

# ADVANCE ADAPTERS INC.

P.O. Box 247, 4320 Aerotech Center Way

Paso Robles, CA 93447

Telephone: (800) 350-2223 Fax: (805) 238-4201

# P/N: ATLAS

PAGE 1 OF 11

Page Rev. Date: 09-21-15

## ATLAS TRANSFER CASE

### THIS UNIT IS SHIPPED DRY!

All open holes are plugged on the new Atlas case with red plastic caps only to keep contaminants out. When unpacking, **inspect** for any lost or damaged items during shipping. All Atlas transfer cases are hand-built to your predetermined specifications. Please verify that **ALL** features, such as input spline and case configurations (left or right hand drop), are correct. We have included a application chart on the next page for your reference. If changing a yoke or checking your yoke options, see the last page of this instructions.



We offer several billet aluminum shifter knobs in 5 colors



We offer an Atlas installation kit for the 2 and 4 speed transfer cases. Which includes a new vent hose, vent and oil for the first oil change.



Amsoil is the recommended oil for the Atlas 2 & 4 speed units

## The universal drivetrain jack GREAT FOR ATLAS INSTALLATIONS

This new patented drivetrain jack is for anybody that works on their own vehicles as well as shop owners and mechanics. The Uni-Raise allows you to remove the stock skid pan and/or crossmember while it supports the drivetrain. The Uni-Raise is versatile enough for the avid four wheeler to do on-the-spot trail repairs safe & simple, as well as the shop mechanic for his daily work. The Uni-Raise is adjustable to different frame widths and capable of supporting 600 pounds. Rather than using a floor jack to support your drivetrain making it impossible to move the vehicle around if needed, the Uni-Raise supports the drivetrain from the frame rails allowing you to move the vehicle without having to reinstall the crossmember for support. The Uni-Raise can be installed in minutes. Just adjust the unit to your frame width, connect the hooks to your frame, and center the jack under the transmission or rear of the engine.



**SPECIAL NOTE:** The components packaged in this kit have been assembled and machined for specific type of conversions. Modifications to any of the components will void any possible warranty or return privileges. If you do not fully understand modifications or changes that will be required to complete your conversion, we strongly recommend that you contact our sales department for more information. This instruction sheet is only to be used for the assembly of Advance Adapter components. We recommend that a service manual pertaining to your vehicle be obtained for specific torque values, wiring diagrams and other related equipment. These manuals are normally available at automotive dealerships and parts stores.

# 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 11 different Atlas input shafts; however, we are trying to simplify the choices and applications.

