Chapter 7
Brakes, wheels and tires

Note: *Unless specifically mentioned in this Chapter, the information given for the 1982 750 Sabre applies to the UK VF750S-C, and that for the 1987 and 1988 700/750 Magnas applies to the UK VF750C-H and C-J respectively.*

Contents

Section

Specifications

Disc brakes

Brake fluid type	See Chapter 1
Disc thickness (front brake)	
New	
1986 700 Magna model	4.5 to 5.2 mm (0.18 to 0.20 in)
All other models	4.8 to 5.2 mm (0.19 to 0.20 in)
Service limit	4.0 mm (0.20 in)
Disc thickness (rear brake)	
New	
1986 1100 Magna model	7.1 to 7.7 mm (0.280 to 0.303 in)
Other 1100 models	6.9 to 7.1 mm (0.272 to 0.280 in)
Service limit	
1986 1100 Magna model	6.6 mm (0.26 in)
Other 1100 models	6.0 mm (0.24 in)
Disc maximum runout	0.3 mm (0.012 in)
Caliper bore ID	
Front (700/750 models)	
New	30.23 to 30.28 mm (1.1902 to 1.1921 in)
Service limit	30.29 mm (1.1925 in)
Front (1100 models)	
New	32.03 to 32.08 mm (1.2610 to 1.2630 in)
Service limit	32.09 mm (1.263 in)
Rear (1100 models)	
New	30.23 to 30.28 mm (1.1902 to 1.1921 in)
Service limit	30.29 mm (1.193 in)
Caliper piston OD	
Front (700/750 models)	
New	30.148 to 30.198 mm (1.1869 to 1.1889 in)
Service limit	30.14 mm (1.1866 in)
Front (1100 models)	
New	31.948 to 31.998 mm (1.2578 to 1.2598 in)
Service limit	31.94 mm (1.258 in)
Rear (1100 models)	
New	30.148 to 30.198 mm (1.1869 to 1.1889 in)
Service limit	38.090 mm (1.500 in)
Front master cylinder bore ID	
1982 through 1986 models	
New	15.870 to 15.913 mm (0.6248 to 0.6265 in)
Service limit	15.93 mm (0.6272 in)
1987 and 1988 700/750 models	
New	12.700 to 12.743 mm (0.500 to 0.5016 in)
Service limit	12.755 mm (0.502 in)
Front master cylinder piston OD	
1982 through 1986 models	
New	15.827 to 15.854 mm (0.6231 to 0.6242 in)
Service limit	15.82 mm (0.6228 in)
1987 and 1988 700/750 models	
New	12.657 to 12.684 mm (0.498 to 0.499 in)
Service limit	12.645 mm (0.498 in)
Rear master cylinder bore ID (1100 models)	
New	14.000 to 14.043 mm (0.5512 to 0.5529 in)
Service limit	14.06 mm (0.553 in)
Rear master piston OD (1100 models)	
New	13.957 to 13.984 mm (0.5495 to 0.5506 in)
Service limit	13.95 mm (0.549 in)

Drum brake

Brake shoe lining thickness	
New	4.9 to 5.0 mm (0.19 to 0.20 in)
Service limit	2.0 mm (0.08 in)
Brake drum ID	
1985-on Magna models	
New	180.0 to 180.3 mm (7.09 to 7.10 in)
Service limit	181 mm (7.13 in)
All other models	
New	160.0 to 160.3 mm (6.30 to 6.31 in)
Service limit	161 mm (6.34 in)

Wheels

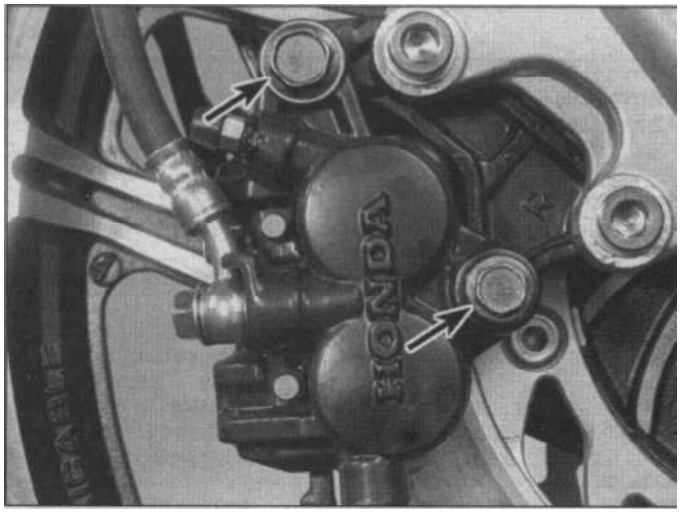
Maximum wheel runout (front and rear) Axial (side-to-side)	2.0 mm (0.08 in)
Radial (out-of-round)	2.0 mm (0.08 in)
Maximum axle runout (front and rear)	0.2 mm (0.01 in)

Tires

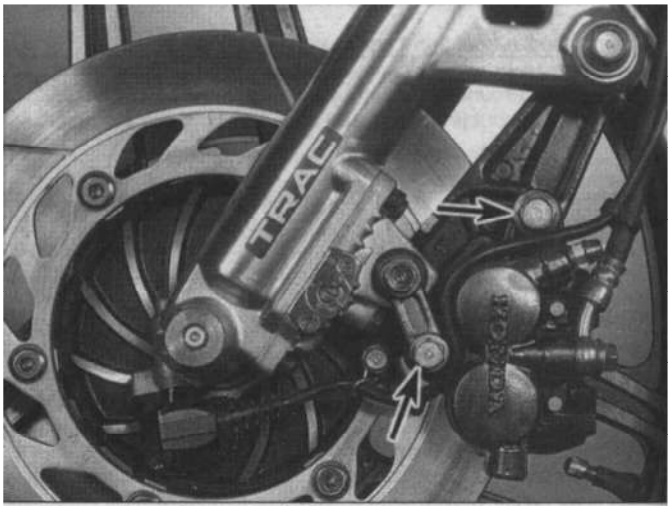
Tire pressures	See Chapter 1
Tire sizes	
Front	120/60VR17or120/60ZR17
Rear	160/60 VR 17 or 160/60 ZR 17

