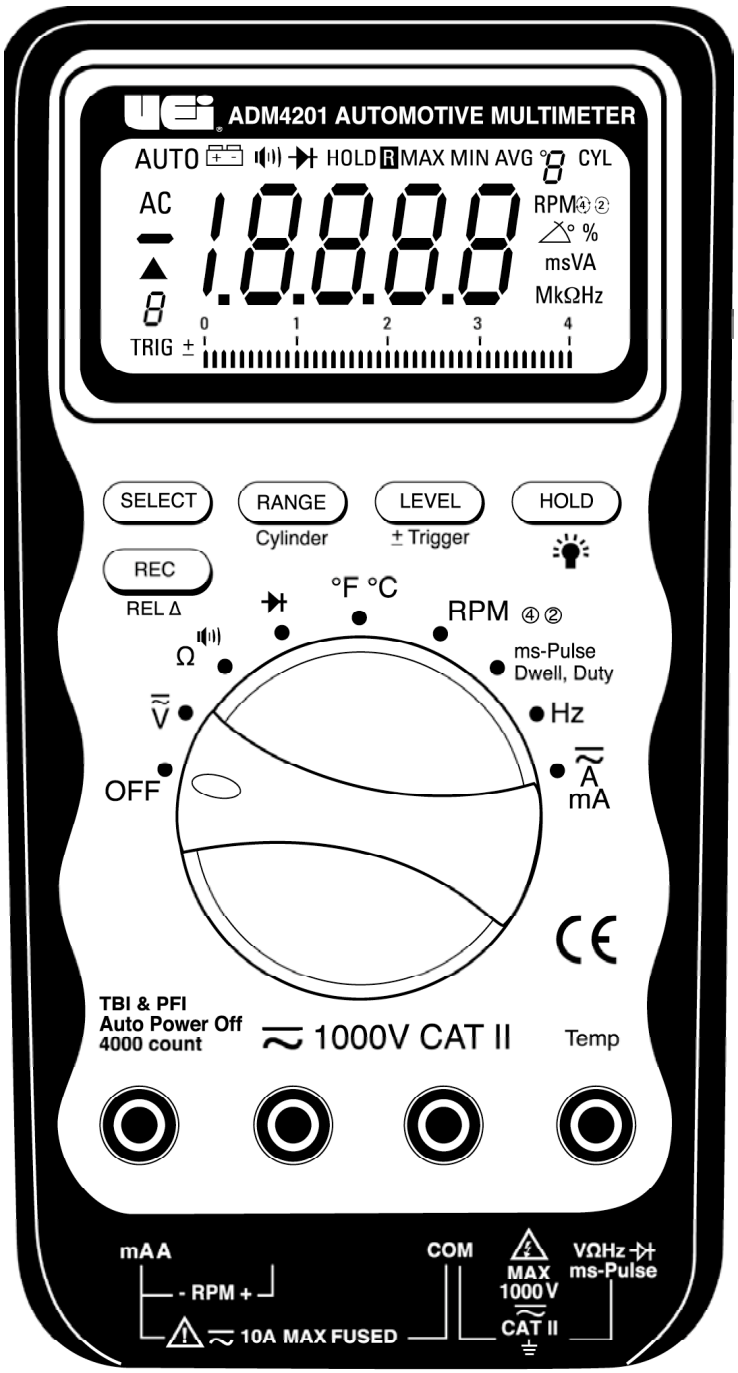
UEi Automotive

INSTRUCTION MANUAL

ADM4201

Digital Multimeter



1-800-547-5740 • Fax: (503) 643-6322

www.ueiautomotive.com • email: info@ueitest.com

Introduction

The ADM5201 is a handheld battery operated professional automotive multimeter designed to provide trouble shooting solutions to the most difficult problems encountered in today's sophisticated automotive electronic systems. The ADM4201 has a bright LED backlight. A battery access door allows users to replace the battery and fuse without breaking calibration seals! High impact over-molded case absorbs shock over more of the case than a conventional rubber boot design.

Features include

- Accurate RPM measurement for 2 and 4 stroke automotive engines with 1 to 8 cylinders using the inductive pickup
- ms-pulse Width function to test on-time of both PFI type and TBI type fuel injectors
- Duty Cycle and direct DWELL reading
- 4 step adjustable triggers on 1 to 8 cylinders
- Temperature measurement up to 2,498˚F or 1,370˚C
- 3-3/4 digit, 4,000 count display with bar-graph (Frequency range: 99,999 counts)
- Backlit display
- Auto power off
- High impact over-molded case
- CE-mark
- IEC 1010.1-92, CAT II 1000 V rating

Safety Notes

Before using this meter, read all safety information carefully. In this manual the word **"WARNING"** is used to indicate conditions or actions that may pose physical hazards to the user. The word **"CAUTION"** is used to indicate conditions or actions that may damage this instrument.

WARNING!

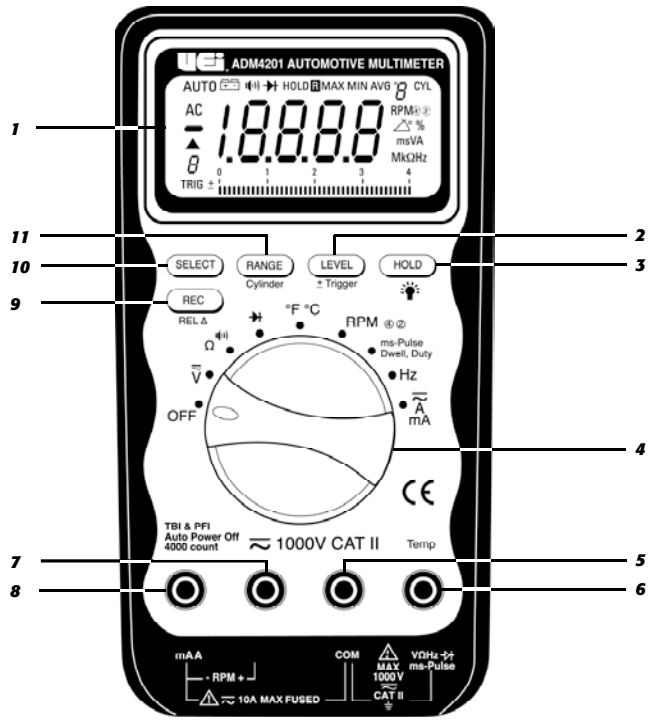
Exceeding the specified limits of this meter is dangerous and can expose the user to serious or possibly fatal injury.

