Chapter 6 Wheels, brakes and tyres

Contents

Specifications

Tyres		
Sizes	*Front*	*Rear*
750S and S3	3.25 H 18	3.50 H 18
850T and T3	3.50 H 18	4.10 H 18
850 Le Mans	3.50 H 18	4.10 V 18
V-1000	4.10 H 18	4.10 H 18

all tyres 18 inch diameter.
**Tyres rated as 'H' are safe up to speeds of 130 mph. 'V' rated tyres are safe at speeds above 130 mph.*

Tyre pressures	*Front*	*Rear*
750S, S3, 850T3 and Le Mans	29 psi (2 kg cm^2)	33 psi (2. 3 kg cm^2)
850T	26 psi (1.8 kg cm^2)	33 psi (2.3 kg cm^2)
V-1000	30 psi (2.1 kg cm^2)	34 psi (2.4 kg cm^2)

**When carrying a pillion passenger the rear tyre pressure should be increased by 3 psi (0.2 kg cm^2).*
When travelling at continuous high speeds an additional 3 psi (0.2 kg cm^2) should be added to both front and rear tyres.

Brakes	*Front*	*Rear*
750S	Twin 300 mm (11.8 in) discs	Single leading shoe drum brake 220 x 25 mm (8.66 x 0.98 in)
850T	Single 300 mm (11.8 in) disc	As above
All other	Twin 300 mm (11.8 in) disc	Single 242 mm (9.5 in) disc

1 General description

All models are fitted with 18 inch diameter wheels, both at the front and rear. With the exception of the Le Mans model, which has one-piece cast aluminium alloy wheels, all models are fitted with aluminium safety rims laced to cast aluminium hubs by chrome finished spokes.

The front brake of the 750S and 850T models is an hydraulically operated disc unit mounted on the right-hand side of the hub and operated by a handlebar lever. The rear brake is a rod operated drum unit. All other machines are fitted with twin front disc brakes and a single rear disc brake. The right-hand front disc is operated by the normal method. The rear disc and left-hand front disc are interconnected and operated by the rear brake pedal. The integration of the brakes in this way, using a system patented by Moto Guzzi, allows the rear brake pedal only to be used during normal riding. A compensator unit in the system controls the braking force applied so that the front brake receives about 75% of the effort and the rear 25%.

2 Front wheel: examination and renovation (spoked wheel models)

1 Place the machine on the centre stand so that the front wheel is raised clear of the ground. Spin the wheel and check the rim alignment. Small irregularities can be corrected by tightening the spokes in the affected area, although a certain amount of practice is necessary to prevent over-correction. Any flats in the wheel rim should be evident at the same time. These are more difficult to remove and in most cases it will be necessary to have the wheel rebuilt on a new rim. Apart from the effect on stability, a flat will expose the tyre bead and walls to greater risk of damage.
2 Check for loose or broken spokes. Tapping the spokes is the best guide to tension. A loose spoke will produce a quite different sound and should be tightened by turning the nipple in an anticlockwise direction. Always recheck for run-out by spinning the wheel again. If the spokes have to be tightened an excessive amount, it is advisable to remove the tyre and tube by the procedure detailed in Section 17 of this Chapter; this is so that the protruding ends of the spokes can be ground off, to prevent them from chafing the inner tube and causing punctures.

3 Front wheel: examination and renovation (cast alloy wheel models)

1 Carefully check the complete wheel for cracks and chipping, particularly at the spoke roots and the edge of the rim. As a general rule a damaged wheel must be renewed as cracks will cause stress points which may lead to sudden failure under heavy load. Small nicks may be radiused carefully with a fine file and emery paper (No. 600 - No. 1000) to relieve the stress. If there is any doubt as to the condition of a wheel, advice should be sought from a Moto Guzzi repair specialist.
2 Each wheel is covered with a coating of lacquer, to prevent corrosion. If damage occurs to the wheel and the lacquer finish is penetrated, the bared aluminium alloy will soon start to corrode. A whitish grey oxide will form over the damaged area, which in itself is a protective coating. This deposit however, should be removed carefully as soon as possible and a new protective coating of lacquer applied.
3 Check the lateral run-out at the rim by spinning the wheel and placing a fixed pointer close to the rim edge. If the maximum run-out is greater than 1.0 mm (0.040 in), it is recommended that the wheel be renewed. This is, however, a counsel of perfection; a run-out somewhat greater than this can probably be accommodated without noticeable effect on steering. No means is available for straightening a warped wheel without resorting to the expense of having the wheel skimmed on all faces. If warpage was caused by impact during an accident, the safest measure is to renew the complete wheel. Worn wheel bearings may cause rim run-out. These should be renewed as described in Section 10 of this Chapter.

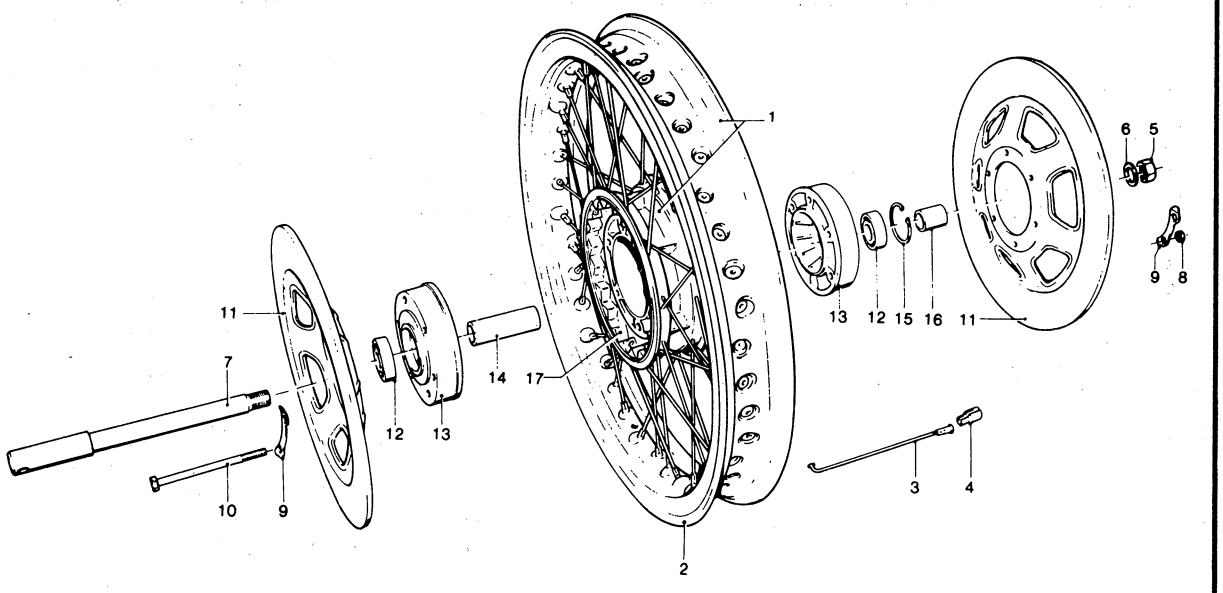


Fig. 6.1. Front wheel - component parts

1 *Front wheel*
2 *Rim*
3 *Spoke and nipple - 40 off*
4 *Balance weight*
5 *Nut*
6 *Washer*
7 *Wheel spindle*
8 *Nut - 6 off*
9 *Lock plate - 6 off*
10 *Bolt - 6 off*
11 *Brake disc - 1 off or 2 off*
12 *Journal ball bearing - 2 off*
13 *Disc spacer - 1 off or 2 off*
14 *Bearing spacer*
15 *Circlip*
16 *Wheel spacer*
17 *Hub*

4 Front disc brake: examination and renovation

1 Check the front brake master cylinder, hoses and caliper units for signs of leakage. Pay particular attention to the condition of the hoses, which should be renewed without question if there are signs of cracking, splitting or other exterior damage. On machines with integrated braking the front left-hand disc is operated by the rear brake hydraulic circuit. For the purposes of maintenance (except for fluid level inspection) the procedures are identical.

2 Check the level of hydraulic fluid by removing the cap on the brake fluid reservoir and lifting out the diaphragm plate. The condition of the fluid can be checked at the same time. Checking the fluid level is one of the maintenance tasks which should never be neglected. If the fluid is below the lower level mark, brake fluid of the correct specification must be added. **Never** use engine oil or any fluid other than that recommended. Other fluids have unsatisfactory characteristics and will rapidly destroy the seals.

3 The sets of brake pads should be inspected for wear after prising off the corrugated inspection plate from the top of each caliper. If either pad is less than 6 mm (0.2362 in) thick, both pads must be renewed as a set. Where twin disc brakes are utilised it is likely that the right-hand set of pads will wear less quickly, since the handlebar lever operated brake is used relatively rarely.

