7.5 Chains and Sprockets

"DEM DRY DRY CHAINS"

by Theoreticus.

Anyone who has ridden a Scott with a good motor, carburetion and ignition just right, and fitted with a brand new set of chains, perfectly adjusted, could not fail to enthuse upon it's absolute silken smoothness and it's purring, innocent desire to please. But how many Scotts on the road display even a fraction of this ultimate in perfection? Not many in the experience of the writer, and probably the first thing to mar the idyllic state once it has been achieved, is the clashing of tortured chains after the first fifty miles of fistfulls. The ride back from Brighton after the Pioneer Run was halted for over an hour to allow the assistance rendered by Magbutton Mike of the Pease Bros. Eporium to a Scott Owner who had suffered his magneto chain completely broken in two. The sight of this tattered, rusty string of agony being fed patiently back onto the sprockets by Mike's rouge red fingers has prompted the writer to scribe this screed on the subject in YOWL.

CHAIN STRUCTURE.

The way to successfully solving any problem lies best through an understanding of the principles involved, so a paragraph or two on chain structure, wear, and lubrication must come first. A simple way to see how a roller chain is made up is to fully dismantle a complete inner and outer link set with a rivet extractor. Then try and understand the following description.

Each swivelling joint is built up upon the pin whose ends appear, lightly riveted, through the outer link plates. Around this pin is the bush which on most chain is reduced in diameter at it's ends where it fits into the inner plates. Because of these shouldered ends, the inner plates cannot gradually work inwards and bind the roller which is fitted over the bush and should be free to rotate upon it. In addition, the ends of the bushes are usually peened in some way or other to prevent the inner link plates working their way outward and jamming against the outer link plates, and making the joints go stiff.

CHAIN ACION.

As the chain circuits the revolving sprockets, each joint is bent once and straightened once at each sprocket; in a simple two shaft arrangement this means four actions per circuit of the chain at each pivot. Where sprockets have only a few teeth, the bending is through quite a large angle, which means hard wear, but since even the magneto drive on a Scott has at least twenty teeth, the transmissions should suffer only a slow rate of wear. Normally the greatest wear occurs on the ends of the taut run of the chain since the loading on the slack run is only due to the weight of the chain and the centrifugal throw outward. If the chain is slack, however, or has a few bad links, it oscillates in the slack run and each joint is bent many times extra. This leads to excessive wear and noise. When a chain and sprocket are new, the rollers drop neatly

between the sprocket teeth and as the driving sprocket revolves each tooth picks up a roller, which rotates slightly as it rolls into the hollow in front of the tooth. If the inner link section is on the sprocket and the outer section just off of it, the pin and bush take the load as the joint pivots. If the outer is on and the inner just off the sprocket, the roller being supported by the tooth supports in turn the bush inside it and relieves to some extent the pressure between bush and pin as the joint bends. At first sight this would appear to mean that alternate joints get more wear than their neighbours, but it must be remembered that, at the other end of the chain run, the situation is reversed. All parts of a chain, where rubbing takes place suffer some where, but the most significant point is at the pivot. The pins develop flats and wear into the bushes on the pressure sufaces, and the main result is an overhall elongation of the chain. This first shows up as slackness, which, if not taken up by adjustment to the shaft positions, leads to clashing and backlash in the drive. Bang goes the silky smoothness. After many such adjustments the chain has to have a link removed, the shaft being taken forward again. It is, at about this point that the second phenomenom becomes noticeable. The chain no longer hugs the sprocket, but tends to ride up the teeth on the slack run. The pitch of chain and sprockets are no longer the same, and rollers strike well up the teeth. Extra rubbing also occurs as a roller escapes from each tooth of the driven sprocket on the taut run. This means extra wear on the sprockets and, since these are usually expensive, it is false economy to fit half links to extend the useful life of chains where the sprockets are in good condition. Owing to the drive being predominantly in one direction, this wear occurs more on one face of the teeth than on the other and leads eventually to a hook-like form. If a new chain is fitted to sprockets approaching this condition, the rollers are not supported by the teeth as the joints pivot and this leads to unnecessary wear on the new chain.

CAUSES OF CHAIN DETERIORATION.

Where a chain transmission runs in an enclosed oilbath with clean oil,it is extremely long lived & reliable. Few practical oilbaths meet these conditions, particularly where crankcase breathers discharge the acid blow by gases from a worn top half into the chain enclosure. Where a chain runs exposed it suffers from rusting in the pivots. This rust is abrasive and once rusting starts the joint wears rapidly, and unless the rust is disolved out, oiling alone will not eliminate wear in joints so affected. If a group of worn links are on a sprocket, their pitch is compressed back to normaland the chain appears tight, but when these bad links are in either chain run, the chain goes slack. Whilst in the slack run these links oscillate and suffer further detioration. When in the taut run the opposing links in the slack run likewise suffer extra wear and the outcome is the development of the familiar two 'tight spots'. Once started the process develops by itself.Road grit is another cause of wear for,when

mixed with oil, it makes an excellent lapping compound. Chain wear from this cause is mainly external, but the worst sufferers are the sprockets. Even good chains will wear their way into the the spaces between the teeth, the sprockets then become short in pitch, hardened sprockets suffering almost as badly as mild ones.

LUBRICATION.

The four common means of lubricating chains are; (1) immersion, usually in an oilbath; (2) periodic cleaning and impregnation with a semi-solid lubricant; (3) feeding the chain with, or running it in, an oily vapour; (4) drip feed of oil.

The first is that usually employed for primary chains, some auxilliary drives, and final drives on luxury machines in the era when all the latest things on modern machines were thought out. The second method is the best a careful rider can do for his rear drive chain on most machines, even to this day. It is not much use however, unless backed up by a weekly application of the oil can, and even then more wear occurs due to corrosion than the work done. Number three is often relied upon for magneto, dynamo or camshaft drives. Some machines use vapour from the crankcase to wet the final drive chain, and an early Velocette two-stroke used a feed from one silencer to the primary chain. On a Scott machine, none of these first three are easy or sufficiently reliable and many machines run their entire life span revelling in the luxury of a squirt round with an oil can when the owner has time. The drips of reddened oil on the ground after the treatment is a tribute to its efficiency. The answer here lies in the old adage, 'a little and often' and the only reliable method is an automatic feed. This is most conveniently arranged by taking a gravity feed from the oil tank through a metering tap down to the chain. 1949 and 1950 Scotts had a very neat arrangement under the separate oil tank, but the oil mearly dropped on the primary chain on top of the clutch. If left on with the engine stationery it ran into the clutch and wrote off the linings, but at the same time, with the engine running the oil was immediately slung off without penetrating to the pivots where it was vitally needed. Very reminiscent of a well-known O.H.C. single which for many years was made with what seemed to be high pressure external lubrication of the cambox, and drip feed to the cylinder fins.

But, joking aside, there is only one place to oil, and that is on the edges of the link plates on top of the lower chain run. In this way the oil is thrown radially outward as the chain circuits to the next sprocket and is forced between the link plates into the pivots. Plenty will persist inside and outside the roller and on the sprockets if Ted Murphy's reccomended four drops per minute are used. At speed, one drop will oil half a dozen links, and on an average, each pivot gets oiled every few minutes. The chain oiler is turned on or off at the same time as the petrol and with this treatment chains will always look like new and the primary chain needing adjustment every 1,500 miles only. A special double

V1/6 July 1959

'DEM DRY DRY CHAINS' (cont'd.)

feeder is desirable, but perfectly good results can be obtained by oiling one edge. Once the oil is inside it will spread across the full width almost instantly. The best point to apply the oil is just before the chain goes onto the driven sprocket, so that the drops are not dissipated, or shaken off, before the centrifugal forces get to work at the sprocket. At this point, also, the chain does not vibrate, even when the drive is slack. The feeder, therefore, may be brought close to it with accompanying greater certainty of putting the oil where it is wanted. Applications of this principle to the lubrication of Scott chains, and how to get rid of the used oil, will be dealt with in the next issue of YOWL.

V7/1 Sept. 1970

YOUR CHAIN CAN BE METHUSELAH!

Members may find it a little hard to believe that I fitted a new chain to my Super Squirrel a couple of years ago before the 750 mile Beira Rally. It was used for the whole of that year, then before last year's Beira, it was taken off, boiled and refitted. Another six months passed by and the Super clocked 2,000 miles plus on the Durban Jo'burg Run. A mere fraction of adjustment and it seems as good as ever and good for another 5,000 miles!

