

# Atlas Specifications

## ATLAS 2 SPEED

### CASE:

Material ..... 356-T6 Heat Treated Aluminum  
Weight ..... 110 lbs. (dry)

### INTERNAL COMPONENTS:

Gears ..... Helical Cut  
Bearings ..... Needle & Taper Rollers  
Synchronizers ..... Borg Warner  
Available Input Shaft Splines: 10, 21, 23, 25, 27, 28,  
29, 31, 32, 34, 35  
Tail Shaft ..... H.D., 32 Spline,  
Front Output ..... 26 Spline or 32 Spline

### RATIOS:

Low Range: ..... 2.0:1 **or** 3.0:1 **or** 3.8:1 **or**  
4.3:1 **or** 5.0:1 **or** 6.0:1  
High Range ..... 1:1

### LUBRICATION:

Quarts ..... Liters  
2.0 ..... 1.89

### LENGTH COMPARISON:

\*Atlas Short tail 11.8" NP 231, 20.5"  
\*Atlas Long tail 13.8" NP241 Rock Trac T/C, 15-1/4"  
Dana 300, 12"

## ATLAS 4 SPEED

### CASE:

Material ..... 356-T6 Heat Treated Aluminum  
Weight ..... 125 lbs. (dry)

### INTERNAL COMPONENTS:

Gears ..... Helical Cut  
Planetary Gears ..... 6 Gears Helical Cut  
Bearings ..... Needle & Taper Rollers  
Synchronizers ..... Borg Warner  
Available Input Shaft Splines: 21, 23, 27, 29, 31, 32, 34  
Tail Shaft ..... H.D., 32 Spline,  
Front Output ..... 32 Spline

### RATIOS:

Low Range ..... 2.0:1, 2.72:1, & 5.44:1 **or**  
2.72:1, 3.8:1, & 10.34:1  
High Range ..... 1:1

### LUBRICATION:

Quarts ..... Liters  
2.5 ..... 2.36

### LENGTH COMPARISON:

\*Atlas Short tail 15" NP 231, 20.5"  
\*Atlas Long tail 17" NP241 Rock Trac T/C, 15-1/4"  
Dana 300, 12"

**\*The lengths of the Atlas transfer cases listed above are measured with the longest yoke installed on the output shaft.**

## DESIGN OF THE ATLAS:

Through the analysis of other successful transfer case designs, we have manufactured a rugged, all gear-driven transfer case. Combining the latest in CAD/CAM technology and years of in-house CNC machining capabilities, the Atlas transfer case is sure to bring you the utmost in dependability and performance.

The Atlas is available for both left and right hand vehicle applications with centered rear differentials. The solid, one-piece case design is manufactured from 356-T6 heat-treated aluminum alloy. This material is also used for the structural access cover and all other exterior components. The massive gears are helical cut and synchro-equipped for quiet performance and "shift-on-the-fly" capability. These gears are supported by needle bearing elements, precision matched to strong 8620 shafts. The ruggedly designed output shafts are amply supported by large taper bearing sets. The Atlas also features a unique twin stick design to deliver crisp, quiet operation.



The Atlas transfer case offers you the ability to customize the transfer case to your vehicle. We offer several upgrades, options, and different configurations for this transfer case. Listed on the following pages is all the information to make your custom "made-to-order" Atlas the ultimate gear driven transfer case.

# Atlas Description

The Advance Adapters Atlas gear-driven transfer cases are the ultimate in gearing and strength. These units are the solution for combining both on and offroad performance. From its inception in 1996, we have had numerous inquiries to fit the Atlas into a wide spectrum of vehicles. Today the Atlas has been installed in both full and down size vehicles such as Jeeps, Broncos, Explorers, Dodge, Chevy & Ford Trucks. These units can be found in daily driven vehicles, all the way up to the extreme rock crawling vehicles. When you want or need peace of mind on the trail, in the rocks, on the sand, or in the mud, the Atlas is the transfer case for you.

## RATIO OPTIONS:

Since there are numerous engine, transmission, and axle combinations, the need for various transfer case gearing options has increased. The Atlas transfer case now has 6 different low gearing options to suit the needs of your driving habits and your drivetrain components. Along with these 6 different ratio options, we are now producing our new 4 speed Atlas transfer case. The 4 speed Atlas gives you a few more choices when it comes to 4-wheeling. You can now have the ultra low gearing for rock crawling, a low range gear for trail use, and mid range for sand and mud. Whether you're looking at the 2 speed Atlas or the 4 speed Atlas, your ratio options will be diverse.

The wide variety of Atlas gear ratio options have been designed to accommodate any type of drivetrain combination. Please be aware that the lower the final drive ratio gets, the harder it is to stop the vehicle when in gear. Larger brakes will be required to slow the vehicle. Shifting the transmission into neutral on an automatic or depressing the clutch on a manual will be required to bring your vehicle to a complete stop.

### Atlas 2 Speed Ratios

- 2.0:1 : This unit is more of a stock ratio found in most early full size trucks.
- 3.0:1 : This unit is popular in numerous applications.
- 3.8:1 : The Atlas 3.8 is a good choice for the avid 4-wheeler since this low gear ratio is ideal for moderate to some extreme rock crawling.
- 4.3:1 : This unit is popular in numerous applications.
- 5.0:1 : This unit is popular in numerous applications.
- 6.0:1 : This unit is the most popular for smaller engine vehicles that need to get the engine RPM's higher to obtain engine performance.

### Atlas 4 Speed Ratios

- 1.0:1 / 2.00:1 / 2.72:1 / 5.44:1  
 or  
 1.0:1 / 2.72:1 / 3.8:1 / 10.34:1

With any of the Atlas ratios equipped in your 4WD, you have the opportunity to select a sensible ring and pinion gear ratio for great street performance. Combined with a low-geared crawl ratio of your choice, your vehicle will have the ultimate combination. This allows you to compete with the most well-equipped vehicle, but then be able to cruise comfortably down paved roads. If you are serious about on and offroad performance and dependability, then demand one of the Advance Adapters Atlas transfer cases.



The Atlas 2 speed (left) & Atlas 4 speed (right) in comparison to the NP231

# Atlas 4 Speed Information

The 4SP has essentially two parts. The first is the reduction housing. This housing holds a planetary assembly that has a gear ratio of 2.72:1 when in "low" range, and a 1:1 in "high" range. It has one shifter coming out of the top to select the desired range. The planetary is not a synchronized shift-on-the-fly design and must be operated when the vehicle is stopped. The main case still retains the shift-on-the-fly capability just like the standard Atlas. The reduction housing shifter is designed for a cable or an electric shift option.

The second part of the 4SP may look the same as the standard Atlas, but it does have some differences. All of the gears, with the exception of the input, are the same. The front output uses all of the same parts along with the cluster. The rear output shaft has been radically changed and different bearings have been utilized in some spots. The main case of the 4SP is the same raw casting, but has some machining differences to make it into a 4SP. The main case functions independently from the front reduction housing and retains all of the normal Atlas features (front and rear outputs controlled independently, and the "front only" option).

The strength of this unit is not an issue. Advance Adapters uses a planetary assembly that was originally run in a NP241-HD transfer case. This assembly has been rated to withstand 5,555 ft./lbs. of torque, and up to 11,000 lbs. gross vehicle weight. The six planetary setup has proven its durability and has been used in countless heavy-duty vehicles. Other attributes to the planetary assembly include a very quiet operation, easy shifting, and low rolling resistance. When all of this is put in front of a legendary Atlas Transfer Case, you get the best combination of gear ratios and reliability.



The 4SP units will fit nearly all applications that the standard Atlas will bolt to. These will include spline counts of 21, 23, 27, 29, 31, 32 and 34. The unit has a circular bolt pattern on the front, identical to the one found in Jeep vehicles. Advance Adapters has a variety of different adapters available to retrofit the 4SP into nearly any application. The twin sticks for the main unit can be either the standard linkage or the cable linkage. The standard linkage is offered in a variety of custom packages available for particular vehicles and can be modified to fit many custom applications. The installation of a Atlas 4 speed should be nearly the same as a standard 2 speed Atlas with the exception on the 4 speed being a bit longer.

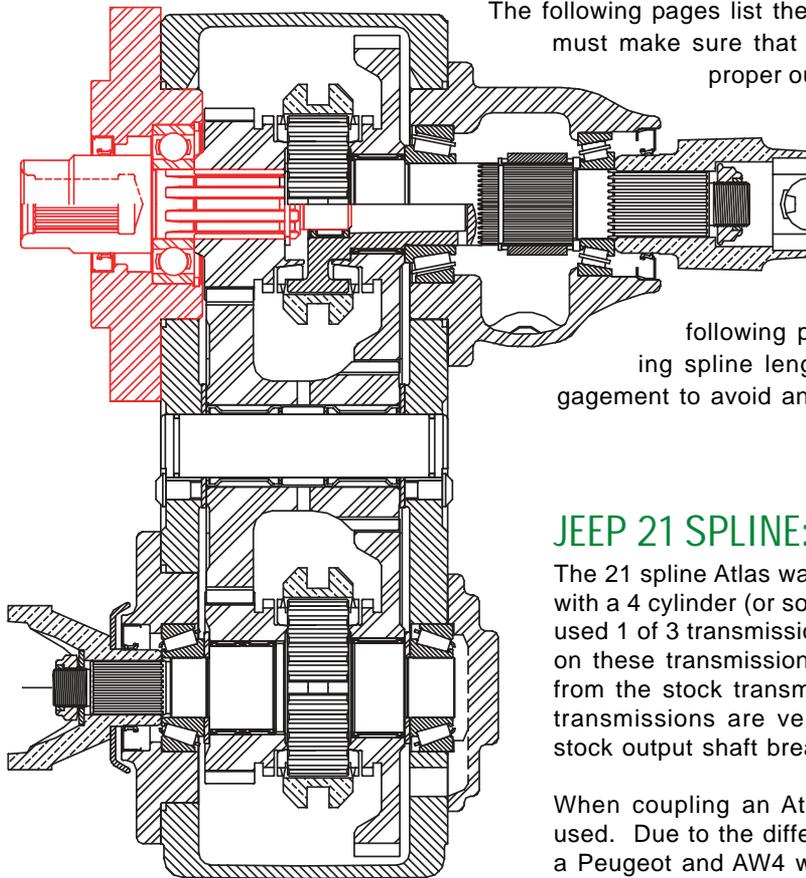
## Divorced Atlas Information

The mount plate included in our kit will give you the rigid mounting location for supporting this gear box to the frame. Prothane bushings and all hardware are included in this kit. It is necessary that you fabricate a support bracket from our transfer case mount to the frame rails of your vehicle. Please be aware that this new mount bracket should be very rigid and should be able to withstand the extreme twisting load that the gearing of the Atlas transfer case creates. Keep in mind that a good amount of frame flex may be generated in severe offroading conditions.



# Atlas Front Input Shaft

The Atlas is designed to fit numerous types of transmissions. The multitude of Atlas inputs are designed to fit to various stock transmission output shaft splines. Depending on the transmission of your choice, the Atlas can be bolted to the transmission using either a stock adapter or one of our transfer case adapter housings. When using a transmission out of a 2WD vehicle or even with some 4WD transmissions, you may be required to install a complete adapter kit which would include a new output shaft. This is because the length of the output shaft or the length of the stock adapter may be too long for your application.



The following pages list the different available input splines for the Atlas. You must make sure that your transmission has the proper bolt pattern and proper output shaft stickout length. **Incorrect output shaft lengths or improper indexing adapters can cause internal damage to the unit, voiding the warranty.** Please read the following information to verify the correct application. The Atlas diagram (left) has a highlighted section in red. This highlighted portion of the Atlas is what is shown under each input spline option on the following pages. These inputs show the recommended mating spline length requirements. Please confirm your spline engagement to avoid any problems.

## JEEP 21 SPLINE:

The 21 spline Atlas was designed to fit Jeeps that were originally equipped with a 4 cylinder (or some 6 cylinders). Jeeps 1987 & up (with a 4 or 6 cyl.) used 1 of 3 transmissions: the AX5, the Peugeot or AW4. The output shaft on these transmissions are either flush or protrude approximately a 1/2" from the stock transmission adapter. **NOTE:** The 21 splines on these transmissions are very small in diameter, and thus we have seen the stock output shaft break on many engine converted vehicles.

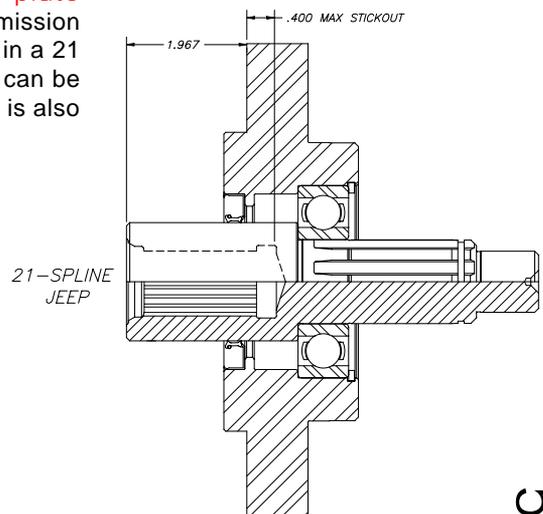
When coupling an Atlas to these transmissions, the factory adapter is used. Due to the different output stickout lengths, vehicles equipped with a Peugeot and AW4 will require a 1" spacer plate to obtain proper spline engagement. In 1997, late model AX5 transmissions were changed to an output shaft that protrudes a 1/2" from the stock tailhousing. Although this

transmission can bolt directly to the Atlas transfer case, we recommend using the 1" spacer plate for transfer case shifter clearance. This spacer plate should only be used on an AX5 that has a 1/2" output shaft stickout. This plate can be obtained *free of charge* when an Atlas is purchased. **Failure to use this plate will cause damage to the Atlas.** The Jeeps with the 21 spline transmission were coupled to only left side drop stock transfer cases. We offer the Atlas in a 21 spline left hand case configuration only. The Atlas 21 spline transfer cases can be ordered in any low gear ratio offered for a 2 speed Atlas. The 4 speed Atlas is also an option for this spline count.

- Left Side Front Driveshaft Atlas 2 Speed: **P/N A21L**
- Left Side Front Driveshaft Atlas 4 Speed: **P/N A4-21L**
- 1" Spacer Adapter: **P/N AS-0404**



AW4 automatic stock transmission adapter



## JEEP & DODGE 23 SPLINE:

### STOCK JEEP TRANSMISSIONS:

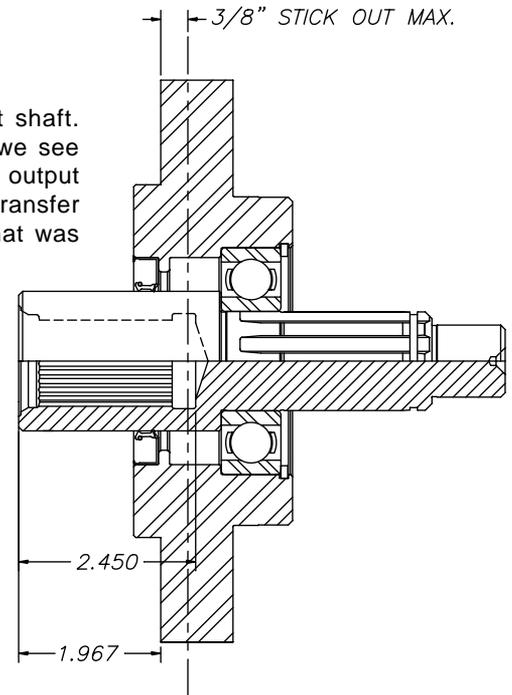
Stock Jeep transmissions 1980 & up with a 6 cylinder or larger engine were normally equipped with a 23 spline output shaft (except Peugeot). Since the Atlas was designed as a Jeep heavy-duty, low-geared transfer case replacement, it will bolt up directly to the stock Jeep transmission tailhousing that is equipped with the 23 spline output shaft. In these year Jeeps, the stock transfer cases used were both a driver's side (left hand drop) and passenger side (right hand drop) front driveshaft. The units listed accommodate both stock transfer case configurations.

Some of the later model Grand Cherokees with the A518, A500 & AW4 transmission will have some spline depth interference. On these applications, you may be required to use our spacer adapter [P/N AS-0404](#). This plate can be obtained free of charge when an Atlas is purchased. **Failure to use this plate (when necessary) will cause damage to the Atlas.**

### STOCK DODGE TRANSMISSIONS:

Most Dodge 4WD transmissions are also equipped with a 23 spline output shaft. The Dodge NV4500 is probably the most popular Dodge transmission that we see coupled to the Atlas. The Dodge 4WD NV4500 (1993-2000) has a 23 spline output shaft and has the correct tailhousing to bolt directly to the 23 spline Atlas transfer case. Dodge also has a heavy-duty version of the NV4500 transmission that was bolted up to a Cummins diesel engine. This transmission, along with the 2001 & newer gas version NV4500 transmission, was equipped with a 29 spline output shaft. We offer an Atlas input spline for these heavy-duty and late model transmissions (See the 29 Spline section for more information). Besides the NV4500, Dodge also used a lighter duty 5-speed called the NV3500 and a few different automatic transmissions. Since these transmissions are not as popular as the NV4500, we do not have a lot of experience coupling the Atlas to them. We don't foresee any major problems with regard to the rotation of the Atlas as long as the transmission is a 4WD model and that it was originally coupled to a New Process 231 or 241 transfer case. We also know that the output shaft is a 23 spline; however, our area of concern is the output shaft length. If bolting an Atlas to the NV3500 or to an automatic, spline length and spline engagement should be checked.

23-SPLINE  
JEEP



### ADAPTED TRANSMISSIONS TO A STOCK JEEP TRANSFER CASE:

The transfer case adapters we manufacture to fit the GM or Ford transmissions in a Jeep are usually designed to retain the stock Jeep transfer case input spline. Since stock 1980 & up Jeeps were normally equipped with a 23 spline input, the adapters we manufacture require you to change the stock transmission output shaft with a modified shaft from us. These modified shafts basically mimic the stock Jeep output splines. If your vehicle was previously converted with a GM or Ford transmission to the stock Jeep transfer case, then the Atlas you need would be a 23 spline unit. There are a few exceptions. On some Dana 300 transfer cases the transfer case input spline has been changed to match the stock transmission output shaft. If you have an adapter that does this, we offer the Atlas with different splined inputs to fit these stock GM and Ford output shafts. In most cases, the Atlas fits up to the same adapter as did the Dana 300.

The Atlas 23 spline transfer cases can be ordered in any low gear ratio offered for a 2 speed Atlas. The 4 speed Atlas is also an option for this spline count.

Left Side Front Driveshaft Atlas 2 Speed: [P/N A23L](#)

Right Side Front Driveshaft Atlas 2 Speed: [P/N A23R](#)

Left Side Front Driveshaft Atlas 4 Speed: [P/N A4-23L](#)

Right Side Front Driveshaft Atlas 4 Speed: [P/N A4-23R](#)

1" Spacer Adapter: [P/N AS-0404](#)

### JEEP 42RLE TRANSMISSION:

This automatic overdrive transmission was used in Jeep Wranglers from 2003 through 2005. We have installed several Atlas transfer cases to this transmission. The rear section of this transmission is the same circular bolt pattern with a 23 spline output. The 23 spline output shaft of this transmission has a short spline length requiring a short input on the Atlas transfer case. The standard length 23 spline input on an Atlas will not work on this transmission.

Left Side Front Driveshaft Atlas 2 Speed: [P/N A23LS](#)

Left Side Front Driveshaft Atlas 4 Speed: [P/N A4-23LS](#)

## JEEP 45RFE TRANSMISSION:

The 45RFE transmission was used in 1999 to 2004 WJ Grand Cherokees with the 4.7 V8 and a NP247 transfer case. This transmission was also used in 2002 & newer Dodge Durangos and Dakotas with a 4.7 V8, and the Jeep KJ (Liberty) 2002 & newer with a 3.7 V6. This transmission had a 1" recessed output shaft from the rear of the transmission. We offer the Atlas transfer case with a longer input shaft to couple to the 45RFE shorter transmission shaft length.

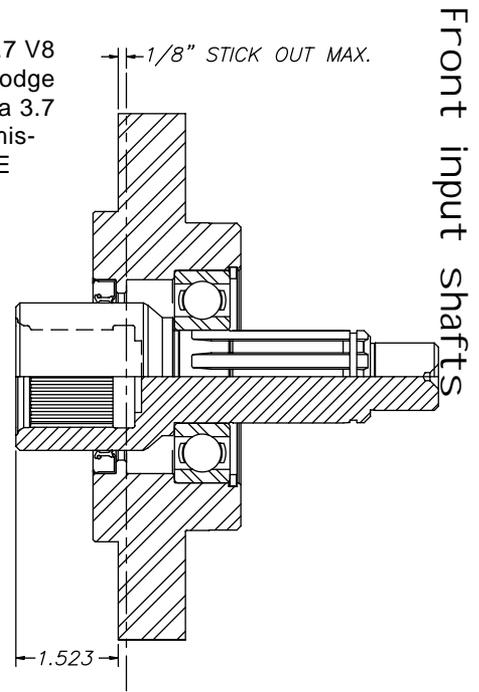
Left Side Front Driveshaft Atlas 2 Speed: [P/N A23LL](#)  
 Left Side Front Driveshaft Atlas 4 Speed: [P/N A4-23LL](#)

## DODGE 29 SPLINE:

The 29 spline Atlas was designed to fit *only* the 4WD Dodge heavy-duty NV4500 transmission and the 2001 & newer gas version NV4500 transmissions. When coupling an Atlas to this transmission, the stock Dodge 4WD tailhousing can be retained. The Dodge tailhousing bolt pattern is shown on the rotation Option #1 found on Page 12.

