1992 AND LATER FORD TRUCKS WITH LIQUID CRYSTAL DISPLAY (LCD) ODOMETERS

INTERMITTENT OR CONTINUOUS LOSS OF VSS

COMPLAINT: Vehicles with LCD odometers equipped with either an E4OD, AODE or 4R70W transmission may suddenly go to a neutral condition while driving or, after coming to a stop, the transmission is stuck in first gear. The TCIL (Transmission Control Indicator Lamp) flashes as a result and a scanner reveals that a code 29,452, PO500 or PO503 has been stored. These symptoms may occur intermittently as well as erratic speedometer operation. The above codes may also be stored in memory from past intermittent failuresor glitches.

CAUSE: These symptoms may be caused by one or more of the following.

1. A faulty vehicle speed sensor (VSS) known as the Rear Antilock Brake Sensor (RABS) now located in the rear differential (Refer to Figure 1).
2. A loose speed sensor exciter ring on the differential ring gear carrier.(Refer to Figure 2).
3. Excessive use of silicone on the sensor altering the sensor to exciter ring air gap.
4. A deteriorated RAB Sensor connector or wiring.
5. A malfunction of the PSOM (Programable Speedometer/Odometer Module).
6. A loss of power or ground to the PSOM.
7. A faulty PCM/TCM.

The PSOM:

The PSOM 's operation directly affects all shift scheduling! 1992 and later Ford trucks with the VSS located in the differential are equipped with an internal microprocessor located within the speedometer cluster that uses a liquid crystal display odometer known as the Programable Speedometer/Odometer Module. The PSOM receives an analog signal from the VSS (RABS) in the form of AC voltage. This frequency (HERTZ) is proportionate to road speed and is converted by the PSOM to an 8000 pulse per mile signal that can be deciphered by the PCM/TCM and is calibrated for each vehicles tire size and differential gear ratio. The PSOM can be re-calibrated by the technician should tire size and/or differential gear ratio change. An electrical overview of the PSOM system can be seen in Figure 3. Using the following diagnostic procedures, replace or repair the faulty component.

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CORRECTION: **1.** The first step would be to question the customer to see if their problems began after tires and/or the differential were changed. The problem may be as simple as over or undersized tires or a changed ratio in the differential. If this has occurred, the situation may need to be evaluated as to whether it would be best to go back to OE or remedy the change by reprogramming the PSOM to accommodate the modified ratio. If this is not the case, road test the vehicle taking note of the speedometer and odometer operation for function and accuracy. If DATA is available from a scanner, compare the speedometer to that of the scanner. If the scanner reads correct but the speedometer is erratic and bouncy, the speedometer head is faulty. If both the DATA and speedometer are bouncy or if DATA is not available for comparison, perform the following checks with the rear wheels off the ground.
Locate the two wire RAB Sensor test connector (*Red with a pink tracer and light green with a black tracer*). For "F" series trucks it is located in the left rear corner of the engine compartment (See Figure 4). For "E" series vans look behind the left side headlamp assembly (See Figure 5).
Set your multi-meter to hertz (HZ) and probe the RABS test connector and raise vehicle speed to 30mph (48km/h). The multi-meter should indicate approximately 667 Hertz. If the hertz reading is correct, go to step 2. If the hertz reading is erratic, unplug the sensor in the differential and repeat the test at the sensor. If the hertz reading continues to be erratic the exciter ring in the differential may be loose or, the speed sensor itself is faulty. If a steady 667 hertz is seen directly from the sensor at 30mph, the sensor's connector or its wiring to the PSOM is faulty and will need to be repaired or replaced.

2. Using figure 4 locate the vehicles computer for "F" series trucks which is to the left of the brake booster. Use figure 5 for "E" series vans where the computer is located to the right of the brake booster. With the multi-meter still set to hertz, back probe the following wires:

EEC-IV processors have a 60 pin connector of which back probe wires 3 and 6. Wire 3 is *gray in color with a black tracer* and is known as circuit 679. Wire 6 is *pink in color with an orange tracer* and is known as circuit 676.

EEC-V processors (1994-95 "F" series Turbo Diesels and 1996 and later vehicles) have a 104 pin connector of which back probe wires 33 and 58. Wire 33 is *gray in color with a black tracer* and is known as circuit 679. Wire 58 is *pink in color with an orange tracer* and is known as circuit 676.

Raise vehicle speed to 30mph (48km/h), the meter should indicate approximately 67 Hertz. If the reading is correct, the PCM is faulty. If there is no reading or it is erratic or the reading is incorrect, the problem could be faulty wiring between the PSOM and the PCM. A faulty PSOM and/or the number 8 or 18 fuse has blown. To locate the problem, a step by step pin check of the PSOM circuits must be performed beginning with step 3.

3. Remove the instrument cluster from the dash to gain access to the 12 pin PSOM connector as seen at the bottom of Figure 6. Refer to the schematic seen in Figure 6 for the following pin checks at the PSOM connector. **NOTE**: ***If the dash panel has a dual tank fuel switch, it is necessary to remove the switch from the dash allowing it to remain plugged into the harness. If this switch remains unplugged, the vehicle will not start.***

Continued on next Page

CORRECTION CONTINUED:

4. With the PSOM connector plugged into the cluster, set a multi-meter to DC volts and place the negative lead to a good known ground. With the positive lead, locate and probe a *light green wire with a yellow tracer* (circuit 54) at terminal 1 in the PSOM connector. This is keep alive power at all times and must have full battery voltage there even with the ignition off. If it does, move to step 5. If it does not, inspect the number 8 fifteen amp fuse in the under the dash fuse box for power. The fuse location can be seen in Figure 7. If the fuse is blown, replace it. If it blows again there is a short to ground in the LG/Y wire from the fuse to the PSOM connector and will need to be replaced. If there is power and the fuse is not blown, the LG/Y wire from the fuse to the PSOM connector is severed and will need to be replaced. If the number 8 was not blown and did not have power either, the 50 amp "S" maxi-fuse in the under hood fuse box should be checked and replaced if necessary (See Figure 8 for location). If the maxi-fuse is not blown, the *black wire with an orange tracer* between the maxi-fuse and the under the hood fuse box may have been severed or there is an internal problem within the fuse box itself.

5. Keeping the multi-meter set to DC volts and the negative lead to a good known ground, locate and probe the *white wire with a purple tracer* (circuit 269)at terminal 3 in the PSOM connector. System voltage must be observed when the ignition is on. If it does, continue on to step 6. If it does not, inspect the number 18 ten amp fuse for power (See Figure 7). If there is power and the fuse is not blown, the W/P wire is severed and will need to be replaced. If the number 18 fuse was not blown and did not have power either, the ignition switch or the *grey wire with a yellow tracer* (circuit 687) from the switch to the fuse is faulty and will need to be replaced.

6. With the PSOM connector still plugged in as well as the multi-meter set to DC volts with the negative lead fixed to a good known ground, locate and probe the *pink wire with the orange tracer* (circuit 676) at terminal 2. This is the PSOM's ground circuit. With the vehicle running, no more than 0.3 of a volt should be observed during this voltage drop test. It is best to see 0.1 volt or less. If this reading is acceptable move on to step 7. If this reading is higher than 0.3 volts, this ground wire must be repaired or replaced until 0.1 volt or less is observed. **NOTE:** *This wire changes to a black wire with a white tracer (circuit 570) after the factory splice.*

7. This step verifies the RAB Sensor input to the PSOM. Step 1 verified that the RAB Sensor was working from the sensor to its test connector. This step verifies that the wiring from the test connector to the PSOM is good . To do this, unplug the PSOM connector and set a multi-meter to hertz. With the positive lead, back probe terminal 4 (a *red wire with a pink tracer* or with Bronco's, an *orange wire with a light blue tracer,* circuit 523) and the negative lead to terminal 5 (a *light green wire with a black tracer* or with Bronco's a *light green wire with a yellow tracer*, circuit 519). There should be approximately 667 HZ @ 30mph (48km/h). If it does, proceed to step 8. If the hertz reading is unacceptable, an additional check of the circuit can be performed by turning the ignition off and switching the multi-meter setting to the ohms position. This checks the sensor circuit for proper resistance which should be between 900 to 2500 ohms. If erratic, incorrect or no readings are observed (hertz and/or ohms), use the wire diagram in Figure 3 to isolate and check each wire from the PSOM connector to the RABS test connector. Repair or replace one or both wires as necessary.

