

SECTION C

PRIMARY TRANSMISSION

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TRANSMISSION

DESCRIPTION

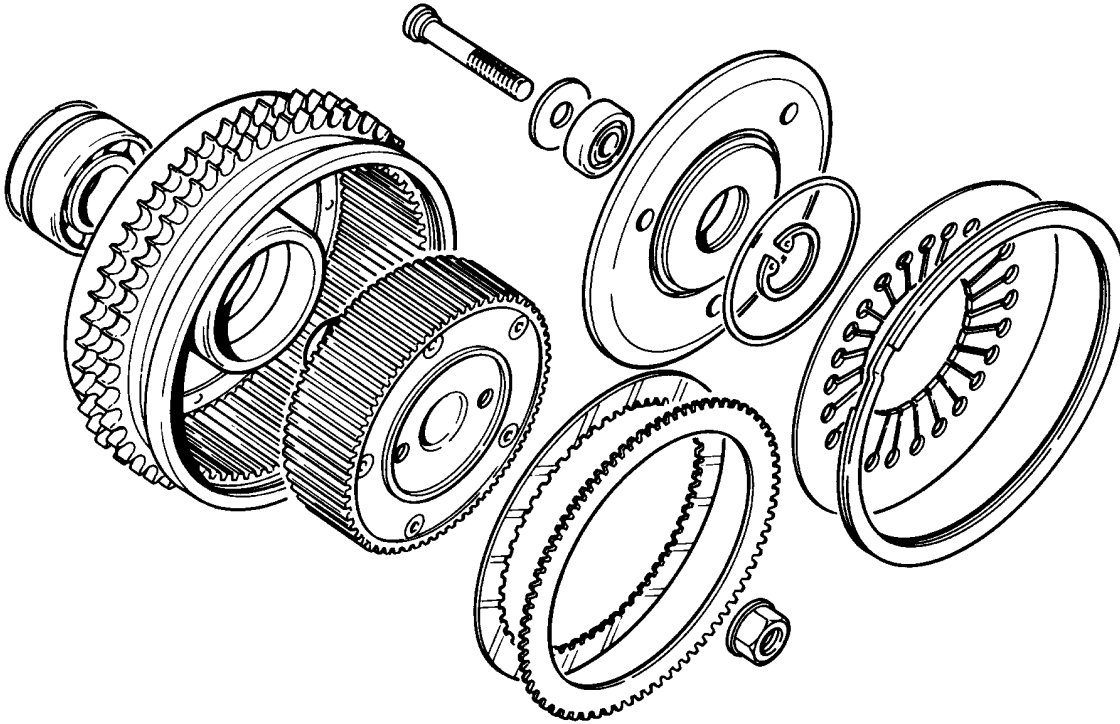


Fig. C1 The Clutch Components

The engine unit transmits its power by sprocket and duplex primary chain to the clutch chainwheel containing a multi-plate all metal diaphragm spring clutch, and through to the gearbox by means of rubber vane type shock absorber contained within the clutch hub.

The clutch drum houses a large circlip retaining a diaphragm spring, pressure plate, nine bronze driven plates and nine steel driving plates. The diaphragm spring applies the clamping pressure through the pressure plate to the clutch plates. The clutch drive is released by a pull rod acting on a ball bearing situated in the pressure plate which allows the driven and driving plates to separate, causing the drive from the engine to be disengaged from the gearbox. There is no need to 'free' the clutch before starting the engine.

From the clutch, power is transmitted through the gearbox to the high gear and gearbox final drive sprocket and, in turn, by the heavy duty rear chain, which is totally enclosed and running within an oil bath, to the rear wheel sprocket located in an aluminium housing and then via a second rubber 'cush drive' to the rear wheel. It is not necessary to remove the

engine unit to carry out work on the primary transmission.

MAINTENANCE

The only maintenance necessary is adjustment of the clutch pull rod (Section C8). Should clutch slip or clutch drag occur, first check that the clutch pull rod is not binding. If no fault is found it will be necessary to strip the clutch and make replacements. Should the motorcycle continue to be driven under conditions of clutch slip, the heat generated may cause considerable damage to the clutch unit.

Primary chain tension is maintained by the automatic tensioner comprising two spring loaded pistons using the chaincase oil as a damping medium. Should the slippers become worn or cease to function the tensioner should be replaced as a complete unit.

