

Chapter 5 Frame and forks

For information relating to the RD350 F II and N II models, refer to Chapter 8

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Specifications

Frame

Type	Tubular, double cradle
Caster angle:	
RD350 LC II	27°
Other models	26°
Trail	96 mm (3.78 in)

Front forks

Type	Oil-damped telescopic, air assisted
Travel	140 mm (5.51 in)
Spring free length:	
RD350 LC II	506.2 mm (19.9 in)
Other models	429.6 mm (16.9 in)
Oil capacity:	
RD350 LC II	253 cc (8.92 Imp fl oz)
Other models	297 cc (10.48 Imp fl oz)
Oil grade:	
RD350 LC II	SAE 10W30 SE motor oil
Other models	SAE 10W fork oil
Oil level:	
RD350 LC II	120 mm (4.72 in)
Other models	106.1 mm (4.18 in)
Air pressure:	
Std	0.4 kg cm ² (5.7 psi)
Min	Zero
Max	0.8 kg cm ² (11 psi)

Rear suspension

Type	Rising rate (Yamaha Monocross, new type)
Suspension unit travel	40 mm (1.57 in)
Rear wheel travel	100 mm (3.94 in)
Spring free length:	
RD350 LC II	184 mm (7.24 in)
Other models	186 mm (7.32 in)
Gas type	Nitrogen (sealed)
Gas pressure	12 kg cm ² (171 psi)
Damping adjuster	Remote, by toothed belt
Swinging arm free play:	
End float	1.0 mm (0.04 in)
Side-to-side	0.1 – 0.3 mm (0.004 – 0.012 in)

Torque wrench settings

Component	kgf m	lbf ft
Steering stem top bolt	8.5	61.0
Top yoke pinch bolts:		
RD350 LC II	2.3	17.0
Other models	2.0	14.0
Lower yoke fork pinch bolts	2.0	14.0
Handlebar section to top yoke:		
RD350 LC II	Not applicable	
Other models	0.9	6.5

Component	kgf m	lbf ft
Handlebar to fork stanchion pinch bolts:		
RD350 LC II	Not applicable	
Other models	2.0	14.0
Fork brace:		
RD350 LC II	Not applicable	
Other models	1.0	7.2
Front wheel spindle	7.5	54.0
Rear wheel spindle:		
RD350 LC II	10.0	72.0
Other models	10.5	75.0
Swinging arm pivot:		
RD350 LC II	7.0	50.0
Other models	9.0	65.0
Rear wheel sprocket	3.3	24.0
Rear suspension unit frame mounting	4.0	28.0
Relay arm to frame mounting	4.0	28.0
Relay arm to links	6.5	47.0
Links to swinging arm	4.0	28.0
Footrest	6.5	47.0
Brake disc mounting bolts	2.0	14.0
Master cylinder hose unions	2.5	18.0
Hydraulic hose to 3-way union	2.5	18.0
Hydraulic hose to caliper	2.5	18.0
Caliper bracket bolts	3.5	25.0
Caliper bleed screw	0.5	4.0

1 General description

The Yamaha RD350 YPVS models employ a conventional welded tubular steel frame. Front suspension is by oil-damped air-assisted coil spring telescopic forks. Rear suspension is by Yamaha Monocross suspension, a rising-rate system controlled by a single central suspension unit. The rear suspension unit is a De Carbon type nitrogen pressurised coil spring unit and features a toothed belt remote preload adjuster.

The RD350 LC II model is equipped with a small handlebar fairing and a separate belly pan beneath the front of the engine and frame. The RD350 F model features a full fairing consisting of a main fairing section, two side sections and a lower section. The RD350 N model is effectively a stripped version of the F model and is unfaired.

2 Fairing: removal and refitting – RD350 LC II and RD350 F models

1 There are a number of occasions where it is either necessary or desirable to remove the fairing from the machine. In the former instance it allows access to areas normally obstructed by the fairing panels, whilst in the latter case, though access may be possible, there may be a risk of damage to the fairing surface. The fairing can be removed quite quickly, so do not be tempted to try to work around it.

RD350 LC II

2 The main fairing section is designed to hinge down to allow access to the headlamp and instruments. Remove the two bolts which retain the fairing moulding to the headlamp brackets and pivot the fairing forward and down. To release the fairing completely, remove the split pin and clevis pin which form the lower pivot and lift the fairing away.

3 The belly pan is secured by four screws, two at the back edge and two just below the radiator. Remove the screws and lift the belly pan away.

RD350 F

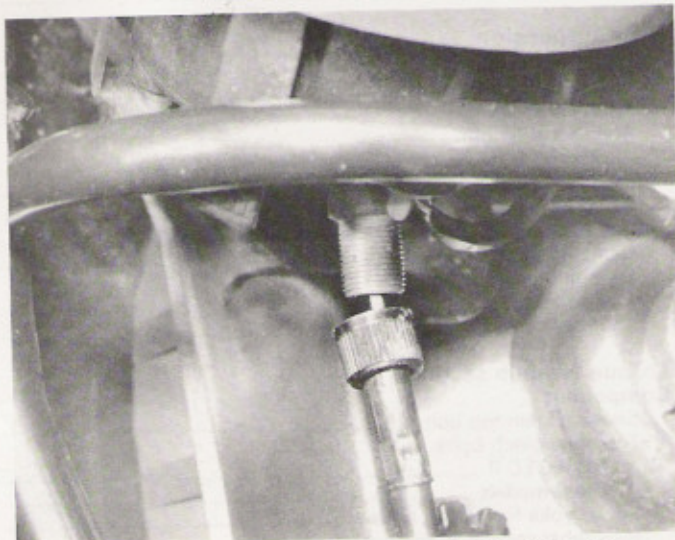
4 To release the belly pan, remove the single Allen-headed bolt, spacer and grommet on each side, then remove the three screws on each side which secure the belly pan to the side sections.

5 The side sections are retained to the upper edge of the belly pan by the six screws mentioned above, and by a further four screws and plain washers to the lower edge of the main fairing. Remove the remaining screws and lift away the side sections.

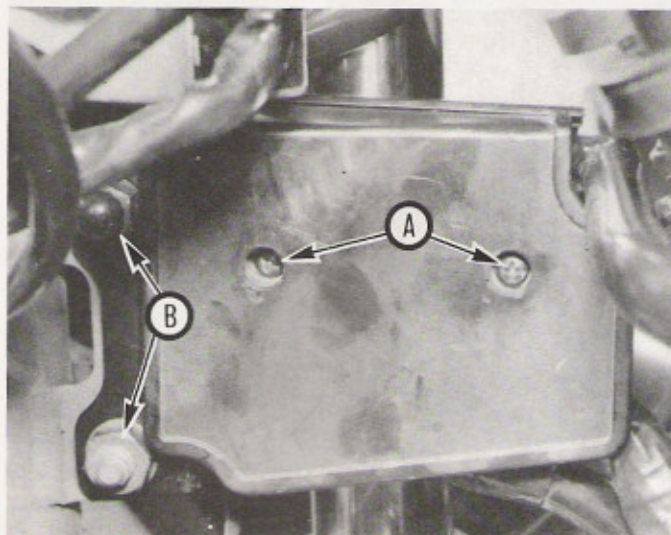
6 The main fairing can be removed complete with the subframe, headlamp, instrument panel and front turn signals. Slacken the knurled ring which retains the speedometer drive cable to the underside of the instrument head. Moving to the right-hand side of the machine, trace and disconnect the wiring to the headlamp, turn signals and instrument panel at the various connectors near the steering head. Release the two mounting bolts which secure the fairing subframe to the steering head and lift the assembly clear of the frame.

All models

7 When refitting the fairing sections, reverse the dismantling sequence, taking care not to strain or crack the plastic mouldings. Fit all fasteners finger tight only, and check that the various sections are correctly aligned. Make sure that all spacers and grommets are fitted correctly. Finally, tighten the fasteners to secure the fairing sections, being careful to avoid overtightening.



2.6a Speedometer cable can be reached from inside fairing (F model)



2.6b Wiring connectors are below cover held by two screws (A). Bolts (B) hold fairing to steering head (F model)

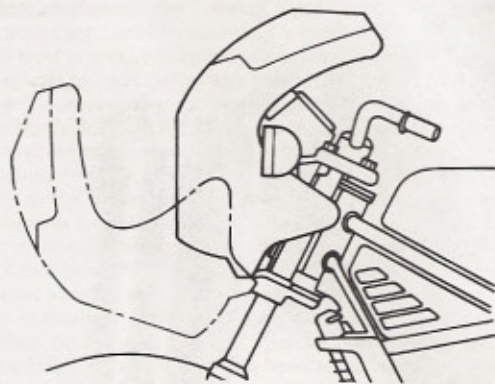
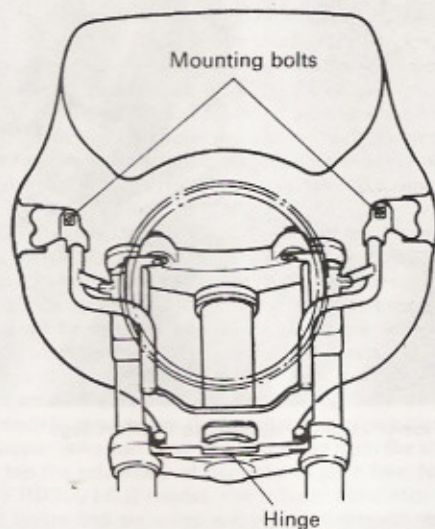


Fig. 5.1 Fairing mountings – RD350 LC II model

3 Front forks: removal and refitting

1 Place the machine on its centre stand on level ground. In the case of the RD350 LC II and RD350 F models, remove the main fairing section as described above. Remove the front brake caliper mounting bolts and lift the calipers clear of the front wheels and forks. Tie the calipers to the frame to avoid straining the hoses, and place a wooden wedge between the pads to prevent the pistons from being expelled if the brake lever is accidentally squeezed.

2 Remove the front wheel, referring to Chapter 6 if additional information is required. Remove the front mudguard. On the RD350 LC II model the mudguard is retained by four bolts passing through from the inside of the mudguard and into the side of the fork lower legs. In the case of the RD350 F and RD350 N models, the mudguard incorporates a fork brace and the four fixing bolts pass down from the top of the brace and through the mudguard.

3 On RD350 F and RD350 N models, slacken the pinch bolts securing the handlebar castings to the top of the fork yokes. On all models, release the upper and lower yoke pinch bolts. The fork legs can now be removed by twisting them and pulling downwards. If the fork legs are to be dismantled, it is preferable to slacken the top bolt before the legs are removed completely.

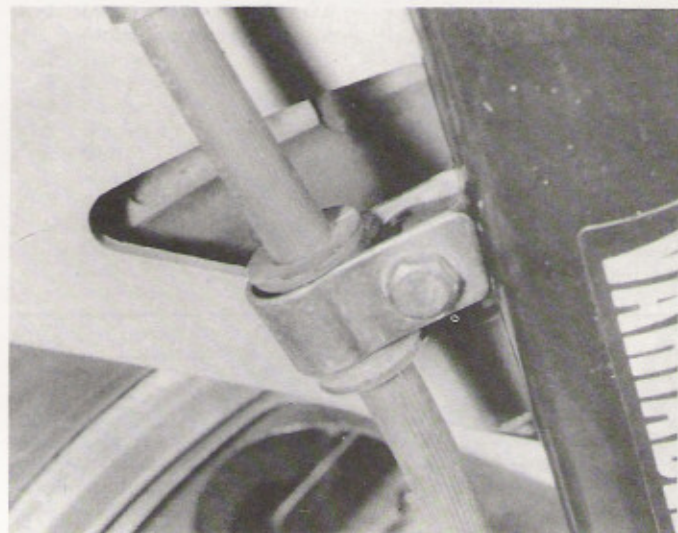
4 Pull the leg down by one or two inches and temporarily tighten the lower yoke pinch bolts to hold them. Remove the fork air caps and release pressure by depressing the valve cores for a few seconds. The top bolts can now be slackened. The RD350 F and RD350 N models have hexagon-headed bolts, whilst that of the RD350 LC II model should be slackened using self-locking pliers on the projecting boss.

5 Installation is accomplished by reversing the removal sequence. Check that the fork oil has been topped up to the correct level and that the top bolts are tightened as the forks are slid into position in the yokes. Note that the top of the stanchion should align with the top face of the upper yoke in the case of the RD350 LC II model, whilst on the RD350 F and RD350 N models it should align with the upper edge of the handlebar castings.

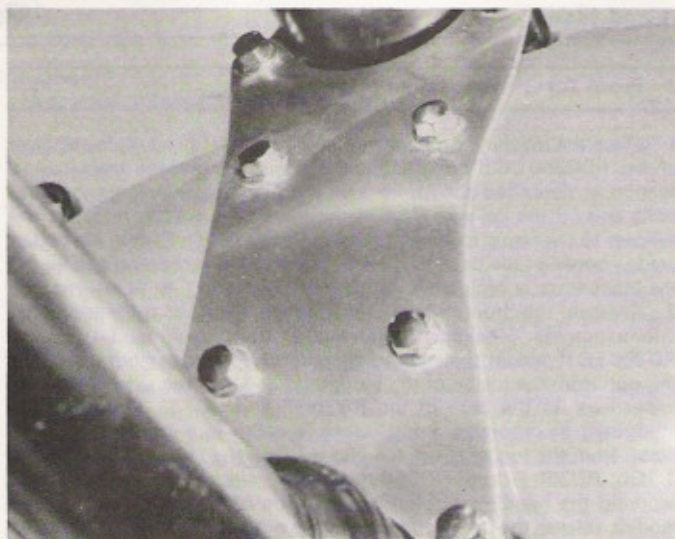
6 In the case of the RD350 LC II model, once in position, tighten the upper yoke pinch bolts to 2.3 kgf m (17 lbf ft) and the lower yoke pinch bolts to 2.0 kgf m (14 lbf ft).

7 On RD350 F and RD350 N models, tighten the lower yoke pinch bolts to 2.0 kgf m (14 lbf ft) then tighten the fork cap bolt to 2.3 kgf m (17 lbf ft). Next, tighten the handlebar pinch bolts and the upper yoke pinch bolts to 2.0 kgf m (14 lbf ft).

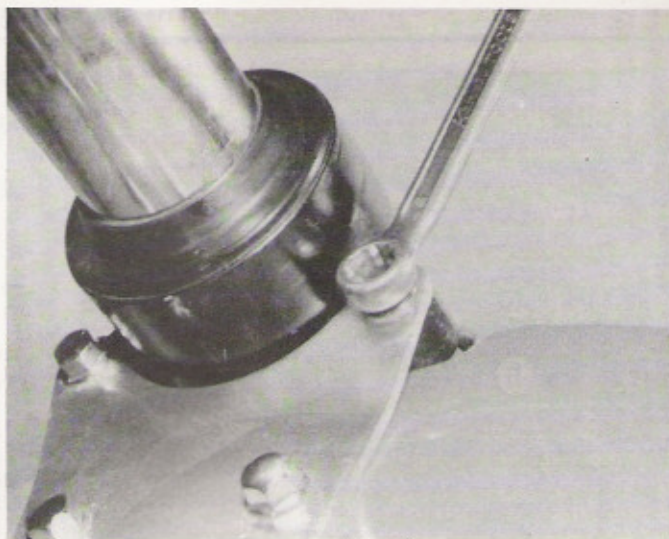
8 Complete reassembly by refitting the mudguard, front wheel and brake calipers. Check that the forks operate normally, and remember to set the fork air pressure as described later in this Chapter.



