



# **KX500AF**

Kawasaki KX 500AF-2007

**Building a KX500AF**

**Benny Lindberg**



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# Document History

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## Revision History

Revision Number	Revision Date	Summary of Changes	Changes marked
1.0	2009-03-25	First version	(N)
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# 1. Summary

This document is a basic documentation of all the steps I went through building the KX500AF. I decided to go all in with this project which was a very costly decision by the way. Nevertheless I am very pleased with the outcome. You will find some tips and how to's in this document and I hope this documentation can help others in building their KXAF's.

You may find some language errors but you will get them for free as English is not my native language.

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## 1.1 Sources of inspiration

I used to race in the 1980's when the 500 cc two stroke bikes still was around. I never raced one but I can still sense the feel of the magic low tone bark of the 500's. So, like 20 years later during a off road trip we met a guy dirt riding a CR 500 in the woods. I was a bit stumbled as he did not seem to have any problems in the tight woods. At one point when we came on to a small deserted road, he just barked pass me, leaving me with the sound waves from his roaring 500. I knew from that moment that this would be my next project, and for me it was the KX 500 that always have been the green beast of the 500's.

Said and done, time for shopping. The result was a complete restoration of a KX500 from 1993. That project can be found with full documentation at [http://www.500twostrokeonly.se/500twostrokeonly\\_025.htm](http://www.500twostrokeonly.se/500twostrokeonly_025.htm).

With the experience of the real KX500 and having another modern KX250, the idea to mix the two was a fact. And of course my friend Jesse pushed me to get started.

The bikes that Service Honda produces are so great and that was also a good source of inspiration.

A.J Waggoner at Service Honda as well as others in the KXRiders community has really helped a lot.

Jerry Lemons provided some great information regarding the air box setup for example. Mr Doordie has also been very helpful in overall technical knowledge concerning the engine.

As I already had another scrappy 1992 KX500 I realized that a KX450F donor bike was the thing to get. The 1992 KX500 engine was in a real bad shape but could be restored.

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## 1.2 The object

I bought the donor bike in parts. A KX450F 2007 with 10 hours on the meter. The story was that the owner had mounted the oil filters the wrong way which in turn cause the engine to seize. The following parts were bought as a bundle:

- Frame
- Triple clamps
- Foot pegs and holder brackets
- Swingarm including linkage, lower chain guide
- Airbox
- Shock (new)
- Radiators
- Front brake including brake line
- Rear brake including brake line and master cylinder
- Rear Shock and linkage

To summarize: Frame and parts looked fine and should be able to get them into new condition with ease.

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### 1.3 The target

The target was to make a modern version of the KX500 by placing the mighty KX500 power plant into a modern aluminum frame.

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### 1.4 The Outcome

This is the first pictures taken after the restoration. As you can see, the front fork is Öhlins and the exhaust is the special build KX500AF exhaust from FMF. Besides that, most is standard parts.



The bike is built to be used. A friend of mine, a top national rider will race the bike at some regional race during 2009. It will be really nice to see the bike in the hands of a highly skilled rider roosting others with this 16 year old engine in a modern chassis. The bike will be kept as long as I can find room for it in my garage. Of course, everything has a price but I have no plans to sell the KX500AF.

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## 2. Technical overview of the object

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### 2.1 Finding and identifying missing parts and information

One of the fun moments of building a hybrid bike is the hunt for parts and information. I saved all receipts and came up with the following list of sources for the parts. I had track of the cost for a while but I found it somewhat easier to hide the cost as it would not hurt the same way.

#### 2.1.1 *KXRiders.com*

What a great place. I found a lot of tips and not to mention inspiration here. See below for some of the major links to interesting subjects in the forum.

