



# Technical Service Information

## FORD E4OD, 4R70W, 4R44E, 5R55E NEW DIGITAL TRANSMISSION RANGE (DTR) SENSOR FOR SOME 1997 MODELS

**CHANGE:** Beginning at the start of production for 1997, some vehicles will be equipped with a new Digital Transmission Range (DTR) sensor, and externally looks identical to the previous Manual Lever Position Sensor (MLPS). Refer to Figure 1.

Internally however, the new Digital Transmission Range (DTR) sensor operates totally different than the previous sensor. The new DTR sensor completes the start circuit in Park and Neutral, the backup lamp circuit in Reverse, and the neutral sense circuit (4X4 Only) when in Neutral. The new DTR sensor also opens/closes a set of four different switches that are monitored by the Powertrain Control Module (PCM) to determine the position of the transmission manual lever.

**REASON:** Increased accuracy of information to the PCM, and increased durability of the sensor.

### VEHICLES AFFECTED:

1997 model Mark VIII (4R70W), Aerostar (4R44E-5R55E), Econoline (4R70W Only), Expedition (4R70W Only), Explorer (4R44E-5R55E and 4R70W), F-150 Pick-up (E4OD and 4R70W), Ranger Pick-up (4R44E-5R55E), and Mountaineer (4R70W).

### PARTS AFFECTED:

- (1) DTR SENSOR - Replaces the previous manual lever position sensor and is identified by the new basic part number which is -7F293-, as shown in Figure 1. The prefix and suffix will be different depending on the vehicle model and transmission type. The **only positive** identification will be the F7TP-7F293-AA engineering number on the DTR in the location shown in Figure 1.

### INTERCHANGEABILITY:

The new design Digital Transmission Range (DTR) sensor **will not** back service **any** previous model vehicles built before 1997, nor **any** current 1997 model vehicles that are equipped with the manual lever position sensor.

Manual Lever Position Sensor (MLPS) = basic part number -7A247- (Stamped on Part)

Digital Transmission Range Sensor (DTR) = basic part number -7F293- (Stamped on Part).

### TESTING PROCEDURE:

***Testing the new Digital Transmission Range sensor is totally different than the previous design Manual Lever Position Sensor. Refer to next page for testing procedure.***

### SERVICE INFORMATION:

4R70W, 4R44E, 5R55E, Transmissions equipped with the DTR .....	F7LZ-7F293-AA
E4OD Transmissions equipped with the DTR .....	F7TZ-7F293-AA



## TESTING PROCEDURE FOR THE 1997 DESIGN LEVEL "DIGITAL TRANSMISSION RANGE SENSOR"

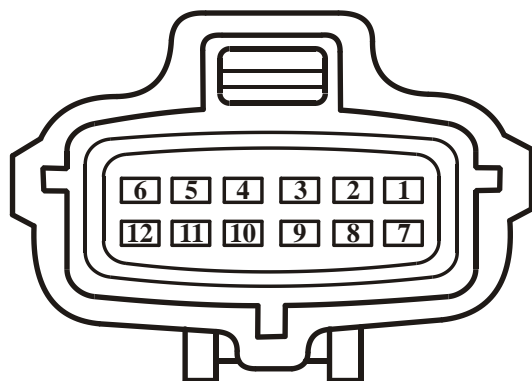
In Figure 1 we have provided you with pin number identification for both the transmission range sensor and the vehicle harness connector, and a chart that will give you the function of each pin.

In Figure 2 we have provided a chart that will give you the open/closed state of each internal switch, dependent on selector position, and notice that three positions read a 270W resistor that is also internal. Also in Figure 2 we have included a chart with wire colors, which is for the 1997 Ranger.

