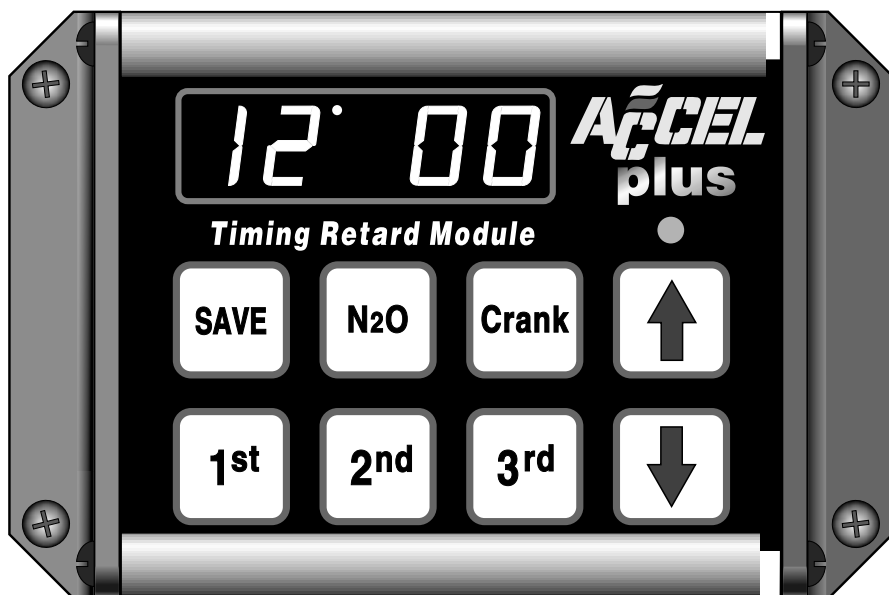


ACCEL Timing Retard Module



CONTENTS

	Page		Page
<i>Congratulations</i>	2	Main Wiring Diagram	8
Your Timing Retard Module – Overview	3	The 2-pin Input Connector (Main Power)	10
Connecting to an ACCEL Ignition	3	The Square, Input Connector (Trigger Input)	10
Some Important Points to Remember	3	4-pin Flat, Input Connector	10
Some Precautions	4	Wiring Gear Shift Switches	11
Modes of Operation	4	Wiring For Nitrous	11
The SAVE Button	4	The Square Output Connector (Trigger Output)	11
Selecting the Number of Cylinders	5	Troubleshooting	12
Setting <i>Reasonable</i> Values	5	Diagnostic Mode	12
Important Programming Details	5	Quick Reference	13
Wiring & Programming an H-Pattern Gear box and Manual Shifter	6	Installation Checklist	13
Wiring & Programming an Automatic Transmission (Shifted Manually)	6	Compatibility Chart	14
Wiring & Programming a Lenco Shifter	7		

Congratulations! You have purchased the ACCEL TIMING RETARD MODULE.
This unit can be programmed to automatically retard your engine's ignition timing or four different inputs. When not being programmed, your ACCEL TIMING RETARD MODULE functions as a digital retard meter.

Use *ACCEL 300+ RACE WIRE* spark plug wires!
Solid-core spark plug wires emit RFI and EMI static,
which can disrupt On-board electronics.

Do *not* use your TIMING RETARD MODULE
with another timing control module.
They both may try to override each other.

Do *not* use your TIMING RETARD MODULE
with more than 18 volts.

Your ACCEL TIMING RETARD MODULE, like
any electronic component, is sensitive to heat.
Keep it away from temperatures greater than 150° F (65° C).
Follow the installation instructions in this Owners Manual carefully.
Incorrect installation may damage your engine, this unit,
and may **VOID YOUR WARRANTY.**

This unit cannot be returned to your
dealer for testing or for warranty.

It must be returned to:

MR. GASKET PRODUCT REPAIR
8700 BROOKPARK ROAD
CLEVELAND, OH 44129
216-398-8300 Ext-310

Your warranty card must be on record at
ACCEL to insure warranty processing.
(See your warranty card for details.)

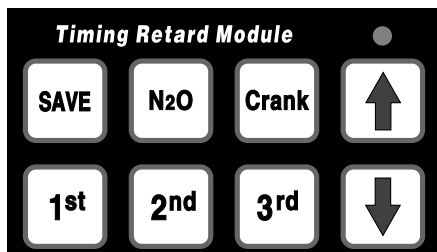
This package provides everything
you will need to install your
ACCEL TIMING RETARD MODULE
Wire lengths provided are enough for almost all vehicles.
If you must splice additional wire use 16 gauge wire, or larger.

THE ACCEL TIMING RETARD MODULE - AN OVERVIEW

Your new ACCEL TIMING RETARD MODULE is a computer module. It is meant to be installed between your ignition triggering device (distributor pickup, crank trigger, etc.) and your ignition module. It controls the signals that tell your ignition when to fire.

