

# Extreme Automatics 2004R

Thank you for choosing Extreme Automatics to build your new 2004R. These instructions are intended to provide you with basic suggestions for successful installation and operation of your new 2004R. Items that will be covered are Fluid recommendation, TV cable adjustment, Main line and boosted pressure checks, Shift characteristics, Break in procedure, Warranty, Maintenance and care of your new 2004R. Before you fill your New 2004R with fluid please read all the instructions.

## Fluid Recommendation

Your New transmission will operate on most available transmission fluids. We have our favorites and will list if you choose to use them.

- 1.) B&M Quick Shift : This is a high quality type F fluid
- 2.) Redline, Royal Purple and Most Dextron Synthetics work well and have Hi Temp capacity
- 3.) Dextron 6: Look on the container for Dextron 6
- 4.) Dex 3, Type F are all fluids that can be used

## Preface

The theory and operation of the TV Circuit outlined is universal to all 2004Rs. **The measurements referenced apply only to an Extreme Automatics 2004R.** There are known factors with the transmissions we build that will be unknown on any other 2004R built by someone else. We use a specific length TV Spring with a specific spring rate and know where its placement will be in reference to the measurements we provide. **If you change your Extreme Automatics TV spring, the info provided will no longer be correct!!!** You will then be on your own and we will no longer be able to provide you with tech advice. There is no way to know what the length and spring rate of an unknown spring will be. Every builder uses something different.

If you purchased a TV system from another company that changes the TV Spring, you will need to follow their instructions for TV setup and adjustment. Using another vendors TV system will not Void your warranty but Incorrect setup and adjustment will. To avoid an expensive repair, verify all adjustments using Line Pressure Verification.

## Universal TV Kits

The name implies exactly that, "Universal." You should never assume they are 100% correct. The universal kit's main objective is to get the TV cable connected to the Carb or Throttle body. You should never assume the geometry is correct. Even a kit purchased from Extreme Automatics is universal. The manufacturer of these kits have no way of knowing the TV Spring length installed by the builder or the exact degree of travel from the pivot point of every carburetor or throttle body made. They have you hooked to the Carb or TB. It's your responsibility to do the geometry work. It's your money when the trans fails, if you don't.

## TV Cable Adjustment

The TV Cable Adjustment is the most important part of a successful installation of your 2004R. The TV cable is not a kick down cable as some think. The TV cable or detent cable is a Throttle Valve Cable that adjusts main line pressure of your 2004R based on throttle position. This variable adjustment of main line pressure is to insure proper line pressure for the amount of torque that is being applied to the clutch packs inside of your transmission, based on throttle position. Too much TV pressure results in 2nd gear starts and harsh extended shifts. Too little TV adjustment results in early shifts, soft shifts and ultimately in the failure of the transmission. The TV cable adjustment also provides the proper timing for part throttle down shifts and full throttle detent down shifts of your 2004R. Although in some applications the geometry is so far off that it will require a new TV cable system for geometry correction. No magic spring or TV cable is guaranteed to correct this adjustment. **The adjustment must be verified.** There are two procedures to properly check TV cable adjustment. Mechanical and Visual adjustment and Line Pressure verification of adjustment, I recommend both procedures.

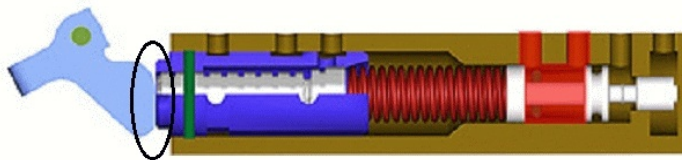
Most Fuel injected cars that were equipped with the 2004R as The Grand National and T-Type should still be checked. In most cases nothing will be needed. It seems common knowledge in the Turbo Buick community that there is an adjustment of the TV cable to change shift points, etc. This is a myth. There is no adjustment of the TV cable that is acceptable to change shift points, etc. The only adjustment outlined in a GM manual is to return the cable to the factory specs outlined in the service manual. This will change over time with worn TV springs, Cable, Installed shift kits, etc. If you want it right, check it! The time you spend obtaining perfect TV will pay off in the life of your 2004R and driving experience.

