

Introduction

We hope that the installation of your new Novak shifter goes very smoothly and that you achieve the improved results with your Jeep® that you intend.

Note to the Installer

This document and the use of any Novak products assumes a safe and adequate working knowledge of the automotive systems involved. We do not know and there is no way for Novak to determine the skill level of the customer and/or the installer of Novak products, or for Novak to publish all of the information on fundamentals that an individual should know before attempting some procedures. It is upon the customer to ascertain whether they are working within their expertise or whether they should acquire assistance.

Novak products and procedures are intended and recommended for off-road use only.

Applications & Compatibility

These kits have been designed and tested for, and this guide covers the installation of the Novak cable shifter kit #SK2XR, for the Jeep TJ Wranglers featuring the NP241OR “RockTrac” transfer cases as commonly found in the Rubicon package of these Jeeps, or other Jeeps that have been fitted with the factory TJ / XJ, “dog-leg” floor shifter handle. If you have fitted another Jeep with a 241OR transfer case, you’ll have to make accommodations by installing a TJ or XJ style shift lever assembly.

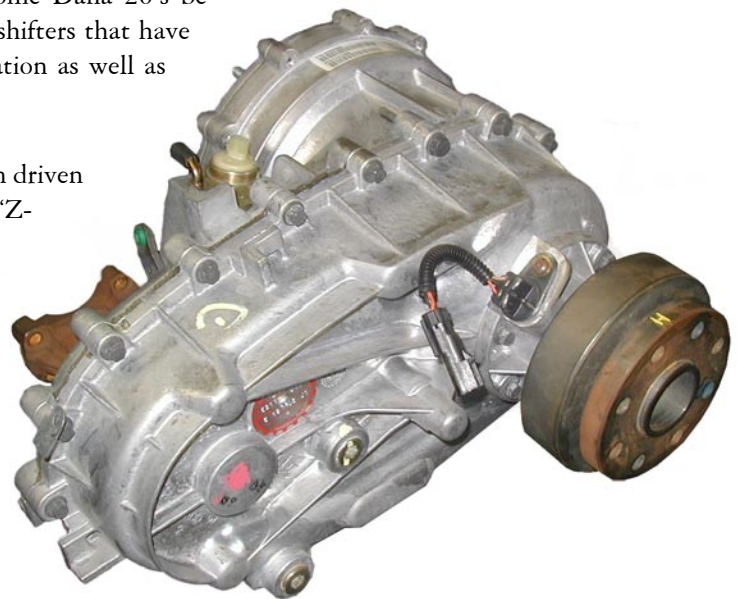
Benefits

This shifter kit will not only provide superior shifting to the factory shifter assembly, but can adjust for nearly any modifications and variations, such as suspension lifts, body lifts, tummy tucks, powertrain conversions, etc.

About Transfer Case Shifters

A trend of “dumbing down” transfer case shifters has long been in effect. Original Jeep transfer case shifters of the WWII era Dana 18’s were double stick versions. These were very simple, reliable controls that took some initial thinking on the driver’s part to figure out. Dana 20’s and some later Dana 18’s received a single lever to simplify operation. However, some Dana 20’s began to receive problematic remote-style shifters that have aggravated many a Jeoper in their operation as well as reliability.

With the advent of the New Process chain driven transfer cases, a single shifter with a “Z-gate” design was introduced, ostensibly as a safety to keep the operator or any unrestrained occupants in the Jeep from inadvertently shifting the transfer case during operation. One major fault these systems have is the complex maze of linkage rods, joints and brackets that zig and zag their way, eventually arriving to the transfer case shift plate. Of note is the welcomed simplicity of the elegant de-



sign offered by New Process, in that the rotating action of the shift plate on the transfer case proper, works in a clean, smooth manner - when independent of the OEM linkages between the driver and the transfer case itself.

Our goal at Novak was to simplify the shifting mechanism through the removal of the problematic z-bar linkages and their joints, and thus the clean and flexible cable design of these shifter kits.

Suggested Tools

Please note that you will need:

- Conventional open and box end wrenches
- Socket, hex (Allen) wrenches
- Conventional socket set



Factory Shifter Assembly Replacement

Preparation

Shift your transfer case into 2-High.