4 The pads may be removed with the wheel in place. Depress the pin keeper spring at one end and withdraw one pin. Remove the second long pin and the spring. The central taper pin can now be removed followed by the two pads, one at a time.

5 The pads set on the integrated front brake can wear very quickly. Where a 'riding on the brakes' style of riding is used, the pad life may be as little as 2000 miles.

5 Front brake caliper: overhaul

1 Caliper removal and replacement can take place without removing the front wheel. Where twin disc brakes are utilised, each caliper should be removed and dismantled individually, using an identical procedure. Again it should be remembered that the left-hand caliper is operated by the rear brake hydraulic circuit.

2 Detach the brake feed pipe from the caliper, allowing any fluid to drain into a suitable container. **Do not** allow any fluid to contact the paintwork. It is a superb paintstripper. Remove the two bolts which secure the caliper unit to the fork leg, and lift the complete caliper from position on the disc.

3 Prise off the inspection cover and remove the brake pads, as described in the previous Section. The caliper consists of two cylinders and pistons retained by two bolts and interconnected by a passageway that allows the brake fluid pressure to equalise. Remove the two securing bolts and separate the two components. Note the O ring which seals the passageway.

4 Carefully prise off the dust excluding boot from one piston. The piston can be displaced most easily using an air hose or tyre pump connected to the fluid feed orifice. Using a fine pointed instrument dislodge the sealing O ring from the groove in the cylinder. Dismantle the other caliper half in a similar manner.

5 Wash the brake caliper components in clean hydraulic fluid. **DO NOT** use petrol or other solvents to clean brake parts as the rubber components will be damaged. Inspect the pistons, and cylinder bores for scoring which may lead to leakage. If damage is evident, renew the components affected.

6 Reassemble the caliper by reversing the dismantling procedure. Owing to their low cost it is recommended that all seals and boots be renewed without question. When refitting the O ring seals, apply a little hydraulic fluid as lubricant. Special brake component grease which has a very high melting temperature should be used to lubricate the pistons. If required, the caliper may be centralised on the disc using shims placed between the caliper and the mounting lug on the fork leg.

7 Note that work on hydraulic brake systems must be carried out in scrupulously clean conditions. Particles of dirt will score the working parts and cause early failure of the system.

8 After reassembling and refitting the caliper units, the hydraulic systems must be bled of all air as described in Section 7 of this Chapter.

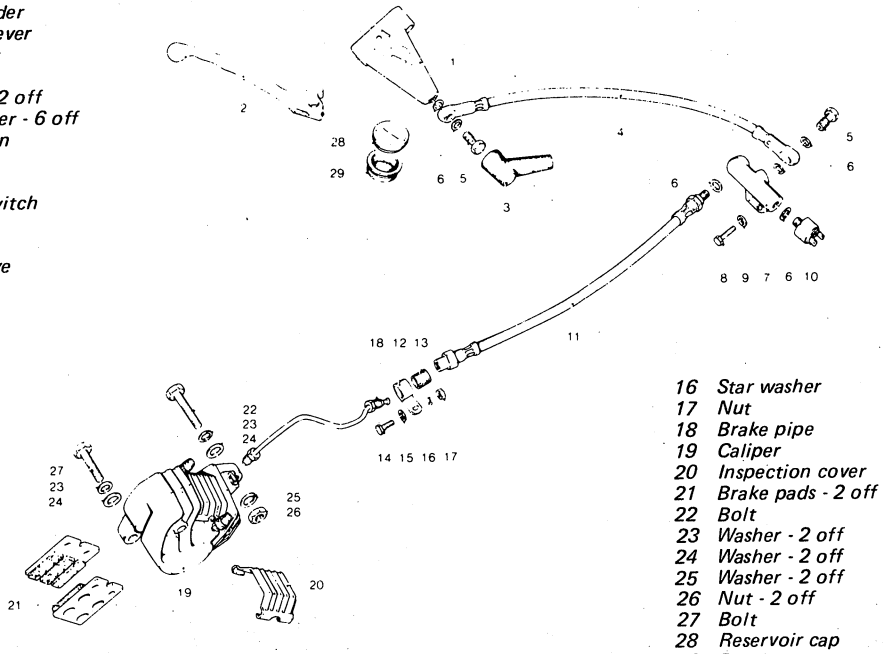
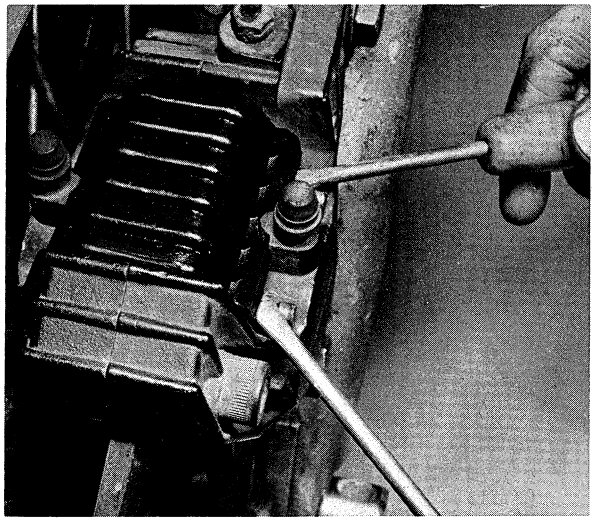
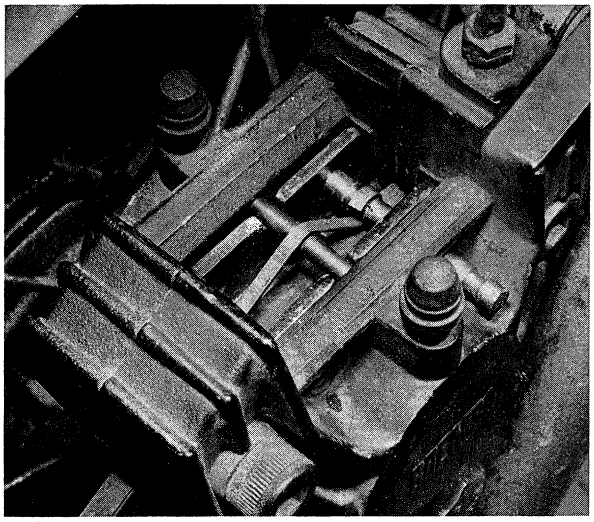


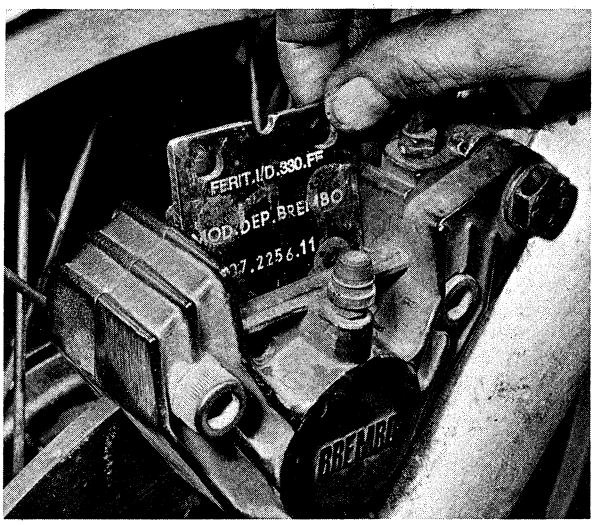
Fig. 6.2. Front brake assembly



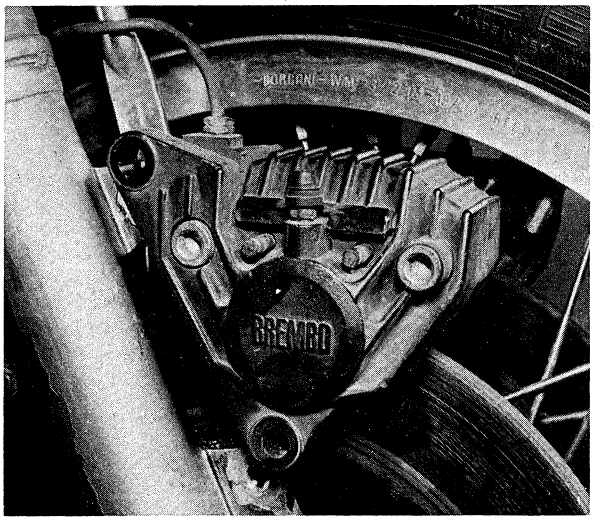
4.3 Prise off the cover to gain access to the pads



