



EM

**OPERATING
MANUAL**

E8 / 9 LOCOMOTIVES





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EMD E8A & E8B LOCOMOTIVE PRODUCT GUIDELINES

Thank you for purchasing this model of the one of the most celebrated diesel-electric locomotives of all time, the EMD E8A and/or E8B. Due to the rising cost of gold-pressed latinum and the cutting back of our coffee budget, we're not printing different manuals for the E8A and the E8B; if you bought a E8B, just imagine from here on that every time you read E8 it means E8B.

If this is your first Rapido locomotive, we must ask – why is this your first Rapido locomotive? No, seriously, we've been around now for a long time now and we're not just a Canadian company, eh? We've produced an imperial ton of US products, like the New Haven FL9s, coaches, parlors and diners, Amtrak F40s and Cabbages, RDCs, FA-2s, RS-11s, etc. So just for that, we're going to make sure you LOVE your EMD E8. And then you'll say to yourself, "What have I missed out on all these years? I need to find and buy every Rapido model that has ever been released, in every scale! Even the UK ones!"

If you are a returning customer, welcome back! Just put your engine on the track. All we ask is you don't intentionally set it on fire, don't use it on a daredevil stunt off the end of the layout, and don't MU it to anything made by Tyco. Oh, and REALLY keep it away from cheap DC controllers. Crappy power packs can quickly and easily give any Rapido locomotive an unwanted makeover ... and not the good kind (more like the smokey kind).

If this is your first Rapido Manual, we should warn you up front - there's usually a good amount of humor through these manuals. Well, at least we think so. We have gotten some e-mails from people that don't agree, but we suspect that they have no sense of humor. After all, model railroading is supposed to be fun!

As always, if there is anything amiss with your EMD E8, please do not hesitate to contact us. We stand by our products 100%. The best way to contact us is through email (trains@rapidotrains.com) but you can also reach us by phone, the postal service, or Messenger Pterodactyl as well. Our contact info is near the back of this manual.

However, PLEASE do not send a faulty model back to us without first getting authorization. You wouldn't believe how many times we get a delivery of a broken locomotive with only a name inside (sometimes only the FIRST name), meaning we have no idea what's wrong with it! (Hey Frank – your package of telephone poles is still sitting on the shelf in our bathroom.) If the issue with your model is something simple – like a loose grab iron – then we'll likely tell you how to fix it yourself. While we generally will support repairs to your EMD E8 for a considerable length of time, please realize that eventually the parts supply will run out. That, or the Earth will be assimilated by the Borg and all humans will become drones for the Collective; whichever comes first. Unfortunately, that will dictate when we can no longer help you. Again, please make sure you contact us first so we can tell you whether there's enough parts (or humanity) left to do your repair.





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LOK SOUND
EST. 1999

Sound-equipped Rapido models feature ESU Loksound V5 decoders. For more information, please visit www.esu.eu.

E8 DCC FUNCTIONS

| | | | |
|-----|----------------------------------|-----|------------------------------|
| F0 | Headlight | F13 | Rear Backup Light |
| F1 | Bell | F14 | Gyalite <i>(if equipped)</i> |
| F2 | Horn | F15 | Spitter Valve |
| F3 | Coupler Clank | F16 | Cab Interior Light |
| F4 | Dynamic Brake | F17 | Brake Set/Release |
| F5 | Doppler Horn | F18 | Track Inspection Lights |
| F6 | Ditchlights <i>(if equipped)</i> | F19 | Numberboards |
| F7 | Dim the Headlights | F20 | Radiator Fans |
| F8 | Startup/Mute/Shutdown | F25 | Steam Generator |
| F9 | Drive Hold | F26 | Sanding Valve |
| F10 | Independent Brake | F27 | Short Air Let Off |
| F11 | White Class Lights | F28 | Air Compressor |
| F12 | Switching Mode | | |





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PROTOTYPE HISTORY

The EMD E8 was the quintessential North American passenger locomotive of the 1950s through the 1970s with a total of 450 E8A and 46 E8B units produced from 1949 to 1954. These units pulled passenger trains from coast to coast and later became the backbone of Amtrak's fleet in its early days. Many more were later used in commuter service before being retired. Several live on today in museums and tourist railroads throughout North America.

The EMD E-unit is known as the diesel that knocked steam locomotives off America's premier passenger trains. Earlier passenger diesel designs had their limits, restricting them to very lightweight trains of fixed length like UP's *M-10000* or CB&Q's *Pioneer Zephyr*. What was needed was more horsepower for higher speeds on heavier trains. In 1937, a streamlined, multiple-unit, multi-engine design using twin 900 hp diesels was manufactured and dubbed the EA/EB for its Eighteen hundred horsepower (plus A for cab or B for booster). Initial units were joined by handful of slant-nose E1, E2, E3, E4, and E5 units for other roads while power was increased to 2000 hp. It wasn't until the E6 design when railroads finally ordered them in quantity...only for World War II restrictions to take effect in 1942. No further E-units were made until 1945 when the "bulldog" nose E7 hit the scene. Now convinced of the diesel loco's superiority, the railroads ordered hundreds of them to replace aging and costly steam engines. The 2250 hp E8 was a further improvement to the line and proved to be even more popular than the E7. The final variant arrived in 1954 with the 2400 hp E9. By then, steam had been all but vanquished from mainline passenger service.

The EMD E-unit was so successful at replacing steam locomotives on passenger trains that they were purchased by nearly all of the large railroads in the United States with only a few notable exceptions. Of the 1,350 E-units sold, only three Es were purchased new by Canadian railroads.

BREAK-IN

Just so we're clear, that doesn't mean break into anyone's layout room to steal their EMD E8. And don't break into a hobby shop either because that is really frowned upon. Just buy more for yourself. But this isn't about that kind of break-in.

