

PRO-CUBE®

INSTALLATION AND OPERATING INSTRUCTIONS

Congratulations on your purchase of the most advanced combination delay box/timer unit available for today's precision drag racing. The new **PRO-CUBE®** is designed to give you unprecedented precision control of your reaction time and ET with a host of standard features. There are a ton of features packed in one super-compact unit that can be mounted almost anywhere. You should read and understand this entire manual, including the warranty section beginning on page 8, before proceeding with installation.

STANDARD FEATURES

- **Automatic Cross-Over**

Allows you to react to a "slower" opponent's top bulb on a "Cross-Talk" or full "Open" Tree simply by entering dial-ins.

- **Second Hit**

Allows you a second shot at the tree and leaving on the better of the two.

- **Bump-Down®/Bump-Up**

A powerful tool, enabling you to correct for a late or early reaction.

- **Built-in Flinch Protection™**

There are built-in methods to avoid a **known** red light caused by a "*Flinch*" (accidental early reaction).

- **Pro-Stage™**

A must for the "Cross-Talk" tree, the patented **Pro-Stage™** starting line control provides better driver concentration, improved consistency, and reduced wear and tear on the engine and converter.

- **Transbrake Output**

Precision high current output for use on all types of transmission brakes, and clutch release solenoids.

- **Line Lock Output**

This versatile output is activated and released simultaneously with the transbrake output but includes a blocking diode to prevent back feed into the transbrake circuit.

- **Transbrake Lockout**

This adjustable built-in timer prevents re-activation of the Transbrake and Line Lock outputs during a run.

- **Reset Switch**

When toggled, it instantly stops all outputs and timers. Simply "reset" to instantly release transbrake and stop timers from "cycling". Great for releasing "*pro-brake*" reverse after backing-up.

IMPORTANT NOTE: IT IS REQUIRED TO "TOGGLE" THE RESET AFTER BACKING UP FROM BURNOUT (for "Pro-Brake" systems) IN ORDER TO ACTIVATE THE "PRO-STAGE" STARTING LINE CONTROL.

- **Run Info**

Information will **automatically** be displayed 15 seconds after launch to indicate the difference in your reaction times for "double-hits", as well as the number of times you "**Bumped-Down/Up**" your reactions. Run info continues to display until unit is "RESET" (as mentioned above), or until transbrake is cycled again.

SPECIFICATIONS

Overall Dimensions (H x W x D):	4.7" x 4.7" x 2.95"
Power Supply Voltage:	10 - 18 Vdc
Power Supply Input Current (no outputs activated):	0.1 Amps
Output Current, Transbrake:	20 Amps for 1 minute
Output Current, Line Lock:	2 Amps continuous
Output Current, Pro-Stage :	10 Amps continuous

