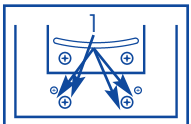


## OPTIONAL COUPLER BOX ASSEMBLY

**NOTE:** For operation on 8 foot diameter curved track, the optional coupler box must be used. If snow plow is used, some trimming of the sides around the coupler pocket is necessary.



(1) Remove 4 screws that hold coupler support bracket and coupler centering spring. Hook and loop coupler assembly should slide off. Loosen the front two screws holding metal truck guide so you can remove coupler centering spring. Re-tighten two screws holding the metal truck guide.

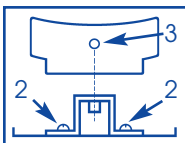
(2) Mount coupler support bracket provided with coupler box assembly to frame using same screws used for the hook & loop bracket.

(3) Mount coupler box top plate to coupler support bracket provided (1 screw)

(4) Clip rear of knuckle coupler arm off (D page 5)

(5) Mount coupler arm onto slide spring then insert slide spring onto plate making sure coupler is right side up. (thick black coupler release should be facing you)

(6) Attach bottom coupler plate using the two long screws provided.



## SERVICING

This Diesel locomotive is built with pride by USA Trains and is covered by a limited warranty. (See limited warranty terms). Please follow these instructions carefully before sending your locomotive for service:

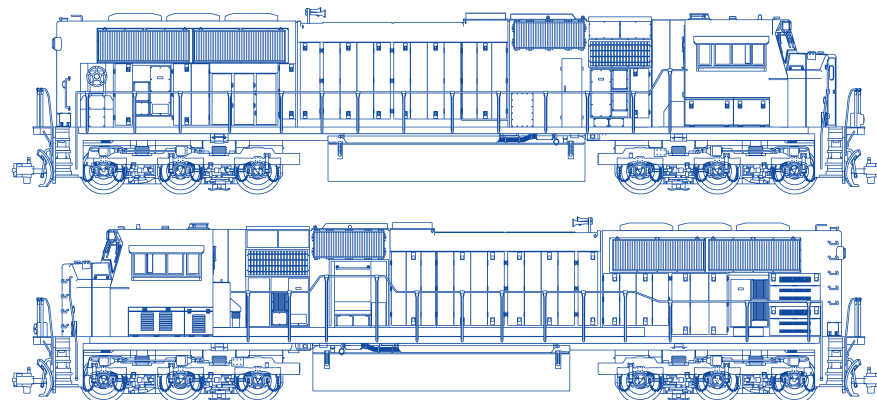
1. Return locomotive in its original blue/red box with the proper foam inserts and then pack the original box in a proper shipping carton so it is well protected in shipment. The package must be fully insured and pre-paid. USA Trains is not responsible for damage or loss during shipment.
2. Include a note explaining the problem and servicing you need performed. Be sure to include your name, street address, (NO P.O. BOXES PLEASE) City, State, Country (if outside U.S.A) and zip code along with a daytime phone number including area code. If the locomotive service is not covered by warranty, a reasonable service fee will be charged. For any locomotives to be returned outside the continental U.S.A., please include \$25.00 U.S. currency to cover return postage. Any locomotives returned in the continental U.S.A. will be reshipped to you pre-paid by USA Trains.
3. Ship your item to: USA TRAINS, 662 CROSS STREET, MALDEN, MA. 02148

## LIMITED ONE YEAR WARRANTY

This USA Trains locomotive is warranted for one year from the date of purchase against defects in material or workmanship. We will repair or replace (at our option) the defective part without charge for parts or labor within one year of the original date of purchase provided the warranty registration card has been received by USA Trains. This warranty does not cover items that have been abused or damaged by careless handling or improper operation such as a train derailment, modification or repair by non-factory technicians. Parts that "wear out" due to excessive use are also not covered under warranty. USA Trains reserves the right to determine "excessive use". Transportation costs incurred by the customer are not covered under this warranty.



## SD70 MAC DIESEL LOCOMOTIVE OWNERS MANUAL



**USA TRAINS**  
**662 Cross Street**  
**MALDEN, MA 02148, USA**  
**[www.usatrains.com](http://www.usatrains.com)**



Dear Customer,

Congratulations on your purchase of this highly detailed replica of the electro-motive (EMD) SD70 MAC.

