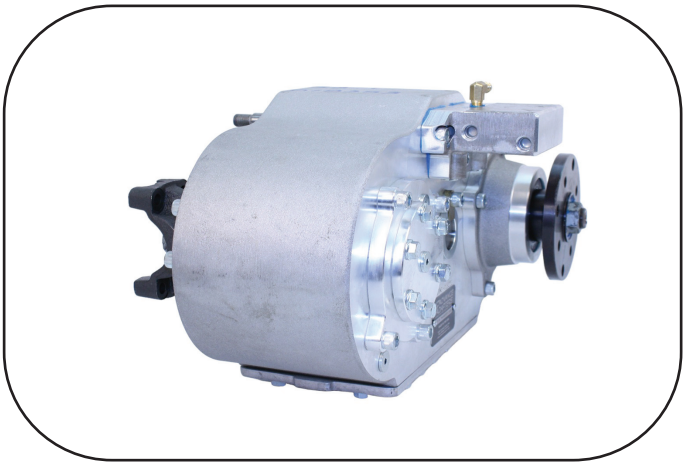
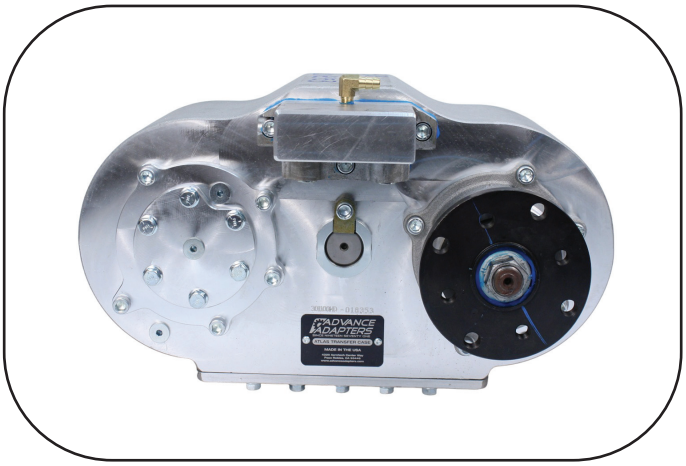
ADVANCE ADAPTERS

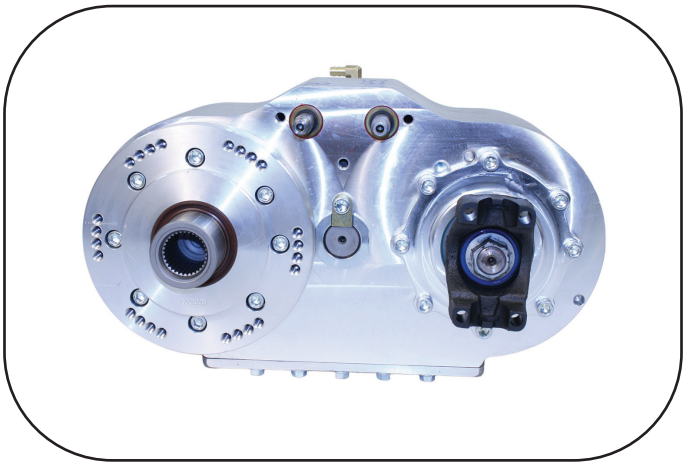
ATLAS

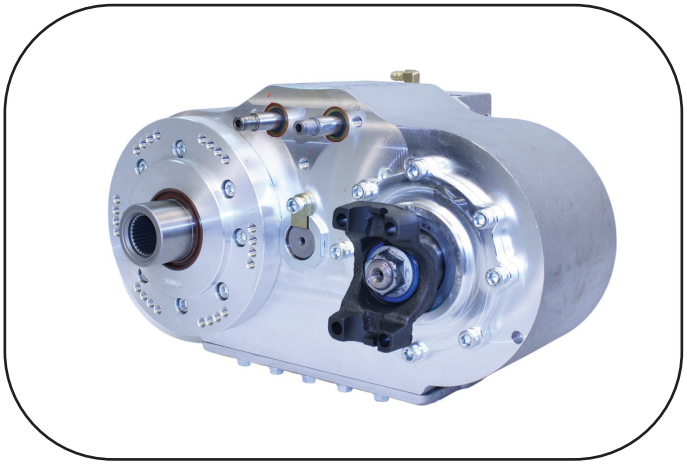
PERFORMANCE TRANSFER CASES

Complete Atlas Information









Vehicle Specific
Installation Information

JANUARY 2024

Atlas Specifications

ATLAS 2 SPEED "Trail Rated"

The Atlas Trail Rated case is our standard application Atlas for most stock vehicles.