The secret is a piece of 3/8 inch felt on a bracket below the magneto. A pair of 'fingers' cut in the felt just touch the primary and magneto chains as they thrash around. A drip feed from the oil tank keeps the felt barely moist and that is that! (I do also have a disc of soft leather next to the crankshaft sprocket to ensure that all oil escaping from the main bearing finds it's way on the chain. Avisoil)

Have always fitted a guard to the rear chain LOWER run so there is no great quantity of much being thrown forward, but I'm sure the oil-pad is the key to success.

Neil Smith, Salisbury, Rhodesia.

CHAINS

V7/6 July 1971

Some people seem to be pre-occupied with these—we have people lauding the new four figure priced B.M.W. because of the lack of 'em—Motorcycle Sport reporting that John Mugleston was warned by Tom Ward about thrashing chains and other imperfections when taking to Scotting—poor George Woodward almost driven to despair in sunny New Zealand in his struggle to find a remedy for adjustment, and so on.

The weekly m/c press carry adverts for quite expensive conversions for the Japanese "super" bikes in order that British equipment can be fitted, so it is thought that the following item may be of interest to members.

Messrs. Duckhams, well known by Scott riders for their oil, now market "Chainguard" a completely new type of grease specifically for motorcycle chains. To use the grease, it is similar to the old "Boiling in tallow" method. The grease is sold in a tin which is big enough to accommodate the largest motor-cycle chain, so the chain can be coiled and dropped in the tin which is then placed over the gas ring. When the grease reaches a creamy constituency, remove from the heat and allow the chain to drip. After a few minutes, the surplus is then wiped off and the chain is ready for refitting. There is enough grease for about 15 applications—price 42½p. More from Duckhams, Summit House, West Wickham, Kent, or most dealers, if you're interested.

Reprinted from Renold leaflet 312/26 of 1956.

NOTES ON FITTING CHAIN OILERS

General: These notes have been compiled for the use of riders who wish to fit chain oilers, and represent essentials that have been determined from our experience in motorcycle racing. The duplex feed has been developed for Norton "Featherbed" machines, but the principles are equally applicable to any other model or make.

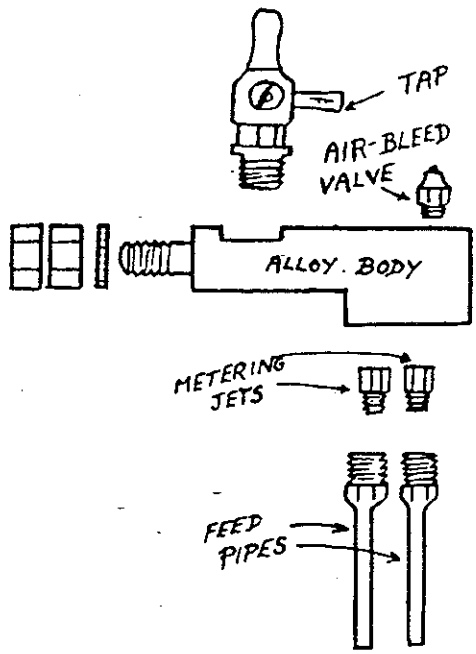
1. It is essential to have an independent oil supply (approximately half a pint) to the chain oiler, so that a suitable grade of oil may be used irrespective of the normal engine lubricant. Generally, any branded commercial oil SAE 30 is suitable.

2. The actual drip feed should incorporate copper pipes for at least two-thirds of the distance between the fitting and the run of the chain; the final 1" between the pipe and the chain being rubber pipes. Long flexible pipes defeat the object of the oiler as they allow the feed to be defected from the chain.

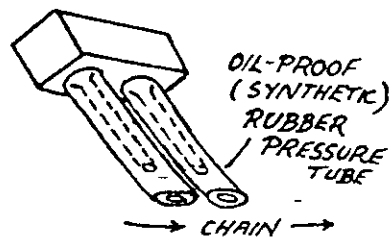
3. The control of the rate of flow (6/8 drops per minute from each pipe) can be conveniently arranged by incorporating standard No. 30 Amal jets which will be found to meter SAE 30 oil at approximately the rate indicated.

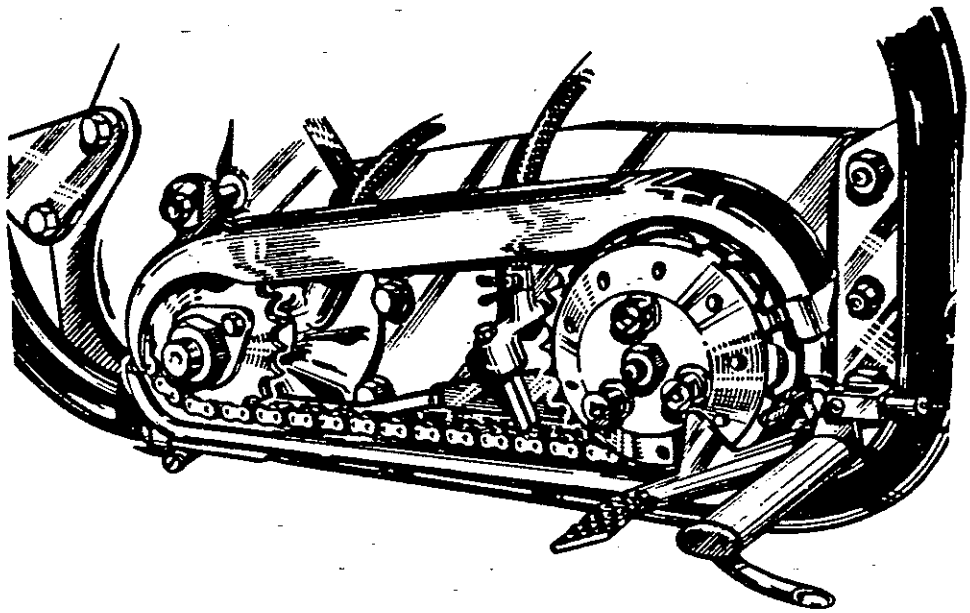
4. It is important to avoid an airlock between the oil tank and the jets; and provision should be made in the jet block for bleeding air. A small ball grease nipple which can be depressed by thin wire makes a suitable form of airbleed.

5. Only one tap is required — on the oiler itself, so that a head of oil is maintained. This tap should be set so that the handle is in the lowest position to which it can be turned when the tap is open.