When undertaking this operation, or whenever the primary chain is removed it would at the same time be advantageous to examine the clutch driven and driving plates for wear thereby eliminating the work involved in gaining subsequent access to these parts.

SECTION C1

REMOVAL & REPLACEMENT OF PRIMARY CHAINCASE COVER

REMOVING THE PRIMARY CHAINCASE COVER

Position a suitable receptacle below the primary chaincase. Remove the bottom-most socket headed bolt and drain the oil. Slacken the right footrest securing bolt and swing footrest clear of the primary chaincase.

Extract and remove the clutch access cover by inserting one of the 8 mm. screws from the air transfer ports into one of the three cover fixing screw holes. (Early machines not providing this facility in the access cover can be converted by removing the cover using an 11 mm. (7/16 in.) diameter bar inserted into the screw hole counterbore, and levering to break the seal joint. Tap each hole 8 mm. (fine) prior to refitting). Remove the two locknuts on the clutch pull rod and, being careful to collect three 10 mm. ball bearings, remove the clutch lift plate (Fig. C3).

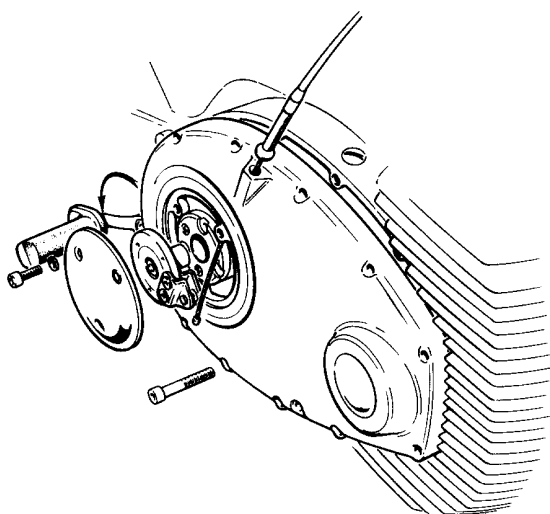


Fig. C2 Removing the Primary Chaincase Cover

Disconnect the clutch cable and remove (Fig. C2). Remove the remaining socket headed screws noting that the location of the one shallow headed screw is the closest to the footrest mounting. Avoid damaging the highly polished surface finish of the covers by inserting an 8 mm. diameter bar down the clutch cable hole to assist in cover removal.

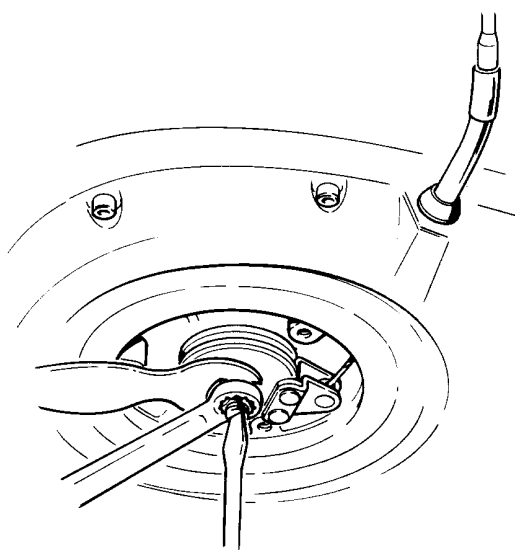


Fig. C3 Removing the Clutch Adjuster and Locknuts

REPLACING THE PRIMARY CHAINCASE COVER

Refitting is the reverse of removal but care must be taken to clean any silicone jointing compound from mating surfaces and re-apply the recommended type. Before re-assembling, examine the clutch lift mechanism for any signs of wear or damage. Apply grease to the working faces of the clutch lift mechanism back and lift plates, and position the three ball bearings into the grease to assist in re-assembly. Do not forget to refill the chaincase with the correct quantity of the recommended oil.

