



**Introduction: Welcome to KTM!**

**Chapter One: The Guru's Guide To Clutching**

- 1.1 Clutch Removal: Dig that clutch out and take a look at it**
- 1.2 Clutch Adjustment: Clutch Stack Analysis By Alex Manga**
- 1.3 Clutch Adjustment: Understanding the Spring Clutches and you're options**
- 1.4 Reassembling your clutch: Torque Specs and Proper Loctite applications**
- 1.5 Fluids: ATF? Gear Oil? What do I use! And what is Two2Cool????**
- 1.6.1 Kickstarter O-Ring Leaking?**
- 1.6.2 Kickstarter "Double O-Ringing"**

**Chapter Two: The Guru's Guide to Gearing & Brakes**

- 2.1 Gearing: Gear Ratio Chart**
- 2.2 Applications: What to use, and when?**
- 2.3 Chain: What to use?**
- 2.4 Maintenance: What chain lube to use?**
- 2.5 Disc Brake system analysis**
- 2.6 Disc Brake system maintenance**

**Chapter Three: The Guru's Guide to Jetting**

- 3.1 Tech Help: How do I jet my carb?**
- 3.2 Jetting: What jetting should I run?**
- 3.3 Maintenance: Clean That Carb!!!**
- 3.4 Temp Changes: What jetting to use in 10 degree weather?**
- 3.5 What is K100?**
- 3.6 What Gas should I use? Mixed at what ratio with what oil?**
- 3.7 Keep that filter clean!!!**

**Chapter Four: The Guru's Guide to Suspension**

- 4.1 Set up suspension for safety!**
- 4.2 Seat Height Adjustment**
- 4.3 Forks: Adjust and maintain**
- 4.4 Rear Shock: Adjust and maintain**

**Chapter Five: Liquid Cooled Bikes & The Electrical System**

- 5.1 Water Pump FAQs**
- 5.2 Keep It Cool!: Coolant Levels and Tips**
- 5.3 Electrical System Analysis**
- 5.4 Testing Stators and Coils**

**Chapter Six: The Guru's Guide to fixing the dreaded "BOG"**

- 6.1 What causes Bog?
- 6.2 What are some minor fixes that can be done first?
- 6.3 Now what needs to be done???

#### **Chapter Seven: Odds & Ends**

- 7.1 Best Tires?
- 7.2 Best Handlebars?
- 7.3 Best Hand Grips?
- 7.4 Best Pegs?
- 7.5 What the hell is a frame brace? Is it legal?

#### **Chapter Eight: The Kids Wanna Ride with Experience and Style!**

- 8.1 Pimp That Kid!!!
  - 8.1.1 MotoCross Schools: Manga's Camp for Kids!
  - 8.1.2 Drills to run at home
  - 8.1.3 Safety Gear: What is needed?
  - 8.1.4 Custom ID Plates for Chest Protectors (see 8.2.1)
  - 8.1.5 MX Toys, they gotta have em!
  - 8.1.6 KTM Hardparts make anyone look smooth!
  - 8.1.7 Kids Mags & DVDs (Safe for kids)
- 8.2 Pimp That Bike!!!
  - 8.2.1 Most Recommended Custom Graphics Companies
  - 8.2.2 Powdercoat or Paint?
  - 8.2.3 Anodize to Complete the circle!
  - 8.2.4 Custom Seat Straps and Seat Covers

#### **Chapter Nine: Give a little back - Become Part of Our Team: Team KTM Talk**

- 9.1 Why Should I join Team KTM Talk?
- 9.2 When Should I join Team KTM Talk?
- 9.3 How Do I join Team KTM Talk?

#### **Chapter Ten: Special Messages, Tips, Tricks and advice from the Gurus**

- 10.1 [Alex Manga](#)
- 10.2 [Todd Heemsbergen](#)
- 10.3 [Ken Carter](#)
- 10.4 [Hacksaw](#)
- 10.5 [Mike Burkeen](#)
- 10.6 [Doug, Pam & Darren Walsh](#)

#### **Chapter Eleven: AMA Racing MX, HS, SX, AX, XC, Drag etc etc etc**

- 11.1 How do I get started?
- 11.2 What district am I in?
- 11.3 Where are the tracks in my area?
- 11.4 What bike do I need, and what class are we in?
- 11.5 AMA Rules

## **Chapter Twelve: Miscellaneous**

**12.1 Tips and Tricks to make your life easier**

**12.2 Helpful links**

**12.3 Spare Parts Bin**

**12.4 Tools Needed**

**12.5 Here's some pics for your kids to check out!**

**12.6 Meet your fellow KTM Talkers!**

**12.7 Math Conversions for In to mm, oz to mL etc**

**12.8 Lacing up your own wheels**

**12.9 Example of a top end rebuild**

## [Introduction: You're New Bike \(Or New "Used" bike\)](#)

### **The 50SX and SX Junior:**



### **The Senior Adventure:**



### **The Mini Adventure:**



Welcome to the world of KTM Minis 🤪 Now that you have your KTM, the best thing to start with is tearing into it and making sure it is up to snuff for your little rider/racer. There are a few things to watch out for/adjust when buying new and used. I will outline all of the necessary steps needed to help you along your way in this report. Good Luck and Enjoy!!!

## [Chapter One: The Guru's Guide To Clutching](#)

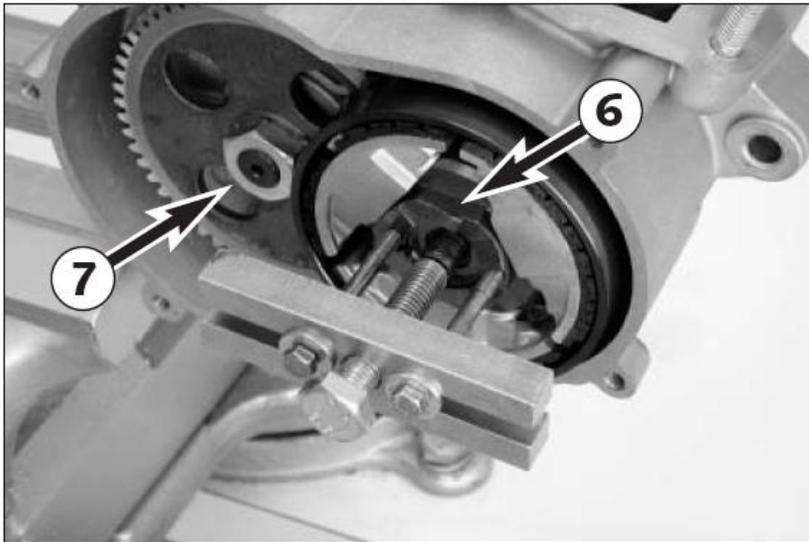
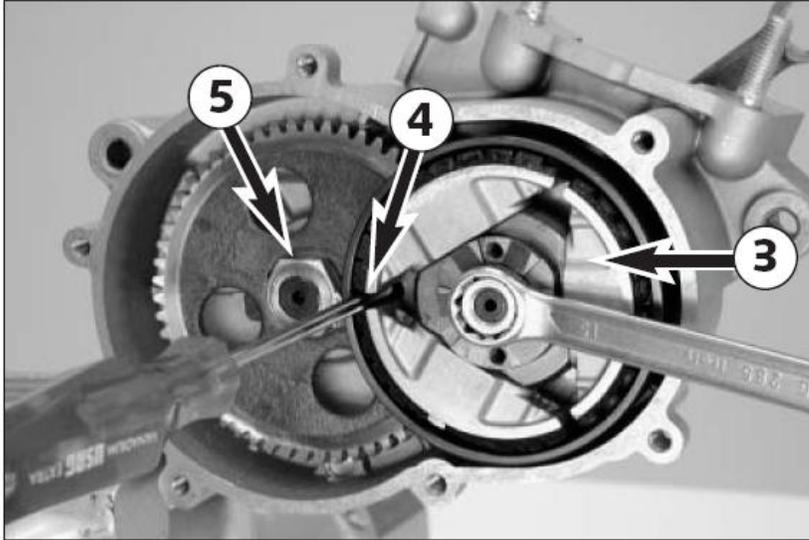
Alrighty then, lets start off with the most enjoyable part of your bike, the dreaded 3 shoe spring washer clutch (SX Sr & Jr). Clutch maintenance is one of the most important factors in keeping the bike running strong. If you slack on the clutch, the bike will slack on your kid. There are many ways to adjust the power "hit" of this clutch. From a smooth hitting clutch, to a high revving wheelie machine that hits harder than Tyson.

### [1.1 Clutch Removal: Dig that clutch out and take a look at it!](#)

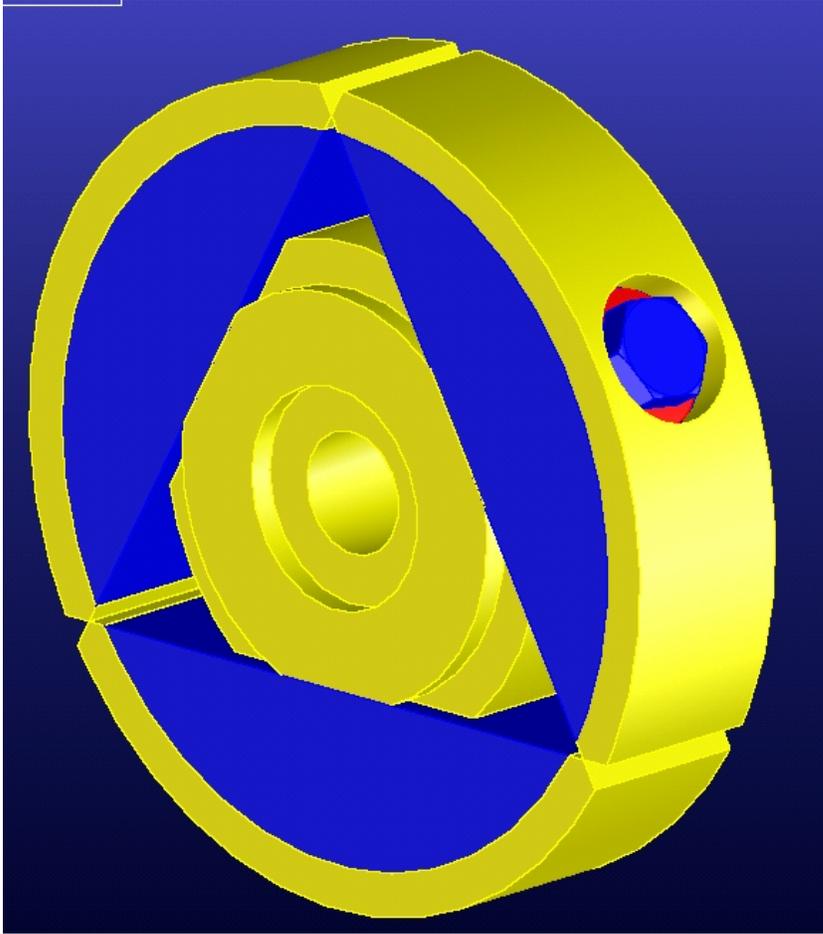
Step 1 Drain oil and remove clutch cover.

Step 2 Remove clutch nut. You can do this with two methods. One is to buy a piston stop, and just insert it into the spark plug hole. Another is to use a small screw driver to slip through the holes in the clutch basket and the holes in the primary gear. Then install your clutch puller (KTM or aftermarket). Make sure to insert the bolts as far as you can, to insure they are evenly aligned. (See fig)

Note: If you can not get your clutch to "Pop" off, heat the hub and cool the crank shaft... it will pop 🤪



Step 3 Disassemble your clutch completely. Inspect all parts to keep an eye on wear and tear. If your washers have more than 8 hours of use on them, replace them. If your spacers are grooved, replace them. **Thoroughly clean off all loctite from all bolts and crank end threads.**

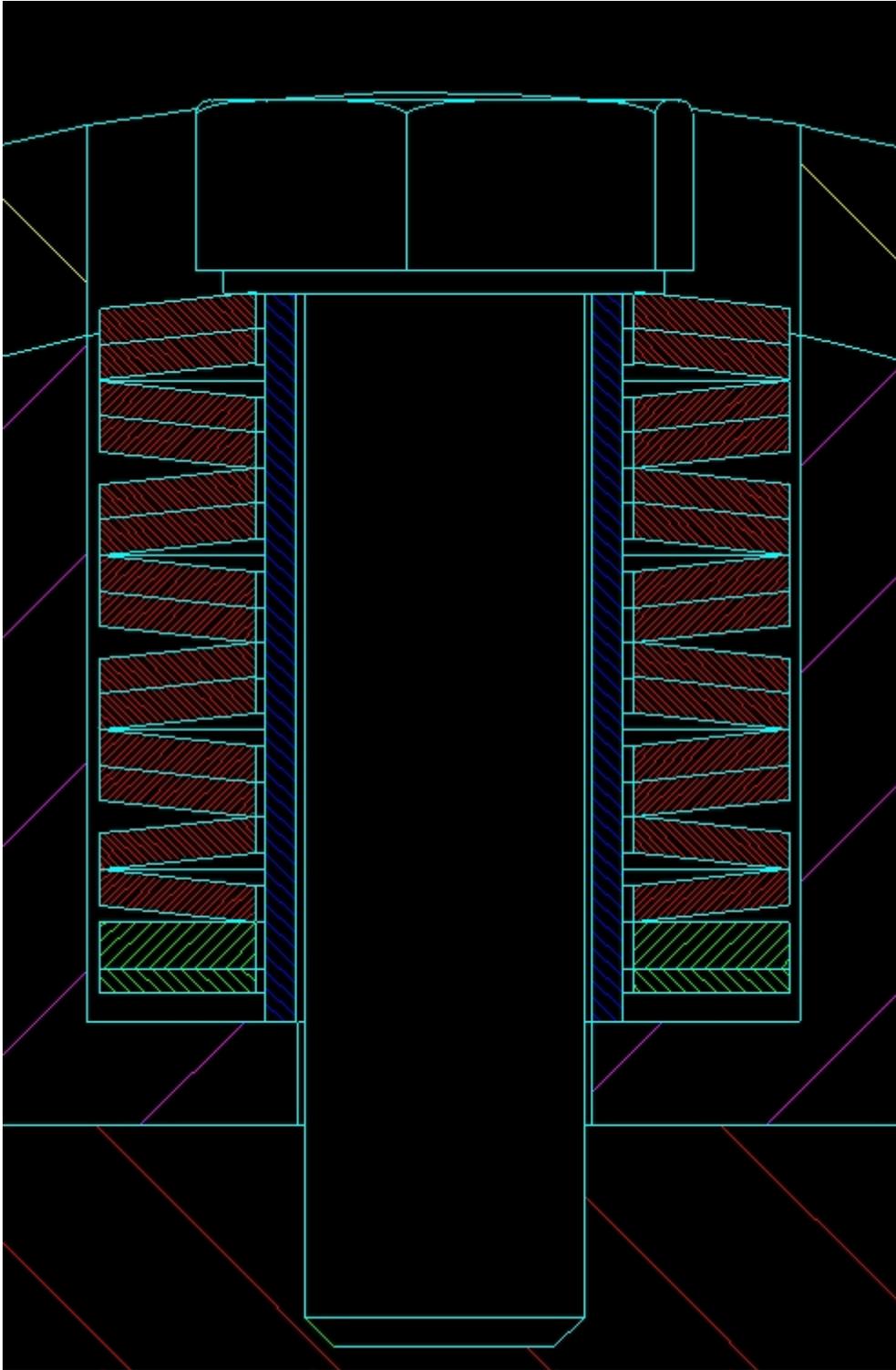




Step 4 (spring clutch's can omit this step) Clean each and every washer. Any gunk left on them, just means the hit will be that less consistent. Many people scrub each and every washer. I just put them in a 20 oz pop bottle with gas in them, and have the kids kick it around for a while 😊 Then I wipe them clean. One simple trick when only cleaning the washers and not replacing them, is to remove the entire stack from the clutch, and run a zip tie through it, this way, you can put them back on in the exact configuration they were put on.