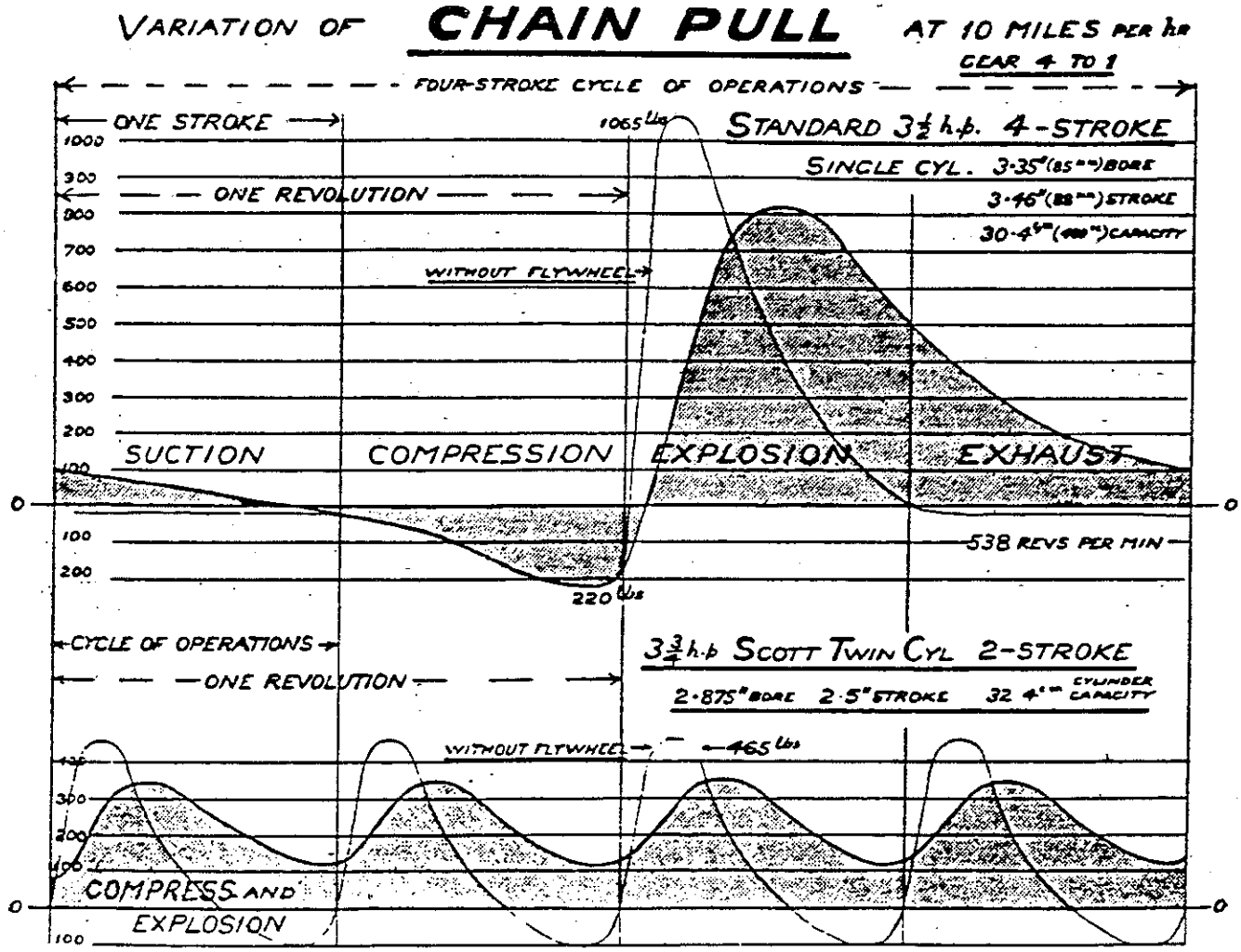


Sketches of the standard Renold oiler. For Scott primary chain lubrication, modify and mount on a long threaded rod between crankcase walls, adjusting by locknuts.





The most efficient position for a chain oiler is inside the lower run — just before the clutch sprocket — and the only really worthwhile type is the duplex model developed by Renold Chains Ltd. and described in their leaflet 312/26 of 1956. (Now unfortunately, out of print.) This sketch of Geoff Monty's Norton transmission was made by Bruce Smith and the block kindly provided by **Motor Cycle News.** The accompanying notes are reproduced from the Renold leaflet. It should be noted that the 6/8 drops per minute quoted is for racing conditions.



THE AGONY OF A FINAL CHAIN

The chain pull chart opposite is reproduced from a 1915-16 Motorcyclists Handbook. The Editor was evidently pro-Scott. I believe these charts were first published in pre-war Scott catalogues. One would have thought from this graph that a Scott chain would have lasted a lot longer, especially with the later cush hubs, but mine never seem to.

SPOT-ON TWO-SPEEDER CHAIN ADJUSTMENT

G. R. Reeves

Recently I had to dismantle my two-speed gear to fit a new bearing. When I looked at the two gear lugs I thought I would devise a once-and-for-all method of getting accurate alignment without using the angular measurement suggested in the Book of the Scott. This is what came up: a length of mild steel ⅔" long. The ends were turned down to ½" diameter at one end (to stick though the hollow bolt hole about ½"), the other end to stick out about ½" beyond the slot in the gear pedal side lug. The ⅔" diameter of course sits in the slots in the lug. Now measure from the door strap stud to the ½" diameter each side — I used a vernier calliper gauge, but you could use a rule. When both measurements are equal, tighten lug and re-check.

Now measure from edge of lug along the frame about ½", and scribe a line; do this on both sides. You now have two reference points, one on each side. When adjusting chains, provided the distance from scribed line to edge of lug is equal on both sides, you will retain the alignment.

CHAIN CHATTER — or clatter!

I was interested to read that Keith Rhodes has a formula for calculating chain centres accurately; could he let all have the benefit of it!

Correct tensioning of two-speeder chains has always been an almost impossible problem to solve if one is fussy about sprocket alignment. That most 2-speeder riders have not been so fussy is apparent from the wear which is nearly always evident on the sides of the high and low gear sprocket teeth!

To set the record straight, the standard low gear sprockets supplied by Scotts had either 40 or 47 teeth (plus for some models only, a close ratio 36 tooth sprocket).

At one time or another, I have used each of these sizes and with new chains there is no doubt that it is not possible to achieve ideal chain tension *AND* perfect alignment with any of them.

What I have found though, is that (especially when pulling a sidecar) the much higher rate of wear of high gear chains completely overshadows the tensioning problem experienced with new chains. Contrary to expectations, with all that oil flying about from the gear lubrication system, the high speed gear chain very soon dries out and rapid wear takes place, in spite of regularly stewing it in 'Chainguard'. The only answer to this is a controlled oil feed straight to the bottom run of the chain. The low gear chain appears to retain its lubrication adequately, as does the rear chain. The mag: chain requires regular attention to prevent link seizure.

Of the three Scott-specified low gear sprockets, if I remember correctly, the 47 tooth one is the worst from chain tension point of view, because even with new chains the high speed gear is the slacker of the two, and this situation gets worse as the high gear chain wears. By the time you have gone through about 3 high speed chains, the low gear chain has worn enough to even things up a bit.

Moral: Don't replace low gear chains unnecessarily!

Without Keith Rhodes formula, I cannot say whether a 46 tooth low gear sprocket gives a better compromise. My guess is that it does by ensuring that the high gear chain is initially tighter than the low gear chain and therefore tending to even up as wear takes place.

For very hilly country even with the early 532cc machines, it is possible that a change of driving sprockets from 22 teeth down to 21 or even 20 will be beneficial, though this will, of course tend to reduce the cruising speed on level ground as engine R.P.M. is often limited by vibration where iron pistons are fitted.

With my sidecar outfit, I am now using a curious set of ratios, originally installed for the Manx Week lap of the T.T. circuit, but even in hilly Bucks it works surprisingly well.

Low gear is 36 teeth, final drive 19 to 75 teeth, giving overall ratios of 4.93 and 7.11 to 1. It will not tackle 1 in 4 hills, about 1 in 6 being the limit, but for the majority of hilly runs the close bottom gear is an advantage as it allows the engine to run cooler (i.e., it goes further up before coming to the boil!) Maximum cruising speed is about 50 m.p.h.

I hope all this has not confused everyone even more.

TED FARGUS.

CHAINS
(From 1926 Edition of the Scott Handbook)

1. To adjust Engine Chains (Two Speed models)
   Engine chains are adjusted by sliding the gear backward or forward

along the frame tubes having first slackened off the bolts under both gear lugs several turns. On the latest models screw adjusters are provided behind each gear lug which makes the operation very simple. On earlier models, the gear can be moved in the desired direction by a few gentle hammer blows using a copper punch or piece of hard wood against the lugs themselves. Alternatively (to avoid possible damage to frame tubes) the left side can be drawn back by depressing the driving chain, and the right side by tapping the gear pedal.

WHEN MAKING ADJUSTMENT ALWAYS MOVE EACH SIDE A LITTLE AT A TIME ALTERNATIVELY.

It is of much more importance to have the gear and chains in perfect alignment than to get both chains in equal tension. This can be done by measuring the distance from the gear spindle to the crankcase door strap clamping bolt which should be the same to within an eighth of an inch on both sides.

NOTE: If the measurement is done with an ordinary rule and not a special gauge allowance should be made for the angularity of the distances between centres on the *pedal side*. The measurement of this side should therefore, be $\frac{1}{8}$ to 1/16 of an inch more than the other side measurement that can be taken parallel to the frame tubes.

Correct adjustment is when the tighter of the two chains can be lifted three eighths of an inch from its normal position half-way between the sprockets. and this at its tightest point. The gear lugs must of course be clamped to the frame tubes, after which the Engine should be turned slowly and the adjustment finally checked.

It is better to run with chains too slack than too tight.

(Above supplied by Con Whitlock)

Re Keith Rhodes letter on chain tension on two speed Scotts with a 47 low gear tooth, the correct length as given on the 1930, machine general data sheet is 78 links low and 66 high gears. now whether this would apply to a 1914 machine I do not know.

