90 Control V and Starting Line RPM Controls
#9000, #9004, #9001, #9009, #9010, #9011 and #9011K

**********************CAUTION**********************
The Throttle Control should be installed only by a qualified race mechanic. If you are unfamiliar with any of the operations or terms in these instructions, you should have a qualified race mechanic install this device for you. Improper installation may cause property damage, personal injury or death.

INSTALLATION

1. Read all instructions before installing as most installations vary and you may not follow the steps in this exact order. The ACD 90 Control V and the ACD Starting Line RPM Control are very similar in function & installation. Both units will be referred to as a throttle control in the following instructions. Any specific information about either will be noted.

2. Make sure you understand the operation of the control, as outlined in the operation section of these instructions, before you modify your throttle linkage.

3. Mount the quick connect ball stud(a) in the uppermost hole in your carb throttle linkage arm. With a "fishing type" scale attached to the ball on the throttle arm, check the pull required to completely open the carb butterflies. The pull required should not exceed 40 lbs. If it exceeds 40lbs check for bad pump cams, rusty throttle shafts, binding linkage, etc. do not proceed until the throttle operates free and smooth.

4. Your car MUST have a solid throttle pedal stop. A solid stop is a bolt or tube welded to the chassis. A block of wood under the pedal or the pedal against the aluminum firewall are NOT positive stops. Ninety nine (99%) of all consistency problems encountered with "in linkage" type throttle controls are due to poor throttle linkages or lack of a positive pedal stop.

5. Run the air line (b) from the CO2 bottle to the engine compartment. Leave enough line to allow full movement of the linkage.

6. The threaded adapter (H) is internally threaded to accept a 10-32 "Morse type" cable. If your throttle linkage is the "rod type" you may need to drill and tap the adjusting bolt to 1/4"-28 threads to connect to your throttle rod. SPECIAL NOTE - Factory (OEM) cables. We do not recommend the use of factory cables (GM, Ford, or Chrysler). These cables were not made for race use. Although you can modify them to work with the Throttle Control, know in advance they will generally fail. If you want to retain a cable, change to a Morse cable or a Lokar cable. For most applications it is easier to change to a solid rod linkage.

7. Thread adjusting bolt (c) 1/2 way into the air cylinder (d) and tighten the lock nut (e).

8. Using brass fitting (f) connect airline (b) to the solenoid (g). Use Teflon sealant at this connection NOT Teflon tape). Be sure to hold the brass hex adapter with a wrench while installing fitting.
9. Adjust CO2 pressure to 85psi. If you purchased the complete kit (#9001 or #9010), the furnished regulator is preset.

10. Open CO2 bottle and check for leaks at all fittings using soapy water.

11. The easiest way to install the Throttle Control into the linkage is to have someone sit in the car and push the pedal hard against the solid stop. With the CO2 bottle open and the Throttle Control attached to the Q.C. ball(a) on the carb linkage, open the throttle butterflies wide open by hand. Now align the Throttle Control with the throttle rod or cable, side by side. For rod type linkages mark the rod at the point where the threaded adapter (H) ends. Leave an additional 1/2" for threads and cut the rod at this point. Rethread the end of the rod with 1/4"-28 threads. For cable type linkages, move the cable mounting bracket back until the Throttle Control can be threaded onto the cable.

12. Disconnect the Throttle Control from the Q.C. ball on the carb and disconnect airline. Attach Throttle Control to the throttle rod or cable and tighten the lock nut on your rod or cable (I). Reconnect the Throttle Control to the Q.C. ball on the carb and reconnect airline.

13. You must now adjust for wide open throttle on your solid pedal stop. If your pedal stop is adjustable, screw the pedal stop in or out to achieve wide open throttle with the gas pedal pushed hard against the solid stop. If your carb is not opening fully, turn the pedal stop in until it does. If the throttle is overriding the air pressure and trying to separate the air cylinder on the Throttle Control, back the pedal stop out until it is not trying to separate the air cylinder. If your pedal stop is not adjustable, wide open throttle can be adjusted by threading the Throttle Control in or out on the throttle rod or cable.

14. **NOTE:** The adjustment bolt (c) will not change the overall length of the Throttle Control, i.e.: if the adjustment bolt (c) is turned in or out, the stroke of the air cylinder will change but the overall length will not. Once you have properly cut and adjusted your linkage, your wide open throttle will never change.

15. Test the operation of the linkage at both full throttle and closed throttle to be sure there is no interference with the carb, manifold, firewall, hood, etc.

16. "90 Control V Wiring - Connect one wire to a good chassis ground. Connect the other wire to the yellow wire of either ACD Dual, Quad timer or 12 volt source.

"Starting Line RPM Control Wiring" - Connect one wire to a good chassis ground. Connect the other wire to a 12 volt source that will be activated when you want to control the RPM. i.e.: transbrake, lineloc, brake switch, etc.
OPERATION

1. The throttle control is a very simple but precise device. It is either open or closed. When 12 volts are sent to the solenoid it opens. When there is no power at the solenoid it closes. All the consistency is in your linkage, positive stop and carb setting. If your linkage looks and operates like something that should be in a scrap yard, the consistency with the throttle control will be very poor at best.