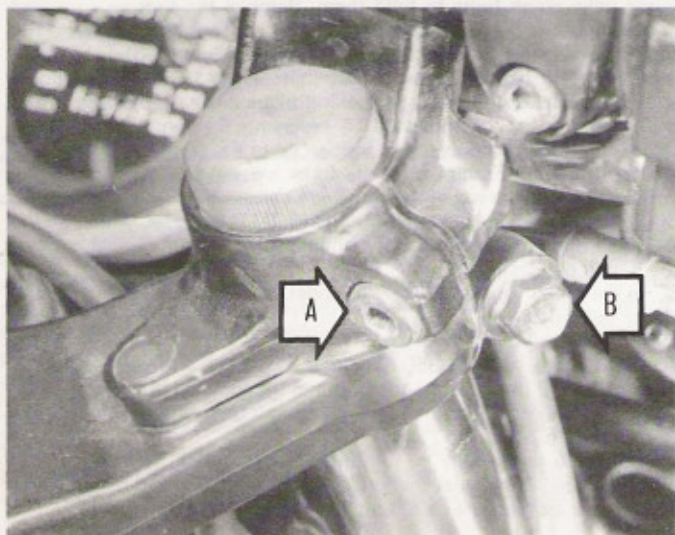
3.1 Remove the calipers and free hydraulic hose clips from fork legs



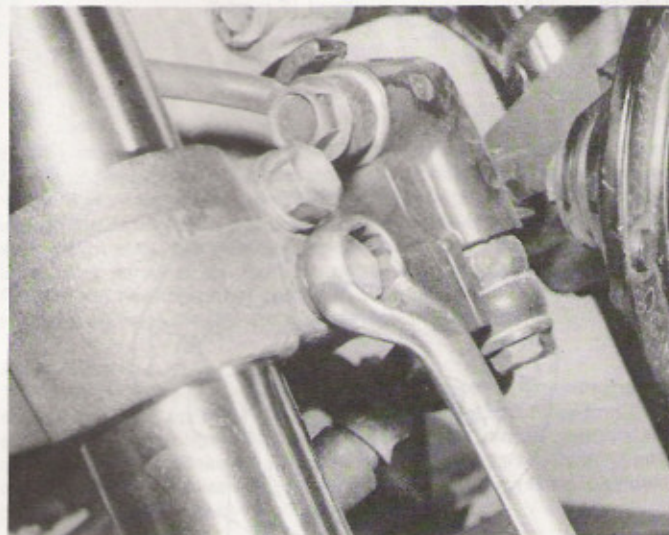
3.2a 'F' and 'N' models have alloy fork brace fitted between fork legs



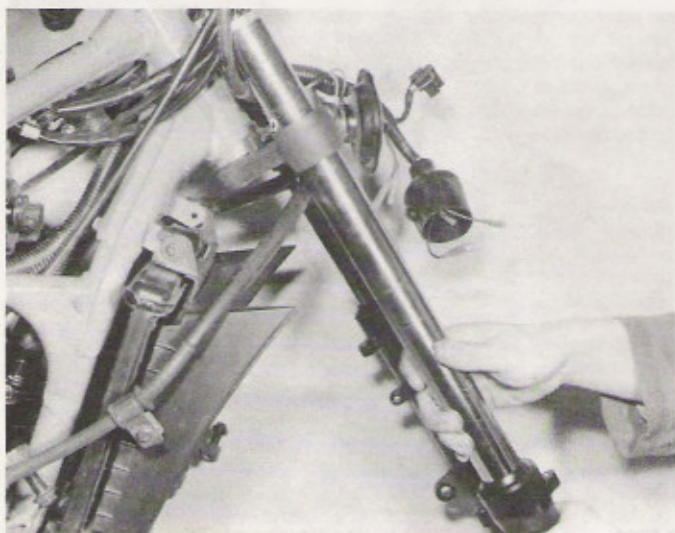
3.2b Remove outer bolts only to free mudguard and fork brace from fork legs



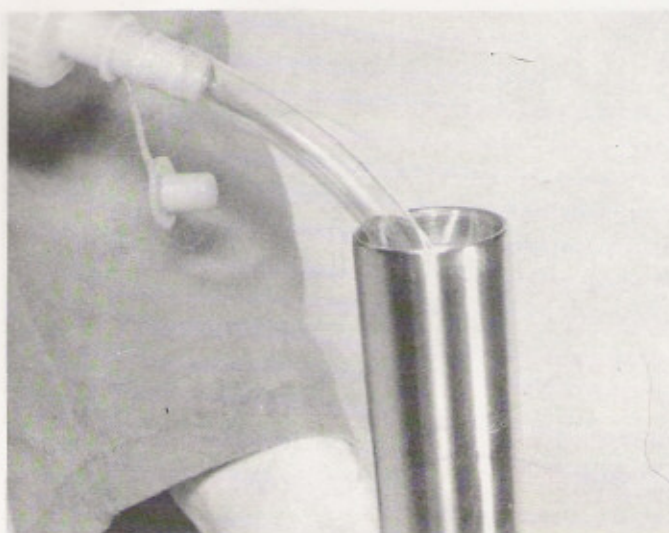
3.3a Slacken handlebar clamp bolts (A) where fitted, and upper yoke clamp bolts (B)



3.3b Slacken lower yoke clamp bolts to free fork legs



3.4 Slacken fork top bolts before pulling leg down and clear of yokes



3.5 Top up damping oil to correct level **before** fitting legs into yokes

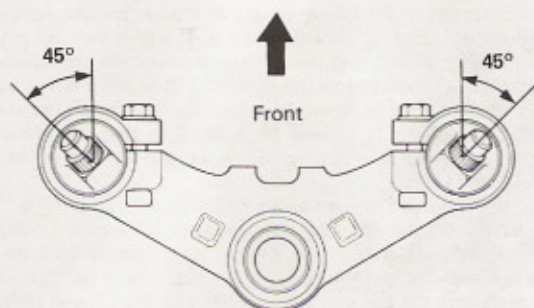


Fig. 5.2 Air valves should be positioned as shown when installing fork legs – RD350 LC II

4 Steering head: dismantling and reassembly

1 Start by removing the fairing (Section 2) where applicable, and the front fork legs (Section 3). Note that in the case of the RD350 F model, the headlamp unit and instrument panel will be removed together with the fairing. On RD350 LC II and RD350 N models, remove the headlamp unit from its shell after releasing the two retaining screws. Lift the unit clear and unplug the headlamp and parking lamp connectors. Unplug the handlebar switch and turn signal wiring at the connectors and push the wiring clear of the headlamp shell. Disconnect the ignition switch and instrument panel wiring.

2 Free the speedometer drive cable from the underside of the instrument panel. On RD350 LC II models release the tachometer cable in the same way. Remove the bolts which retain the instrument panel to the headlamp bracket, lift the panel assembly clear, and place it to one side. Remove the bolts retaining the headlamp bracket to the upper and lower yokes and lift it away.

3 On RD350 F models, much of the preliminary dismantling described above is not necessary. The ignition switch and steering lock assembly can normally be left attached to the upper yoke, but its wiring may need to be disconnected. On all models, free the front brake hydraulic union from the lower yoke, and where appropriate, remove the horn and bracket from the lower yoke. Disconnect the clutch cable to allow more manoeuvring room.

4 Slacken and remove the steering stem top bolt. On RD350 F and RD350 N models, manoeuvre the handlebar sections clear of the upper yoke. The upper yoke can now be lifted away from the steering stem. If necessary, tap the underside of the yoke to jar it free. Note that in the case of the RD350 LC II model, the tubular handlebar together with the control levers and switches will come away with the upper yoke. These can be left in position unless there is some reason that the upper yoke must be removed completely. On all models, try to lodge the controls, cables and hydraulic hoses clear of the steering stem.

5 Before slackening the steering head nut note that the upper and lower races each contain nineteen $\frac{1}{4}$ in steel balls. These are uncaged and will tend to drop free as the lower yoke is removed, so spread some rag or an old blanket below the steering head to catch any that drop. Using a C-spanner, slacken and remove the steering stem nut whilst supporting the lower yoke. Lift away the nut, bearing cover and the top cone, then remove the steel balls from the upper race.

6 Carefully lower the yoke and steering stem, trying not to dislodge the balls in the lower race. Remove the balls from the lower race and place them in a container for safe keeping.

7 The steering head assembly should be reassembled in the reverse order of that given for dismantling. When fitting the steel balls to their races, they can be held in place with grease. Check that the correct number is fitted to each bearing race. When fitting the steering stem nut, it must be adjusted so that all perceptible free play is taken up, but no more. It is easy to damage the head races by overtightening. When correctly adjusted, it should be possible to move the steering from lock to lock with the lightest pressure on the handlebar end. Final adjustment can be made after reassembly, by slackening the top bolt and adjusting the steering stem nut as required.

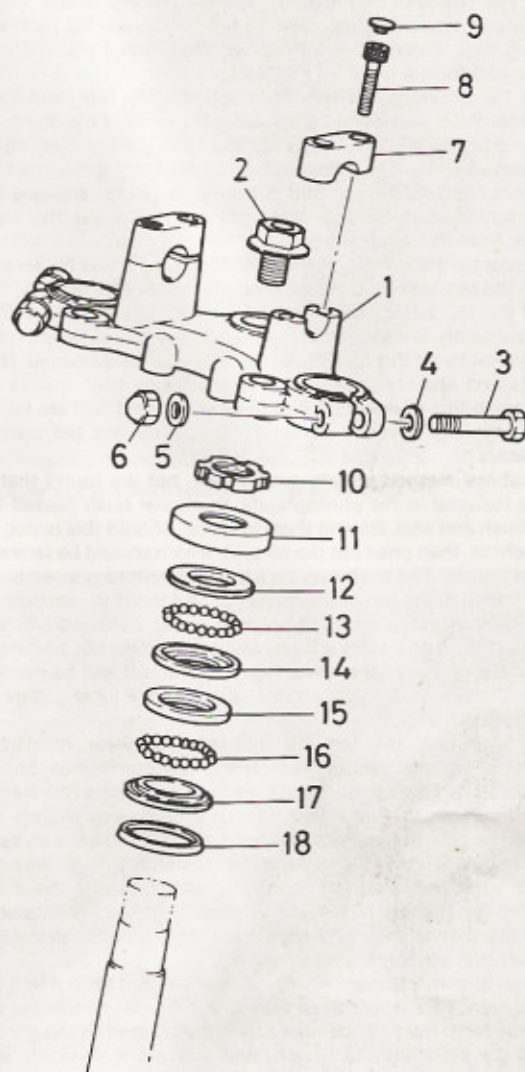


Fig. 5.3 Steering head – typical

- | | |
|---|------------------|
| 1 Upper yoke – RD350 LC II (others similar) | 11 Bearing cover |
| 2 Top bolt | 12 Top cone |
| 3 Bolt | 13 Steel balls |
| 4 Washer | 14 Top cup |
| 5 Washer | 15 Bottom cup |
| 6 Nut | 16 Steel balls |
| 7 Handlebar clamp – 2 off* | 17 Bottom cone |
| 8 Allen screw – 4 off* | 18 Dust seal |
| 9 Cap – 4 off* | |
| 10 Steering stem nut | |

*RD350 LC II model only

5 Front forks: dismantling and reassembly

1 With the fork legs removed from the yokes, unscrew the top bolt and lift out the spacer (RD350 F and RD350 N models only) and the fork spring. Invert the leg over a drain tray and "pump" the fork to expel the old damping oil. Slide the dust seal away from the lower leg and remove it. Prise out the wire circlip which retains the oil seal and the plain washer.

2 Once the oil has been drained, slacken the bolt which passes up through the bottom of the lower leg and into the damper rod. It is quite likely that the damper rod will tend to rotate in the lower leg and thus

impede the removal of the bolt. If this problem arises, clamp the assembly in a vice using soft jaws to hold the lower leg by the caliper mounting lugs. Obtain a length of wooden dowel about 1/2 inch in diameter and form a taper on one end.

3 Pass the dowel down the stanchion, having first withdrawn the fork spring. Push the dowel hard against the head of the damper rod to lock it in position whilst an assistant slackens the retaining bolt. If the dowel proves difficult to hold a self-grip wrench or similar can be used to obtain sufficient leverage and pressure. Once the retaining bolt has been removed slide off the dust seal and withdraw the stanchion assembly from the lower leg.

4 To separate the stanchion from the lower leg it will be necessary to displace the top bush and the oil seal. The lower bush should not pass through the top bush, and this can be used to good effect. Push the stanchion gently inwards until it stops against the damper rod seat. Take care not to do this forcibly or the seat may be damaged. Now pull the stanchion sharply outwards until the lower bush strikes the top bush. Repeat this operation until the top bush and seal are tapped out of the lower leg. Invert the stanchion and tip out the damper rod components.

5 The above method usually works well, but we found that on the machine featured in the photographs, the lower bush passed through the top bush and seal, leaving them in place. Should this occur, remove the stanchion, then prise out the oil seal, which should be renewed as a matter of course. The bush may be a little difficult to remove because it sits quite deep in the top of the lower leg and tends to jam on a tapered shoulder. Try working it out of position using a screwdriver with the end bent at right angles as a lever, and taking care not to damage the bush surface or that of the lower leg. If this fails it will be necessary to resort to a bearing extractor; a Yamaha dealer or a local garage may be able to help out with this.

6 After checking the fork components for wear or damage as described in the next section, reassembly can commence. Ensure that all components are clean and that they are fitted to the fork from which they were removed. Always fit a new oil seal; if even slightly worn or damaged the fork will not hold air pressure. The bushes can be reused only if in perfect condition. It is recommended that they too are renewed as a precautionary measure, particularly if the stanchion pulled through the top bush during dismantling. The lower bush is split to allow fitting over the end of the stanchion. Do not open the split any more than is essential to ease it into place.

7 Fit the rebound spring over the damper rod and drop it into place in the stanchion. Pass a length of dowel or a broom handle up through the stanchion to hold the damper rod in place, then fit the damper rod seat. Oil the stanchion and bush, and support it vertically with the damper rod uppermost. Slide the lower leg over the stanchion assembly and refit the damper rod bolt. Use Loctite on the bolt threads and tighten to 2.0 kgf m (14.0 lbf ft).