In addition to its trigger input, your ACCEL Timing Retard Module uses four external inputs to activate timing retard values.

The four inputs may be connected to any type of switch to activate selected retards. Normally input switches are connected to three gear positions and an N2O activation input. You can then select and adjust values for these inputs with the key pad.



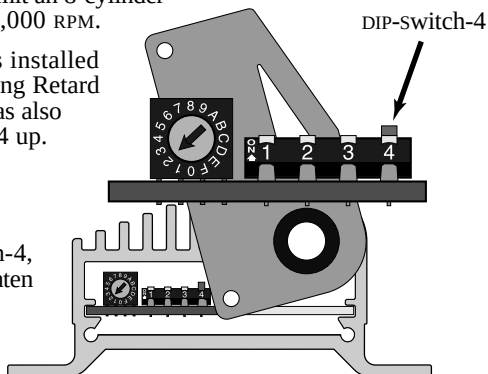
CONNECTING THE ACCEL TIMING RETARD MODULE TO AN ACCEL IGNITION SYSTEM

The ACCEL Timing Retard Module uses special signals to communicate with your ACCEL ignition module; and DIP-switch-4, inside the ACCEL ignition module, must be re-set UP.

- Open the ACCEL ignition's cover plate (the one with the wires coming through it). Unscrew the three screws and swivel it out of the way to reveal the DIP-switches.
- Using a small tool (A pencil is good) gently push up DIP-switch-4.

This ACCEL 300+ ignition box has been set to rev-limit an 8-cylinder engine at 5,000 RPM.

The owner has installed an ACCEL Timing Retard Module, and has also set DIP-switch-4 up.



- After you have set DIP-switch-4, close the cover plate and retighten all three of its screws.

IMPORTANT POINTS TO REMEMBER

When you should remove your ACCEL Timing Retard Module from the car, remember to re-set DIP-switch-4 inside the ACCEL ignition module DOWN.

- When connected to an ACCEL control module, the ignition module's DIP-Switch-4 must be UP.
- When *not* connected to a control module the ignition *will not start* with DIP-Switch-4 UP

The rev-limit set inside your ACCEL ignition module is the engine's ultimate rev-limit. Make sure that its chosen rev-limit fits your engine's needs and the needs of any additional control modules.

PRECAUTIONS AND WARNINGS

The ACCEL Timing Retard Module will cause a small, fixed timing retard in the trigger. This is due to computational delay. Engine ignition timing must be checked, and re-adjusted, to account for this delay after your timing retard module is installed.

This flexible product makes it easy to select values that can damage your engine. Start by selecting safe values. Carefully evaluate their effect. Make small changes, when changing values, and use caution.

MODES OF OPERATION

our new ACCEL TIMING RETARD MODULE has three different modes of operation.

1. Programming Programming and Control modes overlap in the sense that timing control is still performed in Programming Mode.
2. Control In Programming Mode the display shows the value you are

in the process of programming. In Control mode the LED's display the current timing retard from the trigger input.

3. Diagnostics Mode – See Pg. 12.

THE SAVE BUTTON

Pressing the **SAVE** button tells the Timing Retard Module to store all the values that have been adjusted. They will be remembered until they have been re-programmed and over-written with the **SAVE** button. Turning off the module does not erase any values that have been stored with the **SAVE** button.

You can adjust, and test, different settings, without storing values, by turning your Module off, before pressing **SAVE**. The unit remembers the *last values stored* with he **SAVE** button, and restores them the next time it is used.

CAUTION: It may take a few seconds for the Timing Retard Module to **SAVE** values. *Be sure* the display shows the current timing retard (default display) before turning the module off. *Powering off during a SAVE may cause you to lose stored values.*

After you have completed the wiring (according to diagrams detailed later in this ocument) you must do some basic configuration of your ACCEL Timing Retard Module.

1. With the unit powered off press, and hold down, both the **SAVE** and **CRANK** buttons.



2. While holding those two buttons down, apply power to the module. The module will enter its *Programming Mode* and display a number that represents the number of cylinders in an engine (the factory default).
3. Use the $\uparrow$ and $\downarrow$ keys to select the number of cylinders for *YOUR* engine.
4. When finished, press **SAVE**. This stores this new information and puts the module back into *Control Mode* operation.

Make this selection only once per installation.

If you do not make this selection your
Timing Retard Module uses the factory default.

SETTING SOME *REASONABLE* TIMING RETARD VALUES

Enter Programming Mode by pressing the key for the function you wish to modify. Adjust the timing retard of that function to an appropriate value. Exit Programming Mode by pressing that same key again.

