RATIO TEST

Siemens VDO Service Information

In most vehicles the speedometer calibration is based on certain tire and transmission ratio. These factors were used by the speedometer manufacturer to establish the proper combination of gears and worms inside the speedometer head to obtain accurate speed readings.

Some car manufacturers and individuals building custom cars are using different tires and/or transmission ratios than the ones designed by the OEM. If this is your situation, a new ratio must be established.

In general: If the tires or transmission, including the differential, has been altered from its original design, or if any other changes have been made that are not listed as original or factory specifications or approved equipment, the ratio must be adjusted.

TEST:

- 1. Check to see if the tire pressure is the same as recommended by the factory.
- 2. Measure (by making chalk marks) a distance of 52' 91/2" (16.09 meters).
- 3. Unscrew the speedometer cable at the speedometer head.
- 4. Mark the inner core with a paper flag, paper clip, or preferably with a hairpin.
- 5. Push or drive the vehicle over the entire distance, counting the full and partial revolutions of the cable.
- 6. Always roll the car towards the first mark until you see the inner core of the speedometer cable start turning (thus eliminating the gear clearance). Before you start counting, mark the part of the vehicle that is exactly over the beginning chalk mark. Stop counting when the marked part of the vehicle is exactly over the the second (ending) chalk mark.





Date

Product:	Description

Speedometer		Oct 2003
Type: Mochanical	TROUBLESHOUTING GUIDE	lssue 1
Intechanical		1

General Information:

This troubleshooting guide is intended to help you with the installation of Siemens VDO Automotive instruments. Please however check the instructions provided within the package the instrument came in for more details.

Testing

American cars are geared for the speedometer cable to turn 1,000 revolutions in a mile. Changing tires or ring gears and pinion, changes the revolutions by a percentage at all speeds. This percentage can be determined as follows:

1) Drive a measured 10 mile course after setting the trip meter to "0". Note the reading at the end of the ten mile course. A 9.4 reading means 6% slow. A 10.4 reading means 4% fast.

2) Mark a 52 foot 9 1/2 inch course on a driveway or parking lot with tape. Place a piece of tape on the rocker panel under the driver's door. Disconnect the speedometer cable from the speedometer head. Push the car up to the starting point aligning the tape on the car with the tape on the ground. Place a paper clip on the speedometer cable core and mark the cable housing at this starting point. Push the car along the marked course counting the cable revolutions as you go until you reach the tape marking the end of the course. The core would turn ten times if the tires and drive train were to factory standard. If the core turned 9-1/2 times, you are 5% slow. If it turned 10-3/4 times, you are 7-1/2% fast. Run test three times and average.

Once you determine the percentage of difference, you may be able to correct the difference by changing the speedometer gears. The following is a listing of gears available from G.M. dealers for turbo 350 and 400 transmissions.

Part Number	Number of Teeth
3987917	17
3987918	18
3987919	19
3987920	20
3987921	21
3987922	22

G.M. Driven Gears (the gear on the end of the speedo cable) for Turbo 350 and 400:

By installing a driven gear with more teeth than the one on the speedometer cable, the cable turns faster and increases the speed shown on the speedometer.

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Turbo 350 Part #	No. of Teeth	Turbo 400 Part #	No. of Teeth
6261783	8	8629549	18
6261782	9	8629547	15
8629547	15	8440055	8

G.M. Drive Gears (the gear in the transmission driving the speedometer cable gear):

If the drive gear is changed to a gear with more teeth, the speedometer will show a decrease in speed. Fewer teeth will show an increase in speed. The percent of change depends on how many more or fewer teeth are on the gears compared to the gears you are changing.

If you cannot correct the speedometer reading sufficiently with gear changes, most speedometer repair shops can make a ratio adapter which will make the correction. VDO also manufactures programmable speedometers which can be adjusted in the field by the owner to virtually any ratio. Check with your selling dealer.

