HANDBOOK AND SERVICE MANUAL

Trials Models

IMPORTANT

1. Replacement parts fitted to CCM motorcycles must be manufactured or supplied by CCM Britain Ltd.

2. When work is to be carried out in replacing parts or making adjustments to the machine always entrust it to CCM Britain Ltd., their approved agents or a competent mechanic with the aid of this service manual.

3. Particular attention should be given to the correct lubrication procedure and where possible the special lubricants available from CCM should be used.

4. Pre-delivery check list must be completed, signed by customer and dealer then returned to CCM Britain Ltd., without delay.

5. No warranty claim will be considered unless the above conditions are satisfied. Engine frame numbers must be stated in any correspondence relating to the owners' machine.

CLEWS COMPETITION MACHINES BRITAIN LIMITED

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Prefix Messages CCM LTD.

CONTENTS

TORQUE WRENCH SETTING

Application	thread diameter and form	T.P.I.	Hexagon A.F.	Torque lb./ft.	Torque kg./m.
Ignition rotor bolt	¼" UN.F.	28	0.437"	6	0.8
Clutch centre nut	½" B.S.C.	20	0.820"	20	2.8
Crankcase stud nuts.....	5/16"UN.F.	24	0.5000"	16–18	2.2–2.5
Crankshaft pinion nut	1/8" UN.F.	18	0.9375"	55	7.6
Cylinder head nuts	5/16" UN.F.	24	0.5000"	18–20	2.5–2.8
Cylinder head nuts	7/16" UN.F.	20	0.6875"	30–33	4.1–4.6
Kickstart ratchet nut	½" B.S.C.	20	0.705"	38–40	5.3–5.5
Oil pump stud nuts	¼" UN.F.	28	0.437"	5– 7	0.7–1.0
Oil return union	7/8" UN.C.	16	1.00"	25	3.5
Rotor mounting nut	5/8" UN.F.	18	1.125"	60	8.3
Rocker box screw	¼" UN.C.	20		4	0.55
Gearbox sprocket nut	1 3/16" W.F.	20	1.479"	100	13.8
Timing and primary cover ..... screws.....	¼" UN.C.	20	–	3.5–4.5	0.5–0.6
Fork yoke pinch bolts	10mm		17mm	23–25	3.2–3.5

When using special tool T24 on 7/16" head nuts, fit torque wrench at right angles so that no extra leverage is obtained.

INTRODUCTION

The first CCM trials bike was manufactured during the Winter/Spring of 1977/78 and was ridden in the Scottish Six Days and National Trials by Development Rider Nick Jefferies.

Since then modifications have been carried out to produce the present production CCM trials bike.

Unlike its rivals the CCM is hand constructed from the finest and most advanced materials available and is an exact replica of our works machinery.

This manual is intended to help the owner to understand the maintenance and care needed to operate his machine. A competent mechanic will find all necessary information within these pages in order to undertake major repairs.

Changes in specification due to development are inevitable and so where details in this manual vary with the machine in the owners' possession he should contact his nearest dealer or the CCM factory direct giving engine and frame numbers in any correspondence relating to his machine.

The engine number is stamped on the L/H side of the engine immediately below the cylinder base.

The frame number is stamped on the steering headstock behind the front number plate.

STARTING PROCEDURE

1 Check that dealer pre-delivery work has been carried out

2. Before starting it may be necessary to free the clutch plates which tend to stick together if the machine is left for a period without use. This is accomplished by selecting fourth gear (top) and pulling the machine backwards sharply. When the clutch plates are free, select first gear and pull machine backwards until compression is felt. Select neutral, operate carburettor tickler or choke and switch on ignition if total loss type is fitted. Operate kickstart lever through full stroke when engine should start. Should engine fail to start repeat the procedure. If engine kicks back heavily, then this is an indication that the ignition is set too far advanced. This condition should not be allowed to continue or damage to kick start mechanism may result.

RUNNING IN AND SUBSEQUENT USE

It is necessary to run in the machine before competition use so that the engine parts become lapped together properly and to allow brakes and tyres time to bed together.

Never be tempted to subject your machine to the rigours of full output without first using gently for at least three hours. During this period adjustments may be made and setting checked.

When the machine has been running for a time, full power should be used for short periods gradually extending in length until it is felt that the machine is ready for competition.

The success in Trials is partly dependent on proper machine maintenance, the anticipation and correction of faults before they occur.

GENERAL DATA

CARBURETTOR (MOTOCROSS ONLY)

Type Mk II	Amal Concentric	
Main jet	140–160 as required	140
Needle jet	106	105
Needle position	2	3
Throttle valve	3.5	3.5
Choke diameter	24mm 26mm	24

VALVES

Seat angle	45°	
Head diameter (inlet)	1.386m or 1.537"	DAH 1535-
Head diameter (exhaust)	1.340	B44 1407-
Stem diameter (inlet)	.3100" – .3105"	
Stem diameter (exhaust)	.3095" – .3100"	

VALVE GUIDES

Material	Phosphor-bronze	
Bore diameter	.3120" – .3130"	
Outside diameter	.5005" – .5010"	B44
Length	1.859"	
Interference fit in head	.0015" – .0025"	
Counterbore in exhaust guide	.323" – .326" x .12" deep	

VALVE SPRINGS

Free length (inner)	1.50"	(38.1 mm)
Free length (outer)	1.67"	(42.4 mm)
Fitted length (inner)	1.22"	(31.0 mm)
Fitted length (outer)	1.31"	(33.3 mm)

VALVE TIMING

Tappets set to .015" (.38 mm).
for checking purposes only:–

	Std.
Inlet opens B.T.D.C.	51°
Inlet closes A.B.D.C.	68°
Exhaust opens B.B.D.C.	78°
Exhaust closes A.T.D.C.	37°

CAMSHAFT

Journal diameter, left to right	.7480" – .7485"	
Cam lift (inlet)	.345"	
Cam lift (exhaust)	.336"	
Base circle radius	.906"	
Bush bore diameter fitted	.7492" – .7497"	
Bush outside diameter, left and right	.908" – .909"	.15 mm
Tappet clearance (inlet)	.006"	
Tappet clearance (exhaust)	.008"	.20 mm

SPARK PLUG

Type	Champion N5	
Gap setting	.020" – .025"	(.50 – .65 mm)
Thread	14 mm	

GENERAL DATA

IGNITION TIMING

Crankshaft position T.D.C.		
Air Gap	.010"	(25 mm)

CRANKSHAFT

70 mm stroke	First two numbers on engine denotes stroke.

CYLINDER BARREL

Bore diameter (standard)	79.25 mm
Oversizes	+ .010 and as available.

PISTON

Compression ratio	6 – 1 or 7 – 1	
Clearance (top of skirt)	.005" – .007"	
Clearance (bottom of skirt)	.003" – .0035"	
Gudgeon pin hole diameter	.7499" – .7501"	
Ring Gap	.009" – .014"	(.23 mm – .36 mm)

CONNECTING ROD AND FLYWHEEL ASSEMBLY

Connecting rod small end eye diameter	.8115" – .8125"	
Small end bush bore diameter	.7503" – .7506"	
Connecting rod big end eye diameter	2.0190" – 2.0195"	.0755" wide
Big end bush bore diameter	1.770"	
Connecting rod length between centres	5.54"	
Crankpin bearing diameter	1.270"	
Big end bearing (24 roller)	.25 x .25	
Flywheel shaft diameter (left and right)	.9841" – .9844"	

CLUTCH

Type	Multiplate with integral cush drive	
Number of friction plates	5	
Number of plain plates	5	
Overall thickness of friction plates	.167"	(4.2 mm)
Free length of springs	1.66"	(42.0 mm)
Clutch pushrod length	9.0"	(22.9 cm)
Clutch pushrod diameter	.1875"	
Clutch rollers	.1875" x 1875", 25 off	

GEARBOX

Type	4 speed, constant mesh
Layshaft bearing (needle roller)	
Layshaft diameter (left and right)	.6245" – .6250"
Mainshaft diameter (left)	.7485" – .7490"
Mainshaft diameter (right)	.6245" – .6250"
Sleeve pinion inside diameter	
Sleeve pinion diameter	1.179" x 1.180"

GENERAL DATA

GEAR RATIOS

Gearbox :	Std	Alt.
Top	1.00	
Third	1.9	
Second	2.67	
First	3.6	

SPROCKET SIZES (TEETH)

	Std.	Alt.
Engine	23	(28, 18, 32 special fittings)
Clutch	52	52
Gearbox	11	14, 15, 16, 17
Rear Wheel	46	42, 44, 48, 50

CHAINS

Primary Chain (all models)

Pitch	.375"	(9.53 mm)
Roller diameter	.250"	(6.35 mm)
Distance between plates	.225"	(5.72 mm)
Length	72 x 28T 74 x 32T 70 x 23T 68 x 18T	
Breaking Load	3,900 lbs.	(1770 Kg.)
Type	Renolds 114 038 Duplex endless	

Rear Chain:

Pitch	.625"	(15.88 mm)
Roller diameter	.400"	(10.16 mm)
Distance between plates	.255"	(6.48 mm)
Length	As required	
Breaking load	5,000 lbs.	(2268 Kg)
Type	Renolds 110 054	

FRAME AND FITTINGS

FRONT FORKS

Type	High Strength/Weight Ratio Marzocchi 607" (170 mm) movement
Steering head bearings	Sealed Taper Roller
Springs:	Main Spring Recoil Spring
Shaft diameter	34 mm
	Heat treated to High Strength
	Slider Material Magnesium Elektron
	Damper Adjustment Facility by air.

SWINGING ARM

Bearings	Needle roller
Housing diameter	1.2505" – 1.2495"
Spindle diameter	.800" – .801"

REAR SUSPENSION UNITS

Type	Marzocchi Gas Filled Long Movement	
Extended length between centres	13" (	(330 mm)
Compressed length (between centres)	507" 5.7"	(145 mm)
Springs:	See Spares Catalogue	

GENERAL DATA

WHEELS, BRAKES AND TYRES

WHEELS

Rim size and type:

(Front)	WM1 x 21"	Alloy 36 hole
(Rear)	WM3 x 18"	~ " ~

TYRES

Front	2.75 x 21
Rear	400 x 18
Pressures	
Dry Rocky Ground	As required
Wet Slippy Ground	As required

BRAKES

Front	125mm
Rear	125mm

IGNITION SYSTEM

AC Generator mounted on c/shaft.
Self contained, generator powered ignition box incorporating HT coil, electronics and regulator. 30 KV output.

	CAPACITIES	TYPE
FUEL TANK		
British gallons	1	100 octane
U.S gallons	1 16	
Litres	4.54	
OIL RESERVOIR		
British pints	3	20/50W GTX
Litres	1.70 1.8 ℓ	
GEARBOX		
British pints	½	EP90 EP80
cm^3..	280 300 cc	
PRIMARY CHAINCASE		
British pints	1/3 1/4	20/50W GTX
cm^3...	140 150 cc	
FRONT FORK (EACH LEG)		
cm^3..	175	Universal fork oil
AIR FILTER		
See page 10	Y17	
	Filter Oil	

GENERAL DATA

DIMENSIONS AND WEIGHT

Wheelbase ins. (cm.)	51½" (130 cm)
Ground Clearance ins. (cm)	12½" (31 cm)
Seat height ins. (cm)	32" (81 cm)
Dry Weight	209 lbs. (95 Kg)

LUBRICATION – GENERAL

The types of lubricant (page 8) must be strictly adhered to in normal circumstances, otherwise damage may occur.

When using the engine for the first time or after a long lay off it is advisable to pour ¼ pint (½ litre) of 20/50 into the engine via the pushrod inspection cap. This will ensure that the camshaft and piston have sufficient lubrication under these circumstances.

Always allow time for the engine to warm gradually before employing maximum revs.

Never mix castor and mineral based oils as this is likely to cause damage.

20/50 and EP90 are available from your dealer or direct from CCM. They will give best results in your machine.

LUBRICATION – ROUTINE MAINTENANCE

Always

1 Ensure that the frame breather tube is clear otherwise oil will fill up in crankcase causing engine to smoke and slow.

2 Ensure all connections on oil pipes, breather tubes are firm and leak free.

3 Engine cases and inspection caps should be oil tight – failure to observe 2 and 3 may result in foreign matter entering the engine and lodging in the sludge trap and filter.

4 Fill the frame tank until oil can just be seen through filter orifice. Overfilling wastes oil and impairs engine ability to return.

5 Change oil every 6–8 trials or according to conditions.

6 Ensure that non-return valves A and C Fig. 2 page 8 are operating correctly. (This will only be necessary if the crankcase fills up with oil when the machine has been left standing for some time).

7 The filter Fig. 1, page 9 should be removed for cleaning every three meetings by unscrewing drain cap B, catching the oil from the frame down tube and removing filter cartridge A. Never use screwdrivers to lever out the cartridge as this will pull off the end cap and destroy the filter. Use a piece of wire bent at the ends in the shape of a hook. Insert up the side of the filter and into one of the holes in the outer shield. Pull downwards and place filter in a tray containing petrol. Allow to soak for a few minutes and then blow into filter from the end with an airline. Repeat this operation several times before allowing to drip dry. Replace filter and end cap. Return the oil from the tray and refill with clean oil to level as in 4 above.

Oil changing may be accomplished by removing drain cap B, Fig. 1 and remove connecting tube H. Fig. 2.

When changing oil or oil filters, utter cleanliness must be observed otherwise foreign matter will enter the engine with adverse results.

To drain lower frame cradle it is necessary to remove to bottom rubber oil pipe.

LUBRICATION

A–Oil filter cartridge
B–Drain cap
C–Return pipe
D–Frame down tube

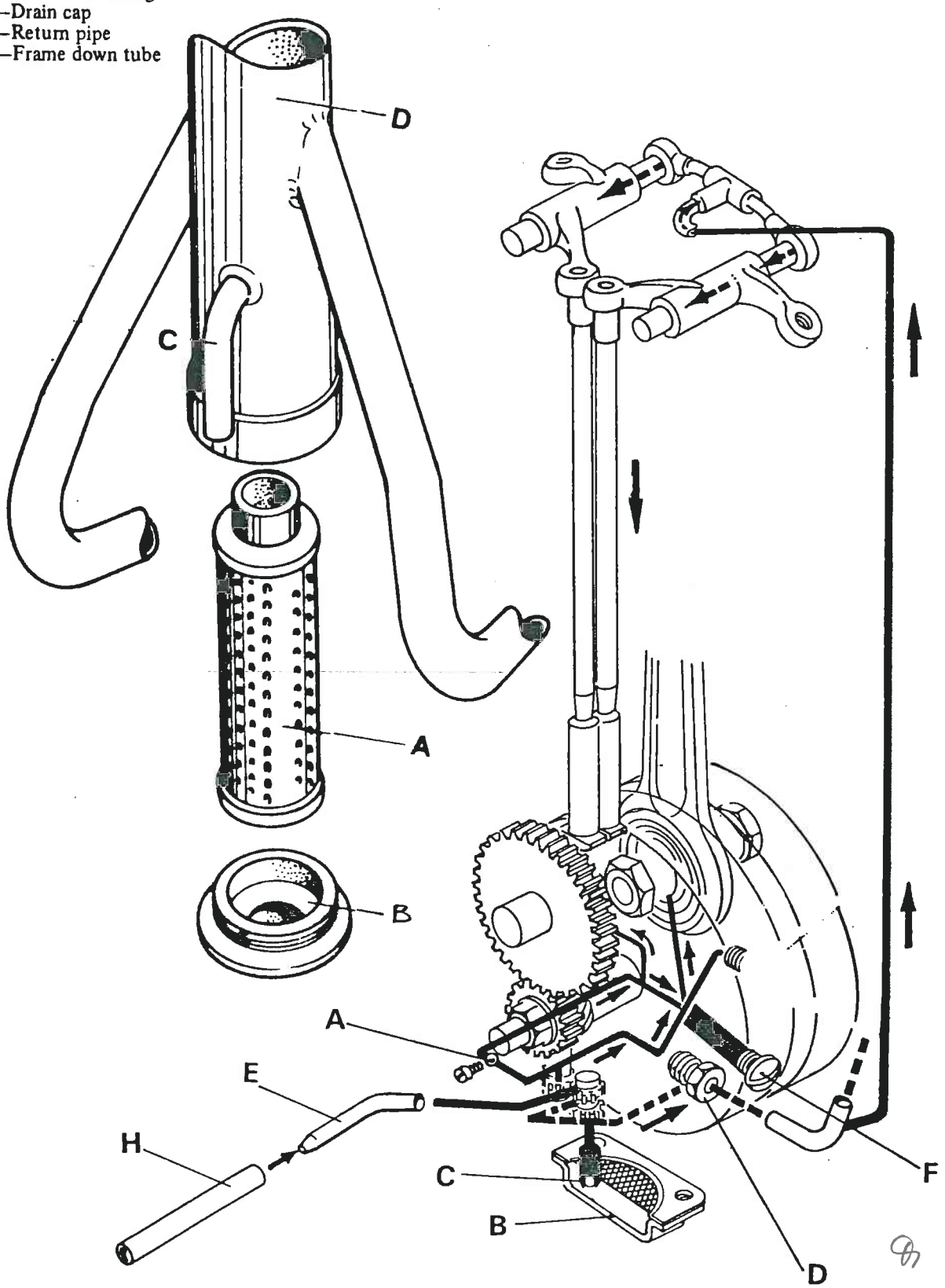


Fig. 2 *General engine lubrication diagram.*

A–Non-return valve (feed side)
B–Sump plate and filter
C–Non-return valve (return side)
D–Oil union (return side)
E–Oil pipe feed
F–Crankshaft sludge trap
H–Connecting tube to frame reservoir

EP ~ Extreme Pressure

LUBRICATION

GEARBOX LUBRICATION

The gearbox, having its own oil bath, is independent of the engine for lubrication but the oil level must be checked and any loss due to leakage made good.

The layshaft gears run in the oil bath and oil carried by or thrown off these gears lubricates the mainshaft gears, bearings and bushes.

To drain the gearbox, take out the filler plug/dipstick on top of the gearbox ("D", Fig. 3), then remove the drain plug underneath ("E") draining the oil into a suitable receptacle.

After draining, replace the drain plug, having made sure that the rubber "O" ring is in good condition.

Oil changing should be every 6-8 trials or as necessary.

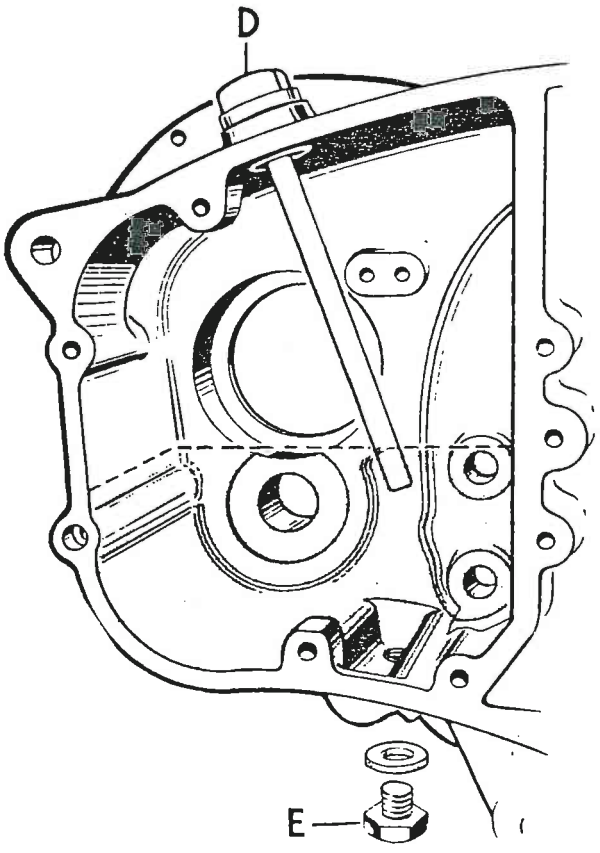


Fig. 3 *Gearbox oil level*

Fill the gearbox with EP 90 and check the level with the dipstick, which should be screwed home.

Note! EP90 (EP80)

If oil of too low a viscosity is used, pinion tooth wear will occur quickly causing failure.

Always ensure that the seal behind the gearbox sprocket is in good condition otherwise foreign matter will enter and pollute the lubricant.

Primary chaincase oil level is maintained by oil mist entering the compartment past the drive side main bearings. The oil finds its level and returns to the sump through filters fixed in the crankcase wall.

Therefore, periodic checking of the oil level is not called for, but it must be remembered that oil drained from the chaincase at oil change intervals must be replaced before further running to avoid damage to the primary transmission assembly.

All models were fitted with chaincase breathers and it is necessary to see that all tube connections are tight and that the filter is clean.

Soak filter in oil after cleaning.

SWINGING ARM

Sufficient grease is packed around the bearings to last a considerable time.

Occassionally the swinging arm should be removed for cleaning and repacking with grease. Use a propriety general purpose grease.

WHEEL BEARINGS

These bearings are of the sealed type and require no maintenance except to check the condition of the outer seals.

CONTROL CABLES

Cables can be lubricated by oil gun at the points provided midway along their length.

REAR CHAIN

This should be removed after every event and cleaned in a proprietary solvent. Solid lubricant should then be heated and the chain soaked for a few minutes. Hang up the chain to dry and refit.

LUBRICATION

AIR FILTER

Best results will be obtained by having a spare foam ready at the meeting so that a very dusty or muddy filter can be changed before coking occurs. Filter foams may be cleaned by immersing in petrol and squeezing until clean. Hang up and allow to dry. When foam is dry, immerse in special filter oil, Y17, and squeeze out excess. Allow to dry and refit to machine taking care not to allow any leaks between foam and airbox. Torn foams must be replaced immediately.

Note–The special blue filter oil should be used exclusively. This is the only oil which prevents the ingress of dust and water. Obtainable from your dealer or direct from CCM.

ENGINE

DESCRIPTION

As a power unit for trails, the single cylinder 4-stroke, 4-speed bloc unit has not equal. Hi-torque characteristics mean fewer gearchanges and easier riding.

This type of engine enjoys a high reliability factor but when maintenance is necessary, ease of accessibility is paramount. The gearbox, for example can be completely disassembled without removing the unit from the motorcycle.

The aluminium alloy slipper piston has two tapered compression rings and a two-piece scraper ring and is fitted to the H-section steel connecting rod which employs a needle roller bearing big-end assembly.

Two balanced flywheels (with crankshafts) and the crankpin are pressed together by two large nuts, the unit revolving in three crankcase bearings The right flywheel is fitted with a centrifugal oil sludge trap.

The aluminium alloy cylinder head has cast-in, heavy duty cast-iron valve seats and removable valve guides. Housed within the rocker box are two valve rocker spindles, carrying the inlet rocker at the rear and the exhaust rocker at the front.

The camshaft revolves in two bushes, one of phosphor bronze and the other of sintered bronze.

Contained within the primary drive case on the left side of the crankcase are the clutch assembly, primary chain and alternator †. The alternator unit consists of an encapsulated stator, mounted on two studs, and a rotor secured to the drive-side engine shaft. The chaincase contains an oil bath fed by the engine lubrication system.

A vertically mounted oil pump of the double gear type is driven from a worm gear on the timing side crankshaft and supplies oil to the big-end assembly, piston, cylinder walls and the timing gears.

The four-speed, constant mesh gearbox, at the rear of the right half of the crankcase, is independent of the engine lubrication system and contains its own oil-bath.

Power from the engine is transmitted through the engine sprocket and duplex primary chain to the clutch assembly which has a built-in cush drive. Here the drive is taken up by the bonded friction plates and is transmitted through the gearbox to the final drive sprocket.

MAINTENANCE

If care is taken to ensure that there are no leaks on the air intake system and points such as carburration and ignition timing are maintained correctly, then the engine should operate satisfactorily for an extended period. Should, however, it become necessary to strip the engine for overhaul, the following points are of note.

The cylinder head can be removed from the engine whilst leaving the engine in place if first the rocker box is removed.

The cylinder barrel and pushrods can then be removed so that all parts exposed can be inspected.

Perfect cleanliness is essential when undertaking repairs or overhauls and so in every taks care should be taken not to allow the ingress of foreign matter when rebuilding the engine.

ROCKER BOX

Inspect the rocker box for cracks around the head steady fixing point. Cracking at this point is caused by loose head steady bolts.

Inspect the gaskets at the three inspection caps, replace if necessary. Check that the tension springs on the rocker spindles are not broken.

PUSHRODS

Check that the pushrods are not bent by rolling them along a flat surface.

Inspect the hardened steel ends for looseness and cracks. The tapered ends must be free from dents, etc.

Replace in original positions.

CYLINDER HEAD

Dismantle the valves, springs, cups, etc., check the valve spring free length and measure the valve stress for wear. Check the valve for pitting or bending. Replace as necessary.

Inspect the valve guides and seats for wear.

Valve guides

An old valve guide may be driven out with service tool No. T20 but the cylinder head must first be heated.

The new guide may be driven in with the same punch whilst the head is still warm. Note that the exhaust guide is counterbored at its lower end.

† Alternator model only

Whenever new guides have been fitted, each valve seat must be refaced with a piloted valve seat cutter, to ensure that the seat is concentric with the guide bore.

Valves

Check the valves in their guides; there should be no excessive side-play or evidence of carbon build-up on that portion of the stem which operates in the guide. Carbon deposits may be removed by careful scraping and very light use of fine-grade emery cloth, but if there are signs of scoring on the valve stems, indicating seizure, both valve and guide must be renewed.

Valve heads may be refaced on a valve refacer (possessed by most dealers) but if pitting is deep or the valve head burnt, a new valve must be fitted and ground-in.

The valve seats in the cylinder head are unlikely to require attention, but if they are marked, they must be refaced with valve seat cutter T11.

The seat angle is 45°

Sometimes, when an engine has been decarbonised many times, valves become "pocketed". When the valve head and seat are below the surface of the combustion chamber, so impairing efficiency of the valve and affecting gas flow, the "pocket" (area "A", Fig. 5, must be removed with a special blending cutter. This work can be carried out by CCM.

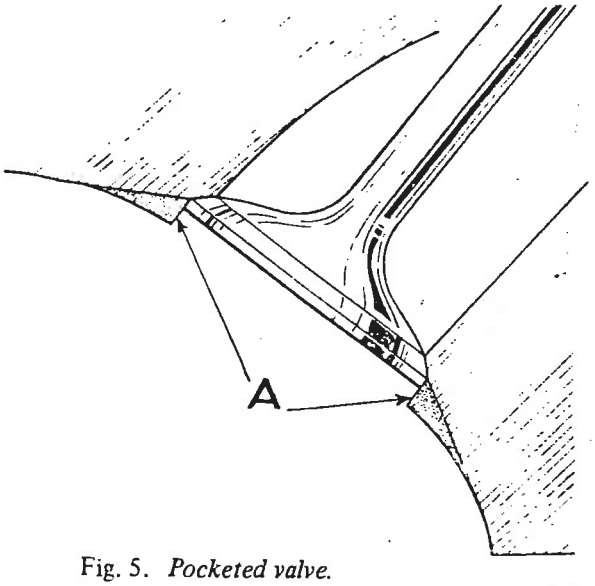


Fig. 5. *Pocketed valve.*

Removing carbon deposits

Removal of carbon may be carried out with scrapers or rotary files, but whichever method is used great care must be taken to avoid scoring the soft metal of the cylinder head and piston crown. A stick of tinsmiths solder, flattened at one end, provides an ideal scraper.

