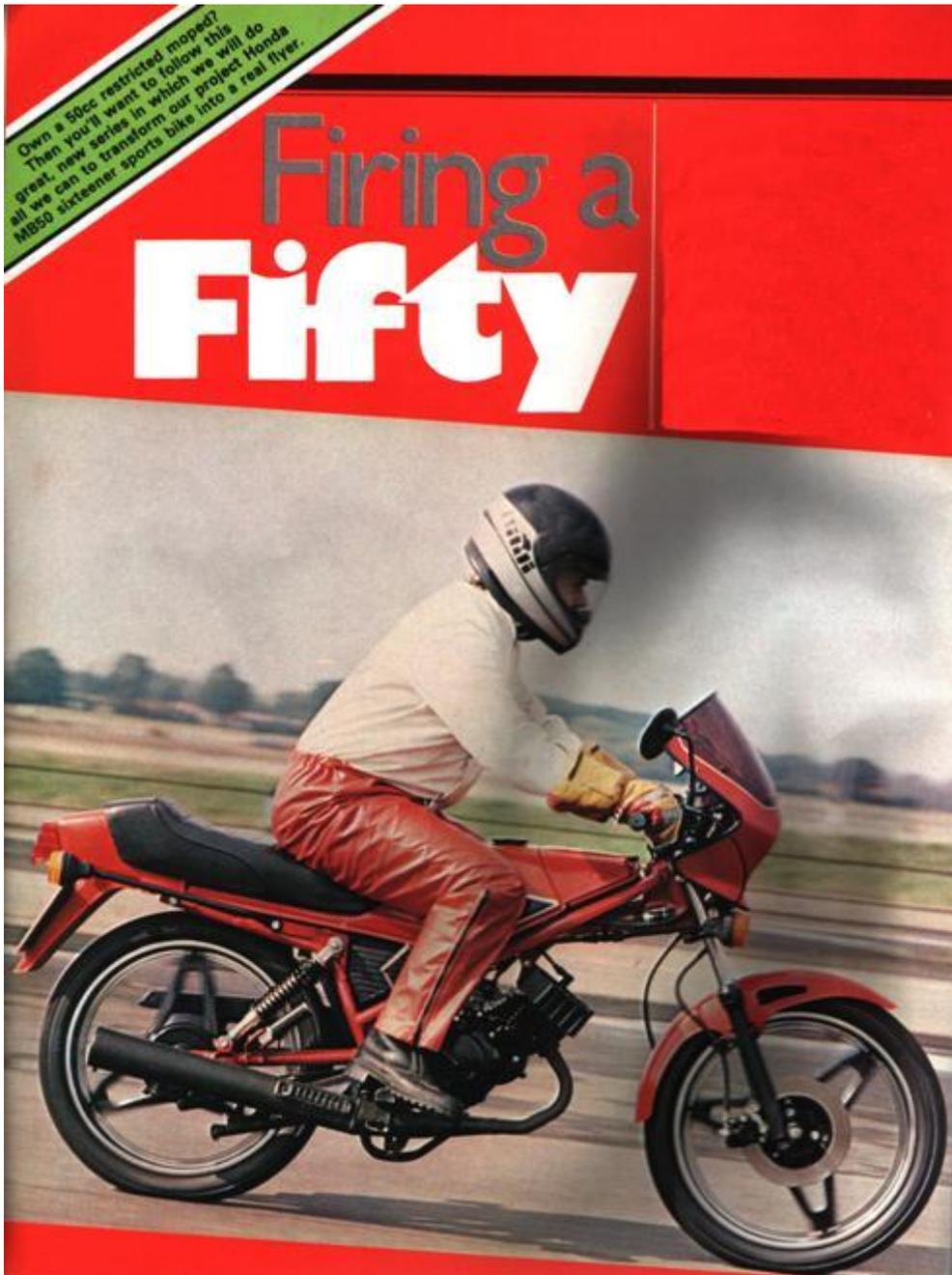


# Motorcycle Mechanics Project 60 mph MB5! Part 1



This is part 1 of a 4 part series in which Motorcycle Mechanics de-restrict an MB5 in an attempt to reach a "true" top speed of 60mph.

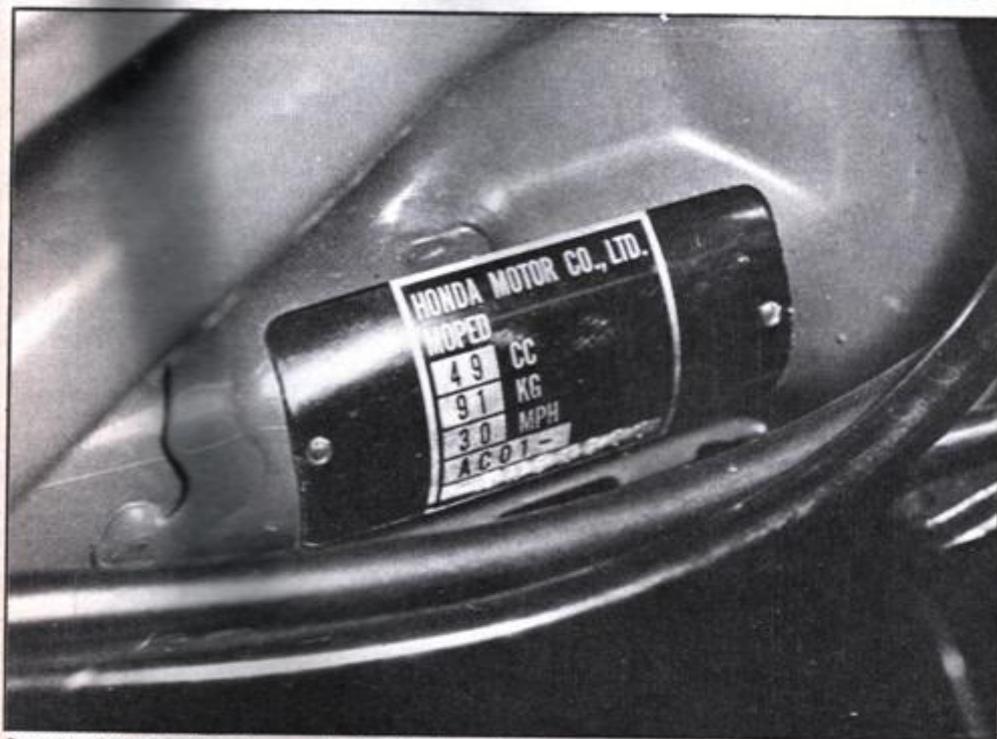


If you have ever ridden a restricted 50cc sports moped you'll know just how feeble they are. Honda's MB and MT50 models are no exception. Secret tuning details to turn these mouse motors into mini road rats were slipped under Brian Crichton's desk. Memorise and then swallow these pages.

Displayed on these pages are authentic tuning secrets which originate from Honda for the MB and MT50 Honda's. if the next issue of this magazine doesn't appear you'll know we have all been shot for revealing them.

In addition to the Honda secrets we have a few ideas of our own and we now have our own MB50 on which to try them.

We decided to buy the Honda because it has proved to be a popular buy in its road and trail forms. Also the road version which we have looks so sporty. It deserves to have a bit more power to its elbow.



*Required by law, this plate marks the Honda as a lowly 30mph restricted moped.*

We have chosen to increase the performance of our MB50 and this story is the first of a series which will appear from time to time on improving the model.

The first step is to re-register the machine as a motorcycle. To do this you have to be 17 or over. At 16 you cannot ride a restricted moped which has been performance modified. Even changing the gearing would be illegal.

You will see from your log book that under the heading "Model/Type" the machine is registered as a moped. On the back of the log book are various sections to notify the authorities about various changes.

I couldn't see any headings which dealt directly with changing of type so I wrote a letter to DVLC, Swansea SA99 1AR explaining that I wanted to re-register the bike as a motorcycle because I was going to tune it. I included the log book so that necessary alterations could be made. Now its a question of waiting to see what happens.



**Off with the head and barrel ready to commence power tuning in the MB50's new life as a genuine motorcycle — Swansea permitting.**

If you own a restricted moped you will have noticed that somewhere on the machine is a plate stating it is a moped and giving details of capacity, weight and showing the wording 30mph. if your restricted model doesn't have a plate for some reason then you are breaking the law if you are riding it while 16.

On the Honda the "restricted plate" is riveted to the head stock on the right side.

Once you have dealt with the paperwork you can get down to business of freeing yourself from the 30mph gutter riding by peppering the engine up.

Instead of the usual way magazines have of giving you details in stages, we thought we would blow the gaff on Honda's tuning mods straight away so that you can get on with the job if you so wish.