We have tried to cover most problems or situations you may encounter. If you need further assistance, please call 1-800-265-1818 for technical support

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A	u	t	0	т	0	t	i	v	е		No. TB-300 001
Produ	ict:						D	escri	ption		Date
		G	aug	jes							Oct 2003
Туре	:								-uel/	Température/ Pressure Gauges	Issue
		Ele	ectr	ical							1

General Information:

This troubleshooting guide is intended to help you with the installation of Siemens VDO Automotive instruments. Please however check the instructions provided within the package the instrument came in for more details.

Testing Gauges

If a gauge is suspected to be faulty, the following test can be performed on VDO gauge.

- Turn the key on: Pressure Gauge – pointer to "0" Fuel Gauge – pointer to amount in fuel tank Temperature Gauge – pointer to temperature of engine water
- With the key on, pull sender wire off the sender: Fuel & Pressure Gauge – pointer will go to maximum right hand position Temperature Gauge – pointer will go to maximum left hand position
- With the key on, ground the sender wire to the engine chassis: Fuel & Pressure Gauge – pointer will go to maximum left hand position Temperature Gauge – pointer will go to maximum right hand position
- 4. All VDO electric gauge pointers peg full left hand position with the key off.

SIEMENS	VDO
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Product:	Description	Date
Senders		Jan 2005
Туре:	TROUBLESHOUTING GUIDE	Issue
Electrical		1

General Information:

This troubleshooting guide is intended to help you with the installation of Siemens VDO Automotive instruments. Please however check the instructions provided within the package the instrument came in for more details.

TEMPERATURE & PRESSURE SENDERS

Do not use Teflon tape on the threads. It will interfere with the sender ground. Sender threads are tapered pipe threads and are self sealing. Temperature senders are most accurate when installed in the intake manifold. It is also acceptable to use the OEM engine manufacturing specified location. Do not use tee adapters or angle adapters for temperature senders since the sender tip or bulb must be immersed in the water flow.

Senders can be tested with an ohm meter that measures from 10 to 2,000 ohms. Connect the positive lead from the tester to the sender terminal and the negative lead to a good ground. The following readings will occur if the sender is operating properly.

> Temperature Sender: Cold -700 Hot (250 degrees) -22

Pressure Sender: Engine off – 10 ohms Engine running 40psi = 105 ohms, 60psi = 152 ohms

FUEL SENDERS

Gauge manufacturers use different ohm ranges when building their fuel senders. The following are typical:

	EMPTY	FULL
VDO Lever Arm (included in instrument kit)	10 ohm	180 ohm
Stewart Warner	240 ohm	33 ohm
G.M. from '65	0 ohm	90 ohm
G.M. pre '65	0 ohm	30 ohm
Ford pre '90	73 ohm	10 ohm
VDO Tube Type	60-90 ohm	0 ohm

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VDO makes compatible fuel gauges in some styles. Check the catalogue for the style and part number which matches your sender.

Note: The sender and gauge ohm ranges must match.

FUEL TANK SENDERS

As explained before, there are many different ohm ranges in sending units. Therefore, <u>with an ohmmeter you can check</u> to ascertain if unit is working properly.

VDO No. 226 001 E = 10 ohms F = 180 ohms

An empty tank will read 10 ohms. As you add gas, the ohm reading will go up until the tank is full and reads 180 ohms.

G.M.: Both 0-30 and 0-90. Empty tank will read "0" ohms. As you fill the tank, ohm reading will go up.

Stewart Warner and Ford: Empty tank will read high ohm range (S.W. 240) (Ford 73) and go <u>down</u> as you fill tank.