The engineering and design staff at USA Trains has spent many hours reviewing original blueprints and developing a locomotive that looks authentic and will provide you with many hours of operating enjoyment all at a reasonable price. Over 400 parts make up this model - the level of detail found in brass locomotives costing thousands of dollars for a fraction of the cost. This locomotive will enhance the appearance of any modelers railroad.

Please read the following instructions which will help you understand and operate the numerous features of this locomotive.

Happy Railroading

**USA TRAINS**

## HISTORY OF THE EMD SD70 MAC

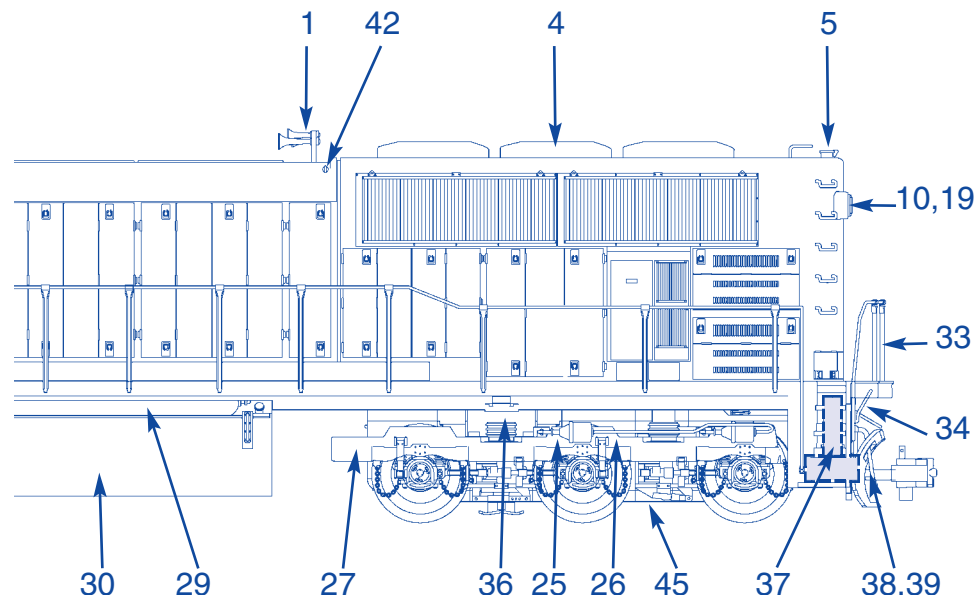
The EMD SD70 MAC changed the railroad industry the same way the Boeing 707 changed the commercial airline industry. It was a dramatically improved product that provided the railroad industry much greater economy and efficiency.

In 1993, the General Motors Electro-Motive Division (EMD) introduced a radical design change, the SD70 MAC. These new alternating-current (AC) locomotives offered radically improved performance - five of these new locomotives can replace nine of the old ones. The increased efficiency convinced Burlington Northern to place the largest locomotive order in history for 350 units. Within the first few months of the SD70 MAC's operation, the order was increased to 434 units. BN found it could haul coal trains out of Wyoming's Powder River Basin with just three SD70 Macs instead of 5 SD40-2's. The Southern Pacific and Union Pacific began buying them also. A new era was born.

The accurate reproduction of this locomotive by USA Trains will allow the modeler to have their favorite railroad SD70 MAC running among the other locomotives on his/her railroad.