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CORRECTION CONTINUED:

8. This step checks the conditioned signal that the PSOM sends to the PCM/TCM. This requires the PSOM connector to be plugged into the instrument cluster. Place the multi-meter to the hertz selection and fix the negative meter lead to a good known ground. Locate and probe with the positive meter lead the gray wire with a black tracer, circuit 679 at terminal 7 in the PSOM connector. There should be approximately 67 HZ @ 30mph (48km/h). If this reading is erratic or severely off, either the PSOM is defective and will need to be changed or the differential was changed which may be corrected by re-calibrating the PSOM. If this reading is correct and DATA to the scanner reads differently, the PCM/TCM is defective. If DATA is not available but shift scheduling is erratic, chances are the PCM/TCM is defective. If all readings are correct, repeat this test on the road. If readings become altered, it may be possible that a modification in tire size did in fact occur which may be compensated by re-calibrating the PSOM. For re-calibrating the PSOM, refer to the following procedures:

RE-CALIBRATING THE PSOM:

The PSOM requires re-calibration when a tire size or differential gear ratio change has occurred, or the speedometer was serviced in some way, and/or when a loss of power to the PSOM for lengthy periods of time has also occurred. Should any one of these occur requiring re-calibration of the PSOM, there are 3 pieces of information needed which will be used to acquire a specific number necessary in the re-calibration procedure called “the conversion constant.” These 3 pieces of information are as follows:

A) The differential or (axle) capacity (gear ratio).
B) The tooth count of the speed sensor’s exciter ring on the differential.
C) The tire size.

STEP 1 - AXLE RATIO

To find the axle capacity, there is a sticker on the inside door jam that looks like the sticker shown on the top of Figure 9. Locate at the bottom of the sticker the word “AXLE.” Under that word is a number. The example given in Figure 9 is the number 29. In Figure 9, there is also a cross over chart for Bronco and “F” series trucks of which 29 equates to a 5300 axle capacity with an axle ration of 3.55. Use the cross over charts in Figure 10 for all “E” series Vans.

STEP 2 - EXCITER RING TOOT COUNT

Mounted on the differential ring gear is the speed sensor exciter ring (See Figure 2). There are only two different teeth counts available at the time printing; 108 teeth and 120 teeth. The only way to know which one you have is to physically remove the pumpkin cover and count the teeth. For our example, we have a vehicle with 120 teeth.

STEP 3 - TIRE SIZE

Tire size may generally be obtained in one or two places. On the tire itself or from the sticker on the inside door jam as seen in Figure 9. The example in Figure 9 reveals a tire size of : **LT 215/85R 16D.**

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RE-CALIBRATING THE PSOM: (Cont'd)

STEP 4 - CALCULATING THE CONVERSION CONSTANT

From the above three steps, we have an “F” series truck with an axle capacity of 5300, a speed sensor exciter ring with a tooth count of 120 and an LT 215/85R 16D tire size. Now look at the chart for “F” series pick-ups & Broncos in Figure 11. Find the 5300 axle capacity column where directly below you will find the 120 tooth speed sensor exciter ring listed. Follow the column down until it lines up with the LT 215/85R 16D tire size column to the left. Intersecting these columns you will find in the intersection the conversion constant number of **9.96**. With this number, the re-calibration of the PSOM can begin.

STEP 5 - RE-CALIBRATING THE PSOM

Locate the enable circuit 567 wire connector. This is a *light blue wire with a yellow tracer* coming from the PSOM connector pin 9 to a single connector. It is located under the left side of the dash below the fuse box near the bulkhead connector on "E" series vans as seen in Figure 12 and under the center of the dash below the glove box on "F" series trucks (See Figure 13). **NOTE:** ***The letters PSOM should be printed on the enable connector. Once found, use the following procedures to reprogram the PSOM.***

With the ignition in the "OFF" position, ground the enable connector with a jumper wire.

While pushing in on the trip odometer reset button (See Figure 14), turn the ignition to the "ON" position. ***Do not start the engine.*** Once in the ON position, release the trip odometer reset button.

At this time the speedometer needle should sweep across the face of the speedometer and back again. This sweep indicates that the PSOM has been put into the enable mode. Looking into the LCD odometer window, you should now see the English/Metric display, the revision level number and the lockout countdown number which indicates how many times the PSOM can be reprogrammed.(Refer to Figure 14).

CAUTION: ***Each time the PSOM is re-calibrated, the number of times this can be done is reduced by one!*** 1992 vehicles can be re-calibrated 3 times, while 1993 and later vehicles can be re-calibrated 6 times. If the countdown number is zero and the PSOM requires re-calibration, the instrument cluster will require replacement.

Next, press the odometer reset button once again. Now you will see inside the odometer window the conversion constant number without the decimal point followed by the abbreviation "CAL" (Refer to Figure 15)

Next, press and release the select button as many times as necessary to change the conversion constant number until the desired number is reached which for our example is 996. Each time the select button is pressed, the constant will decrease by one number. When the desired constant number is reached, press and release the reset button once to lock in the new conversion constant.

Turn ignition "OFF", remove jumper wire from PSOM Enable Connector and verify proper speedometer operation.

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RE-CALIBRATING THE PSOM: (Cont'd)

STEP 6 - THE “WHAT IF” PROCEDURE

There may be times where one might say, “What if the differential was changed and now we don’t know what the axle capacity or ratio is, what do we do now?” Or, “ What if the tires have been changed and the dimensions of the tire do not match up with the vehicles door jam sticker, what do we do now?” These are difficult problems with involved procedures to remedy them. The easiest remedy is to get the factory specified tires and/or axle ratio required. However, if there are brave technicians who want to go where few technicians have gone, here might be some helpful methods.

1. For the unknown axle capacity, one method that may be employed is to see how many turns of the drive shaft it takes to make the rear tire rotate one complete turn. If it takes slightly more that 4 turns of the drive shaft to make the rear wheel rotate one complete revolution, you would have a 4.1 axle ratio. When comparing the charts in Figures 9 and 10, this ratio applies to many different axle capacities. The breakdown would be like this:

For Bronco and “F” Series Trucks with a 4.1 axle ratio, the rear could have a 3800, a 5300, a 6250, a 7400 or a 8250 axle capacity. “E” Series Vans would have a 6340, a 7800,or an 8000 axle capacity.

Looking now at the axle capacities for both F and E series vehicles found in the Figure 11 charts, only a 3800 axle capacity vehicle would have an exciter ring tooth count of 108. All others would have 120. If the pumpkin cover on the differential is removed and the exciter ring has 108 teeth, this was an easy find. Now all one would have to do is match the appropriate tire size from the left side column and intersect it with the top 3800/108 column to obtain the conversion constant number. Once the conversion constant number is acquired, the PSOM can now be re-calibrated.

But what if the exciter ring has 120 teeth? Now it becomes necessary to obtain the tire size. Let’s say you have an E series van with a LT225/75R16E/A/S...689 tire size. You can find this tire size looking at the bottom chart in Figure 11. There you will notice that all of the 120 teeth exciter ring axle capacities with this tire size has the same 10.34 conversion constant number. You are now ready to re-calibrate the PSOM.

But what if the vehicle tire size is other than OE specified? This situation will require an involved mathematical procedure of which there are four to choose from. Choose which ever one you are most comfortable with.

Formula 1 in Figure 16 uses the entire equation because overall tire height is not known.
Formula 2 in Figure 17 uses the tire inches above and below the rim is known.
Formula 3 in Figure 18 uses overall tire height.
Formula 4 in Figures 19 and 20 are used when tire size or gear ratios are questionable.