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, 26, 27, 28, 29, 31, 32, 34, 35, Divorced unit

Rear Shaft .....32 Spline
Front Output.....32 Spline
Idler Pin.....1.25" diameter

RATIOS:

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

LUBRICATION: 2.0 Quarts Redline 75-90

ATLAS 2 SPEED "G2 PRO Rated"

The Atlas G2 Pro Rated case is designed for Race competition vehicles. The case has a 300M output shaft and super finished gears. This case is race-proven and excels in short courses as well as K.O.H.

CASE:

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

INTERNAL COMPONENTS:

Gears .....Helical Cut Super Finished
Bearings .....Needle & Taper Rollers
Synchronizers .....Borg Warner
Input Shaft Splines: 27, 29, 31, 32, 34, Divorced unit

Rear Shaft .....32 Spline 300M
Front Output.....32 Spline
Idler Pin.....1.50" diameter

RATIOS:

Low Range: .....1.5:1 or 2.0:1 or 3.0:1 or 3.8:1
High Range 1:1

LUBRICATION: 2.0 Quarts Redline Shockproof

ATLAS 2 SPEED "G2 HD Rated"

The Atlas G2 HD Rated case is our step-up case for vehicles that are a bit more modified. The larger cluster pin design with improved bearing support provides a perfect fit for vehicles demanding more.

CASE:

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

INTERNAL COMPONENTS:

Gears .....Helical Cut/Super Finish option
Bearings .....Needle & Taper Rollers
Synchronizers .....Borg Warner
Available Inputs Shaft Splines: 10, 23, 26, 27, 28, 29, 31, 32, 34, 35, Divorced unit

Rear Shaft .....32 Spline/ 300M option / Flat tow or oil pump option
Front Output.....32 Spline
Idler Pin.....1.50" diameter

RATIOS:

Low Range: .....1.5:1 or 2.0:1 or 3.0:1 or 3.8:1 or 4.3:1
High Range 1:1

LUBRICATION: 2.0 Quarts Redline Shockproof
2.0 Quarts Redline ATF for Flat Tow units

ATLAS 4 SPEED

The Atlas 4 speed gives you a variety of gearing. This box was originally designed for low horse-powered rigs. Today, gearing options for different terrain is the main need for this unit. With the Planetary increasing the torque in the Atlas, high horsepower and racing applications are not recommended.

CASE:

Material .....356-T6 Heat Treated Aluminum
Weight .....135 lbs. (dry)

INTERNAL COMPONENTS:

Gears .....Helical Cut
Planetary Assy.....6 Pinion Helical design
Bearings .....Needle & Taper Rollers
Synchronizers .....Borg Warner
Available Input Shaft Splines: 23, 27, 29, 31, 32, 34

Tail Shaft & Front Output.....32 Spline
Idler Pin.....1.50" diameter

RATIOS:

Low Range.....1.5:1, 2.72:1 & 4.08:1
or 2.0:1, 2.72:1 & 5.44:1
or 2.72:1, 3.0:1 & 8.16:1
or 2.72:1, 3.8:1 & 10.34:1
or 2.72:1, 4.3:1 & 11.70:1
High Range 1:1

LUBRICATION: 2.5 Quarts Redline 75-90

Atlas Information & Accessories

Oil Specification: The Atlas is shipped DRY. Before operating your Atlas, please fill with the recommended gear lubricant:

Red Line 75W-90 API GL4 Trail series case and the Atlas 4 speed cases **P/N 303200**.
Red Line Heavy Shockproof G2 HD series **P/N 303201**.
Red Line ATF for the Flat Tow case option **P/N 303202**.

Additional oil options: Amsoil MTF GL-4, Torco MTF GL-4 or any other A.P.I. GL-4 rated synthetic gear oil.

The recommended oil capacity for the **Atlas 2 speed is 2 quarts**, and the **Atlas 4 speed is 2-1/2 quarts**. The Atlas does have a 'weep hole' to verify the oil level; however, we recommend our site tube kit be used to aid in determining the correct fluid level. Once the required quarts are put into the Atlas, we recommend marking the oil level on the site tube. *The oil site tube should be marked to indicate proper oil level for the Atlas at the rotation installed in your vehicle.* We prefer using a small zip tie as an oil level marking device.