SECTION C2

REMOVING AND REPLACING THE CHAIN TENSIONER

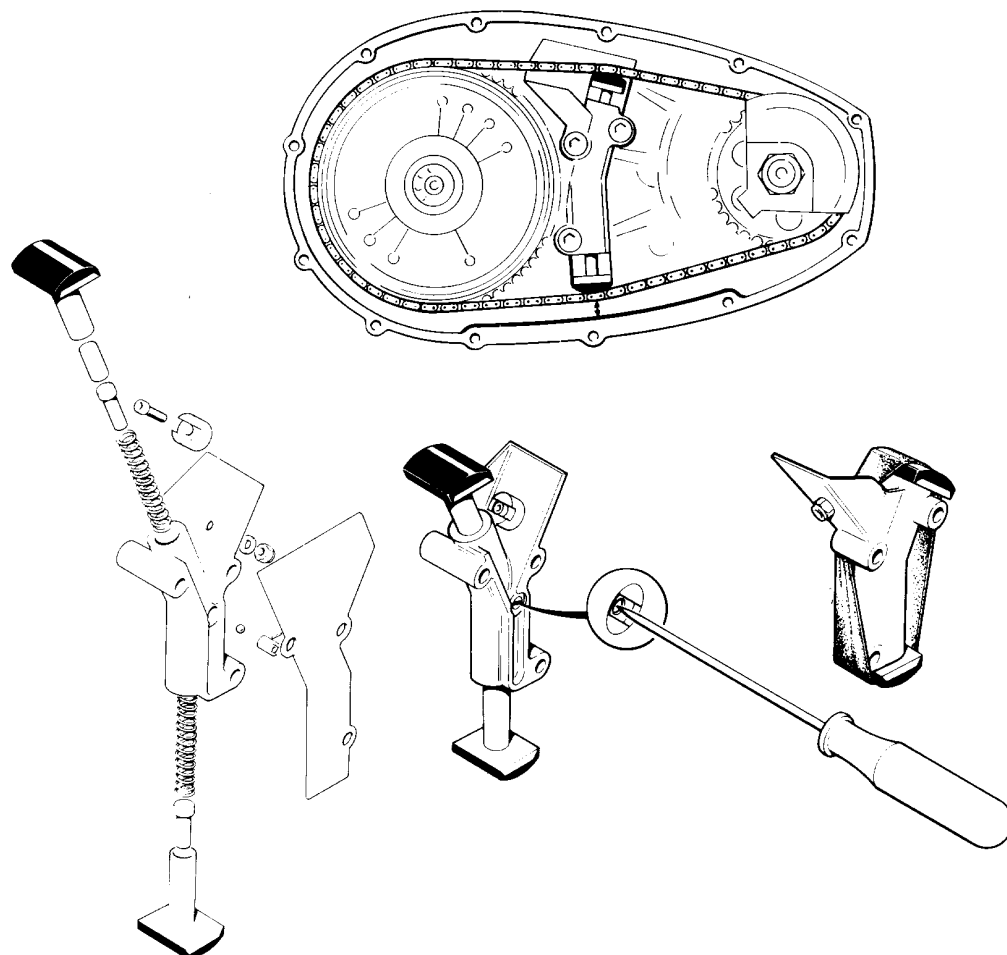


Fig. C4 Removing and Replacing the Primary Chain Tensioner

Remove the primary chaincase cover (see previous section C1) and place a strong elastic band around the chain slippers. This is to prevent the spring loaded slippers 'flying out' when removed (Fig. C4).

Remove the three bolts securing the unit to the right end plate. The unit can now be withdrawn. Replacement is the reverse of dismantling. However, care should be taken to ensure the backing plate is assembled behind the primary chain, silicone jointing compound being applied to the rear face of the tensioner avoiding ingress of the sealant into the one-way valve mechanism, and the tensioner carefully offered into position and located by the three bolts which are locked in position with 'Loctite 270'. Replace primary chaincase cover, re-sealing with the recommended silicone sealer and re-fill with the recommended oil to correct level. See Fig. C5

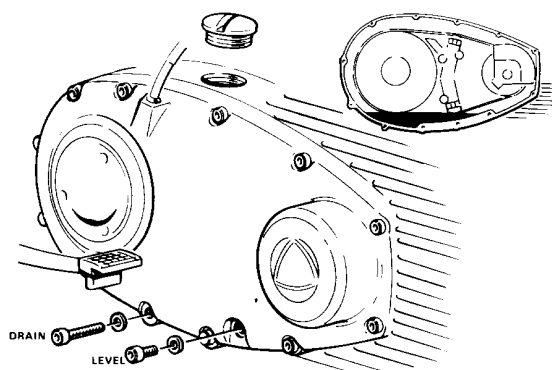


Fig. C5 Replenishing the Oil in the Primary Chaincase

NOTE:

The primary chain tensioner must be re-assembled in the correct sequence in order to operate normally. See inset in Fig. C4

SECTION C3

REMOVAL OF THE PRIMARY TRANSMISSION AND CLUTCH

PRIMARY TRANSMISSION AND CLUTCH

Remove the primary chaincase cover as described in Section C1. Remove the chain tensioner as described in Section C2. Remove the generator cover situated on the left end plate. Fit flywheel restrainer. Fig. C6 (Part No 50-0231).

Fit clutch diaphragm spring compressor Part No 69-0614 to the clutch pull rod and tension the diaphragm spring. Release the large circlip located in the clutch drum and remove the diaphragm spring and clutch pressure plates. (See Fig C1).

The clutch driving and driven plates can now be removed. Fit the clutch locking tool, (Part No 50-0410), and release the clutch hub nut, and then remove nut on right end of the rotor shaft and remove the balance weight.

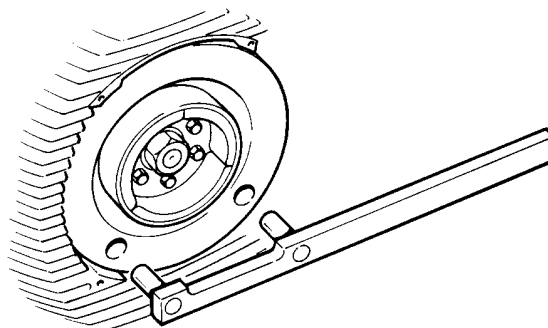


Fig. C6 Using Flywheel Restrainer Part No 50-0231

Fit the hub puller Part No 50-0408, and pull off clutch hub and engine sprocket together to avoid damage to primary chain.

SECTION C4

INSPECTION OF COMPONENTS

CLUTCH DIAPHRAGM SPRING

The diaphragm spring should be inspected for signs of wear, obvious damage, distortion and discolouration due to excessive heat. Check for distortion by placing on a flat surface table and inspecting for flatness at the outer rim, and the parallel height of the inner spring 'fingers'. Any distortion may be the cause of clutch 'judder' or snatch. The plate must be replaced if any distortion is evident.

CLUTCH PLATES

The clutch driven and driving plates should be checked for flatness on a surface plate and any damaged plates should be replaced.

CLUTCH PRESSURE PLATE

Check for distortion. Examine the clutch pull rod and pull rod bearing for signs of heat, roughness or mis-alignment. Replace as necessary.

STARTER GEAR & FREEWHEEL BEARING

Examine the starter free wheel sprag unit by removing the retaining circlip and easing the bearing out of its housing. Check for obvious

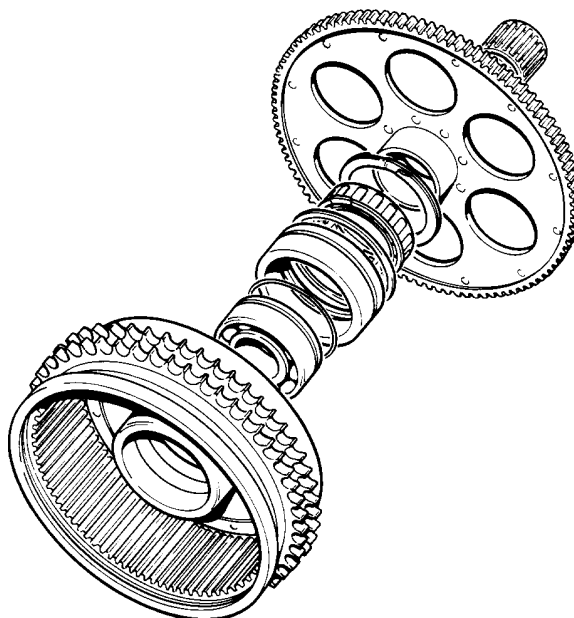


Fig. C7 Starter Gear and Freewheel Bearing

signs of wear, discolouration, chipped bearing and, where necessary, replace. Examine the other bearings for sign of damage, wear and overheating, and replace as necessary. Check the starting ring gear and starter motor gear for wear.