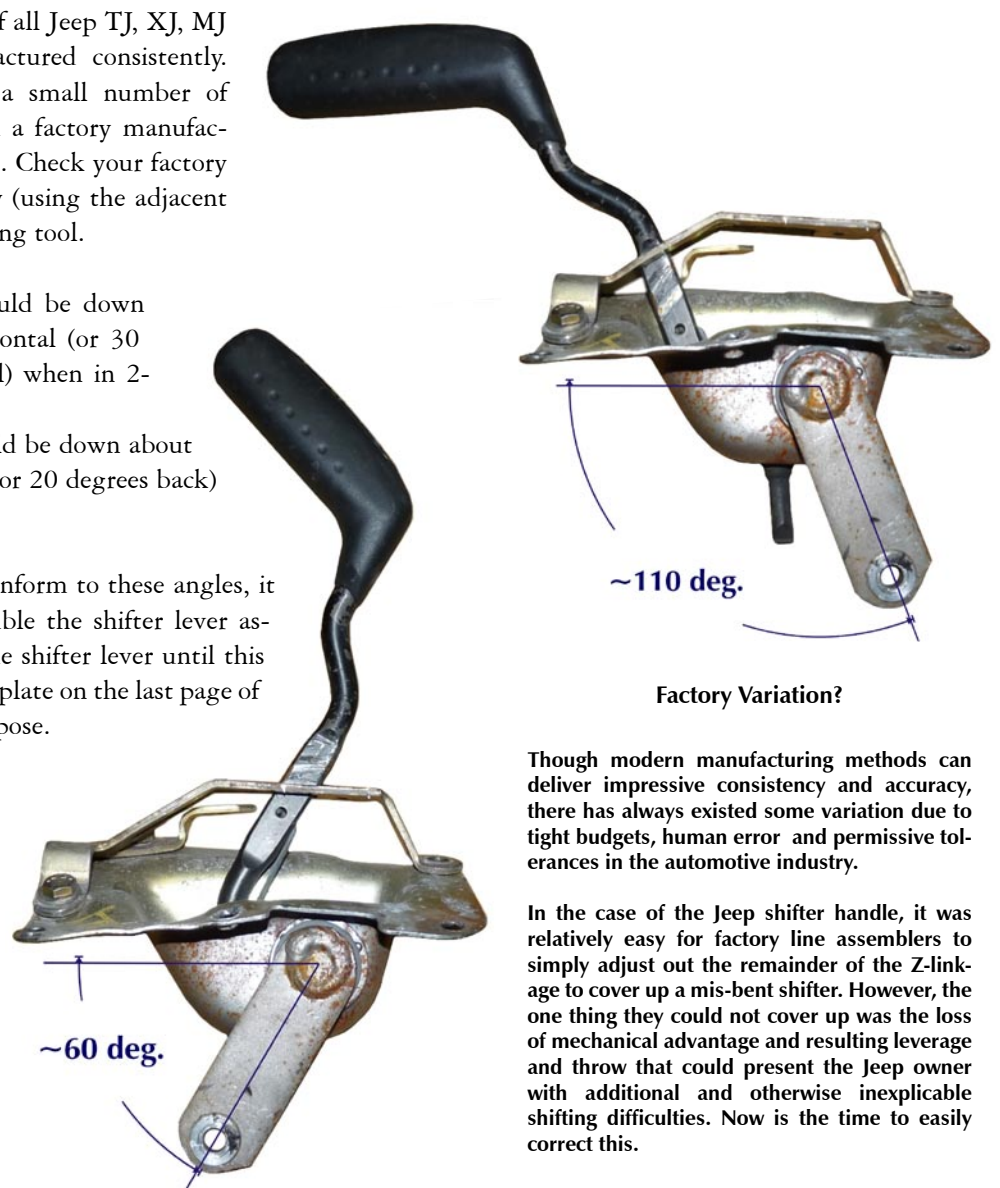
We estimate that over 95% of all Jeep TJ, XJ, MJ shifter handles were manufactured consistently. However, we've learned of a small number of shifters that were made with a factory manufacturing variation in their angle. Check your factory shift handle assembly visually (using the adjacent photos) or with an angle finding tool.