ATLAS TRANSFER CASE ADAPTER SELECTION CHART FOR GM, FORD, JEEP & DODGE MANUAL & AUTO 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
<b>GM SM420 4 SPEED</b> <i>10.5" CASE LENGTH</i>	<b>50-9702 (2)</b> <i>5.25" ADAP.</i>	<b>23</b>	<b>GM TH350 2WD TRANS.</b> <i>21.5" CASE LENGTH</i>	<b>50-6300 (2,3)</b> <b>50-6802 (3)</b>	<b>23</b> <b>23</b>
<b>GM SM465 4WD 10 SPL.</b> <i>12" CASE LENGTH</i>	<b>51-9807 (7)</b> <i>3.5" ADAPTER</i>	<b>10</b>	<b>GM TH350 4WD TRANS.</b> <i>21.5" CASE LENGTH</i>	<b>50-6304 (2)</b> <b>AS-6800 (5)</b>	<b>23</b> <b>27</b>
<b>GM SM465 2WD 35 SPL.</b> <i>12" CASE LENGTH (NOTE 9)</i>	<b>51-9807 (4,7)</b> <i>3.5" ADAPTER</i>	<b>35</b>	<b>GM TH400 2WD TRANS.</b> <i>SHAFT STICKOUT OF 5" (NOTE 9)</i>	<b>51-6400 (4)</b>	<b>32</b>
<b>FORD T &amp; C 4 SPEED O.D.</b> <i>10.25" CASE LENGTH (4WD trans)</i>	<b>STOCK (5,8)</b>	<b>31 OR 28</b>	<b>GM TH400 4WD TRANS.</b> <i>SHAFT STICKOUT OF 1.5" (NOTE 9)</i>	<b>AS-6401 (5)</b>	<b>32</b>
<b>FORD &amp; JEEP T98 4 SPEED</b> <i>11.87" CASE LENGTH</i>	<b>50-7503 (3,7)</b> <i>3.25" ADAP.</i>	<b>23</b>	<b>GM TH400 4WD TRANS.</b> <i>SHAFT STICKOUT OF 2.5" (NOTE 9)</i>	<b>AS-6401 &amp; AS-0404 (5)</b>	<b>32</b>
<b>JEEP T18 4 SPEED</b> <i>11.87" CASE LENGTH</i>	<b>50-7502 (3,7)</b> <i>3.25" ADAP.</i>	<b>23</b>	<b>GM 4L80 &amp; 4L80E 4SP TRANS.</b> <i>USE GM 4WD SHAFT (NOTE 9)</i>	<b>51-6408 (5)</b>	<b>32</b>
<b>FORD T18 4 SPEED</b> <i>11.87" CASE LENGTH</i>	<b>50-7500 (3,8,7)</b> <i>3.25" ADAP.</i>	<b>23</b>	<b>GM 700R / 4L60 O/D 4 SPEED 2WD TRANS</b> <i>23.375" CASE LENGTH</i>	<b>50-9102 (3)</b>	<b>23</b>
<b>FORD T19 4 SPEED</b> <i>11.87" CASE LENGTH</i>	<b>52-6501 (3,8,7)</b> <b>51-7500</b>	<b>27</b>	<b>GM 700R / 4L60 O/D 4 SPEED 4WD TRANS</b> <i>23.375" CASE LENGTH</i>	<b>AS-9111 (5)</b>	<b>27</b>
<b>FORD NP435 4 SPEED</b> <i>10.87" CASE LENGTH</i>	<b>50-3801 (3,8,7)</b> <i>4.25" ADAP.</i>	<b>23</b>	<b>GM 4L60E 2WD &amp; 4WD</b> <i>23.375" CASE LENGTH</i>	<b>50-0404 (3)</b>	<b>23</b>
<b>1980 to 1986 STOCK JEEP TRANSMISSIONS</b>	<b>STOCK ADAPTER</b>	<b>23</b>	<b>GM 4L60E 4WD TRANS.</b> <i>23.375" CASE LENGTH</i>	<b>AS-9111 (5,10)</b>	<b>27</b>
<b>1987 &amp; NEWER STOCK JEEP TRANS</b> <i>21 SPL. OR 23 SPL.</i>	<b>STOCK (7) ADAPTER</b>	<b>21 OR 23</b>	<b>GM 4L60E 2WD</b> <i>W / REMOVABLE BELLHOUSING</i>	<b>50-0405 &amp; E 50-9102 (3)</b>	<b>23</b>
<b>GM NV4500 4WD 32 SPL.</b> <i>12.375" CASE LENGTH</i>	<b>51-0205 (5)</b> <b>51-0220</b>	<b>32</b>	<b>GM 4L60E 4WD TRANS.</b> <i>W / REMOVABLE BELLHOUSING</i>	<b>50-0405 &amp; E AS-9111</b>	<b>27</b>
<b>DODGE NV4500 4WD 23 SPL.</b> <i>12.375 CASE LENGTH</i>	<b>STOCK (5,7)</b> <i>6.3" ADAPTER</i>	<b>23</b>	<b>GM 4L60E 4WD TRANS. SHORTY</b> <i>W / REMOVABLE BELLHOUSING</i>	<b>50-9300 (3)</b> <b>50-9305 (3)</b>	<b>23</b>
<b>DODGE NV4500 4WD 29 SPL.</b>	<b>STOCK (5,7)</b> <i>6.3" ADAPTER</i>	<b>29</b>	<b>GM 6L80 6L90</b>	<b>50-9600</b>	<b>32 or 29</b>
<b>FORD ZF 4WD TRANS.</b>	<b>STOCK (1,5,7)</b>	<b>31</b>	<b>FORD C4 3 SPEED TRANS.</b> <i>REPLACING A BRONCO DANA 20</i>	<b>STOCK (5,8)</b>	<b>28</b>
<b>GM MUNCIE 4 SPEED</b> <i>10" CASE LENGTH</i>	<b>50-6000 (2,3,7)</b>	<b>23</b>	<b>FORD C4 3 SPEED TRANS.</b> <i>ALL OTHER VEHICLES</i>	<b>50-8100 (3)</b>	<b>23</b>
<b>GM ZF 6SP S6-650 TRANS</b>		<b>29</b>	<b>SHORTY C4 FORD TRANS.</b>	<b>50-2903/2905</b>	<b>27</b>
<b>TACOMA TRANS 23 SPLINE</b>	<b>50-5710</b>	<b>23 short</b>	<b>ALLISON 1000 TRANS.</b>	<b>SEE PAGE 14</b>	<b>29</b>
<b>TACOMA TRANS 26 SPLINE</b>	<b>50-5711</b>	<b>23 short</b>	<b>FORD AOD EARLY 4SP 4WD</b>	<b>STOCK (1,5,7)</b>	<b>31</b>
<b>POWERGLIDE (automatic)</b>	<b>50-9200</b>	<b>27</b>	<b>1987 &amp; EARLIER 2WD TRANS</b>	<b>50-2902 (3,7)</b>	<b>23</b>
<b>Toyota Crawler Box to Atlas Case</b>	<b>50-5915</b>	<b>23</b>	<b>1988 &amp; UP 2WD TRANS</b>	<b>STOCK (1,5,7)</b> <b>50-2901 (3,7)</b>	<b>31</b> <b>23</b>
<b>2012 &amp; Newer JEEP AUTOMATICS</b>	<b>STOCK</b>	<b>26</b>	<b>FORD C6 3 SP. TRANS.</b> <i>20" CASE LENGTH</i>	<b>STOCK (1,5,7)</b>	<b>31</b>
<b>2012 &amp; Newer JEEP Manuals</b>	<b>STOCK</b>	<b>23</b>	<b>FORD EXPLORER/RANGER/BRONCO II</b> <b>1980-11 JEEP AUTOMATICS</b>	<b>STOCK (5)</b> <b>STOCK (1,5)</b>	<b>25</b> <b>21 or 23</b>

