



# NEWSLETTER

Vol. 36 – No. 4  
July – August 2024

**Current Central Station 3 Version – 2.5.2 (6)**  
**Current Central Station 2 Version – 4.3.0 (11)**  
**Current Mobile Station Version – 4.15**

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We have just returned from the annual “EuroWest” Model Train show in the San Francisco Bay Area. As always, it was a great show. The show features modules from several ETE Chapters who travel a healthy distance to attend, including the Pacific Northwest Chapter and the SoCal Chapter. The willingness and sacrifice of these chapters to travel so far is one of the things that make this a wonderful show to attend.

## **CS3 Update**

There was another minor update to the CS3 which did not change the version number. According to the “Changelog,” the update included a change in the software to allow the CS3 to operate at lower voltages and fixed a problem with the 60041-power supply. Also included in the update was a change that makes starting the CS3 safer and allows it to restart after shutting down.

Please note, the statement in the Changelog is directly from Märklin and we have not tested it, nor do we have any more information on the statement.

This update also contained a minor Mobile Station update which shortened the version number from 4.15.0.10 to 4.15, as of now, I am not sure what the update contained.

Our first article is about “Locomotive (over) lubrication,” while the second article is regarding “Understanding A Track Power Feed System.”

## **Locomotive Lubrication**

As many are aware, a locomotive needs service at some point, and sometimes the service needs to be more extensive than others. I have covered doing deeper service in the past (March/April 2018) and will cover basic lubrication here.

I must stress that any oil you use must be “Plastic Safe” and Märklin 7149 is our preferred oil. Unfortunately, most of the locomotives I work on have too much oil in them. When it comes to trains,

less is better, and precise lubrication is even better than “more”. This means I use very little oil and I put it exactly where it is needed. One must remember that oil will run down with gravity so it will eventually find its way to the track collecting dirt along the way and collecting more once it is on the track. In short, less oil in precise spots helps to reduce dirty track. This is particularly a problem when oiling the axles. For this reason, and for my personal locomotives, I choose not to oil the axles unless there is a specific problem with one or more of them. While the drive axles are mostly sealed in the frame, dirt doesn't penetrate very well but oil will still tend to flow out. This doesn't mean it will all run out until it is dry, it will find its natural balance and not really flow out as much anymore unless fresh oil is applied. So basically, it is a cycle of flow.

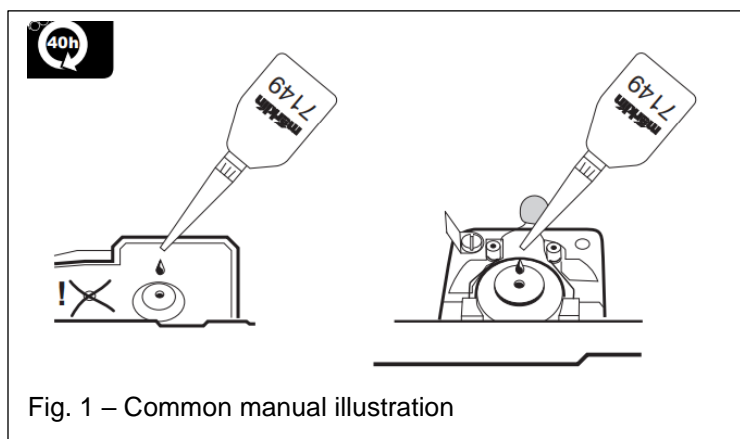
Oil and grease take a long time to evaporate. Evaporation rate is subject to environmental conditions and the type of oil. A lighter oil will naturally evaporate somewhat faster, but it will still take a long time. Also, use will help keep the oil fluid.

Most people get accustomed to when their locomotives need basic oiling or a deeper service. For me it is the sound of the locomotive when it runs that tells me it is time for service. Sometimes the sound is a rough sounding motor, almost a growl sound. This is usually the armature in a 3 or 5-pole motor that needs oil (Marklin 7149). I will also oil the axles of the gears – NOT THE TEETH.

This brings up a newer locomotive with a can motor or an LGB locomotive. The worm gear on a can motor will be lubricated with grease (Trix 66626). This is only as needed because grease tends to stay where you put it and will take a long time to flow down to the lower parts of the locomotive.

