

How To...
UNCORK
The Suzuki DR-Z250
For under \$100!



2001 - 2008

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Preface

As the owner of a Suzuki DR-Z250, you know that your bike provides you with hours of high performance fun in an economical package. What you might not know, however is that there is huge untapped potential in the heart of that 249cc engine. That's right! What you think of as a fun trail bike can be *uncorked* to become a race winning, trail pounding, hill climbing powerhouse – all for **under 100 dollars**.

Whether you own a 2001 with a TM 28 carburetor or a 2008 with the now infamous BSR 32 “California Carburetor”, you can turn this tame machine into a wild beast in only a few hours.

Get a pen and paper ready because if you have a bit of basic mechanical ability, you're just a few moments away from stellar upgrades in power and performance!

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Before We Begin

Before we begin, your first step on the road to more power is to take stock of your bike and understand how it's configured.

All instructions within this book pertain to a stock, unmodified bike. It is important to know these items before you begin so that you can adjust the modification instructions if necessary.

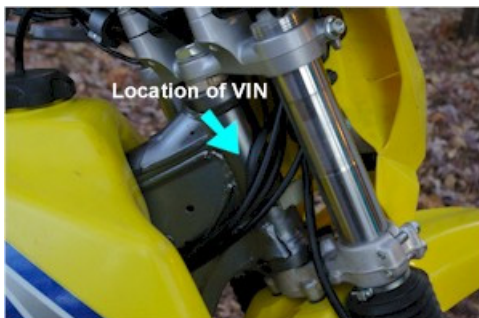
Refer back to this list as you make each modification.

Fill out the worksheet below. Help is provided on the following pages:

1. Model Year _____
2. Carburetor Type: a) TM-28 b) BSR- 32 c) Other
3. Carburetor Modifications a) Modified b) Stock
4. Intake Box: a) Modified b) Stock
5. Air Filter a) Aftermarket b) Stock
6. Exhaust: a) Modified b) Aftermarket c) Stock
7. Spark Arrestor a) Modified b) Aftermarket c) Stock
8. Current running condition a) Rich b) Lean c) Normal

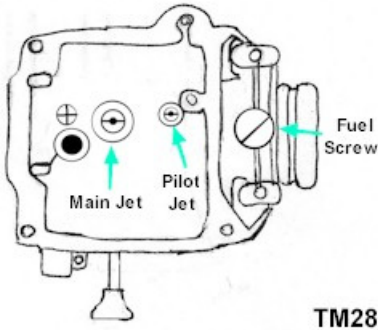
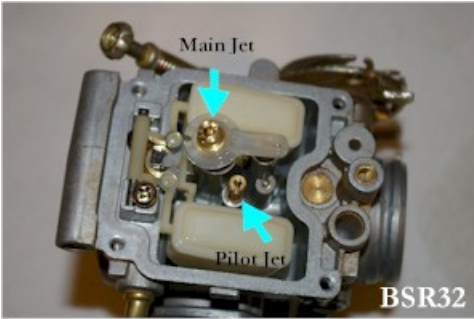
Taking Stock of your bike – Instructions:

1. The model year can be determined by your VIN or vehicle identification number. This can be found on the right side of the steering head pipe



The tenth character in the VIN is a number representing the year of manufacture ("1" indicates a 2001 model, "2" indicates a 2002 model and so on)

2. The BSR 32 carb has a round black plastic top and is marked E-33 on the body. The TM28 carb has a somewhat triangular stamped metal top and is marked E-03 or E-28 on the body.
3. Unless you know for certain whether or not your carburetor was modified, the only way to tell is to open the float chamber body (bottom) and look at the jet sizes and pilot screw position.



The chart below indicates stock jetting for the TM28 and BSR 32 carbs:

Item	TM28	BSR 32
Main Jet	#127.5	#132.5
Main Air Jet	1.2mm	-
Jet Needle	6FN3-3	5DH46
Needle Jet	P-6M	P-OM
Pilot Jet	#37.5	#12.5
Pilot Screw	Pre-set 1.25 turns back	Pre-set 2.75 turns back

4. If your intake box has any holes in it besides the rectangular hole in the top left rear or if the rubber snorkel is not attached to this hole, then your air box has been modified.