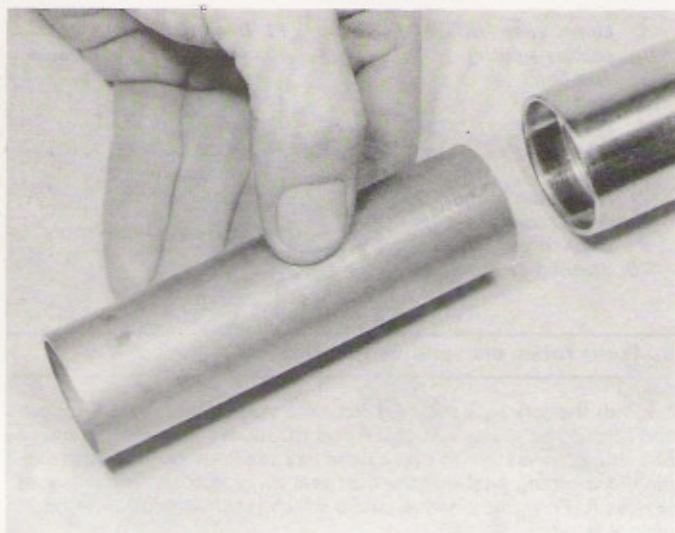
8 Oil the top bush and slide it down over the stanchion. To fit the bush in its recess it will be necessary to devise an alternative to the tubular drift tool used by Yamaha dealers. The best method is to use a length of tubing slightly bigger in diameter than the stanchion. Place the large plain washer against the bush and then tap it home using the tube as a form of slide hammer. Take care not to scratch the stanchion during this operation; it is best to make sure that the stanchion is pushed fully inwards so that any accidental scoring is confined to the area above the seal.

9 Once the top bush is seated, the new oil seal can be fitted. Fit the plain washer with the chamfered edge facing upwards. Lubricate the seal lips, then slide it down over the stanchion. Take care not to damage the seal lips during fitting. The seal should be tapped gently and squarely into the top of the lower leg, using a tubular drift. Check that the seal remains square to the lower leg and that it seats fully, then fit the retaining clip and slide the dust seal into place.

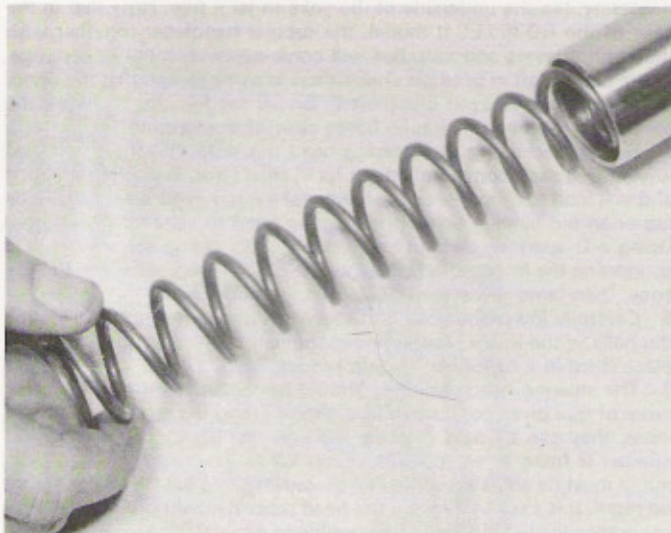
10 Before fitting the spring, spacer (except RD350 LC II models) and top bolt, add the prescribed amount and grade of damping oil. Check that the oil is at the correct level below the top of the stanchion, with the fork fully compressed and held vertically. When refitting the springs, note that the tighter coils must be uppermost. Once the leg has been refitted in the yokes, check and adjust the air pressure.



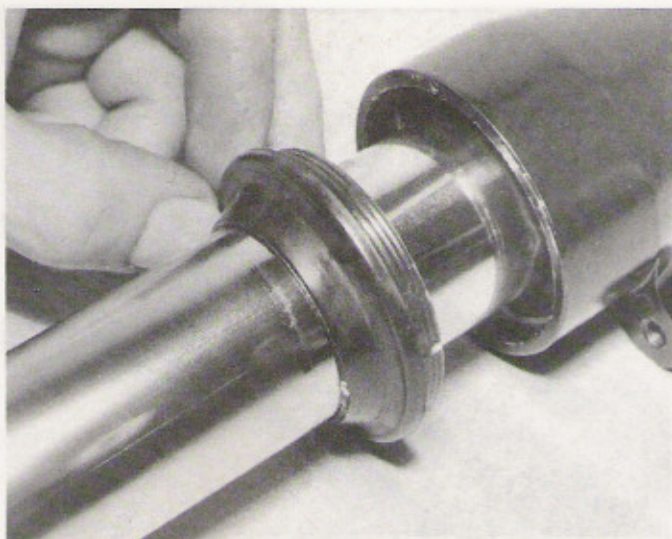
5.1a Remove fork top bolt ...



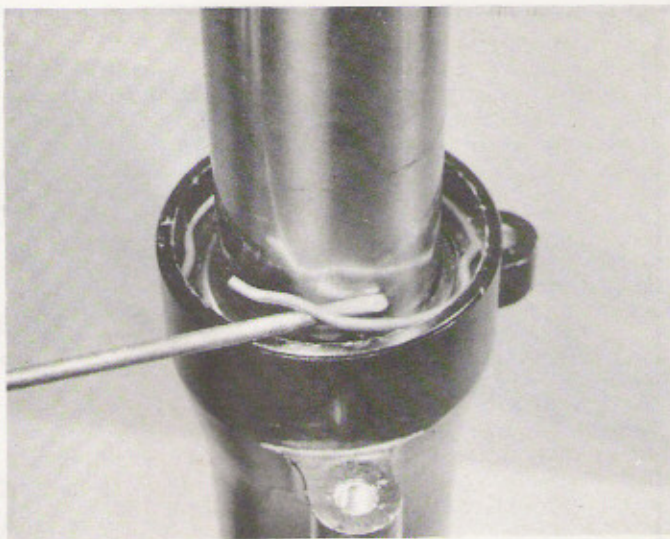
5.1b ... and also spacer, where fitted



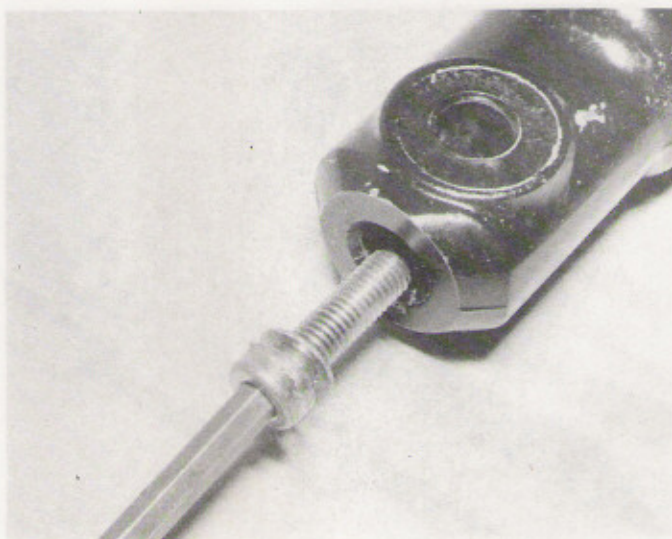
5.1c Remove the fork spring, then drain damping oil



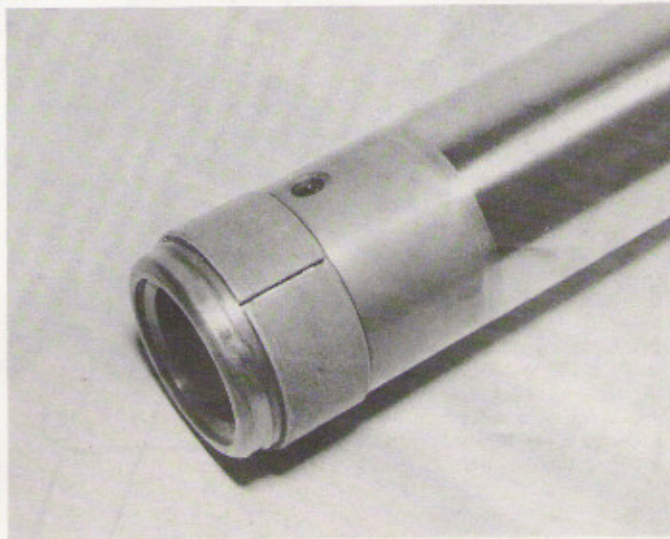
5.1d Prise out and remove the dust seal



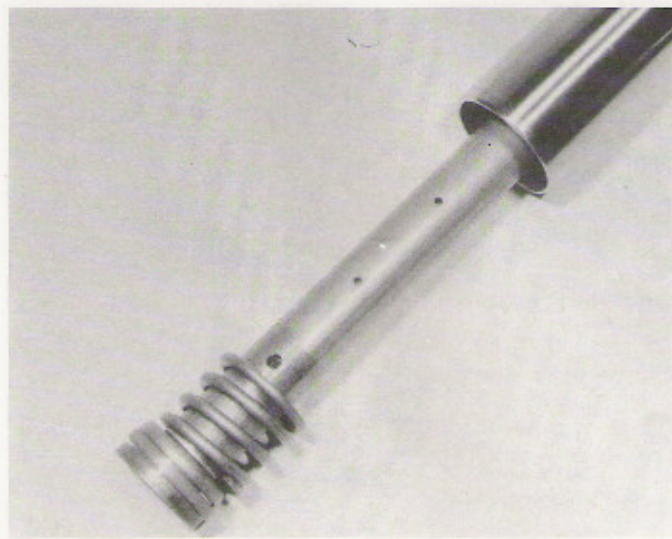
5.1e Lever out the wire retaining clip as shown



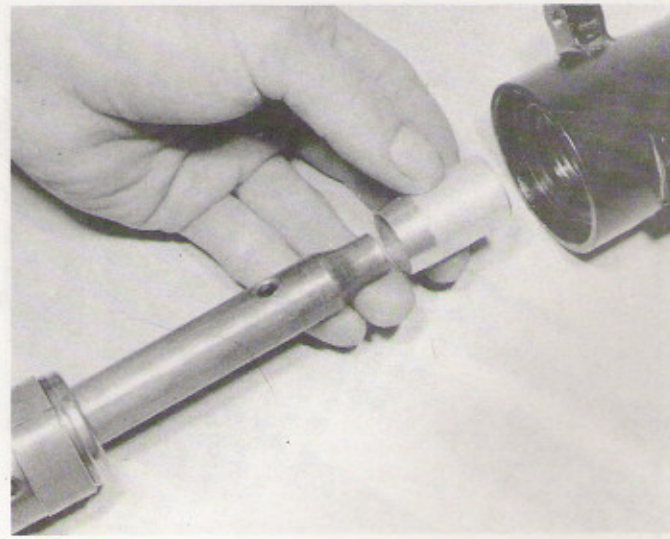
5.3 Slacken and remove the damper rod bolt and separate stanchion and lower leg (see text)



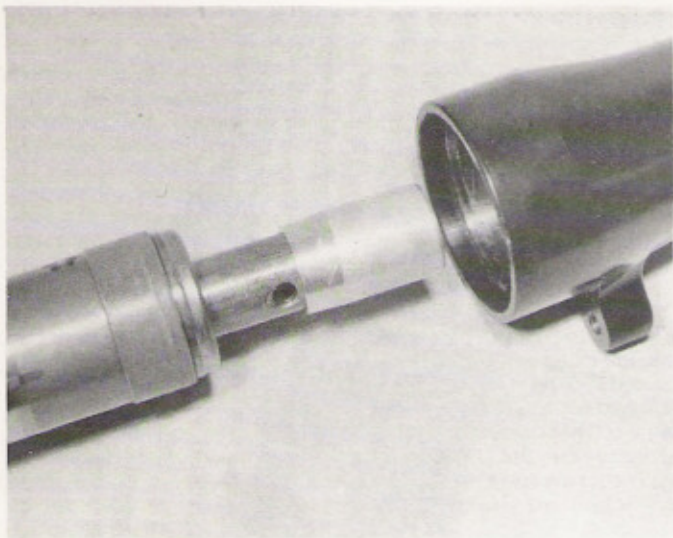
5.6 Bottom bush is split to facilitate removal – do not stretch new bush more than absolutely necessary during fitting



5.7a Fit rebound spring and slide damper rod assembly into the stanchion



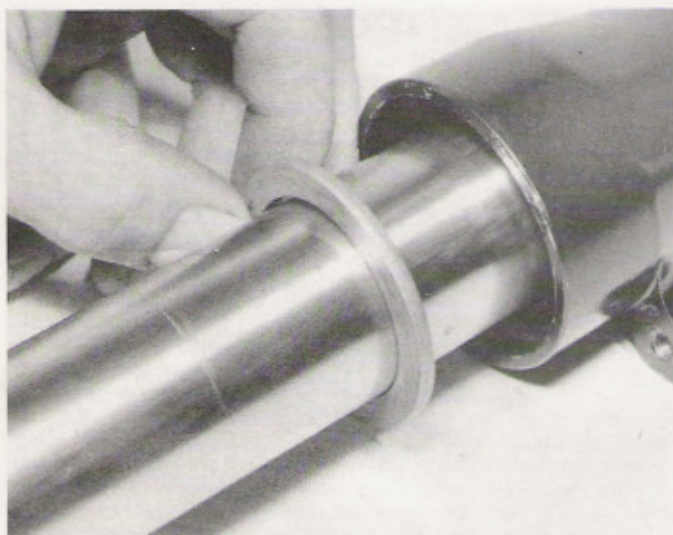
5.7b Fit damper rod seat, then lubricate stanchion ...



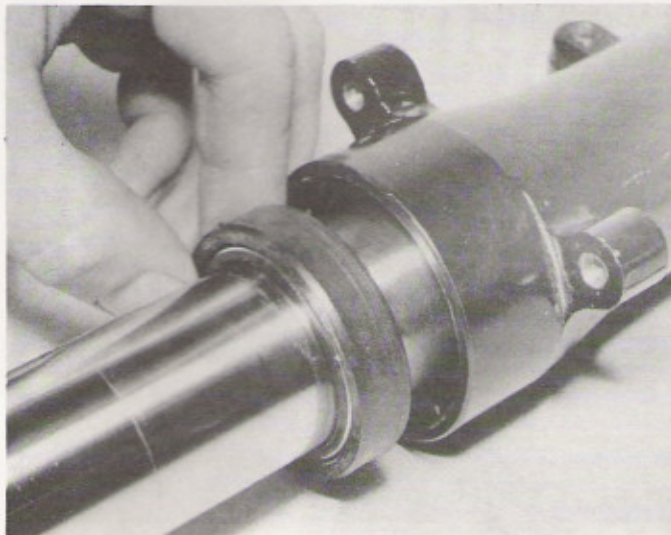
5.7c ... and slide into lower leg



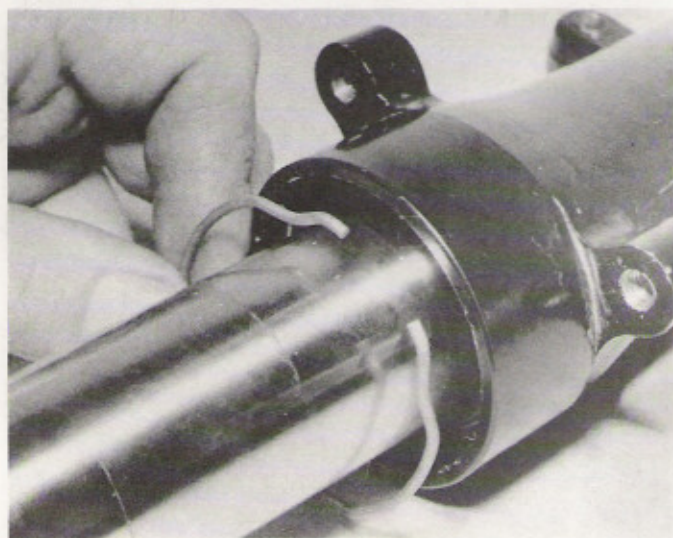
5.8a Lubricate top bush and slide into place