NOTE: *When the Atlas is overfilled with more than the recommended level, it will cause the unit to vent the extra oil out the breather.* ***Atlas oil levels should be monitored frequently. The oil should be drained and replaced after the first 500 miles and then at intervals of 10,000 to 15,000 miles thereafter.***

Atlas 2 and 4 Speed Replacement Site Tubes: We carry replacement parts for existing Atlas site tubes. We currently offer two of the three thread sizes that fit the Atlas case. Early cases were drilled and tapped for 1/2" flare pipe fittings, we switched to a 1/4" flare pipe fittings for a few years, and now use a 9/16" - 18 thread (Manufactured after Nov. 2014.)

P/N 301600	Site tube kit with 1/4" fittings
P/N 301603	Site tube kit sold for current production units 9/16" - 18
P/N 301602	Replacement site tube for all cases with 90 degree fittings

Breather, Hose & U-Bolts: Normally a new breather and breather hose is required to properly vent an Atlas 2 or 4 speed transfer case. We now offer these items along with additional Atlas oil for the first or future oil changes. U-bolt kits for the standard yokes are also listed below.

Breather, Breather Hose & Oil

P/N X11320	2SP Atlas kit
P/N X11324	4SP Atlas kit

U-Bolt kits (includes two U-bolts)

P/N X11340	1310 & 1330 U-Bolt kit
P/N X11341	1350 & 1410 U-Bolt kit
P/N X11342	1410 Strap kit

Atlas Stud and Nut Kit: **P/N 302070**

Body Mounts: When installing an Atlas in some vehicles, floorboard clearances can become an issue. The Jeep TJs and YJs can be installed with an Atlas without a lift, but the extra 1" provided for these applications aid in the installation process.

ATLAS *O.A.L. with the Yoke list*	Atlas 2 speed *STD. tailhousing*	Atlas 2 speed *Short tailhousing*	Atlas 4 speed *STD. tailhousing*	Atlas 4 speed *Short tailhousing*
1310 NON CV	13.405"	11.380"	18.381"	16.356"
1310 CV	13.842"	11.817"	18.818"	16.793"
FLANGE 1300	12.224"	10.199"	17.200"	15.175"
1350 NON CV	13.467"	11.442"	18.443"	16.418"
1410 NON CV	13.655"	11.630"	18.631"	16.606"
1350 CV	14.027"	11.815"	18.816"	16.791"
FLANGE 1410	12.092"	10.067"	17.068"	15.043"

LENGTH COMPARISON:
Dana 300, 12"
NP231, 20.5"
NP241, 15-1/4"

Yokes

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)

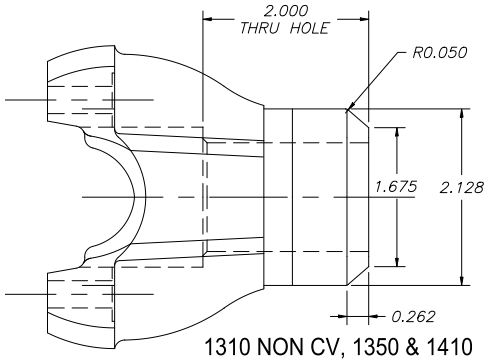
1410 non C.V. flange yoke. Spicer companion yoke number is 3-2-329 (1410 non-C.V.) 3-2-159

Flange yoke may require the companion flange bolts to be installed through the yoke before the yoke is installed onto the transfer case. This depends on the series of companion yokes used. If the flange yoke is currently installed on your transfer case, you may be required to first loosen the yoke retaining nut, then pull the yoke away from the transfer case enough to install the companion flange bolts. Once the bolts are in place, a new lock nut should always be installed and torqued to 150 ft.-lbs. to secure the yoke to the transfer case.

If any yoke nut is ever removed from the shaft for any reason, it should always be replaced with a new one. When installing a new yoke, use a small amount of silicone to prevent oil leakage down the shaft splines.

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 for clearance on this caged bearing. The yoke drawing shows the required machining on these yokes.

NOTE: *When replacing the front or rear 32 spline yoke with any yoke, the nut that retains the yoke has torque specifications of 150 ft.-lbs.*

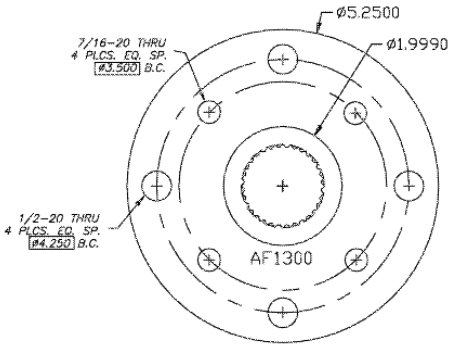


1310 NON CV, 1350 & 1410

Yoke Design Change:
We changed the design of our yokes and their mating components. These updates started in 2017 with the new flat tow option on the Atlas and expanded into 2018 to include the standard Atlas 2 speed and 4 speed units.