- **DO NOT** attempt to measure any voltage that exceeds 600 volts with this meter - UEi offers numerous alternatives for measuring high voltage and current
- Voltages above 600 volts DC or 25 volts AC may constitute a serious shock hazard
- **DO NOT** attempt to use this meter if either the meter or the test leads have been damaged. Send unit in for repair by a qualified repair facility
- Test leads must be fully inserted prior to taking measurements
- Never attempt a voltage measurement with the test leads inserted into the "**A**" terminal and the "**COM**" terminal - The "**A**" terminal is protected by a fuse. You might be injured or damage the meter
- Always disconnect the live test lead before disconnecting the common test lead from a circuit
- Turn the engine off before connecting or disconnecting inductive pickup to avoid a shock.
- Disconnect the test leads from the test points before changing functions to avoid damaging the meter when testing above 350V AC
- Choose the proper range and function for the measurement - Always set the meter to the highest range and work downward for an unknown value if you are using manual ranging mode
- Do not try voltage or current measurements that may exceed the ratings marked on the input limit for switch or terminal
- Use current probes to measure circuits exceeding 10A
- Disconnect the "**LIVE**" test lead before disconnecting the "**COMMON**" test lead
- Do not test a recently recharged lead-acid battery
- Disconnect the power and discharge all high-voltage capacitors before testing in the resistance, continuity, and diode functions
- If the engine has been running, do not place the meter and its accessories near the engine or the exhaust manifold which might be hot and can damage the meter
- If any of the following indications occur during testing, turn off the power source to the circuit under test:
  - Arcing
  - Flame
  - Smoke
  - Extreme Heat
  - Smell of Burning Materials
  - Discoloration or Melting of Components
- Read the safety precautions associated with the equipment being tested and seek assistance or advice when performing unfamiliar tasks.
- Keep your fingers away from the test lead metal probe contacts and bus-bars when making measurements. Always grip the instrument and test-leads behind the hand guards (molded into the probes).
- In the event of electrical shock, ALWAYS bring the victim to the emergency room for evaluation, regardless of the victim's apparent recovery. Electrical shock can cause an unstable heart rhythm that may need medical attention.

International Symbols

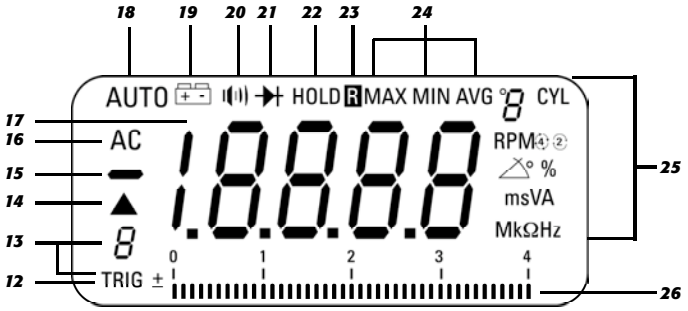
Dangerous Voltage	Ground
AC Alternating Current	Warning or Caution
DC Direct Current	Double Insulation (Protection Class II)
Either AC or DC	Fuse
Not Applicable to Identified Model	Battery

Controls and Indicators



1. **LCD Display:** 3-3/4 digit, 4000 count display with bar-graph.
2. **LEVEL Push-button:** Press this push-button momentarily to select trigger levels. Press this push-button for more than 1 second to toggle between positive and negative trigger slopes.
3. **HOLD Push-button:** Press this push-button momentarily to activate "**HOLD**" for simply freezing a reading. Press this push-button for more than 1 second to turn the LCD backlight on.
4. **SELECTOR:** Turn the power ON/OFF and select a function.
5. **COM:** Common (ground reference) input terminal for all functions except RPM functions.
6. **VΩHz →\|, ms-Pulse & Temp:** Input terminal for all functions except current and RPM functions.
7. **RPM +:** Input terminal (+) for RPM function.
8. **mA A/RPM-:** Input terminal (+) for mA A functions. Ground reference (-) input terminal for RPM function.
9. **REC Push-button:** Press this push-button momentarily to activate "**Record**" function. Press this push-button for more than 1 second to select "**Relative Zero**".
10. **SELECT Push-button:** Press this push-button momentarily to select (blue colored around selector) secondary functions.
11. **RANGE Push-button:** Press this push-button momentarily to select ranges in the manual ranging mode of most functions or number of cylinders on "**Dwell**" function. Press this push-button momentarily to toggle between the "**PFI**" mode and the "**TBI**" mode when measuring on-time of fuel injectors. Press this push-button for more than 1 second to toggle "**Auto/Manual**" ranging in most functions.

LCD Display Functional Description



12. **TRIG ±:** These annunciators indicate that positive (+) or negative (-) "**Trigger Slope**" is selected.
13. **8 TRIG:** These annunciators indicate trigger level status.
14. ▲**:** This symbol indicates the "**Relative**" function is activated.
15. **▬:** This symbol indicates "**Negative Polarity**".
16. **AC:** AC annunciator indicates alternating current is selected.
17. **DATA:** Digital readings of data being measured.
18. **AUTO:** This annunciator indicates "**Autoranging**".
19. **+ -:** Low battery alert. Replace the battery as soon as possible to ensure accuracy.
20. **•)):** This symbol indicates the "**Continuity Test**" function is selected.
21. **→\|:** This symbol indicates the "**Diode Test**" function is selected.
22. **HOLD:** This annunciator indicates the "**Hold**" function is activated.
23. **R:** This annunciator indicates the "**Record**" function is activated.
24. **MIN/MAX/AVG:** These annunciators indicate Minimum, Maximum and Average reading is being displayed.
25. **°8 CYL...:** These annunciators indicate the function being selected and/or the appropriate measurement units.
26. **0 4:** Analog bar-graph with scale.