- i.e. To select a timing retard for starting your engine press the **CRANK** button. The display shows its current value and The *Programming Dot* will start to flash. Use the $\uparrow$ and $\downarrow$ keys to adjust (in 1° increments) the value displayed. When finished press **CRANK** again. The Programming Dot stops flashing and the current timing retard displays.

Do the same for all timing retard inputs. It is not necessary to exit Programming Mode to select a new function, simply press the next value's key.

- i.e. Press **1st** and select its value. Then press **2nd** and select its value. Since **2nd** was the last value you programmed, you exit Programming Mode by pressing **2nd** again.

When you have finished programming press **SAVE** to store all new values.

IMPORTANT PROGRAMMING DETAILS

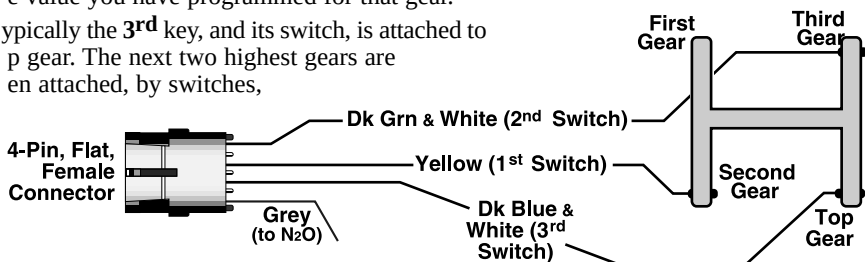
The initial values you program and save into your Timing Retard Module will get you started. You will eventually want to modify them. Just select a function and change it. Modifications take effect immediately. Press that function's key again (displaying current timing retard), and the newly selected value takes effect.

The **1st**, **2nd**, and **3rd** switches do not represent gears, but rather switches. On a four speed manual transmission the switches are normally installed on 2nd, 3rd, and 4th gears. Timing retard is *additive*. For example: you program 3° of retard for the **1st** key and 4° of retard for the **2nd** key. The module will provide 3° of retard when switch #1 gets activated, then adds 4° (7° total) when switch #2 is activated (while switch #1 remains active). N₂O timing retard, when active, is also additive.

If your shifter and switches are designed so that only one switch can be activated at a time, the value programmed for each individual switch is not additive.

When connected to an H-Pattern, manual transmission, your Timing Retard Module's **1st**, **2nd**, and **3rd** keys each program how much retard takes effect when *one* gear is selected. Install switches on the shifter that, when closed, signal the module that a gear is engaged. When the ACCEL Timing Retard Module receives its signal it adjusts timing retard to the value you have programmed for that gear.

Typically the **3rd** key, and its switch, is attached to top gear. The next two highest gears are then attached, by switches,



wires from the 4-Pin, Flat connector. When using your H-Pattern transmission, the values programmed by the Module's **1st**, **2nd**, or **3rd** keys take effect when their switches trip. Install switches so one side is connected to +12 volts and the other side is connected to the Timing Retard Module's harness. Switches should be OPEN when their gear is *not* engaged

i.e. You have programmed, and stored 9° with the **2nd** button, ↓ and ↑ keys, and the **SAVE** button.

When you shift into 3rd gear its switch, connected by the DK GREEN & WHITE wire (Connector Pin-C), is tripped and ignition timing retards by 9°.

REMEMBER: the **2nd** button refers to the second switch, *NOT* 2nd gear! In this example the **2nd** key, and its switch, is wired to 3rd gear.

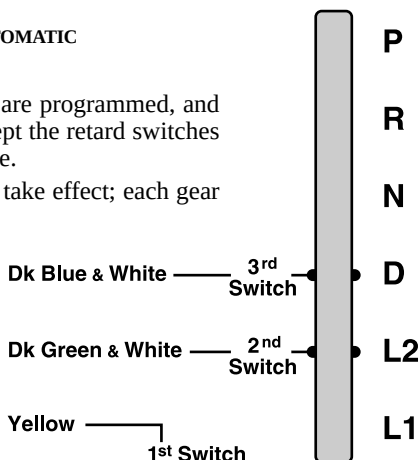
WIRING AND PROGRAMMING AN AUTOMATIC TRANSMISSION (Shifted Manually)

Automatic transmissions and their shifters are programmed, and wired, like manual H-Pattern systems, except the retard switches are connected to the shifter in a straight line.

As you shift gears, the values programmed take effect; each gear with its own programmed value.

i.e. You have programmed and stored a value of 15° into the module with the **3rd** button.

When you shift into Top gear the DK BLUE & WHITE wire's switch trips (Pin-D on the connector), and timing retards by 15°.