Every locomotive needs a break-in period. Your EMD E8 has been tested at our factory for about two minutes ... maybe ... just to make sure everything functions as it should. That is certainly not enough time to get the gears to mesh nicely or to even out any jerky operation in a new motor. We suggest that, after reading this manual, you put your EMD E8 on a test loop and just let it run in each direction for an hour or two. Fast and slow. Don't have it pulling anything either while you're breaking it in.





There already should be enough grease in the gearbox so you don't need to add any. Just let the thing run. If you are running this thing on track on the carpet, please vacuum first. You have no idea how many models come back to us with gearboxes full of carpet fluff and pet fur. Our models are not cat-proof.

HOW TO HOLD YOUR LOCOMOTIVE

Hold your EMD E8 gently, and with much love, care, and attention. Your model has numerous delicate parts, especially on the roof and underframe. If you want to back date it to be the quality of a model produced in the 1970s, then rip all the parts off and handle it like a doughnut from Dunkies after skipping breakfast. We're assuming you don't want to do that, so the EMD E8 should be picked up carefully. It is best to pick it up with your fingers along the bottom edge of the body. That way you won't leave greasy fingerprints on the sides and you also won't stress any of the delicate parts. Always make sure your hands are free of shmutz before touching your engine, otherwise you'll shmutz up your fuel tank. Hey – if your hands have enough oil on them that could be realistic.

If you are taking your EMD E8 to the club all the time and regularly handling it, stuff will likely break off. Sorry. The little bits are made of plastic and metal and attached with glue, which is all a bit fragile. We attempted to make the small parts out of unobtainium and use Steady-State Micro Welding to install them. Unfortunately, with the current global supply crisis, unobtainium has become unobtainable.

We suggest wrapping your EMD E8 in a plastic bag before placing it in the packaging or in your holder so you can catch bits that fall off. White glue is the recommended adhesive for reattaching the bits, although you are welcome to use CA but only if you are very careful or very brave. Remember to apply the CA to just the part and not the model (don't ask us how we know this).

CHECKING AND ADJUSTING YOUR LOCOMOTIVE

We try and make sure that every locomotive is perfectly up to spec before it leaves the factory, but if it was a Monday night and our factory workers were placing bets on last night's football game between Taiwan and Singapore rather than assembling models, there may be a couple of bugs. Doing a quick pre-service check will solve most operational glitches.

- Check to see that all wheelsets are correctly in gauge using an NMRA RP-2 Standards Gauge. Should any of the wheelsets be out of gauge, then remove the affected wheelset from the truck by prying off the bottom lid of the gearbox with a small flat screwdriver and then spreading apart the sideframes. The wheelset can be regauged by grabbing each wheel and twisting. Reverse the





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steps to replace the wheelset and ensure the gearbox cover is snapped into place before placing it on the track.

- Check that all underbody piping and appliances are firmly installed and clear of the track. Of particular note are the air hoses on the ends of the locomotive and both coupler trip pins. Bend up any low coupler trip pins so they don't interfere with your switches and crossings. We recommend using Kadee part #237 (Trip Pin Pliers) or Micro-Mark part #80600 (Trip Pin Bending Plier). If your track transitions from flat to a 12% grade in three inches, you might also want to cut off the pilot and the fuel tank as they will foul the rails. Have you ever considered roller coaster modeling? That might be more your style.
- Make sure that the trucks swivel freely and without binding. If they catch on anything, check to ensure that the sides of the trucks don't bind against the steps. If they do, see that everything is firmly installed.

MISSING OR DAMAGED PARTS

If you open your EMD E8 box and discover that something has obviously been bumped in transit and is damaged, please contact us. We know that some of you don't like the idea of human beings touching your models, but if it is a matter of gluing an exhaust stack back on you can do it yourself in less than a minute with a drop of white glue. If you really want to send your model back to us for us to install that, we would be happy to. But if you do send it back to us for us to put that one part back on and other stuff falls off when we send it back to you, then tough tooties. We're not fixing it again.

We try to make our models courier- and mail-proof, but there really is no way to protect a model from damage when it is used in a game of football at the UPS or FedEx distribution center. Model trains generally don't survive well after being "spiked" because Bobby scored a touchdown near the warehouse receiving doors.

If you see some grab irons are missing and they are not floating around the packaging, let us know and we will send you replacements. More information about our warranty can be found towards the end of this manual.

ADDITIONAL FEATURES

Over the years, the EMD E8 came with a few special features that were often customized for or by the purchaser. Some railroads opted for additional lights or details. With that said, let's have a look at what some of the interesting EMD E8 features are:





FRONT PILOTS

The pilot options include either flush pilots that share the contours of the nose itself (often called “passenger pilots”) or a pilot with a recessed crease in it near the top (often called a “freight pilot” because it was common on freight F-Units). E8Bs have no pilot; not even an autopilot. Or is that Otto Pilot? Surely, you can’t be serious.

MULTIPLE UNIT CONNECTIONS

Multiple Unit (MU) receptacles were added to the noses and rear ends of most E8s as the technology for operating multiple engines in a consist evolved. MU receptacles were often placed in recesses behind hinged doors in the nose which sometimes lost their doors in later years. This left a recess in the nose with an MU receptacle in it. Some MU connections were added as a protrusion on the nose with the receptacle mounted on it.

GYRALITE (CB&Q, EL, IC & UP)

The Pyle-National Co. “Gyalite” oscillated in a circular pattern with the idea that it would attract more attention trackside and at grade crossings. These had a red lens as part of the fixture; the engineer could choose to use the white or red light as circumstances called for. Before you ask, the red lens does not light up on our model.

TRAINPHONE (PRR)

This was voice communication system developed by the PRR in the 1930s. It allowed an engineer to talk directly to lineside towers and with the crew in the caboose using electromagnetic induction through the track or via lineside wires. The roof top antennas on the locos look like short handrails.

