

45RFE

Quick Learn Procedure

Clutch volume index (CVI) represents the volume of fluid needed to stroke the clutch return spring. The programming of the TCM allows it to constantly monitor the time it takes to fill the clutch. If the TCM detects a longer or shorter than normal shift it will try to make the necessary adjustments to the solenoids through modulating the duty cycle. By doing this the TCM can keep the shift quality consistent over the life of the vehicle.

L/R Clutch volume is updated when doing a 2-1 or 3-1 manual downshift to lower gear with the throttle angle below 5°. Transmission temperature must be above 110°F. the Clutch volume should be between **82-134**

2C Clutch volume is updated when doing a 3-2 kickdown shift with the throttle angle between 24° and 54°. Transmission temperature must be above 110°F. the Clutch volume should be between **25-64**

OD Clutch volume is updated when doing a 2-3 upshift with the throttle angle below 5° and 54°. Transmission temperature must be above 110°F. the Clutch volume should be between **25-64**

4C Clutch volume is updated when doing a 3-4 upshift with the throttle angle between 5° and 54°. Transmission temperature must be above 110°F. the Clutch volume should be between **30-64**

UD Clutch volume is updated when doing a 4-3 kickdown shift with the throttle angle between 20° and 54°. Transmission temperature must be above 110°F. the Clutch volume should be between **44-92**

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Quick Learn Procedure (continued)

Concern: The transmission doesn't shift smoothly. This condition may occur even after a Quick Learn procedure has been completed. The 45RFE transmission adapts to its mechanical tolerances by learning the clutch volume indexes (CVI's) as well as the duty cycle and other parameters that control shift quality. Performing a Quick Learn will simply reset all transmission adaptive values to factory preset values and it will exercise the transmission clutches to learn an approximate value for the clutch CVI's.

Quick Learn should not be used as a remedy for shift quality complaints. Quick Learn resets more than 70 learn parameters to their preset values and will require them to be relearned.

Quick Learn should only be used when a transmission has been replaced or overhauled, or when the Transmission Control Module has been replaced or flashed. Once Quick Learn is performed, an initial drive evaluation should be performed to determine if the transmission is shifting smoothly.

The first step is to verify that the shifter linkage is adjusted properly and that the CHECK PRNDL fault (code 28) is not present.

A misadjusted shifter will not set code 28. A misadjusted shifter cable will however cause poor 2-3 shift quality.

It is critical that the PRNDL code be OD when the shifter is in the OD position gate. Use a scan tool to confirm that the correct code is present. If the shifter has a temporary code (T3 or T4) in the OD shifter position, then this is the most likely cause for consistent poor 2-3 shift quality. If the linkage is out of adjustment, then adjust the shifter cable.

Perform the portion of the following 45RFE Quick Learn Procedure that will learn the specific shift characteristic for the shift problem in question.

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Quick Learn Procedure (continued)

Procedure to Learn a Smooth 1st Neutral to Drive Shift

Perform this procedure only if the complaint is for a delayed or harsh shift the first time the transmission is put into gear after the vehicle is allowed to set with the engine not running for at least 10 minutes. Use the following steps to have the TCM learn the 1st N-1 UD CVI.

NOTE: **The transmission oil temperature must be between 80°-110° F (27°-43°C).**

- Start the engine only when the engine and ignition have been off for at least ten (10) minutes.
- With the vehicle at a stop and the service brake applied, record the UD CVI while performing a Neutral to Drive shift. During the shift, the UD CVI will temporarily show a different value which is the 1st N-1 UD CVI. The 1st N-1 UD CVI account for air entrapment in the UD clutch that may occur after the engine has been off for a period of time.
- Repeat until the recorded 1st N-1 UD CVI value stabilizes.

It is important that this procedure be performed when the transmission temperature is between 80°-110° F (27°-43°C). If this procedure takes too long to complete fully for the allowed transmission oil temperature, the vehicle may be returned to the customer with an explanation that the shift will improve daily during normal vehicle usage. The TCM also learns at higher oil temperatures, but these values (line pressure correction values) are not available for viewing on a scan tool.