Step 5 (spring clutches can omit this step) Using your digital Micrometer, measure each stack before re-assembling your clutch. Using shims (flats) try to get all three stacks to measure as close as possible. The best you will be able to do will be +/- .003". If you get it within that margin, you're set 🛠️

## 1.2 Clutch Adjustment: Understanding the “Clutch Stack” (Pro Sr & Pro Jr)



[Alex Manga's Clutch Analysis, this is all you need to know about your clutch](#) 🤖

### 1.3 Clutch Adjustment: Understanding the Spring Clutches and your options

The springs in the Adventure series models are much more simple than the washer stacks

☺ All you have to do is change your oil once and a while, and let 'er buck. But, if you want more out of your Adventure clutch, you have options. You can “shim” the clutch. That simply means, putting a washer or two on the spring bolts along with the spring. The washer can go on either side. This will increase your stall speed and make the stack “hit” harder. I recommend starting with a .040” and going from there. If you're rider still wants more, throw a .020” as well. If it's still not enough, throw out the springs and replace with a complete washer stack like the LC bikes. Note: This is not AMA legal.

## 1.4 Reassembling your clutch: Torque Specs and Proper Loctite applications

Step 1 Re-assemble the clutch. This is just as important as washer stacking. Assemble the three stacks as noted in step 5, put them into the counter-bored holes in the shoes, and apply a drop of blue loctite on the threads (after you put them through the shoes, this insures no loctite of interfering with you washers/springs). **Tighten these bolts to 7-8 ft-lbs.** No more, no less. Do the same for the other 2 stacks.

Step 2 Once your clutch is assembled and ready to go, set it down for a second (to let the loctite set) and inspect the inner workings of your transmission. Check your basket (drum) for grooves and cracks in welds. Check your primary for any faults. Check your Hub for hairline cracks. It will save you headaches if you catch it before the moto vs. during the moto.

Step 3 Slide the clutch onto the shaft. It is always a good idea to mate the hub to the shaft with a lapping compound to insure a perfect connection between the two.

Step 4 Apply a drop of red loctite onto the crank threads, and tighten clutch nut to 25 lbs.

Step 5 Install clutch cover, and add oil.

## 1.5 Fluids: ATF? Gear Oil? What do I use! And what is Two2Cool????



The most recommended oil is Maxima MTL 75wt. It can be purchased from anyone on the left. There are many others that are good, and many that aren't good. Maxima seems to be the favorite. Along with [Two2Cool](#) mixed in. And get yourself a Ratio Rite (pictured above) it'll be your best friend.

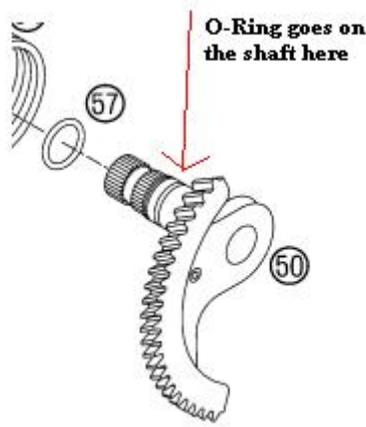
Your KTM manual will tell you to use 150cc of blah blah blah... Wrong. For trail riding and HS etc... it is recommended to use 250cc of fluid. Due to the high amount of slippage going on, slippage is the main heat source that will burn up your clutch (also

“Blipping” as outlined in Mangas analysis). For MX, it is recommended to use 200cc.

In any case, you should use the oil additive Two2Cool. It will decrease your transmission temps in a major way; and will also save you big \$\$\$ in the long run on burned out parts. It's very simple to use. When you buy a new quart of oil, mix 2 oz of Two2Cool into it, and mark it. Then you're set, it's that easy 🤪 Hence the name, Two (ounces) to cool 🏍️

### 1.6.1 Kick starter O-Ring Leaking?

Courtesy of Hacksaw 🤪



#### QUOTE

There really isn't a whole lot of tension on the spring. I usually just lay the clutch cover spring side down, remove the C-clip and press the shaft through with my hand. The spring will pop right out. I have done it this way every time and never had any problems.

Putting it back in is slightly more complicated so here is what I do step by step:

3. Place spring tab in hole on main gear
4. Try to hold the spring tab in place while pushing bottom spring tab into groove on clutch cover.
5. When step 4 fails use a maximum of five obscene words and take a drink of beer.
6. Repeat Step 4 and 5 until main gear is in place or until you have finished two beers. **IT IS NOT RECOMMENDED GOING BEYOND TWO BEERS, OTHERWISE YOU MAY LOOSE THE SPRING WHEN YOU FLING THE CLUTCH COVER ACROSS THE SHOP.**
7. Once you have the main gear in flip the clutch cover over and install C-clip.
8. Line the small gear up and push into place.
9. Make sure the assembly moves freely, so it doesn't lock up and break a tooth when

you kick it over the first time on the bike.

the stock O-ring is a 12 by 1,5

we use a 12 by 2

I now machine the cover on the inside for a seal

and leave the o-ring to seal out the dirt

### 1.6.2 Kick starter "Double O-Ringing"

When you get the kick starter off, wrap Teflon tap around the end of the shaft so you don't mess up the new o-ring going on. Put the first o-ring all the way back then put the second o-ring down in the groove where it's supposed to go. This is called double o-ringing, it works great! No more leaks. Now take the Teflon tape off and put it all back together 

## [Chapter Two: The Guru's Guide to Gearing & Brakes](#)



### 2.1 Gearing: Gear Ratio Chart

Here is a gear ratio chart to help you decide what gearing you want for different applications:

## GEARING CHART

FRONT REAR	8	9	10	11	12	13	14
38	4.75	4.22	3.80	3.45	3.17	2.92	2.71
39	4.88	4.33	3.90	3.55	3.25	3.00	2.79
40	5.00	4.44	4.00	3.64	3.33	3.08	2.86
41	5.13	4.56	4.10	3.73	3.42	3.15	2.93
42	5.25	4.67	4.20	3.82	3.50	3.23	3.00
43	5.38	4.78	4.30	3.91	3.58	3.31	3.07
44	5.50	4.89	4.40	4.00	3.67	3.38	3.14
45	5.63	5.00	4.50	4.09	3.75	3.46	3.21
46	5.75	5.11	4.60	4.18	3.83	3.54	3.29
47	5.88	5.22	4.70	4.27	3.92	3.62	3.36
48	6.00	5.33	4.80	4.36	4.00	3.69	3.43

HIGH TOP SPEED    SLOW TAKE OFF    FAST TAKE OFF- LOW TOP SPEED

## 2.2 Applications: What to use, and when?

### QUOTE

Courtesy of MJM Cycles:

### Gearing

Motocross bikes are designed to make most of their horsepower in a certain RPM range of the motor. This RPM range is commonly referred to as the “power band”.

If the bike doesn’t reach this range or exceeds past this range you are not making the most of the power the motor has to offer. Your choice of gearing can help keep the motor in the proper RPM range, making you motor more efficient on more parts of the track.

While this is true for all motorcycles, it is critical on a 50cc automatic bike because you do not have the option to shift into another gear for different parts of the track.

Gearing refers to the size of the sprockets, both front and rear, that are installed on the bike. Look at a ten speed (or any of today’s multi speed) pedal bikes, those extra gears are not on there just to make the bike cost more. There is a range of gears for different circumstances. If you are on a steep hill, or maybe rough ground, you would be in a lower gear to make pedaling easier.

Try to start from a dead stop in 8th gear on a 10 speed bike. You will not get a very “quick” start. Now try going down a long flat smooth straightaway in 3rd gear, you will pedal your heart out but not go very “fast”.

Quick and fast are two different things. Dragsters are quick, race cars are fast. With an automatic bike you have to sacrifice one for the other because there is only one gear.

You're driving me crazy.

Since your front sprocket is being turned by the motor it is referred to as the driving sprocket. It is the one that has the power delivered to it. The rear sprocket is referred to as the driven sprocket. It is the one being driven by the front sprocket.

The front sprocket is also referred to as the countershaft sprocket.

The combination of these two sprockets will determine your gear "ratio". Your gear ratio is the number of teeth on the rear sprocket divided by the number of teeth on the front sprocket.

If you have a 48 tooth rear sprocket and a 12 tooth front sprocket you have a gear ratio of 4.00.  $48 / 12 = 4.00$ .

This means that the front sprocket has to turn 4 times for every one turn of the rear sprocket. Since the teeth are the same size (they are connected by the same chain), this should make sense.

Got it? Good. Now we will go faster.....

So, with that in mind, a larger front sprocket would make the rear wheel turn more for every revolution of the front sprocket. Or, make the bike go faster at the same rpm of the motor. Just like switching gears on a 10 speed bike.

Or, let's back up. Let's also look at the rear wheel. If you were to make the rear sprocket smaller it would complete a revolution sooner, even with the same size front sprocket.

Making sense yet? Here is another way to look at it. Think of the front sprocket as a spool and the chain as a rope. For now, let's pretend the end of the rope doesn't connect to anything, it is just really long and is stretch out behind the behind the motorcycle.

For every turn of the front sprocket (spool) you will reel in as much rope as the circumference of the spool. The bigger the spool, the more rope that will come in with every turn.

For those of you who don't remember, circumference is equal to  $2 * \pi * \text{radius}$ . So for every turn of a 2 inch diameter spool you will get  $2 * \pi * 1$  (radius is  $\frac{1}{2}$  of the diameter) = 6.28 inches of rope. But if you put a bigger sprocket on, let's say 4

inches, you would get  $2\pi \times 2 = 12.56$  inches of rope with every turn.

So a bigger front sprocket is pulling more chain and making the rear sprocket (and wheel) turn more, which gives you more speed at the same rpm as a smaller sprocket would.

Okay, that should clear up the front sprocket but what about the rear sprocket. Well, it is the same thing only in reverse. The rear wheel is being “driven” by the front sprocket. Let’s pull the rope and pretend it is hanging around the rear sprocket. As we pull the rope, the rear wheel will travel a complete revolution for every turn (or trip around the circumference) of the sprocket. So a smaller sprocket will make a complete revolution sooner than a larger one.

### Choosing the proper gearing

You want your bike to be as quick off the line as you can get it (starts can be EVERYTHING in a motocross race) but you don’t want to sacrifice anything in the fast straights.

To gear you 50cc bike correctly you need to listen to it on the fastest part of the track, this is usually the longest straight away. The bike should be at the very top of the power band (or even a little past it). If they are not winding the motor all the way out the gearing is too “tall” (gear ratio too high) for the track and the riders ability. With too tall of gearing you are losing the “jump” out of the start and every corner on the track.

If the bike is completely wound out 3/4 of the way down the fastest straight you are giving up speed down that straight away.

Since there are usually many more corners on a track than fast straights, it is usually best to run gearing that is a little too low than too high. This will get the bike off the line quicker and get the bike on the pipe sooner out of every corner.

Gearing on bigger bikes isn’t usually as critical but still should not be overlooked. The proper gearing for a manual transmission bike can make the difference in being able to clear a double or case it. If you can’t keep the bike in the power band coming out of a corner before a jump, try changing the gearing and it might make all the difference.

### Changing sprockets

If you are not real serious about racing but still want to be close with your gearing you should at least change the front sprocket for different tracks and conditions. Changing the front is easier than changing the back and makes a bigger difference. In most cases simply remove the chain guard (or ignition cover) and using snap ring pliers remove the snap ring holding the sprocket on. Replace with different sized one

and adjust the chain.

If you want to get real critical, you can change the rear or both. Changing the rear by 1 or 2 teeth can make a big difference for a kid who is attacking the track. The little bit of difference can pick up a bike length or two in a straight, which is enough to make a pass.

When changing the rear sprocket you must remove the rear wheel (unless you use a split sprocket, JMJ Cycles can get these). There is more work changing the rear sprocket but you can fine tune the gearing for the track. (Don't forget to Loctite the bolts)

### Additional Tips

-Have two different lengths of chain, one a link or two longer than the other. When you change sprockets you may find that the chain you are using will be too short or long with the different gearing. You will probably go through two (or more) chains in a season anyway and you just as well have the right size chain available when you change the gearing.

-You will also probably go through several sprockets. Buy different sizes now, before you need a new one and have them available for changes. Making them all last longer and they will provide the right gearing for any track.

-You don't need a bunch of sprockets to have a wide range of different gearing. Two fronts and two rear sprockets offer many combinations to help most gearing situations. (see chart above)

-Keep notes of what gearing you ran on what track, this will help you have the right setup next time you go back.

-On a 50cc bike, the clutch will hit harder with lower gearing. The lower gearing will give the bike more torque resulting in a harder hit. Taller gearing will take some of the hit out of a clutch.

-On dry slippery tracks with lots of turns, taller gearing may help take some of the wheel spin out of the bike (see above).

-Don't be afraid to change gearing during race day. Race conditions can make gearing changes a necessity. If the track gets rougher, dries up or the rider gets more familiar with the track are all things that may change the speed they are racing.

-DO NOT necessarily run the same gearing as other riders of different abilities. The fastest kid in the track should have the tallest gearing, because he has the ability to ride the bike that fast. A beginner rider will struggle with tall gearing because they do not have the torque to keep their momentum up in corners or hills.

-Listen to the motor and adjust the gearing accordingly.

-Gearing changes are completely AMA Stock Class legal and easy to do. Gearing changes will make the most of the motors horsepower and improve lap times, **GUARANTEED!!**

### 2.3 Chain: What to use?

Take your stock chain off, and throw it away, it's junk. Get a DID or similar 415 or 420 chain and you'll be a happy camper.

### 2.4 Maintenance: What chain lube to use?

This is a touchy subject. Many people use WD-40. It is recommended, but if you use it, apply it EVERY time you start the bike. Or your new DID chain will be trash. Others use Chain Wax and similar products. You can pretty much use whatever you have good results with.