To what extent they work we cannot say because we haven't done them ourselves so far. It's our plan to use them as guidelines, combining them with ideas of our own.

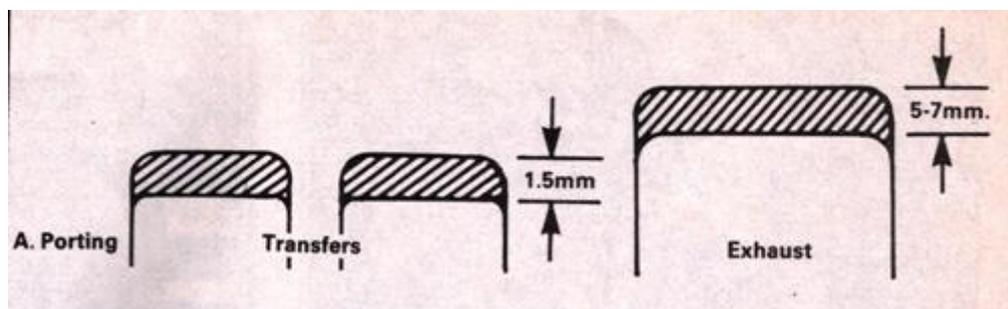


Diagram A: This shows that you have to raise the four transfer ports by 1.5mm and the exhaust ports by 5 to 7mm. This figure for the exhaust is a colossal amount, indicated just how much the Honda is restricted by its porting. For instance, on an RD250 Yamaha it would not be advisable to raise the

exhaust port by more than 2mm. to start with we intend to be cautious and will limit ourselves to 5mm extra exhaust port opening. We can always file away the other 2mm at a later date.

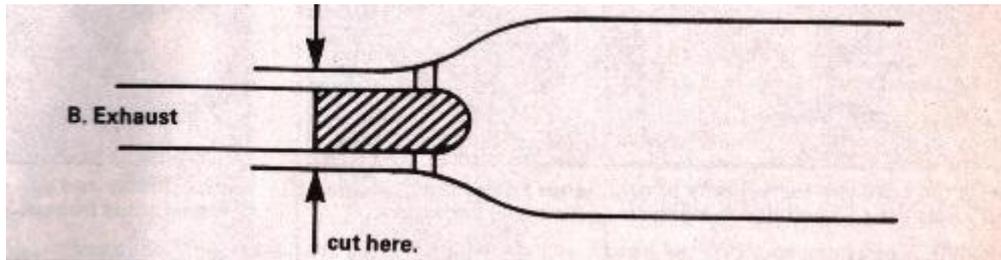


Diagram B: Accompanying this one were the words "cut off and take the inner tube" in reference to the silencer. You'll have to work this one out for yourself for the time being since we have not investigated it.

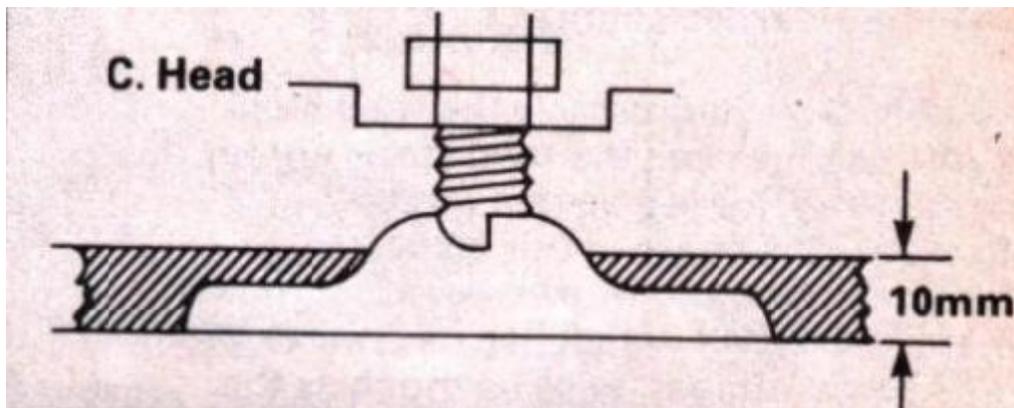


Diagram C: This shows the spark plug in the cylinder head. We are not quite sure where exactly you draw the top line to start the 10mm measurement for shaving the head to increase compression. Not to worry. We have heard a whisper about a company which is about to supply machined heads on an exchange basis for the MB/MT50. We'll give you details as soon as we have them. Meanwhile, if you have your cylinder head shaved the ignition timing will probably have to be retarded slightly.

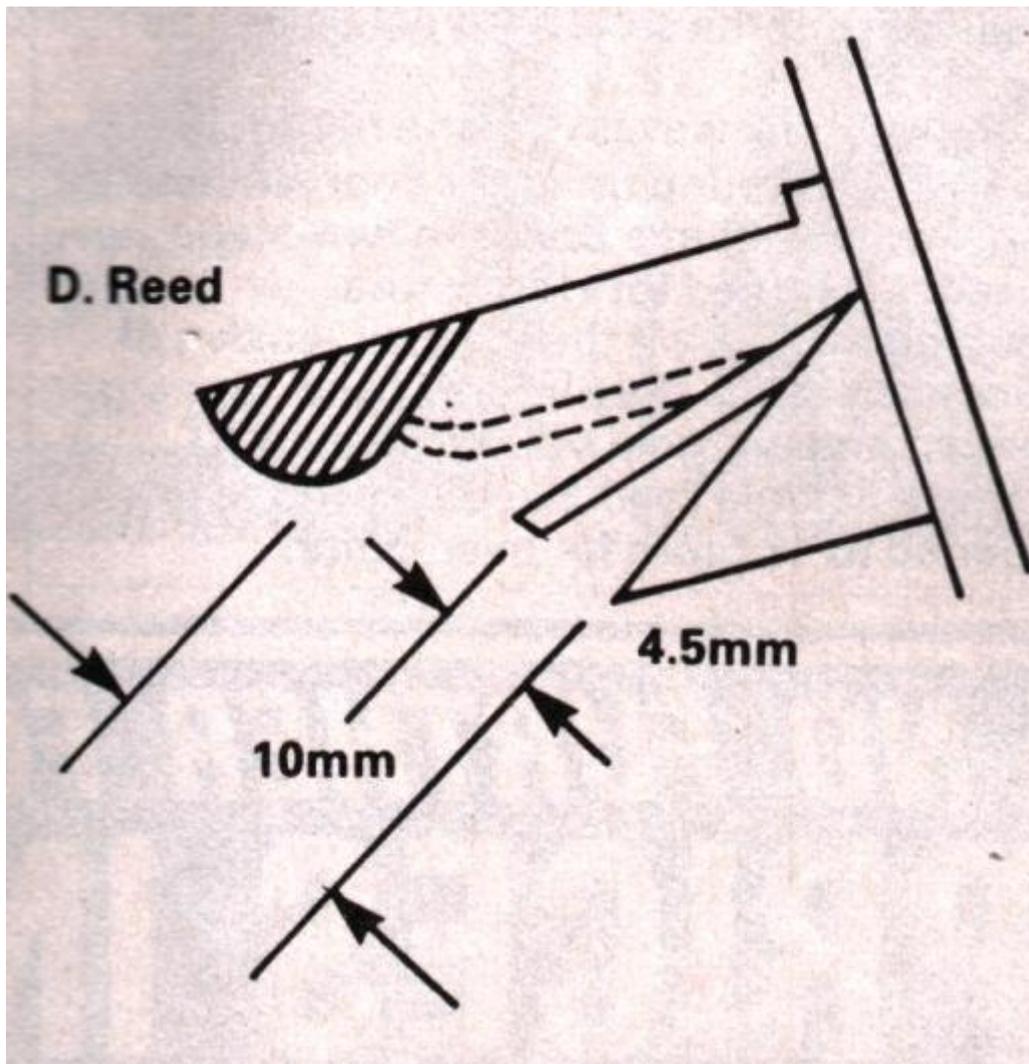
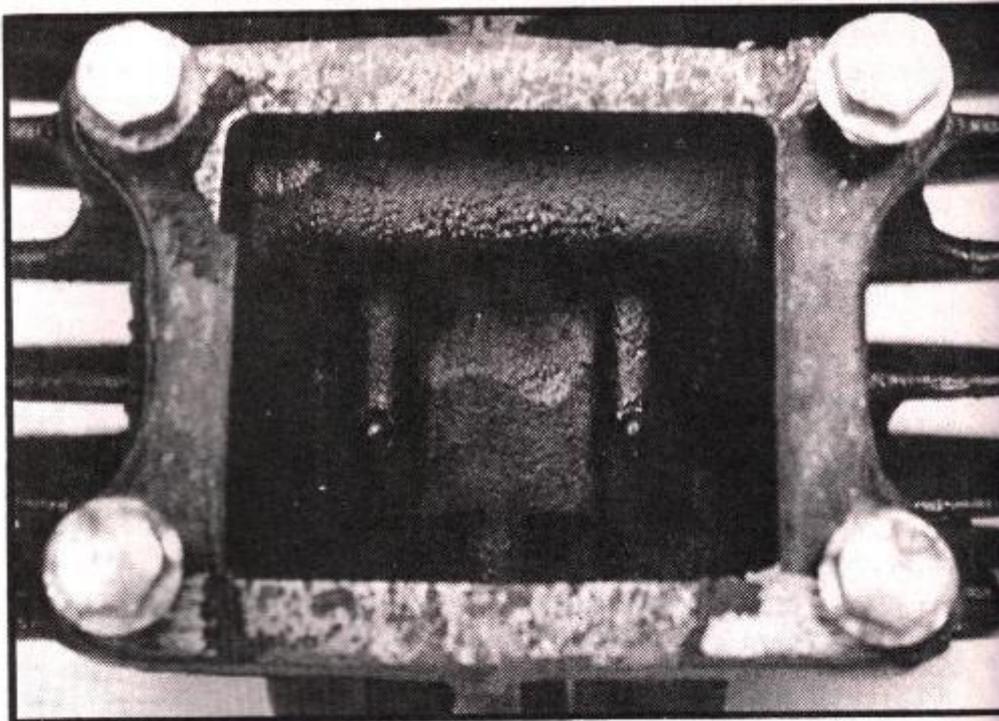


