

5.15 PROGRESSIVE SHIFT

The Progressive Shift option offers a high range maximum vehicle speed limit to encourage the use of high (top) gear during cruise operation. Progressive Shift encourages the driver to upshift from a lower to a higher gear prior to reaching the engine's governed speed. The resulting lower engine speed in high range should result in improved fuel economy. Progressive shifting techniques should be practiced by every driver, but can be forced if fleet management considers it necessary. The benefits from progressive shifting are best realized during stop-and-go driving cycles.

The maximum engine speed will be limited below the programmed MPH to encourage up shifting.

- Progressive Shift should be used in applications where the reduced driveability will not impede trip times or productivity.
- Progressive Shift is not compatible with most automatic transmission.

5.15.1 OPERATION

The Progressive Shift option has a setable gear ratio threshold and engine speed limit parameters, which are programmable with minidiag2. The example shift pattern chart (see Figure 5-16) reflects default values when the Progressive Shift option is chosen and the gear threshold and engine speed limit parameters are modified to a typical value.

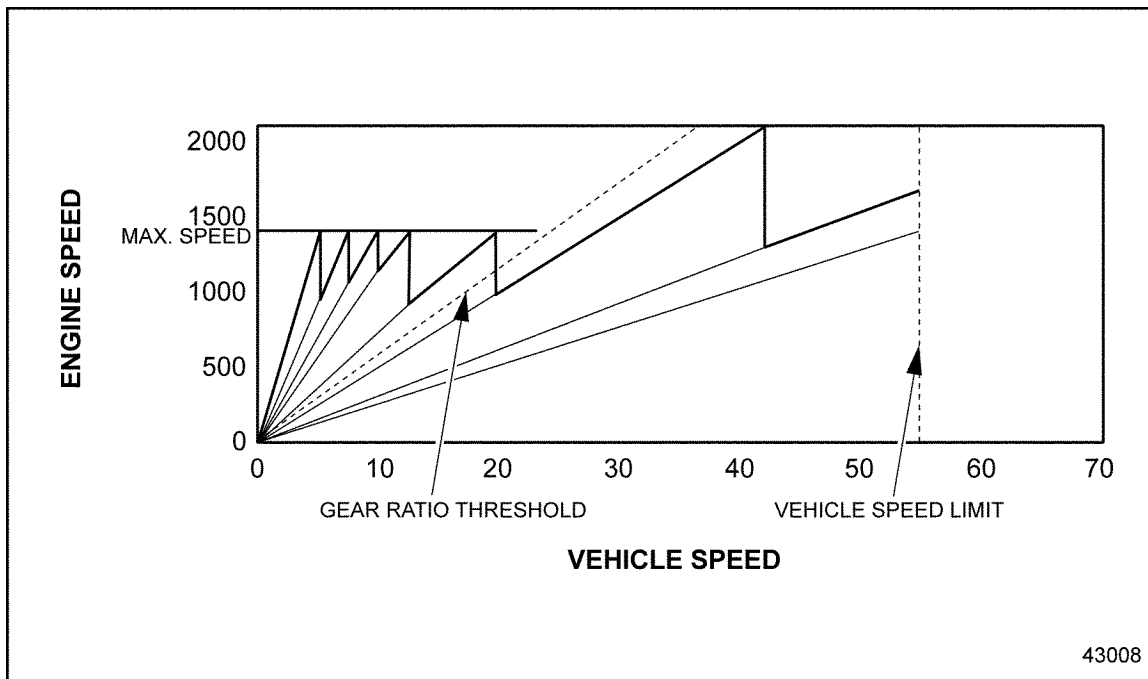


Figure 5-16 Progressive Shift Chart - Represents Default

An alternate use for the Progressive Shift option would be to encourage a driver into top gear. Normally this condition exists when the gearing selected at the time of order allows a vehicle speed limit to be reached in a gear lower than top gear.

5.15.2 GEAR RATIO THRESHOLD

The low range threshold of operation is defined by a Gear Ratio (DDEC-VCU parameter ID 1:23:07). The maximum engine speed will be limited to a maximum progressive shifting engine speed (DDEC-VCU parameter ID 1:23:06) when the transmission is a ratio less than the Gear Ratio. The engine will be allowed to run up to maximum rated engine speed when the transmission is in a ratio greater or equal to the Gear Ratio.

The Gear Ratio for progressive shifting may be calculated as follows:

$$\text{Gear Ratio} = \text{Transmission Output Shaft Speed (rpm)} / \text{Engine Speed (rpm)}$$

The ratio should be selected to be the lowest gear in which full engine speed is desired. The calculated number for calibration should be decreased by 10% to prevent engine limitation cycling due to changing conditions.

5.15.3 INSTALLATION INFORMATION

A Vehicle Speed Sensor (VSS) must be installed. It must be enabled, and all proper calculations entered into the DDEC-VCU with VEPS or the minidiag2. Refer to section 3.7.6, "Vehicle Speed Sensor," for additional information.

5.15.4 PROGRAMMING REQUIREMENTS AND FLEXIBILITY

Progressive Shift parameters that can be set by the Nexiq DDR, DDDL, DRS, VEPS or minidiag2 are listed in Table 5-50.

Parameter	Description	Default	Range	Sample Values	Parameter ID
Gear Ratio for Progressive Shifting	Gear ratio for which engine speed is limited when transmission gear is below this ratio	0.015	0.000 - 2.000	0.5	1 23 07
Max Engine Speed for Progressive Shifting	Maximum engine speed (rpm) when driving in lower gear	3000 rpm	500 – 3000 rpm	1400	1 23 06

Table 5-50 Progressive Shift Programming