When using a Atlas left hand drop transfer case, the stock Dodge tailhousing requires the removal of the stock transfer case shifter bosses. The removal of these two bosses provide the necessary Atlas shifter clearance. NOTE: The seal in this stock tailhousing must also be removed because it will interfere with the Atlas input.

Left Side Front Driveshaft Atlas 2 Speed: [P/N A29L](#)      Right Side Front Driveshaft Atlas 2 Speed: [P/N A29R](#)  
 Left Side Front Driveshaft Atlas 4 Speed: [P/N A4-29L](#)      Right Side Front Driveshaft Atlas 4 Speed: [P/N A4-29R](#)



## FORD 25 SPLINE:

The 25 spline Atlas was designed to fit *only* the Bronco IIs, Ford Rangers, and Explorers. The stock transmissions used in these vehicles were normally coupled to a Borg Warner 1350 transfer case. The bolt pattern on the face of the B/W1350 is a 5-bolt pattern, which we mirror on the Atlas transfer case. Fitting an Atlas into these vehicles will require either a body lift or modifications to the stock crossmember. The rotation of the Atlas is identical to stock. The Atlas unit available for these transmissions is as follows:

Left Side Front Driveshaft Atlas 2 Speed: [P/N A25L](#)

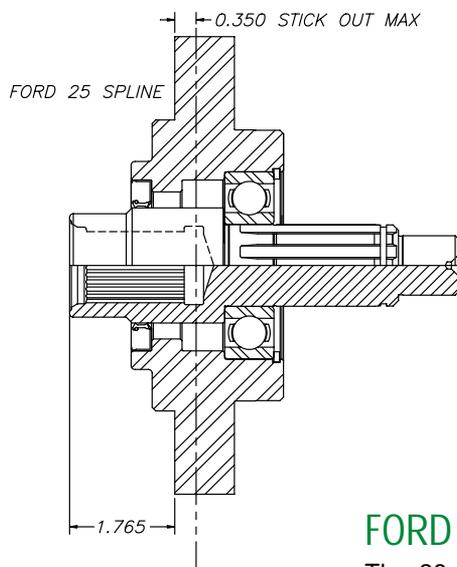


Photo of a stock Ford tailhousing. All Ford Explorers, Rangers, and Bronco IIs have the same bolt pattern and splines when coupled to a 1350 transfer case. The adapters we manufacture for these vehicles to fit the C4 and AOD would also have this same pattern.

## FORD 28 SPLINE:

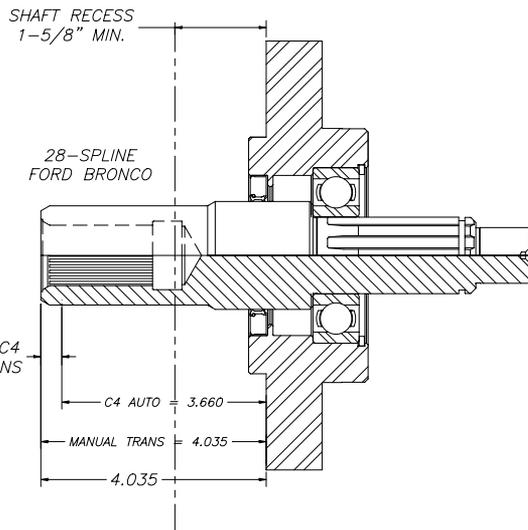
The 28 spline Atlas was designed to fit *only* the 1966-77 Broncos. The stock transmissions used in these vehicles were normally coupled to a Dana 20 transfer case. The bolt pattern on the face of the Dana 20 is a 6-bolt hex pattern, which we mirror on the Atlas transfer case. The rotation options of the Atlas into these vehicles are 42 degrees (which

is stock), 35 degrees (for additional ground clearance), and 28 degrees (requires some internal frame modifications). NOTE: When bolting the Atlas up to an automatic C4 transmission, we offer a shorter Atlas input shaft to avoid spline run-out. When using a NP435 or T18 transmission (with one of our adapter housings), the threaded portion of the transmission output shaft must be removed. The Atlas units available for these transmissions are as follows:

Left Side Front Driveshaft Atlas 2 Speed: [P/N A28L](#)

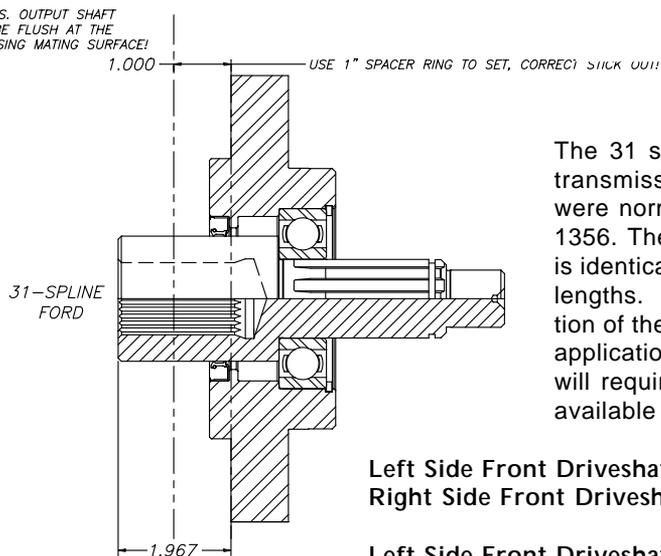
Left Side Front Driveshaft Atlas 2 Speed for the C4 transmission: [P/N A28LS](#)

Front input shafts



REMOVE 0.375" FOR C4 AUTOMATIC APPLICATIONS

THE TRANS. OUTPUT SHAFT SHOULD BE FLUSH AT THE TAIL-HOUSING MATING SURFACE!



### FORD 31 SPLINE:

The 31 spline Atlas was designed to fit the 4WD Full Size Ford transmissions. The stock transmissions used in these vehicles were normally coupled to either a NP205, NP208 or Borg Warner 1356. The bolt pattern on these transmission tailhousing adapters is identical to a stock Jeep. Ford used various output shaft stickout lengths. **Caution** should be used in order to avoid the spline portion of the shaft from "bottoming out" in the Atlas input shaft. Some applications that have an output shaft stickout past the tailhousing will require a 1" spacer adapter, [P/N AS-0404](#). The Atlas units available for these transmissions are as follows:

Left Side Front Driveshaft Atlas 2 Speed: [P/N A31L](#)  
Right Side Front Driveshaft Atlas 2 Speed: [P/N A31R](#)

Left Side Front Driveshaft Atlas 4 Speed: [P/N A4-31L](#)  
Right Side Front Driveshaft Atlas 4 Speed: [P/N A4-31R](#)

### FORD 34 SPLINE:

The 34 spline Atlas was designed to fit the 2004 & newer 5R110 (Torqueshift) transmission. This 4WD transmission has the speed sensor in the transmission tailhousing, so when ordering the Atlas tailhousing a speedometer hole plug is required.

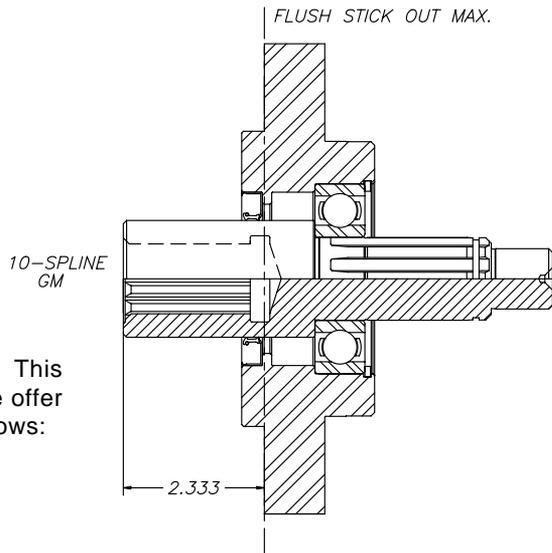
Left Side Front Driveshaft Atlas 2 Speed: [P/N A34L](#)  
Right Side Front Driveshaft Atlas 2 Speed: [P/N A34R](#)

Left Side Front Driveshaft Atlas 4 Speed: [P/N A4-34L](#)  
Right Side Front Driveshaft Atlas 4 Speed: [P/N A4-34R](#)

### GM 10 SPLINE:

The 10 spline Atlas input was designed to fit *only* the 4WD version of the SM465 transmission. This output shaft protrudes approximately 2-1/2" from the rear of the transmission. When coupling an Atlas to this transmission, you will need one of our adapter housings, the SM465 gasket, and fasteners to bolt the casting to the transmission, [P/N 51-9807](#). This adapter housing measures 3-1/2" long and is the shortest adapter that we offer for the SM465. The Atlas units available for this transmission are as follows:

Left Side Front Driveshaft Atlas 2 Speed: [P/N A10L](#)  
Right Side Front Driveshaft Atlas 2 Speed: [P/N A10R](#)



## GM 27 SPLINE:

The 27 spline Atlas was designed for transmissions with a 27 spline output. The TH350, Powerglide, 700R, and 4L60 transmissions are the most common GM transmissions equipped with this 27 spline output. These transmissions have various output shaft stickout lengths depending on the vehicle that the transmission was originally removed from.

Left Side Front Driveshaft Atlas 2 Speed: [P/N A27L](#)

Right Side Front Driveshaft Atlas 2 Speed: [P/N A27R](#)

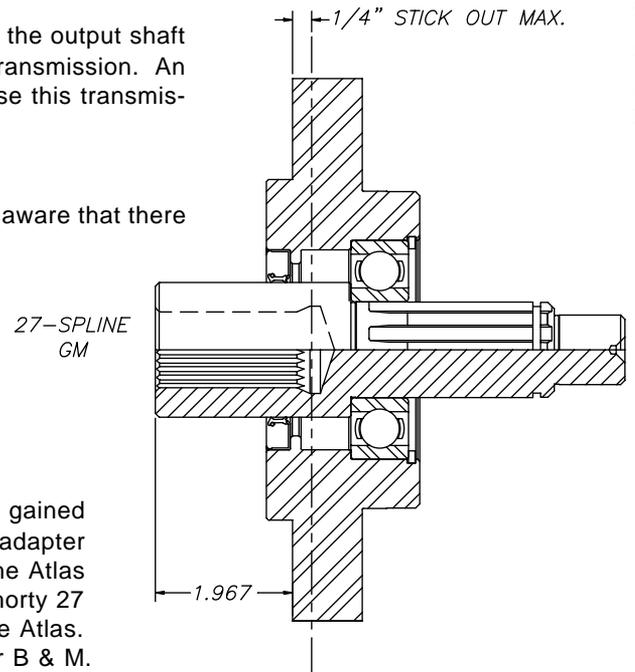
Left Side Front Driveshaft Atlas 4 Speed: [P/N A4-27L](#)

Right Side Front Driveshaft Atlas 4 Speed: [P/N A4-27R](#)

**TH350 4WD:** When obtaining a TH350 out of a 4WD vehicle, the output shaft will protrude approximately 1" from the rear square flange of the transmission. An adapter housing ([P/N AS-6800](#)) can be purchased from us to use this transmission with this stock 27 spline 4WD output shaft.

**TH350 2WD:** When obtaining a TH350 out a 2WD vehicle, be aware that there are three different stickout lengths: 6, 9 & 12 inches. These transmissions would be better suited to either switch to a 4WD TH350 output shaft and use the adapter housing listed above, or use [P/N 50-6300](#) (3.6" long), or [50-6802](#) (1.5" long). Both of these kits require the installation of a new output shaft which switches the output spline to a 23 spline (See the 23 Spline section).

**POWERGLIDE:** The Powerglide automatic transmission has gained popularity in rock crawling vehicles. We offer a new cast aluminum adapter and crossmember mount designed to couple the Powerglide to the Atlas transfer case ([Part No. 50-9200](#)). The adapter kit requires a shorty 27 spline output shaft to be use when coupling the Powerglide to the Atlas. Two sources to obtain this shaft would be Hughes Performance or B & M.



**700R & 4L60 4WD:** When obtaining a 700R or 4L60 out of a 4WD vehicle, the output shaft should have a stickout length of 2.75" from the rear square flange of the transmission. Adapter housing [P/N AS-9111](#) (2.5" long) can be purchased from us to use these transmissions with this stock 27 spline 4WD output shaft.

**700R & 4L60 2WD:** When obtaining a 700R out of a 2WD vehicle, the stock output shaft will be too long. These transmissions would be better suited to either switch to a 4WD 700R output shaft and use the adapter housing listed above, or use [Part No. 50-6303](#) (3.6" long), or [50-9102](#) (1.5" long). Both of these kits require the installation of a new output shaft which switches the output spline to a 23 spline (See the 23 Spline section).

**4L60E 4WD w/non-removable Bhsg:** When obtaining a 4L60E out of a 4WD vehicle, the output shaft stickout length should be 2.75" from the rear square flange of the transmission. Adapter housing [P/N AS-9111](#) (2.5" long) can be purchased from us to use this transmission with this stock 27 spline 4WD output shaft. **Note: On these transmissions, you must use a reductor kit, [Part No. 716073](#).**

**4L60E 2WD & 4WD w/non-removable Bhsg:** When obtaining a 4L60E out a 2WD vehicle, the stock output shaft will be too long; or if you have a 4WD transmission and would like to use an adapter housing with the reductor as part of the kit, you can purchase [Part No. 50-0404](#) (4.6" long). This kit requires the installation of a new output shaft which switches the output spline to a 23 spline (See the 23 Spline section). This kit also incorporates a reductor ring and sensor for proper transmission operation.

**4L60E 4WD w/Removable BHSG:** When obtaining a 4L60E out of a 4WD vehicle, the output shaft stickout length should be 4.438" from the rear hex bolt flange of the transmission. We offer [P/N 50-0405](#) which adapts the hex bolt pattern to a square bolt pattern. This adapter also provides a reductor sensor and clamp on reductor ring. Adapter housing

Part No. AS-9111 (2.5" long) can be purchased from us to use this transmission with the stock 27 spline 4WD output shaft.

**4L60E 2WD w/Removable BHSG:** When obtaining a 4L60E out of a 2WD vehicle, the stock output shaft will be too long. To use this transmission, you will be required to use Part No. 50-0405 which adapts the hex bolt pattern to a square bolt pattern. This adapter also provides a reluctor sensor and clamp on reluctor ring. To couple this tranny to the Atlas transfer case, you will then need adapter P/N 50-9102 (1.5" long). This kit requires the installation of a new output shaft, switching the output shaft spline to a 23 spline (See the 23 Spline section).

**STOCK GM ADAPTER:** If using a stock 700R or 4L60E 4WD adapter housing, you will have the correct index diameter; however, this stock adapter will require some modifications. GM used a different bolt pattern rotation on their adapter housing. One or two holes on the housing (depending on a right or left hand drop transfer case) must be re-drilled to match the Atlas bolt pattern. The other problem encountered was the rotation that this housing set the Atlas. Refer to rotation Option #4. If a different rotation is desired than what is shown, the stock adapter housing would have to be completely re-drilled. This could then present casting interference problems.

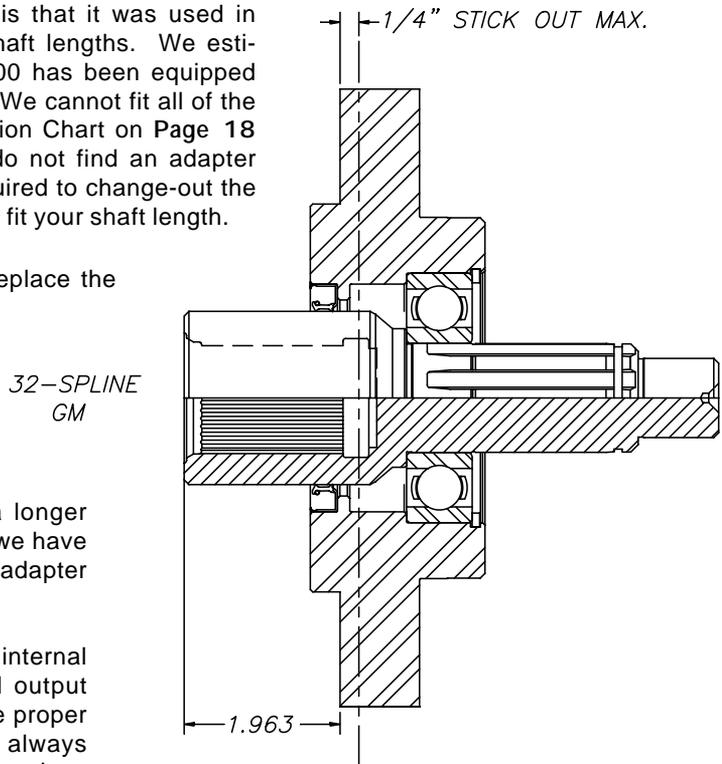
## GM 32 SPLINE:

**TH400:** The 32 spline Atlas was primarily designed for the GM TH400 transmission with a 32 spline output shaft. One of the biggest problems with the TH400 transmission is that it was used in numerous vehicles, which required numerous output shaft lengths. We estimate there are 7 different output lengths that the TH400 has been equipped with over the years in both 2WD and 4WD applications. We cannot fit all of the stock output shaft lengths; however, the Adapter Selection Chart on Page 18 will assist you with the adapters we do offer. If you do not find an adapter housing to fit the output shaft you have, you may be required to change-out the output shaft or use one of the different spacer adapters to fit your shaft length.

**4L80E:** This transmission was designed by GM to replace the GM TH400 transmission. Like the TH400, the 4L80E has a 32 spline output shaft. The major difference of the 4L80E is that the transmission index diameter is different than the TH400. We have seen 5 different output shaft lengths that were used in the 4L80E transmission. The Selection Chart on Page 18 lists the adapter plates that would be used only with the 4WD 4L80E transmission. If you have a 4L80E that has a longer output shaft stickout and the length matches an adapter we have listed under the TH400 section, we can modify a TH400 adapter to work on the 4L80E transmission.

The 4L80E transmission is normally equipped with an internal reluctor ring on both the transmission input shaft and output shaft. The computer takes both of these readings for the proper shifting and operation of this transmission. We have always ignored the reluctor ring requirement for this transmission since it is internally regulated. We have now learned that the rear reluctor ring is not always installed into the transmission. The basic rule of thumb is 4WD transmissions up to 1996 should have a rear reluctor ring in the main transmission case. All 2WD transmissions should have the rear reluctor in the main transmission case. The 1997 & newer 4WD 4L80E transmissions have a sensor provision; however, the reluctor ring in the transmission is left out. Since this transmission is expensive to rebuild and have a reluctor installed, we now offer a reluctor ring on the adapter housing. The reluctor on the adapter (P/N 50-6409) will always provide a 1-to-1 reading on the output even if the transfer case is in low gear. The VSS reluctor in the tailhousing is also an option, but it would require a low range switch to be integrated into the computer system. The VSS tailhousing is, therefore, not recommended.

Note: The information on years and models of the 4L80E transmission mentioned in the above section was obtained from various sources. You should always verify what your transmission is equipped with before beginning a conversion, especially with the 4L80E transmission.



**GM NV4500 4WD:** The GM NV4500 4WD transmission can also be coupled to the Atlas. The stock GM adapter housing has the right index diameter for the transfer case; however, the bolt pattern is incorrect. We have found it easier to use a stock Dodge tailhousing or our replacement Dodge housing, [P/N 51-0205](#). Either one of the 6.300" long adapters coupled with our 1-5/8" spacer adapter, [P/N 51-0220](#), allows you to use the stock GM 32 spline output shaft.

**STOCK GM ADAPTER:** If using a stock TH400, 4L80E or NV4500 4WD adapter housing, you will have the correct index diameter; however, this stock adapter will require some modifications. GM used a different bolt pattern rotation on their adapter housing. One or two holes on the housing (depending on a right or left hand drop transfer case) must be re-drilled to match the Atlas bolt pattern. The other problem encountered was the rotation that this housing set the Atlas. Refer to rotation Option #4. If a different rotation is desired than what is shown, the stock adapter housing would have to be completely re-drilled. This would then present casting interference problems.