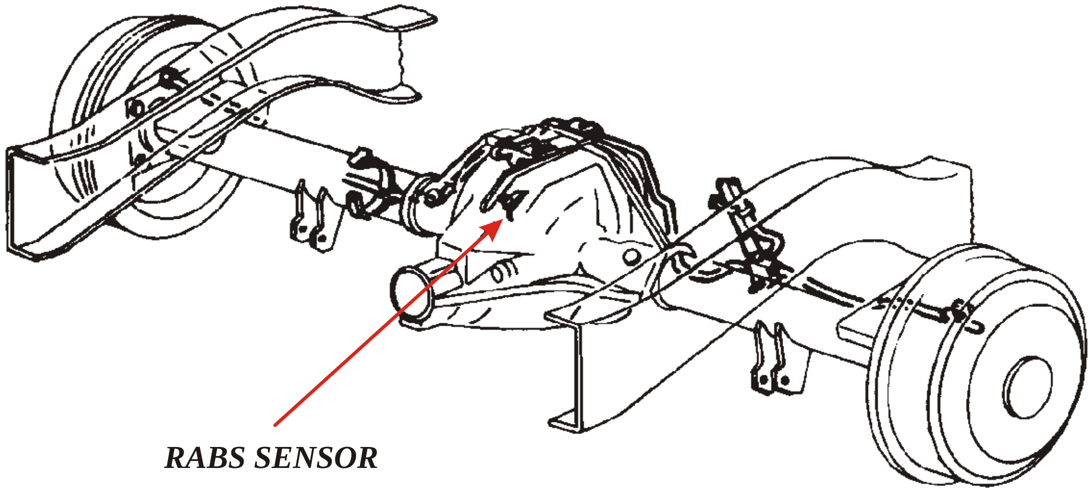


Figure 1

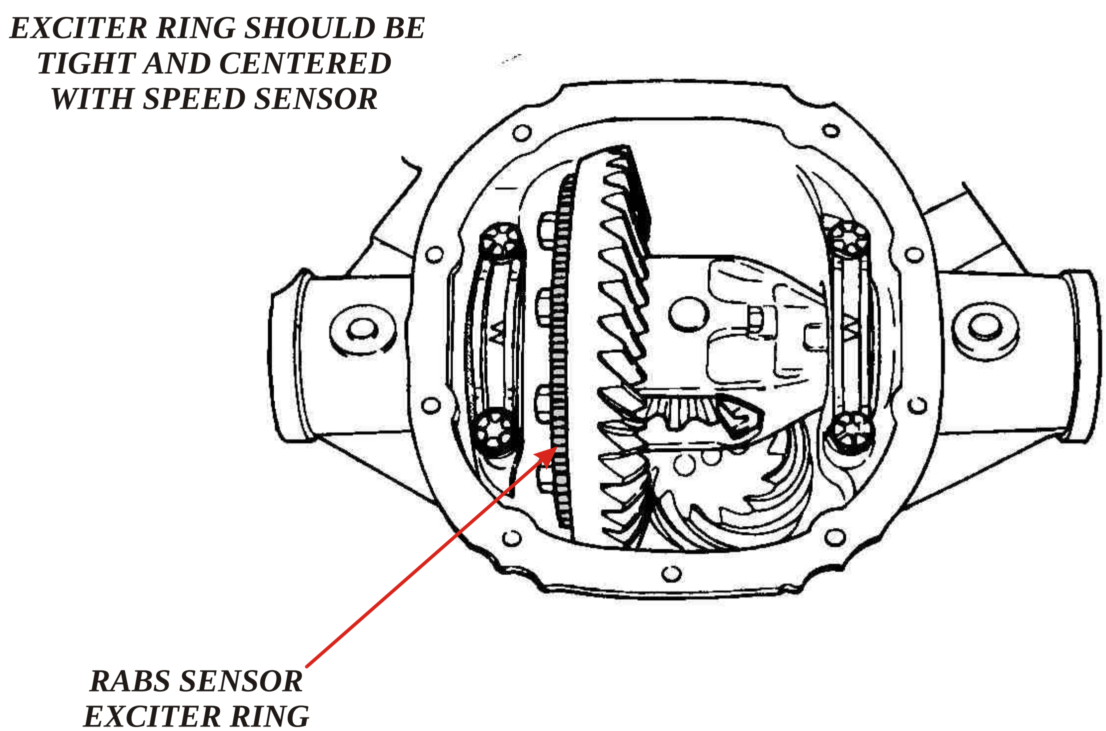
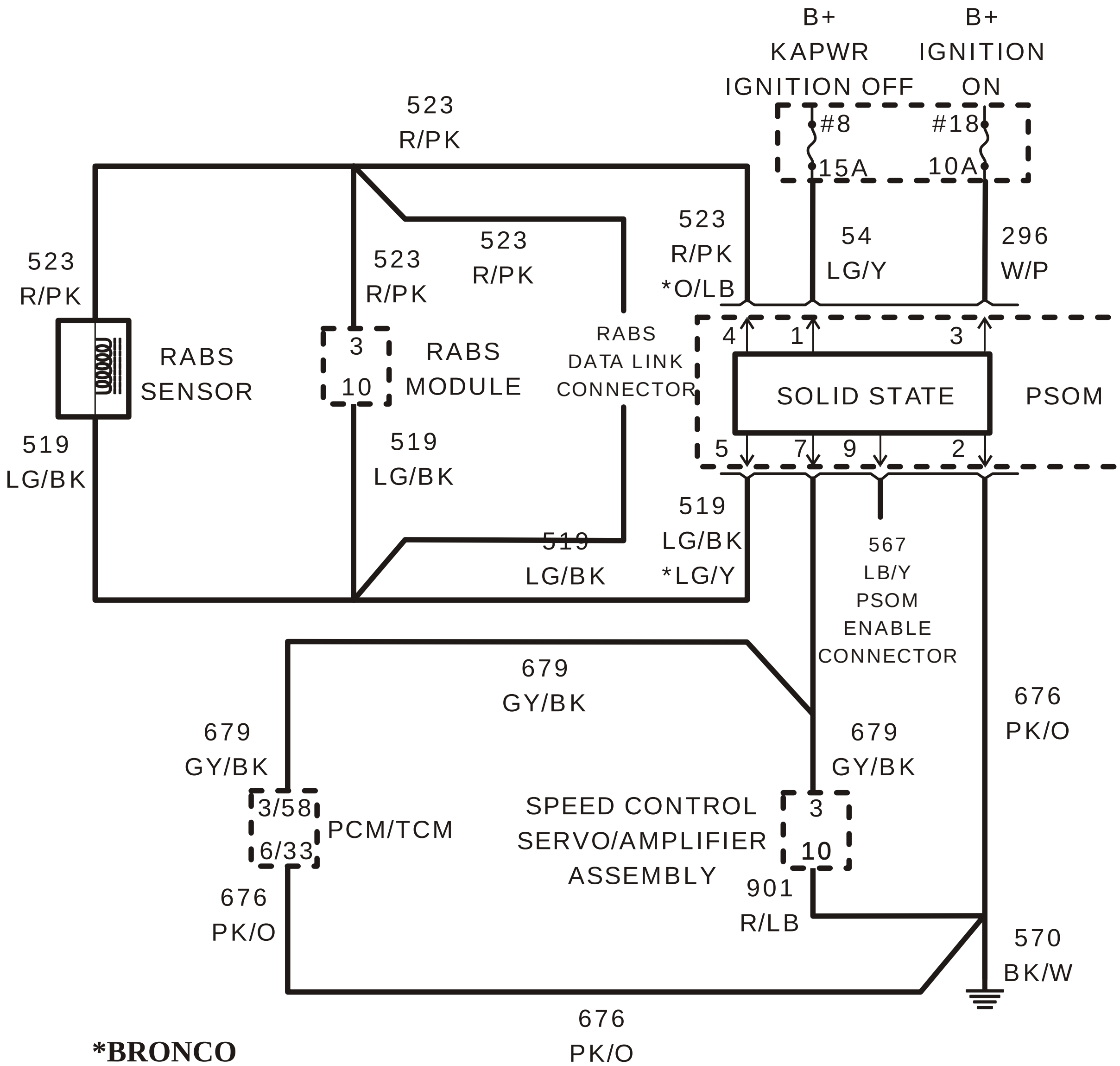


Figure 2

PSOM SYSTEM OVERVIEW



***BRONCO**

WIRE COLOR IDENTIFICATION

BK=black GY=gray LB=light blue LG=light green PK=pink
P=purple W=white Y=yellow R=red O=orange

