind of work.



JEOP POWERTRAIN SUPERIORITY

About the T18 Transmission

The Borg-Warner T18 transmission was found in Jeep CJ's from 1976 to 1979. 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.

Identification

Jeep CJ's from 1976 to 1979 had the option (though more rare than not) of the T18A, the wide ratio version (6.32:1 first gear). No front adapter plate is present on these models, and they have the shortest of the Jeep T18 input shafts.

Compatibility

The T18 was found behind the AMC I6 and V8 engines and only in front of the Model 20 transfer case. It has the unique Jeep front mounting face. It is only compatible with the large bore Model 18 and Model 20 transfer cases. It is easily adaptable to GM engines, and capable of handling any V8 engines.

Adaptation

Preparation

First, wipe the face of the transmission case clean and carefully inspect it to make sure there are no pieces of old gasket, dirt, burrs or anything else that would prevent proper sealing of the adapter to the transmission.

Using a round file by hand, or a rotary file in a drill motor, elongate the two upper mounting bolt holes in the cast iron T18 case so they match the two upper holes in the adapter. You will want to do this before mounting the adapter with sealer to avoid having to remove any filings that may get between the two.

Assembly

Remove the front bearing retainer from the T18 and store it away, as it will not be used with the new assembly. Clean off the old gasket from the front face of the T18. Use a smooth file on the face of the transmission to make sure there are no burrs, particularly along the top edge where the shift housing meets the face of the case. Install the seal ring provided with your kit in the groove on the face of the adapter, making sure it is not twisted. Apply some oil or gear lube to the oil seal and on the input gear oil seal area next to the front bearing. Then, slide the adapter down the input shaft, making sure the seal ring does not come out of its groove. Follow by installing the four 1/4", Allen socket head cap screws in the adapter and into the four threaded holes that formerly held the OEM retainer. Tighten evenly to approx. 25 ft. lbs. We recommend that you tighten to torque in three successive stages.

Now, install the 3 bolt Novak Chevy front retainer supplied with the kit on the adapter.

Install the three flat head bolts provided through the retainer and tighten to approx. 25 ft. lbs. If you are installing our #1879R kit - for GM bell-housings with the 5-1/8" bore - a sizing ring has been provided and should be installed onto the rim of the adapter.

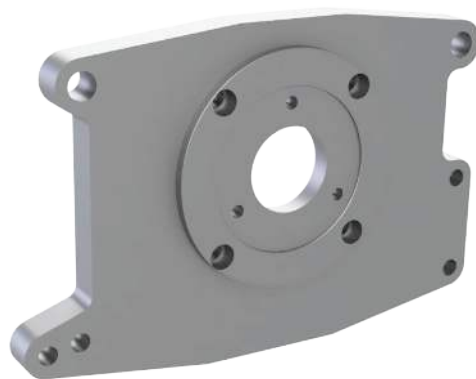
We have supplied the suggested 1/2"-13 upper through bolts that should be compatible with nearly all GM bellhousings. Having clearanced the transmission ears, these bolts should pass through their washers (flat and split-lock style), the transmission flange, the adapter itself and then threaded into the bellhousing finger-tight for now.



The transmission face of the #1879 adapter

If the Chevy bellhousing being used has lower holes that are clearance drilled or tapped for a 1/2"-13 bolt, it is essentially ready to use. The adapter has had two lower 7/16"-14 studs to install into the adapter that will pass through the lower bellhousing holes. You will then fasten them from the inside of the bellhousing each with a flat and lock washer, and the supplied 7/16"-14 nut, finger-tight for now.

Two rearward facing studs now remain to fasten to the lower transmission flange in like manner. Once everything feels and looks good, you may sequentially and in three stages torque all six fasteners to 60 (dry) foot-pounds of torque.



The bellhousing face of the #1879 adapter

Installing the Pilot Bushing

Before installing the transmission to the engine, a special pilot bushing must be installed in the GM 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, as 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 warm the end of the crank with a torch before assembly. This facilitates some installations and provides for a secure fit.

Bellhousing Alignment

On any engine using a standard shift transmission, with or without an adapter, it is important to check the bellhousing locating bore location relative to the crankshaft. The potential for transmission failure or premature wear is so great, due to misalignment at this point, that no engine should be assembled without being checked. The checking procedure is quite simple. Correcting misalignment is not so simple but must be done to insure normal service from the transmission. A dial indicator is required, as well as a suitable means to mount this instrument on the engine crankshaft.



Our adapter is made from 6061 billet aluminum. It is actually stronger than cast iron. In spite of this, the adapter, like anything else, is not indestructible. Misalignment, improper assembly, improper mounting, or incorrect driveshaft lengths, and miscalculated driveshaft geometry on shackle reversal setups are some of the things that may cause adapter failure. 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 workmanship.



Use the pressure plate that is matched to your engine's flywheel. Choose a disc from a Jeep or Ford application that will provide a 10 x 1-1/16" spline, as is compatible with the T18 input shaft.

Note that the Jeep pressure plate will fit most Chevy flywheels that are drilled for a 10-1/2" clutch, allowing you to specify the Jeep clutch assembly to your parts retailer.

the reading on the dial. Keep adjusting the dial assembly until the needle moves the least amount per rotation. When you have achieved the least amount of needle movement through the 360 degree sweep of the indicator, this is your runout. You can then determine the direction it is offset by the movement of the needle.

The total number of thousandths misalignment of the bore relative to the crankshaft is read directly on the dial. Total runout should not exceed .007", with .010" being maximum. The greater the misalignment, the sooner transmission problems and failure will occur. A symptom of misalignment is unusual wear of the pilot bushing. We have checked stock Chevy bellhousings on engines that were out more than 1/32" (.032"). Some Ford ones are reportedly worse. Anything over .010" runout must be corrected before the engine and bellhousing are put in service or you can

A dial indicator (right) is a device that has an arm or contact point, suitably connected to a pointer, that moves in front of a dial with markings on its face. These markings usually represent .001" each. The purpose of a dial indicator is to measure in thousandths of an inch that can be read directly on the dial of the indicator.