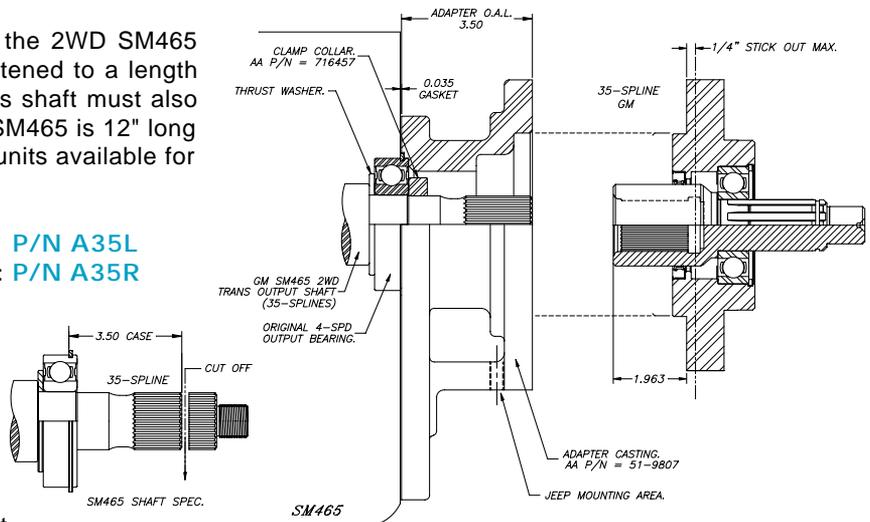
The Atlas units available for all these transmissions are as follows:

- Left Side Front Driveshaft Atlas 2 Speed: [P/N A32L](#)      Right Side Front Driveshaft Atlas 2 Speed: [P/N A32R](#)
- Left Side Front Driveshaft Atlas 4 Speed: [P/N A4-32L](#)      Right Side Front Driveshaft Atlas 4 Speed: [P/N A4-32R](#)

### GM 35 SPLINE:

The 35 spline Atlas was designed to fit *only* the 2WD SM465 transmission. This output shaft must be shortened to a length of 3.5" from the rear of the transmission. This shaft must also be locked into position with a set collar. The SM465 is 12" long and offers a 6.58:1 1st. gear ratio. The Atlas units available for this transmission are as follows:

- Left Side Front Driveshaft Atlas 2 Speed: [P/N A35L](#)
- Right Side Front Driveshaft Atlas 2 Speed: [P/N A35R](#)



### DIVORCED ATLAS:

The "Divorce Mounted Atlas Transfer Case" has been created to give you all of the great gearing options, parts availability, and strength features to vehicles that require a remote mounted transfer case. Early vehicles sometimes ran this type independent transfer case. It was attached to the powertrain by a small drive shaft coming from the transmission. This transfer case functioned identical to others and had a front and rear driveshaft. The entire transfer case assembly was hung from the frame on a crossmember type mount. The Divorced Atlas can be built as either a right or left drop unit. The shifters and crossmember are sold as a separate kit to fit the transfer case. When ordering yokes for this unit, 3 are required.

- Left Side Front Driveshaft Atlas 2 Speed: [P/N AD32L](#)
- Right Side Front Driveshaft Atlas 2 Speed: [P/N AD32R](#)

### NISSAN 32 SPLINE:

The Nissan Titan and Frontier are two of the newest applications for the Atlas transfer case. The Atlas fits the automatic transmission and couples directly to the Nissan output shaft. The Nissan transmission does require an adapter plate to bolt on the Atlas (see the *Adapter Selection Chart*).

- Left Side Front Driveshaft Atlas 2 Speed: [P/N A32LNT](#)

# Atlas Rotation Options

When coupling an Atlas to one of the various stock transmissions or to one of our adapter housings, you will have a number of choices as to the degree of rotations. The drawings that follow represent the stock Jeep and Advance Adapters tailhousing bolt patterns. Once you have identified the bolt pattern on your adapter housing, you can then select from the degree of rotation options listed along side your tailhousing bolt pattern. These degree of rotations are approximate. The rotation on your application may vary 1 to 2 degrees.

We also get quite a few requests for installing the Atlas at a zero degree (or flat) rotation. We offer this option in both a right and left hand case application. This option requires us to machine the case with a different bolt pattern for the Atlas input ring. This case option should only be used if your goal is a flat rotation.

**P/N 301100LF** - Left drop flat rotation

**P/N 301101RF** - Right drop flat rotation

If a flat rotation case is not requested, the Atlas is assembled with the standard case configuration. The rotation options are as follows:



Right Hand Drop Configuration



Left Hand Drop Configuration

## OPTION #1

This stock transmission bolt pattern is found on transmissions that were originally bolted to a Dana 300 transfer case.

This stock transmission bolt pattern is also found on some Jeep transmissions when bolted to a New Process transfer case that had a stock rotation of 23 degrees.

### Left Side Front Driveshaft

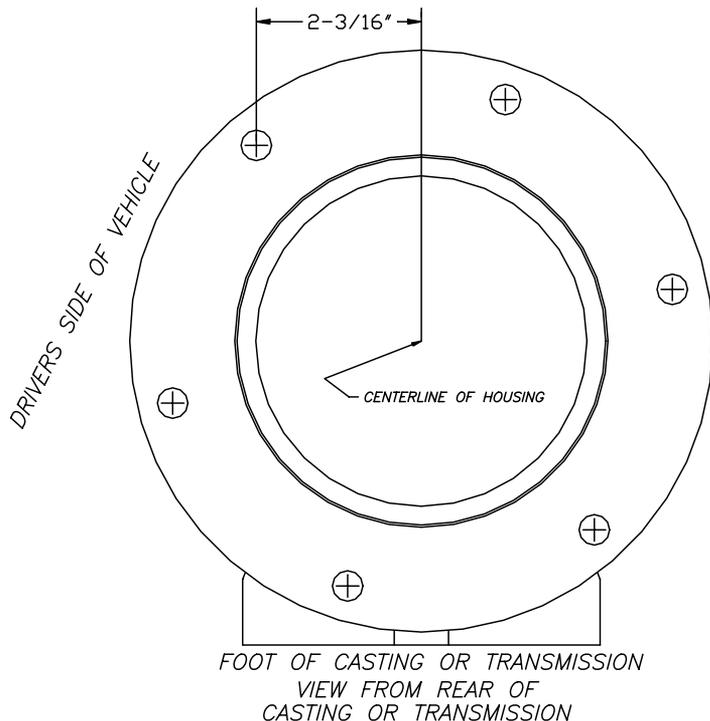
#### Possible Rotations

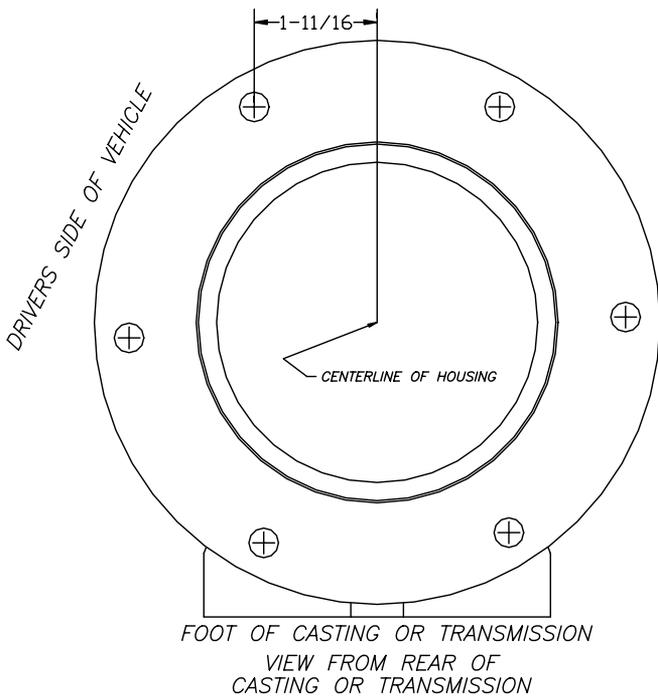
- 17 degrees
- 24 degrees
- 31 degrees
- 38 degrees

### Right Side Front Driveshaft

#### Possible Rotations

- 4 degrees
- 11 degrees
- 18 degrees
- 25 degrees





### OPTION #2

This stock transmission bolt pattern is found on some Jeep transmissions when bolted to a New Process transfer case that had a stock rotation of 13 degrees.

#### Left Side Front Driveshaft

##### Possible Rotations

- 7 degrees
- 14 degrees
- 21 degrees
- 28 degrees

#### Right Side Front Driveshaft

##### Possible Rotations

- 14 degrees
- 21 degrees
- 28 degrees
- 35 degrees

### OPTION #3

This bolt pattern is found on *most* of our adapter housings. If you are currently using one of our castings equipped with the dual bolt pattern, you will have the following rotation options:

#### Left Side Front Driveshaft

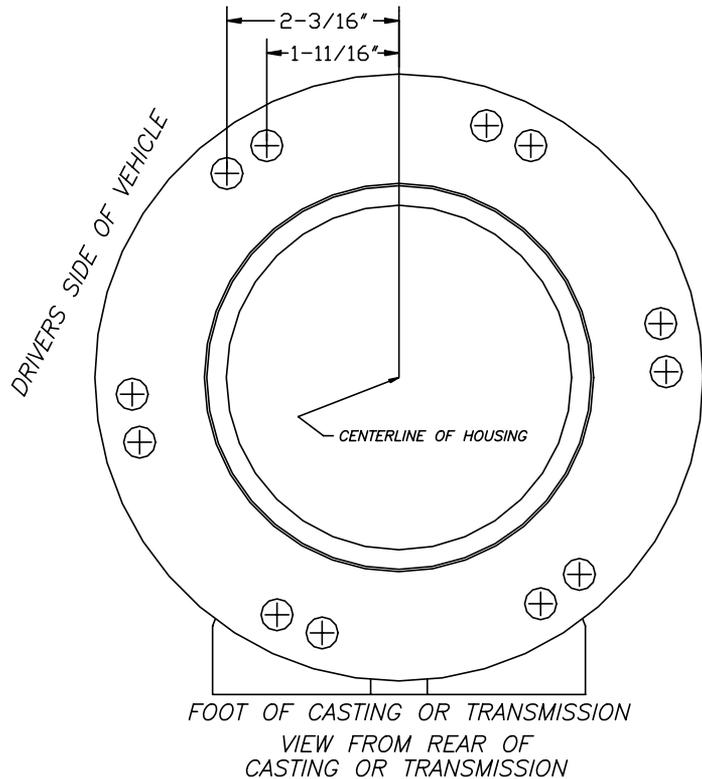
##### Possible Rotations

- 7 degrees
- 14 degrees
- 17 degrees
- 21 degrees
- 24 degrees
- 28 degrees
- 31 degrees
- 38 degrees

#### Right Side Front Driveshaft

##### Possible Rotations

- 4 degrees
- 11 degrees
- 14 degrees
- 18 degrees
- 21 degrees
- 25 degrees
- 28 degrees
- 35 degrees



### OPTION #4

#### Stock Chevy Tailhousings

Possible Right Front Driveshaft Rotations  
(without re-drilling housing)

- 5 degrees

#### Stock Chevy Tailhousings

Possible Left Front Driveshaft Rotations  
(without re-drilling housing)

- 37 degrees

# Tailhousing Options

## REAR TAILHOUSING OPTION:

### Standard Atlas Tailhousing

The standard Atlas transfer case comes with a rear tailhousing that accepts a stock Jeep speedometer from Jeep vehicles 1987 & newer. Atlas units ordered for earlier Jeeps or other vehicles come equipped with a mechanical drive speedometer housing. This housing is the same as an early style Jeep. To connect to this housing, a special cable fitting may be necessary. The speedometer provision on the Atlas also allows you to calibrate your speedometer for tire and gearing changes. The chart on Page 28 lists these options. The Atlas 2 speed tailhousing is [P/N ALT32](#) and the Atlas 4 speed tailhousing is [P/N A4LT32](#). If a speedometer is not needed, the speedometer access hole can be plugged by using [P/N 300621](#).



### Atlas Short Tailhousing (No Speedometer)

Since rock crawling events have become steadily & increasingly popular, so have the requests for additional Atlas upgrades. The rock crawling industry has ventured into shorter drivetrains and light weight rear engines combinations. With these newer combinations, we were prompted to build a shorter Atlas tailhousing. This new tailhousing is 2" shorter than the standard Atlas tailhousing. It is designed for trail or competition use **only** since it does not provide provisions for any type of speedometer. This new tailhousing can be retrofitted to any Atlas case by ordering [P/N 301499R](#). If you're ordering a new case, this item can be included on a new Atlas 2 speed by using [P/N AST32](#); and if you're ordering a new Atlas 4 speed, the tailhousing part number is [P/N A4ST32](#).

### VSS Tailhousing (No Speedometer)

Vehicle speed sensors (VSS) are mandatory for computer controlled engines and transmissions. The VSS sends information to the vehicle computer system for both engine and automatic transmission operations. Early Chevys up to 1992 used a computer that required a D.C. square wave input into the computer. These early computer system requirements could be fed by either a special speedometer drive or a reluctor ring. Chevys 1993 & newer required a A.C. sine wave. This sine wave creates a voltage that increases with vehicle speed. The only way that this voltage can be generated is through a reluctor ring mounted to either the transmission or transfer case shafts. This information was obtained from various sources, so please verify your requirements before doing any vehicle modifications.

Our tailhousing allows a sensor and reluctor to be installed in place of the speedometer drive. Our Atlas tailhousing had to have some slight pattern changes to incorporate this new feature. To add this option to an existing transfer case would require the purchase of a new tailhousing. This new option was primarily developed so that the Atlas could be installed into a newer Chevy 4WD vehicle. When ordering this tailhousing with an Atlas, we also include a modified shift control unit that is drilled and tapped to accept a low range switch. This allows the Chevy computer to re-calibrate the output shaft signal when in low range. Note: The Chevy computer may require some wiring and computer program changes for the different low ratios.

On Vehicles with computer controlled engine swaps, this tailhousing kit can provide the proper VSS signal when using a manual transmission. Vehicles with a computer controlled engine swap and an automatic transmission requiring a VSS *should not* use this tailhousing option *unless* a low range switch is installed and the computer program is modified. When installing this type of engine and automatic transmission combination, we highly recommend a reluctor ring location in the adapter or the transmission. This will give the engine computer system a correct 1-to-1 reading in or out of low range.

# Front Output Options:



The 32 spline upgrade can be identified by a 4 bolt front output seal retainer

The Atlas was originally designed with a 26 spline front output shaft. As the Atlas gained popularity and a rock solid reputation for strength, the owners of rigs with high horse-powered engines, long wheelbase, larger tires, and vehicles with higher G.V.W. ratings began requesting this transfer case for offroad performance and reliability. A longer wheelbase or higher G.V.W. vehicle classification simply means less weight transfer toward the rear of the vehicle under operating load; therefore, more strength demand is put upon the front output shaft. The large tires and higher horse-powered engines also put more stress on the front output shaft when in 4WD. A larger 32 spline front output shaft, capable of handling higher load ratings, is the solution.

We now require you to specify the spline count of your Atlas transfer case, either a 26 spline or 32 spline front output shaft. The 26 spline was designed for vehicles with stock engines, a G.V.W. of 5,000 lbs., and up to a 35" tire size. The 32 spline front output should be used if your vehicle requirements exceed this rule of thumb listed above. The larger 32 spline shaft will accept larger and stronger front yoke assemblies commonly found in larger class vehicles (half-ton to one ton trucks). The choice between the two splines can also be affected by your driving habits. The 26 spline shaft in a stock vehicle can break if the vehicle is abused or power is applied while the tires are bound up while offroading.

- 26 Spline Front Output Shaft Kit: [AF26](#)**      26 spline front output
- 32 Spline Front Output Shaft Kit: [AF32](#)**      32 spline front output

We also offer a kit to retrofit an Atlas from a 26 spline to a 32 spline front output. This upgrade kit can also be installed into any previously built Atlas. Instructions are provided in this manual for mechanically inclined individuals to perform this upgrade. See Pages 51-54 for these instructions.

- 32 Spline Upgrade Kits for [used](#) Atlas Units: [ARF32](#)**      32 spline front output.  
(Yoke is sold separately)



The VSS tailhousing kits we offer are as follows: [P/N AVT32L](#) is for left hand cases and [P/N AVT32R](#) is for right hand cases. These items can be installed on a new Atlas at no additional charge.

If you have installed a newer GM engine into a Jeep with a manual transmission, you may want to retain the Jeep speedometer but the GM engine needs the 40 pulse reluctor to function correctly. The standard Atlas transfer case tailhousing should be retained and one of our TruPulse kits should be used. We offer a reluctor kit that fits on all of our Atlas tail housings. This kit is an externally mounted unit that provides the Tru 40 Pulse required for the computer system. The reluctor ring gets mounted to the transfer case yoke. The kit is offered in several yoke styles. Note: These kits will not work with a flange yoke.

[P/N 50-5040](#) is a 1310 non C.V.

[P/N 50-5042](#) is a 1350 non C.V.

[P/N 50-5041](#) is a 1310 C.V.

[P/N 50-5043](#) is a 1410 non C.V.

## Speedometer Options

The Atlas long tailhousing is the only housing that offers a speedometer option. The Atlas long tailhousing is designed to fit a stock Jeep (1987 & up) mechanical driven speedometer housings. These housings generate a pulse that operate the speedometer. Vehicles requiring a cable connection for the speedometer can include [P/N 301506](#) as part of the Atlas order. This speedometer housing is from a 1983 to 1986 Jeep CJ. If your stock cable does not fit this speedometer housing or if you require additional speedometer connections, then we recommend that you contact Nevada Speedometer at (775)358-7422. We also offer a plug for the tailhousing. Some applications don't require any speedometer connections. If this is what you need we can simply block the speedometer provision with [P/N 300621](#).

[P/N 301506](#) Speedometer housing

[P/N 300621](#) Speedometer hole plug

# Yoke Options And Interchangeable Yokes

With the Atlas transfer case being such a diverse case fitting into such a wide variety of vehicles, naturally we needed a variety of available transfer case yokes. The yokes we offer are for the 26 spline front output shaft and the 32 spline front and rear outputs shafts. The yokes that follow are listed in 3 different ways: 1st column is when ordering a new Atlas; 2nd column is when you're ordering a replacement yoke for an Atlas which would include a new seal, seal washer, and nut; and the 3rd column is just the yoke by itself. The last two columns include our seal number plus the Chicago Rawhide seal number.

## ATLAS YOKE OPTIONS:

Yoke Series & Spline	Yoke P/N's for A New Atlas:	Replacement Atlas Yoke P/N's:	Individual Yokes:	AA Seal P/N's	C/R Seal P/N's
<b>Front Yokes 26 Spline:</b>		(INCL. SEAL, NUT, & WASHER)			
1310 series (C.V.)	P/N A1310CV26	P/N AY1310CV26	P/N 300481	P/N 300501	15635
1310 series (non-C.V.)	P/N A1310-26	P/N AY1310-26	P/N 300477	P/N 300501	15635
<b>Front &amp; Rear Yokes 32 Spline:</b>					
1310 series (C.V.)	P/N A1310CV	P/N AY1310CV	P/N 300475	P/N 300502	18817
1330 series (C.V.)	P/N A1330CV	P/N AY1330CV	P/N 300369	P/N 300502	18817
1310 series (non-C.V.)	P/N A1310	P/N AY1310	P/N 716295	P/N 300473	21164
1350 series (non-C.V.)	P/N A1350	P/N AY1350	P/N 300472	P/N 300473	21164
1410 series (non-C.V.)	P/N A1410	P/N AY1410	P/N 300483	P/N 300473	21164
<b>Flange Yokes 32 Spline</b>					
1310/1330/1350 series (CV & non-C.V.)	P/N AF1300	P/N AFY1300	P/N 300470	P/N 300473	21164
1410 series (non-C.V.)	P/N AF1410	P/N AFY1410	P/N 300471	P/N 300473	21164

Companion yokes for the flange yokes listed above -

1310, 1330 & 1350 C.V. and non-C.V. flange yoke. Spicer companion yoke numbers are as follows: (1310 C.V., P/N 211229x), (1310 non-C.V., P/N 2-2-939), (1330 C.V. - P/N 211631x), (1330 non-C.V., P/N 2-2-1369), (1350 C.V., P/N 212024x), (1350 non-C.V., P/N 3-2-1579).

1410 non C.V. flange yoke. Spicer companion yoke number is 3-2-439 (1410 non-C.V.)

**Yoke Modifications:** Changing the style of yokes on the Atlas transfer case may require your new yoke to be modified. When installed on an Atlas, the yoke will load up against a tapered roller bearing. Some yokes require a chamfer to be machined to clearance the cage of this bearing. The yoke drawing shows the required machining on these yokes.

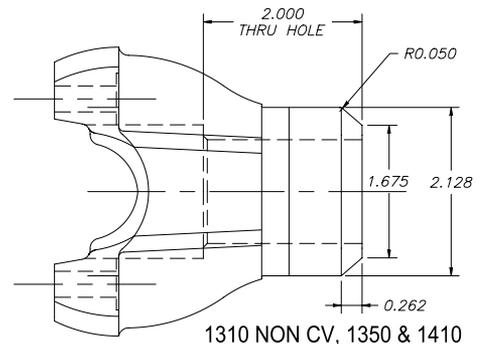
## OPTIONAL YOKEs THAT WE DO NOT STOCK -

Front Yokes for 26 Spline shaft:

- 1330 series (non-C.V.) Spicer P/N 2-4-3571 & C/R # 15635
- 1350 series (non-C.V.) Spicer P/N 3-4-5751 & C/R # 15635
- (There are no C.V. yokes available on these series)

Front & Rear Yokes for 32 Spline shafts:

- 1330 series (non-C.V.) Spicer P/N 2-4-5521 & C/R # 21164



**NOTE:** If you replace the front 26 spline yoke with any of the yokes above, the nut that retains the yoke has a torque specification of 130-135 ft./lbs. When replacing the front or rear 32 spline yoke with any of the yokes listed above, the nut that retains the yoke has a torque specifications of 150-155 ft./lbs.



