

APEX AUTO TIMER For NA & Turbo

Thank you for purchasing this product. Please read all of this manual to ensure proper usage. Also, please keep this manual in a safe place for future reference. Be sure to provide this manual to the next user in case of ownership change.

Part Name: A PEX AUTO TIMER
 Part Code: 405-AO11
 Purpose: Engine After-Idling unit
 Application: DC12V Body Ground Autos

- CAUTION**
- Vehicles that cannot use the A/F function
 - Titanium type O₂ sensor vehicles (BNR32 Skivla GT-R, RPS13 Silvia, 180SX '91, '92, '93, '94)
 - Vehicles that cannot utilize the auto idling feature
 - Vehicles that cannot use the A/F function
 - Vehicles that do not read an A/F near 14.6 during idle
 - O₂ sensors that warm up slowly (reads "----" in display)

Version Information**

No.***	Print Date**	Instruction No.***	***	Notes**
1**	8-25-2000**	7407-0175-00**	1**	**

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Safety Precautions

GLOSSARY

WARNING Failure to do so may result in death or severe injury to the user and others.

CAUTION Failure to do so may result in light injury to the user and others or product and engine damage.

PLEASE Failure to do so may result in product malfunction and damage.

CAUTION This product should ONLY be installed by a professional installer. Installation requires past experience to prevent damage to the unit and vehicle.

CAUTION Discontinue use of this product immediately if any unusual odor or smoke comes from the unit. Failure to do so may result in electrical shorts and potential engine fire.

CAUTION Never disassemble or tamper with this unit. This could lead to serious injury.

Do not use this product for any other purpose than the one listed in this manual.

Never operate this unit while driving.

Do not leave the engine running in closed garages or sealed areas. Failure to do so may lead to exhaust fumes poisoning.

We are not responsible for any damages or injuries incurred from improper usage of this product.

Failure to do so may lead to accidents.

About the Warranty

- If the product malfunctions from a direct manufacturing defect, this unit will be replaced free of charge through the dealer of purchase. (Examination required)
 - In case of a malfunction, the unit MUST be taken back to the dealer of purchase.
 - All expenses incurred during the return process is the sole responsibility of the user (shipping charges, etc.)
 - The following claims will not be honored
 - Unit is not returned with an RMA
 - Units that have been modified or tampered with
 - Scratches and paint discoloration from normal usage.
 - Damage from shipping or abuse.
 - Damage incurred from other products installed on the vehicle.
 - Perishable components/spare parts
 - Any other cause that cannot be proven after proper examination.
 - This warranty is subject to change at any time without prior notice. This warranty is valid only in the U.S.
- CAUTION**
- 1. We are not responsible for any damages or injuries caused by the improper use of this product.
 - 2. This unit is subject to change without prior notice.
 - 3. We will not reissue this manual. Please keep this manual in a safe place.
- To the dealer**
- Be sure to note customer information, date of purchase, and location. This information will be necessary in the event the unit is returned to the shop for evaluation.

Warranty**

All APEX products are shipped in pristine condition. In the event that the unit does not properly, please fill out this card and return the unit to the dealer of purchase. Do not send the unit directly to the manufacturer.

Product #	Name**		Warr. Term** 30 days from purchase date**	
	Address**		Purchase Date**	
Customer #	TEL#**		Sign	
	Please fill out**			

CAUTION

Be sure to shut off the engine when sleeping inside the vehicle. Failure to do so may result in exhaust poisoning.

Never leave the vehicle while the engine is running. This could lead to accidents.

This product is designed for domestic use only. It must not be used in any other country.

CAUTION

Be sure to secure this unit in a safe location away from the driver. Failure to do so may lead to accidents.

Do not expose the unit to excessive shock. This could lead to unit malfunction.

Never use this unit on a vehicle that is not intended for use. We cannot guarantee proper operation of this unit on non application vehicles.

CAUTION

Always connect the hand brake wire. Failure to do so may lead to accidents.