### 2.5 Disc Brake system analysis

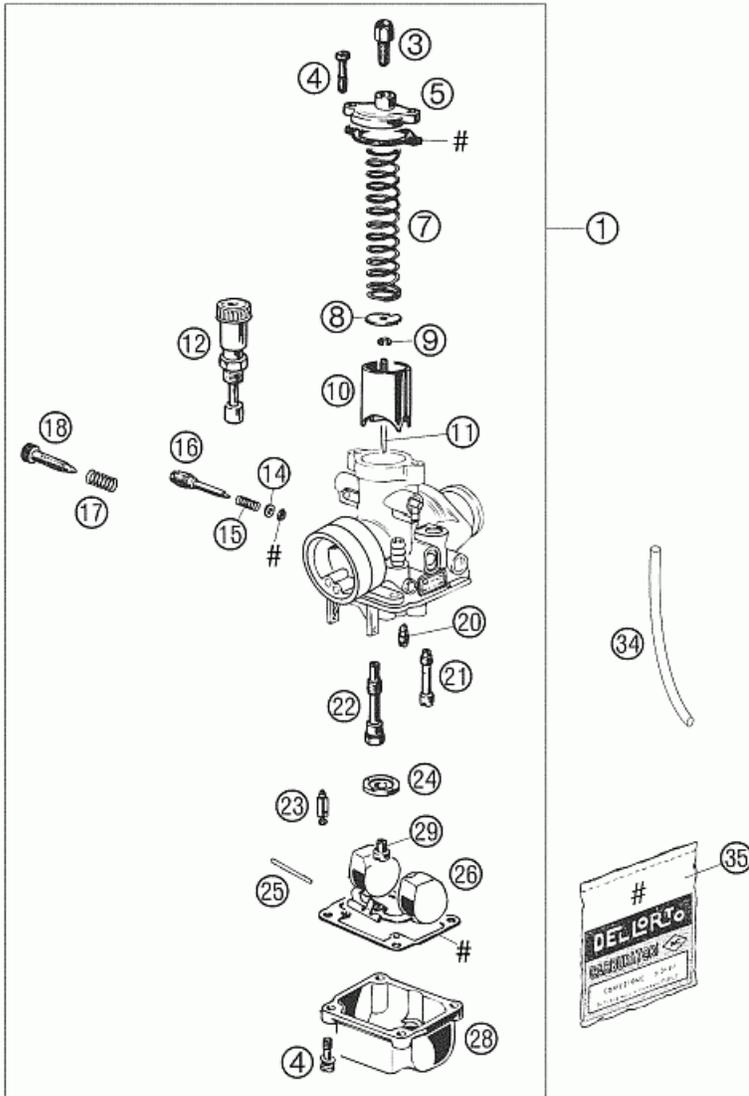
### 2.6 Disc Brake system maintenance

## Chapter Three: The Guru's Guide to Jetting

### 3.1 Tech Help: How do I jet my carb?



ACHTUNG !!!  
Vor dem Einbau des Vergasers, Bedüsung kontrollieren.  
CAUTION  
Before mounting the carburetor, check the jetting.



Jetting is easier than most people think.

### 3.2 Jetting: What jetting should I run?

Pro Sr: 86 main 55 pilot 40 slide needle 2nd clip from top

Pro Jr: 78 main 45 pilot needle on 2nd clip from top

Sr/Mini Adventure: 65 Main 38 Pilot needle clip on 2nd clip from top

### 3.3 Maintenance: Clean That Carb!!!

Use carb cleaner, and don't just spray it off! Take it all the way out, clean every nook and cranny, remove all jets, spray them out with the straw that comes with your carb cleaner. Wipe clean, and spray again. Carb Cleaner is cheap, a new crank isn't! Dirt is bad 😊

### 3.4 Temp Changes: What jetting to use in 10 degree weather? 😊

You go up one jet size for every 10 degrees cooler 😊

### 3.5 What is K100?

K100 is a fuel additive. [Read all about it here](#)

### 3.6 What Gas should I use? Mixed at what ratio with what oil?

Pump Gas! 93 octane. Mixed with a high quality 2 stroke oil. Don't go cheap here! If you do, you'll pay in the long run!!! Mix @ 40: 1

### 3.7 Keep that Filter Clean!!!

#### QUOTE

Courtesy of JMJ Cycles 😊

#### Air Filter Cleaning

Cleaning the air filter is probably the most common and dreaded part of any dirt bike's maintenance schedule. Both performance and engine life can be drastically reduced by neglecting this task. Here is the proper method to cleaning air filters and a few tips to make this chore a little less painful.

1) The most common solvent for the initial cleaning of an air filter is gas. Gas works well to break down the air filter oil which is what holds the dirt on the air filter. To get the dirt out, you most first get the oil out. Gas does work well for this but it is hard on the foam and the adhesives of the filter. Diesel fuel is not as damaging to the filter and does a great job of breaking down the oil. (I know regardless of what is said here, most people will still use gas to clean their filter. And

I have done so myself for years.) There are also special solvents made to clean filters. PJ1 even makes an aerosol spray cleaner.

- 2) After the oil is thinned out, the next step is to get the dirt out. Use warm water and dish soap (like Dawn) to remove the trapped in dirt. Continue this process until you no longer get dirt out of the filter. Cleaning the filter in a Tupperware bowl will let you see how much dirt you are getting out.
- 3) Rinse the soapy filter out with warm water.
- 4) Light wringing of the filter and flinging the water out by whipping it in your hand will remove the majority of the water. Compressed air will also help remove some of the water (but be careful you don't blow a hole in the filter). To speed up the drying process, the filter can be wrapped with paper towels then lightly twisted.
- 5) Once completely dry, you can apply the air filter oil. As mentioned earlier, the air filter oil's job is to trap the dirt in the filter. The tacking oil will hold the dirt on the filter rather than letting it pass through the filter and into the carburetor. Apply the oil liberally and work into the filter. Lightly wringing out any excess oil.
- 6) Clean the air box out of any dirt.
- 7) Grease the mating lip of the filter and carefully install back onto the bike. Be sure to check that it is seated correctly.

#### Additional Tips

- 1) Keep a Tupperware tub full of air filter oil. Use this tub to dip the filter and wring out the excess oil back into. This will save time applying the oil and money on air filter oil.
- 2) Buy several air filters. Clean them all at once and keep some for back ups. It is far easier to go through the hassle of cleaning filters in bulk rather than one at a time. And by having clean filters on hand you will replace them more regularly. Store the clean filters in large Ziploc bags.
- 3) If you see oil in the bottom of your air box, you are leaving too much filter oil on the filter before installing it back on the bike. This oil can get sucked into the carburetor causing the bike to run poorly.
- 4) The paper towels that were used to help dry out the filters can be used to wipe out the air box.
- 5) Always put a clean rag in the air box when waiting for the filter to dry.
- 6) Grease can be used to help seal the center mounting bolt (if your filter has one) and in emergencies places where small cracks and areas where there is a poor adhesive seal. This fix should only be a temporary one and filters with cracks or poor adhesives should not be used and discarded.
- 7) When you are done cleaning the filter, use the solvent to clean your chain before throwing it away

## Chapter Four: The Guru's Guide to Suspension

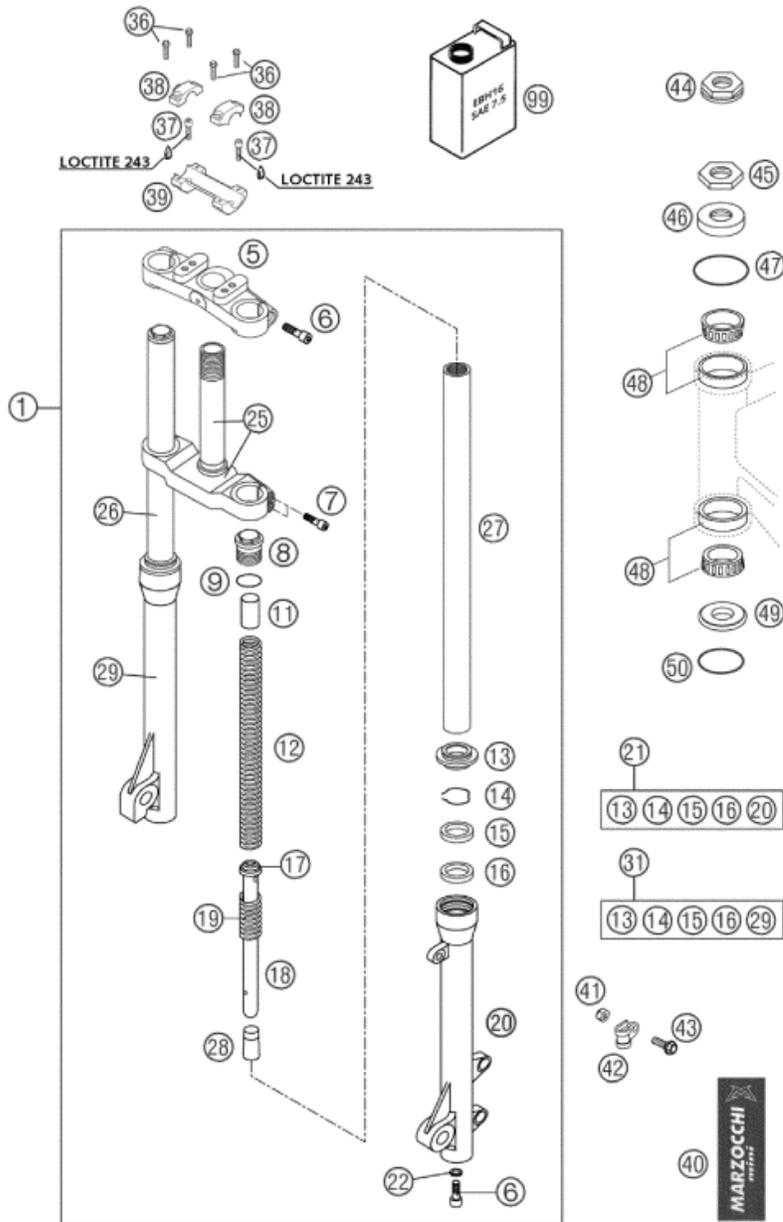
### 4.1 Set up suspension for safety!

Getting the suspension set up for the riders height/weight and ability is first and foremost on these bikes.

### 4.2 Seat Height Adjustment

On the Senior bikes, there is an alternate shock mount that will lower the seat height. Also, when doing this, raise the forks to lower the front end accordingly. And if it's still not low enough, get a Mini Adventure seat, it will snap right on and lower it another 2"...

### 4.3 Forks: Adjust and maintain



## Front Fork Troubleshooting:

### Symptom

*Action Needed*

**Front end "knives" or oversteers in turns (front end will turn inward). This is caused by soft forks.**

*Increase compression damping  
Raise fork oil level  
Install stiffer springs  
Slide the fork tubes down 5mm in the triple clamps*

**Front forks stiffen up too much at the end of the stroke.**

*Reduce the fork oil level*

**Forks overall feel is too stiff.**

*Decrease compression damping Lower fork oil level Re-valve front forks Install softer fork springs*

**Forks dive excessively during braking.**

*Increase compression damping Raise fork oil level Install stiffer springs Re-valve front forks*

**Front pushes or washes out in turns. This is caused by stiff forks.**

*Release built up air in the forks Decrease compression damping Slide forks tubes up 5 mm Lower fork oil level Install softer springs*

**Front end searches while going down hill or during acceleration out of corners. This is caused by soft forks.**

*Increase compression damping Raise the fork oil height Increase fork spring preload Re-valve forks Install heavier springs*

**Front forks do not respond to small bumps in sweeping turns. They may hop over the small bumps. This is caused by stiff forks.**

*Decrease compression damping Decrease fork oil level Re-valve front forks Install softer fork springs*

**Front end shakes under braking.**

*Decrease shock sag Increase shock rebound Increase fork compression Raise fork oil level Tighten headset*

**Soft, sandy tracks (big, rolling bumps)**

*Increase LSC 2 clicks; Slow down Rebound 2 clicks*

**Dry, hard pack tracks (small, choppy, square-edged bumps)**

*Decrease LSC 2 clicks; Speed up Rebound 2 clicks*

**QUOTE**

Courtesy of JMJ Cycles:

Fork Oil Changes

Suspension

One of the most overlooked areas of motorcycle maintenance is the suspension. When people want to make a motorcycle faster they immediately think of modifying the engine. There are only a handful of people riding motorcycles that can get take a stock engine to its potential. Even then, it is only on certain parts of the track.

If your suspension is not adjusted or maintained properly you will have an ill-handling bike on all parts of the race track. If you want to improve your lap times, take the time to set up and maintain your suspension. And, unlike the engine modifications, simple oil changes and adjustments are legal in AMA stock classes.

Here are some tips to help you get started. Let's begin with the forks.

Changing your fork oil can be a lot easier than it looks. If your fork oil has never been changed, it would be best to send the forks to a reputable service shop. The following method is a shortcut to a complete overhaul and will not get them as clean but, it is whole lot better than not doing anything at all.

Fork Oil Changes for Beginners - The quick and "not so dirty" method to fork oil changing. This method is for conventional style forks (not upside forks like on late model KTM 65's).

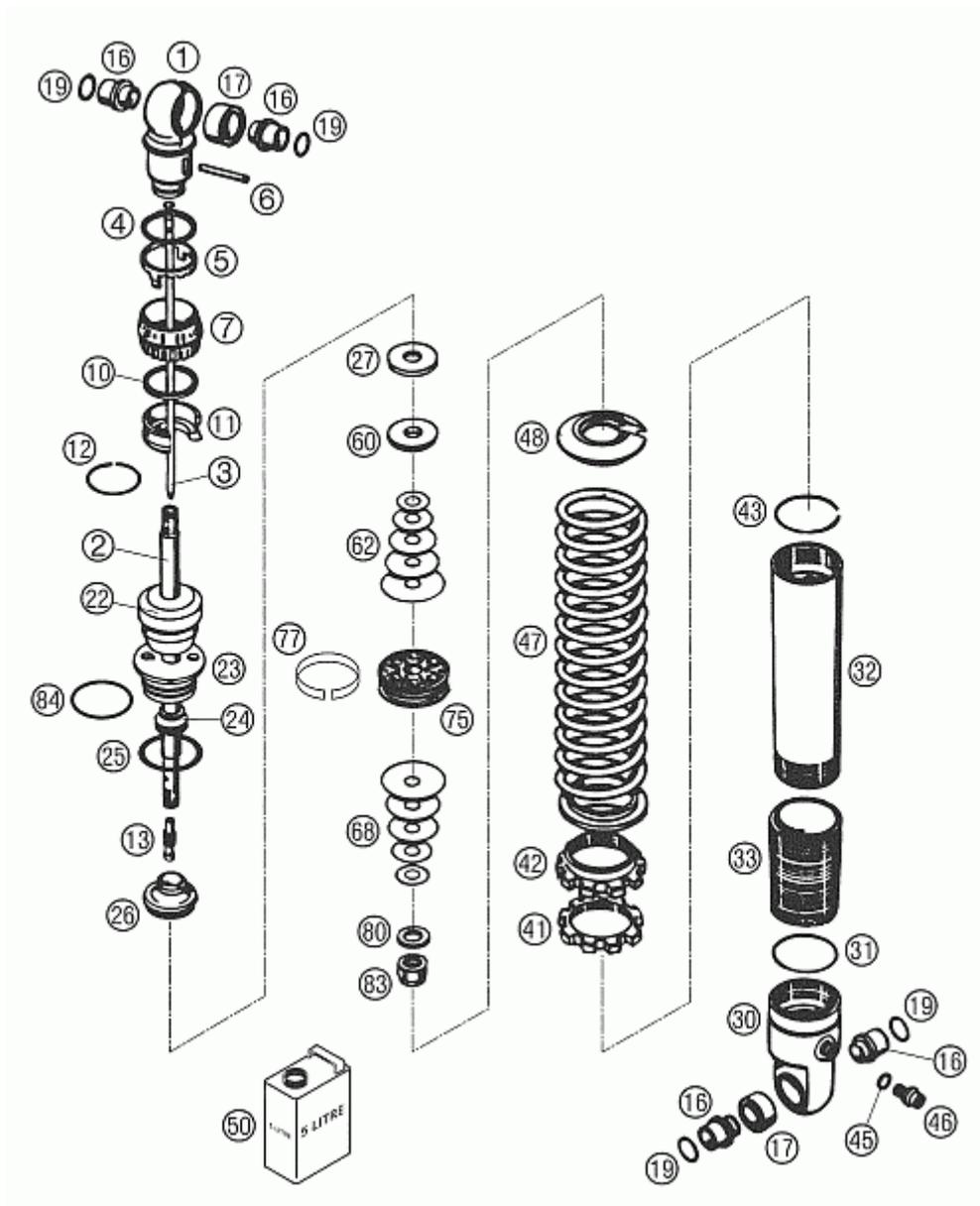
Check with your dealer prior to starting this work and determine the recommended oil weight and capacity for your forks. Make sure you have at least 2 times the recommended oil for both legs.