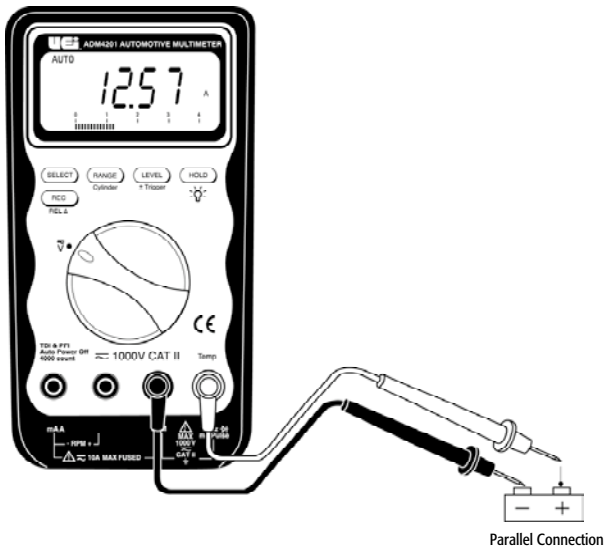
Operating Instructions

Measuring Voltage (V)

To measure DC or AC volts:

1. Set rotary selector to "$\tilde{\overline{V}}$" position. The meter defaults at DC.
2. Press the "**SELECT**" push-button momentarily to select AC, if required.
3. Insert red lead into "**V**" terminal and black lead into "**COM**" terminal.
4. Touch black probe to ground or negative side of the circuit and touch red probe to positive side of the circuit coming from the power source (Fig 1).
   NOTE: *Voltage must be measured in parallel (red probe measuring circuit from power source).*

The analog bar graph is easier to read when the data causes the digital display to rapidly change. It is also useful for trend setting or directional data.



(Fig 1)

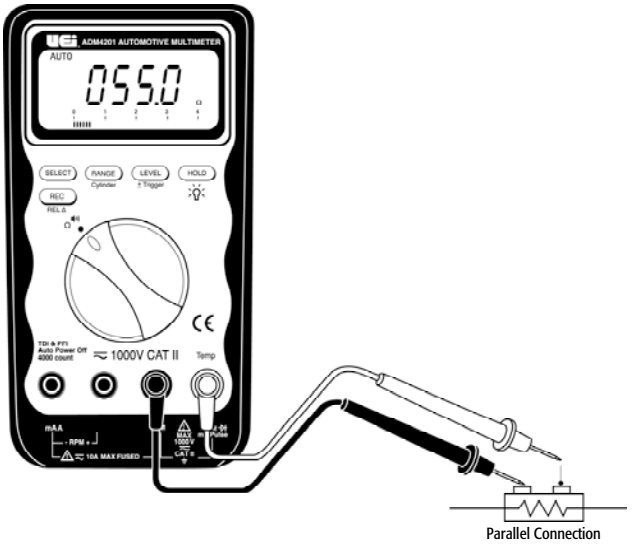
Measuring Resistance (Ω)

CAUTION!

Turn off power and discharge all capacitors on circuit to be tested before attempting in circuit resistance measurements. Accurate measurement is not possible if external or residual voltage is present.

To measure Resistance:

1. Set rotary selector to "Ω •))) " position. The meter defaults at Ω function. "OFL" is displayed.
2. Insert black lead into "**COM**" terminal and red lead into "**Ω**" terminal.
3. Touch the test lead probes across the resistance or circuit to be tested (Fig 2).
   NOTE: *The resistance in the test leads can affect accuracy in the 400Ω range. Short the leads together and press the "**REL▲**" push-button to automatically subtract the test lead resistance from the measured resistance.*



(Fig 2)

Measuring Continuity (•)))

CAUTION!

Turn off power off on the test circuit. A beeper tone does not necessarily mean zero resistance.

To measure Continuity:

1. Set rotary selector to "Ω •))) " position.
2. Press the "**SELECT**" push-button to select "**Continuity**" function. "OFL" is displayed.
3. Insert black lead into "**COM**" terminal and red lead into "**Ω**" terminal.
4. Touch the test lead probes across the device being tested (Fig 3).

If the resistance of the device is more than 50Ω, there is a continuous beep tone.

If the resistance of the device is more than 50Ω, there is no beep tone.

This is useful for checking wiring connections and operation of switches.

(Fig 3)

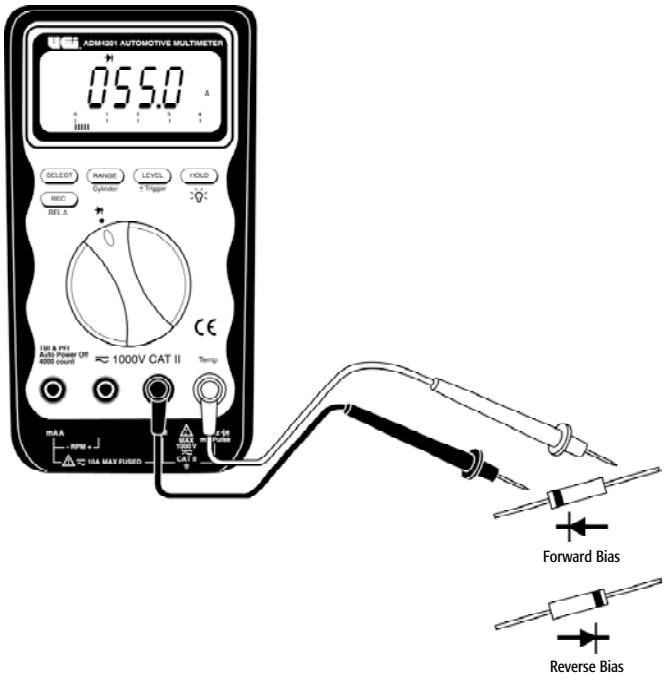
Measuring Diode Test (→|)

CAUTION!

Turn off power off on the test circuit.