It is possible that Alfred in his wisdom decided that it was desirable to have low gear chain on the slack side because the high gear chain gets most of the wear and in due course (sooner if you let them run dry) the high gear chain will stretch and tensions at some point in wear will equal out, it might be worth trying a 66 link high gear chain with the 46 low gear and possibly a cranked link. I have ridden all sorts of two speeders since 1925 but have never had a chain off. the 46 tooth is no doubt the culprit.

Re Best and Lloyd pumps a twin one was made somewhat like a Pilgrim, I never remember seeing one fitted on any machine, was there some trouble with them? Has anyone any experience with one? Len Vale-Onslow had some at his shop on Stratford Road, Birmingham, some years ago.

Left hand twist grip to control the advance and retard of mag were fitted to some Reps and Sprints round about 1929 to 31 or 32. the theory was that you got better acceleration by starting with retard and opening throttle and advancing ignition progressively. I never noticed the difference myself. the snag was if you had a slack wire retard mag you could find yourself running somewhat retarded from fully advance unless the grip was tightened well up so it could not slack. I have one but I have not seen one on a machine for a long time.

CON WHITLOCK

MORE CHAIN CHATTER
(OR THE MISSING FORMULA)

I was pleased to read replies to my query regarding chain tension on the 2-speed Scotts and whilst agreeing with Ted Fargus that standard low gear sprockets were either 40 or 47T. it would also appear that 46T sprockets were also available and fitted as I have a 1919 model with original gear and 46T sprocket. My 1914 model had a 40T sprocket and as this was too high a gear I set out to lower same by fitting a 46T sprocket which I as previously stated gave uneven chain tension to such an extent that the slack chain would not stay on. The original chains were low gear 78 links, and high gear 67 links.

The formula which I have used to establish that with standard High Gear ratio. the *only* gear sprocket to give even chain tensions in 42T is as follows:—

$$L = \left(\frac{2xD}{p} + \frac{N+n}{2} + \frac{Px\,(N-n)^2}{40D}\right)$$

WHERE N = Number of teeth in wheel
n = Number of teeth in Sprocket.
D = Centre distance
L = Number of links in chain
P = Pitch

Thus we get for standard high gear 20/25T sprockets

$$L = \frac{2x11.115}{.5} + \frac{25+20}{2} + \frac{\frac{1}{2}x(25-20)^2}{40x11.115}$$

$$= 44.46 + 22.50 + \frac{12.5}{444.6}$$

$$= 44.46 + 22.50 + .028 = 66.988 \text{ links}$$

i.e. 67 links as specified

If this formula is then repeated subsidising different low gear sprockets it will be found that only 42T gives an accurate linkage, i.e., 76 links.

With 47 tooth sprockets the linkage works out at 78.76, i.e., ¼ of a link short of 79 or ¾ of a link more than recommended thus giving a very slack chain. To the nearest link with 46T it works out at 78.22 links, again ¼ link over-size and slack to the nearest link. I now run it with a 42T sprocket, not quite what I wanted, but it works fine.

Keith Rhodes.

SCOTT

Make and model	*c.c.*	*Year*	*Drive*	*Chain No.*	*Length in links*
Flying Squirrel	498	1927	F	4305	75
			R	5308	92
			M	E7U	69
	596	1927	F	4305	75
			R	5380	92
			M	E7U	69
	498	1928	F	4305	75
			R	5380	94
			M	E7U	69
	596	1928	F	4305	75
			R	5380	94
			M	E7U	69
2-Speed Super Squirrel	—	1929	F	4205	66/78
			R	4305	119
			M	E7U	44
Replica	—	1929	F	4305	70
			R	5380	94
			M	E7U	68
Tourer	—	1929	F	4305	70
			R	5380	94
			M	E7U	68
De Luxe	—	1929	F	4305	70
			R	5380	94
			M	E7U	68
2-Speed Squirrel Solo	486	1925	F	4205	60/72
			R	4305	119
			M	E7U	44
2-Speed Super Squirrel Solo	498	1925	F	4205	66/74
			R	4305	119
			M	E7U	44
2-Speed Standard Solo	596	1925	F	4205	66/78
			R	4305	123
			M	E7U	44
2-Speed Standard Comb.	596	1925	F	4205	66/78
			R	4305	122
			M	E7U	44
2-Speed Squirrel Comb.	596	1925	F	4205	66/78
			R	4305	117
			M	E7U	44
3-Speed Standard Comb.	596	1925	F	4205	66
			R	4305	120
			M	E7U	54
3-Speed Standard Solo	596	1925	F	4205	66
			R	4305	120
			M	E7U	54
2-Speed Squirrel Solo	486	1926/7	F	4205	66/74
	498		R	4305	119
	596		M	E7U	44
2-Speed Touring Solo	596	1926/7	F	4205	66/78
			R	4305	123
			M	E7U	44
2-Speed Squirrel Comb.	596	1926/7	F	4205	66/78
			R	4305	117
			M	E7U	44
2-Speed Touring Comb.	596	1926/7	F	4205	66/78
			R	4305	122
			M	E7U	44
3-Speed Touring Comb.	596	1926/7	F	4205	68
			R	4305	123
			M	E7U	54
3-Speed Squirrel Comb.	596	1926/7	F	4205	68
			R	4305	123
			M	E7U	54
3-Speed Touring Solo	596	1926/7	F	4205	68
			R	4305	123
			M	E7U	54

Extract from 1927 and 1930 Coventry Chain Co. catalogues supplied by member E. J. Horsfall. R = rear, F = front, M = magneto.

Adolfstrasse 110,
5300 Bonn 1, W. Germany.

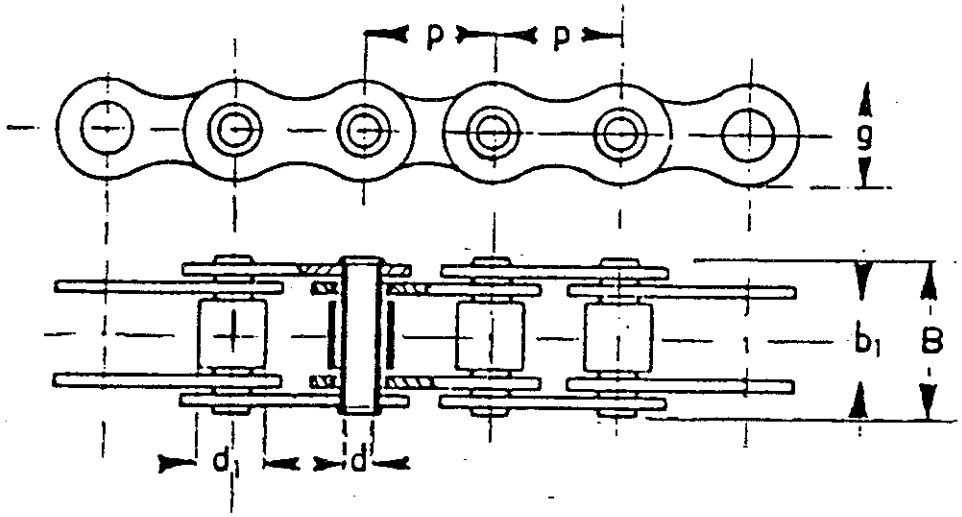
Dear Sir,

Like D. W. Avis in his most enjoyable tale of chains and troubles (*Yowl*, August, 1987) and, I'm sure, many other Scott Owners and riders as well, I had my share of troubles with that magneto chain. I found a solution in using a different-from-push-bike type chain: Wippermann No. 01105, as listed in their catalogue No. K 1072.

They call it a hollow-bolt chain. Its main difference for the purpose I required was that it had loose, not pressed on, inner side plates. My idea in trying this type was this specific construction. Since the inner plates are already loose they cannot become so when running, then pressed off sideways as on the bicycle type chain, seizing with the outer plates after a short while (in spite of generous lubrication). I tried this chain for several years on my 1930 Replica, which I use for Vintage racing, and also on a 1927 Flyer which I rode for a couple of years as my normal road 'bike — and had no trouble at all with the mag. chains any more. The chain has to be rivetted. I obtained a 5 yards length from a local dealer.

A side note: years ago I saw a picture of a Honda Enduro works racer fitted with a rear chain with hollow bolts. The comment accompanying this press photograph emphasised the weight-saving aspect of this detail. I think this was wrong; the mag. chain I use on my Scott is slightly heavier than an ordinary push-bike type chain. I hope that the foregoing will be of some interest to you and the Scott fraternity.

Yours sincerely, Klaus Kretzschmar.