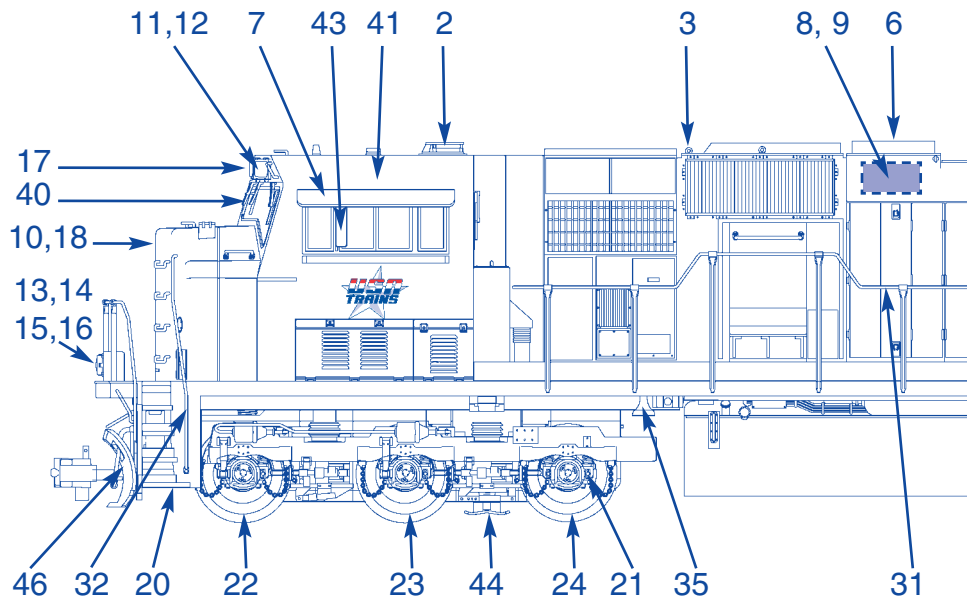
## FEATURES

- Powerful dual-motored 12 wheel Power Trac drive train
- Operating fan driven smoke unit emits realistic diesel exhaust
- Alternating ditch lights at slow speed
- Front & rear directional headlights
- Constant voltage lighting
- Metal handrails
- Interior cab lighting
- Opening cab doors
- Detailed cab interior with engineer and illuminated control panel with computer screen
- Authentic detailing including diamond plate walkways, grating on steps, window shades, sliding windows and MU connectors
- Expert decoration reproducing authentic paint schemes of your favorite railroad



ITEM No.	PART No.	DESCRIPTION
26	R22-626	REPLACEMENT MOTOR ONLY
27	R22-627	TRUCK SIDE FRAMES (2) (specify color)
29	R22-629	AIR CYLINDERS (2) (specify color)
30	R22-630	FUEL TANK (specify color)
31	R22-631	SIDE RAILS (2) (specify color)
32	R22-632	BODY RAILS (Front) (2) (specify color)
33	R22-633	FRONT/REAR HANDRAILS (2) (specify color)
34	R22-634	COUPLER LIFT BAR w/ 4 HOLDERS (1)
35	R22-635	BELL
36	R22-636	TRUCK MOUNTING BLOCK (1)
37	R22-637	COUPLER MOUNTING BLOCK & PIVOT (1)
38	R22-638	AIR HOSES (1 right and 1 left)
39	R22-639	SINGLE AIR HOSE
40	R22-640	WINDSHIELD WIPERS (6)
41	R22-641	LIGHT BULB AND WIRE (cab)
42	R22-642	SIDE LIFT RINGS (4)
43	R22-643	LEFT & RIGHT MIRROR
44	R22-644	SLIDE SHOES & SPRINGS (4)
45	R22-645	LOWER GEAR BOX COVER
46	R2021	SNOW PLOW (1)
	R50001	USA TRAINS SMOKE FLUID
	R50002	USA TRAINS CONDUCTIVE LUBRICANT

Please call our parts department for prices and availability or visit our web site [www.usatrains.com](http://www.usatrains.com) • Phone: 781-322-6084 • Fax: 781-321-6459



ITEM No.	PART No.	DESCRIPTION
1	R22-601	DIESEL HORN (specify color)
2	R22-602	SINCLAIR ANTENNA (specify color)
3	R22-603	BRASS LIFT RINGS (13)
4	R22-604	ROOF FAN WITH ROTATING BLADE (specify color)
5	R22-605	SAND FILLER HATCH (specify color)
6	R22-606	SMOKE STACK COVER (silver)
7	R22-607	SUNSHADE (specify color) (1)
8	R22-608	SMOKE UNIT (Fan Driven)
9	R22-609	SMOKE UNIT (Regular PCB Board)
10	R22-610	BULB AND WIRE FOR HEADLIGHT (for front or rear)
11	R22-611	NUMBER BOARD (specify number)
12	R22-612	NUMBER BOARD BULB
13	R22-613	DITCH LIGHT LENS COVER
14	R22-614	DITCH LIGHT PCB BOARD
15	R22-615	DITCH LIGHT BASE (right/left) (2)
16	R22-616	DITCH LIGHT BULB
17	R22-617	HEADLIGHT LENS (front - upper)
18	R22-618	HEADLIGHT LENS (front - lower)
19	R22-619	HEADLIGHT LENS (rear)
20	R22-620	END STEPS (8) - ONE END (specify color)
21	R22-621	TRUCK SIDE FRAME SPRINGS (8)
22	R22-622	METAL WHEELS w/ GEAR FOR END GEAR BOX (2)
23	R22-623	METAL WHEELS w/ GEAR FOR CENTER AXLE (2)
24	R22-624	TRACTION WHEELS w/ RUBBER TIRES FOR INNER AXLE
25	R22-625	REPLACEMENT MOTOR TRUCK (1)

## ASSEMBLY

Due to the high level of detail designed into the USA Trains SD70 MAC, some simple assembly is required.

