

BOWTIE OVERDRIVES

WARNING!

These parts are engineered to work together in a specific manner. Any variation from these installation instructions or modification made to any part in our TV Made EZ system will void all warranties, written, implied or otherwise!

IMPORTANT NOTICE

If you have a used transmission or one rebuilt by another company, you will need to install our custom length spring into the valve body. This is not an optional step. If you fail to install our spring you will try to run this transmission in an SSS (Short Spring Syndrome) condition which can quickly prove fatal to your transmissions frictions. This is a very simple easy installation but **MUST** be done!

STEP 1

Remove the carburetor and gasket from the manifold. Make sure that the gasket surfaces are clean before you proceed to the next step.

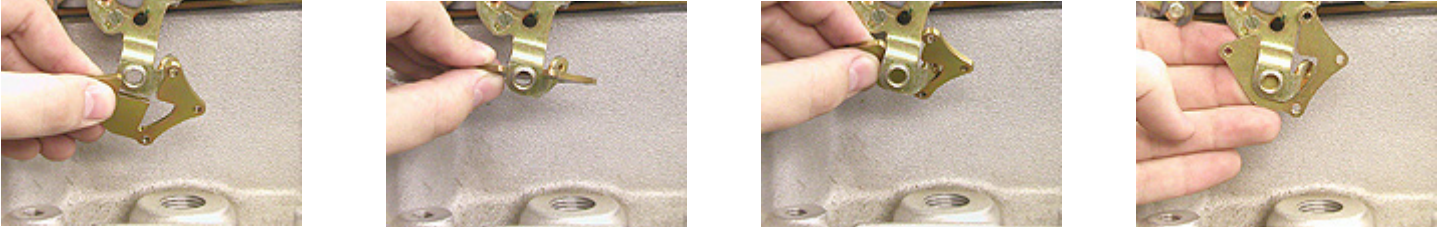
STEP 2

Install one of the two new gaskets supplied in the kit.
Install the spacer plate top of the gasket you just installed.
Install the remaining gasket on top of the spacer plate.

This plate must be positioned directly under the carburetor and supplied gasket.
Spacers of any type, including nitrous kits, must be positioned below this plate.

**STEP 3**

Put your carburetor back on the manifold. Reconnect all the hoses, wires and linkage disconnected when removing the unit. Tighten the hold down nuts evenly using a cross pattern; applying a little more torque each sequence to prevent damaging the carburetor.

STEP 4

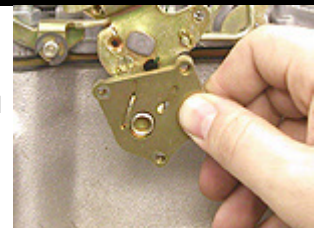
Install the back plate section of the linkage adapter. Bring it in from the back side of the linkage as shown in the near left picture. Index it into position around the carburetor linkage as shown in the far right picture.

STEP 5

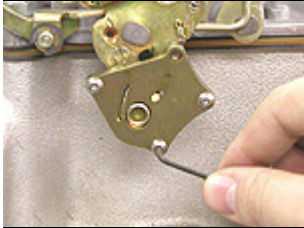
Position the spacer plate piece of the linkage adapter over the linkage as shown in the picture on the left. Simply turn the middle plate until the four bolt holes line up with the back plate section installed in the previous step.

STEP 6

Position the front face plate of the linkage adapter over the linkage as shown in the picture on the left. When correctly positioned, this face plate will index over the extruded (raised area) hole on the linkage. Once indexed over the extruded hole, simply turn the face plate until the four bolt holes line up with the middle plate and back plate sections installed in the previous step.



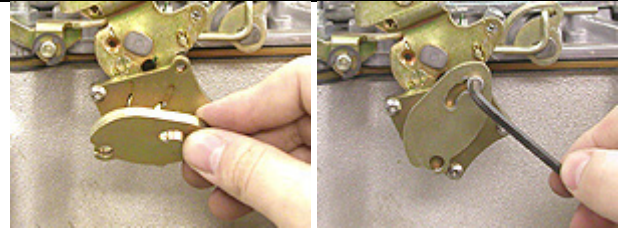
STEP 7



Using the hardware supplied in this kit, fasten the face plate, middle plate and the back plate with the small stainless steel pan head 6-32 screws and 5/64" Allen wrench. Be careful not of over tighten these small screws. **We strongly recommend that you remove each attachment screw and apply a small amount of Lock Tite 242 (or similar product) once the installation, test driving and adjustment procedure has been completed and you are satisfied with the transmissions behavior.**

STEP 8

Align the roll pins on the back side of the cam into the slots on the linkage adapter face plate. Once the cam is indexed correctly, install the 8/32" cap screw loosely, and tighten using the provided 9/64" Allen wrench.



SETTING UP YOUR TV CABLE

- **Refer to the TV cable installation instructions**

PRESSURE TEST

Congratulations, you now have the mounting plate, linkage adapter, cam and have the TV cable installed.