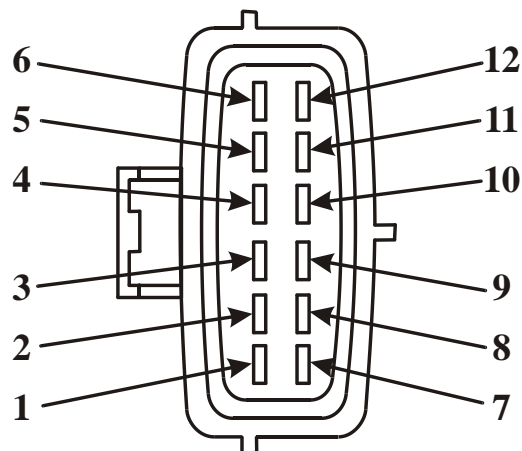
In Figure 3 we have provided you with a schematic of the Digital Transmission Range sensor in each of the six selector positions for those of you that want to follow each circuit.

**NOTE:** *All testing that we have provided for you is done with a DVOM, set to the ohms position, and all tests are performed with the ignition switch in the "OFF" position.*

- (1) Testing the transmission range 3A switch, and the 270W internal resistor is done across pins 2 and 3 of the DTR sensor, and must be checked in each selector position to determine the switch and resistor integrity. Refer to Figure 4.
- (2) Testing the transmission range 1 switch is done across pins 2 and 4 of the DTR sensor, and must be checked in each selector position to determine switch integrity. Refer to Figure 5.
- (3) Testing the transmission range 2 switch is done across pins 2 and 5 of the DTR sensor, and must be checked in each selector position to determine switch integrity. Refer to Figure 6.
- (4) Testing the transmission range 4 switch is done across pins 2 and 6 of the DTR sensor, and must be checked in each selector position to determine switch integrity. Refer to Figure 7.
- (5) Testing the reverse lamp circuit is done across pins 9 and 11 of the DTR sensor, and must be checked in each selector position to determine switch integrity. Refer to Figure 8.
- (6) Testing the neutral start circuit is done across pins 10 and 12 of the DTR sensor, and must be checked in each selector position to determine switch integrity. Refer to Figure 9.



*View looking into DTR Sensor  
harness connector*



*View looking into DTR Sensor*

PIN NO.	FUNCTION
1	<i>Not Used</i>
2	<i>Signal Return to the Powertrain Control Module</i>
3	<i>Transmission Range 3A Switch</i>
4	<i>Transmission Range 1 Switch</i>
5	<i>Transmission Range 2 Switch</i>
6	<i>Transmission Range 4 Switch</i>
7	<i>Ground (Not Used All Models)</i>
8	<i>Neutral Sense Circuit (Not Used All Models)</i>
9	<i>12 Volts from Ignition Switch (Run position only)</i>
10	<i>12 Volts out to Starter Solenoid (Start position only)</i>
11	<i>12 Volts out to Reverse Lamps (Run position only)</i>
12	<i>12 Volts from Ignition Switch (Start position only)</i>

