



FORD TAURUS/MERCURY SABLE

MANUAL LEVER POSITION/DIGITAL RANGE SENSOR DIAGNOSIS

COMPLAINT: A 1999 Mercury Sable with 3.0 Liter engine and AX4N Transmission comes into the shop with codes P0708 and P1702 set along with shift scheduling problems. This would indicate a problem with the digital range sensor or its circuits. After installing a new range sensor, the same codes return as well as the shift complaints.

At this time a wiring diagram was acquired at which time the technician discovered that this vehicle could be equipped with an Manual Lever Position or a Digital Transmission Range Sensor.

CAUSE: Because the original sensor on this vehicle was a 12 pin configuration, it was replaced with a 12 pin Digital Range Sensor. This immediately brought the above mentioned codes back because this vehicle requires an MLPS, not a DTRS. The newer (2nd design) MLPS has a 12 pin connector configuration exactly like the DTRS connector so they both appear to be the same component.

When the 12 pin DTRS was installed in this vehicle the PCM set the codes because a DTRS in this vehicle could never range correctly. The MLPS is a step down resistor style which indicates approximately 4.5 volts in park and drops as you move the selector lever towards low which will be about 0.75 volts. The DTRS produces a combination of circuits to the PCM that can be 5 or 1- to 12 volts while others are grounded. This combination of voltage and grounded circuits tells the PCM where the gear selector lever has been positioned, Figure 1 illustrates the MLPS internal electrical structure and in Figure 2 the eight and twelve pin connector views can be seen as well as the MLPS ranging logic.

Figure 3 illustrates the DTRS internal electrical structure and in Figure 4 the twelve pin connector view can be seen as well as the DTRS ranging logic.

CORRECTION: Once the MLPS was installed, the codes were gone along with the shift complaints.

The way to determine which sensor is required other than checking the circuits for voltage is the Vehicle Identification Number. The break points using the 8TH VIN digit for engine type are as follows:

1998/1999 Taurus VIN "N" for SHO models and VIN "S" for all other models use the 12 pin MLPS.

1998/1999 Taurus Vin "1" or "2" for Flex Fuel equipped vehicles and VIN "U" use the 12 pin DTRS.

1998/1999 Sable VIN "S" use the 12 pin MLPS.

1998/1999 Sable VIN "U" use the 12 pin DTRS.

SERVICE INFORMATION:

12 Pin Manual Position Lever Sensor.....F6DZ-7F293-A

12 Pin Digital Transmission Range Sensor.....F8DZ-7F293-AD

MANUAL LEVER POSITION SENSOR

5 VOLT SUPPLY STEP DOWN RESISTOR TYPE

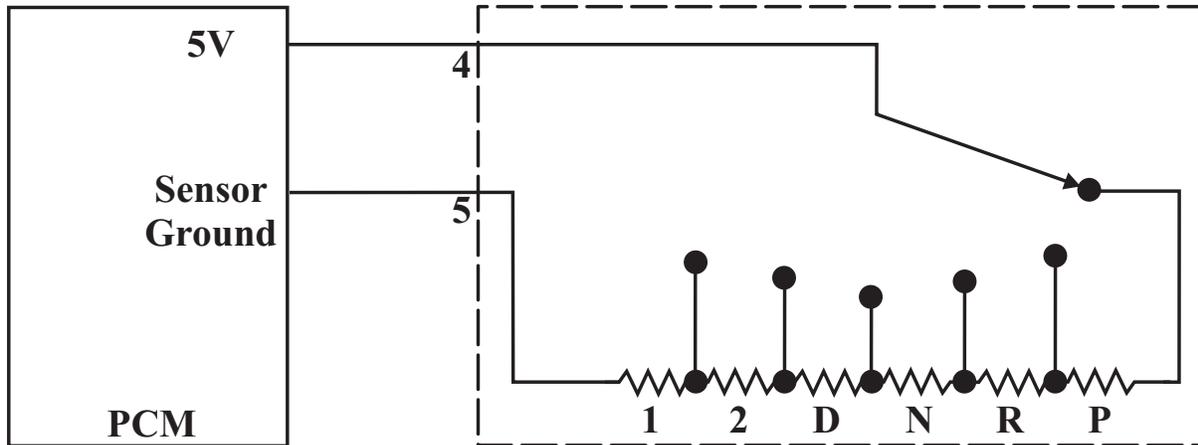
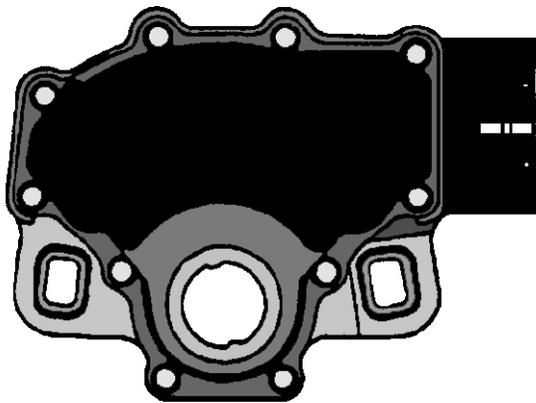
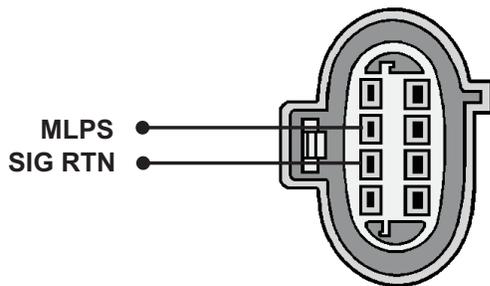