- Your shifter bellcrank should be down about 60 degrees from horizontal (or 30 degrees forward from vertical) when in 2-High.
- Your shifter bellcrank should be down about 110 degrees from horizontal (or 20 degrees back) when in 4-Low.

If your shift lever does not conform to these angles, it will be necessary to disassemble the shifter lever assembly, and carefully bend the shifter lever until this angle is achieved. Use the template on the last page of these instructions for this purpose.

Crossmember Removal

We recommend that you remove the Jeep crossmem-



Though modern manufacturing methods can deliver impressive consistency and accuracy, there has always existed some variation due to tight budgets, human error and permissive tolerances in the automotive industry.

In the case of the Jeep shifter handle, it was relatively easy for factory line assemblers to simply adjust out the remainder of the Z-linkage to cover up a mis-bent shifter. However, the one thing they could not cover up was the loss of mechanical advantage and resulting leverage and throw that could present the Jeep owner with additional and otherwise inexplicable shifting difficulties. Now is the time to easily correct this.

ber for ease of installation as it will provide more working room. However this is not always necessary. If removing the crossmember, be sure to support the transmission assembly with a floor jack and jack stand, and all according to standard automotive service safety procedures.

Shifter Linkage Removal

Remove the entire z-bar linkage from between the OEM shifter lever and the transfer case pivot lever. You will also remove the rubber grommet from the shifter handle's lever. Sometimes, the best way to do this is by severing it with a blade (see image).



Factory Body Bracket Removal

The original linkage's body floor plate should be removed from the underside of the tunnel. You will need to lift your carpet to access these bolts.

Transfer Case Anchor Bracket Removal

Now, remove the factory transfer case anchor bracket by removing the two corresponding 3/8" adapter nuts (of six), typically at about the 1 & 3 o'clock positions.

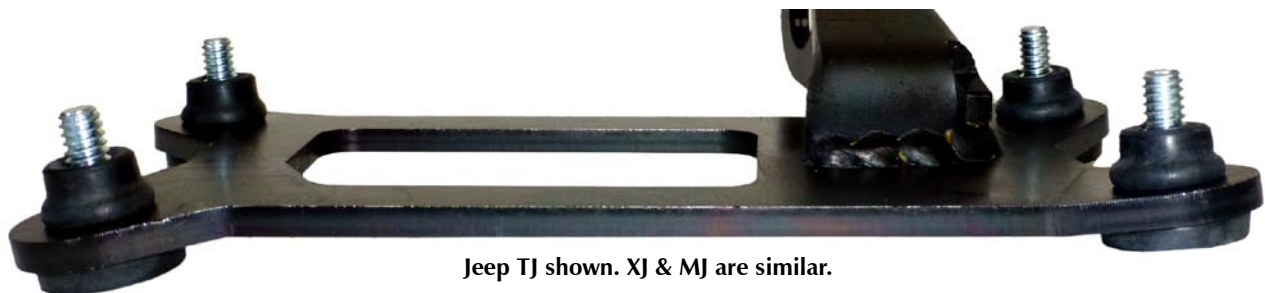
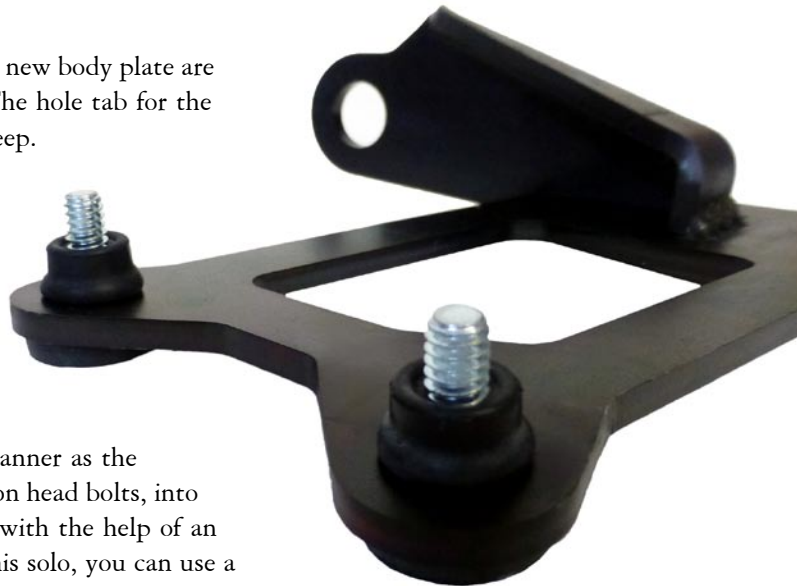
Novak Shifter Installation