Now that the long-winded “Curtis” explanation is over, I will simply show where I lubricate locomotives when I work on them.

Many people are familiar with the lubrication illustrations in the manual, Figure 1 shows an illustration from a typical manual and where to lubricate the motor.



In the illustration, the recommended interval is 40 hrs. This means that after 40 hrs. of operation, lubrication is recommended. For most locomotives this would take several sessions of running and probably weeks to achieve. Compounding this with all the locomotives in one's inventory, it is next to impossible to know which locomotive needs what lubricated.

Some users keep records of the amount of time a locomotive is operated, and some keep a schedule of what locomotives get lubricated in a certain time frame. There are some that take all their locomotives out and oil them annually. I have too many locomotives to allocate time for this or to keep track of run times. This is why I go by the sound of the locomotive.

Figure 2 shows where to grease a worm gear in a locomotive. Since grease is thicker, it doesn't move much, so this lubrication interval is much longer.

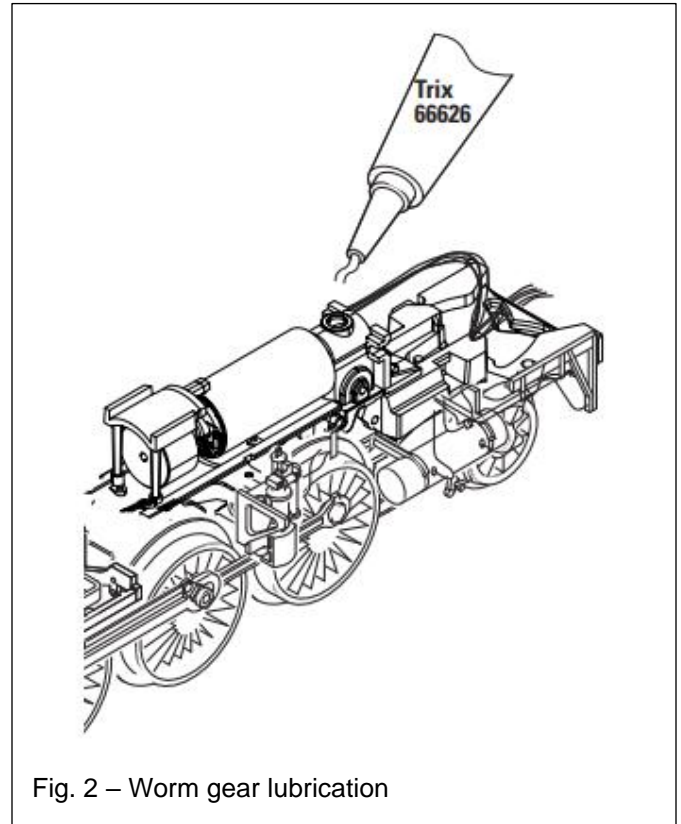


Fig. 2 – Worm gear lubrication

As an example of a real model, I have used a “shop locomotive” that I use to test controllers and decoder settings. It is a nice little V60 diesel. This will give you an idea where to lubricate.



Fig. 3 – Shop diesel

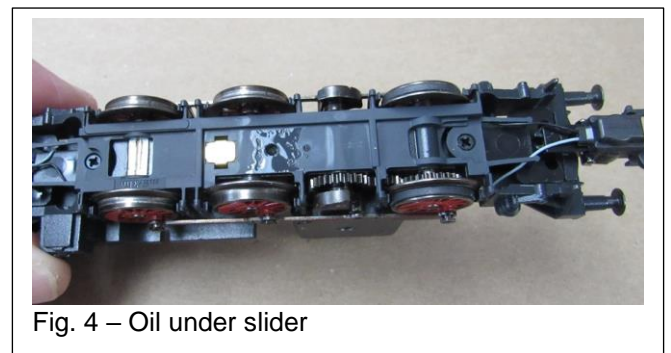


Fig. 4 – Oil under slider

One place that shows a sign of over oiling is under the slider. This makes sense since it is the lowest spot of the frame except for the wheels. There is almost always oil under it so a little is ok. Too much will get on the slider eventually and make its way to the track.