Torque settings	Nm	ft-lbs
Brake caliper-to-bracket bolts All Sabre models and 1982 through 1984 700/750 Magna models		
Upper bolt	25 to 30	18 to 22
Lower bolt	20 to 25	14 to 18
1985 and 1986 700 Magna models		
Upper bolt	30 to 40	22 to 29
Lower bolt	20 to 25	14 to 18
1987 and 1988 700/750 Magna models	25 to 30	18 to 22
1100.Magna models	Not available	
Front brake caliper bracket-to-fork slider bolts Upper bolt (to slider lug)		
All Sabres and 1982 through 1984 700/750 Magna models	30 to 40	22 to 29
1100 Magna and 1985/86700 Magna models	30 to 45	22 to 33
Lower bolt (to anti-dive unit)		
1100 Sabre models	10 to 14	7 to 10
1987 and 1988 700/750 Magna models	30 to 45	22 to 33
Brake disc retaining bolts		
1100 Sabre, 1983 through 1985 1100 Magna, 1982 through 1986 700/750 models	25 to 30	18 to 22
1986 1100 Magna, 1987 and 1988 700/750 models	37 to 43	27 to 31
Front master cylinder clamp bolts (1100 models)	10 to 14	7 to 10
Brake hose banjo bolts		
1985 and 1986 700 Magna and 1986 1100 Magna models	37 to 43	27 to 31
1100 Sabre models	25 to 40	18 to 29
All other models	25 to 35	18 to 25
Rear drum brake lever pinch bolt	24 to 30	17 to 22
Front wheel axle/axle nut	55 to 65	40 to 47
Front wheel axle pinch bolt(s) or nuts		
700/750 Sabre models	18 to 28	13 to 20
1982 through 1984 700/750 Magna models	15 to 25	11 to 18
1985 and 1986 700 Magna models	20 to 30	14 to 22
1987 and 1988 700/750 Magna models	18 to 25	13 to 18
1100 Sabre models	20 to 30	14 to 22
1100 Magna models	18 to 30	13 to 22
Rear wheel axle nut		
1985-on 700/750 Magna models	85 to 105	61 to 76
All other 700/750 models	60 to 80	43 to 58
1986 1100 Magna model	80 to 100	58 to 72
All other 1100 models	85 to 105	61 to 76

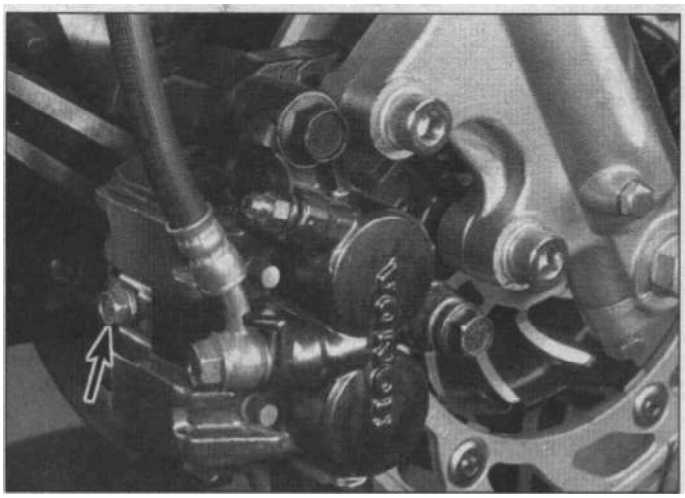
Rear wheel axle pinch bolt	20 to 30	14 to 22
Brake panel stop bolt	35 to 45	25 to 33
Brake panel-to-torque arm bolt	15 to 25	11 to 18
Final driven flange bolts (1983-on 700/750 Sabre models)	50 to 60	36 to 43



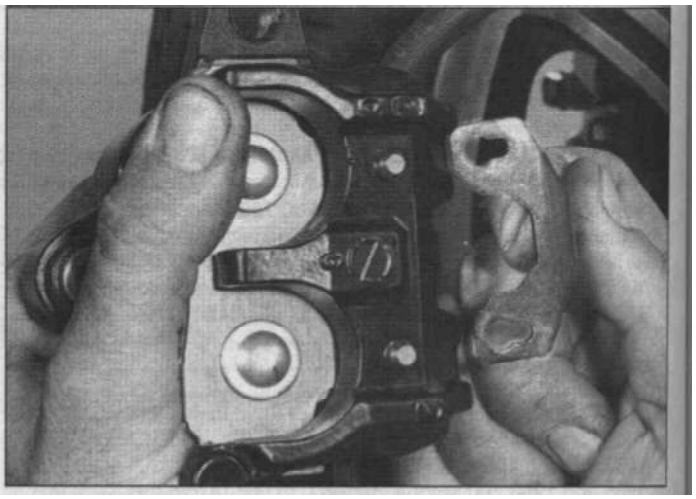
2.1 a Caliper body-to-bracket mounting bolts (arrows) on right side ...



2.1b … and on left side (arrows)



2.2a Remove the pad pin retainer plate bolt (arrow)..



2.2b ... disengage the plate from the pin grooves ...

General information

The models covered in this manual are fitted with cast aluminum wheels designed to accept tubeless tires. The rear wheel of 1987 and 1988 700/750 Magna models is of the disc type, with a removable cover on the left side.

The front brake is a hydraulically-operated twin disc on 1982 through 1986 models, and a single disc on 1987 and 1988 700/750 Magna models; in all cases twin-piston brake calipers are fitted. The rear brake is a rod-operated drum on 700/750 models and a hydraulically-operated disc on 1100 models.