Figure 3

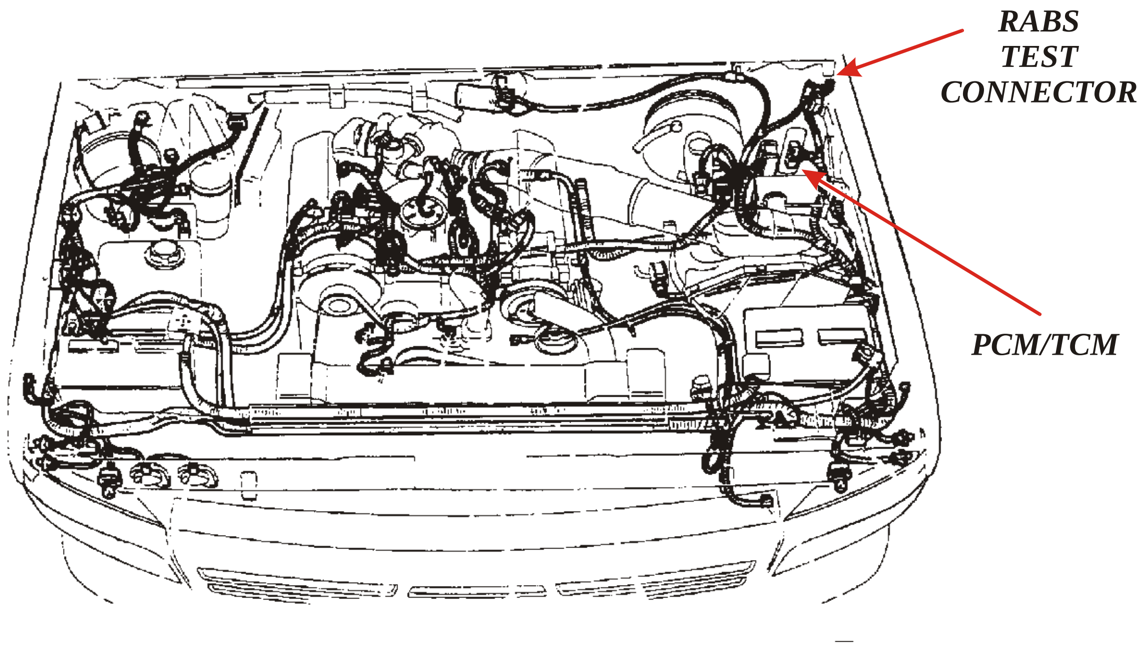


Figure 4

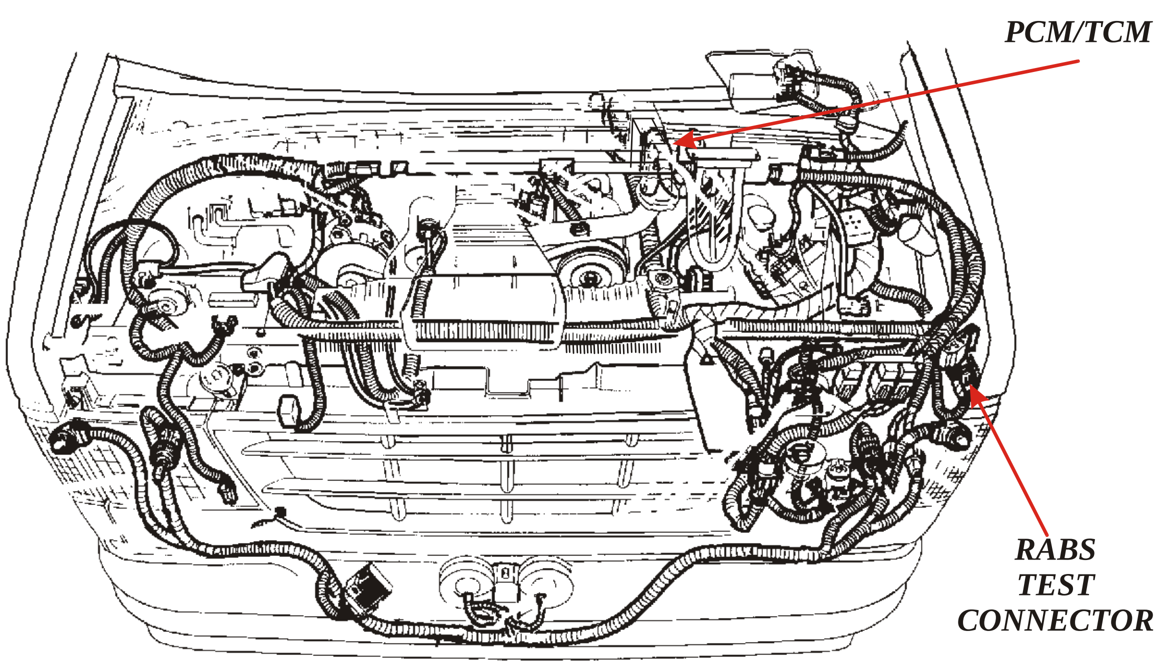
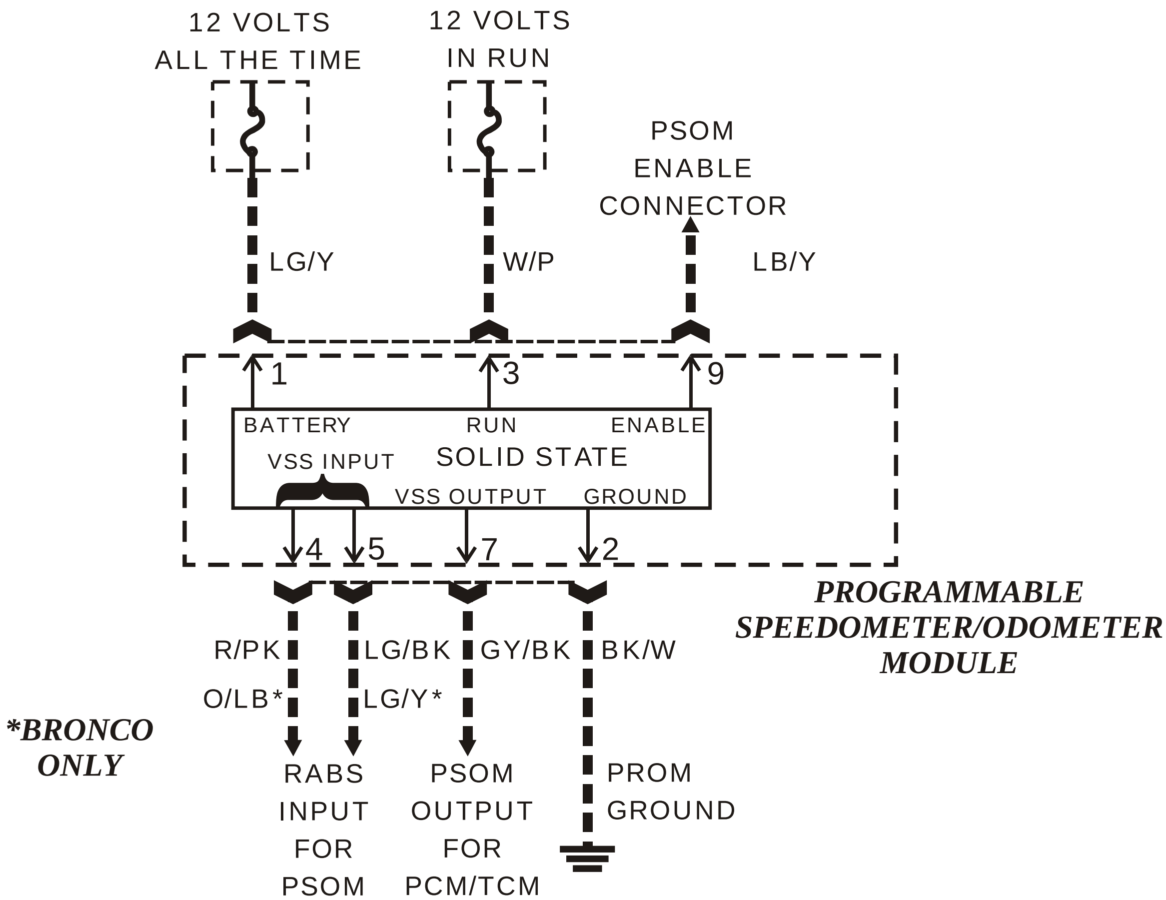
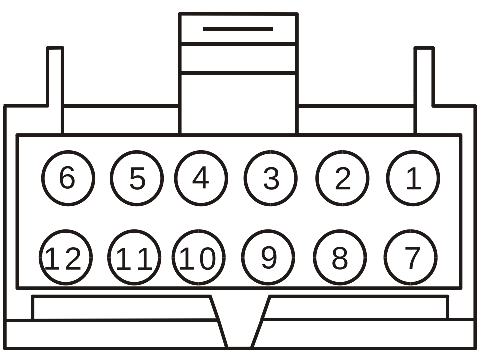


Figure 5

PSOM CONNECTOR PIN IDENTIFICATION





VIEW LOOKING INTO FACE OF CONNECTOR

PIN 1 12 Volts all the time
PIN 2 Ground .1 volt or less
PIN 3 12 Volts run only
PIN 4 RABS signal input
PIN 5 RABS signal return
PIN 6 NOT USED
PIN 7 Speed output to instrument cluster
Cruise Control & PCM/TCM
PIN 8 NOT USED
PIN 9 PSOM dealer enable
PIN 10 NOT USED
PIN 11 NOT USED

