



FT ABA Diesel Engine Set

Compatibility

This diesel engine will operate on any traditional O-31 Gauge track system, including M.T.H.'s RealTrax® or ScaleTrax™ or traditional tubular track. It is also compatible with most standard AC transformers. *(See page 17 for a complete list of compatible transformers and wiring instructions.)*



Page Ware Sound

M.T.H. ELECTRIC TRAINS



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SET UP

There are a few simple steps you must take before operating this Premier Diesel.

1. You should prime the operating smoke unit with smoke fluid before operating. Add 15-20 drops of smoke fluid through the smokestack, then gently blow into the stack to eliminate any air bubbles in the fluid.
(See Fig. 5 on page 11)
2. If you choose not to prime the unit with fluid, turn the smoke unit switch located under the engine to the OFF position. (See Fig. 6 on page 11) Running the engine without a primed smoke unit may cause damage. See the "ProtoSmoke Unit Operation" section of this book for more information on smoke unit maintenance.
3. You should lubricate the wheel axles and pickup rollers to prevent them from squeaking. Use light household oil and follow the lubrication points marked "L" in Fig. 2 on page 8. Do not over oil. Use only a drop or two on each pivot point.
4. You may find, if your locomotive was built several months before you set it up, that the rechargeable battery has run down and needs to be charged before operation. If you notice that the sounds are garbled, test and charge the engine as described in the "Self Charging Battery Back-Up" section on page 13.

At this point, you are ready to begin running your engine.

BASIC OPERATION

THROTTLE

Throttle up the power to your track. Give enough power so that the engine's headlight shines brightly. Then put the engine into motion by either firmly pressing the Direction button on your transformer or remote once or dropping and advancing to throttle to put the engine in forward.

OPERATION BUTTONS

Use the operation buttons on your transformer as described below.

Horn/Whistle - To sound the horn/whistle, firmly press the Horn/Whistle button. The horn/whistle will sound for as long as you continue to depress the button. It will stop when you release the button. The horn/whistle has four different endings, depending on whether you hold the button for less than three seconds, three seconds, four seconds, five seconds or longer.

Bell - To sound the bell, firmly press and release the Bell button. To turn the bell off, press and release the Bell button again. The bell will continue to ring from the time you turn it on until you press and release the button again to turn it off.

Direction - Your engine is programmed to start in neutral. To put the engine into forward and then to change the direction of the engine or to put it into neutral, firmly press and release the Direction button on your transformer. Just as you must stop your car between forward and reverse, this engine will not go directly from forward to reverse; it goes into neutral between directions. If the engine has been moving forward, the first press of the Direction button will put the engine from forward into neutral, the second press into reverse, the third press back into neutral, and the fourth back into forward. To prevent accidental high-speed start-ups, this engine is programmed to restart in neutral each time the track voltage is turned off for 10 seconds or more.

MANUAL VOLUME CONTROL

To adjust the volume of all sounds made by this engine, turn the master volume control knob, located on the underside of the engine, clockwise to increase the volume and counter-clockwise to decrease the volume. (see *Figure 1*)

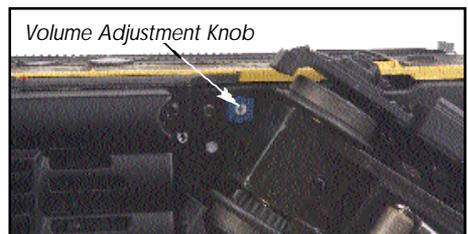


Figure 1 - Proto-Sound 2.0 Volume Adjustment Knob

PROTO-SOUND 2.0 OPERATION

This manual contains the operating instructions for Proto-Sound 2.0 in conventional mode only. Instructions for accessing DCS command mode features accompany the DCS Remote Control System equipment.

Because Proto-Sound 2.0 is an all-new system developed by M.T.H.'s own research and development team, it operates differently from the original Proto-Sound. Most Proto-Sound 2.0 features are automatically enabled, and the reset state has been eliminated, so there is no need to program features as with original Proto-Sound. Although the new system is easier to operate than original Proto-Sound, you should read these instructions thoroughly before using Proto-Sound 2.0 features in order to prevent harm to yourself or your equipment.

Activating Proto-Sound 2.0 Conventional Mode Features: Proto-Sound 2.0 features are activated by sequences of Bell and Whistle button pushes described below. Please read the full descriptions of each feature before using it. To use these buttons to activate features rather than to blow the whistle or ring the bell, you should press the buttons for a shorter time (1/2 second); you may need to practice your timing to make this work smoothly.

Feature to be Activated	Button Code
Freight Yard Sounds	1 Bell, 2 Whistles
Fire the Rear Coupler	1 Bell, 3 Whistles
Fire the Front Coupler	1 Bell, 4 Whistles
Speed Control On/Off	1 Whistle, 2 Bells (from neutral only)
Lock into a Directional State/Unlock	1 Whistle, 3 Bells
Reset to Factory Defaults	1 Whistle, 5 Bells (from neutral only)

Freight Yard Sounds (FYS): Your engine is equipped with a sound package of freight yard sounds that you can play when you pull into a yard. **Each sequence described in the following will play as long as it is left on, randomly generating sounds, but be sure to allow approximately 30 seconds between the button pushes described below to allow the FYS sufficient time to run through each sequence.**

1. To cue the sound system to play the FYS, quickly, but firmly press the Bell button once followed by 2 quick presses of the Whistle button while the engine is moving.

2. Press the Direction button once to stop the engine. This will trigger the first sequence of FYS. The reverse unit is temporarily disabled so that the train will not move as you use the the Direction button to trigger the sounds, and Proto-Sound 2.0 has disabled operator control over the Whistle and Bell buttons until the full FYS sequence is complete.