2. When CO₂ is applied to the inlet of the solenoid, the cylinder will close to its shortest length. When 12 volts is supplied to the solenoid the CO₂ will exhaust and the cylinder can be pulled to its longest length by the carb return spring. Be sure the carb has a good return spring.

3. Adjusting the unit for throttle drop on the 90 Control V or RPM on the Starting Line Control. Once you set full throttle operation you should never need to readjust it, if you make proper travel adjustments to the unit.

   1. Disconnect the unit from quick connect ball stud (A).
   2. Loosen lock nut(e) on adjusting bolt(c). (DO NOT loosen the locknut (I) on your cable or rod) or the quick connect.
   3. Turning the adjusting bolt (c) counter clockwise to expose more threads on the adjusting bolt will allow the throttle to close farther(less RPM for the Starting Line Control).
   4. Turning the adjusting bolt (c) clockwise to expose fewer threads on the adjusting bolt will allow the throttle to close less (more RPM for the Starting Line Control).

4. Starting position "90 Control V" - we have found that closing the carb to the point where the secondary’s are just closed is a good starting point for a 4150 carb. A Dominator should be closed to about 1/4 throttle. When the carb reopens be sure you get a good pump shot. This is important for consistency.

5. Opening Speed - This is the adjusting screw in the brass hex where the CO₂ enters. It controls how fast the throttle reopens to help stop tire spin. Turn screw clockwise to slow the speed. All adjustment takes place from all the way in to about 1 turn out.

6. Closing Speed - This is adjusted at the head of the solenoid by the exhaust port. It controls how fast the throttle closes to help stop chassis unload. (90 Control V only) Turn screw clockwise to slow the speed. All adjustment takes place from all the way in to about 1 turn out.

We highly recommend that you slow down the operation ONLY as much as you need to solve a problem. MOST cars do not need to use either of these speed controls. After you have tested your setting it is good to put a drop of epoxy or silicone on each screw so they can’t move.

7. Twice a year you should turn off the CO₂ and disconnect the line at the control and put just 2 or 3 drops of any type of light lubricating oil or WD-40 in the unit.
TESTING  
(90 Control V & 9200 Only)

All testing should be done on the same day in the same lane under the same weather conditions. If the 60' time on any run varies more than .0005 throw the run away. Woulda, coulda and shoulda are not words to be used in testing for positive results. If you are not willing to seriously test your new product, do not waste your time installing it.

a. Set the "ET Control Cylinder" for amount of throttle closing you desire.
b. Set the timer for the amount of delay that you want to run i.e. one second(1.00) after brake release.
c. Set the timer for 9.99 seconds of duration. This will allow the carb to remain closed for the complete run.
d. Make 3 runs at this setting. A typical 9.40 Super Gas car might run 11.50 ET but should stay within + or -.01. If the car is not consistent try to readjust the carb a turn or two and test again.
e. When the car is running consistently, adjust the duration time to between 2 & 3 times the amount to be slowed.

Example: Super Gas car can run 9.40, set timer to 1.00 delay and between 1.00 and 1.50 duration (use 1.25 for example). Make two runs, car runs 9.84 and 9.85 as an example.
f. Now adjust duration time up 20 numbers to 1.45 duration. Make two runs. Car runs 9.92 and 9.93 as an example.
g. Now adjust duration timer down 20 numbers from the start point to 1.05 duration. Make two runs. Car runs 9.76 and 9.77 as an example.
h. Now return to 1.25 duration and make one run. Car should run about 9.84.

Car will run:
- 9.765 average at 1.05 duration
- 9.845 average at 1.25 duration
- 9.925 average at 1.45 duration

Total E. T. spread .16
Total duration spread .40

i. Duration divided by et equals 2.5. You can conclude for every 2.5 numbers you enter in the duration, your ET will change .01. If extreme changes are needed the number may change.

j. To make this car go 9.90 do as follows:
   - 9.90 (want to run)
   - minus(-) 9.84 (last run with 1.25 in timer)
   - equals .06 (under index)
   - times(x) 2.5 (number per .01 ET as calculated in step i)
   - equals .15 additional duration time needed

1.25 old timer setting
Plus(+) .15 additional duration time needed
1.40 equals new timer setting to run 9.90
WARRANTY

Your product from Advanced Control Devices, Inc. is warranted for one(1) year from date of purchase against defects in material and workmanship. During this period such defects will be repaired, or the product will be exchanged at the option of Advanced Control Devices, Inc., without charge. This warranty does not cover damage caused by misuse, alteration or negligence. **ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF FITNESS AND MERCHANTABILITY, ARE LIMITED IN DURATION. UNDER NO CIRCUMSTANCES WILL ADVANCED CONTROL DEVICES, INC. BE RESPONSIBLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR COSTS ARISING FROM OR IN CONNECTION WITH THE INSTALLATION OR USE OF ANY PRODUCT OF ADVANCED CONTROL DEVICES, INC.**

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