Jeep Floor Bracket Installation

For the SK3XR kit, you'll notice the tabs on the new body plate are bent so that it can only be oriented one way. The hole tab for the shifter cable will face towards the front of the Jeep.

Insert the four provided rubber rivnuts into the bracket with the pads facing towards the body, and the brass inserts within the rivnuts facing the transmission.

Align the floor bracket and rivnuts assembly with the four body holes. Install the provided floor bracket in the same location and manner as the original, using the provided, stainless steel button head bolts, into the threaded rubber rivnuts. This is best done with the help of an assistant in the Jeep, but if you are installing this solo, you can use a strong tape to hold the bracket against the tub while you go topside to tighten the bolts into the rivnuts. Note that you may need to temporarily



Jeep TJ shown. XJ & MJ are similar.

tape the rivnuts to the bracket to prevent them from turning during initial tightening, until they flare enough to start holding their own.

Torque these four fasteners to 1.2 ft. lbs. This will expose about 5 to 6 threads of a 1" long fastener.

Transfer Case Anchor Bracket Installation

Install the main "Z" shaped anchor bracket to the transfer case. This installs on the same two transfer case adapter bolts that the previous bracket was removed from. You can use your existing fastening hardware (typically studs with nuts). Retighten and torque to 38 ft. lbs. or what one can comfortably tighten with a stan-



ard length 9/16" box end wrench.

Cable to Shifter Handle Attachment

Having verified that your transfer case is in 2-High, and that the shifter handle is also in the 2-High position (all the way forward), remove one nut and washer from one side of the threaded cable housing. Spin the remaining nut so that it is about in the middle of its threaded adjustment range. Feed the cable rearward through the hole in the body anchor bracket.

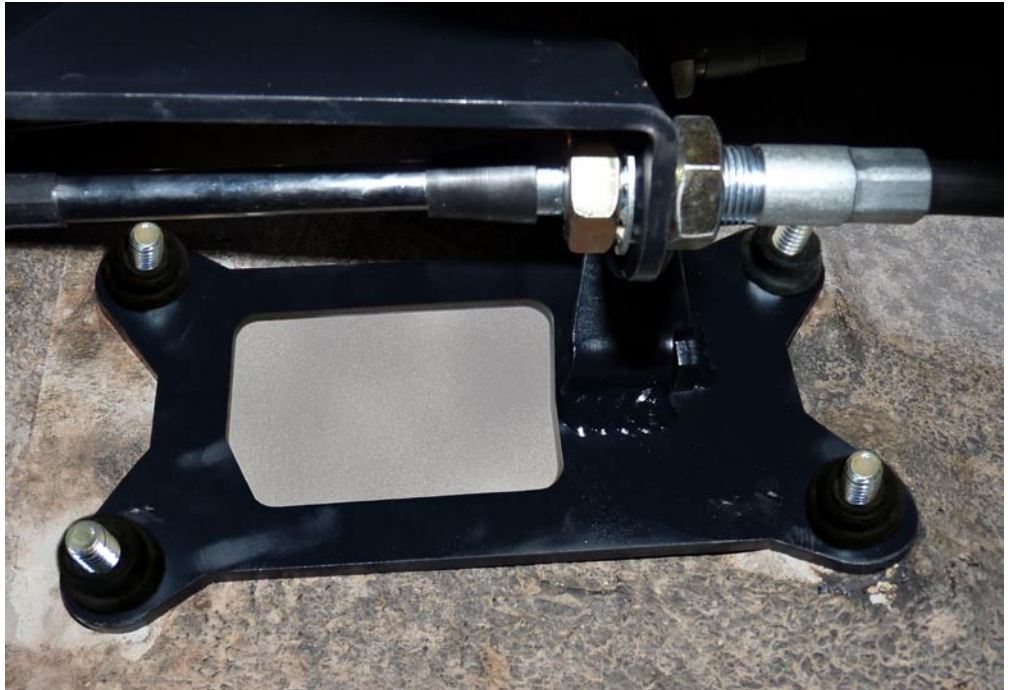
Slip the washer over the threaded end and spin on the nut. Do not tighten this yet.