If you purchased one of our transmissions, our warranty requires a correct TV set up, pressure verification and correct operation be demonstrated during a test drive. Click on the pressure gauge installation guide link below, hook the pressure gauge up to your transmission. Then: click on the pressure test procedures below, take your pressure readings and call us. Once proper operating pressures and responses are verified, you will be ready for your test drive! Our written test driving procedure (click below) will walk you through a step by step process which is designed to confirm that **all** transmissions functions are working correctly. During the test drive you will should confirm that your new transmission is operating at the proper temperature. Also during the test driving procedure you are encouraged to try the various cam positions. This system allows you to fine tune the light and medium throttle driving characteristics. **Once you find the best position for your vehicle combination, you should remove each screw and put a spot of 242 Lock-Tite on the threads to prevent them from coming loose over time.** Enjoy!

If you purchased one of our TV Made EZ systems but don't have one of our transmissions, you are welcome to call us anyway. We would be happy to walk you through our set up, pressure testing and test driving procedures.

[760-947-5240](tel:760-947-5240) Ask for our technical service department.

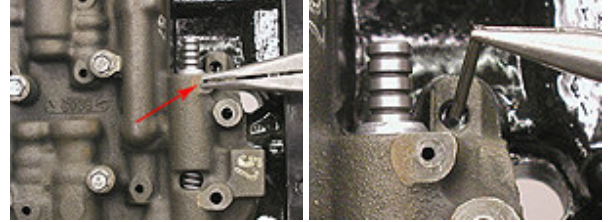
700R4 STEP 1

**700R4 INSTRUCTIONS**

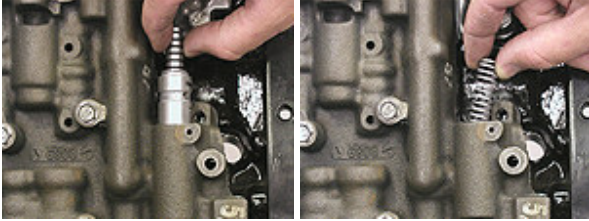
With the pan removed, locate the TV lever and bracket assembly held to the valve body assembly by the two bolts. Disconnect the TV cable at the carburetor / fuel injection linkage. Remove the two bolts (circled in red) holding the TV Lever arm and bracket assembly onto the valve body. The TV lever and bracket assembly is indexed over the roll pin.

700R4 STEP 2

Remove the roll pin (red arrow) using a pair of pliers. Try to not damage the roll pin or lose it as you will be putting it back in once you are finished.



700R4 STEP 3



You will then need to remove the TV Plunger and the bushing. To do this, simply pull the TV plunger and bushing out. Now remove the old spring. If the TV plunger and bushing prove difficult, you can make the TV plunger act as a slide hammer by simply pushing it all the way in, release it in such a way as to cause it to "snap" back out, repeat this action as necessary until you get it removed.

700R4 STEP 4

Slide the new spring that came in your kit, in place of the old one. Replace the TV Plunger and the bushing as they were before. Insert the roll pin, making sure the roll pin lines up with the "slot keyway". Replace the TV lever and bracket assembly. Fill with fluid.



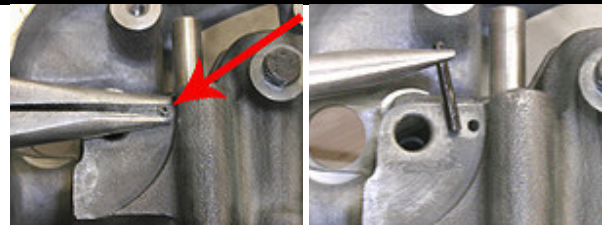
2004R STEP 1

**2004R INSTRUCTIONS**

With the pan removed, locate the TV lever and bracket assembly held to the valve body assembly by the two bolts. Disconnect the TV cable at the carburetor / fuel injection linkage. Remove the two bolts (circled in red) holding the TV Lever arm and bracket assembly onto the valve body. The TV lever and bracket assembly is indexed over the roll pin.

2004R STEP 2

Remove the roll pin (red arrow) using a pair of pliers. Try to not damage the roll pin or lose it as you will be putting it back in once you are finished.



2004R STEP 3



You will then need to remove the TV Plunger and the bushing. To do this, simply pull the TV plunger and bushing out. Now remove the old spring. If the TV plunger and bushing prove difficult, you can make the TV plunger act as a slide hammer by simply pushing it all the way in, release it in such a way as to cause it to "snap" back out, repeat this action as necessary until you get it removed.

2004R STEP 4

Slide the new spring that came in your kit, in place of the old one. Replace the TV Plunger and the bushing as they were before. Insert the roll pin, making sure the roll pin lines up with the "slot keyway". Replace the TV lever and bracket assembly. Fill with fluid.