- (1) OUTPUT SHAFT MAY NEED TO BE SHORTENED OR A SPACER ADAPTER MAY NEED TO BE USED. AS-0404 - 1" AS-8603 - 3/4" AS-8610 - 1/2"  
 (2) THIS KIT USES A SPUD SHAFT  
 (3) NEW OUTPUT SHAFT MUST BE INSTALLED  
 (4) USES A STOCK 2WD OUTPUT SHAFT  
 (5) USES A 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

# 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 on our website at [www.Advanceadapters.com](http://www.Advanceadapters.com) or provided for you with your unit. **Please read all instructions before installing.**

## LUBRICATION

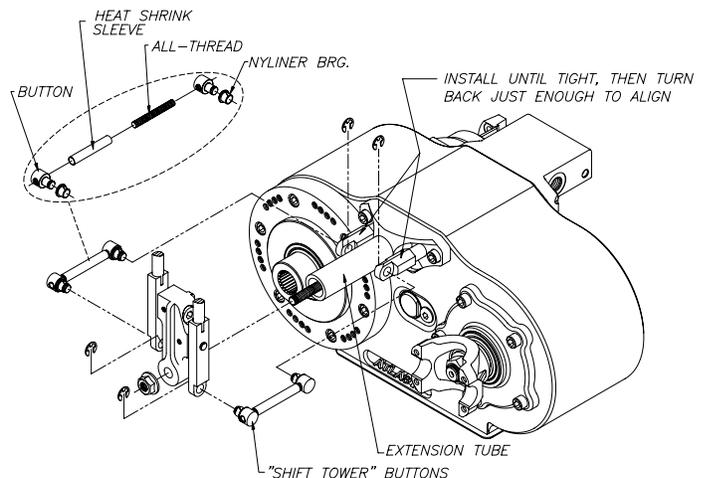
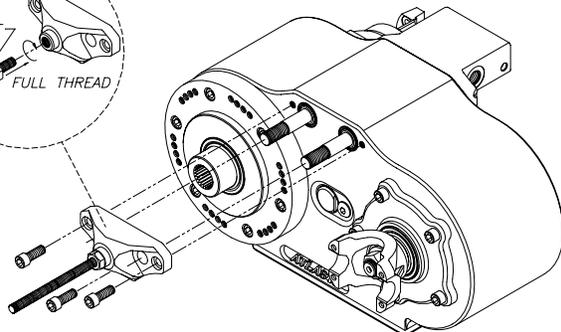
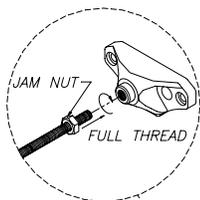
This unit is shipped DRY. Before operating your Atlas, please fill with the recommended gear lubricant (Amsoil MTG GL-4, Torco MTF GL-4, or any other A.P.I. GL-4 rated synthetic gear oil). If you are unable to find these lubricants, Any 75-90w synthetic GL-4 rated oil will work. On the **Atlas HD** applications, we are now recommending **Amsoil SAE 190**.

