



Yamaha RZ-350

Racing Pipe Kit Version 3.0 Instructions

(‘84-’86 U.S. Models)

Inside this box, you will find the following parts:

- Right Pipe Body with Cylinder Flange and pipe springs
- Left Pipe Body with Cylinder Flange and pipe springs
- Right and Left Aluminum (or Carbon) Silencers with attachment bolts
- Aluminum Battery Box assembly. with mount bracket and brake reservoir attach point
- Air Filter assembly. (rubber boot, clamp & filter)
- Perfect Jetting Kit with 410 and 420 main jets, 2 jet needles w/ adjusting circlips (e-clip)
- Sticker Pack
- Embroidered Toomey Racing Hat
- Installation Instructions with Limits of Liability notice

If anything listed above is not found upon opening this package **CALL US NOW!** (805) 239-8870 Do not attempt any installation unless you have read and understand the installation instructions, and have made certain you have all of the above listed parts. We check over and verify each box that leaves our shipping department for accuracy and completeness. All claims for missing parts must be made to the shipping company (usually UPS) as the boxes are complete when they leave our dock.

Installation Procedure:

(From Stock Pipes) First unscrew the heat sensor lines at the middle-rear of the pipes so as not to damage the wires. Only then can you unplug them from the wiring harness under the gas tank. Remove your stock exhaust system, with all the associated hoses, catalytic converter plumbing air filters etc. from the bottom of the engine.

Thoroughly clean the stock exhaust gaskets with acetone or contact cleaner, as you will re-use these parts. Also, clean the area where the gaskets go in the cylinder. On your new Toomey Racing Pipes, you will notice the Blue Machined Aluminum Billet cylinder/

pipe flange on the head-pipe, held on with 2 springs. Remove these springs and pull off the cylinder flange.

You will notice there is a Silicone O-Ring inside a groove in the Flange on the pipe, This will effect a tight seal for the exhaust gasses, you may want to use a little bit of oil on this o-ring when installing the pipe on the Blue Cylinder Flange to ease installation.

Install these Blue Machined Aluminum Billet cylinder flanges on the front of the cylinders, using the stock (clean) metal gaskets, and only finger-tight the nuts holding them on for now.

Now install the aluminum silencers on to the rear of the pipe bodies using the two Allen bolts in the back of the silencer. (Torque= 7-8 ft/lbs) There is an O-Ring Seal here as well.

Slip your new pipes up onto the cylinder flanges while keeping the rear mount bracket inside the rear footpeg bracket, and hook the springs. Now, just finger-tighten the rear mounting bolts.

Only after you have the pipes hung on the bike should you tighten up the front flanges, progressively to 15 ft/lbs. Then, tighten the rear mounts to 15 ft/lbs.

Carburation

The most frequently asked question is: What about bigger carbs? I would like to take a moment and talk about that. You must remember that your RZ is being transformed from a strangled, asthmatic, EPA special to nearly road race specifications with just the installation of Toomey Racing Pipes. Obviously, the carburation requirements are at opposite ends of the spectrum.

Since there is a power increase of some 50% when using your new Toomey Pipes, you might think this is quite a demand on your stock carbs, huh? Not really.

What we have to remember is that a carburetor is an airflow / velocity device; therefore you would want the highest volume flow AND the highest speed through the carb at the same time. It is a balance.

Personally, I would like to see the smallest possible carb on your bike, not the biggest! Emotions aside, the facts are, that the stock carb can out flow the stock reed valve almost two to one, so why make the carb bigger? All that happens, when you do, is the air flow slows, and it makes it much harder to atomize the fuel droplets nearly as fine as with a high speed flow, making them harder to burn therefore contributing less to power. The net result is less power and range.

So you can see that there is really no need for carbs when they are not the thing holding you back. The reeds are. Boyeson reeds help quite a bit and are definitely the best thing we have found for the stock engine. The reason is, they have better flow characteristics from bottom to top, and have better reed control than anything else on the market, including those six petal reeds that some people offer. (Boyesen Reeds are available from us for only \$59.99 for TWO sets (both cylinders). Ask for Part # 603.)

Unless you are willing to spend \$1,000.00 on bigger reeds, and the accompanying extensive port work to get them in there (and I mean BIG, like YZ 125 reeds) you have no need for bigger carbs. We have the dyno tests to prove it.