I will outline both procedures:

- Visual Mechanical inspection.
- Line pressure verification of mechanical adjustment.

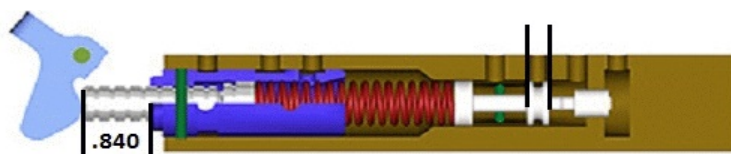
## Mechanical Adjustment

The mechanical adjustment is controlled by the direct coupling of the TV cable from throttle linkage to the TV lifter/plunger assembly inside the transmission. This starts at the carb or fuel injection throttle blade lever. You will need to remove the pan from the transmission so the TV lifter and plunger can be inspected for WOT position.



TV Position Full Throttle

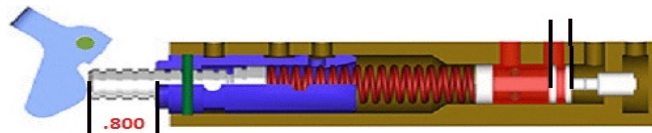
- 1.) Adjust the TV cable for wide open throttle. This adjustment is the easy part. Open the throttle blade to WOT position and adjust cable so there is no slack in the TV cable. From the WOT position you can inspect the TV lifter and plunger to be sure that the lifter is bottomed out on the sleeve of the TV plunger. The TV plunger should be flush with the TV plunger sleeve. This is the full TV position for WOT. No exceptions!! You must have full TV at the same time throttle lever goes to WOT stop position. See Example Above.
- 2.) TV Idle position is the next inspection. This is the most important adjustment of all. From the idle position, the TV system needs to start boosting pressure with even the slightest movement of throttle position. Off idle is where the most damage to the transmission clutches can occur. In the example below, shows the position of the plunger in the idle position. It also shows the TV valve alignment. The edges of the internal TV valve should be center of the middle TV hole shown with the vertical lines on both sides of the TV valve. This is what we are correcting. The alignment inside the VB that you cannot see. The example will represent Perfect Idle TV alignment.



Idle TV Position ( Perfect)

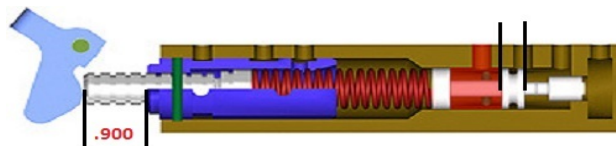
To make it easier we have provided a TV lifter to TV Plunger sleeve measurement of .840. This only applies to an unmodified Extreme Automatics 2004R TV Spring. The window we are looking to achieve is Minimum of .820 to a Maximum of .860, .840 being in perfect adjustment.

If this measurement is not within spec the TV geometry must be changed. This can be done by moving the TV cable connecting point on the Carb or TB closer or further from the pivot point. The TV cable ratchet only lengthens or shortens the cable length. It has no effect on the geometry or degree of movement of the throttle arm from centerline.



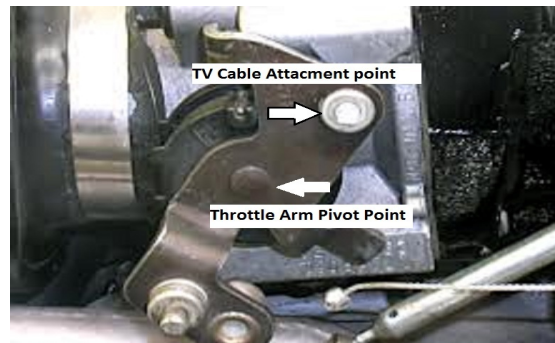
Wrong Alignment (Stroke too Short)

In the Example above we see that our measurement is short of the .820/.860 window. The exact measurement in the example is .800. This tells us the Stroke is too short. The TV cable attachment point on the throttle arm needs to be moved further away from the center of the throttle arm pivot point.