REMOVING THE SHELL

If you need to open your EMD E8 to install a crew or a decoder, things should be pretty straightforward and easy. To get inside your EMD E8, you will need to follow these steps:

- We recommend that you only attempt opening up your locomotive in a zero-gravity environment. That way, if a part does break off, it will just be suspended there, right where you broke it, ready for you to reinstall it. If you don’t have a zero-gravity chamber, then we suggest not installing shag carpet in your workspace. Yes, it looks great and yes it feels great on bare feet, but Rapido employees have experience in understanding that whatever detail bits fall into shag carpet are gone forever. No questions, it’s not coming back. The only way to find it is to walk barefoot and hope that it impales your foot





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in the most painful way possible. And if you decide to use this method to find the missing parts, you're not covered by our health plan.

- To that end, please make every effort to ensure nothing flies away. We normally suggest you work in a room with everything white – walls, floor, ceiling, workbench, tools, clothes – everything. But doing so would be very boring (albeit practical) so that's likely not the case, is it? Instead, wear a shop apron (white, of course!) but attach the bottom of it to the underside of your workbench. That way, at least some parts will be saved from hitting the floor. Just remember to remove the apron before standing up.
- To remove the shell, you *don't* have to remove the screws from the coupler boxes or the pilot. Just carefully spread the body sides out away from the chassis. There are four clips (two on each side) that engage slots in the chassis. It may help to install toothpicks or stiff paper (such as a business card) by each tab to help hold it open while you work on the others. If you are working in a zero-gravity environment, then the chassis will slowly drift away from the shell. On the other hand, if you are not in a zero-gravity environment; remember – gravity sucks. If you hold your loco upright the chassis will now plummet to the nearest solid object. Hopefully that is not a concrete floor. You may want to do this carefully over your workbench with some foam or a cloth underneath.
- If you wish to install a crew inside your EMD E8, the cab is secured to the body shell by two clips – one on each side. With a little manipulation the cab should come free after spreading the sides of the shell and maybe using a small prying tool. Patience will be key here as the clips are also the clear window material. Don't jam a tool in there too hard or you might scratch the glass (it will not buff out).
- If you wish to change out the decoder, then just follow the previous steps about removing the shell. It will expose all the wonders that lie within.

At this point you should have the entire shell off the frame, as long as you followed our super simple instructions. We don't know how to put it back together, so from here you're on your own. Just read the instructions backwards and you should be ok. If you find a cryptic message while reading the instructions backwards, it's not our fault.

Any requests for replacement bodies because you broke the little clips will be met with laughter, followed by sadness, then laughter again, and then a very polite suggestion that you should model a locomotive rebuilder and use your recently broken body as scenery. We did warn you after all. If we can assist, then all joking aside we'll make every effort to do so. But note that we don't have a warehouse full of shells and cabs to replace the broken ones.





OPERATION – DC (SILENT)

If your EMD E8 locomotive is not equipped with a sound decoder, it should function like most other HO scale locomotives. Put it on the track. Give it some juice. Watch it go. In DC, the number boards are always on and the headlights are directional. All other lights – including class lights and optional Gyalites – are wired, but they will not work in DC.

If you are new to the hobby (or just like to occasionally “play trains”) and you have a DC-powered train set, please contact us before operating your EMD E8 as it may not be safe (for your engine and/or your wallet) for you to use your controller.

Some train set throttles put out a very high maximum voltage that is not suitable for scale model trains. The maximum recommended voltage is 15 volts DC. Similarly, controllers designed for large scale trains put out a much higher voltage than your EMD E8 can handle. Please see the highlighted warning not too much further in this manual.

If you use a train set throttle or a throttle designed for large scale trains, your locomotive’s circuitry may end up looking like a TV dinner forgotten in the microwave after you accidentally punched in an extra digit into the timer. In such situations, we’ll try our best to fix it for you, but it may be beyond salvaging. Please note we may have to charge you for the replacement parts and/or the labor involved in restoring it to its former self. That’s because you didn’t read this bit of the manual. For those of you who are reading this, hi! How’s it going? You in the mood for pizza?



GENERAL DATA E8 LOCOMOTIVE

| | |
|--|--------------|
| Weight (fully loaded) "A" Unit (approx.) . . . | 316,500 lbs. |
| "B" Unit (approx.) . . . | 308,300 lbs. |
| Weight on Drivers "A" Unit (approx.) . . . | 210,750 lbs. |
| "B" Unit (approx.) . . . | 207,500 lbs. |
| Fuel Oil Capacity (per unit) | 1,200 gal. |
| Lube Oil Capacity (per engine) | 165 gal. |
| Cooling Water Capacity (per engine) | |
| "G" Valve Level | 200 gal. |
| Steam Generator Water Capacity, Basic . . . | 1,350 gal. |
| Steam Generator Water Capacity with | |
| Hatch Tank | 1,950 gal. |

Gear Ratios and Speeds

| Gear Ratio | Cont. T.E. | Min. Cont. Speed | Max. Speed |
|--|-------------|------------------|---------------|
| 52/25 | 19,500 lbs. | 37 MPH | 117 MPH |
| 55/22 | 23,500 lbs. | 31 MPH | 98 MPH |
| 56/21 | 25,000 lbs. | 29 MPH | 92 MPH |
| 57/20 | 27,000 lbs. | 27 MPH | 85 MPH |
| Sand Capacity (per unit) approx. | | | 22 cubic feet |
| Number of Drivers (per unit) | | | 4 pair |
| Wheel Diameter | | | 36" |
| Truck Centers | | | 43' |
| Truck Rigid Wheelbase | | | 14' 1" |
| Minimum Curve Radius | | | 274' (21°) |
| Center of Gravity above Rail (approx.) | | | 60-1/2" |
| Length: Between Coupler Pulling Faces | | | 70' 3" |
| Height: Over Horns | | | 14' 10-1/2" |
| Width: Outside Grab Irons | | | 10' 8" |





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INSTALLING A DCC DECODER

The EMD E8 contains a motherboard specially designed for our decoders. This is connected to the track, motor and lighting outputs. A blind plug is attached to the motherboard using a 21-pin connector. To install a decoder, remove the blind plug and install a 21-pin decoder. Your chosen decoder should have eight function outputs.