INSTALLATION

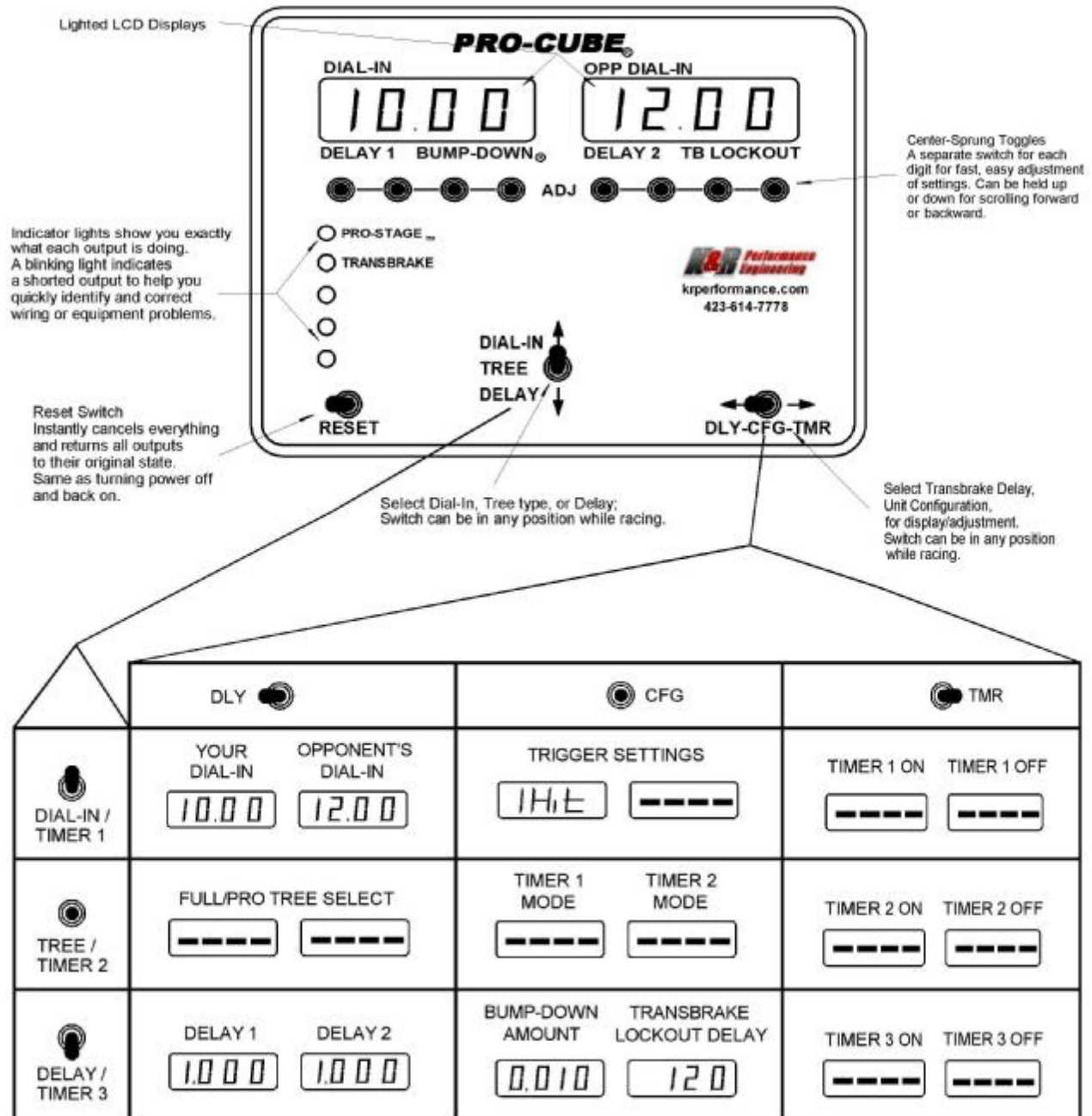
1. Mount the unit in a convenient location where you can easily read the display and reach the front panel when strapped in the driver's seat.
2. Refer to the wiring diagram for electrical connections. BE SURE TO DISCONNECT BATTERY OR TURN MASTER SWITCH "OFF" WHILE MAKING ELECTRICAL CONNECTIONS!

Important! Warranty Void if not followed!

3. IN ORDER TO DAMPEN VIBRATION, THE UNIT MUST BE MOUNTED USING THE THREE RUBBER MOUNTS LOCATED ON THE BACK. SUFFICIENT CLEARANCE SHOULD BE MAINTAINED ALL AROUND THE UNIT SO THAT IT DOESN'T VIBRATE AGAINST ANY SURROUNDING OBJECTS. **NOTE:** RUBBER MOUNTS ARE NOT REMOVEABLE.
4. FOR THRU-DASH INSTALLATIONS ALLOW CLEARANCE BETWEEN DASH AND UNIT. USE FOAM RUBBER MOLDING (SUPPLIED WITH DASH KIT) TO FILL THE GAP. THE UNIT MUST FIT SNUG IN OPENING. SEE TEMPLATE.
5. ALWAYS COMPLETELY DISCONNECT THE UNIT BEFORE ANY WELDING IS DONE ON THE CHASSIS.

