Garden Trains
From A to Z
D is for Delrailments

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Garden Trains - A to Z

What you will find in this document.

Discussion groups are a great way to share information. One thing that is unique to LSOL.com is our Tuesday Topic. Each week, for almost six years, we have discussed a specific group topic. It could be about bridges, or maybe you like steam vs. diesel engines. Many times it is about how people solved a problem, or what they think about a current issue or product. My favorite was several years ago. "If your railroad was a candy bar, what would it be." (Good and Plenty, Milk Dud, etc.) We have fun at LSOL.com as well as help each other with serious issues on our railroads.

Now with almost 300 different weekly discussions online we wanted to make it easier for you to use this vast knowledge base of topics. We are taking the time to edit the best answers on a specific Tuesday topic into PDF documents. We have also added photos as available so you can see just what was being talked about from each of the users.

This paper is different than one written by just one author on a topic. You are getting dozens and dozens of years of combined experience from some of the smartest people running Large Scale Trains today. Save this document and start building your own personal reference library on your computer today.

What is LSOL.com? (Large Scale Online)

Large Scale Online has been providing information for Large Scale Garden Train enthusiasts for almost 15 years. We are the oldest, largest, and most professional web site on the Internet that is exclusive to Large Scale Garden Trains.

LSOL.com provides information in many different ways. We have online articles, videos for you to watch and photos for you to see how it is done. We also have organized and secure online discussion groups. We are the only site that requires people to use their real name. No hiding behind your keyboard making anonymous posts. Join Us.

Derailments

What are the basic steps that you take to keep from having train derailments?

It happens to the best of us. Our trains are running just fine, we turn our back and suddenly there is a real mess on the layout with trains everywhere but on the track.

What are the basic steps that you take to keep from having train derailments? Maybe there are some secret steps or something you learned from running trains in a smaller scale that works with Large Scale Trains. Is it the track, curves, tunnels, switch, wheel sets, trucks, couplers etc.

Tell us your best ideas to stop derailments, PLUS, tell us the story of your worst derailment, and if you have pictures post them for us.

Brian Donovan - acorns, twigs, slugs, giant beetles

Most of my derailments are caused by various track debris - acorns, twigs, slugs, giant beetles, toads, kicked up gravel, small children, etc.

Chris Wolcott - debris on the track, especially at the S-curve

My derailments tend to be debris on the track, especially at the S-curve around the base of the mountain cliff leading to the tunnel. I removed the rails from a re-railer section and replaced a tie section on a 5' section in my tunnel. This should at least help get them back on track. I have also worked on my switches trying to make the points fit better. I lucked out when we hosted our train club meeting. Not a single de-railment or un-coupling!

Dave Marecek - Wheel gauge is VERY important

When I first started in Large Scale I had a lot of derailments (and un-commanded uncouplings). But after some observation I discovered the biggest reasons for derailments on my railroad.

1) Wheels, plastic wheels don't add weight to the cars, and don't tend to track as well as metal wheels. Also I had a car from a certain manufacturer whose plastic wheels would not stay in gauge for more than a few minutes. Wheel gauge is VERY important, and unfortunately I have found variation, sometimes wide variation, in the gauge of wheels on a car I just purchased or a set of metal wheels I just purchased. I made a wheel and track gauge and all my wheels get checked before they ever run on the railroad.

2)Track, checking the gauge and level of the track side to side is important, if I suddenly find I have derailments in a certain place I break out the torpedo level and the track gauge, and sure enough one or the other is out of whack. Of course each spring I re-grade and re-level so I don't have too much problem with this till about late august or after a torrential downpour.

3) Couplers, since changing over to Kadee couplers this isn't a major problem, but every once in a while I come up with a coupler with a low trip pin that catches on a switch.

I answered the poll as 10%, it's actually a lot less then that (except for one or 2 problem pieces of equipment that I won't run again till I fix) but I can't say its zero. If I had to guess I would say I get a derailment about once a month or less. (Unless someone is watching then the chances at least double, but they are still low). Most of my derailments now are caused by outside forces, little twigs that fall on the track, a dog that doesn't get out of the way, or other creatures causing havoc.

