# TECHNICALLY Speaking

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### AW55-50 Differences between Manufacturers - Part Two

Last month we explained the variety of operating modes the different manufacturers use to control AW55-50 units in their vehicles. Knowing the modes and when they are activated is the first step in making an accurate diagnosis. A symptom reported by a customer may be normal, intended operation for one brand of vehicle and a legitimate problem in another. As part of your diagnosis, you should also be aware that every manufacturer has at least one transmission control module (TCM) reflash or replacement bulletin to address various transmission concerns.

If there is a problem and you complete a repair, the next challenge is to understand and correctly use the different relearn procedures. No matter which type of vehicle you are working on, it is imperative that the adaptive relearn procedures be performed to avoid shift feel and engagement feel problems.

#### Volvo

Performing the adaptive learn procedure on a Volvo requires a VADIS (Volvo factory scanner) to put the TCM in the "Control Module Adaptation" mode. Some vehicles do not have this function available and will need to have the TCM software reflashed so that the control module adaptation mode will work.

The TCM will not go into adaptation mode unless the transmission oil temperature is between 150°F and 230°F. The TCM will not adapt in Geartronic or Winter Mode. While the TCM is in the Adaptation Mode, the orange triangle in the center of the instrument cluster will flash when the adaptation has been completed for a particular shift.

#### To adapt the up shifts:

- Use the "D" position. Accelerate from a stop at a light throttle, about 1400 rpm, through the gears to 4th, keeping the throttle steady. Come to a stop and repeat until the orange triangle flashes after each shift.
- Next, accelerate from a stop though all five gears at a throttle opening of about 1800 rpm, keeping the throttle steady. Come to a stop and repeat until the orange triangle flashes after each shift.
- Finally, accelerate through the gears at a throttle opening of 2500 rpm. Repeat until the orange triangle flashes after each shift.

#### To adapt the down shifts:

• Use "D" position. While driving at about 45 mph in 5th gear release the throttle and lightly brake to a stop. Repeat this procedure until the orange triangle flashes after each downshift.

#### To adapt the garage shifts:

- With the engine idling and the brake pedal depressed, shift to "N" and wait 5 seconds, now shift to "R", wait 5 seconds then shift to "N". Repeat this procedure until the orange triangle flashes.
- Repeat the above procedure for "D".

#### To Adapt the Neutral Control Function:

**Note:** Not every Volvo has the Neutral Control Function.

- While driving at about 5 mph in "D", slowly come to a stop. Repeat this procedure until the orange triangle flashes.
- With the engine idling and the brake pedal depressed, move the shifter to "D" and wait about 25 seconds for the orange triangle to flash. This lets you know that the TCM is ready to adapt. Once the flash is seen, release the brake and allow the vehicle to crawl forward. Repeat this procedure until the orange triangle flashes just after the brake pedal is released.

Once all of the adapts have been learned, turn off the ignition and the TCM will exit the adaptation mode.

For more precise information see Volvo Tech Bulletin # 43-27 for 2001 S60, V70, V70VC, and XC90 2.5T. For all other Volvos using the AW55-50 transmission, see Volvo Tech Bulletin # 43-20.

#### Nissan

To clear the shift adapts, a Consult Scan Tool (Nissan factory scanner) must be used. The EEPROM in the TCM is erased and reset to the default settings during a process that Nissan refers to as "TCM Initialization". During this initialization the up shift, down shift, engagement, and torque reduction adapts are relearned.

At this time, no aftermarket scan tool is capable of performing the TCM Initialization, nor is there a manual reset procedure.



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#### Nissan Service Bulletin # NTB05-026,

TCM Reprogramming Needed When Replacing A 5-Speed A/T. This bulletin applies to 2004-05 Maxima and 2005 Altima with 5-speed automatic transaxle.