1. Remove the front wheel.
2. Remove any hardware that is attached to the fork leg and prevents you from removing them. (Brake lines, front number plate, etc.)
3. Loosen the top triple clamp hardware. Leave the bottom hardware tight. Now loosen (do not remove) top fork cap, this is the large hex nut on top of fork. The bottom clamp works as a vise to hold the fork so you can loosen the nut. (Loosening the top removes the pressure from the threads of the fork nut)
4. Now loosen bottom triple clamp hardware and slide each fork leg out of triple clamps.
5. The top nut can now be removed.
6. Under the nut there should be a spacer and a long spring. Remove both of these items and place on a clean rag.
7. Turn each fork leg upside down drain out as much oil as possible. Stroke the fork legs through their travel to help flush any oil out.
8. Now add new oil to the leg and repeat step 7. Continue until only clean oil drains out
9. At this point you might be tempted to continue flushing with some kind of solvent. I suggest that you resist this temptation. If there is any solvent left in the forks legs it will breakdown the fork oil prematurely. If you decide to use a solvent, use something like Brake and Electronic cleaner that dries quickly with no residue. And, let the forks dry overnight before filling with new oil.
10. If you decide not to use solvent, you can now add the proper amount and weight of oil and reverse steps for assembly.

## Additional Tips

- Oil measurements are given in both volumes and “heights”.
- If a volume of oil is used, (i.e. 185cc) this is how much oil is poured into each leg. If a height is given, the fork oil height is measured with the forks collapsed and the springs removed. While holding the leg plumb, measure from the top of the fork leg to the height of the oil in the leg. Make sure the oil height is equal in each leg.
- The most accurate reading will be attained by reading heights. A turkey baster with a short length of fuel line works great for sucking the oil out to the proper height. Place a zip tie on the hose at the proper dimension from the end and rest it on the side of the fork while sucking the oil out.
- Fork oil height affects the later travel of the forks. More oil makes for a harsher stroke at the bottom (more resistance to bottoming).
- Higher viscosity (20wt vs. 5wt oil) gives more resistance to BOTH compression and rebound throughout the travel. (forks will compress harder and return slower)
- Adding preload to the springs (putting in longer spacers) will stiffen the compression travel and quicken the rebound. (not AMA Stock legal)
- If you have a fork leg leaking oil, you probably have a bad seal. The legs should be disassembled to replace the seals.
- Check for scratches or gouges on the inner fork leg. This will cause seals to fail and leak. Burrs can be lightly sanded smooth.
- Keep a record of what oil weight and volume you used for future reference.
- Don't be afraid to experiment with different heights and weights.
- After changing your fork oil a couple of times you will see how easy it really is, this entire process can be done in less than a half hour. So what are you waiting for??????

## 4.4 Rear Shock: Adjust and maintain



## Rear Shock Troubleshooting

### Symptom

*Action Needed*

**Rear shock bounces over bumps while accelerating, will not hook up. Lack of traction due to a stiff shock.**

*Decrease shock spring preload Decrease shock compression damping Install softer spring*

**Rear shock kicks up during braking.**

*Increase shock rebound damping Soften high speed compression*

**Rear shock feels soft on large bumps or jumps.**

*Increase shock compression damping Decrease race sag Shock made need re-valving  
Install stiffer spring*

**Rear shock feels too hard over jumps, large bumps, or a series of small bumps.**

*Decrease shock compression damping Increase sag Shock may need re-valving Install  
softer spring*

**Soft, sandy tracks (big, rolling bumps)**

*Increase LSC 2 clicks; Increase HSC 1/2 turn Slow down Rebound 2 clicks*

**Dry, hard pack tracks (small, choppy, square-edged bumps)**

*Decrease LSC 2 clicks, Decrease HSC 1/2 turn, Speed up Rebound 2 clicks*

**QUOTE**

Courtesy of How2ride.com

How to Adjust Pre-Load



Adjusting pre-load is critical to the start of suspension tuning. This is the foundation from which you will build your other settings. So, before you start turning those knobs and screws on your shocks and forks, read this and put it to practice. Let me say now also that if you adjust your sag correctly, and then tune your adjusters and still don't have the performance you need, then a good suspension specialty shop is your next move. Your riding ability may be off the performance range of the spring or valving you have, in either direction. Let's define our terms. Pre-load is just that, a load put on the spring to change its initial sensitivity. No matter what the sag is, you will start in the same place and end up in the same place in terms of full extension and full compression, but your bike will sag under your own weight differently according to the pre-load. Some tuners call pre-load, "sag" for this reason. OK, let's take some measurements and see what the current setting is. I like to hook the end of the measuring tape in the axle when I start. Sometimes working on bikes can be a team sport, but if you are working alone you will later need to sit on the bike and hold the tape. Hooking the tape on the axle saves a hand. With the bike on a stand and the rear wheel hanging in the air, measure to a point on the bike that is approximately in line with the travel, like a seat bolt. On this Yamaha, the number plate contour makes a nice clean edge to measure to, and I will be able to see it when I'm sitting on the bike in the next position. You can see by the photo that the measurement with the shock fully extended is about 25 1/4. Next, take the bike off

the stand, and sit on it in full riding gear. OK, you don't have to wear your helmet. You need to be able to see the measuring tape. Now, sit in the saddle of the seat, with just your tip toes balancing your teetering. Without leaning too far back to do this, measure to that same place you did before. The next photo shows the view looking down on the tape. You can see that the measurement is 21 3/4. My math skills tell me that this is a Sag of 3 1/2 inches. You want the sag to be about 3 1/2 to 4 inches, so I am in an acceptable range. If I did decide to adjust it I would do so changing the position of the spring nuts, see the next photo. The spring nuts are tightened together so the can't move. If you have a KTM, the spring stop is a sleeve with an allen screw. In that case loosen the allen screw before turning the spring stop. It would be great to use a spanner wrench on the lock nuts, but a screw driver is an acceptable method too. Use your worst "beater" screw driver to hammer against the top nut and back it away from the other nut. Remember, tightening the nut against the spring increases the sag amount. Make your adjustment, lock the nut against the spring nut, and you are ready for a test ride. Do a little experimenting. Try more and then less. Ricky C. did when he set up his Honda for his record breaking season. He found that lots of sag suited his riding style. You may need something different. Now you can fine tune your compression and dampening to suit the track of the day, your riding style and demands

## QUOTE

Another write up on setting preload, by JMJ cycles 🤪

### Setting the Rear Shock Preload

Your preload setting adjusts the tension on the rear shock spring to compensate for the riders weight. If you look at the top of the shock you will see a couple of big funny looking nuts. These are called spanner nuts, and you are supposed to have a special wrench to turn them (more on that later). These nuts can add or reduce the tension on the spring. One of these nuts acts as a locknut.

### Physics 101

Hookes law on springs states that ... $F=KX$ . I know there is a  $KX$  in there, but for a minute lets leave motorcycles out of this. Remember we are in physics class now!! Hooke's law says that the force a spring exerts is equal to the spring rate (how stiff the spring is) ( $K =$  spring rate) multiplied by the distance ( $X$ ) that it travels.  $K$  is a property of the spring and is a fixed number for a given spring. The amount (or distance) you compress a spring is  $X$ .

If you have a spring that compresses easily, to the point you can completely collapse it,  $K$  is very small. If you have a spring that you can't compress it all,  $K$  is very large. As a spring compresses  $X$  gets larger and more force is required to continue to compress the spring. For example, take a spring that has a  $K$  value (spring rate) of 20

lbs/in (for every 20 lbs it will collapse 1 in) and place 100 lbs on it. The spring will collapse 5 inches. ( $X = 5$  inches). With 80 lbs,  $X = 4$  and so on.

REMEMBER THIS.....If you have 40 pounds on the spring it will be collapsed 2 inches. If you add 80 more pounds it will collapse an additional 4 inches. Let's go shopping.....

So, you go into the showroom and you buy a brand new bike. Sure is nice, isn't it? Look at that clean plastic.....WOW!

From the price you paid, you are thinking "these guys seen me coming". So since they knew you were going to buy that bike that already had it set up for you, right? I am sure they had a scale in the shop and they checked your rider's weight and made any necessary adjustments. Sure they did, it is a BRAND NEW bike and everything is perfect. Let's go home and ride it!!!

Hold on though, the weight range of riders for this bike can vary 40 pounds (or more). When little Johnny sits on the bike, the shock barely moves. But, when his big brother Bubba sits on it there is only half the suspension left. Where should it be? Setting the Sag

The amount the bike squats when the rider sits on it is called the sag. How much sag should the bike have? For any motorcycle the best starting point for sag is 30% of the total shock travel.

The following are guidelines to use:

50cc racing bikes – about 2 inches

How do I check the sag?

To check the sag, place the bike on a stand with the rear wheel off the ground.

Measure from the center of the rear axle to a fixed point by the back of the seat. A seat, fender or muffler bracket bolt usually works well.

Note this measurement. Then have the rider get on the bike in their "attack riding position" and take the measurement again. Be sure that all of their weight is on the bike; they may need help balancing the bike as you take the measurement.

It is also a good idea to bounce up and down a few times to be sure the suspension isn't binding.

Subtract the second measurement from the first. This is the amount of sag the bike has. If the number is greater than what is recommended (see above) you have too much sag. If it is less, than you don't have enough sag.

Time to apply Hooke's law.

The preload is the amount of load you apply to the shock spring so that it compresses to the proper distance with the rider and gear on the bike. By turning the spanner nuts at the top of the spring you can reduce or increase the amount of force that is "PRELOADED" into the spring.

This does the same thing as adding weight to the spring. By compressing the spring more you are making it "stronger" and it won't let the bike sag as much. And, loosening it has the opposite effect.

To reduce the amount of sag you need to increase the amount of preload. You do this by compressing the spring further with the spanner nut.

To increase the amount of sag you need to decrease the amount of preload. You do this by loosening the spanner nut on the spring.

Continue this until you reach the proper amount of sag.

## Adjusting the Preload

### Turning the Spanner Nuts

There are special tools available to work with the spanner nuts. They are called spanner wrenches. Most people don't have them. Most people don't adjust their preload settings though either.

If you are one of the first people but don't want to be one of the second people, you can adjust your preload setting (carefully) with a punch (or a big screwdriver if all else fails) and a hammer.

The top nut is a locknut and can be loosened and backed-off out of the way until you have completed the measurement process. The second nut needs to be used to compress or relieve the spring. You can sometimes find a safe place against the frame to "pry" the spanner nut around in small increments. You can also sometimes grip the spring and turn it with your hand and the nut will turn with it.

Once you reach the proper setting tighten up the lock nut to the other spanner nut.

### Race Sag (Do not Confuse with Sag)

Race sag is the difference in the height measurements from the bike on a stand to the free weight of the bike ALONE (no rider). NOT to be confused with "SAG", the measurement difference with a fully dressed rider. There should be some "race sag" to the suspension with the bike alone, probably somewhere around a 1/2 inch for small bikes and 1 1/2 inches for big bikes.

To obtain the proper amount of "race sag" your spring should be compressed about 5 to 20 mm from its free (not compressed at all) length. If you have to go more than that to get the proper amount of sag you need a stiffer spring.

If you reach a point where you have loosened the spanner nut all the way (there is no preload on the spring) and you still don't have enough sag. Your spring is too stiff (or per Hooke's law, K is too large).

KTM LC 50 Pro SR parents, this will probably be the case for many of you.

Your options are to find a softer spring (best option) or run with the spanner nut just touching the spring. If you run AMA stock classes you can change the spring with a previous year or different model of the same manufacturer. Unfortunately, KTM does not have another spring that will work with the KTM LC 50 Pro SR.

Some Polini's come with an optional heavier spring.

### Additional Tips and Comments

·Preload is necessary because not only does the suspension travel up, it must also travel down. When you hit a bump the suspension compresses. When you hit a hole the suspension must extend to keep the wheel in contact with the ground. The same is true when you brake (or accelerate), you lighten one end of the bike and the wheels try to leave the ground.

·Adjusting the sag is FREE, easy and completely AMA stock class legal.

·The dimensions given are just guidelines. Pay attention to how the bike is handling for minor adjustments.

·The forks also should have the sag adjusted. This is done by adding spacers in the forks, NOT AMA stock class legal.

·The forks and shock should work TOGETHER to suspend the motorcycle. The bike should be adjusted evenly and balanced so both ends work together. Hold the front brake of the motorcycle and push the footpeg down. Does the bike compress evenly?

It should (at least close)

**SIDE NOTE:** There are several terms used to describe shock spring settings. The terms race sag, sag and preload are all suspension terms and are used interchangeably, probably incorrectly.

For our purpose here (right or wrong), I referred to the difference of the bike on a stand to the loaded rider (with gear) on the bike as “sag”.

And, the difference of the bike on a stand to the weight of the bike alone as the “race sag”.

This is an easy adjustment that is too often overlooked and really makes a difference in the handling of the motorcycle. It is absolutely FREE and should not be ignored. So go get those tape measures out and make them spanner nuts turn!!!

One last write up 🤖

## QUOTE

Setting Shock Sag

Race Sag

1. Put bike on stand so that wheels are off of the ground.
2. Measure from the center of the rear axle straight up to a point on the fender. Record this distance.
3. Have the rider sit on the bike in a normal riding position with the bike off of the stand. The rider should be wearing all of his or her gear.
4. Measure the distance from the rear axle up to the same point on the rear fender.
5. Calculate the difference between the two measurements. The difference should be approx. 1/3 of the suspension travel. The desired setting will differ from model to model but most 125cc-650cc bikes will require 95mm-105mm. Most 80/85cc bikes will require 75mm-80mm of race sag.
6. If the difference is not within the desired range, adjust the preload on the shock spring to obtain the correct measurement.

Static Sag

Race sag should be properly set prior to checking static sag. Use the same method to measure static sag that is used to measure race sag. To calculate static sag you need the measurement with the bike on the stand and the measurement with the bike off of the stand without a rider on it. This will reveal the amount that the rear sags under its own weight. The appropriate range for a 125cc-650cc bike is 19mm-32mm. If the bike sags more than the desired range, the rider will need a softer shock spring. If the bike sags less than the desired range then the rider will need a stiffer spring.

## Suspension Adjustments I

**Forks** The forks must be installed properly for optimum performance. Make sure that the upper and lower clamps are torqued to factory spec. We recommend 20

ft/lbs for the upper and 14.5 ft/lbs for the lower. This ensures that the inner bushings can pass inside the clamp surface without binding. Binding can also occur when the axle clamps are not aligned with the upper fork legs. Make sure that this does not happen by loosening the bolts on the clamp that slides on the axle. After it is free enough to slide, compress the front end several times to put the lower portion of the forks in a neutral position. Proceed by tightening the clamp bolts to spec. If headshake occurs, the headset (steering stem) may need to be tightened or the race sag is not correct.

#### LSC (Low Speed Compression)

- Turn 2 clicks harder to prevent low ride height or bottoming on smooth landings
- Turn 2 clicks softer to improve initial plushness or traction

#### HSC (High Speed Compression)

- Turn 2 clicks harder to prevent bottoming on flat, sharp landings
- Turn 2 clicks softer to prevent mid-stroke harshness

#### R (Rebound)

- Turn 2 clicks harder to prevent front end from rebounding high off jump faces
- Turn 2 clicks softer to prevent packing down in the stroke on a series of bumps

**Shock** The upper and lower shock mount bolts should be installed with thread lock and torqued to spec. The spring preload should be adjusted to achieve the proper race sag before any other adjustments are made. The measurement from the rear axle to a point on the rear fender should be noted when the bike is on a stand. The same measurement should be taken with the bike off of the stand and the rider standing over the center of the bike in full gear. The desired difference of the two measurements will vary for some bikes but should be approx. 1/3 of the total suspension travel.