5. The stock air filter has Suzuki markings on it.



6. The stock muffler is matte black and tubular shaped.



7. The stock tip / arrestor can be seen below.



8. A rich running condition can be identified by any of:

- a) Bogging down when trying to accelerate
- b) Belching smoke.
- c) Fouled or oily spark plug

A lean running condition can be identified by any of:

- a) Long warm up times
- b) Anemic power
- c) Burned spark plugs

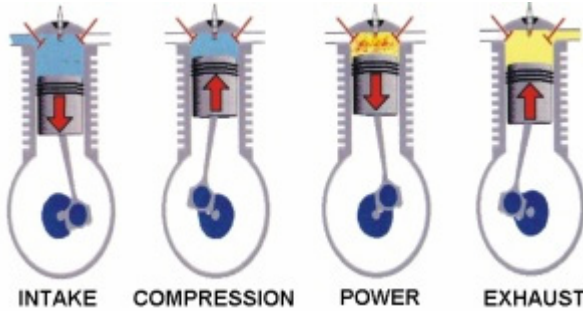
Understanding Your Engine

Your DR-Z250 comes equipped with a 249cc dual overhead cam, four valve, four stroke engine. In other words, a 249cc high performance four-stroke engine. As a high-performance engine, it is also a *high compression* engine with a compression ratio of 10-1. What this means is that you must use high octane gasoline to get the most from your engine and prevent engine wear. Some folks may tell you that 87 or 89 octane is ok. It's not. You must use 90+ octane, or you're robbing yourself of power and may cause premature engine wear. That is performance tip #1!

A four-stroke engine runs through four distinct cycles to produce power, They are:

1. Intake stroke – The intake valves open and an air/fuel mixture is sucked into the cylinder as the piston descends.
2. Compression Stroke – This mixture is compressed with the upward stroke of the piston.
3. Power Stroke – The spark plug fires, igniting the mixture pushing the piston downward.
4. Exhaust Stroke – The piston returns upward as the exhaust valves open to expel the burned fuel/air mixture.

The diagram below illustrates each of these strokes.



Understanding how the four-stroke engine operates will assist your understanding of how each of the modifications will increase engine power.

The modifications will consist of allowing more air into the engine on the intake stroke, allowing more exhaust out on the exhaust stroke, and necessarily, mixing more fuel into the fuel/air mixture.

Understanding The Modifications

The modifications will cause your engine to produce more power by allowing it to breathe in more air, mix in more fuel and push out exhaust gasses more easily.

In summary, the modifications consist of:

1. Intake modifications - Reducing intake restrictions.
2. Carburetor modifications – Tuning the fuel/air mixture.
3. Exhaust modifications – Reducing exhaust restrictions.

It is not necessary to complete all of the modifications listed below at one time. You need not even complete all of them if you feel that your bike is running to your liking. You may stop at any time.

You should, however, do each of the modifications in a specific order.

That order is:

1. Perform an intake or exhaust modification
2. Tune the carburetor (to enrich the air/fuel mixture)
3. RIDE!

This order is important because many conditions can affect rideability. Temperature, humidity, fuel grade and altitude can all affect the way your machine performs. It is important to make sure your bike is running well after each modification before proceeding to the next. Neglecting this

step-by-step process may result in your “getting lost” – getting so far out of tune that you find it very difficult to get things running well again. A slow and steady approach will prevent this.

Carburetor modifications are necessary after each intake or exhaust modification. The intake or exhaust modifications you will perform will allow the engine to “breathe” more air. This will effectively make the air/fuel mixture leaner. You will need to compensate for this by enriching the air/fuel mixture with a carburetor modification.

Let’s look at the modifications in detail:

1. Intake modifications:
 - a. Removing the snorkel
 - b. Cutting open the airbox
 - c. Installing a high-flow filter
2. Carburetor Modifications (all of these are done for each modification)
 - a. Tuning and/or re-jetting the pilot circuit
 - b. Adjusting the mid-range circuit
 - c. Re-jetting the Main circuit
3. Exhaust modifications
 - a. Removing the restrictor weld.
 - b. Replacing / opening the exhaust tip.

What you will need

As mentioned earlier, not all of the modifications need to be done to obtain an increase in power, but here are the modifications presented in recommended order and what you will need for each one.