Phil Benedict - found a few 'gremlins' on my railroad

I don't have the derailments the 1:1 guys have been experiencing lately. However I have found a few 'gremlins' on my railroad. First off was figuring out the Aristo Mikado pilot truck. More spring and NOTHING left on the underside of the pilot for the truck to hang up on, and I mean NOTHING!

Then I started having trouble with the SD45. It had been bullet proof for so long but when the weather turned cold, (Low to mid 30's) it started derailing at the same points time after time. After studying the areas I came up with the reason and the fix. Most of my track work is eBay based so it is a mish-mash of different brands. I found that where I joined Aristo to LBG and used the Aristo brass rail clamps, the rails did not line up very well due to different thickness of the foot or bottom plate of the rails. I replaced the clamps with the crumby rail joiners that come with the Aristo track to solve the problem. I don't quite understand why it didn't do this in the summer. Maybe with everything being cold, the wheels, axles and track were out of spec enough to cause a derailment.

Ran for a couple hours today with no derailments.

Ron Hill - Uneven track is my biggest problem

Uneven track is my biggest problem, especially in a curve. This is mainly caused by the moving of the track from expansion and contraction. I have found that uneven track in a curve can cause the middle axle of a three axle truck to derail. I do not have this problem with two axle loco's or freight cars. Expansion tracks have helped control the movement and the derail have diminished.
By the way, I do not understand that derailment. As the loco and cars lay, it is impossible for it to happen.

Mike Evans - 'mystery' derailments

All the comments above are great examples of problems we all encounter, especially running trains outside. But every once in a while there are 'mystery' derailments - no apparent reason and only on rare occasions. The adage 'a watched train never derails' is too true. It seems my trains wait until my back is turned to misbehave.

Rick Henderson - Rule #1; keep your eye on the train.

There are many contributing factors and no one right answer. In this case it looks like it was avoidable. Rule #1; keep your eye on the train. If you are not there to see it go around, why leave it running. This one came uncoupled and the train was rear ended by its own locomotive. It may have un-couple back on the sharp curve and the train rolled to a stop at the turnout while the loco went around again or it may have uncoupled at the turnout, hard to tell. The snow is a factor in that it shows the rail was likely very cold and gaps could have opened or track shifted with the cold. Two big factors cause un-couplings, mismatched couplers and uneven track work. The coupler solution is to have all one brand and they are best mounted to the body not the trucks.

The track work fix requires you to check your track from several angles. Remove kinks in joints, use easements into and out of curves, have straight sections between reversing curves, have easements on grade changes, especially where a track goes over a hump or goes from level to a sudden grade. This is true in ALL scales and gauges and prototype operations.

If you think your track work is good, take a small mirror and set it at 45° on the top and sight down the length; you may be surprised at what you see.

Finally, heavy cars track better than light cars. If you have a light car, put it at the rear of the train so the weight of the train is not pulling through the light car, which can cause it to derail easily on curves. Oh, make sure your entire wheels roll freely. One bad wheel set can bog down a train, put stress on couplers with the excess drag and again cause derailments.

Phill Lowe - ONLY seem to happen when I'm not watching!

Uncanny. Derailments ONLY seem to happen when I'm not watching! And, a knack for doing it with visitors watching - drat! Fortunately I fall in the 10% category.

I have two turns that I cannot run larger engines on which I think has more to with being unleveled than just the tight curve. Got to work on that.

A "mountain" about 2.5 ft high at track level is the most dangerous. Fortunately lighter equipment and a lot of foliage have kept damage to a minimum.