##### **Complete top end rebuild instruction including KIPS timing**

<http://www.kxriders.com/forums/index.php/topic,1406.0.html>

##### **All about reed spacers**

<http://www.kxriders.com/forums/index.php/topic,1737.0.html>

##### **KX500AF How To**

<http://www.kxriders.com/forums/index.php/topic,1737.0.html>

##### **KX500AF Pictures**

<http://www.kxriders.com/forums/index.php/topic,1737.0.html>

#### 2.1.2 *Needed parts to complete the build*

- Complete KX450F plastic kit including chain rollers and chain guides
- Gear shift lever
- Handlebar Fat Carmichael bend
- Radiator covers
- Mud flap
- V-Force2
- Complete throttle assembly (from a KX250) (shorter stroke about 80 degrees instead of 90)
- Front fork, Öhlins (Private buy from a friend)
- Throttle cable (Kawasaki OEM)
- Clutch cable (Kawasaki OEM)
- Coolant hoses (different car)
- Transmission cover (Kawasaki OEM)
- Impeller (Kawasaki OEM)
- Gauge Oil level 52005-0019 (Kawasaki OEM)
- Nuts Flanged 10 mm cylinder 92015-1415 (Kawasaki OEM)
- Guard rear calliper white (Kawasaki OEM)
- Seal, Oil Kick starter 92049-012 (Kawasaki OEM)
- Bearings Impeller 92045-1305 \* 3 (Kawasaki OEM)
- Complete front master cylinder brake assembly (E-bay)
- Fuel tank complete (E-bay)



- Bolt kit (Cross Center)
- Exhaust springs (Biltema)
- Complete Exhaust system including silencer (Service Honda)
- Complete gasket kit (Hojtorget)
- Complete Clutch lever assembly (Biltema)
- Airfilter (Biltema)
- Kill button (Hojtorget)
- Complete Wheels set (Private buy on blocket.se)
- Friction plates clutch (Hojtorget)
- Steel plates clutch (Hojtorget)
- Spoke set rear stainless
- Rear rim (Hojtorget)
- Left side engine case (Tias)
- Kick (Kawasaki OEM)
- Water pump gear (Kawasaki OEM)
- Kick start bolt (Kawasaki OEM)
- Footpeg bracket bolts (Kawasaki OEM)
- Stator Coil (Aftermarket)
- Steering stem top nut (Kawasaki OEM)
- Front and rear axle including nuts (Kawasaki OEM)
- All bearings in the engine (Kawasaki OEM)
- New Prox A complete piston
- Some of the transmission gears
- 1 Shift fork

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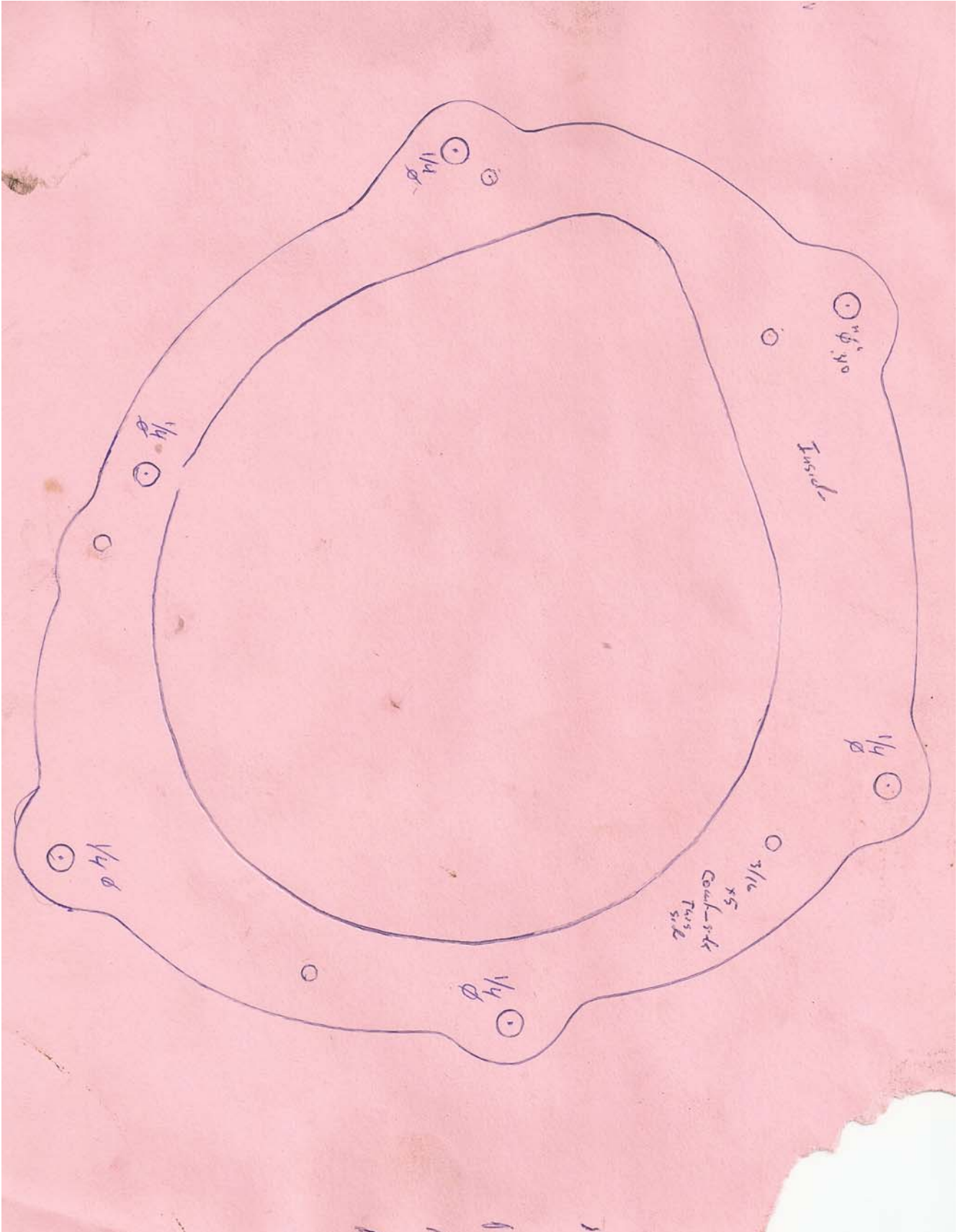
## 2.2 Technical issues