If the cylinder barrel is not to be removed, bring the piston to the top of the bore, and, after plugging the push rod opening with clean rag, proceed to remove carbon from the piston crown.

Always leave a ring of carbon around the edge of the piston crown and around the top of the cylinder bore. This will help to provide an additional seal.

After cleaning the piston crown, rotate the engine to lower the piston and wipe away loose carbon from the cylinder wall.

The cylinder barrel and head joint faces must be cleaned, care being taken not to cause damage with the scraper. Score marks will result in gas leakage, loss of compression and burning of the cylinder head face.

Do not attempt to clean aluminium alloy parts in caustic soda solution.

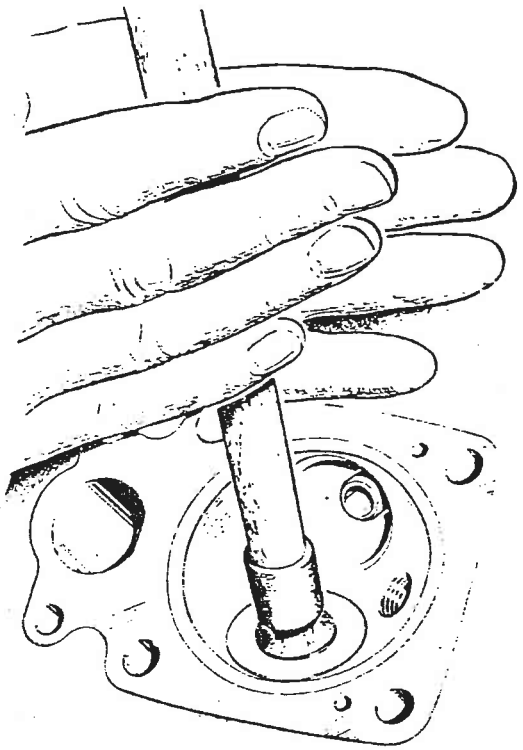


Fig. 6. *Grinding-in valve.*

Valve grinding

If the valves have been renewed or refaced they must be lightly ground-in to their seats to ensure a gas-tight seal.

This operation is carried out only after all carbon deposits have been removed from the combustion chamber, inlet and exhaust ports.

Having decarbonised, smear a small quantity of fine grinding paste around the seating face of the valve and return the valve to its seat.

Now, using service tool No. T12, rotate the valve backwards and forwards, maintaining steady pressure. Every few strokes, raise the valve and turn it to a new position. A light spring inserted under the valve head greatly assists in raising the valve, enabling it to be repositioned.

Grinding must be continued until the mating surfaces of both the valve and seat show a uniform matt finish all round.

Note:—Prolonged grinding-in of the valve does not produce the same results as recutting the seat and must be avoided at all costs.

Reassembling the cylinder head

Before reassembling the valves and springs all traces of grinding paste must be removed from both valves and valve seats.

Smear each valve stem with clean engine oil and replace the valves in the head.

Fit the steel spacer, spring cup, valve springs (with close coils at the bottom), and top collar over each valve stem, then compress the springs with service tool No. T13 to allow the split collets to be inserted in the top collar. A little grease on the valve stem will assist in keeping the collets in position as the compressor is released. Make sure that the collets are correctly seated in the valve stem recesses by tapping the valve stem lightly with a copper hammer.

Cylinder barrel

Unless the condition of the engine indicates that the piston, piston rings or cylinder bore require attention, the cylinder barrel should not be disturbed.

If the bore is worn it may sometimes be detected by placing the fingers on top of the piston and attempting to push the piston backwards and forwards in the plane of flywheel rotation. Symptoms indicating worn piston rings include heavy oil consumption and poor compression, but only if the valves are known to be in good order.

Excessive piston slap when warm may indicate a worn bore of severe damage as a result of seizure.

The cylinder bore may be measured for wear with a suitable dial gauge, after moving the piston to the bottom of the bore.

Removing cylinder barrel

To remove the cylinder barrel, rotate the engine until the piston is at the bottom of its travel, then lift the barrel upwards until the piston emerges from the base of the bore. Steady the piston as it comes free from the cylinder so that it is not damaged by contact with the crank case mouth. As soon as the cylinder has been withdrawn, cover the crankcase mouth with a clean rag to prevent the entry of foreign matter.

Examine the cylinder carefully for wear. If a deep ridge has formed at the top of the bore or the bore shows score marks, the barrel requires reboring.

It is not necessary to remove the piston unless it requires replacement or further dismantling of the engine is to be carried out.

Removing the piston

Prise out one of the gudgeon pin circlips using a suitable pointed instrument, but before attempting to push out the gudgeon pin, the piston must be warmed in order to expand the material of which it is made. In this way, the gudgeon pin may be removed without risk of damaging the piston or connecting rod. Either wrap the piston in a rag that has been soaked in hot water, or apply an electric iron to the piston crown.

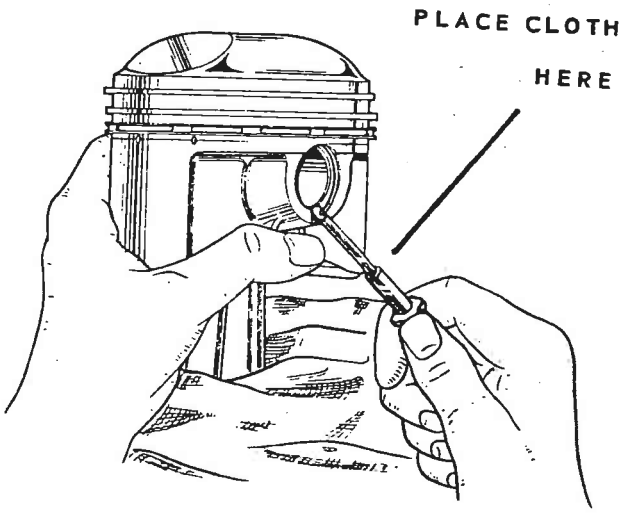


Fig. 7. *Removing a gudgeon pin circlip*

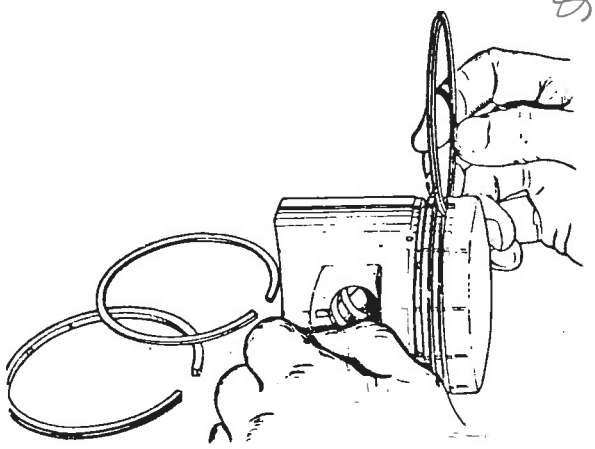


Fig. 8. *Checking piston ring grooves.*

Piston rings

The outside face of each ring should possess a smooth metallic surface. Any sign of discolouration means that the ring is in need of replacement.

The rings should also retain a certain amount of "springiness" so that when released from the barrel the ends of each ring lie at least ¼" apart.

Each ring should be free in its groove but with minimum side clearance. If the rings tend to stick in the grooves, remove them and clean out all carbon from the groove and the inside face of the ring. Care is necessary to permit only a minimum amount of movement when removing the rings as they are very brittle and easily broken.

A piece of a broken piston ring, ground as a chisel, is a useful tool for removing carbon deposits from the ring grooves.

To check the piston ring gaps, place each ring in the least worn part of the cylinder bore (at the bottom) and locate it with the top of the piston to ensure it is square in the bore.

Measure the gap between the ends of the ring with a feeler gauge. The correct gaps when new are .009" – 0.14". Although an increase of a few thousandths of an inch is permissible, any large increase to say .030" indicates the need for a replacement ring.

It is advisable to check the gaps of new rings before fitting. If a gap is less than the specified minimum the ends of the ring must be carefully filed to the correct limit.

Both compression rings on some models are tapered on the outside face and their upper surface is marked TOP to ensure correct fitting, other models have a top compression ring of plain section and the second compression ring only is tapered. This is also marked TOP. If tapered rings are fitted upside down, oil consumption will become excessive.

Small-end bush

Small-end bush wear is normally very slight, but a worn bush will cause an unpleasant high-pitched tapping sound.

The gudgeon pin should be a good sliding fit in the bush, but if there is considerable up and down movement, the bush must be replaced.

Using service tool No. T21 the bush may be changed in one operation by pushing the old bush out and, at the same time, pressing the new one in. The new bush must be correctly aligned with the oil hole in the connecting rod, and reamed to .7503" – .7506" after fitting.

Reassembly after decarbonising

Scrupulous cleanliness must be observed when reassembling, and each component should be smeared with fresh engine oil before replacing.

Warm the piston before inserting the gudgeon pin and ensure that the piston is the correct way round before fitting. Always use new gudgeon pin circlips and make absolutely certain that they are securely fitted. A loose circlip will result in severe damage.

Fit a new cylinder base gasket and support the piston with two pieces of hardwood (½" square by 6" long) placed across the crankcase, under the piston skirt (see Fig. 10).

The piston ring gaps must always be equally spaced round the piston, that is, at 120 degrees apart, to restrict gas leakage through the gaps to a minimum.

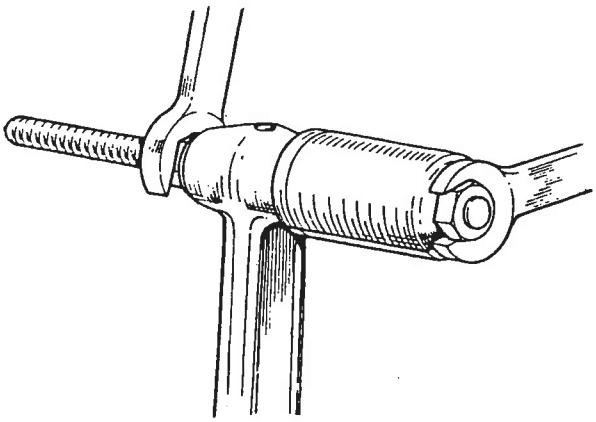


Fig. 9 *Using Service-tool No. T21 to remove small end bush*

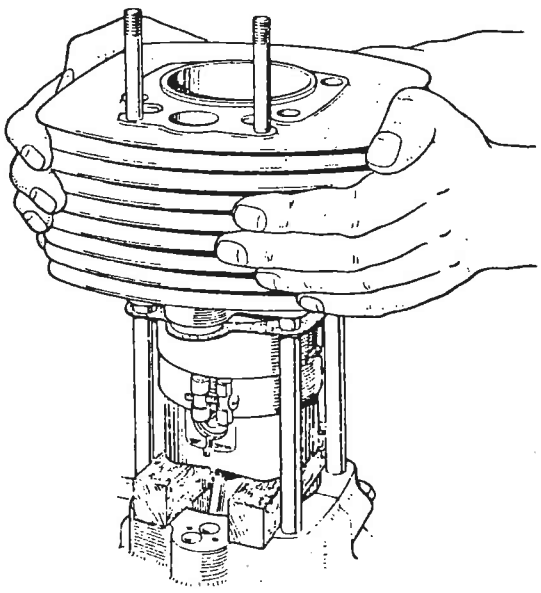


Fig. 10 *Replacing cylinder barrel.*

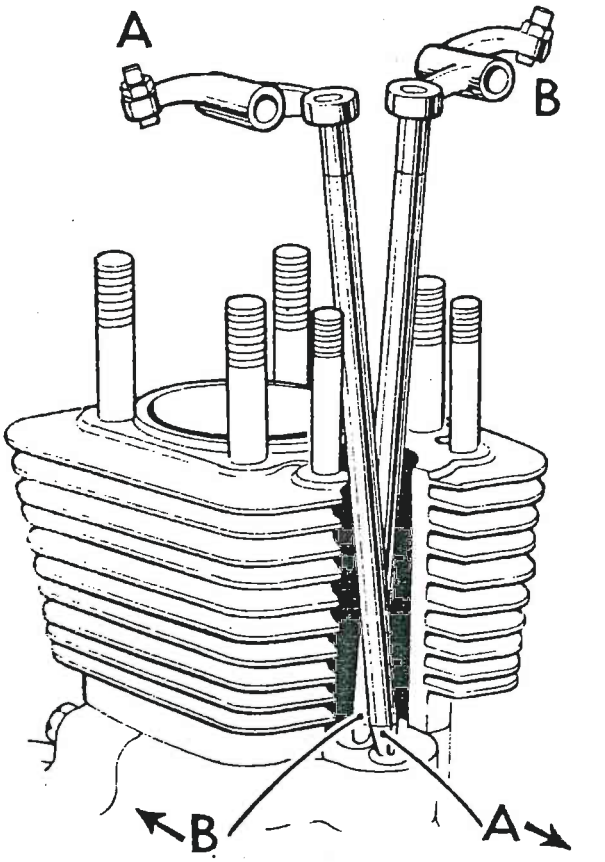


Fig. 11. *Location of pushrods*

Using piston ring slipper No. T10 (Fig. 10) compress the rings is that the slipper is just free to rotate and refit the barrel. The slipper will be displaced as the piston enters the bore.

Take off the slipper and remove the hardwood supports, allowing the barrel to drop on to the crankcase.

Insert the two push rods down the barrel aperture, on to their respective tappets, the outer one operating the inlet valve (see Fig. 11).

Refit the rocker box assembly using a new gasket, and tighten the screws to 4 lbs. ft. using a torque wrench.

In order to avoid any strain on the cylinder head fixing nuts from valve spring pressure, the piston must be set at top dead centre on the compression stroke before attempting to refit the cylinder head assembly.

Check that the push rods are correctly located, place a new cylinder head gasket in position, and refit the head, complete with rocker box.

Now, using a torque wrench, tighten the six cylinder head fixing nuts to the figures given on page 1V. It is necessary to use an extension of the type T24 to reach the nuts on the right side.

The pushrod inspection cover may be refitted at this stage.

CHECKING VALVE CLEARANCES

Valve clearances must be adjusted with the piston at top dead centre on the compression stroke (both valves closed). At this point valve clearances must be adjusted to .006" (.15mm) inlet and .008" (.20mm) exhaust.

The engine must be cold at the time of adjustment.

Checking valve clearances

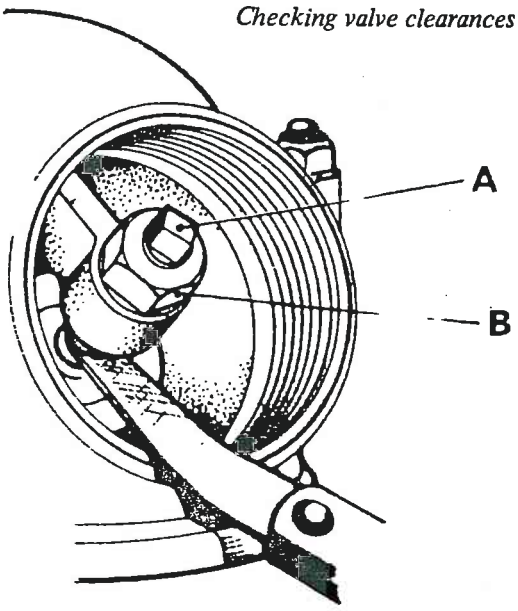


Fig. 12

If the clearances require adjusting slacken the locknut (A) and adjust the pin (B) until the correct gauge will just slide between the valve stem and pin (see inset, Fig. 12).

Holding the pin in its new position, retighten the locknut.

Check the clearance again to make sure that the setting has not altered whilst tightening the locknut, and refit the inspection caps.

REMOVAL AND REPLACEMENT OF THE ENGINE UNIT

During removal of the engine unit, watch for any nuts or bolts which are found to be loose or have worn considerably. Such parts are no longer serviceable and must be replaced.

(1) Remove seat and tank.

(2) Remove exhaust system, loosening the silencer clip and removing the fixing bolt. Remove retaining spring from exhaust pipe and tap outwards from head with hide hammer, pushing exhaust pipe backwards and forwards at same time.

(3) Take off the crankcase shield and drain the oil reservoir. See page 15. If it is not desired to drain the frame reservoir, plug the tube with a 5/16" bolt.

(4) Disconnect the leads from their snap connectors at the electric box and disconnect the high-tension lead from the sparking plug.

(5) On removal, the carburetter may be tied out of the way. Leave the rubber connecting hose attached to the air cleaner box.

(6) Detach the engine steady stay from the tread bracket and frame.

(7) Uncouple the rear chain. Detach the chain from the machine. Disconnect the clutch cable, using a suitable open-ended spanner as a lever on the operating arm.

The engine bolts may now be released, and it must be noted where distance pieces are fitted between the engine and frame on all three bolts.

The engine may now be removed from the lefthand side quite easily.

Replace the engine in the reverse manner making sure that all nuts, bolts, and electrical connections are secure. Take care to replace the distance pieces correctly, make a final check of all nuts and bolts, etc., before using the machine.

TRANSMISSION

Description

Power from the engine is transmitted through the engine sprocket and primary drive chain to the clutch chainwheel, then via the clutch driving and driven plates to the cush drive or shock absorber unit and gearbox mainshaft.

The drive is then transmitted through the four-speed gearbox to the final drive sprocket and finally, to the rear wheel.

The clutch cush drive, as its name implies, smooths out the drive as the power impulses fluctuate.

The clutch, when operated correctly, enables the rider to stop and start his machine smoothly without stalling the engine, and assists in providing a silent and effortless gearchange.

Thus it will be evident that the satisfactory operation of one part of the transmission system is dependent on another. In other words, if one part is worn or faulty, it can very often prevent other parts from working properly.

DISMANTLING AND REBUILDING THE PRIMARY DRIVE

The following notes assume that the engine unit is isolated on a workbench, although attention to the primary drive and gearbox assemblies may be carried out with the engine installed in the frame. However, if this is to be the case, the rear brake pedal must be taken off.

Remove primary cover and break the joint by tapping the cover gently with a hide mallet, but have a suitable receptacle ready to catch any remaining oil.

Clutch dismantling

Remove the locking wire and the four spring retaining nuts and withdraw the pressure plate complete with springs and cups. The remaining clutch plates may now be taken out. If these are the only items requiring attention, the clutch need not be dismantled further.

So that the clutch centre nut may be unscrewed, the clutch centre and chainwheel must be locked together with service tool No. T19 and a bar inserted through the connecting rod small-end. If the service tool is not available, or if the cylinder and piston are still in position, engage top gear and lock the gearbox sprocket with a length of chain in a vice. If the engine is still in the frame, apply the rear brake. Unscrew the nut, which has a normal right-hand thread.

Take off the nut, and distance piece, and withdraw the clutch push rod. Do not attempt to remove the chainwheel at this stage.

Generator removal

As the primary drive chain is endless, it is not possible to dismantle the clutch completely unless the generator and engine sprocket are removed. The generator comprises the rotor, fitted to the engine shaft, and the stator which is mounted on two studs around the rotor, both parts being detailed in section.

ROTOR mk:
CCM 5 RT

To remove the stator, release the two screws and pull the generator lead through the rubber grommet in the chaincase. Take care not to damage the stator casing when pulling the stator off its studs and note that the stator unit is fitted with the lead on the inside.

Bend back the tab of the lockwasher under the engine shaft nut and unscrew the nut. Pull off the rotor, wipe it clean of swarf, and store it in a clean place. Take out the Woodruff key from the crankshaft, and stick it to the rotor for safe keeping.

The clutch sleeve, the clutch chainwheel, chain and engine sproket can be withdrawn together.

Inspecting the clutch

The driving plates have segments of special friction material which are securely bonded to the metal. These segments must be complete, unbroken and not displaced. Even if there is no apparent wear or damage to the plates or segments, the overall thickness of each segment should be measured, and if the extent of wear is more than .030" (.75 mm.), the plates must be replaced. Standard thickness is .167" (4.24 mm.).

The tags on the outer edge of the plates should be a good fit in the chainwheel slots and must not be "hammered". If there are burrs on the tags the plates must be renewed.

The plain driven plates must be free from score marks and perfectly flat. If they have become shiny with use they must be replaced. To check flatness, lay the plate on a piece of plate glass; if it can be rocked from side to side, it is buckled and must be replaced.

Clutch centre and cush drive

To inspect the cush drive rubbers which are contained in the clutch centre, drill out the four round-head rivets adjacent to the clutch spring housings and prise off the retaining plate.

Clutch rubbers must be replaced when worn, otherwise damage to clutch and gearbox can be expected.

When refitting the rubbers it will be found necessary to use a lubricant, in which case a liquid soap is recommended. **Do not use oil or grease.**

The clutch centre housing slots must be smooth and unmarked – damaged grooves will cause a jerky clutch action.

Clutch chainwheel

Examine the slots for wear; if they are corrugated or the teeth are hooked and thin, the chainwheel must be replaced.

Check the chainwheel roller bearing for up and down movement. Slight play is permissible, but if excessive, the rollers must be renewed.

Gearbox sprocket

Access to the gearbox sprocket is possible once the clutch assembly has been removed.

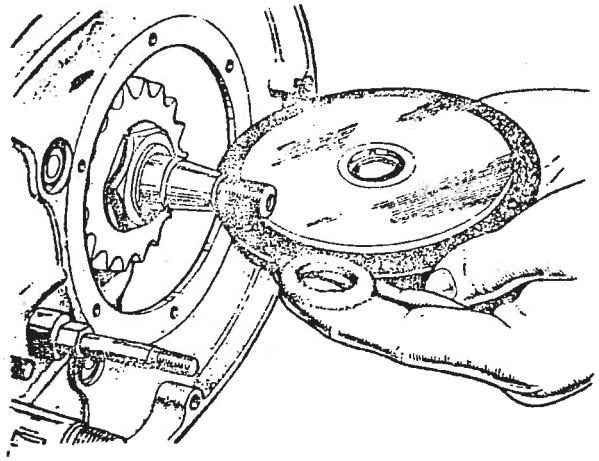


Fig. 15 *Primary case back plate*

Take out the three screws securing the circular plate at the rear of the primary case, break the joint and remove the plate with its bearing.

Look for signs of oil leakage down the back of the cover. If leakage is evident, change the gasket, ensuring that it is fitted correctly.

If it is necessary to renew the gearbox sprocket, place a length of chain round the sprocket and lock in a vice or with a suitable bolt or, in the case of an engine still fitted in the frame, engage top gear and apply the rear brake. Flatten the tab washer and unscrew the retaining nut which has a normal right-hand thread. The sprocket may now be pulled off the gearbox sleeve pinion splines.

The gearbox oil seal may be renewed at this stage if it shows signs of leakage, but the sprocket boss must be examined for signs of wear. A worn sprocket must be replaced, though it may be possible to overcome slight wear by using fine

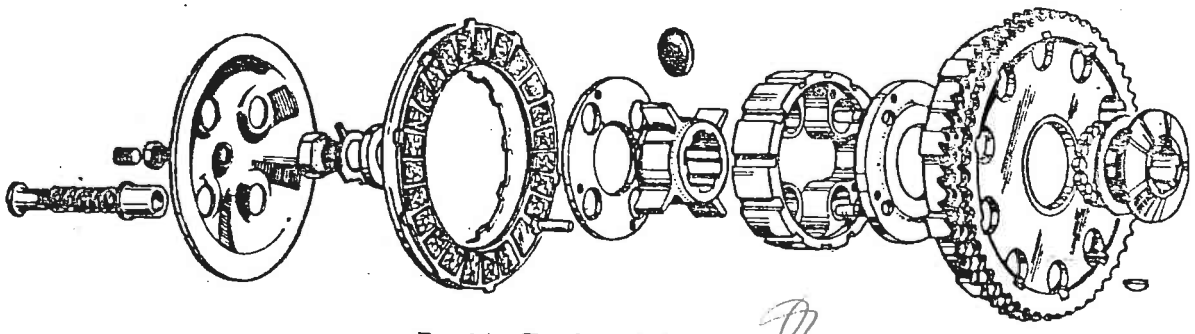


Fig. 14 *Clutch exploded*

emery cloth to rub the boss smooth. A sprocket that is "hooked" must be renewed. Lightly oil the sprocket boss when replacing to avoid damage to the oil seal.

Refit the nut with a new lockwasher, and bend up the washer to lock the nut.

See Torque Settings.

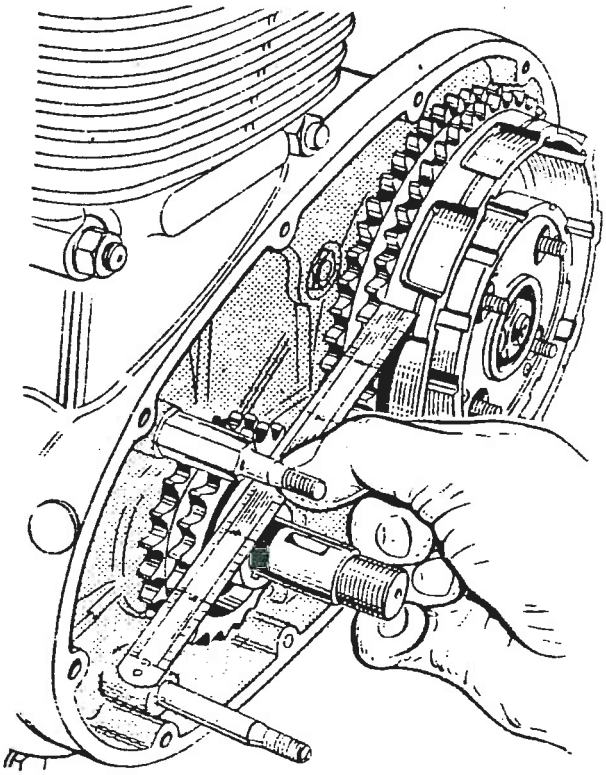


Fig. 16 *Checking alignment of the primary drive*

PRIMARY CHAIN ALIGNMENT

If any engine component such as the crankshaft, crankcase, gearbox mainshaft, engine sprocket, clutch hub, clutch chainwheel or inner timing cover has been renewed, true alignment of the primary chain must be re-established in order to avoid excessive wear of the chain and sprockets.

Rebuild the clutch assembly (see below) without the primary chain and fit the engine sprocket. Do not omit any engine sprocket shims which were originally fitted.

Apply a steel rule or other suitable straight-edge across the face of the clutch chainwheel and engine sprocket teeth, as shown in Fig. 16. The straight-edge will make contact at three points if the sprockets are truly aligned.