Wrong Alignment (Stroke too Long)

In the Example above we see that our measurement is over the .820/.860 window. The exact measurement in the example is .900. This tells us the Stroke is too long. The TV cable attachment point on the throttle arm needs to be moved closer to the center of the throttle arm pivot point. This is the most dangerous. When the Stroke is too long there is no pressure boost at light throttle causing low line pressure.



Example of a Typical Throttle arm

### **Checking Main Line pressure and TV**

The main line pressure port is located on the left side of the transmission above the shift linkage. You will need a gauge that will read 300 psi and hose about 6' long. The pressure port is 1/8" NPT. You will need a helper to sit in the car while it is running to safely perform these checks.

- 1.) Install gauge and hose. Route away from exhaust.
- 2.) Top off fluid level and warm up the vehicle. Move the shifter in and out of gear for a couple minutes at a time and double check fluid level. Top off to full mark.
- 3.) With transmission warm and full of fluid we are ready to check Pressures.
- 4.) All pressure checks should be preformed at 1500 to 2000 RPM unless noted.
- 5.) Disconnect TV cable from linkage.
- 6.) Raise RPM to about 1500 RPM
- 7.) Move the shift lever into each gear. Record the pressure in each gear. This will be the NO TV readings.
- 8.) Next get a helper to sit in the car and elevate the RPM holding the car on the foot brake.
- 9.) Pull the TV cable out till it bottoms at full TV. Move the shift lever into each gear. Record the pressure readings this will be Full TV readings.
- 10.) Last check is to check the pressure reading in the 4th or OD gear position with the car at an Idle. Perform this check with the TV cable connected and disconnected. The pressure reading should not change more than 5-10 PSI. If the pressure changes more than listed, call us.
- 11.) With the TV cable hooked up and car in the 4th or OD position at a slightly elevated idle, take your finger and push ever so slightly on the TV cable. The main line should start to rise at the slightest hint of TV cable movement. If line rises at the slightest movement you're done. If it does not increase pressure at the slightest movement, adjustment it still incorrect.

The pressure chart is listed for reference

	<u>Excellent pressure</u>		<u>Minimum</u>	
	No TV / Full TV		No TV / Full TV	
P	100	275	70	225
R	175	275	150	200
N	100	275	70	225
D	100	275	70	225
3	100	275	70	225
2	----	250 + ----	----	200 ----
1	----	250 + ----	----	200 ----

### Shift Characteristics

Your new 2004R will shift firm at light to mid throttle. As the throttle increases, the firmness will also increase. Our transmission will not bang if the TV cable is correctly adjusted. Your 2004R will make the following: full to part throttle 4-3 4-2 4-1 full and/or part throttle downshifts. The up shift RPM will be proportioned to throttle opening. The more Throttle, the later the shifts will occur. Our transmissions will up shift at a slightly higher RPM than most 2004Rs. This is patterned after the famous Grand National BRF 2004R. The WOT shifts will occur at 4800-5200 RPM unless other RPM is specified by the customer or hi stall converter is used.

Shift points at light throttle as follows: 1-2 @ 2500-2700 2-3 2000-2300 3-4 2000. On BRF Models 3-4 shift can be in the 2900 RPM Range at light throttle. BRF Models may require the throttle to be slightly lifted for 3-4 light throttle shifts.

### Break In procedure

Your new 2004R was dyno tested before shipping. Some of the break in was done for you on the dyno. There is still a short break in period. When you go out for the first test drive, allow the transmission to make all the shifts at light throttle. After a few shifts through all the gears at light throttle it's time to apply moderate throttle up shifts. After few trips through the gears at moderate throttle you are ready to go. You will start to notice the shifts will firm slightly. This is a good indicator that the clutches and band are seated. There is no set number of miles but when I am asked I say 50-100 miles before full throttle up shifts. Another method is to drive the car in an area where stop and go is required. Make several 1-2 shifts. If needed, let the car shift to 2nd and stop car. Drive until the car shifts to 2nd and stop again. This method will ensure that the band is seated well on the new drum and is ready for power. Again there is no set amount of times this needs to be done. The band seating properly is very important to the life of the band.