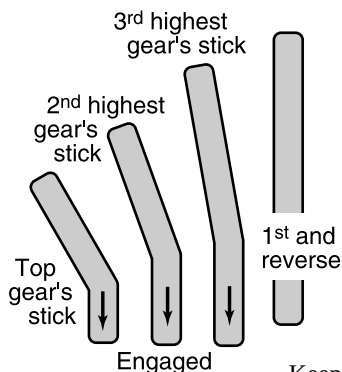
You may not want to use all three retard

switches. Wire a manual switch to an unused

wire, and use it to program a conservative Timing Retard for your drive home.

WIRING AND PROGRAMMING A Lenco-TYPE SHIFTER

here are major differences between the Lenco gearbox and shifter, and an H-Pattern manually shifted transmission:



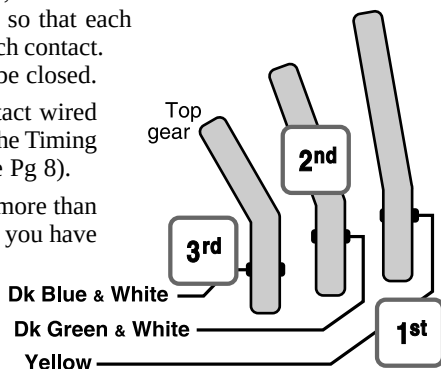
- The Lenco box accumulates gear ratios. Higher gear's ratios are the total of the lower gear shifts.
- The Lenco has a stick for each gear. Before shifting into a high gear, all lower gears must be engaged.
i.e. To be in 4th gear, the 3rd AND the 2nd gear sticks must also be thrown.
- When you are moving forward 1st is always engaged. Reverse is triggered off 1st.

Keep these differences in mind when installing, and programming, your new ACCEL Timing Retard Module.

s with an H-Pattern or automatic shifter; wire the three witches to your top three gear positions so that each gear's stick, as it is engaged, closes a switch contact. When in Top gear all three switches will be closed.

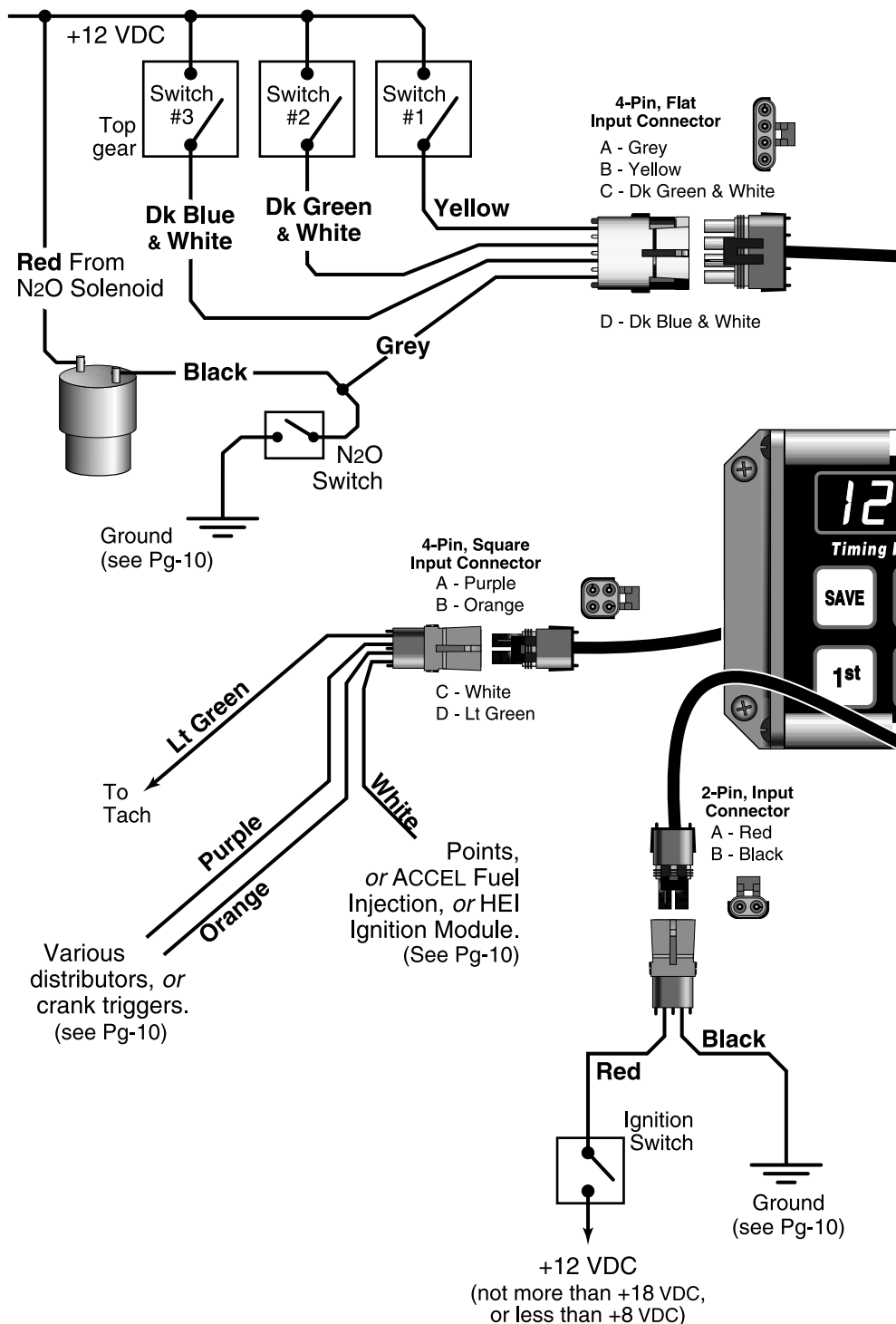
Each stick's switch should have one contact wired to +12VDC, and the other contact wired to the Timing Retard Module's 4-pin flat connector (see Pg 8).