Caution: *Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If any hydraulic brake line is loosened, the entire system be disassembled, drained, cleaned and then properly filled and bled upon reassembly. Do not use solvents on internal brake components. Solvents will cause the seals to swell and distort. Use only clean brake fluid or alcohol for cleaning. Use care when working with brake fluid as it can injure your eyes and it will damage painted surfaces and plastic parts.*

2 Front brake pads - replacement

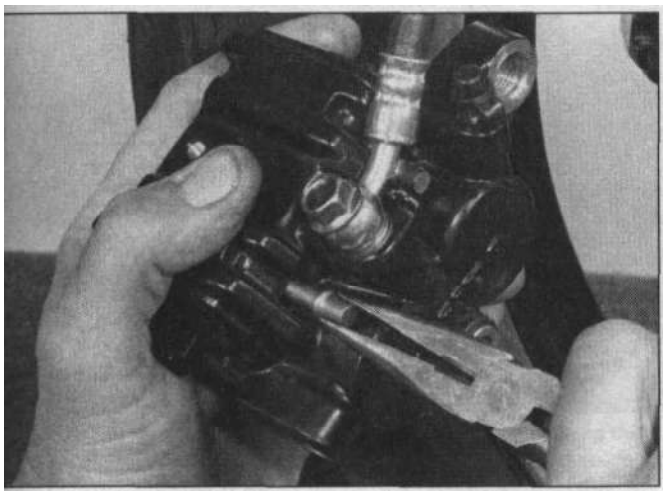
Warning: *When replacing the front brake pads on models with twin discs, always replace the pads in BOTH calipers - never just on one side. The dust created by the brake system may contain asbestos, which is harmful to your health. Never blow it out with compressed air and don't inhale any of it. An approved filtering mask should be worn when wor ing on the bra es. Refer to illustrations 2.1a, 2.1b, 2.2a, 2.2b, 2.2c, 2.3, 2.4 and 2.11*

1 Remove the caliper body-to-bracket mounting bolts and slide the caliper off the disc, leaving the bracket attached to the fork slider (see **illustrations).** Support the caliper while it is removed so that no strain is placed on its hydraulic hose.

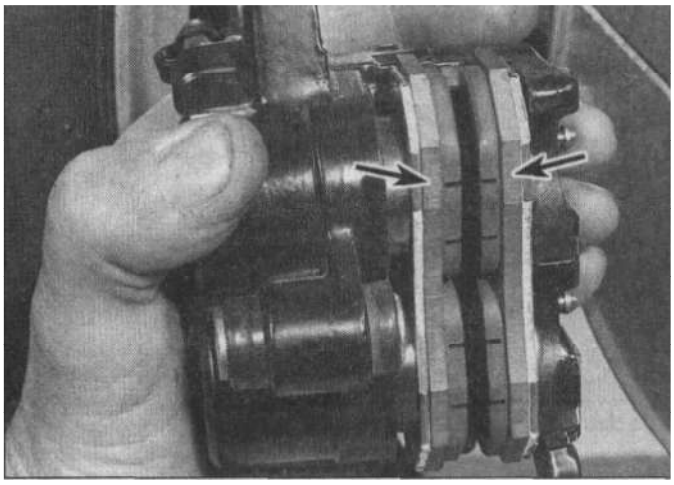
2 Remove the bolt that retains the pad pin retainer to the caliper, then disengage the retainer from the pins and pull both pins out of the caliper **(see illustrations).**

3 Lift out the brake pads **(see illustration).** The pad spring can be left in position in the caliper.

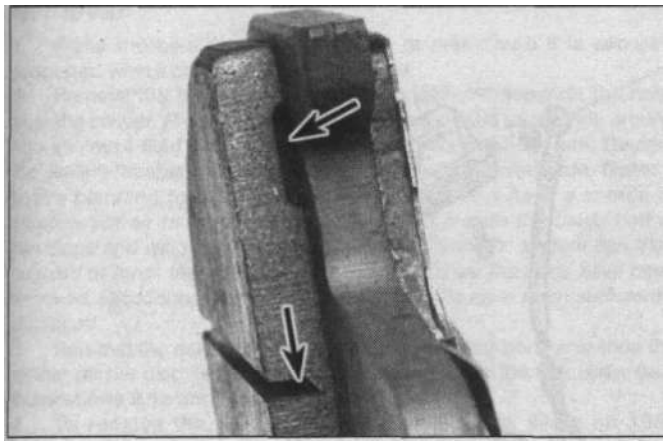
4 Inspect the surface of each pad for contamination and check that the friction material has not worn beyond its service limit groove, or



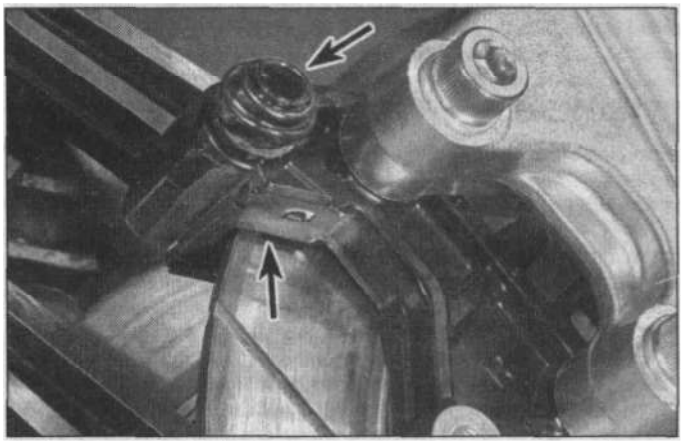
2.2c ... and pull the pins out with pliers



2.3 Lift the brake pads (arrows) out of the caliper



2.4 Brake pad service limit groove (lower arrow) and cutout (upper arrow)



2.11 Anti-rattle spring position (lower arrow). Upper mounting dust boot (upper arrow)

down to expose the cutout in the pad's rear edge; if worn down to this point or are approaching it, the pads must be replaced **(see illustration).** Similarly, if either pad is fouled with oil or grease, or heavily scored or damaged by dirt and debris, both pads must be replaced as a set. Note that it is not possible to degrease the friction material; if the pads are contaminated in any way they must be replaced.

5 If the pads are in good condition clean them carefully, using a fine wire brush which is completely free of oil and grease, to remove all traces of road dirt and corrosion. Using a pointed instrument, clean out the grooves in the friction material and dig out any embedded particles of foreign matter. Any areas of glazing may be removed using emery cloth.

6 Check the condition of the brake disc (see Section 4).

7 Remove all traces of corrosion from the pad pins. Inspect the pins and pad spring for signs of damage and replace if necessary. Also check the anti-rattle spring fitted to the top of the caliper bracket.

8 If installing new pads, push the pistons as far back into the caliper as possible using hand pressure only. Due to the increased friction material thickness of new pads, it may be necessary to remove the master cylinder reservoir cap, plate (where fitted) and diaphragm and syphon out some fluid.

