

DRUM BRAKES – PROBLEMS AND ADJUSTMENT

Owners of modern motorcycles equipped with massive front disc brakes may find it hard to believe that thirty years ago BMW's comparatively puny twin leading shoe drum brake was regarded as being one of the very best front brakes available. Most large motorcycles of the day were still equipped with single leading shoe brakes, which although they provided plenty of stopping power, were not in the same league as the BMW unit found on the /5 Series. This brake had in fact been originally fitted on the Earles-fork models of the mid 'fifties, and was one of the few such units available on a standard production motorcycle.

Although some Italian manufacturers provided twin (and for specialised applications even four) leading shoes, these brakes had a reputation of being fierce to use at low speeds. The BMW brake, however, featured sensitive and progressive operation, producing gentle retardation at low speeds and powerful braking at higher speeds.

As time has gone by these brakes have acquired an undeserved reputation for providing either poor or fierce operation, this being accepted as 'character' or an unfortunate failing of older machinery. This reputation is, as usual, undeserved, and is generally the product of being in poor condition and badly adjusted.

The main areas of concern in terms of condition are easy enough to ascertain, such as worn linings, defective cables, and oval (or even cracked) brake drum liners. After thirty years it would be unusual to find a drum which has not been distorted by spoke tension, but it is surprising how many owners simply assume that their drums are running true, and do not manufacture (or obtain) a suitable tool to check them.

Sometimes a cure is claimed to have been found by adding (or removing!) a chamfer from the 'leading' end of the lining, but such remedies never provide the real answer.

This is usually to be found in the adjustment procedure, for the instructions offered in most books are simply repeats of those contained in the genuine BMW manuals. As the BMW manuals provide a very poor translation from the original German, it is little wonder that the subsequent copies by Haynes and Clymer fail to provide an authoritative adjustment procedure; it is obvious that the authors never attempted to apply their own instructions, or failed to understand why they did not work!

The answer, as always, is to examine the mechanism, understand how it operates, and so devise a suitable adjustment method. This is not difficult, once it is realised that the BMW brake has a fundamental difference in its operation from most other twin leading shoe units. In almost every other case the brake cable is connected to only one of the arms of the cam spindles, which in turn is rigidly coupled to the other by an adjustable linkage, set to ensure simultaneous operation of both shoes.

The BMW brake, however, uses the cable inner to pull on the front cam spindle lever, while the cable outer pushes against the rear arm. This basic difference provides the progressive operating characteristic of the BMW brake, for the cable

must first take up any 'slack' before pulling on its inner. This 'slack' takes the form of movement between the rear brake shoe and the drum, so applying one shoe. Further movement of the handlebar lever will then draw the cable inner against the front spindle arm, so applying the other shoe. When both shoes are firmly pressed against the drum, pressure on the handlebar lever increases the braking effort of both shoes. The BMW brake therefore provides the rider with light, sensitive operation of one shoe for light braking, followed by the application of the second shoe when more powerful braking is required.

Simple, isn't it? The adjustment procedure is equally simple, and begins by slacking off the cable adjusters at both the handlebar and front brake arm. This is followed by removal of the cable from both brake arms. Ideally, disconnect the cable from the handlebar. The cable operates on each arm via a slotted trunnion block, so permitting easy removal over the cable inner. Check that the brake arms and trunnion blocks are not badly worn – they are still readily available through your dealer, from BMW Mobile Tradition. Also check that the arms are correctly aligned to their shafts, this being indicated by a line on the arm, which should align with a dot on the end of the spindle.

The front shoe is adjusted by slacking off the locknut of the adjuster on the brake plate, and turning (with a 3 mm hexagon key) in the anti-clockwise direction until resistance is felt. Turn further, until front brake arm rotates to its limit. The front shoe is now pressed firmly against the drum. Now carefully turn clockwise until the arm has moved back 4 mm, using a ruler to check the available movement, and secure the locknut. The use of a hexagon key which can be easily turned – and held in position – is most important, and a key which fits a socket set is recommended.

Now fit the cable into both brake arms and the handlebar lever, and set the handlebar adjuster to remove any free play in the cable outer. Turn the cable's inner adjuster (on the front brake arm) until total movement of rear brake arm is 4 mm when the handlebar lever is fully operated.

Set the cable adjuster on the handlebar to give a suitable lever travel.

As you will see – unlike most twin leading shoe brakes – the brake arms do not move in unison – the rear arm will rotate first, followed by the front arm. This prevents both shoes from operating simultaneously, so providing the progressive braking effect. As most braking will be provided by the rear shoe (i.e. under light braking effort) it will require to be adjusted (and replaced) more frequently than the front shoe.

The BMW twin leading shoe front brake – if in good condition and properly adjusted – remains completely capable of stopping a 400 lb motorcycle from any sensible speed. It is another example of forty year old technology being completely adequate for today's motorcycling.