Diagram D: If you remove the reed block you will discover that the reed stops are only open 4.5mm. This is a severe intake restriction. Elsewhere in this issue is a feature on squeezing more power out of the Yamaha DT125MX which has its reed stops set at 8.5mm, almost twice as much as the Honda. The Honda stops cannot be opened any further unless the two raised ridges in the barrel intake are filed away.



**Look carefully and you will see the two raised ridges which prevent the reed stops from being opened beyond 4.5mm.**

Honda say you can increase the stop gap to 10mm but the reliability of the steel reed petals will be reduced. Again we think we can go one better. We put Serval Marketing on to the problem and they discovered that a Boyesen two-stage fibre reed designed for Husqvarna scramblers will fit. It's the least expensive of the Boyesen range they import from America and will cost you £6.80 inc VAT. This more flexible reed allows the stops to be opened to 12.5mm for even better breathing.

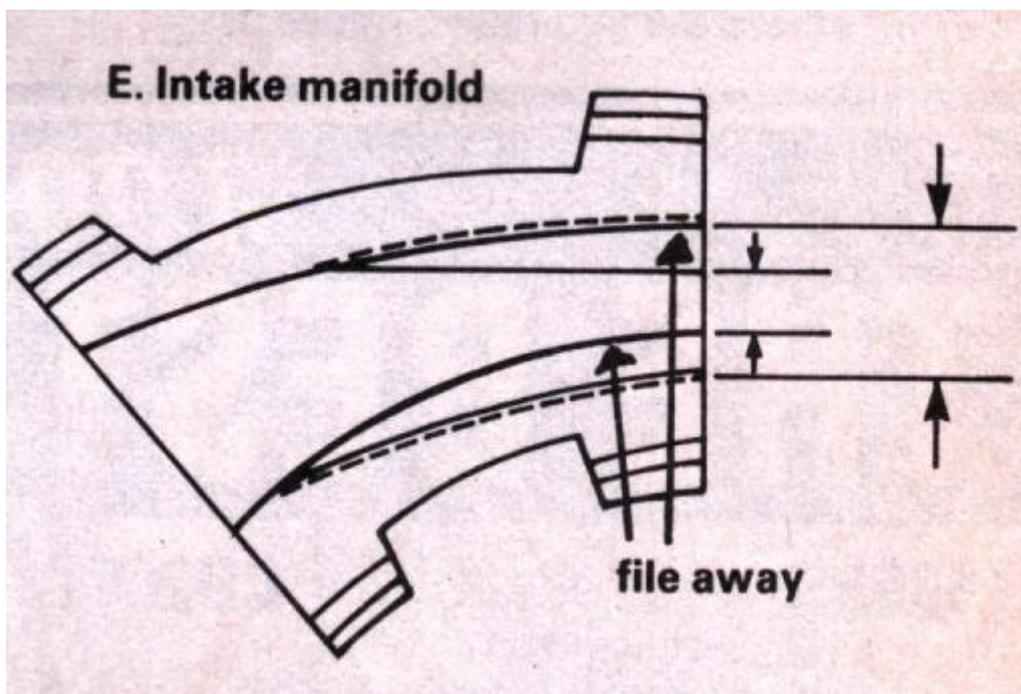
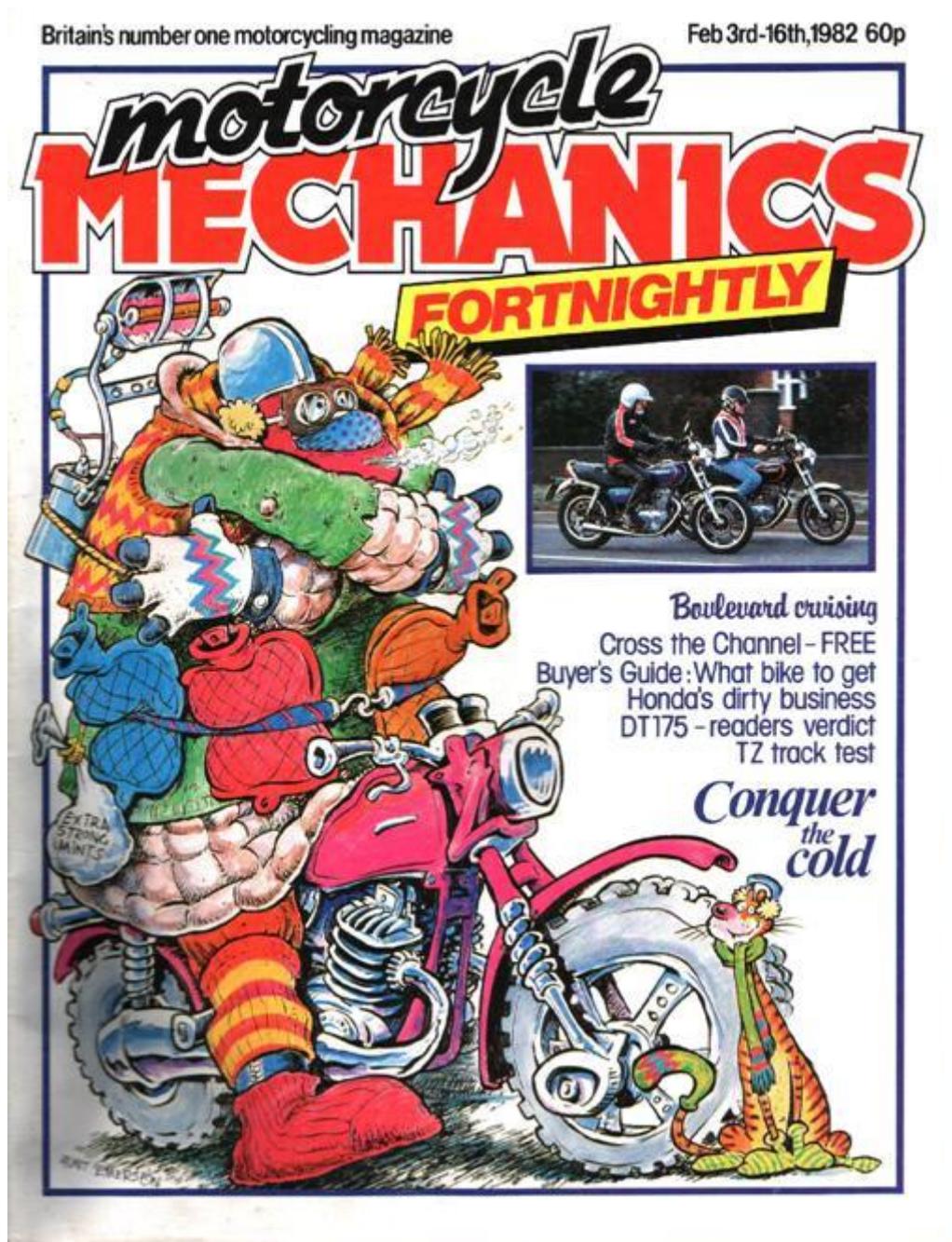


Diagram E: This gives a visual guide of how much to shave away from the inside of the intake manifold. We cannot give you exact measurements at this time.