3. After waiting about 30 seconds for that sequence to run, press the Direction button again to trigger the second sequence of FYS.

4. After waiting about 30 seconds, press the Direction button again to trigger the third FYS sequence.

5. Again, after allowing about 30 seconds for that sequence to run, press the Direction button one more time to trigger the fourth and final FYS sequence. The FYS will continue, and within a few seconds, the engine will start and move out on its own at the current throttle setting, in the same direction it was traveling when you began the sequence. Once the bell turns off, the operator regains control of the transformer's bell and whistle buttons and can ring the bell or blow the whistle as usual.

Tips on Using FYS

- You can terminate FYS at anytime by turning off power to the track for 15 seconds.
- You do not have to be in Forward to use FYS. At the conclusion of the full sequence, the train will pull away from the station in whatever direction you were going when you activated the feature.
- You can use FYS even if you are double-heading with another engine. If the second is not equipped with FYS at all, you must remember not to leave the throttle at a high voltage level once you have stopped the engine to run the FYS. Otherwise, the engine without FYS will start vibrating on the track as its motors strain to move the train, since they cannot be automatically disabled during the FYS cycle. If the second engine is an original Proto-Sound engine equipped with FYS, you may choose to disable it when used in double-heading operations, so you will not experience competing FYS sounds. To disable FYS in an original Proto-Sound engine, see the operating instructions for that engine.
- FYS can be triggered from Neutral. It will operate the same as if triggered while in motion except that, at the conclusion of the FYS, the engine will depart in the next direction of travel, as opposed to the direction it was traveling before entering Neutral.

PROTO-COUPLER ® OPERATION

This engine is equipped with a coil-wound Proto-Coupler for remote uncoupling action. Because the Proto-Coupler is controlled through the Proto-Sound 2.0 microprocessor, it does not require an uncoupling track section or modification to your layout to function. Use the codes listed below.

Rear Coupler: To fire the rear coupler, press the Bell button once followed immediately by three pushes of the Horn/Whistle button. The sound of the lift bar and air line depletion will play, and the knuckle will be released.

Front Coupler: To fire the front coupler, press the Bell button once followed immediately by four pushes of the Horn/Whistle button. The sound of the lift bar and air line depletion will play, and the knuckle will be released.

SPEED CONTROL

M.T.H. engines equipped with Proto-Sound 2.0 have speed control capabilities that allow the engine to maintain a constant speed up and down grades and around curves, much like an automobile cruise control. You can add or drop cars on the run, and the engine will maintain the speed you set.

While the engine is programmed to start with the speed control feature activated, you can opt to turn it off. This means the engine's speed will fall as it labors up a hill and increase as it travels downward. It is also affected by the addition or release of cars while on the run. To maintain a constant speed when speed control is turned off, you need to adjust the track voltage yourself. When speed control is off, the volume will drop to allow for better low voltage operation. Full volume is restored upon reactivation of speed control.

To turn speed control on and off: First, put the engine in neutral, then press the transformer's Horn/Whistle button one time then immediately press the Bell button two times. Two whistle blasts will indicate that the engine has made the change. Repeat the 1 Horn/Whistle, 2 bells code to return it to the other state. **You will want to do this during the initial neutral start-up if you ever couple this engine with another engine that is not equipped with speed control to avoid damaging the motors in either engine.** Each time you shut down the engine completely, it will automatically turn speed control on.

LOCK INTO A DIRECTIONAL STATE

You can lock your engine into a directional state (forward, neutral, reverse) to prevent it from changing directions. To do this, put the engine into the direction you want or in neutral, run it at a very low speed (<10 scale mph), and quickly but firmly press your remote's Horn/Whistle button once followed immediately by three presses of the Bell

button. Two Horn/Whistle blasts will indicate that the engine has made the change. The engine will not change direction (including going into neutral) until you repeat the 1 Horn/Whistle, 3 bells code to return the engine to its normal state, even if the engine has been kept without power for extended periods of time.

RESET TO FACTORY DEFAULTS

To override the settings you currently have assigned to the engine and reset it to its factory defaults, while in neutral press the Horn/Whistle button once, followed immediately by five quick pushes of the Bell button. Two horn blasts will indicate that the engine has made the change

AUTOMATIC SOUNDS

Certain Proto-Sound 2.0 sound effects automatically play in programmed conventional mode conditions:

Squealing Brakes: This sound plays anytime the engine's speed decreases rapidly.

Cab Chatter: This sound play when the engine idles in neutral.

Engine Start-up and Shut-down: This sound plays when the engine is initially powered on or is powered off for five seconds or more.

MAINTENANCE

LUBRICATION AND GREASING

This engine should be oiled and greased in order to run properly.

You should regularly lubricate the engine to prevent them from squeaking. Use light household oil and follow the lubrication points marked "L" in Figure 2. Do not over oil. Use only a drop or two on each pivot.

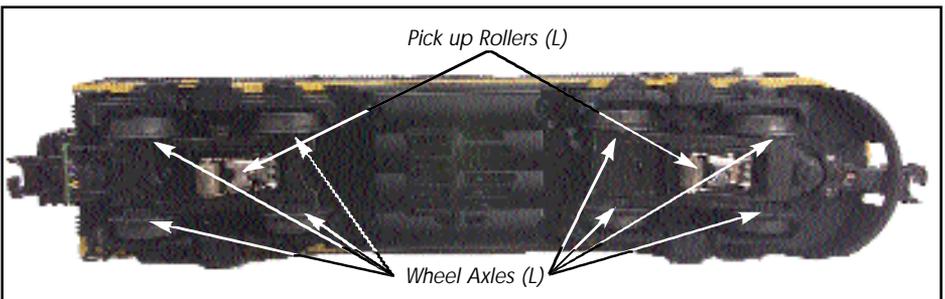


Figure 2 - Lubrication Points on the Engine

The engine's internal gearing was greased at the factory and should not need additional grease until after 50 hours of operation or one year, whichever ever comes first. To access the gear box, do the following:

1. Unscrew the body mount screws as shown in Figure 3 and remove the body shell from the chassis.

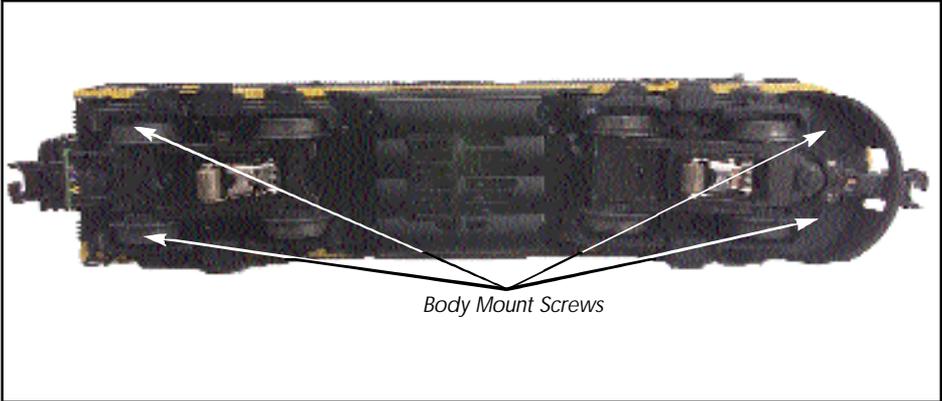


Figure 3 - Location of body mount screws

2. Once the body is removed, remove the trucks by unscrewing the motor mount screw located on the underside of the drive trucks. See Figure 4.

3. Pull the motor away from the truck block and lightly coat the motor worm gear and bronze drive gear with grease.

4. Reassemble the truck and motor being careful not to pinch any wires between the truck block and motor mount.

5. Repeat steps on the other motor.

6. Reassemble the engine in reverse order.

7. Grease Idler Gears. Located on the outside of the truck block.

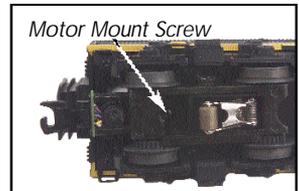


Figure 4 - Motor Mount Screw

CLEANING THE WHEELS & TRACK

Periodically check the engine wheels and pick-up rollers for dirt and buildup, which can cause poor electrical contact and traction and prematurely wear out the neoprene traction tires. Wheels and tires can be cleaned using denatured alcohol (not rubbing alcohol), which can be found in home improvement stores, applied with a cotton swab.

Occasional cleaning of the track will also help to ensure good electrical contact and prolong the life of your engine's tires. To clean the track, use a clean rag and denatured alcohol (not rubbing alcohol). Unplug the transformer and rub the rails of the track, turning the rag frequently to ensure that you are using clean cloth on the rails.

TRACTION TIRE REPLACEMENT

Your locomotive is equipped with two neoprene rubber traction tires on each powered truck block. While these tires are extremely durable, you may need to replace them at some point.

1. Remove the body shell by unscrewing the body mount screws.
2. Remove the motor mount screw from the bottom of the truck block. Detaching the truck block from the motor.
3. Remove the truckside frames giving you access to the traction tires.
4. Make sure the old tires have been completely removed from the groove in the drive wheel, using a razor blade or flat head screwdriver to pry away any remains.
5. Slip the new tire onto the wheel. You may find it useful to use two small flathead screwdrivers to stretch the tire over the wheel.
6. If you twist the tire while stretching it over the wheel, you will need to remove and reinstall the tire. Otherwise your engine will wobble while operating.
7. Make sure the tires are fully seated inside the groove. Use a razor blade to trim away any excess tire that doesn't seat itself inside the groove properly.

One set of replacement tires is included with your model.

Additional tires are available directly from M.T.H. Parts Department (Phone: 410.381.2580).

PROTO-SMOKE® UNIT OPERATION

This engine contains a smoke unit that outputs smoke through the smokestack on the engine. The smoke unit is essentially a small heating element and wick that soaks up and then heats a mineral oil-based fluid that emits a harmless smoke. The smoke is then forced out of the stack by a small electric fan.

With a few easy maintenance steps, you should enjoy trouble-free smoke unit operation for years.

■ When preparing to run this engine, add 15-20 drops of smoke fluid through the smokestack. (see figure 5) We recommend M.T.H. ProtoSmoke, Seuth, LGB, or LVTS fluids (a small pipette of ProtoSmoke fluid is included). Do not over fill the unit or the fluid may leak out and coat the interior engine components.

■ If you choose not to add the fluid (or have already added the fluid but choose to run smoke free), turn off the smoke unit switch located under the engine body. (see figure 6) Failure to either add fluid to the unit or to turn it off may damage the smoke unit heating element and/or wicking material.

■ When the smoke output while running begins to diminish, add another 10-15 drops of smoke fluid or turn the smoke unit off.

■ When storing the unit for extended periods of time, you may want to add about 15 drops of fluid to prevent the wick from drying out.

■ After removing the engine from storage, add another 25 drops of fluid, letting the wick soak up the fluid for 15 minutes prior to operation.

If you experience poor or no smoke output when the smoke unit is on and has fluid, check the wick to see if it has become hard, blackened, and unabsorbant around the heating element. Remove the smoke unit inspection cover from the smoke unit's body. (see figure 7) After removing the inspection cover screws, lift the inspection plate away and inspect the wick. If it is darkly discolored and hard, it should be replaced. You can obtain replacement wicks and instructions from the M.T.H. Parts Department.

