INSTALLATION INSTRUCTIONS

375+ MULTI-FUNCTION ACCESSORY #49375

GENERAL INFORMATION

The ACCEL 375+ Multi-Function Accessory is design to only work with the ACCEL 300+ Digital Multi-Strike CD ignition controller on distributor equipped engines. The 375+ Multi-Function Accessory adds the following programmable capabilities to the ACCEL 300+ Ignition controller; a dual stage RPM limiter, a fixed timing retard function, a start timing retard function and a proportional timing retard function (with the use of an optional 2-BAR sensor p/n 74776 or 3-BAR sensor p/n 74777 and MAP sensor harness p/n 29785).

MISCELLANEOUS INFORMATION

SEALING

Do not attempt to seal the 375+ Multi-Function Accessory. All of the circuits of the 375+ receive a conformal coating of sealant that protects the electronics from moisture. Sealing the 375+ will not allow any moisture that may seep into the unit from escaping and may result in corrosion.

WELDING

To avoid any damage to the 375+ Multi-Function Accessory when welding on the vehicle, disconnect both 4-pin square connectors as well as both the 3-pin and 6-pin flat connectors.

MOUNTING

The 375+ Multi-Function Accessory can be mounted in any position. The 375+ must be mounted inside the passenger compartment of the vehicle. The 375+ can ***NOT*** be mounted in the engine compartment of the vehicle. The 375+ can be mounted in an enclosed area such as a glove box, in a center console storage bin or up under the dash. Mount the 375+ using the mounting hardware included in the kit.

WIRING

The 375+ Multi-Function Accessory is design to plug directly between the 300+ Ignition control and the vehicle specific fit harness supplied with the 300+ Ignition kit. The 4-pin square male connector from the 300+ Ignition control plugs into the 4-pin square female connector from the 375+. The 4-pin square male connector from the 375+ Ignition control plugs into the 4-pin square female connector from the vehicle specific fit harness. The 3-pin flat connector plugs into the MAP sensor extension harness (ACCEL p/n 29785, which is sold separately). The 6-pin flat connector connects to all the external input / control circuits.

WIRE LENGTHS

All of the wires of the 375+ Multi-Function Accessory may be lengthened by using one size larger gauge wire (16 gauge). Pigtail harnesses are included to help fabricate extension harnesses easier. Make sure to use quality butt splice connectors or solder all wire joints.

GROUNDS

A poor ground connection can cause many frustrating problems. When a wire is specified to go to ground, connect it to the chassis or engine. Always connect a ground strap between the engine and chassis. Connect any ground wires to a clean, paint-free metal surface. The black ground wire of the 375+ should be connected to the same place as the ground wire of the Accel 300+ ignition.

WIRE FUNCTIONS

6-PIN FLAT CONNECTOR

Red	12v switched ignition power.
Black	Ground (Connect to the same place as the Accel 300+ ignition ground).

Orange	12v activation wire for stage RPM limiter, such as a line lock activation wire.
Yellow	12v activation wire for fixed or high-speed retard, such as a nitrous solenoid activation circuit or high gear selection micro switch.
Violet	Output wire for RPM switch, connects to ***ground*** when active. This can be used for many purposes, such as shift lights, or as part of the arming circuit for a nitrous system relay. Maximum current is 5 amps.
White	Unused at present time.

ROUTING WIRES

Route all wires away from heat sources, sharp edges and moving objects. If wires need to be routed through the firewall make sure to use pass-through grommets to protect the wires from the edges of the hole. Route the trigger wires separately and directly away from the other wires, spark plug wires and direct away from the distributor. If possible, route them along a ground plane, such as the engine block or firewall, which creates an electrical shield.

MODE SELECTION AND PROGRAMMING

The 375+ Multi-Function Accessory's hand held input device is used to select both the programming mode and to select specific values in each mode. Holding the hand held controller in both hands allows the left thumb to work the mode selection button and the right thumb to work the value selection up and down buttons. There are 11 display / selection modes.

Mode 0 – Tachometer display. This shows engine RPM with a +/– 10 RPM accuracy. The software has an averaging function that smoothes the RPM display and makes it easier to read. You can keep the display in this mode and use it as a digital tachometer readout during engine tuning or normal driving conditions.