If the sprockets are not in alignment, indicated by a gap between the straight-edge and engine sprocket if the straight-edge is applied to the clutch chainwheel only, shims to the value of this gap must be fitted behind the engine sprocket to bring the sprockets into line.

Part numbers and thicknesses of the various shims available are:–

.015" (71–1630)
.030" (71–1629)

Reassembling the primary drive

Remove the clutch assembly complete, if primary chain alignment has been checked, and pull off the engine sprocket.

If the clutch sleeve has been removed from the chainwheel, smear the sleeve with grease and place the twenty-five rollers in position. Slide the chainwheel over the rollers and fit the clutch centre over the splines of the sleeve.

Fit the primary chain around both clutch and engine sprocket.

Pick up the assembly in both hands and locate the sprockets over their respective shafts. (Fig. 17. Ensure that the gearbox mainshaft is correctly located. Add the clutch centre nut distance piece. Ensure that the threads of the clutch retaining nut and gearbox mainshaft are free from grease, and apply a drop of "Loctite" to the threads of the mainshaft before fitting and tightening the nut to a torque of 20 lbs. ft. Fit lock nut torque to 40 lbs. ft.

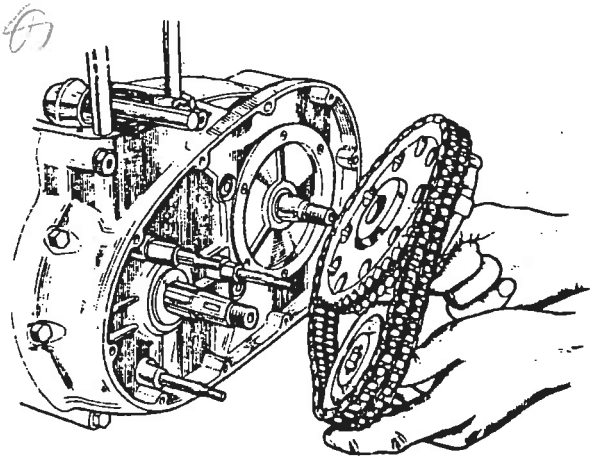


Fig. 17 *Fitting primary drive*

Pass the stator lead through the grommet at the front of the crankcase. Fit the rotor Woodruff key to the engine shaft, and push the rotor home with its marked face outwards. Locate the tag of the lockwasher and fit the nut, having first applied a drop of "Loctite" to the threads. Tighten the nut to **20** lbs. ft. and bend up the lockwasher.

Fit the stator on to its studs with the lead on the inside at the front, and secure with the self-

locking nuts. It is important that the air gap between the rotor and the stator pole pieces is equal all round. The gap may be checked with a .008" feeler gauge. Any variation may be corrected by slackening the stator fixing nuts sufficiently to allow the stator to be tapped into the required position with a hide mallet.

If this point is not closely followed a "spike" voltage may be transmitted to the electric box with subsequent damage resulting.

Important. Check that the stator wire does not foul the primary chain.

Replace the clutch plates, beginning with a friction plate, then a plain plate, and so on alternately, there being five plates of each type. Insert the clutch pushrod into the mainshaft.

Place the pressure plate in position and fit the four spring cups with springs, which should be of equal length 1.7/16" (35mm). If the springs are found to have settled in service they must be renewed. Ensure that the location pips of the spring cups are properly located in the slots in the pressure plate.

Screw on the four spring nuts until the lockwire holes are just clear of the pressure plate at full lift.

If the springs are compressed excessively, the handlebar lever will be stiff to operate. Conversely, if spring pressure is insufficient the clutch will slip. Check the accuracy of the spring setting by declutching and depressing the kickstart lever, when it will be seen whether or not the pressure plage is running "true". If necessary, adjust each nut to correct any "run-out", then lock the spring retaining nuts in position with a length of wire.

When the spring setting has been determined the clutch movement can be adjusted by means of the central screw and locknut on the pressure plate. The pushrod must also be adjusted in this way so that the clutch operating lever on the timing cover lies at an angle of approximately 30° to the cover joint face, make sure that the clutch pushrod has free play and that the adjuster is not fouling the gearbox mainshaft.

Having completed assembly of the clutch, the primary cover may be refitted. Apply grease to each joint face, and, using a new gasket, fit the cover. Tighten the fixing screws evenly to a torque of 3.5 – 4.5 lbs. ft.

IGNITION TIMING

Set piston to top dead centre, removal of spark plug will make rotation of engine easier, gain access to rotor and magnetic pickup by removing chrome cover on kickstart case.

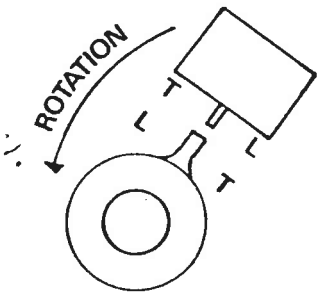
Set magnetic pick up backplate slots central with pillar bolt. This is to give movement both anticlockwise and clockwise.

Loosen ignition rotor fixing screw if not already done and a sharp tap with a 'soft' hammer will break its seal with its taper. Set timing as shown diagrams illustrated and tighten motor fixing screw, (see torque setting).

The air gap must now be set, between rotor and pickup, to .006" – .010". This measurement is very critical as it can affect the timing at low eng. speeds. This setting can be altered by means of the two small fixing screws which must both be loosened and the magnet pickup moved until the airgap is correct. Tighten the fixing screws and recheck the airgap.

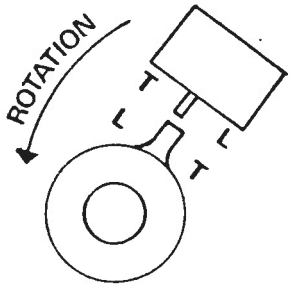
Finally check the position of rotor relative to the pickup slight adjustment can be made by rotating beackplate.

Replace chrome cover with new gasket if necessary, and spark plug if it has been removed.



The position of rotor and pickup for machines fitted with CCMSMK2 ignition pack.

Trailing edge of rotor in line with leading edge of pickup.



Position of rotor and pickup for machines fitted with CCM5Mk3 ignition packs.

Leading edge of rotor in line with trailing edge of pickup.

Interspark, Bosch ignition box made:

CCM-5
M3-T
24-10-78

Symptoms and results of mis-timing

"Pinking", or chinking noises when the engine is under load means that the engine is over advanced.

This must be rectified immediately or rod breakage, overheating of the piston and damage to the bearings may occur.

If the engine lacks responsiveness and the exhaust pipe turns blue then the ignition timing is probably retarded.

This state can cause overheating and damage to piston and exhaust valve.

REMOVING THE TIMING COVERS

To gain access to the camshaft, oil pump and gearbox components it is necessary to remove the covers on what is known as the timing or gear-side of the engine. The primary drive must have been dismantled as described on page 19 though it is possible to carry out attention to the oil pump, tappets and gear selector mechanism without need of this. However, the complete gear cluster cannot be removed unless the primary drive is first dismantled.

Before attempting to dismantle the inner and outer covers, turn the engine to top dead centre on the compression stroke if the rocker box is fitted—this will avoid straining the inner camshaft bush (due to valve spring pressure) as the inner cover is removed.

To remove the outer cover, take off the gear-change and kickstart pedals, then take out the cover retaining screws, noting their respective locations. The cover, complete with back plate and clutch operating mechanism may now be with-drawn, after removing ignition rotor.

Take care to avoid losing the clutch operating rack and ball which are loosely located inside the outer cover.

Disengage the kickstart spring from its anchor and kickstart quadrant and unscrew the spring anchor. Leave the kickstart quadrant in place.

Take out the remaining fixing screws, noting their locations, and break the crank-case to cover joint by tapping the cover gently with a hide mallet. The cover, with gear cluster assembled, may now be removed, but when withdrawing the cover, hold a finger against the camshaft to avoid disturbing the valve timing unnecessarily.

Note that the camshaft bush in the cover is located by a small peg to ensure correct alignment of the oil holes during reassembly. Check that the oil seals in the covers are not damaged and are fit for further service.

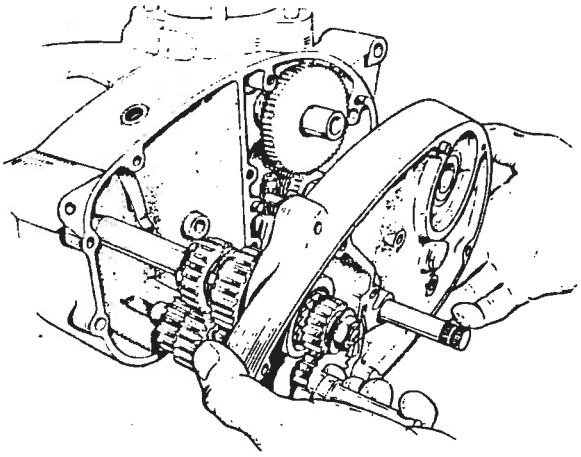


Fig. 23 *Removing inner cover*

OIL PUMP, TIMING GEARS AND TAPPETS

Oil pump removal

During engine dismantling the oil pump need not be removed unless it is known to require attention.

Use a suitable bar through the connecting rod to prevent rotation of the engine, but use pieces of wood beneath the bar to prevent damage to the crankcase face. Flatten the tab washer under the crankshaft nut and unscrew the nut.

Pull off the crankshaft pinion, using extractor No. T14 with angle legs.

Unscrew the nuts securing the pump to the crankcase and pull the pump from its mounting studs.

Do not dismantle the pump unless internal damage is suspected.

Dismantling the oil pump

Having removed the oil pump from the engine, take out the four screws from the base of the pump, releasing the base plate and top cover from the pump body.

The driving spindle and driving worm gear are secured to the top cover with a nut and shake-proof washer. Note the position of thrust washers below the feed gears and that the spindle housing and body are located by means of small dowel pins.

Wash all the parts thoroughly in petrol and allow to dry before examining. Look for foreign matter jammed in the gear teeth and deep score marks in the pump body. These will be evident if regular oil changes have been neglected. Slight marks may be ignored, but any metal embedded in the gear teeth must be removed.

Wear may be found on the gear teeth; if the teeth are worn to the extent that the sharp edges are rounded they must be renewed.

Rebuilding the oil pump

Absolute cleanliness is essential when rebuilding the oil pump.

Insert the driving spindle with fixed gear into its housing, fit the worm drive and secure in position with the nut and spring washer.

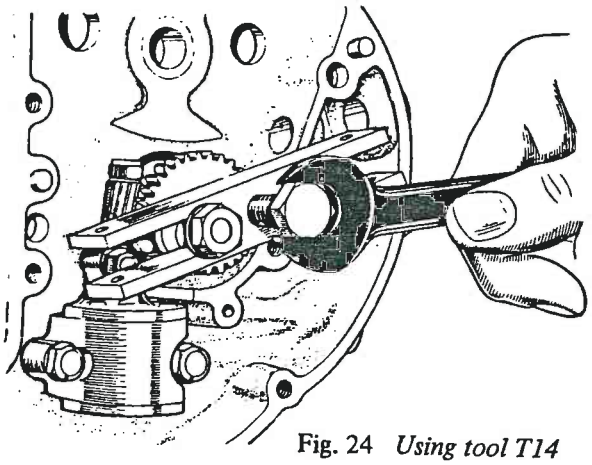


Fig. 24 *Using tool T14*

Fit the thrust washers into the pump body, followed by the driven feed gear with its spindle. Lightly coat one of the join faces with "Loctite Plastic Gasket" and offer the spindle housing and body up to each other, taking care to locate the dowels and gear teeth correctly. Check that the assembly rotates freely.

Proceed to fit the scavenge gears and bottom plate, again using "Loctite Plastic Gasket" to seal the joint. Tighten the four screws evenly, and again check that the pump is free in operation.

Introduce a few drops of clean oil into the passages in the pump body and rotate the driving spindle to draw oil into the pump, thus lubricating the internal parts.

Finally check that the joint faces are parallel. If the housing face is not level it will be distorted when tightened to the crankcase and may prevent the pump from working freely.

Refitting the oil pump

Ensure that the joint faces are perfectly clean, apply a smear of grease to a new gasket and place the gasket in position on the crankcase face. Locate the pump over the studs, replace the fixing nuts and tighten evenly to a torque of 5–7 lbs. ft. The nuts are self-locking using nylon inserts and it is most important that any replacements are of this type. Any alternative nut must be sealed with a drop of "Loctite" to prevent it coming loose in service.

Timing gears

Careful examination of the timing gears will show that there are marks on the faces of the gears, adjacent to the gear teeth.

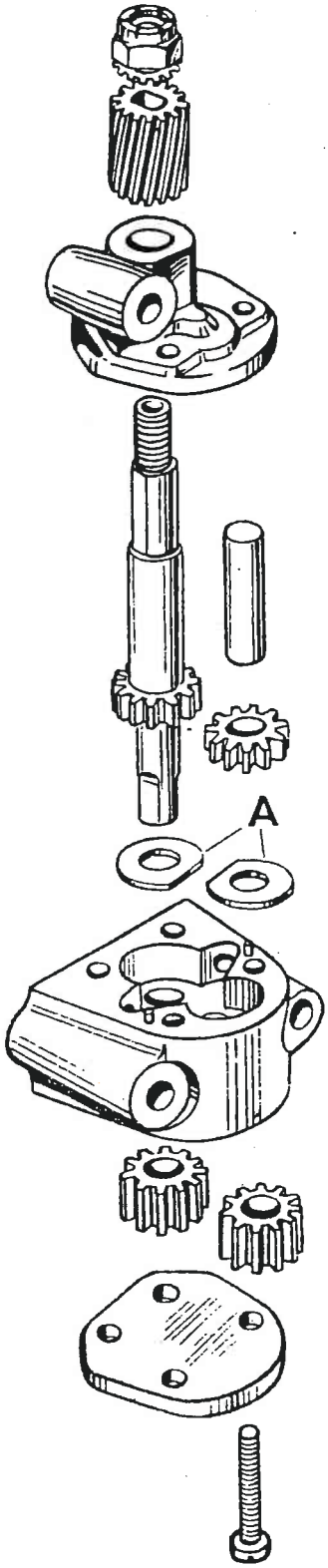


Fig. 25 *Oil pump exploded*

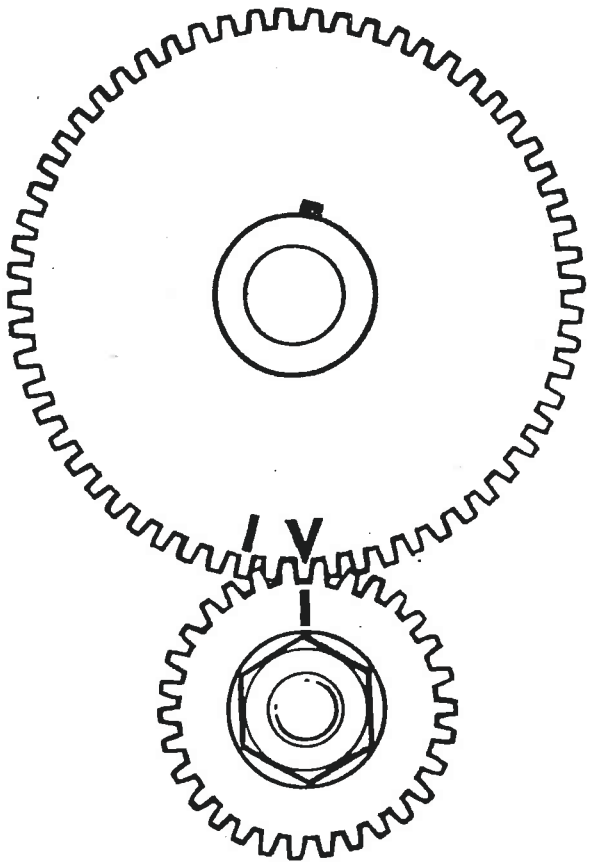


Fig. 26 *Timing marks*

These marks are to assist in correct reassembly, so ensuring precise valve timing. On early engines, it will be noted that there are two marks on the camshaft gear—a dash and a vee—because the same gear is common to other models. The dash must be ignored and the marks aligned as in Fig. 26. If the gears are aligned dash to dash the valve timing will be advanced by two teeth, causing the inlet valve to foul the piston.

Later engines have only one mark on the camshaft gear—a dash. Align the gears dash to dash.

Pull the camshaft, with pinion, from its location in the crankcase and allow the tappets to fall clear. The pinion is a press-fit on to the keyed end of the camshaft, but must not be disturbed.

Removal of the crankshaft pinion and oil pump wormdrive is described in the section dealing with oil pump removal.

Tappets

Examine both ends of each tappet for signs of excessive wear or chipping and make sure that they are quite free to move in their locations in the crankcase. If there are signs of "scuffing" on the feet, they should be reground or replaced. The camshaft must also be examined as this may be damaged too.

Note that one end of each tappet foot is slightly thinner than the other. When refitting, it is most important that this end faces **forward** as indicated in Fig. 27.

On reassembly of the gears, take care to match the timing marks (see Fig. 26 and text).

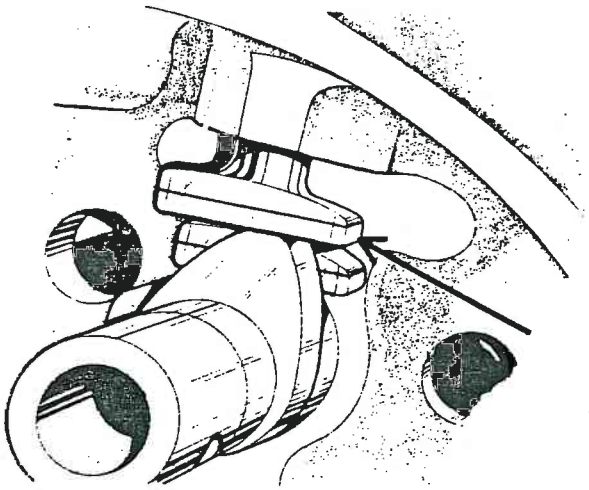


Fig. 27 *Correct fitting of tappets*

GEARBOX DISMANTLING

Having removed the timing covers with gear cluster assembled as described previously, the gearchange mechanism and gear cluster may be dismantled.

Insert a suitable flat blade between the camplate and gearchange quadrant, thus depressing the plungers, and withdraw the gearchange quadrant complete with spring.

The spring-loaded plungers are returned by a small plate, secured with one screw.

The gearchange return spring pivot bolt need not be disturbed.

Take out the camplate pivot retaining split-pin from the outside of the cover, and, using one of the small inner timing cover screws as an extractor, pull out the pivot with a pair of pliers.

The camplate may now be taken out, together with the selector forks and their spindle, permitting removal of the layshaft complete with gears and the mainshaft sliding gear. Note that although the selector forks are of similar dimensions, it is most important that the forks are correctly replaced.

As the gearbox is selectively assembled, sometimes two mainshaft forks are used instead of one of each.

The mainshaft fixed gears and the kickstart ratchet assembly remain fixed to the inner cover bearing.

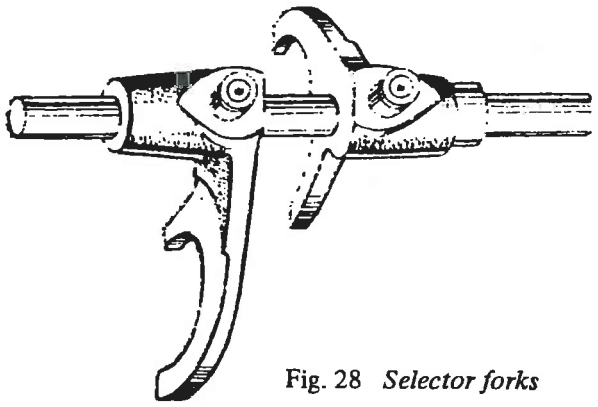


Fig. 28 *Selector forks*

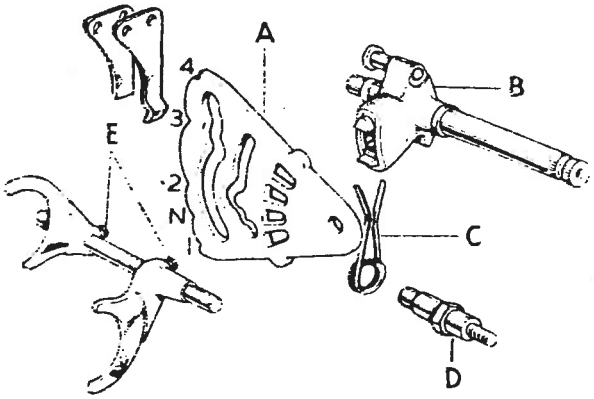


Fig. 29 *Gearchange mechanism*

A–Camplate *D–Pivot bolt*
B–Plunger quadrant *E–Selector forks*
C–Return spring

Grip the mainshaft in a soft vice, bend back the tab washer and release the fixing nut. The kickstart mechanism and mainshaft are now separated.

The layshaft second gear is held by a circlip.

To remove the left gearbox bearing, take off the gearbox sprocket as described on page 17 Using a drift that will pass over the protruding sleeve pinion bush, drive the pinion out of the bearing. Take out the oil seal, and drive the bearing from its housing, having heated the crankcase with the aid of a blow-torch.

Having dismantled the gearbox, make a careful inspection of every component to ensure that is is fit for further service. Look for worn camplate tracks, weak springs, worn bearings and bushes. Examine the gear teeth for pitting on their thrust faces, and replace any part appearing worn or damaged.

GEARBOX REASSEMBLY

With the aid of a blow-torch, heat the crankcase very gently in the area of the bearing housing, being careful to play the flame around so as not to cause distortion, and fit the main gearbox bearing. Refit the oil seal and gearbox sprocket, remembering to bend up the lockwasher. The correct torque for the nut is 100 lbs. ft.

If necessary, fit a new inner cover bearing (having heated the cover in an oven), and assemble the camplate. The camplate must be replaced with the bottom gear notch at the bottom because gear-change positions will otherwise be reversed. Fit the camplate pivot pin, with the threaded end visible to assist future dismantling, and push the split pin through to locate the pin in the inner cover.

The lower side of the camplate is marked ⊥ on most plates for ease of identification.

Re-assemble the mainshaft gears, fit the shaft into the inner cover bearing and fit the kickstart ratchet. Tighten the kickstart ratchet nut to 50-55 lbs. ft. and bend up the lockwasher.

Fit the kickstart quadrant in position, and place the partly assembled inner cover on the edge of the workbench, outside face down, so that the kickstart quadrant is retained but the quadrant shaft and stop are clear of the surface.

Using a little grease to hold it in position, place the layshaft gear shim ("H", Fig. 42) over the bearing in the kickstart quadrant. Engage the layshaft bottom gear ("J") teeth with the corresponding mainshaft gear ("G") making sure that the gear is properly aligned with the layshaft bearing. Take the layshaft sliding gear "K", fit its selector fork (flat face uppermost), and engage the roller of the fork in the lower camplate track.

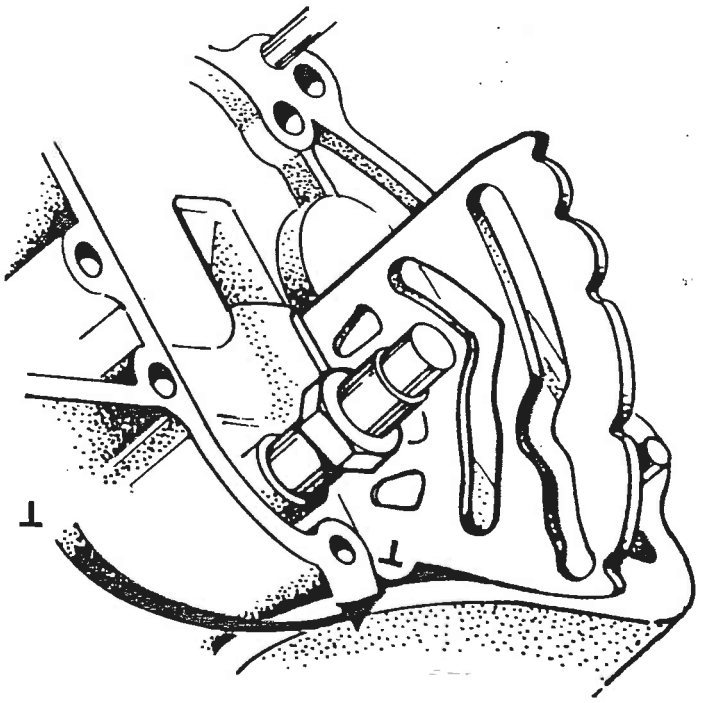


Fig. 41 *Correct fitting of camplate*

Note–The gear clusters illustrated are used for assembly purposes only. The clusters fitted to trials models have been developed in National and International Events to give maximum life and strength.

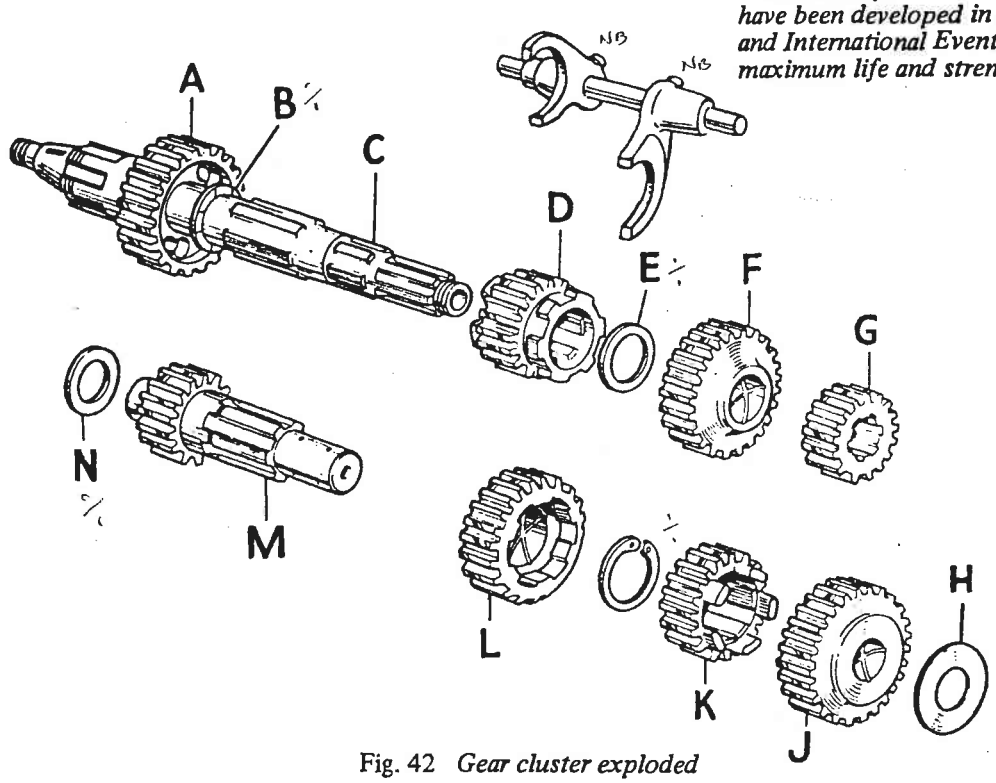


Fig. 42 *Gear cluster exploded*

A–Mainshaft sleeve pinion (top gear)
B–Mainshaft sleeve pinion thrust washer
C–Mainshaft
D–Mainshaft sliding gear (second gear)
E–Mainshaft third gear thrust washer
F–Mainshaft third gear
G–Mainshaft bottom gear
H–Layshaft bottom gear shim
J–Layshaft bottom gear
K–Layshaft sliding gear (third gear)
L–Layshaft second gear
M–Layshaft
N–Layshaft thrust washer

Circlips and thurst washers discontinued on current trials models.