Note: The British dealers for Wippermann chains are Dick Bearings, P.O. Box 28, Blackburn, Lancs BB 22 7S. Tel. 59111, Telex 63197. Type 01105 is ½-inch pitch (12.7 mm), 7.75 mm roller diameter. — Ed.

WIPPERMAN MAGNETO CHAIN

Now that Renold no longer manufacture our push bike size magneto chain, only Wipperman No.18 hollow pin chain seems to be up to the job of being thrashed round and round, whipping up and down, round a small magneto sprocket at up to 5,000 rpm, in the sometimes wet and gritty environment of a Scott crankcase. Try a metre of best push bike racing quality chain and see how long it lasts — Not long at all!

Jim Best phoned me one evening to say that he has located another supplier, (apart from "Sprockets Unlimited") namely Industria Engineering of Eskdale Road, Uxbridge, Middlesex UB8 2SL. When Jim enquired the price (March 88) he was told £10.85 per metre LESS 50% DISCOUNT FOR CASH, which seems remarkably less than Sprockets Unlimited!

The big snag to all this apparently good news is that they don't make connecting links to suit. It has to be rivetted together in-situ, and the cost of the chain splitter/rivetting tool is £25.32 (March 88 price again).

Perhaps the Spares Scheme could look into the situation more fully, perhaps with a view to purchase of the tool for loan to members on request. Does anyone know of any alternatives?

B M

WIPPERMAN II

The glad tidings as conveyed by "Commode" in his article in *"Yowl"* Vol. 16 No. 7 doubtless warmed the hearts of many such as myself who have been beset by Magneto chain problems which they have been unable to solve by conventional means. For me it was a matter of no time at all to put a cheque (very reasonable) in the post and in due course an appropriate length of this interesting chain arrived.

It was only when it came to be fitted that the full implications of the modified G. Clamp and ¼" ball routine became apparent and, in a moment of abstraction, a vision came before my eyes with disturbing clarity. The scene was the top of Shap Fell on the M6 on a wet and windy evening in or around the date of the Stanford Gathering. A stationary two speeder sat at the side of the Motorway and over it bent an elderly gent with his spectacles on the end of his nose and clutching in one benumbed hand a pair of pliers and in the other a ¼" ball. He was obviously expressing himself freely in regard to the task which lay ahead. By the light of a passing headlamp (turned on too early, by some car-bourne moron) I had no difficulty in recognising myself.

This was not to be contemplated. Hence the little gadget as shown in the accompanying sketch which was inspired by a cutting of 1"x½" BMS found in the scrap box and which incorporates both the "extractor" and the "expander" in a unit no larger than a cigarette lighter.

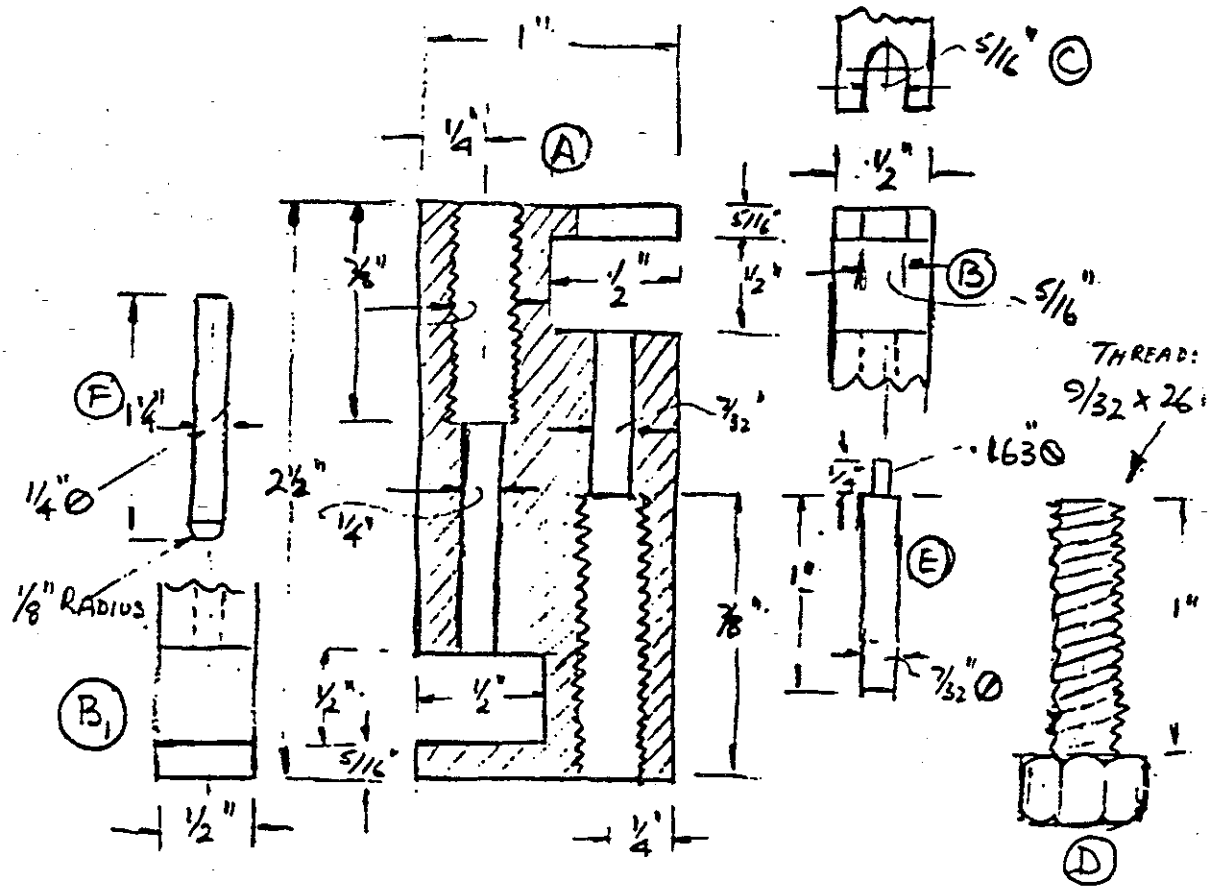
I hope the sketch will be found self explanatory, but the following points are perhaps worth making.

1. The jack screw is to be used for both "extractor" and "expander" and is made with a Hex head to accept the ¼"/5/16" tube spanner which is essential in any Scott tool kit.
2. Some means must be provided to ensure that the anvil rods do not fall out in transit. Provided that the jack screw is left in the "Expander" line, its rod will be retained, but some means will have to be found to ensure that the "Extractor" rod is retained. I have provided a gag for the chain opening and a short screw for the other end to close it off, but doubtless insulating tape would suffice.

Many thanks to G. C. and Anthony Heal for their efforts on our behalf: let us hope that Magneto chain problems become a thing of the past.

P.S. Since writing the foregoing the makings of the spring connecting link have come to hand. Now fitted and the first one hundred miles satisfactorily completed.

Jack Frazer



(A) ℄ Section of Body (2½" x 1" x ½" BAS).
(B) Side Elevation of "Extractor" Gap.
(B1) " " " " "Expander" Gap.
(C) End Elevation of "Extractor" Gap
(D) Jack Screw.
(E) Extractor Anvil Rod. - Silver Steel. Hardened & Tempered.
(F) Expander " " " " " "

NB. Both Holes and Jack Screw made 9/32" x 26 TPI. I think that 5/16" x 26 TPI would provide more clearance for the 1/4"Ø Expander Rod.

Rough Sketch (NTS) of Tool for Lipperman Chain.

JWF 1/90.

CHAIN MAIL

First the bad news..... One or two reports of failure of Wipperman magneto chain are beginning to filter through. Admittedly these failures have been under racing conditions, but it seems that the side plates have been coming adrift. Personally I have a sneaking suspicion that misalignment of the sprockets is the guilty party, rather than any deficiency in the chain itself, but time will tell I suppose, as these chains are now acquiring some larger mileages.

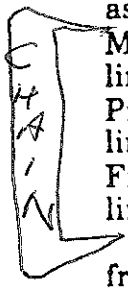
Those of you who have handled Wipperman chain will know that a brand new length has a quite extraordinary amount of 'sideways' play, that is to say it can be bent into a considerable arc in your hands. This quality is rather alarming as of course in a more conventional roller chain it only happens when the chain is clapped out!