The expected cost for all of these modifications is approximately \$66 - \$116

Sources for the tools and parts can be found in the appendix.

1. Carburetor modifications – *These are mandatory.* To complete these, **you will need:**
 - a) Drill bit 1/8" (to drill a hole in the fuel screw cap)
 - b) 1 Pilot Jet (one size up from stock).

	TM28	BSR 32
Stock	# 37.5 (VM22/210)	# 12.5 (N224.103 TMX)
Upgrade (Must be purchased)	# 40 (VM22/210)	#15 (N224.103 TMX)

-
-
- c) .025" (3) washers (to shim the jet needle)

d) 3 main jets (2, 3 and 4 sizes up from stock)

	TM28	BSR 32
Stock	#127.5 (4/042 180)	# 132.5 (102/221)
Upgrade (Must be purchased)	#137.5, #142.5, #147.5 (4/042 180)	#137.5, #140, #142.5 (102/221)

The expected cost of these parts is approximately \$25.00

2. Exhaust header mod. *This modification is highly recommended.*

A large weld in the exhaust header acts as an exhaust restrictor. Removing this weld frees pressure in the exhaust stroke adding instant power. **You will need an 8" half round metal file. Appropriate power tools may be substituted.**

Expected cost: \$8

3. Snorkel Removal. *This modification is highly recommended.*

This consists of simply pulling out the rubber snorkel from the airbox. **No tools are necessary.**

Expected cost: \$0

4. Cutting open the airbox. *This modification is recommended.*

This will entail drilling multiple holes into the top of the airbox. **You will need a 1 – 3/8" metal hole saw.**

Expected cost: \$8

5. Replacing the stock air filter. *This modification is recommended.*

You will need to purchase a UNI or Twin-Air aftermarket filter.

Expected cost: \$25

6. Opening or replacing the stock exhaust tip. *This modification is recommended.*

If Opening:

You will need a 1-3/8" hole saw - Same as in step #4

Expected cost: \$0 – if purchased for step#4

If Replacing:

You will need to purchase a replacement tip.

Expected cost: \$50

Uncork Your DR-Z250!

Having purchased the tools and parts you listed above, you're now ready to uncork your DR-Z250.

Section 1: Carburetion.

Before attempting any of the modifications, you should first adjust your carburetor for optimum performance.

After each modification, you should re-adjust your carburetor to compensate for the "leanness" brought about by the modification.

A test ride should follow and if needed, the carburetor should be re-adjusted until a normal running condition is reached.

Step 1: Determine the running condition of your bike

Rich / Normal / Lean

A rich running condition is characterized by ANY of:

- Bogging down / backfiring.
- Belching blue or black smoke
- Fouled or oily spark plug

A normal running condition is characterized by ALL of:

- Adequate power
- No unusual emissions
- Spark plug is dry but not burned

A lean running condition is characterized by ANY of:

- Long warm up times
- Lack of power
- Burned or blistered plug

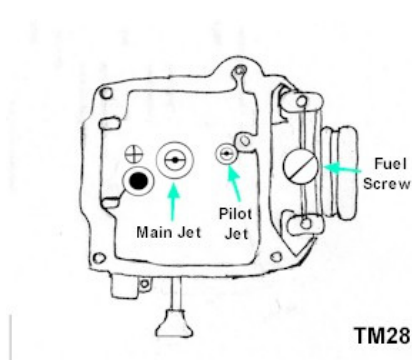
The DR-Z250 generally comes from the factory running LEAN.

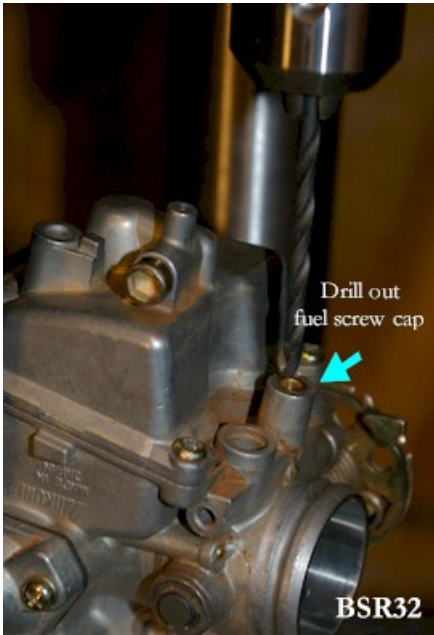
This is especially true of those with the BSR 32 carburetor.