### 2.2.1 Airbox setup

With help from Jerry Lemons or [jfabmotorsports.com](http://jfabmotorsports.com) as alias at Kxridders. Jerrys tip: *Use the 2000 CR250 boot with an adapter fabricated ed from .125 inch thick aluminum to connect it to the stock 450 air box. Remove the screen from the 450 air cleaner holder, as there isn't much of a backfire from a 2 stoke. This combination allows the use of the 450 air filter. With this combo the carb fits EXACTLY as it does in the stock KX500!*

I followed Jerry's advice and with use of some silicone sealant it turned out very well.

The picture below is a template for the adapter plate to be fabricated.





### **2.2.2 Balancing and truing of crank**

Balancing and truing of crank and main bearings replacement. Bengt Lagerblad at Delta Racing is a well known two stroke tuner in Sweden and he has a special relation to the KX 500. His craftsmanship is at the top level and he has tuned motors that are, and have been widely used by many top Swedish riders.

The results are just amazing. I could hardly notice any difference between my standard KX 250 and this balanced KX 500. The saying "it made a feeling like an all new bike" a meaning. Well spent money.

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### **2.2.3 Making the aluminum frame look new**

I Used Welding pickling paste with a very good result. It did not work on the cylinder or engine cases but it worked very good on the frame, subframe and the brake calipers.

Here is a link to a Swedish provider of such a product.

<http://www.avestafinishing.com/4056.epibrw>



The first view after rinsing off the pickling paste. Super clean and shiny.

### **2.2.4 Piston mod**

This modification is supposed to provide better lubrication and cooling of the top crank bearing as well as adding more power throughout the RPM range.

From KxRiders.com

*That port is .850 (2.2 cm) wide and centered its .960 (2.4 cm) from top of piston and its 1.185 (3 cm) long and it does not interfere with reinforcing ribs in piston or radius under ring package it did lightened the piston that is good wiesco makes ther piston 20 grams lighter than a stock piston to begin with so this would be like adding mallory to crank counter weight*





## 2.2.5 Power Now

My experience of the Power Now and similar products is that the engine runs smoother and more responsive down low. Very much like the feeling when switching to Vforce reeds from standard reeds.

The carburetor inlet device is manufactured by many vendors and they all have their own name for it. KX500 are never listed but the device for KTM 125SX up to year 2007 will fit.

## 2.2.6 Print your own decals

There have been label writers and label sheets available for inkjet printers for some time. They all have the same limitation as the output will be on non water resistance paper. I was surprised when I found a photo paper product at the local TV/Video store with a self adhesive side. It is supposed to be water resistant and should work. Even if it probably won't be as durable as aftermarket 3M based decals. You can easily print out new decals at a fraction of the cost for aftermarket decals. If they wear off, or if they are lost while washing, print a new one. You can always put some thick transparent 3M like layer on top of your home made sticker.