To check a bellhousing, mount it on the engine it's going to be used with, make sure there are no burrs or dirt on the block or bellhousing. All bellhousing to block bolts should be in and tight. Mount the dial indicator on the crankshaft of the engine using a suitable magnetic base attachment or mechanical clamping means. The contact point of the indicator should be touching the bore of the bellhousing. The indicator must be mounted rigidly enough so it does not move on its mounting to prevent false readings. Rotate the engine by hand with the spark plugs removed and observe



This Chevy release arm is 6.5" long with a ratio of 2.17:1. This will provide proper geometry for the Jeep mechanical release linkage. It is listed at Novak part #RAGM.

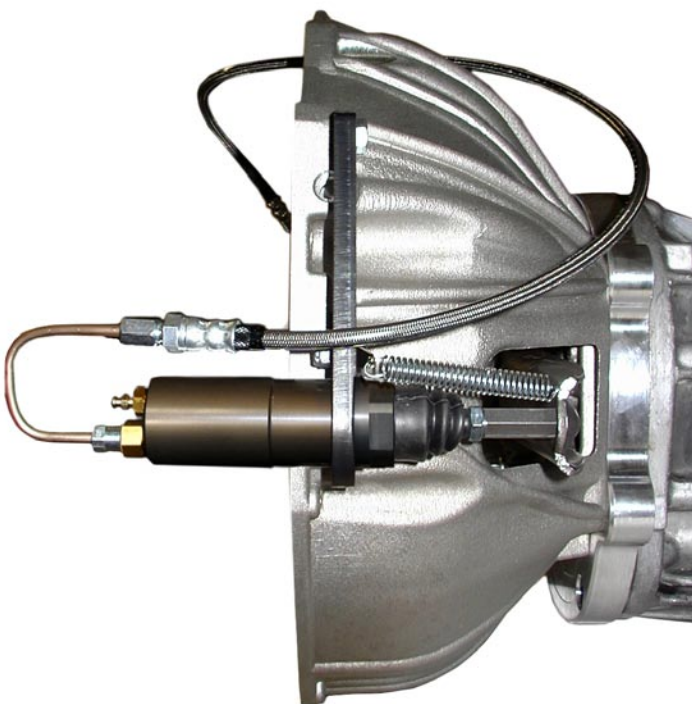
count on pilot bushing, transmission, and clutch problems, followed by transmission failure. The simplest way to correct misalignment is to try another bellhousing or bellhousings. Machining the bellhousing is the best cure but offset dowel pins are simpler. Shims between the block and bellhousing will also work if you have the patience to use this method. Offset dowel pins are sometimes available from speed shops locally or online.

Clutch System

Clutch Release

Most individuals will choose to retain their mechanical clutch release linkage as found on these 1976-1979 Jeep CJ's. As such, the installer will need to fabricate a simple plate to bolt to the GM engine as an anchor for the bellcrank pivot. Nothing need be elaborate here, just geometrically straight and strong.

Some installers will opt to convert to hydraulic release, using a Jeep CJ master cylinder assembly. If this is the



case, a very easy clutch release system that we offer for use with most modern (1970-1991) Chevrolet bellhousings is our #HCR2 kit, shown.

Use the proper clutch release bearing for the clutch being used. There are six different length release bearings for GM clutches. Which bearing to use depends entirely on the pressure plate being used. See the chart below. A very detailed discussion of clutches is at the Novak website Knowledge Base, under Clutches, Linkages & Bellhousings.

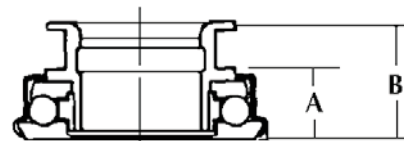
Clutch

Use the Jeep clutch disc in the GM clutch as this will match the 1-1/16 10-tooth spline on the input gear of the transmission. The Jeep pressure plate will fit a Chevy flywheel drilled for 10-1/2" clutch.

GM Clutch Release Bearings

This chart shows the length of the bearing in inches. Most auto parts stores only stock a couple of these release bearings and they may not be the best ones for your swap. This chart lists five bearings by the critical "A" measurement; groove to face dimension as referred to in this article.

-A- length	-B- overall length	Part number
3/4	1-17/64	N 4068
15/16	1-5/8	N 1741
1	1-41/64	N 2001
1-1/16	1-11/16	N 1466
1-1/4	1-7/8	N 1086



Conclusion

While reading through these instructions, and especially while performing the engine 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 drive train conversions that cannot be anticipated. When executed with care, this conversion can be a strong, enjoyable and reliable upgrade to your Jeep.

Novak Kit #1879 includes:

- Adapter plate
- Retainer, GM, front
- Oil seal, National 471652
- Ring seal, FTS #3896L
- Bolts (3), 5/16"-18 X 1", flat head
- Bolts (2), 1/2"-13 X 2-1/2", hex head
- Studs (4), 7/16"-14 X 2-1/2"
- Nuts (4), 7/16"-14
- Washers, flat (4), 7/16"
- Washers, split lock (4), 7/16"
- Washers, flat (4), 1/2"
- Washers, split lock (2), 1/2"
- Ring, bellhousing sizing, 5.125" (1879R)
- Instructions



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

There is no final word to our instruction packages. We update them often and invite our customers to offer any suggestions, images or questions they may have that can make the process easier for any to follow. Note our contact information below.

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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.