Glenn Habrial - No S curves without straight sections

I agree that the uneven track will be clearly in view by using the mirror method. I designed my original garden railroad to be level, all curves start out with 20 foot diameter and then (if necessary) tighten to 10 foot diameter but no tighter than that. Then at least one section of 20 foot diameter track is for the exit. Also I use at least one foot of straight track before reversing the curve. (No S curves without straight sections). I have found that switches when tuned to run smoothly and kept clean will not cause derailments. (See recent article on Aristo stainless Xwide switches)

I have been blessed with VERY FEW Derailments; it has been on the order of less than one percent of the running time. However there have been some and the FRA and NTSB were more than willing to find the cause. Now a list of things that have caused derailments on the Bel Del. (not in any particular order)

- Cat (don't plant the catnip near the tracks)
- Bachman couplers (to a lesser extent, couplers from different brands being coupled together.) (When this happens the train runs into the back of the uncoupled cars and derails)
- Deer stepping on the track and denting it.
- Ballast being frost heaved allowing the track to flex and this will lead to the final problem,
- Broken / loose track joiners.

When I first got my Live steam at ECLSTS I was so anxious to run it I didn't think the heaved track would be a problem. When the heavy locomotive traversed the area where the ballast had heaved differently, leaving a gap under the rails right at a joint, the track flexed and the pony truck picked the locomotive up until the drive wheel flanges rode over the rails and the live steamer went down the embankment on its side drivers still churning (Lots of burned fingers that day).

But the lesson was learned and track repairs made. The track works fine now and the Live Steamer has no problems on that track. The locomotive didn't receive any damage but there was some anxiety on the operator's part as well as a lot of MAGIC words said.

Jon D. Miller - hickory nut shells from the squirrels

From reading the posts so far it looks like all the major reasons for derailments have been covered.

Really don't have a problem with derailments on the CD&StL. In fact, don't have a problem with derailments when running CD&StL equipment on foreign roads. What that tells me is that properly set up locomotives and rolling stock can handle some less than perfect track without a problem.

It's the combination of equipment not being set up correctly (wheel gauge, side bearing, and couplers) and track work that is really bad and not properly maintained.

Usually when we have a derailment it is due to an object on the track; like twigs, gum balls, acorns, hickory nut shells from the squirrels, etc. This happens when I don't take the time to look the track over before making the first run.

Here are a couple of accidents that took place while operating up at Don Burnett's.

Meeting at the Diamond. Someone wasn't paying attention to signals!

Looks like the engineering department didn't take in to account track separation for Mallets.

David Bentley - we filed the inside of the moving rail

I know I am change gauge on us for a moment but I think it really applies to derailment. When I was into HO what we did was go over every rail joint, switch and anything we could find and used a file to level out the track. At every joint we filed the inside and the top of the rail. At each switch we filed the inside of the moving rail to make it thinner and tightened the throw to get a sharper/stronger contact. Worked great. I am going to do the same as soon as I get my elevated "G" layout done, as a derailment from 7 feet in the air will really be ugly.

Tony Goatz - never did find out how it happened

I had a car club come by one time to see my lay out. I put 3 locos on with about 40 cars. The club was running about an hour behind, the whole time that they were late the train run perfectly. Once they arrived, I went out to greet them, when I returned with the entire club following me, not one car was on the track and all of the locos except one had also derailed. I put the trains back on and it run perfectly (of course), never did find out how it happened.

Most of the time when something derails, it is usually the couplers or wheels; sometimes it is junk on the rails. But mostly it is the gremlins

Elaine Haggenbottom - something had fallen on the track

Since my trains were always on a temporary basis, the leveling of the track was done "once" in the beginning when laid, therefore IF I had any derailments it was because: one something had fallen on the track (initially we ran under a magnolia tree, so that was the most likely), OR the track had sunk some in the 3-week interim.
But, that said, we never changed couplers, wheels etc. and ran whatever fit together too. So, I guess ignorance is bliss. OF COURSE, I never left them running without my being there either.

My derailments happened around a curve or something like that when I was sitting there. EEK! I would scream for the hubby, cause at night without a re-railer, with only a small walking path to get into the middle, I couldn't even get them back on the track! (They never came off at a convenient spot either!)

Ed Biesiadecki - wheel alignment is key but easily checked

The scariest derail I've ever had was on my overhead railroad, when my favorite ($800) trolley set hit the switch and was headed to the floor. I wish someone had a camera on me, because I doubt I've moved that fast in years, Thankfully catching both before they hit the ground.