I ended up designing my own set of decals in Adobe Illustrator and then had them printed and laminated by a professional decal printer company.



## 2.2.7 Make your own Electro plating

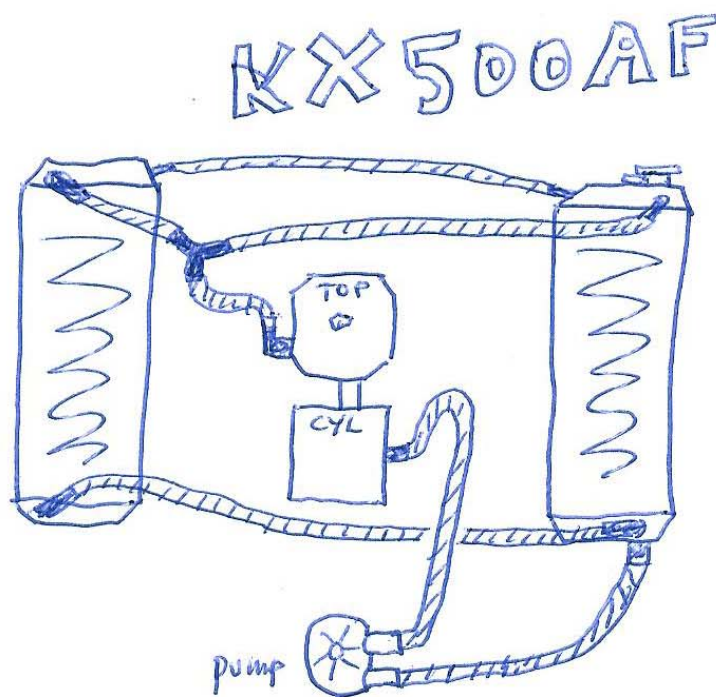
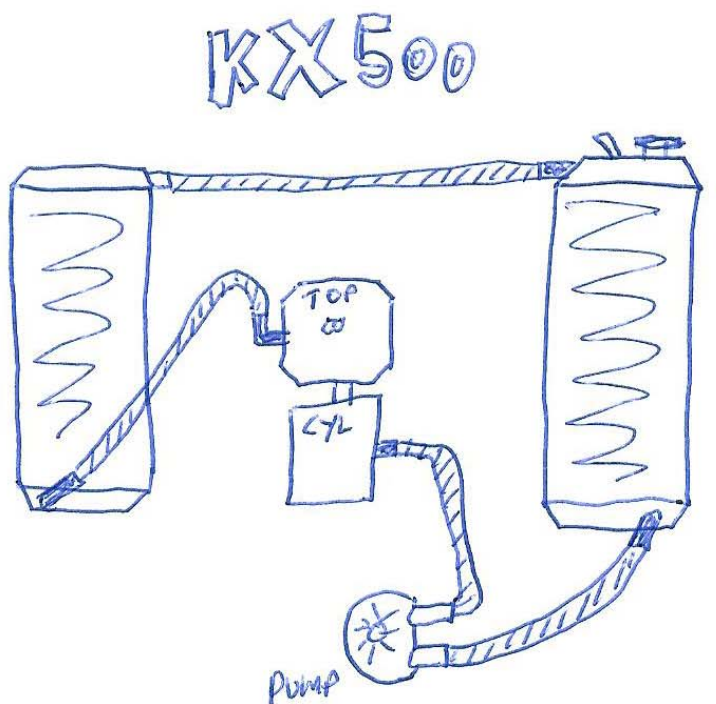
I searched the Internet and found out that a company named Eastwood has a 'Do it your self kit' for zink electro plating. It turned out that the only distributor in Scandinavia was only 15 km away from were I live. Easy, to easy to be true but I found the store in the middle of nowhere on the countryside. Great stuff. I have used this method for restoring several unique bolts since I bought the kit.

<http://www.eastwoodco.com/jump.jsp?itemID=134&itemType=PRODUCT&path=1%2C2%2C389%2C400%2C407&KickerID=49&KICKER>

## 2.2.8 Coolant routing and radiator modifications

The KX450F radiators differ from the KX500. Looking at the pictures of Service Honda built AF's gave me some headache since they had added another connection at the lower right radiator.

