Engineer's Operating Manual

NW-2, SW-8 & SW-9 SWITCHER

THE SHOWCASE LINE®

Quality S-scale model trains from S-Helper Service, Inc.

77 Cliffwood Ave, Unit 7C, Cliffwood, NJ 07721

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THANK YOU

Thank you for purchasing our diesel switcher. Your new switcher comes ready-to-run on American Flyer compatible S gauge track with either AC or DC power. Just be sure to break in your switcher before placing it in normal operation. Simply operate it for 20 minutes in both directions at mid voltage (about 9 volts), lubricate per the instructions in Section 4-1, and then it's ready. We have included additional parts for easy adaptation to different operating conditions. With proper care and maintenance, your diesel switcher should give you a lifetime of operating pleasure.

SECTION 1 - Prototype Data

The Electro-Motive Corporation began to produce 600 hp diesel switchers in the late '30s. In 1940 General Motors bought EMC and changed its name to Electro-Motive Division (EMD). Since then, evolving design improvements were incorporated as newer models were produced. Modifications included increased horsepower, multiple-unit (MU) options, welded construction, and changes in body styling. EMD sold 1149 NW-2s, manufactured between 1939 and 1940, 779 SW-9s (1951-1953) and 369 SW-8s (1950-1953). Hundreds of railroads and industries have owned these switchers with many still in use today.

General Specifications:

Wheel Diameter	**40"**
Truck Wheelbase	**8'-0"**
Locomotive Wheelbase	**22'-0"**
Length	**44'-9"**
Height	**14'-6"**
Weight	**248,000 lbs**
Horsepower (NW-2)	**1000 hp**
Horsepower (SW-8)	**800 hp**
Horsepower (SW-9)	**1200 hp**
Speed (max.)	**55 - 65 mph**

SECTION 2 - Features

Right out of the box, your switcher will run on any layout with American Flyer compatible track and standard transformer, rectifier, and/or rheostat speed control.

Warning - Use of AC voltages higher than 21 volts may damage the electronics and will void the warranty.

Your switcher comes with several optional features listed below: (Those with an asterisk (*) are factory-installed.)

- Two sets of pilots.
  a. Standard handrails*.
  b. A second set with split handrails and walk-over steps for MU operation.
- Accepts two types of couplers.
  a. American Flyer compatible automatic couplers*
  b. SHS #01295 couplers with included machine thread mounting screws (coupler not included).
  c. Kadee No. 802 couplers (not included)
- Two sets of wheels.
  a. American Flyer compatible wheelsets*.
  b. Code 110 NMRA RP-25 contour wheelsets.
- Electronic options.
  a. AC/DC sequence-reversing*.
  b. LocoMatic™ or Sountraxx DCC sound unit
  c. Reversing headlights*.
  d. DC shorting plug (cab light on)*.
  e. DC shorting plug (cab light off)*.
  f. Digital Command Control (DCC) NMRA socket*.
- Complete set of spare electrical pick-up wipers.

The following paragraphs tell you how to set up your switcher to use any combination of these features.

SECTION 3 - Getting Started

You can perform any or all of the following modifications before or after you begin to operate your switcher. If you haven't yet broken it in (see Section 4-1), be sure to do so before placing your switcher into normal operation.

3-1 AC/DC American Flyer Compatible Layouts

Your switcher has American Flyer compatible wheels and automatic couplers. It also has factory-installed forward-neutral-reverse-neutral sequencing (1.0 sec stop) just like most American Flyer locomotives. In order to enhance your operating enjoyment, we have included the following standard ready-to-run features:

- A circuit delay so that the locomotive does not cycle into neutral in case power is momentarily interrupted, as with dirty track.
- Directional lighting, only the headlight pointing in the direction that your switcher is moving lights up.
- Smart reversing. When stopped for 30 seconds or more, your switcher will always resume running in the forward direction.

These features are all factory-installed with the no sound option.