# Shifter Options

We have designed several different shifters to fit various vehicle applications. If your specific vehicle application is not listed, a universal right or left hand shifter should be used. Areas of consideration on any installation are vehicle console and floorboard clearances. These shifters have been designed mainly around stock vehicles. Vehicles with body lifts greater than 1" may require more than the usual modifications for proper fit of the shift handles. All twin stick shifters, with the exception of the cable shifter, are included at no additional cost when an Atlas is purchased.

## SHIFTER SOLD WITH AN ATLAS

<b>P/N 303000L</b>	5.5" Left Universal Atlas shifter	<b>P/N 303004L</b>	Bronco Atlas shifter
<b>P/N 303001R</b>	5.5" Right Universal Atlas shifter	<b>P/N 303005L</b>	ZJ 6" Left Atlas shifter
<b>P/N 303002L</b>	TJ Automatic Atlas shifter	<b>P/N 303006L</b>	Explorer/Bronco II shifter
<b>P/N 303002U</b>	TJ Universal Atlas shifter	<b>P/N 303007L</b>	XJ AW4 Atlas shifter
<b>P/N 303003L</b>	TJ AX15 Atlas shifter	<b>P/N 303009</b>	Cable Shifter (additional cost of <b>\$145.00</b> )

## ATLAS SHIFTER SOLD SEPARATELY

<b>P/N 303000LA</b>	5.5" Left Universal Atlas shifter	<b>P/N 303004LA</b>	Bronco Atlas shifter
<b>P/N 303001RA</b>	5.5" Right Universal Atlas shifter	<b>P/N 303005LA</b>	ZJ 6" Left Atlas shifter
<b>P/N 303002LA</b>	TJ Automatic Atlas shifter	<b>P/N 303006LA</b>	Explorer/Bronco II shifter
<b>P/N 303002UA</b>	TJ Universal Atlas shifter	<b>P/N 303007LA</b>	XJ AW4 Atlas shifter
<b>P/N 303003LA</b>	TJ AX15 Atlas shifter	<b>P/N 303009A</b>	Cable Shifter

Atlas shifters sold separately are **\$130.00** and the cable shifter is **\$275.00**

## DIVORCED ATLAS SHIFTER & SUPPORT

<b>P/N 303025L</b>	Left drop Divorced case shifter and support mount	<b>\$325.00</b>
<b>P/N 303026R</b>	Right drop Divorced case shifter and support mount	<b>\$325.00</b>

## ATLAS SHIFTER CONTROLS

The Atlas is used in a wide variety of applications. We are seeing more rear engine applications now than ever before. One problem with a rear engine application is that the rear tailhousing of the Atlas is now facing the front of the vehicle. When the Atlas is shifted in 2WD high, the power is distributed to the front axle - which at higher speeds is hard to control the vehicle. Our solution to this problem is to change the shifter control on the Atlas case. This allows the Atlas to be shifted into 2WD high putting the power to the front output shaft of the Atlas which is connected to the rear axle. You still have all of the same shifter options as you do with any stock Atlas case.

- P/N 301510** - Left drop shifter (fits right drop case)
- P/N 301511** - Right drop shifter (fits left drop case)

## Atlas Shifter Knobs Option:

The Atlas twin stick shifter kit comes with two standard black knobs. We also offer billet aluminum knobs in two heights. **P/N 303150** is 2-3/4" tall and **P/N 303151** is 3-3/4" tall. Either set sells for **\$55.00**.



# Atlas Adapter Selection Chart

The information listed below is to aid in the selection of the proper Atlas transfer case for the transmission you've selected. On certain transmission applications, we've listed a couple of options when coupling the transmission to the transfer case. The different options usually come about from different adapter lengths, giving you the choice for a longer or shorter drivetrain. With the diversity of adapters we offer, we could actually offer up to 5 or 6 ways to couple some of the different transmissions to the 10 different Atlas input shafts; however, we are trying to simplify the choices and applications. This chart along with the Atlas input spline information listed on the preceding pages should help with your Atlas transfer case selection.

ATLAS TRANSFER CASE ADAPTER SELECTION CHART FOR GM, FORD, JEEP & DODGE MANUAL TRANSMISSIONS	ADAPTER KIT, ADAPTER HOUSING OR STOCK HOUSING	ATLAS INPUT SPLINE	ATLAS TRANSFER CASE ADAPTER SELECTION CHART FOR GM, FORD, JEEP & DODGE AUTOMATIC TRANSMISSIONS	ADAPTER KIT, ADAPTER HOUSING OR STOCK HOUSING	ATLAS INPUT SPLINE
GM SM420 4 SPEED <i>10.5" CASE LENGTH</i>	50-9702 (2) <i>5.25" ADAP.</i>	23	GM TH350 2WD TRANS. <i>21.5" CASE LENGTH</i>	50-6300 (2,3) 50-6802 (3)	23 23
GM SM465 4WD 10 SPL. <i>12" CASE LENGTH</i>	51-9807 (7) <i>3.5" ADAPTER</i>	10	GM TH350 4WD TRANS. <i>21.5" CASE LENGTH</i>	50-6304 (2) AS-6800 (5)	23 27
GM SM465 2WD 35 SPL. <i>12" CASE LENGTH (NOTE 9)</i>	51-9807 (4,7) <i>3.5" ADAPTER</i>	35	GM TH400 2WD TRANS. <i>SHAFT STICKOUT OF 5" (NOTE 9)</i>	51-6400 (4)	32
FORD T & C 4 SPEED O.D. <i>10.25" CASE LENGTH (4WD trans)</i>	STOCK (5,8)	31 OR 28	GM TH400 4WD TRANS. <i>SHAFT STICKOUT OF 1.5" (NOTE 9)</i>	AS-6401 (5)	32
FORD & JEEP T98 4 SPEED <i>11.87" CASE LENGTH</i>	50-7503 (3,7) <i>3.25" ADAP.</i>	23	GM TH400 4WD TRANS. <i>SHAFT STICKOUT OF 2.5" (NOTE 9)</i>	AS-6401 & AS-0404 (5)	32
JEEP T18 4 SPEED <i>11.87" CASE LENGTH</i>	50-7502 (3,7) <i>3.25" ADAP.</i>	23	GM 4L80 & 4L80E 4SP TRANS. <i>USE GM 4WD SHAFT (NOTE 9)</i>	51-6408 & 50-6409 (5)	32
FORD T18 4 SPEED <i>11.87" CASE LENGTH</i>	50-7500 (3,8,7) <i>3.25" ADAP.</i>	23	GM 700R / 4L60 O/D 4 SPEED <i>23.375" CASE LENGTH 2WD TRANS</i>	50-9102 (3)	23
FORD T19 4 SPEED <i>11.87" CASE LENGTH</i>	50-6501 (3,8,7) <i>3.25" ADAP.</i>	23	GM 700R / 4L60 O/D 4 SPEED <i>23.375" CASE 4WD TRANS</i>	AS-9111 (5)	27
FORD NP435 4 SPEED <i>10.87" CASE LENGTH</i>	50-3801 (3,8,7) <i>4.25" ADAP.</i>	23	GM 4L60E 2WD & 4WD <i>23.375" CASE LENGTH</i>	50-0404 (3)	23
1980 to 1986 STOCK JEEP TRANSMISSIONS	STOCK ADAPTER	23	GM 4L60E 4WD TRANS. <i>23.375" CASE LENGTH</i>	AS-9111 (5,10)	27
1987 & NEWER STOCK JEEP TRANS 21 SPL. OR 23 SPL.	STOCK (7) ADAPTER	21 OR 23	GM 4L60E 2WD <i>W / REMOVABLE BELLHOUSING</i>	50-0405 & 50-9102 (3)	23
GM NV4500 4WD 32 SPL. <i>12.375" CASE LENGTH</i>	51-0205 (5) 51-0220	32	GM 4L60E 4WD TRANS. <i>W / REMOVABLE BELLHOUSING</i>	50-0405 & AS-9111	27
DODGE NV4500 4WD 23 SPL. <i>12.375 CASE LENGTH</i>	STOCK (5,7) <i>6.3" ADAPTER</i>	23	FORD C4 3 SPEED TRANS. <i>REPLACING A BRONCO DANA 20</i>	STOCK (5,8)	28
DODGE NV4500 4WD 29 SPL. <i>2001 TRANS</i>	STOCK (5,7) <i>6.3" ADAPTER</i>	29	FORD C4 3 SPEED TRANS. <i>ALL OTHER VEHICLES</i>	50-8100 (3)	23
FORD ZF 4WD TRANS.	STOCK (1,5,7)	31	SHORTY C4 FORD TRANS. ALLISON 1000 TRANS.	50-2903 STOCK	27 29S
GM MUNCIE 4 SPEED <i>10" CASE LENGTH</i>	50-6000 (2,3,7) <i>5" ADAPTER</i>	23	FORD AOD EARLY 4SP 4WD <i>1987 &amp; EARLIER 2WD TRANS</i>	STOCK (1,5,7) 50-2902 (3,7)	31 23
NP203 ADAPTER	50-8810	10	FORD AOD LATE 4 SP 4WD <i>1988 &amp; UP 2WD TRANS</i>	STOCK (1,5,7) 50-2901 (3,7)	31 23
GM ZF 6SP S6-650 TRANS	STOCK	29S	FORD C6 3 SP. TRANS. <i>20" CASE LENGTH</i>	STOCK (1,5,7)	31
TACOMA TRANS 23 SPLINE	50-5710	23	FORD EXPLORER/RANGER/BRONCO II	STOCK (5)	25
TACOMA TRANS 26 SPLINE	50-5711	23	STOCK JEEP AUTOMATICS	STOCK (1,5)	21 or 23
POWERGLIDE (automatic)	50-9200	27			
Nissan Titan (automatic)	50-1114	32NT			

- (1) OUTPUT SHAFT MAY NEED TO BE SHORTENED OR A 1" SPACER ADAPTER MAY NEED TO BE USED (AS-0404)
- (2) THIS KIT USES A SPUD SHAFT
- (3) NEW OUTPUT SHAFT MUST BE INSTALLED
- (4) USES STOCK 2WD OUTPUT SHAFT
- (5) USES STOCK 4WD OUTPUT SHAFT
- (6) THIS KIT SHOULD BE USED IN CONJUNCTION WITH A 700R KIT
- (7) THE CASTING IN THIS KIT ONLY HAS ONE ROTATION AVAILABLE
- (8) THIS TRANSMISSION, IF CURRENTLY ADAPTED TO A BRONCO DANA 20 TRANSFER CASE, CAN USE AN ATLAS 28 SPLINE TRANSFER CASE AS A DIRECT BOLT UP TO THE TRANSMISSION ADAPTER.
- (9) THE OUTPUT SHAFT MUST BE SHORTENED TO BE A FLUSH STICKOUT WITH THE BACK SIDE OF THE ADAPTER HOUSING.
- (10) A RELUCTOR RING AND SENSOR KIT MUST BE PURCHASED, P/N 716073



**SM465 Adapter Parts Required:**  
 (1) **51-9807** Adapter Housing  
 (1) **716515** SM465 Gasket  
 (7) **723723** 3/8" H.H.C.S.  
 (1) **723711** 3/8" Stud Bolt  
 (8) **723704** 3/8" Lock Washer  
 (1) **723701** 3/8"-16 Nut  
**In addition, the 35 spline SM465 Requires:**  
 (1) **716457** Set Collar

**P/N AS-6800** - Includes a 1.5" adapter, an o-ring, 4 metric and 4 standard socket head cap screws.



**P/N AS-6401** - Includes a 1.25" adapter, a gasket, and 6 standard socket head cap screws.



**P/N AS-9111** - Includes a 2.5" adapter, an o-ring, 4 metric and 4 standard hex head cap screws. (adapter not shown)



**4.25" TH400 ADAPTER HOUSING:**  
 (1) **51-6400** Adapter Housing  
 (1) **716510** Gasket  
 (6) **723723** 3/8"-16 x 1-1/2" H.H.C.S.  
 (6) **723704** 3/8" Lockwashers



**Dodge NV4500 4WD Requires:**  
 A stock Dodge tailhousing.  
 23 spline transmissions retain the stock seal in this housing.  
 29 spline transmissions require this seal to be removed.

**GM NV4500 4WD Requires:**  
 (1) **51-0205** Adapter hsg.  
 (8) **720028** S.H.C.S.  
 (1) **51-0220** 1.625" spacer  
 (6) **723766** S.H.C.S.

**ALLISON & GM ZF S6-650 TRANSMISSION:**  
 When coupling to these transmission, a special drilled case is required. When coupled to the Allison transmission, the shifters for the Atlas will require some modifications. Cable shifters cannot be used on the Allison transmission.



**GM 4L80E 4WD Requires:**  
 (1) **51-6408** Adapter housing  
 (1) **50-6409** 1.625" Reluctor kit  
 (6) **720028** S.H.C.S.

**P/N AS-0404** - Includes a 1" spacer adapter, 6 longer studs, 6 lockwashers, and 6 nuts.



**GM NP203 REDUCTION BOX:**

If you're looking for the ultimate low gear option, we offer an adapter that couples a NP203 reduction box in front of the Atlas transfer case. This NP203 must be coupled to a TH350, 700R-4, TH400 or SM465. Transfer case linkage, crossmember, and floorboard modifications are necessary. **P/N 50-8810** couples the Atlas to this NP203 reduction box. The input of the Atlas must be equipped with a 10 spline shaft. The length of the NP203 and adapter to the Atlas is 10.0" long.

# Custom Build Your Atlas 2 Speed Transfer Case



<b>1. GEAR RATIO</b> <span style="float: right;">PAGE 4</span>		
ATLAS20		
ATLAS30		
ATLAS38		
ATLAS43		
ATLAS50 INCLUDES THE AF32 KIT		
ATLAS60 INCLUDES THE AF32 KIT		
<b>2. INPUT SPLINE &amp; CASE CONFIGURATION</b> <span style="float: right;">PAGES 5-11</span>		
LEFT DROP	RIGHT DROP	
A10L	A10R	
A21L		
A23L	A23R	
A23LL		LONG INPUT
A23LS		JEEP 42RLE TRANS
A25L		
A27L	A27R	
A28L		
A28LS		C4 TRANSMISSION
A29L	A29R	
A31L	A31R	
A32L	A32R	
A35L	A35R	
A32LNT		NISSAN TITAN
A34L	A34R	FORD 34 SPL.
AD32L	AD32R	DIVORCED UNIT
<b>3. CASE ROTATION OPTIONS</b> <span style="float: right;">PAGES 12-13</span>		
301100LF	MUST MINUS (1) 301100	
301101RF	MUST MINUS (1) 301101	
DIVORCED ATLAS MUST USE A STANDARD CASE		
<b>4. TAILHOUSING OPTIONS</b> <span style="float: right;">PAGE 14-15</span>		
ALT32	STANDARD TAILHOUSING	
AST32	SHORT TAILHOUSING	
AVT32L	VSS TAILHOUSING LEFT CASE DROP	
AVT32R	VSS TAILHOUSING RIGHT CASE DROP	
<b>5. FRONT OUTPUT SHAFT OPTIONS</b> <span style="float: right;">PAGE 15</span>		
AF26	26 SPLINE FRONT OUTPUT	
AF32	32 SPLINE FRONT OUTPUT	
SKIP THIS ITEM ON ATLAS 5.0 & 6.0 UNITS		

<b>6. YOKE OPTIONS (list rear output 1st)</b> <span style="float: right;">PAGE 16</span>	
A1310-26	26 SPLINE YOKE (non C.V.)
A1310CV26	26 SPLINE YOKE
A1310	32 SPLINE YOKE (non C.V.)
A1310CV	32 SPLINE YOKE
A1330CV	32 SPLINE YOKE
A1350	32 SPLINE YOKE (non C.V.)
A1410	32 SPLINE YOKE (non C.V.)
AF1300	32 SPLINE FLANGE YOKE (\$120.00)
AF1410	32 SPLINE FLANGE YOKE (\$120.00)
<b>7. SPEEDOMETER OPTIONS</b> <span style="float: right;">PAGE 17</span>	
301506	NOT NEEDED ON 1987 & NEWER JEEPS
300621	SPEEDOMETER HOLE PLUG
<b>8. SHIFTER OPTIONS SOLD W/ ATLAS</b> <span style="float: right;">PAGE 17</span>	
303000L	UNIVERSAL LEFT
303001R	UNIVERSAL RIGHT
303002L	TJAUTOMATIC
303002U	TJ UNIVERSAL
303003L	TJ MANUAL
303004L	BRONCO
303005L	ZJ
303006L	EXPLORER
303007L	XJ
303009	UNIVERSAL CABLE
303025L	DIVORCED CASE SHIFTER & MOUNT
303026R	DIVORCED CASE SHIFTER & MOUNT
<b>9. SHIFT CONTROL OPTIONS</b> <span style="float: right;">PAGE 17</span>	
301510	LEFT SHIFTER MUST MINUS (1) 301511
301511	RIGHT SHIFTER MUST MINUS (1) 301510
<b>10. TRANSFER CASE ADAPTERS</b> <span style="float: right;">PAGE 18</span>	
Application may require an adapter (See Adapter chart)	



# Custom Build Your Atlas 4 Speed Transfer Case

Custom build 4 speed chart



## 4 SPEED MAIN CASE SHIFTER :

We have designed several different shifters to fit various vehicle applications. If your specific vehicle application is not listed, the universal shifter should be used. Areas of consideration on any installation are vehicle console and floorboard clearances. These shifters have been designed mainly around stock vehicles. Vehicles with body lifts greater than 1" may require more than the usual modifications for proper fit of the shift handles. All twin stick shifters, with the exception of the cable shifter, are included at no additional cost when an Atlas is purchased.

The 4 speed shifters are basically the same as the standard Atlas shifters except for the extension tube and shift rail connecting links, which are longer to compensate for the added length of the transfer case.

## 4 SPEED REDUCTION HOUSING SHIFTER :

The reduction housing on the Atlas 4 Speed has its own independent shifter control. We currently offer two options.

The first is a cable shifted unit. P/N 344020 provides a cable linkage system that can be mounted to the floor board of the vehicle. This single handle shifter has a front-to-rear movement and only requires a small clearance hole in the floorboard.

The second option is an electrically shifted unit. This electric shifter is mounted to the top of the Atlas 4 Speed case. The unit is shifted by using a toggle switch which could be mounted anywhere in the vehicle.

At the time of printing this manual, both the cable and electric shifted units were still in the prototype stages. Some of this information may have changed. Please call for the most current information.

These shifters are sold separately from the cost of the Atlas 4 Speed transfer case.

<b>1. GEAR RATIO</b>		<b>PAGE 4</b>
ATLAS4-20	(1:1 * 2.0:1 * 2.72:1 * 5.44:1)	
ATLAS4-38	(1:1 * 2.72:1 * 3.8:1 * 10.34:1)	
<b>2. INPUT SPLINE &amp; CASE CONFIGURATION</b>		
		<b>PAGES 5-11</b>
LEFT DROP	RIGHT DROP	
A4-21L		
A4-23L	A4-23R	
A4-23LL		LONG 23 SPLINE
A4-23LS		JEEP 42RLE TRANS
A4-27L	A4-27R	
A4-29L	A4-29R	
A4-31L	A4-31R	
A4-32L	A4-32R	
A4-34L	A4-34R	FORD 34 SPL.
<b>3. TAILHOUSING OPTIONS</b>		
		<b>PAGE 14</b>
A4LT32	STANDARD TAILHOUSING	
A4ST32	SHORT TAILHOUSING	
<b>4. YOKE OPTIONS (list rear output 1st)</b>		
		<b>PAGE 16</b>
A1310	32 SPLINE YOKE (non C.V.)	
A1310CV	32 SPLINE YOKE	
A1330CV	32 SPLINE YOKE	
A1350	32 SPLINE YOKE (non C.V.)	
A1410	32 SPLINE YOKE (non C.V.)	
AF1300	32 SPLINE FLANGE YOKE (\$120.00)	
AF1410	32 SPLINE FLANGE YOKE (\$120.00)	
<b>5. SPEEDOMETER OPTIONS</b>		
		<b>PAGE 17</b>
301506	NOT NEEDED ON 1987 & NEWER JEEPS	
300621	SPEEDOMETER HOLE PLUG	
<b>6. SHIFTER OPTIONS SOLD W/ ATLAS</b>		
		<b>PAGE 21</b>
344000	UNIVERSAL RIGHT or LEFT	
344002	TJAUTOMATIC	
344003	TJMANUAL	
344004	BRONCO	
344005	ZJ	
344007	XJ	
303009	UNIVERSAL CABLE	
<b>7. REDUCTION HOUSING SHIFTER OPTIONS (Sold Separately)</b>		
344020	CABLE SHIFT REDUCTION BOX	
344021	ELECTRIC SHIFT REDUCTION BOX	

# Installation Procedures For All Vehicles

Before the actual installation begins, you should read the installation and operating procedures of your new transfer case. Please verify that ALL features such as input spline and case configuration (left or right hand drop) are correct. Also inspect the unit for any damage that may have occurred during shipping. This section of the manual deals with the general installation procedures of the Atlas. Specific installation instructions for many vehicles are also listed in this manual. **Please read both sections before installing.**

## LUBRICATION

This unit is shipped Dry. Before operating your Atlas, please fill with the recommended gear lubricant (Torco MTF). If you are unable to find this lubricant, one of the following synthetic oils can be substituted for the Torco brand: Castrol Syntec 5w-50, Valvoline 20w-50 or Mobil 1 Synthetic 15w-50. We have found these synthetic lubricants to work well in the Atlas.