To perform Diode test:

1. Set rotary selector to "→|" position. "OFL" is displayed.
2. Connect the test leads as shown and observe the digital display. Normal forward voltage drop (forward biased) for a good silicon diode is between 0.4V to 0.9V. A reading higher than that indicates a leaky diode (defective). A zero reading indicates a shorted diode (defective). An "OFL" indicates an open diode (defective) (Fig 4).
3. Reverse the test leads connections (reverse biased) across the diode.
4. The primary display shows "OFL" if the diode is good. Any other readings indicate the diode is resistive or shorted (defective).



(Fig 4)

Use the table to determine if the diode is good or bad.

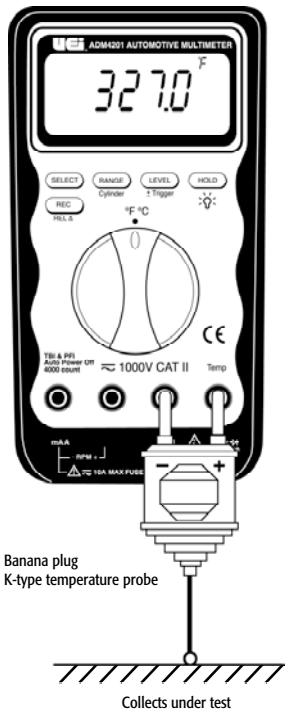
Diode	Forward Bias (→|)	Reverse Bias (|←)
Good	0.4V to 0.9V	OFL
	OFL	0.4V to 0.9V
Bad	OFL	1.0V to 3.0V
	1.0V to 3.0V	OFL
	0.4V to 0.9V	0.4V to 0.9V
	OFL	OFL
	0.000V	0.000V

Measuring Temperature (˚F/˚C)

To measure Temperature:

1. Set rotary selector to "**°F/°C**" position. The meter defaults at "**°F**". "OFL" is displayed with LCD annunciators ˚F turned on. If required, press the "**SELECT**" push-button to select "**°C**" function.
2. Insert banana plug K-type temperature bead probe with correct +/- polarities. You can also use a thermocouple probe adapter (optional accessory) to adapt other standard K-type temperature probes (Fig 5).
3. Touch the end of the thermocouple probe to the measurement point and read the digital display with ˚F or ˚C.

NOTE: *The measured temperature is displayed with 0.1˚F (0.1˚C) resolution up to 400˚F (400˚C) and with 1˚F (1˚C) resolution up to 2,498˚F (1,370˚C) from 401˚F (401˚C).*



(Fig 5)

RPM

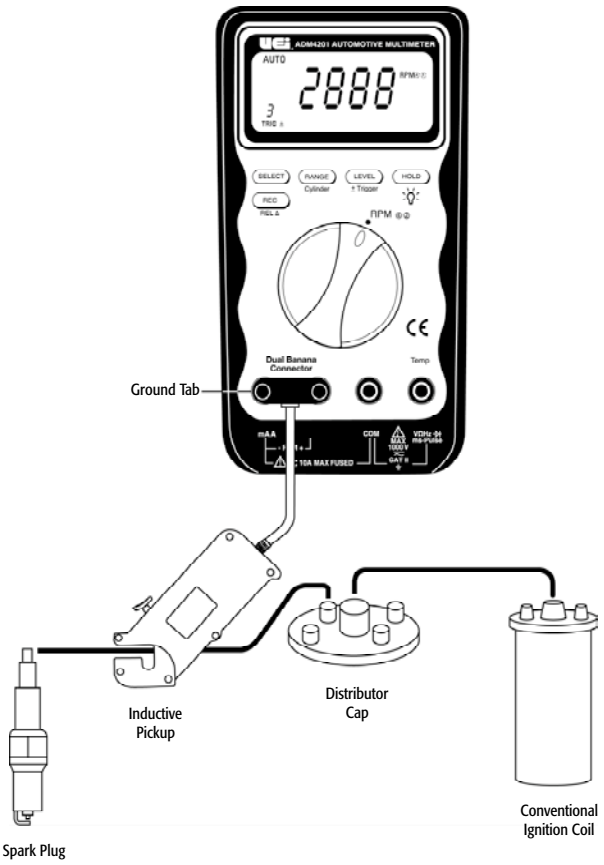
WARNING!

*Be sure the inductive pickup is in the terminals marked "**- RPM +**" when measuring RPM's. If the pickup is in the wrong terminal, personal injury or meter damage may occur.*

The ignition system can generate a potential shock hazard. Ensure that the engine is off before connecting or removing the inductive pickup.

To perform Diode test:

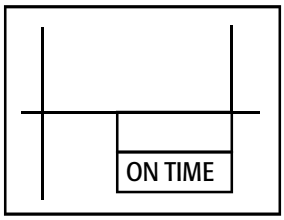
1. Set rotary selector to "**RPM** ④ ② " position. The meter defaults at ³ TRIG (trigger) level.
2. Press the "**SELECT**" push-button to toggle between "**RPM** ④ " for 4-stroke engine and "**RPM** ② " for 2-stroke and DIS engine.
3. Insert the dual banana connector into the "**RPM -**" and the "**RPM +**" input terminals. Ensure the plug with the ground tab goes into the "**RPM -**" terminal (Fig 6).
4. Clamp the inductive pickup to a spark plug wire with the arrow sign facing the spark plug as shown. Ensure the pickup jaws are completely closed.
5. Read RPM in the primary display.



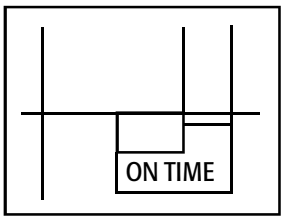
(Fig 6)

Fuel Injection On Time

This function applies to both Port Fuel Injectors (PFI) which operate with a single On Time pulse and Throttle Body Injectors (TBI) which operate with twin pulses.