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Quick Learn Procedure (continued)

Procedure to Learn a Smooth Neutral to Drive Garage Shift

Perform this procedure if the complaint is for a delayed or harsh shift when the transmission is put into gear after the vehicle has had its first shift. Use the following steps to have the TCM learn the N-1 UD CVI.

NOTE: **The transmission oil temperature must be between 80°-110° F (27°-43°C).**

- Start the vehicle engine and shift to drive.
- Move the vehicle forward to a speed of at least 10 MPH and come to a stop.
- Perform repeated N-1 shifts at a stop while pausing in Neutral for at least 2-3 seconds and monitor UD CVI volume until the value stabilizes. The value will change during the N-D shift. This is normal since the UD value is different for the N-1 shift than the normal value shown which is used for 4-3 coastdown and kickdowns. Perform repeated shifts in this temperature range until the UD CVI value stabilizes and the N-1 shifts become smooth.

Procedure to Learn 1st 2-3 Shift After a Restart or Shift to Reverse

Use the following procedure to have the TCM learn the 1st 2-3 shift OD CVI.

NOTE: **The transmission oil temperature must be above 80°F (27°C).**

- With the vehicle engine running, select reverse gear for over 2 seconds.
- Shift the transmission to Drive and accelerate the vehicle from a stop at a steady 15 degree throttle opening and perform a 2-3 shift while noting the OD CVI. During the shift, a different value will appear on the screen, which is the 1st 2-3 OD CVI.
- Repeat until the 1st 2-3 upshift becomes smooth and the 1st 2-3 OD CVI stabilizes.

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Quick Learn Procedure (continued)

Procedure to Learn a Smooth 2-3 Shift and 3-4 Upshift

Use the following procedure to have the TCM learn the OD and 4C CVI's.

NOTE: **The transmission oil temperature must be above 110°F (43°C).**

- Accelerate the vehicle from a stop at a steady 15 degree throttle opening and perform multiple 1-2, 2-3, and 3-4 upshifts. The 2nd 2-3 shift following a restart or shift to reverse will be shown during the shift as a value between the 1st 2-3 OD CVI and the normal OD CVI. Updates to the normal OD CVI will occur after the 2nd shift into 3rd gear, following a restart or shift to reverse.
- Repeat until the 2-3 and 3-4 shifts become smooth and the OD and 4C CVI become stable.

Procedure to Learn a Smooth 4-3 Coastdown & Part Throttle 4-3 Kickdown

Use the following procedure to have the TCM learn the UD shift volume.

NOTE: **The transmission oil temperature must be above 110°F (43°C).**

- At a vehicle speed between 40 - 60 MPH, perform repeated 4-3 kickdown shifts.
- Repeat until the UD volume becomes somewhat stable and the shift becomes smooth.

Procedure to learn 1st 2-3 shift after a restart or shift to reverse

Use the following procedure to have the TCM learn the 2C shift volume.

NOTE: **The transmission oil temperature must be above 110°F (43°C).**

- With a vehicle speed below 30 MPH and the transmission in 3rd gear, perform multiple 3-2 kickdowns.
- Repeat until the 3-2 kickdowns become smooth and the 2C CVI becomes stable.

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Quick Learn Procedure (continued)

Procedure to Learn a Smooth Manual 2-1 Pulldown Shift as well as a Neutral to Reverse Shift

Use the following procedure to have the TCM learn the LR volume.

NOTE: The transmission oil temperature must be above 110°F (43°C).

- With the vehicle speed around 25-30 MPH in Manual 2nd, perform manual pulldowns to Low or 1st gear at closed throttle.
- Repeat until the LR CVI become stable and the manual 2-1 becomes smooth

Procedure to Learn a Smooth Neutral to Reverse Shift

Perform the following shifts.

NOTE: The transmission oil temperature must be above 110°F (43°C).

- With the vehicle at a stop, perform Neutral to Reverse shifts until the shift is smooth. An unlearned Neutral to Reverse shift may be harsh or exhibit a double bump.

If any of the shifts are still not smooth after the clutch volume stabilizes, an internal transmission problem may be present.