Mode 1 – Main RPM limiter value. This feature keeps the engine from exceeding a preset RPM level by not firing the spark plugs in a specific fashion to hold the engine at the specified maximum RPM level. Note this will not protect the engine from over revving due to an incorrect selected transmission down shift. It can be set from 1000 to 12,700 RPM in 100 RPM increments.

Mode 2 – Staging RPM limiter value. This feature is handy for holding the engine at a specific speed as when you are launching the vehicle at a drag strip. It can also be set from 1000 to 12,700 RPM in 100 RPM increments. This limiter requires an activation signal input via the orange lead in the 6-pin flat connector harness from either the solenoid activation circuit of a line lock device or a micro switch or activation light on the emergency brake control.

Mode 3 – Fixed or high speed retard value. This function is vital to reducing the occurrence of pre-ignition and detonation while using nitrous oxide. Please consult with the supplier of your nitrous oxide kit as to the amount of recommended timing retard for the amount of nitrous you are using. It can also be used to retard the timing in a specific gear. Once the signal is received the timing is retarded the full amount selected. Once the activation signal is removed, the timing returns to its normal level. This retard function requires activation signal input via the yellow lead in the 6-pin flat connector harness. It can be set from 0.1 to 15 degrees in 0.1 degree increments.

Mode 4 – Is the start retard value. This feature can be very handy for use with a high compression engine. By retarding the timing during starting, the cranking load on the starter motor itself is greatly reduced and the engine will start easier either when cold or hot. The full amount of selected retard starts at 100 RPM and returns to normal timing at 500 RPM. It can be set from 0.1 to 15 degrees, in 0.1 degree increments. If you do not want or need any start timing retard, make sure that you select .1 degrees for this function.

Mode 5 – The lower RPM value of the window RPM switch.

Mode 6 – The upper RPM value of the window RPM switch.

The RPM window switch function is a very handy way of activating and deactivating a device based on engine RPM. This can be used in the arming circuit of nitrous oxide system. In that way the nitrous oxide cannot be activated below a specific RPM and can be turned off prior to reaching the engine RPM limiter. This helps reduce the possibility of engine damage, which could occur if the nitrous was still activated and you missed a gear while shifting the transmission and the engine free revs. The violet wire in the 6-pin connector is used as the output, and it is connected to ground when active. Note maximum current draw cannot exceed 5 Amps.

Mode 7 – The proportional boost timing retard value. This allows you to select a specific amount of timing retard per PSI of boost pressure, as sensed in the intake manifold. This requires the use of a MAP

sensor and connection harness, which are **NOT** included, but are sold separately (ACCEL 2-BAR sensor p/n 74776 and 3-BAR sensor p/n 74777 MAP sensor harness p/n 29785). By retarding the timing proportionally (only as the boost pressure builds), the engine can make maximum potential power while minimizing the effects and problems of pre-ignition and denotation. As the boost pressure drops the timing retard is proportionally dialed back. It can be set from 0.1 to 4 degrees per PSI of boost in 0.1 degree increments. Say your vehicle is making 10 PSI of boost and you need 6 degrees of timing retard at 10 PSI, you would set the proportional retard value at 0.6 degrees per PSI of boost. That way when you have 5 PSI of boost, you will only have 3 degrees of timing retard and by the time you reach the full 10 PSI of boost, you have a total of 6 degrees or timing retard.

Tuning tip - There are several factors used in determining the amount of boost timing retard required per a specific application, including but not limited to; static compression ratio, aluminum vs. cast iron heads, 2 valve vs. 4 valve heads, inclusion and efficiency of an inter or after cooler, octane rating of the fuel used, the heating characteristics of the super or turbo charger itself, the elevation of the vehicle during use, etc ... Dyno testing is the best way to determine how this feature should be set up. Chassis dynos are available in many areas, and are a good choice when the engine is already in the vehicle.

Mode 8 – Cylinder select value. Select the number of cylinders that your engine has from 3 to 12. NOTE: this controller ***does not*** work with odd-fire engines.

