7.1 Transmission Topics - General

Source: S.O.C. Service and Information Sheets

SCOTT GEARBOX AND CLUTCH

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SCOTT TWO-SPEED GEAR

THIS is removed quite easily from the frame as follows: Disconnect kick-starter chain from rear end, take out hollow bolt in left-hand gear lug, remove footrests (for "freedom"), rear chain, gear pedal, sleeve nut and washer, outer drum and strap, washers on shaft (note the order in which they come off), undo $\frac{3}{8}$-inch shaft nut and remove inner drum, lift up gear, take off kick-starter device complete, and slip off chains; drop gear through bottom of frame (see Fig. 1).

Dismantling Gear

Undo slotted ring on ratchet side (right-hand thread), lift off high gear drum, expanding ring, distance washer and ball cage. Take out two pivoting screws in the thrust lever (you will note locking washers on these: when replacing screws always fit new washers), lift off thrust lever, low gear drum, ring distance washer and ball cage.

Take off locking ring at driving end (also right-hand thread), lift off sprocket (located by two flats on the hub). Cones are accessible, take off cone at *this end first*. As the cups are a drive-in fit, a light tap on the hollow shaft (insert hollow bolt a few threads first) will carry out the whole spindle centre thrust and cup complete (Fig. 2).

Centre Thrust

The two large nuts and thrust washers are threaded on to the sleeve (right-hand thread), and should any of the washer cages, the sleeve or the thrust block itself show signs of pitting or wear, fit new parts. (The sleeve is riveted through the hollow shaft to the solid spindle.)

Reassembly

The sleeve *must* work freely on the spindle; see that no play is allowed on the centre thrust and main bearings, but that all run freely; thin steel washers are supplied for cone adjustment (short end of shaft) to allow the cones to be tightened up against the shoulders of the shaft. (*Note.*—There are 50 balls, $\frac{5}{32}$ inch, in the gear, 24 in the thrust assembly and 26 in the main cups, even number each side.) Special Note.—Put the balls back loosely; don't use grease to "place" them; this only blocks up the oilways and causes trouble.

Lubricate Drums with Paraffin

The quick thread drums should be lubricated with paraffin only and the strap adjusted carefully, as this makes a deal of difference in the sweetness of engagement; if both gears slip unless you have your foot on the pedal, this proves that the strap is too slack, so tighten up slightly. Don't put too much pressure on the sleeve nut when tightening — remember it is only a ¼-inch thread, and very easily broken off.