3-2 Alternate Pilots

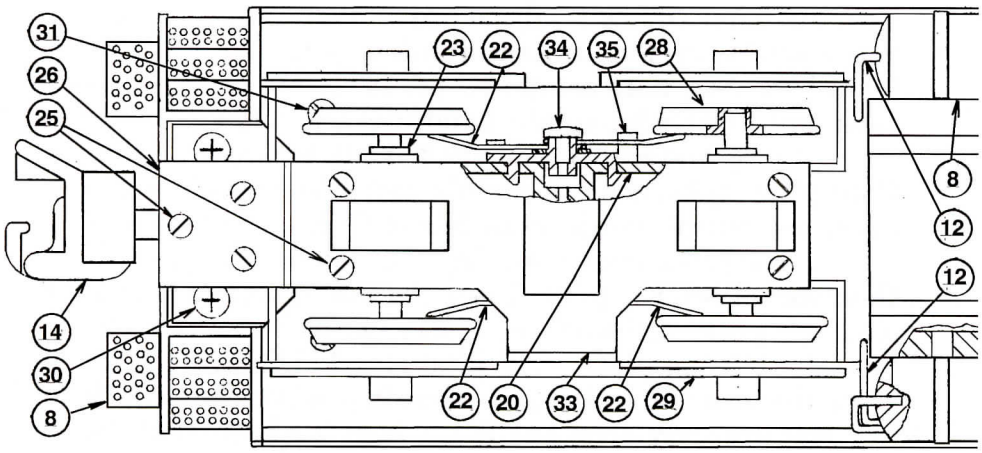
Your switcher comes ready to operate as a single unit. If you want to run two units in tandem, you may want to install the alternate set of MU pilots on one or both ends of each unit. These have split handrails and fold-up walk-over steps that allow crew members to walk between the units. Both pilot styles are compatible with either the American Flyer compatible couplers or KD style No. 01295 couplers.

To replace each pilot, lift the side handrails out of their sockets on the pilot. Place the locomotive upside down on a soft protected surface. Unscrew the two screws that hold the pilot in place. The pilot should lift straight up. Slide the alternate pilot onto the chassis, (if the pilot does not seat properly, trim any flash from the bottom of the pilot) replace the two screws (Do not overtighten), and re-insert the handrails.

3-3 Couplers

If you wish to replace the American Flyer compatible couplers with the body mounted SHS #01295 or KD 802/808 couplers, place your switcher upside down on a soft protected surface. Carefully remove the four screws that hold the American Flyer compatible coupler bracket assemblies in place and lift off. Each coupler pad on the chassis has three holes cored for mounting the Kadee S coupler. The AF coupler box lid with front flange removed is used as a spacer above the KD802/808 or SHS #01295 coupler box. Please use the six threaded metric machine screws included with your switcher or the screws that held the AF coupler bracket assy. The KD screws are not intended for use with a metal chassis and may break.

- Do not overtighten the screws or they will break.
- Do not use the screws that come with the Kadee couplers; these are designed for use with plastic or wood rather than metal. **Their use will void the warranty 'pertaining to the chassis.**



6-1 Bottom view parts drawing - gear box and details

3-4 Code 110 NMRA RP-25 Wheelsets

Code 110 wheels must be used if you have a rail height that is smaller than code 125 (0.125"), or with open-frog turnouts built to the NASG scale standards (American Flyer switches are closed-frog). Install these as follows:

Step 1. If you have not already done so, remove the American Flyer compatible coupler bracket assy.

Step 2. With a small screwdriver, gently pry off the end of the plastic sideframe/gearbox cover to release the tab that holds it to one of the gearboxes. Set the sideframe/gear box cover aside.

Step 3. Remove the two American Flyer compatible wheelsets.

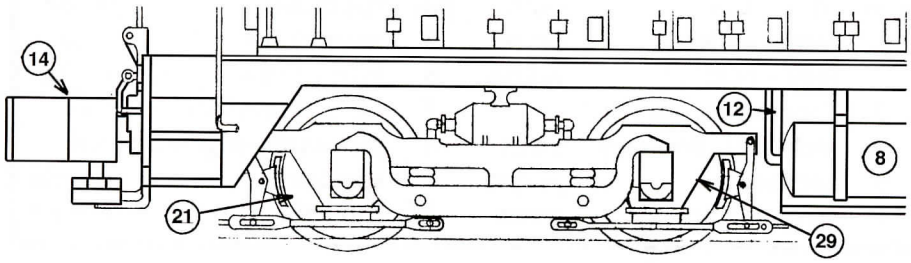
Step 4. Replace these wheelsets with two code 110 wheelsets. Cant each wheelset so as to position one axle bearing at a time into the gearbox. Each bearing must align perfectly in order to slide the wheelsets into position.

Step 5. Once both wheelsets are in place, bend the pick-up wires so that they are touching the back surface of each wheel.

Step 6. Replace the plastic sideframe/gearbox cover by snapping the tabs over the gearbox.

Step 7. Repeat with the other truck. Then check to be sure the trucks move freely.

If you intend to retain the American Flyer compatible couplers, be sure to replace the coupler bracket assemblies.

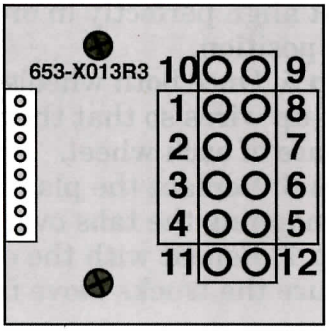


6-2 Lateral view parts drawing - Truck and details

3-5 Alternate AC Starting Direction

Right out of the box, your switcher will always start in the forward (long hood in front) direction if it has been standing for more than 30 seconds. However, if you wish to designate the cab end as "front" (as you would for one of two back-to-back units), the default starting direction can be reversed. To change the default direction, remove the four screws that hold the body assembly to the chassis and lift off the body. You will find a small socket just behind the front radiator grille. (This socket is Part No. 16 in the "cross-section parts drawing - gearbox and details" on page 11.) In this socket there is a slide switch whose position determines the default locomotive direction. To change the default direction, simply slide the toggle to the opposite side of the switch. Replace the body on the chassis and secure it with the four screws (**Do not overtighten**).