Mode 9 – MAP sensor select mode. If you are using a MAP sensor you need to inform the 375+ Multi-Function Accessory as to which MAP sensor your are using, either 2-BAR or 3-BAR units. Typically if your application is limited to no more than 14-15 PSI of boost you should only use a 2-BAR sensor (ACCEL p/n 74776). If you are running over 15 PSI but not more than 29-30 PSI of boost you should only use a 3-BAR sensor (ACCEL p/n 74777). With either MAP sensor you will also need the ACCEL MAP sensor harness p/n 29785.

Tuning tip - Remember that bigger is not allows better. If you don't need a 3-BAR sensor, then do not use it. The signal resolution of a 3-BAR sensor is 33% less than that of a 2-BAR sensor, so the actual values will not be as accurate compared to those of the 2-BAR sensor. Also make sure that the vacuum line running from the intake manifold to the MAP sensor is as short as possible. This will make the reading that much more accurate and relative to real time conditions.

Mode 10 – Is the MAP sensor reading display mode. The display will show a negative sign (–) denoting a vacuum reading in inches of mercury. A lower case "b" indicates a boost pressure reading in PSI. You can leave the display in this mode and use it as a digital vacuum / boost gauge during engine tuning or normal driving conditions. Of course this mode will only function when used with the MAP sensor and harness.

Once the 375+ Multi-Function Accessory has been programmed, the hand held unit can be either detached from the unit itself by removing the cable from the 15-pin port or it can remain attached to the unit and be left in mode 0 for use as a digital tachometer or mode 10 as a digital vacuum/boost gauge.

If you are using a MAP sensor for boost proportional retard, make sure that when you first start the engine that you pause in the ignition "run" mode for a second or so to allow the MAP sensor circuitry to read the normal atmospheric pressure and properly calculate boost pressure.

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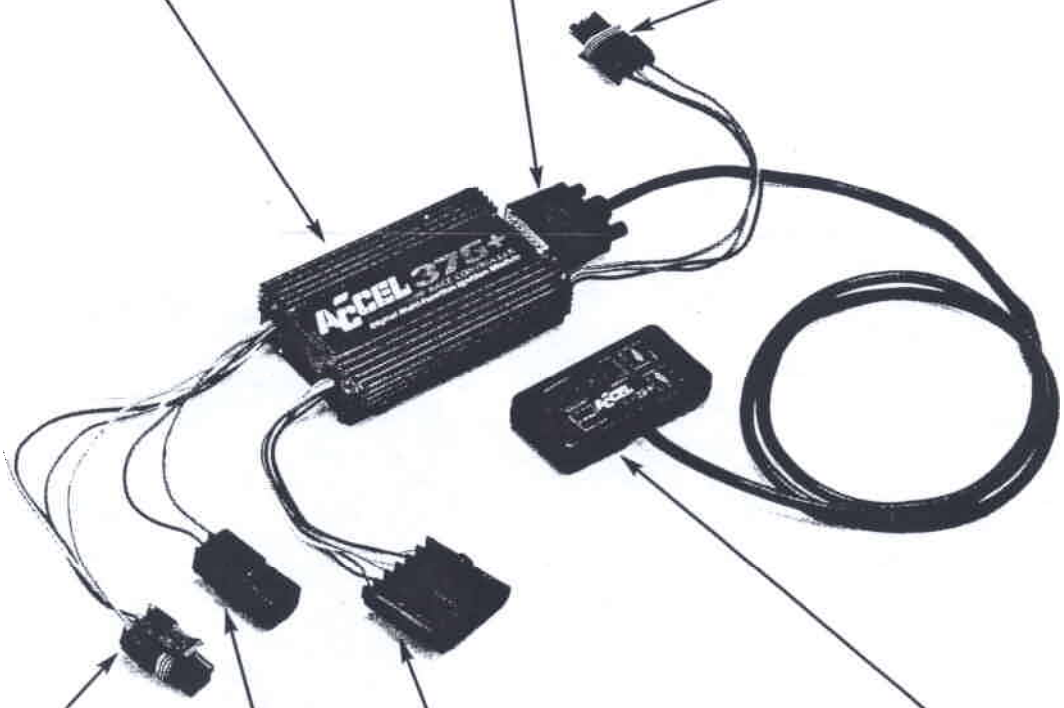
The 3-pin flat connector plugs into the MAP sensor extension harness (ACCEL p/n 29785, which is sold separately)



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