9 Insert the pads into the caliper, ensuring the pad spring remains correctly positioned, so that the friction material of each pad is facing the disc. Insert one pad retaining pin making sure that it passes through the holes in both pads and into the caliper body, then hold both pads firmly against the rear of the caliper body to enable the remaining pin to be installed.

10 Install the pin retainer plate, pressing its slots into the pin grooves to lock them in place. Tighten the retainer plate screw securely.

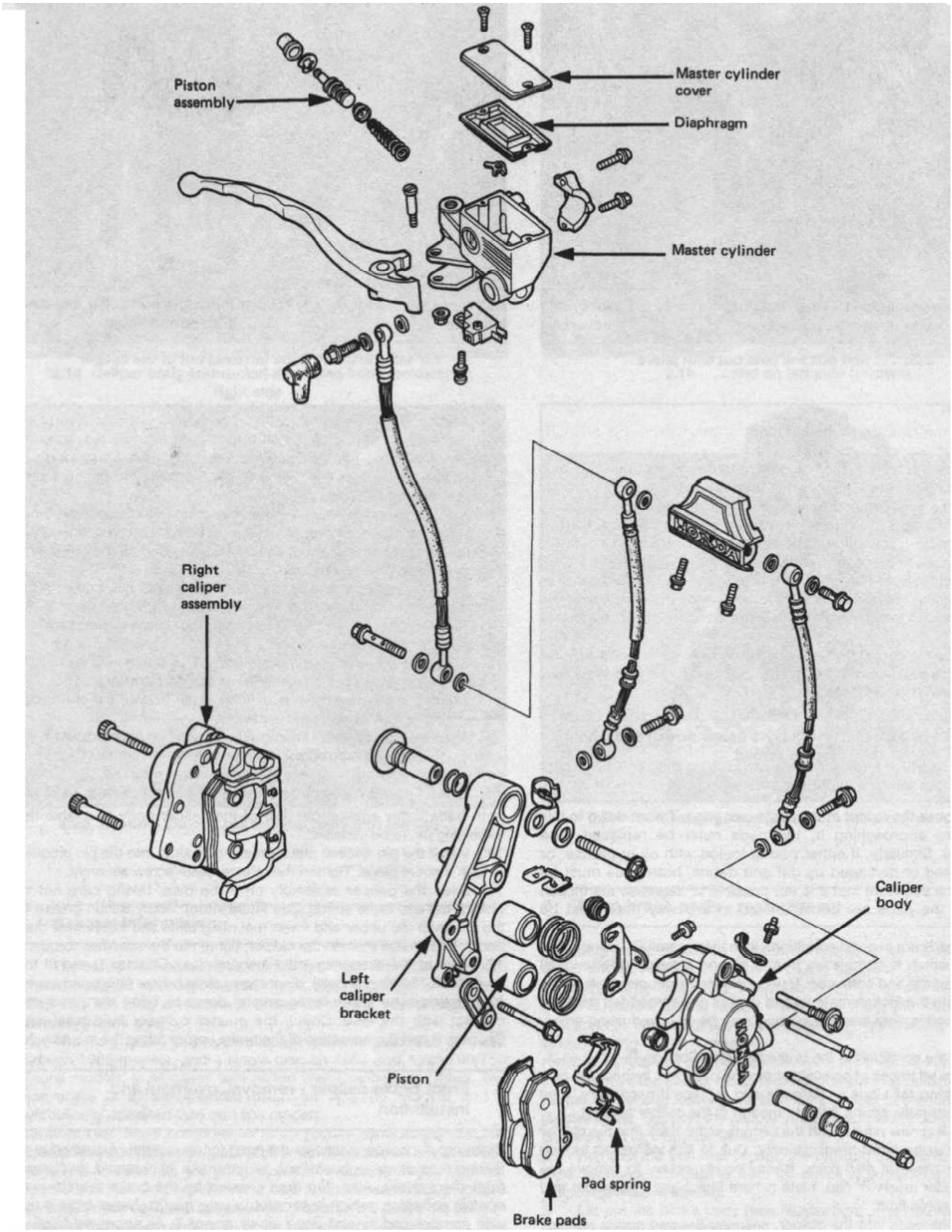
11 Slide the caliper assembly onto the disc, taking care not to disturb the anti-rattle spring **(see illustration).** Apply silicon grease to the shafts of the upper and lower mounting bolts and inside their dust boots, then install them in the caliper; tighten to the specified torque.

12 Top up the master cylinder reservoir (see Chapter 1) and fit the float (1988 750 Magna only), diaphragm, plate (where fitted) and cover.

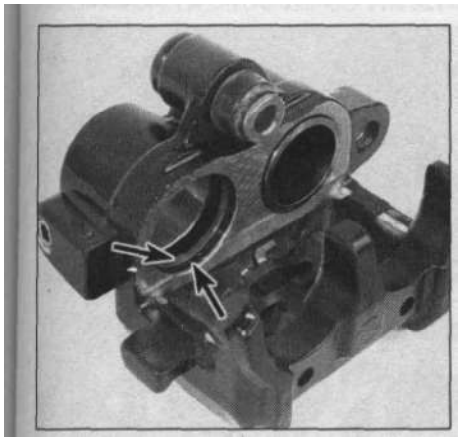
13 Operate the brake lever several times to bring the pads into contact with the disc. Check the master cylinder fluid level (see Chapter 1) and the operation of the brake before riding the motorcycle.