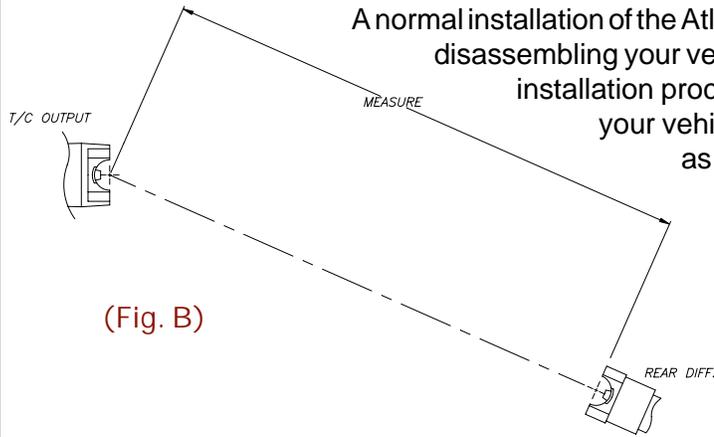
The recommended oil capacity is 2 quarts in the Atlas 2 speed and 2-1/2 quarts for the Atlas 4 speed transfer case. The Atlas does not offer any type of 'weep hole' to verify the oil level. Therefore, we have supplied your unit with a site tube to aid in determining the correct fluid level. Once the 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 beyond 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. On Atlas 4 speed units, the cable shifter on the reduction housing must be installed before installing the Atlas into your vehicle.





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 tranny and engine when the crossmember is removed, and a transmission jack for raising and lowering the transfer cases. The Advance Adapters Uni-Raise (shown left, P/N 15-1000) is also a helpful tool when doing drivetrain work.



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 at [www.advanceadapters.com](http://www.advanceadapters.com)).

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 is also shipped with numerous red plastic caps to keep contaminants out of the unit. At this point in time, remove all caps and properly install all components.

# The Final Installation

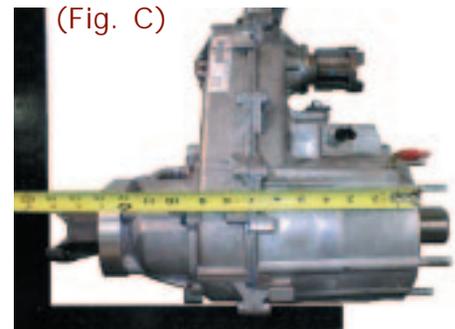
Apply a very thin film of RTV Blue silicone to your transfer case adapter mating surface. Aligning the studs with the adapter holes and the transmission output shaft with the Atlas input, the Atlas should slide completely onto the transmission mating surface. There should not be any GAP between the two 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. Possible problems may be too long of an output shaft or on some Jeep 21 & 23 spline transmissions, a spacer adapter 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

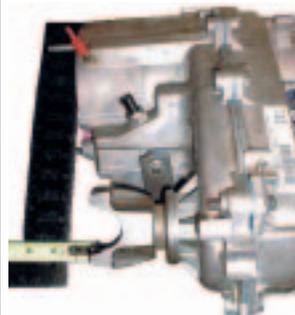
You will normally need driveline modifications when installing the Atlas transfer case. What we have found that works well is either adding or subtracting (depending on the application) the measurements of the Atlas from the stock length of your transfer case.

**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.



(Fig. D)

**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.



*Front Measurement Example (Fig. D):* This stock transfer case (our example) measured 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

### 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. We offer new breather kits for the 2 and 4 speed cases.

### SPEEDOMETER INSTALLATION:

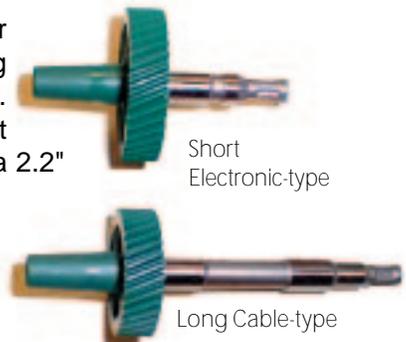
We can supply a cable-type speedometer drive unit for all applications other than Jeeps 1982 to current. The 1982 and newer Jeeps will use the original speedometer drive that came stock. You will simply have to remove it from your New Process transfer case and install it into your new Atlas. It is recommended 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. The newest Jeep that used a New Process 241 transfer case picked up the speed from the axles, and the speedometer hole in the Atlas can be plugged.