Fuel G	aug	е		Des	criptic	on	Re	sist	anc	e Cl	nart	Date Oct 2004
Elect	rica						ne	5151				issue 1
MEASURI RANGE 0 MOVEME	NG RA E 240 NT NU	NGE: 1/8 196 MBER	E - F 1/4 153 : 999 0	3/8 125 10 003	1/2 103 3	5/8 3/ 87 6	4 7/8 7 45	240 F F 33	- 33.5 (DHMS	REVISION 'C' (MAY '96) DAIL NUMBER: 999 040 02 999 040 04 REVISION 'B' (APR '95)	5 8
0 MOVEME	0 3 NT NU	1/8 25 MBER	1/4 45 : 999 0	3/8 65 10 003	1/2 85	5/8 3/ 110 13	4 7/8 8 156	1/1 180			DIAL NUMBER: 999 040 02 999 040 04	4 7
MEASURI RANGE 0 MOVEME	NG RA E 13 NT NU	NGE: 1/8 32.2 MBER	Fuel E 1/4 53 : 999 0	- F 3/8 73.5 10 009	1/2 94.2	5/8 3/ 115 13	4 7/8	16 F 183	- 168 C	DHMS	REVISION 'D' (MAY '96) DIAL NUMBER: 999 040 05 999 040 06	9 0
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MEASUR	NG RA	NGE: 1/4	FUEL	0 - 1 (\ 3/4	/W) 1			73	- 9.6 (OHMS	REVISION 'B' (APR '95)	

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Automotive

Techincal Bulletin No. TB-310 001

Product:	Description	Date
Boost Gauge	DECISTOR	Aug 2003
Туре:	RESISTOR	Issue
Electrical		1

Resistor for a Noisy Gauge

(Make your own Resistor)

Take a short piece of solid core 22 gauge copper wire. Strip insulation away pull the nylon tubing off the back of the gauge. Insert the wire into the nylon tube. About two inches from the gauge end of the nylon tube, with the wire inside, heat the tubing with a heat gun until the tubing collapse, remove the heat. When the tubing cools, pull the wire out of the tubing, re-attach the tubing to the gauge. You have just made yourself a resistor.

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Techincal Bulletin No. TB-310 002

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Electr	ical													
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		00	10	00	50	100	110	120	100	140	150	DIAL NUM	BER:	999 040 013
0	322.8	165	133	112.5	83	62.2	47.5	36.5	28.9	23.1	18.6			999 040 036
MOVE	MENT NU	JMBER:	<u>999 010</u>	005										999 040 052
MEAS	URING R	ANGE -	200 ° C						482.	5 - 14.25	OHMS	REVISION	'A' (AP	R '95)
°C	60	100	120	140	160	180	200							
0	192.5	151.2	0E /E	52	22.2	21.1	14.05					DIAL NUM	BER:	999 040 020
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11510										17 10	0.00	DEV (QLON)		
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Automotive

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MEASURING RANGE: 100 - 280 ° F 556 - 31 OH									JHMS	
°F	100 120 140 160 180 200 220 240 260 280									
0 3 25 45 65 85 110 138 156 180										
MOVEMENT NUMBER: 999 010 003										

MEASURING RANGE: SECONDARY SCALE: 140 ° C 556 - 31 OHMS										
°C	°C 40 60 70 80 90 100 110 120							130	140	
0	0 475 244 180 132 96 72 53 42 34 29									
MOVEMENT NUMBER:										

MEASURING RANGE: 300 ° F 322.8 - 18.6 OHM										OHMS	
°F 120 160 180 200 220 240 260 280 300											
0 322.8 135 105.7 76 57 42 31 23 18.6											
MOVEMENT NUMBER: 999 010 005											

MEASURING RANGE - SECONDARY SCALE: 150 ° C 322.8 - 18.6 OHMS											
°C 50 80 90 100 110 120 130 140 150											
0	0 322.8 135 105.7 76 57 42 31 23 18.6										
MOVEMENT NUMBER: 999 010 005											

MEASURI	MEASURING RANGE: 140 - 320 ° F										OHMS
°F 140 160 180 200 220 240 260 280 300 320											
0 1815 1130 750 490 350 237 170 128 99 80											
MOVEMENT NUMBER: 999 010 009											

MEASURING RANGE - SECONDARY SCALE: 160 ° C 1815 - 80 OHMS											
BAR 60 70 80 90 100 110 120 130 140 150							160				
0 1815 1160 800 550 410 290 210 155 118 90 80										80	
MOVEMENT NUMBER:											