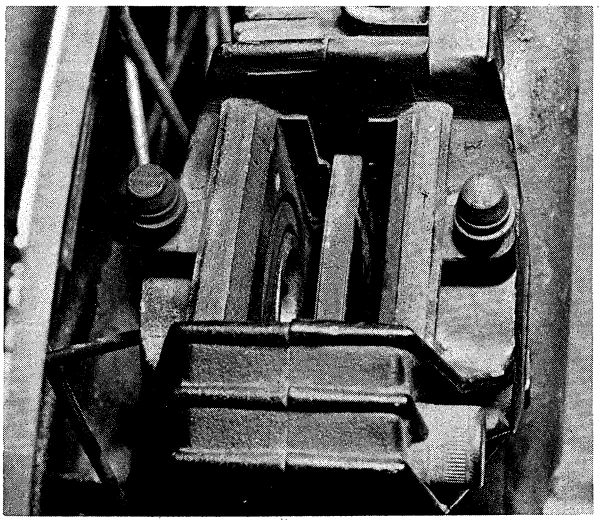
4.4a Depress spring to remove pins



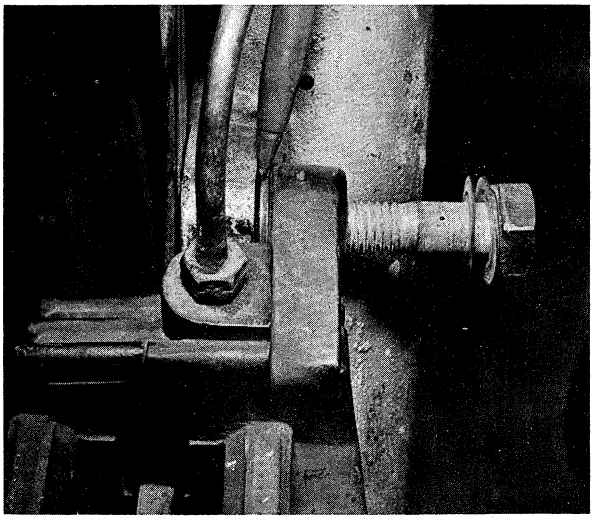
4.4b Pads will lift out individually



5.2 Each caliper is retained by two socket screws



5.6a Check centralisation of disc between caliper halves



5.6b Fit shims as required to centralise caliper

6 Front disc brake master cylinder: examination and renovation (right-hand brake only)

1 The master cylinder and hydraulic reservoir take the form of a combined unit mounted on the right-hand side of the handlebars, to which the front brake lever is attached. The master cylinder is actuated by the front brake lever, and applies hydraulic pressure through the system to operate the front brake when the handlebar lever is manipulated. The master cylinder pressurises the hydraulic fluid in the brake pipe which, being incompressible, causes the piston to move in the caliper unit and apply the friction pads to the brake. If the master cylinder seals leak, hydraulic pressure will be lost and the braking action rendered much less effective.
2 Before the master cylinder can be removed the system must be drained. Place a clean container below the caliper unit and attach a plastic tube from one bleed screw on top of the caliper unit to the container. Open the bleed screw one complete turn and drain the system by operating the brake lever until the master cylinder reservoir is empty. Close the bleed screw and remove the pipe.
3 Place a rag under the banjo union connecting the brake hose to the master cylinder. Pull back the rubber boot and remove the banjo bolt. Loosen the throttle twist grip and slide it off the handlebar end. Slacken the pinch bolt securing the master cylinder/handlebar lever and remove the complete assembly.
4 Remove the reservoir cap and lift out the rubber diaphragm. Detach the operating lever from the master cylinder by unscrewing the nut and bolt. To remove the master cylinder piston, select a short rod that can be inserted through the fluid outlet orifice. The rod should have a smooth rounded end, to prevent damage to the master cylinder interior. Gently tap the rod and drive out the piston and locking ring.
5 From the master cylinder, remove the piston return spring and the spring guide. Pull the lockring off the piston, followed by the thin washer and scraper ring. Check the condition of the two piston rings. If they are unmarked and no leakage was evident, they may be reused.
6 The component parts of the master cylinder assembly and the caliper assembly may wear or deteriorate in function over a long period of use. It is however, generally difficult to foresee how long each component will work with proper efficiency and from a safety point of view it is best to change all the expendable parts every two years on a machine that has covered a normal mileage.
7 Replace the master cylinder by reversing the dismantling procedure. After reconnecting the brake hose, the system must be bled as described in the next Section. Free play at the handlebar lever should be adjusted so that there is 0.15 mm (0.006 in) between the lever and the piston face. Adjustment is effected by a grubscrew fitted to the lever.
8 When positioning the master cylinder, place it so that it is as upright as possible, yet in such a position that the lever operating angle is compatible with easy operation.

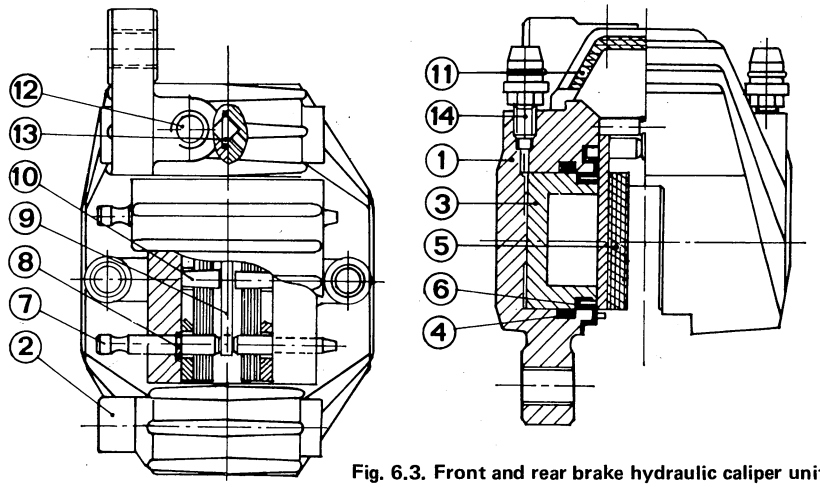
7 Bleeding the hydraulic brake system

Right-hand front disc brake

1 If the hydraulic system has to be drained and refilled, if the front brake lever travel becomes excessive or the lever operates with a soft or spongy feeling, the brakes must be bled to expel air from the system. The procedure for bleeding the hydraulic brake is best carried out by two persons.
2 First check the fluid level in the reservoir and top up with fresh fluid.
3 Keep the reservoir at least half full of fluid during the bleeding procedure.
4 Screw the cap on to the reservoir to prevent a spout of fluid or the entry of dust into the system. Place a clean glass jar below the caliper bleed screw and attach a clear plastic pipe from both caliper bleed screws to the container. Place some clean hydraulic fluid in the jar so that the pipes are always immersed below the surface of the fluid.
5 Unscrew the bleed screws one half turn and squeeze the brake lever as far as it will go but do not release it until the bleeder valves are closed again. Repeat the operation a few times until no more air bubbles come from the plastic tube.
6 Keep topping up the reservoir with new fluid. When all the bubbles disappear, close the bleeder screws securely. Remove the plastic tubes and install the bleeder valve dust caps. Check the fluid level in the reservoir, after the bleeding operation has been completed.
7 Reinstall the diaphragm and tighten the reservoir cap securely. Do not use the brake fluid drained from the system, since it will contain minute air bubbles.
8 Never use any fluid other than that recommended. Oil must not be used under any circumstances.

Integrated braking circuit

9 Bleed the brakes in a manner similar to that given for the single front disc brake circuit. Bleed the front caliper first followed by the rear caliper. If the brake action is still spongy, bleed the front caliper again.