CALIBRATION PROCEDURE

Time, heat and continuous use, will invariably cause the components of the transmissions' Throttle Valve system (part throttle valve, spring and throttle valve) to loose their precise calibration relationship. Bow Tie Overdrives TV Made EZ system is engineered to work with a **properly calibrated part throttle, spring and TV valve assembly**. Our TV Made EZ system cannot fix programming issues associated with an incorrectly calibrated TV system. ***In fact, if left out of calibration, our system can sometimes exaggerate these issues.*** Fixing a TV valve system that's out of calibration is quite simple, quick and easy. **We have always relied on Transgo's Patented TV correction system. We have tried many systems offered by other companies and the Transgo kit is the most foolproof. We use, highly recommend and offer for sale, their TV correction kit for \$27.00 and have them in stock for immediate shipment.**

NOTES

The TV system directly and indirectly controls or influences just about everything that occurs during the operation of a **Th-700R4 or Th-2004R**. ***Everything the transmission needs to know about pressure control plus all aspects of the transmissions behavior must be signaled to these transmissions through the TV cable system. To enjoy the incredible benefits of these modern overdrive automatics, we Hot Rodders no longer have the crudely simple but very effective "no brainer" vacuum modulator signal to protect and control the transmission like used in the ever popular Th-350 and Th-400 transmissions. No more plug and play!***

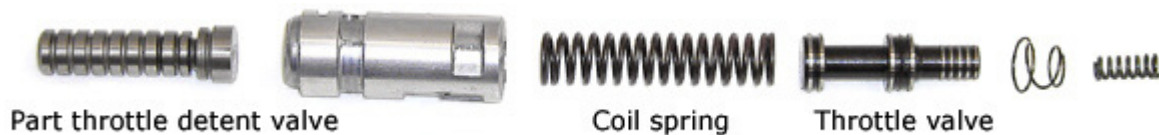
The following is a quick overview of the things directly controlled or influenced by the TV Cable system.

- **Hydraulic pump volume output, pressure boost and regulation (critical to friction life)**
- Upshift timing and feel in relationship to throttle position (critical to your enjoyment)
- Part throttle down shifts (when it happens relative to accelerator pedal position))
- Full throttle detent down shifts (when and how many gears)
- Shift firmness, timing and feel (critical to overall enjoyment)

While all these items are important for proper transmission operation, **sufficient hydraulic pump output and adequate fluid pressure during all operating situations is critical to survivability and longevity**. Even the most expensive, highest quality frictions (bands and clutches) will eventually fail if allowed to slip excessively. Any increase in torque output by your engine **must be instantly offset by at least an offsetting amount of hydraulic clamping force applied to these bands and clutches. Failure to do so and these frictions can fail very quickly indeed!**

On the other hand, incorrect transmission behavior normally has little to do with a transmissions longevity but **has everything to do with whether you'll enjoy driving your vehicle**. A transmission that will not downshift at all or downshifts too soon, upshifts too early or too late, too hard or too soft relative to a particular throttle setting, can be very frustrating! After spending the incredible amount of time, money and effort it requires to build a modern Hot Rod only to have the transmission behave improperly can be very discouraging to say the least. Our TV Made EZ system and this white paper were created to help Hot Rod builders establish a TV cable relationship that **always protects the internal workings with adequate hydraulic pressure and volume**. What makes our system unique is its ability to provide the means for adjusting the **behavior** of these wonderful overdrive transmissions.

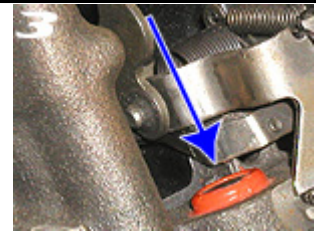
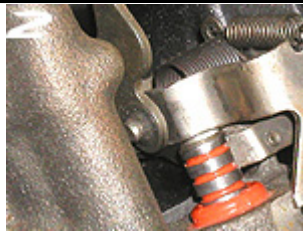
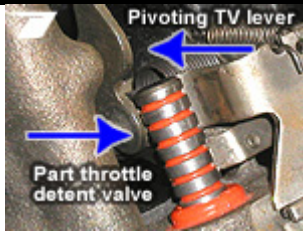
Before you even begin to set up the TV system on a custom installation, always insure that the accelerator pedal inside of the cab will cause the carburetor or fuel injection to go to it wide open throttle position. Many installers **assume** this is taking place when in fact well over 60% of all the cars and trucks that come into our shop will not get wide open throttle with the accelerator pedal! If you perform the installation and set up of our TV Made EZ system correctly, but you fail to get wide open throttle, you've pretty much wasted your time since the transmission will still not behave correctly! Before you start we strongly suggest you get someone to step on the **accelerator pedal** while you confirm your system is reaching wide open throttle at the **carburetor or fuel injection**. If you are replacing an older style transmission that used a vacuum modulator system, the installation of a TV system, required by the Th-700R4 and Th-2004R transmissions will add extra load to the accelerator system. You should check this again once you have it installed and set up properly.