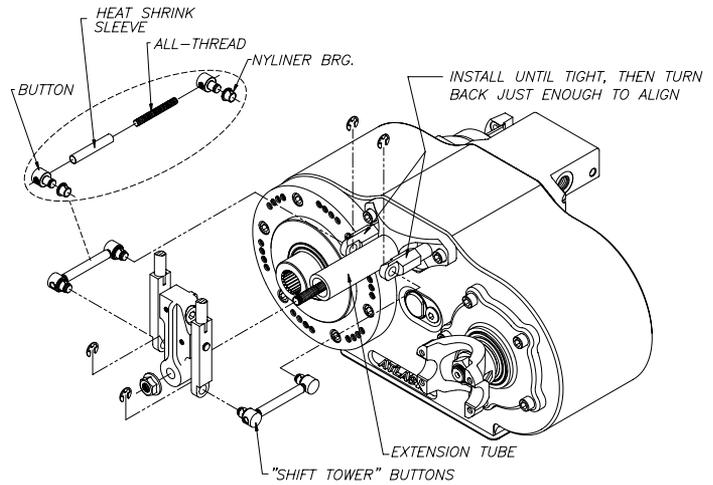
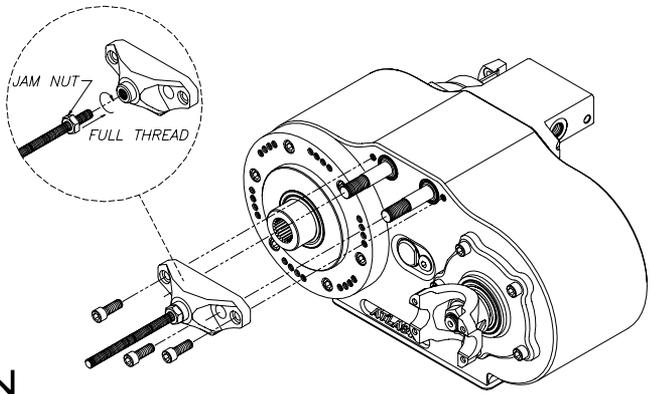
The recommended oil capacity is 2 quarts in the Atlas 2 speed and 2-1/2 quarts for the Atlas 4 speed transfer case. The Atlas does not offer any type of 'weep hole' to verify the oil level. Therefore, we have supplied your unit with a site tube to aid in determining the correct fluid level. Once the required two quarts are put into the Atlas, we recommend marking the oil level on the site tube. We like to use a small zip tie as a oil level marking device. **Note:** When the Atlas is overfilled with more than the recommended levels, it will cause the unit to vent the extra oil out the breather.

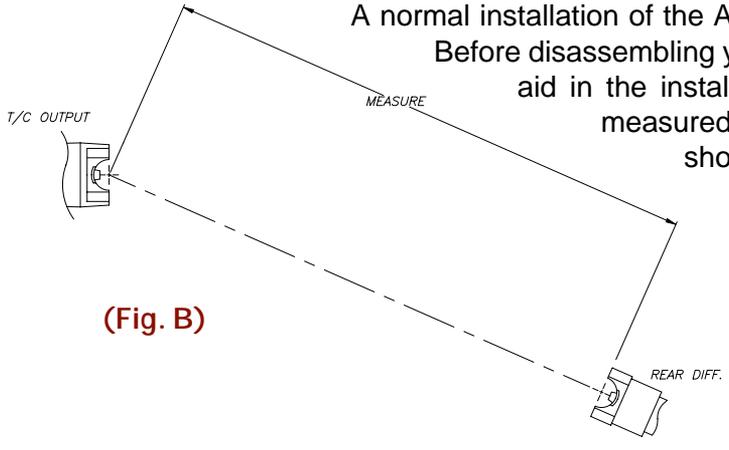


## PREPARATION



Now is a good time to familiarize yourself with the shifter components. Pre-assembly of the shifter items will help a great deal with the final installation. Unpack the shifter and install the shifter base. Use RTV Blue silicone to seal the bolt threads. Pre-assemble the rest of the components. Detailed shifter assembly instructions can be found in The Final Installation section. Once the shifter has been properly setup, remove it from the transfer case (leaving the triangular 3 bolt base on the unit). The Atlas must be installed into the vehicle without the shifters attached.





(Fig. B)

A normal installation of the Atlas transfer case should take around 6 to 8 hours. Before disassembling your vehicle, the undercarriage should be cleaned to aid in the installation process. Stock driveline lengths should be measured with your vehicle on the ground. The measurement should be taken as illustrated on Fig. B. Retain these measurements for later use.

The Atlas offers up to 4 different rotations depending on the application. We offer the same rotation as stock on all units. The other rotations are provided for either additional ground clearance or unique applications. Vehicles using one of our adapters with the dual bolt patterns have 8 rotation

options. Before removing your stock transfer case, an angle finder can be used to obtain the rotation of your stock transfer case.

Your vehicle can now be raised for the necessary removal of the driveshafts, skid pan, and the stock transfer case. Note: Please make sure your vehicle is supported securely!

**Recommended Equipment:** A floor jack to support the transmission and engine when the crossmember is removed, and a transmission jack for raising and lowering the transfer cases.



By unbolting and removing your stock transfer case, you should have your transfer case adapter and output shaft exposed. The adapter housing transfer case mating flange should be cleaned of any debris. Double check the output shaft splines of your transmission and verify the stickout length. Make sure the Atlas has the same spline and that the length of the transmission output isn't too long for the Atlas input. (Refer to the Atlas Input Shaft section for more information).

The Atlas should now be test-fitted into the vehicle. The Atlas should index onto the spline of your transmission and up to the adapter housing. While holding the Atlas securely in place, rotate the transfer case to the desired rotation for your vehicle. Locate a stock hole on the adapter housing. Using a marker, mark the outside of the Atlas index ring. This will help to identify the rotation pattern. Check for tunnel clearance, front driveshaft clearance, and shifter clearance with the Atlas in this new rotation. **Note:** On many of the YJ, TJ, and CJ vehicles, a minor modification to the tunnel area will allow you to mount the Atlas at a higher rotation with little or no crossmember modifications. (Refer to the specific vehicle application for more details).

Once this is done, remove the Atlas from the vehicle. Locate the mark on the index ring of the Atlas transfer case. The bolt patterns on the transfer case index ring are relative. In other words, whatever hole you've selected will be the same all the way around the index ring. Using the stud bolts provided, install them in the chosen pattern rotation. These studs are stock New Process items and are a restrictive fit into the front of the Atlas. If you are using a spacer adapter that requires longer bolts or stud bolts, they should be installed using 242 Loctite. Install the studs so that they have full thread engagement in the transfer case adapter ring. **DO NOT PRELOAD THE STUDS INTO THE ATLAS INPUT RING!**

**TIP:** Before the final bolt up, we have found it easier to equip the Atlas with all the necessary components. For example: Shift indicator switch, speedometer, site tube, and drain plug, etc.

The Atlas was shipped with numerous red plastic caps to keep contaminants out of the unit. At this point in time, all caps should have been removed and all components should be properly installed.

# The Final Installation

Final installation driveline mods.

Apply a very thin film of RTV Blue silicone to your transfer case adapter mating surface. Aligning the studs with the adapter holes and the transmission output shaft with the Atlas input, the Atlas should slide completely onto the transmission mating surface. There should not be any GAP between the two units! If they do not meet, then you have an interference problem! Refer to the Atlas Input Shaft section for the recommended transmission shaft lengths. **DO NOT PULL THE TWO UNITS TOGETHER WITH THE FASTENERS.** This will cause internal damage to the unit. The possible problems may be too long of an output shaft or, on some Jeep 21 & 23 spline transmissions, spacer adapter P/N AS-0404 may be necessary. If you are in doubt regarding your interference problem, please call!

The recommended nuts have been provided to secure the Atlas to your adapter. With the Atlas now secure, check again for proper clearances such as driveshaft, floorboard, skid pan, and exhaust, etc.

## DRIVELINE MODIFICATIONS

You will normally need driveline modifications when installing the Atlas transfer case. What we have found that works well is either adding or subtracting (depending on the application) the measurements of the Atlas from the stock length of your transfer case.

**REAR MEASUREMENT:** To determine the new length for the rear driveline, simply measure from the face of the transfer case to the face of the rear output yoke (Fig. C). Write that measurement down.



Take the same type of measurement of the Atlas. With that in mind, consider the following example.

*Rear Measurement Example (Fig. C):* This stock transfer case measured (on our example) 16.8". When subtracting that measurement from the Atlas measurement of 13.8", you have a difference of 3.0".

Since the Atlas is 3.0" shorter than your stock transfer case, your rear driveshaft would then need to be lengthened 3.0". This difference is now added to the measurement taken from your stock driveline, as recommended in the Preparation section. You would now have your new rear driveshaft length.



**FRONT MEASUREMENT:** Measure the stock transfer case from the front yoke face to the surface of where the transfer case bolts to the adapter housing (Fig. D). Write that measurement down.

The front yoke on the various stock transfer cases can either be a positive measurement (protrudes out from the adapter input face), or a negative measurement (recessed inward from the adapter input face). Most gear-driven transfer cases will have a positive yoke measurement, and most chain-driven transfer cases will have a negative yoke measurement. The Atlas measures approximately 2" positive offset from the face of the front yoke to the transmission adapter input.

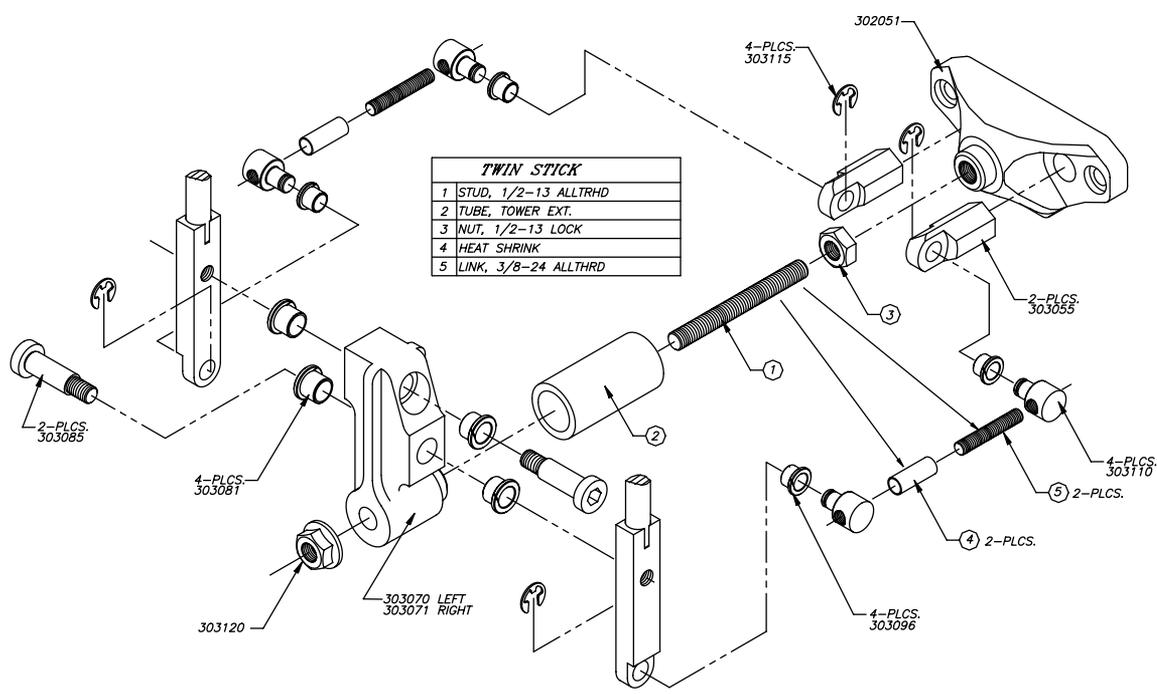


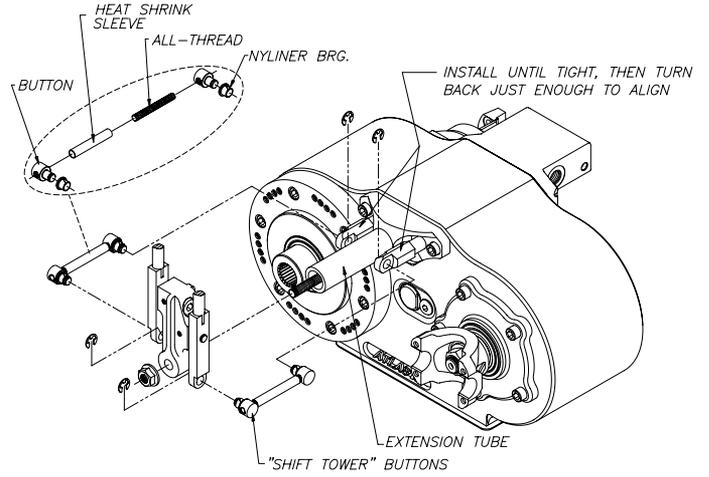
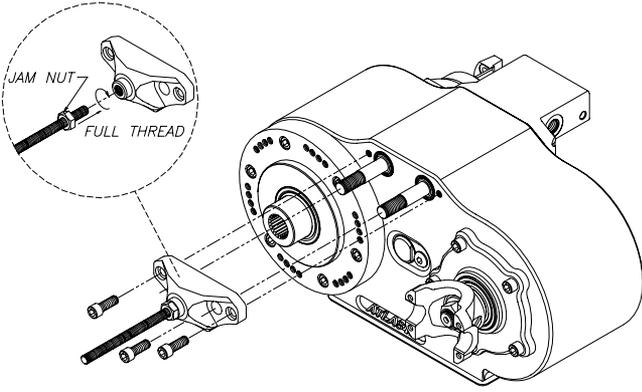
Stock driveshaft (top) vs. new fixed yoke driveshafts

*Front Measurement Example (Fig. D):* This stock transfer case measured (our example) a negative 1-1/4". Adding that to the Atlas measurement of positive 2", the difference is 3-1/4". Since the Atlas front yoke on this application is 3-1/4" closer to your front axle, you would then need to shorten your front driveshaft this distance. This difference can now be subtracted from the measurement taken from your stock driveline, as recommended in the Preparation section. You would now have your front driveshaft length.

### SHIFTER INSTALLATION

1. Install the shifter base to the face of the Atlas using the three S.H.C.S. 3/8"-16 x 1". RTV Blue Silicone should be used on these bolts to prevent leakage. This should be done before the Atlas is installed into the vehicle.
2. Install 1/2"-13 all-thread and jam nut to the shifter base.
3. Slide the shifter tower along the all-thread stud until the shifter arms are at the center of your stock floor cutout.
4. Measure between the tower and the base to obtain the correct extension tube length.
5. Remove the tower and install the extension tube.
6. Assemble the shift handles to the shift tower.
7. Install the shift tower assembly to the extension tube using the lock nut on 1/2"-13 all-thread to secure.
8. Install the brass shift rod ends to the Atlas shift rods. Teflon tape should be used on the threaded portion of the shift rod.
9. With the Atlas in neutral and the shift handles parallel with the shift tower, measure the distance for the linkage rods.
10. Connect the shift buttons and heat shrink tubing to the 3/8"-24 all-thread at the distance measured. Make sure that the all-thread is flush with the outside edge of the shift button. Cut all-thread if necessary.
11. Assemble the linkage rods to the shift handle and brass portion of the shift rod and verify the shift handles are parallel to the tower.
12. Install the e-clips to retain the buttons to the mating parts.
13. Make sure the brass shift rod ends are not too tight. They should be finger tight.
14. Modify the floorboard if necessary.
15. Install the rubber boot and boot ring to the floorboard. (Note: On some twin stick configurations, the boot ring may need to be cut in order to fit around the Atlas twin sticks).





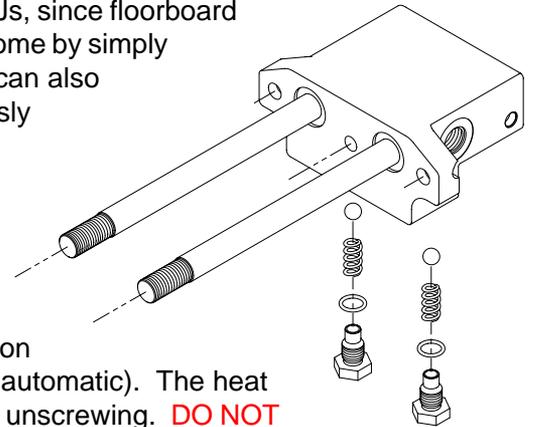
**Atlas shifter problem check list:** When installing the twin stick shifters, there are a few key areas that must be addressed. One of the most common difficulties we hear is that "my unit isn't shifting fully into one of the gear ratios". Incorrect adjustment of the shift handles to the linkage rods is normally the cause. With both shift rods in neutral, the linkage rod (connected to the shift handles) must be parallel with the aluminum shift tower. Refer to the photo left.

Another concern that we've heard is that "my Atlas seems to be hard to shift". This problem could be one of two areas. The brass shift rod ends that the shifter linkage rods connect to are too tight, causing a binding effect on the shifter linkage. The brass shift rod ends should be installed until tight, then loosened enough to align to the shifter button. The second area

to check is the Atlas shift rail detents. These detents are controlled with a ball and spring set. On new units, you can back off the brass set screws located on the shifter boss about a 1/4 turn, allowing an easier shift. As the unit is operated, these components will seat in. After the first service, the brass set screws should be tightened 1/4 turn to return them to their original position. See illustration bottom right.

If a unit has a tendency to pop out of gear, an area to check is proper floorboard clearance in relation with the shift handles. This problem mainly occurs on Jeep TJs, since floorboard modifications are required. Most reported problems have been overcome by simply providing additional clearance. The problem of popping out of gear can also be caused by incorrect alignment of the shifter handles as previously discussed and/or a unit in which the detent set screws have been loosened.

The last of the most common dilemmas we hear is that "the shifter linkage came apart while in operation". The area in question is the all-thread linkage rods. These rods fit into the two shift buttons. To prevent the all-thread from unscrewing out of the shift buttons, a portion of the heat shrink tubing should have been installed (o-rings on a TJ automatic). The heat shrink tubing or o-rings act as a jam nut to prevent the all-thread from unscrewing. **DO NOT** use a jam nut on these linkage rods because it will cause binding of the shifter linkage.



## BREATHER INSTALLATION:



The stock transfer case breather hose should be replaced with a 3/8" fuel hose and connected to the brass elbow located on top of the Atlas. A new breather should be installed on the opposite end of this hose and mounted to the firewall. A free flowing atmospheric breather typically found in earlier model vehicles or used on differentials is best. On later model Jeeps, the stock breather is very restrictive. This stock breather is for lighter viscosity oils such as the ATF used in the stock transfer case. If this breather is not replaced, oil will blow out into the engine compartment.

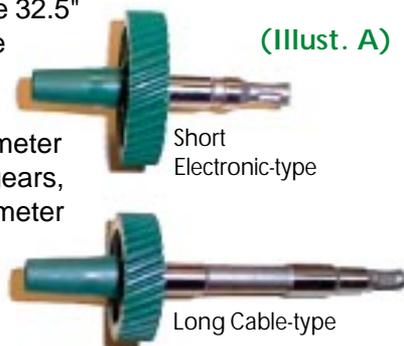
## SPEEDOMETER INSTALLATION:

We supply a cable-type speedometer drive unit for all applications other than Jeeps 1987 to current. The 1987 and newer Jeeps will use the original speedometer drive that came stock. You will simply have to remove it from your New Process transfer case and install it into your new Atlas. It is recommended that you replace the o-ring and seal that we have included with the Atlas package. On older Broncos, Bronco IIs, Explorers and Rangers, a speedometer cable fitting adapter must be used to connect the Atlas speedometer drive to your speedometer cable. Nevada Speedometer (Ph# 775-358-7422) should have the necessary parts to assist you in this manner.

On engine converted vehicles, caution should be used. If your engine has been converted to a newer Chevy, Ford or Chrysler and is computer controlled, it may also require a vehicle speed sensor. The speed sensor is usually connected at the speedometer. Each manufacturer has designed their own unique way of obtaining this computer input. If your vehicle has any computer requirements, you will need to take this into consideration. If you are wanting to install the Atlas into a Chevy, Ford or Chrysler vehicle, the computer requirements mentioned will also apply. Once you've taken into consideration your specific requirements, the speedometer cable can now be connected. Note: As listed in the Tailhousing Options section on Pages 14-15, we do offer a few VSS output components.

**Speedometer Calibration:** There are two factors that affect your speedometer reading; actual tire diameter and axle gear ratio. The actual tire diameter is usually different than what is printed on the side wall of your tire. For example: A 33 x 11.5 x 15 tire (depending on the brand), may actually measure 32.5" in diameter. Tire sizes vary greatly among the manufacturers. Even the same tire from the same manufacturer can vary as much as 7% in diameter.