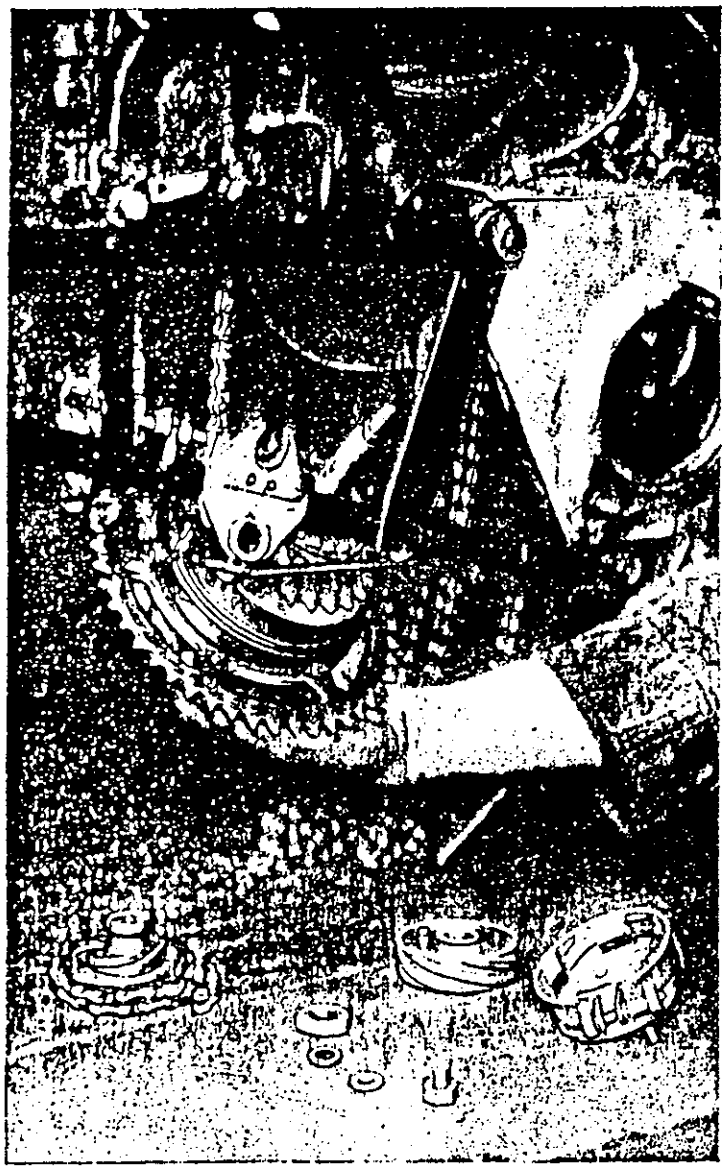

Fig. 1.—How the Gear drops through the Frame when Dismantling.

The thin ¼-in. washers on the thrust rod are for pedal adjustment: increasing the number will engage *low* gear with *less* movement of pedal, and decreasing the number will allow the pedal to go down *farther* into low gear, high gear being affected accordingly (Fig. 6.) Oversize rollers are supplied to take up wear, but don't rush to these immediately; remember that play on the cones or centre thrust (an excessive amount of neutral on the gear pedal usually indicates this) will be taken up by the *whole gear moving bodily*, before the rollers enter the drums.

Fig. 2.—Removing Thrust Assembly from Gear Hub.

Insert a hollow bolt for a few threads. A light tap on the bolt will drive out the assembly.

to the hub flange on the outside (19-, 20-, 21-, and 22-teeth sprockets are supplied).

These sprockets are held on the flange by a lock ring (right-hand thread) and a set screw (also right-hand). On unscrewing these, the sprocket may be removed and another replaced.

See that the locking ring and set screw are *tight* when replaced.

It is not necessary to take the gear out of the frame for this job; remove locking ring and screw, take out hollow bolt and distance washer and sprocket can be removed. When replacing the hollow bolt, take care that you do not cross the threads.

SCOTT KICK-STARTER

This is of course a separate unit from the gear itself, and can be removed without taking out the gear, as follows:

Sideplay on the gear drums (up to $\frac{1}{16}$ inch permissible) can be taken up by means of a slightly thicker side plate distance washer.

Changing Gear Ratios (Two Speed)

This can be done by changing the sprocket fitted

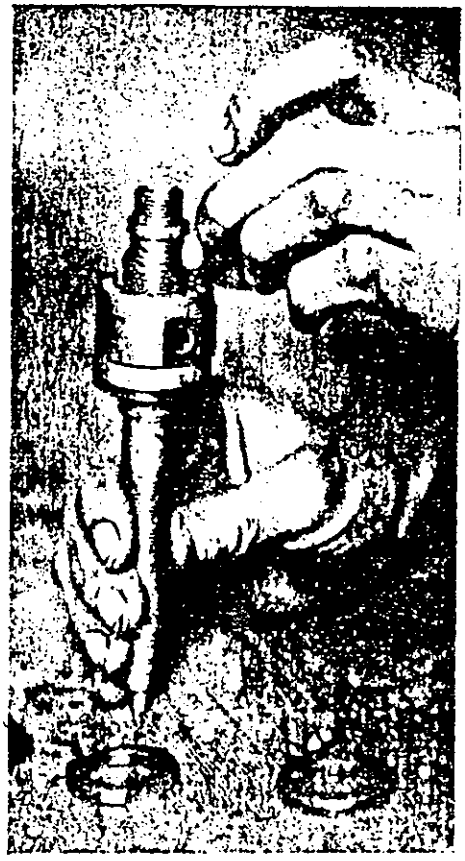

Fig. 3.—Placing Balls in Centre Thrust.