1 *Inner cover/piston cylinder*
2 *Outer cover/piston cylinder*
3 *Piston*
4 *Piston sealing ring*
5 *Brake pad*
6 *Dust excluder*
7 *Pad long pin*
8 *Circlip*
9 *Spring*
10 *Tapered pin*
11 *Transfer passage*
12 *Feed orifice*
13 *Transfer passage 'O' ring*
14 *Bleed nipple*

Fig. 6.3. Front and rear brake hydraulic caliper unit

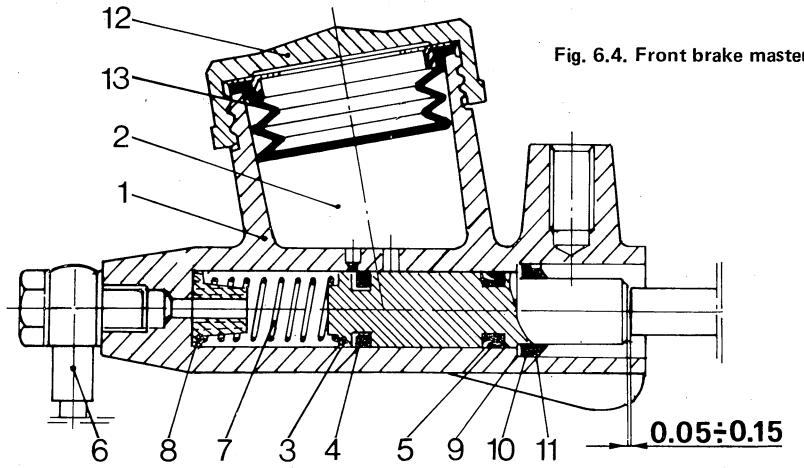
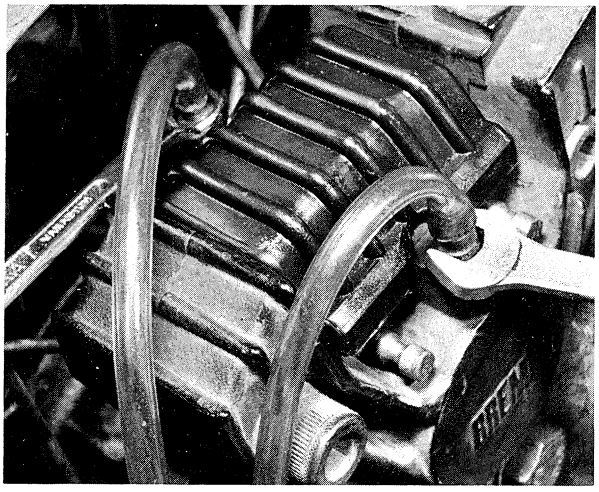


Fig. 6.4. Front brake master cylinder - Except V-1000 models

1 *Master cylinder*
2 *Reservoir chamber*
3 *Piston*
4 *Seal*
5 *Seal*
6 *Delivery hose*
7 *Piston return spring*
8 *Spring seat*
9 *Shim*
10 *Washer*
11 *Lock ring*
12 *Reservoir cap*
13 *Diaphragm*



7.4 Connect pipes to both nipples when bleeding brakes

8 Integrated brake system and rear caliper: maintenance and overhaul

1 The rear brake caliper is identical to the right-hand brake caliper. The checking of the pads, their overhaul and general maintenance is therefore the same.
2 Refer to Sections 4 and 5 of this Chapter for the relevant details.

9 Integrated brake master cylinder: examination and renovation

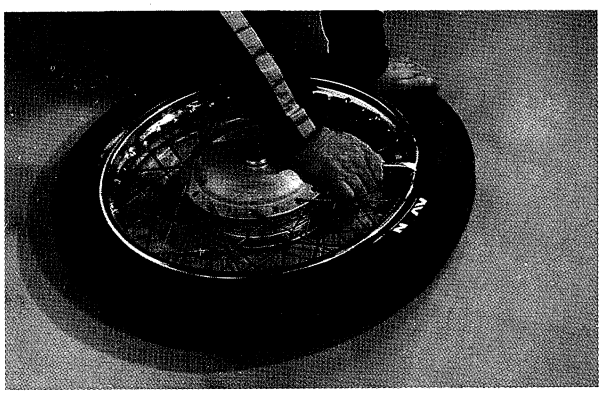
1 The combined rear brake and front left-hand brake master cylinder is mounted on the right-hand side of the machine and is operated from the rear brake pedal via a short link rod.
2 Before the master cylinder is disconnected, the system should be drained of fluid. Place a plastic tube on the bleed screw of each caliper and open the screws one complete turn. Depress and release the brake pedal until all the fluid has been expelled.
3 Place a rag under the banjo union at the rear of the master cylinder. Remove the banjo bolt and allow any excess fluid to drip onto the rag. Disconnect the brake link rod from the bell crank on the master cylinder by removing the split pin and washer. On V-1000 models, detach the two wires that lead to the brake fluid level switch in the reservoir cap. Both wires are a push fit.
4 Remove the nut and washer from the rear of the bell crank pivot stub behind the frame lug. The master cylinder may be lifted away after removal of the second mounting, which is a socket bolt.
5 The master cylinder is fundamentally the same type of unit as that utilised for the single front brake. Refer to Section 6 of this Chapter for dismantling and overhaul details.
6 After refitting the master cylinder and bleeding the system, adjust the clearance between the end of the bell crank and the piston to 0.15 mm (0.006 in) by means of the adjuster screw forward of the crank pivot.

10 Front wheel bearings: examination and replacement

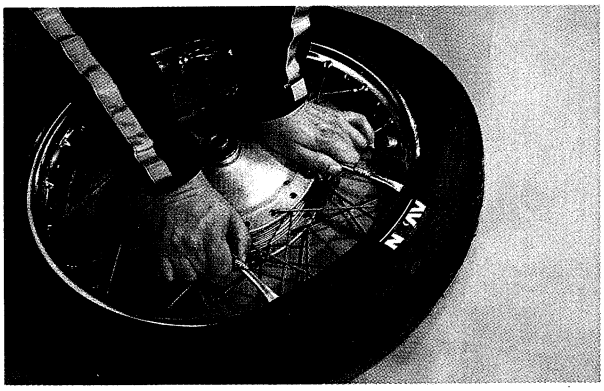
1 If wear has developed in the wheel bearings the front wheel should be removed to gain access to the bearings for renewal. Bearings should also be removed at the specified routine maintenance interval for cleaning, inspection and regreasing.
2 After removal of the retaining circlip from the left-hand side of the hub the wheel bearings can be drifted out of position, using a suitable drift. Support the wheel so the exit of the bearing is not obstructed. When the first bearing has been removed the spacer that lies between the two bearings can be removed. Insert the drift and drive out the opposite bearing.
3 Remove all the old grease from bearings and hub. Wash the bearings in petrol and dry them thoroughly. Check the bearings for roughness by spinning them whilst holding the inner track with one hand and rotating the outer track with the other. If there is the slightest sign of roughness renew them.
4 Before driving bearings back into the hub, pack the hub with new grease and also grease the bearings. Use the same double diameter drift to place them in position.
5 Some machines are fitted with pre-packed ball bearings which are sealed on both sides. The lubricant with which the bearings are packed on assembly will last the life of the bearing.

11 Removing and replacing the discs

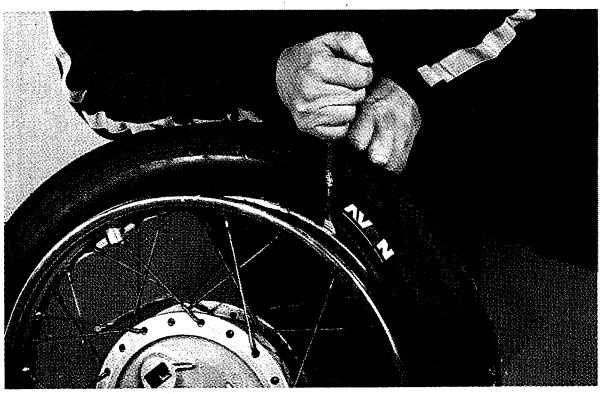
1 It is unlikely that the brake discs will require attention unless bad scoring has developed or the discs have warped. To detach the discs first remove the wheel in question.
2 Each disc is retained against a thick spacer on the hub by six long bolts passing through the hub, the nuts of which are secured in pairs by locking plates. Where two discs are employed on one hub the bolts pass through all the components. Bend down the ears of the locking plates and remove the nuts. Remove the disc complete with spacer and drift the spacer boss out of the centre of the disc.



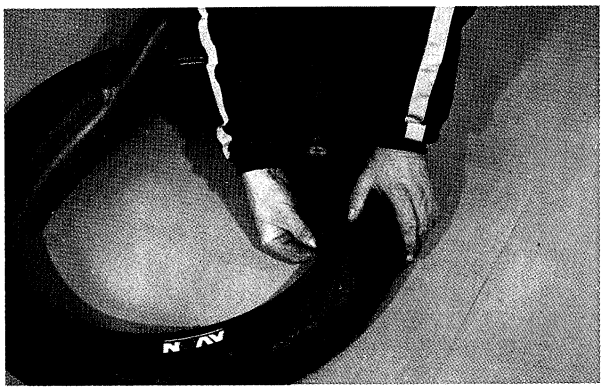
Tyre removal: Deflate inner tube and insert lever in close proximity to tyre valve



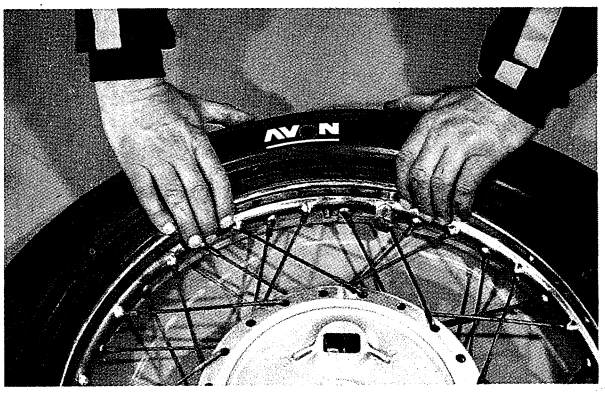
Use two levers to work bead over the edge of rim