Front of switcher



Expanded 8 pin NMRA socket (2:1)

6-3 Socket diagrams

pin	function	color	pin	function	color
1	motor(+/R)	orange	5	motor(-/L)	gray
2	light - rear	yellow	6	light - front	white
3	shorted to pin 7	-	7	light (common)	blue
4	pick-up(L-fireman)	black	8	pick-up(R-engineer)	red
9	speaker	purple	10	speaker	purple
11	strobe light	green	12	cab light	brown

6-4 Eight Pin NMRA socket Key

3-6 DC Polarity Reversing Options

WARNING: Do not use this feature with AC current.

If you run your SW-9 with the AC/DC no sound option on a layout powered by DC, it will operate perfectly and cycle reverse the same as if it were powered by AC. Most DC layouts use DC polarity to reverse direction, however. You can convert your switcher to DC polarity reversing. Access the reversing plug by following the instructions in the previous paragraph (Section 3.5). Remove the factory-installed plug from the socket and replace it with the DC shorting plug, furnished as a separate part in your switcher packaging. Two DC shorting plugs are provided, one with the cab light on and the other with the cab light off. Once the plug is inserted, set the body on the chassis and test the locomotive. Replace the body on the chassis and secure it with the four screws (Do not overtighten).

3-7 AC/DC LocoMatic™ Sound Units

Another option available for your switcher is LocoMatic™ Control with sound. This feature can be ordered factory installed with the switcher, or purchased later for installation by the owner. This allows the unit to operate with AC or DC track power and is different from most other LocoMatic™ systems. It does not contain the DC shift for operation of the Horn and Bell. Therefore it requires the use of the #00552 LocoMatic™ 10 Button Controller for these functions. This was designed for SHS Inc. by Dallee Electronics, Inc and is available for $69.95. DC operators should operate in LocoMatic™ COMMAND CONTROL only. If operated with variable DC track power in standard mode, then normal AC like sequencing will occur. The Horn or Bell will not constantly operating since the decoding circuitry is not present in this system. Conventional AC operation follows the usual sequence of forward - neutral - reverse - neutral - forward sequence pattern except that the initial state is switch selectable for either start in forward or start in neutral. A locomotive can also be switch locked in the forward

position to accomodate operation under automated situations. An additional direction switch is provided so that if several locomotives are run in a multiple unit lash-up simply set this switch on each locomotive to specify which direction is forward. engine. If the direction of the locomotive is opposite of that desired such as back to back operation as commonly seen with switchers.

SOUNDS REPRODUCED

The sounds of the switcher have been recorded from an actual locomotive and are prototypically correct for utmost realism.

HORN is user activated by the HORN button on on the LOCOMATIC™ CONTROLLER. The horn will play as long as the switch or button is held on.

BELL is user activated by the BELL button on the LOCOMATIC™ CONTROLLER. The BELL sound will latch "on" when the bell control is activated and will latch "off" when the control is again activated. Any BELL requests at higher speeds will be ingored. The BELL can be activated at higher speeds if requested at lower speeds and then the locomotive speed is advanced. When BELL sound is requested, the sound system will first adjust the diesel sound to the RPM required for simultaneous play. When deactivating, the BELL will stop at the end of a ring and the diesel sound will return to the correct throttle setting. BELL sound can also be requested when diesel prime mover sound has been turned "off". Again, a manual switch allows the bell to be deactivated for multiple unit (MU) operation.

AIR SYSTEM RELEASE (POPS) Air is pumped continuously in a diesel locomotive to maintain pressure in the brake system and for other purposes. Periodically, accumulated moisture and any excess pressure will be vented through a release valve. These AIR RELEASE sounds (pops) are generated at random intervals during idle and at all throttle settings.

BRAKE RELEASE sound is produced when the locomotive changes from neutral to a movement direction and will always precede locomotive movement.