3 Front brake caliper - removal, overhaul and installation

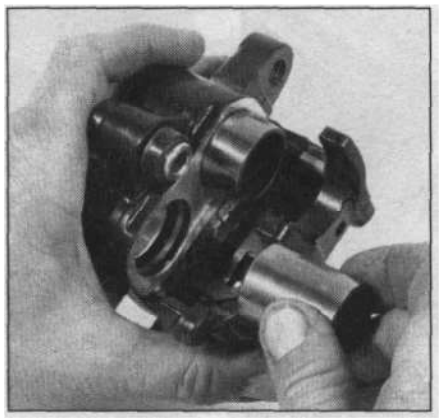
Warning: *If a caliper indicates the need for an overhaul (usually due to leaking fluid or sticky operation), all old brake fluid should be flushed from the system. A/so, the dust created by the brake system may contain asbestos, which is harmful to your health. Never blow it out with compressed air and don't inhale any of it. An approved filtering mask should be worn when working on the brakes. Do not, under any circumstances, use petroleum-based solvents to clean brake parts. Use clean brake fluid, brake cleaner or denatured alcohol only.*



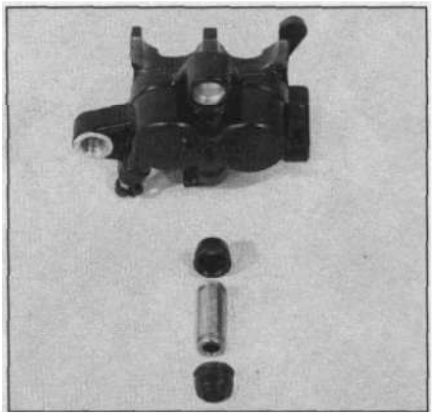
3.6 Front brake components (typical)



3.14 Piston seal (upper arrow) and dust seal (lower arrow) locations in caliper bore



3.16 Ensure that the pistons are inserted squarely into their bores



3.17 Lower mounting bolt collar and dust boot arrangement

Removal

1 Place the bike on its main stand, or make sure it is securely supported where only a side stand is fitted.

2 Remove the brake hose banjo fitting bolt and separate the hose from the caliper. Plug the hose end or wrap a plastic bag tightly around it to minimize fluid loss and prevent dirt entering the system. Discard the sealing washers; new ones must be used on installation. **Note:** *If you're planning to overhaul the caliper and don't have a source of compressed air to blow out the pistons, just loosen the banjo bolt at this stage and retighten it lightly. The bike's hydraulic system can then be used to force the pistons out of the body once the pads have been removed. Disconnect the hose once the pistons have been sufficiently displaced.*

3 Remove the caliper body-to-bracket mounting bolts and slide the caliper off the disc, leaving the bracket attached to the fork slider **(see illustrations 2.1 a and 2.1b).**

4 To remove the caliper bracket from the fork slider on 1982 through 1986 models, remove the two bolts which retain it to the slider lugs (right side) or the upper bolt which retains it to the slider lug and the lower bolt which retains it to the anti-dive housing (left side). Note the exact order and position of any collars, cable guides, washers and dust seals at each mounting. Slip the speedometer cable/sensor wire out of the wire guide on the left caliper bracket.

5 On 1987 and 1988 models, the caliper bracket is retained to the slider lugs by two chrome-headed bolts. Slip the speedometer cable out of the wire guide on the bracket.

Overhaul

Refer to illustrations 3.6, 3.14,3.16 and 3.17

6 Clean the exterior of the caliper with denatured alcohol or brake system cleaner **(see illustration).**

7 Remove the brake pads from the caliper body (see Section 2), then lift out the pad spring.

8 If the pistons weren't forced out using the bike's hydraulic system, place a wad of rag between the piston and caliper frame to act as a cushion, then use compressed air directed into the fluid inlet to force the pistons out of the body. Use only low air pressure to ease the pistons out and make sure both pistons are displaced at the same time. If the air pressure is too high and the pistons are forced out, the caliper and/or pistons may be damaged. **Warning:** *Never place your fingers in front of the pistons in an attempt to catch or protect them when applying compressed air, as serious injury could result. Keep each piston with its bore to ensure that they are not interchanged on reassembly (label them if necessary).*

9 Using a wooden or plastic tool, remove the dust seals from the caliper bores. If a metal tool is being used, take great care not to damage the caliper bores.

10 Remove both the piston seals in the same way.

11 Clean the pistons and bores with denatured alcohol, clean brake fluid or brake system cleaner. **Caution:** Do *not, under any circumstances, use a petroleum-based solvent to clean brake parts.* If compressed air is available, use it to dry the parts thoroughly (make sure it's filtered and unlubricated).

12 Inspect the caliper bores and pistons for signs of corrosion, nicks and burrs and loss of plating. If surface defects are present, the caliper assembly must be replaced. If the caliper is in bad shape the master cylinder should also be checked.

13 If the necessary measuring equipment is available, compare the dimensions of the caliper bores and pistons to those given in the Specifications Section of this Chapter, replacing any component that is worn beyond the service limit.

14 Lubricate the new piston seals with clean brake fluid and install them in their grooves in the caliper bores **(see illustration).**

15 Lubricate the new dust seals with clean brake fluid and install them in their grooves in the caliper bores.

16 Lubricate the pistons with clean brake fluid and install them in the caliper bores **(see illustration).** Using your thumbs, push the pistons all the way in, making sure they enter their bores squarely.

17 Carefully remove the outside dust boots from the lower mounting bolt hole in the caliper, then slip the collar out of the caliper body **(see illustration).** Check the condition of the dust boots and replace them if split or cracked. Check the condition of the dust boot situated between the caliper body and bracket on the upper mounting bolt.

18 Lay the pad spring in place in the caliper. Apply a very thin coat of silicon grease to the lower mounting bolt collar and slip it into the caliper body; install the dust boots on each side of the collar, making sure they are properly seated in the collar grooves.

19 Install the brake pads (see Section 2).

Installation

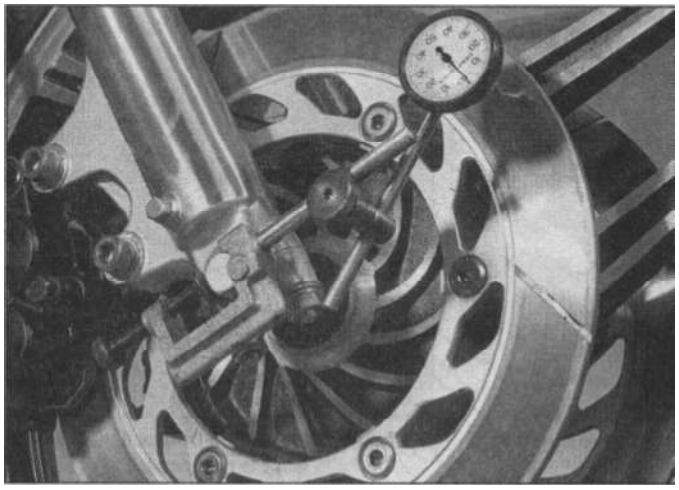
20 If removed from the fork slider, install the caliper bracket. Tighten the caliper bracket bolts to the specified torque (where given). Make sure that the anti-rattle spring is properly installed on the bracket **(see illustration 2.11).**

21 Install the caliper on the bracket, apply silicon grease to the shafts of the caliper mounting bolts and install them in the caliper; tighten them to the specified torque.