HOW TO SELECT AND CHANGE SETTINGS

Two three-position switches are used to select the various screens. These switches may be left in any position while racing; they simply select what is being displayed. The table below shows the content of each screen and the factory default settings. Use the adjustment (“ADJ”) switches just below the displays to change settings. There is one switch for each digit in the display, simply adjust each digit up or down by “toggling” a switch. For faster changes, you may hold a switch in an up or down position to scroll a digit in the direction held.



FACTORY DEFAULT SETTINGS FOR MODEL PCT0 ARE SHOWN IN THIS TABLE

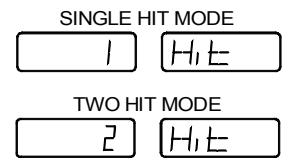
INITIAL SETUP “CFG” MODE----How you want the “**PRO-CUBE PLUS**” to work for you!

“1-Hit” vs. “2-Hit” Interface Modes

The **PRO-CUBE PLUS** allows you to “hit” the tree twice and launch your vehicle on the quicker of two reactions. If attempting two “hits”, the unit must be configured to “**2-Hit**” mode. This allows you two “hits” with one button. Using the “**2-Hit**” mode to “hit” both top bulbs (on an “open” tree), or top bulb and second bulb (on a “cross-talk” tree) is generally not recommended unless you’re at least 1.0 second faster than your opponent. If you do not want to attempt two hits, it is generally recommended to select “**1-Hit**” mode as it provides the preferred *Flinch Protection* (explained in next section).

TO CHANGE INTERFACE MODES

Just as the switches were set for the “configuration” of the switch modes (prior section), also displayed in the left-hand display is the “configuration” of the **hit** mode. You may toggle any of the “ADJ” switches under the left-hand display to change from one mode to the other, “**1Hit**” or “**2Hit**”.



“2-Hit” mode

In “**2-Hit**” mode you release the transbrake button on the first bulb, and then reapply the transbrake button and release on another bulb. On an “open” tree, that would typically be both top bulbs (a secondary delay would typically be set the same as the primary delay). On a “cross-talk” tree, that would typically be the top bulb and your second bulb (a secondary delay would typically be set .500 seconds less for the second “hit”). Each “hit” starts a delay timer and the car will react on the better of the two reactions. The reaction “differential” will be automatically displayed after the run (discussed in later section). **YOU DO NOT HAVE TO TAKE A SECOND “HIT” IF YOU ARE CONTENT WITH YOUR FIRST “HIT”.**

Built-in Flinch Protection®

Another important difference between these modes involves the *Flinch Protection* feature. Simply stated, flinch protection can prevent you from red-lighting when you accidentally “react” before the tree starts. When this occurs using “**1-Hit**” mode, just depress the transbrake switch again and release when the tree is activated. The delay will be reset with full delay again and the “flinch” will be ignored.

In “**2-Hit**” mode, we have developed a whole new concept of *Flinch Protection*. If you “flinched” with one of your “2-hits”, the built-in *Flinch Protection* will save you from your “flinch” and will take the other “hit”. If your “2-hits” (two reactions) are reasonably close, *Flinch Protection* will **not** be activated, and your reaction time will be determined by your “quicker” reaction as described earlier. An “**F**” symbol will be automatically displayed after the run, if a “flinch” was detected and averted (further discussed in later section).

Bump-Down®/Bump-up

One of this unit’s most powerful bracket racing features, **Bump-Down/Bump-up** allow you to correct for late or early reactions by subtracting or adding delay time as the tree is coming down. You can have both “Bump-Down” and “Bump-Up” if both optional switches are connected as illustrated in the *wiring diagram*. The “Bump-Down” feature can be used to subtract time from your delay and timer **TIMER 1** (as a “programmed” amount of throttle stop over-ride), however you cannot “Bump-Up” **TIMER 1**. To adjust the amount of “bump” time, set the bottom right 3-position switch to the middle position to “**CFG**” and the 3-position switch in the center of the unit to the down position. You can then set in the left-hand display how much time you want added/subtracted for each “hit” of a “bump” switch. Range

for this value is 0.000 - 0.099 seconds. These time settings are independently set for “Full tree” and “Pro tree” run programs.

