



M&D Designs - Zenoah G260PUM Setup and Operating Instructions

At M&D designs, we're committed to providing the best modified Zenoah G260PUM engine available. We do our very best to build a fast, reliable and durable engine. We also break-in and dyno test each engine to assure top performance, right out of the box.

As with all products - once a Customer takes delivery - proper setup, adjustments and maintenance are necessary to ensure sustained high-performance and reliability. For this reason, we've put together a couple of pages highlighting setup tips and proper maintenance practices to help keep you in the winner's circle!

NOTE: This document is intended for shipment with an M&D modified G260PUM, however it will also be included with the G231PUM, as there are very few differences in how to set up and maintain the engine.

For current information on M&D products and race results, please visit <http://www.mddracing.com/>

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Tuning Tips

The purpose of this section is to help you get the most out of your engine, and to make sure it starts reliably every time.

1.1 Carb Settings

Since we run and dyno tune each engine prior to shipment, the carburetor comes pre-set. It may however require adjustments to compensate for different ambient conditions (temperature, barometric pressure, altitude, etc.). In general, we like to run the engine with a rich mixture on the low-speed needle, and right on the money for the high-speed needle. The rich low-speed needle setting helps prevent bogging when accelerating from low speeds, and precise setting of the high-speed needle allows maximum power and RPM at full throttle.

For stock WT257 carburetors (on engines shipped until late 2002): The low speed needle should be to approximately 2 1/4 turns out. For modified (bored and finished with a sanding roll), the low needle should be set to 2 3/8 - 2 1/2 turns out. Slight adjustments may be needed due to carb-to-carb variation, and to personal preference. If the engine is easy to start, idles a little rough (rich), and responds well with a brief belch of heavy smoke, it's pretty close. If it tends to bog when you open the throttle quickly (especially when the engine is cold), or idle too high (even with the throttle plate nearly closed) and not smoke too much when you hit the throttle, the low speed needle is probably too lean.

For stock WT257 carburetors (on engines shipped until late 2002): The high-speed needle should be to approximately 7/8 turns out as a starting point. For modified (bored and finished with a sanding roll), the high-speed needle should be to approximately 1 turn out as a starting point. It is acceptable to lean the high needle to optimize the mixture for peak power and on-water RPM, but going too lean can be risky, as engine performance and durability will suffer. When the needle is right, the engine should run cleanly, respond well from half throttle without bogging, and not fall off in the turns. We don't recommend running the high needle at less than 3/4 turn for a stock WT257 and 7/8 turns for a bored WT257. As a general rule, if you can run slightly rich without losing speed, engine life will be improved. An indication of a perfect needle setting is when you hear a slight cackle from the exhaust when the boat bounces and fully unloads the prop (slight four-cycling sound, indicating the engine is slightly rich when free-wheeling). NEVER attempt to power tune the high-speed needle by running the engine at full throttle out of the water!! This is very dangerous and can damage the engine.

To start the engine, choke the carb with your finger and pull the starter slowly. When you feel/hear the engine pop it's been choked enough, and it's ready to start. Next, hold the throttle 1/4 to 1/2 way open, and pull the starter quickly. The engine should fire in the next couple of pulls. You should never have to choke the engine for more than 3-4 pulls. If it doesn't pop by then, you may need to make sure the carb and gas line are primed with fuel.

1.2 Spark Plug

We like to use the NGK CMR7H plug, but the Champion RZ7C is OK also. It's best to set the plug gap to about 0.020 inch. Some folks prefer to set the gap very tight, but we have not seen any benefit to this, and the plug becomes more subject to carbon fouling, or water/fuel fouling if the engine gets wet or flooded with fuel. It's not necessary to replace the plug frequently, but it helps to keep it fresh (replace after 2-3 gallons of gas).

1.3 Fuel

Our testing shows that using regular pump gasoline is best for performance (not to mention that it's required by the rules!). 87 octane is OK, and in some cases can give the best performance, however due to variation in gasoline, we have been using premium unleaded pump gas. We recommend using a high quality two-cycle oil. We prefer Cool Power blue synthetic (available from American Power Sports Karting supply) but any premium quality oil such as Klotz Super Techniplate, Bel-Ray MC1, Mercury Quicksilver, etc. will work fine. We have found that the oil brand is not too critical, but the quantity is. We recommend always using 7-8 ounces of oil per gallon of gasoline. This sounds like an excessive amount of oil, however we have found that power (and therefore speed) increases due to reduced friction and improved ring seal, and also that engine life is greatly improved. If you use a high quality synthetic such as Cool Power, carbon buildup and plug fouling is almost nonexistent, even with this heavy oil mix. The final thing to keep in mind is that only fresh gas should be used, which has been properly stored. Gas can go stale, or pick up moisture if left too long, and not properly sealed. If in question, dispose of the old gas properly and mix a fresh batch.

1.4 Engine RPM

For serious tuning, and getting the maximum performance from your engine, it's very helpful to have an onboard tachometer (Sendec or equivalent). This will allow you to know exactly what RPM you are turning at full speed. This data is valuable to help with boat and propeller setup.

