

This article was developed by National Carousel Association Conservation Chairman, Charles Walker and included in the two-volume National Carousel Association Technical Manual

## AVOIDING THE UNPREDICTABLE BREAKDOWN

One-of the most troublesome spots for breakdown in the mechanics of a carousel is in the bearings. The roller bearing in the center of the center pole to which the sweeps are attached, sometimes called the cheese bearing, breaks down. Excessive wear in this area can be caused from the lack of proper grease and old age. The rollers usually do not wear as much as the race way. Too much wear can cause complete failure and even break the drive gears, sometimes known as the bull gear or seven sisters gear. The play in this bearing, known as flop, can be assessed by watching the bearing area closely with the machine stopped. Let a heavy person step onto the outer edge of the platform then watch the bearing shift. If the bearing shifts more than it is possible it needs looking after.

In order to get to the bearing, you will have to completely disassemble the carousel, which is a major project. There is no easy way to fix this problem. The bearing failure occurs when riders or staff jump on or off while the carousel is in motion. This makes the machine shift hard against the center, binding the roller bearing against the race. Sometimes, rollers break off at the top or bottom, jamming against the race walls and other bearings, scoring the race way. This could put your machine out of-service at the-peak of your season. For every action there is a reaction, the shifting of the center cheese bearing makes the drive gears bottom out or jump out of the teeth, breaking the sister or bull gear. Most mechanics would not think to check the slop in this bearing as this is so well covered and so difficult to get at to repair.

If you realize the carousel has probably had little mechanical attention since its installation, it may be due for a mechanical check up. If you disassemble the carousel, extreme care should be taken in marking each piece. Be sure to mark each horse, telescope, jump pole crank location and crank. The reason for marking these items so carefully is because an old machines parts have worn in one position and if you mix the worn parts it is difficult to get it to run smoothly again. Before loosening the adjustment screws or turn buckles, take note of the adjustments. To help relocate them to the proper position, one might spray the bolts and turnbuckles Threads with a fast drying paint. This would give a clue, When reassembling the machine, as to the original position of the threads. Disassembling a park machine is much like disassembling a-road machine. The shields come off the ends of the sweeps by lifting out, once the wiring is disconnected. Special care should be taken in handling all the wiring as the insulation is old and rough handling may call for replacing some or all of the old wiring. If the wiring should be replaced, Each joint should be soldered to insure trouble free service. Do not use plastic tape as heat and humidity will make it release. Use rubber insulation tape old fashion cloth friction tape. As you remove the wiring, you will notice 50 to 60 year old tape in good condition. This tape is time tested.

When the horses, chariots, and crestings are removed, take care to store them in a secure, well guarded location. Sometimes, tractor trailer trucks, locked down, are the answer.

When the machine is dismantled it is most vulnerable to thieves and breakage. When removing the outside scenery-rims have plenty of help as the scenery panels are heavy. The dust will be heavy and it would be best to clean as much as possible to eliminate finger and hand prints which may be hard to wash off. To get at the problem, all sweeps have to be out and the center pole gear has to be slipped off the end of the pole. If the center pole has to be taken down, be sure to mark all the pieces, including the bolts. Some times bolts sheer off in the old wood and this is a problem. Use a crane or call in a rigger who will be responsible. This is the most dangerous part of the carousel.

Once the pole is on the ground or cleared enough to work on the center bearing, you have several options. The Philadelphia Toboggan Co. says that if the wear is too much, the casting on the pole may need to be built up and turned down. This is a major project and includes a struggle to get the casting off wooden poles. Some have suggested making larger rollers to fix in the race to take up the slop. Some have even had luck replacing larger rollers with bearings still on the machine. Others have suggested measuring the depth and width of the worn spot on the casting and securing a strap of sheet metal the same width and thickness of

the worn spot. This is somewhat involved and special care should be given to securing the strap tightly to keep any movement minimal. It is possible to weld the strap on top, on the bottom and on the seams. Grind the seams down until they are smooth. One cannot predict the permanency of this repair. The more permanent repairs, in my estimation, would be larger rollers or a build up on the casting in the center may be best, the choice is up to you.

After the center cheese bearing is repaired, be sure to check out the top bearing before reassembling the machine. If the machine is a Philadelphia Toboggan, Herschell-Spillman or an Allan Herschell, you should be able to locate replacement parts. Philadelphia-Ski-Ball has the P.T.C. replacement bronze disc. Chance Manufacturing Co. can help with replacement parts for other machines.

When reassembling the machine, return each piece to the premarked location. Remember, cranks should be geared in a quarter turn position, that is, if the first crank is at 12:00 the next crank should be at 3:00 the next at 6:00 the next at 9:00 and so on. This will keep the load evenly distributed and be easier on the mechanism. When a carousel is properly balanced, there will be no problem starting it. If the crank is positioned half up and half down, it will lock into position and be hard to start.

When reassembly is completed and things are running smoothly again, you will feel proud to know that the machine is in top running order for another 15 to 20 years, maybe longer. Be sure and log what work has been done and file it in two locations so as to remember what was replaced for future generations.

National Carousel Association  
[www.NCA-USA.org](http://www.NCA-USA.org)