Transbrake Lockout Timer

To prevent accidental re-engagement of the transbrake after launch, a lockout timer is built-in to disarm the transbrake and line lock outputs for a programmed period of time. The displays will show “(**tb**)(**Loc**)” during the lockout delay and no changes can be made until the lockout timer completes. The **RESET** switch can be used to manually override this delay and allow the transbrake to be reactivated (after backing up from burnout, for example).

To adjust the amount of “lock-out” time, set the bottom right 3-position switch to the middle position “**CFG**” and the 3-position switch in the center of the unit to the down position. Adjust the right-hand display for the amount of “lock-out” time desired. The factory setting is 120 seconds, but you can program it to any value up to 3999 seconds....it is NOT recommended to set lower than the amount of time required to shift into “high” gear (typically 3 seconds minimum).

OPERATION-----Now we're ready to race!

Dial-Ins and Delay Times

Now its time to enter your dial-ins. With the bottom right-hand switch set to “**DLY**” and the center 3-position switch set in the “**DIAL-IN**” position, enter your dial-in in the left-hand display. Now enter your opponent's dial-in in the right-hand display. ANY TIME YOUR OPPONENT'S DIAL-IN IS SET “HIGHER” THAN YOUR DIAL-IN, IT ASSUMES YOU ARE “CROSSING-OVER” AND LEAVING OFF THEIR TOP BULB. IT IS AN **AUTOMATIC CROSS-OVER** AND THE DIAL-IN DIFFERENCE WILL BE ADDED TO YOUR DELAY SETTING. A “**CROSS-TALK**” TREE IS STILL A “CROSS-OVER” TREE, WHERE BOTH TOP BULBS COME ON AT THE SAME TIME. If you are leaving first, you can simply enter your opponent's dial-in equal or lower than your dial-in.

Now its time to enter your delay time(s). With the bottom right-hand switch set to “**DLY**” and the center 3-position switch set to “**DELAY**”, enter your “**DELAY 1**” in the left-hand display. If you are set-up to take 2-hits, you would enter your “**DELAY 2**” in the right display. For further explanation, see “1-Hit” vs. “2-Hit” Mode in prior section.

The **Pro-Stage™** Starting Line System

The **Pro-Stage** system requires a compatible (pneumatic) throttle control adjusted to hold the engine to near idle with the throttle pedal in the full throttle position. The system reduces the amount of work you have to do on the starting line and minimizes the amount of time the engine is at full throttle. By eliminating part of the work, your concentration on the tree is improved and your reactions are more consistent. By minimizing the amount of time the engine is at full throttle, less heat is generated in the engine and converter which should also result in greater consistency. Furthermore, mechanical stress potentially caused by deliberate misfire RPM limiting devices is also reduced.

The **Pro-Stage** output is activated by “bumping” the **Bump-Down** switch as you roll up to the starting line and prepare to stage. Once activated, you can then final stage with your foot to the floor (in the wide open position) as the engine is held to near idle by the “throttle control”. On a Pro tree, the “throttle control” will automatically release and bring the engine wide open soon after the transbrake is activated. On a full tree, the engine will remain at near idle until **your delay** starts. Wide open throttle (WOT) will be further delayed by any cross-over time to keep the engine at low RPM until your side of the tree is activated. With the **Pro-Stage** system, high engine RPM will be limited to a short and consistent amount of time before launch.

