**Troubleshooting Tip – Gear Engagement Issues Causing Excessive Misses**It is totally normal and acceptable for each canister of the Treasure Tower to have 1 or 2 misses per 100 “vends” (much better than most toy vending machines that have a much higher “miss” ratio). If you have more than 1 or 2 misses per 100 “vends”, you likely have an engagement problem with your coin mech spider and tumbler gears. (Be sure to ask your locations to keep track of misses and then reimburse them for these misses when you come to service. They should only pay for tokens that were exchanged for a toy. If they don’t track misses, ask for an estimate and then give them some extra as well. You never want your locations to feel they are being shorted in any way.)

**Correct Allignment**
When placing a canister in the Treasure Tower, make sure your coin mech handle is horizontal and one of the three tumbler wheel circular openings is centered over the opening in the bottom of the canister. If your spider gear and tumbler wheel gears are aligned properly, the alignment will be constant no matter how many coins are inserted. The tumbler wheel will continue to advance exactly 1/3 of the way around with each vend. Before removing a canister, make sure the handle is horizontal. As you look on the underneath side of the canister, you should always see that one of the tumbler wheel circular openings is exactly centered over the opening in the bottom of the canister.

**Warning Signs of Complete Gear Disengagement**
When a coin is inserted in the coin mech, the handle turns but a toy never drops. As you wiggle the handle back and forth, you can see that the tumbler wheel springs at the bottom of the canister are not moving. If you remove an adjacent canister, you can see that the tumbler wheel is not moving when you turn the coin mech handle. In this situation, no matter how many coins are inserted, the spider gear on the back of the coin mech is totally disengaged from the tumbler gear and a toy will never dispense. (Note: Don’t confuse this with a “jam” which is when the coin mech handle won’t turn at all – likely caused from coins stuck in the coin mech or two toys trying to dispense at the same time.)

**Warning Signs of Partial Gear Disengagement or “Skipping”**
2) When a coin is inserted in the coin mech, the handle turns but you can feel and hear that the tumbler wheel is not fully connecting with the spider gear on the back of the coin mech. It may take several attempts before a toy is dispensed. After making sure your coin mech handle is horizontal, you remove the canister and see that one of the three tumbler wheel circular openings is not centered over the opening in the bottom of the canister.

**Possible Causes and Solutions**
1) The chassis walls may have started to bow outward. This usually happens after several years of high-volume use. The solution to this is to insert 4 crossbar wires connecting the four chassis walls with the crossbar ends in the center. This will pull the chassis walls inward and cause the tumbler gears of each canister to engage fully with the spider gears on the back of the coin mechs.

2) You may not have the correct crossbar in place, and therefore it is not properly filling in the gap between the canisters enough to push them forward to engage the gears. Make sure you have Crossbar #1 on the lower level and Crossbar #2 on the upper level. Crossbar #2 is thicker than Crossbar #1. The thicker crossbar is needed on the upper level because the diameter of the upper chassis is slightly wider than the bottom chassis.

3) The e-clip(s) on which your crossbars rest may be set too high on the threaded rod. This will cause the back corner of your canisters to lift and slightly tip forward causing the spider and tumbler gears to disengage. The crossbars are not meant to support the back corner of the canisters. In fact, the bottom of the canister should not even be touching the shelf part of the crossbar. The purpose of the crossbar is for the raised parts to fill in the gap between the canisters and push them forward enough for the gears to engage. The solution is to simply lower the e-clips using needle nose pliers to remove and reposition them.

4) The tumbler cover may not be screwed in tightly on all 4 sides or one or more of the screws may have fallen out. This will enable the tumbler wheel to lift while turning and will cause the spider and tumbler gears to disengage. The solution is to make sure all 4 canisters screws are snuggly screwed into the tumbler cover. Be careful not to screw them too tightly or you will strip the holes and have to replace the tumbler cover.
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5) The leg that extends below the right side of your tumbler cover may have broken off. This can happen when a toy gets jammed in the tumbler and the user forces the handle to turn. That leg rides up one of the ramps on the tumbler wheel and eventually snaps off making it possible for the tumbler wheel to lift up on that side and as a result disengage the gears. The solution is to replace the tumbler cover with a new one. (Note: If that same tumbler cover leg rides up the tumbler wheel ramp but does not break off, it is likely warped inward and will cause additional jams if not fixed or replaced. Try bending it outward and/or shaving the inside edge of the leg to prevent it from catching on the tumbler wheel ramp. If the leg is warped beyond repair, replace the tumbler cover.)

6) The upper edge of your coin mech back plate may not be level due to some excess plastic bumps. This is upper edge is where your canister rests and bumps may raise it up enough to slightly disengage the spider and tumbler gears. The solution is to remove the coin mech and use a file to shave down the bumps and create a smooth, level top edge.

7) The canister also sits on the chute. If you look at the underneath side of your canister, you will see the cut out where it fits over the chute. It is possible when changing out a coin mech that the chute can accidentally be lifted. As a result, the canister will be lifted enough to disengage the spider and tumbler gears. Always make sure your chutes are pushed down all the way and that the back underneath post of the chute is flush with the floor of the chassis. Bottom chassis have a screw that the chute post fits over. Make sure the post is centered over this screw.

8) The gears on your tumbler wheel may be chipped or the gears on your spider gear may be chipped. If this happens, when the gears come together at that point, they will not properly engage and will result in misalignment. The solution is to replace the part that is chipped.

9) The tumbler gear may be defective and have excess plastic between two of the gears. The excess plastic will prevent the spider gear from engaging at that spot correctly and will result in misalignment. Check the tumbler gear directly below the 3 high points of the tumbler wheel ramps (the 3 ramps are on the topside of the tumbler wheel and encourage the toy to fall into the corresponding hole). The excess plastic will only be in one of the 3 areas described. If you find excess plastic between the gears, the solution is to use a Dremel tool or knife to remove the excess plastic or replace the gear.

10) The final situation is not a case of alignment, but it can cause misses and so we wanted to include this potential problem. The tumbler wheel has 3 springs strategically aligned between the 3 holes in which the toys drop. If any of the springs fall off or are not aligned properly, you will experience increased misses. When the springs do not stay in place or fall off, they cannot be screwed back on. The only solution is to replace the tumbler wheel with a new one.