If your bike is running normal or rich, you may skip this step until the first modification is performed.

STEP 2: Enrich the fuel/air mixture:

1. Using a 1/8" drill bit, drill out the fuel screw cap if present
Do this very gently, DO NOT allow the drill bit to come into contact with the fuel screw underneath.





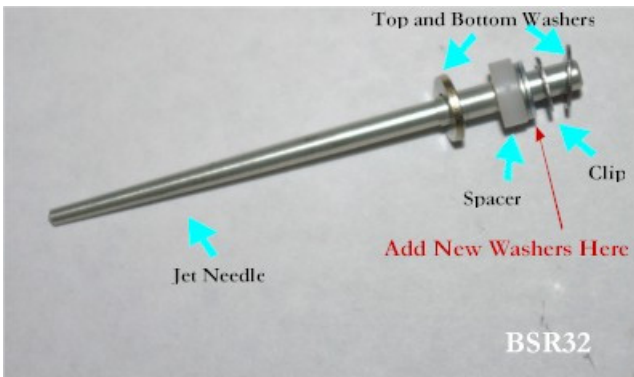
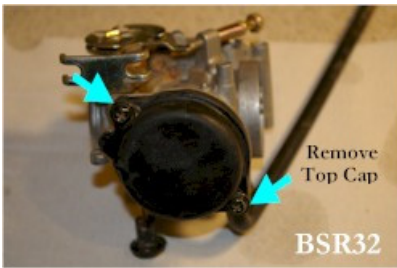
2. Using a precision screwdriver, turn the fuel screw clockwise until *gently* seated carefully counting the number of turns.



3. Turn the fuel screw counterclockwise $\frac{1}{4}$ turn past the number of turns counted in step # 2 (if this results in turning it out 2 turns past stock {see the chapter *taking stock of your bike*}, you should replace the pilot jet with a larger one and start again with the fuel screw at one turn out)

4. Raising the jet needle:

The jet needles on both the TM28 and BSR 32 carburetors are not adjustable. You can still adjust them by shimming the needle with .025" washers. Start out by removing the top cap from the carb, removing the slide, and removing the needle.

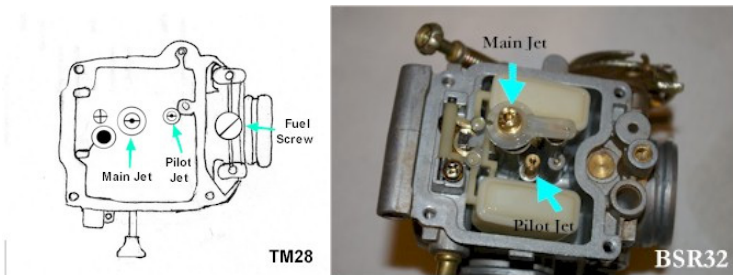


Remove washers and spacers, and insert 1 (one) .025” washer where indicated above. Reassemble.

5. Replace the Pilot Jet and Main Jet with the next highest jet you obtained.

Remove the float bowl cover.

Remove and replace the pilot and main jets



You’ve now completed section 1 – carburetion. This step must be done after each modification UNLESS

The running condition is rich (in which case, the above steps should be reversed to obtain a leaner running condition).

OR

The running condition is normal (in which case, no action should be taken).

Section 2 – Exhaust Header Modification.

Remove the exhaust header by removing the two hex nuts on the exhaust header near the cylinder head



Loosen the oil cooler for clearance



Loosen the muffer clamp and pull the header free from the bike.



You will see a large weld immediately inside the header nearest to the exhaust manifold, This is an exhaust restrictor and will be ground down.



Place the header in a vise and using the half-round file, begin to file the weld down until it is flush with the pipe. Power tools may be substituted if available.

Return to the carburetor modification section and adjust the carburetor until a normal running condition is achieved.

RIDE to determine proper tuning. Make adjustments if necessary.

Section 3 - Snorkel Removal.

Remove the snorkel by first taking off the airbox cover to expose the snorkel and air filter. Firmly pull out the rubber snorkel protruding into the airbox.