The Timing Retard Module senses when more than one switch is closed, and totals the values you have programmed for all lower gear's shifts.



e. Assume you are running a four-speed Lenco transmission, and you have programmed your new ACCEL Timing Retard Module so that the 1st button's value is 4°, the 2nd button is 5°, and the 3rd button is 6°. **Remember:** A button's label refers to its switch, NOT to which gear it is wired.

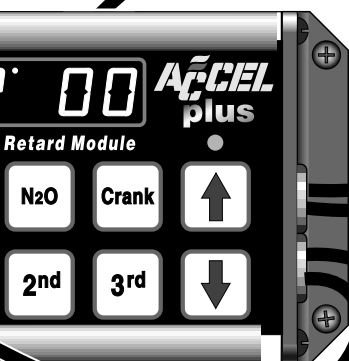
- Usually you will not be adjusting Timing Retard for First gear. The ACCEL Timing Retard Module has been designed to adjust Retard for three forward gears, and for Nitrous (see Pg-11).
- When you shift into 2nd gear you will get 4° of Retard, since the 1st button has been programmed 4° for 2nd gear.
- When you shift into 3rd gear you will have 9° of Retard. The 1st button's 4° is added to the 2nd button's 5°, making a total of 9° when you are in 3rd.
- Shift into 4th (Top) gear and you will get 15° of Retard. 1st and 2nd values are added to the 3rd button's value; 4° + 5° + 6° totals 15° of Retard, for 4th gear.



WIRING YOUR ACCEL TIMING RETARD MODULE

Wires may not be shown in their correct order.

Build a wiring harness according to connector descriptions and colors.

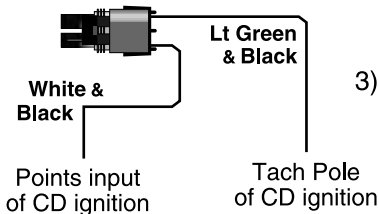


Three possible ways
to connect the
4-Pin, Square
Output Connector

- | | |
|--------------------|----------------------|
| A - Purple & White | B - Orange & Black |
| C - White & Black | D - Lt Green & Black |

1) To the 3-STAGE
REV-LIMITER.

2) Directly to an
ACCEL+ ignition.



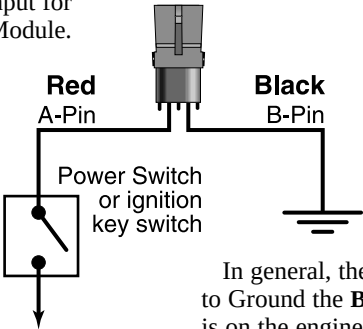
3) To another brand's
CD ignition system.
Build a mating 4-pin
connector with the
connector supplied
(see Pg-12).

HE 2-PIN, INPUT CONNECTOR (Main Power)

This is the main power input for your ACCEL Timing Retard Module.

Its **BLACK** wire is Grounded and its **RED** wire inputs +12 VDC from the battery. (not more than +18 VDC or less than +8 VDC)

The **RED** wire connects to the battery through the power or key switch.



In general, the best place to Ground the **BLACK** wire is on the engine. Make sure that rubber mounted engines are well Grounded.