#### LSC (Low Speed Compression)

- Turn 2 clicks harder to prevent low ride height or bottoming on smooth landings
- Turn 2 clicks softer to provide more initial movement or improve traction

#### HSC (High Speed Compression)

- Turn 2 clicks harder to prevent bottoming on flat landings or square-edged holes
- Turn 2 clicks softer to prevent side swapping or harshness in braking bumps and square-edged holes

#### R (Rebound)

- Turn 2 clicks harder to prevent springy feel or kicking straight up
- Turn 2 clicks softer to prevent packing down in the stroke in a series of bumps

Notes

\*1/4 turn is equivalent to 2 clicks for adjusters without clicks

## Suspension Adjustments II

Various Tracks: In our experience with racing, we have found that the different tracks may require slightly different settings.

For hard pack to intermediate type tracks (square edge type bumps): One way to determine the compression setting is to try to feel slight bottoming on the biggest jump or G-out section. This will determine if all the travel is being used for that particular track. If a slight bottoming is not felt it is to your advantage to soften the compression 1-2 clicks at a time. This will improve the small to medium bump ride.

For sand type tracks (no-square edged bumps): A little bit more low speed compression and rebound is needed compared to a hard packed track.

To accomplish this start by adding 1-2 clicks of rebound and as the track gets rougher, 1-2 clicks of compression damping.

Supercross tracks usually produce slower piston speeds from the shock and forks than an outdoor track, with a much greater G-out load. This means less damping produced by the shock and forks in a situation that causes more or a bottoming load.

Note: to be competitive on a true SX track, a SX only type fork and shock setting is needed to handle today's obstacles. Remember that SX only setting will not be suitable for an outdoor MX.

To compensate, you must adjust the compression stiffer on the shock and forks (anywhere from 2-6 clicks) and in some situations you may have to go stiffer on spring rates.

## SUSPENSION TROUBLE SHOOTING

Bottoming: This is caused by lack of compression damping or too soft of a spring rate. Adjust the compression damping stiffer until bottoming is under control. If you run out of damping adjustment and bottoming is still a problem, a stiffer spring rate is needed. Also if the components have a lot of time on them, bottoming can be an indication that service is needed.

Headshake: is generally caused by too much compression in the forks. Soften 1-2 clicks. If you are a light rider for the size of bike, softer springs are recommended. Also too much rebound can cause a "packing" situation where the damping holds the forks down in a stiffer part of the travel than is needed.

Back End Kicks Side to Side: Generally caused by too much compression. If bottoming isn't felt anywhere on the track, adjust the compression 1-2 clicks softer.

Too much rebound will also cause this because it holds the back end down in a stiffer part of the travel which in turn makes it too stiff for the bumps it is hitting.

Bike Kicks Straight Up: When the back end is compressed deep into the travel by a bump and it kicks straight up, it is generally caused by too light of rebound damping.

Slow rebound damping 1-2 clicks (clockwise). It can also be caused by soft low speed compression, allowing it to use too much travel.

Headshake

Clamp torque

Top- 18 ft/lbs Bottom- 14.5 ft/lbs

Tire psi

11 to 15 psi (front and rear within 2 psi of each other)

Alignment

Chain adjusters should be in the same position (rear wheel should be straight)

Fork height

Forks should be same height

headshake under braking- increase sag to decrease weight on front

headshake under acceleration- decrease sag to transfer weight to front

Bleed forks

Forks should have zero pressure at full extension (bleed with wheel off ground)

Steering torque

Tighten steering so that front end does not fall to side when off of the ground (it should have slight resistance from stop to stop when the bars are tapped)

Rebound speed

Start with fast rebound and slow if bouncing occurs after landing (front and rear should rebound at equal speeds)

Compression balance

Front and rear compression should be equal (if one end compresses easier than the other, more weight will transfer to that end all of the time)

Headshake is generally caused by too much compression in the forks. Soften 1-2 clicks. Also too much rebound can cause a "packing" situation where the damping holds the forks down in a stiffer part of the travel than is needed. (soften compression or speed up rebound)

Suspension Tuning

Getting Started - Shocks

Setting the Rebound:

1. Find a relatively fast straight with braking bumps leading into the entrance of a corner. Reduce (Turn clicker out) the rebound damping until the rear end begins to hop or feel loose. Finally, increase (Turn clicker in) the rebound damping until the sensation goes away.
2. Find a jump that tends to launch the motorcycle out. The rear end should absorb and then smoothly lift the motorcycle into the air. If the rear end bounces up, add rebound. (Turn clicker in)
3. Find some large whoops. The motorcycle should track straight through the

whoops with the rear wheel extending to the ground before the next impact. If it does not perform as described as above, it is packing and the rebound damping should be reduced! (Turn clicker out). Please note that the guide for sand set-up, as these rules don't apply for sand.

Setting the Compression:

1. Find a corner with acceleration bumps on the exit. The rear of the motorcycle should follow the ground. If the rear end "breaks up", soften the compression. (Turn clicker out) (If this fails soften the rebound two clicks.) (Turn clicker out)
2. Find some rough sections, a large jump and a couple of "G-Outs". The shock should bottom on the roughest section but it should not be a slamming sensation. Add compression to fight bottoming. (Turn clicker in.) But avoid going to far as small bump ride will be sacrificed in the trade. Remember the adjusters have a primary effect on the low speed, so even a large change in setting may only affect bottoming resistance slightly. Remember bottoming your suspension is not necessarily a bad thing. You should strive to bottom off the biggest bottoming load obstacle on the track. If you don't you're not getting maximum plushness from your suspension.

Getting Started - Forks

Setting the Compression:

1. The forks should react to all track variations. If the forks seem harsh on small bumps or holes, soften the compression. (Turn clicker out) If they aren't, stiffen (Turn clicker in.) until they do feel harsh and then turn back a click or two.
2. Now find the rough part of the track again. The forks should bottom over the worst obstacle. If harsh bottoming occurs, add oil in 5 mm increments.

Setting the Rebound:

The rebound damping is responsible for the stability and the cornering characteristics of the motorcycle.

1. Find a short sweeper. When the forks compress for the turn, the speed at which the forks return is the energy that pushes your front wheel into the ground. If the forks rebound too quickly, the energy will be used up and the bike will drift wide, or wash. If the rebound is too slow, the bike will tuck under and turn too soon to the inside. Find the appropriate balance for each track.
2. With the bike turning well, the wheel should return to the ground quickly yet not deflect off berms or bounce off jumps.

Different Tracks:

For hardpack to intermediate:

Set the compression softer, (Turn clicker out) front and rear to help get maximum wheel contact and plushness.

Sand tracks:

(Non-square edged bumps); More low speed compression and rebound are necessary. Start by adding 1-2 clicks (Turn clicker in.) of rebound and as the track gets rough, add compression 1-4 clicks. (Turn clicker in.) (Supplementary sand set-up techniques). Harshness is a result of packing in forks. Remember to add compression (Turn clicker in) to help keep the front end from packing. The rear suspension will exhibit packing by swapping. To eliminate swapping begin adding compression (Turn clicker in) until the bike tracks straight and then add rebound

(Turn clicker in) to keep the rear following the terrain of each whoop. Don't be concerned if your clickers are nearly maxed out in sand conditions. Unless of course you had your bike revalved for sand.

Supercross:

(G-load, curb hits); G-loads produce slow piston speeds. This means that less dampening is produced by the shock and forks in a situation that causes more of a bottoming load. To set your bike up for Supercross adjust the compression stiffer (Turn clicker in) on the suspension (2-6), clicks and in some circumstances raise oil level and/or change to stiffer springs.

Problems

Headshake:

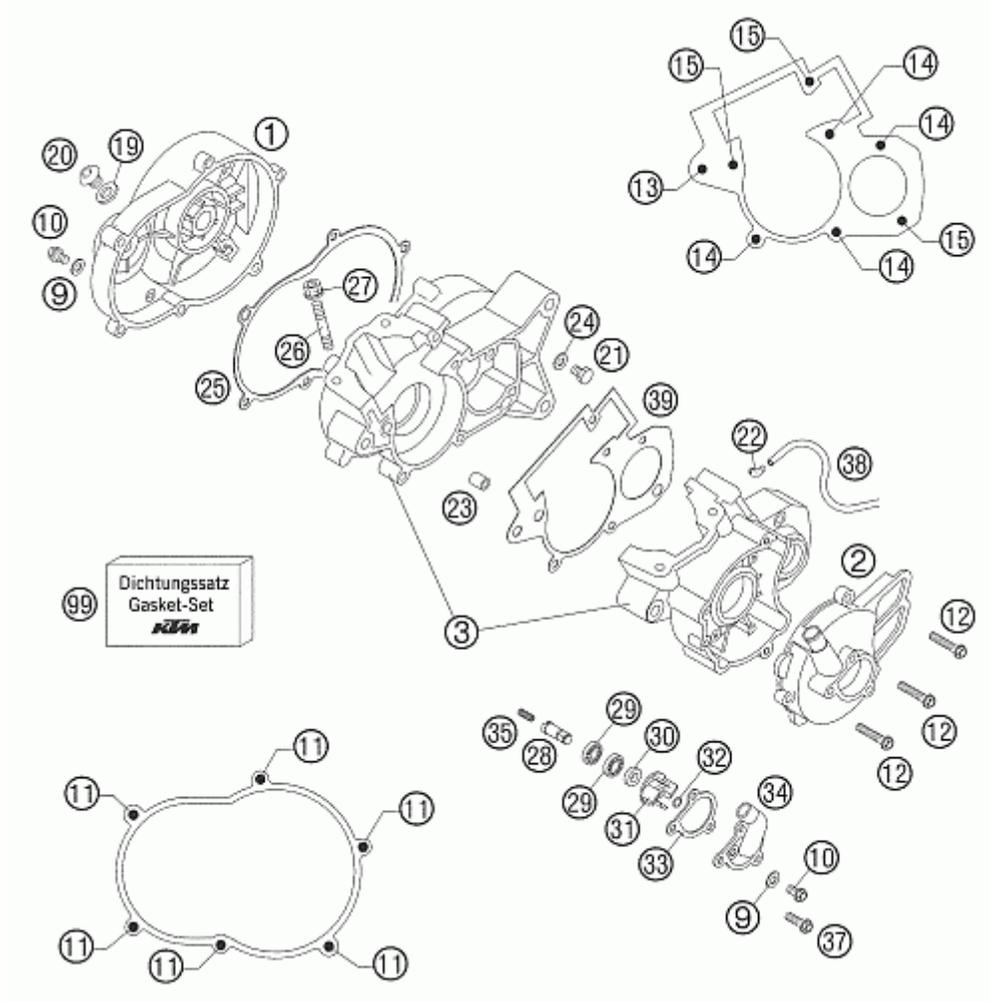
Adjust the forks lower in the triple clamps.

Excessive Rear End Kick:

Check for packing, which is identified by kick to side in hard to loam conditions. If you observe packing, soften rebound. (Turn clicker out.) This cannot be avoided if you brake improperly and lock the rear wheel up and/or pull in the clutch, on the entrance to corners.

The shock can kick up from using too much of the travel on a bump and unloading the full spring energy while the forks are continually compressed from braking.

## Chapter Five: Liquid Cooled Bikes & The Electrical System



### 5.1 Water Pump FAQs

Water pump nut requires red loctite and torqued to 15 ft lbs.

### 5.2 Keep It Cool!: Coolant Levels and Tips

- Fill coolant to top of fins only, NO HIGHER
- Engine Ice and Liquid Performance are both highly recommended

### 5.3 Electrical System Analysis

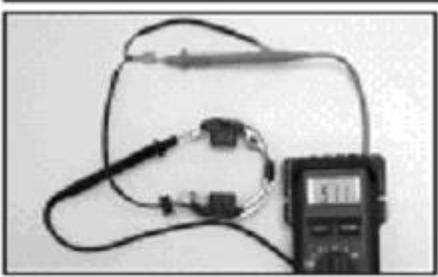
These KTM 50s go through electrical components like nothing. Stators go out frequently, along with the coil.

And on the 05 MA, you'll need to get the wires away from the cylinder/head.

## 5.4 Testing Stators and Coils

Stator=500+ ohms is 

Coil=2200+ is 



## [Chapter Six: The Guru's Guide to fixing the dreaded "BOG"](#) 🤖

6.1 What causes Bog?

6.2 What are some minor fixes that can be done first?

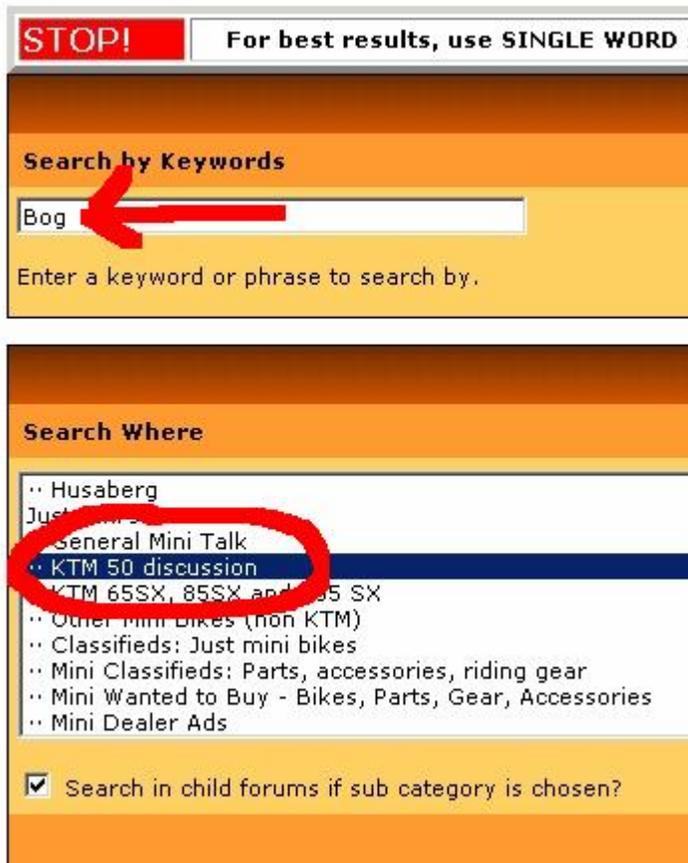
6.3 Now what needs to be done???

Well, I'm going to answer all three of these questions in one shot. By teaching you how to search for answers properly 🤖 Since there are many different causes of "Bog" and so many different answers 🤖

Step One: Click "Search" at the top right of any page of KTM Talk:



Step Two: Type "Bog" into the text box, and select the "KTM 50 Discussion" forum from the next box down.

A screenshot of the search interface. At the top, a red box says "STOP!" and a white box says "For best results, use SINGLE WORD :". Below this is a "Search by Keywords" section with a text input field containing "Bog" and a red arrow pointing to it. Below the input field is a "Search Where" dropdown menu with a list of forum categories. "KTM 50 discussion" is highlighted with a red circle. At the bottom, there is a checkbox labeled "Search in child forums if sub category is chosen?" which is checked.