If you wish to make a start straight away, we suggest you tackle the exhaust port and reed valve restrictions first. That's what we intend to do. See you in part 2!

# Motorcycle Mechanics Project 60 mph MB5! Part 2



The first chapter on how to tune the Honda MB and MT50 restricted (Jan 6-19) has caused quite a stir.

Some of you want the details, and others don't think we should tell you. Honda UK fall in to the second category. They haven't cut our throats yet, but as you can see from the accompanying letter they are not too pleased with us.



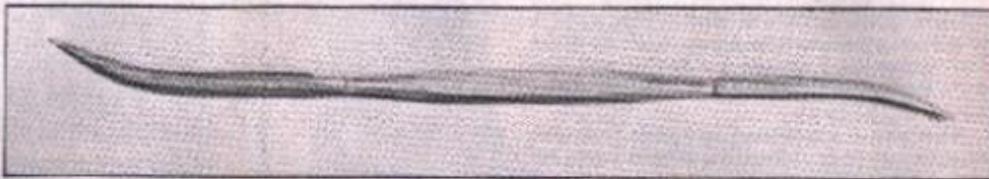
As we said in the opening chapter, we don't want anyone to break the law. It's illegal for any 16-year-old to ride a restricted moped which has been performance modified.

This tuning series is aimed at the 17-year-old or older rider who wants to keep his "moped" and legally de-restrict it for a decent level of performance.

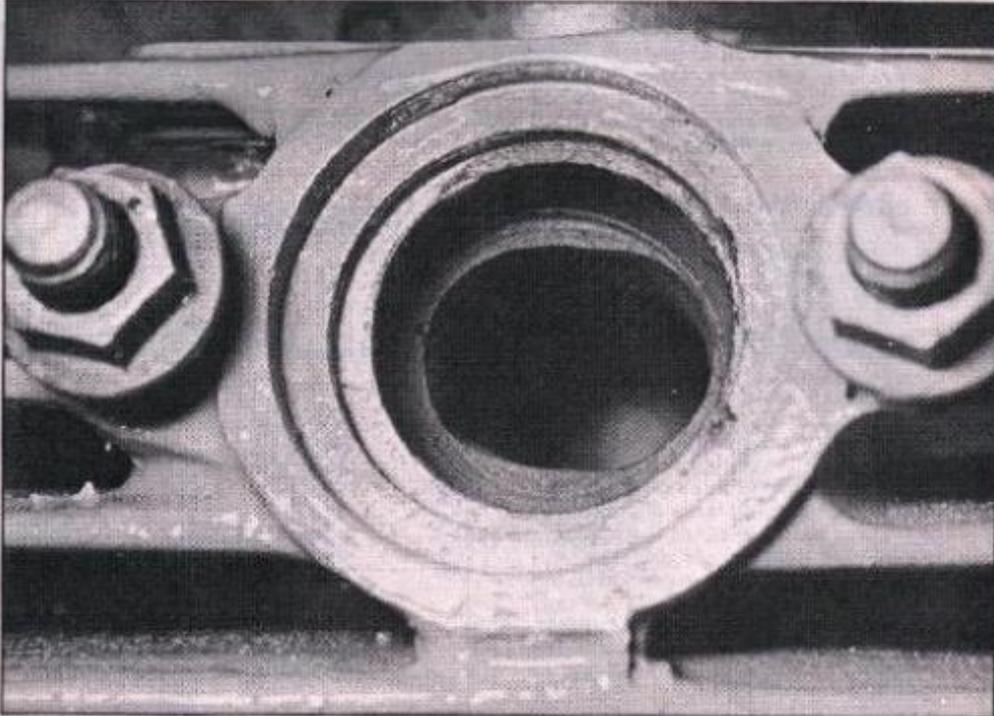
To carry out the modifications listed in the first chapter you will have to buy a riffler and round file or have your barrel modified professionally to the dimensions suggested.

So much metal has to be removed from the constricted ports that to save time on our project bike engineer Colin "Screwloose" Taylor was set to work with milling machinery to raise the exhaust port by 5mm and the transfers by 1.5mm.

All ports were radiused i.e. their edges were smoothed using the riffler to prevent the possibility of the rings snagging in the ports.

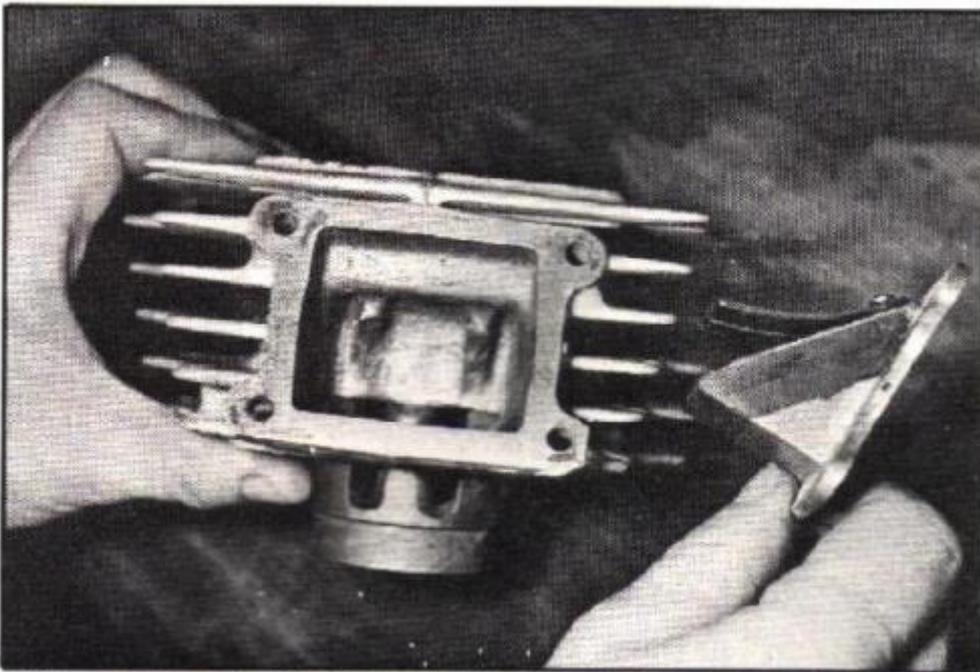


*Riffler file will cost about £4-£5.*



*Exhaust port raised by 5mm.*

The restrictions in the inlet port were filed away. You can use an electric drill and an abrasive stone to get the bulk of the metal out.



*Inlet restrictor ribs filed away and reed stops opened to 12.5mm.*

This allowed the reed stops to be opened back from 4.5mm standard to 12.5mm in conjunction with the Boyesen reeds mentioned last time.

To investigate possible modifications to the exhaust system, "Screwloose" opened the belly of the pipe with a welding torch to find out what was inside.

He soon solved the mystery. The front pipe continues along inside the expanding cone section (see picture)



***Pipe cut open to show extended primary pipe which has to be cut out.***

This is obviously designed to limit power. To cut off the extra length involves hack sawing the pipe just rearward of where the primary pipe meets the cone.

The extra length of primary pipe can then be thrown away and the system welded back up. This allows the exhaust gases to expand by following the inside face of the cone.