The yokes are now being made with a counter bore to fit our shafts. The new shafts have a shorter 32 spline with an index hub that indexes the yoke to the output shaft. This combination aligns these two components to make a stronger combination.

The updated shafts will require the yoke to have a counter bore for indexing to the shaft. The counter bore on the yoke does not affect the yoke to be used on any shaft that we have made over the years. The most important thing to note is that the older yokes will not work on the new style shafts without this counter bore.

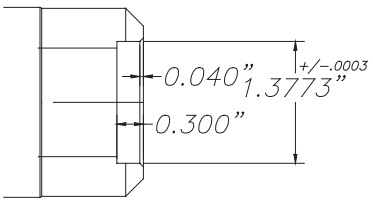


Summary: All Advance Adapters shafts, New and Old will work with the new yokes that are counter bored. Old yokes NOT counter bored will still work on the older shaft but would require a counter bore to work on the new design shafts.

Yoke Options and U-Joints

U-Joints:

Spicer series#	"D"- Dia of cap (in)	"E"-width across caps (in)	Part# Std Spicer (non-C.V.)	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



Speedometer

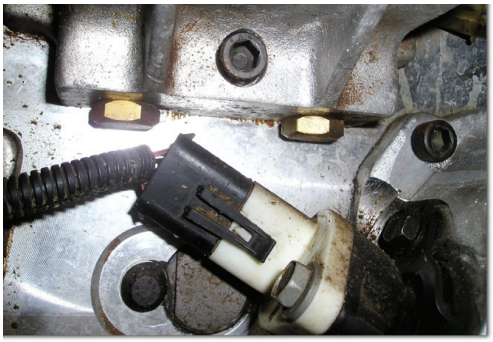
On engine converted vehicles, caution should be used. If your engine has been converted to a newer Chevy, Ford or Chrysler and is computer controlled, it may also require a vehicle speed sensor. The speed sensor is usually connected at the speedometer. Each manufacturer has designed their own unique 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.

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. 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 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.



Shifter

Atlas Shifter Linkage Upgrade: The connection rods for the Atlas were designed to be universal so they could be adjusted for various drivetrain lengths. The stock linkage works well for the majority of applications and vehicles. Extreme racers and rock crawlers, on the other hand, were looking for a linkage that would withstand the abuse that they put their rigs through. The two kits offered are upgrades that work with the standard handles and use heim joints that are bolted to the Atlas linkage. Anyone can upgrade to these kits as they will work on all Atlas ridged-mounted twin stick applications: **P/N 303040** or **P/N 303041**. The application details & descriptions are available online.

Atlas Shifter Knobs Option:

The Atlas twin stick shifter kit comes with two standard black knobs packed in the rubber shifter boot. You can customize your Atlas installation with one of our billet aluminum or anodized aluminum knobs. All knobs come in a standard pattern or reversed pattern for the cable shifters and measure 2-3/4" tall.

P/N 303150 Aluminum knobs Std. pattern
P/N 303150AA Black knobs Std. pattern
P/N 303150BL Blue knobs Std. pattern
P/N 303150GN Green knobs Std. pattern
P/N 303150RD Red knobs Std. pattern

P/N 303152 Aluminum knobs *Rev. pattern*
P/N 303152AA Black knobs *Rev. pattern*
P/N 303152BL Blue knobs *Rev. pattern*
P/N 303152GN Green knobs *Rev. pattern*
P/N 303152RD Red knobs *Rev. pattern*
P/N 303155 2 Speed Std. "Sport" labeled (Black)
P/N 303157 2 Speed Rev. "Sport" labeled (Black)
P/N 303155BL 2 Speed Std. "Sport" labeled (Blue)
P/N 303157BL 2 Speed Rev. "Sport" labeled (Blue)
P/N 303155RD 2 Speed Std. "Sport" labeled (Red)
P/N 303157RD 2 Speed Rev. "Sport" labeled (Red)
P/N 303155GN 2 Speed Std. "Sport" labeled (Green)
P/N 303157GN 2 Speed Rev. "Sport" labeled (Green)

