ARAI DRUM BRAKE

Santana tandems are designed to accept an optional Arai drum brake. This brake is easily attached to the rear hubs supplied on Santana tandems.

The Arai brake is not so much a primary stopping brake as it is an auxiliary, control brake. Because the brake is shielded from the elements, it's relatively unaffected by rain and puddles. Further, the Arai's braking ability is not dependent on well-aligned rims. Most important, using this brake on long descents allows a tandem's rims to remain cool, preventing tire over-inflation and blowouts. Only on a very long downgrade, may some minor brake fade be noticed.

Because the Arai drum brake is extremely smooth and progressive, like a car brake, many tandem owners find they use the Arai brake instead of their rim brakes for all non-emergency braking.

The Arai brake (and all other hub brakes) requires more cable travel than rim brakes and must be operated with its own brake lever. Do not attempt to operate this brake and a rim brake using a double cable, brake lever or a cable wishbone. Instead, operate both rim brakes with a double cable brake lever (non-STI lever) or a cable wishbone (STI, brake/shift lever) and the Arai brake with the other brake lever. The Arai brake can also be operated using a derailleur, bar-end shifter or an old style, ATB, Thumb shifter. Since a tandem cannot be "flipped" during hard braking, controlling both rim brakes with a single lever is quite satisfactory.

INSTALLATION

Do not allow oil or grease to contaminate the brake pads or interior braking surfaces. Handling the internal brake parts with greasy hands will create poor braking performance. See service notes on how to clean a contaminated brake.

1. Install the drum, the larger of the two main parts, by screwing it clockwise onto the left side of the hub, after lightly greasing the hub threads.

2. The smaller of the two main parts, the brake plate, is secured to the axle. Santana tandems are supplied with two types of hubs: Shimano and Hadley. A Hadley hub requires a brake plate with a 14mm hole, and a Shimano hub requires a brake plate with a 10mm hole. (Shimano, 16-spoke wheels will not accept this brake.)

   Hadley hubs:
   Remove the left, axle cap with a 5mm, allen wrench, and remove the spacer washer. Install the brake plate in its place. Re-install the end cap and tighten.

   Shimano hubs:
   These hubs have an extra, outer, left, lock nut and one or two washers between it and the inner, left, lock nut. If there is one washer, remove it or install it between the brake plate and the outer, lock nut if needed. If there are two washers, remove one, and install the other between the brake plate and the outer, lock nut if needed. (There is no need to disturb the factory adjustment of the inner, lock nut.

3. Both main parts of the Arai drum brake should be attached to the wheel. The brake plate, firmly attached to the axle, should spin freely within the drum, which is threaded snugly onto the hub body. The clearance between the two parts should be less than 3mm.

   If your Arai brake was obtained through Santana, it came with our special, proprietary, "quick release," cable fittings. These fittings, when used with Santana's "pac man," braze on or drum brake adapter arm, allow removal of the rear wheel without disconnecting the brake cable. Not only will the brake adjustment remain intact, but the fittings cannot be misplaced while repairing a flat. (The "pac man" braze on can be found on the underside of the left chainstay on pre '99 models. The drum brake, adapter arm can be found mounted to the disc brake, braze on on top of the left chainstay.)

4. Place Santana's, slotted "hook bolt" and nylock nut through the chrome-plated, brake arm.

5. Tighten the nut, mounted facing the spokes, to the extent that the hook-bolt is snug, but can still be rotated.

   The cable anchor assembly is NOT attached to the brake, but is fastened to the brake cable. The positioning of the cable anchor determines the adjustment of the brake.

6. Nest the cable anchor assembly in the concave section of the slotted hook bolt with the end of the cable exiting through the slot.

   To release the cable from the brake, simply pull the end of the cable away from the wheel to unhook the anchor.

7. Install the long, allen bolt into the black, anchor arm of the brake plate, and secure it with the nylock nut. For "pac man," the bolt head faces away from the wheel. For the drum brake, adapter arm, the bolt head faces the wheel. Slide the bolt into the slot on the "pac man" braze-on or drum brake, adapter arm. (The bolt must slide into the slot every time the wheel is re-installed.)

   DO NOT tighten the allen bolt to the "pac man" or adapter arm, as this defeats the "quick release" feature.

