

PART # USGB

BRAZEL'S RV PERFORMANCE PRODUCTS - ULTRASTOP
ALLISON GRADEBRAKE UPGRADE INSTRUCTIONS



W20-W24 CHASSIS
M.Y. 2001-2004

1. Locate an area close to the O/D and cut out a hole to mount the GradeBrake switch. It doesn't have to be next to the O/D switch, but we recommend it for ease of installation and use.
2. Using the provided T-tap connect the blue wire with male spade from the GradeBrake module to the switched (cold) side of the brake switch. Use a test-light to verify which wire goes off and on when you depress and release the brake pedal (usually a light blue wire).
3. Locate the back of the O/D switch and follow the wires down to a 4-wire connector, unplug here and insert the GradeBrake matching connectors between them.
4. Run the red wire from the GradeBrake module to the under-dash fuse block area. Remove the Inst/Ign fuse (#4). Use a test-light to verify which side of the fuse socket does not have power when the ignition is on (this is the "cold side"). On the end of the GradeBrake red wire, you will find the add-a-fuse connector, Install this in the #4 fuse socket with the red wire on the "cold side".
5. Disconnect the chassis battery.
6. Locate the TCM mounted on top of the radiator, the TCM is the top mounted module.
7. Remove the (3) 10mm bolts holding the TCM to the metal frame.
8. Pull the TCM towards you as far as possible to gain best access to the two connectors at the rear of the TCM.
9. Unplug the two connectors by sliding the red locking tabs away from the module allowing you to depress the connector release.
10. Locate the TCM connector with the clear plastic cover over the terminals. Pinch the retainers on the side and slide the plastic cover off to expose the terminals. Open the back of the connector, (it is kind of like a clam-shell) by using a small flat blade screwdriver and gently release the two tabs on either side.
11. Remove the wire and terminal from cavity #7 by very gently lifting the white retainer clip and front of terminal at the same time while pulling back on the wire. Take that wire and terminal from cavity #7 and insert it into the available cavity #8.
12. Run the blue wire from the GradeBrake module through the firewall by drilling an 1/8" hole next to the under-hood fuse block. The wire length is enough to reach the TCM when routing the wire in this manner. Insert the terminal on from the blue wire in to the now available cavity #7. Close the "clam-shell", making sure you feel it click shut. Place the clear plastic cover back over terminals being careful not to bend or push any terminals back. Make sure the cover clicks shut.
13. For 2001-2003 Model Years (10th digit of VIN is 1, 2, or 3): Locate the TCM connector with the red plastic cover. Remove the cover to expose the terminals. Open the "clam-

shell” of the connector. See if you have wires installed in both #30 and #32 locations, if there are then the relay is not needed. If you only have a wire in one location, then remove the wire and terminal from that cavity (#30 or #32). Fold the wire back and tape it to the harness, as you will not be using this wire and terminal moving forward. Once that is done, or if you did not have a wire in either location, then just install the the provided relay as follows. The provided relay has two wires attached with terminals on each. Install these into #30 and #32 locations. It does not matter which wire goes to what terminal. Close the “clam-shell”, making sure you feel it click shut. Place the red plastic cover back over terminals being careful not to bend or push any terminals back. Make sure the cover clicks into place.

- 14.** Plug TCM connectors back into TCM and re-mount the TCM onto it's frame.
- 15.** Connect the black wire with the ring terminal from the GradeBrake module to chassis ground.
- 16.** Reconnect the chassis battery.
- 17.** We test all TCM's prior to building the GradeBrake kits to make sure they are operating properly. The TCM's are reset to factory settings and do require a “relearn” period of approximately 500 miles, so it is not unusual to experience extra firm or delayed shifting at first. If you are having an issue with transmission operation or a “Check Transmission” light is illuminated on your dash, double check your TCM connections (sometimes the terminals will back out if they weren't inserted fully and this will cause a loss of communication to the TCM).

Allison Series 1000 Transmission Grade Braking

The grade-braking's primary purpose is to utilize engine braking to slow the vehicle on steep grades in order to reduce wear on the traditional braking system. The method used to slow the vehicle is selecting the next lower gear range, adjusting pressures, and torque converter lockup automatically.

The GradeBraking function takes into consideration several factors before commanding a downshift. These are the primary inputs:

- ✓ GradeBrake switch position (top of the switch pressed in, is active state)
 - ✓ Throttle position
 - ✓ Brake state (The brake must be applied for 5 seconds or greater to activate grade braking)
 - ✓ Vehicle acceleration/deceleration
 - ✓ Grade/Load
 - ✓ Vehicle speed
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- The GradeBrake is actively monitoring whether or not to command a downshift while on level roadways, but it is much less likely that it will command a downshift under these conditions. The Transmission Control Module (TCM) is using vehicle acceleration/deceleration as a determining factor. When the vehicle is on a downhill decent, the TCM knows this by monitoring negative slip on the torque converter. If it does not see this negative slip, then it will not engage the GradeBrake function. This means on flat ground (or close to it) you will not see the effects of the GradeBrake operation to slow the vehicle.
 - There is no "fixed" shift point for a GradeBraking downshift, however, the GradeBraking downshift will never occur outside GM Truck guidelines for engine speed.
 - The GradeBraking downshift will never occur without depressing the brake pedal.
 - The downshift will always be to the next lower range, i.e.; it will not "skip" ranges. The grade-braking feature has ability to select the 5-4, 4-3, 3-2 downshifts.
 - Grade-braking can be exited by depressing the throttle.
 - Grade-braking monitors the front and rear wheel speeds and can determine if the vehicle is slipping. If a slip occurs, GradeBraking will be exited and the transmission will up-shift to the normal gear range depending on throttle position and transmission output shaft speed.

Important:

Grade Braking is not intended to reduce the need for great care by the driver when driving a heavily loaded vehicle down a grade. Drivers should continue to take all normal and appropriate actions to keep the vehicle under control at all times.