Port Fuel Injection Waveform



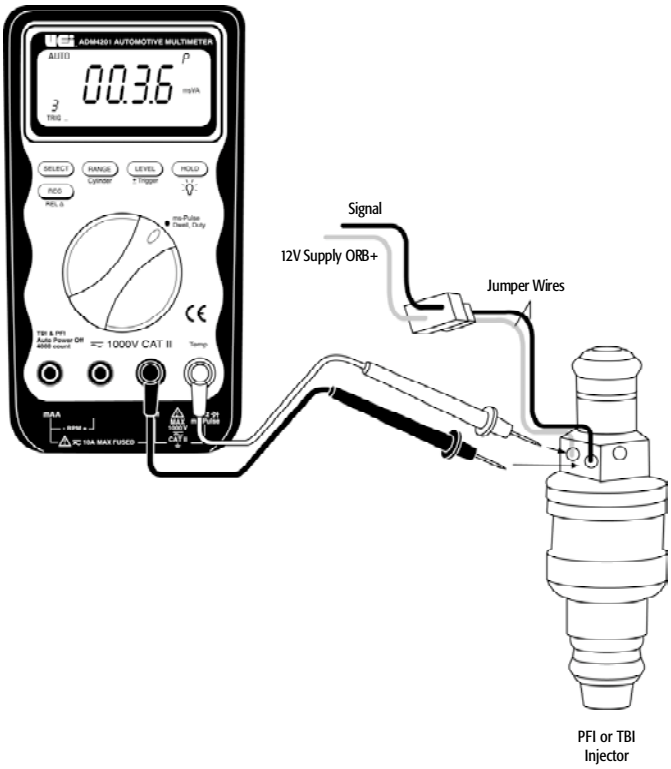
Port Body Injection Waveform

1. Set rotary selector to "**ms-Pulse, Dwell, Duty**" position.

   The meter defaults at ms-Pulse with -TRIG 1 2 3 level in the "**PFI**" mode ("**P**" appears in the display).

   Press the "**RANGE**" push-button to toggle between the "**PFI**" and the "**TBI**" mode ("**E**" appears in the display).

   4 trigger levels (-TRIG 1 2 3 ➔ -TRIG 1 2 ➔ -TRIG 1 ➔ -TRIG 1 2 3 4) are selectable by pressing "LEVEL" push-button momentarily in this function.
2. Insert black lead into "**COM**" terminal and red lead into "**ms(-Pulse)**" terminal.
3. Connect the test leads as shown and read "**On Time**" in the primary display (Fig 7).

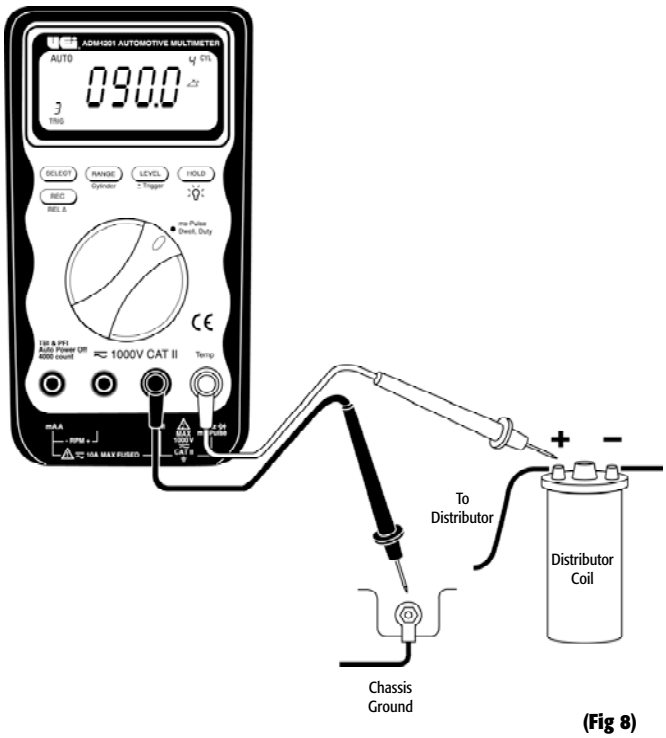


(Fig 7)

Dwell

1. Set rotary selector to "**ms-Pulse, Dwell, Duty**" position.
2. Press the "**SELECT**" push-button to select "**DWELL**" function. The meter defaults at 4 cylinders (4 CYL). Press the "**RANGE**" (Cylinder) button momentarily and repeatedly to select the required number of cylinder and display the cylinder setting at the upper right corner.
3. Insert black lead into "**COM**" terminal and red lead into "**ms(-Pulse)**" terminal.
4. Connect the test leads as shown and read Dwell angle. Adjust trigger levels by pressing the "**LEVEL**" push-button momentarily, if necessary (Fig 8).
5. Press the "**SELECT**" push-button momentarily to display Dwell reading in terms of percentage if required.
6. Adjust the Dwell angle according to the procedures outlined in your vehicle service manual.

NOTE: *Recheck the timing whenever the Dwell angle has been adjusted.*

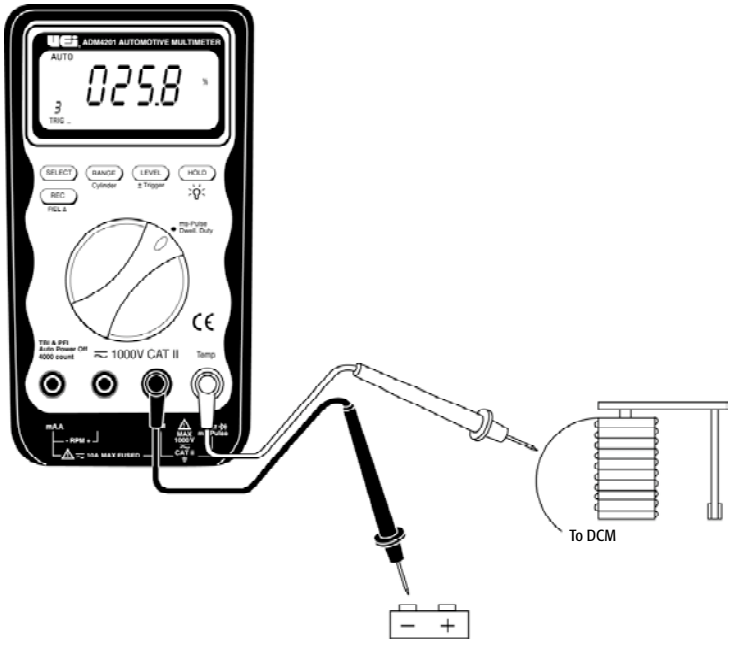


(Fig 8)

Duty Cycle

1. Set rotary selector to "**ms-Pulse, Dwell, Duty**" position.
2. Press the "**SELECT**" push-button twice to select "DUTY" function.
3. Insert black lead into "**COM**" terminal and red lead into "**ms(-Pulse)**" terminal.
4. Connect the test leads as shown and read the Duty Cycle percentage. Adjust trigger levels by pressing the "**LEVEL**" push-button momentarily, if necessary (Fig 9).
5. Press the "**SELECT**" push-button or 3 momentarily to display "**Duty Cycle**" reading in terms of ms (Pulse Width) or (Dwell) angle if required.