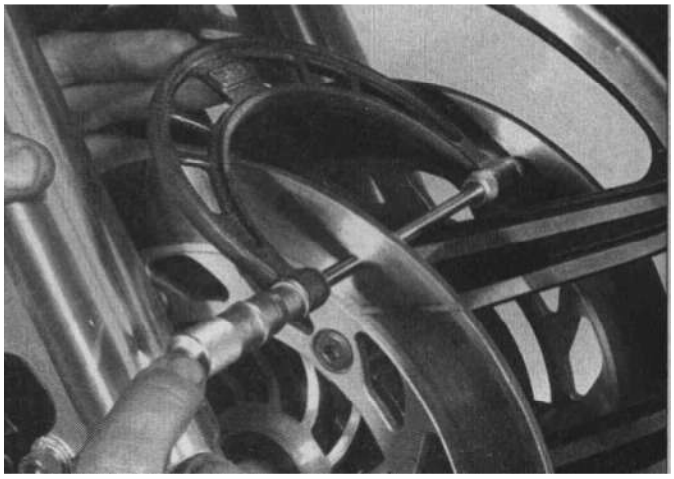
22 Connect the brake hose to the caliper, using new sealing washers on each side of the fitting. Tighten the banjo fitting bolt to the specified torque setting.

23 Fill the master cylinder with the recommended brake fluid (see Chapter 1) and bleed the hydraulic system as described in Section 11.

24 Check for leaks and thoroughly test the operation of the brake before riding the motorcycle.



4.3 Measuring disc runout



4.5 Measuring disc thickness

4 Front brake discs - inspection, removal and installation

Inspection

Refer to illustrations 4.3 and 4.5

1 Set the bike on its main stand. Where no main stand is fitted, support the bike securely under the crankcase so that the front wheel is raised off the ground.

2 Visually inspect the surface of the discs for score marks and other damage. Light scratches are normal after use and won't affect brake operation, but deep grooves and heavy score marks will reduce braking efficiency and accelerate pad wear. If the discs are badly grooved they must be machined or replaced.

3 To check disc runout, mount a dial indicator to a fork leg, with the plunger on the indicator touching the surface of the disc about 10 mm (1/2 inch) from the outer edge **(see illustration).** Rotate the wheel and watch the indicator needle, comparing your reading with the limit listed in this Chapter's Specifications.

4 If the runout is greater than allowed, check the hub bearings for play. If the bearings are worn, replace them and repeat this check. If the disc runout is still excessive, it will have to be replaced, although machining by a competent engineering shop may be a solution. Confirm your findings by removing the disc and checking it for warpage on a surface plate using feeler blades.

5 The disc must not be machined or allowed to wear down to a thickness less than the service limit, listed in this Chapter's Specifications (check also for wear limits stamped on the disc itself). The thickness of the disc can be checked with a micrometer **(see illustration).** If the thickness of the disc is less than the minimum allowable, it must be replaced.

Removal

6 Remove the wheel as described in Section 15. **Caution:** *Don't lay the wheel down and allow it to rest on either disc - the disc could become warped. Set the wheel on wood blocks so the disc doesn't support the weight of the wheel.*

7 Mark the relationship of the disc to the wheel, so it can be installed in the same position. Remove the bolts that retain the disc to the wheel. Loosen the bolts a little at a time, in a criss-cross pattern, to avoid distorting the disc.

8 Remove the disc and on 1982 through 1986 models recover the gaskets which are positioned between the disc and wheel pillars. On twin disc models, the discs should be marked L or R near one of the bolt holes to denote on which side of the wheel they are fitted; if no marks are found, make some with a felt marker.

Installation

9 On 1982 through 1986 models, position a new gasket on each of the wheel's disc mounting pillars. On early models the gaskets have a flat edge, which must face the cast flat on the wheel surface.

10 Install the disc on the wheel, aligning the previously applied match marks (if you're installing the original disc).

11 Install the bolts, ensuring the shims remain in position, and tighten them evenly and progressively to the specified torque. Clean off all grease from the brake disc(s) using acetone or brake system cleaner. If new brake discs have been installed, remove any protective coating from their working surfaces.

12 Install the wheel (see Section 15).

13 Operate the brake lever several times to bring the pads into contact with the disc. Check the operation of the brakes carefully before riding the motorcycle.

5 Front brake master cylinder - removal, overhaul and installation

1 If the master cylinder is leaking fluid, or if the lever does not produce a firm feel when the brake is applied, and bleeding the brakes does not help, master cylinder overhaul is recommended Before disassembling the master cylinder, read through the entire procedure and make sure that you have the correct rebuild kit. Also, you will need some new, clean brake fluid of the recommended type, some clean shop towels and internal snap-ring pliers. **Note:** *To prevent damage to the paint from spilled brake fluid, always cover the fuel tank when wor ing on the master cylinder.*

2 Caution: *Disassembly, overhaul and reassembly of the brake master cylinder must be done in a spotlessly clean work area to avoid contamination and possible failure of the brake hydraulic system components.*

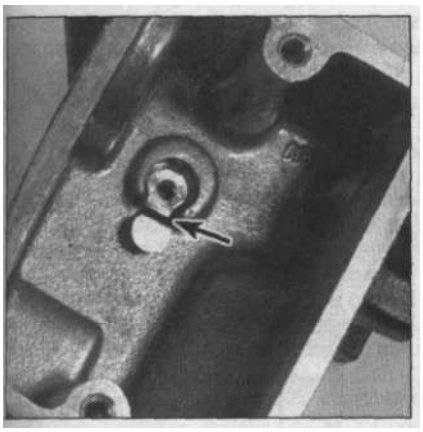
Removal

3 Loosen, but do not remove, the screws holding the reservoir cover in place.

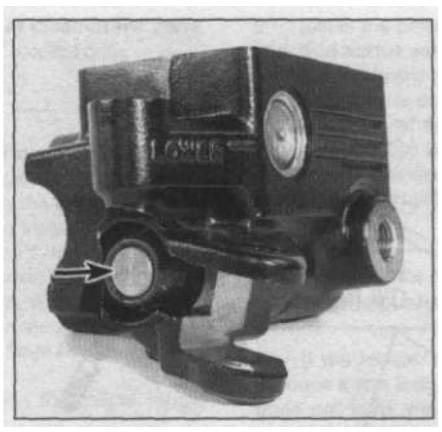
4 Disconnect the electrical connectors from the brake light switch.