Don't use grease to "place" them.

Detach chain from rod, take off gear pedal and drums, slacken off left-hand gear lug clamping bolt and gear chain adjuster nuts, undo gear oil pipe ; gear can then be tilted and the kick-starter pulled off.

When refitting, take out sparking plugs to allow engine to rotate easily, slide kick-starter on shaft, refit gear into frame. (*Note.*—See that the two small pins on the back of the inner quick thread drum fit snugly into the slots in the gear lug, otherwise difficulty will be found in getting the gear pedal adjustment correct.) Attach a piece of cord to the chain, wind round ratchet about 1½ turns (clockwise), bringing loose end to

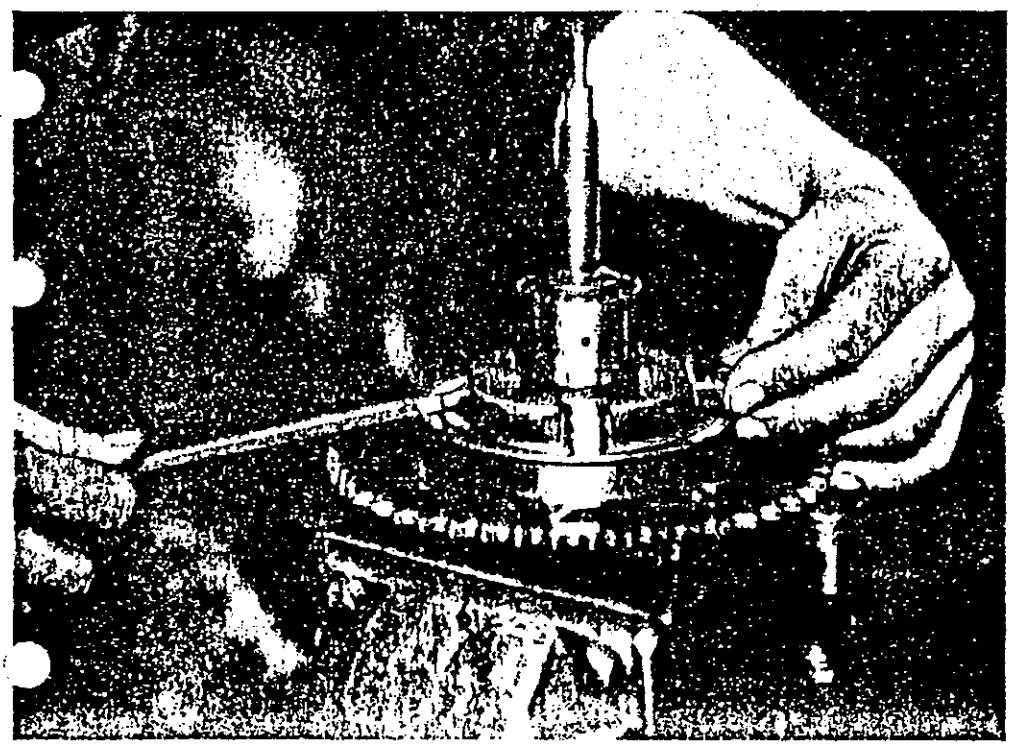

Fig. 4.—How to locate Thrust Lever Screws.

ar ; engage high gear and pull cord, turning rear wheel forward, until chain anchor is within ⅛ of a revolution from top.

Hold ratchet in position with a screwdriver wedged between it and frame, attach starter chain to rod, withdraw screwdriver (Fig. 5).

Just one warning here.—On no account turn the rear wheel backwards, as this will damage the spring.

Adjustment of rod and chain is made by the link at the end of the rod (attached to the lever), and in rest position the ratchets should be just clear of each other. If you find that no amount of adjustment will clear ratchets, remove kick-starter and fit one or more thin gear cone washers

between the ratchets on the shaft; this will then throw them clear of each other.

If the kick-starter sticks at the end of the stroke, this may be due to dirt or want of oil. Clean out thoroughly with petrol, and give copious supplies of oil; failing that, it is possible that the small 2 B.A. nut holding the chain eye on the ratchet drum has become loose and has turned round, fouling the gear lug on the down stroke. This nut should be riveted over and filed flush with the edge of the drum to prevent this.