Figures 5 and 6 show where to oil the motor armature. This only needs a tiny amount of oil.

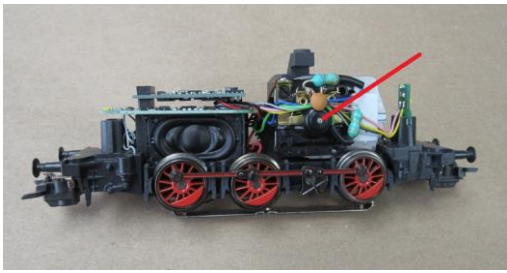


Fig. 5 – Armature lubrication point - front

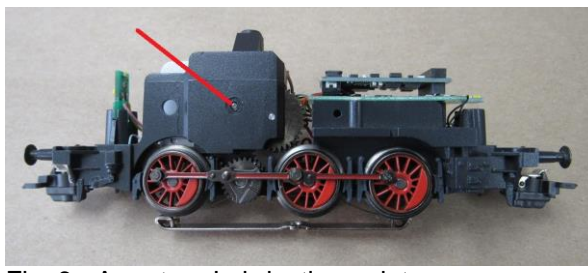


Fig. 6 - Armature Lubrication point - rear

To lubricate the gears, it is not normally necessary to disassemble the motor. Usually, the gear axles are accessible with a little practice. Figure 7 shows the #1 gear of this locomotive. This is the first gear after the armature, and it is held in with a pin that has a head on it. I lubricate the head side of the pin. If the other side is lubricated, the oil will spread all over the side of the gear and the side of the one next to it. This will collect dirt in time. I have removed the armature to show the axle pin clearly in Figure 8. All other gears get lubricated on the gear axles.

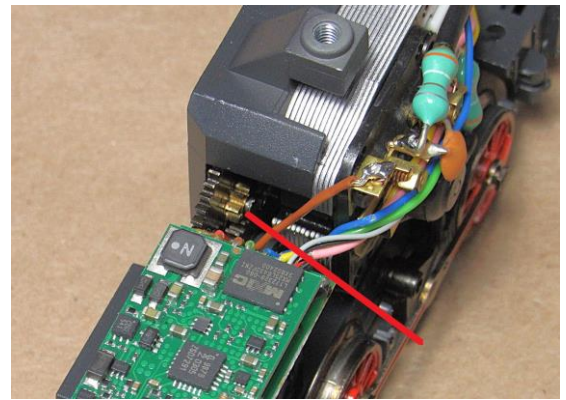


Fig. 7 Axle pin with head

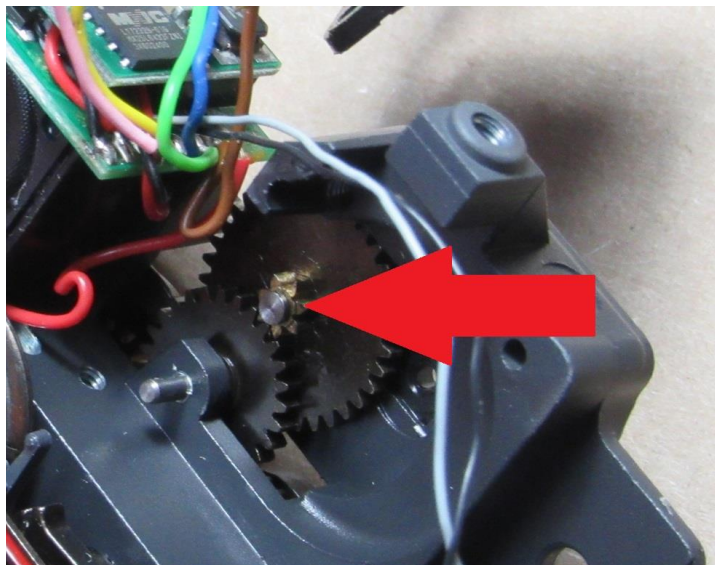
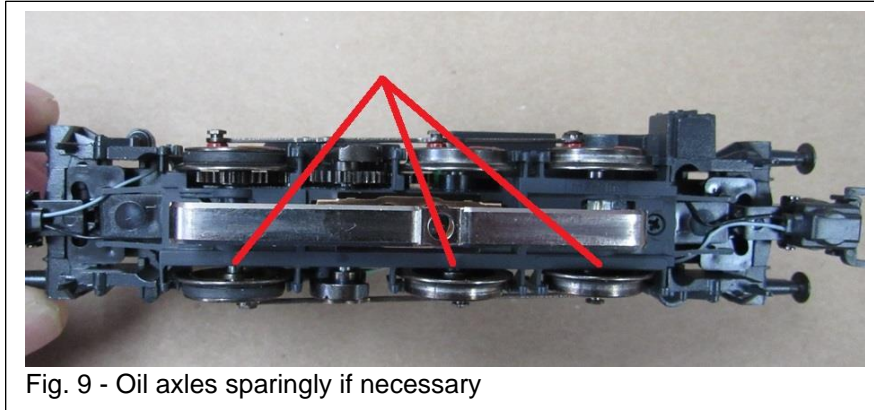


