Chapter 6 Brakes, wheels and tyres

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Degrees of difficulty

Seller's

20

Easy, suitable for novice with little experience

Fairly easy, suitable for beginner with some experience

Fairly difficult, suitable for competent

5/2/2

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Difficult, suitable for experienced DIY mechanic

SAAAA Very difficult, suitable for expert DIY or professional

Specifications

| Brakes | |
|---|---|
| Brake fluid type | DOT 4 |
| Brake pad minimum thickness | 1.5 mm |
| Front disc thickness | |
| 790 cc Bonneville, T100 and Speedmaster, Thruxton and America | 3 |
| Standard | 5.0 mm |
| Service limit | 4.5 mm |
| 865 cc Bonneville, T100 and Speedmaster, Scrambler | |
| Standard | 5.5 mm |
| Service limit | 5.0 mm |
| Front disc maximum run-out | |
| Thruxton | |
| Standard | 0.1 mm max |
| Service limit | 0.3 mm |
| All other models | x |
| Standard | 0.15 mm max |
| Service limit | 0.3 mm |
| Rear disc thickness | |
| Standard | 6.0 mm |
| Service limit | 5.0 mm |
| Rear disc maximum run-out | |
| Standard | 0.15 mm max |
| | 0.3 mm |
| Wheels | |
| Rim size | |
| Bonneville, T100 and Scrambler | front 2.5 x 19 inch, rear 3.5 x 17 inch |
| America and Speedmaster | front 2.5 x 18 Inch, rear 3.5 x 15 inch |
| Thruxton | front 2.5 x 18 lnch, rear 3.5 x 17 lnch |
| Wheel run-out (max) | · |
| Axial (side-to-side) | 0.6 mm |
| Radial (out-of-round) | 0.6 mm |

6•2 Brakes, wheels and tyres

Tyres

| Tyre pressures | see Pre-ride checks |
|--------------------------------|---------------------|
| Tyre sizes* | |
| Bonneville, T100 and Scrambler | |
| Front | 100/90-19 |
| Rear | 130/80-17 |
| America and Speedmaster | |
| Front | 110/80-18 |
| Rear | 170/80-15 |
| Thruxton | |
| Front | 100/90-18 |
| Rear | 130/80-17 |
| Rear | 130/80-17 |

*Refer to the owners handbook, the tyre information label on the swingarm, or your dealer for approved tyre brands.

Torque wrench settings

| Bleed valves | 5 Nm |
|---|--------|
| Brake hose banjo bolts | 25 Nn |
| Brake pad retaining pins (front and rear) | 18 Nn |
| Front axle bolt - America and Speedmaster | 60 Nn |
| Front axle clamp bolt(s) | |
| Bonneville, T100, Thruxton and Scrambler | 27 Nr |
| America and Speedmaster | 20 Nn |
| Front axle nut - Bonneville, T100, Thruxton and Scrambler | 60 Nn |
| Front brake caliper mounting bolts | 28 Nn |
| Front brake disc bolts | 22 Nr |
| Front brake master cylinder clamp bolts | 15 Nn |
| Rear axle nut | 85 Nrr |
| Rear brake caliper mounting bolts | 40 Nn |
| Rear brake disc bolts | 22 Nn |
| Rear brake light switch | 15 Nn |
| Rear brake master cylinder mounting bolts | |
| Bonneville, T100 and Scrambler | 18 Nm |
| Thruxton, America and Speedmaster | 27 Nm |

1 General information

All Bonneville, T100, Thruxton and Scrambler models, and 2002 to 2006 America models, are fitted with steel rimmed and spoked wheels and have tubed tyres. All Speedmaster models, and 2007 America models, are fitted with cast alloy wheels designed for tubeless tyres only.



2.1a Unscrew the plug

Both front and rear brakes are hydraulicallyoperated disc brakes with twin piston sliding calipers. Speedmaster models are fitted with twin discs at the front while all other models have a single front disc.

Caution: Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If a hydraulic brake line is loosened, the entire system must be disassembled, drained, cleaned and then properly filled and bled upon reassembly. Do not use



2.1b ... then slacken the pin

solvents on internal brake components. Solvents will cause the seals to swell and distort. Use only clean DOT 4 brake fluid or denatured 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



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 worn when working on the brakes. Do not, under any circumstances, use petroleumbased solvents to clean brake parts. Use a dedicated brake cleaner or denatured alcohol only.

1 Unscrew the pad retaining pin plug (see illustration). Slacken but do not yet remove the retaining pin (see illustration).



2.2a Unscrew the bolts (arrowed) ...