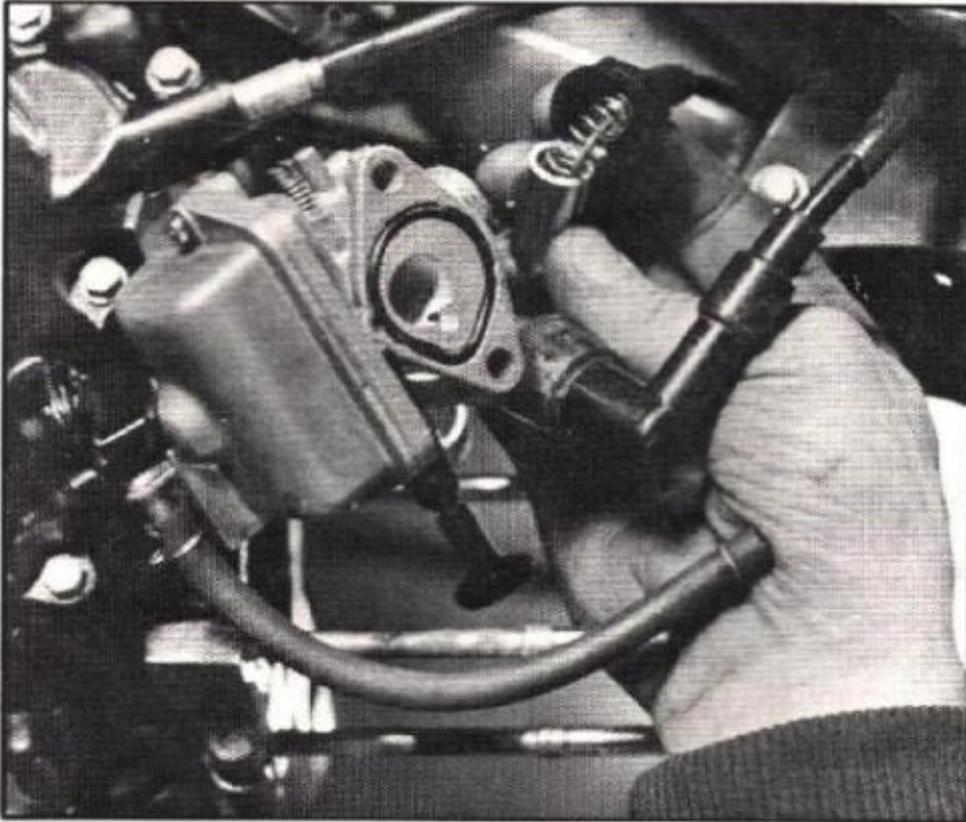
We took out the baffle from the rear of the silencer and after examining it decided to leave it standard for the time being.

The head has so far not been touched, but the inlet manifold has been opened out as detailed in diagram E of the first part of the series.

This led us to look at the carburettor, which has a tiny 14mm bore. To match it to the inlet manifold meant it would have to be bored out.

The important consideration here is not to go beyond the width of the carb slide bore otherwise air would be allowed to enter the engine from either side of the slide instead of from below only.

The slide bore measures 17mm in diameter and the inlet bore was milled out to just a touch under that measurement.



***Carb has been bored and top of slide machined off. NB: Metal thickness between lower part of bore and rubber-seal ring is unaltered.***

Another important consideration is that the lower face of the inlet bore needs to remain unaltered for jetting purposes so the carb has to be bored eccentrically. In other words, it is rather similar to raising the exhaust port.

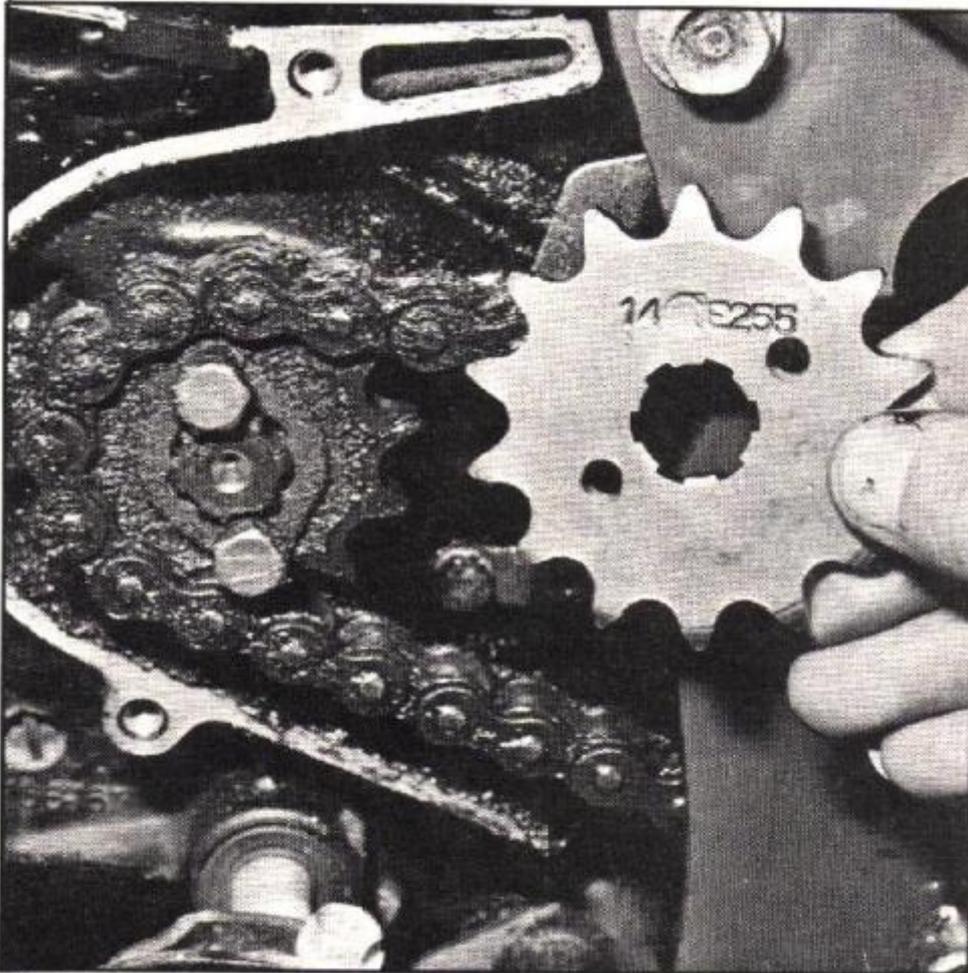
A further problem is created as a progression from this. Because the inlet bore has been heightened the bottom edge of the slide remains hanging down on full throttle.

This obviously would act as an obstruction to gas flow. The cure is to machine away the top of the slide until the lower edge can be pulled up high enough to be flush with the ceiling of the inlet bore when on full throttle.

Now, many of you may not wish to go to the expense of having parts machined, or take the risk of something possibly going wrong.

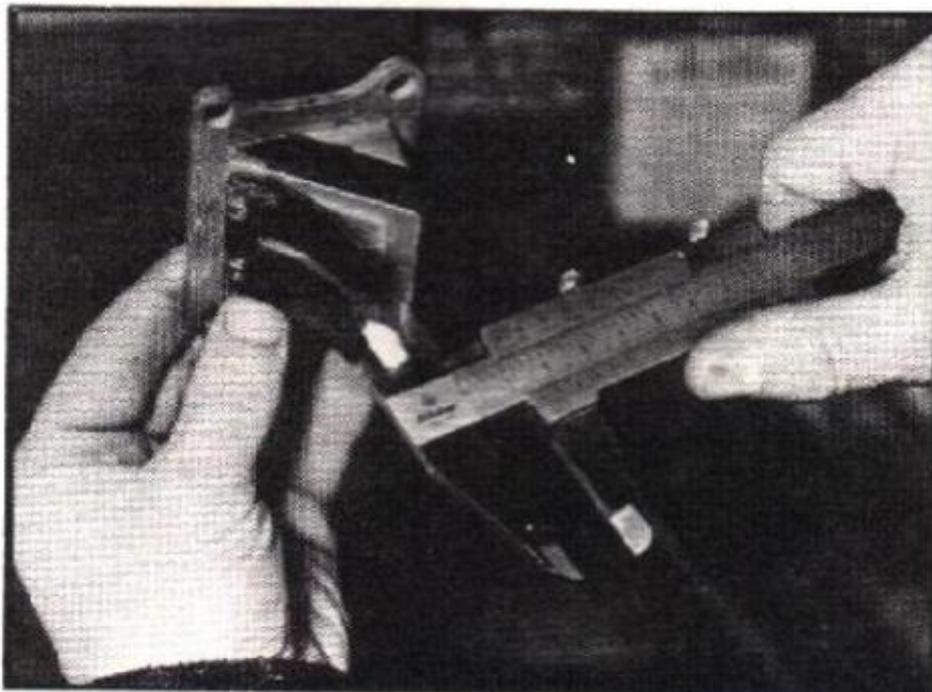
If you wish to limit yourselves to bolt-on modifications only we suggest the following:

Step 1: Fit a 14-tooth drive sprocket in place of the 12-tooth original.



***To increase overall gearing replace 12-tooth (fitted) drive sprocket with 14-tooth alternative.***

Step 2: Fit the Boyesen reed. While you are at it you might as well invest the £5 or so in a riffler to file away ridges on the inlet port. This would allow you to make full use of the new fibre reeds by opening the stops to 12.5mm.