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.

**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 chart below will assist you in obtaining the right speedometer drive gear. 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. We offer many stock gear options for your speedometer housing.



	5.38	5.13	4.88	4.56	4.10	3.73	3.55	3.07
44"	33T	32T	30T	28T				
42"	35T	33T	31T	29T				
40"	36T	35T	33T	31T	28T			
39"	37T	36T	34T	32T	28T	26T		
38"	38T	36T	35T	32T	29T	27T		
37"	39T	37T	36T	33T	30T	27T	26T	
36"	40T	39T	37T	34T	31T	28T	27T	
35"	42T	40T	38T	35T	32T	29T	28T	
33"		43T	40T	37T	34T	31T	29T	
32"			41T	39T	35T	32T	30T	26T
31"			43T	40T	36T	33T	31T	27T
30"				41T	37T	34T	32T	28T
29"				43T	38T	35T	33T	29T
28"					40T	36T	34T	30T

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 oil. This will prevent the o-ring from being nicked upon installation or rotation, causing this housing to leak.

**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. 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 oil provided (Amsoil MTG GL-4, Torco MTF GL-4). 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 these lubricants locally, we offer it under [P/N 303200](#).

### 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 below). 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.

## COMMON Installation MISTAKES

This section highlights a few of the areas that we commonly see mistakes made during the installation of an Atlas 2 and 4 speed. These mistakes will cost you time and money. Most problems occur because the installation is rushed or procedures overlooked. Other errors happen because the instructions were not read or followed.

The most common mistake is having a transmission output shaft that is too long or does not have long enough splines. A shaft that has either one of these problems can bottom out or not engage enough into the Atlas input. Most times, this interference is not noticed until the transfer case is being installed. Most installers get the transfer case near to the mating flange, but find they are lacking roughly 1/16 of an inch between the two gear boxes coming together. They push, pull & rotate to mate the two boxes, then decide to put the nuts on the stud of the transfer case to pull the units together. The transfer case, whether being a 2 speed or 4 speed, is now damaged: the 2 speed having a broken front housing snap ring, and the cage needle bearing of the 4 speed having been pre-loaded. **Running the units in this state will cause complete destruction of the unit.** In short, both units will need disassembly to fix the problem.



The easiest fix is prevention. If the gear boxes do not slide together completely when installing, remove the transfer case and measure the shaft lengths. Refer back to this application guide to the input section for spline engagement lengths. The Atlas is a precision built transfer case. **DO NOT FORCE TOGETHER** even if it's a small gap between the transmission and transfer case.

The second, most common mistake or problem is the cable shifter adjustments and installation. We now offer several custom and universal cable shifters to fit the Atlas 2 and 4 speed transfer cases. The instructions highly recommend installing the shifters to the Atlas while the transfer case is outside the vehicle. This will allow you the opportunity to fine tune the linkage while viewing the movement of both the handle and the shift rail. Adjustments to the linkage could be a half turn of a certain nut. If the Atlas & shifters are installed, that nut is hard to get a wrench on and you could spend a lot of time trying to get it adjusted correctly. Incorrect adjustments to the linkage will make the Atlas hard to shift, and we have seen some cables actually break because of driver trying to force a mis-adjusted shifter.

The last area of concern is more of a precaution, not an installation mistake. After an Atlas was installed, we have seen a couple of transfer cases that have experienced rear output shaft bearing failure. The Timkin bearings require custom shimming for each Atlas built. The tolerance is .001" which is the recommendation from Timkin. The units we've seen failure on have been new installations (having less than 10 to 20 miles on the unit) and in a vehicle that was flat-towed. **We now recommend that a new unit must have the break-in fluid replaced, which is after the first 500 driving miles.** This allows the bearing to seat properly to the bearing race. It also allows the oil to circulate through the unit to lubricate areas that were assembled with assembly lube. **If you plan on flat-towing, we actually prefer that you remove the driveshafts from the vehicle. This eliminates any possible chance of bearing failure on your Atlas 2 speed due to lack of oil circulation. PLEASE NOTE that under absolutely no circumstance should an Atlas 4 speed be flat-towed without removing the driveshafts. Damage to the planetary assembly and the additional needle bearings will occur.**