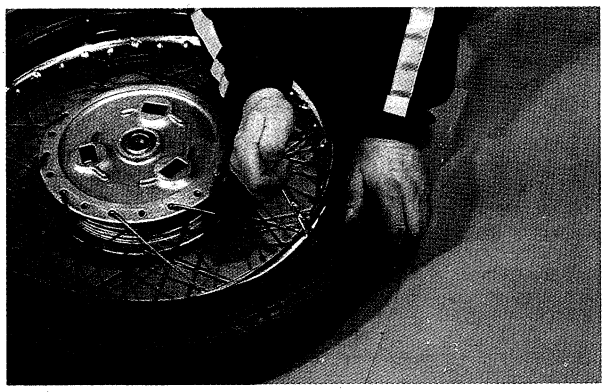
When first bead is clear, remove tyre as shown



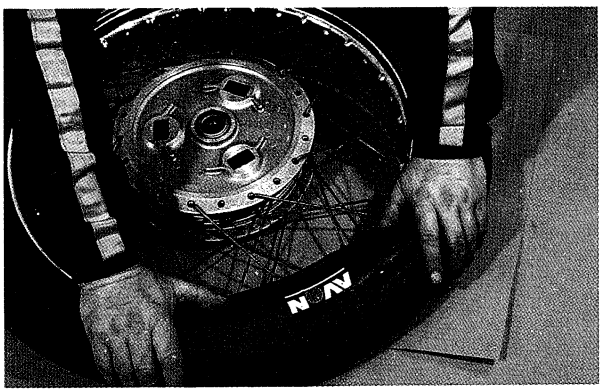
Tyre fitting: Inflate inner tube and insert in tyre



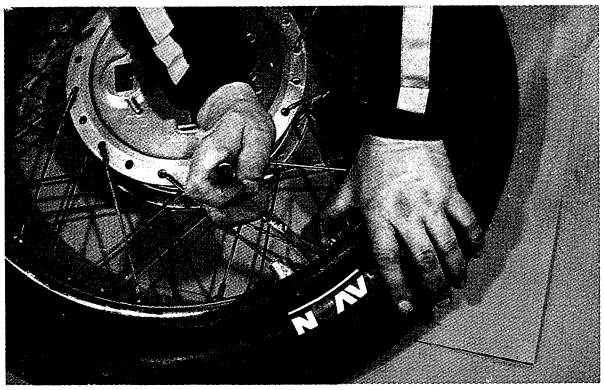
Lay tyre on rim and feed valve through hole in rim



Work first bead over rim, using lever in final section



Use similar technique for second bead, finish at tyre valve position



Push valve and tube up into tyre when fitting final section, to avoid trapping

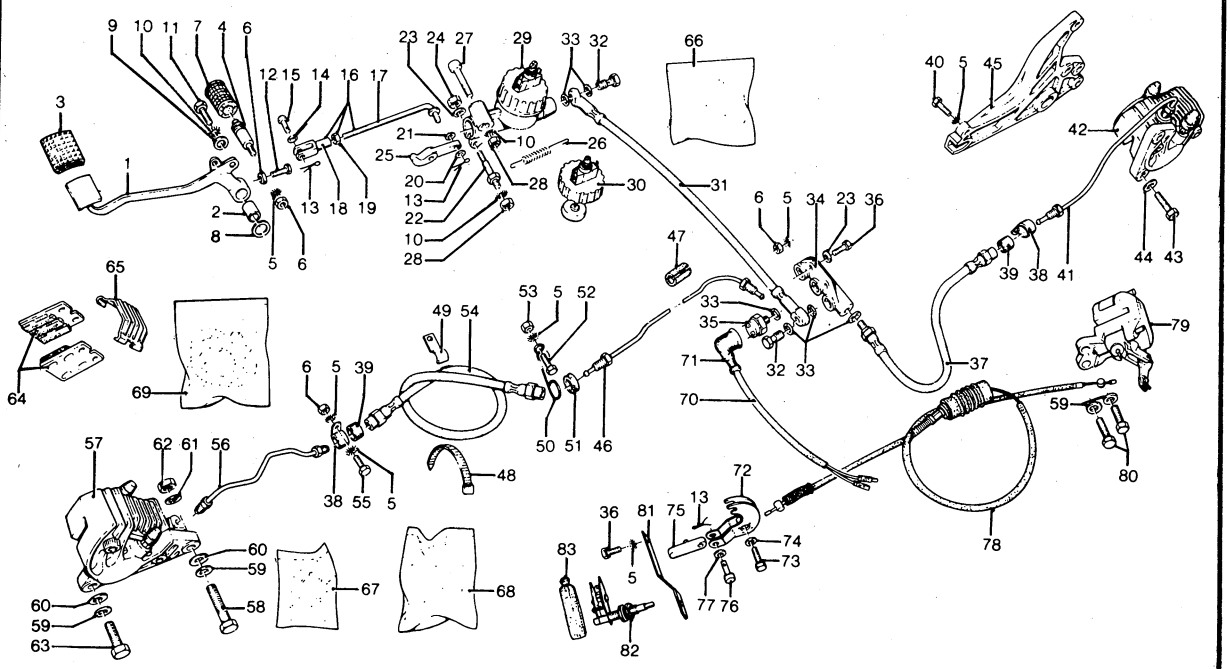
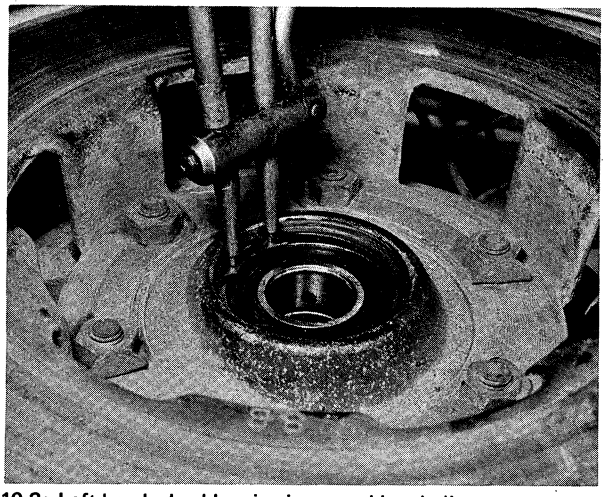
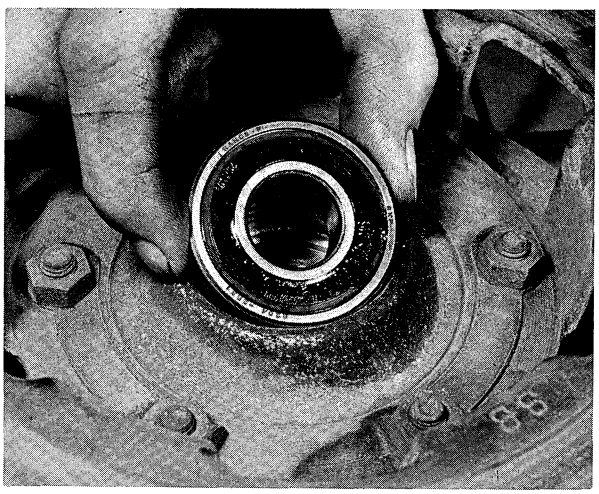