(Glyn Chambers told me that some potential customers have been put off buying it because of this unusual behaviour). The thought occurs to me that at high rpm this sideways flexibility might cause or allow a sideways 'thrashing' to develop, (as well as the usual up-and-down thrash), and this movement could be forcing off the sideplates, particularly if it got to the point where the sideplates were hitting the sides of the sprockets with any vigour.

Pat Hart's interesting Flying Squirrel (the one with Vincent/Brampton forks and twin front brakes) has an unobtrusive and very effective mag chain tensioner-cum-damper consisting of a spring steel blade and polypropylene slipper (Weller style), and this could well be the way to go for longer chain life.

Then the GOOD NEWS..... Renold are again making ½ pitch x .305 roller width chain!! It seems that a disastrous fire at the Yorkshire factory stopped production entirely in this country, but due to demand it has been recommenced, (in Germany instead of the U.K. unfortunately)

Renold chain sizes and lengths for three speed Flying Squirrels are as follows:-



Magneto (Type 11044) ½ inch pitch x .305 inch roller 69 links plus con link.

Primary (Type 11046) ½ inch pitch x .335 inch roller 69 links plus con link.

Final (Type 110056) ⅝ inch pitch x .400 inch roller 95 links plus con link.

Those lengths quoted are for the usual short wheel base, duplex frame common or garden Flying Squirrel. Long wheelbase (1927/8) machines, or those with larger or smaller than standard sprockets may need a different length. If in doubt check the old chain. Similarly the 1931-33 single downtube frame Flying Squirrel and Sprint Specials, which had clutch-driven magnetos will require a different length of mag chain.

If you read some Scott literature, you may find some contradictory sizes, such as:- Magneto ½ inch pitch x .125 inch wide, Primary ½ inch pitch x .305 inch wide, and final ⅝ inch pitch x .380 inch wide. I think that these must have been sprocket teeth dimensions erroneously given as chain sizes but would welcome any comments on this.

"New" (but slightly rusty) primary chains are available from Dave Brierley and Ryan Holder; from the large stock built up by Matt Holder. Dave Brierley also has a stock of the brand new Renold mag. chain as he can obtain it in 25feet lengths at a very good discount, and sell 3 feet lengths to members for less than you would have to pay if buying in 3 feet lengths from elsewhere. I think that all I need say is that it is less than one third the price of a Wipperman chain.....

B.M.

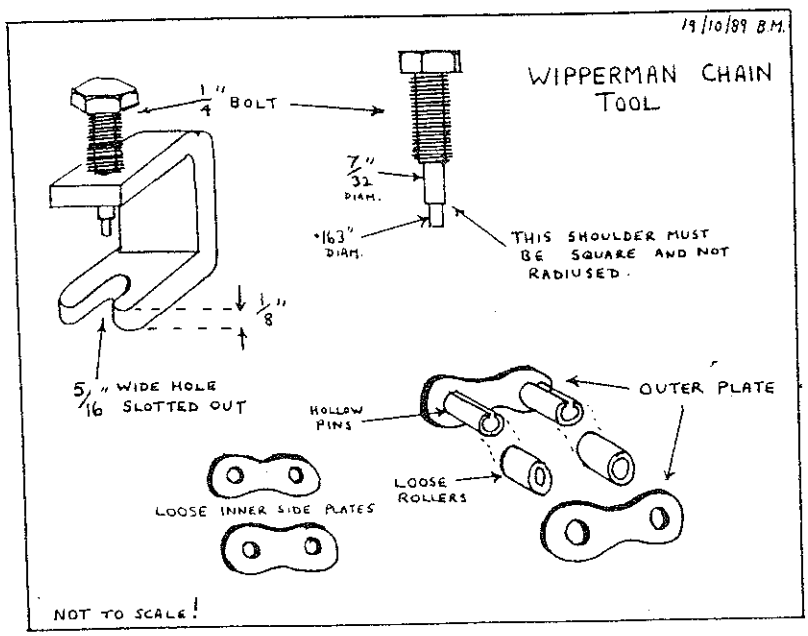
Alternative Chain

Dear Mr Wess,

I have owned a 1932 Frazer Nash car for the last 30 years and, therefore, am no stranger to the problems of grossly overloaded chains. Scotts also suffer from chain problems, I understand, but unfortunately I have not ridden mine enough to prove this. Recently one member of The Frazer Nash Car Club with a 3½ litre Alvis-engined racing car (even more abused than usual in the chain department) has reported excellent results with Japanese S.B.R. (Solid Bush and Roller) chain. He maintains that this is possibly better than the original best quality Reynolds product as, so far, no noticeable stretch has occurred, and the chain appears as good as new despite the same use that would have accounted for one third of the life of Reynolds chain. On the strength of this test the F.N.C.C. spares section has purchased a quantity of this S.B.R. chain for general use by members, but as yet no one has used it long enough to comment on how it behaves on a normal road car.

Perhaps Brian Lilley might like to investigate whether this chain is available in Scott sizes and, if so, arrange for suitability tests on our machines. To quote our racing Nash owner: "Maybe the demise of Reynold chain is not the disaster some predicted".

Peter Whale,
Barnsley, South Yorkshire.



MAGNETO CHAIN TENSIONER

Paul Devitt

Uneasiness at the TT Rep.'s magneto chain flailing around just below my seated person prompted an investigation into the possibilities of taming it.

One way of doing this was described by Vic Sanders in the October 1992 issue of *Yowl*. His device employs a pair of nylon bushes which bear on the upper and the lower runs of the chain. He reported success with it and I decided to make one of these for the TT Rep. But I couldn't find suitable nylon bushes in my boxes of bits, and began to think about alternative ways of controlling the tension and the whip of the chain.

The timing chains of some pre-war cars had a free-wheeling sprocket to take up the slack on the return run of the chain. This requires a rigid but adjustable mounting, and a suitable sprocket, which I didn't have.

Another approach, often used where long drive chains are employed on motor-cycle engines, for example on the AJS 7R camshaft drive and the HRD Twin primary drive, is the Weller tensioner. This consists of a strip of spring steel, held in a arc against the return run of the chain. Some of these are adjustable by means of a screw at one end to increase the pressure of the blade on the chain, but the more sophisticated versions have some form of damping to prevent the tensioner itself from fluttering under alternating or varying load, such as that imposed by a camshaft or a magneto.

In an interview with *The Motor Cycle*, the designer of the 7R AJS engine said of the cam drive that:

> "The rubbing strip ensures that, should chain flutter occur, it would be insufficient to cause overloading of the chain or variations in valve timing. We fit the damper to the tensioner because a camshaft drive is not strictly a one-way drive. Valve spring pressure acting on the steep closing curve of the cam tends to push the camshaft ahead of its drive, thus causing the normally slack side of the chain to tighten. This reversal of the load, with an undamped Weller tensioner, could lead to vibration of the spring blade or even cause the spring to leave the sprockets. ..."(*Motor Cycle Engines, by The Staff of The Motor Cycle. London. 1955. p41.)*

The damper referred to her is simply a coil spring under tension attached to both ends of the 'rubbing strip', and presumably with a frequency different to that of the strip.