This is a “low impact” modification, so if your running condition is normal, you’ll not likely need to re-adjust your carburetor.

Section 4 - Cutting open the airbox.

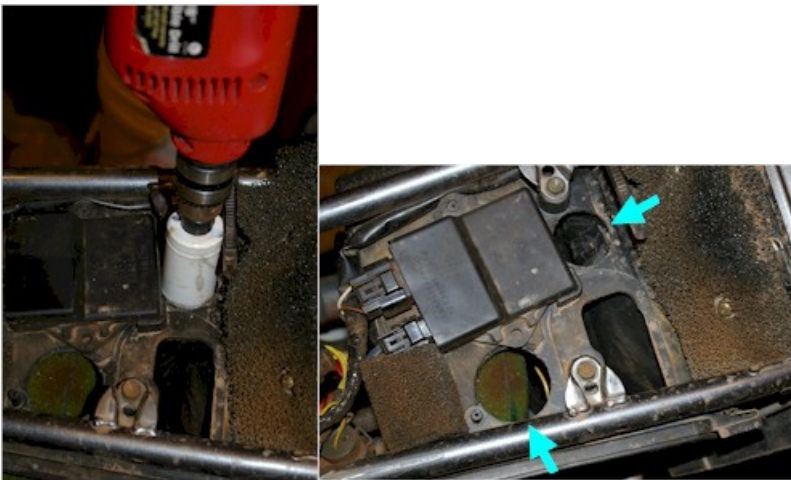
Obtain access to the top of the airbox by first removing the side panels.





Next, remove the seat by unscrewing the two seat retaining bolts, and lift the seat off.

Now, using the 13/8 hole saw, cut 2 or more holes in the top of the airbox.



Return to the carburetor modification section and adjust the carburetor until a normal running condition is achieved.

RIDE to determine proper tuning. Make adjustments if necessary.

Section 5 - Replacing the stock air filter.

Open the airbox side panel and remove the stock air filter.

Replace the stock air filter with aftermarket filter you purchased. Be sure to properly oil the filter before installing.

Return to the carburetor modification section and adjust the carburetor until a normal running condition is achieved.

RIDE to determine proper tuning. Make adjustments if necessary.

Section 6 - Opening or replacing the stock exhaust tip.

If opening:

Remove the three bolts holding the exhaust tip in place and pull the exhaust tip out of the muffler. Hold the exhaust tip in a vise and using a drill press or hand drill, drill out the center of the exhaust tip using the 1-3/8" hole saw.



Use plenty of oil when drilling. After removal, it will be necessary to file down the rough edges produced by drilling. It will also be necessary to remove any metal shavings that might have fallen into the spark arrester. Use compressed air to carefully blow these out.

If replacing:

Remove the three bolts holding the exhaust tip in place and pull the exhaust tip out of the muffler.

Replace the exhaust tip with the aftermarket tip you purchased.

Return to the carburetor modification section and adjust the carburetor until a normal running condition is achieved.

RIDE to determine proper tuning. Make adjustments if necessary.

Final words

Your modifications are now complete. You should notice increased horsepower, torque and throttle response. Keep in mind that as weather turns hotter or more humid or altitude increases, air density will decrease. That means that your fuel/air mixture will effectively become richer. Likewise, as the weather turns colder, drier or altitude decreases, air density will increase, and your fuel/air mixture will effectively become leaner. Adjust the carburetor to achieve a normal running condition when necessary.

Enjoy your newly uncorked DR-Z250!

Appendix

Please note that the list of sources below is provided as a convenience for the reader and is not an endorsement of any of the companies identified.

Sources:

8" File, 1=3/8" hole saw, 1/8" drill bit:

Any hardware store.

Carburetor Jets:

Pilot Jets:

VM22/210

www.motorcyclecarbs.com

www.carbparts.com

N224.103

www.motorcyclecarbs.com

www.carbparts.com

Main Jets:

4/042

www.motorcyclecarbs.com

www.carbparts.com

102/221

www.motorcyclecarbs.com

www.carbparts.com

.025" washers

*Any well stocked hardware store or
motorcycle repair shop*

Air Filters:

Twin Air

www.rockymountainatvmc.com

shop.thumpertalk.com

Uni

www.rockymountainatvmc.com

www.bikebandit.com

Power Tip:

www.2rracing.com