P/N 303156 4 Speed Std. "Sport" (Black)
P/N 303158 4 Speed Rev. "Sport" (Black)

P/N 303156BL 4 Speed Std. "Sport" (Blue)
P/N 303158BL 4 Speed Rev. "Sport" (Blue)

P/N 303156RD 4 Speed Std. "Sport" (Red)
P/N 303158RD 4 Speed Rev. "Sport" (Red)

P/N 303156GN 4 Speed Std. "Sport" (Green) *Not shown*
P/N 303158GN 4 Speed Rev. "Sport" (Green) *Not shown*

P/N 303159
Black knobs Std. pattern

P/N 303159-4
Single knob reduction box

P/N 303159-C
Cable shifter Black knobs reverse pattern

Low Range & 4WD Switch:
A low range switch & pigtail are available options for the Atlas transfer case. This switch is from a stock Jeep TJ. The switch can be used for an indicator light or a low range switch. The switch is **P/N 300364** and pigtail **P/N 300378-C**.

TJ Rubicon, JK & JL Jeeps:
In essence, the Low-Range switch tells the computer what mode the transfer case is in. To operate the needed functions on these vehicles, we only need one of four normal mode positions and that is the "Low-Range" mode. This mode allows the factory lockers (and electric sway bar if equipped) to work on the Rubicon series TJ, JK, JL & Liberty's. The other necessity in the JK & JL series of Jeeps is the ESP (ELECTRONIC STABILITY PROGRAM). By installing the Low-Range switch in the JK or JL, it will automatically turn the ESP to its lowest setting possible allowing front digs in low range, tire slippage without engine hesitation or braking feedback. It will also change the fly-by-wire throttle sensitivity to take away the side effects that usually consist of jerky throttle response as a result of running low range without the Low-Range switch hooked up.

P/N 300378X - Low range pigtail for Jeep (will not light up 4WD indicator in high range) *(FITS UNITS BUILT BEFORE 7/2014)*
P/N 300378A - Low range pigtail for Jeep (will not light up 4WD indicator in high range) *(FITS UNITS BUILT AFTER 8/2014)*

P/N 300377 - Control module for Jeep JK/JL (retains all stock features when an Atlas is installed) *(UNITS BUILT PRE 7/2014)*
P/N 300377A - Control module for Jeep JK/JL (retains all stock features when an Atlas is installed) *(UNITS BUILT POST 8/2014)*

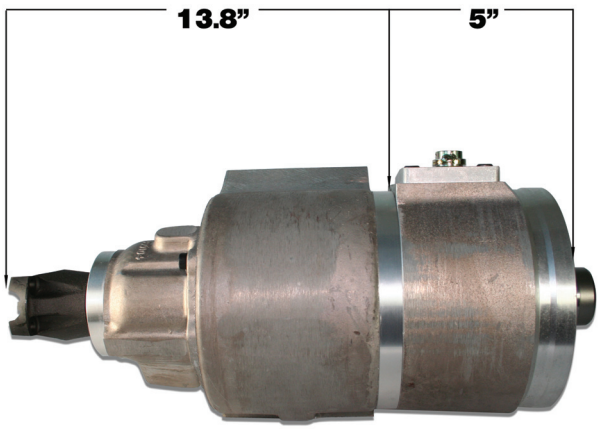
2012 and Up Jeep JK & JL Automatics:
Jeeps 2012 & newer equipped with an automatic transmission will also require a Transmission Control Module flash to operate correctly with the new Atlas transfer case. Jeep coded the stock transfer case ratio of either the 2.72:1 or the 4.0:1 into this module and any different ratio in the transfer case will put the vehicle into a limp mode. A Jeep programmer like an A.E.V. Procal or the Bully Dog with the transfer case ratio option is needed, and we sell both of these programmers. Unfortunately, the Atlas 4 speed is not an option in these newer JKs with the automatic. The exact ratios for the Atlas is required for reprogramming the module. We round up or down to the decimal on our ratios; however, the Jeep computer module will accept the three places right of the decimal. The ratios are as follows: 2.0:1 is exactly 2.11:1; 3.0:1 is 3.030:1; 3.8:1 is 3.824:1; 4.3:1 is 4.286:1; and 5.0:1 is 5.048:1.