### THINGS YOU SHOULD KNOW ABOUT YOUR ATLAS

1. **DO NOT** disassemble the unit! Disassembly of the unit will void your warranty.
2. We have 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.
3. Proper support of the Atlas and transmission with a support mount that is in good shape is recommended.
4. Check the yoke nut torque specifications periodically. The yoke nuts should be torqued at 150 ft./lbs.
5. 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.
6. Layout and inventory all parts. Test fit before starting the installation. Verify the configuration of your Atlas.
7. Give ample clearance between the Atlas and the body. The shifters also need to have complete free range of motion.
8. We have found that driveline angles are responsible for 99.9% of all noises that "seem" to be coming from the Atlas.

# 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. The vehicle should be moving forward when shifting the Atlas.

When shifting into **Low range**, 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.

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 accustomed to the operations of the Atlas and the unit accumulates miles, the shifting will become easier.

## 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. The only shift position that is not available is Front 2WD high.

**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 and the transmission must be in a neutral position. Once the vehicle is stopped, you can then engage or disengage the planetary gearing. The shifting of this unit is designed for a cable shifter.

# 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

The ATLAS 2 speed has been flat-towed for 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. We recommend that the Atlas should have at least 500 driving miles on it before you flat-tow, allowing the bearings to break in.

When a vehicle is being towed with the Atlas 2 speed, both shift levers should be in the Neutral position. 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

**If you plan on flat-towing an Atlas 2 speed equipped vehicle and do not wish to stop to circulate the oil, we actually prefer that you remove the driveshafts from the vehicle. This will prevent any damage that may occur to the internal components due to lack of normal oil circulation.**

The ATLAS 4 speed **should never be flat-towed without removing the driveshafts**. The planetary unit and additional bearings do not receive the normal oil flow as they would under normal driving conditions and, therefore, damage will occur.

## MAINTENANCE

Atlas oil levels should be monitored frequently. The oil site tube should be marked with a zip tie to indicate proper oil level for the Atlas at the rotation installed in your vehicle. The oil should be drained and replaced after the first 500 miles and then at intervals of 10,000 to 15,000 miles. **Note:** If your primary use is extreme offroading, you may consider intervals as frequent as every engine service.

# Yoke Options And Interchangeable Yokes

Yoke Series & Spline 32 Spline Yokes:	Yoke P/N's for A New Atlas:	Individual Yokes:	AA Seal P/N's	O.E. Seal P/N's
1310 series (C.V.)	P/N A1310CV	P/N 300475	P/N 300502	CR 18817 or
1330 series (C.V.)	P/N A1330CV	P/N 300369	P/N 300502	NAT.473239
1310 series (non-C.V.)	P/N A1310	P/N 716295	P/N 300473	CR 21164 or
1350 series (non-C.V.)	P/N A1350	P/N 300472	P/N 300473	NAT.472015
1350 series (C.V.)	P/N A1350CV	P/N 300485	P/N 300473	CR 21164 or
1410 series (non-C.V.) Straps	P/N A1410	P/N 300483	P/N 300473	NAT.472015
1410 series (non-C.V.) U-bolt	P/N A1410U	P/N 300488	P/N 300473	
<b>Flange Yokes 32 Spline</b>				
1310/1330/1350 series (CV & non-C.V.)	P/N AF1300	P/N 300470	P/N 300473	CR 21164 or
1410 series (non-C.V.)	P/N AF1410	P/N 300471	P/N 300473	NAT.472015

1410 Flange yoke is drilled and tapped for (4) 12mm x 1.25 bolts on a 3.75" diameter and has a 2.75" female index for the mating yoke. The 1300 series flange yoke is shown below.

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 below shows the required machining on these yokes.

**NOTE:** If you replace the front 26 spline yoke with any of the yokes listed, 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.

## U-Joints

Spicer series#	"D"- Dia of cap (in)	"E"-width across caps (in)	Part# (non-C.V.)	Std Spicer U-bolt Part
1310	1.062"	3.219"	5-153X	2-98-94X
1330	1.062"	3.625"	5-213X	3-94-58X
1350	1.188"	3.625"	5-178X	3-94-18X
1410	1.188"	4.188"	5-160X	3-94-18X
1480	1.375"	4.188"	5-188X	3-94-28X