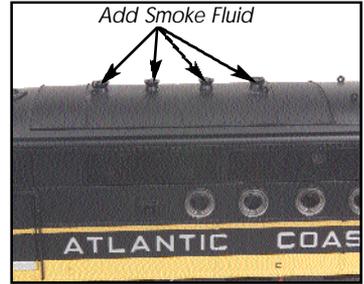


Figure 5 - Add Smoke Fluid

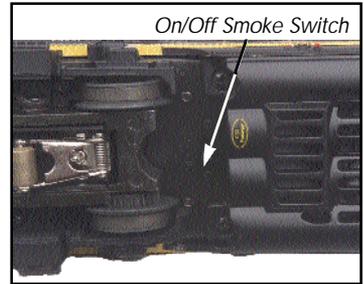


Figure 6 - Smoke Unit On/Off Switch

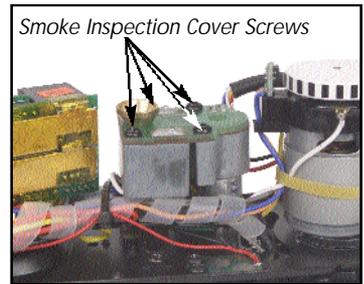


Figure 7 - Smoke Unit Inspection Cover

LIGHT BULB REPLACEMENT

To replace the light bulb in the engine, follow these instructions and see the diagrams below:

Remove shell by removing body mount screw shown in figure 3 on page 9. Once the body shell has been removed, disconnect the bulb harness from the socket on the constant voltage circuit and replace the bulb.

You can obtain replacement bulbs directly from the M.T.H. Parts Department.

To replace the lights mounted on the inside of the shell, remove the shell, and slide the spring contact bracket (see figure 9) off its post. Remove the light bulb and wires (see figure 8) taking care to notice the path that the wires take on the inside of the shell. Replace bulb Spring Contact Bracket and reassemble engine.

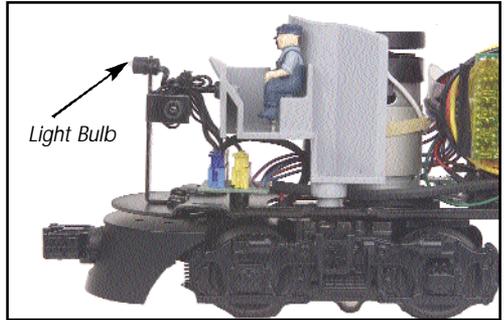


Figure 8 - Light Bulb

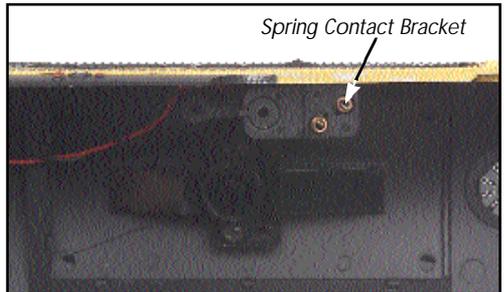


Figure 9 - Spring Contact Bracket

SELF CHARGING BATTERY BACK-UP

The special NiCad 7-cell 8.4v self-charging battery recharges continuously during train operation and should last for up to five years. The battery is a dry battery that should not leak or cause any damage to your engine. Depending upon when your engine was built, it may need to be charged right out of the box. If engine sounds seem distorted or garbled at low voltages or become silent when power from the transformer is turned off, test the battery to determine whether it should be recharged.

Test: Put the engine in neutral and leave the track voltage at 10-12 volts (high enough for the lights to shine brightly and the engine to move steadily) for 15 minutes.

Recharge: If the sounds are improved at the end of the 15-minute test charge, the battery charge has run down and can be recharged. There are a number of ways you can do this:

- Leave the engine in neutral with track voltage at 10-12 volts for 6-7 hours so the battery can fully recharge. If your unit has a smoke unit, be sure that it is turned off.
- Use M.T.H.'s battery recharger (sold separately) that plugs into the wall outlet and a special port under the engine (see figure 10) to recharge the battery overnight without leaving it on the track.

Replace: If the sounds are not improved at the end of the 15 minute test charge, the battery must be replaced (as shown in figure 11, below). Contact the M.T.H. Parts Department (phone: 410-381-2580; e-mail: parts@mth-railking.com; mail: 7020 Columbia Gateway Drive, Columbia MD 21046-1532) for a replacement battery. A standard 9v alkaline battery can be substituted until your replacement arrives, but since alkaline batteries cannot be recharged, it will eventually wear down. Do NOT use a 6-cell 7.2v battery like those found in most convenience stores.

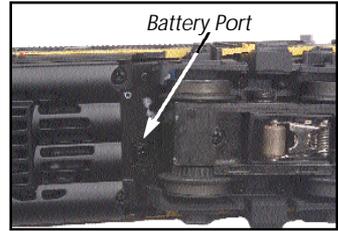


Figure 10- Battery Port

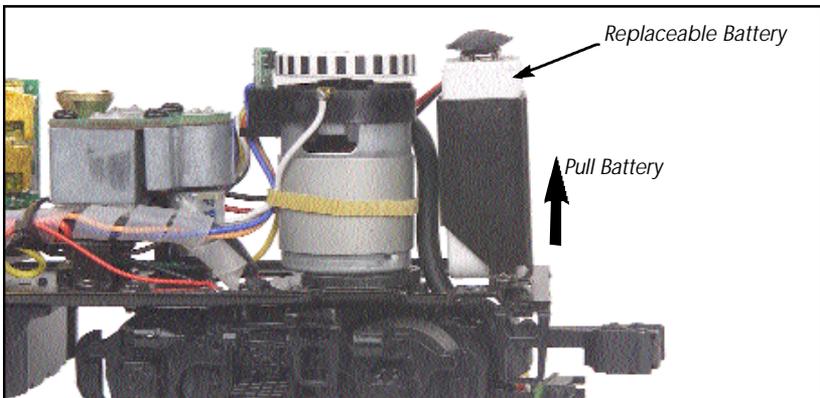


Figure 11- Replacing the Battery

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TROUBLESHOOTING PROTO-SOUND® 2.0

Although Proto-Sound 2.0 has been designed and engineered for ease of use, you may have some questions during initial operation. The following table should answer most questions. If your problem cannot be resolved with this table, contact M.T.H. for assistance (telephone: 410-381-2580; fax: 410-423-0009; service@mth-railking.com, 7020 Columbia Gateway Drive, Columbia MD 21046-1532).