Fig. 6.5. Integrated front and rear brake system

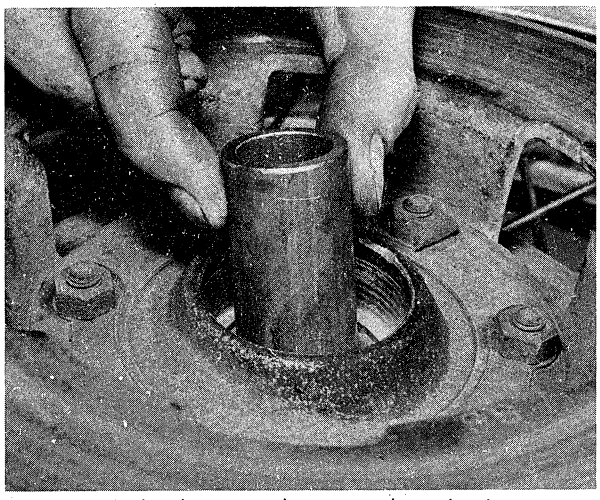
1 *Brake pedal*
2 *Bush*
3 *Rubber*
4 *Pivot pin*
5 *Star washer - 7 off*
6 *Nut - 5 off*
7 *Rubber*
8 *Washer*
9 *Washer*
10 *Star washer - 2 off*
11 *Bolt*
12 *Bolt*
13 *Split pin - 3 off*
14 *Washer*
15 *Clevis pin*
16 *Operating rod*
17 *Link rod*
18 *Clevis fork*
19 *Locknut*
20 *Washer*
21 *Star washer*
22 *Star washer*
23 *Washer - 5 off*
24 *Self locking nut*
25 *Bell crank*
26 *Return spring*
27 *Bolt*
28 *Nut*
29 *Master cylinder*
30 *Cap/fluid level switch*
31 *Brake hose*
32 *Banjo bolt - 2 off*
33 *Sealing washer - 6 off*
34 *Hose junction*
35 *Stop light switch*
36 *Bolt - 4 off*
37 *Brake hose*
38 *Clip - 2 off*
39 *Rubber sleeve - 2 off*
40 *Bolt*
41 *Brake pipe*
42 *Caliper*
43 *Bolt - 2 off*
44 *Washer - 2 off*
45 *Caliper mounting bracket*
46 *Brake pipe*
47 *Rubber sleeve*
48 *Strap*
49 *Clip*
50 *Guide clip*
51 *Grommet*
52 *Bolt*
53 *Nut*
54 *Brake hose*
55 *Bolt*
56 *Brake pipe*
57 *LH front brake caliper*
58 *Bolt*
59 *Washer - 4 off*
60 *Shim - A/R*
61 *Star washer*
62 *Nut*
63 *Bolt*
64 *Brake pad - 2 off*
65 *Inspection cover*
66 *Master cylinder repair kit*
67 *Screw replacement kit*
68 *Clevis pin replacement kit*
69 *Seal kit*
70 *Stop light lead*
71 *Rubber boot*
72 *Parking brake lever*
73 *Bolt*
74 *Washer*
75 *Push bar*
76 *Clevis pin*
77 *Washer - 2 off*
78 *Parking brake cable*
79 *Parking brake caliper*
80 *Bolt - 2 off*
81 *Switch bracket*
82 *Ignition cut-out switch*
83 *Rubber boot*



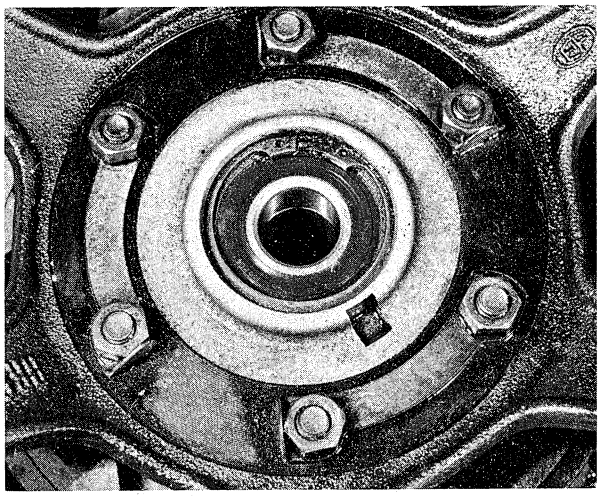
10.2a Left-hand wheel bearing is secured by circlip



10.2b Bearings may be drifted out



10.2c Note the bearing spacer; it must not be omitted



11.2 Disc is retained by 6 bolts and nuts

12 Rear wheel: examination and renovation

1 Place the machine on the centre stand so that the rear wheel is raised clear of the ground. Check for rim alignment, loose spokes etc, as described for the front wheel in Section 2 or 3, depending on the wheel type.

13 Rear drum brake: removal, examination and renovation. 750S and 850T models only

1 To gain access to the rear brake assembly remove the rear wheel as described in Chapter 5, Section 8.2-8.6. Lift the brake backplate out of the hub as a complete unit.
2 Inspect the brake linings for wear. Thin linings should be renewed after removing the two shoes from the brake backplate. Inspect the surface of the drum for scoring and ovality. The former fault will cause accelerated lining wear and reduced braking efficiency. The latter fault will cause brake judder.
3 After removal of the brake shoes the operating cam should be detached. Loosen the pinch bolt on the cam shaft and pull off the arm. Push the cam shaft from place. Clean and relubricate the cam shaft before refitting. Apply a small amount of heavy grease to the cam lobes.
4 If the brake shoe return springs are deformed or the spring ends are worn, the springs should be renewed as a pair.

14 Rear wheel bearings: examination and adjustment

1 On all but 750S and 850T models removal and examination of the rear wheels is similar to that given in Section 10 of this Chapter for the front wheel bearings. As with the front wheel, the left-hand bearing is retained by a circlip.
2 Models fitted with drum rear brakes utilise two tapered roller wheel bearings which allow adjustment to be made to take up normal wear. If discernable play can be felt at the wheel rim, the bearings should be removed for inspection, adjustment and regreasing.
3 Remove the wheel and lift the brake backplate assembly from the hub. Pull out the wheel spacers from the oil seals. The oil seals must be prised from position, using a screwdriver blade. If great care is taken not to distort the housings or damage the sealing lips, the seal can be reused. Lift out the bearing inner races. Do not allow the races to become interchanged; if they are to be refitted, they must be replaced in the same positions. Remove the bearing spacer.
4 Wash all the components, including the outer races in the hub, in petrol and then dry them thoroughly. Check the roller tracks and the rollers for pitting or scoring. If wear is evident the outer races may be drifted out using a suitable long punch inserted from the opposite side of the hub. If slight bearing wear was evident with the wheel on the machine, but no shims were found between the left-hand bearing inner race and the bearing spacers, the bearing must be renewed. New bearings or old bearings with shims already fitted should be adjusted, using shims available for this purpose.
5 Reassemble all the components, except the oil seals in the hub, with a shim between the left-hand bearing and bearing spacer to give zero end play in the bearings. Use the wheel spindle and a suitable tubular spacer to tighten the assembly together. Some experimentation will be required to arrive at the correct shim size. Dismantle the bearing assembly and add one 0.10 mm (0.019 in) shim to those already selected. When the bearings are refitted finally, the correct endfloat will automatically be provided.
6 Repack the bearings with a high melting point grease and replace all the components by reversing the dismantling procedure. The wheel can now be refitted to the machine.

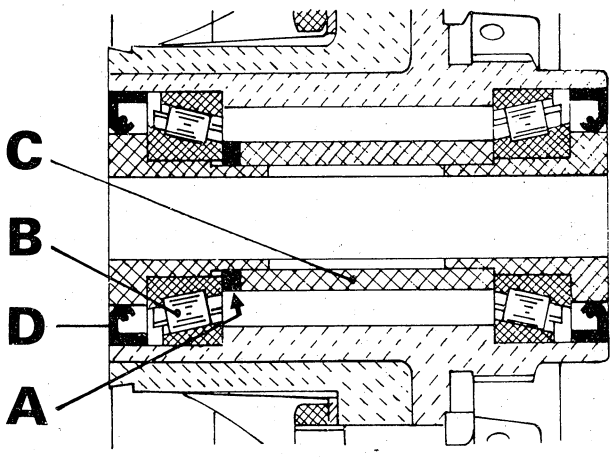


Fig. 6.6. Rear wheel bearing adjustment - 750S and 850T

A = Shims as required
B = Bearing - 2 off
C = Bearing spacer
D = Oil seal - 2 off

15 Cush drive assembly: removal, examination and replacement

1 A cush drive assembly is fitted to all but the 750S and 850T models, to absorb snatch loads in the transmission. The assembly consists of a floating plate with a splined boss which locates with the output boss on the rear bevel drive box. Webs on the inner face of the plate locate with rubber buffers placed in the rear wheel hub, which are prevented from rotation by webs cast into the hub. After considerable service the rubber inserts will compact, giving a noticeable backlash before the drive is taken up.

2 Access to the cush drive unit can be made after removal of the rear wheel from the frame. Remove the locking plate and prise the large circlip from the wheel hub. A large screwdriver is ideal for this operation. It should be possible to lift the cush drive plate straight off the steel sleeve in the centre of the hub. No provision is made for lubricating the hub sleeve and cush drive boss working surfaces after assembly. Because of this, the sleeve and boss may have rusted, making dismantling difficult. Apply a penetrating fluid to the small gap between the sleeve and boss, and allow the fluid time to penetrate.

3 After removal of the drive plate lift out the twelve rubber buffer inserts. These should be discarded if they are compacted or are disintegrating. Reassemble the cush drive by reversing the dismantling procedure. Ensure that the sleeve and boss are well greased. The stepped side of the circlip must face upwards.