We tested 28, 30, 32 and 34mm carbs on the dyno and the best combination for peak power, as well as power range, was the stock carbs with our jet kit. The reason is simple. The air volume being drawn into the engine is a fixed amount determined by the pipe and ports, and does not exceed the maximum flow capacity of the stock carbs. You will get slower air-speed through bigger carbs with a proportional rise in air pressure due to the Venturi effect. Fuel atomization is not as efficient as in a smaller, lower pressure, high speed air flow. The poorer atomization burns less efficiently producing less power.

If, for some strange reason, you ordered pipes without a jet kit, call us today and order Part #RJK

Installing the Jet Kit

Our jet kits are the most accurate jetting combination possible for this pipe kit. We have special equipment to determine the correct needle have the technology to determine precisely the exact fuel needs at all throttle positions and loads for the following equipment ONLY:

- Toomey Racing Pipes using Toomey Racing Silencers
- Stock Carbs
- Standard or Boyesen Reeds on the stock reed block
- Standard cylinders

If you use any other parts, this jet kit may not be accurate and your power can be down. Call us for advise on any special combinations.

It is our recommendation to re-jet only one carb at a time. This way you will positively avoid one of the most common mistakes: reversing the throttle slides. When the slides are in backwards, it will run like the choke is stuck on. If your bike runs like this when you finish re- jetting, this is the most likely cause. Please read all instructions to insure that everything goes well.

First, wash your bike well, especially around the carbs. When you remove the carbs you do not want dirt getting into the engine or the carbs. Secondly, wait for the bike to dry. You do not want water getting into the engine or carbs either.

CAUTION! DO NOT SMOKE OR HAVE ANY SOURCE OR FLAME OR SPARK ANYWHERE NEAR YOUR BIKE OR WORK AREA. YOU WILL BE HANDLING RAW FUEL, AND THE DANGER OF FIRE IS GREAT! WORK ONLY IN A WELL VENTILATED AREA AS FUEL FUMES ARE EXTREMELY TOXIC.

Procedure:

Turn off the fuel petcock and disconnect all the hoses and fuel lines. Disconnect the throttle cables from the top of the carbs. Loosen the clamps on the rubber intake manifolds, at the front of each carb, and the clamps connecting the carbs to the airbox. Remove the carbs from the bike and take them over to your nice, clean work bench. Remove the three screws on the carb top and take off the top cover. You will now see the bolt head for the lever that actuates the throttle slide. Remove this bolt with an 8mm wrench and pull up the slide and needle assembly. Now you can see the two phillips screws that hold the actuation arm to the throttle slide. Remove these screws and take out the slide with the needle.

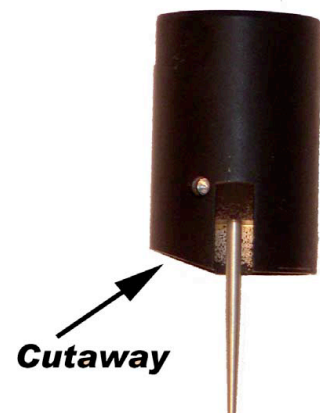
You will notice there is a white plastic spacer with a spring, then the needle with it's circlip, and then a black plastic spacer. Take out the black spacer and the needle. You will not be needing these now.

With one of your new Jet Kit needles, put the needle adjusting circlip on the third groove down from the top (the top being the grooved end of the needle). This is the standard position.

Next, place the white plastic spacer-spring on top of the needle-clip-shim assembly, plastic down first with the spring facing upward.

Now put the slide back in the carb and reattach the actuation arm with the two little screws. Two things to check here are:

1. Make sure you have the slide in the right way.. with the "cutaway", (the slight bevel on the bottom of the slide) facing toward the rear of the bike or air entry side. Visually confirm the slide falls freely to the bottom of the slide bore, and bottoms out on the carb throat floor.
2. Make sure you have not covered up the hole down in the bottom of the slide that lets air pass freely above and below the slide when you work the throttle. If this is covered, there will be pressure above the slide resisting you when you open the throttle. There will also be a vacuum above the slide when you release the throttle which will also resist proper operation downward.



Now replace the bolt that attaches the actuation arm to the actuation shaft. Then replace the carb top and tighten the three screws. Check the operation of the carb and if it operates the same as the other side on which you haven't yet worked, you're probably OK.

Any questions, Call us. Technical Service Staff, (805)-239-8870, or eMail to: tech@toomey.com

Now repeat this whole process with the other carb.