Starting Up	Remedy
When I first turn the power on, the engine will not begin to run. I have to turn the throttle off and on again to get the engine to operate.	This is normal behavior. To prevent accidental high-speed start-ups, ProtoSound 2.0 is programmed to start up in neutral anytime track power has been turned off for several seconds. See the "Basic Operation" section for more details.
Horn/Whistle	Remedy
When I press the horn/whistle button, the bell comes on instead.	Reverse the transformer leads.
I can't get the horn to blow when I press the whistle button.	You may be pressing the button too quickly. Try pressing the horn/whistle button more slowly, taking approximately one full second to fully depress the button.
Bell	Remedy
When I press the bell button, horn/whistle comes on instead.	Reverse the transformer leads.
I can't get the horn to blow when I press the whistle button.	You may be pressing the button too quickly. Try pressing the bell button more slowly, taking approximately one full second to fully depress the button.
The bell won't work on a separate bell button.	Check the wiring of the separate button.
Bell	Remedy
When I try to fire the coupler, FYS starts.	You are waiting too long between whistle button presses.
The Proto-Coupler won't let the engine uncouple on the fly.	Try lubricating the coupler knuckle with a dry graphite lubricant. Do NOT use oil.
The coupler does not fire or stay coupled.	The coupler needs to be cleaned. Wipe with denatured alcohol (<i>not rubbing alcohol</i>) and let dry.

Cab Chatter		Remedy
Sometimes the cab chatter sounds don't play.	Cab chatter plays only in neutral at random intervals	
Lock-out		Remedy
I can't get the engine to run after I power up the transformer. It sits still with the engine sounds running.	The engine is locked into the neutral position. Follow the directions in to the "Lock into Direction State" section.	
The engine won't lock into forward, neutral or reverse.	Engine speed must be below 10 scale mph. <i>(approx. 10 volts or less in conventional mode)</i>	
Volume		Remedy
The sounds seem distorted, especially when the whistle or bell is activated.	Proto-Sound 2.0 volume is set too high. Turn the volume control knob on the bottom of the chassis counterclockwise to reduce the volume.	
Battery		Remedy
The engine will not leave the initial neutral state.	Check to be sure the battery is installed and fully charged. See the "Self Charging Battery Back-up" section.	
I get no sounds when the engine shifts between direction states.	The battery may be dead or need to be charged. See the "Self Charging Battery Back-up" section.	
After I turn off my transformer, my engine continues to make sounds before quitting.	Proto-Sound 2.0 is designed to continue to sound for a few seconds after the power to the track has been shut off.	
FYS		Remedy
The FYS sounds occasionally repeat themselves.	Proto-Sound 2.0 has a built in random number generator that randomly selects each sound clip to play. Because there are a limited number of sound clips available in each FYS sequence, it is probable that some of these sound clips will be repeated from time to time.	
Once in FYS, the engine doesn't go into reverse.	So that FYS effects can be as realistic as possible, Proto-Sound 2.0 disables the reversing unit whenever it is enabled. This way the engine remains still at its stop as the operator cycles through the FYS sequences.	
When the FYS enters its last sequence the bell automatically comes on.	It is programmed to start ringing the bell at that point. After approximately 12 rings of the bell, it will automatically turn off.	

FYS (<i>continued</i>)	Remedy
When FYS is enabled, pressing the whistle and bell automatically comes on.	Because FYS must control various effects in each sequence, Proto-Sound 2.0 takes control of these sound effects until you exit FYS.
I push the direction button but the next sound clip in the sequence does not play or the engine does not come out of FYS after fourth press of direction button.	Each FYS clip must play for approximately 30 seconds before FYS will advance to the next step in the FYS cycle. Wait at least 30 seconds in each FYS sound clip before pressing the sound button.

COMPATIBILITY

This engine will operate on any traditional O-31 or larger O Gauge track system, including M.T.H.'s RealTrax® or ScaleTrax™ or traditional tubular track. It is also compatible with most standard AC transformers. (See page 18 for a complete list of compatible transformers and wiring instructions.)

TRANSFORMER COMPATIBILITY CHART

Note that many of the operational commands described in these instructions require a bell button, so if your transformer does not have its own bell button, you should consider adding one to get the full benefit of the system.