Fig. 8 Axle pin close-up

Once the gears are lubricated the wheel axles get inspected, if they look wet, there is probably more than enough oil on them. I just leave them because removing wheels just to clean out oil is too much work and quartering wheels is not fun. If they do need oil, I will put a small amount on the non-geared side and let it flow in (Fig. 9).

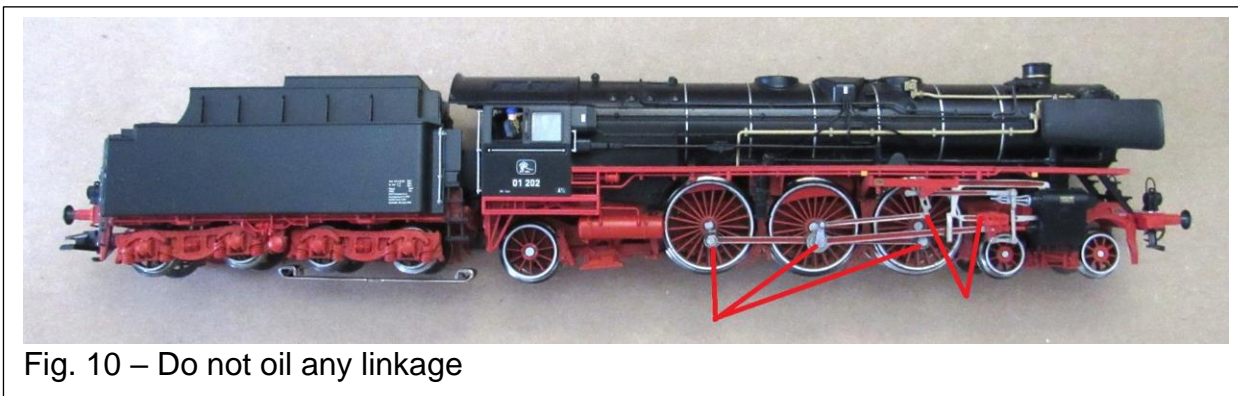




When it comes to oiling pilot trucks, trailing trucks, and tender axles and sometimes axles for freight and passenger cars, I prefer not to. Again, they just collect dirt. If a wheel does not turn, I clean it completely first. If it still does not turn, there must be a reason and I investigate further. If there is a squeak, I recommend a dry lubricant like graphite. This will greatly minimize getting oil on the track.

### **Where NOT to oil**

In doing repairs, I am always amazed that people feel the need to lubricate the drive linkage on locomotives. This is 100% not necessary. What needs to be understood is that the rods and slides on a model train are not such a close tolerance that lubrication is necessary. These are basically cosmetic, and enough play is designed into them that no lubrication will help the run-ability.



In short, I recommend only oiling the armature bearings, gear axles and, if necessary, the drive wheel axles. Also, when needed, non-powered axles get cleaned and a dry lubricant like graphite.