### (1) Coupler Lift Bar Assembly (2)

Insert 2 eye bolts onto each side of lift bar and insert all 4 eyebolts onto frame as in diagram below. (both ends)

### (2) Air Hoses (6)

Insert right and left air hoses (3) into frame and single air hose to right of coupler. (both ends)

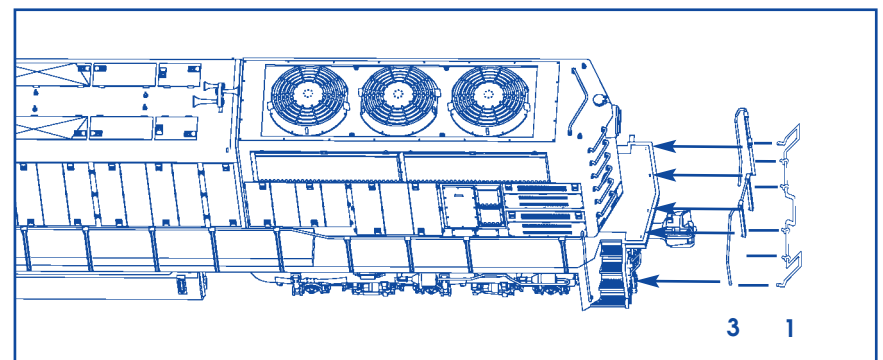
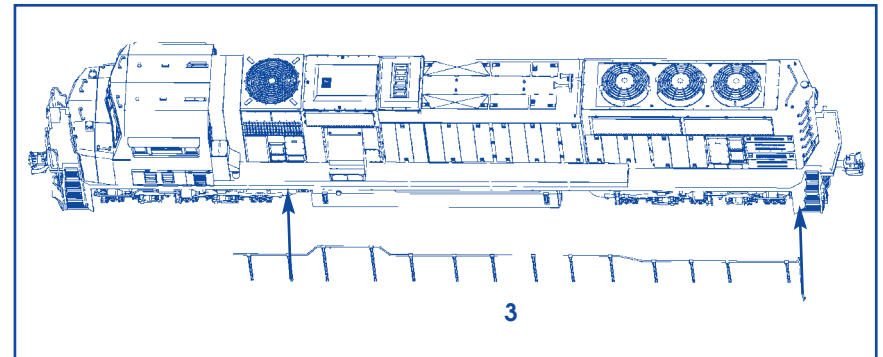
### (3) Hand Rails - Sides and Ends (4)

Insert side and end handrails into frame as shown in diagram below.

### (4) Optional Snow Plow (1)

A snow plow is provided for the front pilot of this locomotive. For coupler operation do not use "knock out portion" of plow to allow the coupler arm to swing freely on curves. Insert snow plow into 4 holes on the front pilot of the locomotive.

**NOTE:** For layouts with inclined track some trimming of the snow plow bottom may be necessary to avoid the plow hitting the track rail.



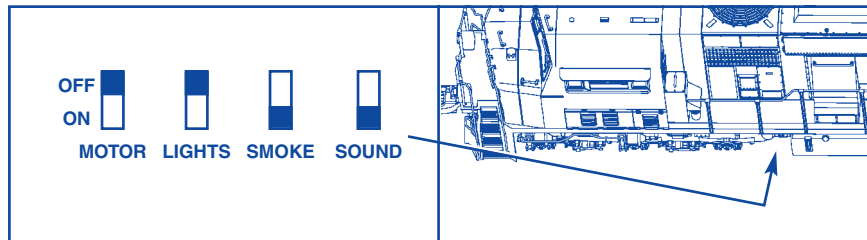
## OPERATION

### POWER REQUIREMENTS

The locomotive is designed to operate on direct current (DC) with output of 0-22 volts.

### CONTROL SWITCHES

The locomotive contains four switches to operate the on/off motors, on/off smoke generator, on/off lights and on/off sound. The control switches are located on the underside of the locomotive, between the front motor truck and the fuel tank. (see diagram below)



**CAUTION!** If the locomotive is going to be run for any period of time without smoke fluid, please position the smoke switch to the OFF position.