MEASURING RANGE: 400 ° F 482.5 - 14.5 OHM										OHMS	
°F	150	175	200	00 225 250 275 300 325 350 375 400							400
0 482.5 270 182 120 82 56 41 30.5 23 18 14.								14.5			
MOVEMENT NUMBER: 999 010 012											

MEASURING RANGE - SECONDARY SCALE: 200° C 482.5 - 14.5 OHMS										
°C 70 90 110 130 150 170 200										
0 420 185 110 66 39 27 15										
MOVEMENT NUMBER: 999 010 008										

REVISION 'B' (APR '95) *120* MARK ONLY ON DIAL NUMBER: 999 040 045 *190* MARK NOT ON DIAL NUMBER: 999 040 045 999 040 022

REVISION 'B' (APR '96)

REFERENCE

REVISION 'B' (APR '95)

DIAL NUMBER: 999 040 016 999 040 039

REVISION 'B' (APR '95)

REFERENCE

REVISION 'B' (APR '95)

DIAL NUMBER: 999 040 023 999 040 046

REVISION 'B' (APR '95)

REFERENCE

REVISION 'A' (APR '95)

DIAL NUMBER: 999 040 017 999 040 040

REVISION 'B' (APR '95)

REFERENCE

0

0

A

Techincal Bulletin No. TB-310 003

Product:DescriptionDatePyrometerGAUGE TESTINGJan 03Type:Electrical1

1. Turn power supply to millivolts (mV)

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- 2. Hook the red lead of the generator to the positive (+) terminal of the gauge
- 3. Hook the black lead of the generator to the negative (-) terminal of the gauge
- 4. Increase the millivolts (mV) to see the needle increase on the gauge
- 5. If the gauge needle does not move the gauge is defective.

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A	u	t	0	m	0	t	i	v	е

Techincal Bulletin No. TB-323 001

Product:	Description	Date
Pyrometer		Jan 03
Туре:	SENDER LESTING	Issue
Electrical		1

1. Turn voltmeter to millivolts (mV)

- 2. Hook the red lead of the voltmeter to the red lead of the thermocouple.
- 3. Take the black lead of the voltmeter to the black lead of the thermocouple.
- 4. Take a flame to heat up the thermocouple at the compression ring.
- 5. The voltmeter should start to rise if not the thermocouple is bad.



Product:	Description	Date
Voltmeter		Oct 03
Туре:	VOLIMETER / WIRING	Issue
Electrical		1

General Information:

This troubleshooting guide is intended to help you with the installation of Siemens VDO Automotive instruments. Please however check the instructions provided within the package the instrument came in for more details.

VOLTMETERS

- ➢ Key on-engine off-12 volts.
- > Engine running without accessories or lights on-13.5-14.5 volts, (approx.)
- Engine running with accessories and lights on-13.0-14.0 volts (approx.)
- Lower readings mean a weak battery or malfunction in the alternator or voltage regulator.

WIRING

We recommend 16-gauge wiring except for the final ground wire which should be 14-gauge. Wire the gauges in a series from a (+) accessory source which is not already overloaded with other accessories such as electric fans and air conditioning. The ground is also run in series including the light socket ground. The final 14-gauge wire needs to be connected to a good ground such as the engine block ground strap or the battery ground itself.

All wiring should be of high quality stranded wire with good insulation. Take care to avoid hot engine components when running engine compartment wire. Use grommets when running wire through the fire wall. If your gauge's pointer moves noticeably when the lights, fans, or air conditioner turns on, you are experiencing a low voltage condition. This may be due to the following factors:

- You have installed the gauges to an overloaded circuit either on the positive or negative wire. Re-wire to eliminate problem.
- Voltage output of alternator during idle conditions may be too small for electrical system. Hook up voltmeter and monitor voltage. Voltage should not drop below 12.75 volts at any time.