At the time of writing, we recommend only the following non-sound 21-pin decoders:

- ESU #59029 - LokPilot 5 Basic with 21MTC
- ESU #59629 - LokPilot 5 DCC with 21MTC

We feel the 21-pin connectors are superior because there are enough pins to ensure that all your lighting functions are connected. The necessary resistors are included on our motherboard so you don't have to futz around with resistors. Just plug in one of the recommended decoders and you have DCC. We know some of you prefer a different brand of decoder, but we honestly can't help you install it or map the functions.

We have made a EMD E8 function mapping which can be downloaded onto ESU decoders so that the function buttons and motor control are exactly the same as our factory-released sound versions. This should be available for download from the Support section of our web site. If it isn't, bug us. You will need an ESU LokProgrammer to write the function mapping to the 59029 or 59629 decoders. If you don't have a LokProgrammer, you can adjust CVs in the usual way.

We will be selling EMD E8 sound decoders separately; if they aren't on our web site by the time you read this, call our office, pick a random number between 1 and 75, divide by $\frac{3}{4}$, multiply by $\sqrt{\pi}$, and then take the second last number. Call that extension and you'll be redirected to someone whom you can yell at. Look at us – we use the correct pronoun and then end the sentence with a preposition. This is a metaphor for the contradictory nature of human existence! You can find further editions of this manual in the philosophy department of your local bookstore!

If you want to install a decoder other than the one we suggest, it's more than just plugging in the decoder and then playing trains. You will have to custom map all the functions. It's just how it is. We won't apologize for that. Sorry.

OPERATION – DC (SOUND)

To operate your sound-equipped EMD E8 locomotive on a DC layout, just give the throttle some juice. The engine will start up once sufficient voltage has been reached (around seven volts). See the note above (in Operation – DC (Silent)) about using





train-set or large-scale throttles. With DC layouts, you have very little control over the sounds of your model.

— WARNING —

Rapido products are designed to operate safely between 0V and 16V. Voltages in excess of 16V - as well as irregular waveforms, voltage spikes or short circuits - may cause severe and sometimes irreversible damage to the product. "Train set" power packs are known to suffer from any one of these unexpected irregularities, whereas higher-end systems have safeguards in place to prevent this. Rapido always recommends using a power supply system that matches the quality of the models you are running. If you're reading this, you've obviously invested in top-of-the-line, museum-quality motive power and equipment, so we hope you've made the same investment with your model railroad power supply too.

While many power supply systems exist, some are known to have caused problems with model train circuitry in the past. If you have any one of the following systems, PLEASE DO NOT USE IT until you contact us for more information: MRC RailPower 1300/1370-series, Bachman Spectrum Magnum, Atlas 313 Universal Power Pack.

The DC lighting is limited. Some throttle manufacturers produce special gadget-like thingies which are meant to trigger the sounds in locomotives on DC layouts. As we have no involvement in the development of those gadget-like thingies, we have absolutely no idea how they will affect your EMD E8, for good or for ill, for richer or poorer, in sickness and in ... sorry, wrong transcript. As always, we'll try to help you fix your EMD E8 if one of these gadget-like thingies turns your locomotive's circuitry into something akin to glowing magma, but we can't guarantee we'll be able to.

It is usually at this point in the manual that Jason inserts a gentle dig at his fellow modelers who won't switch from DC to DCC. The rest of the staff continue to repeatedly remind him what happened the last time he did that. Something about being chased down the county highway by a group of townsfolk wielding transformers and potentiometers. As long as we can keep reminding him of this event, he'll be nice to DC modelers. Not that we're calling DC modelers Luddites - No, sir, not us!

OPERATION - DCC (SOUND)

We go to extreme lengths for accuracy, in sounds as well as in looks. Our sound decoders are LokSound V5 decoders by ESU, with Full Throttle functionality. The





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sounds are about as bang-on accurate as we can make them. EMD E8s were known to be very smooth starting due to their hydraulic load regulator and governor. After all, they didn't want to spill any drinks in the diner. Therefore a certain amount of starting momentum has been pre-programmed into the decoder to replicate that EMD smooth start. If you want to eliminate the delay to speed up, program CV3=00, but when passengers complain about their spilled drinks, don't blame us!

More detailed decoder instructions, including all sorts of weird CV settings we don't understand, can be found in the ESU LokSound V5 decoder manual. It is available for download from the support section of our web site or directly from the ESU website.

LOCOMOTIVE ADDRESS

Your Rapido EMD E8 comes from the factory with a decoder address of 3. We suggest if you are using DCC control that you first test that the locomotive responds on address 3 to all functions – motor, lights, sounds, everything. Once you have verified that the locomotive is responding you should assign it a unique address (normally the road number of the unit) before going any further. This can be done either on your programming track (recommended) or on the main if your system supports programming on the main. Be aware however that if you do program the locomotive on the main and you have any other locomotives assigned to address 3 (the normal default address for new locomotives) that ALL of them will also be changed to your new address! This is great if you want to simulate a bunch of kids getting into the engine shop, notching the controllers, and then heading for the hills.

Note that some DCC systems get a little wonky when programming sound-equipped locomotives on the programming track because of the high current draw. If weird stuff happens, try programming on the main.

TURN ON THE SOUND

Press F8 and you will hear the EMD E8 startup sequence followed by the sound of it idling. You can adjust CVs to prevent the locomotive from moving until the startup sequence has played out. Most of us at Rapido are really impatient so we turned this feature off. Refer to a full ESU LokSound V5 decoder manual for more information. You can now download it from the Support section of our web site. The feature is called the "Prime Mover Startup Delay" and is Section 13.2 on Page 89 of the ESU LokSound V5 manual.