**Enjoy your hobbies!**

**Rick Sinclair**

## Understanding A Track Power Feed System

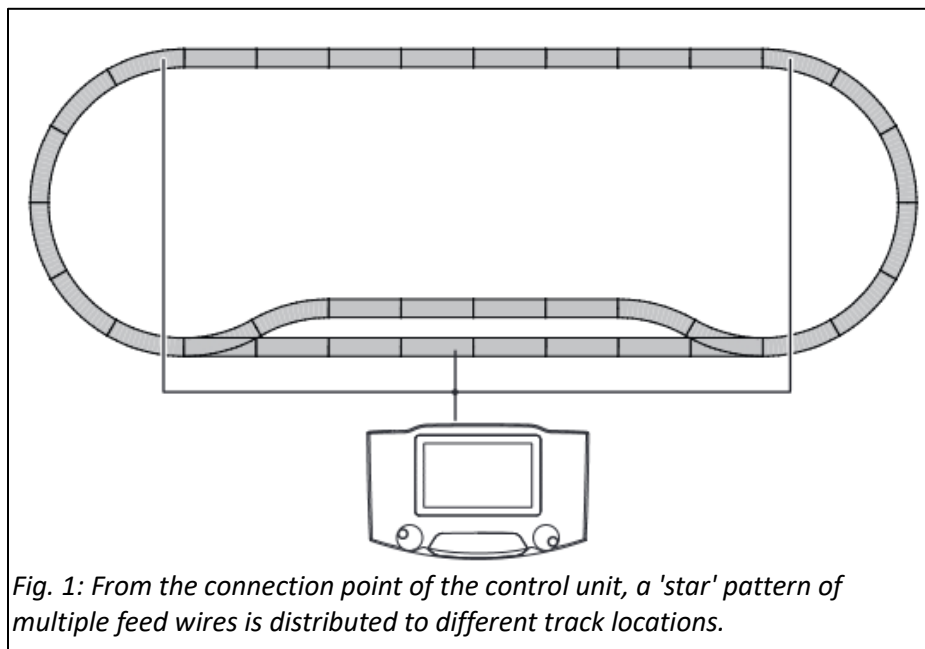
The following article is adapted from Märklin Technical Tip #105

No matter which track-system a model railroader chooses: the track must be powered by electricity. To do this, a two-pole wire is laid from the control unit to the track connector. However, in an analog system, the locomotive speed may soon drop the further it moves away from that connection point.

To explain this phenomenon, we need to take a closer look at the current flow: From the Control unit, current flows to the track via the power/signal feed wire. From the connection point the track power circuit is reliant on the track profile itself, which is then guided to the locomotive.

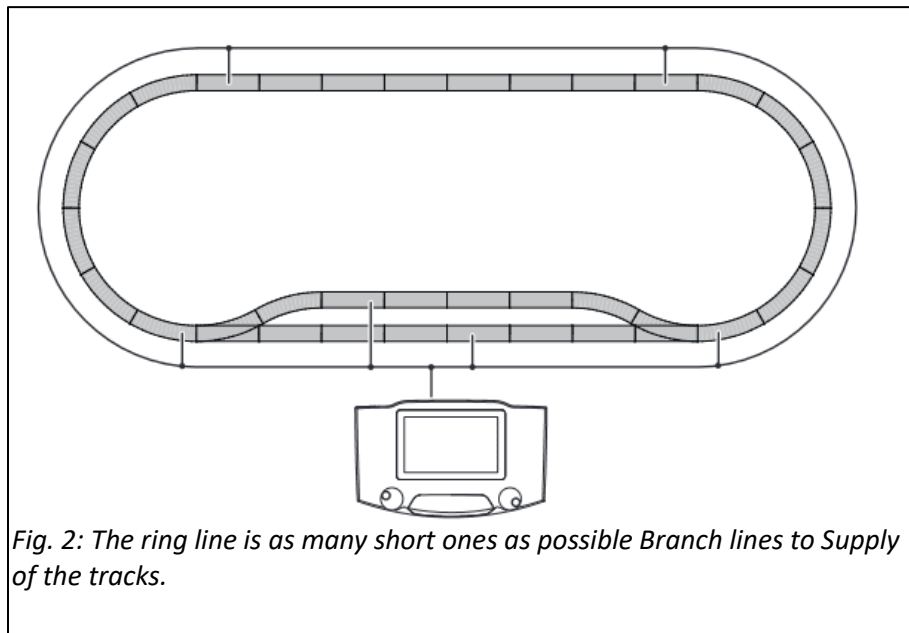
For this purpose, the various pieces of track are connected to one another in an electrically conductive manner. However, due to aging and/or contamination, the electrical resistance at those connection points increases. Each connection point forms additional resistance (like a micro resistor). During operation, each of these resistors causes a reduction in current flow. The locomotive receives less and less power the more track connections there are between the locomotive and the track power connection (or feed location).