Assemble the mainshaft sliding gear ("D" with its selector fork (flat face down), and engage the roller of the fork in the upper track of the camplate. Push the selector fork spindle through the forks and into the inner cover, and complete assembly of the gear cluster by fitting the layshaft and layshaft second gear assembly.

Place the mainshaft top gear thrust washer over the mainshaft and retain it with a dab of grease. Fit the layshaft thrust washer, ensuring that the side having a chamfered internal bore faces the gear. If the washer is reversed, the sharp corner may foul the radius of the layshaft, causing the layshaft to lock up through lack of end-float when the gearbox is assembled. Retain the washer with a dab of grease.

Lightly oil all components and rotate the shafts to ensure freedom of movement.

If it has been removed the gearchange return spring must be refitted to the plunger quadrant. The spring is set on manufacture to give accurate positioning of the quadrant plungers in the camplate windows, and usually, it is only possible to achieve the correct relationship of parts with the spring fitted one way round. For this reason, the spring is marked with a dab of paint on one side of the coiled end after manufacture, and this side should always face the outside of the gearbox, i.e. towards the body of the plunger quadrant.

If for any reason the spring is not marked, the correct position must be established by trial and error. The spring is correctly fitted when the centres of the two pins on the quadrant and the centre of the coil of the spring are in perfect alignment.

To fit the spring to the quadrant the spring must be twisted into position as illustrated in Fig. 43. Hold the quadrant in the left hand and the coil of the spring, marked side uppermost, between the thumb and forefinger of the right hand. Turn the coil over, at the same time keeping the far point of the spring ("A", Fig. 43) beneath the cap of the quadrant pin ("B").

Fit the quadrant plunger and spring assembly to the inner cover, using a flat blade to depress the plungers whilst the plunger is pushed home.

However, engines are fitted with an eccentric adjuster, and the position of the plunger quadrant relative to the camplate windows may be adjusted once the gearbox is reassembled into the engine.

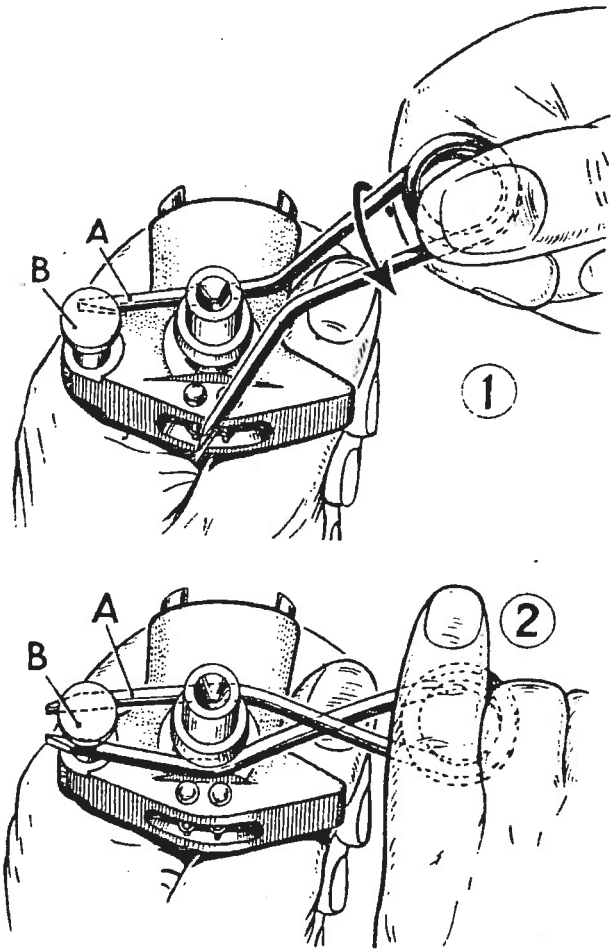


Fig. 43 *Fitting the gearchange return spring*

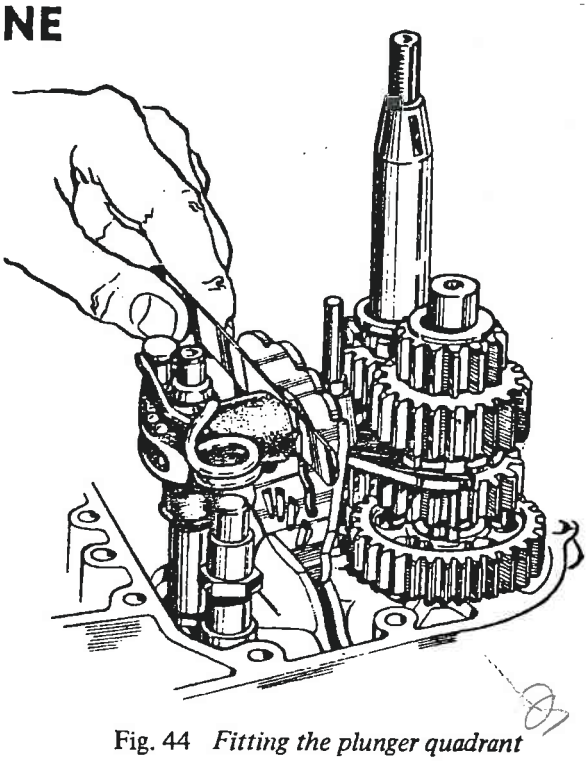


Fig. 44 *Fitting the plunger quadrant*

When all components have been assembled on the inner cover, clean both joint faces with petrol and apply an unbroken film of "Loctite Plastic Gasket" to one face only.

Replace small 'o' ring.

Lubricate the crankshaft oil seal and camshaft spindle, and slide the cover with gears assembled into the crankcase.

The eccentric diameter of the adjuster stop must face the plunger quadrant and any adjustment needed obtained within 90° each way.

To adjust the spring, select each gear in turn. If it is not possible to pick up each gear positively, turn the adjuster a little at a time until a suitable condition is arrived at. Lock the adjuster with the nut (see Fig. 45).

If the gearbox has been re-assembled with its original components there will be no need to check the mainshaft and layshaft for end float. However, if new parts such as a crankcase, inner cover or shafts have been fitted, clearances may have altered and alternative thrust washers may be required to take account of this.

Check available end float before the inner cover is tightened to the crankcase permanently by removing the kickstart ratchet mechanism. Layshaft end-float may be established by means of a pair of pliers after removal of the kickstart quadrant. When doing this, be very careful not to damage the bearing surface of the shaft.

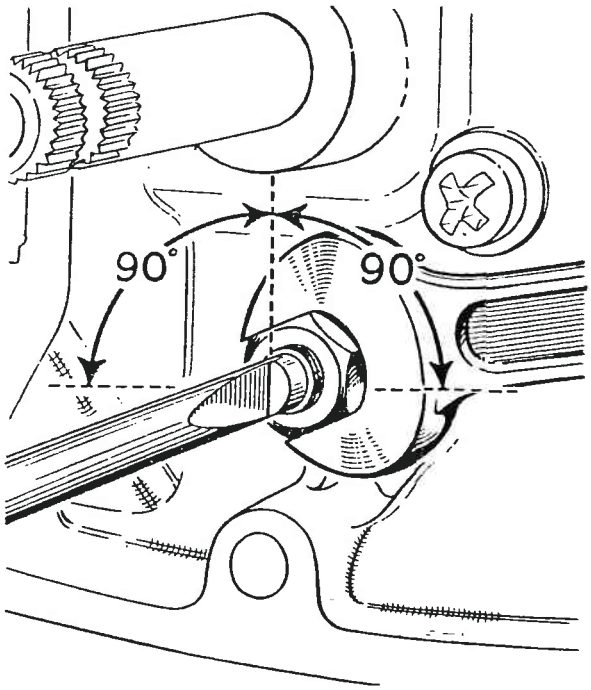


Fig. 45 *Gearchange spring adjustment*

Proceed by fitting all screws to the cover, and tighten them evenly to the correct torque (3.5–4.5 lbs. ft.). Before fitting the outer cover check for correct operation of gears.

Refit the outer cover, again after applying "Loctite Plastic Gasket" to one joint face. Set the ignition timing as described.

Take care to ensure that the rubber strap securing the kickstart lever is always in good condition. If the kickstart lever is allowed to bounce down during use, the ratchet mechanism will be damaged.

SEQUENCE OF GEARCHANGING

Note

Illustrations concerning the sequence of gear-changing show the camplate in the reverse position. This is for clarity only and does not affect the notch pinion positions.

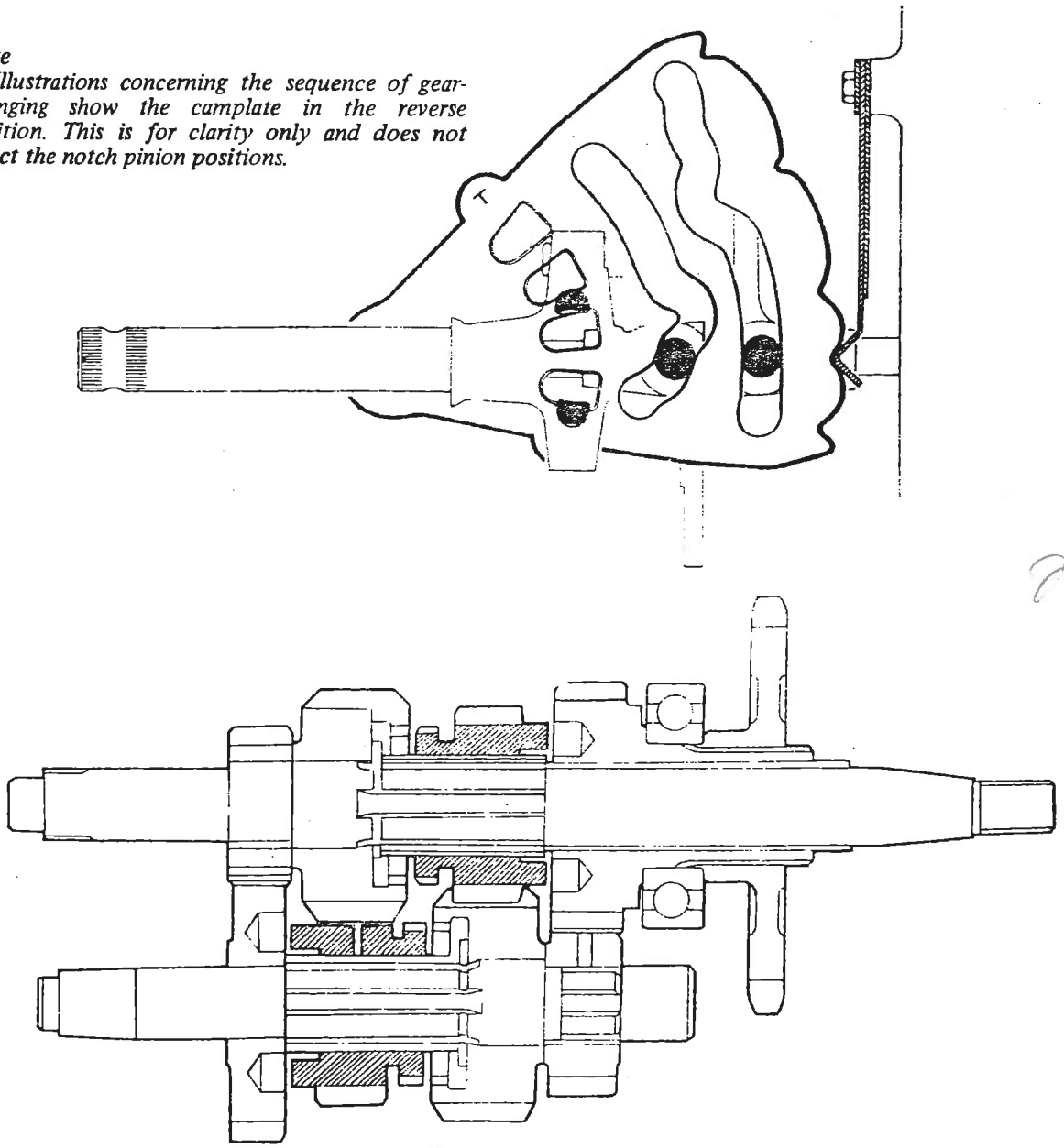


Fig. 46 *Neutral gear position*

The gears must always be in the neutral position for kickstarting the engine. This is the position shown in Fig. 46.

The spring plate is holding the camplate by the second notch. At the other end of the camplate the selector quadrant plungers are compressed ready to operate either way the pedal is moved.

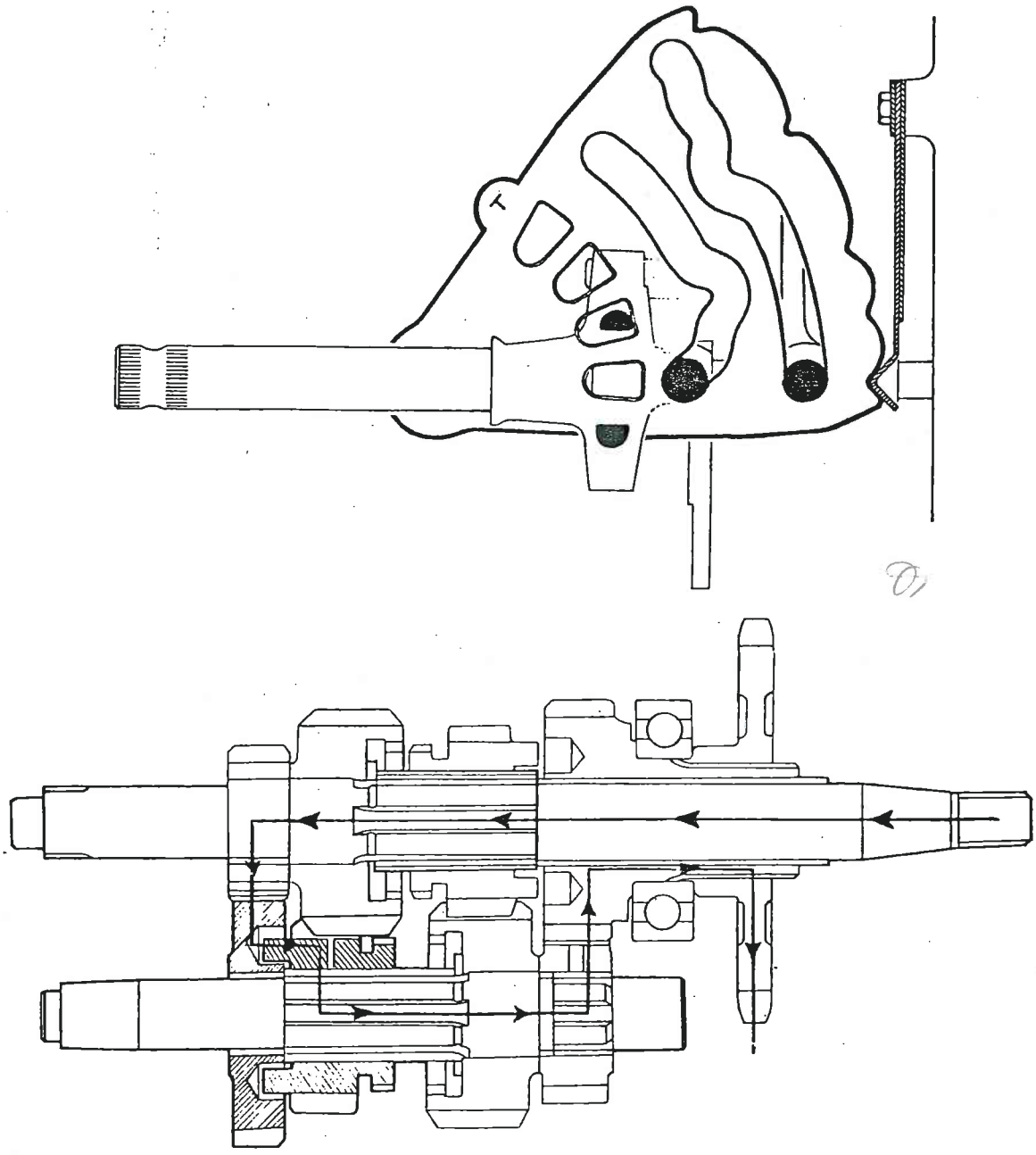


Fig. 47 *First gear position*

When the pedal is moved downwards to engage first gear, the plungers enter the camplate windows to move the camplate to the first gear position. The layshaft sliding gear is engaged with the layshaft first gear, by movement of the layshaft selector fork.

The plungers are poised to move the camplate and gears to the neutral position in half a stroke, or to the second gear position in a full stroke (see Fig. 48).

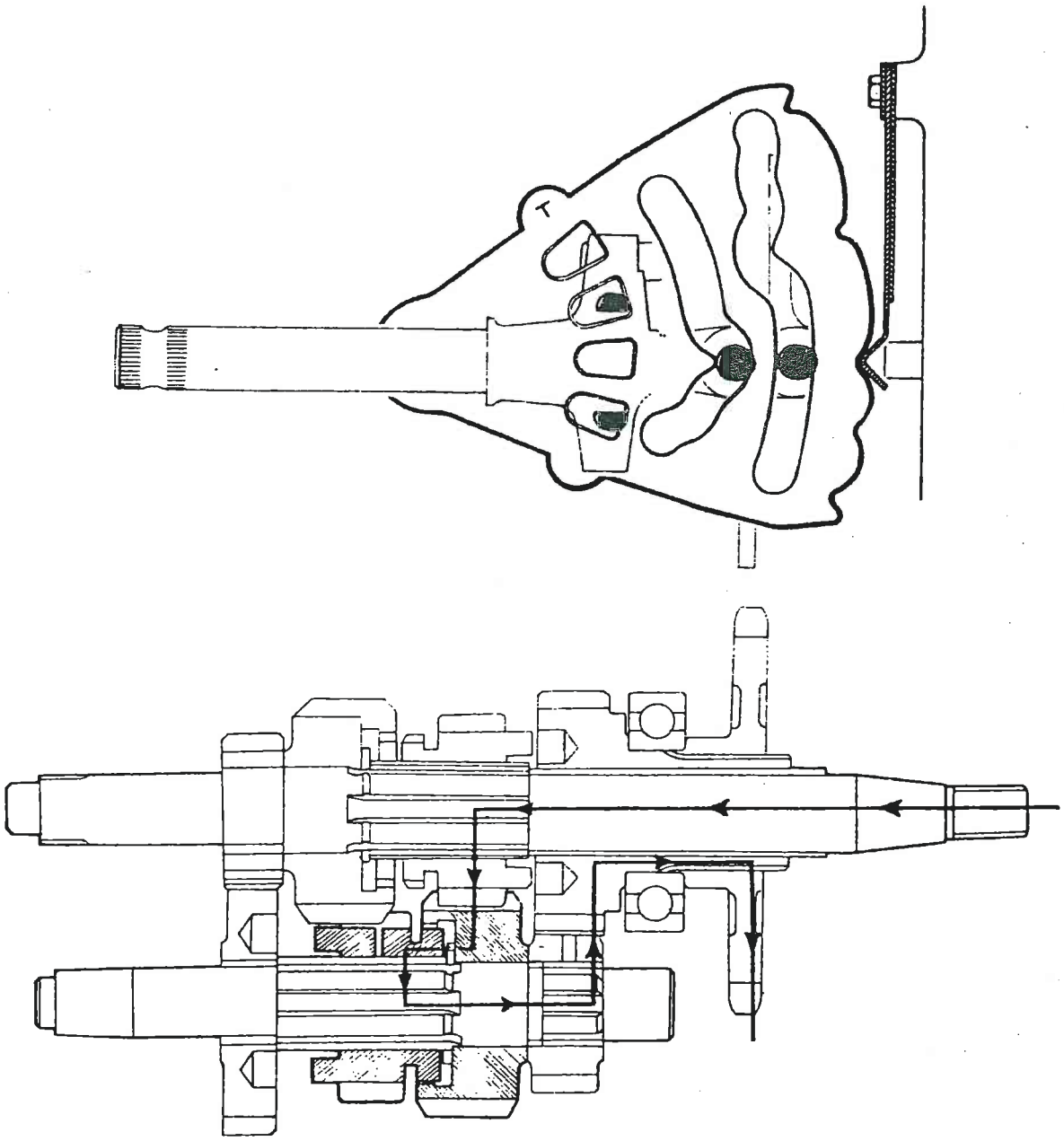


Fig. 48 *Second gear position*

In the second gear position the layshaft sliding gear is engaged with the layshaft second gear. having been moved by the layshaft selector fork.

Fig. 48 shows the quadrant plungers in the camplate windows ready to move the gears from second to either neutral, first or third, according to movement of the gearchange pedal.

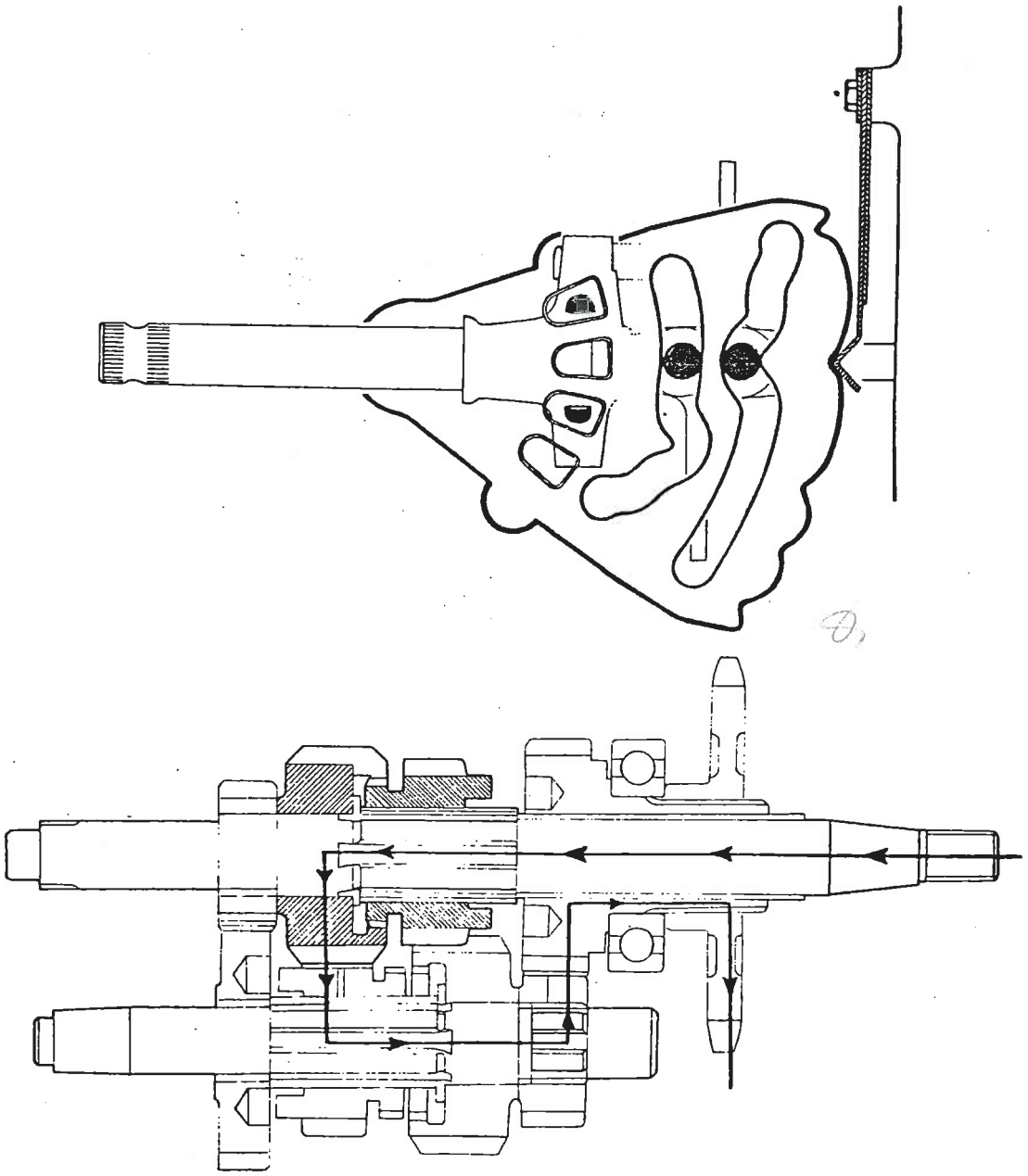


Fig. 49 *Third gear position*

When third gear is selected, movement of the camplate actuates both selector forks. The layshaft sliding gear moves to a neutral position, and the mainshaft fork engages the mainshaft sliding gear with the mainshaft third gear.

In the camplate windows, the quadrant plungers are ready to move the camplate to either second or top gear (see Fig. 49).