#### **GM/Saturn**

#### Resetting the shift adapts

The Chevrolet Equinox and the Pontiac Torrent require a scan tool to initiate the relearn procedure once the transmission oil temperature reaches 150°F. Clear the old shift adapts and initiate the relearn procedure with the Tech 2 or equivalent scan tool, then the adapts can be relearned as follows:

- Neutral position adaptation follow the scan tool instructions.
- **N D engagement adaptation** Shift from neutral to drive, wait 3 seconds, and then shift back to neutral. Repeat 5 times.
- N R engagement adaptation Shift from neutral to reverse, wait 3 seconds, and then shift back to neutral. Repeat 5 times.
- Up shift & down shift adaptation In the drive position, accelerate from a stop at a light throttle, about 15-20 % throttle angle, to 4th gear. Decelerate while braking lightly, using a minimum of 14 seconds to come to a full stop. Repeat 5 times. In the drive position, accelerate from a stop at a throttle opening of 50-55% all the way to 5th gear. Decelerate while braking lightly so that each down shift is felt. Repeat 5 times.
- **2-1 Down shift adaptation** With the shifter in the intermediate range, accelerate above 16 mph, release the throttle, then manually shift to low range and come to a stop. Repeat 10 times.

The Tech 2 will work on Saturn vehicles too. There is a manual relearn procedure that can be used on the Saturn if a scan tool is not available. With the key off, "brain dead" the TCM by disconnecting both battery cables, (remove the negative cable first), and connecting them together. Turn on the headlights and press on the brake pedal to drain the power from the TCM. If you turned the key on to drain the TCM, make sure that you turn the key off before reconnecting the battery. Reconnect the battery (positive 1st, negative last). By draining the power from the TCM, the adaptive learn is cleared to the default level.

Now you can perform the relearn procedures as shown above.

It is always a good idea to check to see if the computer has the latest software upgrades. On GM vehicles this is made easy for the aftermarket technician. All you will need is the software calibration number, which can be retrieved by your scanner, and the vehicle VIN#. Go to the *FREE* GM calibration web site; plug in the VIN# of the vehicle you are working on and all of the software upgrades that are available for that vehicle will appear. Check to see if your calibration # is current. The web address is: http://calid.gm.com.

#### Saab

A Tech 2 or equivalent scan tool must be used to clear the shift adapts in the EEPROM of the TCM, (Saab refers to this procedure as zeroing the adapts). The EEPROM cannot be erased by disconnecting the power from the TCM. The Saab service information says that

relearning the shift adapts can be accomplished with a 10-15 minute test drive under varying driving conditions, although they have a specific procedure set down for relearning the up shift, down shift, engagement, and manual down shift adapts.

#### Resetting the adapts

Using a Tech 2 or equivalent scan tool, zero out the shift adapts in the EEPROM. The transmission temperature must be 65–110°C for the TCM to relearn the adapts. **DO NOT stall test the transaxle to warm it up!** 

#### Engagement relearn procedure

- Set the parking brake.
- With the engine idling at operating temperature, shift from N to R.
- Keep in R for 3 seconds then shift back to N.
- Repeat 5 times then perform the same procedure for D.

#### Up shift and down shift relearn procedure

There is a shifting adaptation procedure in the factory manual for those instances where the normal drive does not produce satisfactory results. Always perform the engagement adaptation first, and then perform the shift adaptation procedure as follows:

- Put the manual shift lever in the D position and accelerate to just over 50 km/h at 15-20% throttle angle until the vehicle shifts into 4th gear. Next, slow the car to a stop with light brake pressure. It is important that it takes at least 30 seconds to get to 4th gear and more than 14 seconds to come to a stop.
- Repeat the above procedure 5 times.

#### Manual shifting from 2nd to 1st adaptation relearn procedure

- Engage M2 with the shift lever.
- Accelerate to 25 km/h.
- Engage M1 and brake smoothly to a stop.
- Repeat procedure 10 times.

#### Saab service bulletins for this transaxle

- TSB # 440-2425, January 2004. Springy up shift from 2nd to 3rd or 2-3 slide/slip. This bulletin involves reprogramming the TCM.
- TSB # 440-2498, October 2004. Hard, delayed or incorrect shifting, rising engine speed during shifting with various symptoms. Depending on the symptoms the fix could be sensors, software upgrades or internal transaxle repairs.

The AW55-50 is everywhere and this unit will show up in your shop. As always, builders must learn the proper build techniques for the unit itself. The additional challenge for this unit is to pay careful attention to the specific program and control influences each manufacturer has applied.

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