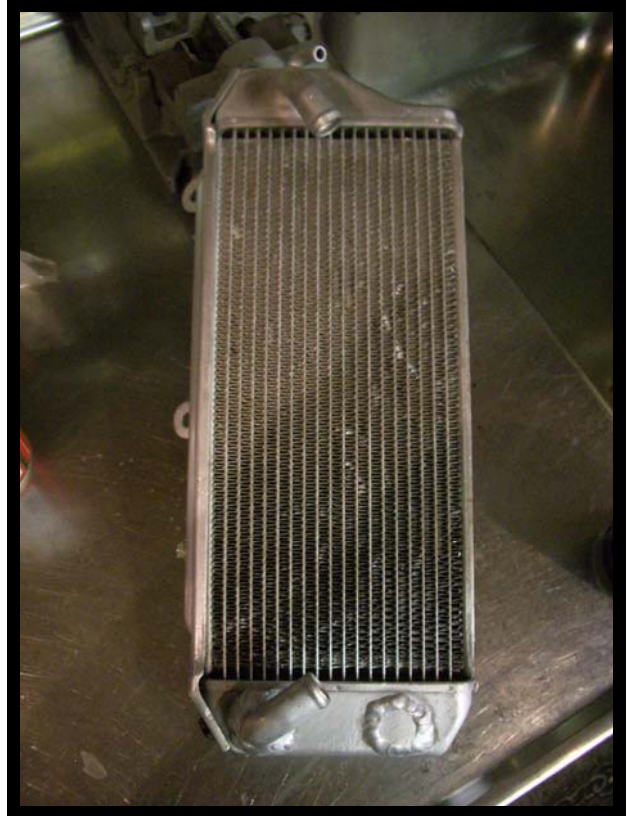
This is the drawing I made in order to sort this out.







Right radiator with a new hose connector at the bottom  
The lower crossover have been re-angled



Left radiator with the bottom connector moved.



I used hoses from different sources, like pre bent car heater hoses

## 2.2.9 Frame conversion/modifications (2007 KX450F frame)

The trickiest part was in this order:

Extend cradle

Head stay mount

Radiator hose mounts

Cut main frame

Lower engine mounts

Engine swingarm hole to 17 mm

Ignition coil mounting tabs

Remount of radiator lower fastener bracket

## 2.2.10 Kips timing adjustment device

See <http://www.kxrider.com/forums/index.php/topic,1367.0.html>

I made my own adjuster which just makes it easier to adjust and it will give you the option to set it to the standard position which will give a bit of compression relief at start.



## 2.2.11 Reed Valve

Pictures shows from left to right: Vforce3, Vforce2, std. After reading and testing the three different setups the Vforce2 with 10 mm reed spacer performed the best.

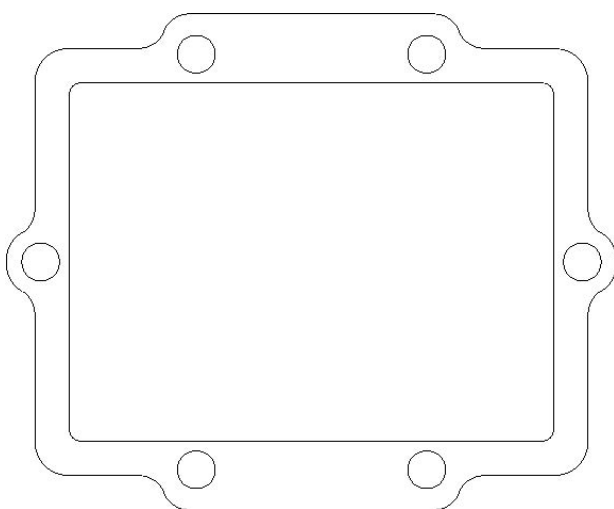




## 2.2.12 Reed spacer

A reed spacer for the KX 500 is supposed to give the engine a smoother character down low in the rpm range. To study this in more details check <http://www.kxrider.com/forums/index.php/topic,1737.0.html>.