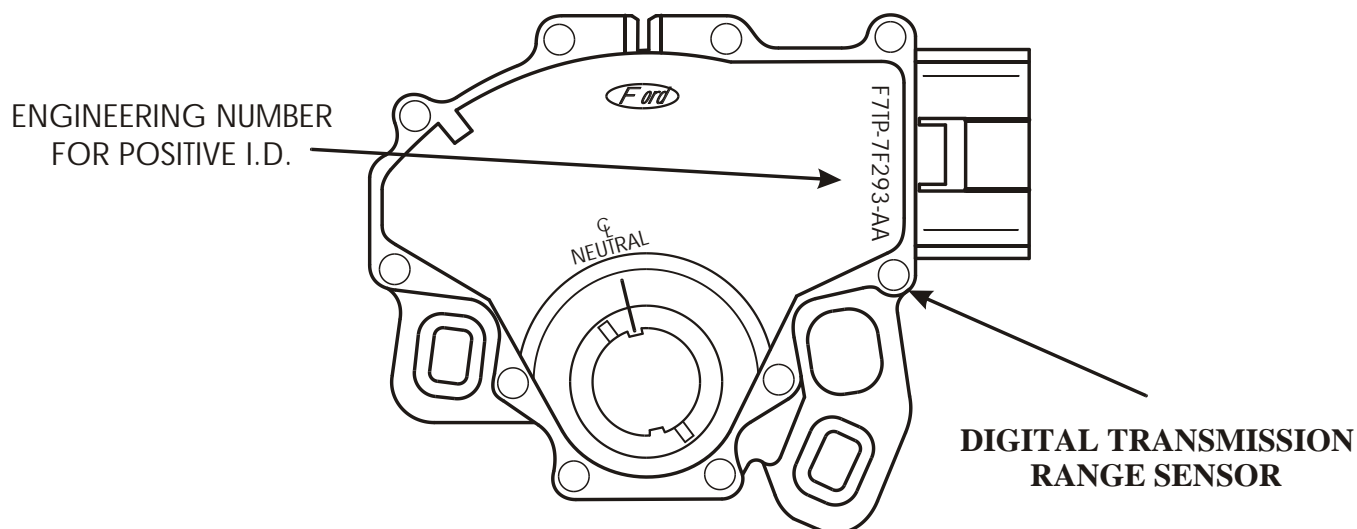
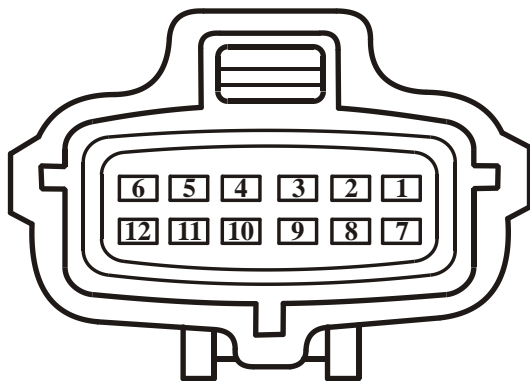
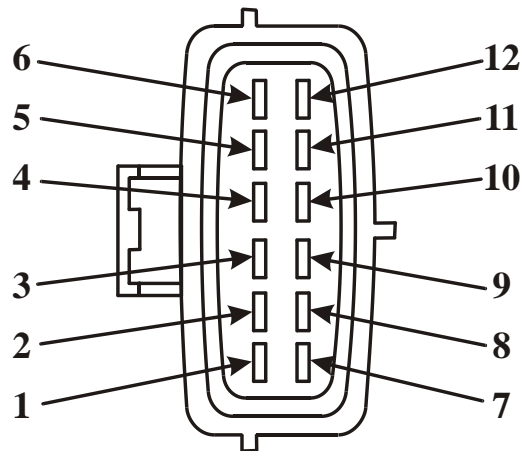


Figure 1



View looking into DTR Sensor  
harness connector



View looking into DTR Sensor

TERMINALS	P	R	N	ⓓ	2	1
2 AND 3	CLOSED	269.5 W	269.5 W	269.5 W	CLOSED	CLOSED
2 AND 4	CLOSED	CLOSED	CLOSED	OPEN	OPEN	OPEN
2 AND 5	CLOSED	CLOSED	OPEN	OPEN	CLOSED	OPEN
2 AND 6	CLOSED	OPEN	CLOSED	OPEN	OPEN	CLOSED
9 AND 11	OPEN	CLOSED	OPEN	OPEN	OPEN	OPEN
10 AND 12	CLOSED	OPEN	CLOSED	OPEN	OPEN	OPEN