The speedometer charts that follow will assist you in obtaining the right speedometer drive gear (Illustr. A). As you can see there are two types of speedometer gears, both long and short. We measured them by the overall length of the speedometer gear. Long being 4.3" and short being 2.2". The speedometer housings that accept these gears are not interchangeable. For example: If your stock vehicle had a 2.2" gear, you cannot put a 4.3" gear onto that speed-o-drive housing.



If you are installing an Atlas in a 1987 or newer Jeep and have not changed your tire size or your axles, your stock speedometer drive gear would remain the same. However, if a new axle ratio and/or tire size is considered, see Fig. E. If the Atlas is shipped with a speedometer drive installed, the tooth count that the Atlas is shipped with is 34T. We do not stock any other speedometer drives other than 34 tooth. If your axle ratio and tire size requires a different combination, see Fig. E & Fig. F. Please contact your local Jeep dealership to order these parts.

When installing a speedometer gear with either 39, 40, 41 or 42 teeth, the gear and the housing must be installed separately. These are all large diameter speedometer gears. By first installing the gear into the tailhousing you will be able to tilt the gear shaft up allowing you to position the gear past the Atlas output shaft. Once this gear is in place, the speedometer housing must be aligned with the speedometer gear shaft and indexed into the tailhousing. When installing the speedometer housing, lube the o-ring that contacts the Atlas tailhousing with a bit of Torco oil. This will prevent the o-ring from being nicked upon installation or rotation, causing this housing to leak.

TIRE DIAMETER	(Fig. E) AXLE GEAR RATIOS							
	5.38	5.13	4.88	4.56	4.10	3.73	3.55	3.07
44"	32T	31T	29T	27T				
42"	34T	32T	30T	28T				
40"	35T	34T	32T	30T	27T			
39"	36T	34T	33T	31T	28T			
38"	37T	35T	34T	31T	28T	26T		
37"	38T	36T	35T	32T	29T	26T		
36"	39T	37T	36T	33T	30T	27T		
35"	40T	38T	37T	34T	31T	28T	27T	
33"		41T	39T	36T	33T	30T	28T	
32"			40T	37T	34T	31T	29T	
31"			41T	39T	35T	32T	30T	26T
30"				40T	36T	33T	31T	27T
29"				41T	37T	34T	32T	28T
28"					38T	35T	33T	29T

(Fig. F)

## CHRYSLER SPEEDOMETER DRIVE PART NUMBERS

SHORT GEARS			LONG GEARS			
Part Number	TEETH	COLOR	Part Number	TEETH	COLOR	OLD JEEP P/N
52067628	28T		52068148	26T	RED	
52067629	29T		52068149	27T	WHITE	
52067630	30T		52068150	28T		
52067631	31T		52068151	29T	BLACK	J3212729
52067632	32T	BLACK	52068152	30T	YELLOW	J3212730
52067633	33T	YELLOW	52068153	31T	GREEN	J3212731
52067634	34T	GREEN	Discontinued	32T	BLACK	J3212732
52067635	35T	ORANGE	52068155	33T	YELLOW	J3212733
52067636	36T	RED	52068156	34T	GREEN	J3212734
52067637	37T		52068157	35T	ORANGE	J3212735
52067638	38T	BLUE	52068158	36T	RED	J3212736
52067639	39T	GREEN	52068061	39T	GREEN	J3212221
52067640	40T	ORANGE	52068062	40T	ORANGE	J3230222
52067641	41T	RED	2538941	41T	RED	53001488
52067642	42T	WHITE	2538942	42T	WHITE	53001489
52067643	43T	BLUE				

**Speedometer Problems:** No matter what speedometer gear you use, you must make sure that the teeth of the speedometer gear have proper contact with the Atlas output shaft. The speedometer housing can be rotated to achieve proper contact. *Note:* There are three rotation possibilities. Many of the Jeep speedometer housings offer index numbers that reference to the gear tooth count. By lining up the retainer clip with the proper index number, the speedometer gear will work properly. If your housing does not have these index numbers, proper engagement can be obtained by rotating the speedometer housing until the speedometer gear meshes with the output shaft. The slots on the housing will then line up with the retainer clip. If this is not done, the speedometer will not engage properly.



**TJ Speedometer Installation:** The Jeep TJ speedometer is a tight clearance fit to the Atlas shift control. One option for clearance is to plug in the connector while the speedometer is rotated away from the shift control, and then rotate the assembly back into position for the speedometer gear engagement. The other option is to keep the white portion of the speedometer rotated 180 degrees from where it would normally be and use a washer under the bolt head to retain this part of the speedometer in place.

### SHIFT INDICATOR:

The transfer case shift indicator (if applicable) should be connected. Make sure wires and/or hoses have proper body clearance and are not bound in any way. For more information, see the specific vehicles applications.

### DRIVESHAFTS & CROSSMEMBER / SKID PAN:

You should now install your modified driveshafts. Trial fit your crossmember or skid pan, noting any modifications that may be necessary. Under each specific vehicle installation, crossmember/skid pan modifications are noted. Due to vehicle variations, the modifications listed may vary slightly with your application. The Atlas is equipped with a drain plug located on the inspection cover. You may wish to cut an access hole in your crossmember/skid plate for easy access. Once the modifications are made, install the crossmember/skid plate securely to the frame and the rubber support to the crossmember/skid plate.

### LUBRICATION:

Before lowering your vehicle, fill your Atlas with the Torco oil provided. By using a hand pump, connect the hose end to the upper fitting of the site tube to fill the Atlas to the recommended oil level. Once this is completed, re-secure the upper site tube fitting to the Atlas. If you are unable to find this oil brand locally, we offer it under [P/N 303200](#), or you can use one of the following synthetic oils as a substitute: Castrol Syntec 5w-50, Valvoline 20w-50 or Mobil 1 Synthetic 15w-50.

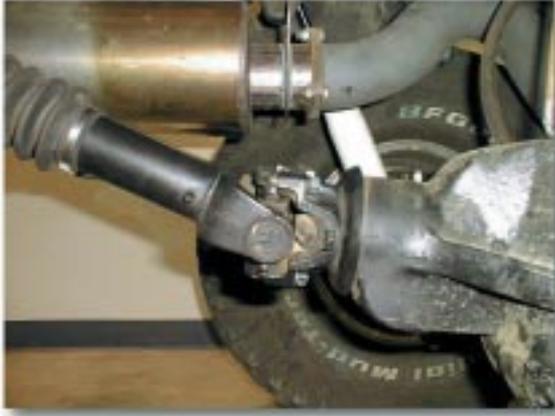


### VISUAL INSPECTION:

Once the vehicle is back on the ground, the transfer case area should be inspected to verify that all fasteners and components relating to the transfer case are properly attached.

A visual inspection should be made with regard to driveline angles and clearance. New and unwanted noises are most often related to poor driveshaft angles! **C.V.** driveshaft combinations must be set so that the differential yokes are in-line with the driveshaft under normal operating load. **Non-C.V.** driveshaft combinations must be set so that the pinion yoke angles match the transfer case output yoke angles under normal operating load. Remember to allow for (spring wrap) if you have leaf springs. The front pinion will dive downward under load and the rear pinion will rise upward. There are many different spring rates on the market, so this may take some tweaking to eliminate a poor driveshaft condition. (For examples, see photos on the following page).

The Atlas transfer case is a close tolerance design. If you feel any vibration at all in the shift handles, suspect improper driveshaft angles!



Rear (too low).  
Will not raise enough for C.V.!



Rear (correct).  
Perfect for C.V.

## Operating Your New Atlas

The Atlas has internal shifter interlocks that prevent the unit from being mis-shifted. The knobs on the Atlas Twin Stick are to assist you with identifying the rear output and the front output.

For **2WD High**, in which the vehicle should first be tested, the knob labeled "Rear" will be in the high position and the "Front" knob should be in the neutral position. After a few miles in 2WD High, we recommend that you shift the "Front" shifter knob into High, putting you in 4WD High. (On manual locking hubs, to achieve any type of 4WD, your hubs must be locked). *The "Front" shifter handle should shift smoothly in and out of neutral and High. IF THE SHIFTER DOES NOT ENGAGE EASILY, DO NOT FORCE IT.* (Your linkage may need to be adjusted). When you are shifting out of 4WD high, the "Front" knob *must always* be disengaged first. If the shifter feels tight or sticky, press in the clutch or shift to neutral (automatic transmission), or simply straighten the front wheels.



When shifting into **2WD or 4WD Low**, REMEMBER the following: The vehicle should be at a slow roll forward, no faster than 5 miles an hour. Speeds faster than recommended could cause personal injury (like unloading the rear payload into the front seats!), or damage to the drivetrain (which is not only embarrassing but expensive!). The Atlas has the unique feature of 2WD low with the rear axle or the front axle. At any time while driving in low ratio, you can disengage either the front or rear by shifting the respective handle into neutral.

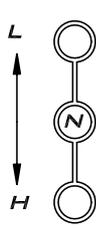
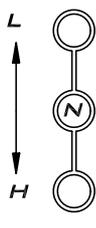
**4 Speed Atlas Reduction Housing:** This is a non-synchronized shifted unit. To shift the reduction housing portion of the Atlas, the vehicle should come to a complete stop. Once the vehicle is stopped you can then engage or disengage the planetary gearing. The shifting of this unit is designed for either a cable shifter or an electric shifter.

**Shifting an Atlas with an Automatic transmission:** While the vehicle is slowly moving forward, place the transmission into neutral and engage the front or rear control into Low. The Atlas is a synchronized shift design, which means synchro sets have been added to SPEED MATCH the gear and shaft relationship. If you are stopped with no forward motion and the unit will not shift, place the *transmission* in Drive or Reverse then back to neutral, then attempt to shift the Atlas. **DO NOT FORCE THE ATLAS INTO GEAR.**

**Shifting an Atlas with an Manual transmission:** While the vehicle is slowly moving forward, depress the clutch and engage the front or rear control into Low. **DO NOT FORCE THE ATLAS INTO GEAR or HOLD PRESSURE ON THE SHIFT LEVERS WHILE RELEASING THE CLUTCH.**

As you become accustom to the operations of the Atlas, and the unit accumulates miles, the shifting will become easier. We have illustrated the shift knob locations to obtain the different gear ranges.

### ***SHIFT POSITIONS***

<i><b>PATTERN</b></i>	<i><b>NEUTRAL (TOWING)</b></i>	<i><b>2WD HIGH</b></i>	<i><b>4WD HIGH</b></i>	<i><b>2WD LOW (REAR)</b></i>	<i><b>4WD LOW</b></i>	<i><b>2WD LOW (FRONT)</b></i>
<i><b>FRONT OUT-PUT CONTROL</b></i>	<i><b>FRONT</b></i>	<i><b>FRONT</b></i>	<i><b>FRONT</b></i>	<i><b>FRONT</b></i>	<i><b>FRONT</b></i>	<i><b>FRONT</b></i>
						
<i><b>REAR OUT-PUT CONTROL</b></i>	<i><b>REAR</b></i>	<i><b>REAR</b></i>	<i><b>REAR</b></i>	<i><b>REAR</b></i>	<i><b>REAR</b></i>	<i><b>REAR</b></i>
						

### TWIN STICK SHIFT POSITIONS

- Neutral:** Both the "rear" and "front" knobs in the "N" position.
- 2WD High:** The "rear" knob in "H" position and the "front" knob in "N" position.
- 4WD High:** The "rear" knob in "H" position and the "front" knob in "H" position.
- 4WD Low:** The "rear" knob in "L" position and the "front" knob in "L" position.
- 2WD Low:**
  - (Rear Drive ONLY) The "rear" knob in "L" position and the "front" knob in "N" position.
  - \*(Front Drive ONLY) The "rear" knob in "N" position and the "front" knob in "L" position.

**\*Special Note:** With the front in 2WD low, the torque is distributed 100% to the front axle. Combined with the low gearing in the transfer case, these factors can cause undue strain on your front axles. This should only be used for quick tight turns in loose soil conditions with posi-traction equipped front differentials. The only shift position that is not available is Front 2WD high.

# Operating Considerations

The low gear reduction of the transfer case will help to ease you through the toughest terrain you can find. The essentials of good 4-wheeling is the sheer ability to maneuver at a safe speed while retaining your line of attack on the course in front of you. The slower rate of approach will not only keep you in the seat, but also keep the tires on the ground for the best possible performance.

If you are considering the Atlas or have purchased one already, it is sure to change the way you 4-wheel.

## KNOW YOUR LIMITS!

Please begin with mild terrain and experiment safely to your new level of potential.

The low reduction will not only slow you to a tactical approach, but will also increase the expected output of your current equipment. Your response from the accelerator may surprise you. The crawl ratio is a torque multiplication. In some transfer case replacements, it can be an increase of more than twice that of the original potential.

## KEY CONSIDERATIONS:

**Brakes:** On flat ground, with the brakes applied and the transfer case in low, you will notice deeper squat in the suspension as you shift your automatic transmission into gear. If you have large disk brakes (front and rear), you will be well equipped to control the increase in torque. If you have drum brakes or a set of stock vehicle brakes (front and rear), you might find it hard to stop the vehicle when the transfer case is in its low range gear. There are many aftermarket brake upgrade kits out on the market. For serious off-roading, this upgrade should be considered.

**Differentials:** You are sure to find your weakest link! If you are not sure about the capacity of your current equipment, you may want to consult with an expert in this field! Research any 4WD magazine for the various sources of manufacturers and distributors.

## TOWING

Advance Adapters has flat-towed an Atlas equipped vehicle a distance of 300 miles and no problems were encountered. At this time, we can only recommend flat-towing at this maximum distance. After 300 miles of travel, the vehicle should be started. With the transmission in gear and the Atlas in neutral, let the vehicle idle for 5-10 minutes. This will circulate the oil in the Atlas and allow for proper lubrication.

If you are planning on flat-towing distances of 300 miles or more, and you don't wish to stop to circulate the transfer case oil; then we recommend the removal of the driveshafts to be on the safe side. This will prevent any damage that may occur to internal components due to the lack of normal oil circulation.

When a vehicle is being towed with the Atlas, both shift levers should be in the Neutral position. If you have an Atlas 4 speed the reduction housing must be shifted into high range. Our experience regarding the transmission towing position are as follows (please also verify in your owners manual what the vehicle manufacturer recommends):

Automatic transmissions should be left in park.

Manual transmissions should be left in any gear.

## MAINTENANCE

Atlas oil levels should be monitored frequently. The oil site tube should be marked to indicate proper oil level for the Atlas at the rotation installed in your vehicle. The oil should be drained and replaced at intervals of 20,000 miles or less. **Note:** If your primary use is extreme offroading, you may consider intervals as frequent as every engine service.

# Frequently Asked Questions

## Questions & Answers

### **QUESTION: Why does my Atlas blow oil out the vent tube/breather?**

**Answer:** Too much fluid will cause foaming at high speeds. Foaming oil expands and fills the entire cavity, which forces fluid out the tube; or the breather hose may be restrictive, causing the Atlas to build up pressure. On late model Jeeps, we have found that you must replace the restrictive breather (located on the firewall) with a free flowing atmospheric vent. This vent is typically found in earlier model vehicles. The stock vent was for lighter viscosity oils such as the ATF.

### **QUESTION: Why does my Atlas pop out of gear?**

**Answer:** Check for shift lever interference around the floor and dust boot. Make any additional clearance modifications needed. Engine and transmission mount combinations vary in rigidity, allowing some with more movement than others. The "TJ" support is by far the softest we have seen.

### **QUESTION: How should the unit be flat-towed? And how is the unit oiled?**

**Answer:** For flat-towing recommendations, please refer to the towing subheading in the Operating section of this manual. In reference to lubrication: The Atlas gears are supported on the shaft by a full complement of needle bearings. This design allows for less friction to develop in the unit. As long as the proper oil level is maintained while driving or flat-towing the vehicle, proper lubrication to these bearings is being achieved.

### **QUESTION: Where is the .090" shim?**

**Answer:** This question only relates to YJ customers. The .090" shim is the white washer that is included with the shift indicator plug. (The .090" washer is installed with the indicator plug on the Atlas shifter housing). The reason we use this shim is that Jeep used a couple of different shift indicator switches. To simplify our assembly and inventory, all of the Advance Adapters shift housings are machined alike. The .090" shim sets the proper height for your application. Refer to your instruction sheet provided with the Atlas transfer case.

### **QUESTION: Does the Atlas have provisions for a P.T.O. unit?**

**Answer:** No. We find very few P.T.O. units being used today. Therefore, the Atlas does not have provisions for a P.T.O. However, some transmission models do include this capability if you need this compatibility.

### **QUESTION: My Atlas seems to be noisy and has a rattling that resonates up through the handles. What is the cause?**

**Answer:** We have had a few customers that have complained of different noises. In every unit we've inspected, we still have not been able to find any type of problem with the Atlas itself. With our experience at this time, most noises originate with improper driveline angles. If you feel any vibration at the shift levers, your pinion angles need attention! Refer to the Final Installation section under the subheading Visual Inspection for driveline information.

### **QUESTION: My Atlas seems to be hard to shift. Why?**

**Answer:** It could be one of two reasons. First, the linkage could be binding. You may need to inspect for possible trouble areas. Refer to the Final Installation section under the subtitle Shifter Problem Checklist for more information. Second, the Atlas has shift rail detents, controlled with a ball and spring set. You can back off the brass set screws located on the shifter boss about a 1/4 turn, allowing an easier shift. As the unit is operated, components will seat in. After the first service, the brass set screws should be tightened 1/4 turn to return them to their original position.

### **QUESTION: Can I change my Atlas gears to a higher or lower ratio?**

**Answer:** This option is available; however, the parts & labor necessary may not be cost effective. New gears would be required. Items such as bearings, seals, and gaskets would need to be replaced. And shipping and labor costs would also apply. We can quote you on the cost of an upgrade, or the other recommendation we could offer is that you sell your current Atlas and purchase a new one with the desired ratio.

# Late Model Jeeps XJ, TJ, ZJ and XJ

YJ, TJ, ZJ & XJ installations have many similarities. The areas that differ will be noted on the pages to follow. To complete an installation into any one of these Jeep models, please review the instructions in the Installation Procedures For All Vehicles section in conjunction with this section.

## Tailhousing Adapters

On all of these late model Jeeps (if retaining your stock transmission), Chrysler used an oil weep hole on the stock adapter housing. This weep hole was located in one of two locations: on the adapter surface where the transfer case mates to the adapter, or on the bottom center of the casting near the crossmember foot. These weep holes were designed for the purpose of informing you when the seal in the tailhousing would fail. The Atlas does not always have the same input shaft length as your stock New Process transfer case to make contact to this seal and the Atlas is double sealed in the front of the transfer case to prevent any fluid transfer. Therefore; we highly recommend plugging the weep hole using RTV Blue silicone (if on the adapter housing face), or RTV Blue silicone and a sheet metal screw (when located near the crossmember foot). This will prevent any type of fluid leak when installing the new transfer case.

The Atlas is designed with a seal and a sealed bearing on the input shaft. The reason for this is to prevent mixing of dissimilar lubricants. Whether this is a stock transmission adapter or special transfer case adapter, gearbox contamination should not be a concern.

On some stock transmissions, most notably the Peugeot (21 spline), the AW4 (21 spline), and the late model Cherokee 23 spline transmissions A518 (46RH) & A500, you may have a spline engagement problem. If the splines bottom out before the two mating surfaces meet, you may be required to use a spacer adapter, [Part No. AS-0404](#). DO NOT force these components together.

## Speedometer

All of these vehicles utilized the same type of speedometer housing in the stock New Process transfer case. The Atlas was designed to accept the stock New Process speedometer housing. If your speedometer is correct (with reference to tire size and axle gear ratio) the stock speedometer will not change. If you plan on changing tires or gear ratio, please use the Speedometer Charts located in this manual. The speedometer housing is retained into the Atlas with a metal clip. When the housing is installed into the Atlas tailhousing, the speedometer housing should be rotated clockwise or counterclockwise until the speedo gear meshes with the Atlas output speedometer gear. The new seal kit you received with your Atlas should be installed to prevent any fluid leakage.

Transfer cases like the Rock Trac 241 use a sensor rather than a speedometer housing. The speedometer housing found on the NP231 will generate the same signal as the Rock Trac sensor. If you are replacing a Jeep transfer case that used a sensor and not a speedometer housing, than we can assist you with the correct parts to fit the Atlas transfer case and retain your stock speedometer.

## Rotation & Oil

The two stock rotations of the New Process transfer case are 13 or 23 degrees. We recommend the Atlas be installed at either a stock or higher rotation. The recommended 2 quarts of Torco oil will be used. As mentioned earlier in this manual, if the Atlas is overfilled it will purge the excess oil out the breather tube. You should also replace the stock breather hose and restrictive vent.



# YJ INSTALLATION

The YJ Wrangler was manufactured from 1987 to 1996. In those 9 years of production, Chrysler used several different transmissions. The overall length of the transmissions (the output shaft spline lengths and tooth counts) varied. We have researched several vehicles, each with a different transmission application. The information in this section is based on those applications. We have not seen every combination Chrysler offered; therefore, some additional modifications may be needed for your vehicle but not noted.