In most applications, the negative trigger slope is assigned to display the percentage of time that the plunger is in the closed position (low duty cycle) during one duty cycle. The positive slop is assigned to display the percentage of time that the plunger is in the open position. Refer to the car's service manual to verify slope assigned to position for each component. Press the "**LEVEL**" (±Trigger) push-button for more than 1 second to toggle between the negative (-) slope and the positive (+) slope, if required.

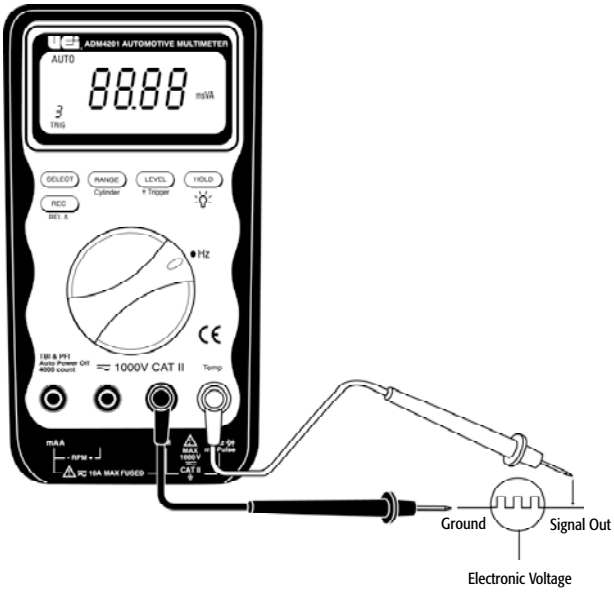


(Fig 9)

Frequency (Hz)

1. Set rotary selector to "**Hz**" position.
2. Insert black lead into "**COM**" terminal and red lead into "**ms(-Pulse)**" terminal.
3. Touch black probe to ground and touch red probe to the "**Signal out**" wire on the sensor (Fig 10).

   Adjust trigger levels by pressing the "**LEVEL**" push-button momentarily, if necessary.



(Fig 10)

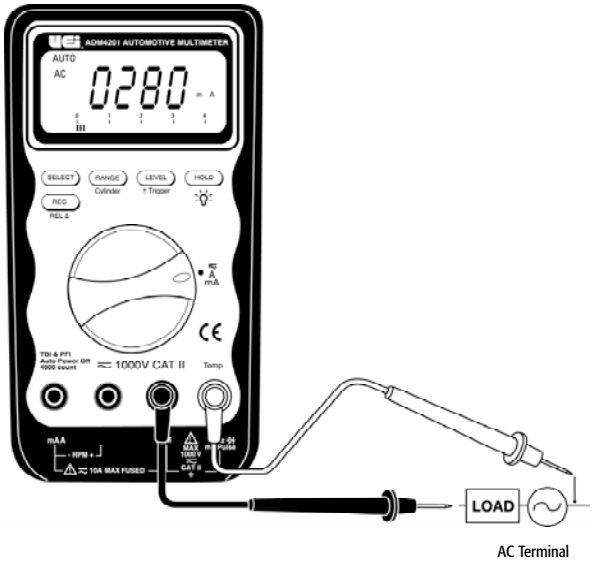
AC or DC Current ($\widetilde{\overline{A}}$)

WARNING!

Do not measure any circuit that draws more than the current rating of the installed fuse. Replace the defective fuse with a proper fuse only. Failure to do this may result in injury or damage to the meter. Do not attempt current measurements where the open circuit voltage is above 600V.

For measuring circuits of more than 10A, use voltage output current clamp adapters compatible with the meter voltage functions.

1. Set rotary selector to " $\widetilde{\overline{A}}$ mA " position. The meter defaults at DC current.
2. Press the "**LEVEL**" push-button to select AC.
3. Insert black lead into "**COM**" terminal and red lead into "**mA A**" terminal.
4. Connect red lead probe to the side of the circuit closest to the power source (Fig 11).
5. Connect black lead probe to the side of the circuit closest to ground.
6. Turn the power ON and test. **DO NOT** crank the engine.



(Fig 11)

Manual and Auto Ranging
Press the "**RANGE**" push-button momentarily to select manual ranging, and the meter will remain in the range it was with LCD annunciator "**AUTO**" turned off. Press this button momentarily again to step through the ranges. Press this button for more than 1 second to resume autoranging.

In Dwell "∠°" function, press the "**RANGE**" (Cylinder) push-button momentarily to display the cylinder setting at the upper right corner of the LCD. Defaults is "**4 CYL**" (4 Cylinder). Press this button momentarily again to select the number of cylinders from 1 through 8 (1, 2, 3, 4, 5, 6 and 8 cylinders) to match the engine under test.

Record Mode (R)
Press the "**REC**" push-button momentarily to activate record mode with LCD annunciators "**R MIN MAX AVG**" turned on. The meter beeps when new maximum or minimum reading is updated. Press this button momentarily to read throughout the Minimum (MIN), Maximum (MAX) and Average (AVG) readings. Press this button for more than 1 second to exit the "**Record**" mode.

Relative Mode (Δ)
Press the "**REC**" (RELΔ) push-button for more than 1 second to select the "**Relative Zero**" (Δ) mode with annunciator Δ turned on.

This feature allows the user to offset the measured value with a relative reference value. Press the "**REC**" (RELΔ) push-button for more than 1 second to exit the "**Relative**" mode and resume normal measurements.