Transformer Rail	Center Rail	Outside Rail	Min/Max Voltage	Power Rating	Transformer Type
MTH Z-500	Red Terminal	Black Terminal	0-18v	50 watt	Electronic
MTH Z-750	Red Terminal	Black Terminal	0-21v	75 watt	Electronic
MTH Z-4000	Red Terminal	Black Terminal	0-22v	390 watt	Electronic
Lionel 1032	U	A	5-16v	90 watt	Standard
Lionel 1032M	U	A	5-16v	90 watt	Standard
Lionel 1033	U	A	5-16v	90 watt	Standard
Lionel 1043	U	A	5-16v	90 watt	Standard
Lionel 1043M	U	A	5-16v	90 watt	Standard
Lionel 1044	U	A	5-16v	90 watt	Standard
Lionel 1053	U	A	5-16v	90 watt	Standard
Lionel 1063	U	A	5-16v	90 watt	Standard
All-Trol	Left Terminal	Right Terminal	0-24v	300 watt	Electronic
Cab-1 Powermaster*	A	U	0-18v	135V.A.	Electronic
Dallee Hostler	Left Terminal	Right Terminal			Electronic
Lionel MW	Outside Track Terminal	Inside Track Terminal	5-16v	50V.A.	Electronic
R.O.W.	Red Terminal	Black Terminal	0-24v	384 watt	Standard
Lionel RS-1	Red Terminal	Black Terminal	0-18v	50V.A.	Electronic
Lionel RW	U	A	9-19v	110 watt	Standard
Lionel SW	U	A	Unknown	130 watt	Standard
Lionel TW	U	A	8-18v	175 watt	Standard
Lionel ZW	A,B,C or D	U	8-20v	275 watt	Standard
Lionel Trainmaster*	Red Terminal	Black Terminal	0-18v	135 watt	Electronic

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ADDITIONAL FEATURES

ACCESSIBLE WITH DCS REMOTE CONTROL SYSTEM

While conventional mode operation of a Proto-Sound 2.0 engine yields wonderfully realistic sound and several train control features, command mode operation allows the user to access a world of command functions never before accessible to O Gauge railroaders. With the addition of the DCS Remote Control System (including a DCS remote hand-held and Track Interface Unit) users gain many advanced features, including:

- DCS Proto-Speed Control-Establishes desired locomotive speed in scale miles per hour increments via a thumbwheel control and allows operator to set maximum speed and acceleration/deceleration rates.
- Locomotive Lighting Control-Independently controls locomotive headlights, marker and interior lights, and ditch lights.
- Emergency Stop-Single button push stops your trains (but does not turn off track power).
- One Touch Global Mute/UnMute-Single button mutes or unmutes all DCS-controlled locomotives' user-defined actions, including sound, lights, and smoke.
- Proto-Dispatch Operation-Public Address-like feature allows users to speak through locomotive speaker during operation.
- Proto-Cast-Allows users to play audio recordings through locomotive speaker during operation.
- Proto-Doppler Sound Effects Set Up-Users can configure locomotive for Doppler Operation, including setting distance points for Doppler start, repeat, and stop modes.
- Independent Volume Control of Engine Sounds, Bell, Horn & Whistle for each Locomotive.
- Control up to 50 different DCS-equipped locomotives at one time with multiple TIUs.
- Proto-Effects™ Set Up-User can select individual Proto-Effects™ operations to be active or inactive, including cab chatter, train wreck sounds, coupler sounds, and wheel clickety-clack sounds.
- Direction Control Set Up-User can set initial individual start-up direction (start in forward or reverse) for double-heading operations.
- Locomotive Consist Set-up-User can determine locomotive values for consist make-ups, allowing multiple locomotives belonging to a consist to operate together.
- Query Locomotive Information-User can query locomotive programming to learn locomotive address and engine data information, including scale miles traveled.

■ User Can Query, Set and Operate Track and Accessory Interface Units for Programming Digital Command Operations for up to 250 Accessories and 250 Individual Switches.

■ User Can Script, Record and Playback Train Routes.

CAUTION:

ELECTRICALLY OPERATED PRODUCT:

Not recommended for children under 10 years of age. M.T.H. recommends adult supervision with children ages 10 - 16. As with all electric products, precautions should be observed during handling and use to reduce the risk of electric shock.

WARNING: When using electrical products, basic safety precautions should be followed including the following:

■ Read this manual thoroughly before using this device.

■ M.T.H. recommends that all users and persons supervising use examine the hobby transformer periodically for conditions that may result in the risk of fire, electric shock, or injury to persons, such as damage to the primary cord, plug blades, housing, output jacks or other parts. In the event such conditions exist, the transformer should not be used until properly repaired.

■ As with all electrical appliances, this product should not be left in operation when unattended.

SERVICE & WARRANTY INFORMATION

How to Get Service Under the Terms of the Limited One-Year Warranty

When you suspect an item is defective, please check the operator's manual for standard operation and trouble-shooting techniques that may correct the problem. Additional information may be found on the M.T.H. Website. Should you still require service, follow the instructions below to obtain warranty service.

First, e-mail, write, call or fax a M.T.H. Authorized Service Center (ASC) in your area to obtain Repair Authorization. You can find the list of ASCs on the M.T.H. Website, www.mth-railking.com. Authorized Service Centers are required to make warranty repairs on items sold only from that store; all other repairs may-- or may not be done at the store's own discretion. If you did not purchase the item directly from the ASC, you will need to select a National Authorized Service Center (NASC). These centers are compensated by M.T.H. to perform warranty service for any customer whose repair qualifies for warranty service. A list of NASC retailers can be located on the M.T.H. Website or by calling 1-888-640-3700. Should the warranty no longer apply, you may choose either an ASC or NASC retailer to service your M.T.H. Product. A reasonable service fee will be charged.

CAUTION: Make sure the product is packed in its original factory packaging including its foam and plastic wrapping material to prevent damage to the merchandise. There is no need to return the entire set if only one of the components is in need of repair unless otherwise instructed by the Service Center. The shipment must be prepaid and we recommend that it be insured. A cover letter including your name, address, daytime phone number, e-mail address (*if available*), Return Authorization number (*if required by the service center*), a copy of your sales receipt and a full description of the problem must be included to facilitate the repairs. Please include the description regardless of whether you discussed the problem with a service technician when contacting the Service Center for your Return Authorization.