The Th-700R4/Th-2004R signaling process starts at the vehicles accelerator pedal, is relayed through the carburetor/fuel injection linkage down the TV cable where it controls the pivoting lever in the pictures below. As the TV cable is pulled by the carburetor/fuel injection linkage, the pivoting lever pushes inward on the **Part Throttle/Detent Valve** (picture #1 below). The Part Throttle/Detent valve pushes on the coil spring which in turn relays this movement to the **Throttle Valve** (see the pictures above). Starting at the accelerator pedal, the **Throttle Valve** is the last component in this system to receive its signal, at the same time it's the only component that's **absolutely critical** to the transmissions longevity. ***The TV valve is critical to transmission longevity because it's the component that directly controls the output of the transmissions internal hydraulic pump! Calibrating this system so any movement of the accelerator pedal provides instant hydraulic pressure response signaled by the Throttle Valve is now obvious! Pushing the accelerator pedal will cause the engine to instantly produce more torque which must be offset by increasing the hydraulic pressure applied to the frictions to prevent slippage. The TV cable is the only link from the throttle valve to the outside world; its importance is immediately apparent! Since the TV valve is the last component in this system, the need for a properly calibrated TV system is also obvious!***

The **Part Throttle Detent Valve** is the first of three components placed in series down a common bore in the valve body (see picture above) and is the only one of these components visible when the pan is removed. The next component is a coil spring followed by the "**Throttle Valve**". Any inward movement by the **Part Throttle Detent Valve** is relayed mechanically by the coil spring to the **Throttle Valve**.

STEP 1



With the transmission pan removed and the TV cable disconnected from your carburetor or fuel injection system, locate the part throttle/detent on the valve body (picture number 1). We have painted the rings orange on this Th-700R4 part throttle detent valve and the aluminum bushing it rides in. This was done for clarity. Picture #1 shows a correctly homed valve. Picture number two shows an incorrectly homed valve. Original General Motors TV system plungers will not totally return to their "home" position as shown in picture #1 because stock systems didn't provide a return spring to mechanically "home" this TV valve assembly. In the original system, the TV valve was designed to home hydraulically once the engine was started. The transmissions hydraulic pump rotor is directly driven by the drive hub of the torque converter. This drive hub engages the inside rotor drive tangs when its installed into the transmission. The torque converter is bolted to the flexplate in turn bolted to the crankshaft. Consequently, transmissions hydraulic pump rotor turns at engine speed and starts pumping the moment the engine is started.

Whether your TV system is totally stock or in a transmission that been rebuilt check the TV system using the following method: Push the plunger all the way in until it's even with the face of the aluminum bushing it rides in. Slowly release the plunger. Once it stops moving, check to see that it's all the way out. Try to pull the plunger out further; if it comes out further, **install a TV correction kit**. This should be done regardless of the cause, whether the TV system spring became too short over time or it's just not homing because there's no factory return spring to push this assembly home. *At this point, the cause really makes no difference, since you must now remove the valve body to correct the problem either way, it's just smart money to install a TV correction system into the valve body while it's off.* Once the TV correction system is installed, in the future you will be able to quickly verify whether this system has remained in proper calibration without pulling the pan. *This is done by simply hooking up a 0-300 PSI gauge to the pump pressure port and following the pressure test procedure.*

The pictures above show the part throttle detent plunger in a Th-700R4. Note it has rings machined into the plungers O.D. The plunger in a Th-2004R has a smooth O.D. but the function is the same. Without a correctly calibrated TV system, you cannot expect the transmission to behave right.

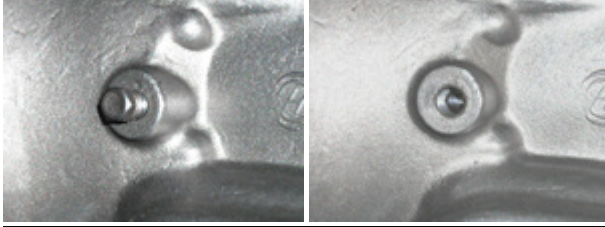
700R4 TV WIRE CONNECTOR LINK LOCATION



2004R TV WIRE CONNECTOR LINK LOCATION



STEP 1



The TV cable is connected to the passenger side of Th-2004R and Th-700R4 transmissions at the locations shown in the above pictures. Same side as your dipstick. The picture at the far left shows the wire link and the TV cable to case seal. This seal must be placed into the transmission before installation, *not onto the end of the TV cable housing!* The wire link will be inserted into the hole of the connector at the transmission end of the TV cable. (See closest picture at left)

STEP 2

We install a new TV cable seal into every transmission we build. A new seal is also provided with new TV cables. With the transmission in the vehicle, it's very difficult to see if a seal is already installed into the case. **Don't try to install two seals into the same hole!** The proper method for installing the TV cable is to remove the seal from the end of the TV cable, install one into the case, lube the end of the TV cable housing then slide this freshly lubricated housing into the seal in the case. Steps three and four will take you through this picture by picture.