Now, install the cable's bearing end bolt through the shift lever plate and attach it using the provided nut and washers.

Without tensioning the shift cable or moving the shift lever, spin the cable housing's nuts into position so that they sandwich the anchor bracket's tab. If you are confident that you didn't move the lever, tighten the two nuts against each other with an open end wrench. No adjustment will typically occur here.





The cable's bearing end will sit outboard of the lever's pivot plate, as shown in the image.



Attach the Cable to the Transfer Case Anchor Bracket

Spin one nut and washer off the opposite end of the cable. The cable should be pointing forward. Loop it rearward and feed the threaded housing into the hole in the tab on the transfer case anchor bracket. Don't kink your cable, but don't worry if you have a bend that looks tight. This is a high-grade and extremely low friction cable that can handle and operate for many, years with as little as a 5" radius bend.

Now, slip the washer over the threaded end and spin on the nut. Do not fully tighten this yet.



Shown here is the bushing installed into the transfer case pivot plate. There is no need at all to remove this bracket from the transfer case, like the one shown here for clarity.

Cable & Joints Maintenance

The cable is teflon lined, internally and prelubricated for many years. However, in five years or earlier (if water crossings or other contamination) situations occur, one should spray some TriFlow down the cable and work it in. The linkage joints should be lubed yearly with a spray lube such as TriFlow or silicone spray.



Transfer Case Rotator Plate

Just like you've done with the shifter lever, you will now attach the cable end through the transfer case's rotating lever. We have provided an aluminum bushing that will insert into the end hole, in place of the grommet that you've already removed. The flanged side of this bushing will face outboard.

Bearing End Installation

Now, attach the cable end through the bushing in your pivot plate. The cable will install inboard of the pivot plate. Tighten the bearing end, using the provided nut and washers.

Testing and Adjustment

You can now test shift your transfer case. This is best done with the wheels off the ground and the Jeep securely supported by jack stands. Shift into each range and mode as you turn the driveshafts for shifting ease. Verify that the shift lever position corresponds with the detent positions in the transfer case.

Usually, little adjustment is required. You can lengthen the shift cable by turning the clevis and bearing end a few turns out, but don't leave too little thread engagement - six or more threads of engagement are recommended. You can also effectively lengthen the cable by turning the housing jam nuts away from the ends, and what you do to one end of the housing, you should mimic on the other.

To shorten the effective length of the cable, do the opposite of above.

Finishing

Reinstall any interior components you may have removed. Reinstall the skid plate, if you removed it and attach all factory components as before.



Conclusion

We have had great results with this shifter. When executed with care, this conversion can be a strong, enjoyable and reliable upgrade to your Jeep.

We suggest that you keep these instructions for future reference. For questions concerning your conversion, contact us. We'll be pleased to answer your questions.

There is no final word to our instruction packages. If you have a question you feel this information should have covered and didn't, please let us know about it. You are also welcome to submit your suggestions, ideas and images that you think we should include here which may help future conversion installers. Note our contact information below.



Completed view. Note that this is the earlier version body bracket and fasteners pictured. The new version installs similarly.



Novak Kit #SK3XR includes:

- 1 x Body mounting bracket
- 1 x Transfer case anchor bracket
- 1 x Control cable assembly
- 4 x Bolts, Allen, button head, 1/4"x1"
- 4 x Rivnut, rubber with brass insert
- 1 x Bearing End
- 1 x Step Bushing
- Instructions



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877.602.1500

This template is provided for the installer to use if they assess that their Jeep XJ / TJ factory shifter handle was not properly bent at the factory, as discussed on page 2.