PRIME MOVER (Diesel) sounds range from idle to full RPM with eight throttle notches. In neutral or with no power to the motor the sound system will produce diesel engine idle sounds. When a movement direction is selected and the speed control is advanced to put the locomotive in motion, a brake release will sound (see above) and the diesel sound will initially accelerate to about throttle notch #4, and then seek the correct notch setting for locomotive speed. This simulates the normal delay on a diesel locomotive between throttle action and actual movement. There will be a distinct volume increase during acceleration. Sound volume should be somewhat lower once speed has stabilized and should be reduced during deceleration. Depressing the ALT / FORWARD button on the LOCOMATIC CONTROLLER will direct the sound system to accelerate to full RPM regardless of motor voltage. Depressing the ALT / FORWARD button again will release the sound system to return to the correct throttle notch setting. This feature allows the simulation of a heavy load with very slow locomotive speed or "pumping air" in a standing train.

LIGHTING FEATURES

The switcher is equipped with lighting that is directional so that the headlight will illuminate when the locomotive is in forward motion. When the locomotive is in reverse motion the headlight will turn off. The headlights and interior cab light also be manually operated by means of the SHS #00552 LOCOMATIC™ CONTROLLER.

OPERATION USING A TRANSFORMER

With this sound / control system installed, your locomotive will operate in the same manner as other locomotives when using a transformer to vary speed. When power is applied the locomotive will come "on" in either the forward or

neutral position as you have selected. Momentary interuptions of power will allow the locomotive to sequence through the usual direction positions. Sequencing can be accomplished either by a direction switch/button or by turning the speed control to "off" and then back "on".

An added feature of this sound / control system involves the way the motor is driven, particularly at slow speeds. When track power is at lower voltages the system further reduces the power to the motor so as to provide extremely smooth slow speeds for starting and stopping your train. If the track power fluctuates at these lower voltages you may notice a slight surging in the speed of the locomotive. If track power is set high while in neutral and you sequence to a direction, the locomotive will gradually increase its speed rather than jump directly to the high speed. This type of operation not only looks better but also results in less strain on the entire motor / gear drive system and is less likely to cause derailments of the locomotive or its train.

SHS #00552 LOCOMATIC™ CONTROL

Your SHS switcher will operate correctly with your transformer in the same manner as traditional locomotives, but with the simple installation of the optional LocoMatic Control Box, operation will be greatly enhanced.

The LocoMatic Controller contains ten operating buttons and is usable either in conjunction with your regular transformer or as an independent control with a fixed voltage applied to the track. The LocoMatic Controller is a pass through type of device which is wired between your transformer and the track. The LocoMatic Controller itself is powered by a 9 volt DC plug-in power supply which is included. Some of the buttons cause activation as long as they are held "on" while others work in a push-on,push-off mode. The lower right hand button, labled 'ALT', is the alternate button which provides a second function to each of the other nine buttons. For example; pressing the HORN

6-5 LocoMatic 10 Button Control Box

button will operate the HORN. Not all of the buttons have alternate functions on this locomotive. The ten controller buttons perform the following:

BELL - turns bell "on" or "off", push on and push off.

ALT/BELL - restores automatic directional lighting. Note - lighting on this locomotive is directional until a request is made via the CONTROLLER for a manual activation. Lighting functions will then remain manual via the CONTROLLER. Pressing ALT/BELL will allow all lighting functions to return to directional operation at the next direction request.

HEADLIGHT - turns front headlight "on" or "off"

ALT/HEADLIGHT - turns rear headlight "on" or "off" .

MARKERS - no function on this locomotive.

ALT/MARKERS - no function on this locomotive.

NUMBERBOARD- no function on this locomotive.

ALT/NUMBERBORARD - turns cab light "on" and "off".

MARSLIGHT/STROBE - no function on this locomotive

ALT/STROBE - turns strobe "on" and "off"

HORN - activates the horn

ALT/HORN - no function on this locomotive

FORWARD - forward motion overriding sequencing from neutral in standard mode. Increases speed in command mode if already running in forward. If running in reverse, speed will decrease through neutral to forward depending on how long the button is pressed.

ALT/FORWARD - this forces the prime mover RPM sound to full speed (notch 8) regardless of voltage setting. Use this to simulate pulling heavy drags, pumping up air tanks when sitting still, etc. Pressing ALT/FORWARD again returns RPM sound to normal.

REVERSE - reverse motion overriding sequencing from neutral in standard mode. Increases speed in command mode if already running in reverse. If running in forward, speed will increase through neutral to reverse depending on how long the button is pressed.

ALT/REVERSE - turns OFF main sounds leaving only the Horn and Bell if selected (only the horn if dip switch 3 set on). Another push will restore the main sounds. Main sounds include brake release, air pops and prime mover.

SLOW - neutral position overriding sequencing to a momentum stop - in standard mode. Slow down a step per push of button in command mode.

ALT/SLOW - neutral position or emergency stop.