Overall, wheel alignment is key but easily checked, but the cross points on the switches (Aristo's) are my biggest issue as the centers of these are sometimes too high and lift the wheels as they cross. A bit of Dremel work and they're usually ok.

Barbara Karkutt - Switches were a problem

Derailment on Witsend's Rocky RR have had a couple of reasons:

1)Side to side out of level (I think I have that fixed with only minor tweaking this spring)

2)Couplers I'm in the process of changing all of my couplers to Kadee...the Bachman Passenger cars were the worst.

3) Though I clean the track before running sometimes a leaf or twig will fall on a piece of track that I cannot see from the control point.

4)Switches were a problem until I put solid wood under them

5)Occasionally my Snuggles will jump off his viewing rock at the wrong time
My worst derailment..I walked the layout running the train and everything was fine so I let it go around with me at the control point...well there must have been a gremlin because the 4th time around it derailed off the trestle (2.5 ft off the ground) onto the rocks below. Fortunately the only thing hurt were a couple of details easily glued back on.

As far as the couplers are concerned I have been told to do truck mounts because of my sharp curves. Though I do have a straight going into and out of the curves they are sharp due to the unmovable boulders/trees they go around.

Noel Widdifield - switches are the biggest causes

The worst derailment that happened to me was the first time I ran the outdoor railroad and the indoor railroad at the same time. It was at Ann's open house and I had the indoor railroad all set up with the power on but the Train Engineers off so that when we came in from the outside, I could start the trains before people got to the indoor railroad. My son-in-law was running the outside one for people and when we walked into the indoor railroad room one of the trains had run off the bridge and down on the side of the track. Turns out that I had one of the outdoor and one of the indoor Train Engineers on the same settings, so that when my son-in-law was using it outside it started up the indoor train and ran it off of the unclosed bridge.

In my day to day running inside, switches are the biggest causes of derailments and outside it is the tight curves. Nothing is ever easy. ;+)

Paul Roberts - Derailment by slug!

Derailment by slug! That was the strangest one yet on my logging line. My wife and I were sitting have a cuppa one evening and the Heisler with 8 or 9 skeleton loggers was chugging around right smartly for about 15 or 20 minutes when suddenly, wham!!! One huge derailment. Ran to the spot and sure nuff! One sliced and diced Banana slug (we grows 'em real big on the wet coast). As tragic as it was to the slug, it just proves the point that "any time is train time!" Silly slug should have paid more attention to Operation Lifesaver.

Bill Rohm - "Someone" had thrown a switch

My worst derailment was when I drove an LGB Mikado off a 4 foot platform onto a concrete floor. "Someone" had thrown a switch that led to the edge of a section of the platform where a bridge had been removed for repair. Wonder who that was?

Todd Brody - at least one wheel has not come off

Was I the only one to post that we ALWAYS have a derailment. Come on guys, I'm talking about the initial runs before the guests arrive when still getting all the plants trimmed back, setting up the running the track cleaners, getting stuff going initially, etc. all weekend.

I can't think of one session where at least one wheel has not come off the track at least once over the course of the weekend.

Ray Turner - forgetting to throw a switch

My largest cause for derailments is ME forgetting to throw a switch. Most of the time, if the train goes around once; it will keep going around without problem (debris on track and ballast in the switch frogs). One time my Aristo Mallet went around 15-20 times and suddenly - on a straight section of track - fell over on its side. One derailment was caused when the plastic "rivet" that holds a coupler on fell out. The worst derailment was when a ten-wheeler derailed coming into a switch and got stuck in the switch. The on-board throttle controller, sensing that the wheels had slowed down, applied more and more power burning out the motor before I noticed the problem.

To avoid derailments I re-ballast each spring, leveling side-to-side and adjusting grades. I check the wheel gauge - even new LGB cars have been found out of gauge. I have metal wheels on (almost) all my cars. I walk the railroad the first time around to clear any debris. This is all done before running for open houses. With this I have very few derailments while running. I'm not nervous about going inside for an hour while the train runs - which I commonly do for parties.