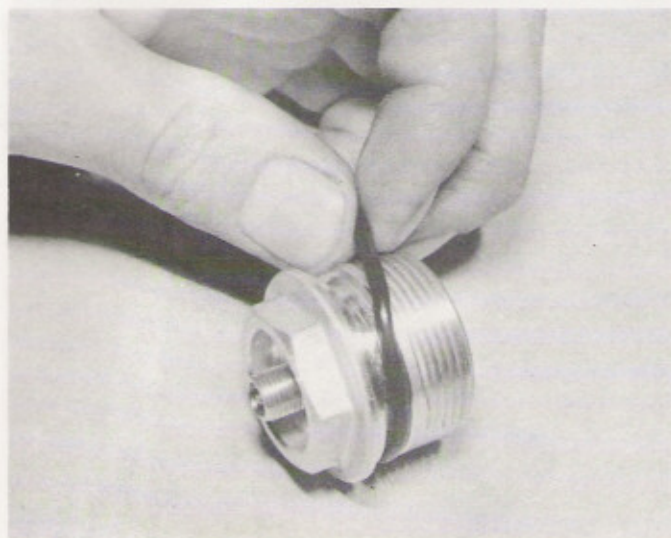
5.8b Fit plain washer and tap bush into top of lower leg



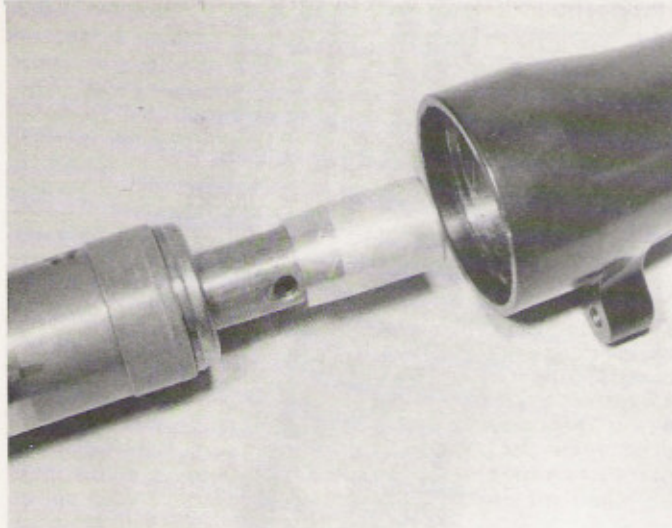
5.9a Lubricate and fit fork oil seal ...



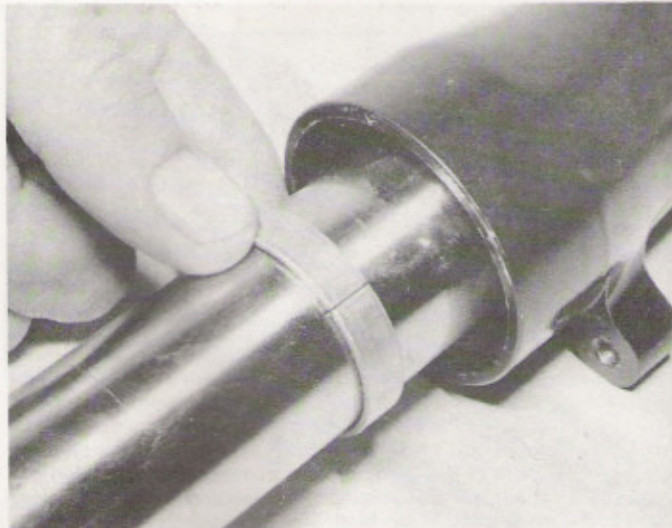
5.9b ... and retain with wire clip



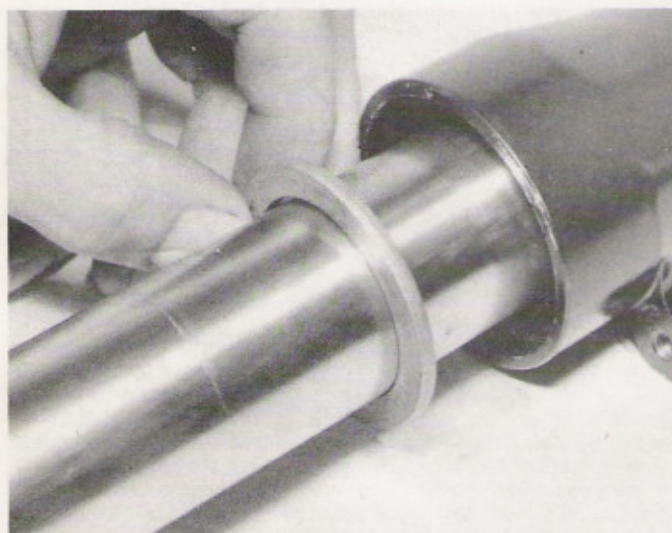
5.10 Check condition of O-ring before adding damping oil and fitting top bolt



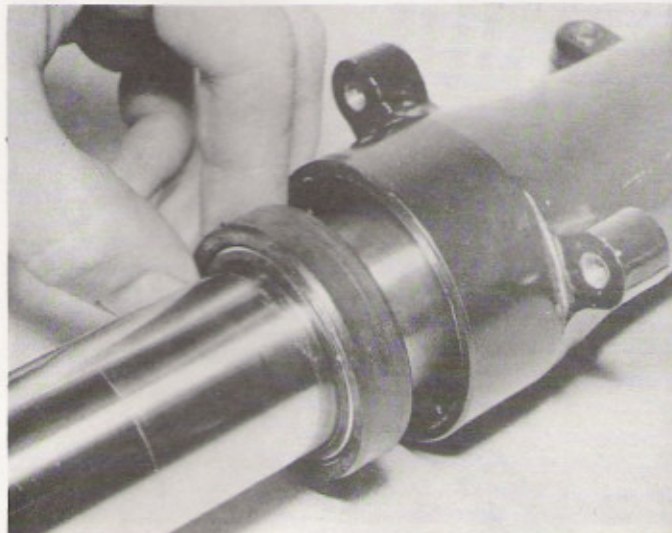
5.7c ... and slide into lower leg



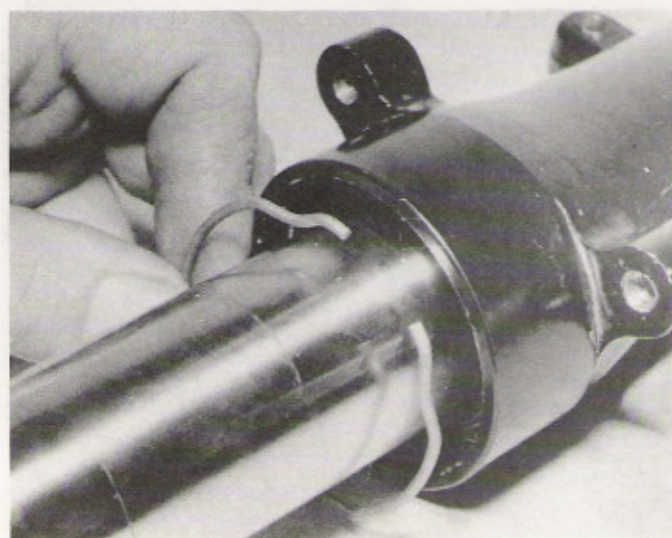
5.8a Lubricate top bush and slide into place



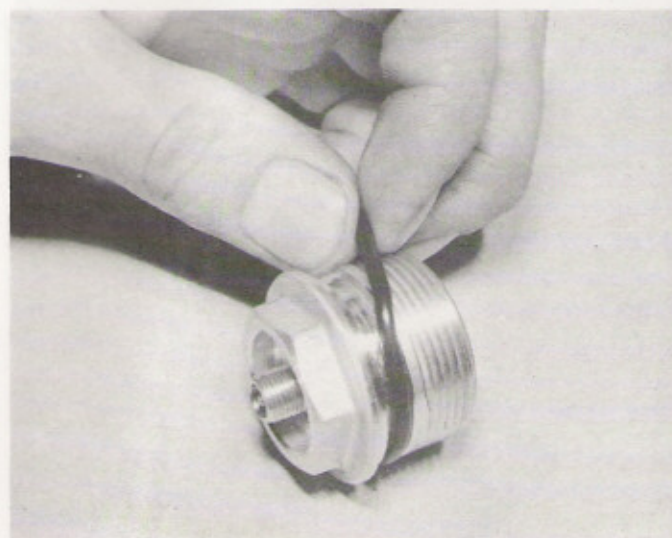
5.8b Fit plain washer and tap bush into top of lower leg



5.9a Lubricate and fit fork oil seal ...



5.9b ... and retain with wire clip



5.10 Check condition of O-ring before adding damping oil and fitting top bolt

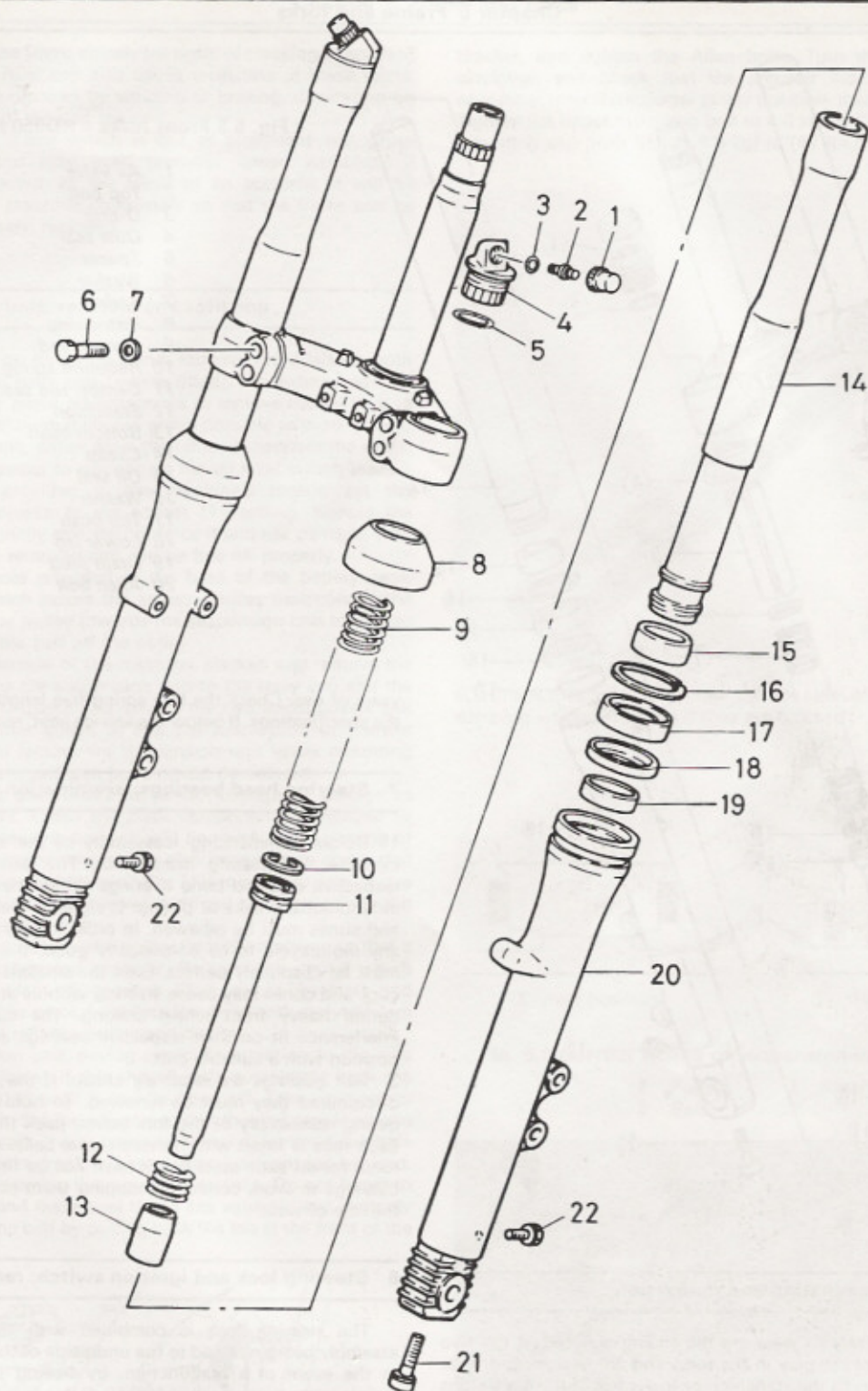


Fig. 5.4 Front forks – RD350 LC II model

- | | | | |
|----------------|-------------------|--------------------|-----------------|
| 1 Cap | 7 Washer – 4 off | 13 Damper rod seat | 18 Backing ring |
| 2 Air valve | 8 Dust seal | 14 Stanchion | 19 Top bush |
| 3 O-ring | 9 Spring | 15 Bottom bush | 20 Lower leg |
| 4 Top bolt | 10 Piston ring | 16 Circlip | 21 Allen bolt |
| 5 O-ring | 11 Damper rod | 17 Oil seal | 22 Drain plug |
| 6 Bolt – 4 off | 12 Rebound spring | | |

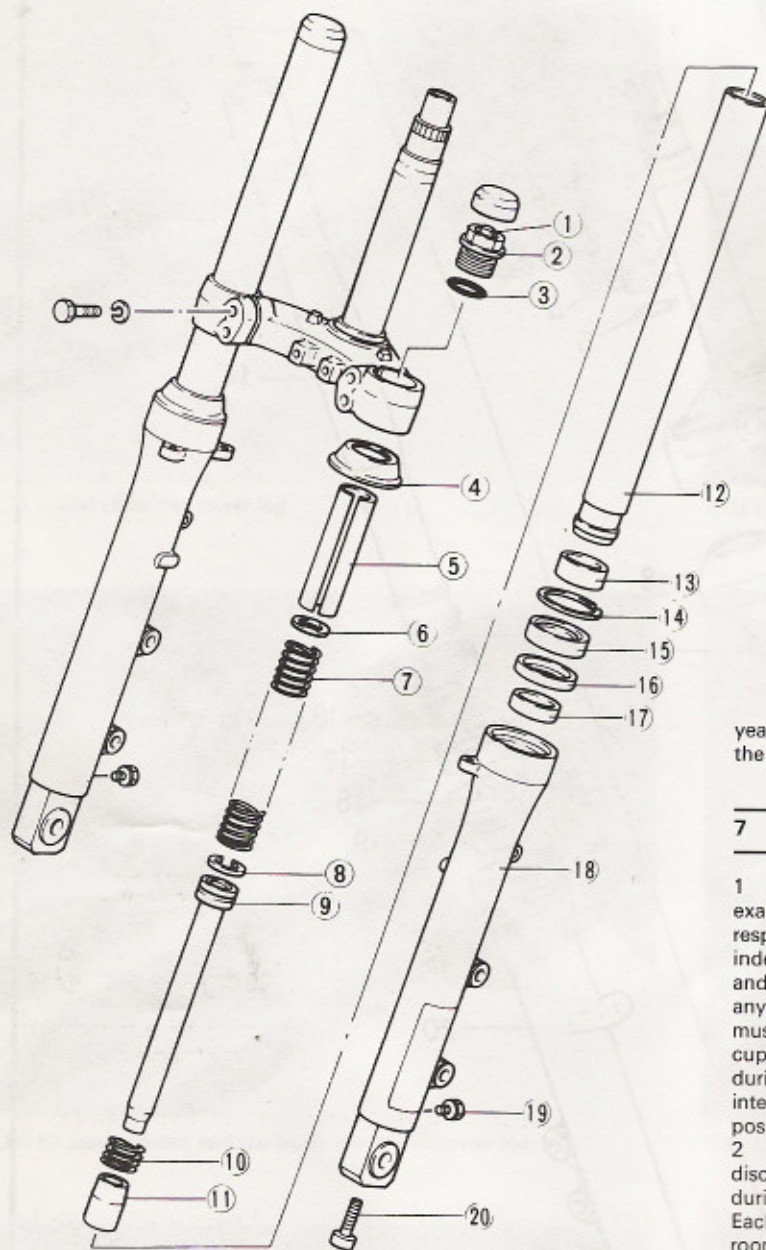


Fig. 5.5 Front forks – RD350 F and N models

- 1 Air valve
- 2 Top bolt
- 3 O-ring
- 4 Dust seal
- 5 Spacer
- 6 Washer
- 7 Spring
- 8 Piston ring
- 9 Damper rod
- 10 Rebound spring
- 11 Damper rod seat
- 12 Stanchion
- 13 Bottom bush
- 14 Circlip
- 15 Oil seal
- 16 Washer
- 17 Top bush
- 18 Lower leg
- 19 Drain plug
- 20 Allen bolt

years of use. Check the fork spring free length against that shown in the specifications. If below the service limit, renew the springs as a pair.