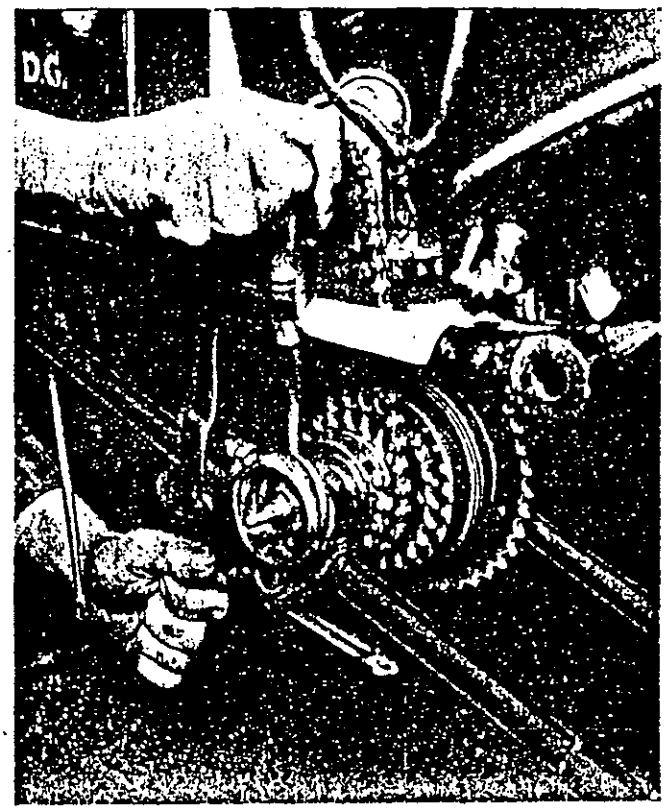

Fig. 5.—Connecting up Kick-starter Chain.
After giving spring a full turn, jamb screwdriver between gear lug and device to hold in position.

SCOTT THREE-SPEED GEARBOX

This requires little attention above the usual oiling, but we will dismantle for safety.

Remove kick-starter screw and cap and hold the spring with a pair of pliers, pull it off the pin, release spring. Take off kick-starter cap (the notched one), *left-hand* thread, and kick-starter stop by detaching sleeve nut. Then kick-starter itself will pull off by rotating in a forward direction until the pawl "rides" on the boss.

The ratchet bolt and washer can now be removed (right-hand thread) and ratchet taken off its square; now take out the three remaining cover sleeve nuts.

A smart tap on the end of the mainshaft will break the cover joint (assuming that the sprocket housing has been taken off, of course); continue tapping the shaft and the end of gearbox will come off with the middle- and low-gear wheel assembly. Assuming that the "innards" *don't* come out with the cover, withdraw layshaft, slip off middle- and low-gear wheel assembly from mainshaft. Mainshaft can then be with-

drawn, which will allow sliding dog to fall free ; take care that you collect the small fork shoes, which may drop out of the fork.

High-gear wheel can only be removed after clutch is dismantled. When reassembling, be sure that all parts and joints are perfectly clean, making cover joint with Metalastine.