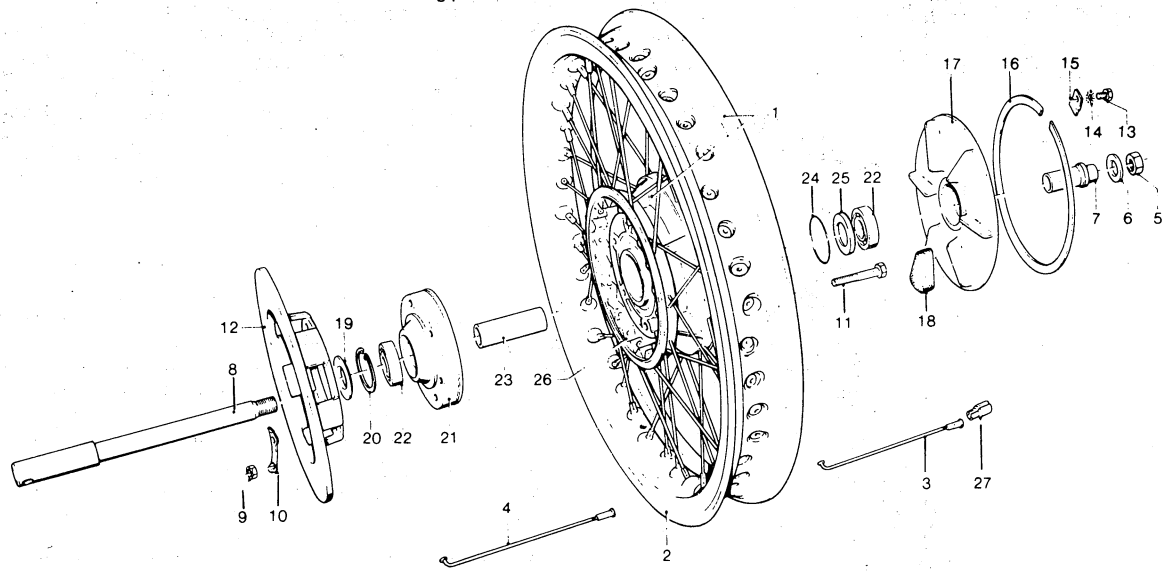
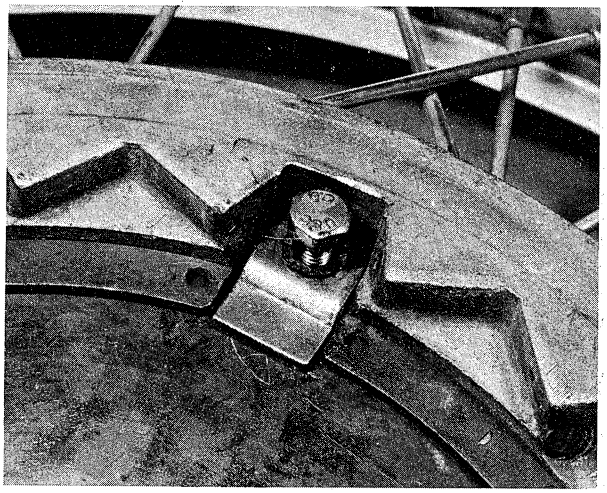
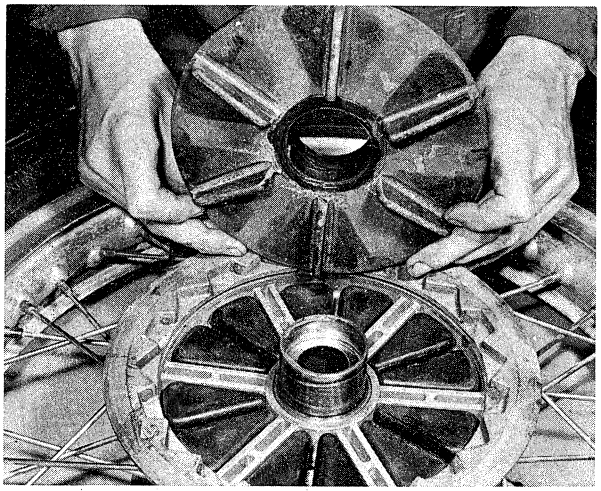


Fig. 6.7. Rear wheel and cush drive - Except 750S and 850T

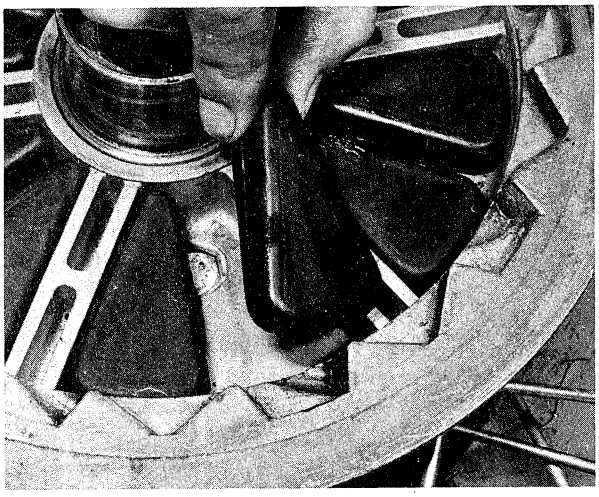
1 *Rear wheel*
2 *Rim*
3 *RH spoke and nipple - 20 off*
4 *LH spoke and nipple - 20 off*
5 *Nut*
6 *Washer*
7 *Spacer*
8 *Wheel spindle*
9 *Nut - 6 off*
10 *Lock plate - 3 off*
11 *Bolt - 6 off*
12 *Brake disc*
13 *Bolt*
14 *Star washer*
15 *Lock plate*
16 *Circlip*
17 *Cush drive plate*
18 *Rubber insert - 12 off*
19 *Spacer*
20 *Circlip*
21 *Disc spacer*
22 *Journal ball bearing - 2 off*
23 *Journal ball bearing - 2 off*
24 *'O' ring*
25 *Cup*
26 *Hub*
27 *Balance weight*



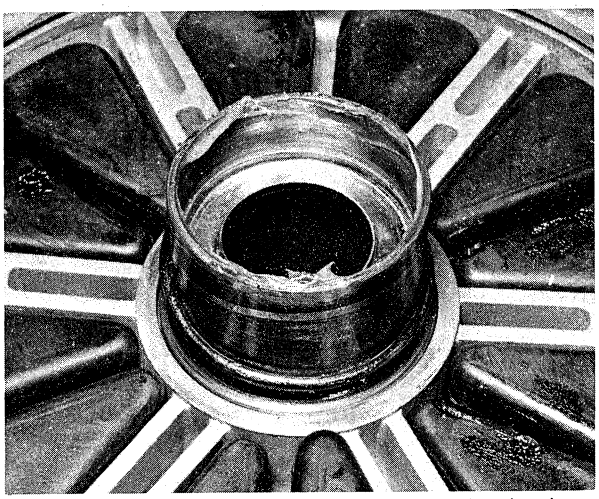
15.2a Remove the locking bolt and plate and circlip



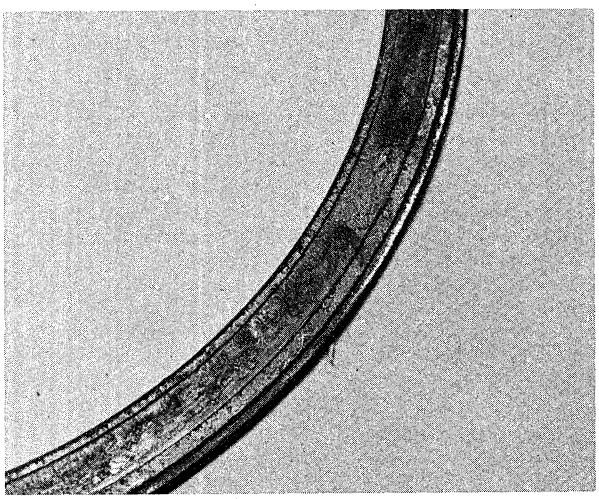
15.2b Lift off the cush drive plate



15.3a Cush drive consists of twelve separate inserts



15.3b Grease the cush drive boss heavily before fitting the plate



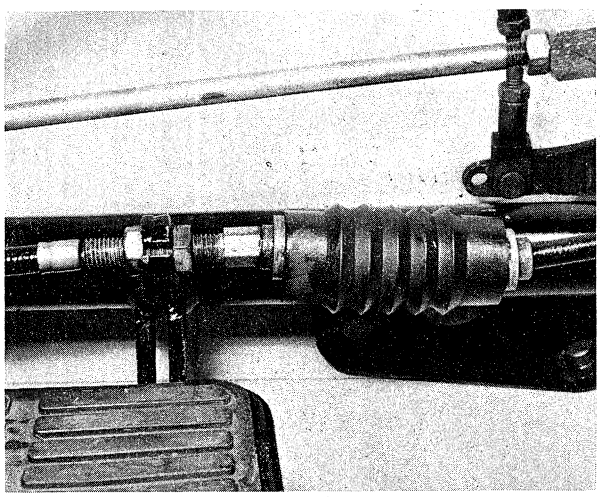
15.3c Shouldered face of circlip must face outwards