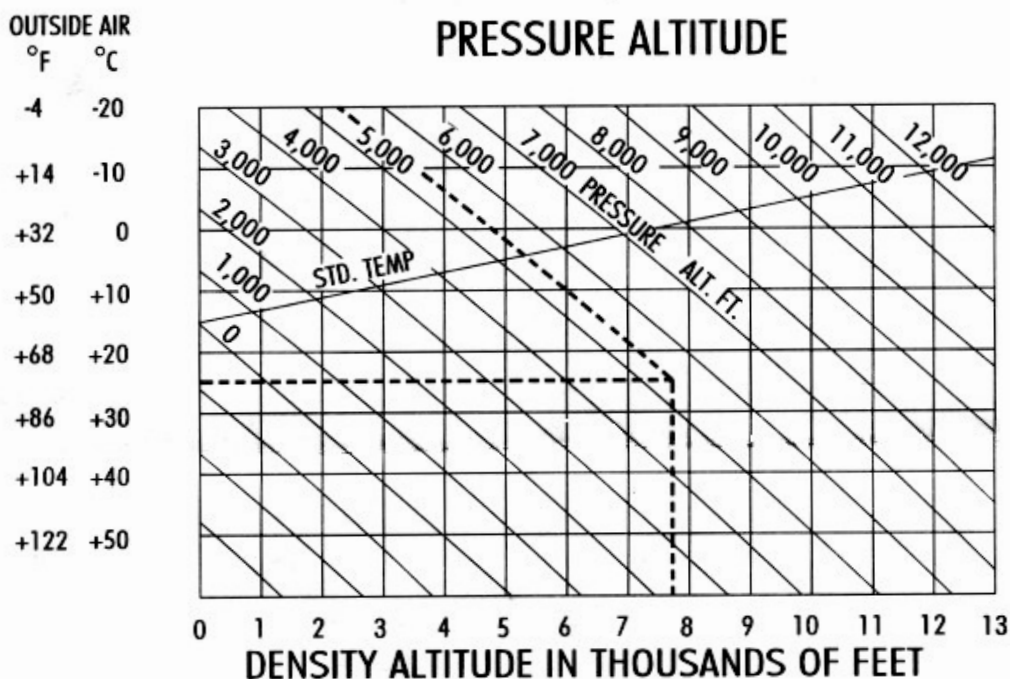
Next, remove the float bowl and the float bowl gasket. Do not rip it, they are hard to find. Some fuel will run out, so be careful. With the float bowl off, turn the carb upside down. The main jet will be right in the middle: the 1/4 inch long, brass hex piece with the hole in the middle, and a number either on the end or on the side.

Use a 6mm wrench to unscrew this jet, and replace it with the #420 jet found in your Toomey Racing Jet Kit. (The #410 Jet is for operation at altitudes higher than 3,000 feet.) Don't forget to reuse the brass washer from the stock jet.

NOTE:

The #410 Jet is for operation higher than 2500 feet in **DENSITY altitude**. Density altitude is actual physical feet above sea-level, corrected for temperature, and it is the altitude at which the engine thinks it is running. For example, at 3000 feet actual, on a 104 degree temperature day, according to the chart below, you go from 104 on the left scale, and follow the chart to the right to meet with the 3000 ft diagonal line, then follow down to the Density altitude of approximately 6500ft.

THIS is the altitude for which you will be jetting. So you can see, a sea-level jet is quite rich there.