PRIMARY CHAIN

Inspect the primary drive chain for excessive wear of the rollers and pivot pins and check that the elongation is less than $1\frac{1}{4}\%$. The extent of wear is most conveniently checked against a new chain, but if a new chain is not available, lay the chain out on a flat surface, compress the chain ends inwards to take up the play and mark the ends of the chain. Pull the chain out to its fullest extent and again mark the position. The difference in lengths obtained should not be more than $1\frac{1}{4}\%$ of the total length of the chain. (ie 1.3 cm/0.5 in. max). As the chain is "endless", the measurement in looped condition will exhibit half the overall dimension. A further indication the chain requires replacement will be given when wear marks are exhibited on the inner chaincase lower wear pad coupled with associated chain noise.

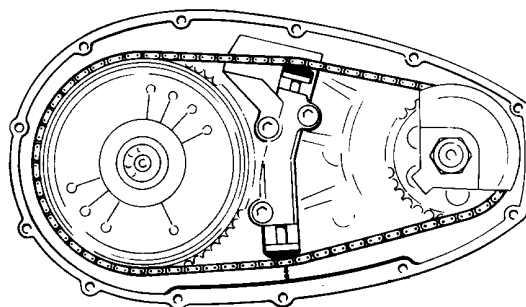


Fig. C8 Primary Chain Wear Limitations

SECTION C5

REPLACING THE CLUTCH SHOCK ABSORBER RUBBERS

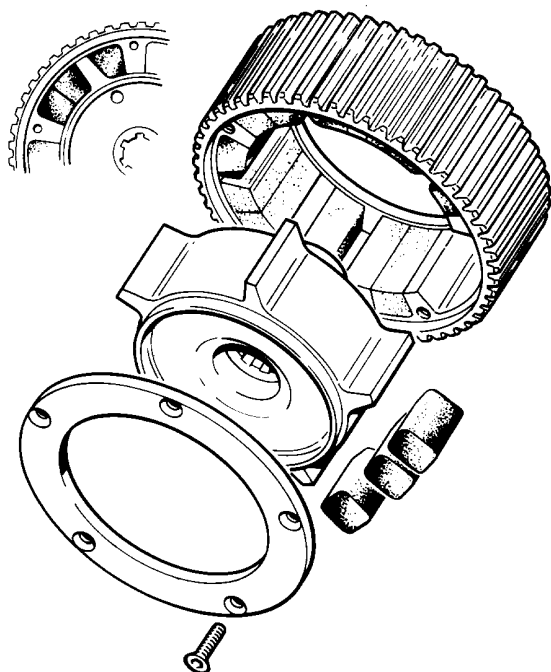


Fig. C9 The Clutch Shock Absorber Unit

Replacement of the rubber segments requires specialised equipment, and for this reason it is advisable to return the shock absorber unit to the Factory Service department for service unit exchange.

If there is no alternative but to recondition locally, some improvisation in the manufacture of a simple fixture and wrench will be required, drawings for which will be supplied on application to the Service Department. Place the clutch hub on a dummy mainshaft gripped in a vice. Using a suitable strap wrench, compress the shock absorber rubbers and remove them from the hub. When refitting, please note that there are 15 rubber segments and these should be fitted as indicated in Fig. C9.

Refit the clutch shock absorber assembly cover plate and secure with five screws. Use 'Loctite' to secure the screws.

SECTION C6

PRIMARY CHAIN ALIGNMENT

The primary chain alignment is set at the factory and during the normal life of the machine should not need re-setting. If, however, the rotor shaft is replaced for any reason or the primary side main bearings are replaced, then adjustment could be called for. Adjustment is achieved using shims between the engine sprocket and right rotor shaft ball bearing Fig. C10. The primary chain alignment can be examined by installing the engine sprocket and clutch drum/chain wheel in place, prior to final assembly without the primary chain and chain tensioner being fitted. Before screwing the Primary Chain Alignment Gauge to the tensioner upper mounting, ensure the boss is clean and free from burrs or damage. Once in position the gauge should be zeroed on the face of the teeth of the clutch sprocket. The gauge should then be rotated to the face of the teeth on the engine sprocket.

Any misalignment can be adjusted out by the use of spacer shims between the engine drive sprocket and rotor shaft. When making this adjustment due regard must be taken of the residual mainshaft end float, final alignment being set to within 0.25 mm (0.010 in.) of mean shaft location.