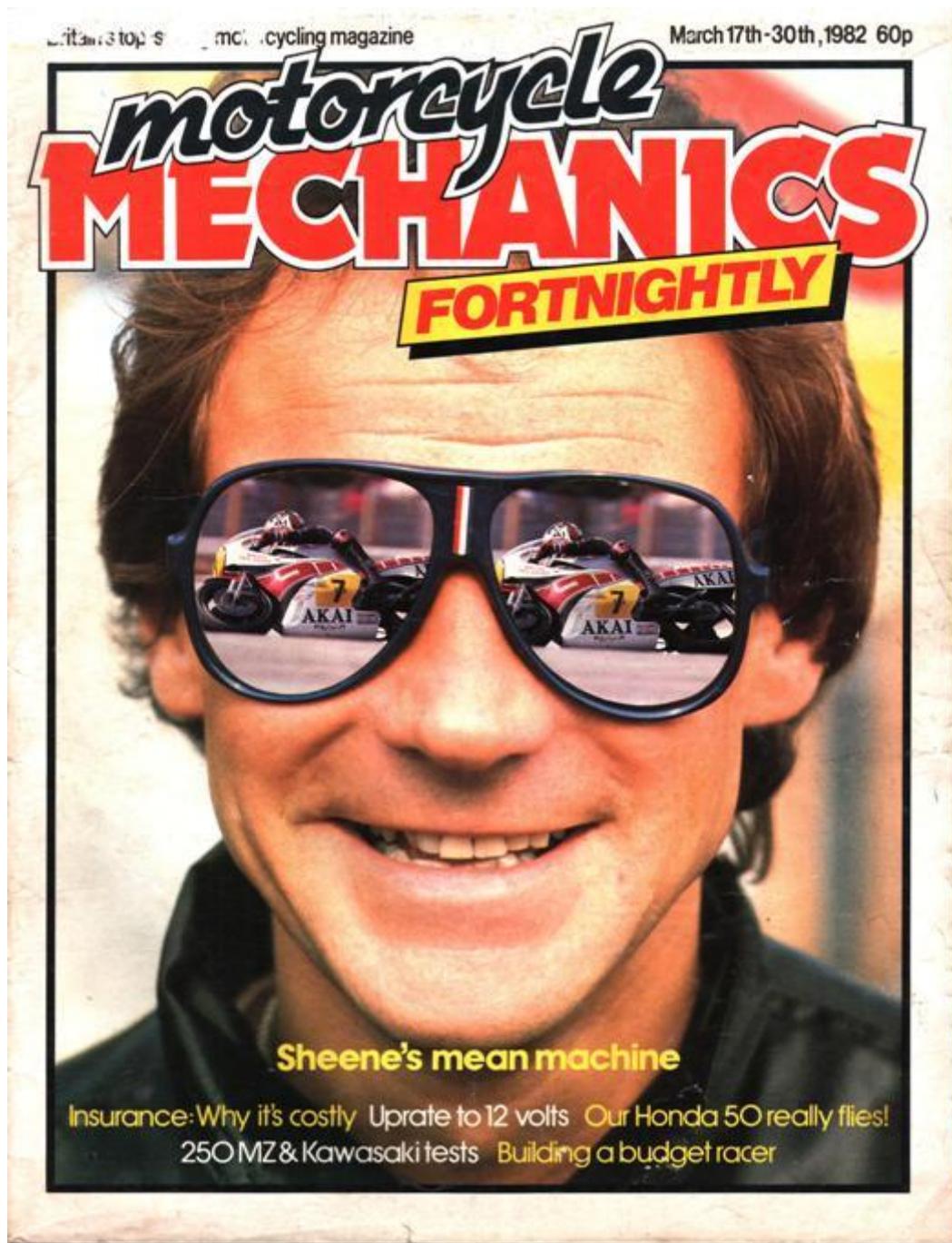


***With the two-stage Boyesen reeds fitted the stops can be pulled back to 12.5mm.***

**FEBRUARY 3 1982**

That's it for this issue. Next time we are hoping to be able to bring you some speed figures. at present we are looking for a double score target - 60 mph top speed instead of the weak-kneed 30 mph the bike was born with. Fingers crossed.

# Motorcycle Mechanics Project 60 mph MB5! Part 3



# Way off the clock

In our quest for a 100 per cent improvement in top speed from our Honda MB50 project bike, recent MIRA speed trials have put us 60 per cent of the way there.

When we first obtained the machine it was speed trapped at MIRA in stock form at 31 mph and with a standing quarter-mile of 33 sec.

The news is now a top speed of 49.70 mph and a standing quarter time of 24.27 secs electronically timed at MIRA.

It was on the standing quarter run that the Honda recorded its best top speed. This indicates that it might have been able to pull slightly higher gearing for the top speed runs and break into the 50 mph bracket.

we were hoping for even better results from these initial speed tests

But after reflecting on the results we concluded that it was rather too much too soon. After all a 60 per cent improvement in top speed is not to be sneezed at.

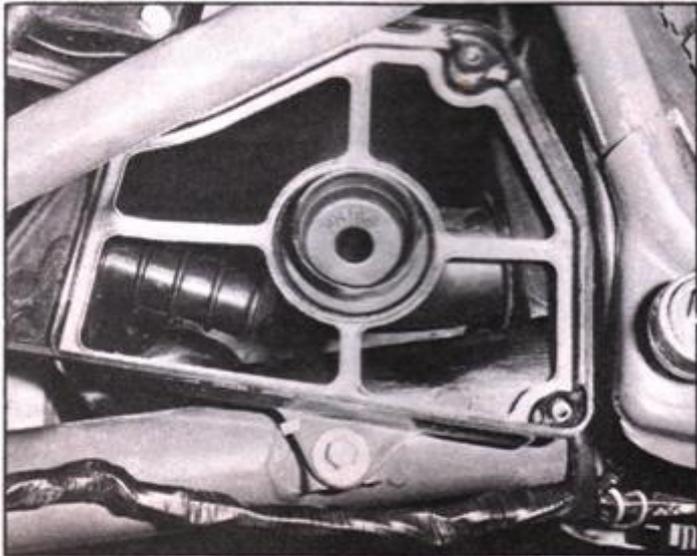
To find out exactly what has been done to the engine you will have to look back to our first two parts reported in the January 6-19 february 3-16 issues.

After completing the tuning modifications detailed in those issues the next step was to examine the air box.

In order to give the carburettor, bored from 14 to 17mm, a better chance to breathe, the air filter sponge was removed. The air box was left in place.

Since the object of the exercise is to get performance from the engine as an initial project the removal of the filter was justified. At least leaving the air box with its intake and exit trumpets in place cuts down on the likelihood of particles of any size getting into the motor.

With the intake system modified to quite an extent it was hoped the engine would breathe harder. Consequently it would need a larger main jet to allow more fuel to pass into the engine.



***Air filter foam has been removed but the airbox shown here has so far been retained.***

The carburettor was set with its needle pegged in its lowest groove i.e. so that it was high as possible when at rest. This enrichens the mid range mixture.

In standard form, a size 60 Keihin main jet was found to be fitted. This was replaced by a size 65 as a starting point.

With the engine completely reassembled and ready to go it was fired up, and although it ran it was not able to pull at high revs.

The carburettor was removed to check the float height. But the float is a plastic item which is not really adjustable. So the 65 main jet was substituted by a size 70.

This was a vast improvement. It may have been that some dirt has found its way into the carb and fuel lines while the machine has been standing, thus not giving the 65 a chance.



Whatever, the oversuited rider I had collared to give it a quick try in the lower gears outside our workshop said it was going well.