If you press F8 when the locomotive is already moving, it will skip the startup and the sound will just turn on. Press F8 again to turn the sound off.





Note that if you are listening to your EMD E8 idling nicely and then you select another engine, your locomotive still thinks F8 is pressed so it will keep idling along. However, if someone else selects your locomotive's number and F8 isn't pressed on their controller, the EMD E8 will promptly shut down. They will need to press F8 again.

FUNCTIONS

| | | | |
|-----|------------------------------------|-----|--------------------------------|
| F0 | Headlight | F13 | Rear Backup Light |
| F1 | Bell | F14 | Gyalite (<i>if equipped</i>) |
| F2 | Horn | F15 | Spitter Valve |
| F3 | Coupler Clank | F16 | Cab Interior Light |
| F4 | Dynamic Brake | F17 | Brake Set/Release |
| F5 | Doppler Horn | F18 | Track Inspection Lights |
| F6 | Ditchlights (<i>if equipped</i>) | F19 | Numberboards |
| F7 | Dim the Headlights | F20 | Radiator Fans |
| F8 | Startup/Mute/Shutdown | F25 | Steam Generator |
| F9 | Drive Hold | F26 | Sanding Valve |
| F10 | Independent Brake | F27 | Short Air Let Off |
| F11 | White Class Lights | F28 | Air Compressor |
| F12 | Switching Mode | | |

FUNCTIONS: MORE INFORMATION

F0 Headlight

Just like the real thing, our EMD E8 headlight is not directional. No matter which way you're going, the front headlight IS the front headlight. Not like some frumpy GP or SW unit where it always leads the way. If you want the headlight facing the opposite way of travel to be on, then read a little further on under the Rear Backup Light function.

F1 Bell

Probably one of the most difficult sounds to master is the bell because it's such a noticeable feature, and no matter what, chances are they all had their own unique tone to them. We have provided six slightly different bell sounds so that you can add a little variety to your huge fleet of EMD E8s. You DO have a huge fleet of EMD E8s, don't you? You can choose between the bells by changing CV164 to a value of 0 through 5.

F2 Horns

We love our horns. Like really! Seriously, who doesn't love a good sounding horn? So, we're now providing a wide range of horns for you to apply to your locomotive





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as appropriate or as you see fit (even if it's not appropriate). To get a short "toot" just tap F2 or your "HORN" button. If you hear a long tail-off, you are tapping for too long. If, no matter what you do, you just can't get the darn thing to make a short "toot," switch to NCE. The default horn is either a Leslie A-125 or a Nathan M3, but we've included several others. Refer to the "Custom Sound Settings" section below.

F3 Coupler Clank

Just as you're easing into a standing cut of passenger cars, hit F3 and through the miracle of modern electronics you'll hear the couplers clank together.

F4 Dynamic Brake (*if equipped*)

Press F4 to get dynamic brake sounds. Who does that? Well apparently a lot of people because once upon a time, we got flak for putting it in the higher tiers of functions on our old locomotives. So for that, we apologize and have brought it to the forefront of functions for your acoustic pleasure. If your unit does not have dynamic brakes, you can think about using F4 but that would be so wrong.

F5 Doppler Horn

You can play this when approaching level crossings or any other whistle post. The doppler is nicely timed for a moderately paced train blowing for a level crossing. When you change the default horn for F2, the doppler horn will also change to the appropriate tone as well. It's like we're wizards or something!

F6 Ditchlights (*if equipped*)

Ditchlights were invented in Canada in the 1960s to illuminate right-of-way ditches for rockslides and other obstructions. They became mandatory in Canada in 1975 and do not alternately flash. They are either both on or both off because their job is just to light up ditches. The flashing kind of ditchlights are for American locos.

F7 Dim the Headlights

When approaching a station stop or an oncoming train, press F7 to dim your lights and turn off your ditch lights – you don't want to blind your passengers or the oncoming train's engineers. It will also turn off any other potentially blinding lights you may be running. Not dimming your lights is a direct violation of what's commonly referred to as "Rule 17". The internet can answer all your questions about said rule.

F8 Startup/Mute/Shutdown

While your locomotive is stationary, pressing F8 will begin the startup sequence of the engine sounds. If your locomotive is silent but already in motion, pressing F8 will skip the startup sequence and simply turn on the sound. If the sound is already on,





press F8 to mute the sounds. If your locomotive is stationary, then you will hear the engine shut down sequence before the sound turns off.

If you have a DCC system that only allows eight functions, you can remap the functions following the guidelines in the ESU LokSound V5 manual, which can be downloaded from the support section of our web site. Or you can upgrade to a newer DCC system, which may be less stressful.

F9 Drive Hold

ESU's "Full Throttle" feature allows you to play the prime mover of your EMD E8 like a musical instrument. When you press F9, you turn on "drive hold." This keeps the speed of the engine constant at whatever speed step your throttle happens to be on. Then as you increase the throttle, you hear the prime mover revving up. This sounds awesome, especially when you're taking off from a commuter station stop at warp speed.

"Full Throttle" is even neater when you throttle down, as it allows you to simulate "coasting" which is such an important part of running a real train. When you press F9 again you turn off "Full Throttle" and the engine will accelerate or decelerate to whatever speed step your throttle happens to be on. For realism it's a good idea to take note of what speed step your throttle was on when you turned on "Full Throttle" and be back at that speed step when you turn "Full Throttle" off. Otherwise, your EMD E8 may fly like an eagle, to the sea. Yes, fly like an eagle. Please don't make us sing the whole chorus.