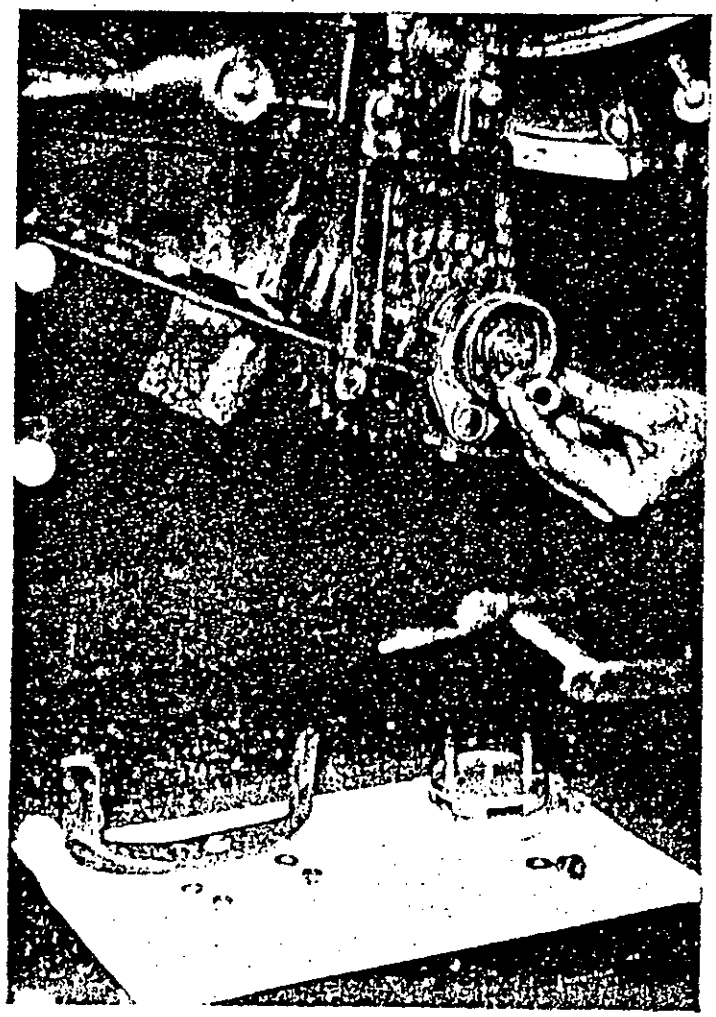

Fig. 6.—Order of Gear-pedal Washers.

Plain ¼-inch washer is on shaft and ⅜-inch double-coil washer in hand ready to put on. Ordinary ⅜-inch spring washer and sleeve nut are put on after outer drum is fitted.

THE SCOTT CLUTCH

How to Dismantle

This can be dismantled, if required, without disturbing the gearbox by just removing the sprocket housing and rear chain and then carrying on as follows :

Remove hexagon nuts (or screws, according to type) and clutch springs (6), and the whole clutch body and plates will come away together. Take care that none of the race rollers (30 Flyer and Super) fall out and get lost.

If you wish to get at the clutch operation worm, take off race-plate locking nut (the edge of its locking washer must be prised off the flat face of the nut first), pull off race plate, then the ball-thrust race, washer, clutch worm lever and spring.

Should the thrust washer be worn this may be reversed, as may also the corresponding washer which is fitted *in* the lever itself, these being case hardened ; if they are pitted, reverse at once, as once this has started

it will wear quickly, with the result that a lot of waste movement is set up on the lever before the thrust pins touch the outer plate and " clutch drag " sets in.

Reassembling the Scott Clutch

When reassembling, be sure that the race-plate nut is tight and the locking washer turned over. It will be as well to note the condition of the felt washer inside this nut, as if this is hard or perished, oil will tend to creep along the mainshaft and cause clutch slip (i.e. if gearbox is too generously filled).

The order of plates is as follows : (1) small plate ; (2) plate with inserts, two similar groups, then the outer plate. Springs should be replaced, tightening them in pairs diametrically opposite each other ; lock the nuts by split pins or a length of copper wire.

Don't burn Oil off Inserts

If at any time you wish to examine plates without taking gearbox out of frame, make sure that you hold the clutch body in position (if solo, lean machine over on right-hand footrest), in order that the rollers do not drop out from their cage. If you get clutch slip through oil-saturated inserts (this may happen if you overfill the gearbox, which by the way should only be filled up to the oil boss plug, about half-way up on the gearbox cover), let the plates soak in petrol for a few minutes, brush vigorously and " rough up " with a file. DON'T BURN THE OIL OFF, this only buckles the plates and swells the inserts ; if you think the inserts too bad or worn, replace one plate (next the *outer* plate) with new inserts (about three shillingsworth).

Just another point : it may be advisable, after many thousands of miles' wear on the inserts, to grind the thrust pins down a little, but these *must* be done evenly, otherwise you will get a " cockeyed " action and clutch drag, but on relining the plates with *new* inserts you must fit standard pins (the others of course being now too short).