Techincal Bulletin No. TB-332 002

Automotive

Product:	Description		Date
Voltmeter Gauge	Deel	interne Chart	Oct 04
Туре:	Res	Istance Chart	Issue
Electrical		1	
MEASURING RANGE: 8	16 Volts	8 - 16 Volts REVISION 'B' (API	R '95)
VOLTS 8 9	10 11 12 13 14	15 16	
O 8 9	10 11 12 13 14	15 16 DIAL NUMBER: 99	99 040 018
MOVEMENT NUMBER:	99 010 010	99	99 040 041
		99	99 040 054
		99	99 040 056
MEASURING RANGE: 1	- 32 Volts	18 - 32 Volts REVISION 'B' (API	R '95)
PSI 18 20	22 24 26 28 30	32	,
0 18 20	22 24 26 28 30	32 DIAL NUMBER: 99	99 040 019
MOVEMENT NUMBER:	99 010 011	99	99 040 042
		99	99 040 057

A u t o m o t	DO i v e		Techincal Bulletin No. TB-333 007
Product: Tachometer	Description	ERRATIC OPERATION	Date Aug 03
Electrical			1
To Red	uce or Elir	minate Erratic Operation in Tach	nometers

- 1. Purchase diode #1N4005 from your local electronics store.
- 2. Cut both ends of the diode so each is approx. 3/ 4" long.
- 3. Crimp a 1/4" female spade connector on the end of the diode with the silver band.
- 4. Crimp a butt-splice connector on the other end of the diode.
- 5. Crimp the opposite end of the butt-splice connector to the wire connected to ignition signal source.
- 6. Connect 1/ 4" female spade connector used in step # 3 above to terminal # 4 on the back of the tachometer.
- 7. Connect a ground (-) wire to terminal # 3.
- 8. Connect a switched 12-volt power wire to terminal # 2.
- 9. Set switches for the appropriate number of cylinders.

Automotive

Techincal Bulletin No. TB-333 003

Tachometer	
	Aug 05
Type: FORMULA CALCULATION	Issue
Electrical	1

Formula for determining number of pulses to set on the Tachometer (with engine hour-meter) fitted with Alternator

Divide the **diameter of the Crankshaft Pulley** by the **diameter of the Alternator Pulley.** Multiply this number times **one-half the number of poles on the alternator.** (14 pole alternators = 7, 12 pole alternators = 6, etc.)

This total gives you the number of pulses per revolutions.

Use this number to determine dip switch settings as shown in the table on Page 2 of the instruction sheet.





Wiring of Sender to Speedo:

Red on sender to terminal #2 on speedo Black on sender to terminal #3 and ground (important) Off-white on sender to terminals #6 and #8 Keyed Power of 12volts to term #4

Testing Hall Effect Sender and Wiring:

- Turn ignition key "ON". Put red lead of a voltmeter to term #2 of the speedometer and black lead to term #3. You should have approx. 5volts dc.
- With the key "ON", leave the black lead of the voltmeter on term #3 and put the red lead on term #8. Remove the sender from the transmission with the <u>square drive</u> key in place in the sender. Rotate the square drive shaft key in either direction very slowly with your fingers. You should see the voltmeter pulse from 0-4 volts dc (0-4-0-4-0). If it pulses, the sender is working properly.
- If the voltmeter stays a constant 5 volts dc, the sender is defective.

Programming the Speedo:

- Mark a measured mile with another vehicle by spraying a paint line on the side of the road, drive 1 mile and spray another paint line on the side of the road.
- Hold the black button "in" on front of speedometer while starting the vehicle. Once the vehicle is started release the button.
- Now using the button on the front of the speedometer, push and scroll until it says "AUtOCI". Then wait a few seconds and the word "bUttOn" will appear on the display.
- Drive to your first mile marker at this point. Your speedo will not work in this mode. At your first mile marker, press the button on the front of the speedo. The word "StArt" will appear. Start driving until you reach your next mile marker, press the button. You are finished and the speed as well as odometer will be calibrated.
- If you change gearing or tire sizes in the vehicle at any time repeat the process for re-calibration of the speedometer.