STEP 3



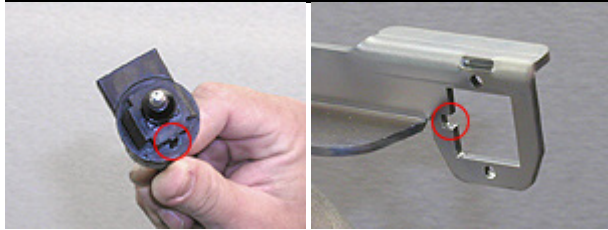
Slide the bent end of the link through the attachment hole at the end of the TV cable. Gently pull on the opposite end of the TV cable (carburetor/fuel injection end) of the TV cable while feeding the transmission end of the cable housing down into the transmission seal. Be sure the wire link doesn't slip out while performing this procedure.

STEP 4

Start the end of the cable housing into the rubber seal and push it all the way in using a twisting motion until it's completely seated flush with the case. Now line up the bolt hole on the cable housing with the bolt hole on the transmission case. Install and tighten the bolt. Use caution not to over tighten and break the housing.



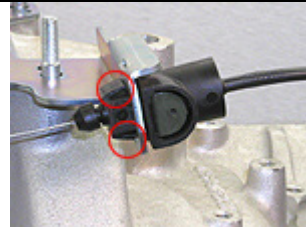
STEP 1



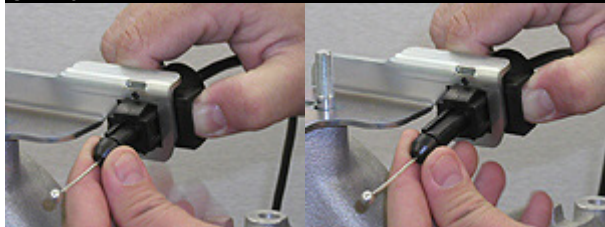
Insert the TV cable into the base plate bracket until you hear it click into position. To do this, match the index guide on the TV cable housing, with the notch in the base plate bracket (red circles in pictures at left). The TV cable will not go in any other way.

STEP 2

Check that the two retaining "tabs" on the TV cable housing have spread out and locked the cable into the base plate bracket. These tabs prevent the cable housing from coming out. (Red circles at right)



STEP 3

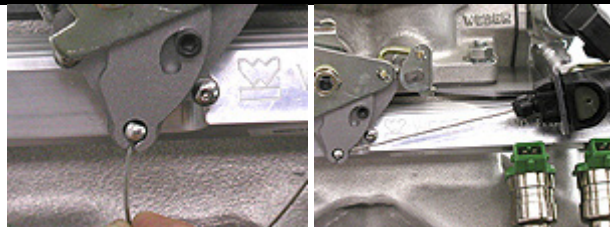


Pressing in and holding the 'D' shaped slider release button (pictures at left and above) the inner cable housing (known as the "slider") will be released and freely slide back and forth in a range of approximately one inch. Press the "D" button and pull the "slider" all the way to its outermost (forward towards the front of the engine) position. Positioning the slider all the way out like this makes the next step, installing of the TV cable "ball" into the hole on the TV Made EZ cam, much easier to accomplish.

STEP 4

Note: The TV Made EZ system shown in the pictures at right is our system for the Edelbrock Pro-Flo 3500, the cam on your system may not look like this, but all TV Made EZ Evolution Two systems have a similar type cable ball attachment hole in the cam.

The pictures at right illustrate how to connect the TV cable by inserting the ball through the provided opening on the cam. Rotating the cable to the rear will prevent it from coming out.



Once connected, press in the "D" shaped release button, push the "slider" rearward (towards the transmission) as far as it will travel. While holding the "slider" rearward, release the "D" shaped button to "fix" the slider in this rearward most position. From the drivers seat position, press the accelerator pedal all the way to the floor. While holding the accelerator pedal to the floor, have your assistant try to rotate the carburetor/fuel injection linkage further to confirm it's getting W.O.T with the accelerator pedal. If he can rotate the Throttle linkage further, you need to fix the throttle linkage. Once the pressure gauge is connected to the transmissions diagnostic port (See gauge installation instruction link below), check for instantaneous pressure rise by gently pulling the cable where it leaves the cable housing. Once instant pressure rise is confirmed, You're ready to perform your test drive!

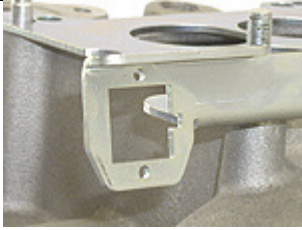
STEP 5



We strongly recommend you leave the pressure gauge hooked up during all test driving. It is very educational to observe the operating pressure reactions caused by the TV system. During the test driving we also recommend taking along the Allen wrench supplied in the TV Made EZ kit that fits the cap screw that holds the cam from moving. (Like the one shown within the red circles at left) We recommend you start with the cam in the lower position (far left picture),

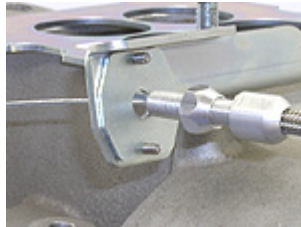
Perform a test drive while making mental notes of the shift timing and feel characteristics **during light to medium throttle driving**. Stop, loosen the attachment bolt, rotate the cam clock wise to the upper position (near left picture), then perform another test drive and notice the difference in shift timing and feel **during light to medium throttle driving** with this different set up. We encourage you to freely experiment with the unlimited number of positions along the cam track until you find the one that gives you the best overall driving characteristics that match your driving style. Be sure to check for instantaneous pressure response with even slight cable movement after each adjustment. These adjustments can be done while the engine is running.