6 Front forks: examination and renovation

1 The parts most likely to wear are the sliding surfaces of the two bushes. These control the play in the forks and are designed to wear before damage occurs to the stanchion or lower leg. If there are signs of scoring or obvious wear, the bushes must be renewed. Only in extreme cases will the stanchion or lower leg be worn; in these cases the affected item must be renewed.

2 Check the stanchion for signs of scoring. Damage of this type can be caused by dirt trapped below a damaged or worn dust seal and can be avoided by ensuring that it is renewed whenever the oil seal is renewed. If there has been impact damage, check that the stanchions are straight by rolling them on a flat surface. A bent stanchion must be renewed; do not attempt to straighten it.

3 The oil seal should be renewed each time the forks are dismantled. Bear in mind that it must also withstand air pressure. A worn or damaged seal will allow air to leak out of the fork and thus will prevent normal fork operation.

4 The fork springs will become permanently compressed after some

7 Steering head bearings: examination and renovation

1 Before commencing reassembly of the steering head assembly, examine the steering head races. The ball bearing tracks of the respective cup and cone bearings should be polished and free from indentations, cracks or pitting. If signs of wear are evident, the cups and cones must be renewed. In order for the straight line steering on any motorcycle to be consistently good, the steering head bearings must be absolutely perfect. Even the smallest amount of wear on the cups and cones may cause steering wobble at high speeds and judder during heavy front wheel braking. The cups and cones are an interference fit on their respective seatings and can be tapped from position with a suitable drift.

2 Ball bearings are relatively cheap. If the originals are marked or discoloured they must be renewed. To hold the steel balls in place during reassembly of the fork yokes, pack the bearings with grease. Each race is fitted with nineteen steel balls. Although each race has room for an extra steel ball it must not be fitted. The gap allows the bearings to work correctly, stopping them skidding and accelerating the rate of wear.

8 Steering lock and ignition switch: renewal

The steering lock is combined with the ignition switch, the assembly being retained to the underside of the top yoke by two bolts. In the event of a malfunction, try freeing the mechanism using a maintenance spray such as WD40. If this fails to effect a cure, the lock must be renewed. Repair is not practicable.

9 Frame: examination and renovation

1 The frame is unlikely to require attention unless accident damage has occurred. In some cases, replacement of the frame is the only satisfactory course of action if it is badly out of alignment. Only a few frame repair specialists have the jigs and mandrels necessary for resetting the frame to the required standards of accuracy and even then there is no easy means of assessing to what extent the frame may have been overstressed.

2 After the machine has covered a considerable mileage, it is

advisable to examine the frame closely for signs of cracking or splitting at the welded joints. Rust can also cause weakness at these joints. Minor damage can be repaired by welding or brazing, depending on the extent and nature of the damage.

3 Remember that a frame which is out of alignment will cause handling problems and may even promote 'speed wobbles'. If misalignment is suspected, as the result of an accident, it will be necessary to strip the machine completely so that the frame can be checked and, if necessary, renewed.

10 Rear suspension unit: removal and refitting

1 Place the machine on its centre stand. Remove the dualseat, both side panels, the fairing belly pan (where fitted), the exhaust system and the battery. It may prove advantageous to remove the oil tank to provide easier access, though it should prove possible to work around this. If removing the tank, either drain the oil or disconnect the outlet pipe and plug it. Remember to disconnect the oil level switch leads.

2 Using the tools provided in the machine's toolkit, set the suspension preload adjuster to the softest (1) setting. Should the adjuster prove exceptionally stiff, do not force it and risk damage; wait until the unit has been removed and can be free off properly.

3 Working via the hole provided in the base of the battery case, slacken the screws which secure the adjuster pulley assembly to the frame. Pivot the adjuster pulley towards the suspension unit to release belt tension, then slip the belt off the pulley.

4 Moving to the underside of the machine, slacken and remove the pivot bolt which retains the suspension unit to the relay arm and the two suspension links. Displace and remove the two thrust covers and tap out the tubular inner sleeve to free the suspension unit lower mounting. Slacken and remove the suspension unit upper mounting bolt. The unit is now free and can be removed downwards.

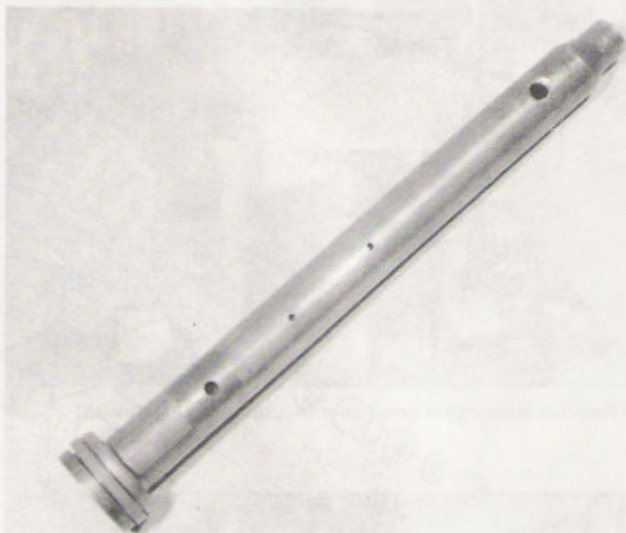
5 Before refitting the unit, check for wear, damage or leakage as described in Section 11. Clean the pivot components to remove all traces of road dirt. All moving parts should be given a thin coating of grease before assembly commences. It is also important to check that the spring preload adjuster works normally. This is prone to seizure due to the effects of corrosion and accumulated road dirt, particularly if it has not been used for some time.

6 It is worth removing the adjuster pulley from the machine so that it can be cleaned and lubricated properly. Remove the circlip which retains the pulley and lift it off its pivot. Clean the pulley teeth and internal bore, and also the pivot. Lubricate the pivot with molybdenum disulphide grease, then refit the pulley and circlip.

7 Clean the suspension unit, paying particular attention to the area around the preload adjuster. If this should seize completely, soak the adjuster in penetrating oil until it can be freed off. Take care not to damage the pulley teeth. Set the adjuster so that the ring cam is on one of its peaks, then lubricate it with graphite or molybdenum disulphide grease. As an alternative, a graphite-based chain lubricant can be used.

8 Install the unit by reversing the removal sequence. Do not forget to refit the adjuster belt, and make sure that it sits squarely and centrally on its pulley. Tension the belt by pulling back the tab at the front of the

bracket, and tighten the Allen bolts. Turn the adjuster fully anti-clockwise and check that the adjuster indicates position "1". If necessary, reset the adjuster pulley position, then reset the belt tension. Tighten the upper mounting bolt to 4.0 kgf m (28 lbf ft) and the lower mounting and pivot bolt to 6.5 kgf m (47 lbf ft).



6.1 Check that holes in damper rod are clear of dirt and old oil – damping will be impaired if they are blocked

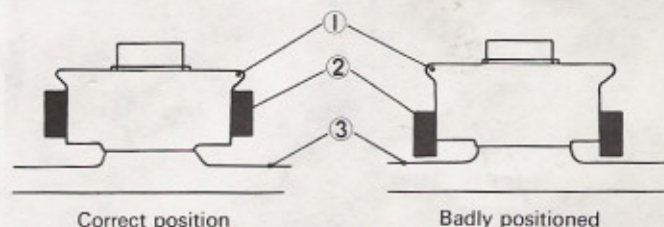


Fig. 5.6 Correct fitting of suspension unit adjuster belt

- 1 Pulley 3 Bracket
2 Belt

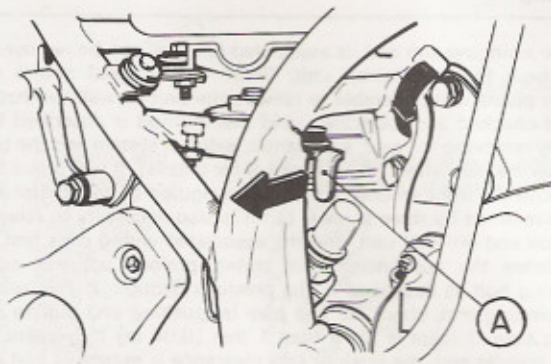
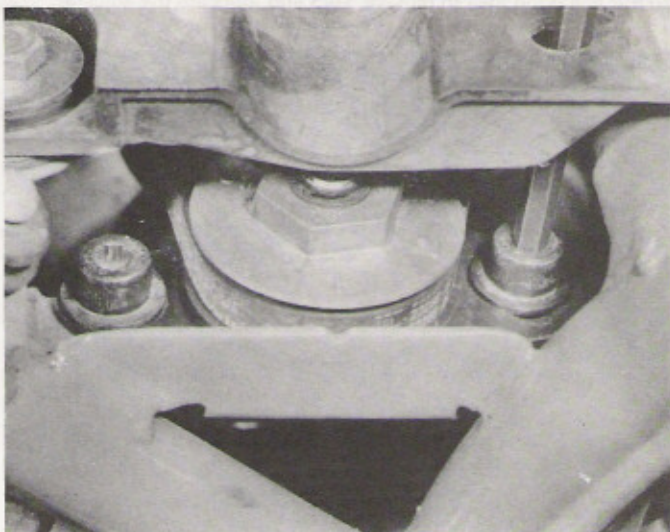
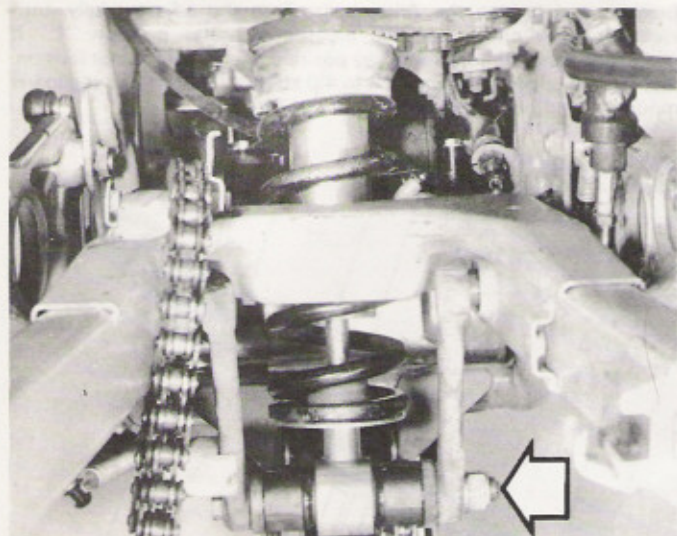


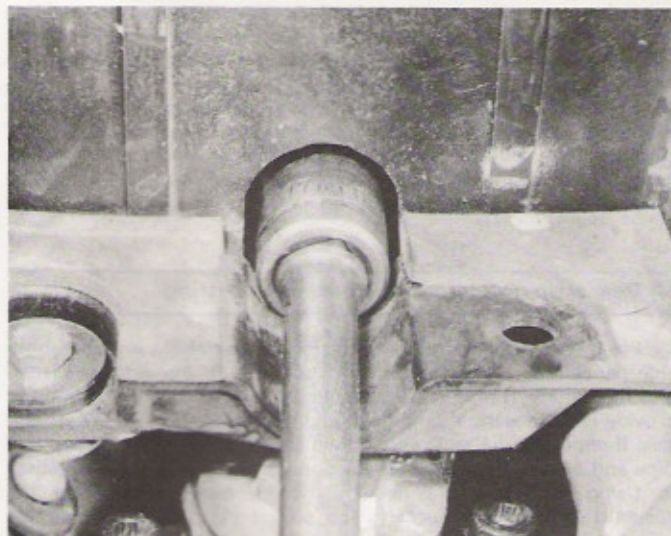
Fig. 5.7 Pull back tab (A) and tighten Allen bolts to tension adjusting belt



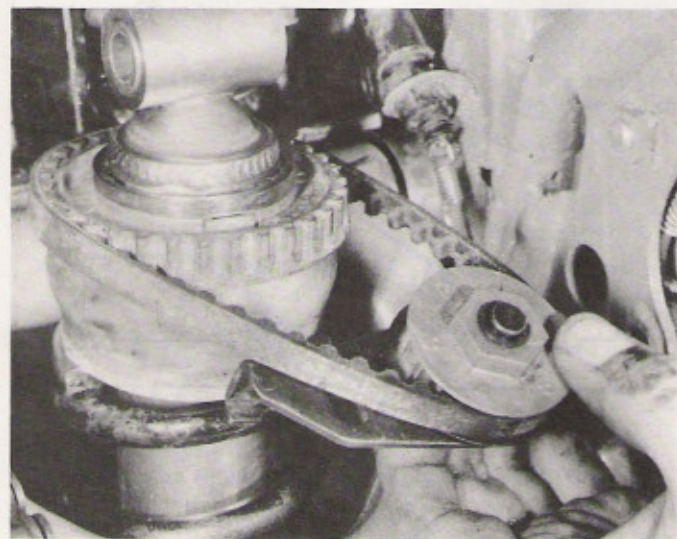
10.3 Remote adjuster Allen bolts can be reached through hole in battery tray



10.4a Remove suspension unit lower mounting bolt (arrowed)



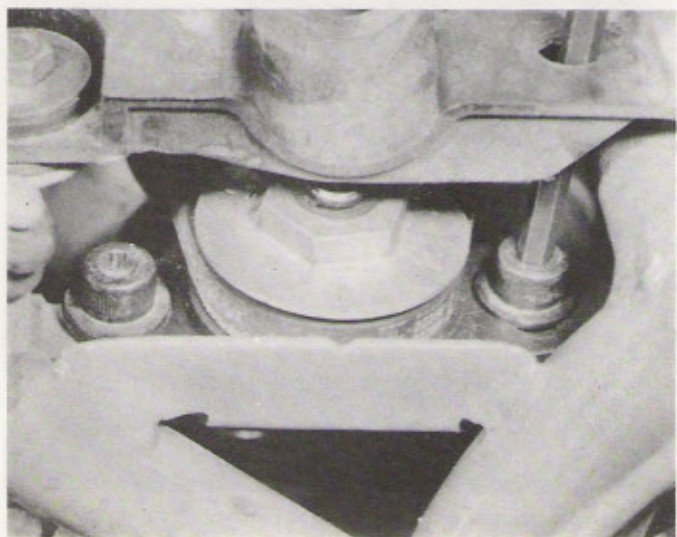
10.4b Upper mounting bolt can be reached through battery tray



10.6 It is a good idea to remove, strip and lubricate the adjuster



10.8a Tension belt by pressing lever (arrowed) ...