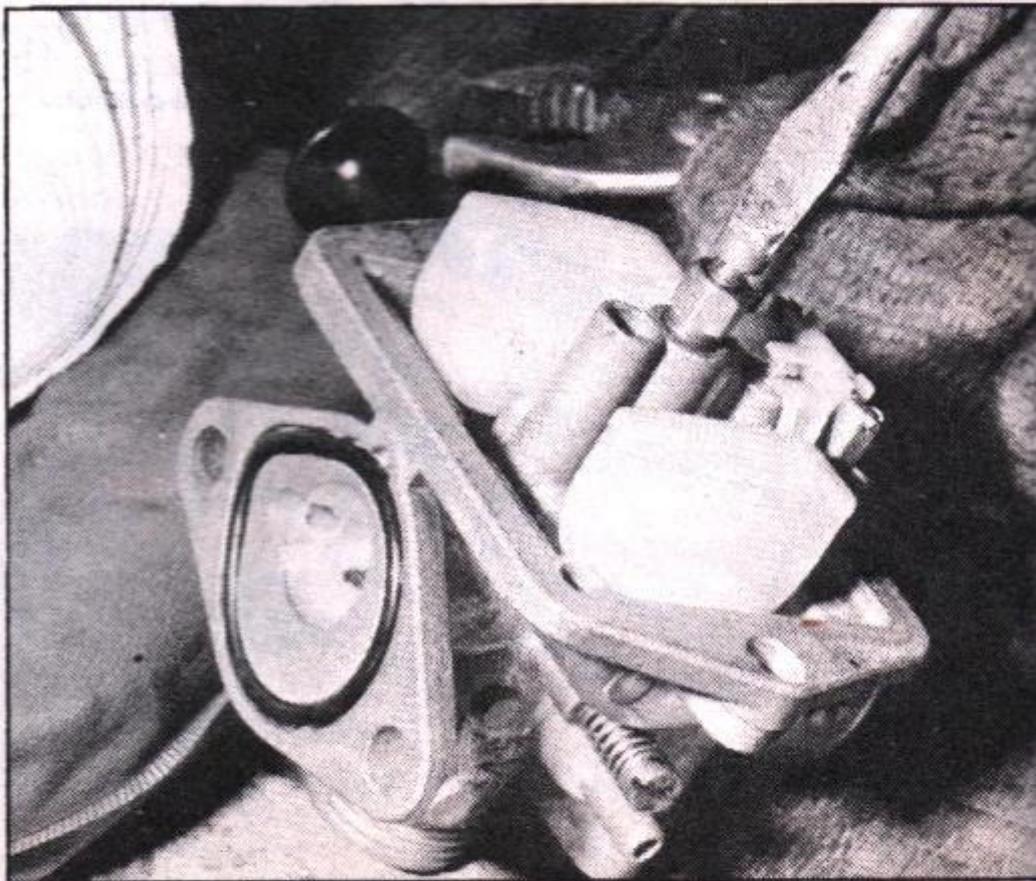
Since it was raining and late evening I took his word and made plans to get it to MIRA at a later date.

Two days later we were at the MIRA proving ground in Warwickshire. The Honda fired willingly but needed a lot choke.

It still didn't want to rev out unless the choke was left on feeding it extra fuel. It also ran better with throttle not quite fully open

This all pointed to too small a main jet. Checking the new harder grade B9ES NGK plug showed that the problem wasn't drastic so the Honda was run through the lights giving a standing quarter of 25.61 sec / 45.96mph terminal, and top gear roll on from 30mph indicated of 22.76sec / 47.33mph terminal speed which was also its highest speed.

Pushing the choke off simply slowed the bike down. So a size 90 jet replaced the size 70.



**Changing the main jet. Currently a size 90 is in use.**

**MOTORCYCLE MECHANICS**

This was much better. the engine revved out with the choke off. it pulled almost 10,000rpm in the lower gears and went through the lights in top (fifth) at 9500rpm. In its previous restricted form it had run out of useful power at 7000rpm.

The engine also responded to the throttle much better. While restricted it was slow to respond, gaining revs gradually like a turbine. Now it was crisp and instantaneous like a performance two stroke should be.

The engine felt like it wanted to be revved. Not much happened below 6000rpm, but above that it sung out, freed at last from its red tape restrictions and promising more power to come with the right modifications.

the standing quarter time improved marginally to 24.27 sec / 49.51 mph terminal, and top gear roll on to 22.40 sec / 49.70 mph terminal which also turned out to be its best speed.

That day we were blessed with a strong tail wind which obviously helped the speeds. It would have been nice to try a few more runs just to crack the 50 mph barrier. but the track was booked to another party and our time was up.

At least this first speed session had proved that the Honda detailed modifications (part1) and those of our own were on the right track.

Since it was already pulling 9500rpm in top, higher gearing will be necessary for possible future increases in speed. The drive sprocket has already been increased from the standard 12 to a 14 tooth FM sprockets item. There's no more space for a bigger one so a smaller rear sprocket will be needed at the back.

What's it like on the road? More than 100 per cent better than it was in stock trim.

The best top speed so far has been when a lorry overtook me and the slipstream let the revs rise to 10800rpm which computes to 56.5mph - way off the 46mph speedo. The best speed downhill has been 55.5mph at 10,600rpm. That 60mph initial goal is not that far away!

# HONDA MB50 speed tune — part three

*Below: The Honda now spends most of the time well off the speedo which ends its calibrations at 46mph.*

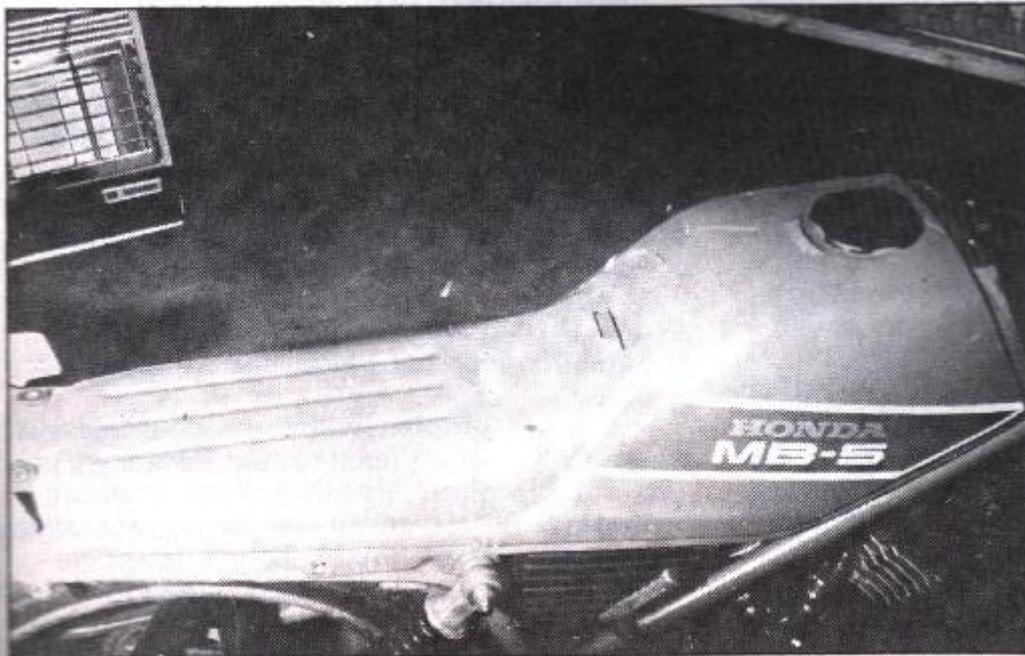


*The exhaust front pipe has been painted with Hermetite engine lacquer, and the barrel with blue Spectra heat resistant paint.*

Over 100 flat-out road miles have proved that the jetting meets the engines requirements. Best of all the Honda climbs the Northamptonshire hills in top gear. Before it was tuned the occasional downchange was necessary.

Also I can actually overtake cars. the needle rarely drops below 40mph indicated and the bike is much safer in that it can keep up with traffic flow.

At last the brakes and suspension have some work to do. The good news is that they are well up to the increases in performance.



*An interesting feature of the MB50 is that the fuel tank extends under the seat.*

MARCH 17 1982

# Motorcycle Mechanics Project 60 mph MB5! Part 4

Britain's top-selling motorcycling magazine

April 28th-May 11th, 1982



The cover features a central photograph of a motorcyclist in a black and red racing suit and helmet, riding a red motorcycle on a road. The background shows a hilly landscape under a clear sky.