NOTE: TO PREVENT ACCIDENTAL REACTIVATION OF THE **Pro-Stage DURING THE RUN, THERE IS A 15 SECOND ACTIVATION LOCKOUT OF THE **Pro-Stage** FROM THE TIME THE TRANSBRAKE RELEASES. THE DISPLAY WILL SHOW “(PS) (Loc)” WHEN LOCKOUT IS IN AFFECT. SIMPLY USE THE “RESET” SWITCH TO CLEAR THIS LOCKOUT IF YOU HAVE JUST ACTIVATED THE TRANSBRAKE (Example: activating “pro-brake” to back-up after burnout).**

Run Information

If you hit the tree twice or use the **Bump-Down/Bump-up** feature, reaction time information and bump-down/up counts will be automatically displayed approximately 15 seconds after you launch. The reaction time display will indicate which side of the tree you launched on as well as the difference in your reaction times. The quicker reaction is indicated with 0000 in the window its corresponding dial-in, and the differential (slower reaction) is displayed with its corresponding dial-in. Also if a “flinch” is detected, an “F” symbol will be displayed in the corresponding dial-in window. The bump-down display simply indicates how many times you bumped down or bumped up. The bump-down/up count for the transbrake release is displayed in the left window. The reaction and bump-down/up information displays alternate about every four seconds until you clear it by using the **RESET** switch. Since the information is not saved, you may want to record it for future reference.

EXAMPLES

Example 1: “Cross-Talk” Tree, 2-Hits

The “**Cross-Talk**” tree in use, **your** dial-in is 9.30; your **opponent's** dial-in is 10.92. Your delay time is 1.105 seconds and you're in “**2-Hit**” mode. Enter 9.30 for your dial-in, 10.92 for your opponent's dial-in, and 1.105 for **DELAY 1** and .605 for **DELAY 2** (.500 less for reacting to **second** bulb). The difference between the dial-in's (cross-over delay) will be automatically calculated and added to **DELAY 1** (1.105). When you stage your car, activate the transbrake output by pushing and holding the transbrake button (labeled “**TRIGGER**”) down. The transbrake will be activated. Release the transbrake button (“**TRIGGER**”) on the first “flash” of the tree. Re-push and hold the “**TRIGGER**” and release again on “your” second bulb. You will launch on the quicker reaction. If your reaction time was quicker on your tree by 0.009 seconds the display will show 0.000 in the left window, and 0.009 in the right window for reaction time information. A bump-down/up count of 0 will appear every 4 seconds in each window indicating that you did not use the feature.

Your time slip indicates your actual reaction time was 0.015. This was your reaction time to your side of the tree. The reaction time information indicated you were 0.009 slower reacting to your opponent's tree, so your actual reaction to your opponent's side of the tree would have been: 0.015 + 0.009, or 0.024.

Example 2: Flinch Protection, 1-Hit

You're using “**1-Hit**” mode. After staging, the starter takes longer than usual to start the tree and you flinch, releasing the trigger switch too soon. Just press the switch again and release it when the tree starts. If you're late, use Bump-Down to correct for it. (In “**1-Hit**” mode, the delay time is reset whenever the trigger switch is re-depressed, and started over when released.)

Example 3: Flinch Protection , 2-Hit

You're using the switch mode and set in “**2-Hit**” mode. You reacted to the cross-over bulb but anticipated the next hit and “flinched” way before the next bulb was lit. No worry, the built-in **Flinch Protection** will ignore the “flinch” and you will leave on the first reaction. The “Run Info” will display 0.000 in the right window (indicating you left on the “cross-over”), and “**F**” will be displayed in the left window which indicates you “flinched” on your side.

TROUBLESHOOTING

The front panel includes an indicator light for each output. These lights give you direct indication of whether the corresponding output is off or on. A flashing light indicates a shorted or overloaded output. If this occurs, first disconnect the output and cycle the unit again, watching the indicators. If the output operates normally while disconnected, then the problem is in your wiring or equipment. If the unit operates erratically when the engine is running, and normally when the engine is off, check for sources of electrical interference. The **PRO-CUBE**® is designed to tolerate extreme interference but the ignition coil, spark plug wires, and ignition unit are powerful sources of RF interference and a minimum distance of 12” is recommended. It is also recommended for “door” cars, that the ignition

coil be located on engine side of firewall. If you're using solid core spark plug wires, replace them with an RF suppressive spiral core wire set.