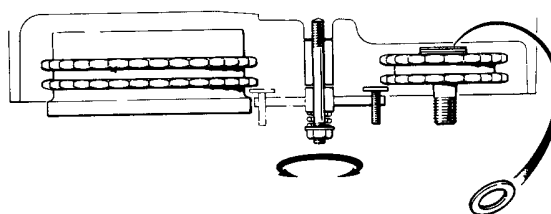


Fig. C10 Checking Primary Chain Alignment

SECTION C7

RE-ASSEMBLY OF CLUTCH AND PRIMARY TRANSMISSION

If not already replaced, refit the clutch bearing, the starter freewheel sprag unit and circlips into the clutch sprocket assembly (Fig C7). If the freewheel unit outer spool is being replaced, it must be retained by using Loctite 270 during re-assembly, and circlips (where fitted) refitted.

Refit the needle roller bearing assembly and gently rotate and push the starter gear into the clutch housing and test for the sprag clutch operation. Fit the primary chain to the clutch and engine sprockets and offer this assembly onto the gearbox mainshaft and rotor shaft simultaneously. Fit the rotor shaft counter balance weight and fit nut – torque load to the

recommended setting (General Data) using Loctite 270 on the nut.

Position the clutch locking tool (Part Number 50-0410) and tighten the mainshaft nut to the recommended figure. Fit clutch plates, and refit pressure plate and diaphragm spring unit.

Before releasing the clutch spring compressor, ensure that the circlip is properly located in the groove in the clutch drive housing – **FAILURE TO DO THIS COULD RESULT IN INJURY** – the circlip could spring out, due to incorrect location of the circlip in its groove.

Refit chain tensioner and refit the primary chaincase cover. (Section C2).

SECTION C8

ADJUSTING THE CLUTCH OPERATING MECHANISM

Before adjusting the clutch operating mechanism.

1. Slacken the adjustment at the handlebar clutch lever cable adjuster.
2. Remove the inspection cover from the primary case (transmission cover not previously having been removed).
3. Check the slotted pull rod for correct adjustment. The lift bearing at the inner end of the pull rod should be lightly pre-loaded. The pre-loading is correct when there is no end float on the pull rod, but it can still just be rotated by gripping the adjusting nuts with the fingers, with no slackness being felt.
4. If there is end-float, slacken the lock nut and screw out the stud until the end-float just disappears.
5. Tighten the inner ring nut whilst holding the stud, then tighten the lock nut whilst holding the inner nut.
6. Recheck for end-float after tightening lock nut.
7. Readjust at the clutch lever to just $1/8$ in. (3.2 mm) free play in the cable.
8. Replace the inspection cover, ensuring the sealing 'O' ring is in place, and the plastic washers are located under the heads of the three fixing screws.

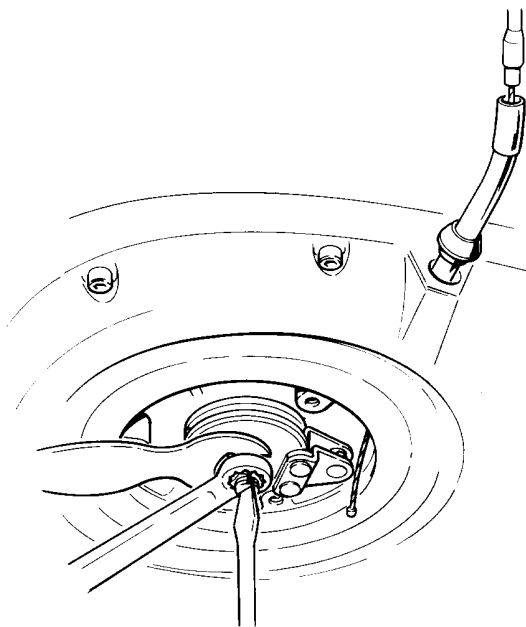


Fig C11 Adjusting the Clutch Operating Mechanism

NOTE

If the clutch has any tendency to slip when the clutch lever is fully released, it is a sign that the clutch pull rod (or the cable) is pre-loaded excessively. If the clutch fails to free completely when the clutch lever is fully compressed, it is a sign that too much end-float (or free play) exists in the cable or pull rod.