In digital operation, the digital signal is also attenuated (diminished) and so it can also cause “unexplained” malfunctions to occur.



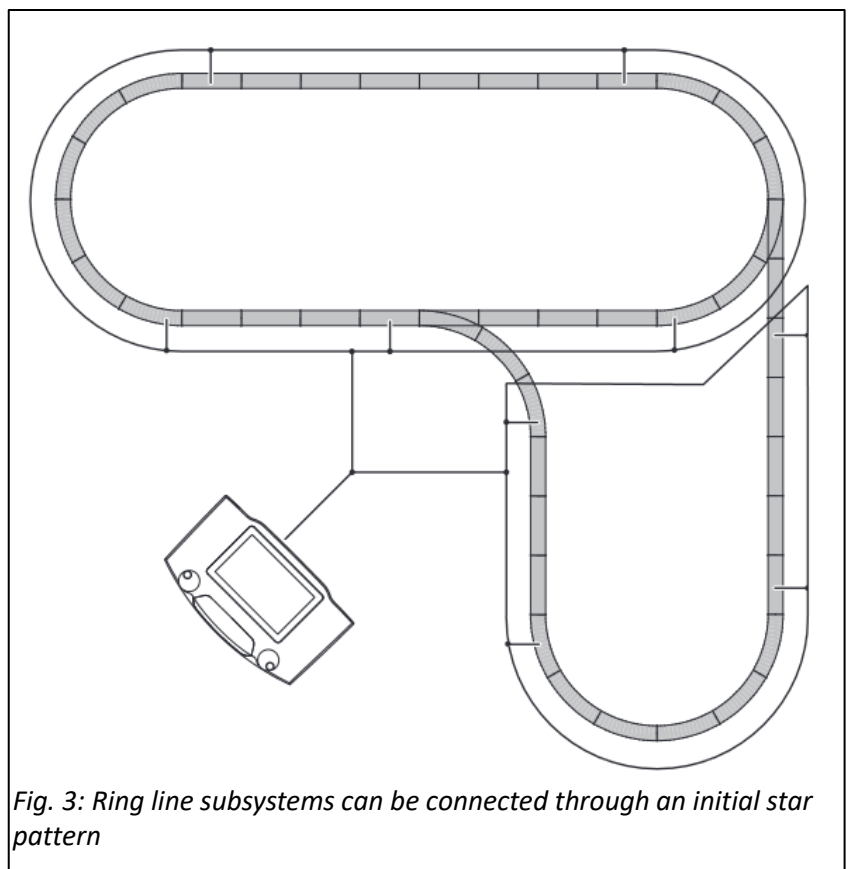
The simple solution to the problem is called “multiple feeding.” The more often the track is connected to the supply voltage, the shorter the path the electricity must travel over the track (See Fig. 1).

But with larger systems this can quickly become confusing. It is then advisable to lay a ring line parallel to the track, and then connect the track to the ring line with short spur lines (Fig. 2).



This means that the cable routing is always clear and increases the frequency of direct track control by the control unit.

The principle of the ring line can also be combined with that of the star pattern. Different cables can connect to individual parts of a system in a star pattern to be connected to a respective ring line. Fig. 3.



Basically, the following must be noted:

- The cable routing should be as clear as possible.
- The lines should not cross each other (clarity).
- The cable cross sections should be selected according to the load.
- It is advantageous to close a ring line again at the end.
- The polarity must be the same at all feed points.
- Multiple feeds, whether with star or ring lines, do not replace the use of a booster.
- It is advisable to identify possible separation points for possible troubleshooting (preferably in the branch lines). Plug connections can be made here, e.g. with Plugs 7141x and the Märklin 72090 or LGB 50720 Distribution Strip.