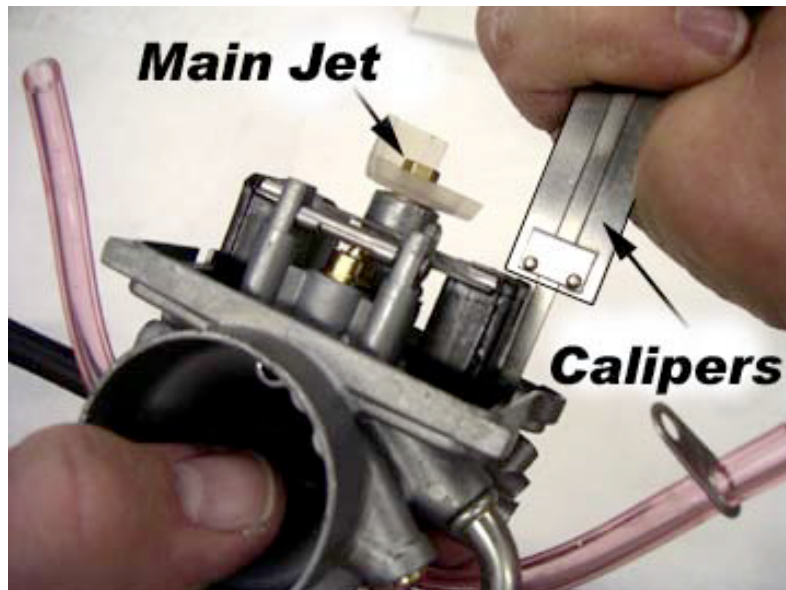


The #420 is the sea level setting up through 2500 feet. On particularly cold days or at very low altitudes (winter in Glamis, which is 200ft BELOW sea-level) you may need a #430 or #440. Conversely, at high altitudes, above 3000 feet you may need a 400, 390 or even less depending on how high you are and how hot it is. We haven't tested at these altitudes, so any recommendation from me would just be a guess. You would do far better to use the chart, or test it yourself when you are there.

Adjusting the Floats

Now you must verify the float level setting as they are frequently out of adjustment. Any bouncing around that the bike does can make the float level setting go out of spec. They should be checked at least every 6 months. If you are racing, set them before every race during your normal pre-race maintenance.

Hold the carb with the throttle bore vertical, and the float hinge at the top, in order for the floats to swing freely. Swing the floats with your finger to verify that they are free and operating properly. Now just rotate the carb towards the upside-down position, only until the floats just sit down on the float needle valve. Any more rotation will cause the weight of the floats to push down on the spring-loaded float needle valve and you will get an incorrect reading. The proper angle is about a 45 degree angle from the vertical. Re-read this if you don't understand it.

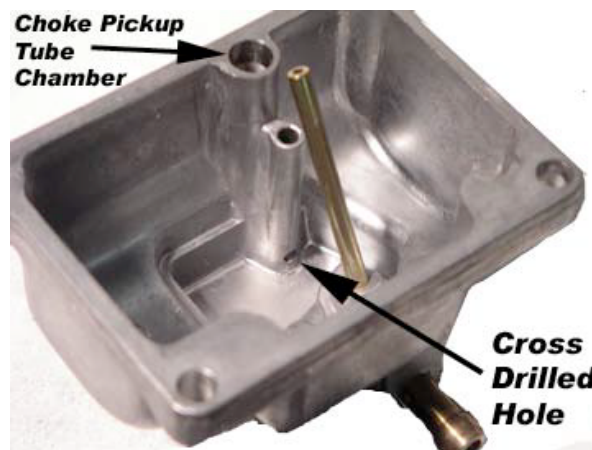


At this point, with either a metric measuring scale, or the tail end of a pair of calipers, (as in the photo) or other such accurate measuring device, measure the distance from the float bowl gasket surface **WITHOUT THE GASKET** to the top of the float itself. This measurement should be **21mm** exactly on both floats. If you get some other reading, just bend or tweak the float arms until you get this setting. Do not bend them sideways so that they interfere with the float bowl itself.

Check for proper clearance when you are finished. When you are satisfied they are perfect, replace the float bowl gasket and float bowl. Now do the other carb the same way.

When you have finished be sure you have the black rubber cross-over hose connected between the two carbs properly. If this hose is inadvertently knocked off, the right cylinder will run extremely lean, will not idle properly, and will probably seize soon.

Verify that your throttle is working properly by cycling it several times and making certain it lets the slides come all the way down. Now reinstall the carbs on the bike.



You may want to synchronize the two carbs since they have been off the machine. The best tool I recommend for this is a tool called a "UNI-SYN", available at most auto parts stores. It is fast and accurate.

Carb Sync Procedure

I will assume the throttle handle, cables and the carbs are in perfect condition, and clean.

Synchronization starts with the idle screw backed all the way out so that the throttle valve (slide) is sitting on the bottom of the carb. You will aurally hear the slides bottom out, with a click sound.

You may have to remove the air box, to have the ability to see the slides, or to get your hand in there so that you can put a fore-finger and pinky on each slide at the same time to feel the movement in the case that you cannot see in there.

We use a tool called a "UNI-SYN" which is a hand held vacuum gauge usually available at auto parts stores, or Volkswagen shops. With this tool, you hold it up to the back of each carb to see visually the vacuum level on the attached gauge, but if you don't have one, the following manual method will get you VERY close, if not perfect.