F10 Independant Brake

F10 works just like the brakes on a real engine. Press F10 and you put on the brakes. Turn off F10 and the brakes come off, so you can start moving again. ESU's Drive Hold feature has made the brake function more popular, so we've moved it up to F10 to match the ESU standard. The default sound is based on composite brake shoes but if you hate your eardrums, you can change it to cast iron brake shoes and writhe in pain every time the train stops. Change CV165 from 0 to 1 to hear the glory that is a cast iron brake shoe.

F11 White Classification Lights

When you press F11, the white class lights will turn on. Hitting F11 a second time will cycle the lights off. White Class lights were used to signify a train was running as an extra in train order territory.

F12 Switching Mode

Are you one of those folks who models a large urban passenger terminal, like, say Toronto Union Station? Do you have lengthy light engine moves between engine





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storage and the coach yard? Then this function is for you! It limits the top speed of your EMD E8 by about 50% to reduce the risk of damage when coupling to parked passenger equipment. Function F12 also dims both the headlight and the rear light so as not to blind your trainmen on the ground.

F13 Rear Light On/Off

A common misconception on cab units is that the light on the rear should be on whenever the engine is moving backwards. Actually, it's only on when the engine is running light or switching cars. Pressing F13 will simply toggle the rear light 'on' and 'off'. It's magic, I tell you!

F14 Gyalrite (if equipped)

Multiple railroads equipped their EMD E8 units with a flashing Gyalrite, replicated on our model by using function F14. This light fixture moves the beam of light around in a circular pattern ahead of the loco. In addition to warning pedestrians and cars along the right of way, it also signals to low-flying aircraft and possibly UFOs. Only the white light illuminates, not the red one.

F15 Spitter Valve

To save you from the saliva clean-up should you try to mimic the sound of the spitter valve, we've provided its sporadic sounds on F15. By default, it's always on, as the real thing would always be going when the locomotive is running (and for a few minutes after it's shut down). But if you prefer to not hear it at all, just press F15 to silence the spit.

F16 Cab Interior Light

When the sun sets or you are in a tunnel, how do you read your train orders? Flashlights were too heavy and bulky back in the 1950s to carry one around with you all the time (and back then a "cell phone" was the payphone inside the local jail), so just turn on the cab light instead. Just remember to turn it off as soon as possible so as not to ruin your night vision.

F17 Air Brake Set/Release

This function turns off the brake release and brake set sounds when you start or stop moving, respectively. It has no effect on the function of the engine – it just effects the sounds.

F18 Track Inspection Lights

These lights shine down onto the roadbed. Why did we include them? Because they look neat, of course. Oh, and your engineer will be happy at night when he's making a shove. By default they are on. Pressing F18 will turn them off.





F19 Number Board Lights

The number boards are on all the time as a default. We hate having to turn number boards back on after a power failure. If you want to turn off the number boards, just press F19.

F20 Radiator Fans

On the EMD E8, the radiator fans are the small ones on the roof above each engine compartment. By default, these fans are automatic meaning the sounds turn on and off at seemingly random times. But if you need to take direct control of the fans in your life, press F20 to hear that buzzing whine whenever you want.

F25 Steam Generator

Of course we had to add the steam generator sounds to the EMD E8 as they all had them to begin with. Nothing like the soothing sound of steam escaping. Of course as time went by and passenger E8s became freight E8s, steam generators were removed or left to rust. If you're modeling them in freight service, I hope you bought at least four of them.

F26 Sanding Valve

Steel wheels on steel rails are rather slippery when wet. If you find yourself livin' on a prayer, raise your hands to the sanding valve and let it rock. If you never say goodbye to traction, you'll be wanted dead or alive by every railroad.

F27 Short Air Let Off

No, this is not about the Wednesday after Taco Tuesday. You get a simple release of air when you hit F27, that's it. "Psssst!" Kind of like shushing someone at the local library.

F28 Air Compressor

Pump that air up! By pressing F15, this will activate the air compressor but by default, the sound file will randomly play this feature.

CUSTOM SOUND SETTINGS

The EMD E8 was used by several operators and, as such, were equipped with a multitude of different horns, and could even feature slightly different bell tones, different brake materials and everything else in between.

The default horn on your model is either a Leslie A-125 or a Nathan M3, depending on the road. We have justified doing this because most E8s were delivered with Leslie A-125 "blat" horns but some had Nathan 3-chimes. You can change the default horn by changing the value of CV 163. We've also chosen defaults in the





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remaining categories because someone had to make the important decisions. They can all be changed by adjusting the value of their respective CVs.

Horns

- CV163=0 Leslie A-125
- CV163=1 Leslie A-200
- CV163=2 Leslie S-2M
- CV163=3 Wabco E2
- CV163=4 Nathan P3-R4 (Old Cast)
- CV163=5 Leslie S-3L
- CV163=6 Nathan M3
- CV163=7 Nathan M3H
- CV163=8 Nathan M5
- CV163=9 Leslie S-5T
- CV163=10 Nathan P5A (Old Cast)
- CV163=11 Leslie A-75

Bells

- CV 164=0 Bronze Bell #1 (*Default*)
- CV 164=1 Steel Bell #1
- CV 164=2 Bronze Bell #2
- CV 164=3 Steel Bell #2
- CV 164=4 Bronze Bell #3
- CV 164=5 Steel Bell #3

Air Dryer

- CV 166=0 Air Dryer #1 (*Default*)
- CV 166=1 Air Dryer #2
- CV 166=2 Air Dryer #3
- CV 166=3 Air Dryer #4

Brake Squeal

- CV 165=0 Composition Brake Shoe (*Default*)
- CV 165=1 Cast Iron Brake Shoe

Note that after you change the horn, bell or any other sound effect, you may need to cycle the power (turn it off and on). And changing the default horn automatically changes the doppler recording on F5 too.

SOUND VOLUME SETTINGS

The sound volumes on your decoder have been pre-set at the factory to levels that we found comfortable on our test tracks.