Please use our TIMER Harnesses for easy installation. Other manufacturer harnesses may be used but proper operation using those harnesses is NOT guaranteed.

Be sure that the unit has been properly connected when selling the vehicle. Also, be sure to provide the instruction manual to the new user.

Remote Door Lock Systems and Adjustable Steering Columns may not function properly after installation of this unit.

Be sure to turn AUTO LIGHT systems OFF. Failure to do so may cause the lights to stay on after the engine has been shut off. This may kill the battery.

Be sure to test unit operation and safety wire operation after installation.

Product Features

- This unit will work on any 12V vehicle.
- O₂ sensor voltage A/F value can be displayed.
- Displays A/F ratio as RICH or LEAN via 2 LED
- Displays battery voltage. Also warns of extremely LOW battery voltages.
- 16 way adjustment of after idle timing from 0-10 minutes
- Automatic after idling feature. In order to ensure the most optimum after idling setting from the widest array of vehicles, the user can choose from 144 different settings.
- First Timer to utilize O₂ sensor voltage when calculating after idling time. Compared to timers that only use vehicle speed and RPM, this TIMER can set the most accurate after idling time possible.
- Parking Brake safety switch

Installation Procedures

Relay and Control Unit Installation

Please**

This unit has been designed to be used with an installation harness. (separately sold) For ultimate ease in installation, please purchase a vehicle specific installation harness.

- Installing the Relay**
1. Disconnect the negative terminal of the battery.
 2. Pull the harness coming from the key cylinder. (In some vehicles, the whole key cylinder is a harness)
 3. Insert the installation harness between the cylinder and harness.
 4. Connect the 3 prong Timer harness to the relay.
 5. Splice the black ground wire from the relay into the Engine ECU ground wire. (Please refer to the vehicle specific wiring diagram.) When not using the O₂ sensor, A/F ratio monitor, and automatic after idling functions, connect the ground wire connector to the chassis.
 6. Splice the white wire from the relay (O₂ sensor signal) into the O₂ sensor wire from the ECU. (Refer to diagram charts.)
 7. Splice the gray parking brake wire from the relay to the parking brake switch. (With the IG key ON, be sure to check that the parking brake switch reads 0V when the parking brake is up, and 12V when the brake is down.)

CAUTION

Do not mount the unit near high temperatures, dust, or under direct sunlight.

When mounting with double sided tape, take care not to damage the case when relocating.

Please**

Be sure to remove all oil and debris from unit before mounting.

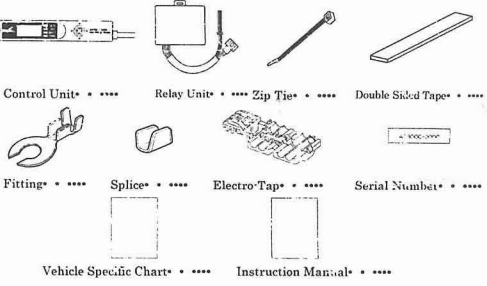
Never pull hard on any connectors or harnesses.

Mounting the Control Unit

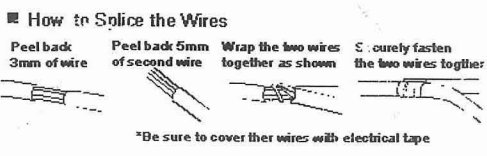
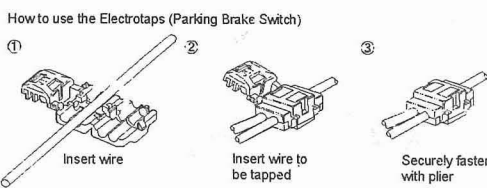
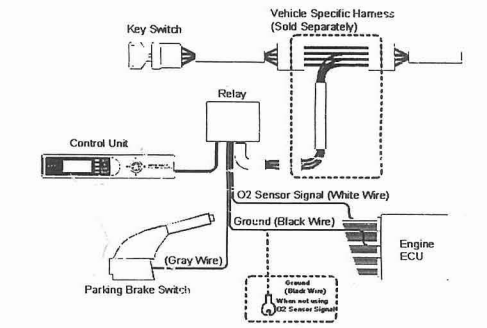
1. Use the included double sided tape to mount.
2. Mount in a location that does not interfere with driving. Connect to relay.
3. Reconnect battery.