SERVICE

The Arai drum brake is the most trouble free, bicycle brake ever produced. Except for adjustment resulting from normal cable stretch, the Arai brake rarely requires any sort of service. The only adjustment point is the cable anchor – there are no internal adjustments. The pad life is probably 20 years or 1,000,000 miles; we don't know of any pads that have worn out in normal use.

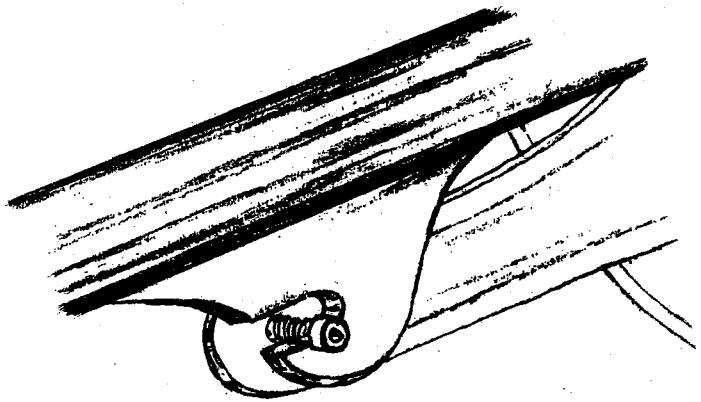
Like car brakes, under certain braking pressures and atmospheric conditions, some brake squeal is normal. Excessive squeal or screech means something is loose and vibrating. Disassembly and inspection will be required.

If the Arai brake performance is such that the rear wheel cannot be skidded while the tandem is being ridden by the front rider only, the brake has probably become contaminated, and the internal braking surfaces need to be cleaned. Disassemble the brake by first removing the wheel, then removing the axle lock nut, and pulling the brake plate assembly off the axle. (It's not necessary to remove the drum from the hub.)

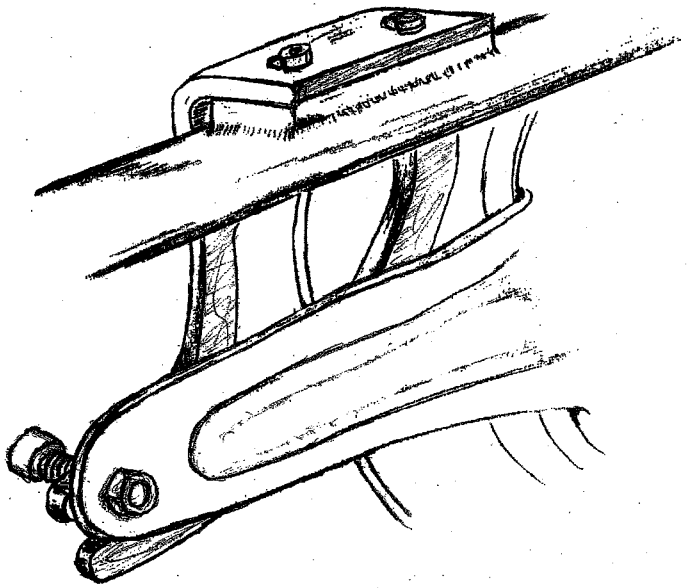
Clean the braking surface on the interior of the drum with a clean rag and alcohol. Clean the surface of the brake pads with emery cloth. The brake pads contain ASBESTOS, and care should be taken to minimize airborne dust while cleaning; DO NOT use a power tool. Clean the pads in a well-ventilated area, and avoid inhaling the dust. Do not re-use the emery cloth.

If the drum ever needs to be removed from the hub (i.e. to replace a broken spoke) the proper shop tool is a 41mm socket wrench. Since such a tool is rarely found in a bike shop, enterprising mechanics have learned they can clamp a pair of large bolts or allen wrenches into the jaws of a large, bench vise, and grasp the drum by inserting the protruding ends of these "pins" through two opposing holes in the finned section of the drum. A ready-made version of this "pin-tool" that can be used with a smaller vise is now available to bike shops through Quality Bike Products, part # TL4092. Removing the drum using either form of pin tool is exactly like removing a freewheel; turn the wheel counter clockwise.