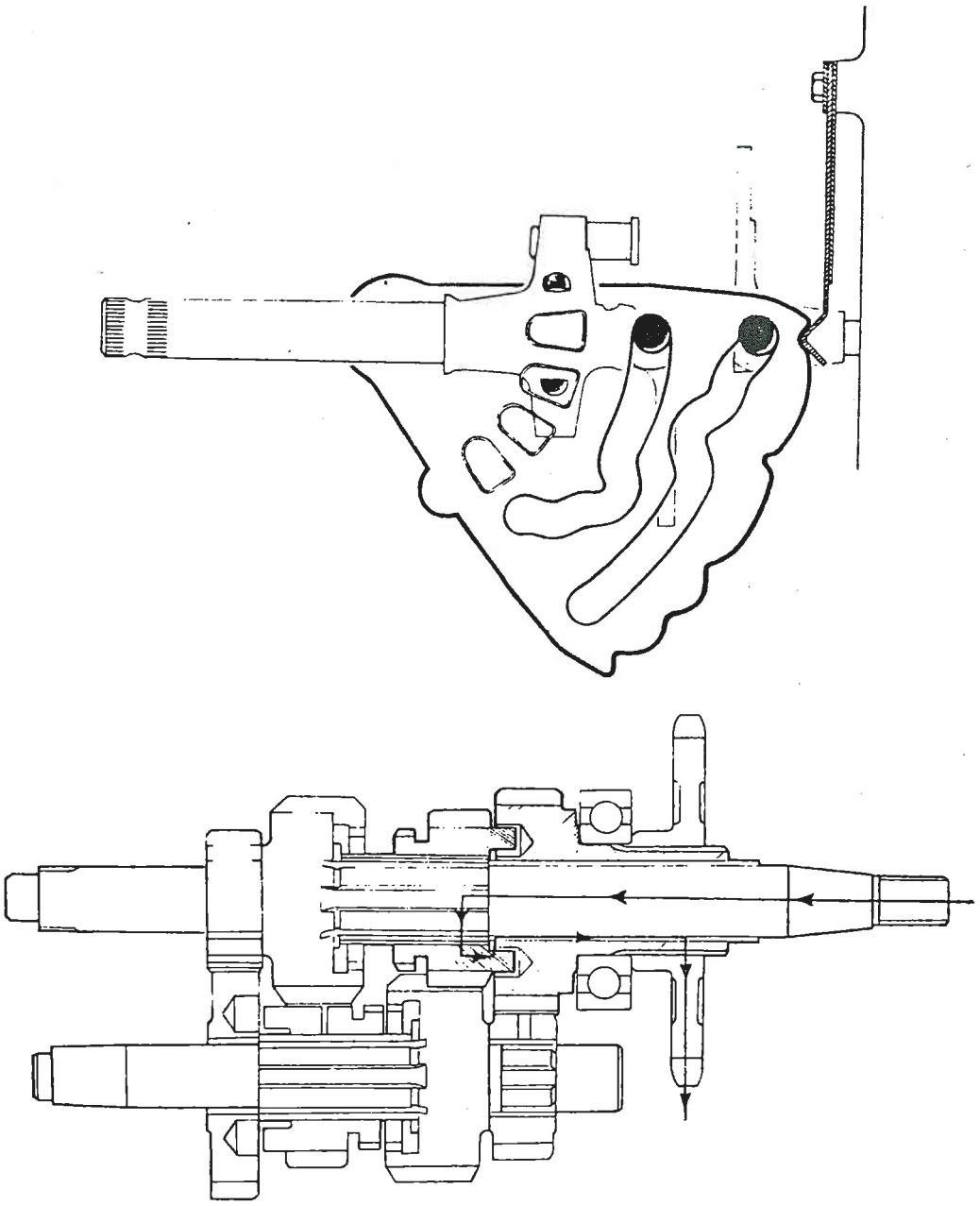


Fig. 50 *Fourth gear position*

The change into top gear moves the mainshaft sliding gear into engagement with the mainshaft sleeve pinion.

The top quadrant plunger is now concealed behind the camplate, and only the lower plunger is able to engage in a window and so move the camplate to the third gear position.

SPLITTING THE CRANKCASE HALVES

Before attempting to part the crankcase halves, remove the primary drive assembly, timing covers and timing gear as described on previous pages.

Working on the left side of the crankcase, remove the three bolts at the lower front of the case then take off the four stud nuts; two from the centre of the case and two from the cylinder base.

Remove any Woodruff keys which may still be in the shafts, noting their particular locations, and break the crankcase joint by tapping gently with a hide-mallet.

Do not attempt to prise the crankcase halves apart by using a tool between the joint. This will only damage the joint faces, resulting in oil leak.

Support the crankcase assembly timing side in a vice (Fig. 51 for a suitable support) and, using a hide-mallet, strike the timing side engine mainshaft until the drive side crankcase and crankshaft assemble assembly are removed. Having done this, the crankshaft may be lifted out of the drive-side crankcase half, gentle pressure may be required due to the main bearing arrangement.

Which is a roller bearing on the drive side and a ball on the timing side.

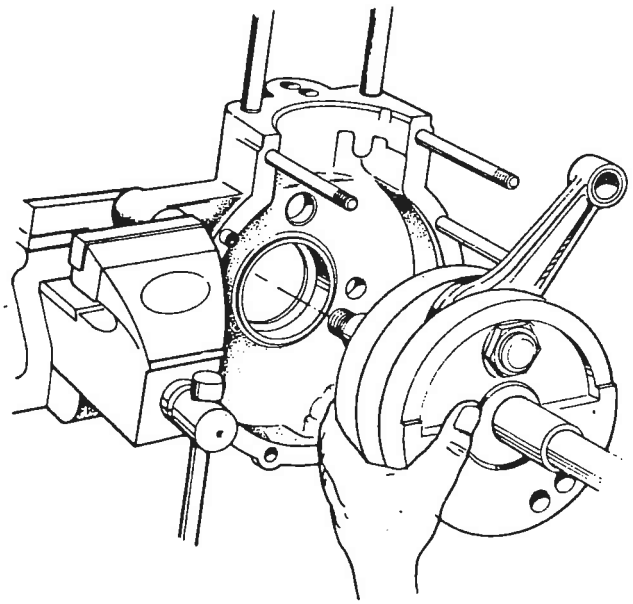


Fig. 51 *Parting the crankcase halves*

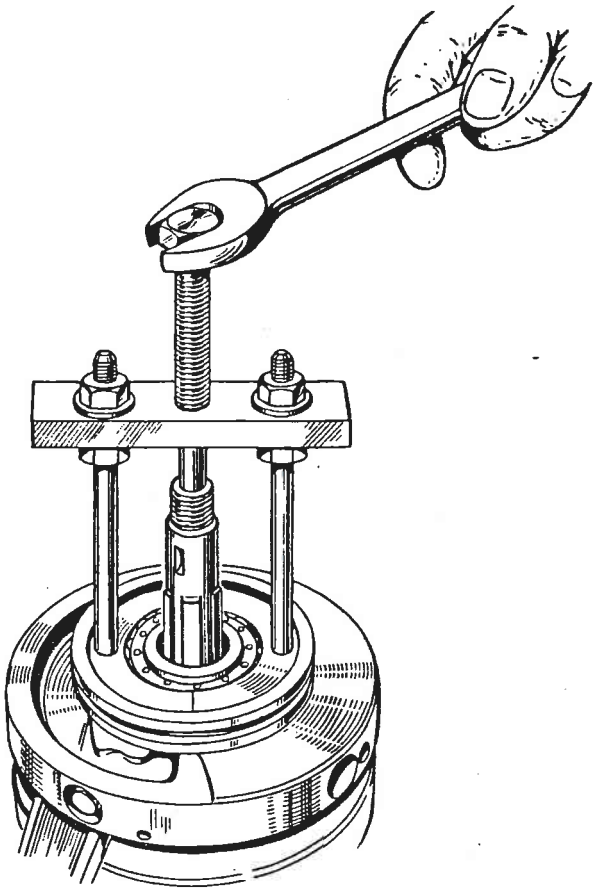


Fig. 52 *Using tool No. T18 to remove the roller bearing inner race*

The outer face on the drive side can be removed by heating the case and tapping out. The ball race can be removed by heating the case and it is free to be tapped out. The inner race on the drive side can be removed by using extractor No. T18 as in Fig. 52.

Main bearings

CCM trials engines have a pressed up flywheel assembly comprising of two flywheels complete with crankshafts, a crankpin, a conrod of H Section Steel, a big end roller cage and 24 roller bearings.

The flywheel assembly is fitted with a centrifugal oil sludge trap which is located in the right flywheel. It is a wise precaution to clean the oil sludge trap whilst the flywheel assembly is removed from the engine.

Remove the screwed plug and thoroughly clean out with paraffin. If possible use an air line to blow through the oilways. Replace the screwed plug, using an impact screwdriver to prevent the plug working loose during use.

Important

It is recommended that all flywheels are overhauled by either CCM or an appointed dealer who have the specialist equipment to undertake such a repair.

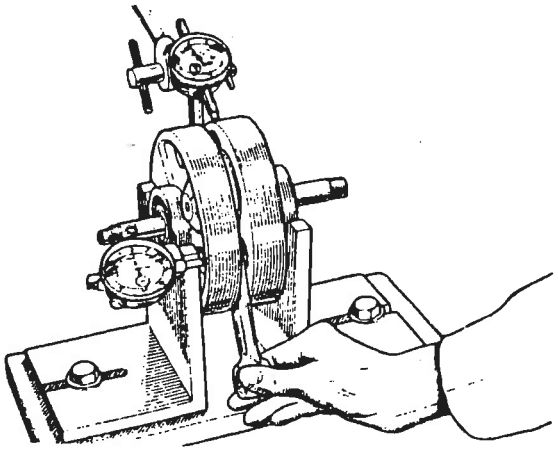


Fig. 53 *Checking the flywheels*

Flywheel truing

Place the crankshaft bearings on to the shafts and mount the assembly in vee-blocks. True-up the flywheels as indicated in Fig. 53 using dial indicators for checking.

Flywheel truing may only be carried out successfully using the equipment illustrated. Therefore, it is recommended that the work be entrusted to a specialist or dealer or CCM.

The flywheels must be true on their side faces to .005". The drive-side shaft must be true to .002" and the timing-side shaft to .005".

Using a pressure oil-can, force clean oil through the duct in the right engine shaft until it is seen to issue from around the big-end bearing, thus indicating that the oil-ways are not blocked and are full of oil.

REASSEMBLING THE CRANKCASE

Heat the crankcase in order to fit new bearings and bushes as required.

Hold the timing side crankcase in the vice as in Fig. 51. Replace the crankshaft assembly.

Do not forget to omit the shims between flywheel and ball bearing.

Apply a thin coating of "Loctite Plastic Gasket" to one joint face of the crankcase halves and fit the timing-side half.

Replace the three bolts at the front of the case and the four nuts (two at the base of the cylinder and two in the primary case). Loctite should be applied.

Tighten nuts and bolts evenly, to a torque of 16–18 lbs. ft.

Check that the crankshaft assembly rotates freely. If it does not, alignment may be incorrect or too many shims are fitted behind the timing side ball bearing. The cause of the trouble must be located and rectified.

Reassembly from this point is described in previous pages.

GENERATOR TYPE

Check keyway location in rotor (see Fig. 55).

Check that air gap between rotor and stator is constant, otherwise spike voltages could occur and damage to the electronics could result.

Ensure that all wiring and connections are sound and secure.

The electronics box should be securely mounted which should be checked regularly.

Check earthing.

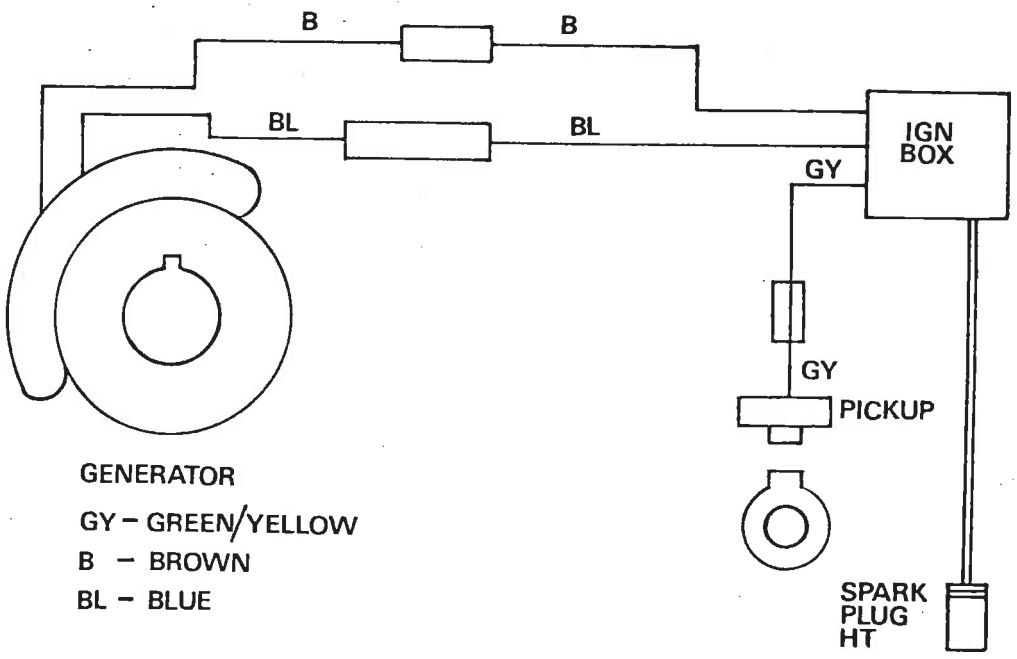


Fig. 55

CARBURETTER AMAL R2624

See parts list for correct carburetter illustration.

All models are fitted with Amal carburetters. Whilst the principle of operation is common to all bore sizes there are points worth noting in the following text.

Dismantling and assembly is easily accomplished after studying the carburetter illustration in the parts list. It is important when tuning the carburetter to make sure that all parts are in good working order and free from excess wear. Gaskets and seals should be replaced if at all suspect. Parts should be cleaned in petrol before re-assembly and checked for wear.

The parts most likely to be worn after considerable use are as follows.

1 Slide
2 Needle
3 Needle Jet
4 Float Needle
5 Body

When replacing parts be sure that they are exactly similar to the old one, i.e. do not replace a 4-stroke type needle with a 2-stroke equivalent and so on. If in any doubt consult the factory. Always use genuine spares.

When replacing the slide, be sure that it does have a sticky action as this cane be dangerous in use.

TIMING PROCEDURE

1 Always adhere to standard settings.
2 Ensure that there are no air leaks at joints. Air leaks will cause the engine to run on even though the throttle is shut.
3 If the engine eight strokes at full revs look for loose engine or head steady bolts. These will cause the engine to vibrate and the float needle to lift off its seat causing flooding.

Effect of altitude on carburation

Increased altitude tends to cause a rich mixture; the greater the altitude, the smaller the main jet required. The carburetter is suitably set for use in altitudes of up to approximately 3,000 feet. Carburetters used constantly in altitudes of between 3,000 and 6,000 feet should have a reduction in main jet size of 5 per cent from standard, and a further reduction of 4 per cent should be made for every 3,000 feet in excess of 6,000 feet altitude.

No adjustment can be made to compensate for lost power dues to rarified air.

TRACING FAULTS

Faults likely to occur in carburation can be placed in one of two categories; either richness or weakness of petrol/air mixture.

Indications of richness

Black smoke from exhaust.
Eight-stroking.
Heavy, lumpy running.
Sparking plug sooty.

Indications of weakness

Spitting back in carburetter.
Erratic slow-running.
Overheating.
Engine runs better if throttle is almost closed.

Having established whether the mixture is too rich or too weak, check if caused by:–

(1) Fuel feed–check that jets and passages are clear, that the filter gauze in the "banjo" connection is not choked with foreign matter, and that there is an ample flow of fuel. Ensure there is no flooding.

(2) Air leaks–usually at the flange joint, but possibly due to a worn inlet valve stem and/or guide.

(3) Worn or loose parts–such as a loose-fitting throttle valve, worn needle jet or loose main jet.

(4) Cracks in carburetter body.

BEMÆRK:

CHOKER OP : SLÅET FRA
" NED : " TIL

The carburetter specification should never be altered without first consulting the works.

Needle 2A1
" jet 105
Pilot jet 25
Main 140
Slide 3,5 (mk 2622)

CARBURETTER

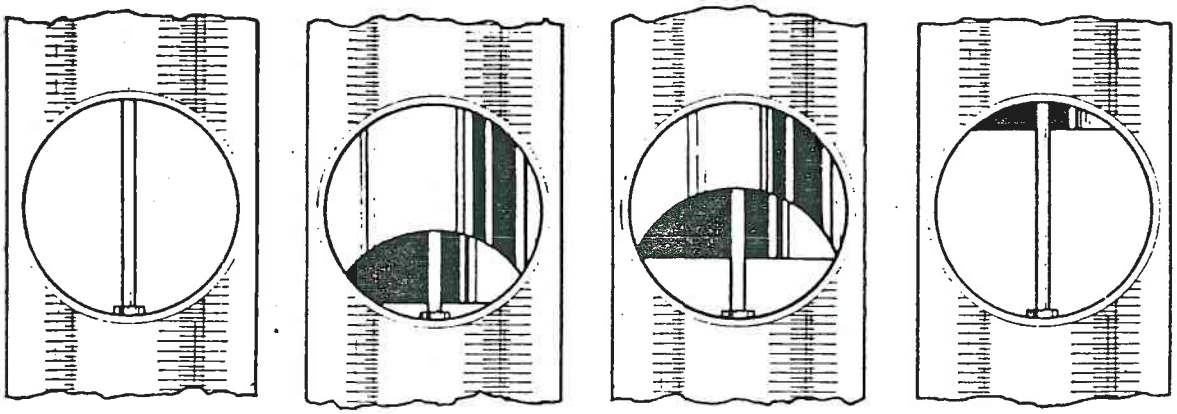


Fig. 57 *Sequence of tuning*

A–First Stage: Main jet size (¾ to fully open).

B–Second and Fifth Stages: Pilot jet (up to 1/8 open).

C–Third Stage: Throttle cut-away (1/8 to ¼ open).

D–Fourth Stage: Needle position (from ¼ to ¾ open).

(5) The air filter being blocked.

Having ensured that the fuel feed is correct and that there are no air leaks etc., check the ignition timing, valve operation and timing. Now test to see if the mixture is rich or weak.

If required, proceed as follows:–

(Positions 1, 2, 3 and 4 refer to positions of throttle openings as shown in Fig. C2).

To cure richness

Position A. Fit smaller main jet.

Position B. Screw out pilot air adjusting screw.

Position C. Fit a throttle valve with a larger cut away.

Position D. Lower needle one or two grooves.

To cure weakness

Position A. Fit larger main jet.

Position B. Screw pilot air adjusting screw in.

Position C. Fit a throttle valve with a smaller cut away.

Position D. Raise needle one or two grooves.

It is incorrect to attempt to cure a rich mixture at half-throttle by fitting a smaller jet because the main jet may be correct for power at full throttle. The correct method is to lower the throttle needle.

VARIABLE SETTINGS AND PARTS

Throttle valve adjusting screw

Set this screw to hold the throttle open sufficiently to keep the engine running when the twist grip is closed.

Pilot air screw

This screw regulates the length of the pilot mixture for idling and for initial opening of the throttle. The screw controls depression on the pilot drilling by metering the amount of air that mixes with the petrol. Screw out to weaken the mixture, in to richen.

CARBURETTER

Main jet

The main jet controls the fuel supply when the throttle is more than three-quarters open, but at smaller throttle openings, although the supply of fuel goes through the main jet, the amount is diminished by the metering effect of the needle in the needle jet.

Each jet is calibrated and numbered so that its exact discharge is known, and two jets of the same number are alike. Never ream out a jet—fit another of the right size. The larger the number the larger the jet.

Needle and needle jet.

The needle is attached to the throttle valve assembly and, being tapered, either allows more or less petrol to pass through the needle jet as the throttle is opened or closed throughout the range, except when idling or nearly full throttle. The needle position in relation to throttle opening can be set according to requirement by fixing the retaining clip in an alternative groove, thus either raising or lowering the needle. Raising the needle richens the mixture and lowering it weakens the mixture at throttle openings from a quarter to three-quarters open.

Throttle valve cut-away

The atmospheric side of the throttle is cut away to influence depression on the main fuel supply and thus gives a means of tuning between the pilot and the needle jet range of throttle opening. The amount of cut-away is recorded by a number marked on the top face of the valve, viz. 3½. Larger cut-aways give weaker mixtures, smaller cut-aways a richer mixture.

Cold start assembly

This is a valve which temporarily enriches the mixture which in turn enables the engine to fire more readily. It is operated by means of a lever located on the carburetter body.

TUNING THE CARBURETTER

1st—Main jet with throttle in position A. If at full throttle the engine runs "heavily", the main jet is too large. If at full throttle, the engine seems to have better power when the throttle is eased off the main jet is too small.

With the correct sized main jet, the engine should run evenly and regularly at full throttle with maximum power.

If testing for speed, ensure that the main jet is sufficiently large for the mixture to be rich enough to maintain the engine at normal working temperature. To verify this, examine the sparking plug after taking a run at full throttle, declutching and stopping the engine quickly. If the sparking plug electrodes are light brown in colour, the mixture is correct; if sooty, the mixture is rich; if, however, there are signs of intense heat, the plug being white in appearance, the mixture is too weak and a larger main jet is required.

2nd—Pilot jet with throttle in position B. With the engine idling fast and the twist grip closed (use the throttle adjusting screw): (1) Screw out the pilot air screw until the engine runs slower and begins to falter. Then turn the screw in or out to make engine run regularly and faster. (2) Now lower the throttle adjusting screw until the engine runs slower and just begins to falter. Adjust the pilot air adjusting screw to get best slow-running. If this second adjustment leaves the engine running too fast, go over the job a third time.

3rd—Throttle cut-away with throttle in position C. If, as the throttle is opened from the idling position, there is spitting from the carburetter, slightly richen the pilot mixture by screwing in the air screw. If this is not effective, return to the original adjustment of the screw and fit a throttle valve with a smaller cut-away. If the engine jerks under load at this throttle position and there is no spitting, either the jet needle is much too high or a larger throttle valve cut away is required to cure richness.

4th—Needle with throttle in position D. The needle controls a wide range of throttle openings and also acceleration. Try the needle in the lowest position with the clip in the top groove: if acceleration is poor raise the needle a groove at a time until the best results are obtained. If the mixture is too rich even with the clip in the top groove, the needle and needle jet probably need replacement because of wear.

5th—Finally, go over the idling again for final touches.

AIR CLEANER

Light dust on the cleaner will not affect the running but when it is clogged with dust or mud it will be necessary to replace the foam. See page 00 for instructions on servicing the filter.

The importance of refitting the air filter correctly cannot be over emphasised. Failure to do so will result in worn piston/rings/bore.

Do not interchange 2 and 4 stroke carburetter parts as this will cause uneven engine running through the rev range.

This is common to both Mk1 and Mk 2 concentrics.

	4 STROKE	2 STROKE
Jet holder	Long	Short
Needle jet	Drilled	Not drilled
Needle	Long	Short
Spray Tube	Square	Angled

FRAME AND FITTINGS

The frame is constructed entirely from Renolds '531' and 'T45' annealed or as drawn tubing, depending on application. Contrary to popular belief, this tubing is far stronger than the chrome-alloy tube used by other manufacturers. We are able therefore to construct a frame whose strength/weight ratio is second to none.

It cannot be overstressed that in order to keep the frame free from cracks it is necessary to keep engine and head steady bolts tight. Failure to follow this simple rule will result in cracks appearing in the frame and elongation of the engine bolt holes. A loose engine can often break the steering spindle through high frequency vibrations.

Frame twisting is almost unheard of but should the machine be subjected to collision or somersaulting and twisting occurs, the frame should be returned to the factory for repair or replacement.

TESTING FOR OIL LEAKAGE

Following the resetting of a frame, it is essential to examine the main tube for possible fractures, especially at the welded joints, which must be rewelded as required. This is necessary to ensure that all joints are oil-tight. A major fracture of course, means that the frame must be returned to the factory for repair or replacement.

Seal the three pipe apertures (breather, oil return and oil supply) by means of short lengths of flexible tubing, retained by arm clips. Screw down the filler cap firmly, using a rubber sealing ring.

Replace the oil filter, at the base of the front tube, and take out the drain plug. It will then be necessary to adapt a tyre valve to a screwed union to replace the drain plug for test purposes.

Inject compressed air at a pressure of 20 p.s.i. (maximum) into the frame tube and immerse the frame in a bath of water, when any air leaks will be apparent. Mark all sources of leakage and re-weld.

The air-line from a tyre service pump will be suitable if the gauge is first set to the above figure. As an alternative, a foot pump may be used, but in this case it will be necessary to add a pressure gauge to, say, the filler cap.

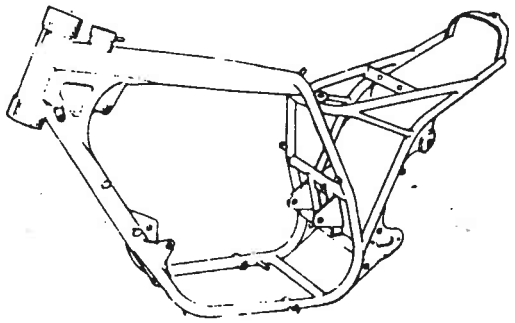


Fig. 58

THE SWINGING ARM

The swing arm is packed with grease on assembly at the works and should not require attention until after considerable service. It may then become necessary to replace the needle rollers, journals or seals as explained below.

1 First remove the thrust washers, dust seals, journals and seals (A) Fig. 59.
2 Drift out the needle rollers (B) using a long circular bar with a flat end. (Destruction of the needle roller is almost unavoidable).
3 Take out spacer (C) and clean bearing housing.
4 Replace one needle roller using a press and a drift of the correct size for the needle roller.
5 Replace the spacer and refit the other needle roller.
6 Pack with grease and reassemble.

It can easily be ascertained if the swing arm is twisted by the use of mandrels through the spindle housings and bearing housing on a suitable flat surface. Fig. 60.

If the arm is only slightly twisted it is permissable to straighten it by the use of levers. Should the arm be badly twisted return it to the works for repair or replacement.

The swing arm bolt should be kept very tight otherwise the adjuster plate location holes will break out. Always make sure that adjuster plates are on equivalent locations or wheels will be out of line.