2.2b ... and slide the caliper off the disc



2.9a Slide the caliper and bracket apart and check the pins (A) and boots (B) as described

2 Unscrew the caliper mounting bolts and slide the caliper off the disc (see illustrations) – there is no need to disconnect the hose.

3 Unscrew and remove the pad pin, noting how it fits (see illustration). Remove the pads from the caliper, noting how they fit (see illustration 2.11a). Note the pad spring in the caliper and the pad guide on the caliper bracket and remove them if required for cleaning or replacement, noting how they fit (see illustrations 2.9b and c).

4 Inspect the surface of each pad for contamination and check that the friction material has not worn beyond its service limit (see Chapter 1, Section 12). If either pad is worn down to or beyond the service limit wear indicator, is fouled with oil or grease, or is heavily scored or damaged by dirt and debris, both pads (in each caliper on Speedmaster models) must be replaced with new ones. Note that it is not possible to degrease the friction material; if the pads are contaminated in any way, new ones must be fitted.

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 groove in the friction material and dig out any embedded particles of foreign matter. Spray the caliper area with a dedicated brake cleaner to remove any dust and remove and traces of corrosion which might cause sticking of the caliper/pad operation.

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

7 Remove any traces of corrosion from the



2.9b Make sure the spring (arrowed) . . .

pad pin. Check it for signs of damage and replace it with a new one if necessary.

8 Clean around the exposed section of each piston to remove any dirt or debris that could cause the seals to be damaged. Now push the pistons back into the caliper - if new pads are being fitted you need to push them all the way in to create room for them: if the old pads are still serviceable push them in a little way, not only because it makes installation easier, but also because it serves as a check that neither of the pistons is seized in its bore. To push the pistons back use finder pressure, either on each piston individually or on a piece of wood across both pistons, or use grips and a piece of wood, with rad or card to protect the caliper body (see illustration 3.15b). Alternatively obtain a proper piston-pushing tool from a good tool supplier. It may be necessary to remove the master cylinder reservoir cover or cap and siphon out some fluid. If the pistons are difficult to push back, remove the bleed valve cap, then attach a length of clear hose to the bleed valve and place the open end in a suitable container, then open the valve and try again (see illustrations 11.5a and b). Take great care not to draw any air into the system. If in doubt, bleed the brakes afterwards (see Section 11). If either of the pistons appears seized, block the other piston so all pressure is applied to the one being checked, then apply the brake lever and check whether the piston moves at all. If it moves out but can't be pushed back in the chances are there is some hidden corrosion stopping it. If it is completely seized you will have to overhaul the caliper (see Section 3).

9 Slide the caliper and bracket apart (see illustration). Clean off all old grease and any



2.3 Unscrew and withdraw the pin then remove the pads



2.9c ... and the guide (arrowed) are correctly fitted

signs of corrosion from the slider pins. Check the condition of the rubber boot for each slider pin and make sure they are correctly fitted – they are not listed as being available separately so if they are damaged a new caliper should be considered. Make sure the pad spring is correctly fitted in the caliper and the guide is correctly fitted on the bracket (see illustrations). Apply fresh lithium grease to each pin and boot then slide the caliper and bracket together (see illustration 3.16).

10 Lightly smear the backs and sides of the pad backing material and the shank and threads of the pad pin with copper-based grease, making sure that none gets on the friction material.

11 Fit the outer pad into the caliper with the back of the pad against the pistons and seat it against the guide on the bracket (see illustration). Press the pad down against the



2.11a Fit the outer pad, making sure it locates correctly against the guide (arrowed)...



2.11b ... then insert the pin

spring and insert the pad pin part-way to locate the pad (see illustration). Fit the inner pad so its friction material faces the outer pad, locating it in the same way (see illustration). Press its end down, slide the pin through and thread it into the caliper tightening it lightly (see illustration 2.3).

12 Slide the caliper onto the disc, making sure the pads locate correctly on each side (see illustration 2.2b). Install the mounting bolts and tighten them to the torque setting specified at the beginning of the Chapter (see illustration).

13 Now tighten the pad pin to the specified torque setting (see illustration 2.1b). Smear some copper grease onto the plug and tighten it (see illustration 2.1a).

14 Top up the master cylinder reservoir if necessary (see *Pre-ride checks*), and refit the diaphragm, plate and reservoir cap. Operate the brake lever several times to bring the pads into contact with the disc. Check the operation of the brake before riding the



3.3 Brake hose banjo bolt (arrowed)



3.4a Slip the hose out of its guide



2.11c Fit the inner pad, making sure it locates correctly against the guide (arrowed)

motorcycle and remember that new pads will take a while to bed in.