Figure 6

UNDER DASH FUSE BOX

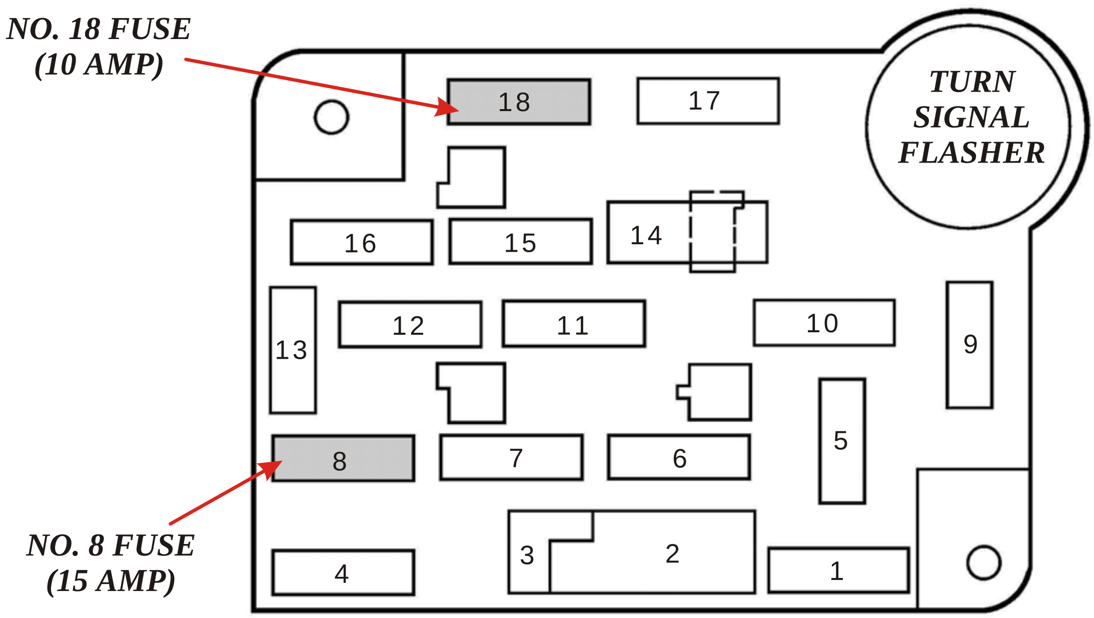


Figure 7

UNDER HOOD FUSE BOX

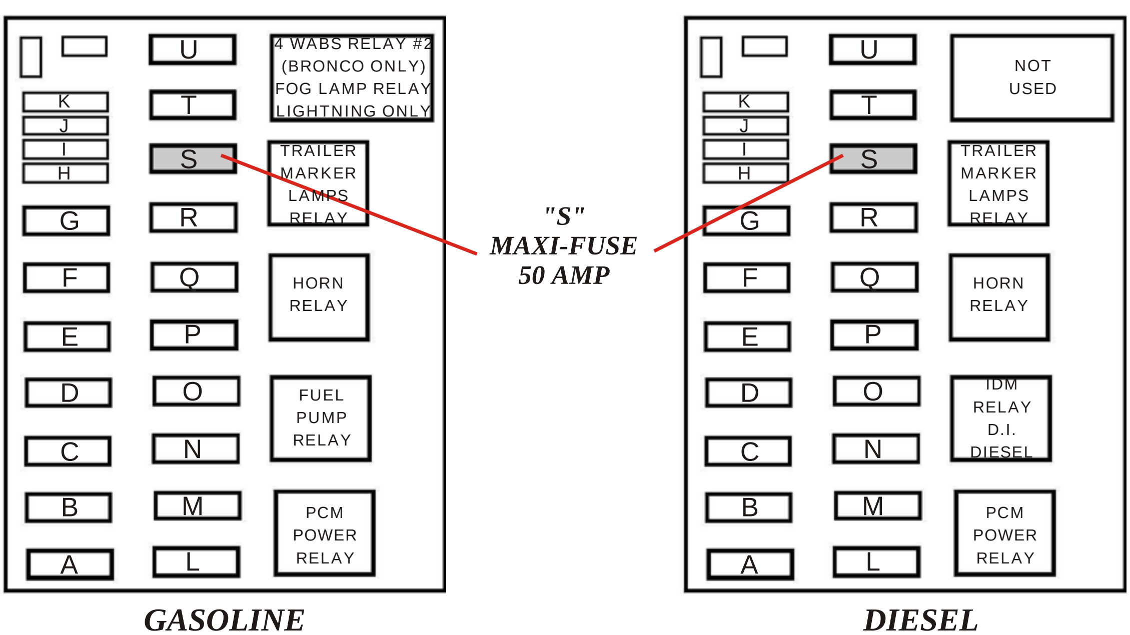
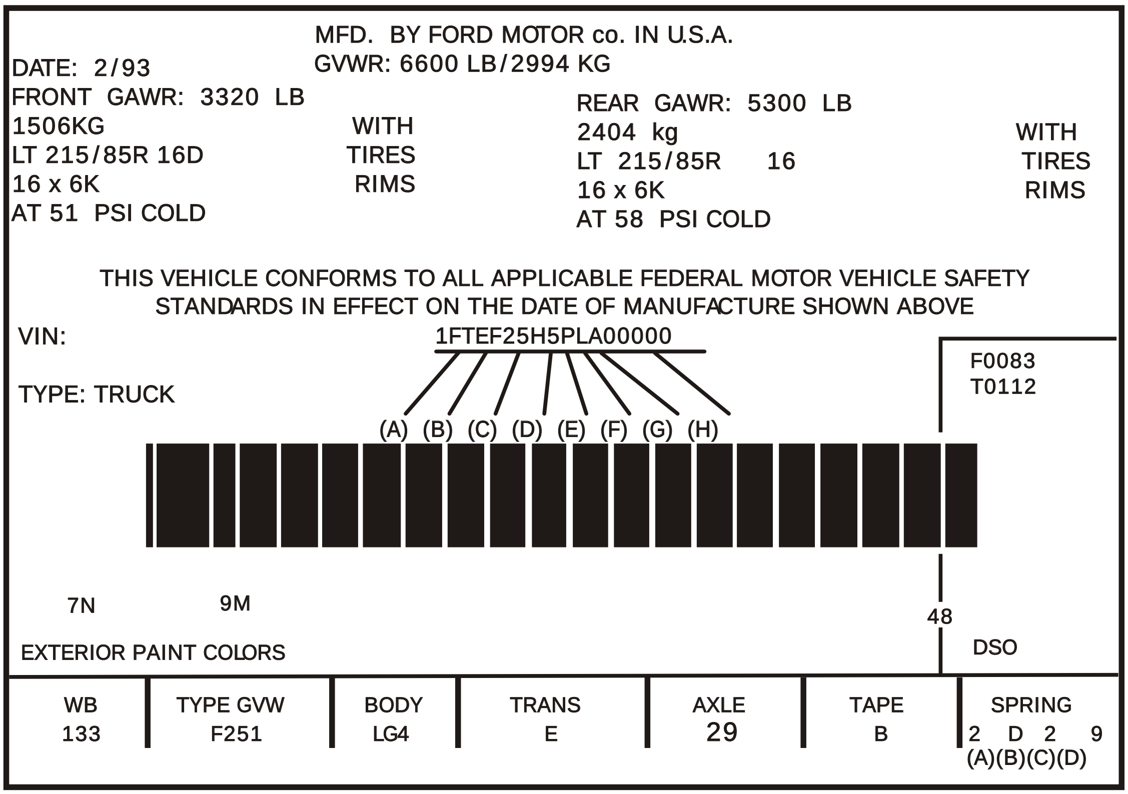


Figure 8

BRONCO & "F" SERIES TRUCKS

VEHICLE CERTIFICATION LABEL (VCL)



REAR AXLE CODES	CAPACITY (LBS)	RATIO
12	3800	2.73
18	3800	3.08
19	3800	3.55
H5	3800	4.10
H8	3800	3.08
H9	3800	3.55
25	3800	4.10
29	5300	3.55
B5	5300	4.10
B9	5300	3.55
35	6250	4.10
39	6250	3.55
C5	6250	4.10
C9	6250	3.55
45	7400	4.10
49	7400	3.55
D5	7400	4.10
65	8250	4.10
69	8250	3.55
E5	8250	4.10
72	11,000	4.63
73	11,000	5.13
W5	8250	4.00

FRONT AXLE CODES (NOT APPLICABLE ON E150-250-350)

BRONCO AND F-150-250-350	
CODE	DESCRIPTION
2	FRONT AXLE LIMITED SLIP

Figure 9

"E" SERIES VANS

E150-250-350 REGULAR REAR AXLE

CODE	CAPACITY	RATIO
12	3800	2.73
18	3800	3.08
19	3800	3.55
23	5400	3.54
24	5400	3.73
33	6340	3.54
52	7800	4.10
32	6340	4.10
62	8000	4.10
17	3800	3.31
35	6340	4.09
34	6340	3.73
56	7800	4.10

E150-250-350 LIMITED SLIP REAR AXLE

CODE	CAPACITY	RATIO
H8	3800	3.08
H9	3800	3.08
B4	5400	3.73
C2	6340	4.10
C3	6340	3.54
E2	7800	4.10
F2	8000	4.10
H7	3800	3.31
C5	6340	4.09
C4	6340	3.73
E6	7800	4.10

Figure 10

CONVERSION CONSTANT CHARTS

CONVERSION CONSTANT CHART ("F" SERIES PICKUP & BRONCO)