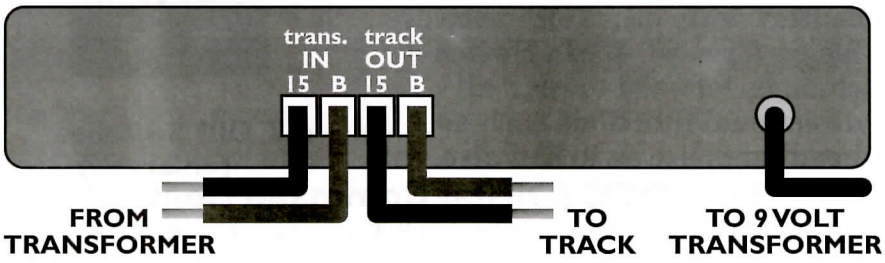
ALT - alternate button for second functions of other 9 buttons. Must be held down in conjunction with one other button. It may be depressed first and held without another button leaving only one other button to press.

Notice: Pressing more than one button, other than the ALT, produces no signal. It is an invalid operation.

INSTALLATION OF THE LOCOMATIC™ CONTROLLER

Connect two wires from your transformer to the terminals on the CONTROLLER labeled Trans, IN. The "B" terminal is the base and the "16" terminal is the "hot". Then connect two wires from the terminals labeled Track OUT to the track. The "B" terminal is connected to the inside rails of your track and the "16" is connected to the outer rail. This installs the CONTROLLER as a pass through between your transformer and the track. We recommend using #20 stranded wire, as a minimum, for these connections. If the CONTROLLER is not "on", your transformer will still function normally. Connect the 9 volt DC power supply to the input jack on the CONTROLLER and plug it in. The CONTROLLER is now "on" and is ready to operate with your transformer.

In summary, LocoMatic Control allows fingertip operation of a unique sound and control system with the additional features of realistic, prototypical speed and direction control. Right out of the box, your switcher will always start in the forward direction if it has been standing for more than 30



6-6 LocoMatic Controller wiring

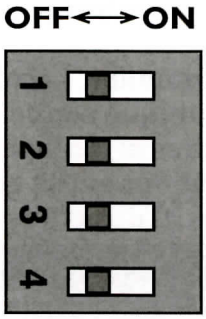
seconds. However, if you wish to designate the rear end as "front" the default starting direction can be changed.

DIP SWITCH OPTIONS - MANUAL ADJUSTMENTS

The exhaust stack section can be removed to reveal the LocoMatic Sound unit. Grip one of the exhaust stacks with your thumb and finger, and pull straight out. It just snaps in place. There are four dip switches and a volume control on the small circuit board. The sound potentiometer is factory set at a mid range (12 o'clock). Rotating this control counter-clockwise will increase the volume. It is suggested that the volume control be set at about the middle of its range for comfortable listening. The four dip switches are normally set to the "off" position and select the following operations:

	OFF	ON
# 1	start in forward	neutral
# 2	sequencing normal	lock in start
# 3	bell can sound	does not sound
# 4	forward direction is	front rear

Switches 3 & 4 are used primarily when two or more locomotives are operated together. You can turn off the bell in the trailing locomotives. If any of the locomotives are actually facing to the rear, Switch 4 on such locomotives allows operation in concert with other locomotives facing forward. When Switch 4 changes forward to rear, all directional functions such as headlights are switched also.



6-7 DIP Switches (enlarged)

3-7 DCC (Digital Command Control)

A Digital Command Control (DCC) decoder is not included with your switcher. However, your locomotive comes factory-ready to receive a DCC decoder without modification*.

Purchase a DCC decoder from a vendor of your choice. We recommend purchasing a 1.0 to 2.0 amp decoder. To install your DCC decoder, expose the reversing-plug socket by following the instructions in Section 3.5. Remove the factory-installed printed circuit board (or the DC shorting plug) and plug your DCC decoder into the socket. Many DCC manufactures offer the NMRA medium plug.
Factory installed "Tsunami" DCC Sound decoders by Soundtraxx are available. Those switchers come with an additional instruction booklet on their operation and installation.

*** DCC Installation Note:** If your switcher has a DCC warning label attached to the socket printed circuit board, it was not wired to the NMRA standards and will need to be replaced for DCC operation. Replacement sockets are available. Please contact SHS regarding our replacement program.

SECTION 4 - Maintenance

4-1 Lubrication

Your new switcher diesel switcher comes factory lubricated and ready for the break-in period. After break-in, we recommend inspection and careful lubrication of the wheel bearings. With the model upside down, place a small drop of Aero Lube "Conducta Lube" on each axle next to each of its two bronze bushings and the back of the wheels. Use only a drop, over lubrication can damage the body as well as void the warranty.

4-2 Golden White LEDs

The LEDs in your switcher are rated at 3.5 volts and 30 milliamps for maximum life and should not need to be replaced. But, just in case:

Step 1. Remove the four screws that hold the body assembly to the frame and lift off the body.
Step 2. Unplug the AC/DC circuit board.
Step 3. Before removing LED printed circuit board,

note the position of the wires and copper contacts.