TECHNICAL SUPPORT

Contact: *K+R Performance Engineering, Inc.*
Telephone: 423-614-7778
Address: 4252 Spring Place Rd SE
Cleveland, TN 37323

WARRANTY

We at K&R Performance Engineering Inc. warrant to the original purchaser the products manufactured by us to be free from defects in material and workmanship under normal use and service, for which it was intended, but only if it has been properly installed and operated. Our obligation under this warranty shall be limited to the repair of any product or products which may thus prove defective under normal use and service, for which it was intended, within two (2) years from the date of installation by the original purchaser, and which our examination shall disclose to our satisfaction to be thus defective. Any defect affecting operation of the unit will be repaired at no charge. You will be billed only for shipping. Damage caused by severe vibration and metal-to-case contact or restricted movement due to improper mounting is NOT covered.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE AND OF ALL OTHER OBLIGATIONS OR LIABILITIES ON OUR PART, AND WE NEITHER ASSUME, NOR AUTHORIZE ANY OTHER PERSON TO ASSUME FOR US, ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF THIS PRODUCT. THIS WARRANTY SHALL NOT APPLY TO THIS PRODUCT OR ANY PART THEREOF WHICH HAS BEEN SUBJECT TO ACCIDENT, NEGLIGENCE, ALTERATION, ABUSE, OR MISUSE. WE MAKE NO WARRANTY WHATSOEVER IN RESPECT TO ACCESSORIES OR PARTS NOT SUPPLIED BY US. THE TERM "ORIGINAL PURCHASER" AS USED IN THIS WARRANTY, SHALL BE DEEMED TO MEAN THAT PERSON OR ENTITY WHO ORIGINALLY PURCHASED THE PRODUCT. THIS WARRANTY

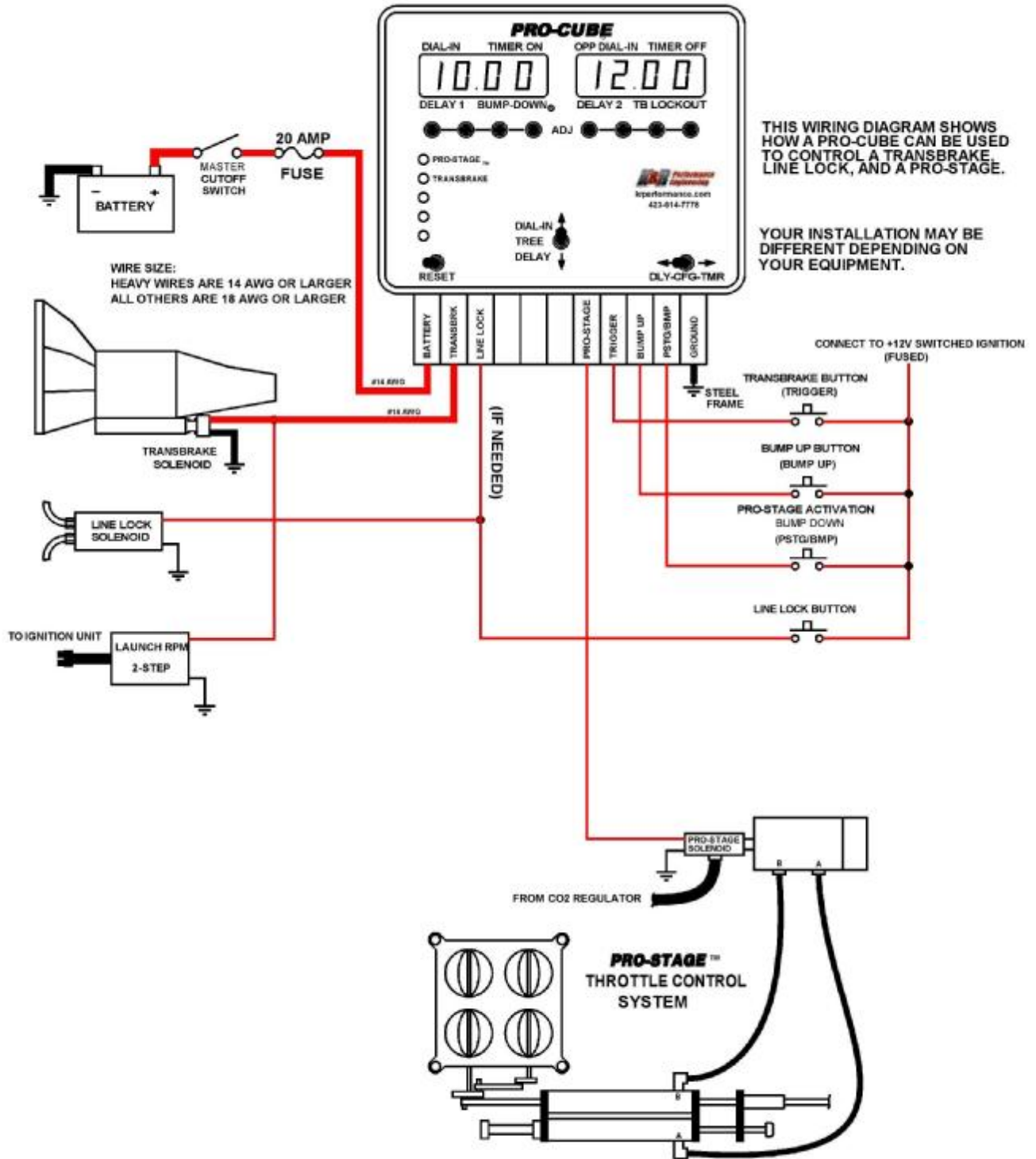
SHALL APPLY ONLY WITHIN THE BOUNDARIES OF THE CONTINENTAL UNITED STATES.