Parts List

- Be sure to check the contents before attempting installation.
- Please notify your dealer of purchase for any missing or broken parts BEFORE attempting installation.



Installation Diagram



CAUTION

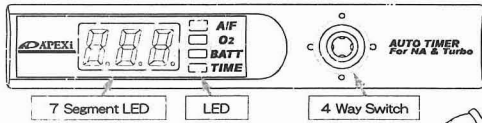
Be sure to cover the wires with electrical tape.

Be sure to use a proper wire crimper when splicing. Failure to do so may lead to faulty connections.

Checking the Safety Switch (Parking Brake Switch)

1. Pull the parking brake, start the engine, and make sure the IG key is ON.
2. Set the Timer to a random setting above 30 seconds.
3. Turn the IG key OFF and activate the Timer countdown.
4. Release the parking brake during the countdown process.
5. Be sure the engine shuts completely off.

Part Names and Functions



Glossary of terms:
 [Hold] Tilt knob over 0.5 sec in specified direction
 [Activate] Tilt knob less than 0.5 sec in specified direction

Display

Turning the IG key ON will activate the display mode.
 (Power must be on)
 Contents may be checked through flashing lights

Display Parameters

- A/F ratio
- O₂ Sensor Voltage
- Battery Voltage
- After idling time

Choose Display Parameter

To toggle between A/F ratio, O₂ Sensor Voltage, Battery Voltage, After idling Time,
 [Activate the knob either UP or DOWN]

Display Selection

[Activate the knob either UP or DOWN]

Set the unit

While in display mode and while the parking brake is activated,
 [Hold the knob to the RIGHT] This will activate the Setting mode for that parameter.

The LED will flash to confirm setting mode.
 During Setting Mode [Hold the knob to the LEFT] to end.

Parameters that can be Set

- A/F ratio according to O₂ Sensor Voltage
- O₂ Sensor Voltage according to A/F ratio
- Minimum Battery Voltage Warning
- After Idling Time

Setting the Minimum Battery Voltage Warning

- To activate Setting Mode...
 While battery voltage is being displayed,
 [Hold the knob to the RIGHT]
 BATT will flash indicating that the setting mode has been activated
- After setting...
 [Hold the knob to the LEFT]
 This will return to the Display Mode

How to Set

[Activate the knob either UP or DOWN]
 Set the minimum warning battery voltage
 Choose between 10.0V~15.0V in 0.1V increments

Setting the After Idling Time

- To activate Setting Mode...
 While After Idling is being displayed,
 [Hold the knob to the RIGHT]
 TIME will flash indicating that the setting mode has been activated
- For Calculation Mode... (Manual or Auto)
 After Idling times can be selected through Manual or Auto modes.
 To toggle between Manual or Auto mode,
 [Hold the knob to the RIGHT]
- After setting...
 [Hold the knob to the LEFT]
 This will return to the Display Mode

How to Set

Select Calculation Mode

[Hold knob to the RIGHT]

Manual Mode

If display looks like below.
The unit is in [Manual Mode]

"Minute" "Second"

0 sec 10 sec 20 sec 30 sec 40 sec 50 sec

1 min 1 min 30 sec 2 min 3 min 4 min 5 min 6 min 8 min 10 min

Auto Mode

If display looks like below.
The unit is in [Auto Mode]

MAX After Idle Value Auto Calculation Rate MIN After Idle Value

This sets the maximum amount of idle time. The vehicle will always be at least this amount of time.

There are three modes. Please choose between 1 "H" High "N" Normal "L" Low

This sets the minimum amount of idle time. The vehicle will always be at least this amount of time. Choose between 0-60 seconds in 10 second increments.