**NOTE:** Colors listed below are for 1997 Ranger with 5R55E.

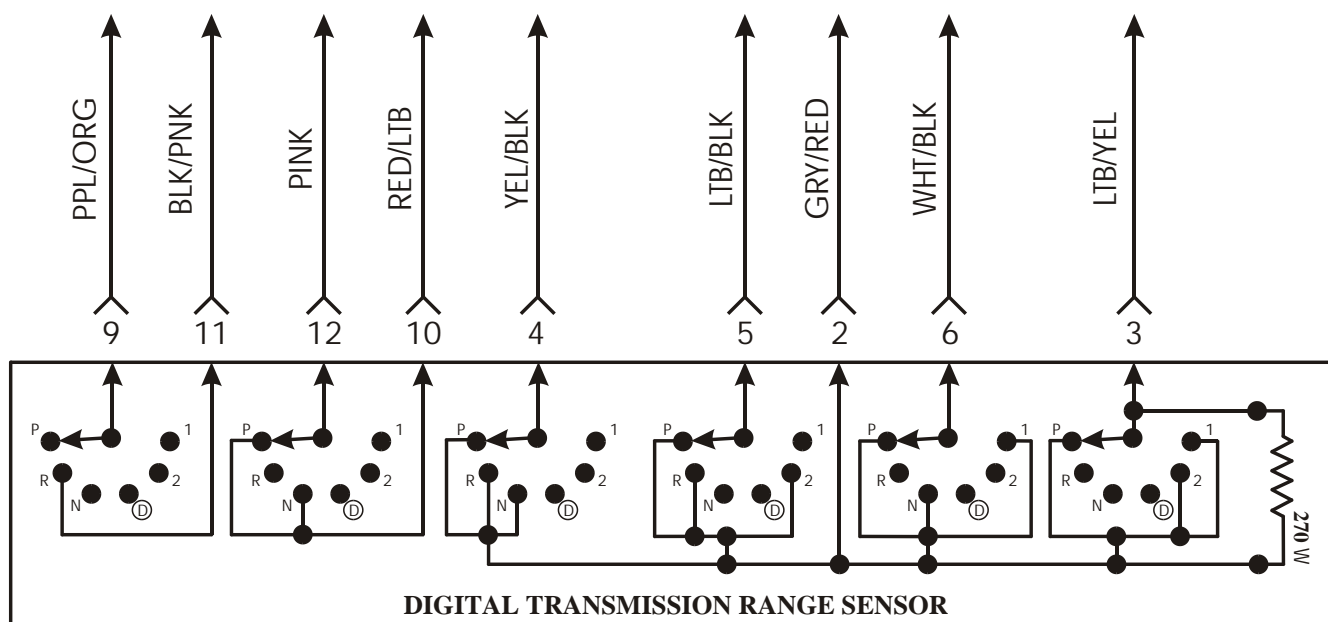