5 Pull back the rubber boot, loosen the banjo fitting bolt and separate the brake hose from the master cylinder. Wrap the end of the hose in a clean rag and suspend the hose in an upright position or bend it down carefully and place the open end in a clean container. The objective is to prevent excessive loss of brake fluid, fluid spills and system contamination.

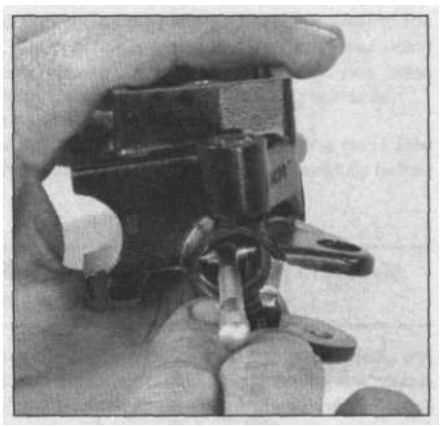
6 Remove the locknut from the underside of the brake lever pivot bolt, then unscrew the bolt and remove the brake lever.



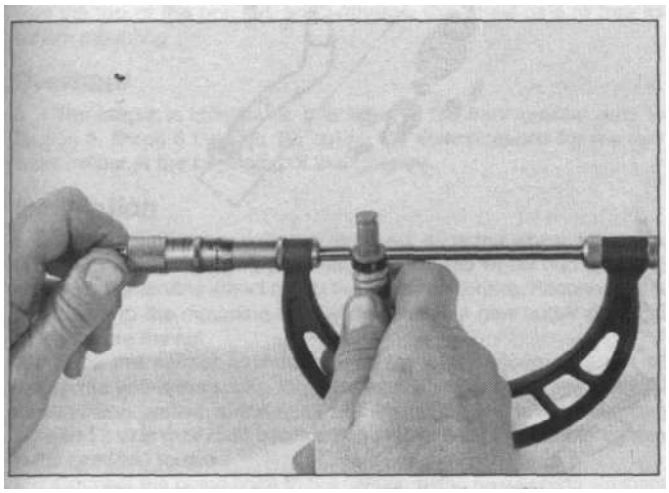
5.8 Location of port baffle in fluid reservoir base



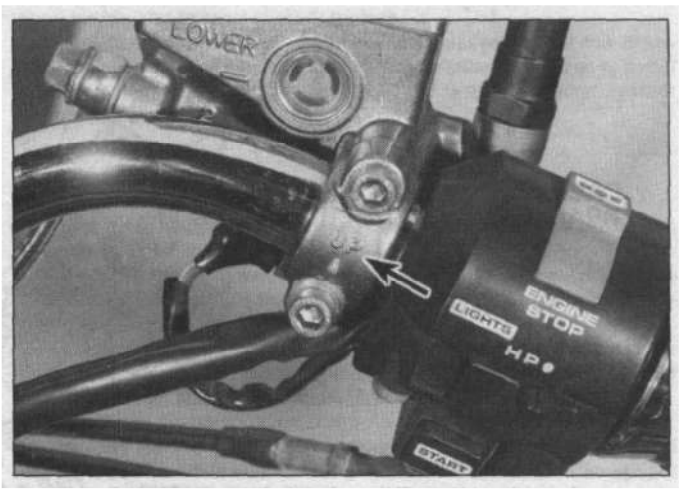
5.10 Master cylinder piston and dust boot location



5.14a Measuring master cylinder bore ID



5.14b Measuring master cylinder piston OD



5.19 Master cylinder clamp UP marking (arrow)

7 Remove the master cylinder mounting bolts and clamp to free the master cylinder from the handlebar. **Caution:** *Do not tip the master cylinder upside down or brake fluid will run out.*

Overhaul

Refer to illustrations 5.8, 5.10, 5.14a and 5.14b

8 Detach the reservoir cover and remove the plate (where fitted), rubber diaphragm, and on 1988 750 Magnas lift out the float, then drain the brake fluid into a suitable container **(see illustration 3.6).** Wipe any remaining fluid out of the reservoir with a clean rag. If the port baffle in the base of the reservoir was disturbed, ensure it is installed correctly **(see illustration).**

9 Undo the screw and remove the brake light switch.

10 Carefully remove the rubber dust boot from the end of the piston **(see illustration).**

11 Using snap-ring pliers, remove the snap-ring and slide out the piston assembly and the spring. Lay the parts out in the proper order to prevent confusion during reassembly.

12 Clean all of the parts with brake system cleaner (available at auto parts stores), isopropyl alcohol or clean brake fluid. **Caution:** *Do not, under any circumstances, use a petroleum-based solvent to clean bra e parts.* If compressed air is available, use it to dry the parts thoroughly (make sure it's filtered and unlubricated).

13 Check the master cylinder bore for corrosion, scratches, nicks and score marks. If damage is evident, the master cylinder must be replaced with a new one. If the master cylinder is in poor condition, then the calipers should be checked as well.

14 If the necessary measuring equipment is available, compare the dimensions of the master cylinder bore and piston to those given in the Specifications Section of this Chapter, replacing any component that it is worn beyond the service limit **(see illustrations).**

15 The dust boot, piston assembly and spring are included in the rebuild kit. Use all of the new parts, regardless of the apparent condition of the old ones.

16 Before reassembling the master cylinder, soak the piston and the rubber cup seals in clean brake fluid for ten or fifteen minutes. Lubricate the master cylinder bore with clean brake fluid, then carefully insert the piston and related parts in the reverse order of disassembly. Make sure the lips on the cup seals do not turn inside out when they are slipped into the bore and ensure the spring is fitted the correct way around.