10.8b ... while securing Allen bolt

11 Rear suspension linkage and swinging arm: removal and refitting

1 The swinging arm and its associated linkages can be removed with or without the suspension unit. Given the exposed nature of the various pivots it is preferable to remove the unit as well, so that it too can be checked and lubricated, and this method is described below. Start by removing the seat, side panels, exhaust system and the battery. Remove the rear wheel (see Chapter 6 for details). It will prove helpful to remove the front section of the rear mudguard to gain better access. This is retained by three screws, but it is also necessary to release the fuse box and the CDI unit, and the associated wiring clips first.

2 Release the suspension unit spring preload adjuster and top mounting bolt as described in the previous Section. Before removing the swinging arm, check for free play by pushing and pulling it from side to side. If there is more than 1 mm (0.04 in) movement at the wheel spindle end, the bush or side clearance is excessive and should be investigated.

3 Slacken and remove the relay arm pivot bolt from the frame bracket. Remove the swinging arm pivot shaft nut, then tap the shaft out to release the swinging arm and suspension linkage assembly. Make a

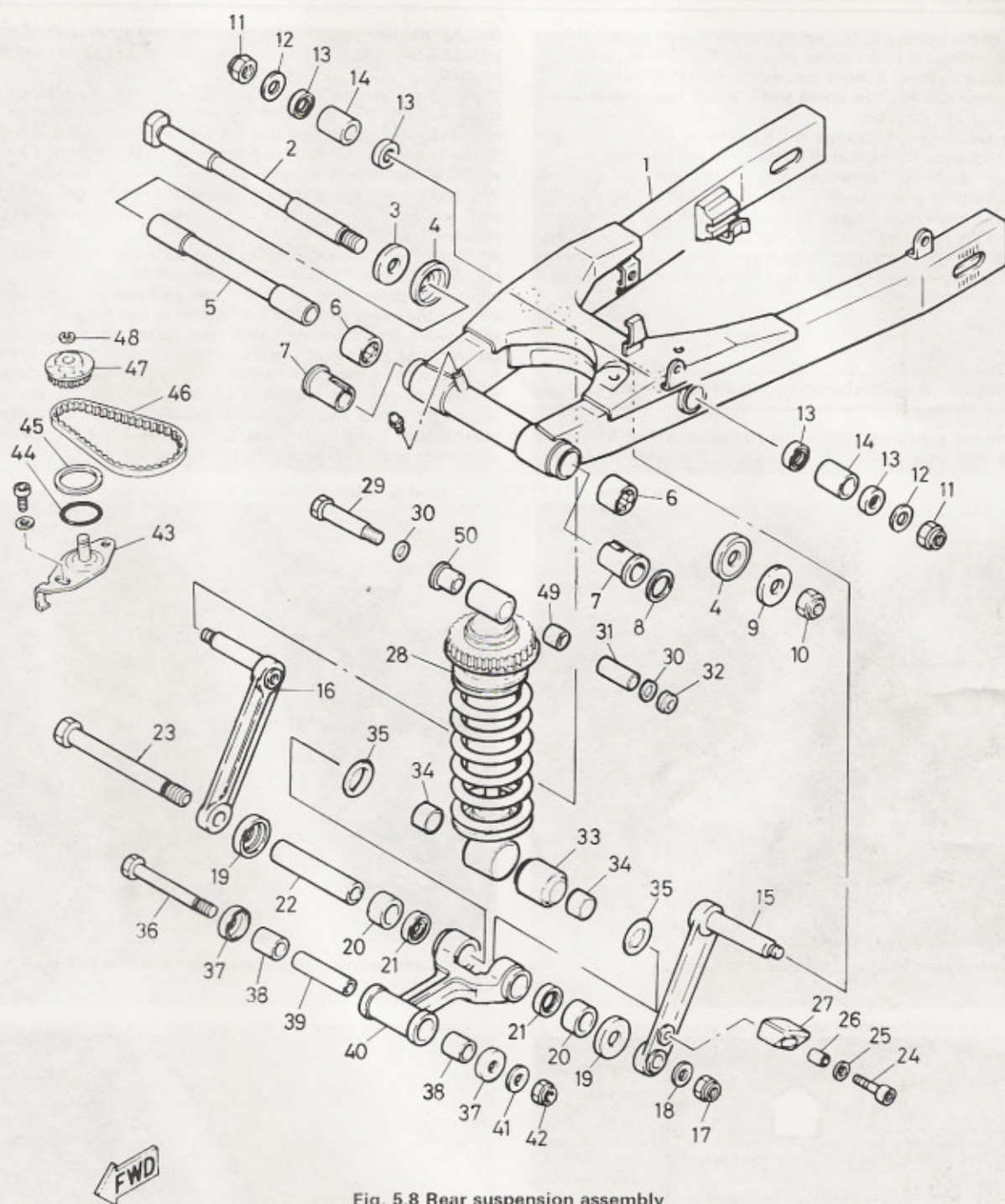


Fig. 5.8 Rear suspension assembly

- | | | | |
|-------------------|-------------------------------|-----------------|-------------------------------|
| 1 Swinging arm | 15 Left-hand suspension link | 29 Bolt | 42 Nut |
| 2 Pivot bolt | 16 Right-hand suspension link | 30 Washer | 43 Adjuster pulley bracket |
| 3 Washer Δ | 17 Nut | 31 Sleeve | 44 O-ring |
| 4 Thrust cover | 18 Washer | 32 Nut | 45 Washer |
| 5 Sleeve | 19 Thrust cover | 33 Bush | 46 Adjuster belt |
| 6 Bush Δ | 20 Bush | 34 Sleeve | 47 Adjuster pulley |
| 7 Bush \square | 21 Oil seal | 35 Dust seal | 48 Circlip |
| 8 Shim \square | 22 Inner sleeve | 36 Bolt | 49 Bush \circ |
| 9 Washer | 23 Bolt | 37 Thrust cover | 50 Headed bush \circ |
| 10 Nut | 24 Allen screw | 38 Bush | Δ RD350 N and F only |
| 11 Nut | 25 Washer | 39 Sleeve | \square RD350 LC II only |
| 12 Washer | 26 Spacer | 40 Relay arm | \circ 1983 RD350 LC II only |
| 13 Oil seal | 27 Chain guide | 41 Washer | |
| 14 Bush | 28 Suspension unit | | |

careful note of the position of the various spacing washers and shims. These must be refitted in their original positions. Lower the assembly to the ground and remove it from the machine. Before refitting the suspension components, clean, check and lubricate them as described in Section 13 of this Chapter.

4 Refit the swinging arm, linkage and suspension unit by reversing the removal sequence. Check that all shims, seals and thrust caps are in place and well lubricated. Tighten the relay arm to frame pivot bolt and the link to swinging arm nuts to 4.0 kgf m (28 lbf ft). Tighten the suspension unit lower mounting to relay arm and link bolt to 6.5 kgf m (47 lbf ft) and the swinging arm pivot shaft nut to 7.0 kgf m (50 lbf ft). Lubricate the swinging arm pivot by pumping grease into the grease nipple provided, then check that the suspension moves smoothly and without discernible free play.

12 Rear suspension unit: examination and renovation

1 As mentioned previously, the rear suspension unit is of sealed construction and thus cannot be repaired in the event of failure.

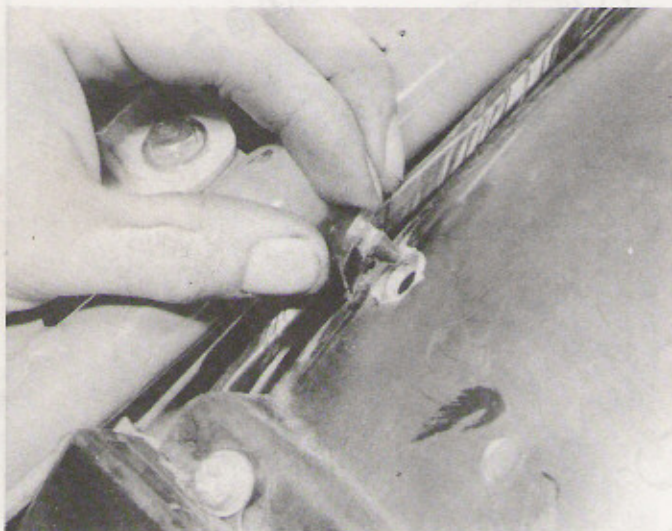
Should the damping effect become reduced as a result of wear it is advisable to obtain a new replacement unit well in advance of intended renewal.

2 Should it become necessary to dispose of the cylinder do not just throw it away. It is first necessary to release the gas pressure and the manufacturers recommend that the following procedure is followed.

3 Refer to the accompanying figure and mark a point 10 – 15 mm above the bottom of the cylinder. Place the unit securely in a vice. Wearing proper eye protection against escaping gas and/or metal particles, drill a 2 – 3 mm hole through the previously marked point on the cylinder.

4 Clean the suspension unit, paying particular attention to the area around the preload adjuster. If this should seize completely, soak the adjuster in penetrating oil until it can be freed off. Take care not to damage the pulley teeth. Set the adjuster so that the ring cam is on one of its peaks, then lubricate it with graphite or molybdenum disulphide grease. As an alternative, a graphite-based chain lubricant can be used.

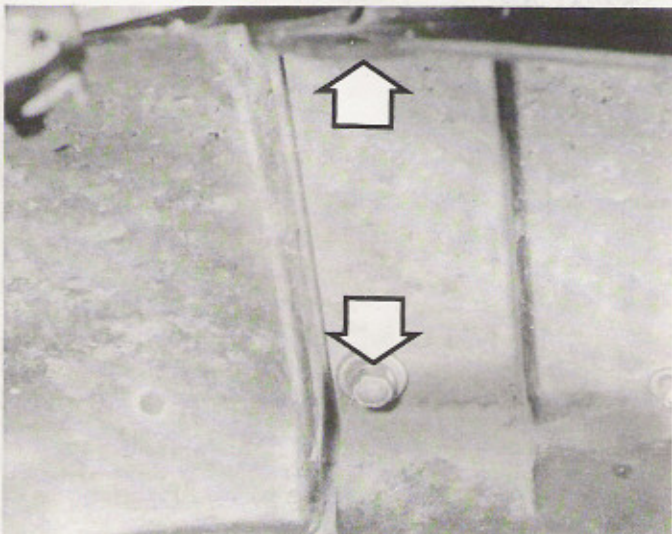
5 It is worth removing the adjuster pulley from the machine so that it can be cleaned and lubricated properly. Remove the circlip which retains the pulley and lift it off its pivot. Clean the pulley teeth and internal bore, and also the pivot. Lubricate the pivot with molybdenum disulphide grease, then refit the pulley and circlip.



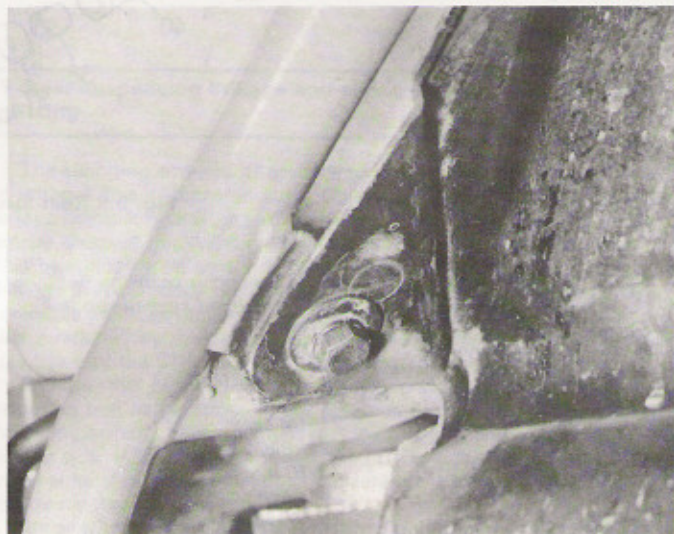
11.1a Free wiring clips from rear mudguard ...



11.1b ... and remove YPVS control unit and fuse box from mudguard



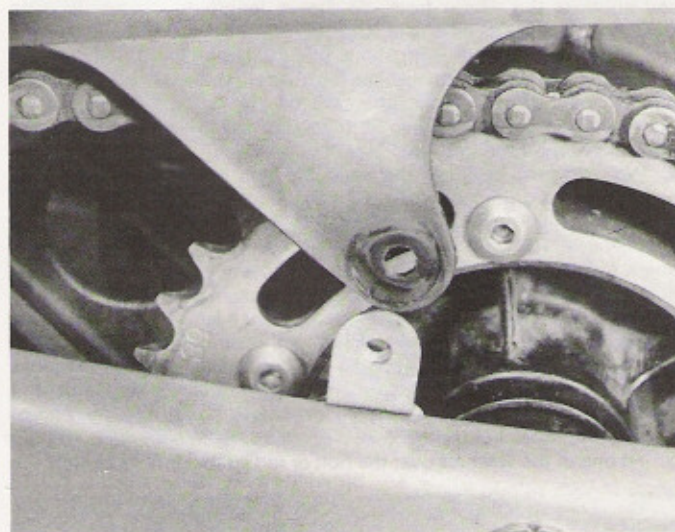
11.1c Release two bolts on underside of mudguard ...



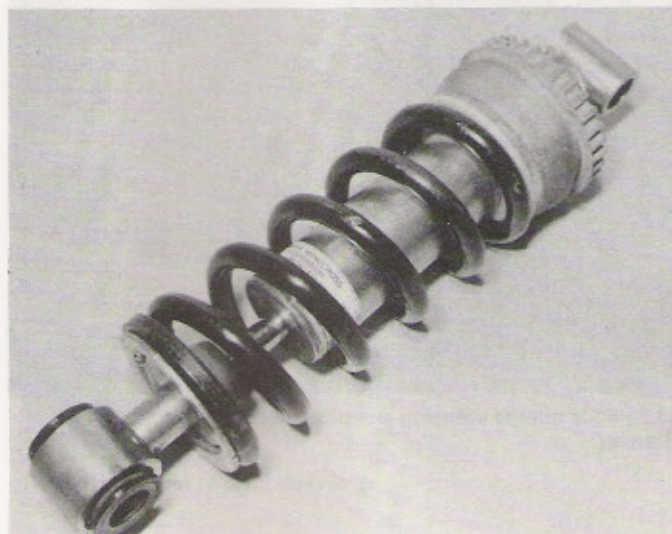
11.1d ... and single bolt on left-hand side



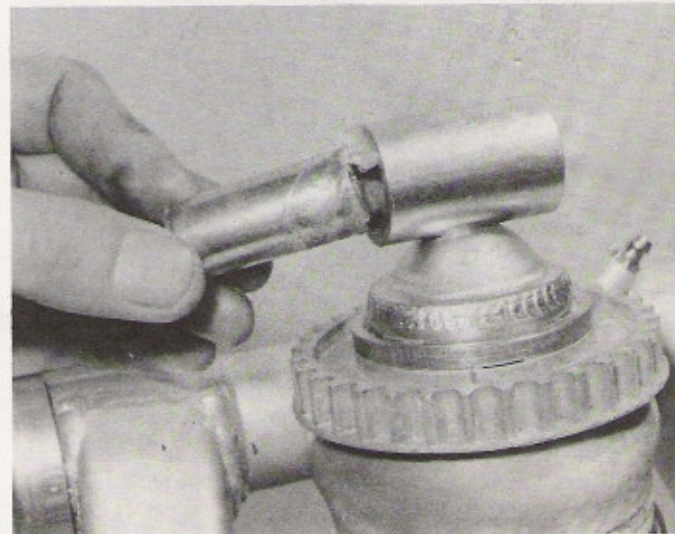
11.1e Chainguard is retained by screw and plain washer at front ...