TIRE SIZE/TYPE AND SAE REVS PER MILE	AXLE CAPACITY	3800	5300	6250	7400	8250	11000
	SPEED SENSOR EXCITER RING TOOTH COUNT	108	120	120	120	120	120
P215/75R15SL/A/S...728		**9.83**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
P235/75R15XL/A/S...699		**10.48**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
P235/75R15XL/A/T...699		**10.48**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
31-10.50R15C/A/T...651		**8.79**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
LT215/85R16D/A/T...664		**N/A**	**9.96**	**N/A**	**9.96**	**9.96**	**N/A**
LT215/85R16D/A/S...664		**N/A**	**9.96**	**N/A**	**N/A**	**N/A**	**N/A**
LT235/85R16E/A/T...636		**N/A**	**9.54**	**9.54**	**N/A**	**9.54**	**9.54**
LT235/85R16E/A/S...636		**N/A**	**9.54**	**9.54**	**N/A**	**9.54**	**9.54**
7.50R-16D/HWY...651		**N/A**	**9.76**	**N/A**	**N/A**	**N/A**	**N/A**
7.50R-16D/A/T...651		**N/A**	**9.76**	**N/A**	**N/A**	**N/A**	**N/A**
P265/75R15/A/T...659		**8.90**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
P275/60HR17/A/S...673		**9.08**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

CONVERSION CONSTANT CHART ("E" SERIES VANS)

TIRE SIZE/TYPE AND SAE REVS PER MILE	AXLE CAPACITY	3800	5400	6340	7800	8000
	SPEED SENSOR EXCITER RING TOOTH COUNT	108	120	120	120	120
P215/75R15SL/A/S...728		**9.83**	**N/A**	**N/A**	**N/A**	**N/A**
P225/75R15SL/A/S...713		**10.70**	**N/A**	**N/A**	**N/A**	**N/A**
P235/75R15XL/A/T...699		**10.48**	**N/A**	**N/A**	**N/A**	**N/A**
LT225/75R16D/A/S...689		**N/A**	**10.34**	**N/A**	**10.34**	**10.34**
LT225/75R16E/A/S...689		**N/A**	**10.34**	**10.34**	**10.34**	**1034**
LT235/85R16E/A/T...636		**N/A**	**9.54**	**9.54**	**N/A**	**N/A**