COMPONENT	QTY	BOLT SEALANT/THREADLOCK	WASHER (Ft-Lbs)	TORQUE SPEC.
HOUSING - OIL PAN - BLIND	10	RTV SILICONE	N	20
HOUSING - OIL PAN - THRU	4	RTV SILICONE	N	20
HOUSING - OIL PAN	10	RTV SILICONE	N	20
HOUSING - INPUT	6	RTV SILICONE	Y	30
HOUSING - DIVORCED INPUT	6	MED. STRENGTH THREADLOCK	Y	30
HOUSING - REAR OUTPUT	5	RTV SILICONE	N	30
HOUSING - FRONT OUTPUT	5	RTV SILICONE	N	30
HOUSING - SHIFT RAIL	3	RTV SILICONE	N	30
HOUSING - SHIFTER SUPPORT	3	RTV SILICONE	N	20
HOUSING - FRONT BRG. CAP	4	RTV SILICONE	N	20
BRACKET - DIVORCED PAN	10	RTV SILICONE	N	23
SHAFT - CLUSTER	2	SEAL WASHER	N	20
RETAINER - SPEEDO	1	RTV SILICONE	N	10
FITTING - SITE TUBE	2	RTV SILICONE	N	15
FITTING - BREATHER	1	RTV SILICONE	N	10
PLUG - OIL PAN	1	SEAL WASHER	Y	10
SHIFT SWITCH BORE	2	SEAL WASHER	Y	12
SWITCH-4WD/LOW RANGE			N	12
SHIFT FORK - SHIFT RAIL	2	MED. STRENGTH THREADLOCK	N	12
NUT - YOKE - 26SPL	1	RTV SILICONE	N	130
NUT - YOKE - 32SPL	1	RTV SILICONE	N	150
ATLAS 4SP PLANET BOLTS	6	RTV SILICONE	Y	35

Atlas Case Operating Temperature:

The case temperature will vary with the type of driving you are doing with the vehicle as well as outside air temperature and air flow around the drivetrain. The numbers listed below are what we feel are the normal operational temperatures. If you connect a temperature gauge to your Atlas and are getting temperature variances from what we have listed, you should first make sure your gauge is accurately calibrated. If the gauge is reading correctly and your case temperature is 15% greater than what we have listed, please call one of our technicians.

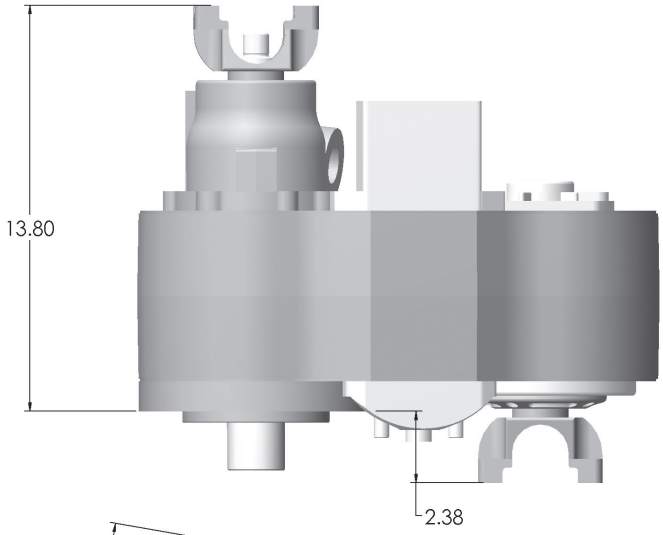
Normal Operating Temperature: 160 - 175F
Vehicle using high horsepower or pulling a heavy load: 190 - 220F
Maximum recommended case operational temperature: 230 - 240F

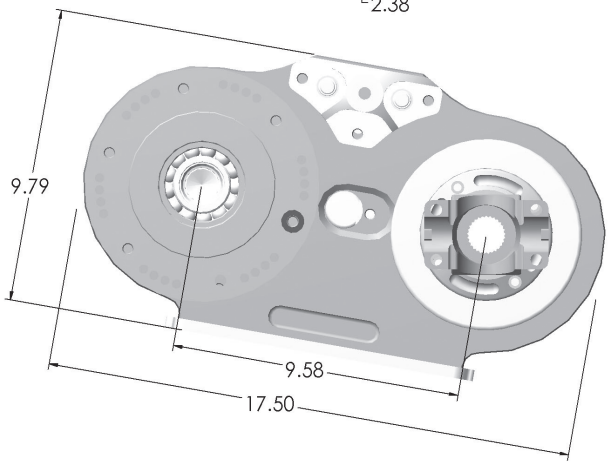


ATLAS 4 SPEED 18.8” OAL

The Atlas measures approximately 14” from the center of the input to the outside edge of the main case.