S	IE	M	IE	NS	5 \	V		C	D
Α	u	t	0	m	0	t	i	v	е

Techincal Bulletin No. TB-350 001

-		Descrip	tion							Date	
sure Gaug	е	Resistance Chart								locus	Oct 04
Electrical										ISSUE	1
MEASURING		E: 80 PS		40	50 00	70	10	- 192 OI	HMS	REVISIO	N 'B' (APR '95)
PSI	0 10	20	- 30	40	50 60	70	80			DIAL 999	040 007
	10 36 NUMBE	61 R: 999 (84 010 009	108	132 156	179	192			999	9 040 030
MEASURING							10 - 1		19	PEV/ISIO	N 'B' (APP '95)
BAR	0 1	2	3	4	5					NE VIOIO	U (A R 33)
0	10 48	82	116	151	184						
MOVEMENT	NUMBE	R:								REFERE	NCE
MEASURING	RANG	E: 80 PS	51				240 -	33.5 OI	HMS	REVISIO	N 'B' (APR '95)
PSI	0 10	20	30	40	50 60	70	80			DIAL 999	040 006
	240 190 NUMBE	3 153 R: 999 (125	103	87 67	50	33.5			999	9 040 028
		- 050 C		,		_	0.10	00 5 0			
BAR	0 1	<u>- SEC</u> 2	3	4 4	LE: 5 BA 5	х	240 -	33.5 0	HMS	REVISIO	N 'B' (APR '95)
0 2	240 17	5 128	97	71	46						
0 2 MOVEMENT	240 175 NUMBE	5 128 R:	97	71	46					REFERE	NCE
O 2 MOVEMENT	240 179 NUMBE	5 128 R:	97	71	46					REFERE	NCE
O 2 MOVEMENT	240 175 NUMBE	5 128 R: : 5 BAR	97	71	46		10	-180 OI	HMS	REFERE	NCE N 'B' (APR '95)
O 2 MOVEMENT MEASURING BAR	240 175 NUMBE	5 128 R: 5 BAR 5 1	97 2 1.5	2	462.5 3	3.5	10 4	-180 OI 4.5	HMS 5	REFEREI REVISIO	NCE N 'B' (APR '95) 9 040 003
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O 2 MOVEMENT	240 173 NUMBE	5 128 R: 5 BAR 5 1 48 R: 999 (97 1.5 65 010 009	2 82	46 2.5 3 99 116	3.5	10 4 151	-180 O 4.5 168	HMS 5 184	REFERE REVISIO DIAL 998 999	NCE N 'B' (APR '95) 9 040 003 9 040 026
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Automotive

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0	10	36	66	82	103	125	141	161	184			999 040 0
MOVEMEN	NT NU	MBER	999 0	10 009	9							
												-
MEASURI	NG RA	NGE -	SECO	ONDAF	RY SC/	ALE: 2	5 BAR		10 - 1	84 OH	IMS	REVISION 'B' (A
BAR	0	5	10	15	20	25						
0	10	50	69	110	136	169						
MOVEMEN	NT NU	MBER	999 0	10 008	8							REFERENCE

10 - 184 OHMS

400

0	240	162	125	96	67	37				
NOVEMEN	NT NU	MBER:	: 999 0	010 003	3					
VEASURI	NG RA	NGE -	10 BA	AR					10 -	-180 C
MEASURII BAR	NG RA 0	NGE - 1	10 BA	AR 3	4	5	6	7	10 - 8	180 C
MEASURII BAR	NG RA 0	NGE - 1	10 BA	AR 3	4	5	6	7	10 - 8	180 C 9

MOVEMENT NUMBER: 999 010 009

MEASURING RANGE: 150 PS

0

10

10 20

40

 MEASURING RANGE - SECONDARY SCALE: 10 BAR

 BAR
 0
 2
 4
 6
 8
 10

26

PSI

0

MEASURING RANGE: SECONDARY SCALE: 150 PSI 10 -180 O										OHMS		
PSI	0	30	60	90	120	150						
0	10	55	90	127	162	189						
MOVEMEN	MOVEMENT NUMBER:											