Rear LEDs (Steps 4-7):

Step 4. Push the rear LED contact wires (brass) to the side

Step 5. With a small flat-blade screwdriver, release the tab below the cab side windows and remove the cab floor.

Step 6. Remove the LED circuit board bracket by unscrewing the two phillips-head screws. Gently pull the contact wires from the tabs on the cab roof and unsolder the two rear bulb leads.

Step 7. Solder a new LED circuit board into place and attach the rear LED bracket. Push the contact wires back into the tabs and position and replace the cab floor. Re-install cab onto the body, bend the contact wires up, and replace rear LED wires into the six body tabs.

Step 8. Remove the front LED bracket by unscrewing the two phillips-head screws. Replace with a new LED pcb assembly and solder in place. Then re-attach the front LED bracket.

Step 9. Re-insert the AC/DC circuit-board plug (if used) into its socket. Then re-attach the body assembly to the frame (**Do not overtighten screws**).

4-3 Cleaning

Body - Remove dust with a small soft brush (make-up brush or similar). If your switcher requires more extensive cleaning, we recommend removing the body from the chassis and cleaning the body with dishwashing detergent and a small sponge. Rinse with clean water (making sure not to get water into the interior of the cab) and blot or blow dry with low heat. Pilots can be removed from the chassis and cleaned in the same way.

Wheels - Dirt will build up on the wheel treads over time. To remove this and improve traction and electrical pick-up, we recommend using 91% isopropal alcohol and a Q-tip.

Again, remove the body from the chassis, as the alcohol can damage the body finish. Rub each wheel tread with the alcohol-moistened Q-tip, applying slight pressure to remove the dirt build-up. The wheels can be rotated by hand-turning the flywheel. Once the wheels' treads are clean, check the electrical pick-up wipers for cleanliness and for contact against the inside surfaces of the wheels.

Storage - Whenever your switcher is withdrawn from service for an extended period, we suggest you store it in its original foam tray and gift box for maximum protection.

4-4 Pick-up wipers replacement

Step 1. Using a small screwdriver, gently pry loose the end of the plastic sideframe/gearbox cover to release the tab that holds it to the gearbox.

Step 2. Remove the two wheelsets.

Step 3. Remove the pick-up wipers' bracket screw. Then remove the worn pick-up wipers.

Step 4. Replace the worn pick-up wipers with new ones and reinstall the pick-up wipers' bracket screw.

Step 5. Re-insert the wheelsets. Note that the bearings must align perfectly for the wheelsets to slide into the gearbox.

Step 6. Once both wheelsets are in place, check that the pick-up wipers are all contacting the inside surface of the drivers.

Step 7. Replace the plastic sideframe/gearbox cover by snapping the tabs over the gearbox.

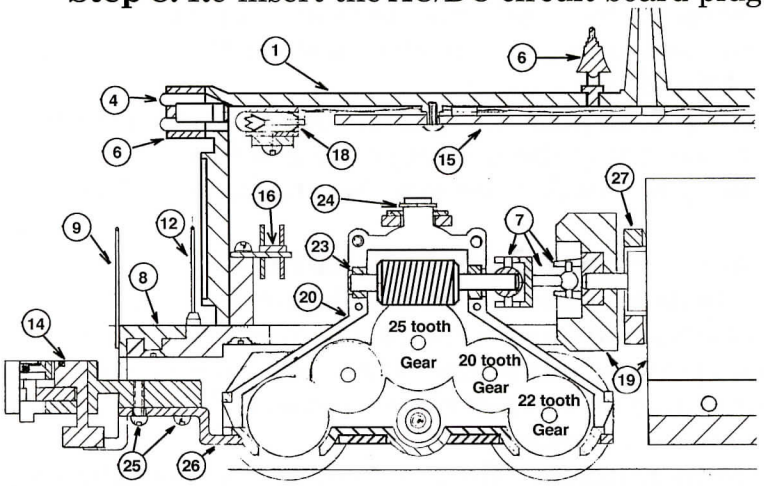
Step 8. Check to be sure the trucks move freely.

4-5 Heavy Duty Lubrication

If your switcher operates on a club layout, at shows, or receives unusually heavy usage, the worm and idler gears will need periodic lubrication to prevent excessive wear. To lubricate these areas most effectively, complete disassembly of the gearbox is necessary.

Step 1. Remove the four screws that hold the body assembly to the frame and lift off the body.