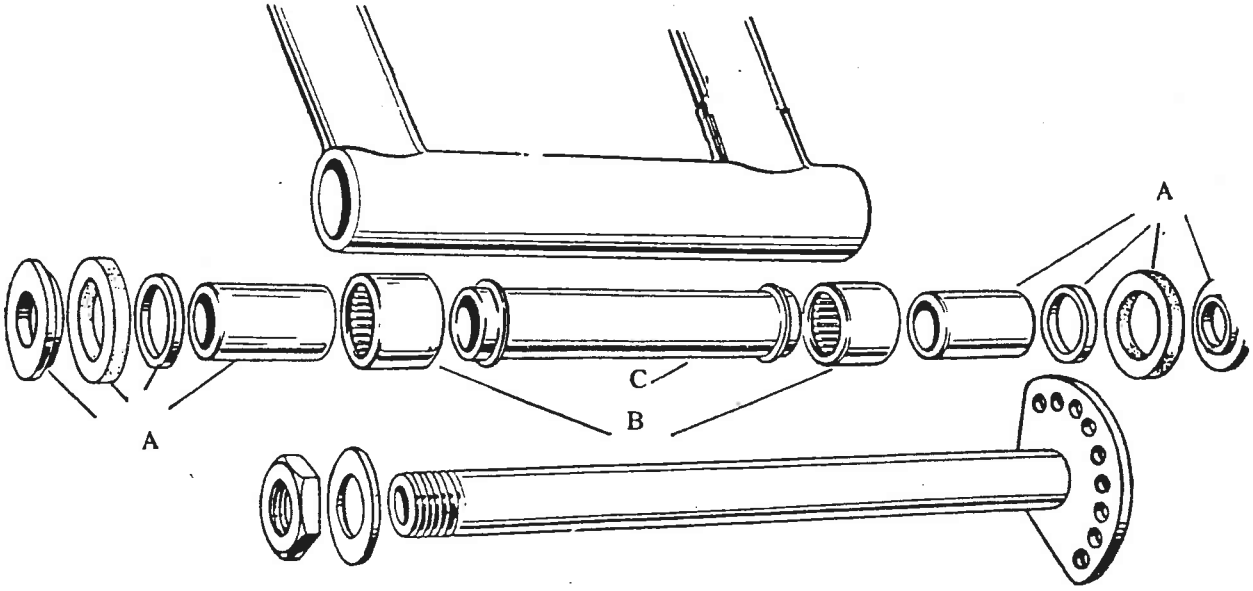


Fig. 59 *Swinging arm bearings*

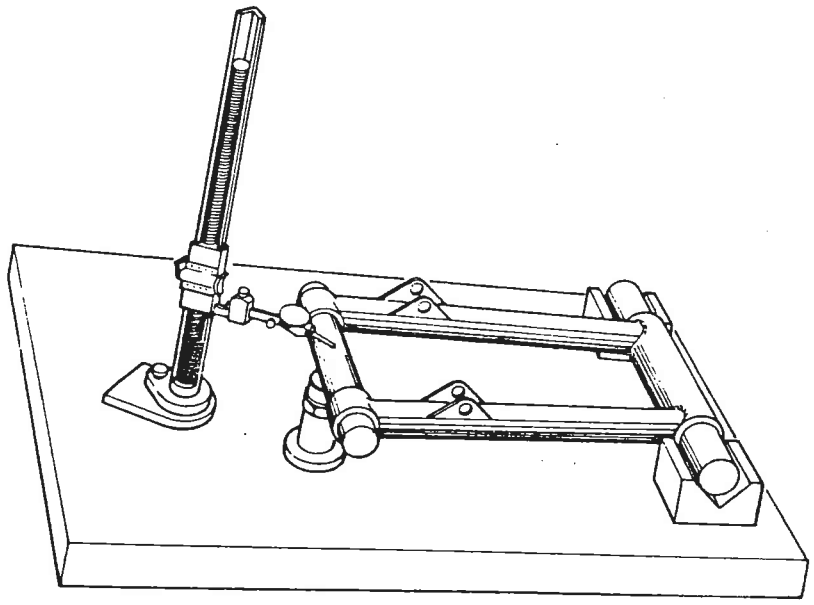


Fig. 60 *Checking alignment of the swinging arm.*

FUEL TANK

Check condition of rubber fixing straps and locating rubber. If suspect, replace. Direct contact with frame during use will cause damage through vibration. Check and replace rubber mounting pads on frame if necessary.

SEAT

Check fixing points for security at regular intervals. Seat covers must be replaced when worn, otherwise seats will become waterlogged if used in wet conditions.

REAR SUSPENSION

The rear suspension is by spring/gas/oil dampers which control fade to close limits.

The dampers are initially hard due to separation of the oil and nitrogen with which they are filled. However, after only 30 seconds to 1 minute of operation they become stabilised at a slightly softer setting and thereafter successfully control fade over a wide temperature range. Appreciable fade should not be experienced even during long trials.

Should the mounting rubber bushes become worn they should be replaced. (Use petrol or soap and water).

FRAME AND FITTINGS

If the dampers leak or lose their damping they should be replaced. Never allow plunger rods to become damaged as this will cause premature wear of the seals.

SPRINGS

Different types of spring are available, see spares catalogue.

TC10 Soft 5,5
TC11 med 5.7
TC12 Heavy 6.0

They can be pre-tensioned by rotating the lower spring retainer. If the rider is above average weight, stronger springs should always be selected, as pre-tensioning the weaker spring will not have the same results.

If weak springs are continually used, bending of the swing arm could result through "bottoming out".

REAR CHAIN

32 mm

The 5/8" x ¼" rear chain should be adjusted at its tightest point where there should be 1¼" of movement vertically midway between the two sprockets.

There is available a range of gearbox and rear sprockets for all gearing applications.

FRONT FORKS

The front forks are constructed for greatest strength with lowest unsprung weight.

The stanchions are heat treated to high strength It is almost unknown to bend one of these tubes.

The sliders are made from Elektron alloy and are extremely light. They incorporate an air damping system described in the lubrication section.

Yokes are constructed in alloy with thick sections to minimise twisting and are supported on sealed taper roller bearings. Adjustment should be carried out so that there is no play at the steering head. If the bearings are too tight or in need of lubrication a sticky action and poor steering will result.

To dismantle forks remove wheel spindle and using allen key remove socket screw through hole in bottom of slider; Have container ready for oil dropping through hole. It is advised to leave top nut and spring in place until the valve block screw has been loosened.

Remove stanchion from yokes by slackening clamp screws and tapping with hide mallet.

When reassembling the fork, ensure all parts are assembled in correct order. (See spares catalogue). Before tightening allen screw slider should be in uppermost position to locate lower valve bloc. Failure to do this will result in restricted movement.

Do not overtighten yoke clamp screws as this is not necessary and will cuase damage to the castings.

WHEELS AND TYRES

Tyres

Tyre pressure should be maintained to personal preference.

Spokes

Spokes should never be over-tight but should be of even tension. Failure to observe this point will result in spoke breakage and ovality of the brake drum in the case of the front wheel. Spokes should be checked between trials and should never be left over-tight in freezing conditions. Cracking of the hubs could occur if this point is missed.

Wheel Bearings

Are of the sealed type and require no lubrication. Replacement is effected by removing circlip on brake side, heating hubs to not more than 100°C and tapping spacer through from other side. The second bearing can then be tapped out from brake side. Reassemble in reverse order.

Brakes

Brake linings should be renewed before excess wear is evident. Worn linings will result in poor brakes and possible damage to hub liners.

Dust and dirt should be removed from brakes regularly.

HANDLEBARS AND CONTROLS

The handlebars are made from light gauge best quality tubing supplied in two heights. (See parts list).

They should be inspected regularly for cracks in the interest of safety, particularly after a fall.

Levers have cable adjusters and are manufactured for ease of operation.

The throttle is smooth action and the throttle cable can be removed by merely unscrewing the large cable stop in the drum housing.

Cables have lubrication points and should be lubricated regularly. When frayed or trapped they should be replaced.

GENERAL

Care should be taken in every stage of maintenance or repair.

Do not over-tighten nuts and bolts but refer to torque settings.

It is essential to use correct sizes of tools for the job and to replace worn items before trouble is experienced.

The machine as a whole is designed to give the very best power to weight ratio with consideration to reliability and longevity.

However, the performance and reliability of the machine will depend upon the owner's adherence to the foregoing instructions.

Spares Catalogue
Trials Model

VOL 1

CONTENTS

SUNDRIES

ASSEMBLIES COMPLETE

TA1	FRONT SPOKE SET AND NIPPLES
TA2	REAR SPOKE SET AND NIPPLES
TA3	GASKET SET CTE. (10 GASKETS)
TA4	CARB. 2624 MK. II AMAL
TA5	CRANKCASE C/W STD. FITTINGS
TA6	FLYWHEEL AND CONROD ASS. 70mm STROKE
TA7	CONROD AND BIG END ASS.
TA8	FRONT FORK C/W YOKES
TA9	FRONT WHEEL LESS BRAKE DETAILS
TA10	REAR WHEEL LESS BRAKE DETAILS
TA11	FRONT BRAKE PLATE CTE
TA12	REAR BRAKE PLATE CTE.
TA13	FRONT HUB C/W BRGS. AND SPACER
TA14	REAR HUB C/W BRGS. AND SPACER
TA15	CABLE SET
TA16	YOKE SET (FRONT FORKS)
TA17	GEAR CLUSTER, BASIC INTERNALS
TA18	GEAR CLUSTER C/W CLUTCH HUB AND BACKPLATE
TA19	OIL SEALS SET (4 SEALS, 1 0' RING)
A11a	TAB WASHER SET (5 WASHERS)
A18a	CLUTCH ASS. CTE.

PART NO.	FRAME AND FITTINGS	NO. PER SET
TC??	SPACER, STEERING HEAD BRGS.	AS REQD.
TC4	NYLON SEAL, STEERING HEAD BRGS.	2
57–2166	OIL FILLER CAP	1
70–8782	O' RING, OIL FILLER CAP	1
TC 2	STEERING HEAD BRG. CUP	2
TC3	STEERING HEAD BRG. CONE	2
TC29	LOCK STOP	2
B72	SCREW, SUMP GUARD	4
TC1	SUMP GUARD	1
TC 5	BREATHER PIPE, FRAME	1
TC6	TANK PACKING, UPPER	1
TC7	TANK PACKING, LOWER	1
B33	BOLT, HEAD STEADY	2
W2?	WASHER, HEAD STEADY	4
TCb	HEAD STEADY BAR	1
C11	HEAD STEADY PLATE	1
N2a	NUT, HEAD STEADY	2
TC9	FRAME	1
N3a	NUT, REAR ENGINE BOLT	1
C5	SPACER REAR ENGINE BOLT	AS REQD.
B38	REAR ENGINE BOLT	1
C18	SPACER, LOWER ENG. BOLT, SHORT	AS REQD.
C17	SPACER, LOWER ENG. BOLT, LONG	AS REQD.
B41	LOWER ENGINE BOLT	1
C30	OIL FILTER	1
C9	RETAINER CAP, OIL FILTER	1
C59	FIBRE WASHER, FILTER CAP	1
N3?	NUT, FRONT ENGINE BOLT	1
W3a	WASHER, FRONT ENGINE BOLT	2
B40	FRONT ENGINE BOLT	1
H113	FOOTPEG, LEFTHAND	1
H114	FOOTPEG, RIGHTHAND	1
H115	SPRING, FOOTPEG, LEFTHAND	1
H117	SPRING, FOOTPEG, RIGHTHAND	1
H116	SPACER, FOOTPEG	2
B84	BOLT, FOOTPEG TO FRAME	2
N6	NUT, FOOTPEG BOLT	2
W2c	WASHER FOOTPEG BOLT	4
	SWINGING ARM, REAR SUSPENSION	
TC31	CHAIN GUARD	1
W1?	WASHER CHAIN GUARD FIXING	4
N1a	NUT CHAIN GUARD FIXING	2
B31	BOLT CHAIN GUARD FIXING	2

PART NO.	SWINGING ARM, REAR SUSPENSION CONTD.	NO. PER SET
TC13	GAS DAMPER	2
B30	SCREW, DAMPER FIXING	4
TC18	ALLOY RETAINER, REAR DAMPER	4
W11	WASHER, DAMPER FIXING	4
TC19	SWINGING ARM	1
TC20	SPINDLE, SWINGING ARM	1
C14	THRUST WASHER, STEEL, SWINGING ARM	2
C25	DUST SEAL, NYLON, SWINGING ARM	2
C26	OIL SEAL, SWINGING ARM	2
C28	NEEDLE BEARING, SWINGING ARM	2
C39	JOURNAL/BUSH, SWINGING ARM	2
TC21	SPACER, SWINGING ARM BRGS.	1
TC14	ADJUSTER COLLET, REAR DAMPER SPRING	2
TC10	SPRING, REAR DAMPER SOFT 5.5	AS REQD.
TC11	SPRING, REAR DAMPER MED 5.7	AS REQD.
TC12	SPRING, REAR DAMPER HEAVY 6	AS REQD.
TC15	SPLIT COLLET, SPRING RETAINER	2
C27	ADJUSTER PLATE SWINGING ARM	1
C38	NUT, SWINGING ARM SPINDLE	1
TC17	RUBBER BUSH, DAMPER 'EYE'	4
TC16	STEEL BUSH, DAMPER 'EYE'	4
TC30	REAR DAMPER CTE	2
W1c	WASHER, PIVOT CHAIN TENSIONER	2
TC22	CHAIN TENSIONER, CTE	1
N1a	NUT, CHAIN TENSIONER PIVOT BOLT	1
C68	PIVOT TUBE, CHAIN TENSIONER	1
C65	SPRING, CHAIN TENSIONER	1
TC25	CHAIN SLIPPER BLOCK CHAIN TENSIONER	1
W1c	WASHER, SLIPPER BLOCK BOLT, SMALL	1
H37	WASHER, SLIPPER BLOCK BOLT, LARGE	1
N1a	NUT, SLIPPER BLOCK BOLT	1
B15	BOLT, SLIPPER BLOCK	1
TC26	SIDE STAND	1
TC27	SPRING, SIDE STAND	1
B33	PIVOT BOLT SIDE STAND	1
N2a	NUT, SIDE STAND PIVOT BOLT	1
W2a	WASHER SIDE STAND PIVOT BOLT	2
TC24	RUBBER BUFFER SIDE STAND SPRING	1
TC23	WEAR PAD, SWINGING ARM/CHAIN	1
B22	BOLT, WEAR PAD	1
N1a	NUT, WEAR PAD	1
W1c	WASHER, WEAR PAD	2
TC22b	CHAIN TENSIONER, BARE	

ART NO.	MUDGUARDS AIRBOX	NO. PER SET
TH1	FRONT MUDGUARD	1
TH	REAR MUDGUARD	1
TH3	AIR FILTER BOX	1
TH4	NUMBER PLATE, FRONT	1
TH6	AIR FILTER FOAM	1
TH7	STAY, FRONT MUDGUARD	1
B54	SCREW, STAY TO FORK	3
N9	NUT, STAY TO FORK SCREW	3
W1c	WASHER, STAY TO FORK SCREW	7
TH8	CABLE BLOCK/STAY FIXING	1
N12	NUT, CABLE BLOCK	1
B51	SCREW, MUDGUARD FIXING, FRONT & REAR	6
N9	NUT, MUDGUARD SCREW, FRONT & REAR	6
W1c	WASHER, MUDGUARD SCREW, FRONT & REAR	12
TH	RUBBER BOOT, CARB TO AIRBOX	1
TH11	CLIP, RUBBER BOOT TO AIRBOX	1
TH12	CLIP, RUBBER BOOT TO CARB.	1
TH13a	RETENTION PLATE, TOP, AIR FILTER	1
TH13b	RETENTION PLATE, BOTTOM, AIR FILTER	1
N12	NUT, AIR FILTER RETENTION PLATE, TOP	1
H37	WASHER, AIR FILTER RETENTION PLATES	2
N12	NUT, AIR FILTER RETENTION PLATE, BOTTOM	1
TE5	RUBBER PAD, AIRBOX PACKING REAR	1
TH9	NUMBER PLATE, REAR	1
B29	BOLT, NUMBER PLATE FIXING, REAR	2
N1a	NUT, NUMBER PLATE FIXING, REAR	2
W1c	WASHER, NUMBER PLATE FIXING, REAR	4
TH	RUBBER WASHER, REAR MUDGUARD FIXING	2
TH47	DIRT SHIELD, MUDGUARD TO AIRBOX	1
B52	BOLT, DIRT SHIELD, REAR MUDGUARD FIXING	1
N9	NUT, DIRT SHIELD, REAR MUDGUARD FIXING	1
W1c	WASHER, DIRT SHIELD, REAR MUDGUARD FIXING	2
	SEAT, TANK, CONTROLS	
H22	BREATHER PIPE, FUEL TANK	1
H23	PETROL CAP, FUEL TANK	1
TH23	FUEL TANK	1
TH14	TRANFER/DECALS CTE (TANK & SIDE PANELS)	1
TH34	'350' DECAL	2
TH	RUBBER GRIP, THROTTLE CONTROL	1
TH	THROTTLE CONTROL	1
TH31	FERRULE/CABLE ADAPTOR, THROTTLE CONTROL	1

PART NO.		NO. PER SET
TH43	RUBBER COVER, THROTTLE CONTROL	1
TH20	HANDLEBAR, STD RISE	1
TH21	HANDLEBAR, HI RISE	AS REQD.
H111	CLIP, FUEL LINE	2
H31	FIBRE WASHER, FUEL TAP	1
H110	FUEL TAP	1
TH22	FUEL LINE	1
TH17L	CONTROL LEVER, LEFT HAND CTE	1
TH17R	CONTROL LEVER, RIGHT HAND CTE	1
TH18	ADJUSTER, CONTROL LEVER	AS REQD. (2)
TH24	BRAKE PEDAL, REAR	1
TH25	PIVOT BOLT, REAR BRAKE PEDAL	1
N17	NUT, REAR BRAKE PIVOT BOLT	1
TH19	RUBBER GRIP, 'DUMMY' LEFT HAND	1
TH26	THROTTLE CABLE	1
TH27	CLUTCH CABLE	1
TH28	FRONT BRAKE CABLE	1
TH29	REAR BRAKE CABLE	1
H46	ADJUSTER, REAR BRAKE CABLE	1
H47	CLEVIS PIN, REAR BRAKE CABLE	1
H48	SPLIT PIN, REAR BRAKE CABLE	1
TH30	SEAT/SIDE PANELS CTE	1
TH35	TOGGLE CLIP, SIDE PANEL	1
TH36	TOGGLE CLIP FRAME	1
TH37	'POP' RIVET TOGGLE CLIP	8
H93	RUBBER STRAP, TANK RETENTION, FRONT	1
TH44	SEAT ONLY	1
TH45	SIDE PANELS ONLY	1
TH37	'POP RIVET' SEAT TO SIDE PANELS	AS REQD.
TH48	BULB HORN	1
H68	LEVER COVER	2
	IGNITION SYSTEM, EXHAUST SYSTEM	
TH32	IGNITION PACK	1
B51	SCREW, IGN. PACK TO FRAME	2
N9	NUT, IGN. PACK SCREW	2
W1c	WASHER, IGN. PACK SCREW	4
TH42	EX. PIPE	1
H20	SPRING EX. PIPE TO CYL. HEAD	1
TH40	SILENCER	1
B51	SCREW, SILENCER TO FRAME	2
N9	NUT, SILENCER FIXING SCREW	2
W1c	WASHER, SILENCER FIXING SCREW	4
TH38	CLAMP, EXHAUST PIPE TO SILENCER	1
TH39	'D' WASHER, EXHAUST CLAMP	2

ART NO.		NO. PER SET
B1	SCREW, EXHAUST CLAMP TO FRAME	1
TH41	SPACER, EXHAUST CLAMP TO FRAME	1
N1	NUT, CLAMP TO FRAME SCREW	1
W2c	WASHER, CLAMP TO FRAME SCREW	1
H8	PLUG CAP, RUBBER	1
H7	STEEL CLIP, PLUG CAP	1
	FRONT FORKS AND YOKES	
TF1	TOP YOKE	1
TF6	CLAMP, HANDLE BAR	2
B76	SCREW, HANDLE BAR CLAMP	4
TF2	BOTTOM YOKE	1
B75	BOLT, PINCH YOKE TO STANCHION	4
W9	SPRING WASHER STANCHION PINCH BOLT	4
TF	STEERING STEM	1
TF4	TOP NUT, STEERING STEM	1
TF5	ADJUSTER NUT, STEERING HEAD BEARINGS	1
TF7	MAIN SPRING	2
TF8	STACHION	2
TF9	DUST SEAL, RUBBER	2
TF26	CLIP, DUST SEAL	2
TF10	CIRCLIP, OIL SEAL RETENTION	2
TF11	OIL SEAL	4
TF12	LOCATING WASHER, MAIN SPRING LOWER	2
TF13	PLAIN WASHER, OIL PISTON	2
TF14	OIL PISTON	2
TF15	SEAL, OIL PISTON	2
TF[illegible]	SPRING, OIL PISTON/SEAL	2
TF16	CIRCLIP, OIL PISTON RETENTION	2
TF17	SPACER, REBOUND SPRING	2
TF18	REBOUND SPRING	2
TF19	WASHER, LUGGED VALVE BODY	2
TF20	GUIDE BUSH, DAMPER TUBE/VALVE BODY	2
TF21	VALVE BODY	2
TF22	CIRCLIP, VALVE BODY RETENTION	2
TF23	DAMPER TUBE	2
TF24	LOCATING BLOCK, DAMPER TUBE	2
TF28	COPPER WASHER, LOCATING BLOCK SCREW	2
B80	SCREW, DAMPER TUBE THROUGH LOCATING BLOCK	2
TF25L	SLIDER L/H	1
TF25R	SLIDER R/H	1
TF[illegible]	O' RING DRAIN PLUG	2
TF30	TOP NUT STANCHION	2
TF31	O' RING, TOP NUT	2

PART NO.		NO. PER SET
TF32	AIR VALVE TOP NUT	2
TF33	O' RING, AIR VALVE	2
W15	WASHER STEERING STEM TOP NUT	1
	FRONT WHEEL, SPEEDO	
TR1	TYRE, FRONT	1
R2	TUBE, FRONT	1
TR2	RIM, GOLD ANODISED ALLOY FRONT	1
TR3	NIPPLE, FRONT WHEEL SPOKES	36
TR4	SPOKE, BRAKESIDE, OUTER	9
TR5	SPOKE, OFFSIDE	18
TR6	SPOKE, BRAKESIDE, INNER	9
TR7	SPINDLE, FRONT WHEEL	1
TR8	BEARING, WHEEL Same for 8 brg	2
TR9	SPACER, FRONT WHEEL BRG.	1
TR10	HUB, FRONT, BARE	1
TR12	BRAKE SHOE Same for 2g brg	2
TR13	SPRING BRAKE SHOE RETURN	2
TR14	ACTUATING CAM, BRAKE SHOE	1
R16F	TYRE BOLT FRONT WM1	1
TR16	CIRCLIP, BRG RETENTION WHEEL	2
TR19	BRAKE PLATE, BARE	1
TR18	BRAKE ARM, FRONT	1
N15	NUT, BRAKE ARM TO CAM	1
N13	NUT, FRONT WHEEL SPINDLE	1
W13b	WASHER FRONT WHEEL SPINDLE	1
TR20	TORQUE STAY, FRONT BRAKE PLATE	1
TR21	RETAINING RING, SPOKE	1
B46	BOLT, TORQUE STAY TO FORK	1
W2a	WASHER, TORQUE STAY TO FORK	1
W8	SPRING WASHER, TORQUE STAY TO FORK	1
B47	BOLT, TORQUE STAY TO BRAKE PLATE	1
W3a	WASHER TORQUE STAY TO BRAKE PLATE	1
TR22	SPACER, SPEEDO GEARBOX	1
TR23	SPEEDO GEARBOX	1
TR24	CABLE SPEEDO	1
TR25	SPEEDO HEAD MPH/KPH	1
TR26	NUT, SPEEDO MOUNTING	1
TR27	RUBBER SHROUD, SPEEDO HEAD	AS REQD.
	REAR WHEEL	
R21	TUBE REAR	1
TR28	RIM, GOLD ANODISED ALLOY REAR	1
TR33	NIPPLE, REAR WHEEL SPOKES	36

PART NO.		NO. PER SET
TR29	SPOKE, BREAKESIDE REAR	18
TR30	SPOKE, OFFSIDE REAR	18
R1	REAR CHAIN, 5/8 x ¼ STATE LENGTH	AS REQD.
R25	SOFT LINK 5/8 x ¼	AS REQD.
R26	SPRING LINK 5/8 x ¼	AS REQD.
R27	LINK AND HALK 5/8 x ¼	AS REQD.
TR16	CIRCLIP, WHEEL BRG. RETENTION	2
TR8	BEARING, WHEEL same for 8 bag	2
TR11	SPACER, WHEEL BRG.	1
B73	BOLT. SPROCKET FIXING	6
W7	WASHER, SPROCKET FIXING BOLT	6
TR37	SPROCKET 42 TEETH	AS REQD.
TR38	SPROCKET 44 TEETH	AS REQD.
TR39	SPROCKET 46 TEETH	AS REQD.
TR40	SPROCKET 48 TEETH	AS REQD.
TF	SPROCKET 50 TEETH	AS REQD.
TR31	SPINDLE, REAR WHEEL	1
N13	NUT, REAR SPINDLE	2
W13a	WASHER, REAR SPINDLE	2
TR17	BRAKE ARM, REAR	1
TR42	PIVOT PIN, REAR BRAKE ARM/CABLE ADJUSTER	1
TR15	SPRING, BRAKE ARM RETURN	1
TR43	BRAKE PLATE, REAR BARE	1
TR12	BRAKE SHOE same for 8 bag	2
TR13	SPRING, BRAKE SHOE RETURN	2
TR36	ACTUATING CAM, REAR BRAKE	1
B79	PINCH BOLT, BRAKE ARM	1
TR34	TYRE, REAR	1
R1[illegible]R	TYRE BOLT, REAR WM2	2
TR[illegible]5	SPACER, REAR WHEEL TO SWINGING ARM	1
N16	NUT, TORQUE FIXING STUD	1
W9	WASHER, TORQUE FIXING STUD	1
TR32	HUB, REAR BARE	1
TR44	BOLT, REAR TORQUE STAY	
	CYLINDER HEAD, ROCKER BOX	
B82	SCREW ROCKER BOX TO CYL. HEAD/HEAD STEADY CENTRE	1
B25	SCREW ROCKER BOX TO CYL. HEAD/HEAD STEADY	2
B82	SCREW ROCKER BOX TO CYL. HEAD OUTSIDE RIGHT	2
B58	SCREW ROCKER BOX TO CYL. HEAD OUTSIDE MIDDLE	2
B57	SCREW ROCKER BOX TO CYL. HEAD OUTSIDE LEFT	2
71 1429	GASKET, PUSHROD INSPECTION COVER	1
B71	SCREW, PUSHROD INSPECTION COVER	1
E6	PUSHROD INSPECTION COVER	1

PART NO.		NO. PE SET
C9	VALVE CAP, ROCKER BOX	2
97 – 3765	O' RING, VALVE CAP	2
71 – 1989	DOWEL, ROCKER BOX TO CYL. HEAD	2
65 – 2494	VALVE SPRING OUTER	2
65 – 2495	VALVE SPRING INNER	2
TE7	COLLETT, VALVE SPRING TOP CAP	4
TE6	TOP CAP, VALVE SPRING	2
71 – 1626	VALVE GUIDE, INLET	1
68 – 0931	BOTTOM CUP, VALVE SPRING	1
TE4	INLET VALVE	1
71 – 1627	VALVE GUIDE, EXHAUST	1
TE5	EXHAUST VALVE	1
TE2	CYL. HEAD	1
TE58	ROCKER BOX, BARE	1
TE49	GASKET, ROCKER BOX	1
70 – 1435	NUT, ROCKER SPINDLE DOMED	2
70 – 1335	COOPER WASHER, OIL FEED UNION	4
41 – 0807	OIL FEED PIPE, ROCKER SPINDLE	1
24 – 0563	NUT, ROCKER ADJUSTING SCREW	2
68 – 0155	SCREW, ROCKER ADJUSTING	2
70 – 1330	THRUST WASHER, ROCKER, LARGE	2
40 – 0296	ROCKER, EXHAUST	1
40 – 0296	ROCKER, INLET	1
70 – 1575	THRUST WASHER, ROCKER, SMALL	2
40 – 0148	O' RING ROCKER SPINDLE	2
70 – 1574	SPRING, ROCKER SPINDLE	2
40 – 0294	ROCKER SPINDLE INLET AND EXHAUST	2
19 – 7606	SPARK PLUG, N5	1
E63	VALVE SPRING SET (4 SPRINGS)	AS REQD.
	CYL. BARREL, CRANKSHAFT	
TE1	CYLINDER BARREL CTE, (LINER ONLY NOT-AVAILABLE)	1
TE3	GASKET CYL. HEAD	1
TE26	STUD, CYL. BARREL TO CYL. HEAD	2
N2	NUT, CYL. BARREL STUD	2
70 – 8215	WASHER, CYL. BARREL STUD	2
TE8	STUD, CRANKCASE TO CYL. BARREL	4
N4	NUT. CYL. BARREL STUD	4
41 – 0639	WASHER, CYL. BARREL STUD	4
TE22	GASKET, CYL. BARREL BASE	1
TE9	CONROD	1
66 – 0492	BUSH, CONROD SMALL END	1
TE11	CRANKPIN	1
TE10	BUSH, CONROD BIG END	1