Please make sure you have followed the instructions carefully before returning any merchandise for service. Authorized M.T.H. Service Centers are independently owned and operated and are not agents or representatives of M.T.H. Electric Trains. M.T.H. assumes no responsibility, financial or otherwise, for material left in their possession, or work done, by privately owned M.T.H. Authorized Service Centers.

If you need assistance at any time email MTH Service at service@mth-railking.com, or call 410 381-2580.

LIMITED ONE-YEAR WARRANTY

All M.T.H. products purchased from an Authorized M.T.H. Train Merchant are covered by this warranty.

See our website at www.mth-railking.com or call 1-888-640-3700 to identify an Authorized M.T.H. Train Merchant near you.

M.T.H. products are warrantied for one year from the date of purchase against defects in material or workmanship, excluding wear items such as light bulbs, pick-up rollers, batteries, smoke unit wicks, and traction tires. We will repair or replace (*at our option*) the defective part without charge for the parts or labor, if the item is returned to an M.T.H. Authorized Service Center (ASC) or M.T.H. National Authorized Service Center (NASC) within one year of the original date of purchase. This warranty does not cover damages caused by improper care, handling, or use. Transportation costs incurred by the customer are not covered under this warranty.

Items sent for repair must be accompanied by a return authorization number, a description of the problem, and a copy of the original sales receipt from an Authorized M.T.H. Train Merchant, which gives the date of purchase. If you are sending this product to an Authorized Service Center, contact that Center for their return authorization.

This warranty gives you specific legal rights, and you may have other rights that vary from state to state. Specific questions regarding the warranty may be forwarded to M.T.H. directly.

**Service Department • M.T.H. Electric Trains
2702 Columbia Gateway Drive • Columbia MD 21046-1532**

FT ABA DIESEL ENGINE SET

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AUTHORIZED SERVICE CENTER

7020 Columbia Gateway Dr. - Columbia, MD 21046
 Information: 410-381-2580 Fax: 410-381-6122
www.mth-railing.com

PARTICIPATING N.A.S.C. RETAILER LIST

CANADA

Toy Train Workshop
 Cumberland
 613-833-9331

The Train Room
 Fergus
 519-787-3280

CALIFORNIA

Tin Plate Junction
 Oakland
 510-444-4780

COLORADO

Mizell Trains Inc.
 Westminster
 303-429-4811

CONNECTICUT

New England Hobby Supply
 Manchester
 860-646-0610

FLORIDA

Roundhouse South
 Port Orange
 386-304-7002

MARYLAND

Plaza Hobby
 Cumberland
 301-729-6424

Engine House Hobbies
 Gaithersburg
 301-590-0816

Catoctin Mountain Trains
 & Hobbies
 Thurmont
 301-694-8331

MICHIGAN

Michigan Model Train Center
 Pinckney
 734-426-1651

Brasseur Electric Trains Inc.
 Saginaw
 989-793-4753

NEW HAMPSHIRE

Treasured Toys
 Salem
 603-898-7224

NEW YORK

Aurora Rails & Hobbies
 East Aurora
 716-652-5718

OHIO

Davis Electronics
 Milford
 513-831-6425

Rick's Toy Trains
 Toledo
 419-478-0171

PENNSYLVANIA

Bussinger Trains
 Ambler
 215-628-2366

Fairchance Pharmacy
 Fairchance
 724-564-7817

Toby Tyler
 Pittsburgh
 412-653-5030

VIRGINIA

Locust Grove Trains
 Locust Grove
 540-854-8955

Davis Hobby Supplies
 Portsmouth
 757-397-1983

TSG Hobbies
 Warrenton
 540-347-9212

WISCONSIN

Sommerfeld's Trains
 Butler
 262-783-7797

Grampa's Train Shop
 Rice Lake
 715-234-2996

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PARTICIPATING A.S.C. RETAILER LIST