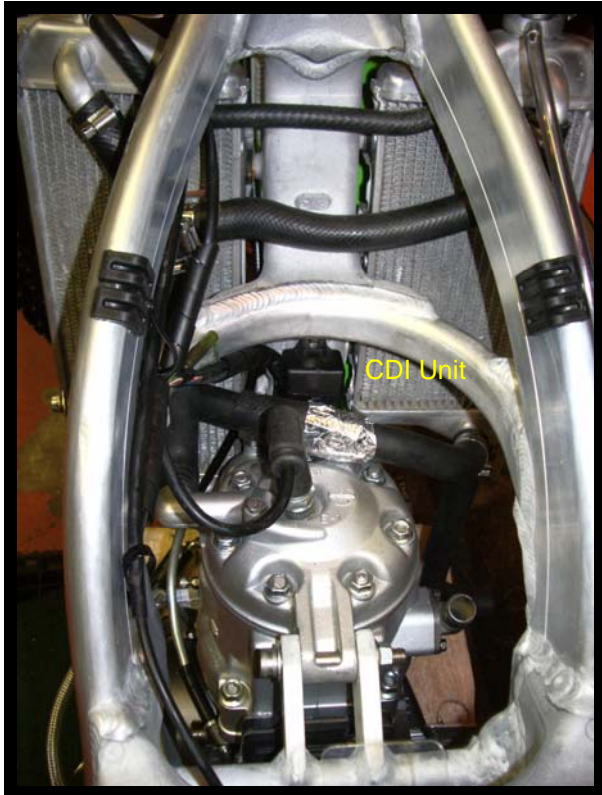
A friend used the reed cage gasket and made a CAD drawing which was used by the CNC machine to make this very nice fitting 10 mm spacer. You can find the Cad drawing as spacer.dxf at <http://bempa.homeftp.net> in the KX500 folder. This format is suitable for many cutting robots.



You can find the Cad drawing as spacer.dxf at <http://bempa.homeftp.net> in the KX500 folder. The .dxf format is suitable for many cutting robots. Note the picture on the left is **not** in scale 1:1.

## 2.2.13 Ignition parts and placements

CDI unit is placed under the horseshoe shaped frame piece. The ignition coil is placed on the left side of the frame. The 450 mounting tabs have to be cut off and welded in place. This placement does not require any new cabling or extensions and are the way that Service Honda has placed these parts on the 2007 frame. See picture.



This picture gives a view of the head stay as well.

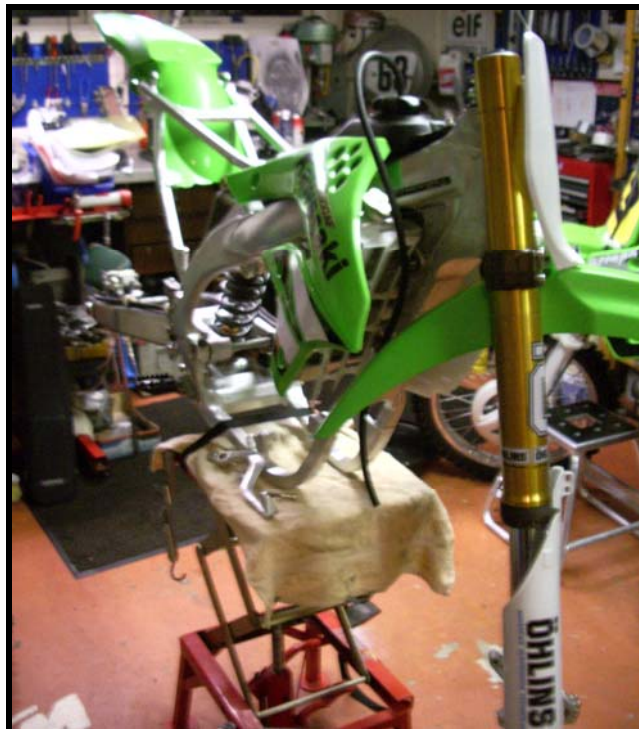


The mounting brackets for the coil welded in new place

### 2.2.14 Öhlins Front Fork

I mounted a set of Öhlins forks as Öhlins forks can be found laying around in the woods here in Sweden due to Enduro guys giving up the fight against mother earth.

The upper standard KX450F triple clamp had to be enlarged 1 mm in diameter in order to fit the Öhlins fork.





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## 3. Pictures taken during the project

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### 3.1 Before



The Frame stripped with lower engine mounts and water pump guard mount removed. Frame still uncut.

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### 3.2 During

Rolle, my brother in law making some fine adjustment on the home made frame extensions. Twisted and curved at the same time. He made it look easy. He is the man behind Pro Alu and without his assistance this project would not have been.