On Supers

If the plates get too saturated, fit four new Ferodo linings, putting one of these immediately behind the race plate, and if clutch tends to slip under heavy sidecar work, put a thin washer under each of the six springs (this tensions them a little), although this will necessarily make the clutch a little " heavier " in action.

Lengthening the Life of Clutch Wires

Many people consider that the heavier the clutch cable the longer the life. Well, this may be, but a light clutch wire does not necessarily mean a short life—what it does mean is a really light action. The writer has

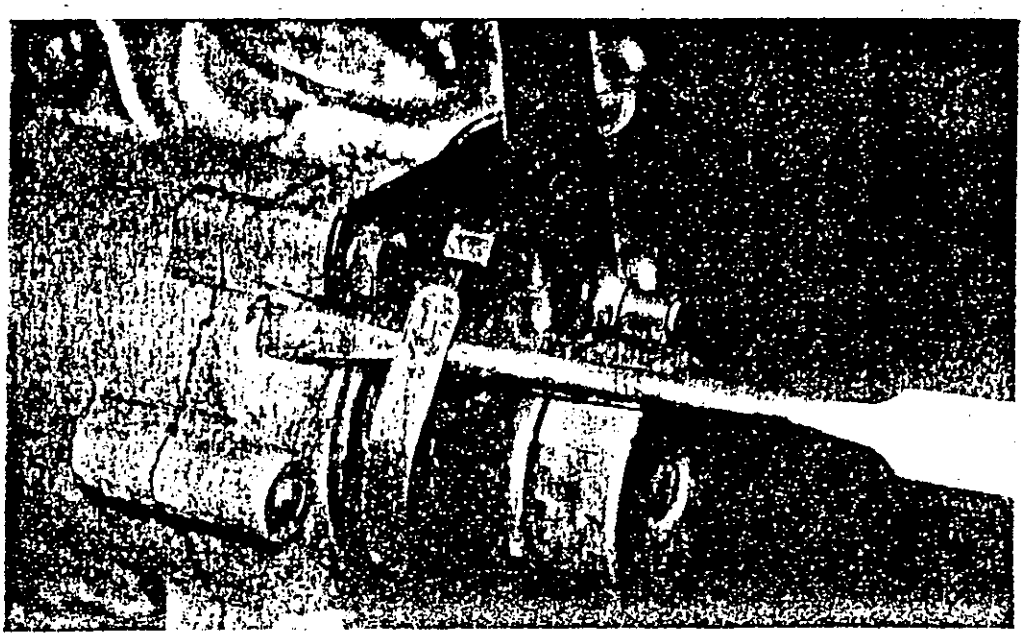

Fig. 7.—Lifting up Pawl Spring.
To replace pawl which has jumped out after violent backfire.

the original light clutch wire on his Flyer and sidecar—used quite a lot in London traffic (Londoners will appreciate this point!)—which has seen nearly eighteen months' service. There is nothing wonderful about this, and the secret (if you can call it such) is a $\frac{5}{16}$-inch round nipple at the top end which *floats* in the lever, i.e. not jammed in, as, sad to relate, we see so many, cable oiled frequently (particularly at the adjuster, half-way along the cable), and the top nipple and first few inches of inner wire *thoroughly greased* periodically against the rain rust.

Alter Gear Ratios when Fitting Sidecar

The gear ratio can be changed in about twenty minutes, by taking off the sprocket housing complete, remove end plate which screws out, unscrew sprocket lock nut, and tap out sprocket from ballrace—refit new sprocket by reversing process.

Scott Kick-starter Trouble

If this slips it is usually due to dirt on the pawl or broken ratchet teeth; in any case, it is a matter of minutes to take it to pieces and examine. Worn pawls or ratchets should be replaced. If, after a backfire, the kick-starter slips, you will find that the pawl has "jumped" from under the long clip spring around the kick-starter body; lift this spring up with a screwdriver and replace pawl. The spring will automatically press pawl back into engagement (see Fig. 7).