Dean Mead - ballast washes out too easily

Lots of good ideas in the above posts! I have many Bachmann cars and locos; and am now considering changing all couplers.

I live where it rains a lot (Washington coast), and the ballast washes out too easily. So I glued a level to a flatcar, checking side-to-side leveling, and have found that if it's more than a half a bubble off, there's going to be a derailment problem.

Since I have DCC, a 10-minute cleaning and walk-around takes care of all debris on the track, which has prevented many derailments. Worst derailment was caused by a bad coupler on a 3% grade. The car uncoupled from the engine along with 7 tailing cars, down the grade they went and over the 24" tall trestle curve. What a sight, eight cars sailing off the trestle in what seemed like slow motion. Luckily, none were damaged, not even a scratch.

Most common derailments are caused by critters hauling nuts and other junk onto the track. Usually the track cleaner gets it, but occasionally we miss a nut or two.

Richard Friedman - Fix track, fix derails

Just like the big RR's, most of my derailments came from excessive speed and operator error! Since my track floats in ballast, some derailments occurred where ballast was soft and the track deformed under the weight of locos. Some points were the same problem. Fix track, fix derails. Have also gone to metal wheels and Kadee couplers, but that doesn't seem to have solved anything, as most derailments are as above!

William Manby - engines with RUBBER tires!

I have read every one of the preceding comments and have learned a lot from them. I have suffered derailments such as those described...but no one mentioned engines with RUBBER tires! They give me derailment problems from time to time, occurring mostly when bringing the train to an emergency stop. I mean it really STOPS. But the kinetic energy built up in the following consist tries to keep moving and it tends to buckle the cars trucks if they are mounted too loosely. Firming up the truck to bolster contact helps a lot but rubber tires? Get rid of them. USA will furnish tireless wheels for their diesels and LGB will, at least on my Mikado provide me with the geared front wheel to replace the rubber tired geared wheel on the rear motor block..This helps greatly!

Kenneth Allen - gremlins

All of the above and me, but most of the time it is those smart %^& gremlins for the minute I turn my head or step away they knock something off the track, engines, cars or loads on the cars. One day I will catch them and I am going to wring some necks.

Paul Bottino - my U-boat seems to derail more often

Under the same track conditions, my U-boat seems to derail more often than my RS3. I haven't weighed the two Locos, but the RS3 "feels" a lot heavier than the U-boat. So I conclude it's the weight. My Heavier SD45s never derail confirming my observation. So I am looking to put more weight into the U-boat, because I really like it.

John B Pedersen - NEVER have derailments

We NEVER have derailments here. This one was caused by ice between the rails.
OR when couplers break, rails move (with some help) or when the vice president's plants reach out and grab a car as it goes by.

Paul Arvidson - track washout or sticks

I have not had any real serious derailments on my layout but I have had wrecks while running on some of my friend's layouts. Most is due to track washout or sticks but nothing serious.

Sometimes I run too many trains at the same time on my layout and it is easy to get tangled a little but for the most part it is trouble free.
I credit my low crash rate to doing track inspection and a slow run on the first round. I have wide switches, all curves 10 ft diameter and over, and I try to run heavy locos and all my running rolling stock has steel wheels. I run fast when I can and I run with live steam. My mainlines are straight and flat and curves are banked.
I have an acorn problem along with sticks and leaves in the fall and I shut the layout down in winter and do in-house projects. That is about it. Now that I have a number of high trestles I am sure my luck could change in the future but so far things look great.

Tim Anderson - Car weight consistency

I hobby in two worlds of trains - HO and Garden (1:29). Perhaps, not surprising is all the reasons for derailments are basically the same. There are the minor things that cause derailment in HO that probably are not a problem in G. So here is my big 4 list.