STEP 1



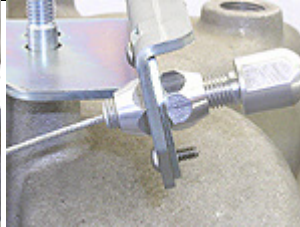
Install the stainless steel braided cable adapter piece provided in the TV Made EZ kit. This adapter must be mounted on the back side of the base plate bracket as shown in the pictures above. Secure the adapter to the base plate bracket with the provided 6-32 stainless steel pan head screws and Allen wrench.

STEP 2



Remove the first adjuster nut, the one indicated by the red arrow in the above left picture. Position the second adjuster nut on the threaded cable housing so the adapter plate will be in the middle of the threaded areas once it's installed into the adapter plate. Slide the cable adjuster housing through the hole in the adapter plate as shown in the pictures at upper right and below left.

STEP 3

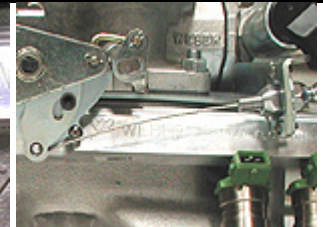


Screw the first adjuster nut back onto the cable adjuster housing. You're now able to make the proper starting set up of the TV system by screwing these nuts along the threaded area of the cable adjuster housing. Moving the position of these two adjuster nuts along the threaded area of the cable adjuster housing relative to the adapter plate will allow you to "preload" a slight pressure boost. Attach the pressure gauge and hose assembly. Refer to Section 4 for pressure gauge installation.

With the transmission full of fluid, engine at idle, TV cable connected to the cam, preset the idle pressure so there's a minimum of two pounds of pressure higher than the disconnected TV cable reading at idle as shown in step 4.

STEP 4

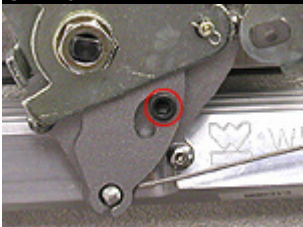
Note: Edelbrock Pro-Flo 3500 shown in pictures, the cam on your system may not look like this, but all TV Made EZ Evolution Two systems have this hole in the cam.



The pictures at right illustrate how to connect the TV cable by inserting the ball into the provided opening on the cam. Once connected, using the adjuster nuts, you need to adjust the cable until you see a 2-4 PSI increase on your pressure gauge **above the pressure shown at idle with the TV cable disconnected**.

Once this preload pressure has been established, even slight gentle forward movement of the TV cable where it exits the TV cable adapter housing should result in instant pressure response on the gauge. This test must be done by gently pulling the TV cable not movement of the Throttle linkage! The pressure response must be evident with even very small forward movements by the TV cable. If you have one of our transmissions, refer to Section 5 for pressure test procedures. Perform the pressure test and call us.

STEP 5



You are ready to perform your test drive! We recommend the pressure gauge remain hooked up during all test driving. Pay attention to the reactions caused by the TV system, it is very educational. During the test driving we also recommend Allen wrench supplied in the TV Made EZ kit that fits the cap screw shown within the red circles at left. Start with the cam in the lower position (far left picture), perform a test drive while making mental notes of the shift timing and feel characteristics.

Stop, loosen the attachment bolt, rotate the cam clock wise to the upper position (near left picture), then perform another test drive and notice the difference in shift timing and feel with this set up. You are free to move this cam anywhere along its engineered path with full confidence as long as you check for instantaneous pressure rise with even slight cable movements.

PRESSURE TEST

Now that you have your TV Made Ez kit installed, you will need to perform a standard pressure test before you do a test drive. Once you have done the pressure test, you will need to call in your pressures to verify the set up is correct. If you do not have our transmission, we still encourage you to proceed to the pressure and drive testing so we can teach you what your pressure readings mean and verify that everything is in working order, or diagnose any problems that you may have.

If you have one of our transmissions, you need to to the pressure tests and call these figures in before you proceed with the test driving.