MEASURI	NG RA	NGE:	25 BA	R					10 -	- 180 C	HMS
BAR	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25
0	10	32	53	73	92	101	125	143	155	169	184

50 100 150 200 250 300 350

MOVEMENT NUMBER: 999 010 009

MEASURING RANGE: 400 PSI

0

PSI

0	10	55	90	127	162	189					
MOVEMEN	NT NU	MBER:									
MEASURI	NG RA	NGE:	25 BAI	R					10 -	- 180 C	OHMS
BAR	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25

HMS 10

MOVEME	NT NU	MBER	: 999 (010 00	9						
MEASURI	NG RA	NGE -	10 B	AR				10-1	89.50	HMS	REVISION
BAR	0	2	4	6	8	10					
0	10	52	88	124	155	184					
			_						_		

80 90 100 110

240 - 33.5 OHMS

184

103 115 127 138 149 160

	v	-		Ŭ	0	10			
	10	52	88	124	155	184			
EN	IT NU	MBER:							

MEASURING RANGE: 150 PS 240 - 33.5 OHMS PSI 15 30 60 75 90 105 120 135 0 45 150 0 240 188 160 138 121 103 92 76 60 46 33.5 MOVEMENT NUMBER: 999 010 003

40

67 78 90.5

50 60 70

30

53

BAR	0	2	4	6	8	10			
0	10	52	88	124	155	184			
MOVEME	NT NU	MBER:							REFER

N 'B' (APR '95)

169

10-189.5 OHMS

150

140

178 189.5

RENCE

120 130

REVISION 'B' (APR '95)

DIAL 999 040 043 999 040 053

REFERENCE

REVISION 'B' (APR '95)

DIAL 999 040 004 999 040 027 999 040 049

999 040 058 REVISION 'B' (APR '95)

REFERENCE

REVISION 'D' (APR '95)

DIAL 999 040 005

REVISION 'B' (APR '95)

DIAL 999 040 010 999 040 033

APR '95)

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REVISION 'B' (APR '95)

DIAL NUMBER: 999 040 009 999 040 032



Deadurat		Data
Product:	Description	Date
Programmable	Oslikustisu Osisla	Oct 04
Speedometer	Calibration Guide	
Туре:		Issue
Electrical		1

Calibration of the **VDO Programmable Speedometer** is a relatively simple procedure. To Calibration:

1. Your vehicle must be driven over a 1 mile markers or between a 1 mile course – either between highway mile makers or between a 1 mile stretch that you mark off with your family car.

1Mile





- 2. Bring your vehicle to the beginning of the 1 mile course and shut off your ignition.
- 3. Hold in the odometer trip button and while holding it in, restart your engine.





- 4. The odometer window should say "AUTOCL". If it doesn't it will read "PULSE" or "ADJUST", as shown at left. If it reads "PULSE" or "ADJUST", hold in the button until "AUTOCL" appears in the window and then release the button.
- 5. In about 3 seconds, the word "AUTOCL" disappears and the word "BUTTON" appears.
- 6. Push the button again.
- 7. The word "BUTTON" disappears and the word "START" appears and flashes
- 8. Start driving toward the next mile or the end of your marked course. You may drive at any speed you like. The word "START" will continue to flash and the pointer will stay on "0".
- At the next mile marker or the end of the mile course, stop your vehicle.
 DO NOT SHUT OFF YOUR ENGINE!
- 10. Push the button again.
- 11. The odometer window will show "P" with numbers after it. These are the pulses the sender produced over the mile you just drove.
- 12. The window will then switch to either the odometer reading or the trip odometer reading. You are finished calibrating your VDO Programmable speedometer.
- 13. To switch between the odometer and trip odometer, simply push the button.
- 14. To zero out the trip reading, hold the button for about 2 or 3 seconds.