Sound levels are very much a matter of personal taste (especially if you are showing signs of advanced deafness like we are), and what sounds great in one layout environment may sound too loud or too soft in another. Fortunately, the sound levels can be easily adjusted to best suit your own requirements and we recommend that you experiment with different settings if you don't care for the default levels.

To set the volume levels go into the program mode on your DCC system (refer to your system's manual for instructions on how to do this as each system is slightly different); enter the desired CV number; then enter the desired levels. Note that this can be done either on a programming track or on the main (Ops mode) if your DCC system supports programming on the main.





We strongly recommend that you keep notes on which settings you have changed, and which values were used. If you ever need to do a reset on the decoder (see "Factory Reset" below) then having good notes will allow you to easily re-enter any changes that you wish to keep.

— VERY IMPORTANT —

Before you manually change any of the volume control CVs, you must set CV 31 to 16 and then CV 32 to 1. CV 31 and CV 32 are used as index selection registers and if you don't set them first, unspeakable things may happen to your unit. You must set the CVs every time before changing any volume CV settings.

Or just get a LokProgrammer. No, we will not teach you how to use it!

EMD E8 SOUND VOLUME SETTINGS

| KEY | FUNCTION | CV | DEFAULT | RANGE | YOUR VALUE |
|-----|--------------------------|-----|---------|-------|------------|
| | Master Volume | 63 | 155 | 0-192 | |
| F1 | Bell Volume | 283 | 60 | 0-255 | |
| F2 | Horn Volume | 275 | 110 | 0-255 | |
| F3 | Coupler Clank Volume | 291 | 60 | 0-255 | |
| F4 | Dynamic Brake Volume | 299 | 128 | 0-255 | |
| F5 | Doppler Horn Volume | 411 | 165 | 0-255 | |
| F8 | Diesel Volume | 259 | 100 | 0-255 | |
| F10 | Independant Brake Volume | 339 | 40 | 0-255 | |
| F15 | Air Dryer Volume | 387 | 80 | 0-255 | |
| F17 | Brake Set/Release Volume | 483 | 40 | 0-255 | |
| F20 | Radiator Fans Volume | 315 | 109 | 0-255 | |
| F25 | Steam Generator Volume | 435 | 60 | 0-255 | |
| F26 | Sanding Valve Volume | 355 | 20 | 0-255 | |
| F27 | Short Air Let Off | 443 | 80 | 0-255 | |
| F28 | Air Compressor | 307 | 65 | 0-255 | |
| F29 | Air Dryer | 387 | 80 | 0-255 | |





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FACTORY RESET

On your EMD E8 you can perform a factory reset by entering a value of “8” into CV 8. Note that this will cause all of your new volume and motor settings to be lost, so you will need to reprogram any settings that you want to keep. What do you mean, you didn’t take any notes? WE JUST TOLD YOU TAKE NOTES! If we had a band, you’d be kicked out of it. Again!

You can NOT lose all the pre-recorded sounds on your EMD E8 decoder by doing a factory reset. However, after performing a factory reset your EMD E8 may begin to sing *Engine of Love* and recite lines from the musical *Starlight Express*. If that happens, you have probably lost your mind. But don’t worry. Just sit back, grab some popcorn, and enjoy the show.

By the way, pay no attention to the person breaking into your layout room attempting to steal your Rapido EMD E8 because they misread the instructions on Page 4.

AWESOME SLOW SPEED THINGY

There is an awesome trick that you can use to get even better slow speed running and smoother operation with your 5-pole skew-wound motor-equipped EMD E8. It’s called the Automatic Motor Tuning Feature. This feature will automatically adjust the Back-EMF in most cases (again, in MOST cases) and give you phenomenal slow-speed performance. We highly recommend breaking in your locomotive (as mentioned earlier in the manual) to get the gears meshing nicely before applying this feature.

In order to use this automatic adjustment, you need to setup the following:

- Use Ops mode programming, i.e. programming on the main
- Make sure your locomotive is in “forward”
- Make sure you have a level, straight section of track with ample space ahead of the locomotive. When we say ample, we mean like 3-5 feet (1-1.5 meters) of empty track. Avoid gaps, switches or other special track work if possible. Any disruptions or irregularities could cause improper reading of the motor resistance.
- You may have to set up pylons or a work block to keep other errant model railroaders from entering your territory. Little blue flags are also beneficial too.





Once you've established your setup, start by setting CV 54 to a value of 0. Then get out of programming mode and turn on the bell (press F1).

Your EMD E8 will quickly take off at full speed and suddenly stop. If you had previously installed an HO scale crew without HO scale seatbelts, you may want to dispatch an HO scale ambulance to attend to the injured. After that, you should have fabulous motor control. If you ever have to reset your locomotive, you can do the automatic adjustment thingy again – it just takes a few seconds. Just remember to install the seat belts if you haven't already.

MORE INFORMATION

While addressing the features that most modelers will need for normal operation, these instructions have covered just a small number of the many customizable features of your ESU LokSound decoder. For advanced users who want to more fully explore the capabilities of the decoder we suggest downloading the ESU LokSound V5 decoder manual. This is available in the Support section of our web site.

LIMITED WARRANTY

We will do our best to solve any problems or issues that you may have with your EMD E8 locomotive. If your locomotive has any defects that originate from the factory, we will repair your locomotive using new components or replace it outright should a repair not be possible. However, we can only replace your locomotive while we have additional ones in stock. While we would love to have an infinite supply of spare parts and do our best to keep as many on hand as possible, eventually these will run out too. In some cases, future productions of the same locomotive may result in a parts supply being restocked, but that is not always guaranteed. If you are like most of us and – after purchasing this locomotive – you put it on the collection shelf under the darkest corner of your layout and are now just discovering it 30 years later after your friend at the club ran theirs, then you are on your own if there are any issues. Jason is long retired and probably touring the country on our restored sleeping car, *Edmundston*. The rest of us have also retired but probably don't have the luxury of our own private rail car. And we're not bitter at all. Really. Not.... at... all....