Figure 2

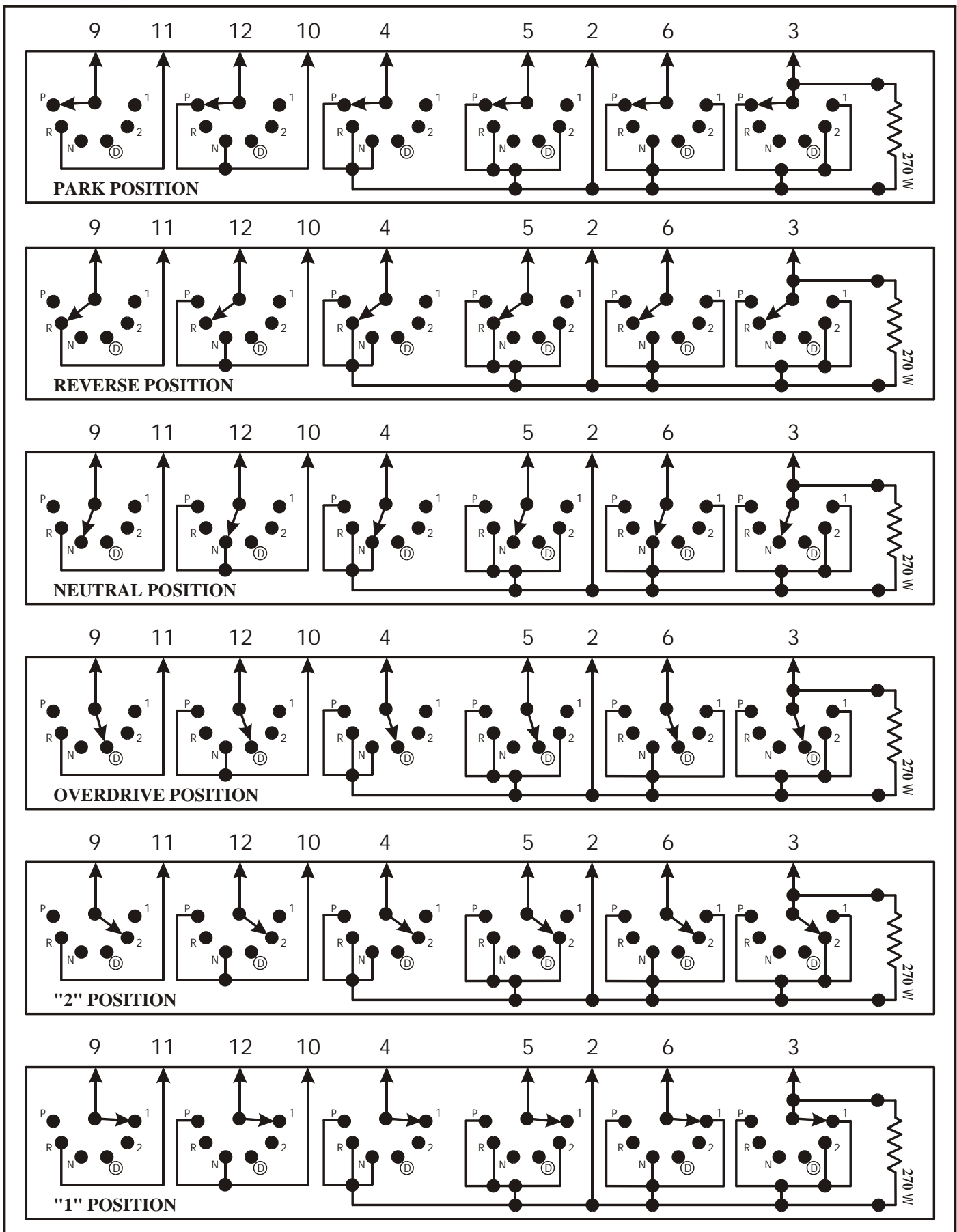


Figure 3

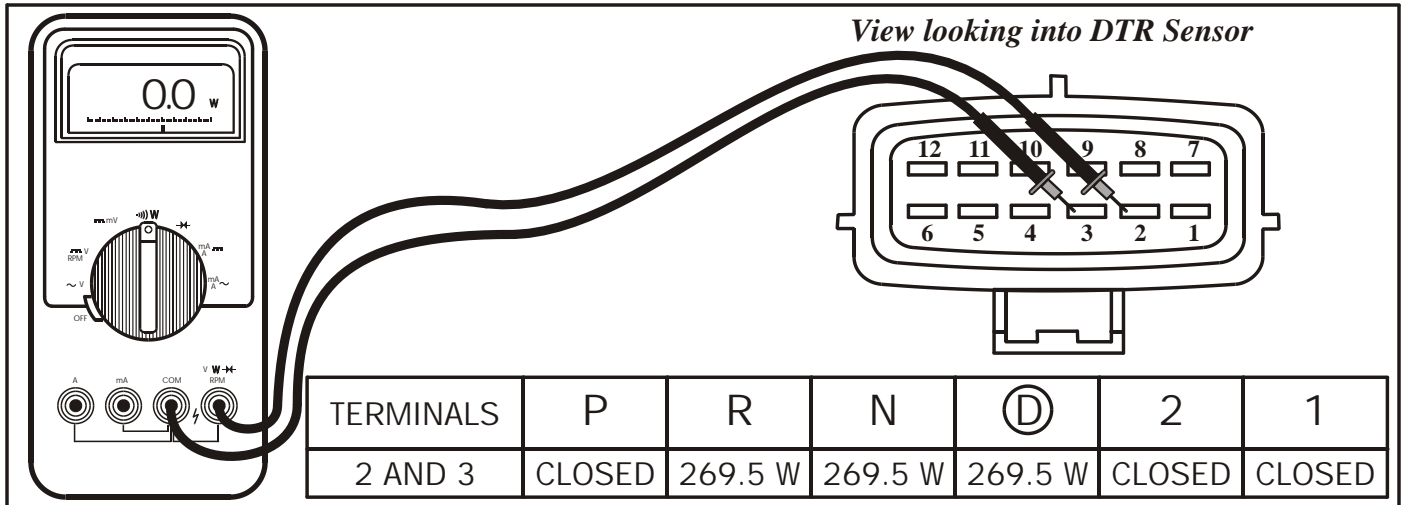


