



Technical Self-Help

DIRT BIKE CYLINDER REPAIR SERVICES



Millennium Technologies offers the biggest selection of cylinder repair services for all makes and models of dirt bikes from 1970 to present day. Our services are driven by our customers' demands and the R&D efforts of our staff or engine tuners and race mechanics.

Our goal is to help you solve your mechanical problems with our maintenance solutions. The best thing is you can call us and get a free consultation by one of our knowledgeable telephone representatives or send your damaged top end parts and we'll give you a free estimate with multiple repair scenarios ranging from inexpensive and reliable to full-bore performance.

KNOW WHAT YOU WANT? PULL THE TRIGGER AND GET STARTED!

Click on the Service Order Form, print it from your browser screen, and complete it in pen and send it with your top end assembly. We'll get started on your repairs the day it arrives.

DON'T KNOW WHAT YOU NEED? CHECK OUT OUR SERVICE OFFERINGS!

#1 FREE EVALUATION SERVICE ZERO DOLLARS!

Millennium Technologies technicians are the best in the business, we're like a trained group of CYLINDER CSI agents. We can figure out the prime causes of a failure for free and give you at least 3 service-scenario estimates.

#2 CYLINDER REPAIRS FOR A BARE CYLINDER START AT \$199

This is the best deal we offer on cylinder repair because you share the work by stripping the cylinder of the powervalve system, head, and studs.

#3 REPAIRS FOR A TOP END ASSEMBLY START AT \$250

Do you really want to deal with the scummy slimy powervalves and try to refinish the head with sand paper and glass? And do you really trust your abilities? Trust us instead because we know what we're doing! We'll clean and inspect the PV system, replace broken or worn parts, R&R the studs and alignment pins, and fit it all back together on your repaired cylinder.

#4 ALL-INCLUSIVE REPAIRS TO A TOP END WITH DISCOUNTED PISTON AND GASKET KITS START AT \$400

#5 ALL-INCLUSIVE PERFORMANCE AND REPAIR WITH PARTS \$400-\$660

OK so your bike's top end is broke right? Why not spoil yourself and get a big bore with power to make you faster, be more competitive, and for the vet riders to supplement your relaxed riding style with a wide smooth powerband that enables you to seat-bounce jumps and run your bike on pump gas? We've got a wide variety of big bore kits to enhance your riding experience.

Check out the performance side of our affiliate company at the website www.eric-gorr.com

Powered by Millennium Technologies!

PIZZA TOPPINGS

We offer ala-carte specialty machining services on top of our cylinder plating services. Kind of like pizza toppings. The following pictures show the benefits of our ala-carte repair services and the estimated cost. Some services are already a part of the 5 cylinder repair options listed above.



1.
The best deal we offer on plating is when you supply a stripped-down cylinder. If you want us to remove the power valves we'll do it for \$20. The cylinder on the right is finished clean and ready to accept the power valve system.



2.
The cylinder on the left has the power valves finished and installed. The head has been resurfaced and polished. That costs between \$75-\$100 extra above the cost of the cylinder bore repairs.



3.
The best package deal for the most reliable repair is to combine head and power valve service with a fitted piston and gaskets of your choice. We offer Wiseco, Wossner, and Vertex piston kits. For stock cylinders we plate them to the "A" size and because we put the plating on thicker and harder than original, our cylinders can accommodate up to the "D" sized piston (approx. .004 inches).



4.
The cylinder on the left has been chemically stripped, blasted clean and welded. The cylinder on the right is finished and the top surface has been welded, turned, and resurfaced smooth.
One of the most common cylinder failures that occur on o-ringed cylinders is a warped head and a coolant leak. The problem appears as erosion marks on the top edge of the cylinder and head. Most of the time it happens at the rear of the cylinder just under the head stay because that's where the most distortion is. When this happens your bike will start to pump coolant out of the vent tube located under the radiator cap. The coolant enters the cylinder and combustion gasses leak into the water jacket. Eventually the coolant is blown out, the engine overheats while simultaneously the coolant entering the cylinder washes the oil off the piston and cylinder and a seizure of the piston damaged the bore. We can fix the whole problem so it doesn't happen again costing you double!



5.
Here is an example of the most common cylinder problem, worn plating. Notice the gray spot on the cylinder wall under the exhaust port? That's the base metal exposed. The same gray ridge appears near the top of the cylinder. This problem is caused by the piston rings. When the cylinder travels to TDC and BDC the ring flaps when it changes direction and that's what causes the wear. Stock cylinders have thin and soft plating that wears out fast. Our cylinders have 4-5 times the life of a stocker. The best piston and ring combination is found on Wiseco's GP piston. The rings are coated with Titanium-nitride, which doesn't wear the bore coating, plus the ring grooves on the piston are coated with hard-anodized Teflon, a smooth self-lubricating coating. Original cylinders have a typical wear life of 60-80 engine hours or about 2 riding seasons.