Step Three: Choose "Any Date" from the "Search Posts from" box:



Step Four: Check "Search Title Only" and hit "perform the search":



Now, read for a while and then come back here 📺

## Chapter Seven: Odds & Ends

### 7.1 Best Tires?



The best "overall" tires voted on by KTM Talk members in descending order:

- Michellin Starcross
- Bridgestone
- Dunlop

### 7.2 Best Handlebars?



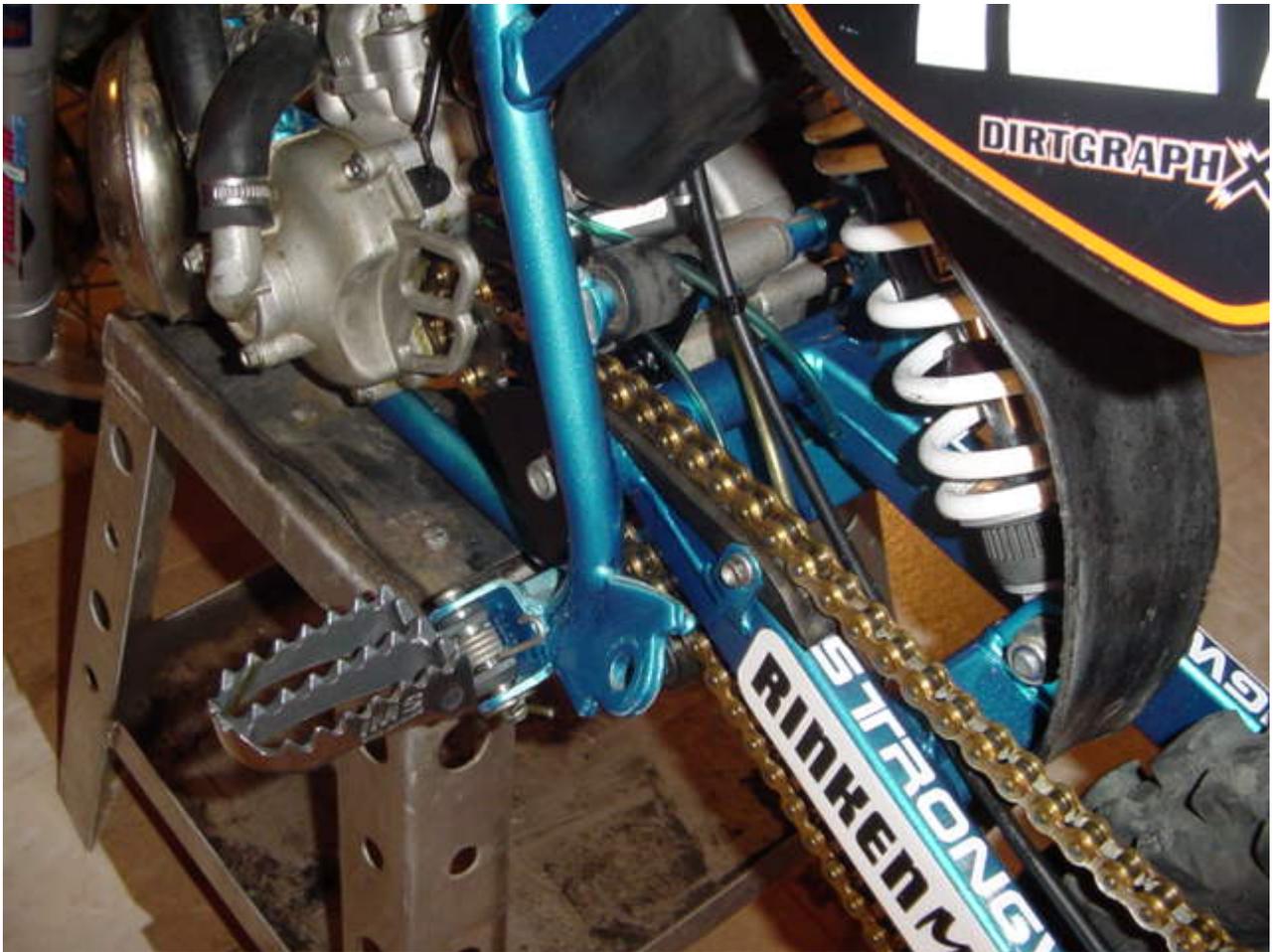
The best Bars voted on by KTM Talk members in Descending order:

- Renthal
- Tag
- Pro Taper
- DeMarini

### 7.3 Best Hand Grips?

Renthal Grips, Spyder, Tag.. they're all nice. Just use what you're rider is most comfortable with 🤔

### 7.4 Best Pegs?



- IMS Pro Peg
- Stock
- Pegs off a larger model KTM

## 7.5 What the hell is a frame brace? Is it legal?

The frame brace is a product invented by Ken Carter, owner of PVK. It helps prevent the rear motor mount and frame from breaking. Yes, It is AMA legal.

### [Info and Installation of Frame Brace](#)

There are copy cats out there as well. But this is where it originated.

## Chapter Eight: The Kids Wanna Ride with Experience and Style!

### 8.1 Get that kid Stylin!!!



#### 8.1.1 MotoCross Schools: Manga's Camp for Kids!



#### 8.1.2 Drills to run at home

From Pam Walsh: Drills to run at home...turns.turns.turns...make them a circle in the yard and time them...have them do it over and over until they are practically dizzy...

#### 8.1.3 Safety Gear: What is needed?

Here is a list of safety gear that your rider should have:

- Real MX boots (not snow boots)
- Knee Pads w/shin guards
- Rider Pants (heat resistant to pipe)
- Kidney Belt
- Chest Protector

Elbow Pads  
Gloves  
Neck Brace/Roll  
Helmet  
Goggles

If your child does not have all of the above, then your child should not have a bike.

Others to add in:  
Back Brace  
anyone got any suggestions?

#### 8.1.4 Custom ID Plates for Chest Protectors (see 8.2.1)



Can all be designed and purchased from 8.2.1

#### 8.1.5 MX Toys, they gotta have em!

[MX Toys](#)  
[Smooth Industries](#)

### 8.1.6 KTM Hardparts make anyone look smooth!

(click "Shop Online" above, and click "2006 Hard Parts Catalog" for all your accessories needs 

### 8.1.7 Kids Mags (Safe for kids)

Moto Kids  
AmatureMX  
Moto Playground  
Final Lap

## 8.2 Pimp That Bike!!!



### 8.2.1 Most Recommended Custom Graphics Companies

[Tom @ Hunt Graphics](#)

[Dammer Designs](#)

[Dirt GraphX](#)

[Cut-N-Edge Graphics](#)

[Moto GraphX](#)

[Speed Graffix](#)

[Roost MX](#)

### 8.2.2 Powdercoat or Paint?



Any of the Dealers to the left can help you in your quest to Powdercoat or Paint your frame 

### 8.2.3 Anodize to Complete the circle!



Any of the Dealers to the left can help you in your quest to Anodise your parts 

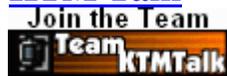
### 8.2.4 Custom Seat Straps and Seat Covers



[Website for the above](#) 

## Chapter Nine: Give a little back - Become Part of Our Team: Team

### KTM Talk



#### 9.1 Why Should I join Team KTM Talk?

To help those that help you. This site will save you big bucks... SO why not give a little back to help support the best KTM site on the web?

#### 9.2 When Should I join Team KTM Talk?

When ever you want. You are not required to, but it is a nice thing to do.

#### 9.3 How Do I join Team KTM Talk?

[It's All Here](#)

## [Chapter Ten: Special Messages, Tips, Tricks and advice from the Gurus](#)

This chapter is for the people "who know" to share the knowledge they think could help you. If you have something to add, shoot me a pm, and I'll add it in here 🤖

### [10.1 Alex Manga](#)

[50ccparts.com](#), [Manga Racing Schools](#), [Planet Minicross](#)

What is a stuffer motor?

#### **QUOTE** (Alex)

It's like this:

Thru geometric changes and optimization of volumetric crank cavity configurations and transfer port integration: We reshape, add to, and take away from the crank and it's peripheral cavitation to enhance the velocity and pressure of charged air/fuel mixture.

The result of which is an extremely fast accelerating motorcycle. Peak horsepower is gained, but most of the advantage comes from going 1000-13,000 RPM's in about 32% less time than before.

### [10.2 Todd Heemsbergen](#)

[TH Racing](#)

Todd's Tips: From [www.thracing.com](#) 🤖

#### **QUOTE** (Todd)



Todd' Tips - Part 1  
September 2003 Some things never change.

This picture was taken about mid way through the 2002 season. It's a shot of my son's bikes.

Why share it with you? I often times get calls from parents new to motocross who are frustrated when their riders "bike" breaks.

This is not a sport for everyone. It requires a sizable investment in time, money, family commitment, and so on.

If you expect or demand 100% from your racer make sure to live up to their expectations as well.

If you are a 50cc racers parent and consider yourself serious about racing. Having a stock and a mod bike or a practice and a race bike is a must. You will find that "backup bike" to be a big frustration reliever at some point.

Todd Heemsbergen / Owner T H Racing

## QUOTE (Todd)



Todd' Tips - Part 2 October 2003

Make racing fun!

It is easy to get caught-up in the “must win or it is not fun” game.

We all engage in this sport for different reasons. For some it is a hand-me-down of what dad did. For some it is a way to stay close to their kids. Others just enjoy racing no matter where they finish. There is not a right or wrong to what attracts us to this great sport.

For me personally, I would rather change a dozen tires that be forced to watch a ball game. If it has something to do with spending time with my family and bikes, count me in!

I think most parents including myself have taken too hard of a stance on our young riders at some point in time.

For whatever it is worth, I am done with anything other than a positive approach with my son. I have found I get a lot better results from finding a positive thing to discuss about each race, and telling him how proud I am of “that” accomplishment.

I could not resist putting a picture of my happiest rider Matt Lemoine out to the right. At Matt's young age, he is the one I give credit to for teaching me about having fun at the races

Todd Heemsbergen / Owner T H Racing

### QUOTE (Todd)



Todd' Tips - Part 3 Don't blow it all - keep some for mom!

Okay, you have been bit by the “motocross bug”, now what?

You followed the tips on getting the extra 50cc bike or two. You are remembering to keep racing fun. What is next? I can tell you from the been there done that racer's dad that this stuff will get expensive. The harder the old “motocross bug” bites you the deeper you dig in your pockets.

I have known those that skip the rent payment to make it to a “big race.” Do not loose sight of what you are doing. It does not matter how fast your rider is or what you do, odds are against them becoming the next big thing. For every local rider that win's week in and week out, there are 10's of others just as fast across the country that you probably have not encountered yet. Even if you are fortunate enough to have a superstar rider, what happens over time? If you can keep your racer focused through the teen years, dating, driver's license, parties, etc., you should start buying lotto tickets because you have been blessed with uncanny luck!

If your wife is driving a Yugo and your rider has state of the art bikes, it is time to rethink your program. As parents, it is easy to spend money on our children.

If you plan on being involved in this sport for years to come, do not forget about mom's needs. Share your time and resources with the rest of your family and your reward will be great!

Todd Heemsbergen / Owner T H Racing

### QUOTE (Todd)



Todd' Tips - Part 4 December 2003

The odds game If you race the odds are against you racing year after year without injury of some sort or another. My thoughts for this months "Todd's Tips" unfortunately came while sitting in the emergency room, yet again. I remember the first time to the ER. My son was 5 years old; as he left the starting gate he tangled bars with another rider. Next thing I know I see him being dragged down the track by his arm. Somehow he managed to get his little arm wedged into another racers bike. Once the doctor had confirmed the break, my son looked at me and said, "well it looks like I have my first broken bone now." Almost as if the cast was some sort of motocrossers badge of courage. Seven weeks later he was back on a bike, his choice and doing what he loves once again. Less than a year later we are back waiting to see the doctor once again. This time it is a broken clavicle, the next visit is for a severed fingertip, then broken arm, then another collarbone fracture. As a parent of a young racer you get conditioned to the comments of friends, family, coworkers, doctors, and so on. Some people look at you like a child abuser, others see beyond that and watch the enjoyment the closeness that this sport brings families.

Part of this conditioning process brings you to the point where you are fearful every time your rider goes down. Then luck is on your side for a period of time and you seem to almost forget about the dangers that come with this sport or any sport that you attach a motor to.

My caution to parents new to motocross and the point in writing this is to be prepared. If you believe your rider will never be injured, I suggest you burrow your head back into the sand.

Sometimes you are lucky enough to be close to home when "it" happens. Other times you can be far from home and the comfort of your own support system (friends, family, doctors, etc).

Less than 8 months ago my son and I made a 16-hour drive to a Loretta Lynn regional qualifier. He was running top 3 and I couldn't have been happier. Then he slides out in a dry slick corner, no big deal. He's back up and working his way through the pack once a gain. A lap and a half later he rides into the infield of the track, hits a small ditch and goes over the bars. As he lay out in the middle of the track I have to make "the decision." I know the rules under which the race is being run can disqualify a racer if they get outside assistance. As a parent I have trouble anytime I am supposed to watch my child left in the hands of track workers who try to assess his needs. In this case I hated to throw away the 16-hour drive, yet jumped the fence. When I reached my son rather than be concerned of injury, I was mad because he appeared to have made the mistake of going off the track and not getting going again frustrated me. After all we had driven across the country to try and qualify in another class this was for Loretta's, what could be more important? Well, upon returning frustrated to our pits my son informs me that he had injured his thumb on that little slide out that looked like nothing. Knowing that the race was important, he tried with everything he had to continue until the pain overcame his ability to safely race to the checkers. The doctor later confirmed his pain was due to a broken thumb. The moral of this story, not every injury comes from a huge crash. And, everything on the track is not always what it seems. Have an emergency plan in place for your family when your time comes. If you race, your time will come!

Going into the Christmas season my son is once again injured. The doctor asked him what color cast he wanted for his broken wrist. His reply, "HOT PINK." When the doctor asked why he had picked that color, my sons reply was that it was the only color cast he had not had. Now that we have that covered, let's hope they don't design any new colors and that we can last a few seasons without and ER visit.

Happy Holidays, Todd Heemsbergen

### 10.3 Ken Carter

[Pamona Valley KTM](#)

## 10.4 Hacksaw

[Contact Hacksaw](#)

## 10.5 Mike Burkeen

[Contact "Mattsdad"](#)

### **QUOTE** (Mike Burkeen)

#### How To Be a Good Peewee Parent

As my wife and I look back on our 7-year-old son's first two years of PeeWee motocross racing, we are excited at the progress he has made and the fun our entire family has had in this wonderful sport. We have seen improvements in our son's schoolwork, his attitude, and also in his ability to ride a motorcycle. Although we have made some of the common mistakes parents make in all sports, we are confident that we are on the track to fun and success for our family in motocross. For those who are new to the sport or are considering starting, I would like to share what we feel are ten of the most important things we have learned through trial and error and from other parents over the last 2 years:

1. Do not yell at your child to go faster when he is racing- This is very distracting to a peewee racer. I wish I had a dollar for every time I have seen a young racer crash while looking at a parent who was screaming. A five year old needs to watch where he is going. In most cases a child is not going to go fast because his parents want him to go fast, he will go fast when his competitiveness is stronger than his fear. Only the child can make this decision.
2. Always keep safety as a high priority- We have purchased every piece of safety gear made and our son, Matthew, wears all of it every time he rides. He wears boots, pants, a long sleeve jersey, a helmet, goggles, a neck brace, knee pads, a chest protector, and elbow pads every time he practices or races. Knee braces will be the next piece of protective equipment that we will make him wear. Don't let your child use the excuse that all of this gear is not comfortable. After a couple of rides in a new piece of gear they will not even notice it is on.
3. Give three pieces of praise before any criticism and end each critique with a compliment- When our son comes off the track I always ask him how he felt that his moto went. He is usually pretty in tune with the things he did well and the opportunities he has to improve. I then tell him at least three things that he did perfectly before giving him any constructive criticism. These compliments usually involve things like getting the holeshot, taking a great line or making a great pass but can also be less significant things like not falling down, finishing the race, or keeping his goggles on. It really doesn't matter how far you have to reach for the

compliment, just make sure there are three good things before any constructive criticism.