THE SQUARE, INPUT CONNECTOR (Trigger Input)

he **ACCEL Timing Retard Module** takes all kinds of triggering, except Distributor-less. s digital micro-processor controls are as sensitive as your trigger, and we recommend you se an ACCEL Crank Trigger or Billetech Distributor. The triggering inputs are read either hrough the Square, Male connector's **PURPLE** and **ORANGE** wires, or the **WHITE** wire.

he **WHITE** wire typically gets its quare wave input from:

- All Points ignitions
- Some HEI modules
- Most Fuel Injections

he **PURPLE** and **ORANGE** wires get heir inputs from either Magnetic ickup or Crank-triggered systems.

he **PURPLE** wire is the Positive (+) nput and the **Orange** wire is the egative (-). See chart at right.

your system uses the **WHITE** wire, ou must isolate and insulate both he **PURPLE** and **ORANGE** wires.

your system uses both the **PURPLE** nd **ORANGE** wires, you will isolate nd insulate the **WHITE** wire.

he **LIGHT GREEN** wire connects irectly to the Tach's signal lead.

Lt Green (Pin-D)			
To Tach			
Triggering From	Purple (Pin-A)	Orange (Pin-B)	White (Pin-C)
ACCEL Crank Trigger*	Black	White	—
ACCEL Distributor	Black	White	—
ACCEL Fuel Injection	—	—	B7
Chrysler	Black	Orange/White	—
Ford (MSD)	Purple	Orange	—
GM Distributor	Green	Orange	—
GM HEI (Module In)	—	—	Brown
Mallory	Orange	Purple	—
Moroso	Black	White	—
MSD Crank Trigger	Purple	Green	—
Points Ignitions	—	—	Usually Green

* Older ACCEL Crank Triggers may connect WHITE to PURPLE and BLACK to ORANGE

THE 4-PIN, FLAT CONNECTOR (Input from Switches)

his connector receives signals from switches telling the module when to adjust Timing etard. You do not have to connect all four switches. (See Wiring Diagram on Pg, 8)

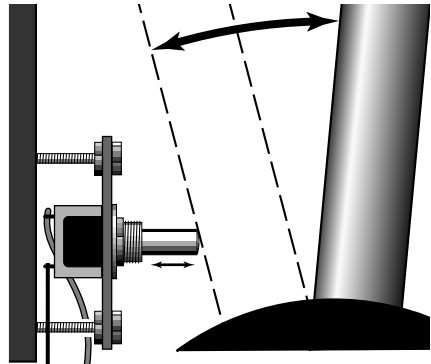
WIRING GEAR SHIFT SWITCHES

Although *programming* may be different for Automatic, H-Pattern, or Lenco type transmissions, the way you place and connect their switches will probably be similar.

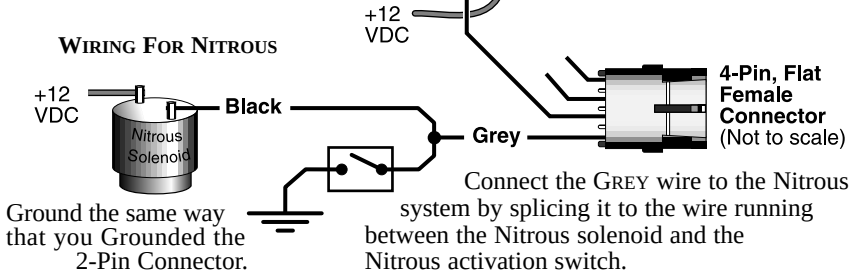
Unfortunately gear shifts come in *many* different shapes, and we cannot tell you which kind of switch you should use. You'll have to choose and attach your own switch.

SOME GUIDELINES FOR ATTACHING SWITCHES

- A momentary or a toggle switch is probably best: one that stays in its tripped position until the shifter is put into another gear.
- Place your switch so that only the selected gear shift can trip it.
- Make sure all switches are firmly fixed in place, and that nothing can tangle their wires.



WIRING FOR NITROUS



Timing Retard for Nitrous is added on top of whatever Timing Retard is already active.

i.e. You have programmed Top gear to retard timing by 15° with the 3rd button, and Nitrous to retard by an additional 5° with the N₂O key.

You are in Top gear when your ACCEL 3-Stage Rev-limiter activates the Nitrous system. Total Timing Retard instantly becomes 20°.

With Multi-stage Nitrous use any unused switch to sense when the system is activated. Wire the unused switch to the negative terminal of any Nitrous solenoid. (See Pg 8.)

THE SQUARE, OUTPUT CONNECTOR (Trigger Output)

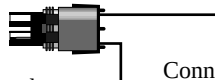
Outputs the triggering signals received, through the 4-Pin Square Input connector, to your ignition. If you are using an ACCEL+ ignition, its input connector is already in place.

Using a third party's CD ignition, build a mating connector, with the connector supplied.

The BLACK & WHITE wire connects to the Points terminal of a CD ignition.

The LIGHT GREEN & BLACK wire connects to a CD ignition's Tach input.

Connect wires according to the instructions that come with your CD ignition system.



Connect the the White & BLACK wire (Pin-C) to the CD's Points input.

Connect the LT GREEN & BLACK (Pin-D) to the CD's Tach input.