Figure 4

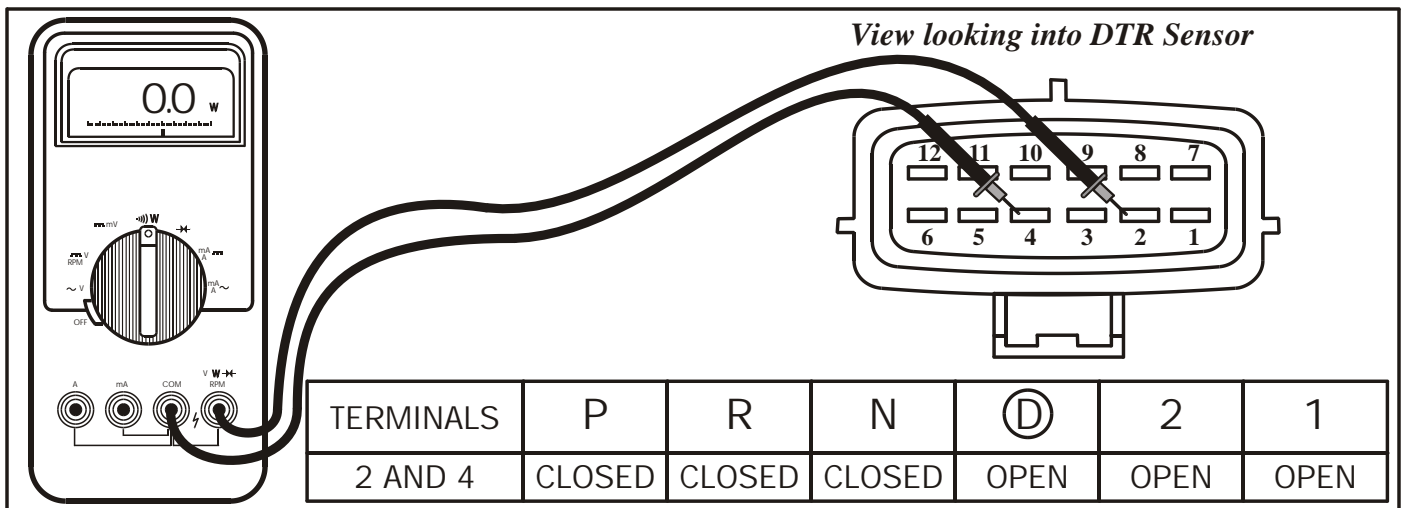


Figure 5