1. Gauge - especially frog alignment and flange clearance.

2. Car weight consistency - NMRA has had a formula for cars for years. I have one for G for myself.

3. Fully sprung or flexible trucks. I'm really surprised how little this is discussed in outdoor railroads.

4. Long cars on small diameter curves. Another way to look at this is the car lateral centerline is too far from the track centerline.

That's my four cents. In HO scale I saw an entire train go on its side when the engine hit auto crossing because the coupler gladhand was too low. In G about 90% of the derailments I've seen, is due to the cars being to light and hitting some small object on the track.

David Maynard - gauge, level, no S turns, tuning up switches

Car weight is discussed by those of us who advocate metal wheels. As for standers for car weight it hasn't become as popular as the smaller scales. I hardly have problems with underweight cars since I follow the rules I learned as a truck driver, the heaviest in front and lightest in back. My scratch built passenger cars are real light weights, but with metal wheels they track just fine. As for sprung or flexible trucks, there have been articles about making even Bachmann trucks flexible, but even my ridged trucks aren't a problem so long as they can rock under the cars, and the track doesn't have them areas where it goes out of level one way, then the other way in a short space.

It was mentioned about body mount couplers, this works for those who have broad curves, but for my smaller curves I use the truck mounted jobbies. Since I don't back my trains much this difference hasn't been a problem, but if I were to do a lot of switching operations it could become a problem. Backing derailments with truck mounted couplers become more frequent with lighter cars (again back to the weight issue).

But if due diligence is paid to the track (gauge, level, no S turns, tuning up switches etc) and trucks (gauge, free rolling, and free swiveling) then most "mystery" derailments can be avoided. This leaves debris and human error

Geoffrey Cullison - uneven trackwork, SWITCHES, couplers

Ah yes, the gremlin of inattention caused this wreck on the Arlington and Little Falls Railroad last July just an hour after the Great Nathan Train Wreck. Can't blame this one on a plant though, it was my fault.

The ALF mail train is a mixture of Bachmann and LGB cars. Most have been converted to body-mounted Kadee couplers, but there are still a few with truck-mounted Bachmann couplers, which we all know hang way too low. In this case, a small hunk of mulch between the rails was just high enough to trip the coupler pin on one of the Bachmann couplers between the second and third cars. The loco and the first two cars then ran all the way around the layout and rear ended the last five with the results shown. Dramatic, but no damage done. We have very few derailments on the ALF. The track is all pre-curved Aristo, floating in the ballast. The tracks are not fastened to the roadbed at any point. Any time there is an alignment or cross level issue, a little ballast is added and the tracks "wiggled" into correct alignment.

As has been noted before, easements into tight radius curves solve a lot of problems. All of my 10 ft D curves are lead into with a section of 20 ft D track. We love the vision of our trains snaking though S curves. We have three S curves; all use 20ft D curves with no straight section. Even a USA PA/B with six USA streamline passenger cars has no problem passing though those curves, and looks pretty good doing it. Oh yeah, this was about derailments, wasn't it. Well, the previous commenter's covered the causes; uneven trackwork, SWITCHES, couplers, wheel gauge, SWITCHES, kinks at the ends of vertical curves, and SWITCHES. The ALF has only two switches outdoors (LGB R6 and Aristo #6) and are both are trailing point in normal operation.

When I take the time to maintain the track before an event, the trains run without derailments except for the human-caused ones.

Joe Fotschky - track and couplers are my biggest culprits

Before I run I check the track looking for sticks, pinecones, and other things on or near the track that should not be there. I would say that track and couplers are my biggest culprits for derailments/crashes.

I don't know what ideas I could share with others then to just inspect your track work and keep your equipment in good running condition and if a wreck occurs just have your camera handy. My derailments are usually when a train comes uncoupled and comes back around and plows in to the cars sitting on the track. Depending on what caused the train to come uncoupled in the first place as well as where on the layout will depend on how spectacular of a wreck I get.

The last recorded wreck on the Flat Top & Mystic Valley Railroad was when the Southern Railway Mikado's lead truck broke loose and was run over by the engine causing it to leave the rails. By the way the Mikado has been repaired and was riding the rails only a few weeks after the incident.