Assuming the slides DO bottom out, and there is normal play in the throttle twist handle, (at least an eighth of an inch of rotation), cycle the throttle a few times forcibly, to full throttle and zero, back and forth, to fully seat the cables. Then... Gently twist the throttle open from zero to 1/4 throttle as you either see or feel the slides to assess how they open, evenly?, or does one lead and the other lag?

If so, using the differential adjuster on the cable actuation wheel in the center of the carbs where the cable attaches, adjust the lagging carb, to match the motion of the leading carb, until the slides open together. This can be aurally confirmed by the sound of ONE carb slide bottoming out (good sound, "CLICK!") when the throttle is snapped closed, as opposed to the sound of two independent slides ("Clip-clop" -not good).

When you have them opening in synchronous, tighten all the adjusters, and start the bike. Warm it up, and hold the throttle where you like it to idle, by hand, and set the idle-screw to the level you prefer (1300-1400rpm ?)

PLAY in the cables is really important for safety, so insure there are no routing problems, or snags that affect the idle when turning the handlebars from side to side. If there are, fix them BEFORE you go ride.

You must also drill out the plugs covering the air screws in order to adjust them.

CAUTION: Be very sensitive to the feel of the drill as you are drilling. Just as you feel it go through, STOP! If you go too far, you will drill off the head of the screw.

You don't want to do that.

This is the final carb setting check list:

- Needle on the third groove.
- #420 Main Jet.
- Float setting: 21mm.
- Aircscrew at approximately 0.5 to 1.0 turns out, from full in.
- Standard #20 pilot jet.

Air-Cleaner Systems

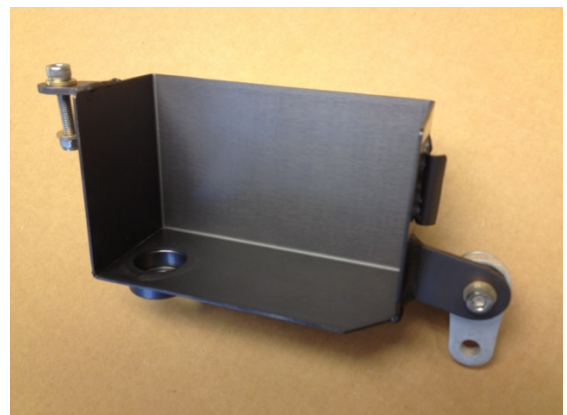
We do not recommend using the stock air box as it is just too restrictive. Remember, these pipes produce 14 to 15 more horsepower than the stock ones, and anywhere from 8 to 16 more horsepower than our competitors' pipes (according to our testing). As you may imagine, the engine needs a lot of air!

That is the thinking behind our 2:1 Air Cleaner Assembly. We have done a lot of testing and we feel this system is absolutely the best. On the track and the dyno, this system will out-flow open carbs at all flow rates. Peak flow is far above that of the carbs alone and way above that of individual filters on each carb.



You must remember when you remove the stock box, you also remove some of the intake tract length. This machine needs, and indeed is designed to have a certain intake tract length to take advantage of the sonic activity in the system. When people use the individual filters on the back of each carb, the resulting shortened intake tract length upsets the sonic wave activity in the intake tract and there is a power loss down low. Even more important, there is a marked increase in the "spit-back" of fuel due to this upsetting of sonic wave activity that leads to a thorough soaking of the filters, further reducing airflow and compounding the problem. This length is restored with our 2:1 unit so sonic wave activity is restored and the filter is up and out of the way of any spit-back. End of problem.

The other drawback to removing the stock air box is that you lose your battery box. This is why we supply you with the 6061 Aluminum Battery Box. This box is designed to utilize the stock bottom rubber grommet, bolt, and metal spacer from the stock air/battery box. You can then bolt it to the frame in the same place the stock box occupied. The other mount simply goes to the top engine mounting bolt. Your brake master cylinder hooks up to the box too. You will also use the stock rubber battery strap.



CAUTION: Watch out for contact between the positive terminal of the battery and the gas tank! In order to eliminate problems you must remember that when all the parts are right, everything will work perfectly.

Most difficulties result from simple things such as:

- Forgetting to tighten the rubber carb manifolds and they leak air.
- Not setting the float levels at 21mm accurately.
- Not synchronizing the carbs accurately.
- Dirt in the jets.
- Forgetting to re-connect the choke cross-over hose between the carbs.