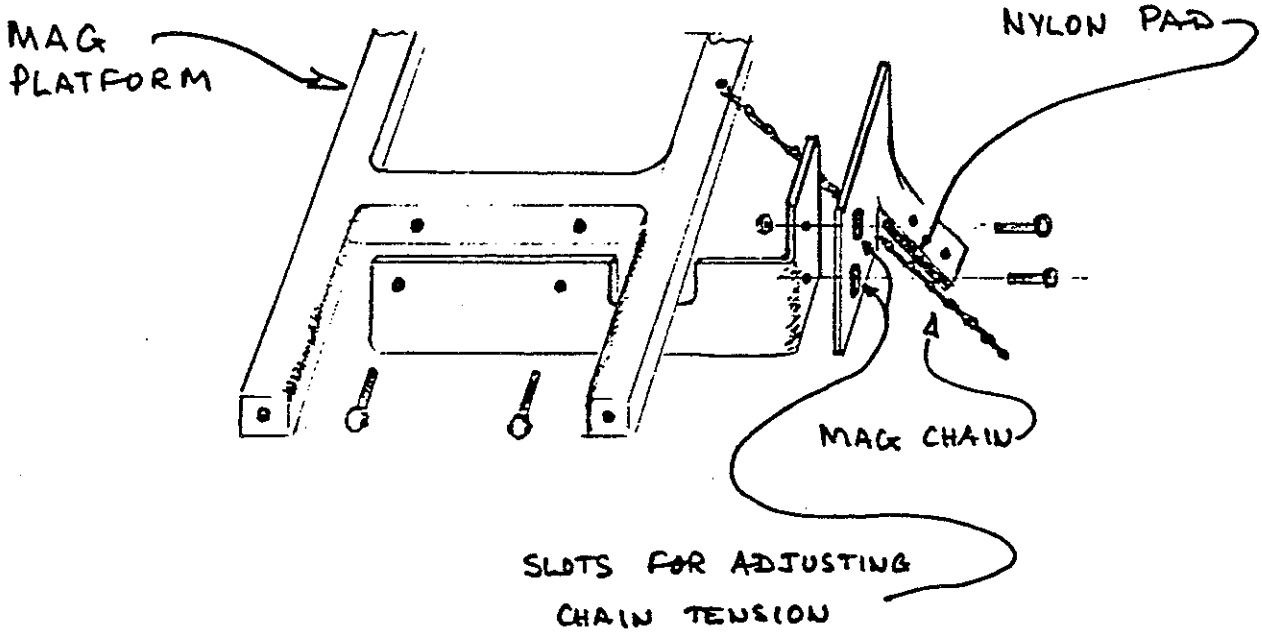
A Weller tensioner is an attractive idea, but making one from scratch and fitting it into the small space available on a Scott seemed to raise some complex mounting problems.

With my limited skills and resources the problem was how to apply these principles to reduce mag. chain flutter in the simplest way using materials I already had.

For the rubbing strip I used an old nailbrush with a nylon back. From this I cut a strip about 2.5" long by $^3/_4$" wide and $^3/_8$" deep. This was mounted by countersunk screws on an adjustable plate which holds it in contact with the mag. chain. In 1930 the TT Rep.'s Pilgrim pump migrated from the mag. platform to the RH crankcase door. This leaves a pair of $^1/_4$" BSF threaded holes in the mag. platform free to accept something else — in this case the plate carrying the tensioner. This is shown in the accompanying drawing.

The main snag with this device is that it defies convention by running

MAGNETO CHAIN TENSIONER



on the drive side of the chain, that is the top run, rather than the slack, or return, side. The reason for this is that the lower run is much less accessible. The nailbrush seems to wear rather fast and may need replacement with material of superior quality, such as a good hairbrush handle. However, it has greatly reduced chain flutter.

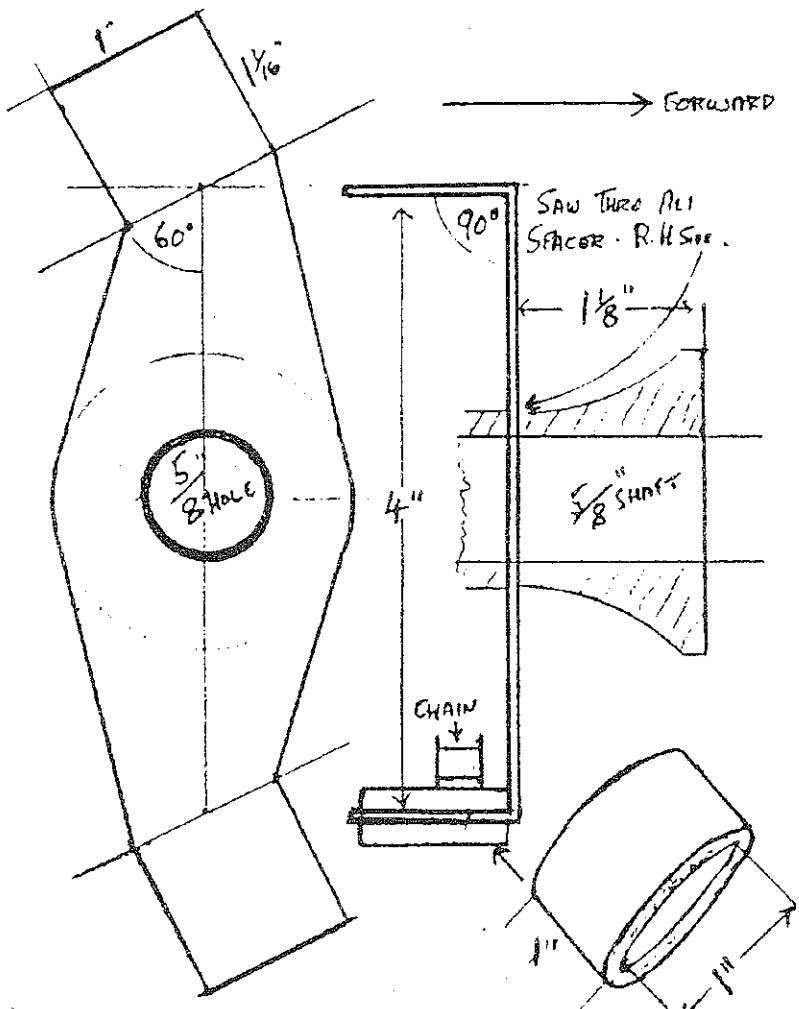
The Nailbrush Tensioner is made of $^{1}/_{8}$" mild steel plate, and is easy to fit and to adjust. When fitted it is inconspicuous. It could be combined with a chainguard to make it even less visible and could also be fitted with the felt oil pad described by Neil Smith in his article on page 7.5.04 of *Scott Technicalities*.

I have only ridden about 50 miles with it, so it is not really tested and if it causes problems I'll let you know.

A QUICK AND SIMPLE MAGNETO CHAIN TENSIONER

Jim Shelley

Having studied two tensioners in *Yowl* I felt that a simple and more effective one could be made which would eliminate the problems of installation and the limits imposed. It is based on two oval 1" x 1" I.D.mower-type friction chain sliders which can easily be installed using the crankcase spacer as the fulcrum. This design can be installed with both sliders inside or outside the chains. Adjustment is made by loosening the spacer nuts and re-tightening at correct chain tension.



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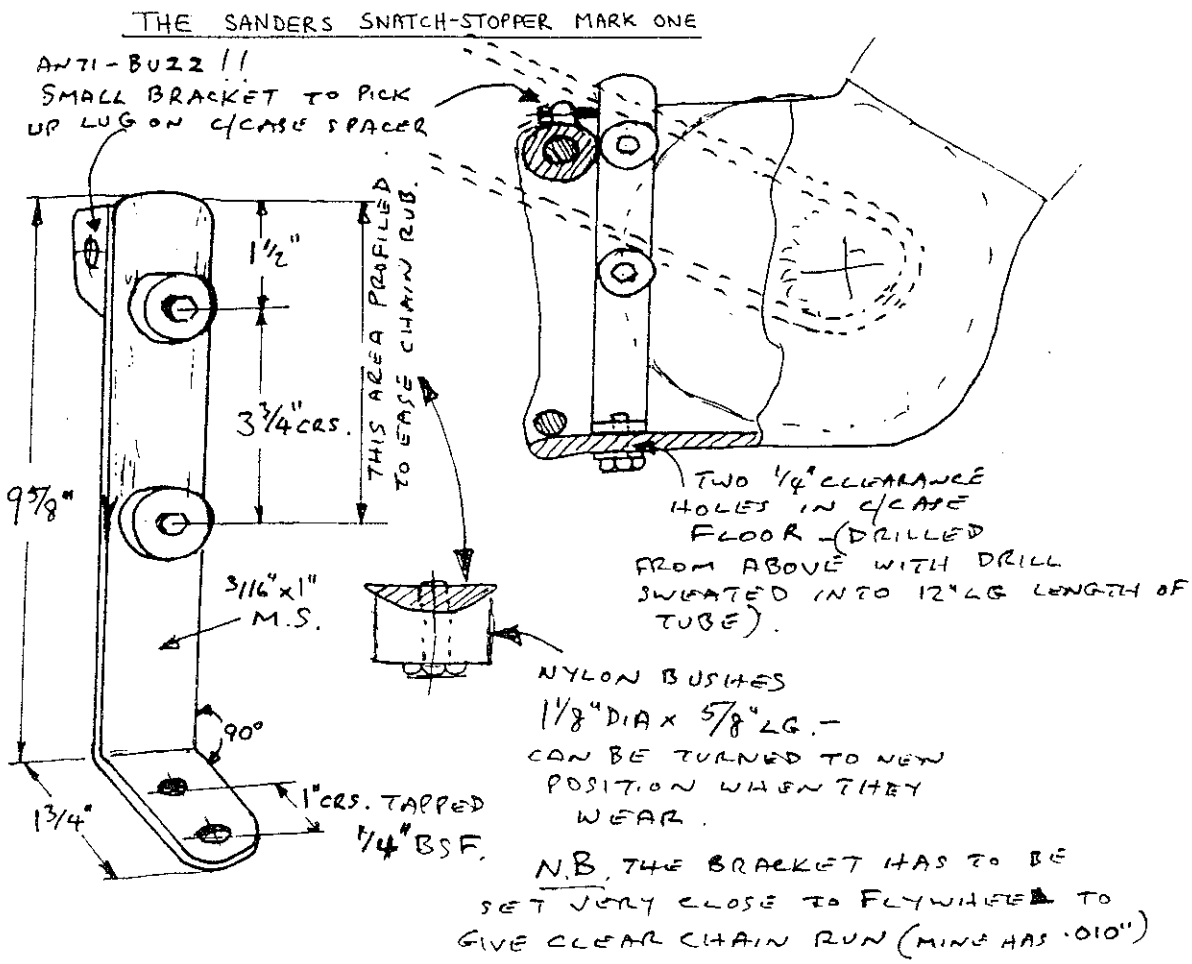