## Shift Indicator Switch

The Atlas is designed to accept the stock YJ shift indicator/modulator switch. This switch not only indicates the dashboard 4WD lights, but also activates the vacuum actuated solenoid for front axle engagement. When installing this switch into the Atlas, you must utilize the white nylon washer to obtain the proper spacing of this switch. (The .090" washer is installed with the indicator plug on the Atlas shifter housing). If your vehicle has a custom front axle, this switch can still be used - but for dashboard lights only. If you wish to omit this switch altogether, just make sure the indicator plug is secured in the shift indicator hole.



YJ sensor with .090" washer



The vacuum actuator to engage front axle.

## Shifter Installation

The Atlas twin stick is designed as a universal application. We recommend [P/N 303000L](#) for the correct shifter configuration. This shifter protrudes from the face of the Atlas 5-1/2", but is easily shortened to other lengths. Both handles on the shifter are straight and fit in the vehicle side-by-side. As long as your YJ is not equipped with an aftermarket console, these shifter handles should have adequate clearance.

## Crossmember & Body Modifications

The stock skid pan of the Jeep Wrangler may need some modifications to allow proper clearance for the Atlas. These modifications will vary depending on the transmission length and the degree of rotation you install the Atlas. Modifications are normally done to allow the transfer case skid pan to fasten directly to the frame rails without



Possible crossmember modifications

spacers. The stock rubber mount should be retained in the stock location. By placing the skid pan into position, inspect for necessary clearance. The Atlas may interfere with certain portions of the skid pan. Mark these locations, remove the skid pan and modify the pan were necessary. We also use a drain plug which is located on the inspection cover of the Atlas. You may want to open a location on the skid pan to access this plug.



Possible crossmember modifications



Upper body clearance modification without a body lift and a shallower rotation than stock.

With the many rotation options available with the Atlas, most offroad enthusiasts desire more ground clearance. To obtain this additional ground clearance, the Atlas is usually installed in a shallower than stock rotation. Body modifications will normally be required. To avoid these modifications, a body lift can be used. These photos show an Atlas installed with the least degree of rotation



*without* a body lift. **NOTE:** The shallower rotation may provide the needed clearance on the crossmember to avoid crossmember modifications.



The Atlas installed at a shallower rotation than stock.



## TJ INSTALLATION

The TJ Wrangler began to be manufactured in 1997. This vehicle model is normally equipped with either an automatic transmission (Torqueflite & 42RE), or a manual transmission (AX5, AX15 & NV3550). The installation photos in this section relate to both automatic & manual transmission applications.

### Shift Indicator Switch



The Atlas is designed to accept the stock TJ 4WD indicator switch. This switch only indicates the dashboard 4WD light. Unlike the previous YJ model, TJs have a full time engaged front axle. This switch is installed into the Atlas shifter housing without the use of any spacer or washer. **Note:** Since the front axle is always turning, the TJ uses a C.V. front yoke.

### Shifter Installation

The twin stick for the Atlas TJ application has three design options. **P/N 303003L** should be used with a AX5, AX15 & NV3550 transmissions, and **P/N 303002L** should be used with the Torqueflite automatic transmission. These shifters are designed specifically for these applications and fit the stock console. **P/N 303002U** should be used with the 42RE automatic transmission or any vehicle that has had a drivetrain swap. This shifter has a long extension from the front of the Atlas and can be modified to fit most applications. The photos in this section illustrate a TJ installation.



The stock floor mount (shifter and linkage) is removed before initial installation. The console and driver's seat should also be removed for ease of installation.



The sticks will come up through the stock floorboard hole. You will be required to cover a small portion of the stock hole. The rear driver's side will need a piece of sheet metal to be added. **Make sure the handles move freely and don't touch the floorboard. Interference will cause the unit to pop out of gear.**



Place the stock console in its original position to test fit the Atlas handles. Rotate the twin stick assembly so that it aligns with the console slot. Once the correct position is obtained, remove the console again.



Shift the Atlas into 4WD low (both handles forward), verifying at least a 1/2" clearance between the handle and the body. Test fit the shifter boot and boot ring. You will need to add a small piece of sheet metal at the REAR of the boot to extend the floorboard. Check the shifter boot and the handles for any interference or binding. Fasten the shifter boot and boot ring to the floorboard using high temperature silicone for an airtight seal around the boot area. **Note:** Sometimes the shifter boot will tend to bunch up, causing the unit to pop out of gear. We have found that if you apply a small amount of grease where the boot and handles contact, it will help to prevent this problem.



### Crossmember & Body Modifications

The Atlas is able to be installed without spacing the stock crossmember, even with a suspension lift. Without spacers, it is crucial that the pinion angles be considered. Improper pinion angles can cause driveline noise which could easily be misinterpreted as transfer case noise. If you opt to use some type of spacers on your crossmember, this can affect the installation and operation of your twin stick shifter.



If you plan on using a lift kit in addition to your new Atlas, it is important that you correct your pinion angle when running a rear C.V. type driveshaft. The pinion angle should be equal to that of the output driveshaft. Many aftermarket suspension systems allow you to adjust the lower control arm length to give you the pinion angle you need.

Note the new Atlas installed with no crossmember spacers (which robs you of precious ground clearance), and the gain of over 6 inches of new and much needed REAR driveshaft length.

On TJ installations, you will have a few modification options when installing the Atlas transfer case. The first and most desirable option is to rotate the Atlas to a shallower than stock rotation. This will cause interference with the floorboard of the vehicle on the driver's side. By positioning the Atlas in the vehicle and rotating it up to where it makes contact with the body, you will need to mark this location. Modifications will require some 'hammering' on the floorboard to provide clearance. By installing the Atlas with this modification, you will obtain the necessary crossmember clearance. If your vehicle has a body lift, modifications to the body may not be necessary.



A second option is to use the same rotation as your stock transfer case. Since the Atlas is physically larger in size than the stock New Process case, modifications to the skid pan will be required. The Jeep TJs used a few different skid plate designs, so the modifications may vary. We have shown some of the most typical modifications required. There are also several aftermarket companies that offer new skid plates that fit closer to the frame rails and have been cleared for the Atlas transfer case.



No matter which option you decide to do, we recommend that you provide clearance on the crossmember for the Atlas drain plug. This drain plug is located on the access pan of the transfer case.

On stock AX15 & NV3550 manual transmission applications, the crossmember bracket will need to be modified. The photos below and the illustration on the following page will aid in the necessary modifications.



The stock manual transmission bracket before modifications.



The modified transmission bracket with the rubber support in the new location.

Once the bracket has been modified, the crossmember must be modified to fit the angle of the transmission and rubber support.



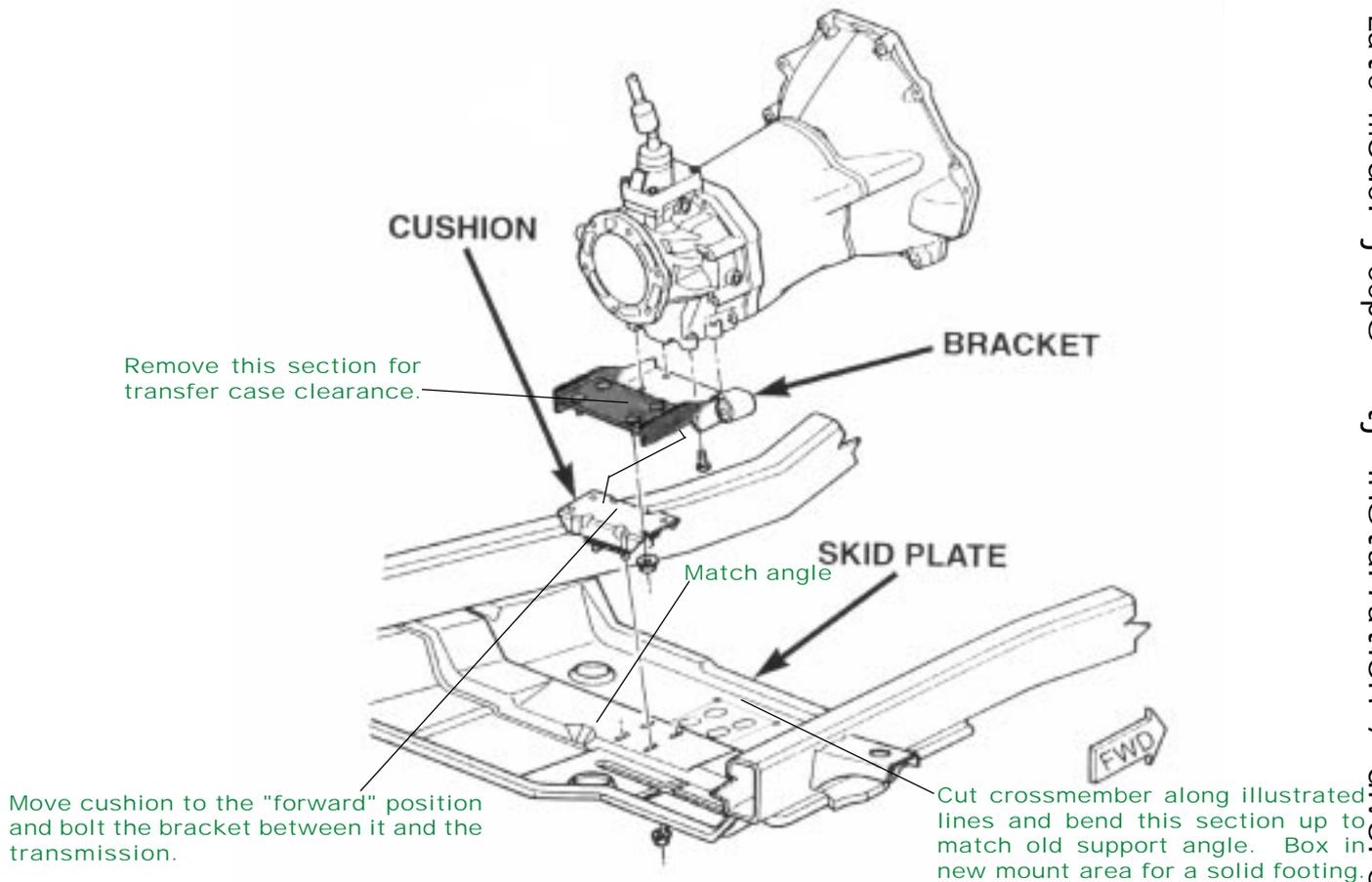
Modified pan.



The crossmember with the new rubber mounting area modified.



Modified pan (inside)



The AX5 transmission is slightly shorter than the other manual 5 speeds found in the TJs. The 1997 & newer AX5 found in TJs has a 21 spline output shaft that protrudes .500" from the back of the 5 speed. This 1/2" stickout allows for this transmission to be equipped with a 1" spacer. The 1" spacer is recommended because it allows for a cleaner shifter installation. The rubber support must be modified and moved under the transmission tailhousing. In its original location, the rubber support will interfere with the Atlas.



1" spacer allows for easier shifter installation



Modified rubber mount.



AX5 should have 1/2" output shaft stickout.

# ZJ INSTALLATION

Jeep Cherokees known as the "ZJ" are a great platform for offroad use. They are comfortable enough to be driven daily, yet rugged enough to warrant the Atlas. The majority of the information in this section is based on a 1994 ZJ.

The '94 ZJ was equipped with a 5.2 liter V8, a A518 (46RH) transmission, Dana 30 and 35 differentials with a 3.73 gear ratio. First, the ZJ was raised enough to clear 32 x 11.50 tires, which took 4.5 inches of lift consisting of new springs, adjustable control arms, and longer shocks. Since the Cherokee is uni-body in design, the suspension had to be adjustable allowing us to dial in our pinion angles. This was crucial to obtain correct driveshaft angles when installing an Atlas transfer case. Because of this uni-body construction, any driveline vibration (due to improper driveline angles) will be very noticeable.

## Shift Indicator Switch

The Atlas is designed to work with both the vacuum actuated front axles and the stock dash board indicator lights. Since these features were designed into the Atlas based around the YJ & TJ Jeep vehicles, installing the Atlas into the ZJ & XJ presented a few problems in this area.

The shifter indicator on many of the ZJs is a 4-prong connector that indicates 4WD High, 4WD Low, and part time 4WD. Unfortunately, the shift rail detents in the Atlas cannot provide the same features as your stock indicator did. You can use a Jeep TJ switch which will indicate when you are in 4WD, but not high and low range. On our application, we opted to not use any type of shift indicator light.



Front output shaft provides better crossmember clearance due to the positive offset yoke.

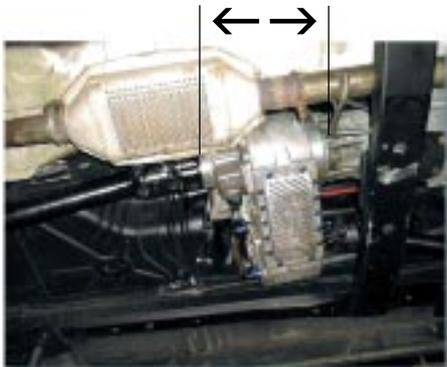


## Crossmember & Body Modifications

The installation of an Atlas requires little or no modifications to the body or the crossmember. The installation that we performed actually improved driveline angles, crossmember clearance, and ground clearance. The photos that follow illustrate the Atlas with a shallower than stock rotation. On some XJs, a full crossmember/skid pan was used. If this is the case with your vehicle, you may have some of the same modifications as shown in the TJ section.

## Shifter Installation

There are several configurations of Atlas twin stick handles. For the vehicles that we have installed the Atlas into, we have designed specific shifters for each application. The photos show the stock ZJ console with [Part No. 303005L](#) Atlas twin sticks installed.



Because of the shorter overall design, the Atlas tucks up behind the crossmember. It reduces the high center problems on longer wheelbase vehicles.



Driver's side view (ZJ).



ZJ twin sticks side-by-side in 2WD High.

# XJ INSTALLATION



Late model jeeps - XJ installation

The Jeep Cherokee "XJs" are also great platforms for offroad use. They are comfortable enough to be driven daily, yet rugged enough to warrant the Atlas.

The majority of the information in this section is based on a 1998 XJ. The XJ was equipped with a 4.0L 6 cylinder and a AW4 transmission.

The XJ model is very similar to the ZJ installation. Since the Cherokee is uni-body in design, the suspension had to be adjustable allowing us to dial in our pinion angles. This is crucial to obtain correct driveshaft angles when installing an Atlas transfer case. The XJ model Cherokee has a rear leaf spring & front coil design suspension system. If a lift kit is used on an XJ, make sure that you are able to shim the axle to obtain proper driveshaft angles. Any driveline vibration (due to improper driveline angles) will be very noticeable because of this uni-body construction.

## Shift Indicator Switch

The Atlas is designed to work with both the vacuum actuated front axles and the stock dash board indicator lights. Since these features were designed into the Atlas based around the YJ & TJ Jeep vehicles, installing the Atlas into the XJ presented a few problems in this area.



XJ sensor will need a .090" washer for proper spacing

Many of the early XJs used a vacuum operated front differential. The stock vacuum control switch, located on your stock transfer case, can be reused on the Atlas. Your vehicle will operate as it did stock. On later model XJs, the front axle was redesigned and the vacuum controls were removed. These vehicles should have an indicator light similar to the TJs. The front axle is always engaged, in which the indicator switch is nothing more than a dash light. Note: The .090" washer is installed with the indicator plug on the Atlas shifter housing.

## Crossmember & Body Modifications

The installation of an Atlas requires little or no body or crossmember modifications. The installation that we performed actually improved driveline angles, crossmember clearance, and ground clearance. The photos that follow illustrate the Atlas with a shallower than stock rotation. On some XJs, a full crossmember/skid pan was used. If this is the case with your vehicle, you may have some of the same modifications as shown in the TJ section.

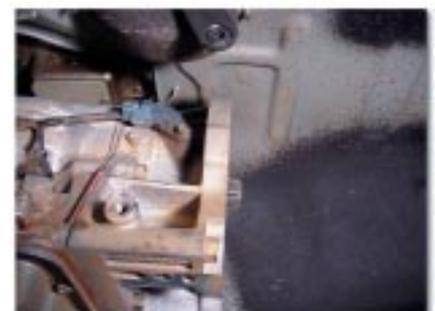
## Shifter Installation

If your XJ does not have a center console, universal shifter [P/N 303000L](#) is recommended. XJs with a center console should use [P/N 303007L](#).



Rear view of the AW4 automatic.

The photo (below) shows the rotation we used to obtain the proper shifter clearance.



The stock output shaft protrudes .500" past the stock adapter housing. To achieve the proper spline engagement on the Atlas, a 1" spacer is required (Part No. AS-0404).



The photo (above) shows the minor body modification made for clearance on the Atlas.



The stock console will require disassembly and the stock transfer case linkage will need to be removed.



This photo shows the Jeep console removed and the transfer case linkage removed.



Floorboard modifications are necessary to fit the Atlas twin sticks. This photo shows 1" of material removed from the right side and front of the stock hole. (.500" needs to be removed from the left side)



Once the floorboard has been modified, it should look like the photo shown here.



Since the stock floorboard hole is longer than needed, we recommend using a piece of sheet metal to cover the rear 1" section of this stock hole. (photo shown left)



Test fit the Atlas shift handles. If proper clearance has been obtained, screw the rubber boot and ring to the floorboard. Note: The boot ring will need to be cut in half for proper fit to your floorboard.



Since the stock transfer case shift indicator cover will not fit with the Atlas twin-sticks, we modified this cover. Remove the indicator panel and cut the plastic that supported the indicator panel. Ideally, the plastic housing that snaps into the console is what your trying to retain. We purchased a small piece of black plastic from a local stereo installation shop and cut it to fit our plastic housing. We heated it to fit the contour and glued it into position. We then cut new access holes in the black plastic to fit our twin sticks.



# Cj Installation



The Atlas can be used in Jeep CJs 1980 to 1986. These vehicles would normally be equipped with a Dana 300 transfer case. Whether you have your stock transmission or not, the Atlas will bolt directly to the transfer case adapter that previously supported the Dana 300. Since the Atlas is 1.8" longer than the Dana 300, driveshaft lengths should be considered. The vehicle that we used to install the Atlas was a 1983 CJ7 with a T5 transmission. It also had a 3" suspension lift.

### Shift Indicator Switch



On some CJs, Jeep used an indicator light for 4WD. The Atlas has provisions to use a late model 4WD indicator switch found in the stock "TJ" models, Jeep Part No. J8134473. On average, this part is priced around \$20.00. If you prefer not to use the indicator, use the plug included in your kit.

### Shifter Installation



The Atlas twin stick is designed as a universal application. We recommend [Part No. 303001R](#) for the correct shifter configuration. This shifter protrudes 5-1/2" from the face of the Atlas, but is easily shortened to other lengths. Both handles on the shifter are straight and fit in the vehicle side-by-side. As long as your CJ is not equipped with an aftermarket console, the shift handles should have adequate clearance.

### Rotation, Crossmember & Body Modifications

The stock rotation of the Dana 300 transfer case is 35 degrees. We recommend the Atlas be installed either at the stock rotation or a shallower than stock degree of rotation. The recommended 2 quarts of Torco oil should be used. The stock crossmember will most likely have to be spaced off the frame rails to allow for proper driveshaft angles. This will also aid in the clearance of the Atlas in reference to the Jeep body. If the rotation of the Atlas is shallower than stock, some body modifications may be necessary, or a body lift could be used. These



Skid pan with spacers. Spacers can usually be eliminated with the shallow transfer case rotation and minimal transmission mount height.

modifications will vary depending on the length of the transmission that your CJ Jeep is equipped with.



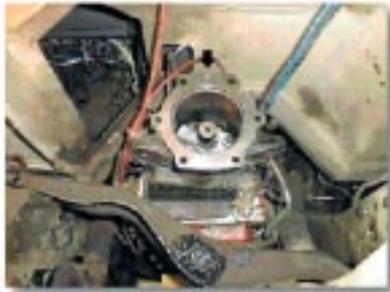
Upper body modification for clearance when the Atlas is rotated shallower than stock.



# 1966-77 Bronco Installation

The Bronco Dana 20 transfer case has a stock rotation of 42 degrees. When installing the Atlas, we offer both this stock rotation and a 7 and 14 degree higher rotation for clearance. On the vehicle we installed the Atlas transfer case into, we opted to use the 7 degree higher rotation which provided extra front driveshaft clearance on the exhaust and crossmember. This rotation also allowed us a cleaner shifter installation. The only area of concern was the frame rail clearance, which we felt was still adequate. (On some applications, your brake lines may need to be moved to provide the extra clearance between the Atlas and your frame rail).

The project that we completed was on a 1977 Bronco with a late model injected 302, and a C4 automatic transmission. The information contained in this section was obtained while completing this installation. The biggest difference on this vehicle compared to other Broncos (with reference to the transfer case installation) would be the transmission that was either stock or retrofitted. The Atlas should fit properly on all other applications; however, the shifter linkage or floorboard may need to be modified to obtain proper shifting clearance. Your Bronco should be equipped with a minimum 2" body lift. This will aid in shifter clearance.



