FORD 4R100

POWER-TAKE-OFF DESCRIPTION AND OPERATION

DESCRIPTION:

Beginning at the start of production for 1999 models, Ford Motor Company introduced a new 4R100 transmission in some F250, F350, F450 and F550 Super Duty Trucks, equipped with the 5.4L, 6.8L and 7.3L engines. Basically the new 4R100 is a revised version of the previous E4OD transmission with a Power-Take-Off (PTO) window on the left side of the transmission case, right behind the front pump. Refer to Figure 1. The revisions that have occured have created many major engineering changes that have affected many internal and external parts that will create service concerns and diagnostic concerns.

PTO REQUIREMENTS:

(1) Obviously the case must be PTO capable with the cast-in window in the transmission where the PTO unit mounts to the transmission, as shown in Figure 1.

(2) Designed for use during Mobile (Some Models) or Stationary conditions.

(3) PTO is available as an option ***only*** on 8500 GVW or above, Super Duty F-Series trucks with 6.8L Gasoline and 7.3L Diesel engines. Ford 4R100 transmissions on other models ***are not*** PTO capable.

(4) Battery voltage ***must*** be supplied to the Electronic Engine Control (EEC) input pin 4 on gasoline models, or pin 66 on diesel models, ***when PTO is engaged.*** The processor uses this information to raise EPC pressure to approximately 55 PSI so that you do not smoke the coast clutch. ***This voltage must be provided by the PTO installer.***

CONDITIONS FOR PTO OPERATION (General):

(1) The vehicle is not in the crank or start mode.

(2) The transmission range selector ***must*** be in P, R, O.D, 2 or 1 position. The PTO will not operate when selector is in the neutral position.

(3) PTO operation is inhibited when in cranking mode, neutral, or 4th gear.

(4) Transmission only operates 1st through 3rd gears. Computer strategy does not allow 4th gear to engage, even if selected.

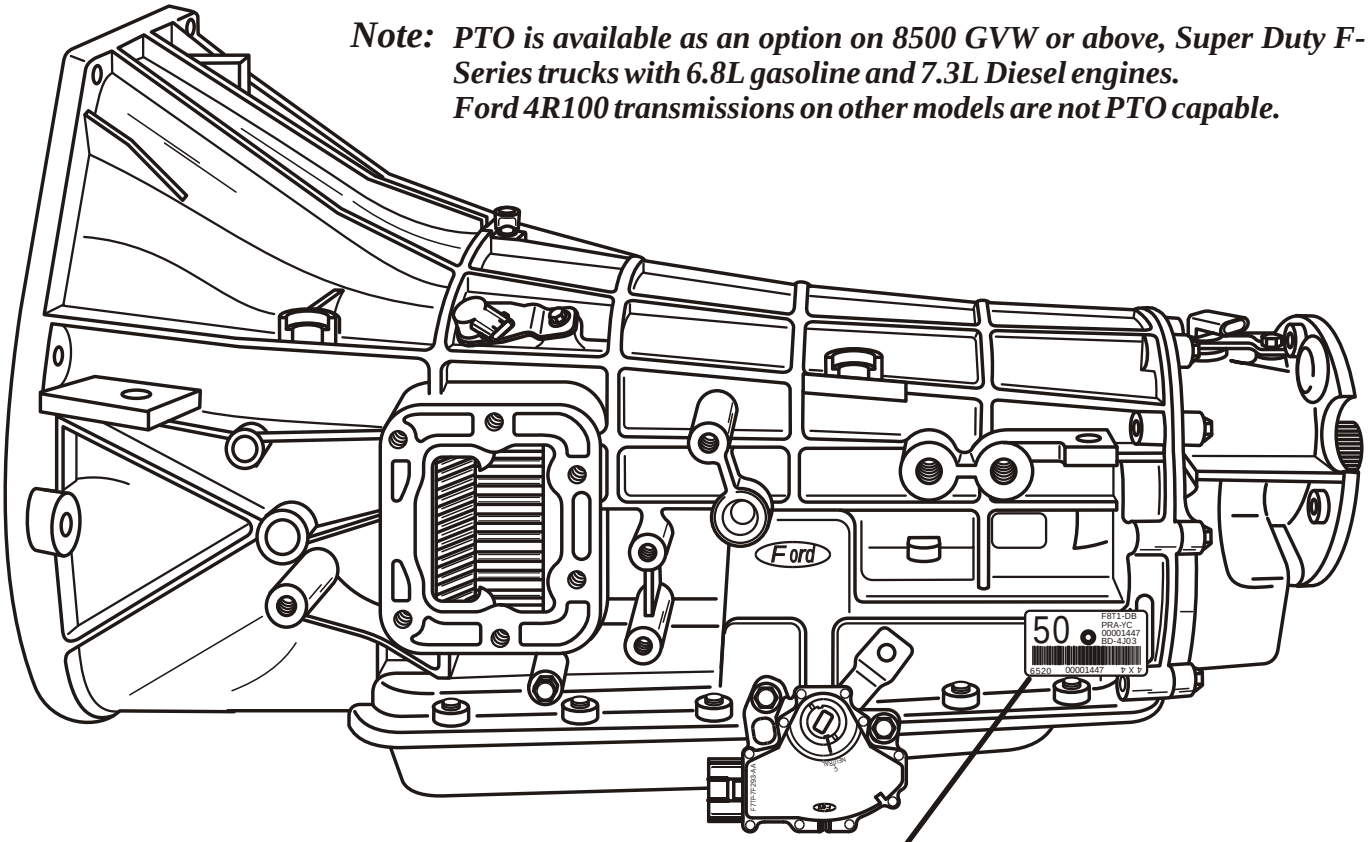
(5) Transmission Fluid Temperature Sensor reading is up to operating temperature.