3 Front brake caliper(s)

Warning: The dust created by the brake pads 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. If a new caliper is being installed all old brake fluid should be flushed from the system. Do not, under any circumstances, use petroleumbased solvents to clean internal brake parts - use new DOT 4 brake fluid only. Use care when working with brake fluid as it can injure your eyes and it will damage painted surfaces and plastic parts - cover these with rag.

Note: If the entire front brake system is being removed (i.e. master cylinder as well as caliper(s)), or if you intend to change the brake fluid, drain the brake fluid completely from the system (see Section 11), as opposed to retaining the old fluid within it by blocking the hose as described (Step 3).

1 If the caliper is leaking fluid, or if the brake pads are wearing unevenly, or the pistons do not move smoothly or are tight or stuck in their bores, then caliper overhaul is required – seal kits with or without pistons are both available as required.

2 If you are completely removing the caliper



3.4b Unscrew the bolt (arrowed) and detach the guide



2.12 Fit the caliper and tighten its bolts

rather than just displacing it, you will need some new DOT 4 brake fluid and some clean rags.

Removal

3 If the caliper is just being displaced and not completely removed or overhauled, do not disconnect the brake hose. If the caliper is being completely removed or overhauled, unscrew the brake hose banjo bolt and detach the hose(s), noting the alignment with the caliper (see illustration). On Speedmaster models take note of the double hose arrangement on the left-hand callper (see illustration 3.4b). Discard the sealing washers as new ones must be used on installation. To retain the fluid in the hose either plug the hose using another suitable short piece of hose fitted through the eye of the banjo union (it must be a fairly tight fit to seal it properly), block it using a suitable bolt with sealing washers and a capped (domed) nut, or wrap some plastic foodwrap tightly around (a finger cut off a latex glove also works well), the object being to minimise fluid loss and prevent dirt entering the system. Whatever you do, also cover the end of the hose in rag, just in case. Similarly block or cover the caliper where the hose connects. Alternatively place the hose end into a jar or other suitable container to collect the fluid - make sure the container is properly supported and do not knock it over.

4 If the caliper is just being displaced, on Bonneville, T100 and Scrambler models free the brake hose from its guide (see illustration). On Thruxton, America and Speedmaster models unscrew the bolt securing the brake hose holder (see illustration). On Speedmaster models free the hose from its clips on the mudguard (see illustration).



3.4c Free the hose from its clips (arrowed)



3.8a Position the wood as shown ...

5 If the caliper being overhauled, remove the brake pads (see Section 2).

6 If the caliper is just being displaced, unscrew the caliper mounting bolts and slide the caliper off the disc (see illustrations 2.2a and b).

Overhaul

7 Slide the caliper and bracket apart (see illustration 2.9a). Clean of all old grease from the slider pins. Clean the exterior of the caliper with denatured alcohol or brake system cleaner.

8 Place a piece of wood in the caliper to protect the pistons and caliper and to prevent the pistons from completely leaving their bores – the wood needs to be the thickness shown (see illustration). Displace the pistons using compressed air directed into the banjo bolt bore (see illustration). Use only low pressure to ease the pistons out – do not worry if one comes out before the other, the



3.8b ... then apply compressed air ...

other will come out when the first one contacts the wood and can go no further (see illustration). Remove the wood, then remove the pistons (see illustration). Mark each piston head and caliper body with a felt marker to ensure that the pistons can be matched to their original bores on reassembly.

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.

Caution: Do not try to remove the pistons by levering them out, or by using pliers or any other grips.

9 Remove the dust seal from each caliper bore using a wooden or plastic tool (see illustration). Discard them as new ones must be used on installation. If a metal tool is being used, take great care not to damage the bores.



3.8c ... until both pistons are displaced ...

10 Remove and discard the piston seals in the same way (see illustration).

11 Clean the pistons and bores with new brake fluid of the specified type.

Caution: Do not, under any circumstances, use a petroleum-based solvent to clean brake parts.

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 and/or pistons must be replaced with new ones. If the caliper is in bad shape the master cylinder should also be checked.

13 Lubricate the new piston seals with clean brake fluid or brake grease and fit them into their grooves in the caliper bores (see illustrations).

14 Lubricate the new dust seals and fit them into their grooves in the caliper bores (see illustration).

15 Lubricate the pistons and fit them



3.8d ... then remove the wood and withdraw the pistons



3.9 Remove the dust seal . . .



3.10 ... and the fluid seal from each bore



3.13a Lubricate each piston seal , . .



3.13b ... before fitting it into its groove



3.14 Fit each dust seal in the same way