CANADA

Toy Train Workshop
Cumberland
613-833-9331

The Train Room
Fergus
519-787-3280

Credit Valley Railway Company
Streetsville
905-826-1306

BH Trains
Terrebonne
450-492-0317

ALABAMA

Southerland Station
Huntsville
256-533-4720

Lil' Bobby's Hobbies
Montgomery
334-277-1715

ARIZONA

Arizona Train Depot
Mesa
480-833-9486

CALIFORNIA

Central Coast Trains
Atascadero
805-466-1391

Train Shack
Burbank
818-842-3330

Roundhouse
North Hollywood
818-769-0403

Dollhouses, Trains & More
Novato
415-883-0388

Tin Plate Junction
Oakland
510-444-4780

Ron's World
San Clemente
949-361-5596

Trucks & Trains Hobbies
Santa Rosa
707-537-6586

COLORADO

Custom Railway Supply
Colorado Springs
719-634-4616

Mizell Trains Inc.
Westminster
303-429-4811

CONNECTICUT

New England Hobby Supply
Manchester
860-646-0610

FLORIDA

Hollywood Station
Hollywood
954-921-2700

Depot Hobby Shop
Lake Worth
561-585-1982

Ready To Roll
Miami
305-688-8868

Frank's Trains & Hobbies Inc.
Oldsmar
813-855-1041

Colonial Photo & Hobby
Orlando
407-841-1485

Warrick Custom Hobbies
Plantation
954-370-0808

Roundhouse South
Port Orange
386-304-7002

ILLINOIS

Bike & Choo Choo Connection
Schaumburg
847-882-7728

INDIANA

Y.O.R.K. Trains
Munster
219-838-9999

Samuelson's Train Shop
Valparaiso
219-462-2708

IOWA

Caboose Stop Hobbies
Cedar Falls
800-642-7012

KENTUCKY

L&N Trains & Things
Louisville
502-897-9005

LOUISIANA

America's Train Yard
Baton Rouge
225-926-5592

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MAINE

Wheels, Wing & Things
 Ludlow
 207-532-6277

MARYLAND

Plaza Hobby
 Cumberland
 301-729-6424

Hobbytown USA
 Frederick
 301-694-7395

Engine House Hobbies
 Gaithersburg
 301-590-0816

J&B Trains
 Hagerstown
 240-420-4930

The Train Room
 Hagerstown
 301-745-6681

Purkey's Toy Trains
 Sykesville
 410-549-6061

Catoctin Mountain Trains
 & Hobbies
 Thurmont
 301-694-8331

MASSACHUSETTS

Northeast Trains
 Peabody
 978-532-1615

East Bay Hobbies
 Seekonk
 508-336-5573

MICHIGAN

Michigan Model Train Center
 Pinckney
 734-426-1651

Brasseur Electric Trains
 Saginaw
 989-793-4753

MISSOURI

Switch Stand
 Saint Louis
 314-781-4458

Mark Twain Hobby Center
 St. Charles
 636-946-2816

NEVADA

Reno Rails
 Reno
 775-337-6669

NEW HAMPSHIRE

Railroad Specialties
 Nashua
 603-801-0801

Treasured Toys
 Salem
 603-898-7224

NEW JERSEY

Country and Stuff
 Andover
 973-786-7086

Columbus Train Station
 Columbus
 609-518-1800

Atlantic Rails
 Hamonton
 609-567-8490

Grand Central Station
 Kearny
 201-955-6200

J&B Trains
 Maple Shade
 856-414-0092

Hobby Shop
 Matawan
 732-583-0505

Hobbymasters, Inc.
 Red Bank
 732-842-6020

Ridgefield Hobby
 Ridgefield
 201-943-2636

Tom's Model Trains
 Scotch Plains
 908-322-6122

Trains & Things
 Trenton
 609-883-8790

Coast Trains and Collectibles
 Wall
 732-556-9005

Holly Beach Train Depot
 Wildwood
 609-522-2379

NEW YORK

Aurora Rails & Hobbies
 East Aurora
 716-652-5718

Nassau Hobby Center, Inc.
 Freeport
 516-378-9594

Hobby World
 Monticello
 845-794-8770

City Depot, Inc.
 New Hampton
 845-374-3010

Americana Store
 Tivoli
 845-757-4246

Kross Hardware
 West Babylon
 631-669-3069

NORTH CAROLINA

The Roundhouse & Backshop
 Cary
 919-465-0810

Trains LTD.
 Charlotte
 704-566-9070

Day Bridge Station
 Mount Airy
 336-786-9811

The Freight Yard
 Smithfield
 919-934-6229

Train Loft
 Winston-Salem
 336-760-9817

OHIO

Glen's Train Shop
 Akron
 330-253-6527

E&S Trains
 Akron
 330-745-0785

T&K Hobby Shop
 Bridgeport
 740-633-6607

Parma Hobby
 Cleveland
 216-741-6440

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Sandy's Hobbies & Collectibles Cranberry Hobby Depot
Elyria
440-365-9999

Hudson Toy, Train & Hobby Fairchance Pharmacy
Hudson
330-653-2997

Clearview Train & Hobby Toy Train Station
Lorain
440-277-4488

Dixie Union Station The Caboose
Mason
513-459-0460

Davis Electronics Hobby City
Milford
513-831-6425

Trains-n-Things The Station
North Canton
330-499-1666

Grand Pacific Junction Fryer's Store
Olmstead Falls
440-235-4777

Rick's Toy Trains Chestnut Toybox
Toledo
419-478-0171

Erie Railway Depot Toby Tyler
Troy
937-440-9972

PENNSYLVANIA
American Hobby Center
Aliquippa
724-378-3930

Allentown Toy Train Service
Allentown
610-821-0740

On The Right Track
Altoona
814-942-4345

Bussinger Trains
Amblèr
215-628-2366

Ye Old Train & Christmas Shoppe
Boyertown
610-369-0755

Charleroi Sweeper Center
Charleroi
724-483-3397

Cranberry Hobby Depot
Cranberry Township
724-776-3640

Fairchance Pharmacy
Fairchance
724-564-7817

Toy Train Station
Feasterville Trev
215-322-5182

The Caboose
Lehighton
570-386-5352

Hobby City
McMurray
724-942-2557

The Station
New Cumberland
717-774-7096

Fryer's Store
Orwigsburg
570-366-2258

Chestnut Toybox
Philadelphia
215-545-0455

Toby Tyler
Pittsburgh
412-653-5030

Wilcox Greenhouse & Nursery
Titusville
814-827-3823

SOUTH CAROLINA
Emerald Train & Hobby
Greenwood
864-223-2247

TENNESSEE
Model Railroad & Hobby Shop
Memphis
901-384-6500

TEXAS
Hobby Time
Amarillo
806-352-9660

Riverview Trains
Angleton
979-848-3895

Great Trains & Hobbies
Longview
903-757-2720

VIRGINIA
Locust Grove Trains
Locust Grove
540-854-8955

Train Depot
Manassas
703-335-2216

Chesterfield Hobbies
Midlothian
804-379-9091

Davis Hobby Supplies
Portsmouth
757-397-1983

Toy Train Center
Richmond
804-288-4475

Nutbush Express
Victoria
434-696-1902

TSG Hobbies
Warrenton
540-347-9212

Norge Station
Williamsburg
757-564-7623

WEST VIRGINIA
Patrick's Trains
Wheeling
304-232-0714

WISCONSIN
Woodcrafters Shop
Burlington
262-763-5239

Sommerfeld's Trains
Bulter
262-783-7797

Hobby Outlet
Fond Du Lac
920-924-3770

GB TV & Tains
Greenbay
920-496-9697

Grampa's Train Shop
Rice Lake
715-234-2996

The Train Store
Waukesha
262-650-6675

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