The Atlas 4 speed has the same case dimensions as the 2 speed with the exception of the overall length and the linear distance of the front yoke to the transfer case input face.





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 vehicle installation instructions for many applications are also on our website at www.advanceadapters.com. **Please read all instructions before installing.**

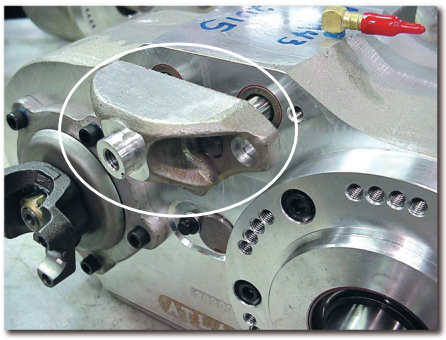
LUBRICATION

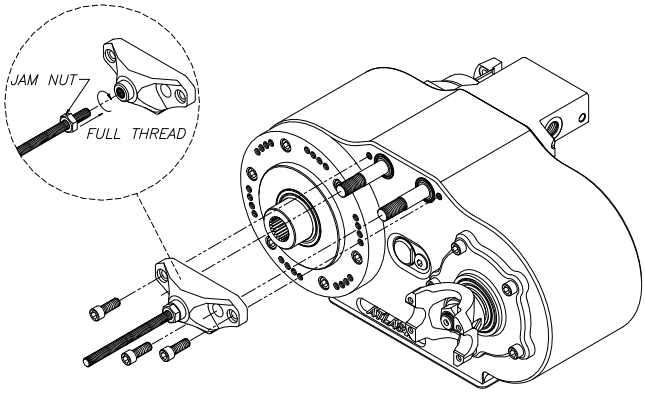
This unit is shipped DRY. Before operating your Atlas, please fill with the recommended gear lubricant.

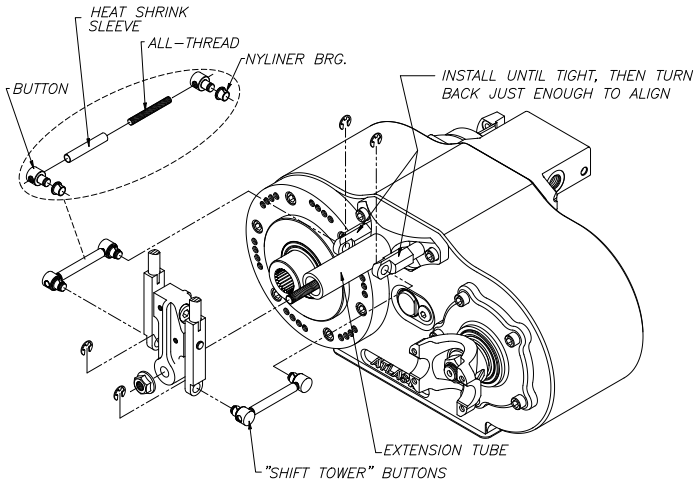
The recommended oil capacity is 2 quarts in the Atlas 2 speed and 2-1/2 quarts for the Atlas 4 speed transfer case. The Atlas does offer a 'weep hole' to verify the oil level. However, we recommend all units unit use our site tube to aid in determining the correct fluid level. Once the required quarts 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.

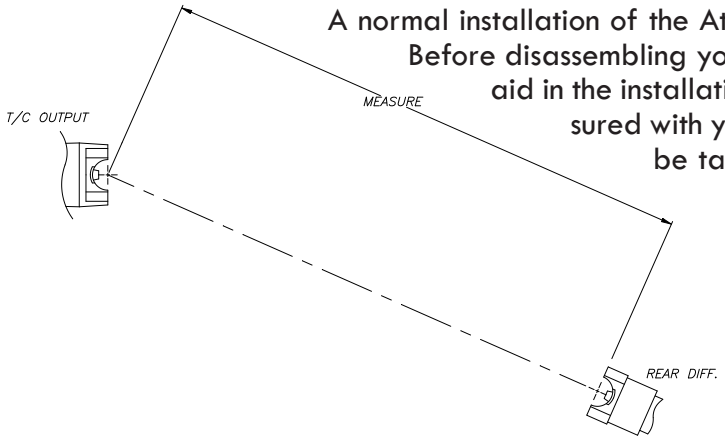
PREPARATION

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 on the web or on the shifter instruction sheet. On non-cable units, the shifter handles will need to be removed, (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.