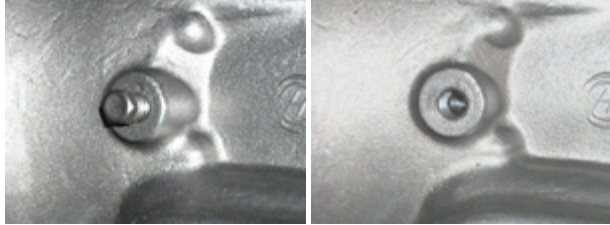
700R4 PRESSURE PORT LOCATION

2004R PRESSURE PORT LOCATION

4L80E PRESSURE PORT LOCATION



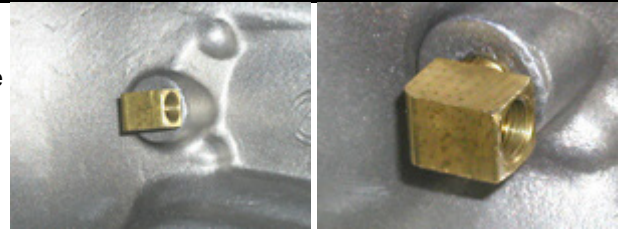
STEP 1



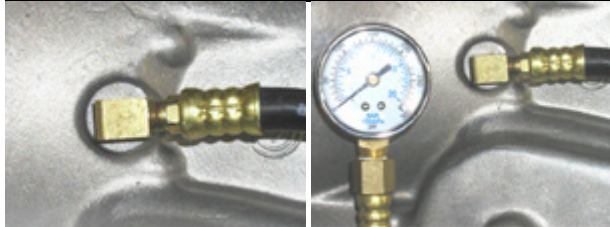
The pressure gauge must be connected to the transmission at the location shown above. This is a direct fluid passage to the transmissions internal hydraulic pump. This **installation** will be done while the engine not running. **Testing** will be done with the engine running. To hook up the gauge, locate the 1/8" plug on the "Driver Side" of the transmissions bell housing as shown in the above pictures; unscrew the plug from the transmission.

STEP 2

Install the 1/8" NPT 90 degree elbow fitting into the transmission. As you tighten the fitting, be sure to end up with the elbow fitting pointing toward the rear of the transmission. This will ensure that the pressure gauge hose will not interfere with your shift linkage while you are test driving.



STEP 3



Screw the pressure gauge hose into the 90 degree fitting. Be sure that it's snug inside of the fitting to prevent leaking. Route the pressure gauge hose above the frame and away from the exhaust. You can now use the gauge under the hood or while test driving, routing up through the driver side window.. That's it! We don't recommend this gauge be installed permanently, it should be removed after the set up and test driving are completed.

IMPORTANT NOTES

Use of a pressure gauge is the only way to be sure the TV cable system is working correctly. Refer to the pressure check procedure section for a step by step method of setting up this critical system! Adequate pressures during all transmission operations is critical to friction longevity and parts longevity. We highly recommend this procedure be followed anytime the TV cable is disconnected or it's relationship to the transmission is altered in any way. While this system is critical to the very survival of the transmission, making sure its correctly set up is not difficult to accomplish.



PRESSURE GAUGE INSTALLATION

You will need to install a 0-300psi pressure gauge in order to perform this test. The pressure gauge must be attached to the direct pump pressure port on the driver's side of the transmission. These readings should be taken right after the initial startup of the transmission, the vehicle shouldn't be driven until you verify these pressures with our facility. If the vehicle is driven prior to our approval it may void your warranty.

- [See Pressure gauge installation guide](#)

PRESSURE TEST

Please read the following three tests very carefully, these are very critical.

Once you have set up the T.V. cable correctly according to the instructions for your specific T.V. system, you will need to bring the engine up to operating temperature and perform the following three tests as follows:

PRESSURE @ IDLE T.V. CONNECTED

With the vehicle running at an idle, make sure that the T.V. cable connected to the carburetor/fuel injection linkage, and adjusted to the appropriate settings. With the gear selector in park record the reading off of the pressure gauge. Next pull the gear selector down into reverse and take that reading, then continue to shift the shifter down through the rest of the gears one by one taking a reading in each gear.

PRESSURE @ IDLE T.V. DISCONNECTED

Once again with the vehicle running at a idle, disconnect the T.V. cable from the carburetor/fuel injection linkage, and simply record the pressure readings again in each gear.

PRESSURE @ HIGH IDLE FULL T.V.

You will need a helper to help you perform this last test. This test is a little bit more complex and will require the use of an assistant. On this test we will once again start off in park, bring the vehicle up to approximately 1500 rpm's and have your assistant pull the T.V. cable all of the way out until he can feel it stop, it will stop when it buries the plunger in the transmission, now take a pressure reading, release the T.V. cable and let the engine rpm back down to a idle. Now we need to perform this same test in the remaining six gears, upon doing this in the other gears the car is going to try to move as if we were power braking it, so we highly recommend that you set the emergency brake and keep you foot planted firmly in the brake pedal

Pressure test chart

Park			
Reverse			
Neutral			
Overdrive			
Third			
Second			
First			

NOTICE

CAUTION MUST BE EXERCISED DURING THE INITIAL TEST DRIVE. IF YOU FEEL SOMETHING IS NOT CORRECT, STOP AND CALL US. WE CAN CORRECT WHATEVER THE PROBLEM IS BEFORE ANY DAMAGE IS DONE. DURING ALL THE YEARS OF TEST- DRIVING VEHICLES WE HAVE NEVER DAMAGED A TRANSMISSION DURING THIS PROCESS. IF SOMETHING DOESN'T FEEL RIGHT, STOP THE TEST AND CALL US TO HELP YOU DETERMINE WHAT IS WRONG.