RPM ④ ② Selection
In the "**RPM**" function, the meter defaults to RPM④ for conventional 4-stroke engine. Press the "**SELECT**" push-button momentarily to toggle to "**RPM④**" for DIS or 2-stroke engine.

Trigger Level and ± Trigger Slop Selection
This feature is available for Hz, RPM, Dwell, ms-Pulse, or Duty function. The meter is set at selected trigger level as power up default in individual function as follows:

Functions	Default Trigger Level
Hz, RPM	$^{3}_{TRIG}$ + (= + TRIG 1 2 3)
Dwell, ms-Pulse, Duty	$^{3}_{TRIG}$ - (= - TRIG 1 2 3)

However, car signal levels under test may vary due to aging of components, abnormal conditions, and each car manufacturer's different design. Therefore, positive and/or negative 4 selectable trigger levels, which are carefully designed and tested to cover all the extreme conditions, are available in these functions to provide more flexibility to cope with your applications.

If your reading is unstable, select lower sensitivities (high trigger level number) by pressing the "**LEVEL**" push-button momentarily.

If your reading shows zero, select higher sensitivities (lower trigger level number).

The 4 selectable trigger levels are cycled through as follows:

- Hz, RPM:
  $\rightarrow {}^{3}_{TRIG}\text{+(= +TRIG 1 2 3)} \rightarrow {}^{2}_{TRIG}\text{+(= +TRIG 1 2)} \rightarrow {}^{1}_{TRIG}\text{+(= +TRIG 1)} \rightarrow {}^{4}_{TRIG}\text{+(= +TRIG 1 2 3 4)}$
- Dwell, ms-Pulse, Duty:
  $\rightarrow {}^{3}_{TRIG}\text{-(= -TRIG 1 2 3)} \rightarrow {}^{2}_{TRIG}\text{-(= -TRIG 1 2)} \rightarrow {}^{1}_{TRIG}\text{-(= -TRIG 1)} \rightarrow {}^{4}_{TRIG}\text{-(= -TRIG 1 2 3 4)}$

In some cases, positive trigger levels may be required for measuring Dwell, ms-Pulse, or Duty. Press the "LEVEL" (±Trigger) push-button for more than 1 second to toggle between positive (+) and negative (-) trigger level for the selected trigger level.

NOTE: *Positive (+) trigger or negative (-) trigger is to identify whether the On or Off portion of the signal under test is of measuring interest. For example, if you get a reading of 10% Duty Cycle in the Positive (+) Trigger (On portion), you then will get a reading of 90% Duty Cycle in the Negative (-) Trigger (Off portion).*

Backlight
Press the "**HOLD**" (☼) push-button for more than 1 second to toggle the backlight On and Off. The backlight will also automatically be Off 30 seconds after each activation to extend the battery life.

Auto-Power Off
The meter automatically turns off after approximately 30 minutes of no activities to extend the battery life. However, if there is any activity within 100 counts from the last activity, the Auto-Power Off time will always be counted from the new last activity.

Maintenance

Periodic service

WARNING!
Repair and service of this instrument is to be performed by qualified personnel only. Improper repair or service could result in physical degradation of the meter. This could alter the protection from electrical shock and personal injury this meter provides to the operator. Perform only those maintenance tasks that you are qualified to do.

These guidelines will help you attain long and reliable service from your meter:

1. Calibrate your meter annually to ensure it meets original performance specifications.
2. Keep your meter dry. If it gets wet, wipe it dry immediately. Liquids damage electronic circuits.
3. Whenever practical, keep the meter away from dust and dirt, which can cause premature wear.
4. Although your meter is built to withstand the rigors of daily use, it can be damaged by severe impacts. Use reasonable caution when using and storing the meter.

NOTE: *When servicing the meter, use only the replacement parts specified.*

Battery: 9V, NEDA 1604 or IEC 6F 22
Fuse: 600V / 15 A IR 100 kA fast acting fuse for A input

Cleaning and Decontamination
Periodically clean your meter's case using a damp cloth. **DO NOT** use abrasives, cleaning solvents or strong detergents, as they may damage the finish or affect the reliability of the structural components.

Battery Replacement

Always use a fresh replacement battery of the specified size and type. Immediately remove the old or weak battery from the meter and dispose of it in accordance with your local disposal regulations. Old or defective batteries can leak chemicals that corrode electronic circuits.

⚠ WARNING!

To avoid electric shock, be sure to turn off the meter's power and disconnect both test leads from any equipment before you remove or install batteries.

To install a new battery, follow these procedures:

1. Remove the screw from the battery compartment cover on the back (lower half) of the meter and lift the cover.
2. Remove and discard the old battery. Always dispose of old batteries promptly in a manner consistent with local disposal regulations.

⚠ WARNING!

*Under **NO** circumstance should you expose batteries to extreme heat or fire as they may explode and cause injury.*

3. Place a fresh 9V battery in the compartment.

***NOTE:** If you do not plan to use the meter for a month or more, remove the battery and store it in an area that won't be damaged by a leaking battery.*

4. Reattach the battery compartment cover to the meter and reinstall the screw.

Specifications

Safety & Compliance

Maximum voltage between any terminal and earth ground	600V DC/AC (but, 1000V DC/AC peak for and functions)
Compliance	Complies with UL&cUL standard UL 3111-1, CSA C22.2 No. 1010.1-92, ANSI/ISA-S82, 01-94 to 1000V Overvoltage Category II
Certifications	CE-marking certificated
Surge Protection	6.5 kV peak per IEC 1010.1-92
⚠ Fuse Protection for A input	600V / 15 A IR 100 kA fast fuse