Continued on Page 3

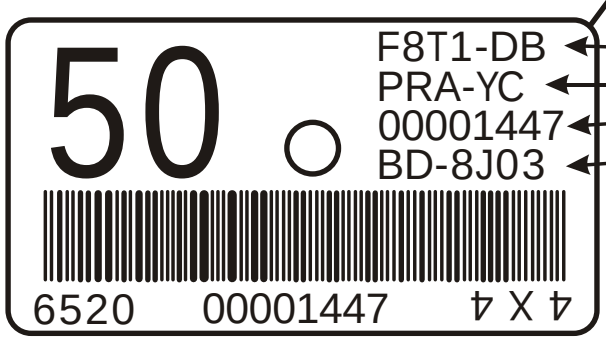
FORD 4R100

WITH POWER TAKE OFF OPTION

Note: ***PTO is available as an option on 8500 GVW or above, Super Duty F-Series trucks with 6.8L gasoline and 7.3L Diesel engines. Ford 4R100 transmissions on other models are not PTO capable.***



F4 = 1994
F5 = 1995
F6 = 1996
F7 = 1997
F8 = 1998
F9 = 1999



Assembly Part Number (Prefix and Suffix)
Transmission Model
Serial Number
Build Date - (Year, Month, Day)

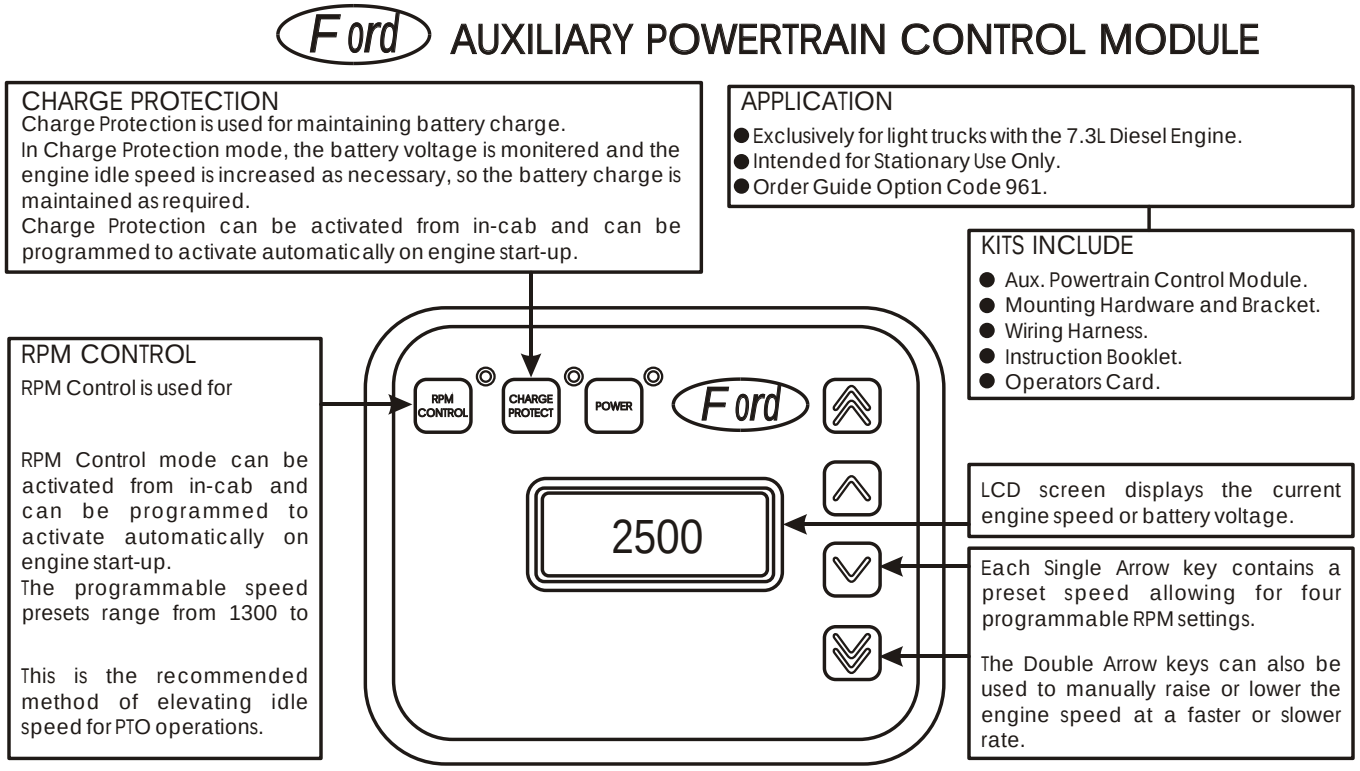
A = JAN	**G = JUL**
B = FEB	**H = AUG**
C = MAR	**J = SEP**
D = APR	**K = OCT**
E = MAY	**L = NOV**
F = JUN	**M = DEC**