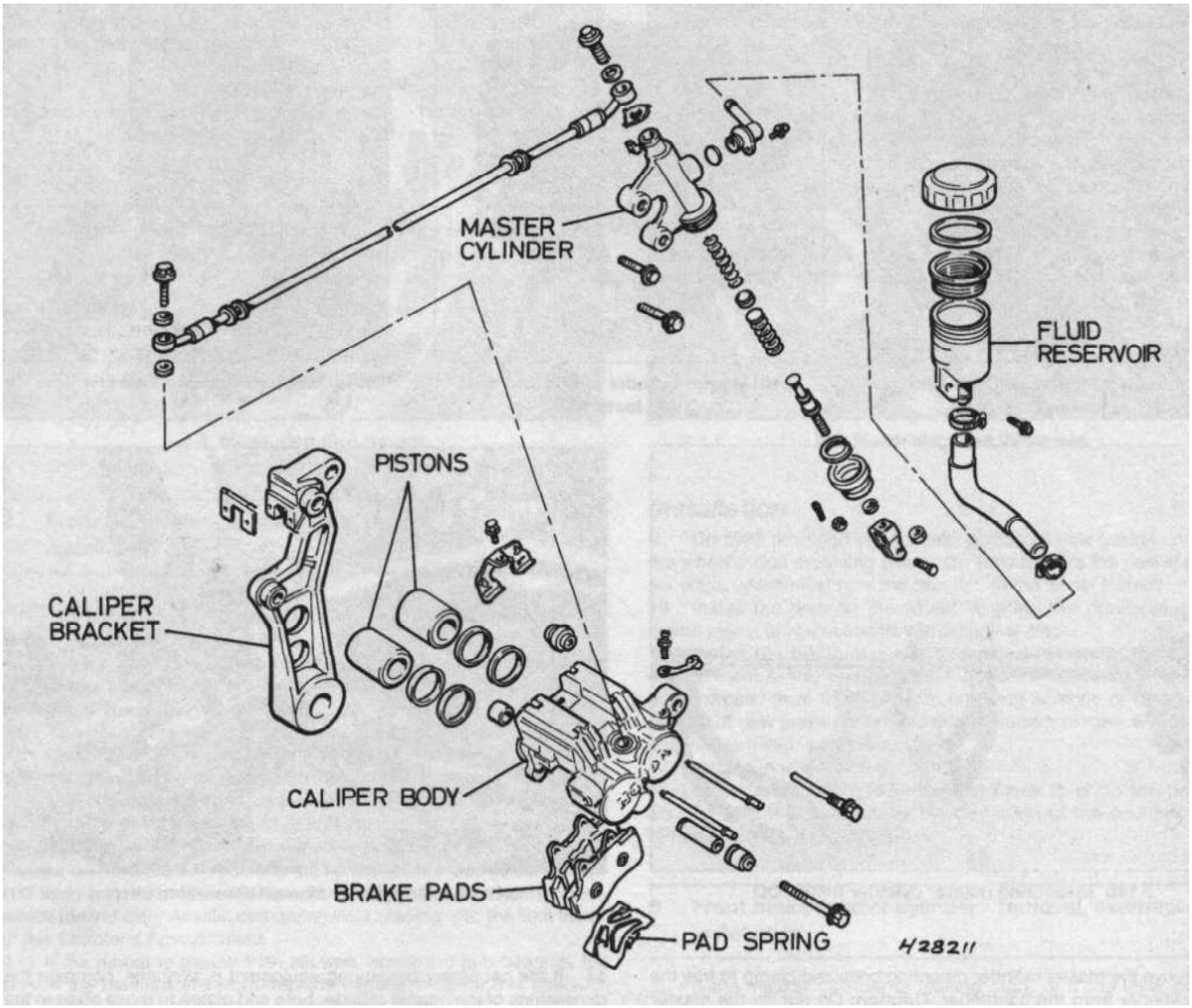
17 Depress the piston, then install the snap-ring (make sure the snap-ring is properly seated in the groove). Install the rubber dust boot (make sure the lip is seated properly in the piston groove).

18 Install the brake light switch and securely tighten its retaining screw.

Installation

Refer to illustration 5.19

19 Attach the master cylinder to the handlebar then fit the clamp making sure the 'UP' mark is facing upwards **(see illustration).** On Magnas and 1984-on Sabres, the joint of the clamp should align with the punch mark on the handlebar to ensure that the reservoir is positioned upright. On all models, fully tighten the upper bolt first, then the lower, both to the specified torque (where given).



6.2 Rear brake components (1100 models)

20 Connect the brake hose to the master cylinder, using new sealing washers. Tighten the banjo fitting bolt to the specified torque setting.
21 Install the lever and pivot bolt. Install the pivot bolt locknut and tighten it securely. Connect the brake light switch wiring.
22 Refer to Section 11 and bleed the air from the system. Check the operation of the front brake carefully before riding the motorcycle.

6 Rear brake pads (1100 models) - replacement

Warning: *The dust created by the brake system may contain asbestos, which is harmful to your health. Never blow it out with compressed air and don't inhale any of it. An approved filtering mask should be orn when wor ing on the bra es. Refer to illustration 6.2*

1 Set the bike on its main stand.
2 Remove the caliper mounting bolts and slide the caliper off the disc, leaving its mounting bracket in place **(see illustration).**
3 The caliper is identical to that fitted to the front brakes and pad renewal can be performed as described in Section 2, Steps 2 through 10.
4 Slide the caliper assembly onto the disc, taking care not to disturb the anti-rattle spring fitted to the top of the mounting bracket. Apply silicon grease to the shafts of the upper and lower mounting bolts and inside their dust boots and install them in the caliper; tighten to the specified torque.
5 Top up the master cylinder reservoir (see Chapter 1) and fit the diaphragm, plate and cap.
6 Operate the brake lever several times to bring the pads into contact with the disc. Check the reservoir fluid level (see Chapter 1) and the operation of the brake before riding the motorcycle.

7 Rear brake caliper (1100 models) - removal, overhaul and installation

Warning: *If the caliper indicates the need for an overhaul (usually due to leaking fluid or sticky operation), all old brake fluid should be flushed from the system. Also, the dust created by the brake system may contain asbestos, which is harmful to your health. Never blow it out with compressed air and don't inhale any of it. An approved filtering mask should be worn when working on the brakes. Do not, under any*