Physical Specifications

Display (LCD)	Digital - 4000 counts display updates 3/sec nominal Analog - 41 segments, updates 3/sec
Operating Temperature	32˚ to 122˚F (0˚ to 50˚C)
Storage Temperature	-4˚ to 140˚F (-20˚ to 60˚C)
Temperature Coefficient	nominal 0.15 x (specified accuracy) /˚C @ (0˚ to 18˚C or 28˚ to 50˚C) or otherwise specified
Relative Humidity	0% to 80% @ (32˚ to 95˚F) 0% to 70% @ (94˚ to 122˚F)
Altitude	Operating - up to 2000 m Storage - 10000 m
Battery Type	Single 9V battery - NEDA 1604, JIS 006P or IEC 6F 22
Battery Life	180 hrs. typical (with backlight off)
Shock Vibration	Per MIL-T-P RF 28800 for a Style D, Class III Instrument
Pollution Degree	2
E.M.C	Meets EN 61326 : 1997 + A_1
Size (H x W x D)	6.77 x 3.62 x 1.59" (172 x 92 x 40.5mm) without mounted accessory
Weight	Approx. 386g (0.86 lbs.)
Warranty	3 years
Calibration Interval	1 year

Feature Summary

Backlight	For clear readings in poorly lighted areas
Fast Autoranging	Meter automatically selects the best range momentarily
HOLD	Holds readings on display for later view
Continuity/Open test	Beeper sounds
Bar Graph	41 segments for peaking an nulling
Record Mode	Record maximum, minimum, and average values
Relative	Relative zero
Level	4 selectable trigger levels
±Trigger	Selectable positive and negative trigger slope
Cylinder	7 selectable number of cylinders in Dwell
RPM 4	For 4-stroke engine application
RPM 2	For DIS and 2-stroke engine application
ms-Pulse/Duty Cycle	Measures the time signal is On or Off in milliseconds or in %
Battery/Fuse Access Door	Battery or fuse replaceable without voiding calibration
High-impact Over molded Case	Protective holster features

Electrical Specifications

Accuracy is given as ±([% of reading] + [number of digits]), or otherwise specified, at 23˚C ±5˚C and less than 80% RH for a period of one year after calibration.

DC Voltage

Range	Resolution	Accuracy
400.0 mV	0.1 mV	0.5% + 2 d
4.000 V	0.001 V	
40.00 V	0.01 V	
400.0 V	0.1 V	
1000 V	1 V	

NMRR: > 50 dB @ 50/60 Hz
CMRR: > 100 dB @ DC 50/60 Hz, RS = 1 KΩ
Input Impedance: 10 MΩ, 30 pF nominal
(16 MΩ nominal for 400.0 mV range)

AC Voltage (50 - 400 Hz)

Range	Resolution	Accuracy
4.000 V	0.001 V	0.75% + 3 d
40.00 V	0.01 V	
400.0 V	0.1 V	
1000 V	1 V	1.2% + 5 d

CMRR: > 60 dB @ DC to 60 Hz, RS = 1 KΩ
Input Impedance: 10 MΩ, 30 pF nominal

DC Current

Range	Resolution	Accuracy
4000 mA	1 mA	0.75% + 3 d
10.00 A	0.01 A	1.0% + 10 d

AC Current (50 - 400 Hz)

Range	Resolution	Accuracy
4000 mA	1 mA	1.5% + 3 d
10.00 A	0.01 A	1.5% + 10 d

Burden Voltage: 0.03 V/A

Ohms

Range	Resolution	Accuracy
400.0 Ω	0.1 Ω	0.75% + 10 d
4.000 kΩ	0.001 kΩ	0.75% + 3 d
40.00 kΩ	0.01 kΩ	0.75% + 3 d
400.0 kΩ	0.1 kΩ	0.75% + 3 d
4.000 MΩ	0.001 MΩ	.075% + 5 d
40.00 MΩ	0.01 MΩ	1.5% + 10 d

Open Circuit Voltage: Typical 1.3V DC (2.7V DC @ 400.0Ω Range)

Diode Tester

Range	Resolution	Accuracy
2.00 V	3.0 mA	<3.0V DC

Temperature

Range	Resolution	Accuracy
-40˚ to 68˚F (-40˚ to 20˚C)	0.1˚F (0.1˚C)	±(5.4˚F) ±(3.0˚C)
68˚ to 400˚F (20˚ to 400˚C)	0.1˚F (0.1˚C)	±1.0% + 3.6˚F (±1.0% + 2.0˚C)
400˚ to 2,498˚F (400˚ to 1,370˚C)	1˚F (1˚C)	±3% of reading (±3% of reading)

Sensor: K-type Thermocouple, sensor accuracy not included

Audible Continuity Tester

Audible Threshold	Approx < 50Ω
Open circuit voltage	< 1.2V

Frequency

Range	Resolution	Accuracy
199.99 Hz	0.01 Hz	0.02% + 3 d
199.9 Hz	0.1 Hz	
19.999 kHz	1 Hz	
199.99 kHz	0.01 kHz	

Minimum frequency 0.5 Hz, sensitivity 250 mV
4 Selectable trigger levels

RPM

Range	Resolution	Accuracy
4-stroke	120 - 19999 RPM	±2 RPM
2-stroke	60 - 10000 RPM	

4 Selectable trigger levels

Dwell

Range*	Resolution	Accuracy
0.0 - 356.4	0.1	1.2/krpm + 2 d

*Selectable trigger levels and ± trigger slopes
*Selectable cylinders 1, 2, 3, 4, 5, 6, 8
*Specified ranges depend on ± trigger slopes, engine RPM

ms-Pulse and Duty Cycle

Mode	Resolution*	Accuracy
Multi-Point-Injection	0.5 ms - 1999.9 ms	0.5 ms + 1 d
	0.0% - 100.0%	0.2%/krpm + 2 d
Single-Point-Injection	0.5 ms - 1999.9 ms	0.5 ms + 1 d
	0.0% - 100.0%	0.2%/krpm/cyl + 2 d

Fuel Injection Detector (Both TBI & PFI)
*Selectable trigger levels and ± trigger slopes
*Specified ranges depend on ± trigger slopes, engine RPM and number of cylinders

ADM4201
Digital Multimeter

Limited Warranty

The ADM4201 is warranted to be free from defects in materials and workmanship for a period of three years from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UEi's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UEi shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss. A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge. Return the unit postage paid and insured to:

1-800-547-5740 • FAX: (503) 643-6322
www.ueiautomotive.com • Email: info@ueitest.com

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

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