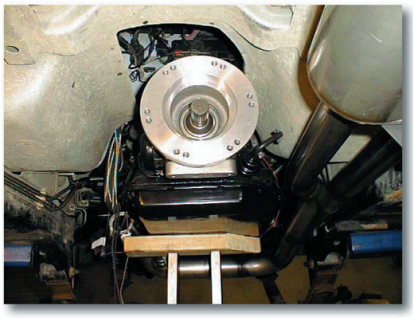


A normal installation of the Atlas transfer case should take around 6 to 8 hours. Before disassembling your vehicle, the undercarriage should be cleaned to aid in the installation process. Stock driveline lengths should be measured with your vehicle on the ground. The measurement should be taken as illustrated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

The Atlas offers numerous 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 numerous 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.



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.

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).

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 contaminates out of the unit. At this point in time, remove all caps and properly install all components.

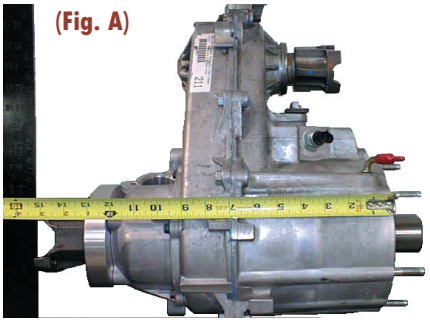
The Final Installation

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 online 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.



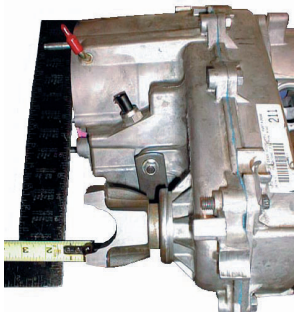
(Fig. A)

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. A)**. 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. A): 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.

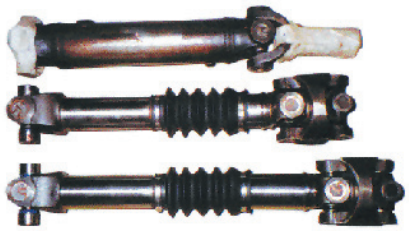
FRONT MEASUREMENT: Measure the stock transfer case from the front yoke face to the surface of where the transfer case bolts to the adapter housing **(Fig. B)**. Write that measurement down.



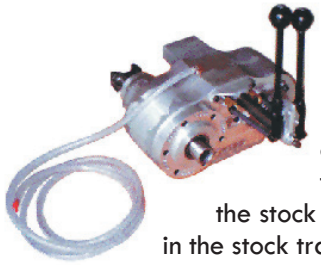
(Fig. B)

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. B): 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 subtracted from the measurement taken from your stock driveline, as recommended in the Preparation section. You would now have your front driveshaft length.



Stock driveshaft (top) vs.
New fixed yoke driveshafts



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.

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. *See specific vehicles applications online for more information.*

DRIVESHAFTS & CROSSMEMBER / SKID PAN:

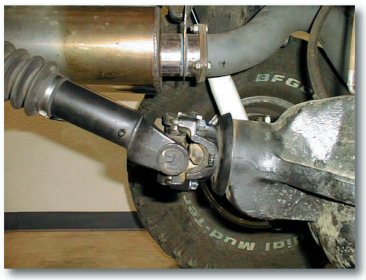
You should now install your modified driveshafts. Trial fit your crossmember or skid pan, noting any modifications that may be necessary. The Atlas is equipped with a drain plug located on the inspection cover. You may wish to cut an access hole in your crossmember/skid plate for easy access. Once the 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. 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.

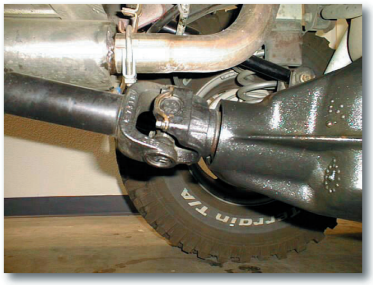
VISUAL INSPECTION:

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 regards 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 where 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 either 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. **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. 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 issue involves installing and adjusting cable shifters. We 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.

THINGS YOU SHOULD KNOW ABOUT YOUR ATLAS

1. DO NOT disassemble the unit!
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 correctly 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've 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 a 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!

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. After extreme offroading, you may consider intervals as frequent as every engine service.

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 owner's 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 like they would under normal driving conditions and, therefore, damage will occur.