11.1f ... and at rear



12.4a Clean suspension unit and check for corrosion around spring preload collar



12.4b Clean and grease pivot sleeves before refitting unit

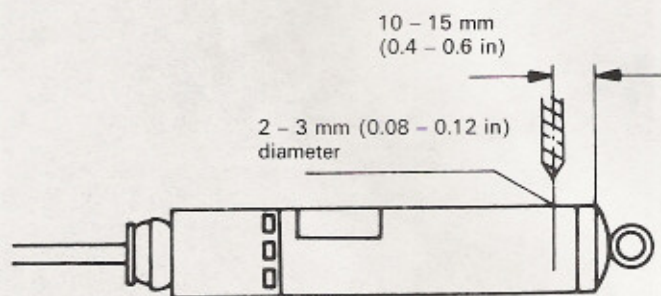


Fig. 5.9 Position of drilling on rear suspension unit

13 Swinging arm and rear suspension linkage: examination and renovation

1 With the swinging arm and its associated linkages removed from the machine, examine the various pivot bolts, sleeves, bushes, seals and thrust caps for signs of wear or damage. If any fault is noted, the affected component should be renewed, together with any related part. For example, if a pivot sleeve shows signs of scoring or other damage, renew it, together with the bushes in which it runs; do not renew the sleeve alone or rapid wear can be expected.

2 Displace and remove the swinging arm pivot sleeve, then degrease and clean it and the swinging arm bore. If the sleeve and the bushes are undamaged and judged to be re-usable, check the swinging arm side clearance as follows. Measure the overall length of the sleeve. This should not have worn significantly under normal circumstances, but if it is not within the range 205.2 – 205.5 mm (8.079 – 8.091 in) it must be renewed, together with the bushes. For details refer to paragraphs 4 to 6 below before proceeding further.

3 Next, measure the distance across the swinging arm bush heads

and subtract this figure from the sleeve length to obtain the side clearance. The specified clearance is 0.1 – 0.3 mm (0.004 – 0.012 in) which can be adjusted using shims fitted between the thrust cap and the bush heads. If additional shims are needed, these can be purchased from Yamaha dealers. When fitting shims, they should be distributed evenly on each side of the pivot. If there is an odd number of shims, put the extra one on the left-hand side.

4 Worn bushes in either the swinging arm or the various linkage pivots can be drifted out of their bores, but note that removal will destroy them; new bushes should be obtained before work commences. The new bushes should be pressed or drawn into their bores, rather than driven into place. In the absence of a press, a suitable drawbolt arrangement can be made up as described below.

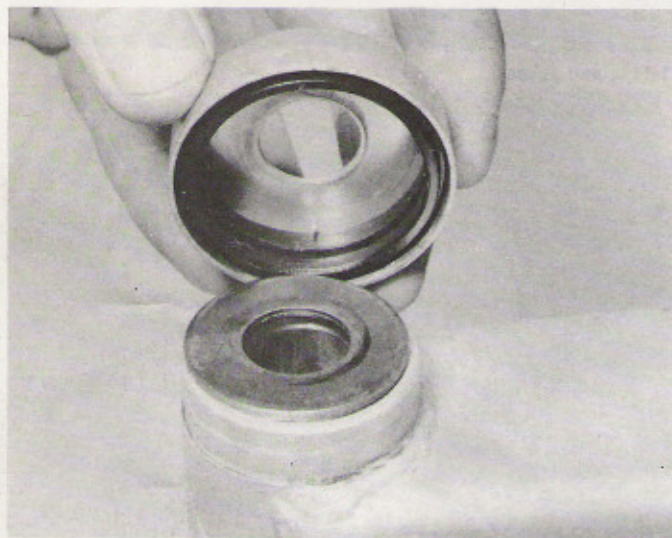
5 It will be necessary to obtain a long bolt or a length of threaded rod from a local engineering works or some other supplier. The bolt or rod should be about 1 inch longer than the combined length of the cross tube and one bush. Also required are suitable nuts and two large and robust washers. In the case of threaded rod, fit one nut to one end of the rod and if required, stake it in place for convenience.

6 Fit one of the washers over the bolt or rod so that it rests against the

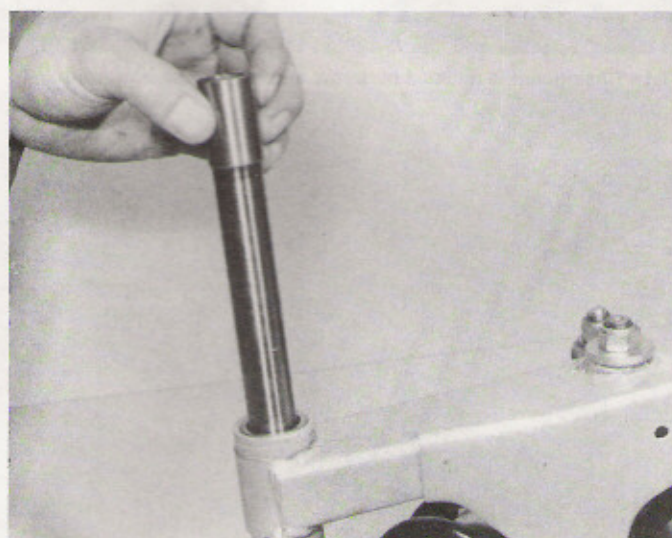
head, then pass the assembly through the cross-tube. Over the projecting end place the bush, which should be greased to ease installation, followed by the remaining washer and nut. Holding the bush to ensure that it is kept square, slowly tighten the nut so that the bush is drawn into the cross-tube. Once it is fully home, remove the drawbolt arrangement and repeat the sequence to fit the remaining bush.

7 When fitting the swinging arm pivot bushes, note that the groove must be fitted within a 90° arc as shown in the accompanying line drawing. Before commencing assembly, check all seals and renew as required, then lubricate the various moving parts as follows. When installation is complete, pump grease into the swinging arm pivot using a grease gun. Wipe off excess grease as it emerges from the ends of the swinging arm. Observe the following greasing requirements:

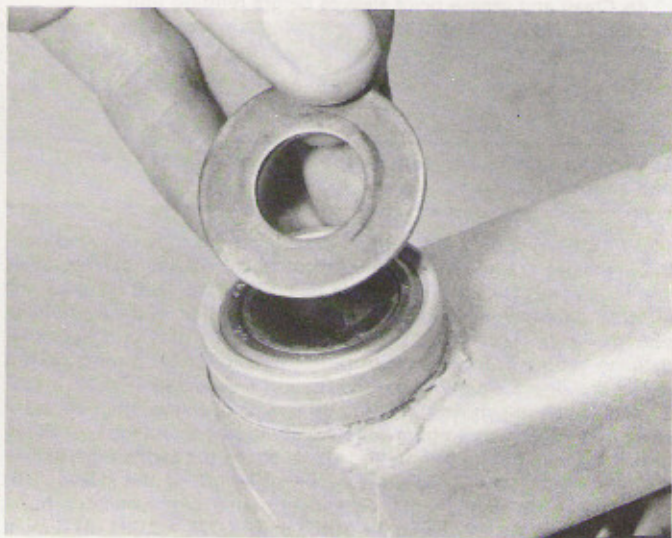
- a) Bushes: Coat the inner surface of all bushes with grease
- b) Seals: Fill the lip area of all seals with grease
- c) Dust seals: Coat inside and out with grease
- d) Thrust caps: Fill the inside with grease
- e) Pivot shaft and sleeves: coat outer surface with grease



13.2a Remove end seals and any shims, noting their position



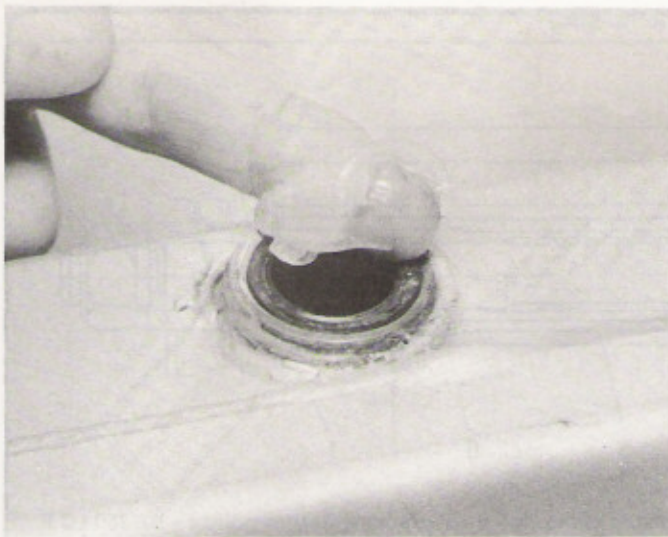
13.2b Slide out the swinging arm pivot sleeve for examination and cleaning



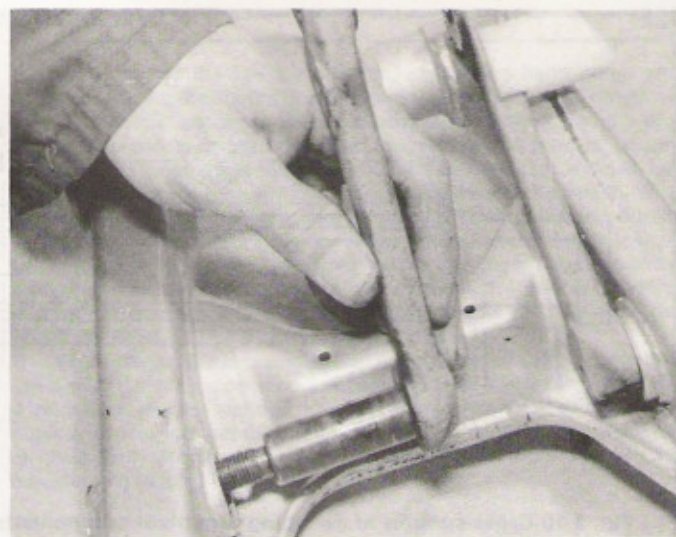
13.3 Do not omit to fit shims of the required thickness (see text)



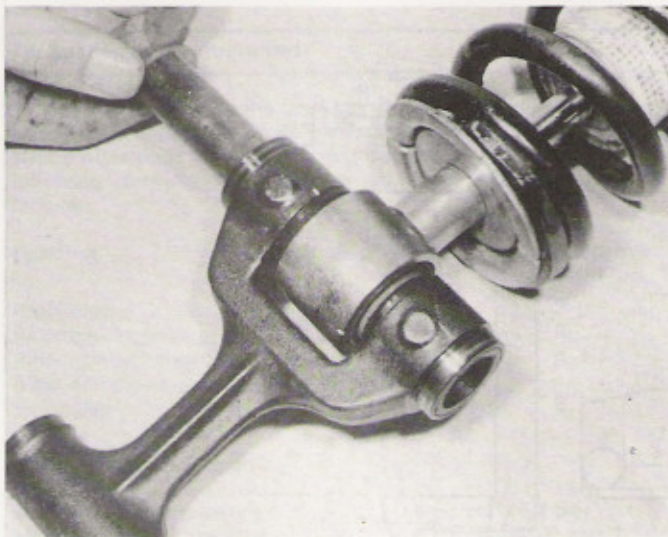
13.7a Fit new grease seals as required ...



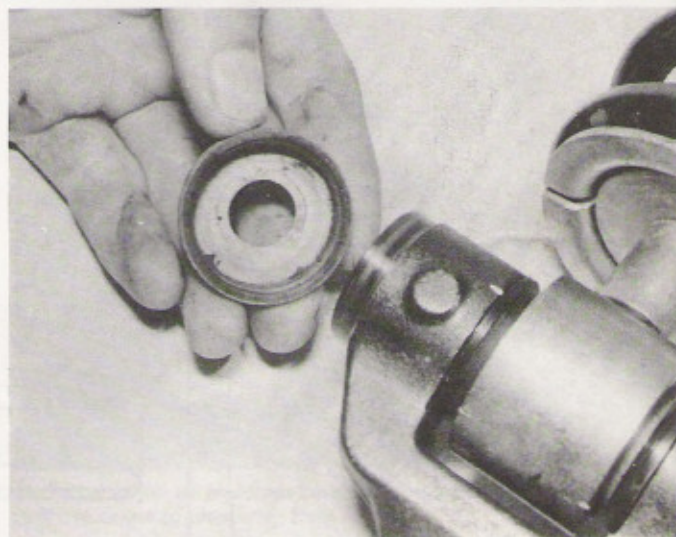
13.7b ... and lubricate with grease ...



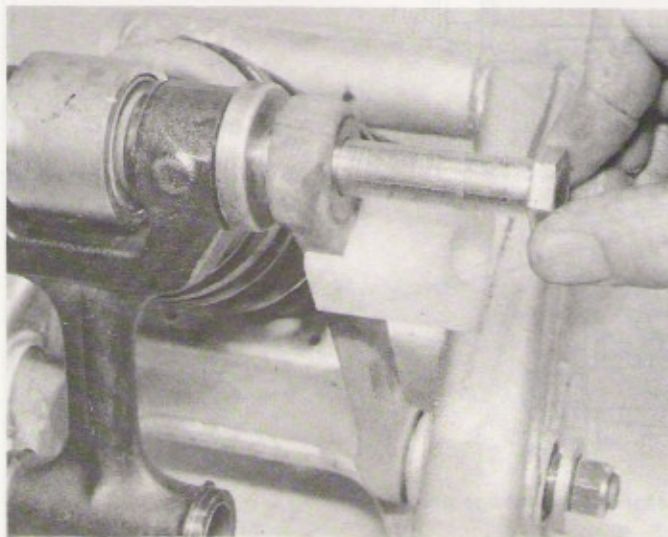
13.7c ... before fitting the link arms



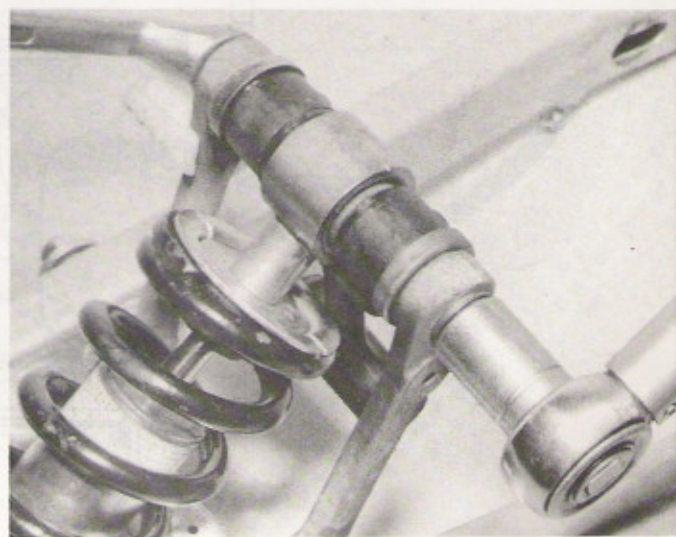
13.7d Grease and fit pivot sleeves ...