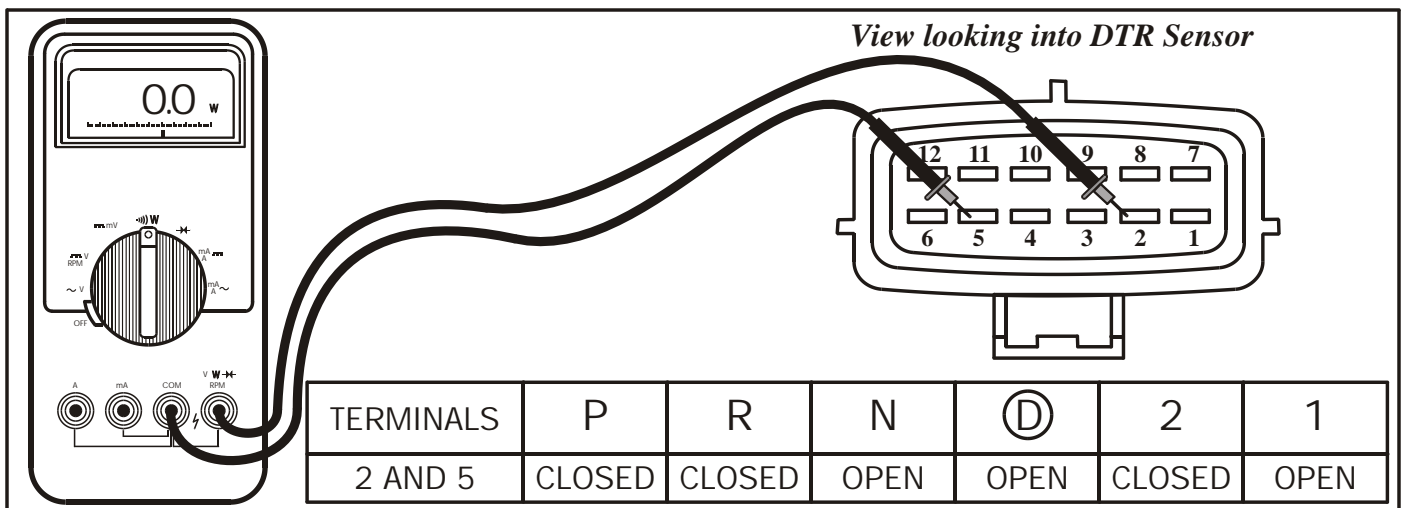


Figure 6

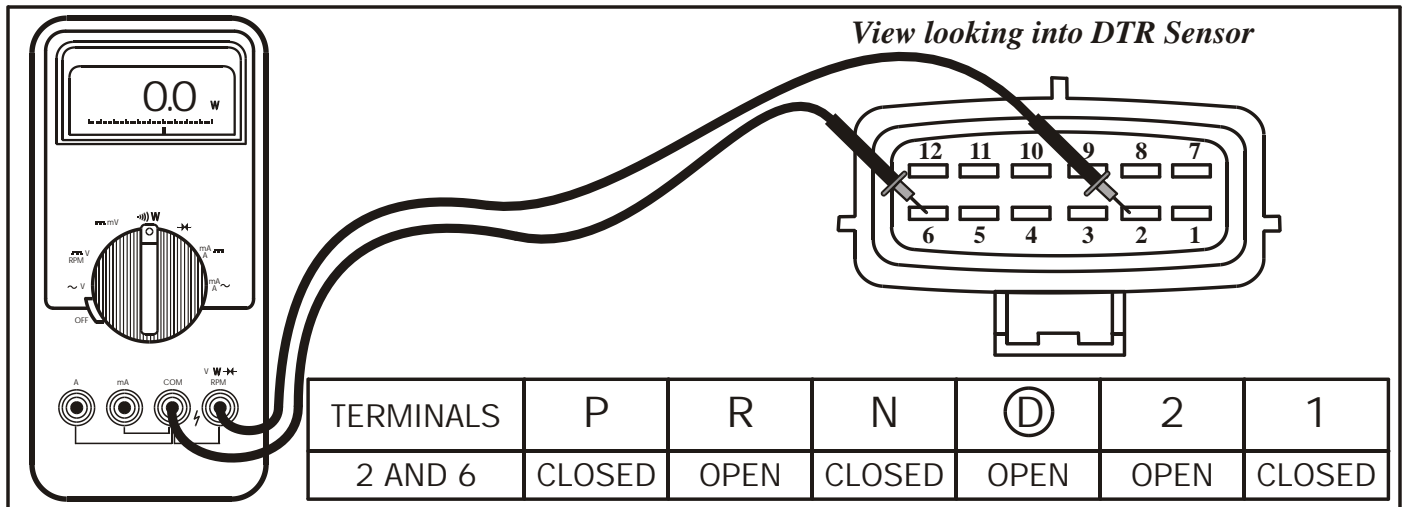


Figure 7