### SMOKE GENERATOR

The locomotive contains a fan driven smoke unit which produces "diesel exhaust" through the stack on the topside of the cab body. The smoke generator requires the periodic addition of smoke fluid in order to operate properly. Add 25-30 drops of USA Trains smoke fluid (USA Trains part # R50001) into the smoke generator hole. Never overfill the smoke generator and promptly wipe up any excess smoke fluid that may have spilled onto any painted surfaces. Begin operation. Smoke production will begin when the fluid becomes heated and should last approximately 20 minutes. It may take longer to generate the smoke if the unit is full. When the smoke chamber is empty the unit will shutdown automatically until more fluid is added. By following these directions the smoke generator will provide hours of enjoyment and enhance the realistic operation of your SD70 MAC locomotive.

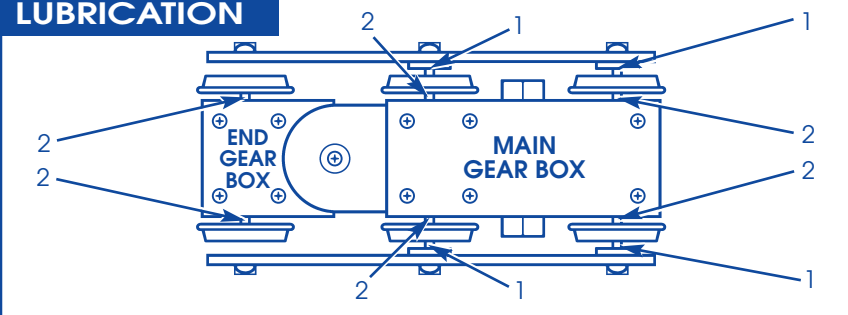
**CAUTION!** Even though your locomotive is equipped with an automatic shut-off when the smoke generator runs out of fluid, we suggest you shut off the smoke switch on the underside of the locomotive to prevent accidental burning out of the smoke generator.

## MAINTAINING AND SERVICING YOUR SD70 MAC

### LUBRICATION

Your locomotive was lubricated at the factory and under normal operating conditions will not need to be lubricated during the first 50 hours of operation. The locomotive has three lubrication points. (See diagram next page)

## LUBRICATION



**1. SIDEFRAME JOURNAL BOX:** The axle ends fit into brass bushings which bring power into the locomotive. These brass bushings should periodically be cleaned out and lubricated with a small amount of USA Trains electrically conductive lubricant (USA Trains Part #R50002). Use only our conductive lubricant to avoid loss of electrical contact which could cause your locomotive to lose power or run erratically. The frequency of lubrication depends on your operating conditions.

**2. AXLE LUBRICATION:** Two drops of oil should be placed on all six contact points where the axle enters the gear box. An ultra light oil such as Hob-E-Lube (#HL653) is recommended.

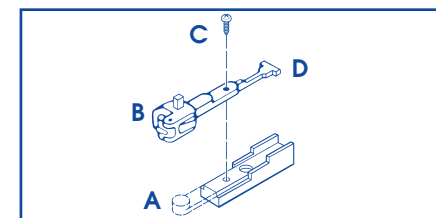
**3. GEAR BOX LUBRICATION:** Under normal operating conditions, the gear box should not have to be lubricated. However, you may want to lubricate the gears after each 100 hours of operation by removing the six screws on the bottom of the main gear box to expose the gears and applying moly grease by Hob-E-Lube to the gears on the axle only. Replace main gear box. Remove 4 screws from end gear box cover and lube. Replace end gear box cover. Do not apply grease to any electrical contacts inside the gear box as you may hinder the electrical contacts required for smooth operation.

### WHEEL/SLIDE SHOES

The SD70 MAC units are equipped with twelve electrical pickup points-six per motor truck. Each of these must be cleaned periodically to ensure proper electrical contact with the track which will ensure smooth operation of your locomotive. Clean all six wheels and the bottom surface of the slide shoes periodically to ensure good electrical contact with the track. A good indication that you need to clean these contacts is flickering lights, non-operation of the smoke unit, or a jerking motion of the locomotive.

## KNUCKLE COUPLER INSTALLATION

- Remove Hook & Loop coupler.
- Clip tab "A" from end of tongue and file smooth.
- Attach USA knuckle coupler "B" with #4 screw (C) provided.



See page 8 for optional coupler box assembly for operation on 8 foot diameter curve track.