6.
Does your bike pump dirty disgusting spooge out of the exhaust pipe to cylinder junction? That happens because the steel pipe and sharp o-ring grooves wear into the soft aluminum cylinder. We have a service where we Tig-weld the cylinder and re-machine it to original specs so the spooge stays in the exhaust instead of leaking out. This service helps performance too because the expansion chamber exhaust needs to maintain pressure for best performance. This service costs \$75



7. Notice how shiny the cylinder base is on this example? We offer cylinder base and head machining for \$75—\$100. This service has multiple benefits for performance and reliability of the engine. Machining the cylinder base on an expanding mandrel squares the cylinder base with the bore for less piston friction and wear. The porting timing can be altered for more low to mid-range. And if the cylinder base was scared by extraction of the cylinder from the crankcases with hammers, chisels, and screwdrivers, we can fix it to prevent dangerous air-leaks and runaway-throttle syndrome.



8. This picture shows a view of the intake port on cylinders with bridged intake ports common to 1992-2005 Kaw KDX200/220, KX250, KX500 and 1999-2002 Suz RM250. Those bridged ports are prone to cracking which seizes the piston. We can weld a gusset in the bridges, make them wider to spread the workload to greater surface area, and greatly increase the piston life without hurting performance. This service costs \$50



9. This picture spotlights a popular service that practically triples piston life and improves low end power for trail riding or endurance practice training in motocross. We can Tig-weld the exhaust bridge wider on late model 125s for about \$30 on top of cylinder plating. This service requires powervalve service also because we need to modify the powervalve shape in accordance with the wider bridge mod.



10. If you buy a used bike its like Forest Gump says about chocolate “You never know what you gonna get”. Most people can’t tell the difference between original nickel-composite plated cylinders and aftermarket cast-iron sleeved cylinders. The photo on the left shows a magnet sticking to the sleeve and you can see a distinct line between the parent metal of an aluminum cylinder and the darker colored sleeve, especially when you look at the cylinder from the bottom. Sleeved cylinders are cheaper to repair the bore at \$60 vs \$200 for a plated cylinder. And if the bore wears to the limit of available piston sizes we can plate it and layer the plating up to save the cylinder. This is especially great for vintage and antique cylinders. For late model 125 and 250s, we offer a special big bore plated sleeve service to make your 125 a 144 and a 250 into a 295. We call this service ENDURAMAX because it’s the toughest most durable big bore repair in the business.

APPLICATION CHART

All 2 and 4-stroke cylinders for motorcycles including Aprilla, GasGas, Honda, Husqvarna, Kawasaki, KTM, Pavesi, Suzuki, Rotax, TM, and Yamaha.

HOW TO GET STARTED

Just CLICK & PRINT a copy of the **Service Order Form on our website** and follow the directions on packaging your parts for shipping. All the options are listed for services, powerband choices, fuel types, spare parts, shipping methods, and payment options.

FAQs on 2-Stroke Cylinder Repairs

If the piston breaks can I just powerwash the crankcase and change the oil to get out the broken pieces?

The crankcase on 2-stroke engines is sealed so draining the transmission oil won't help. Most likely the metal particles will contaminate the bottom end to the extreme that you'll need to rebuild the bottom end with a new crankshaft, bearings, and seals. We offer that service and it averages \$500 parts and labor. Additionally you'll need to powerwash the exhaust pipe (not silencer) because metal may be trapped in there and re-enter the cylinder once you restart the freshly rebuilt engine.

If I send my old piston with the cylinder can you tell me what the original failure was caused from and recommend repairs to keep it from happening again?

Yes, we recommend that you send any and all damaged parts, especially if you've had repeated failures. Also you should check out the tech article (PDF format) from Eric's book titled Piston Diagnostic Guide (on our home page). We'll diagnose your mechanical problem and recommend action solutions.

My bike has an aftermarket sleeve and now the coolant blows out the vent hose from the radiator. Why does this happen and what can be done to fix it?