**motorcycle**  
**MECHANICS**  
**NIGHTLY**

**Fiery flat-tracker**

**60p**

**Guzzi California:  
Cruiser or bruiser?**

**Flying tonight-  
Honda 50 tune-up**

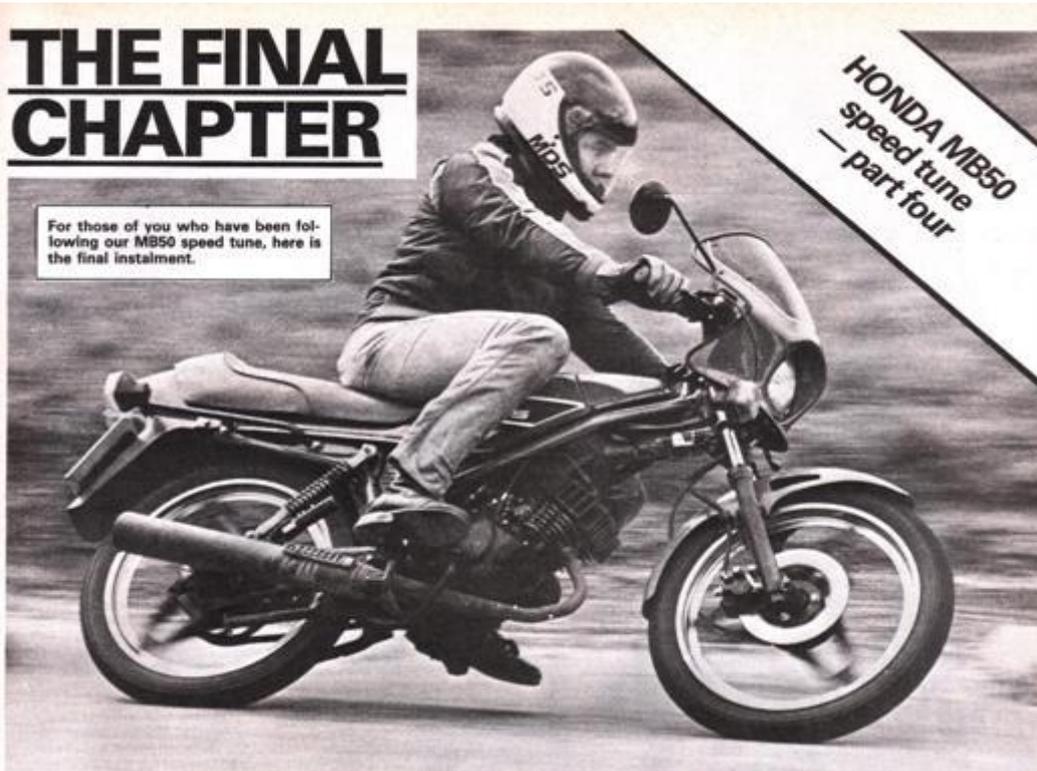
**RS250DX and HT100 check-out**

**Leathers: How not to get skinned**

# THE FINAL CHAPTER

For those of you who have been following our MB50 speed tune, here is the final instalment.

HONDA MB50  
speed tune  
— part four



So far when tuning our MB50, we have always taken the lesser of the options open to us, aiming for a series of gradual improvements rather than going for maximum power right from the start. For example, where it was possible to raise the exhaust port by 7mm, we only lifted it 5mm. Similarly, we were pretty conservative with alterations to the transfer and inlet ports.

But now there is no going back! And of course, we've been criticised quite heavily by a couple of organisations and not a few individuals as well. But at no time have we told people that they should alter their engines and we have been at pains to point out the legal complications involved in so doing.

Anyway from the readers letters we have received, it's obvious that the thing you are interested in is the performance so here goes....



You may remember that we bored the standard carburettor out from 14mm to 17mm and then altered the inlet manifold to match. Just too late for this final part of the story, we found out that the Kawasaki AR80 has an 18mm carb. Fitting this would be a worthwhile experiment for anyone who has the time and the inclination.

We have raised the exhaust port by a further 2mm, giving a total increase of 7mm over the standard height. We've also cleaned up the rest of the port, carving away some of the metal to give a smoother flow of burnt gases from the combustion chamber. The tops of the transfer ports have now been raised by a further 1mm, giving a total height increase over standard of 2.5mm.

Early on in this series, we achieved a very significant gain in performance by cutting away the extended primary pipe in the exhaust header pipe (Mechanics Feb 3rd -16th 1982). Since then, we have tried out some aftermarket expansion boxes. True some of the chambers we tried made the bike sound more like a racer, but that was all they did. They did nothing for the performance. In the end, we decided that the modified standard system gave the best engine performance in terms of flexibility and exhaust outlet noise.

We did make one mistake though. A photograph in the March 17th - 30th issue of Mechanics showed that we were using Hermetite engine lacquer to paint the exhaust. We were indebted to Hermetite for pointing out that this paint only has a service temperature of 150 degrees centigrade - too low for the heat of the pipe it was used on. We should have used Hermetite Pot Black which is now available to withstand temperatures of up to 450 degrees centigrade.

One item we have changed is the cylinder head. Our MB now sports a service exchange head from Haywood Power. This has given us a modest increase in compression ratio and, used in conjunction with the modifications we have already listed, it seems to be a worthwhile investment at £9 including postage and packing plus your old head.



**The MB's registration plate minus the speed restriction figure. One last time, don't tune yours up like ours unless you're legally allowed to use it on the road.**

The main effect of increasing the secondary compression ratio is the increased mep (mean effective pressure) of the engine which is perhaps more useful than an increase in absolute power at peak

revs. It's not much use on a road bike to have a 65mph top speed if the power band has to be cut to a ridiculously narrow limits to achieve it. The thing would be almost unrideable in traffic.

Our final maximum speed came out at 50.5mph with the rev counter well over the 10,000rpm mark. we have already fitted a 14 tooth engine sprocket (two more teeth than standard) but it seems that the machine could pull even taller gearing quite happily. Although it would not be quite so easy to ride as it is now.

We reckon that the state of tune we have now reached with our MB is just about right for road use. There is undoubtedly more power available from the engine but only at the cost of flexibility.

One big criticism that was levelled at Mechanics was that the standard frame and chassis parts would not be able to cope with the increased power. Well, we're happy to be able to say that they were wrong. The frame and suspension work as well if not better at 50mph than they did at 30mph. The same is true of the brakes. If anything, the MB in restricted form was overbraked, now it is just right.

Well that's about it. If you want to be the next owner of our MB50, cut out the coupon below and see the next issue of Mechanics.

WIN +++ WIN +++ WIN +++ WIN +++ WIN +++ WIN +++ WIN +++

Now you can win this fabulous little flyer. Cut out and keep this coupon which you will need to enter our free competition in the next issue. Don't miss it!

**HONDA MB50**  
competition  
voucher 1

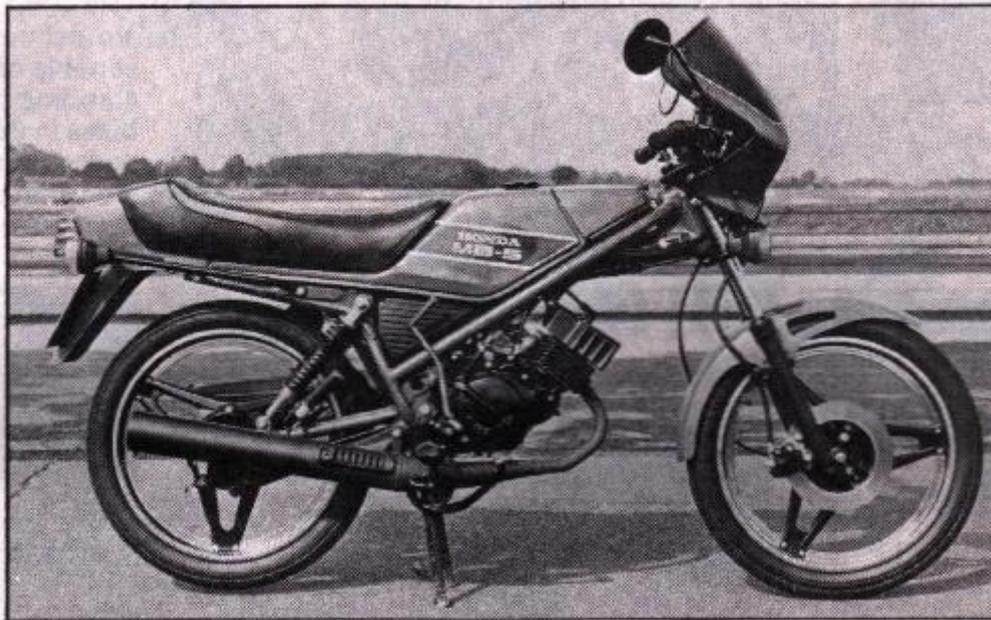
WIN +++ WIN +++ WIN

30 MOTORCYCLE MECHANICS

No don't cut out the coupon! Don't forget this is an extract from a 1982 magazine article!

Seriously does anybody know what became of this unique MB5?

If you have any details email me via the contacts page



**Our Honda MB50 flier.**

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### **MB50 kits**

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I READ with great interest your article on tuning a Honda MB50. Honda say tuning them makes them "unreliable disasters." Why then in Holland do Honda dealers sell de-restriction kits for them? Are they selling them knowing they make the bike unreliable?

I have bought one of these kits and am very pleased with the performance. My bike now accelerates well and I can now go 46mph plus on level ground with a pillion.

I have read a test in an American

magazine of the Honda MB50 and they say it revs to 10,500rpm and is capable of 50mph.

Are Honda selling "unreliable disasters" in the USA?

Over here, *MCM* costs £1.20 and you can only ride a bike bigger than 50cc if you are 18. And in England people think it's bad with the 125 learner law!

**M. Whittle,  
Den Haag,  
Holland.**

● Yes, we've heard about these kits in Holland and we'll give more details in a later issue — Editor.