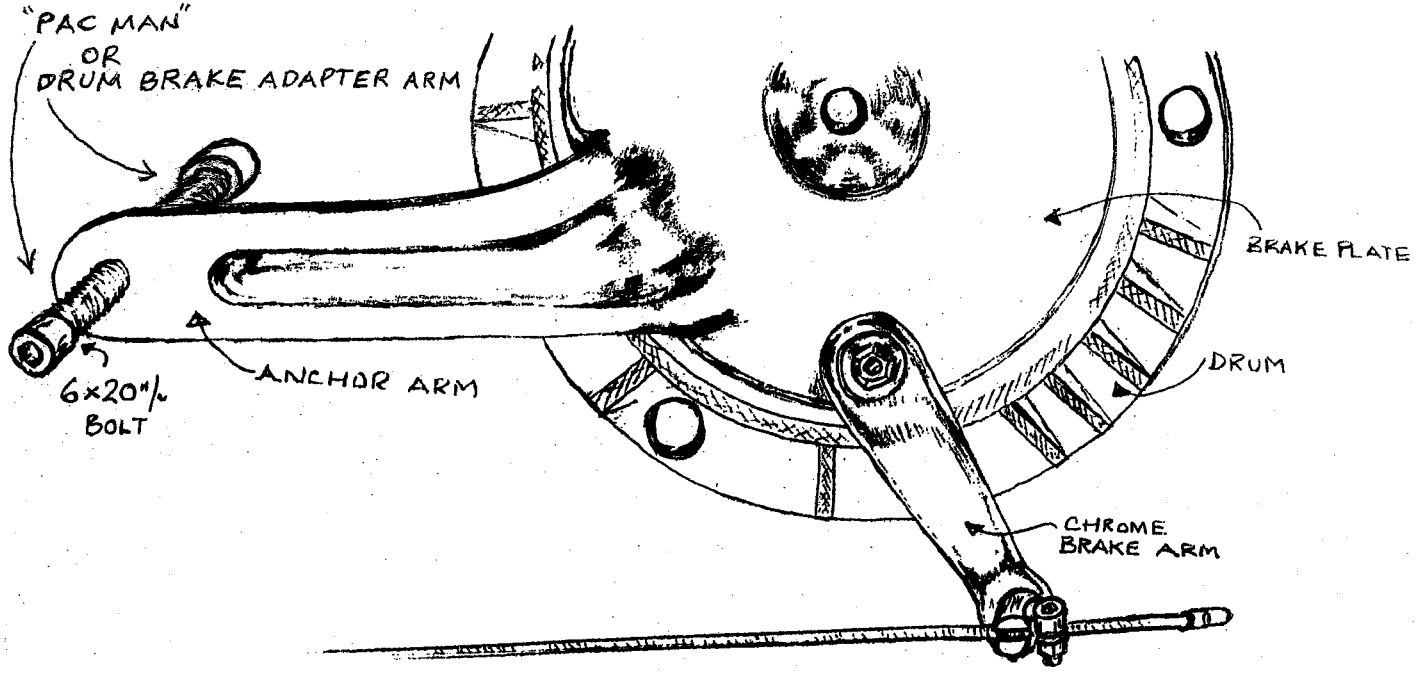
The easiest removal method is to loosen the drum while the wheel is still on the bike. If the bike is fairly new, just apply the brake and roll the bike backward. Removing a well used brake will take two people: one person will stand at the front of the bike to hold the tandem upright and push it backward, while the other person stands at the rear of the bike to apply the brake by using the toe of his shoe to place some weight on the bare, brake cable just forward of the brake arm. As soon as the drum starts to loosen, take the rear wheel off, and remove the brake plate. Once the brake plate is out of the way, the loosened drum can be easily removed by hand.

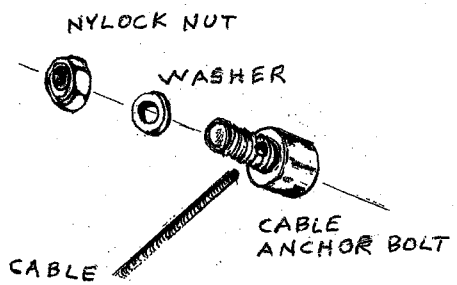


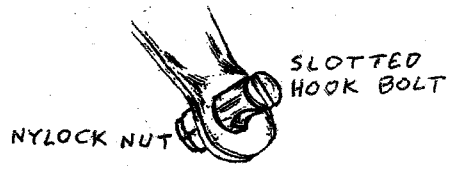
"PAC MAN"



DRUM BRAKE ADAPTER ARM







CHROME BRAKE ARM