PART NO.		NO. PER SET
TE12	CAGE ONLY, BIG END	1
TE13	ROLLER, BIG END	24
71 1681	ENGINE SHAFT, TIMING SIDE	1
TE14	FLY WHEEL, TIMING SIDE	1
71 – 1678	PLUG, FLY WHEEL SLUDGE TRAP	1
TE15	FLY WHEEL, DRIVESIDE	1
TE16	ENGINE SHAFT, DRIVESIDE	1
TE17	GUDGEON PIN	1
TE18	CIRCLIP, GUDGEON PIN LOCATING	2
TE19	PISTON, STD, CTE	1
TE20	PISTON, 1st OVERSIZE, CTE	AS REQD.
TE21	PISTON, 2nd OVERSIZE, CTE	AS REQD.
TE23	PISTON RING SET. STD	AS REQD.
TE24	PISTON RING SET, 1st OVERSIZE	AS REQD.
TE25	PISTON RING SET, 2nd OVERSIZE	AS REQD.
TE	SHIM, ENGINE SHAFT DRIVE SIDE	6/AS REQD.
	CRANK CASE, GENERATOR	
SEE ASSEMBLIES	CRANKCASE WITH FIXED FITTINGS	1
TE36	ROTOR, GENERATOR	1
TE37	STATOR, GENERATOR	1
TE53	NUT, ROTOR FIXING	1
71 – 1731	LOCKWASHER, ROTOR NUT	1
TE29	ENGINE SPROCKET 23T	1
71 – 1629	SHIM (.030) ENGINE SPROCKET	AS REQD.
TE38	SPACER, ENG. SPROCKET TO MAIN BRG.	1
F35	SPACER, ROTOR TO ENG. SPROCKET	1
B1	SCREW, STATOR FIXING	2
W2a	WASHER, STATOR FIXING SCREW	1
70 – 8144	KEY, ROTOR	1
E21	OIL RETURN UNION	1
70 – 1335	COPPER WASHER, OIL RETURN PIPE	1
21 – 2117	NUT, OIL RETURN PIPE	1
TE60	OIL PIPE, RETURN, ROCKER FEED	1
70 – 9737	FIBRE WASHER OIL RETURN UNION	1
TE30	OIL PIPE, ENGINE TO FRAME	1
E23	CLIP, OIL PIPE	2
21 – 1872 %	PLUG, TIMING APERTURE WERE FITTED	1
70 – 8896 %	WASHER, TIMING PLUG WERE FITTED	1
14 – 6219	BOLT, CRANKCASE HALF	3
70 088	WASHER CRANKCASE BOLT	3
TE34	MAIN BEARING, TIMING SIDE	1
71 – 1422 %	GASKET, TACHO DRIVE COVER WERE FITTED	1

PART NO.		NO. PEI SET
70 – 9384	⁄ COVER, TACHO DRIVE, WERE FITTED	1
57 – 1150	⁄ SCREW TACHO DRIVE COVER, WERE FITTED	1
70 – 9974	MAIN BEARING, DRIVE SIDE	1
14 – 6102	BOLT, BLANKING REAR CHAIN OILER	1
70 – 8180	FIBRE WASHER, CHAIN OILER BOLT	1
71 – 1419	GASKET, PRIMARY CHAINCASE BACKPLATE	1
G5	BACKPLATE, PRIMARY CHAINCASE	1
G6	BEARING, PRIMARY CHAINCASE BACKPLATE	1
B30	SCREW, PRIMARY CHAINCASE BACKPLATE	3
N1a	NUT, PRIMARY CHAINCASE BACKPLATE SCREW	3
W1c	WASHER, PRIMARY CHAINCASE BACKPLATE SCREW	3
TE27	SPACER, STATOR SCREW	2
	TIMING GEAR, OIL PUMP	
TE35	PUSH ROD, INLET AND EXHAUST	2
71 – 2513	TAPPET INLET AND EXHAUST	2
TE33	CAMSHAFT CTE	1
TE31	CAMSHAFT ONLY	AS REQD.
TE32	CAMWHEEL ONLY	AS REQD.
TE57	KEY, CAMSHAFT	AS REQD.
70 – 8040	PINION, CRANKSHAFT	1
70 – 1580	KEY, CRANKSHAFT PINION	1
21 – 2039	NUT, CRANKSHAFT TIMINGSIDE	1
70 – 8043	LOCKWASHER, CRANKSHAFT NUT	1
70 – 8041	OIL PUMP DRIVE, CRANKSHAFT	1
70 – 9975	DISTANCE PIECE, OIL PUMP DRIVE	1
N1a	NUT, OIL PUMP DRIVE GEAR	1
W1a	WASHER, OIL PUMP DRIVE GEAR	1
70 – 8094	GEAR, OIL PUMP, DRIVE, TOP	1
71 – 2119	SPINDLE HOUSING/TOP, OIL PUMP	1
71 – 2123	DRIVING SPINDLE, OIL PUMP	1
71 – 1147	SPINDLE, OIL PUMP DRIVEN GEARS	1
71 – 2121	GEAR OIL PUMP FEED DRIVEN, UPPER	1
71 – 3001	OIL PUMP, COMPLETE	1
N1a	NUT, OIL PUMP, FIXING	3
W1a	WASHER, OIL PUMP FIXING	3
21 – 0597	STUD, OIL PUMP FIXING, LONG	2
14 – 1606	STUD, OIL PUMP FIXING, SHORT	1
70 – 8100	SCREW, OIL PUMP COVER PLATE	4
70 – 8099	COVER PLATE OIL PUMP	1
71 – 2124	GEAR, OIL PUMP, SCAVANGE DRIVEN, LOWER	1
71 – 2122	GEAR, OIL PUMP, SCAVANGE DRIVING, LOWER	1
71 – 2115	GASKET, OIL PUMP	1

PART NO.		NO. PER SET
70 – 8022	DOWEL, OIL PUMP LOCATING	2
71 – 1148	DOWEL, OIL PUMP TOP TO BODY	2
N	NUT CRANKCASE FIXING STUDS	4
W2a	WASHER, CRANKCASE FIXING STUDS	4
21 – 1890	STUD, CRANKCASE REAR	2
21 – 2042	STUD, CRANKCASE FRONT	2
57 – 4679	DIPSTICK, GEARBOX	1
70 – 8315	BUSH, CAMSHAFT T/S CRANKCASE	1
E74	SCAVENGE VALVE, CRANKCASE SUMP	1
71 – 1424	GASKET, SCAVENGE COVER	2
E67	SCAVENGE COVER/SUMP	1
E66	FILTER, SCAVENGE COVER	1
B49	SCREW, SCAVENGE COVER	4
21 – 2111	DRAIN PLUG, GEARBOX	1
60 – 3530	O' RING, DRAIN PLUG	1
57 4306	SPROCKET, FINAL DRIVE IIT	1
57 – 2702	LOCK WASHER FINAL DRIVE SPROCKET NUT	1
57 – 1434	NUT, FINAL DRIVE SPROCKET	1
70 – 8011	DOWEL SOLID, GEARBOX CASE LOCATING	1
70 – 8014	BEARING, GEARBOX MAINSHAFT LEFT	1
70 – 8015	OIL SEAL GEARBOX M/S BRG LEFT	1
70 – 8005	NEEDLE BEARING, LAY SHAFT	1
71 – 1271	SHIELD G/BOX M/S BRG LEFT	1
70 – 6026	CIRCLIP, G/BOX OIL SEAL	1
70 – 8010	DOWEL, G/BOX COVER LOCATING REAR	1
70 – 8009	DOWEL, CRANKCASE HALFS LOCATING	2
57 – 1249	SPRING PLATE, CAMPLATE LOCATING	1
57 – 2691	SPRING CRANKED, CAMPLATE LOCATING	1
57 – 1180	LOCK PLATE, CAMPLATE SPRING BOLTS	1
57 – 1076	BOLT, CAMPLATE SPRING	2
21 – 2117	NUT, OIL FEED PIPE	1
70 – 1335	COPPER WASHER OIL FEED PIPE	1
E65a	OIL FEED PIPE	1
E30	BLANKING PLUG, OIL PIPE UNION APPERTURE	1
E29	BLANKING PLUG, REAR CRANKCASE BASE	1
E29	BLANKING PLUG, CRANKCASE SUMP	1
TE50	RUBBER PIPE ROCKER FEED	1
E33	CLIP, ROCKER FEED PIPE	2
	GEARBOX INTERNALS	
TG1	SLEAVE GEAR MAINSHAFT	1
G1	NEEDLE BEARING, SLEAVE GEAR	2
TG3	RETAINER, NEEDLE BRGS, SLEAVE GEAR	1
TG2	SPACER, NEEDLE BRGS, SLEAVE GEAR	1

PART NO.		NO. PER SET
TG4	SELECTOR FORK, MAINSHAFT	1
TG5	SLIDING PINION, MAINSHAFT	1
TG6	SPINNING PINION, MAINSHAFT	1
TG7	BUSH L/S, M/S SPINNING PINION	2
TG8	FIXED PINION, MAINSHAFT	1
TG9	MAINSHAFT	1
TG10	CAMPLATE	1
TG11	PINION LAYSHAFT 1st SPINNING RIGHT HAND	1
TG12	BUSH, LAYSHAFT 1st GEAR	1
TG13	SELECTOR FORK, LAYSHAFT	1
TG14	SLIDING PINION, LAYSHAFT	1
TG15	SPINNING PINION, LAYSHAFT CENTER	1
G30	SNAP RING/CIRCLIP LAYSHAFT	1
TG16	FIXED PINION, LAYSHAFT	1
TG17	LAYSHAFT	
57 – 1391	BUSH, MAINSHAFT/CLUTCH PUSHROD	1
57 – 2733	CLUTCH PUSHROD	1
	GEARBOX CASE/INNER COVER	
57 – 2105	PLUNGER, GEARCHANGE QUADRANT	2
57 – 2435	SCREW, PLUNGER RETAINER PLATE	1
57 – 2107	RETAINER PLATE, GEARCHANGE PLUNGERS	1
57 – 2692	GEARCHANGE QUADRANT COMPLETE	1
57 – 1277	RIVET, PLUNGER SPRING	2
57 – 2106	PLUNGER SPRING	2
57 – 1109	RETURN SPRING, GEARCHANGE QUADRANT	1
57 – 4454	ANCHOR BOLT/CAM RETURN SPRING	1
N2	NUT, ANCHOR BOLT/CAM	1
W2a	WASHER, ANCHOR BOLT/CAM	1
60 – 2724	SPLIT PIN, CAMPLATE SPINDLE	1
57 – 4048	SPINDLE, CAMPLATE	1
57 – 2688	SPINDLE SELECTOR FORKS	1
70 – 8162	PLUG, CRANKSHAFT OIL FEED	1
70 – 8157	CIRCLIP, CRANKSHAFT FEED OIL SEAL	1
70 – 8154	OIL SEAL, CRANKSHAFT OIL FEED	1
TE40	O' RING INNER COVER,	1
57 – 1026	BREATHER PIPE, INNER COVER	1
70 – 8150	CAM BUSH, INNER COVER	1
70 – 3172	PEG, CAMBUSH	1
B56	SCREW, INNER COVER, FRONT/CENTER	4
70 – 8153	OIL SEAL, CAMSHAFT	1
70 – 9526	PLUG, INNER COVER FRONT AND BASE	2
60 – 2364	BALL, NON RETURN VALVE	1
40 – 0385	SPRING, NON RETURN VALVE	1

PART NO.		NO. PER SET
TE55	PLUG, NON RETURN VALVE	1
B50	SCREW, INNER COVER BOTTOM	2
57 – 4339	KICK START RATCHET	1
57 – 4343	LOCK WASHER K/S RATCHET NUT	1
57 – 2686	NUT, K/S RATCHET	1
57 – 4338	SPRING K/S LEVER RETURN	1
57 – 4342	STOP, K/S QUAD AND SPINDLE	1
57 – 2658	CIRCLIP K/S QUAD STOP	1
TE59	GROMMET, INNER COVER	1
TE46	KICKSTART SPINDLE/QUADRANT	1
70 – 8005	NEEDLE BEARING K/S QUAD	1
57 – 4336	RATCHET PINION, K/S	1
57 – 2682	BUSH, K/S RATCHET PINION	1
57 – 2684	SPRING, K/S RATCHET PINION	1
57 – 4452	WASHER, K/S RATCHET PINION SPRING	1
70 – 8151	BEARING, GEARBOX MAINSHAFT RIGHT	1
70 – 8152	CIRCLIP, GEARBOX BEARING RIGHT	1
57 – 3764	ANCHOR BOLT K/S RETURN SPRING	1
70 – 8010	DOWEL, INNER TO OUTER COVER, RIGHT	2
21 – 1899	PLUG, INNER COVER REAR, ALLOY	1
B53	SCREW, INNER COVER REAR	1
TE47	INNER COVER	1
	KICKSTART CASE	
70 – 4747	PILLAR BOLT, RELUCTOR PLATE FIXING	2
70 – 8164	WASHER, PILLER BOLT	2
TE61	RELUCTOR PLATE/PICKUP	1
E6P	ROTOR, IGNITION	1
W1a	WASHER, ROTOR FIXING	1
B69	SCREW, ROTOR FIXING	1
70 – 8737	COVER, ROTOR/RELUCTOR	1
97 – 0430	FIBRE WASHER, COVER FIXING SCREW	2
B83	SCREW, COVER FIXING	2
71 – 1423	GASKET, COVER	1
TE41	GEAR CHANGE PEDAL	1
B67	BOLT, GEAR CHANGE PEDAL	1
57 – 2648	RUBBER, GEARCHANGE PEDAL	AS REQD.
TE45	KICKSTART LEVER COMPLETE	1
57 – 4357	COTTER PIN, K/S LEVER	1
W1a	WASHER, K/S LEVER	1
N1a	NUT, K/S LEVER	1
57 – 2330	RUBBER, K/S LEVER	AS REQD.
TE42	KICKSTART CRANK ONLY	1

PART NO.		NO. PER SET
TE43	SWIVEL BLOCK K/S LEVER	1
TE44	SPRING, K/S LEVER	1
B49	BOLT, K/S LEVER SPRING	1
B78	BOLT, K/S CRANK TO SWIVEL BLOCK	1
W4a	WASHER, K/S CRANK BOLT	1
N14	LOCKNUT, K/S CRANK BOLT	1
B48	SCREW, K/S CASE FRONT	3
B58	SCREW, K/S CASE BOTTOM FRONT	1
B59	SCREW K/S CASE BOTTOM MIDDLE	1
B56	SCREW K/S CASE BOTTOM REAR	1
B59	SCREW K/S CASE CENTER	1
B58	SCREW K/S CASE TOP FRONT AND MIDDLE	2
B50	SCREW K/S CASE TOP REAR	1
57 – 2641	OIL SEAL K/S SPINDLE	1
57 – 4559	BUSH K/S SPINDLE	1
57 – 2750	CLUTCH LEVER, PUSHROD OPERATING	1
57 – 2700	PINION, CLUTCH OPERATING RACK	1
57 – 2699	RACK, CLUTCH OPERATING	1
60 – 2363	BALL, CLUTCH OPERATING RACK	1
TE48	KICKSTART CASE/RIGHT HAND COVER	1
60 – 3755	GROMMET K/S CASE	1
	CLUTCH, PRIMARY CHAINCASE	
A18a	CLUTCH ASSEMBLY COMPLETE	1
57 – 2166	INSPECTION PLUG, PRIMARY CHAINCASE	1
70 – 8782	O' RING, CHAINCASE INSPECTION PLUG	1
70 – 8148	GROMMET, GENERATOR LEAD	1
B55	SCREW, PRIMARY CHAINCASE FRONT MIDDLE	1
B53	SCREW, PRIMARY CHAINCASE FRONT TOP BOTTOM	2
B56	SCREW, PRIMARY CHAINCASE REAR	7
TE51	PRIMARY CHAINCASE	1
70 – 8010	DOWEL PRIMARY CHAINCASE LOCATING	2
71 – 1418	GASKET. PRIMARY CHAINCASE	1
TE62	FILTER HOUSING, CRANKCASE BREATHER	1
TE63	FILTER FOAM, CRANKCASE BREATHER	1
TE64	RUBBER 'BOOT', CRANKCASE BREATHER	1
TH11	CLIP, RUBBER BOOT	1
TE28	FIBRE WASHER, FILTER HOUSING	1
57 – 4019	PRESSURE PLATE	1
57 – 2725	CLUTCH PLATE, PLAIN, DRIVEN	5
57 – 2726	CLUTCH PLATE, CORK, DRIVING	5
G9	DISTANCE PIECE, CLUTCH RETAINING NUT	1
E72	RETAINING NUT, CLUTCH	1
57 – 2686	LOCK NUT, CLUTCH RETAINING NUT	1

PART NO.		NO. PER SET
14 – 0401	NUT, CLUTCH PUSHROD ADJUSTER	1
57 – 4189	SCREW, CLUTCH PUSHROD ADJUSTER	1
– 4121	CUP, CLUTCH SPRING	4
TE56	SPRING, CLUTCH	4
41 – 3215	NUT, ADJUSTER CLUTCH SPRING	4
41 – 3212	RUBBER, SHOCK ABSORBER CLUTCH	8
57 – 4507	RIVET, SHOCK ABSORBER CLUTCH	4
57 – 4510	RETAINING PLATE OUTER	1
57 – 2715	SPIDER, SHOCK ABSORBER CLUTCH	1
57 – 4511	CENTER SHOCK ABSORBER CLUTCH	1
57 – 4531	SHOCK ABSORBER ASSEMBLY CTE	1
57 – 4508	RETAINING PLATE C/W STUDS INNER	1
57 – 4198	CLUTCH CHAIN WHEEL	1
57 – 3931	THRUST WASHER	1
G2	CLUTCH HUB, SPLINED	1
– 2719	ROLLER BEARINGS, CLUTCH HUB	25
E48	PRIMARY CHAIN 70 PITCH	1

SERVICE TOOLS

T10	PISTON RING SLIPPER (STATE PISTON SIZE)
T11	VALVE SEAT CUTTING TOOL
T12	VALVE GRINDING STICK
T13	VALVE SPRING COMPRESSOR
T14	PINION/SPROCKET EXTRACTOR SET
T18	BEARING RACE EXTRACTOR
T19	CLUTCH LOCKING TOOL
T20	VALVE GUIDE DRIFT
T21	GUDGEON PIN EXTRACTOR
T24	EXTENSION SPANNER CYL. HEAD NUTS
T25	CHAIN LINK EXTRACTOR
T26	TYRE PRESSURE GAUGE
T27	SMALL END BUSH EXTRACTOR

NOTE
ALTERNATIVE GEARING AVAILABLE BY FITTING EITHER OF THE FOLLOWING :

TE65	ENGINE SPROCKET 18 TOOTH
TE52	PRIMARY CHAIN 68 PITCH
	OR
574306	FINAL DRIVE SPROCKET, 14, 15 OR 17 TOOTH
1	CHAIN, FINAL DRIVE AS REQD.

CCM 350 TRIALS DATA SHEET

Plugs: Champion N5 0,5-0.65mm

Owing to unforseen circumstances, manuals and parts lists have been delayed. These will be available shortly.

CAPACITIES	QTY.	TYPE.
Fuel tank Frame.	4,54 l 1.7l 3 pts. (1.8L)	100 20/50 G.T.X.
Gearbox.	½ pts. 280cc (300cc)	EP 80 (90)
Primary case.	¼ pts. 140cc (150cc)	20/50 initially, thereafter self levelling.

Oil Filter is located in front downtube and should be changed as required.

Forks. √ 175cc per leg. Castrol fork oil.

Air filter. - Clean in petrol after every event and soak in filter oil allowing to dry before re-fitting.

Filter in sump should be removed and cleaned every month.

Filter on chaincase should be cleaned after every event and soaked in engine oil.

Pressure in rear dampers. 28 lb per Sq. in.

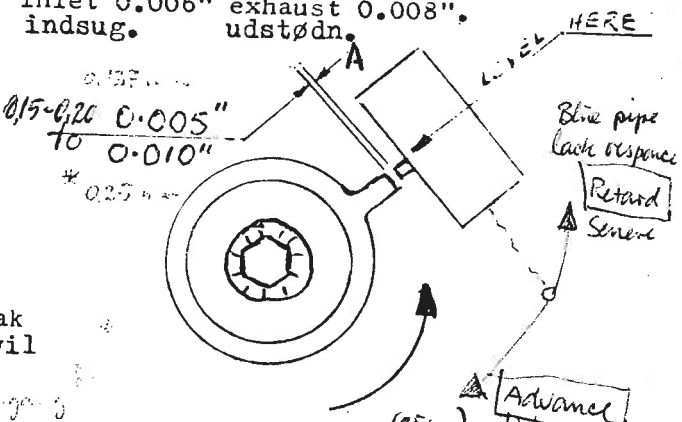
Pressure in forks. up to 8 lb per Sq. in. according to wieght of rider.

Tappets. With engine at T.D.C. firing stroke. inlet 0.006" (0,1524mm) exhaust 0.008" (0,2032mm).
Ventiler: stempel i top død center indsug. udstødn.

Ignition Timing.

With engine at T.D.C. firing stroke: 0,15-0,20 0.005" to 0.010" (0,127 mm) (0,25 mm)

Leading edge of rotor to trailing edge of donor.



Caution. Ulempe
Too large a gap at A will result in weak spark at tickover. Ved for stor gab vil (tænding udeblive)

Carburettor Settings.

Std Amal R2624-1 Manifold/indsugningsgrenrør indv Ø 35 mm (25mm)

Some experimentation may be necessary for optimum results after initial 'bedding down' of engine. Good results have been obtained with factory bikes with the following settings b t localities may have some effects on these.

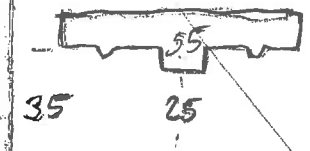
Needle jet	105	(106)	Main jet.	140	(140)
Pilot jet	25	(25)	Slide	3	3.5

Needle second from (middle) top.

After initial running Torque head nuts to 30lb/ft. (14kg) and reset tappets. Ensure that 1/16" (1.5mm) free play exists in clutch lever arm on gearbox.

Rear Chain. 5/8" x 1/4" "625" (25) (32mm) 1¼" movement

There should be at least ½" up and down movement halfway along top run at tightest position when rear suspension is compressed.



Karbonator slangestykke : mm

indv Ø	mm	35/25
(ind Ø	mm)	42/46
længde	mm	38.2

karbonator AMAL R 2624

needle jet	105	Choke jet 40
pilot jet	25	
main jet	140	
slide No.	3.5	

needle pos. from top 3 middle (5)

mål 2 A 1

Bagfjeder

Bagfjeder fra 6202 2 RS

Not yet five years old — CCM's modern trials 'classic'

In 1978, CCM designed, built and sold just 105 four-stroke trials bikes. They didn't set the world on fire through the sections, but they did inspire a curiouis mixture of devotion and dislike. T+MX editor BILL LAWLESS takes a look at a bike which looks set to be a modern classic.

T+MX News SPECIAL FEATURE

CCM boss Alan Clews, then riding high in terms of motocross sales and results, took a decision to build a four-stroke trials bike at the back end of 1977, a decision that was to trigger off a 'modern classic'.

The over-riding reason for this was to give his Bolton factory some more work to do outside the peak season for building motocrossers. He had a small, highly-skilled workforce, and there was no way he could lay people off during slack periods and re-hire them when seasonal demand increased. A new project seemed the answer to keep the factory wheels turning.

The second reason, of course, that Alan's first love was trials. He started his career in the lean and clean game and was one of the best North West Centre riders for several years on a variety of machinery including James, Triumph Cubs and latterly a nice 350 Ariel special.

There was yet another factor. Alan had a gut feeling that the market was ready for a four-stroke trials bike. Sammy Miller had helped sow the seeds of a thumper revival and was in the process of splitting with Honda after helping Rob Shepherd score his sensational British Championship victory in 1977.

While Sammy was in the process of leaving Honda, he had wanted to keep the four-stroke flying and asked Alan if CCM could build him a suitable engine. The answer was yes, but when the exercise was costed Alan found it wasn't viable to be just a supplier of motors. But if he did a complete bike, it could be an economic proposition.

The jigsaw came nicely together when Alan found a ready-made works-development rider in the tall, tough form of Nick Jefferies, Sammy's one-time protege and a member of the old Miller-Honda works team.

STUDY

Nick, one of the most talented motorcycling all-rounders in the sport, jumped at the chance to work with the new project. His first job was to 'lend' CCM his works Honda for detailed assessment. The bike was kept shrouded under wraps during its brief stay at the Bolton factory to avoid invoking the wrath of Miller! However, it has to be said that it is common practice for a rival manufacturer to carefully study a successful machine.

Brian Leask once saw a new CCM motocrosser in Yamaha's research and development department from which emerged before long the XT500C Yamaha trail bike with certain similarities in the engine room. As Alan himself puts it: "There's no use in starting at the back of the grid."

In fact, CCM studied AL the popular trials bike and many of the ne machine's vital statisti were based on a mea reading of measurement like wheelbase, footre height and position an frame geometry. The mai purpose of the Hond evaluation was to see ho it handled a four-strok motor and its relationshi to everything else. Certain ly the CCM frame woul have to be different if onl because the motor was t be heavier and taller tha Honda's compact littl overhead camshaft engine

Alan looked carefully a the choice of motor an finally settled for a B44 B50 hybrid with 79 x 70 bor and stroke giving 343cc - the old B40 measurement Con-rod was B40 wit pressed-in big-end. A stee crankpin was used wit caged roller bearing mad specially by Alpha. B4 castings were used for th cylinder head and barre and flywheel weight wa tried out at 5½ lbs a side. conventional frame sur rounded the engine wit Marzocchi front forks an Girling dampers at th rear.

DEBUT

The prototype was buil in two weeks and presente to Nick on February 4. Nic tested it over the weeken and it came back to Bolto on the Monday with Nick' preliminary findings. H thought the flywheels wer too light, the bike neede more oil capacity and th rear suspension wasn' working to his liking.

Modifications started im mediately. Flywheel weight was bumped up to 7·8 lbs a side and the oil-in-frame capacity was increased, together with various other mods. Nick had the bike back on February 9 and brought it back for more work on the 13th. He wanted the steering head angle pulled in by two degrees, mods to the 24mm Amal carburettor and thought the bike should be hushed up by about five decibels.