Product: Description

m 0

	Speedometer
Type:	

Electrical

CALIBRATION PROGRAM

Date Aug 03 Issue

1

CALIBRATION PROGRAM FOR HALL EFFECT SENDER

In Parameters Are The Following:

- Tire Diameter X 3.14159 = Tire Circumference
- Tire Circumference / 12 = Tire Circumference in feet
- > 5280' / Tire Circumference in feet = Tire Revolutions per Mile
- Tire Revolutions per Mile X Rear End Ratio (411 rear enter as 4.11) Pulse
- Pulse X (Drive Gear or Driven Gear) X 16 Pulse per Revolution Sender = Pulse per Mile

Computation Results:

Computed Driven Gear is 39776 Ratio of Driven over Drive Gear is 2486.0

Engine	No. of pulses per mile
Transmission	Known:
	16 pulse/rev.
	Tire Diameter
	Rear End Ratio
Rear	1 mile = 5280 feet
X= Tire Diameter	



Example:

Tire circumference = 2**?** R R = Diameter / 2 = 28.88 / 14.44 $= 2 \times ? \times 14.44 = 90.73$ inches / 12 inches = 7.56 feet So \dots 1 tire revolution = 7.56 feet of travel \dots

How many revolutions (tire) to go 1 mile ? 5280 feet / 7.56 feet = 698 revolution Rear end ratio = 3:55:1

3:55? 1 2479? 698 2479 = revolution at transmission 2479 revolutions x 16 pulses (Teeth) / revolution = 39669 pulses. Automotive

Techincal Bulletin

Automotive

No. TP- 310 001

Product:	Description	Date
Temperature Gauge	Testing Cylinder Head Temperature	Jan 04
Туре:		Issue
Electrical		1

Gauge Testing

- 1) Turn power supply to millivolts (mV)
- 2) Hook the red lead of the generator to the positive (+) terminal of the gauge.
- **3)** Hook the black lead of the generator to the negative (-) terminal of the gauge
- 4) Increase the millivolts (mV) to see the needle increase on the gauge
- 5) If the gauge needle does not move, the gauge is defective

Techincal Bulletin

No. TP- 323 001

Automotive

Product:	Description	Date
Sender	CYLINDER HEAD TEMPERATURE	Jan 04
Туре:		Issue
Electrical		1

Sender Testing

- 1) Turn voltmeter to millivolts (mV)
- 2) Hook the red lead of the voltmeter to the black lead of the thermocouple.
- 3) Take the black lead of the voltmeter to the red lead of the thermocouple.
- 4) Take a flame to heat up the thermocouple at the compression ring.
- 5) The voltmeter should start to rise. If not the thermocouple is bad.



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Product:	Description	Date
Tachometer	GENERATOR SENDER TESTING	Sept 03
Туре:		Issue
Electrical		1

Resistance Testing Generator Sender

- Unplug sender wires from the back of the tachometer.
- Using an ohm meter, check the resistance of the sender by connecting across the two wires.
 - 1. The sender should produce a resistance of 50 ohms. If not, re-test at the sender terminals.
 - 2. If reading is 50 ohms at the sender, the fault is in the vehicles wiring.
 - 3. If reading is less than or greater than 50 ohms, replace the sender. Continue on with function test.

Function Testing Generator Sender

- Unplug sender wires from the back of the tachometer. Start the vehicle and run at 1000 rpm. Measure output AC voltage across sender wires.
 - 1. A nominal voltage of 10 volts RMS should be obtained. If not, remove the sender terminals.
 - 2. If reading is 10 volts RMS at the sender, the fault is in the vehicles wiring.
 - 3. If reading is OK, fault is in the vehicles wiring.
 - 4. If reading is below 10 volts RMS, replace the sender.
- **NOTE:** WHEN FUNCTION TESTING, BEAWARE THAT THIS IS ASSUMED TO BE ON AN APPLICATION OF 1:1 RATIO OF ENGINE GRANKSHAFT SPEED. SENDERS RUNNING OFF THE CAM SHAFT MUST BE TESTED AT 2000 RPM. ALSO INCREASE OR LOWER ENGINE SPEED ACCORDINGLY IF USED IN CONJUNCTION WITH SPEED REDUCERS OR RATIO ADAPTERS.

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