LED's do not display	The Timing Retard Module is not getting power. Check the 2-Pin connectors's Red and Black wires. See Pg 10.
A timing light does not show he programmed value	The engine was not retimed when the Timing Retard Module was originally installed, or the wrong number of cylinders was selected Time the engine again. See Pg 3. Check the number of cylinders (4, 6, or 8). See Pg 5.
Tachometer does not work	Any one of the Tachometer wires throughout the system may be disconnected or shorted, or the Tach itself may be broken. Check the square, input connector first. See Pg 10.
Your ACCEL+ sparks randomly	DIP-Switch-4 inside your ACCEL+ ignition is down. See Pg 3.
Status Light on Your ACCEL+ is Dim	The ignition is not firing, or the Timing Retard Module is unplugged from the ignition. The battery may be low. If the 2-Pin connector and battery are OK, pull a spark plug, lean it against the engine. It should spark as you crank the starter. See Pg 10.
Status Light on Your ACCEL+ is OFF	The unit is not sending a trigger signal, probably because it is not receiving a trigger signal. Check the trigger device and the square, input connector. See Pg 11.
Timing doesn't hange when car is in a new gear	The unit does not have a value programmed for that gear, or it is not getting a signal from that gear shift. Check the switch and its wires. See Pg 11.

DIAGNOSTIC MODE

our ACCEL Timing Retard Module has features that test functions through your key pad. iagnostic Mode does not perform any Control Mode engine functions. you enter Diagnostic Mode with the engine running, your engine will stall.
(Read this whole section before entering Diagnostic Mode)

DISPLAY, PROCESSOR, and MEMORY test

Enter Diagnostic Mode by simultaneously pressing and releasing three keys:

1ST, 2ND, and 3RD. The display will show 00000.

About every two seconds the display will increment: 11100, 22200, up to 99900. The 'degree dot' will appear with the odd numbered (33300, 55500) displays.

EY PAD test

When 99900 appears the 'programming dot' will start flashing. *From now on* you must press the proper key within eight seconds or the module will return to Control Mode. Keys must be pressed in order:

DISPLAY	PRESS
99900	1ST
11100	2ND
22200	3RD
33300	↑ (UP ARROW)
44400	↓ (DOWN ARROW)
55500	CRANK
66600	SAVE
77700	N2O

After each key is pressed the display will update. It starts at 11100 and increments to 77700 as each key is pressed, in order. If the proper key is not pressed within eight seconds Diagnostic Mode ends and returns you to Control Mode.

If you press the correct key and the display does not update (and the unit exits Diagnostics), the test has found a key pad failure.

When the last key (**N2O**) is pressed and released the unit returns to Control Mode operation.

QUICK REFERENCE

Crank

Adjusts how much Retard takes effect when you first start your engine. Press the **CRANK** button and adjust the value with the ↓ or ↑ buttons. Cranking Retard only takes effect below 600 RPM. (See Pg 5)

1st

Sets how much Timing Retard will take effect when Switch #1 is ON. Press the **1st** button and adjust the value with the ↓ or ↑ buttons. The Module senses through the **YELLOW** wire when Switch #1, on the shifter, is **CLOSED**, and Retards by the amount designated. (See Pg 6)

2nd

Sets how much Timing Retard will take effect when Switch #2 is ON. Press the **2nd** button and adjust the value with the ↓ or ↑ buttons. The Timing Retard Module senses, through the **DARK GREEN & WHITE** wire, if Switch #2, is **CLOSED** and Retards by the set amount.

3rd

Sets how much Timing Retard will be in effect when Switch #3 is ON. Press the **3rd** button and adjust the value with the ↓ or ↑ buttons. The module senses, through the **DARK BLUE & WHITE** wire, if Switch #3, on the shifter, is **CLOSED** and Retards by that designated amount. Switch #3 is typically attached to the tallest gear.

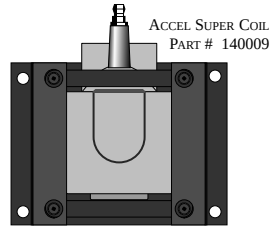
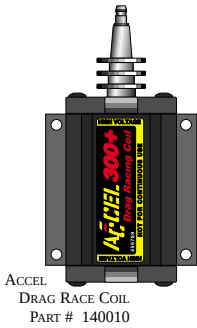
N2O

Sets how much Timing Retard takes effect when Nitrous is activated. Press the **N2O** button and adjust the value with the ↓ and ↑ keys. Nitrous activation is sensed through the **Grey** wire (4-pin, flat connector), spliced to the **Black** wire between the **N2O Solenoid** and the **N2O Switch**. The **N2O Solenoid** activates Nitrous Retard. (See Pgs 8 & 11)