[Tilt the knob either to the RIGHT or LEFT] to select parameters
 [Tilt the knob either UP or DOWN] to change values

[Hold knob to the LEFT] to return to Display Mode

A/F value, O₂ Sensor Voltage Setting

This product contains various A/F and O₂ Sensor values. The values range between A/F value(1) - O₂ sensor voltage (1) A/F value(8) - O₂ sensor voltage(8)
 Please use the chart below when changing the setting A/F - O₂ sensor voltage data

A/F	10.0	12.0	14.0	14.6	15.0	16.0	18.0	20.0
O ₂ Sensor V	900	940	820	450	010	006	004	002

Setting the A/F Value

- To enter the setting mode...
 While displaying A/F
 [Hold the knob to the RIGHT]
 IF will flash indicating setting mode
- How to set...
 The A/F and O₂ sensor voltage will alternately display (A/F will display longer)
 Input the A/F data corresponding to the displayed O₂ sensor voltage
 The O₂ sensor data can be changed in the next section
- Once setting is complete...
 [Hold knob to the LEFT]

Procedure

A/F value (1) A/F value (8)
 O₂ sensor V (1) O₂ sensor V (8)

[Tilting knob to RIGHT or LEFT] will change the range of A/F, O₂ data (see Table 1)
 A/F and O₂ will alternately display (A/F will display longer)

A/F Value
 [Tilting knob either UP or DOWN] will allow setting of desired A/F value.

O₂ Sensor Voltage Setting

- To enter the setting mode...
 While displaying O₂ sensor voltage (V)
 O₂ will flash indicating setting mode
- How to set...
 The O₂ sensor voltage and A/F will alternately display (O₂ will display longer)
 Input the O₂ sensor voltage corresponding to the displayed A/F data
 The A/F sensor data can be changed in the previous section
- Once setting is complete...
 [Hold the knob to the LEFT]

Procedure

O₂ sensor V (1) O₂ sensor V (8)
 A/F value (1) A/F value (8)

[Tilting knob to RIGHT or LEFT] will change the range of A/F, O₂ data (see Table 1)
 O₂ and A/F will alternately display (O₂ will display longer)

O₂ sensor voltage (mV)
 [Tilting knob either UP or DOWN] will allow setting of desired O₂ value.

To turn OFF the Auto Timer

Turn the TIMER OFF when not in use.

- To turn the TIMER OFF...
 During display mode,
 [Hold the knob to the LEFT]
 The 7 segment LED will read [OFF] shutting OFF the unit
- To turn the TIMER back ON...
 While the unit is OFF,
 [Hold the knob to the LEFT]
 Or,
 [Hold the knob to the RIGHT]

Other...

- To turn engine OFF during a TIMER countdown...
 During countdown,
 [Hold the knob to the LEFT]
 Or,
 [Hold the knob to the RIGHT]

This will turn the TIMER OFF thereby shutting the engine OFF.
 (Ignition key must be removed)

- Changing the after idling time during TIMER countdown...
 During TIMER countdown,
 [Tilt knob UP] to increase time
 [Tilt knob DOWN] to decrease time.

About the A/F ratio values...

This unit calculates a theoretical A/F value based upon the factory installed O₂ sensor. O₂ sensor voltage output characteristics follow the chart to the right, where rich conditions produce a near 1V signal while a lean condition produces a near 0.1 V signal. Although the A/F value is calculated off of this O₂ sensor voltage, factors such as exhaust temperature prevent the O₂ sensor from producing a stable and constant reading. Please use this feature only to determine rich or lean conditions. Also, different O₂ sensors will produce different voltage readings.

Fig #1. O₂ Sensor Output Characteristics

If the O₂ sensor has not warmed up enough,
 A/F will flash red and green.
 Once the O₂ sensor warms up, the display mode will initiate.

When the A/F reaches over 10.0,
 A/F will flash red.

When the A/F goes under 20.0,
 A/F will flash green.