4. Be supportive of your child and all of the other kids at the track- In our area most of the parents are very supportive of all of the kids racing. Some of Matthew's biggest rival's parents are on the track cheering for him as well as their own children. When Matthew won the first moto of his career, the mother of one of his competitors was the first person to congratulate him. She ran up to him and gave him a huge hug and cheered wildly. This was an awesome display of support because Matthew had passed her son a couple of turns from the finish for the moto win. In a recent race Matthew and a good friend of his were battling side by side all night long in both of their classes. In one moto his friend fell in a corner and Matthew was stuck in a rut behind him. The boy's father was the first to get to the crash and he made sure Matthew was able to get by before picking up his son's bike, starting it, and sending him on his way. It was a great display of sportsmanship!

5. If you are not an experienced motocross racer it makes sense to get professional instruction for your child- If your child wants to play competitive tennis or golf you would send them to a tennis or golf professional. It is very important that kids learn to use correct form early when racing! If your child is not using proper form he may still be quite fast but will probably tend to crash a lot and have inconsistent results. Professional instruction will help them progress as quickly and safely as possible.

6. Be a resource to the parents of the kids in your child's class and to the kids coming up- If we named all of the people who gave us advice, both good and bad, over the last year it would fill this page. While we are by no means experts, we have gained a lot of knowledge from other parents over the last 2 years and are happy to share our experience with anyone. In addition to knowledge, most of the parents in our district are quick to offer up parts or one of their bikes to ride if another rider has bike problems.

7. Match or exceed the effort of your child- Peewee motocross racing is a lot of work for the child and also for the parents. Parents are responsible for taking the child to practice, making sure they have a clean well-maintained motorcycle, motivating their rider, and a host of other tasks. Without a huge amount of effort on the parent's part, it will be very difficult for their child to have success.

8. DO NOT CHEAT- It never ceases to amaze me that some parents think winning a race for 4-6 year olds is important enough for them to cheat. We have seen and protested kids with 60cc pistons running in the 50cc shaft class. Parents who succumb to the pressure to run illegal bikes are doing a disservice to their kids. I wonder how they explain it to their child when they get caught? Well Johnny, I didn't think you were as good as the other kids so I made your bike faster so you could win? I also do not buy the excuse that you have to cheat because everyone else does. If you think someone is cheating, and you need to be pretty sure you are right, file a protest. That's why the protest procedure is in the rulebook. If you happen to

be wrong, apologize and hope the protested party takes it as a compliment.

9. Set goals- Families participate in this sport for many different reasons. Some feel they have the next James Stewart on their hands while others are just out to have some fun. Figure out why your family is involved in the sport and set your goals accordingly. Make sure the goals are attainable yet challenging and reward your child for attaining them. When your child reaches their goals, raise the bar.

10. HAVE FUN!!!

## 10.6 Doug, Pam & Darren Walsh

### [Darren Walsh MX](#)

#### **QUOTE (Pam)**

The jumps are nuts. But I have no room to talk because Darren jumps them and he jumped them on a 50 with most of his competition jumping also. It will always be a competition, peer pressure thing. As a parent if you have one of these jumping kids you do and you will have to make sure that they have and are getting schooled on jumping. They need to hear techniques from trainers and riders that know what to tell them to do if their jump gets out of control. That is the biggest fear of all the parents hear...our kids getting hurt. But the jumps are in arenacross and in motocross as well.

So no...Don't tell your kid to jump. DO walk the track and listen to your kids. They will tell you which jumps they are planning to try and then you must be able to discuss technique. The parent is just as important in the jump as the rider.

And it is in the turns and the whoops...training rule #1 turns.

Jumping scares me to Death!!! But if you have the faith that you have given your racer ample time with other riders, other teachers and you have heard and seen that your rider has the skills and technique that is required...well, it only makes you feel a little better about watching your son jump.

But again...it is dangerous! Some of those kids should not jump...it wasn't like this weekend and jumping made a difference really in the 50 class..

## 10.7 Chris Kruger, the MX history Mastermind, and maintenance GOD

### [Contact "Stinkdad 021"](#)

## Chapter Eleven: AMA Racing MX, HS, SX, AX, XC, Drag etc etc etc

### 11.1 How do I get started?

[AMA-Getting Started](#)

### 11.2 What district am I in?

[Districts](#)

### 11.3 Where are the tracks in my area?

Go into your district website, and they will have everything you need to know 

### 11.4 What bike do I need, and what class are we in?

[2005 Approved bikes for each class](#)

### 11.5 AMA Rules

[2006 AMA Racing Rules](#)

## Chapter Twelve: Miscellaneous

### 12.1 Helpful Links

### 12.2 Helpful "Home Remedy" style tips to make maintenance easier

#### **QUOTE**

Courtesy of JMJ Cycles 

-Use Teflon tape (plumbing tape) under your clutch and front brake perches. Keep the bolts firm but not tight. If you crash it is better that the perch rotates then break.

-Go to your local bicycle shop and buy a bike steering head bearing wrench. They are real slim wrenches that allow you to get under the triple clamp to adjust the steering head bearing. You will probably have to grind off some of the material on the outside of the wrench opening. I use mine all the time.

-Use a rag to roll between the sprocket and chain when tightening the rear axle during chain adjustments. This will keep the rear wheel against the chain adjusters as you tighten the axle.

-Rotate your fuel petcock to the inside of the bike. This will keep the riders foot (or a collision with another bike) from accidentally hitting it and turning the fuel off.

-When you are done cleaning your air filters, soak your chain in the same solvent.

-Use baby oil on the foam of your goggles to help keep dust out.

-Don't overlook tightening all the bolts on your bike. Including motor mounts, swingarm bolts, steering stem bearing nuts and wheel spokes.

-Don't spend a bunch of money on aftermarket parts and ignore the basic maintenance items. Things like new tires, a properly jetted bike, fresh top end, a clean air filter, suspension oil changes and adjustments, good brakes, chain and sprockets will do plenty for all but the fastest riders.

-Use Vaseline on the clutch cover gasket to keep it in place while re-assembling clutch

-After you break a couple of top rear motor mount bolts, always obvious by the resulting vibration, Try this trick: Order up a 8mm x 110mm socket head bolt (12.9 hardness), drill the treads out of the mount on the frame and put the new bolt all the way through. No more breaky!!

The factory bolt is cantilevered into the mount and they break because of the reduced diameter of the threads and the resulting stress concentration caused by the V-shape of the thread. The long bolt all the way through just has threads on the end, giving the strength of the 8mm diameter

### 12.3 Spare Parts Bin

Just to get by from week to week (to replenish when used):

- Spare Silencer (if your kid hits the jumps and whoops hard)
- Clutch Basket, Primary & key
- Complete clutch (already restacked and ready to go)
- Bars (something cheap, just to get by if he should happen to bend the existing ones)
- Few different sprockets for different track conditions
- Stator & Coil
- Rear Fender
- Chain

To be very comfy, and to take your mind out of the stress zone.... just find a spare bike, same year and model. It will save you lots of headaches.

### 12.4 Tools Needed

Tools:

Digital Micrometer  
Fluke Ohm-Meter  
Torque Wrench  
Clutch Puller  
Piston Stop  
Spoke Wrench  
Spanner Wrench  
Chain Breaker

A nice set of T-handle metric socket head wrenches 🛠️

### 12.5 Here's some pics for your kids to check out!

[Fender Kiss Thread](#)

[Favorite Parent Pic Thread](#)

[Girls Rippin' it up!](#)

[Then - Now Pic Thread](#)

12.6 Meet your fellow KTM Talkers!

[Post Your Mugshot Thread](#)

[Post "Their" Mugshot Thread](#)

[Moto Mom's Pic Thread](#)

[Moto Dad's Pic Thread](#)

12.7 Math Conversions for In to mm, oz to mL etc

12.8 Lacing up your own wheels & Changing Tires

## **QUOTE**

Courtesy of JMJ Cycles

Lacing a 50 Wheel with Buchanan Spokes Tips

First - This can be a very trying experience. Allow lots of time and don't be in a hurry.

Second - The Buchanan spokes lace up differently then the stock spokes. The pattern is different. Please compare attached picture to pattern of stock wheel before starting. The Buchanan spokes are longer and the method used to lace this way stretches the spokes out further. There are more spokes in between each end with the new way.

Third – There are two different spokes... one has a slight bend. The bent ones must go on the outside of the hub while the straight ones go on the inside of the hub.

Fourth - You will probably have to drill out the hub and rim to accept the spokes. Don't drill any bigger than you have to. There is not a lot of "meat" left before you reach the end of the hub.

Fifth - Follow the exact pattern as shown in the picture when inserting the spokes into the hub. Insert all spokes into the hub before going through the rim. Start with one hole in the rim and progress to the very next hole in the rim. Do not try to lace all of one side of the hub or any other way. These spokes are so short and stiff that they do not bend and you can't "squeeze" one in later.

Sixth - As you get the spokes through the rim attach a nipple so the spoke stays in. Do not run the nipple down too far because you will want to push the rim down the spokes as you work to the opposite side. This will give you more room to get the spoke through the rim.

Seventh - It might take a buddy to help pry the last couple of spokes through. They can be a bear.

Eighth - After getting all the spokes through, work your way around the rim tightening them equally. Temporarily put the wheel (without the tire) onto the swingarm. This will serve as your truing stand. Attach a zip tie around the swingarm and cut it so that the end just barely misses the rim. Spin the rim on the swingarm and adjust it so that it runs true with the zip tie.

Ninth - Check to make sure the spokes do NOT protrude past the nipples inside the rim. If they do grind them down until they are flush with the top of the nipple. Run a strip of duct tape (cut down to about 1 ½ wide) inside the rim to protect the tube from the spokes.

## Changing Tires

Keeping fresh tires on a dirt bike is an important part of making sure that the bike handles properly. This and the occasional flat tire make tire changing a necessary skill for the average dirt biker to have. Below are a few tips to make this chore a bit easier.

1. Always use the proper tools when changing tires. Screwdrivers are NOT tire irons. Invest in a good pair of tire irons. Decent tire irons will cost around 10-15 dollars each and you will need two. Other tools include a valve stem remover and a low pressure tire gauge.
2. When removing and installing the tire always work from the side without the sprocket or disc brake. If the wheel has both you are usually better off to work from the disc brake side.
3. When using the tire irons never go beyond 90 degrees to the wheel. The extra distance you go is more likely to pinch the tube.
4. Getting started....When removing the tire make sure all the air is out of the tube.
5. Make sure the bead is broken all the way around the wheel.
6. \*\*\*\*\*This is often the most overlooked part of changing a tire and it makes tire removal and installation much more difficult.\*\*\*\*\*

When working on removal or installation of a tire, pinch the tire bead together and make sure that the bead is seated into the center of the rim. This will allow the tire to move further away from the rim on the opposite side making it much easier to get the bead off or on the rim. Failure to do this may make it literally impossible to remove or install the tire. Continually check to make sure the tire is seated into the middle of the rim as you work your way around the tire.

7. If you are fixing a flat the tire does not need to be completely removed. Once you have

one side of the tire off the rim you can reach in and grasp the tube and pull it out of the wheel. If you are changing tires the tube should come out before proceeding with the removal of the second side of the tire.

8. If you are repairing a flat, find where the hole is in the tube and check the inside of the tire in the same location. Make sure there is not an object still stuck in the tire. And it is a good idea to feel the inside of the tire all the way around while you can for any other protrusions or defects.

9. Before installing the tube back into the tire it is a good idea to remove the valve core and inflate the tube. This will give the tube some shape and allow it to fit into the tire better. The tube won't hold air but this removes the tight folds from the packaging of the tube.

10. Before installing the tube back into the tire apply some baby powder to the tube. This keeps the tube from chaffing against the tire and will increase the tube life. It also helps reduce the chance of pinching the tube during assembly.

11. When inserting the tube start with the valve stem. Once you get the valve stem through the rim, loosely install the locknut to keep the valve stem from falling back through. Put the lock nut on only by a few threads. After the tube is in the tire carefully check that it is inside all the way around. It may not hurt to give it another blast of air to help shape it again.

12. Start installing the tire bead at the valve stem. Push the valve stem into the rim to help keep the tire centered in the rim. (Remember the lock nut is only on by a couple of threads)

13. Work your way around the tire making sure the tire bead is pushed together and center on the rim. Get as much of the tire on by hand before using the tire irons.

14. Once you get to the point where you need tire irons take small "bites" and do not go past 90 degrees to the wheel when lifting the tire irons. Keep the opposite side of the tire bead on the rim as you work your way around. **KEEP CHECKING THAT THE BEADS OF THE TIRE ARE PINCHED TOGETHER AND CENTERED ON THE RIM.**

15. Slowly work your way around the tire and try to keep the cuss words to a minimum. Once the tire bead is on all the way around, inflate the tire with the valve core removed. (This allows a good rush of air into the tire to help seat the bead). Check to make sure that the tire bead is on all the way around the tire and on a consistent amount. If not, let the air evacuate itself and give it another blast. Tire pressure should not exceed about 30-35 psi during this process. Once it is all "beaded up" install the valve core and check your tire pressure.

Other tips:

Rim locks add a whole new level of fun to tire changing. As with the valve core, keep the stem pushed into the tire so the bead is centered on the rim.

When the tire is removed check your rubber strap that protects the tube from the inside of the spoke nipples. You can add a couple of passes of duct tape about 1 to 1 1/2 inches wide to provide additional protection as well.

Tires can often be "flipped" to keep the sharp knobbies in the forward direction for better

traction. It is often a good time to flip the tire when repairing flats. Make sure the tire is not a directional tire before doing this. Most dirt bike tires are not.

It is often much easier to install a tire when you apply a soap or other compound to the bead of the tire. But be careful, this could allow the tire to spin in the rim and tear the valve stem.

Don't install the valve stem locknut tight against the rim. Keep it loose so that if the rim spins in the wheel it has some ability to move before tearing.

Before airing up the tube rotate the tire so that the valve stem is pointing in the reverse direction. This way if you do spin the rim in the tire it has to go through being straight before it will tear.

If the tire will not seat the bead you can apply some WD40 or soap compound to the spot that won't seat. But, again be careful this can cause the wheel to spin in the tire.

Upon completion of seating the bead leave the extra air temporarily in the tire. The added pressure will help the tire "bite" into the rim. Take a good reading of the air pressure when you are done then check the air pressure later and see if it is the same. You may find a slow leak by checking this. Often I will leave the valve stem cap off until I have installed the tire and checked the pressure. This serves as a reminder that the tire is over inflated.

## 12.9 Example of a top end rebuild 🤖

From an unknown source:

### QUOTE

NOTE: This procedure was done on a 2004 200SX, your machine may not look exactly

like this, but it should be pretty close. Also, this will detail the install after the teardown

since I had already performed the tear down prior to writing this. To perform the teardown just go in reverse order.

At this point your engine probably looks something like this:

(Note: Use rags to prevent dust from entering engine while the top end is disassembled)



## QUOTE

Now it is time to install the piston back onto the rod, here are the parts you will need

- Piston
- Ring(s)
- Needle Bearing
- Wrist Pin
- Circlips



## QUOTE

(For the observant, yes, this is actually a 200EXC two ring piston instead of a one ring 200SX piston)

First, you will need to put the rings on the piston, if you have a two ring piston, put the bottom ring on first. Be careful not to stretch the ring too much or you will break it. Also, notice in the gap on the piston there is a pin that you should center the gap of the ring on. (Hard to see, but on the top ring look between the ring gap)



## QUOTE

Next, put the needle bearing into the hole in the rod. I like to put a little 2 stroke oil on the needle bearing so it has some lube at the initial start up.