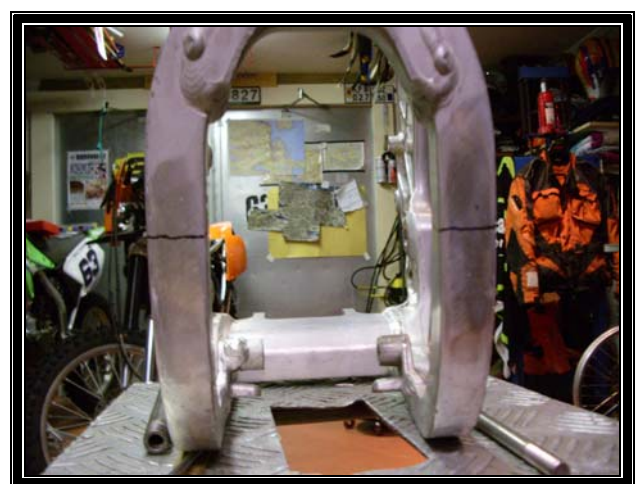


Rolle in the works of bending, twisting and fitting frame extensions out of 25x25x2 mm aluminum profile.

# ***PRO-ALU***



Lower engine mounts welded in new place

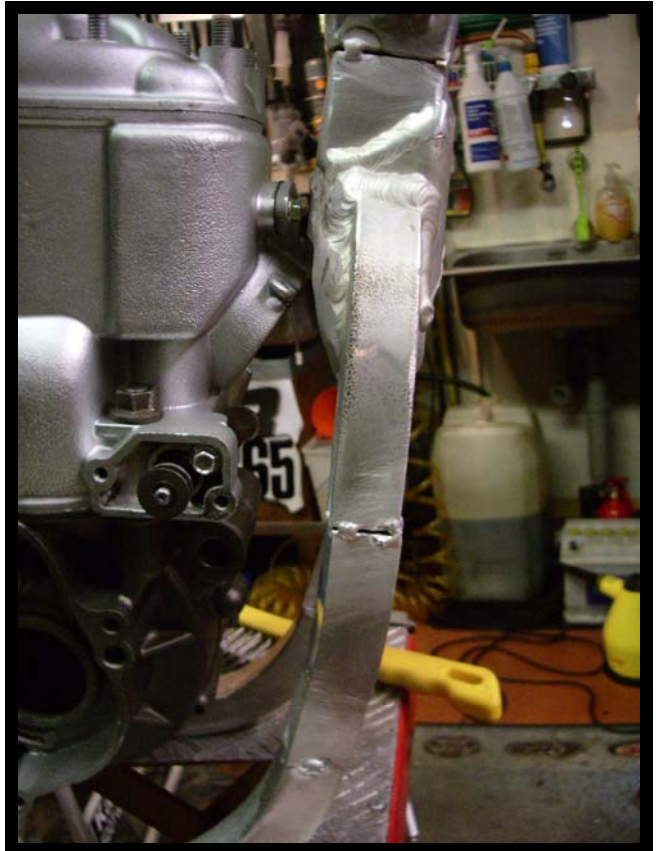


Cut marks, this was the most straight piece





Point of no return...6 cm of the main frame profile.