Unfortunately, there is no fixed rule for the number or distance between feeds. The better the electrical connection works at the track joints, the larger the distance can be between connection points. On the other hand, there are also disruptions in the track that require more frequent feeding. For example, it makes sense to install a feed before and after areas where switches are involved.

For large tracks (track 1, track G), the distance must be a maximum of 2.5 m - 2 m (~8 - ~6 ft.) in feed wire spacing. For smaller gauge tracks a maximum of 2 m, preferably 1.5 m (~6 ft to 4.5 ft), can be fed in. In the case of special current loads these distances should be reduced accordingly. An example would be staging yards or stations.

### Cable cross sections (Wire Gauge/thickness)

The required wire gauge thickness can depend on their application and the resulting current load. The ring line should distribute the full voltage across the entire system. For the ring line (or power buss) it is recommended to use a slightly lower gauge (thicker cross section) wire.

The branch line, by comparison, is a short piece of track. A higher gauge wire is sufficient for this. In addition, higher gauge wire is easier to solder and conceal under track.

The following table is intended to be a rough guide (Gauge conversions are in Parenthesis).

| Track width          | Ring/powerBuss:<br>cross section Gauge) | Part Number   | Feed wire:<br>cross section(Gauge)       | Part Number   |
|----------------------|---|---------------|--|---------------|
| Z gauge              | 0.19 mm <sup>2</sup> (32-33)            | märklin 710x  | 0.19 mm <sup>2</sup> (32-33)             | märklin 710x  |
| N gauge              | 0.19 mm <sup>2</sup> (32-33)            | märklin 710x  | 0.19 mm <sup>2</sup> (32-33)             | märklin 710x  |
| HO gauge             | 0.75 mm <sup>2</sup> (20-21)            | märklin 71060 | 0.19 mm <sup>2</sup> (32-33)             | märklin 710x  |
| Track 1<br>(märklin) | 1.5 mm <sup>2</sup> (14-15)             | LGB 51233     | 0.75 mm <sup>2</sup> (20-21)             | märklin 71060 |
| Gauge G (LGB)        | 1.5 mm <sup>2</sup> (14-15)             | LGB 51233     | 0.75 mm <sup>2</sup> (20-21)             | märklin 71060 |
| Accessories          | 0.75 mm <sup>2</sup> (20-21)            | märklin 71060 | for all applications<br>and track widths |               |



It is recommended that you monitor your application of wire lengths. For example, wire loads with the standard 0.19 mm<sup>2</sup> (32-33 gauge) Märklin 710x package should not exceed lengths beyond 5m (~16 ft).

Finally, it should be noted, wire gauges that are too large can cause malfunctions.

In systems, usually track 1 or track G that operate with high power requirements, we recommend using the 100 VA switching power supplies from Märklin (60195 120V or 60101 220-240V) or LGB (51095 230V). These devices allow a current of up to 5A on the track. That means particular care is employed both when wiring and during subsequent operation.

Improper application and operation can pose a risk of injury. For example, excessive current or power can cause significant damage to vehicles because of short circuits from derailment. Pets, as well as kids, should stay away from the tracks when high current is in use as it can cause injury.

If the above-mentioned switching power supplies are deemed insufficient to supply adequate control/power to all model areas, then it is recommended to subdivide the layout and then added divisions be connected using boosters

It should also be noted that the switched power supplies (60195 and 60101) must not be operated outdoors.

Furthermore, protection can also be provided with the use of current limiting circuit breakers.

Outdoor operation

For a model railway that is operated outdoors, one should pay attention to their regional aspects of weather exposure. Good contact between track connections should be maintained more frequently as efficiency is reduced more rapidly due to exposure. Good contact can also be augmented by shorter intervals between feedline connections. Regular cleaning and refurbishment are recommended.

Curtis Jeung

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### **Upcoming appearances:**

- **Trainfest 2024 – Milwaukee, WI – NEW LOCATION**  
November 23-24, 2024
- **ONLINE Webinar**  
August 14, 2024

**To contact Rick and Curtis for help with your Digital, technical and product related questions:**

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