When using an M&D designs fully-modified Zenoah G260PUM, the engine should be running between 16,500-17,500 RPM for peak performance. This is 1000-2000 RPM beyond the peak HP RPM, but through extensive testing, we've found that targeting 1000-2000 RPM past peak gives the best combination of acceleration, drivability and top speed. These target RPM.s will drop somewhat at high altitudes or during very hot weather, due to lower air density.

1.5 Exhaust System

We recommend using a good quality steel tuned pipe. We recommend (and only offer) our own M&D designs tune pipe, with built-in muffler, however most available pipes will work OK, but may not deliver maximum performance from your M&D engine.

2.0 Maintenance and After-Run Tips

A key to making sure your engine will perform well for you the next time you go to a race is what you do at the end of the day. Proper maintenance practices will help make sure you have good reliability and durability from your engine.

2.1 Routine Maintenance

If your engine is running normally, and you have not flipped the boat within your last couple runs, no special maintenance is required. It's good to get any water out of the boat, and it doesn't hurt to spray some WD-40 into the carb and spark plug hole and pull the engine over quickly several times. This helps protect the engine bearings and crankshaft. Be careful with the spark plug/wire, as you can get shocked, or worse yet, the gas/WD-40 vapor could ignite. You should always ground out the spark plug lead, or use a kill switch to avoid this. It's good to replace the spark plug after every 2-3 gallons of gas, to keep the engine running it's best and starting reliably. If you dunk the boat and suspect the plug ceramic has been cracked, or if you experience misfiring, try changing the plug.

2.2 What to do after flipping the boat

Warping the cylinder due to the rapid cool-down, or hydraulicing are the two most common ways to damage the engine due to dunking. It's critical to shut the throttle immediately when you know your boat is flipping, to reduce RPM's and minimize how much water is gulped into the engine through the carb.

Assuming you've managed to avoid serious damage, the following steps will usually get you running again quickly:

- Remove the spark plug, and hold the boat at an angle that will drain water out of the engine/pipe
- Hold the boat upside down, with the throttle fully open, and pull the starter quickly 8-10 times
- Pull 4-5 more times with the carb still at full-throttle, but fully choked
- Pull 4-5 more times without choking (this sequence helps clear the water, and prime the engine with fresh fuel)
- Clean and dry the spark plug, and re-install
- Start the engine normally

If the engine is hard to pull over, or won't start, try repeating the above steps to clear any remaining water. The final thing that can cause nagging problems after a flip is water in the gas tank. After a flip, always take a close look at your gas tank and make sure it does not have ANY water in it. If so, it has to come out for a complete flush.

3.0 Repairs

The G260PUM is a very durable engine, and with proper care and correct use, it should last a long time before requiring any repairs. However, due to the extreme RPM and performance level of the engine in a fully modified condition, it is possible to experience premature wear or failure. In our experience, the vast majority of problems that we've seen with the G260PUM engine (regardless of who modified it) are related to misuse or poor maintenance practices, including a few instances of us learning the hard way!

3.1 Guarantee - What's Covered

If you have a problem with your engine within the first month of operation, which is specifically related to the quality or workmanship of the modifications that M&D designs has done, we will repair the engine for you at no charge. Since each engine we sell is broken-in and dyno tuned & tested prior to delivery, we are able to catch just about any problem that would occur as a result of a potential defect in parts, modifications, or assembly, but it is possible that a problem could still occur that we did not detect during testing.

3.2 Guarantee - What's Not Covered

Again, in our experience, most of the failures that we've seen with the G260PUM (including a couple of our personal engines, due to some of the reasons outlined below) are due to poor maintenance practices or misuse. M&D designs cannot be held liable for damage caused by misuse or poor maintenance.

Please use the following list for two purposes. First, as a checklist/reminder to help make sure that you don't do any of these!! The second purpose of this list is that it details the type of damage that we will NOT repair free of charge.

Damage due to:

- Overheating
- Insufficient lubrication (not enough, or poor quality oil in the gas)
- Part Damage / Breakage due to Hydraulicing (I.E. crank misalignment / cylinder flange breakage etc.)
- Part Damage / Breakage due to over-torqueing of fasteners
- Stripped threads
- Cylinder Warpage due to Dunking / Rapid Quench
- Corrosion
- Crash or physical impact to the engine
- Modifications not made by M&D designs
- Routine wear and tear from extended use

Should you experience a problem, feel free to give us a call. The guidelines outlined above are subject to discussion and interpretation, so it's always best to just talk through any issues with one of us, and we'll do our best to work out a fair resolution to your problem.

Also, we do not take responsibility for quality problems associated with hardware manufactured by other RC suppliers, and we recommending contacting them directly, should you have a problem.

3.3 If You HAVE to take it Apart.

If you find it necessary to disassemble the M&D Zenoah, please heed all normal engine maintenance best practices (cleanliness, organization, etc.), plus make sure to install a new base gasket any time you re-install the cylinder, especially if there are any signs of the gasket being mashed out around the flange bolt holes. Also, do not over torque the bolts. If you don't follow these tips, you will have a much greater risk of warping the cylinder base flange and destroying the cylinder beyond repair.

4.0 M&D designs Contact Information

With any questions, please contact M&D designs as follows:

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The best way is to send an e-mail, with both of us on copy.

For current information on M&D products and race results, please visit

<http://www.mddracing.com/>

Thank You and Good Luck!
Matthew Waldron & Mike Hoffmeister
M&D designs Racing