TEST DRIVE PROCEDURES

It has been our experience the first hour after start up of a newly built automatic transmission is critical. Realize what we are doing is very similar to starting a new engine. Get through this phase and you are well on your way to a long happy life with your new transmission.

1. When you are ready to test drive place the selector in the overdrive position. Softly run the transmission through all the forward gears. Come back to a stop and do the same thing at least two more times. This will bring the transmission up to operating temperature. Bring the vehicle back to a full stop.
2. Keep the selector in the overdrive position and perform a minimum throttle first to second shift. This will be the slowest vehicle speed you can get the vehicle to ease into second gear. When the transmission shifts to second you need to aggressively floor the accelerator to make the transmission perform a second gear to first gear downshift. If the transmission fails to downshift. Terminate the test drive. Carefully return to your shop and call us.
3. Next you perform a minimum throttle (Minimum vehicle speed) third gear into fourth gear. If you have a tachometer this is easy to see when this occurs. Without a tachometer you might have to play with the gear selector to determine when you are in fourth gear at minimum vehicle speed. When you are certain that you have the vehicle into fourth gear at the slowest vehicle speed, aggressively floor the throttle to force the transmission to downshift to second, bypassing third in the process. If the transmission fails to perform this test, terminate the test drive and call us.
4. Let the transmission go back into fourth and check for converter lock up. Put your vehicle in light acceleration with your throttle pedal. Hold that position with your right foot while you gently apply the brake pedal with your left foot. Not enough to apply the brakes but just enough to turn on the brake lights. If your brake pedal disconnect circuit is working; you will feel the engine rpm jump up as the torque converter disengages. Continue to hold the throttle position with your right foot. When you release the brake pedal with your left foot, the engines' rpm should drop right back down as the converter re-engages. You must have some acceleration going on while you perform this test or you probably won't feel the engagement and disengagement when it occurs. Now bring the vehicle back to a complete stop.
5. Select manual first gear. Accelerate to 3000 rpm and hold that setting for five seconds. When you are sure the transmission will not go into second gear on its own, release the throttle pedal back to idle. You should feel a strong compression braking action happening. Accelerate back to 3000 rpm.
6. Select second gear with the selector. You should get a clean crisp shift into second gear. Accelerate up to 3000 rpm and hold that rpm setting for five seconds. When you are sure the transmission won't shift on it's own into third gear, release the throttle pedal back to the idle position and check for engine compression braking once again. Accelerate back up to 3000 rpm.
7. Select manual third gear with the selector. The transmission should cleanly and quickly shift into third gear. Take the engine rpm up to 3000, hold it there for five seconds, release the throttle pedal and confirm that you have the correct engine compression braking. Bring the vehicle back to a complete stop.
8. Perform a minimum throttle first to second gear up shift, then aggressively floor the accelerator pedal to perform a second gear to first gear downshift. This time hold the throttle pedal to the floor and record the rpm that the transmission automatically up shifts to second gear and then to third gear. If you don't have a tachometer, the shift points should feel reasonably close to appropriate for passing situations. (Note: You will be asked what your transmission and engine temperatures were at this point)
9. Stop the vehicle and open the hood. Feel the return line from your cooling system. Please use some common sense here. Use extreme caution around any moving or hot engine components. Please don't call us complaining of burnt fingers or shredded clothes. When you touch the return line, do so with caution, use a quick, light tap to determine if the line is scolding hot. You should be able to touch this line without burning your hands. Even the outgoing line shouldn't be hot enough to burn you if you touch it momentarily. If you feel very high temperatures on the return line you should add a cooler. A transmission temperature gauge will help determine what is occurring. If you error on this topic, please do with too much cooling. The temperature gauge is recommended even if you don't plan to tow. 150 degrees F or less should be indicated with a temperature probe (sender) positioned in the pan. The fluid can be seriously overheated if pan temperatures exceed 150 degrees F. This happens because overheating is occurring in the converter, not the pan. What they don't realize is the temperature that we are observing is the fluid temperature after it has returned from the cooling system! People are confused about this because they know that Dextron III can withstand higher operating temperatures than 150 degrees F. What they are failing to realize is the gauge is reading the fluid after it has gone through the cooling system. While it is impractical to probe the inside of the torque converter when it is operating, it's known to be the hottest component in the system. The converter is the heat source and the main reason a cooling system is essential to automatic transmissions. So we have learned though years of observation this transmission is doing fine at 150 degrees F and overheating when over that if you are sensing the fluid temperature in the pan. Call with your observations concerning this drive test. Install the remaining pan bolts. (See torque specification sheet) Check for any leaks. These transmissions normally are not "Leakers", but the cooling lines can sometimes be pesky especially at the transmission end. The lines can be difficult to get a wrench on correctly. Recheck the fluid level.