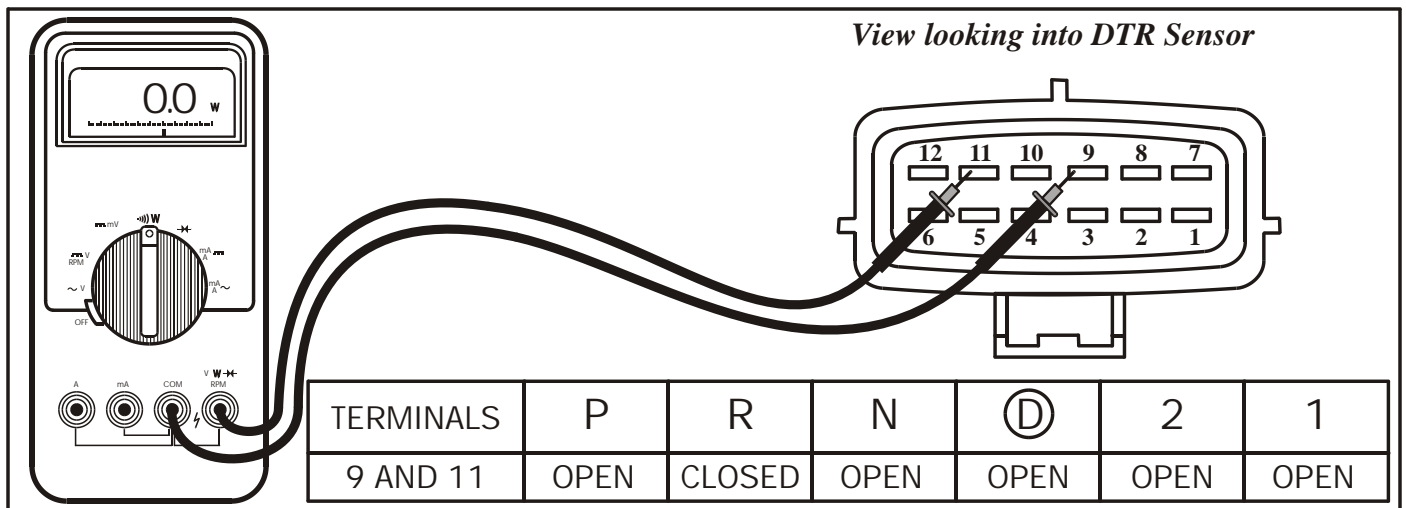


Figure 8

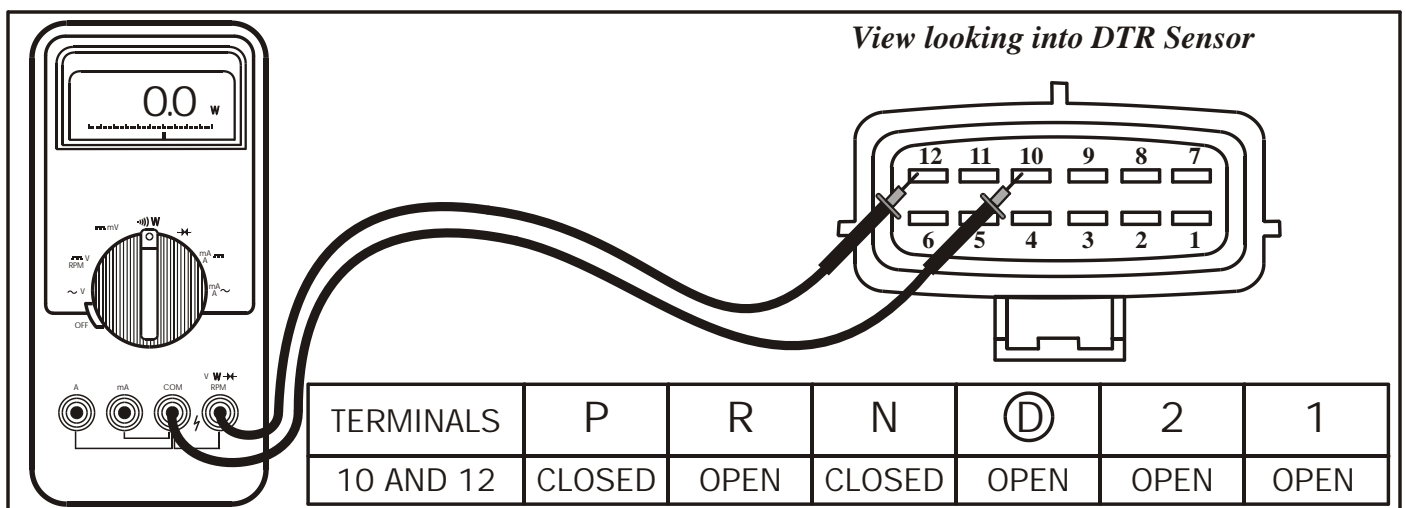


Figure 9