## Care of your 2004R

Vital to the life of any automatic transmission, is cooling. Keep your 2004R cool. Check cooling system to be sure you have adequate cooling for the conditions you operate your transmission. This does not mean that you need to add additional coolers. Short burst of hi temps when racing or accelerating are normal and do not damage your transmission. Long periods of Hi temperature does. If using a spragless converter you should install a temperature gauge. Spragless converters build heat and can get out of control at highway speeds in warm weather. Change the fluid and filter at least once per year at a minimum. **If the fluid starts to darken or smell, change the fluid immediately. If using a transbrake or spragless converter, fluid should be changed often. Transbrakes and Spragless converters generate lots of heat and can break down fluid quickly.**

## Warranty

Extreme Automatics will warranty your 2004R for a period of 1 year on Stage 1 and 2 transmissions. 2 Years on Stage 3 units.

Extreme Automatics offers a limited warranty covering all new transmissions for a period of 1 year and all repair services for thirty days from the original date of purchase to be free from flaws in material and craftsmanship. The warranty is non-transferable. Under no circumstances will Extreme Automatics extend its warranty to products, new or repaired, which have been abused, misused, or incorrectly installed. Disassembly of any product by means other than by an Extreme Automatics technician will void any potential warranty. All warranty claims must be accompanied by the original invoice and are subject to the approval of Extreme Automatics. All warranty repair work must be performed at Extreme Automatics. It is the owner's sole responsibility to return this transmission, any related parts to our Bethel, NC. facility and pay for any costs incurred, this will be true whether for warranty, adjustments, or repair work unless authorized in advance by Extreme Automatics. Neglect, abuse, overheating, poor maintenance, converter lock-up failure or burned up fluid related problems are not warranty issues but are easily controlled, monitored and prevented by the operator. This policy allows whatever time is required on project vehicles, in other words, you can't consume the warranty during the construction process. The customer must inform EA of the approximate project completion date and contact Extreme Automatics when the project is completed. Extreme Automatics will not pay for a 3rd party to perform any warranty work what so ever. If the customer decides to have a 3rd party perform work to the transmission all warranty will null and void and customer will be responsible for any charges incurred. Extreme Automatics will not under any circumstances reimburse the customer or a 3rd party for repairs or adjustments under the warranty policy. Leaks are covered for a period of 30 days. The 30 day money back guarantee is limited to 30 days no exceptions. Items not cover by the limited warranty.

- 1.) Damage caused by converter failure or converter clutch failure
- 2.) Shipping cost to and from Extreme Automatics after 30 days
- 3.) R&R labor of the unit or fluids and or other install supplies
- 4.) Any item cover under the installers responsibly.
- 5.) Lock up function electrical or mechanical after 30 days. Includes pressure switches and TCC solenoid.
- 6.) Improper installation including but not limited to TV cable adjustment

### **Installer responsibility**

Extreme Automatics can not control the installation of your new transmission. The installer has the responsibility to properly install the transmission. Check the TV cable adjustment, Fluid level, Converter engagement, Flush the cooler with an approved cooler flush (not brake clean and compressed air). To make sure the alignment dowels are installed in the engine block. To be sure if lock up is used its working properly. Flush any used converter that is to be installed in the new transmission. Unpack the transmission and be sure there is no damage to the unit prior to installation. Follow the proper break in procedure.

### **Internet Terrorist**

We **WILL NOT** deal with any customer who takes a problem to the internet with the intention of holding our reputation hostage to obtain their personal desired result. This person is called an **Internet Terrorist !!!** We will cut off all contact, Void remaining warranty and pursue legal action against any individual or company who uses this tactic of slander against Extreme Automatics LLC.

Extreme Automatics wants you to be thrilled with your purchase. If you have a problem we will go the extra mile if given the chance to correct it. Going to the internet fixes nothing. Making a call to us does. We pride ourselves in handling our problems and will continue to do so. If you have given us the opportunity to reach a fair resolution and we have fallen short or you're not happy with our product, by all means share your experience.