The stock Bronco Dana 20 transfer case is normally indexed onto the stock adapter housing with an aluminum bearing retainer. When using the Atlas, this aluminum retainer will be removed because the Atlas has its own indexing plate. We have found on some stock adapter housings that Ford used a one piece adapter housing with a cast-in retainer. On these applications, your stock tailhousing adapter will need to be machined. If you find this to be the case, please



contact us for the necessary machining specifications or for a replacement housing. When removing the stock transfer case and exposing the tailhousing adapter, you'll also find that Ford used a large dowel pin located at the top of the stock housing (shown above left). This dowel pin must be removed (shown above right).

With the two different stock transmission/transfer case combinations, spline engagement is always a concern. The Atlas was designed to obtain the utmost spline engagement. Ford used two different transfer case input shaft lengths. Since this problem exists, we have opted to design two different length input shafts for the Atlas to match the stock. The long input was normally found on the T&C transmissions and the shorter input on the C4 transmissions. When ordering your transfer case, this should be considered. If a long input gets ordered and you needed the shorter style input, the long Atlas input shaft can be shortened .300 inches.

The speedometer housing on the Atlas transfer case is a stock 1982-86 Jeep application. To hook your speedometer cable onto the Atlas, *Nevada Speedometer* offers the necessary components to couple your stock cable to the Atlas. If your vehicle's engine requires a pulse generator, they can also assist you in this area. Their phone number is (775)358-7422.

The stock Bronco Dana 20 front driveshaft uses a C.V. yoke on the transfer case. This transfer case also had a breather located right on the transfer case. The Atlas has a brass 90 degree elbow on the top of the transfer case for a breather tube to be installed. We recommend that you obtain a 3/8" fuel hose and run it from the transfer case to the back side of the firewall. The end of the tubing that fastens to your firewall should also be equipped with a breather vent. This provides two benefits. First, the vent will eliminate transfer case pressure. Second, the breather located on the backside of the firewall prevents water from entering into the transfer case.



The twin stick configuration for the Bronco applications (P/N 303004L) was designed around the C4 transmission configuration. There are numerous transmission options available for the Bronco's; therefore, this shifter configuration may not work in all vehicles. You may be required to modify the shift handles to work in your vehicle.

Use the recommended 2 quarts of Torco oil. If the unit is overfilled, it will cause the unit to vent oil out the breather hose.



Stock location



Custom location



The stock Dana 20 transfer case measured 10-1/4" from the surface of the stock adapter housing to the face of the output yoke.

# Bronco ii, Ranger And Explorer Installation

The Atlas has been designed to replace the stock Borg Warner 1350 transfer case. Before you begin, a few items should be taken into consideration.

## Preparation

You should first consider clearance for the Atlas case. You will either be required to have a body lift (1" minimum), or else be prepared to do crossmember modifications and/or considerable underbody modifications.



We have provided (5) 10-1.5mm x 35mm long bolts in the Explorer shifter kit for the transfer case-to-transmission adapter. Due to different adapter thicknesses, make sure that these do not bottom out in the Atlas case when tightened. You will be required to remove the stock breather hose bracket from the stock tailhousing because it will interfere with the Atlas shifters.



When we performed the Atlas installation into an Explorer, we opted to use a 1" body lift which only required minor floorboard modifications. When test-fitting the Atlas into your vehicle, mark the areas that interfere with the Atlas. Clearance should be checked on the shifter housing, the shifter linkage rods, and the upper front portion of the case. Modify the body accordingly to acquire proper clearances.



## Shifter Installation

The shifter assembly for these vehicles (P/N 303006L) will require modifications to be done to your floorboard for shifter handle access. It is easiest to perform the installation by removing the driver's seat, along with pulling back the carpet to expose the tunnel area. With the Atlas bolted in position, install the twin stick extension tube and shifter base to locate the position best suited for clearance. Cut the floorboard to allow at least 1/2" clearance around the shifter handles in both 4WD high and 4WD low.

## Speedometer

Your stock speedometer connection off of your Borg Warner transfer case is different than the Jeep speedometer housing that the Atlas uses. To connect your speedometer cable to the Atlas, you must first reroute the cable over the driver's side frame rail. A speedometer cable and in-line speed sensor must be purchased from Nevada Speedometer to retain your stock (O.E.M.) setup. Nevada Speedometer's phone number is (775)358-7422.



## Breather Hose & Oil

At the top of the Atlas you will find a 90 degree brass elbow. You will need to attach a new vent tube hose (3/8" fuel hose) to this elbow. Route this hose along the transmission or frame rail, ending up at the upper portion of the firewall. Attach a free flowing atmospheric breather onto the end of this hose. This type of breather can be found in earlier model vehicles or on many differentials. To prevent the Atlas from building up pressure and blowing oil out this breather, fill the Atlas with the recommended 2 quarts of oil.





# Toyota Tacoma, Tundra, And T100 Information

Toyota tacoma, tundra and t100 installation

## Toyota Tacoma 1995 & 1/2 to 2004

Application	4 cyl. 5sp man.	4 cyl. auto	3.4L V-6 5sp	3.4L V-6 auto
Stock T-case input spline	26	26	23	23
Atlas Adapter kit	50-5711	50-5711	50-5710	50-5710

## Toyota Tundra 2000 to 2004

Application	3.4L 5sp	3.4L auto	4.7L I-force V-8 (auto only)
Stock T-case input spline	23	23	23
Atlas Adapter kit	50-5710	50-5710	50-5710

## Tacoma, Tundra & T100 - Atlas swap information:

<b>Adapter length</b>	3/8"
<b>Left drop Case</b>	Stock is a left hand case drop (RH solid axle swaps are common)
<b>Atlas Input Spline</b>	23 (for both 50-5710 & 50-5711 kits)
<b>Std case Rotations</b>	LH: 3 to 46 degrees (40 degrees is stock); RH: 15 to 46 degrees
<b>Atlas Tailhousing</b>	ALT32
<b>Yokes</b>	Jesse @ High Angle can make a special Toyota flange yoke (Tel# 530-877-2875)
<b>Shifters</b>	Cable shifters recommended (std shifter comes through the floor near the dash)

**Install notes** No crossmember modifications needed. The stock mount and location are retained. Some floorboard modifications are needed. Driveshaft modifications are required and some grinding may be required on the Atlas tailhousing and shifter tower. There is also some wiring needed on later Tacoma models with VSS and/or push button shifting.

**Speedo / VSS**

1995-1997 Fully mechanical speedo. Call a speedo shop for an adapter cable to the Atlas Toyota speedo cable. One source is *Nevada Speedometer*, Tel# (775)358-7422.

1998-2004 A speedo driven VSS is used. Square wave, 3 wire, 4 pulse/rev. A Jeep TJ speedo driven VSS has been used successfully with an in-line calibrator. The signal will be about 20% off if signal is not calibrated. See the chart below for Jeep VSS parts. Otherwise, some sort of speedo driven square VSS will be needed.

### TJ SPEEDO HOUSING VSS PARTS TJ Wiring code

Part #	Description	+5V	Violet /orange
*05013660AA	Sensor 8 pulse/rev	Grnd	black / light blue
*52069315	Sensor housing	signal	white / orange
*52067-629	29T driven gear		

\*We stock these parts under a kit, [P/N 300640](#).

**Optional Items:** For customers who want a low range switch for the dash light, a VSS shift control ([Part No. 300400](#) or [300400R](#)) has provisions for the 2wd/4wd and a low range switch. (The standard shift control will need to be subtracted from the order). The switch is a Jeep TJ switch sold under [P/N 300378](#) (two required).

# ATLAS INPUT SHAFT CHANGE

4WD vehicles seem to always be in a state of change. You may be changing gear ratios in your axles, going to larger tires, or changing out your transmission. The Atlas is only affected when a transmission is being changed. For example: You may have ordered an Atlas to fit your stock Jeep transmission; however, now you've decided to upgrade to a GM TH400. The Atlas would need the front input changed if you wanted to keep the stock 32 spline TH400 output shaft. The photos below describe this input shaft change out.

Once the Atlas is removed from the vehicle, drain the oil. Remove the brass elbow on the top of the transfer case. Shift the unit into 4WD low range (both shift rods back into the case). Set the unit upside-down on a work surface. Remove the 14 access cover bolts and the cover itself. The cover is sealed to the case, so it is a little tough sometimes to separate from the case. Once the cover is off,



you will need to remove the cluster pin bolts from both the front and rear of the transfer case (photos shown right & left). From the front of the transfer case, push the cluster pin out of the case. You should be supporting the cluster gear with one hand as you push out the cluster pin with the other.

Once the cluster pin is removed, you will need to remove the cluster gear from the case. Be careful so that the caged needle bearings do not fall out of the cluster. Set the cluster gear aside and remove the two thrust washers from the case. These washers fit between the cluster gear and the inside of the case.



Remove the 6 Atlas input ring bolts and remove the input ring assembly from the transfer case.

Remove the snap ring from the input shaft. This snap ring retains the drive gear to this assembly.

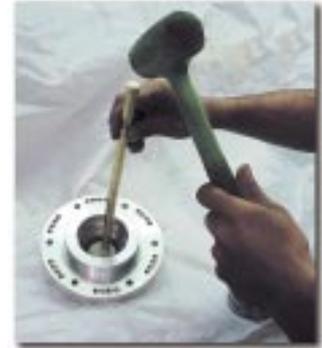


The drive gear is a light press fit onto the input shaft. It is required to be pressed off for disassembly and pressed on for assembly.



Once the gear is removed, the input shaft can also be removed. Since the input shaft is a press fit onto the front bearing, the shaft is pressed out as shown above.

Any time an input shaft is replaced, we recommend changing the front bearing and front seal. If you are changing the front input to a different input spline, a new front seal may be required.



Install the new seal (spring side out) into the input retainer. Press the new bearing and secure it with the snap ring. Lubricate the seal and press the new input shaft into the input ring. Turn the retainer over and press the drive gear onto the new shaft. Once the gear is installed, retain it with the small snap ring. Set the brass synchronizer ring on the gear. Before installing the input assembly onto the transfer case, a new square o-ring must be installed to seal the input ring to the case.

You are now ready to install the input ring to the case assembly. Care should be taken to make sure the brass synchronizer ring lines up properly with the synchronizer dogs. Failure to line these up can cause internal damage to the unit.

Once the input is properly aligned, you will be required to line the 6 counter sunk holes with the case assembly. The input ring only bolts to the case, lining up all 6 holes in one rotation. Once the holes are lined up, install the 6 bolts using Loctite 242 and torque these bolts to 18 ft./lbs. Reinstall the two cluster gear thrust washers into the Atlas case and set the cluster gear into the case. Install the cluster pin, making sure the thrust washers don't fall down into the case. As the pin gets closer to being fully installed, install the small o-ring on the cluster pin. The pin must be installed far enough through the opposite side of the case to expose the other o-ring groove to install the new o-ring and thereby properly sealing the Atlas transfer case. Install the cluster pin bolts on both the front and back of the Atlas case to properly retain the cluster pin, preventing the pin from turning.

Install the new pan gasket and reinstall the 14 access cover bolts. Torque bolts to 8 ft./lbs. Before reinstalling the unit into the vehicle, check it for proper shifting. Reinstall unit as per the installation directions and fill with the recommended fluid.

#### Parts required to change out to a new front input:

- (1) 300499 - Input seal for (29, 31, 32, 34 & 35 splined input shafts)
- (1) 300500 - Input seal for (10, 21, 23, 25, 27 & 28 splined input shafts)
- (1) 300490 - O-ring for input ring
- (1) 300510 - Sealed bearing
- (6) 723730 - Front retainer bolts
- (1) 301400 - Access cover gasket
- (2) 300358 - Cluster pin o-rings

#### New front inputs:

- 300012 - long 23 spline input
- 300013 - short 23 spline input
- 300014 - Nissan 32 spl. input
- 300034 - 34 spline input
- 300111 - 35 spline input
- 300112 - 23 spline input
- 300113 - 29 spline input
- 300114 - 10 spline input
- 300115 - 31 spline input
- 300116 - 32 spline input
- 300117 - 27 spline input
- 300118 - 28 spl. long input
- 300118S - 28 spl. short input
- 300119 - 21 spline input
- 300120 - 25 spline input

# ATLAS SHIFT FORK UPGRADE & HEAVY DUTY FRONT OUTPUT INSTALLATION

The following pages are installation instructions for both the shift fork replacement and the heavy duty front output shaft kit. The instructions for the front output shaft require the shift forks to be removed. Therefore, if you are just doing a shift fork change, stop at procedure 11 and move forward to procedure 20.

## SHIFT FORK KIT:

[P/N 301550](#). The Atlas transfer case has undergone some shifter fork changes since its inception. The first shift forks used in the Atlas were equipped with non heat-treated material. These shift forks had a tendency to bend after a period of time. A bent fork would then prevent the shifter slider to fully engage the drive cogs of the gear, allowing the transfer case to pop out of gear. We changed the shift fork material on cases numbered 81 & up to a special heat-treated alloy. This shift fork proved to be the fix for the early style Atlas shift fork.



We have recently experienced a few of these newer style shift forks breaking. The shift fork was designed as a two piece component. The physical fork is spot welded to a steel bushing. This steel bushing is then fastened to the shift rail. The breakage that occurred on the few shift forks we've seen occurred at the weld. Since these forks are made from heat-treated material, heavier welds would not be the answer because it just softens the metal similar to the early shift forks. We, therefore, opted to add a gusset to the shift fork which moves the torsional shifting load away from the weld. This latest version shift fork will give the Atlas additional strength; however, *this fork upgrade should not be done unless a shift fork problem exists.*

## Why Forks Break:

The Atlas was designed to lower your gears and give you a reliable transfer case. The few units that have actually broken shift forks were being used in extreme vehicles, competing in rock crawling competitions. Since time is a factor at these events, the Atlas is being worked hard and shifted hard. The shifting design of the Atlas starts with the shifter slider. This component (shown below right) has a taper on the splines (this shifter slider is known as a torque lock slider). When shifted onto a gear that is under power from the drivetrain, this torque lock slider actually pulls the slider onto the gear. When trying to shift the transfer case out of gear in this situation, you're basically opposing the torque of the engine and the taper of the slider with the Atlas shift assembly. The shift fork is then trying to overcome the torque of the engine which is locking the torque lock slider to the Atlas gear. Therefore, to shift the Atlas transfer case under these conditions and to actually get the unit to shift, you would have to use extreme force and inevitably break something - the shift fork being the most likely candidate. This locking mechanism on the Atlas also applies when a vehicle front axle is binding, putting torque on the front driveshaft and thus locking the slider on the gear.



This photo shows the taper of the splines on the shifter slider.

## HEAVY DUTY FRONT OUTPUT SHAFT KITS:

[P/N ARF32](#) - 32 spline front output shaft kit (no yoke is supplied)

### Shift Fork & H.D. Front Output Installation Procedures:

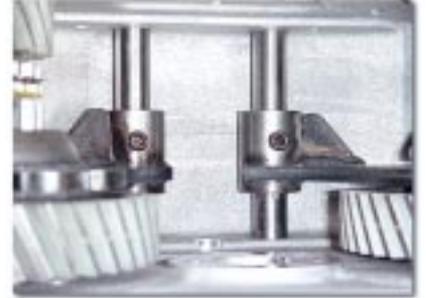
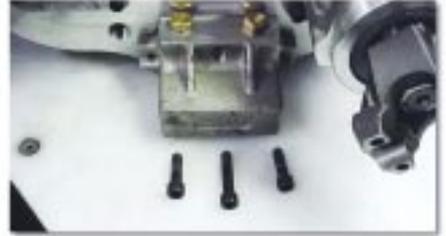
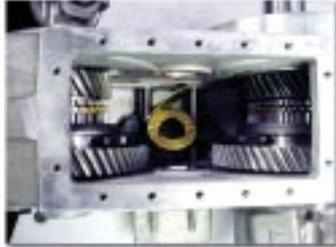
1. Remove the transfer case from the vehicle.
2. Remove the drain plug and drain the oil.
3. Remove the (14) torque head bolts and remove the inspection cover. Clean the surface of any debris.



4. Remove the cluster pin retaining the bolts.
5. Remove the cluster pin from the unit.



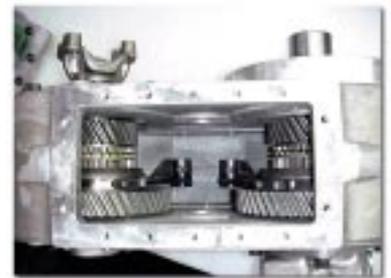
6. Remove the cluster gear. **Note:** Use special care not to drop the bearings from inside the gear.
7. Remove the two thrust washers from inside the case.
8. You should now have access to the shift fork set screws which need to be removed.
9. Remove the three bolts from the shifter control.



10. Using a plastic dead blow hammer, use one hand to support the Atlas shift forks inside the case to prevent binding on the shift rails and the other hand on the hammer *lightly* tapping the shift rails from the front of the case. This provides an easy way of pulling the shifter control from the Atlas case. Once the shift control is removed, clean both the case and shifter control mating surfaces.



11. Remove the shift forks. If you are doing a shift fork upgrade only, move to procedure 20. **Note:** Atlas cases #1929 & earlier are the only units that need to have shift fork upgrades.



12. Remove the 5 bolts from the front output shaft retainer and the 4 rear bearing cap bolts. Remove the front assembly from the Atlas case. **Note:** The low range gear, bearing, spacer, and rear bearing will be left in the case.
13. Remove the front yoke nut and front retainer. Remove the bearing and spacer. The gear and needle bearing can then be removed.





14. Next, remove the shifter slider, the synchronizer springs, the synchronizer dogs and the brass rings. These components need to be reinstalled back onto the new 32 spline front output shaft.



15. Once the slider and synchronizer parts are installed on the new shaft, you'll need to install the caged needle bearing back onto the new output shaft along with the high range gear. A new spacer has been included in the kit which fits between the high range gear and the new tapered roller bearing. You can now install the new front retainer over the shaft assembly. Install the new seal washer and the new front yoke with the nut. Torque the nut to 150 ft./lbs. We have also included a new o-ring for the aluminum housing, and this should also be installed now.



16. Take the new front assembly and turn it over (as shown below) and install the caged needle bearing for the low gear on the shaft. Insert the new assembly into the Atlas case. As the front assembly is being installed, slip the low gear onto the rear portion of the shaft and onto the needle bearing.



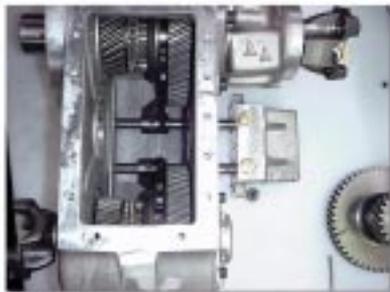
17. With the front assembly further into the case, install the original spacer and the original tapered bearing. This assembly will then pilot into the bearing race located in the back of the transfer case.



- Shift fork and h.d. front output install
18. Once the shaft assembly is fully installed, line the 5 retainer bolt holes up with the case and install the 5 fasteners. Make sure you put a dab of RTV Blue silicone on the threads and tighten.
  19. We have included three new bearing shims and a new cap because this is how the tapered bearings are set to the correct tolerance. The shims can be added to the machined cap to accept different bearing thicknesses. Ideally, with the rear cap installed you want approximately 10 inch./lbs. of drag when turning the front output assembly. We recommend measuring the stickout with a depth micrometer, then use the bearing cap and shim or shims that is closest to that measurement. Once the proper combination is found, use Loctite 518 on the mating surfaces and tighten the 4 Allen bolts.



20. Use Loctite 518 to reseal the shifter control to the Atlas case. Insert the shift rails into the back side of the case and guide them through the shift forks inside the Atlas. Once installed, bolt the shifter control into position with the three bolts and torque to 25 ft./lbs.
21. Align the shifter set screw hole on the shifter fork with the matching hole on the shift rod. Install the set screw with Loctite 242 and torque to 15 ft./lbs.



22. Install the cluster gear, thrust bearings, and cluster pin. Two new o-rings have been provided for the cluster pin. Be careful to make sure that the thrust washers are properly aligned between the inside of the case and cluster gear.
23. Install the two cluster pin bolts & seal washers to retain the cluster pin in its proper location. Torque bolts to 16 ft./lbs.
24. Install the new pan gasket and inspection cover. Torque (14) bolts to 10 ft./lbs.
25. Replace the drain plug, fill with oil, and reinstall the unit back into the vehicle.

### Miscellaneous Atlas information:

We've had a few customers that have disassembled their Atlas transfer case. One mistake commonly made is the reassembly of the unit. The tailhousing on the Atlas is a component that must be shimmed properly in order for the unit to operate properly. When reinstalling the tailhousing, most individuals use a silicone sealant which changes the end play on the Atlas and will cause internal problems.

Check the yoke nut torque specifications periodically. The front 26 spline shaft should be torque at 130 ft./lbs.; and the 32 splined shafts should be torqued at 150 ft./lbs.

Shifting is an acquired "touch" and "feel". You will not learn it overnight.

It is twice as hard to shift the transfer case if the vehicle is not at least slowly rolling forward. In addition, trying to shift the transfer case while the wheels are turned puts a bind on the synchronizers, making it almost impossible to shift in or out of gear.

We have found that driveline angles are responsible for 99.9% of all noises that "seem" to be coming from the Atlas.

# Atlas Dimensions

Atlas dimensions