As with most anything, if you take the time to do a really careful job, the results will be impressive.

If you need help, please do not hesitate to call Technical Service, (805)-239-8870 or eMail to tech@toomey.com

We are only too glad to help.

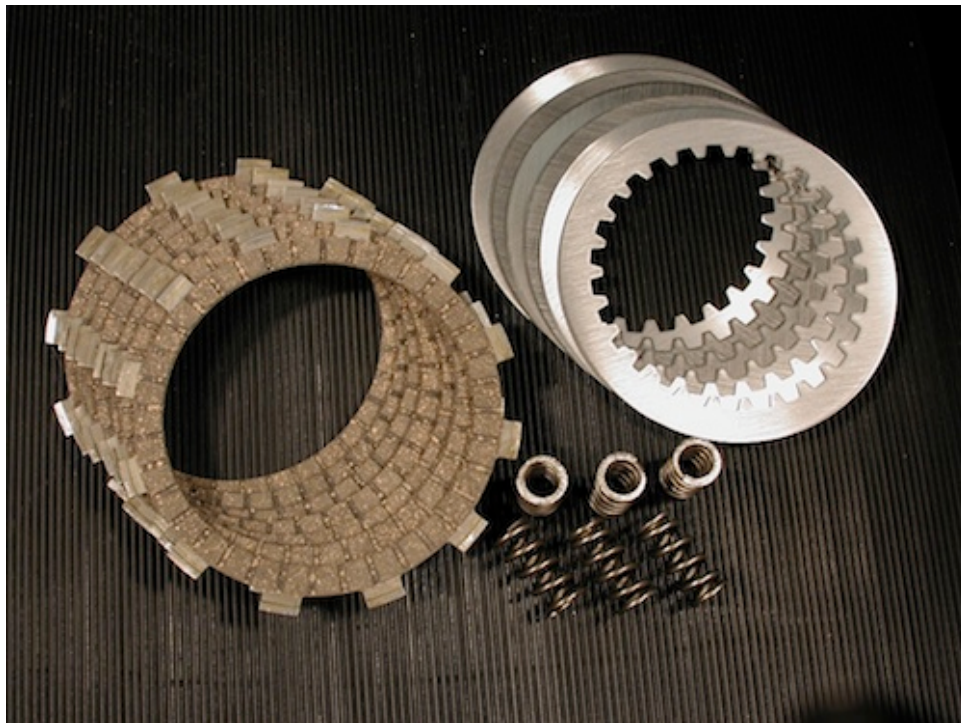
That is why you bought **Toomey Racing USA** products, for the service!

Thank you again for your choice of
Toomey Racing USA 5050 Wing Way Paso Robles CA 93446
(805) 239-8870 (805) 239-2514 (fax) www.toomey.com sales@toomey.com
"A wise man once said, "In order to go fast, you must not go slow"

Specifications subject to change without notice!

Next, you might want to consider, a Racing Clutch Kit, now that you have more than enough power to overcome the capacity of the stock clutch!

Part# BCK \$105.99 complete



IMPORTANT MESSAGE--PLEASE READ AND UNDERSTAND!

WARRANTY LIMITATIONS

Toomey Racing USA, Inc. (Toomey) warrants only to the original purchaser the equipment purchased is free from defects in material and workmanship under normal use and service. Components of the equipment are supplied to Toomey by others and Toomey warrants such components to the purchaser only to the extent that such components are warranted to Toomey by the supplier. Toomey's obligation under this warranty shall be limited to the repair or exchange of any part or parts which may thus prove defective under normal use and service within one year from date of the invoice and which Toomey's examination shall disclose to Toomey's satisfaction to be thus defective. This warranty is expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part, and Toomey neither assumes, nor authorizes any other person to assume for Toomey any other liability in connection with the sale of this equipment or any part thereof which has been subject to accident, negligence, alteration, abuse, or misuse. Toomey makes no warranty whatsoever in respect to accessories or parts not supplied by Toomey. The term "original purchaser", as used in this warranty, shall be deemed to mean that person for whom the equipment is originally invoiced. This warrant shall apply only within the boundaries of the continental United States.

The remedy defined in this statement shall be the Purchaser's exclusive remedy against Toomey Racing USA. In no case shall Toomey Racing USA be liable hereunder for any consequential damages.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY, WHICH EXTEND BEYOND THE FACE OF THIS STATEMENT.

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