13.7e ... and fit end caps



13.7f Fit pivot bolt after greasing ...



13.7g ... and tighten to prescribed torque setting

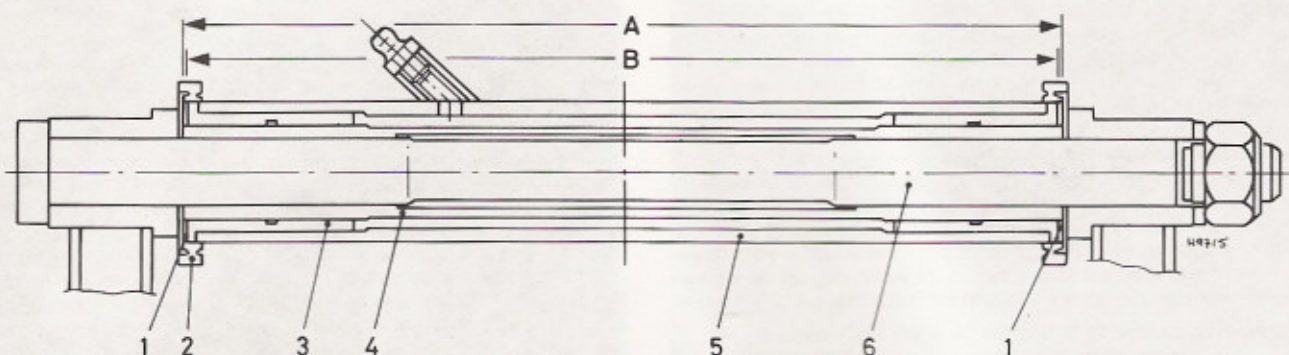


Fig. 5.10 Cross-section of swinging arm pivot components and side clearance measurement datum points - RD350 LC II

- | | | | |
|----------------------|----------------|----------------|----------------------------|
| 1 Shim - as required | 3 Bush | 5 Swinging arm | A Length of pivot sleeve |
| 2 End cap | 4 Pivot sleeve | 6 Pivot bolt | B Length across bush heads |

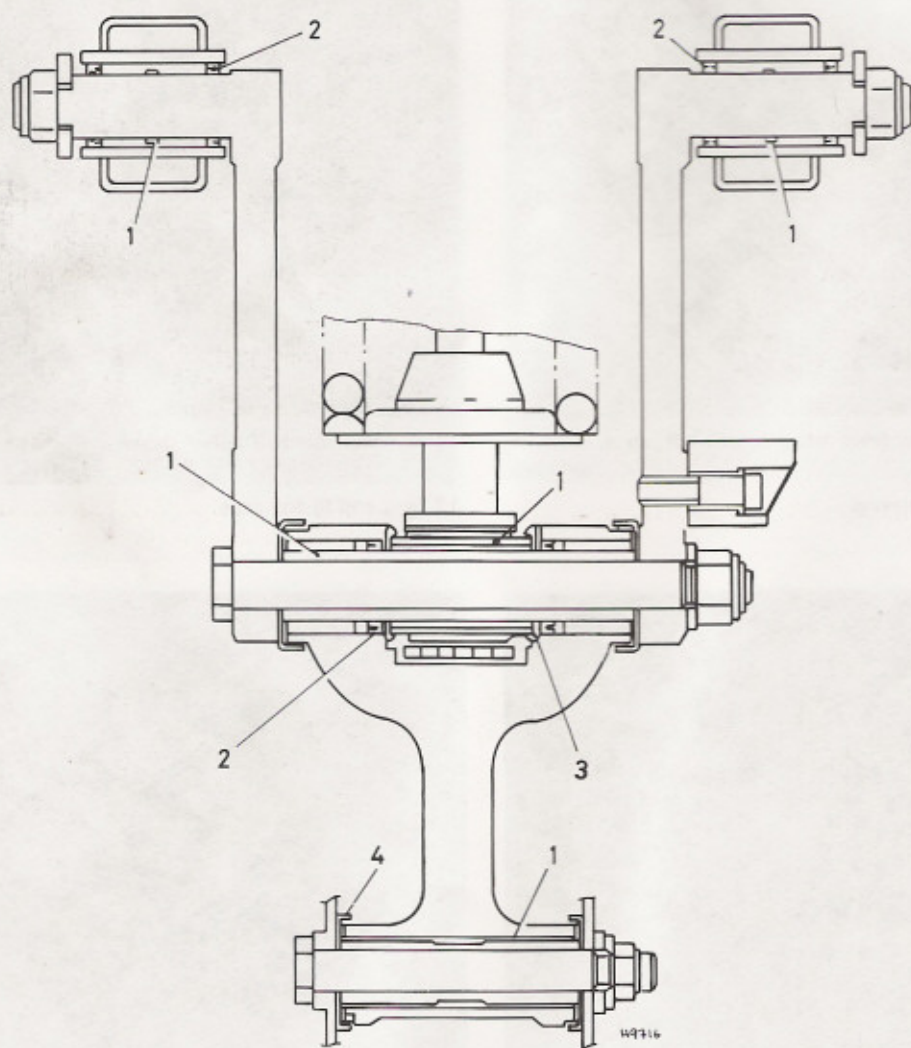


Fig. 5.11 Cross-section of rear suspension linkage pivots

- | | |
|-------------|----------------|
| 1 Bushes | 3 Washer |
| 2 Oil seals | 4 Thrust cover |

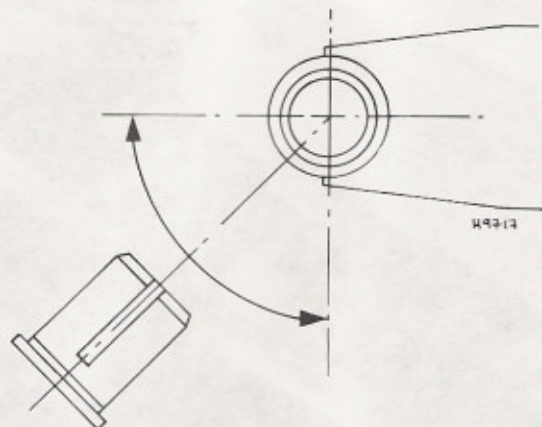


Fig. 5.12 Swinging arm pivot bush groove position – RD350 LC II only

14 Suspension adjustment

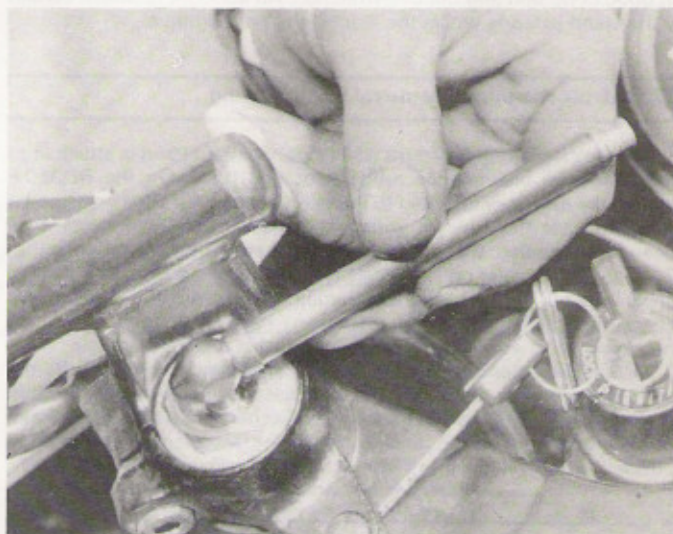
1 It is possible to vary the front fork air pressure and rear suspension spring preload to compensate for various loads on the machine. The choice of settings is to some extent discretionary, but as a guide, the following combinations of settings are recommended by the manufacturer.

Loading	Fork air pressure	Rear spring preload
Rider only	0.4 kg/cm ² , 5.7 psi	2
Rider and luggage	0.6 kg/cm ² , 8.5 psi	3
Rider and passenger	0.8 kg/cm ² , 11.0 psi	4
Rider and passenger + luggage	0.8 kg/cm ² , 11.0 psi	5

Standard rear suspension preload	2
Standard fork air pressure	0.4 kg/cm ² (5.7 psi)
Maximum fork air pressure	0.8 kg/cm ² (11.0 psi)

2 When altering the fork air pressure, use only a hand pump and gauge. These are obtainable from motorcycle dealers and are produced specifically for suspension use. Alternatively, use a bicycle tyre pump with a schraeder-type adaptor and a plunger type tyre pressure gauge. When taking pressure readings it should be noted that a small but significant pressure drop will occur each time the check is made. With practice it will be possible to take this into account, allowing one or two psi extra when taking the reading to compensate for the loss of pressure when the gauge is removed. Note that the pressure must be equal between the two legs (within 0.1 kg/cm², 1.4 psi) or handling will be impaired. On no account inflate the forks to more than the maximum pressure or the seals may be damaged.

3 When altering the rear suspension spring preload setting, note that the standard setting is position 2, 1 being an extra soft setting, whilst 3, 4 and 5 are harder settings to allow for additional loading. If the adjuster proves too stiff to turn it should be dismantled and lubricated as described elsewhere in this Chapter. Regular operation of the adjuster will help to keep it freed off.



14.2 Check fork air pressures carefully, using pocket gauge – do not use airline to pressurise forks

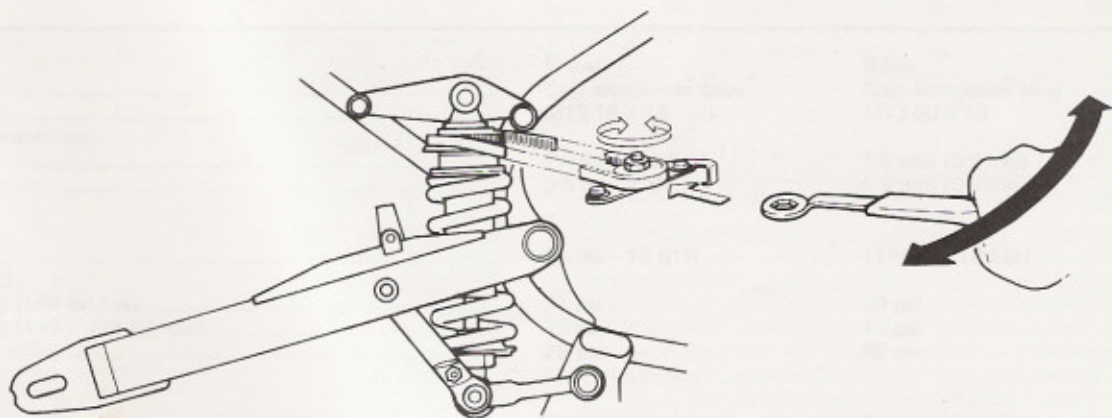


Fig. 5.13 Rear suspension unit adjustment

15 Centre stand: examination and maintenance

1 The centre stand is an important but largely neglected feature of most motorcycles. It is important to check the stand for wear or damage from time to time, as failure of the stand can result in costly repair bills. Check that the stand mounting shaft is secure and in good condition, and that it is kept adequately lubricated.

2 Check that the return spring is in good condition. A broken or weak spring may cause the stand to fall whilst the machine is being ridden, and catch in some obstacle, unseating the rider.

16 Prop stand: examination and maintenance

1 The prop stand is attached to a lug welded to the left-hand lower frame tube. An extension spring anchored to the frame ensures that the stand is retracted when the weight of the machine is taken off the stand.

2 Check that the pivot bolt is secured and that the extension spring is in good condition and not overstretched. An accident is almost certain if the stand extends whilst the machine is on the move.

17 Instrument panel: removal and refitting

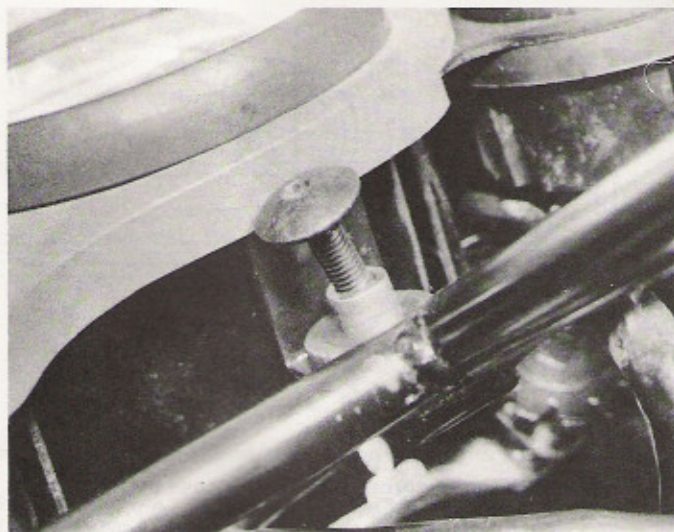
1 The instrument panel forms a self-contained unit and is attached to the headlamp brackets via rubber-mounted bolts. On the RD350 F model, the assembly is bolted to the fairing subframe. The panel can be removed after the relevant wiring and instrument drive cables have been disconnected; this will be self-explanatory upon examination.

2 The speedometer on all models is mechanically driven via a flexible cable from the front wheel drive gearbox. In the event of a fault, always check the cable first. If the instrument head is at fault, it will be necessary to fit a new one, unless a specialist repairer can help.

3 The tachometer on the RD350 LC II is mechanically driven from a take-off point near the rear of the crankcase, and can be dealt with in the same way as the speedometer. On all other models the tachometer is electronic, measuring engine speed by monitoring the ignition pulses.

18 Instrument drive cables: examination and maintenance

1 It is advisable to detach the drive cable(s) from time to time in order to check whether the outer coverings are damaged or compressed at



17.1 Instrument panel mounting bolt (F model)

any point along their run. Jerky or sluggish movements can be traced to a damaged drive cable.

2 It is not possible to effect a satisfactory repair to a damaged or broken drive cable, and in this event the complete cable must be renewed.

19 Instrument drives: examination and maintenance

1 Drive to the speedometer is taken from a small gearbox mounted on the front wheel and anchored to the left-hand fork leg. The gearbox rarely gives rise to problems provided that it is kept well greased whenever the front wheel is removed. In the event of failure, the gearbox must be replaced as a unit, no individual parts are available.

2 In the case of the RD350 LC II model only, the tachometer is driven from a mechanism incorporated in the engine unit, its takeoff point being near the rear of the crankcase. Part of the drive is contained within the crankcase halves and it is therefore necessary to remove and dismantle the engine unit to gain access to it. Further information on the tachometer drive will be found in Chapter 1.