Cast-iron sleeves are installed with an interference thermal fitting method. The sleeve is chilled in a freezer and the cylinder is heated in an oven and the sleeve is quickly installed in the cylinder where it expands and locks into place. Good sleeving companies install the cylinder in a press and hold the sleeve down until it cools to room temperature and then machine the top of the cylinder flat. On your cylinder the sleeve is squeezing upwards out of the bore, which allows combustion gas pressure to escape into the cylinder's water-jackets. The excess pressure blows-out past the radiator cap. The only way to fix it is to machine the top of the cylinder and that machine-op is included in the \$50 package for cylinder boring/honing.

My bike pushes a lot of spooge out of the exhaust pipe to cylinder junction. What's wrong and is there a reliable repair for this problem?

We offer a solution to spooge pollution! Our technicians weld-repair the exhaust spigot of the cylinder because it gets worn from the pipe vibration. We re-machine it to factory specs so a new set of o-rings or gasket for the header pipe can seal effectively.

I ride a 125 and my piston always wears out the same way, it makes a square notch in the ring directly over the exhaust port's bridge. My piston and ring only last for 5 engine hours. Is there a way to extend the piston life?

Cylinders with bridged exhaust ports are subject to wear because that is the hottest and highest pressure point of the cylinder. We offer a service to TIG-weld the exhaust bridge wider to extend the piston and ring life. This service can be combined with cylinder plating and the power valves must be modified for the wider bridge. The average cost of this repair is an extra \$75-\$100.

I just had my cylinder plated by a different plating company for a 2mm oversize and now my bike is slower than before and pings like crazy in the upper mid range. What's wrong and how can I fix it?

Other plating companies do not employ engine builders! They don't have people with the knowledge to do the job right. When a cylinder is over-bored there are many other factors to consider like head and crankcase clearance to the piston, compression ratio, and port heights. Just boring the cylinder 2mm oversize and installing the stock head and power valves effectively raises the compression ratio to dangerous levels which limits the top end power and makes the powerband flatten-out lower in the rpm range and causes detonation. Additionally the power valves may contact the piston. We offer all-inclusive performance big-bore kits through our division Forward Motion.

FAQs on 4-Stroke Cylinder Repairs

My bike's cooling system is pushing coolant out of the radiator cap's vent tube soon after I start my bike. If I warm it up too long it does it too, without even putting a load on the engine. What could be wrong and what repair service do I check on the Service Order Form?

It sounds like the head gasket could be blown, enabling combustion pressure to escape into the cooling system and causing a pressure build-up in the radiators which forces open the radiator cap's spring-loaded blow-off valve. Sure you could replace the head gasket and experience has shown us that the cylinder and head will need to be surface-grounded to a super-fine finish so a new gasket can seal. Millennium offers high quality American-made Cometic EST Gasket kit, the standard for turbo-charged sport compact cars.

I read on the Internet that I can get better throttle response from my 250F by machining down the cylinder to get the piston to bounce off the head like a basketball, and that makes it go down faster and make more torque. Is that real or just an Internet trap!

That statement is partially true! Reducing the clearance to a "race standard" clearance of .050 inch will "squish" less fuel mixture into the squish-band to cool the piston and utilize more fuel to burn and produce power. However the piston should never contact the head or valves otherwise the engine could suffer catastrophic damage. Millennium offers a service to machine the cylinder base to reduce the wasted clearance and align the cylinder base perpendicular to the bore for low piston friction.

How big can stock Japanese dirt bike cylinders be over-bored? Do I need to buy an expensive imported aftermarket cylinder to get a big bore kit?

You don't need to be responsible for America's gluttony for imported products that serve to increase the trade deficit! You can be part of the solution! Millennium's engineers evaluate all OE original cylinders and offer a myriad of choices for big bore solutions based on piston manufacturers and compression ranges. Millennium offers 2-3mm over-bores with 2 different compression ratios from 5 different piston manufacturers including Wiseco, Wossner, CP, JE, and Vertex. These kits are matched with Cometic EST gaskets and a variety of cylinder head service and performance machining options from a basic valve-job and re-surfacing to the installation of over-sized AMPCO-45 super alloy valve seats and guides with valve-train options from KPM Black Diamond S/S, CV-4 Xceldyne Ti and S/S. And the best part is that if you send your entire top end assembly, Millennium can repair it with new parts and set the valve clearance so you get it ready-to-go!

I was doing a top end job on my bike and noticed on the cylinder bore, a funny wear pattern on exhaust side. What could that be caused by?

How long does the piston and cylinders last on a 450F?

Millennium's extensive research shows that original cylinder plating lasts approximately 25 to 75 engine hours before there is significant measurable wear that can affect performance and wasteful blow-by. The main cause of the cylinder's short life can be linked to low-hardness plating for cheap costs, and oil quality makes the biggest difference.

Millennium Technologies