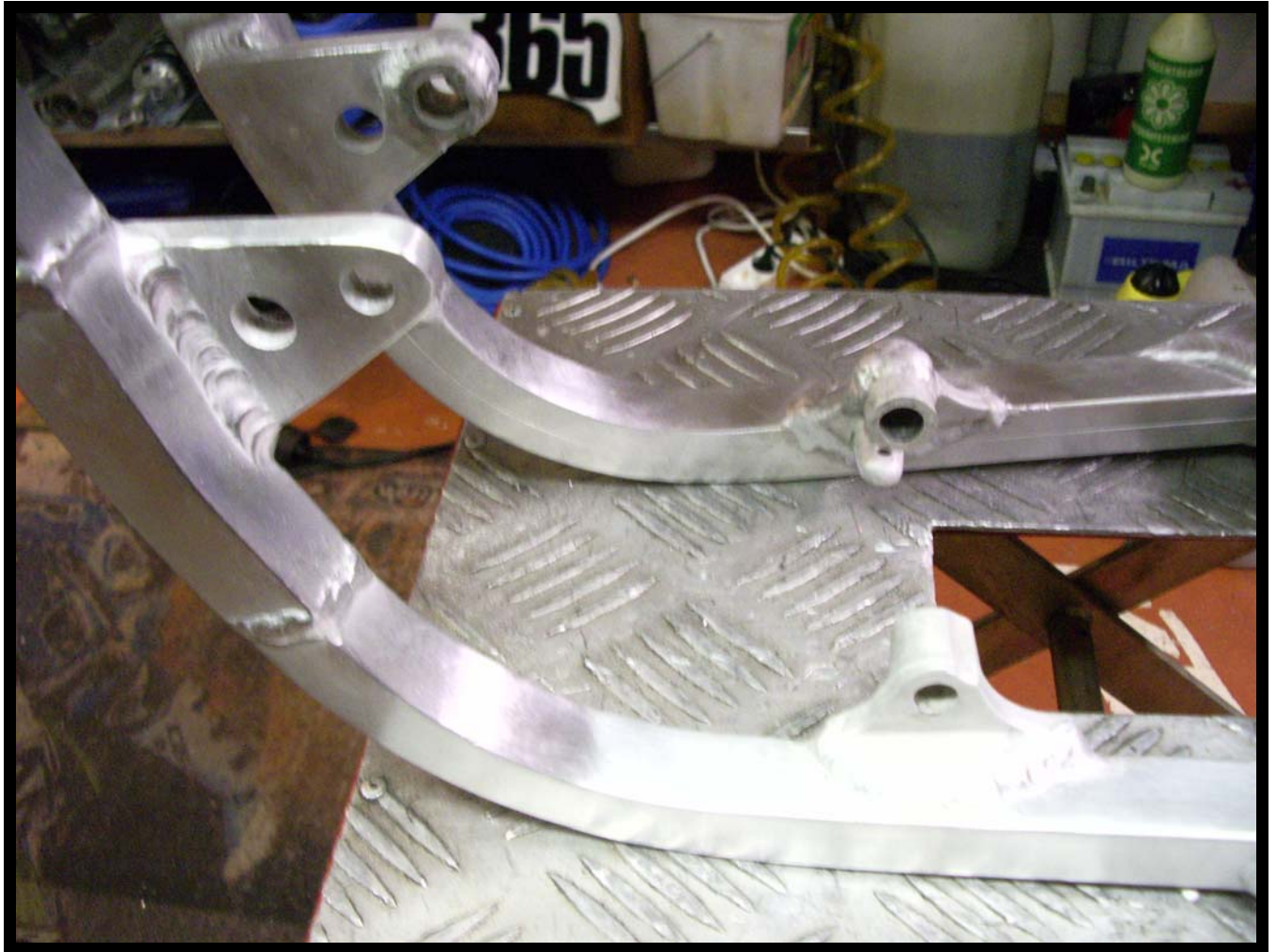
Cradle extensions in place.



I Removed the 450 engine and welded an aluminum plate on top to cover the hole.



Another view of the head stay



New home made front engine mounts out of 10 mm thick aluminum plate. A piece of a handlebar on the right mount in order to fit the engine width.



### 3.3 After



Thank you for supporting this bike rebuild, whoever feels like they have made a contribution in some way.

I would like to thank:

- Roland Forsström at ProAlu for the very labor intensive TIG welding and frame altering.
- Jesse Westerlund for the idea and moral support to start the project.
- Janne DoOrDie Pettersson for tips and ideas regarding technical issues
- Jerry JFAB Lemons for tips and ideas regarding the airbox setup
- AJ Waggoner at Service Honda for some build tips and as a supplier of the AF custom built exhaust
- Jonas Grelsson who donated the SDG Step Seat

***Expect a KX500AF video later on.***

The to-do list is quite small, currently only 2 items:

- Buy and mount a Kawasaki OEM clutch control assembly
- Buy a aluminium ignition cover from Jfab with KX500AF imprinted

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### 3.4 First ride impression

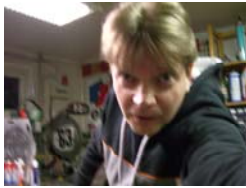
Well, the first ride was on hard packed snow in dark so the impression from the first ride was somewhat concentrated. I could note the following traits from that first ride.

- This is a big bike
- It had all the new feeling
- The sound was great with the short Powercore2 silencer
- The handling was just like a modern bike, nothing like the real KX500
- Vibrations comparable to my KX250.

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### 3.5 Contact information

You are welcome to contact me for any feedback or otherwise



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Next project will be a homemade Electric powered dirt bike most likely based on a steel twin spar framed KX250.