16 Parking brake: adjustment and maintenance

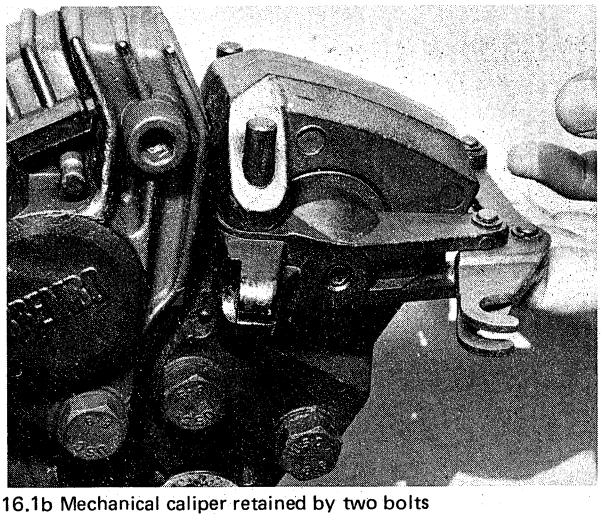
1 A mechanical caliper is fitted to the rear brake caliper bracket, to the rear of the standard hydraulic caliper, to act as a parking brake when the machine is at rest. The caliper is operated by the prop stand via a cable.

2 If the brake does not prevent movement of the machine when the stand is extended, adjustment may be made by means of the adjuster screw at the forward end of the cable.

3 Because the brake pads are rarely subjected to wear caused by the rotating disc, they will have a very long life, probably that of the machine itself. Maintenance is minimal, requiring only lubrication of the pivot points on the mechanical linkage at the caliper and of the pivot and push bar arrangement at the propstand.



16.1a Adjustment of parking brake cable - V1000 models



16.1b Mechanical caliper retained by two bolts

17 Tyres: removal and replacement

1 At some time or other the need will arise to remove and replace the tyres, either as the result of a puncture or because a renewal is required to offset wear. To the inexperienced, tyre changing represents a formidable task yet if a few simple rules are observed and the technique learned, the whole operation is surprisingly simple.
2 To remove the tyre from the wheel, first detach the wheel from the machine by following the procedure in Chapter 5, Section 2.7 for the front wheel and Section 8, paragraphs 5 and 6 for the rear wheel. Deflate the tyre by removing the valve insert and when it is fully deflated, push the bead of the tyre away from the wheel rim on both sides so that the bead enters the centre well of the rim. Remove the locking cap and push the tyre valve into the tyre itself.
3 Insert a tyre lever close to the valve and lever the edge of the tyre over the outside of the wheel rim. Very little force should be necessary; if resistance is encountered it is probably due to the fact that the tyre beads have not entered the well of the wheel rim all the way round the tyre.
4 Once the tyre has been edged over the wheel rim, it is easy to work around the wheel rim so that the tyre is completely free on one side. At this stage, the inner tube can be removed.
5 Working from the other side of the wheel ease the other edge of the tyre over the outside of the wheel rim furthest away. Continue to work around the rim until the tyre is free from the rim.
6 If a puncture has necessitated the removal of the tyre, reinflate the inner tube and immerse it in a bowl of water to trace the source of the leak. Mark its position and deflate the tube. Dry the tube and clean the area around the puncture with a petrol-soaked rag. When the surface has dried, apply rubber solution and allow this to dry before removing the backing from the patch and applying the patch to the surface.
7 It is best to use a patch of the self-vulcanising type, which will form a very permanent repair. Note that it may be necessary to remove a protective covering from the top surface of the patch, after it has sealed in position. Inner tubes made from synthetic rubber may require a special type of patch and adhesive, if a satisfactory bond is to be achieved.
8 Before replacing the tyre, check the inside to make sure the agent that caused the puncture is not trapped. Check also the outside of the tyre, particularly the tread area, to make sure nothing is trapped that may cause a further puncture.
9 If the inner tube has been patched on a number of past occasions, or if there is a tear or large hole, it is preferable to discard it and fit a new one. Sudden deflation may cause an accident, particularly if it occurs with the front wheel.
10 To replace the tyre, inflate the inner tube sufficiently for it to assume a circular shape but only just. Then push it into the tyre so that it is enclosed completely. Lay the tyre on the wheel at an angle and insert the valve through the rim tape and the hole in the wheel rim. Attach the locking cap on the first few threads, sufficient to hold the valve captive in its correct location.
11 Starting at the point furthest from the valve, push the tyre bead over the edge of the wheel rim until it is located in the central well. Continue to work around the tyre in this fashion until the whole of one side of the tyre is on the rim. It may be necessary to use a tyre lever during the final stages.
12 Make sure there is no pull on the tyre valve and again commencing with the area furthest from the valve, ease the other bead of the tyre over the edge of the rim. Finish with the area close to the valve, pushing the valve up into the tyre until the locking cap touches the rim. This will ensure the inner tube is not trapped when the last section of the bead is edged over the rim with a tyre lever.
13 Check that the inner tube is not trapped at any point. Reinflate the inner tube, and check that the tyre is seating correctly around the wheel rim. There should be a thin rib moulded around the wall of the tyre on both sides, which should be equidistant from the wheel rim at all points. If the tyre is unevenly located on the rim, try bouncing the wheel when the tyre is at the recommended pressure. It is probable that one of the beads has not pulled clear of the centre well.
14 Always run the tyres at the recommended pressures and never under or over-inflate. The correct pressures for solo use are given in the Specifications Section of this Chapter.
15 Tyre replacement is aided by dusting the side walls, particularly in the vicinity of the beads, with a liberal coating of French Chalk. Washing-up liquid can also be used to good effect, but this has the disadvantage of causing the inner surfaces of the wheel rim to corrode.
16 Never replace the inner tube and tyre without the rim tape in position. If this precaution is overlooked there is good chance of the ends of the spoke nipples chafing the inner tube and causing a crop of punctures.
17 Never fit a tyre that has a damaged tread or side walls. Apart from the legal aspects, there is a very great risk of blow-out, which can have serious consequences on any two-wheeled vehicle.
18 Tyre valves rarely give trouble, but it is always advisable to check whether the valve itself is leaking before removing the tyre. Do not forget to fit the dust cap, which forms an effective second seal.

18 Valve cores and caps

1 Valve cores seldom give trouble, but do not last indefinitely. Dirt under the seating will cause a puzzling 'slow-puncture'. Check that they are not leaking by applying spittle to the end of the valve and watching for air bubbles.
2 A valve cap is a safety device, and should always be fitted. Apart from keeping dirt out of the valve, it provides a second seal in case of valve failure, and may prevent an accident resulting from sudden deflation.

19 Front wheel balancing

1 The front wheel should be statically balanced, complete with tyre. An out of balance wheel can produce dangerous wobbling at high speed.
2 Some tyres have a balance mark on the sidewall. This must be positioned adjacent to the valve. Even so, the wheel still requires balancing.
3 With the front wheel clear of the ground, spin the wheel several times. Each time, it will probably come to rest in the same position. Balance weights should be attached diametrically opposite the heavy spot, until the wheel will not come to rest in any set position, when spun.
4 Balance weights, which clip round the spokes, are available in 5, 10 or 20 gramme weight. If they are not available, wire solder wrapped round the spokes and secured with insulating tape will make a substitute.
5 It is possible to have a wheel dynamically balanced at some dealers. This requires its removal.
6 There is no need to balance the rear wheel under normal road conditions, although any tyre balance mark should be aligned with the valve.
7 Machines fitted with cast aluminium wheels require special balancing weights which are designed to clip onto the centre rim flange, much in the way that weights are affixed to car wheels.

20 Fault diagnosis: wheels, brakes and tyres

Symptom	Cause	Remedy
Handlebars oscillate at low speeds	Buckled front wheel	Remove wheel for specialist attention. Renew wheel (cast alloy type).
	Incorrectly fitted front tyre	Check whether line around bead is equi-distant from rim.
Forks 'hammer' at high speeds	Front wheel out of balance	Add weights until wheel will stop in any position.
Brakes feel spongy	Air in hydraulic line	Bleed brakes.
	Fluid leak in system	Renew faulty part.
Tyres wear more rapidly in middle of tread	Over-inflation	Check pressures and run at recommended settings.
Tyres wear rapidly at outer edges of tread	Under-inflation	Check pressures and run at recommended settings.