INSTALLATION CHECKLIST

- ☐ Disconnect the battery's negative (ground) connections.
- ☐ Install the your **ACCEL** ignition module and set its **DIP-switches**. (Pg 3)
- ☐ Install and connect the **1st**, **2nd**, and **3rd** switches. (Pgs 6-11)
- ☐ Install and connect the **N2O** input. (Pg 11)
- ☐ Install the trigger input. (Pg 11)
- ☐ Connect your **ACCEL Timing Retard Module** to your **ACCEL** ignition module. (Pg 3)
- ☐ Reconnect the battery.
- ☐ Program your Timing Retard Module for the proper number of cylinders. (Pg 5)
- ☐ Program *reasonable* values for **1st**, **2nd**, **3rd**, **N2O**, and **Crank**. (Pg 5)
- ☐ Save these initial values into memory with the **SAVE** button. (Pg 5)
- ☐ Adjust and verify the correct engine timing. (Pg 4)
- ☐ Fine tune any values that need re-adjustment and save the new values.

ACCEL TIMING RETARD MODULE COMPATIBILITY CHART

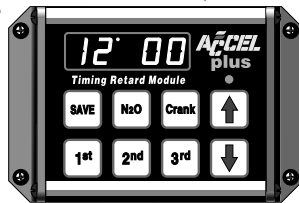


Any of the ACCEL+
ignition systems,
in this case an
ACCEL 300+.

ACCEL 3-STAGE REV-LIMITER
ART # 49345



ACCEL TIMING RETARD MODULE
PART NUMBER - 49355

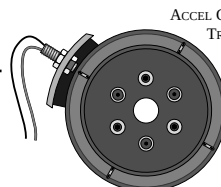
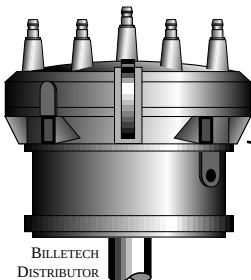


Your **ACCEL TIMING RETARD MODULE** connects directly to any Capacitive Discharge ignition system.

If it is connected through an ACCEL 3-STAGE REV-LIMITER, it outputs to the ignition through the Rev-limiter.

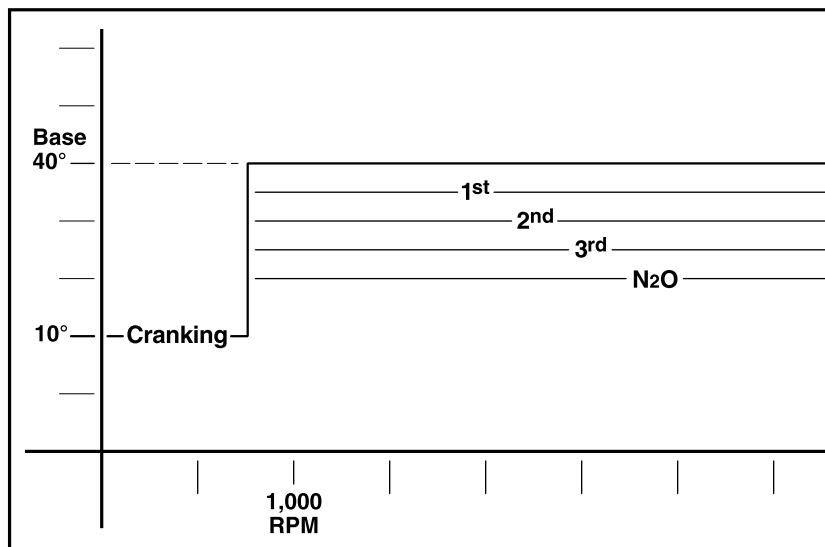
The ACCEL TIMING RETARD MODULE accepts input from any Accel distributor, Crank Trigger, Nitrous system, or fuel injection.

Do not connect with an ACCEL TIMING COMPUTER.



Fuel Injection
and/or
Nitrous system.

ACCEL+ TIMING RETARD MODULE



rag Racers must be able to launch off the line *hard*, with *MAXIMUM TIMING ADVANCE*. eat, caused by combustion, can cause engine damaging “Detonation”. Retarding ignition ming can prevent detonation. The ACCEL+ TIMING RETARD MODULE has been specifically esigned for this purpose. Your new ACCEL+ TIMING RETARD MODULE can also adjust gnition timing retard for single or multi-stage Nitrous.

When using the ACCEL+ TIMING RETARD MODULE you have four possible adjustments for etarding ignition timing, based on four different specific inputs: three gear switches, and ne Nitrous switch. These four switches do not have to be wired only to the various gears, r Nitrous, that their control panel keys suggest. If you wish, you can wire the retard nputs to whichever switch or device you like. You may even want to rig a manual switch or specific situations, such as driving to or from the race track.

For installation questions call
216-398-8300 Ext-310