Step 2. Unplug the AC/DC circuit board (if you are not using DC polarity reversing or DCC) and the two forward and reverse light plugs.
Step 3. Remove the American Flyer compatible coupler bracket and the four wheelsets. (See Code 110 NMRA RP 25 Contour Wheelsets, Section 4.4.)
Step 4. Remove the e-clips that hold the gearbox to the gear tower and lower the gear box from the chassis.
Step 5. Remove the plastic pick-up wiper assembly, taking care not to break the wipers. Note on which side of the gearbox each belongs.
Step 6. Remove the two screws holding the two halves of the gearbox together. Once the gearbox is apart, clean the old grease from the gears and worm. Lubricate the worm with ACT gear Lube and the idler gears with ACT motor bearing lube.
Step 7. Re-assemble the gearbox **(Do not overtighten screws)** and plastic pick-up wire assembly. Carefully re-connect the universal drive shaft to the gear tower and push the e-clip back onto the gearbox stem.
Step 8. Re-insert the AC/DC circuit board plug into



6-8 Cross section parts drawing - gear box and details

its socket (if you are not using DC polarity reversing or DCC) before re-attaching the body assembly to the frame **(Do not overtighten screws)**.

SECTION 5 - PARTS LIST

Part#	description	price
1	Body (damage exchange only)	$0.00
2	Cab (damage exchange only)	NA
3	Chassis (damage exchange only))	NA
4	Windows & lens set (6)	NA
5	Gear set (5), Celcon®	5.00
6	Detail Parts set (20)	12.50
7	Universal set (6)	5.00
8	Pilot & air res.	10.00
9	Handrail set (4), Celcon®	5.00
10	Interior fixtures set	9.00
11	Crew (2 man engine), painted	5.95
12	Metal detail parts set (21)	15.00
13	Horn (1) brass, turned	2.95
14	Coupler, AF comp. assy.	3.95
15	AC/DC no sound board	39.95
16	NMRA socket assy.	9.95
17	DC ONLY shorting plug set (2)	5.00
18	LED pcb, frt & rear assy.	11.95
19	Motor w/ flywheel assy.	15.00
20	Gearbox assy., code 110	20.00
20A	Gearbox assy., AF compatible	20.00
21	Drivers assy(4), code 110	16.00
21A	Drivers assy(4), AF compatible	16.00
22	Pick-up wipers (8), contacts	4.00
23	Bearings (8),Bronze	4.00
24	E-clip(2)	1.00
25	Screw, coupler (14)	1.00
26	Coupler bracket(2)	2.50
27	Motor mounts (2), rubber	1.00
29	Sideframe(2), AAR type A	5.00
30	Screw, pilot (4)	1.00
31	Screw. body (4)	1.00

34	Screw, pick-up wiper bracket (4)	1.00
35	Pick-up wiper bracket (4)	2.00
36	Single lens headlight (2)	5.00
-	#01612 Speaker, switcher 28 mm	2.95
-	#01302 LocoMatic switcher sound board	149.95
-	#01295 coupler (2 pair)	5.95
-	Exhaust stacks (2 each of 3 types)	3.00
-	DCC decoder 1.2/2.0 amp(Digitrax DH-123P)	24.95
-	Aero-loco lubrication set(Train Pak)	15.00

Ordering Information

All Showcase Line products are available from Hobby Shops. If your local Hobby Shop is unwilling to stock our products, you can order directly from S Helper Service,Inc. US orders under $100 include $6.50 s/h, plus $1 for each extra $100. Master Card/Visa/AMEX/Discover cards are accepted. Fax orders can be received 24 hours a day at 732-441-0751, phone orders can be placed at 1-800-465-0303. Catalogs and our newsletter, ***The SHS Update*** are available upon request. Items can be ordered online at:

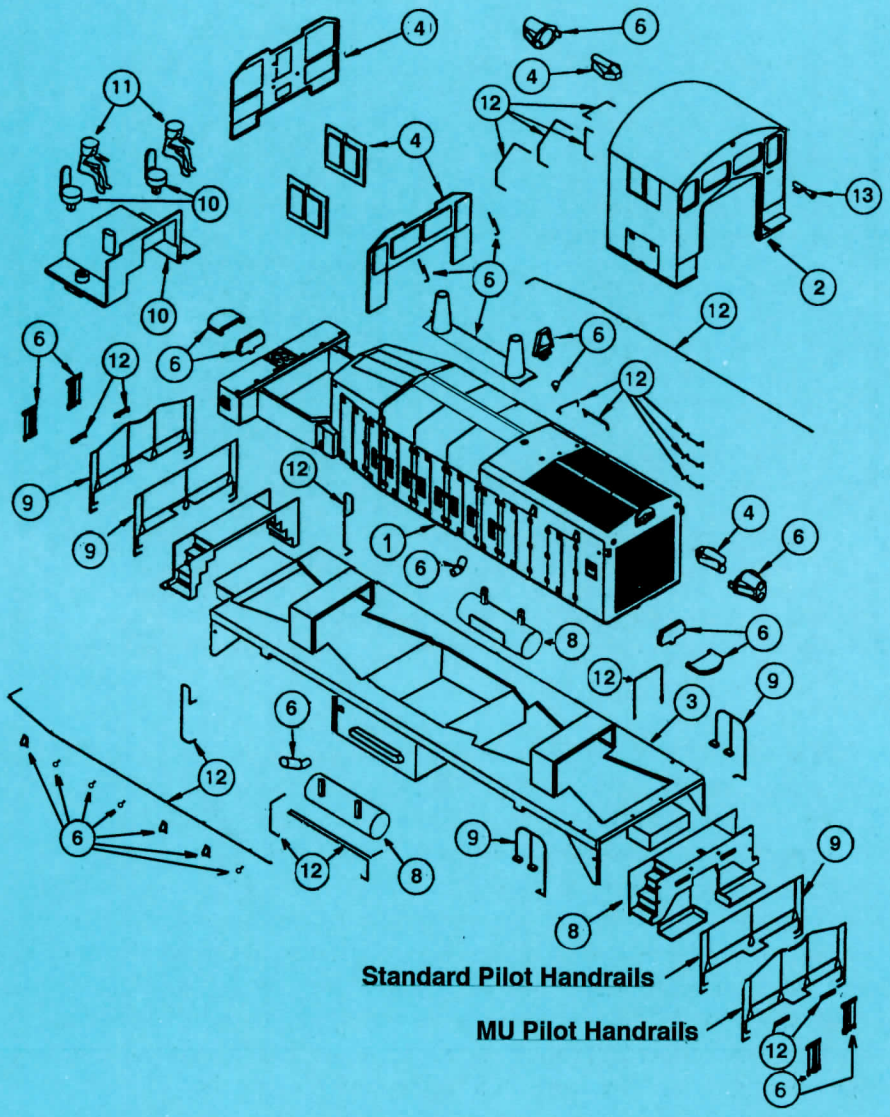
www.showcaseline.com

We have PS-2 covered hoppers (both 2 & 3 bay), USRA single & double sheathed boxcars, 40' stock cars, 40' steel rebuilt boxcar, 48' bulkhead flat car, 53'6" TOFC (trailer on flatcar), a 53' 6" GSC standard flatcar, 40'wooden reefer, 70 ton ore car, 4 versions of 2 bay open top hoppers and a ICC extended vision caboose. For motive power we have SW-1, NW-2, SW-8 & SW-9 diesel switchers, phase II & IV F-3 A & B, and phase I F-7 A & B units.

We are now working on a 2-8-0 steam engine, E-7 passenger diesel and a ICC bay window caboose.

Our S gauge track system includes 3 radii of curved track (20", 25" and 30"), 5", 10" and 15" straights, insulated rail joiners, American Flyer track adaptors, bumpers, Right & Left #3 switches and flex track.

We expect our R&L #5 switches (turnouts) next year. We are in the design phase for a 90° & 30° crossing as well as a signal system.



6-9 Exploded parts drawing - Body & detail parts

LIFETIME LIMITED WARRANTY

S HELPER SERVICE, Inc will replace or repair (at it's discretion) any part which it finds fault in workmanship or material provided these instructions are followed:

1. Include a note indicating nature of problem with your name and address.
2. Returned items must be shipped to S HELPER SERVICE shipping fully pre-paid along with $10.00 for return shipping and handling. If part is returned within 90 DAYS of purchase, return postage and handling fee need not be included. NOTE: Proof of purchase with date must accompany returns.
3. Send diesel in original foam tray and giftbox plus shipping and handling to: S HELPER SERVICE Inc., 77 Cliffwood Ave., Unit 7C, Cliffwood, NJ 07721
4. Pack properly to protect switcher against added damage. Use original tray and gift box. Carefully pack and insure.
5. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

This Showcase Line switcher is warranted against defects in workmanship and materials for as long as it is in the possession of the original purchaser or owner.

This warranty does not include the cost of any inconvenience nor does it cover the cost of transportation damage, misuse, abuse, accident, normal wear or any item which has been tampered The warranty does not cover Sound units, LEDs dirty wheels, electrical wiper replacement or speakers.

ACKNOWLEDGEMENT

We would like to thank all of our friends that helped us bring this project to fruition:: Dallas Gutacker, Will Holt, Ron Sebastian, Don Richards, Vic Roseman, Howie Waelder, Michael Greene, Bill Clark, Hiram Graves, John Prior, Bob Werre, Nancy Workman and Steve Domingues. If we have forgotten anyone, please forgive us.

We appreciate Jonathan Chung who's gentle patience as our project manager guided this loco to completion, Clement Nip and and Lucan Ng who aided Jonathan, Karen Kwok for her superb artwork, Mr. Wai Shing Ting and Mr. Paul Chiu who were good enough to let our products be made in their facility and especially our customers. Without this support, there would never have been an S Helper Service switcher.

Thank you all.

Updates to this manual can be found on our website at:

www.showcaseline.com

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