The biggest job was to lift the swinging arm pivot position so that when the bike was powered on, the ground clearance wasn't reduced — another of Nick's criticisms. The work was all done in a considerable rush ready for an ambitious debut in the first World Trials Championship round, the Hurst Cup in Northern Ireland, on February 18. It was a mighty effort even by CCM's standards.

The new bike created enormous interest when Nick unveiled it in the paddock. Observers didn't go much on the tortuous plumbing of the exhaust system, nor the bulky drive-side case, but the general standard of engineering was most impressive. Nick said at the time that he would learn more about the bike that day than in all the previous weeks, and so it turned out.

PLEASURE

The Hurst Cup that year was a grueller, and made worse by the frozen, rock-hard ground. Nick was forced to retire with a broken footrest and a split fibreglass fuel tank, but for all that it was a promising debut. They were the sort of injuries that could afflict any bike in a tough world round. The main problem was that the bike was too high-geared (Nick used first and second gears almost exclusively). More improvements were made back at Bolton, including a new, slimmer primary chaincase. The swinging arm was shortened by one inch to put a bit more weight bias on the back wheel, and the compression ratio was upped from 6·5:1 to 7·2:1. Later that month Nick rode the bike in the Belgian world round and finished in 30th position.

Alan built two other experimental units, of 351 and 412cc capacity, but did not pursue matters because they were difficult to make and didn't seem to go any better. On March 26 Nick won his first Yorkshire Centre trial, and this gave Alan quite as much pleasure as a big motocross win.

The next major test was the Scottish Six Days Trial, and for that Alan built a brand-new bike which embodied all the modifications learned to date. This machine was, in effect, a production prototype, although the engine size was bigger. Contemporary reports said it was 420cc, but there is some doubt about that. Alan isn't dead-sure, and Nick thinks it was 400cc. Almost certainly it was bigger than the 345cc capacity of the production bikes which were soon to follow.

Nick started off well and was just off the leader board on the first two days. On the Wednesday he finished 12th and the bike was running well, with no problems that spannerman Derek Lord couldn't cope with. Then, on the Thursday, disaster struck. Nick holed his fuel tank first, and then lost a valve cap unknown to him. A lot of Highland muck got into the engine and clapped it out within minutes. Sadly, Nick's great bid for Scottish glory ended on the Thursday afternoon and he was forced to retire.

MORE

Immediately after the Scottish Alan decided that the bike was ready for production, and within the next few months the factory produced a total of 105 bikes. They started going out to the dealers in October and — as far as the factory was concerned — were all gone by Christmas, proving that the magic of those three initials was not confined to motocross.

The bikes retailed at just under £1,300 and followed the pattern of Nick's SSDT prototype in that they had bottom frame tubes and a bash plate in between. They were beautified for the showrooms and had a modified exhaust system, losing that distinctive triangular muffler. Marzocchi rear units joined the front forks from the same factory. Capacity was 345cc with a compression ratio of 6·2:1. The motor was fired by Interspan's magnetic trigger ignition system as fitted to the motocrossers, but suitably modified for trials.

The project had gone so well for CCM that at one stage Alan thought about producing another batch of 100 or so machines. But he held back for one good reason. The fact was the trials production run had made huge inroads in his stock of BSA engine parts, and more bikes would have meant addition tooling expense, pushing up the retail cost of the bikes to an unacceptable level.

BSA, the goose that laid the golden egg, had long since flown away and CCM was running out of certain parts with frightening rapidity. It was this fact alone that halted a second production batch. The last straw came when Nick Jefferies left the factory because of pressure of work at the family motorcycle business following the death of his father, Alan.

The bike would have benefitted from further development work, and there was no-one in sight to do it. Dave Thorpe did ride a works CCM for the first few months of 1979, but was handicapped by an old back injury which later necessitated quite a major operation.

GADSBY

Both Nick and Eddie Smith, who rode a Sandiford-sponsored CCM, had some good results on the thumper, but generally speaking it wasn't really competitive.

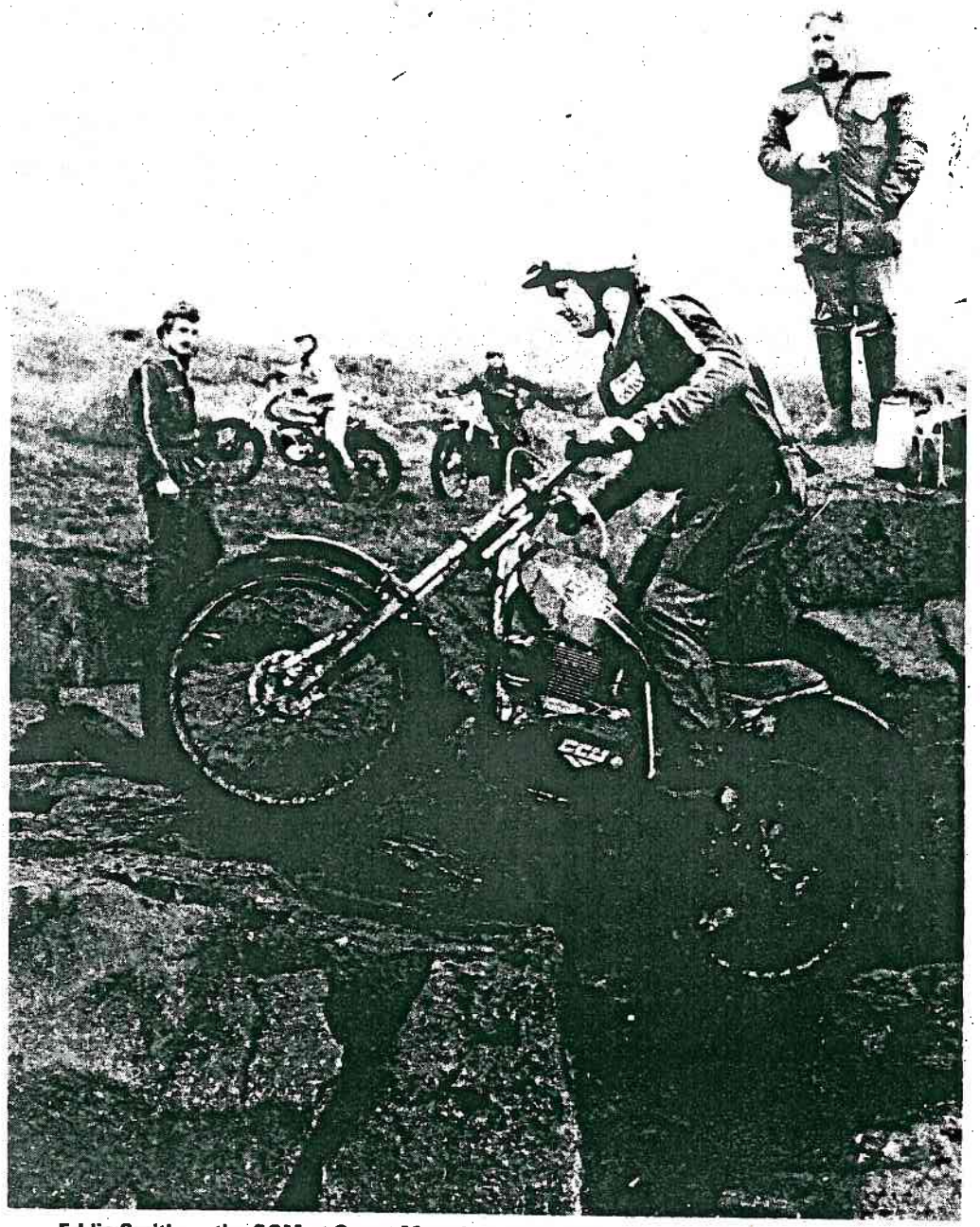
Only one rider got to grips with the CCM, preferring it to modern two strokes, and that was sidecar star Geoff Gadsby and his passenger Mick Gaunt. They started out with a standard production machine, which became more and more modified to stand the extra strains of sidecar work, but never lost the CCM characteristics.

Geoff and Mick had more national success on their machine than any of the others put together, winning several national trials including the Kickham, Hoad and Inter Centre Sidecar trial, finally finishing in fifth place in the 1981 British Championship.

Even now they are still riding the Bolton based outfit, preferring it to two stroke power from the running company. Their main problem is quite simply keeping it running.

But despite this success which came long after the last bikes had been sold, there were enough four stroke fans around at that time who welcomed the bike, and certainly the bike was a success for the factory. It produced around £100,000 in turnover and helped smooth out the peak on the production graph.

Anyone owning one of those 105 CCMs now is vised to hold onto it n terms of limited numbers and general charisma, if not in top class performance, the CCM trials four stroke looks set to be a modern classic.



Eddie Smith on the CCM at Scout Moor in a North West Centre trial. Eddie was sponsored by Jim Sandiford and achieved some good results on the Bolton thumper.

An optimistic smile from Nick Jefferies at the start of the 1978 Scottish Six Days Trial. When his 350cc CCM went out, no British bike remained.

CCM boss Alan Clews

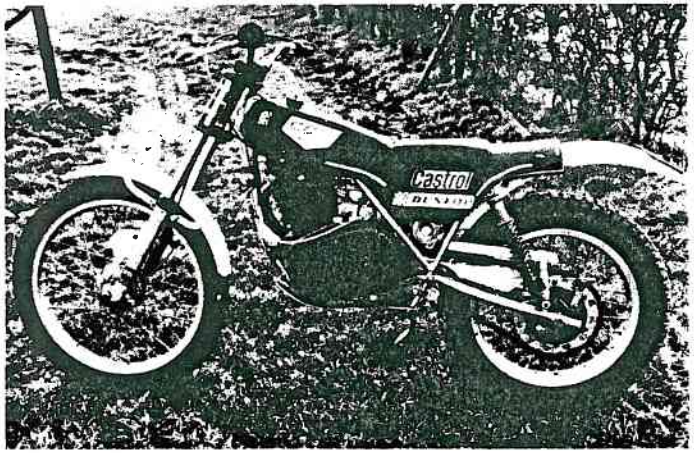
A factory publicity picture of the production CCM, which differed in many respects from the prototype developed by Nick Jefferies.

Strong lad! Nick risks a rupture with the first prototype outside the Bolton factory. The Girlings later gave y to remote Marzocchi rear shocks.

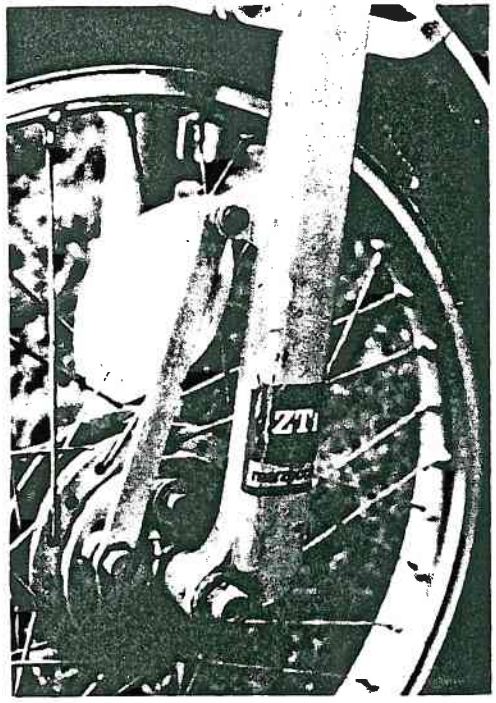
Nick Jefferies, the Yorkshire trials and road-race ace on the prototype he helped to develop early in 1978. Note the "temporary" bash plate, which has already had a

CCM
für Nick Jeffries

Mit 195 lbs., gleich 88,4 Kilogramm ist die CCM mit ihrem Radstand von 1409 mm ein handliches Trialeisen.



Der Rahmen ist offen, das Kurbelgehäuse wird auch hier tragend eingesetzt, um die Bodenfreiheit möglichst groß zu halten. Die übliche Kunststoffverkleidung birgt den auch in England vorgeschriebenen Metalltank, während das Öl im Kurbelhaus Platz findet, bei der Beanspruchung im Trial nicht nachteilig. Das schlichte, funktionelle Schwarz ist nicht erst seit Rhayader aufgetragen worde.

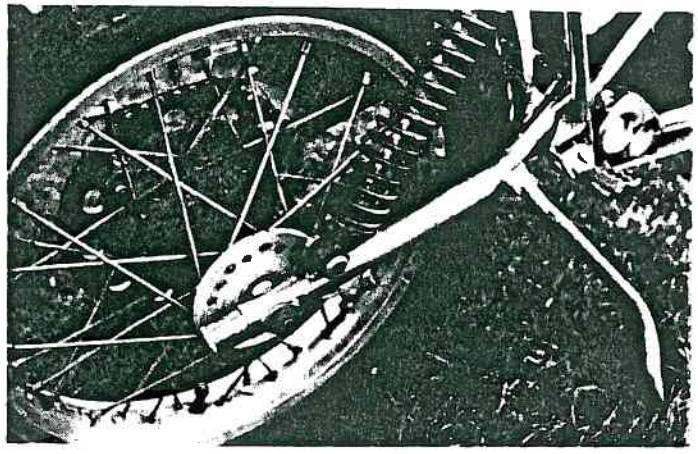


Die Marzocci-Gabel, wie sie heute bei fast allen Trialmaschinen von Rang und Namen zu finden ist. Bemerkenswert der gut versteckt geführte Bremshebel, hier von der Gabelfaust völlig verdeckt. Am oberen Bremswiderlager die Zulassungs- und Steuerplakette: 31.1.79!

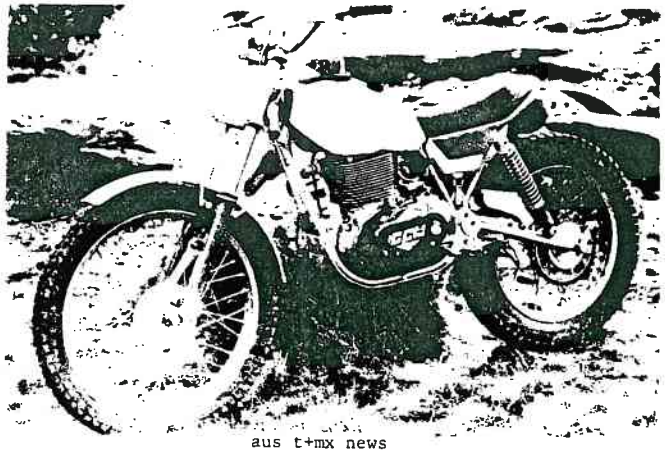
Bemerkenswert an der CCM ist nicht so sehr die Lösung des Schalldämpfersystems, als vielmehr die Tatsache, daß diese Maschine fünf Wochen nach Herstellung der ersten Entwurfszeichnung bereits am ersten Februar Wochenende beim Hurst Cup Trial eingesetzt wurde! Sicherlich mußte danach einiges geändert werden, wie der Vergaser, ein 27-mm-Amal Mk 2, im Durchmesser verringert wurde und die Girling-Federbeine - die "Gas"-Ausführung eine andere Federkennung bekamen.

Das Triebwerk hat 343 cm³, bei 79 mm Bohrung und 70 mm Hub und ist ein O.H.V.- Schwerere Schwungmassen durch verstärkte Kurbelwangen und eine höhere Primärübersetzung sorgen für die notwendige Zähmung des gut hochdrehenden Motors. Um auch den englischen Forderungen nach Drosselung der Lautstärke zu genügen und anderseits keine Einbuße an Bodenfreiheit zu erleiden, ist hier ein besonders ausgeklügeltes Schalldämpfersystem gebastelt worden, das zudem noch den Fahrer in keiner Weise behindert.

Bemerkenswert ist die auf der rechten Seite angebrachte Fußschaltung mit dem überlegt gekröpften Kickstarter. Dieser war anscheinend gut übersetzt, denn Nick ließ den Motor immer auf den ersten Tritt kommen. Hinter das Geheimnis der Kettennachstellung gelang es uns in Bilstain leider nicht mehr zu kommen; die abartig gekrümmte Seitenstütze erwies sich als praktisch. Was die Bilder nicht zeigen ist der Ton - für die Viertakter-Fans ein Ohrenschmaus auch in der Trialversion, also zivilisiert gedämpft!



Nick Jeffries
CCM



aus t+mx news

Die ersten hundert 350-Kubik-CCM-Banger, in ähnlicher Ausführung, wie sie Nick Jeffries in den ersten Läufen zur WM gefahren hat, werden nun ausgeliefert.

Dieser "Thumper", der fast vollständig aus britischen Teilen besteht, ist reine Handarbeit.

Wer "gromono" sagt, meint erhöhtes Gewicht. Die CCM-Leute sagen, daß dieses Gefährt trokken 105 kg auf die Waage bringe, also gute 10 kg über den spanischen Leichtgewichten.

Das "geringe" Gewicht wurde möglich durch Verwendung eines leichten aber dennoch stabilen Rahmens, der aus verschiedenen Prototypen und aus Erkenntnissen aus dem Crossrahmenbau resultierte.

Das Fachwerk besteht aus unter Argon geschweißten Reynolds 531-Rohren, die hintere Schwinge erhielt Nadellagerung. Der äußerst wichtige Unterschutz ist am Doppelschleifenrahmen befestigt und gibt so noch zusätzliche Steifigkeit.

Der Motor hat 345 cm³ (79,25Ø und 70 Hub), obenliegende Nockenwelle und ein Verdichtungsverhältnis von 6,2:1. Der Vergaser ist wieder einmal ein Amal von 24 mm Ø. Für das Serienmodell wurde ein 4-Gang-Quaife-Getriebe verwendet (Jeffries fuhr einige Läufe zur WM mit einem 3-Gang-Getriebe).

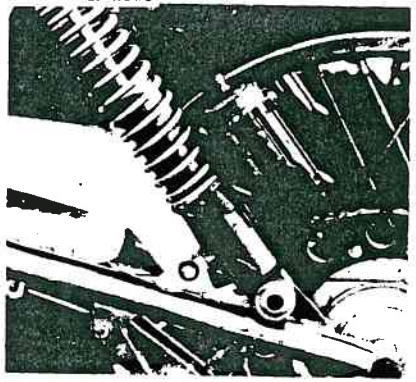
Die ersten drei Gänge, dicht beieinanderliegend, sind etwas "länger" als die der zweitaktenden Konkurrenz, bei soviel Kubik fällt eben auch ganz schönes Moment an.

Gegenüber unserem Bericht in Heft 26, Seite 54 ist die Linienführung der Tank-Sitzbank-Kombination noch geändert worden; die Zündung wurde auf Interspan-Elektronik umgestellt und sitzt unter dem Sattel, hermetisch versiegelt in ein Kasch'l eingebaut.

Das Öl befindet sich im Rahmenrohr und wird mittels Pumpe durch das Gehäuse befördert.

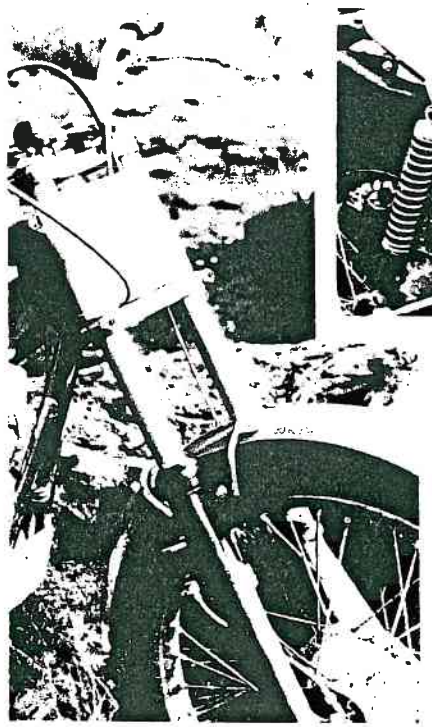
Die Federung hinten übernehmen Federbeine

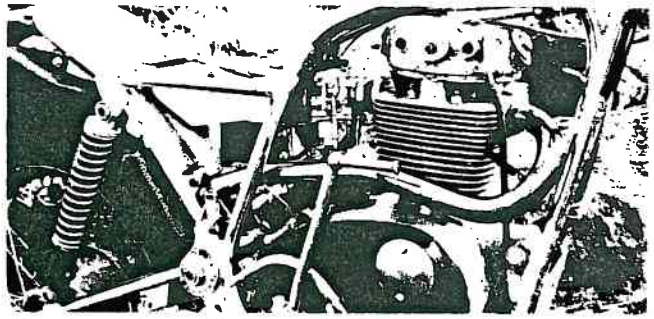
aus t+mx news

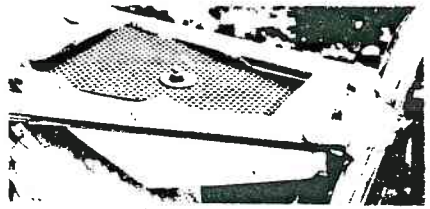


von Marzocchi und vorn steckt eine Magnesium-Gabel des gleichen Herstellers drin.

rainer heise







Mike Rapley von T+MX NEWS hat die neue CCM getestet. Sein Urteil: Vorsicht! (Warschau auf Hamburgerisch!) Eine Fahrt auf der neuen CCM und man mag keine Zweitakter mehr! Er fuhr dabei die erste Produktionsmaschine, Eigentum von Starfahrer Nick Jeffries.

Mike bemerkte als besonders art(un)typisch das Fehlen des traditionellen Ölflecks unter dem Motor der stehenden Maschine. (Woran erkennt man den Fahrer eines englischen Motorrades? An seinem vorsichtigen Gang - er versucht nicht mit seinen verölten Stiefeln auszurutschen!) Die neue CCM blieb während des ganzen, tagelangen Herumfahrens öldicht...

Der einstige Sandsteinbruch bot schurrige Sektionen zum Probieren. Für den absoluten Zweitakt-Fan Mike war es überraschend, wie gut er mit dem ungewohnten Hobel die von Nick vorgefahrenen Sektionen meisterste (Kein Wunder, hatte er doch seinerzeit mit einer Tiger Cub das Trialfahren angefangen und war dann zu einer Royal Enfield avanciert...), nachdem er ganz heimlich hinter einem Hang den Blicken der Beiden, Nick und Mannix (Begleiter mit Strahlenfalle von T+MX NEWS), verborgen erst ganz piano einige Passagen an sanften Hängen probiert hatte (Was, der tut das auch? Ganz meine Art, Blamagen zu entgehen!)

Nahezu alle Sachen wurden im ersten Gang absolviert, außer Schlamm, der im zweiten genommen werden mußte, und natürlich die steilen Hänge mit losem Untergrund. Die CCM fühlte sich dabei gar nicht wie ein Viertakter mehr an; Kein Wunder, sorgt doch die Zündung mit 36° Vorzündung für ein sauberes Verhalten bei wenig Umdrehungen, ohne Rückschläge üblichen Viertaktverhaltens. Nur wenn man Sektionen mit Dampf nach Zweitaktart anging, stellte man überrascht fest, daß die CCM eine andere Taktik verlangte: ruhig bleiben, Zeit lassen und die CCM nicht bei der Griffsuche behindern: Sie kommt von selbst durch die Sektion.

Das Fußen wird - sofern notwendig - nicht behindert. Die Schaltung ist mit ihren langen Wegen nahezu perfekt leicht und sicher. Die Kupplung trennt sauber und leichtgängig. Nur brennt man sich leicht Löcher in seine Gummistiefel an dem herausragenden Auspuffkrümmer. Der Fotomensch bestätigte mit seinen gelungenen Versuchen die leichte Handhabung des CCM-Klopfers, als er nach mehreren Versuchen mit einigen Fiasko-Einlagen an einem steilen Stück oben das Gas wegnahm, nachdem er unten mehr Dampf gemacht hatte. Es schien dann, als führe er eine Straße hinauf!

Nicht nur ist die CCM ein sicherer Gewinner in der rechten Hand, sie ist auch als Anfängergerät geeignet, wie die ständig besser werdenden Passagen von Mannix Bewiesen. Der Tester selbst fühlte sich als bekehrt.

Hinderlich für einen Massenzulauf sind die geringen Produktionsziffern - man spricht von einer möglichen zweiten Auflage von weiteren 100 Stück -, und der ganz schön happige Preis: 1.279 Pfund, (Was unter den heute vorherrschenden Umständen das Gerät für ein paar Cracks gerade begehrlich macht!)

aus t+mx news

TRIALSPORT 1978

Bidding has ended on this item.

Rare CCM Trails 350 4 stroke prototype EX works (Dave Thorpe)

Enlarge

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Item condition: **Used**

Ended: 18 Oct, 2011 16:51:04 BST

Starting bid: **£5,000.00** [0 bids]
Reserve not met

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Item location: Kendal, Cumbria, United Kingdom
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Seller assumes all responsibility for this listing.

Item number: 260868789724

Item specifics - Motorcycles

Condition:	Used: An item that has been previously used. See the seller's listing for full details and description of ... Read more	Manufacturer:	CCM
Model:	350 Trails 4 stroke	Number of Previous Owners:	1
Type:	Trails	Engine Size:	350 cc
Mileage:	–	Power:	–
Model Year:	1979	Colour:	Silver/Alloy
Date of 1st Registration:	–	Metallic Paint:	–
Gears:	Four-speed manual	MOT Expiration Date:	–
Drive Type:	Chain	Warranty:	–
Start Type:	Kick start	Independent Vehicle Inspection:	–
V5 Registration Document:	–	Road Tax:	–
Customised Features:	–	Extra Features:	–
Performance Upgrades:	–	Previously Registered Overseas:	–

For sale a RARE 1979 prototype CCM Trails bike (CCM - PR-OTO-2-1979)

Original owner - EX works Dave Thorpe.

Bought direct from CCM factory and has never been road registered, been stored for the last 10 years so in excellent condition. Bike has never been registered but I have the Application for a Licence for a New Motor Vehicle and Declaration for Registration Form (V55/3), this can be seen on request.

Trail bike to be collected upon clearance of funds, sold as seen

If you require any further details please feel free to inbox me.

Thanks For looking

Questions and answers about this item

No questions or answers have been posted about this item.

from ebay october 2011

Rare CCM Trails 350 4 stroke prototype EX works (Dave Thorpe)

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Mileage:	--	**Power:**	--
Model Year:	1979	**Colour:**	Silver/Alloy
Date of 1st Registration:	--	**Metallic Paint:**	--
Gears:	Four-speed manual	**MOT Expiration Date:**	--
Drive Type:	Chain	**Warranty:**	--
Start Type:	Kick start	**Independent Vehicle Inspection:**	--
V5 Registration Document:	--	**Road Tax:**	--
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Hvordan kan det være at årstallet står til 1979?
Er det en prototype der er lavet for yderligere produktion end serien lavet i 1978.
Det eneste jeg kan se er at lydpotten er ikke som serien, men det er ikke unormalt.

How can it be that year: **1979**?
Is it a prototype made for further production than the series created in 1978.
The only thing I can see is that the muffler is not like the series, but it is not unusual.

oktober 2011