Figure 1

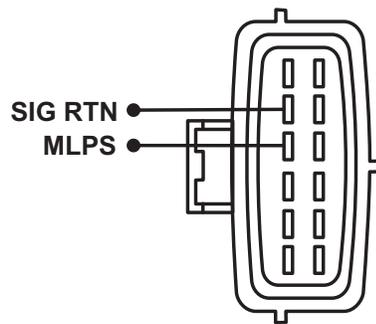
MLPS RANGING LOGIC



TRANS RANGE SELECTOR LEVER POSITION	RESISTANCE (OHMS)		RANGE (VOLTS)
	MINIMUM	MAXIMUM	
P	3770	4607	3.97-4.85
R	1304	1593	3.24-3.96
N	660	807	2.55-3.11
D	361	442	1.88-2.30
D/2	190	232	1.23-1.51
1	78	95	0.61-0.75



VIEW LOOKING INTO 8 PIN MLP SENSOR



VIEW LOOKING INTO 12 PIN MLP SENSOR

Copyright © 2009 ATSG

Figure 2



Technical Service Information

DIGITAL TRANSMISSION RANGE SENSOR

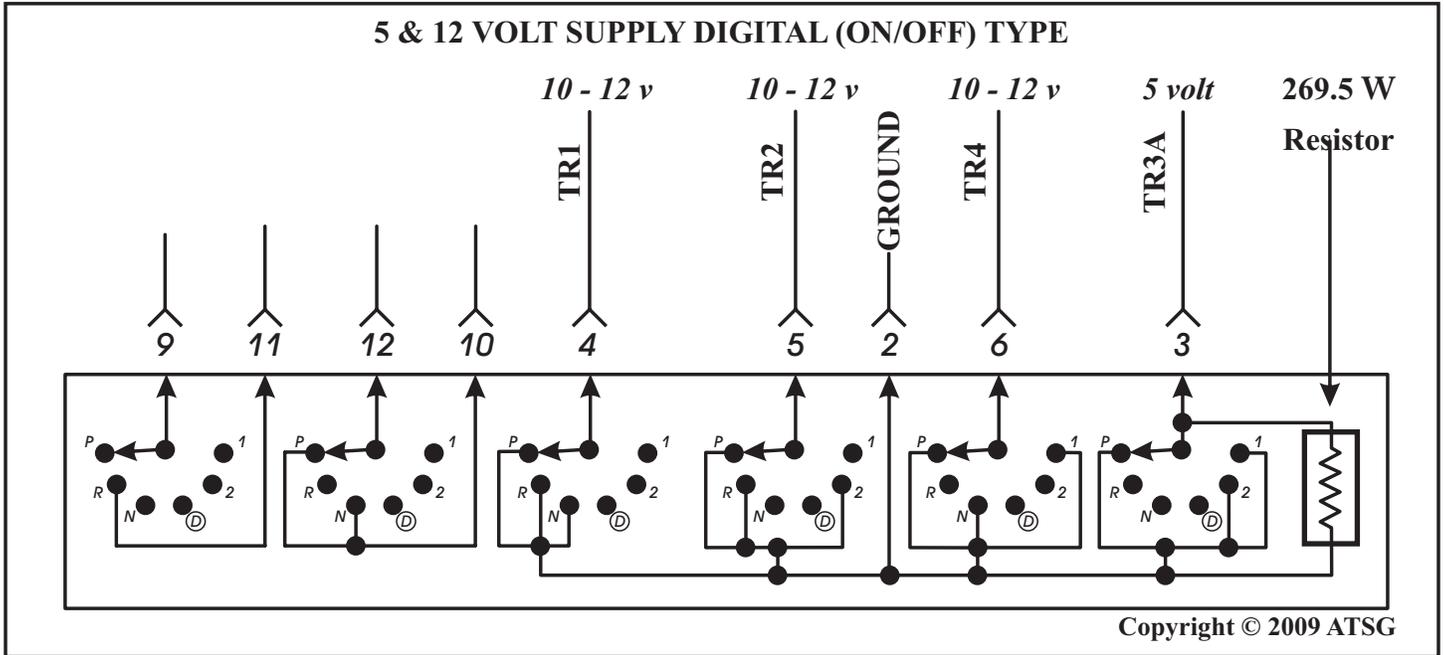


Figure 3

DTRS RANGING LOGIC

Scanner Data
0 = Grounded 0 volts
1 = Open Battery volts
Except TR3A

Scanner Data
TR3A

SELECTOR POSITION	PID:TR	PID:TR-D				PID:TR-V
		TR4	TR3A	TR2	TR1	TR3A (175B pin 9 to signn)
PARK	P/N	0	0	0	0	0.0 Volts
REVERSE	REV	1	1	0	0	1.3 to 1.8 Volts
NEUTRAL	NTRL	0	1	1	0	1.3 to 1.8 Volts
OVERDRIVE	OD*	1	1	1	1	1.3 to 1.8 Volts
MANUAL 2	MAN 2**	1	0	0	1	0.0 Volts
MANUAL 1	MAN 1	0	0	1	1	0.0 Volts

* Will read "Drive" if OD is canceled.
** MAN 2 = Drive for applications without OD cancel feature.

VIEW LOOKING INTO DTR SENSOR

Copyright © 2009 ATSG

Figure 4