Original Purchaser must notify K&R Performance Engineering, Inc. of a breach of warranty within thirty (30) days after discovery thereof, but not later than the guarantee period; otherwise, such claims shall be deemed waived. No allowance will be granted for any repairs or alterations made by the Original Purchaser without K&R Performance Engineering, Inc.'s prior written consent. No person, firm, or corporation is authorized to assume for us any other liability in connection with the sale of these goods.

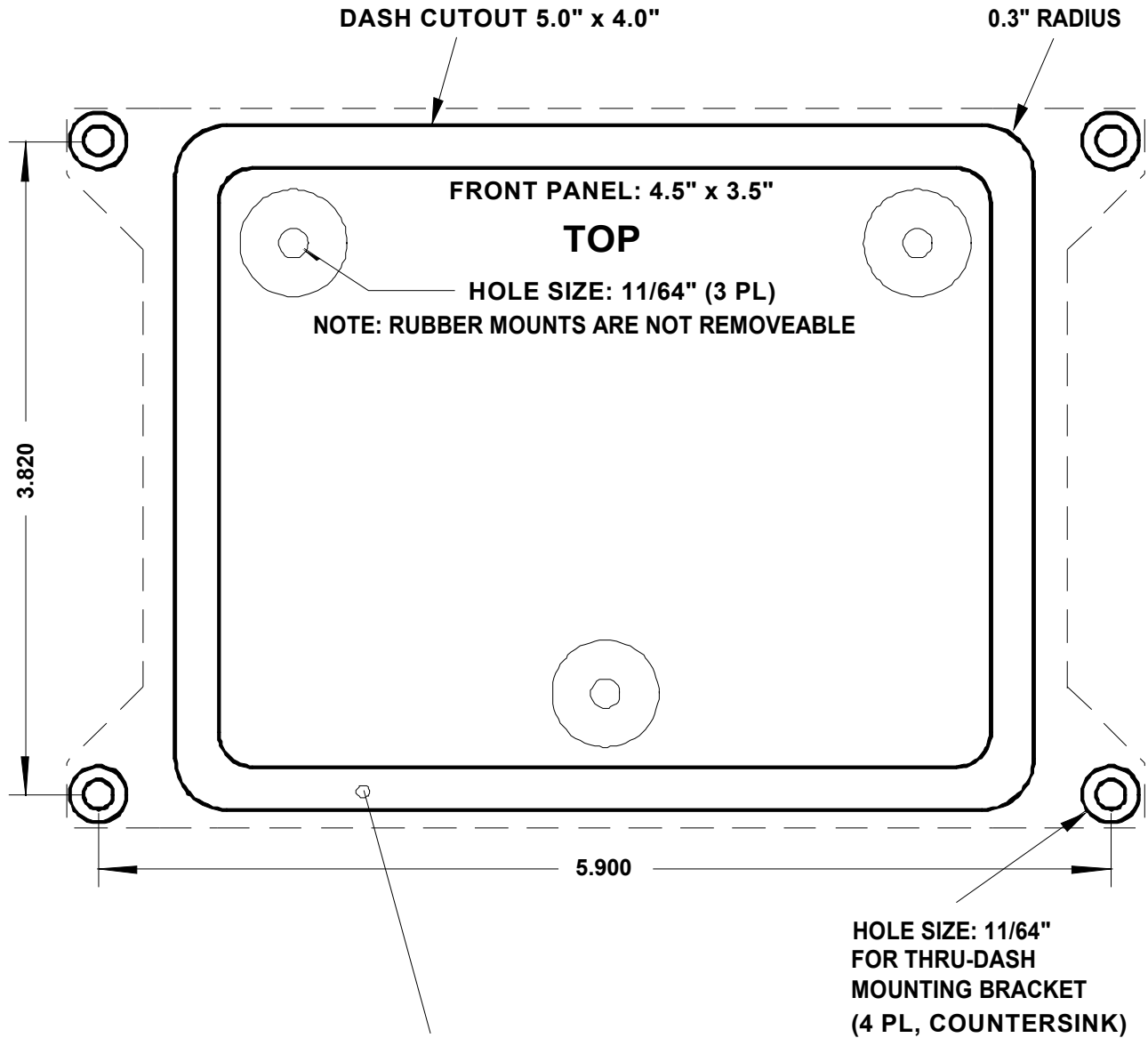
This warranty shall not apply to any K&R Performance Engineering, Inc. product, or parts thereof, which has been repaired or altered, without K&R Performance Engineering, Inc.'s written consent, outside K&R Performance Engineering, Inc.'s factory, or altered in any way so as, in the judgement of K&R Performance Engineering, Inc. to affect adversely the stability or reliability of the K&R Performance Engineering, Inc.'s product, or has been subject to misuse, negligence, or accident, or has not been operated in accordance with K&R Performance Engineering, Inc.'s printed instructions or has been operated under conditions more severe than, or otherwise exceeding, normal use for such product.

K&R Performance Engineering, Inc. shall not be liable for any injury, whether to person or property, or for any damages, whether direct, indirect, consequential, or special, or any other damage resulting from the use, or misuse, of this product. Any injury or damage so incurred will be limited to the original purchase price of the product.

The **PRO-CUBE®** is protected and licensed under the following US Patents:
Re: 32,474; 4,784,099; 5,600,185; 5,642,712; 5,839,419; 5,855,196; 7,866,762



MOUNTING TEMPLATE



IMPORTANT!

FOR THRU-DASH INSTALLATIONS, ATTACH RUBBER GASKET TO PRO-CUBE TO FILL GAP AND PREVENT METAL-TO-METAL CONTACT WITH DASH. UNIT MUST FIT SNUG IN DASH OPENING.

ORDER OUR INSTALLATION KIT FOR FAST, EASY THRU-DASH MOUNTING. KIT INCLUDES A BEHIND THE DASH MOUNTING BRACKET, GASKET, AND SCREWS.