### QUOTE

Now, note the forward direction of your piston, this piston was easy, it has an arrow stamped on it.



### QUOTE

Next, insert the wristpin part of the way into the hole of the piston, just enough to hold it in there.



### QUOTE

Set the piston on the rod, and line up the hole in the piston with the hole in the rod and needle bearing assembly. Make sure the piston is facing the right way.



### QUOTE

Push the wristpin through the piston and needle bearing until it is flush with the piston.



### QUOTE

A socket can be used to help you push, just find one that is the right size.



### QUOTE

Now it is time to put in the circlips that hold the wristpin in place.

NOTE 1: This is another good time to make sure that you have a

rag in the opening to the lower end. These clips are springy and tricky to get in. You don't want one falling into the bottom end!!!

NOTE 2: Some people may prefer to install one of the circlips prior installing the wristpin. That way you avoid having to install two circlips over the open bottom end.

NOTE 3: Notice how the open ends of the circlip is not lined up with the dimple in the hole of the side of the piston.



## QUOTE

There is a ridge on the inside of the hole in the piston that the circlip seats into. I usually stick one end of the circlip in the groove then squeeze it with my fingers to get it the rest of the way in. You may need to push it in a little more with a flat blade screwdriver to get it seated properly. You can see the ridge in this picture just on the far side of the dimple in the hole in the side of the piston.



### QUOTE

Install the 2nd circlip in the other side of the piston in the same manner.

Put a little premix on the skirt of the piston.





### QUOTE

Also put some premix on the crank in the lower end. Just enough to cover it lightly.



### QUOTE

Install the cylinder base gaskets, make sure the metal surfaces are clean

and free of dirt and/or grease.

NOTE: Notice there are 3 gaskets in my particular application. This is to get the "X" dimension right. I put the thinnest gasket in between the other two.



## QUOTE

Now it is time to install the cylinder.

NOTE: An extra pair of hands comes in real handy during this particular step. Either to hold the cylinder, or to compress the rings. Especially with a two ring piston.



## QUOTE

Position the cylinder above the piston, try to have the cylinder lined up with the mounting studs so that after installing the cylinder over the piston you do not need to twist the cylinder to get it to line up with the mounting studs.

Squeeze the ring(s) with your fingers so that they compress and fit into the cylinder.

NOTE: Make sure the ring gap is lined up with the positioning pin in the groove of the piston. Otherwise, if the ring is sitting over the pin, you

will not be able to compress it enough for it to fit in the cylinder.

NOTE: Sorry no pictures of that last step since I did not have a helper and both hands were occupied.

Here is a picture of the cylinder with the piston installed.



Before sliding the cylinder all the way down, make sure that the powervalve actuating arm lines up with the receiving fork in the cylinder directly above it.

Slide the cylinder down all the way.



### QUOTE

Open the side door and verify that the powervalve actuating arm did in fact get seated in the receiving fork. Then put the side door back on.



### QUOTE

Install cylinder base nuts.



### **QUOTE**

Check the "X" dimension, refer to owner's manual for instructions.

Torque the cylinder base nuts down to the value specified in the owners manual.

NOTE: Now you are asking yourself, how do you get a socket on the cylinder base nuts in order to torque them correctly? The way I did it was to grind down my motion pro torque wrench adapter.

**BEFORE:**



**QUOTE**

**AFTER:**



## QUOTE

I hated to do it, but it was the only way to get the nuts torqued correctly. Torque the nuts down, tightening each nut a little bit at a time in order to achieve uniform torque readings.



## QUOTE

NOTE: If you use a motion pro torque wrench adapter, make sure to adjust the torque setting on the torque wrench accordingly.  
Install the o-rings into the top of the cylinder. A little assembly lube will help to keep the o-rings in place.

NOTE: Your engine may have a cylinder head gasket instead of o-rings.



## QUOTE

Install the head, and torque down the head bolts to the value specified in your shop manual.



## QUOTE

Install the engine braces.



#### QUOTE

Install the cooling system hoses.



#### QUOTE

NOTE: When installing the hose that connects to the head, near the spark plug, make sure the face the tightening screw away from the sparkplug. This makes

it easier to get a wrench on the sparkplug.

Install the powervlve setting indicator gasket and breather hose.  
(Left side of cylinder)



### QUOTE

Install a fresh sparkplug. (Aren't you glad you left room for the sparkplug wrench?) Don't forget to put on the sparkplug cap.



**QUOTE**

Add fresh coolant.



**QUOTE**

Put on the tank, shrouds, and seat. You are done!



## QUOTE

Turn on the gas, hold your breath, and kick her over!

## 12.0 Read your spark plug

### [Reading your NGK Spark Plugs \(What do the symbols mean?\)](#)

Use BR8 EIX and BR9 EIX depends on conditions. (Higher number=colder plug). These also produce a great spark without putting lots of strain on that selletta ignition. The standard B8 ES give a big spark that put strain on the ignition. Use EIX and the stator will last longer. EIX plugs were designed to reduce strain on ignition systems.

It is important to understand that spark plugs CANNOT create heat, only remove it! The spark plug works as a heat exchanger, pulling unwanted thermal energy away from the combustion chamber and transferring the heat to the engine's cooling system. The heat range is defined as a plug's ability to dissipate heat. The rate of heat is determined by:

Spark Plug Heat Range:

A spark plug's heat range has no relationship on the actual voltage transferred through the spark plug. Rather, the heat range is a measure of the spark plug's ability to remove heat from the combustion chamber. The heat range measurement is determined by several factors:

- The length of the ceramic center insulator nose
- The insulator nose's ability to absorb and transfer combustion heat

- The material composition of the insulator
- The material composition of the center electrode
- The longer the insulator nose gives you a larger surface area exposed to combustion gasses and heat is dissipated slowly. This also means the firing end heats up more quickly. We are talking about exposed ceramic length, not extended tip length.

Bearing in mind that the insulator nose length is a determining factor in the heat range of a spark plug, the longer the insulator nose, the less heat is absorbed, and the further the heat must travel into the cylinder head water journals. This means that the plug has a higher internal temperature, and is said to be a "Hot" plug. A hot spark plug maintains a higher internal operating temperature to burn off oil and carbon deposits, and has no relationship to spark quality or intensity.

Conversely, a "Cold" spark plug has a shorter insulator nose and absorbs more combustion chamber heat. This heat travels a shorter distance, and allows the plug to operate at a lower internal temperature. A colder heat range can be necessary when an engine is modified for performance, subjected to heavy loads, or it is run at high RPMs for significant periods of time. The higher cylinder pressures developed by high compression, large camshafts, blowers and nitrous oxide, not to mention the RPM ranges we run our engines at while racing, make colder plugs mandatory to eliminate plug overheating and engine damage. The colder type plug removes heat more quickly, and will reduce the chance of pre-ignition/detonation and burn-out of the firing end. (Engine temperatures can affect the spark plug's operating temperature, but not the spark plug's heat range).

## Conclusion:

Enjoy 🤪 Don't forget where the info came from 🙌 And if you cannot find what you're looking for here, go through the search function outlined in the "Bog" section... One-word Searches 🙌🙌

## Credits:

Who to thank if this helped you 🙌

twomorrows

JMJCycles

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TH Racing

Hacksaw

50ccparts.com

pvkracing

The Walsh Family

Mattsdad

admin

Fatman

nsb

Bonus Notes For reading the whole book lol :

[Story on Black Drool from your silencer, it isn't cool! Thanks Barfly 🤪](#)

[Mixing K100 Properly \(conversion math inside\)](#)

The ratio is 250 : 1

Which is 250 oz of Gasoline to 1 oz of K100.

So, to find out how many oz of K100 goes into one gallon of gas, you must find how many gallons are in 250oz first.

250oz divided by 128oz per gallon = 1.953125 gallons

So, it goes 1 oz of K100 to every 1.953125 gallons...

So, you will need to cross multiply to find the desired amount in one gallon..

Like this:

$$1/1.953125 = X/1$$

Then transpose the formula like this:

$$\frac{1 \times 1}{1.953125} = X$$

X = .512 oz of K100 per 1 gallon of gas

And to get that to mL is like this...

.512 oz X .02957L per oz = .01513984 L of K100

.01513984 L X 1000 mL per L = **15.13984 mL of K100 per gallon of gas** Round that off to whatever you want, I'd say 15 1/8 mL should be safe.

Do you have thick black oily drool coming out your expansion chamber/silencer? Some people will tell you to run less oil to get rid of the oily drool. Granted, less oil mixed in the gas running through your engine will produce less oily residue, but this is not the solution. The reason this heavy black oil is migrating through your expansion chamber and silencer is because the engine is not tuned properly. Some stage or stages of the carburetor are too rich causing reduced exhaust port temperatures. When exhaust port temperatures are too low, the oil does not turn into carbon smoke vapor. It simply oxidizes and becomes the thick black oily drool that migrates through the expansion chamber, eventually plugging up your silencer.

#### **DROOL ISN'T COOL**

So, how do we fix this problem?

Obviously, we need a higher exhaust port temperature. Most people are able to tune and adjust the main jet portion of their carburetors, but when it comes to the pilot jet, air screw and needle adjustments, many times riders don't realize how important these adjustments are for the proper tuning of a 2-cycle engine. 99% of the time this black drool coming out your exhaust chamber is caused by a pilot jet that is 1 or 2 sizes too large. We will cover the exact tuning procedures for your pilot jet in a few minutes.

#### **RING SEAL IS GOOD**

First, we want to explain what is wrong with some common misunderstandings about tuning and oil mix ratios. What happens when you reduce the amount of oil mixed with your gas or increase the mix ratio? Increasing the ratio from 32:1 to 50:1 means you now have 50 parts of gas for every 1 part of oil, when you used to have 32 parts gas to each 1 part of oil. When you run less oil than you should for your application, you could be losing some valuable piston ring seal, which can result in a power loss. You could be sacrificing your engine's life span by starving your engine of life saving lubrication. The worst-case scenario of not running enough oil in your gas mixture can be engine seizure or crankshaft failure. If you run too much oil in your mixture for your application, your engine can run too hot, because the excessive oil acts like an insulator in the combustion chamber and will not allow the engine to transfer the heat and cool itself down. When you increase the mix ratio (reduce the amount of oil mixed in the gas), this also makes your engine run richer. You will have "more" gas and "less" oil going through your carburetor at any given time. Anytime the oil ratio is changed, the carburetor settings need to be checked and adjusted if necessary. The same holds true when you decrease the mix ratio (increase the amount of oil mixed in the gas.) Increasing the amount of oil will make your engine run leaner and if you add too much oil you could run the risk of engine damage if you don't adjust the carburetor settings accordingly

to adjust for the leaner mixture. The selected oil ratio should be determined by the oil migration time through your 2-cycle engine for your particular application.

#### SAY WHAT?

What is this oil migration time? The oil migration time is the time it takes the oil that is mixed in your gas to go from your carburetor through the crankcase and out the exhaust port.

The lower the rpm (revolutions per minute) range of your engine, the longer some of the oil remains in your engine and the less oil you will need in your gas mixture. The size of your engine, the velocity (speed of the air) through your engine and the amount of sustained full throttle usage required for your application determines the oil migration time through your engine. The velocity of the air going through your engine is largely determined by the rpm of your engine.

A single piston 500cc 2-cycle engine used in a motocross application will lubricate just fine and provide optimum power with a 50:1 gas to oil ratio, because of the slower rpm's this big single piston engine turns at. A much higher rpm 125cc single 2-cycle engine used in a motocross application will need a 32:1 gas to oil ratio to provide optimum power and the best oil protection for the engine.

However, a 125cc engine used in a go-kart or road race application will require an oil mixture ratio in the 20:1 to 24:1 range. A 125cc engine used in a trials bike would work fine with a 100:1 oil mixture ratio, providing a high quality 2-cycle oil was used. The brand of the 2-cycle oil, or the fact that there is smoke or black drool coming out the expansion chamber, has very little or nothing to do with the gas and oil ratio that should be used.

#### TUNE UP TIME

So, how do you start tuning your 2-cycle engine? First off, get the starting point on your carburetor settings from your local dealer or call your motorcycle manufacturer direct. Also, remember that racing 2-cycle engines should not idle. If your engine idles when you let go of the throttle, you need to adjust the throttle stop screw or the throttle cable adjustment to allow the carburetor slide to close completely. While you're at it, check to make sure the throttle slide stays down whenever you move the handlebar from side to side. You will be able to slow down in the corners a lot easier and faster if your bike doesn't idle.

When you have your engine warmed up, hold the throttle grip flange with your thumb and fore finger by holding the throttle grip flange tightly to the throttle housing that is clamped to the handlebar. This will allow you to hold the throttle open at a steady rpm. It is usually easier if you get a buddy to help you do this part. You want to hold the throttle open and steady so that the engine is running at about 1,200 rpms, and sounds like, "tat, tat, tat, tat."

With the throttle being held steady so that the rpm's don't change, adjust the air screw on the carburetor slowly in and out, at 1/4 turn each adjustment, until you find the highest running rpm spot. The engine should noticeably slow when you

go in too far. When you back out the screw the rpm's will increase up to a point and then will not change when you keep backing out the screw. Find the point where the rpm's are at the highest point and stop backing the screw out right there. When you are satisfied That you've found the correct adjustment, shut the engine off and see how far the air adjustment screw is backed out. You check this by slowly screwing in the air screw in 1/4 turn increments, counting as you go, to see how many turns the air screw is out from the carburetor.

If your air screw is more than 1-3/4 turns out, this means you need the next size smaller pilot jet. If the air screw is less than 1 turn out, this means you need the next size larger pilot jet. After you have changed the pilot jet in the carburetor, you need to repeat the tuning process above and find the optimum rpm point by adjusting the air screw. Higher quality 2-cycle racing oils that have the capacity to withstand higher engine temperatures are more sensitive to **proper carburetor tuning**.

This is the reason why some customers, after changing to a high quality racing 2-cycle oil, may find that they have the dreaded black drool coming from their expansion chambers. If you observe closely, you will never see black drool on a factory race bike or a highly tuned professional race team bike.

99.9% of all factory and professionally tuned race bikes will use a 32:1 oil mix ratio for motocross applications.

#### COOL YOUR JETS

Remember altitude and ambient temperature will affect your jetting (lean or rich.)

On cold damp days your engine will run slightly leaner; hot dry days will cause your engine to run slightly richer. The higher the change in altitude, the richer your engine will run. A change from a higher altitude to a lower altitude will cause your engine to run leaner. The octane of your gasoline will also affect your jetting. Gasoline with a higher octane, like "race" gas, has a slower burn speed and will cause your engine to run richer. Gasoline with a lower octane, like 92 octane pump gas, will burn much faster and cause your engine to run leaner. Choose your gasoline and octane rating, tune your carburetor to match and then stick to it for practice days "and" for race day. It is not a good idea to use inexpensive pump gas with a lower octane rating for practice and then try and use a race gas with a higher octane on race day.

#### MIX IT UP

If you want to figure out how many ounces of oil you need to add to each gallon of gasoline for your oil mix ratio, you just divide the ratio's larger number, (32 in a 32:1 ratio), into the number of ounces in a gallon, (128 ounces in a gallon). 128 divided by 32 equals 4. This means you will need 4 ounces of oil for each gallon of gasoline you are mixing. While we are on the subject of mixing, it is always better to take the total amount of oil you are going to use and mix with just one or two gallons of gasoline in the 5 gallon can, shaking vigorously. Then add the balance of the gasoline to this can and shake again. Metal airtight cans are best to store fuel but the best solution is to mix up what you need and use up what you mix.