A magneto chain tensioner
devised by Vic Saunders

V20/6 Oct 1997

THE CHAMBERS CHAIN CHALLENGE
or what to do with your Verbindungsgleider mit Feder
Glyn Chambers

For reasons that are beyond me, I have had enquiries recently from several members who have bought their Wipperman Hohlbolzenketten (hollow pin chain) from sources outside the Club.

I sell it cheaper, post free in the U.K., and include a free Verbindungsglieder mit Feder (spring link) with instructions on how to modify easily the link for use.

Officially Wipperman do not make a spring link for the Hohlbolzenketten (chain) and it was only thanks to one of our members with family connections in Germany that I got them to provide a link which, simply modified, has proved a great success.

Other suppliers have now discovered that the link will fit (Steckglieder 999 dw 06) but have no idea how it can be properly modified to make it suitable for motor-cycle use. Basically the link is about twice as wide as it needs to be.

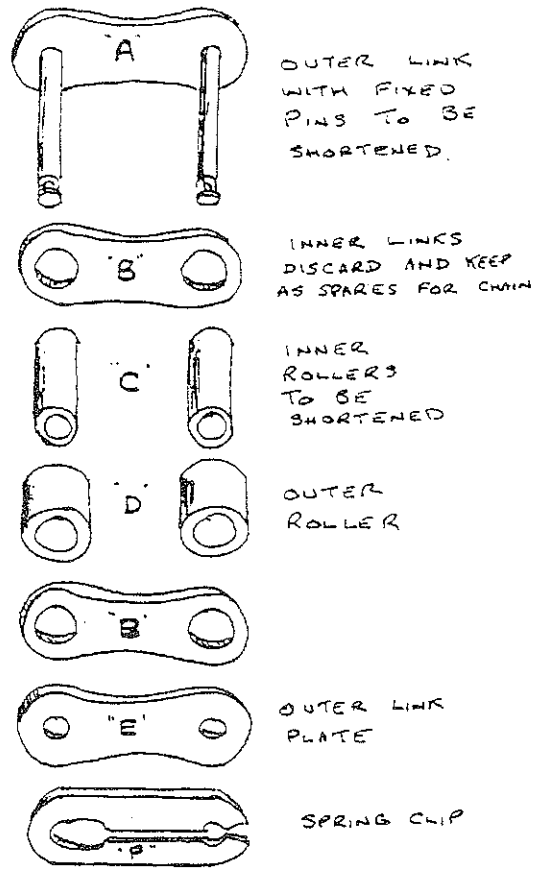


FIG 1.
ASSEMBLY OF SPRING LINK BEFORE MODIFICATION

See Fig. 1.

1. Take link apart and discard parts 'B' (keep as spares for chain).
2. Put inner roller 'C' on pin, support link 'A' on a solid block with a hole in it (or use an old nut — no pun about squirrels please).
3. Punch pin so that it just projects from 'C' as shown in Fig. 2.

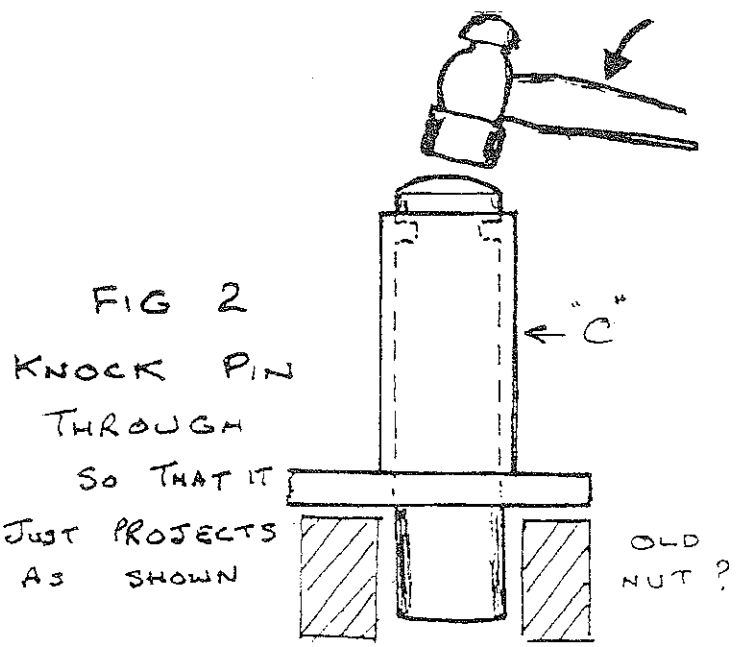
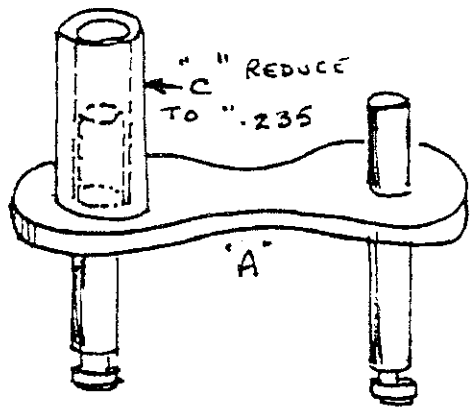


FIG 2
KNOCK PIN THROUGH SO THAT IT JUST PROJECTS AS SHOWN

FIG 3

LINK USED AS HOLDER



See Fig. 3.

4. Transfer inner roller 'C' to back of link so that the pins now projecting at the back act as a holder and grind the length of the inner roller down to 0.235" (1/4" less 15 thou) in length —Fig 3 — using a rotary stone.
5. Grind off most of projecting pin and lightly pein.

POTTY'S CHAIN GANG

I have just imported a new batch of Wipperman magneto chain, 1/8" x 1/2". Prices remain as they have for the last ten years at 30p per link (or pin) and include a rivet link and one split link and postage in the U.K. at no extra charge. The spring link takes five minutes to modify so that it will fit properly. Extra spring links, £1.50 each.

I also have a limited amount of two-speeder and three-speed Super primary chain, 3/16" x 1/2". This I am selling at 10p per link (or pin) and Reynolds spring links for same are £1.50 each.

Please do not ask for chain for 'my Scott'. I must know the length required. *Technicalities* will give you a guide, e.g. most Flyers are 70 links, but some are 68 or 72 and there are no half-links, as so-called. If you run out of adjustment and the chain is too long, a 14 SWG or 1/8" plate will take up about one link. I can never work this out because, to my way of thinking, a 1/4" plate is required to tighten up a chain of 1/2" pitch regardless of the angle at which the chain runs, or have I got it all wrong?

Don't forget all this chain is being sold at a subsidised price to members and comes post free in the U.K. Overseas, please add a little to help out. The scheme was originally started by a donation of chain from Anthony Heal who, had he been alive, would have underwritten the cost of new crank manufacture. The scheme was perpetuated by a donation from main funds in memory of Flo and Jack Dodds, and recently by some of the small profit from *Technicalities*. However, I cannot see us subsidising it for more than the next two years. Alternative sources of supply will then be offered to you.

Glyn Chambers.