Figure 11

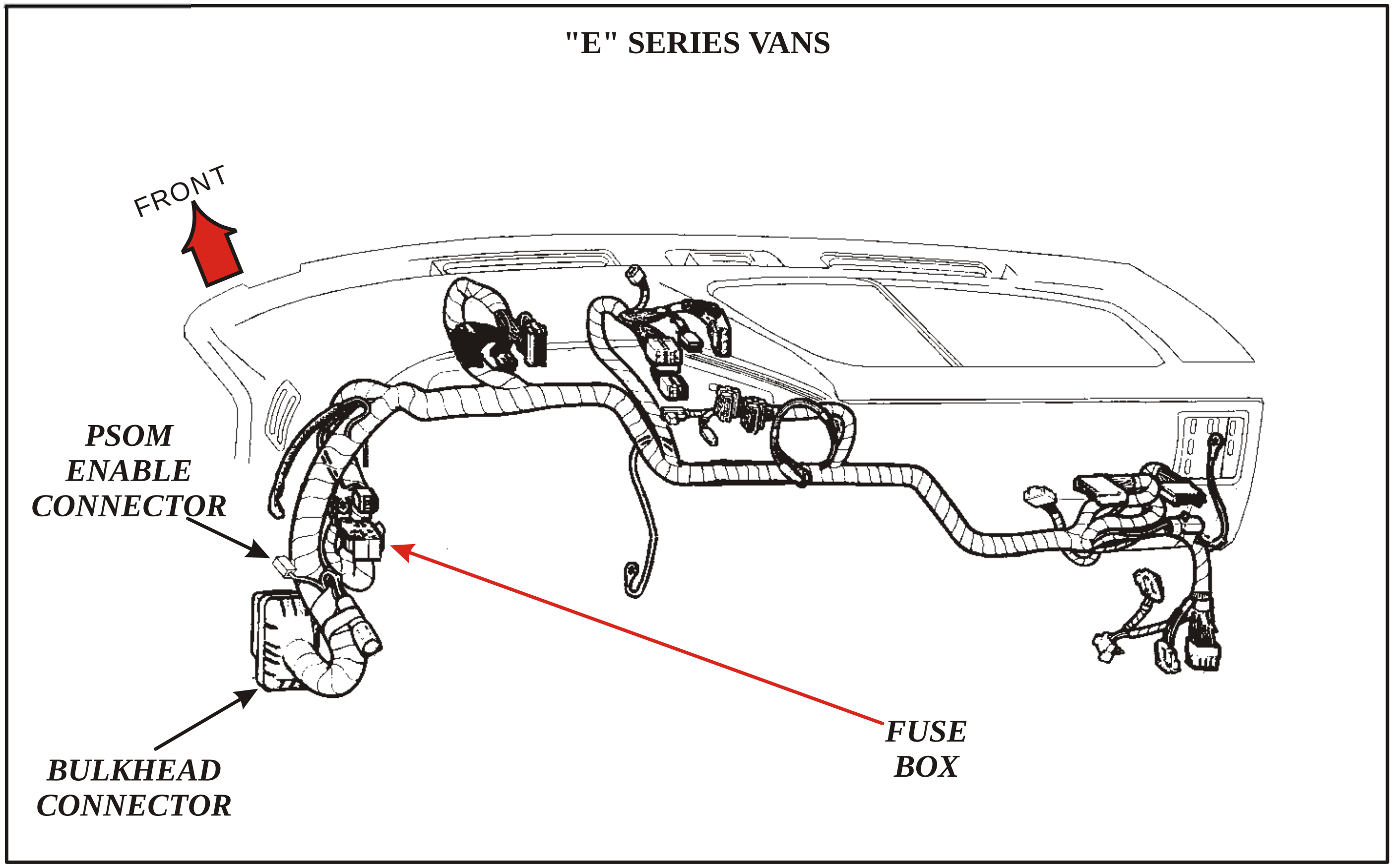


Figure 12

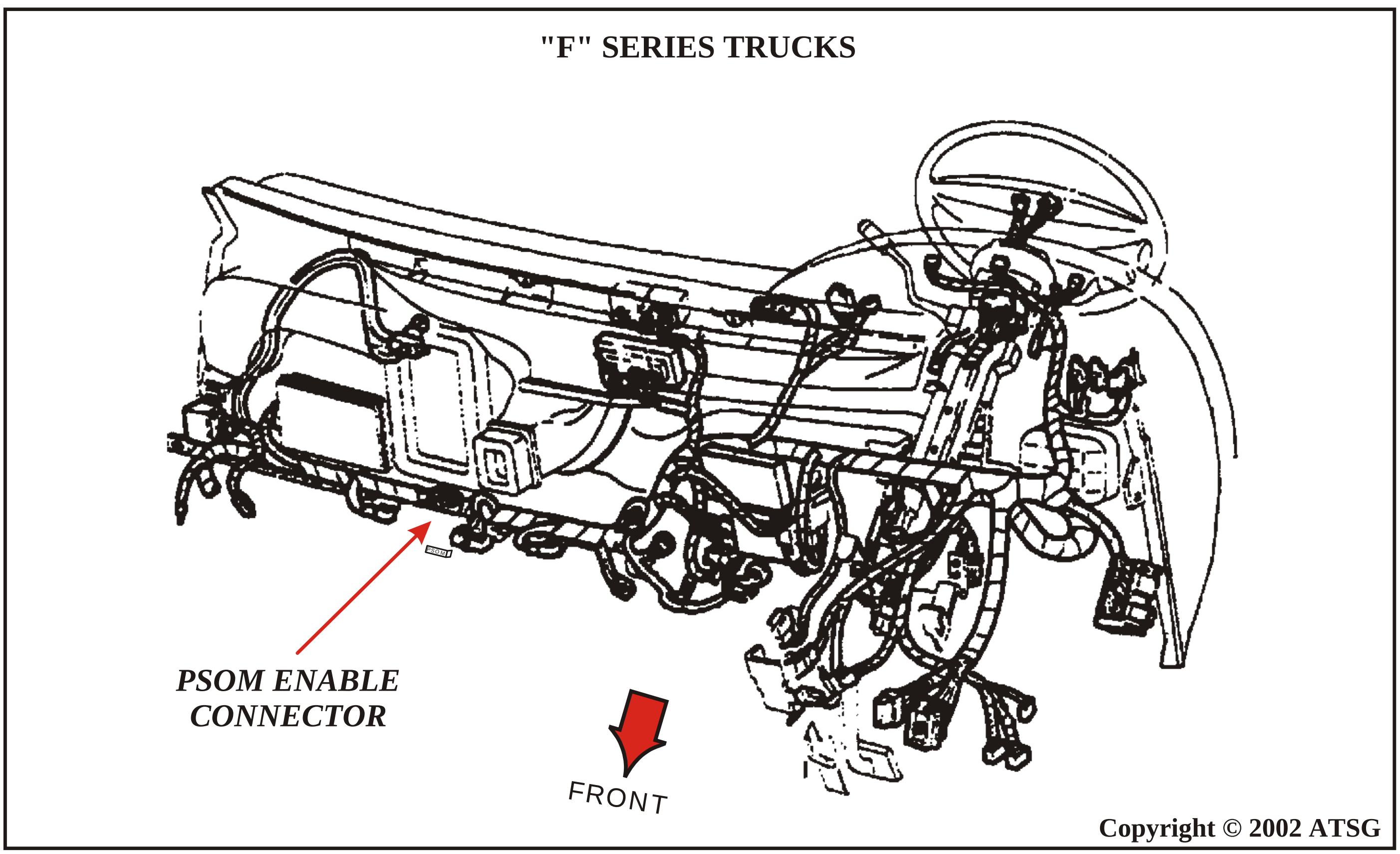


Figure 13

PSOM ODOMETER DISPLAY

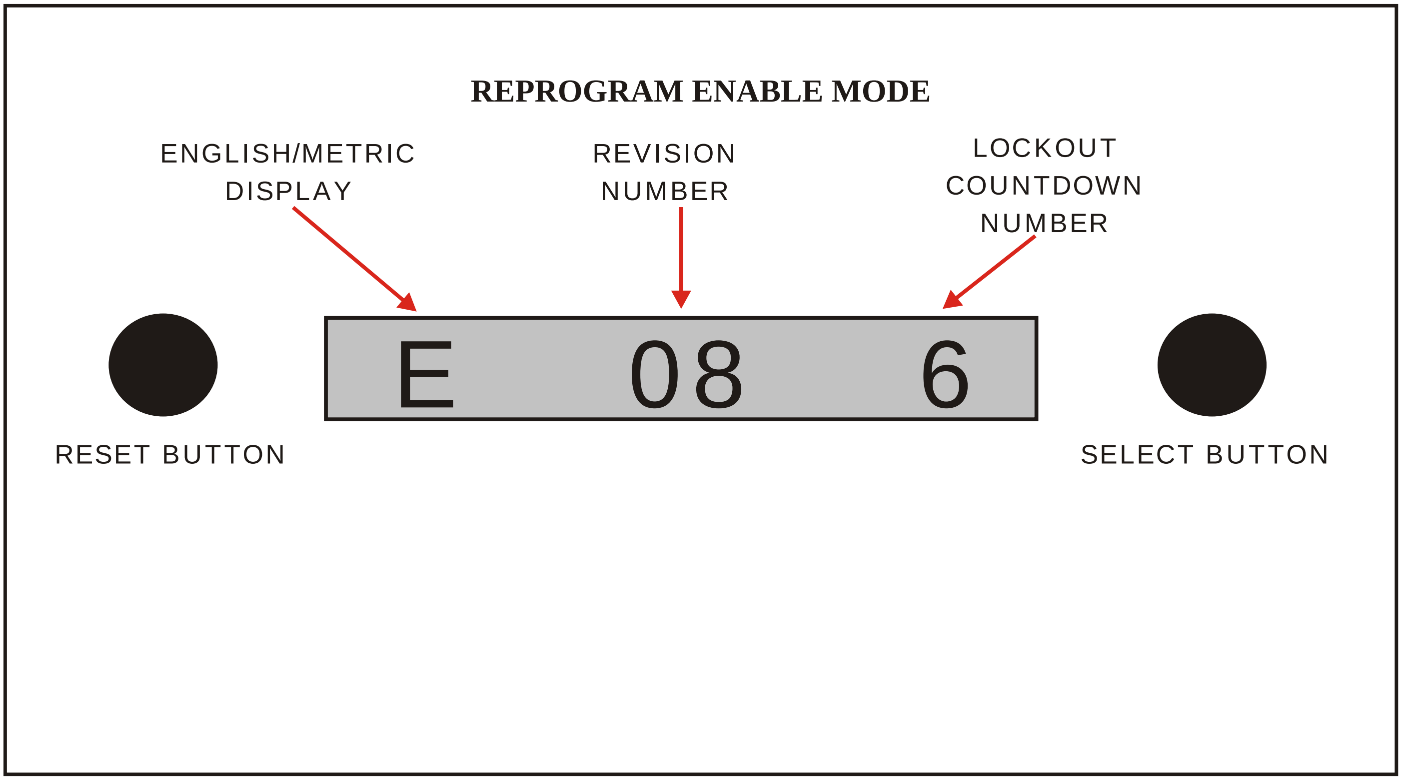


Figure 14

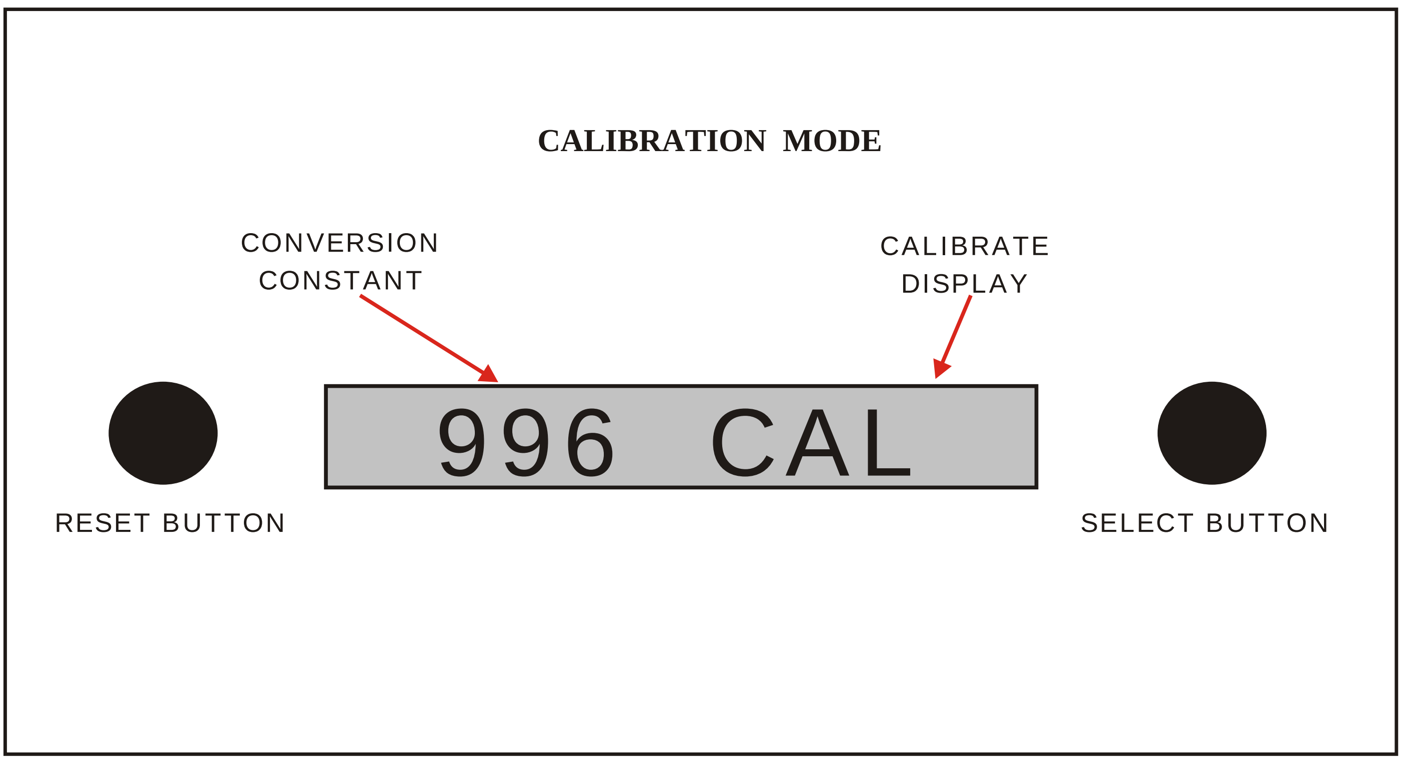


Figure 15

Formula #1 uses the following equation when using the overall tire height:

___>____x .3937 =____
___>____x ____ =____ x 2 + _____+____ =_____x 3.14 = 63360 ÷ _____x___ =______ ÷ 8000 = CC

Here is an example of how this equation works using an LT235/85R-16 tire as an example:

Millimeters / Convert to / Centimeters / Multiplied by / In per Centimeter / equals / Centimeters per Inch
235 > 23.5 x .3937 = 9.25

Millimeters / Convert to / Centimeters / Multiplied by / Centimeters per Inch / equals
85 > .85 x 9.25 =

/ Tire Inches Above & Below the Rim / Multiplied by / Two / equals / _____ / plus / Rim Size / equals
7.86 x 2 = 15.72 + 16 =

/ Overall Tire Height / Multiplied by / Pi / equals / Overall Tire Circumference / Inches per Mile
31.72 x 3.14 = 99.60 63360

Divided by / Overall Tire Circumference / equals / Revolutions per Mile / Multiplied by /
÷ 99.60 = 636.14 x

RABS Sensor Exciter Ring Tooth Count / equals / _______ / Divided by / PSOM Pulses per Mile / equals
120 = 76336.8 ÷ 8000 =

/ **Conversion Constant.**
9.54

Figure 16

Formula #2 uses the following equation when using the tire inches above and below the rim:

____ x 2 = _____+ __ =_____ x 3.14 = _____ 63360 ÷ _____ = ______ x ___ = _______ ÷ 8000 = CC

Here is an example of how this equation works using a 7.50R - 16 tire:

Tire Inches Above and Below the Rim / Multiplied by / Two /equals _____ / plus / Rim Size
7.50 x 2 = 15.00 + 16

/ equals / Overall Tire Height / Multiplied by / Pi / equals / Overall Tire Circumference / Inches per Mile
= 31.00 x 3.14 = 97.34 63360

/ Divided by / Overall Tire Circumference / equals / Revolutions per Mile / Multiplied by
÷ 97.34 = 650.91 x

/ RABS Exciter Ring Tooth Count / equals / _______ / Divided by / PSOM Pulses per Mile / equals
120 = 78109.2 ÷ 8000 =

/ **Conversion Constant**
9.76

Figure 17

Formula #3 uses the following equation when using the overall tire height:

__ x 3.14 = _____ ÷ 63360 = ______ x ___ = _______ ÷ 8000 = CC

A 31-10.50R-15 tire will be used for this example:

Overall Tire Height / Multiplied by / Pi / equals / Overall Tire Circumference / Inches per Mile / Divided
31 x 3.14 = 97.34 63360 ÷

by the Overall Tire Circumference / equals / Revolutions per Mile / Multiplied by
97.34 = 650.91 x

RABS Exciter Ring Tooth Count / equals / _______ / Divided by / PSOM Pulses per Mile / equals
108 = 70298.3 ÷ 8000 =

/ **Conversion Constant**
8.79

Figure 18

Formula #4 uses the following procedure and equation when tire size or gear ratios are questionable:

When gear ratio and/or tire size are questionable, one final method which will determine a conversion constant would be as follows:

Mark the tire at the 6 o'clock position and the floor at the same time so as to have both marks lined up with each other.

Roll the vehicle so the marked tire has made one complete revolution. At this time, make another mark on the floor so that it lines up with the mark on the tire which should be, once again, at the 6 o'clock position.

Now measure the distance between the two marks on the floor (See Figure 20). For this example, the measurement between the two marks was 39¼" which in decimal equals 39.25"

The Formula:

Floor measurement / Multiply by / 2.54 / Equals / Centimeters / Overall Tire Circumference / Divided by
39.25 x 2.54 = 99.69 99.69 ÷
Pi / Equals / Tire Diameter
3.14 = 31.74

The next step is to calculate tire revolutions per mile as follows:

Tire Diameter / Multiplied by / 28 / equals / _____ / 1528 / Minus / _____ / equals / Revolutions per Mile
31.74 x 28 = 888.72 / 1528 - 888.72 = 639.28

With the revolutions per mile, use this following equation to determine the conversion constant:

Revolutions per Mile / Multiplied by / RABS Sensor Exciter Ring Tooth Count / equals / _______
639.28 x 120 = 76713.6

/ Divided by / PSOM Pulses per Mile / equals / **Conversion Constant**
÷ 8000 = **9.59**

Once a numerical conversion constant has been established, the re-calibration process of the PSOM can begin.

Special note: If the arrived numerical conversion constant is not one listed in the PSOM, then the tire size or differential gear ratio far exceeds OE tolerances prohibiting PSOM re-calibration.

Figure 19

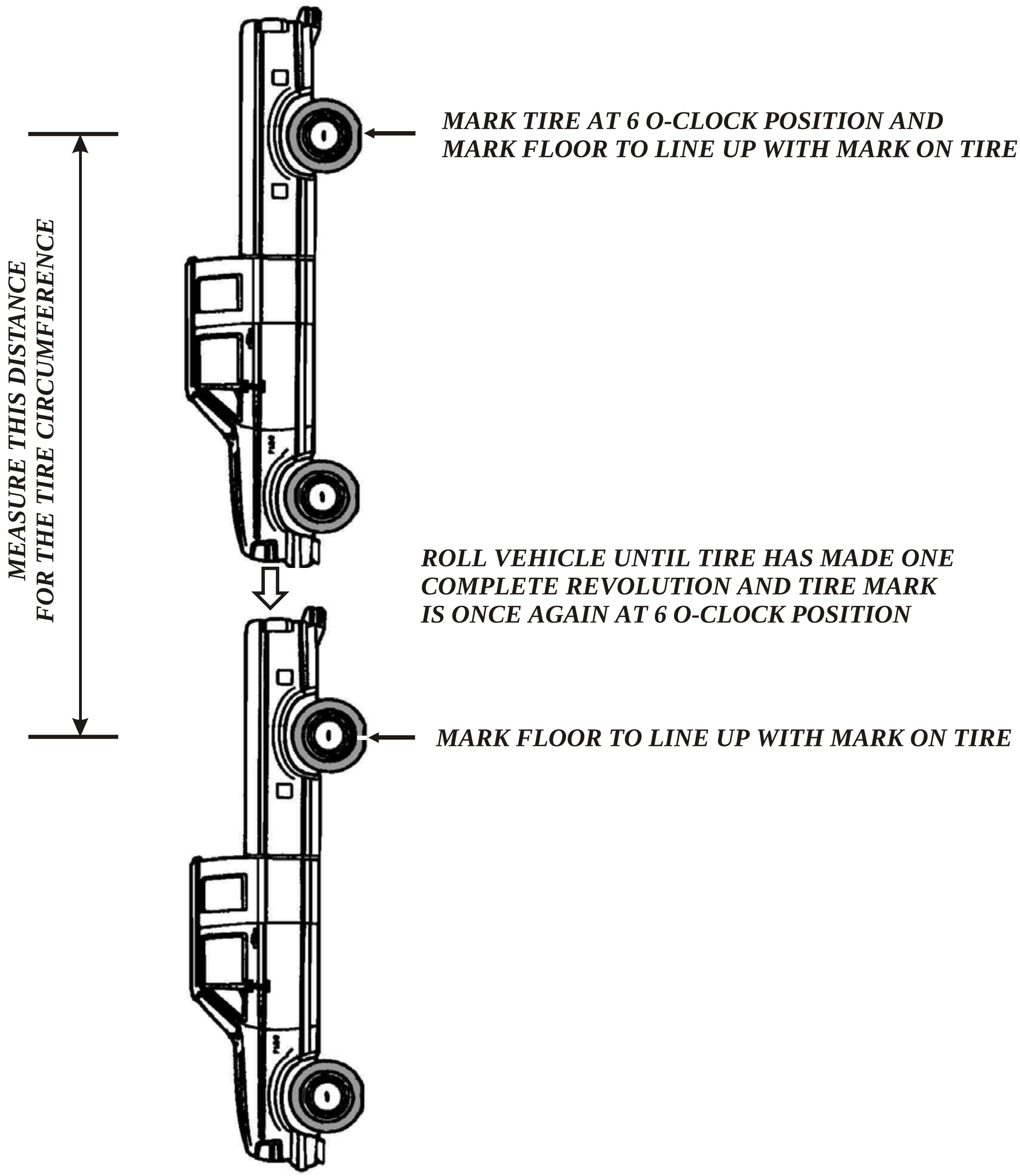

MEASURE THIS DISTANCE
FOR THE TIRE CIRCUMFERENCE
MARK TIRE AT 6 O-CLOCK POSITION AND
MARK FLOOR TO LINE UP WITH MARK ON TIRE
ROLL VEHICLE UNTIL TIRE HAS MADE ONE
COMPLETE REVOLUTION AND TIRE MARK
IS ONCE AGAIN AT 6 O-CLOCK POSITION
MARK FLOOR TO LINE UP WITH MARK ON TIRE

Figure 20