There are several things that this warranty cannot cover. If your EMD E8 arrives with a couple of loose grab irons or underbody bits, there is a very good chance that you can affect a repair in less time and effort than it would take to contact us. Don't be afraid to do some model railroading! White glue works wonders for securing all sorts of parts and will not mar or damage your paint. However, if parts are missing





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that is another story – contact us directly through our website or give us a call and we'll send you some replacements.

Of course, damage caused by running your locomotive at full speed around a 15" radius curve along the edge of your 60" high layout, weathering it with canola oil, or any other unique damage caused by you and that we haven't been able to cover here is not covered by the warranty. If catastrophe does strike – even as the result of your own actions (or possible inactions) – and your locomotive gets damaged, please give us a shout and we'll do our best to help you out if possible. Don't be shy.

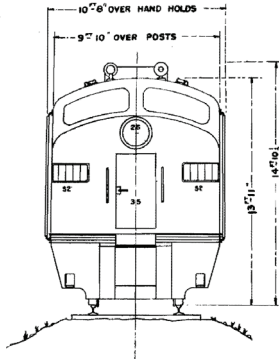
ACKNOWLEDGEMENTS

The EMD E8 project was very much a labor of love as many of us on the Rapido team also love these locomotives. However, this project would not have been possible without the extensive help and expertise provided by the following folks:

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- June 2022



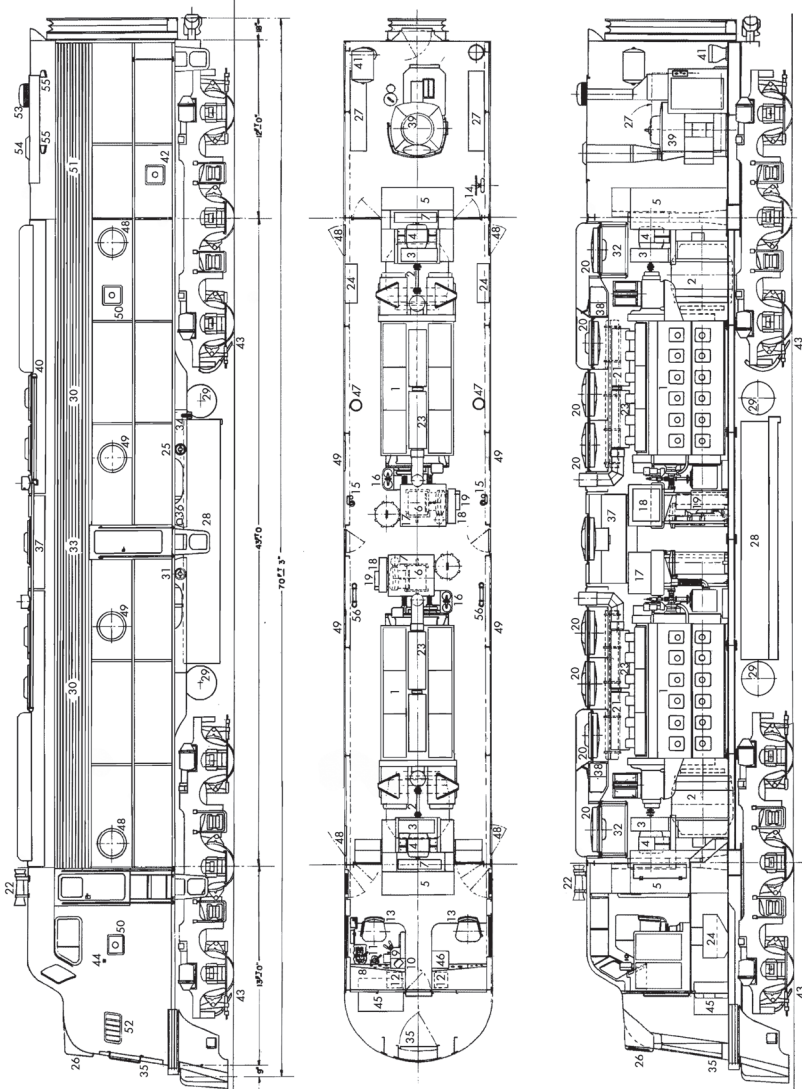
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- 55 BATTERY BOX VENTS
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- 43 SANDING NOZZLES
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- 40 STEAM GENERATOR CABINET
- 39 "A-C" CONTACTOR CABINET
- 38 DYNAMIC BRAKE HATCH
- 37 REVERSE FUEL CUT-OFF
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- 35 AIR INTAKE FOR GRIDS
- 34 ENGINE ROOM VENTILATOR
- 33 ROBERTS VALVES
- 32 MAIN AIR RESERVOIR
- 31 FUEL (1200 GAL.) & WATER (1200 GAL.) TANK
- 30 BATTERIES
- 29 HEAD LIGHT
- 28 SAND BOX
- 27 EXHAUST MANFOLD
- 26 HORN
- 25 RADIATOR
- 24 LOAD REGULATOR
- 23 ENGINE CONTROL & INSTRUMENT PANEL
- 22 ENGINE WATER TANK & LUB. OIL COOLER
- 21 LUB. OIL FILLER
- 20 FUEL TANK VENT WITH FLAME ARRESTOR
- 19 HAND BRAKE
- 18 SEAT
- 17 CAB HEATER
- 16 AIR BRAKE STAND
- 15 SPEEDOMETER RECORDER
- 14 INSTRUMENT PANEL
- 13 TRACTION MOTOR BLOWER
- 12 AIR COMPRESSOR
- 11 CONTROL CABINET
- 10 GENERATOR BLOWER
- 9 MAIN GENERATOR & ALTERNATOR
- 8 ENGINE-MODEL 12-567-B

• MODIFICATIONS

2250 H.P. MODEL E8 LOCOMOTIVE "LEAD" UNIT



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