IDENTIFICATION TAG LOCATION AND INFORMATION

DIESEL ENGINE PTO OPERATION:

"AUXILIARY" POWERTRAIN CONTROL MODULE 7.3L DIESEL ENGINE *(ONLY)*

- The Auxiliary Powertrain Control Module (APCM) commands the Electronic Engine Control (EEC) module to increase the idle speed during PTO operation. The APCM controls engine speed from 1200 to 2500 RPM.
- The Auxiliary Powertrain Control Module is a seperate option, ***it does not come standard*** with a PTO capable transmission, and is for 7.3L diesel applications only.
- Intended for stationary use only, and in stationary operation the PTO requires an engine idle speed of 1200 RPM. During stationary PTO operation on the 7.3L diesel, the EEC increases the idle to 1200 RPM automatically.
- During stationary PTO operation, the Torque Converter Clutch (TCC) engages once the RPM reaches 1200-1300 RPM.
- The following conditions ***must*** be met before the idle speed is increased:
  1. Parking brake must be engaged for all applications.
  2. No hydraulic brake actuation.
  3. Accelerator pedal must be in the idle position.
  4. Vehicle speed must be zero MPH.
  5. Brake lights must be functional.



Continued on Page 4

GASOLINE ENGINE PTO OPERATION:

(1) PTO installer must obtain a "High Idle Throttle Control" from an aftermarket source.

(2) Auxiliary Powertrain Control Module seen on the previous page ***does not*** work on the gasoline engine models. APCM module works ***only*** on the 7.3L diesel engine.

(3) For stationary PTO operation an engine idle speed of 1300 RPM is required.

(4) The Torque Converter Clutch (TCC) engages once the engine reaches 1300 RPM.

TRANSMISSION FUNCTIONS DURING PTO OPERATION:

(1) Shift Solenoid "B" (2) is turned on, the coast clutch activates and does not allow 4th gear operation during PTO operation.

(2) The Electronic Pressure Control (EPC) pressure is raised to approximately 55 PSI. This is why the coast clutch will be smoked in a short period of time if the battery voltage wire is not applied to EEC input pin 4 (gasoline) or pin 66 (diesel) when the PTO is engaged.

(3) The Transmission Control Indicator Lamp (TCIL) illuminates.

(4) When the PTO is turned ON, the transmission operates only in 1st through 3rd gears. Overdrive 4th gear is not allowed by the strategy.

(5) The transmission shift schedule is ***early*** and shift feel is ***very firm.***

DIAGNOSIS CONCERNS WITH PTO EQUIPPED VEHICLES:

(1) ***Always*** ensure that PTO is turned OFF, before any diagnosis procedures begin.

(2) ***Never*** perform any transmission special tests (i.e. pressure test, stall test etc.) when the PTO is turned ON.

(3) If a transmission concern or symptom goes away with the PTO turned OFF, it is most likely ***not a transmission concern.***

(4) On Board Diagnostics operate normally during PTO operation with the exception of the engine misfire moniter. The circuit checks made by the PCM and Failure Mode Effect Management (FMEM) capability will continue. The PTO ***must*** be turned OFF to access Diagnostic Trouble Codes (DTC's) and perform OBD tests.

(5) ***No testing with the PTO turned ON.***