Spectrum®

1:20.3 Scale Two-Truck Climax
Operator's Manual

BACHMANN
QUALITY SINCE 1833
®

Thank you for purchasing Bachmann's *Spectrum*® 25 Ton Class "B" Narrow Gauge Climax.

This locomotive continues Bachmann's tradition of producing the finest state-of-the-art, award-winning large scale locomotives ever made.

Your Bachmann *Spectrum*® Climax has been designed to provide a lifetime of model railroading pleasure. However, like all precision instruments, it must be properly maintained. PLEASE READ THIS MANUAL AND WATCH THE ENCLOSED VIDEO BEFORE OPERATING YOUR LOCOMOTIVE.

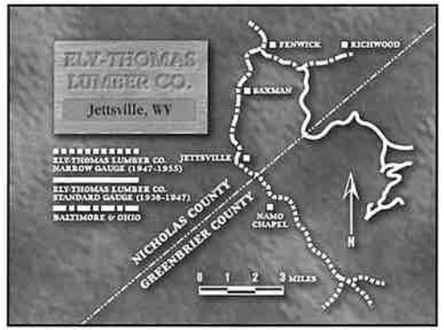
CAUTION

IT IS IMPORTANT THAT YOU FOLLOW THE RECOMMENDED PROCEDURES FOR LUBRICATING YOUR LOCOMOTIVE BEFORE RUNNING IT FOR THE FIRST TIME. FAILURE TO DO SO COULD CAUSE SERIOUS MECHANICAL PROBLEMS.
NOTE: KEEP YOUR ORIGINAL PACKAGING IN CASE YOU NEED TO RETURN YOUR LOCOMOTIVE TO BACHMANN FOR SERVICE.

CLIMAX HISTORY

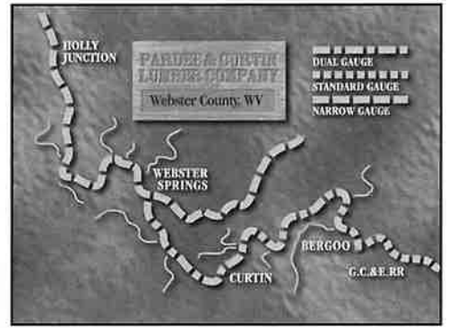
Climax locomotives were built from 1888 to 1928 by the Climax Manufacturing Company of Corry, Pennsylvania. The first Climax weighed just 10 tons in working order, and was the precursor for hundreds of Class A-type locomotives which were manufactured right up to the closing of the company in 1928.

In 1893 a Class B locomotive was designed featuring cylinders positioned alongside the boiler at an elevation of approximately 40 degrees. The first locomotive built to this design weighed 25 tons. The new Class B design was an instant success, and quickly became Climax's most popular model throughout the company's history. Initially the Class B was offered in sizes from 17 to 35 tons. However, as demand for larger locomotives grew, Climax increased the size of its Class B offerings until they topped off at 62 tons.



In 1897 Climax built a 50 ton locomotive with three trucks. It was designated Class C. Climax soon standardized the three truck design in weights from 70 to 100 tons. The additional truck allowed for a larger water tank and longer distances between water stops, and the extra weight provided greater tractive effort and a more stable engine.

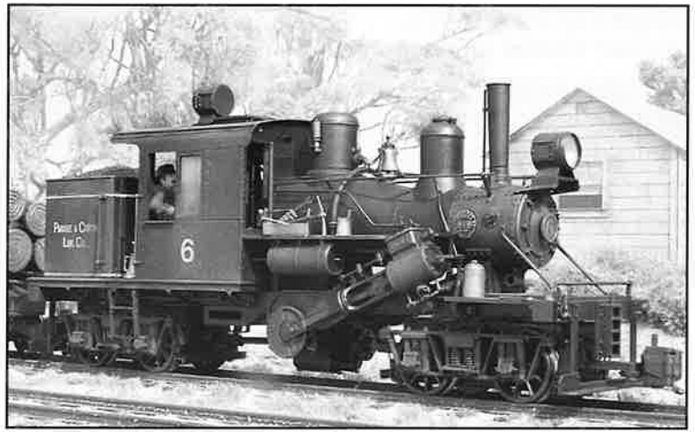
Due to their unique design and construction, Climax locomotives easily navigated sharp curves and steep grades. Pound for pound they could outwork any other geared locomotive in their weight class. They were ideally suited for rough track laid over rugged terrain.



The Climax was very popular in the logging regions of the United States and Canada, and many were exported to foreign countries as well. The logging railroads, utilizing a combination of home brewed parts and backwoods ingenuity, frequently modified their locomotives to imitate factory design improvements. Your Bachmann *Spectrum*® Climax represents one of many possible prototypes. Besides logging, Climax locomotives operated in a variety of environments that included open pit mining, industrial switching, stone quarries, brick yards, wood chemical plants, and sugarcane plantations. Some even served in passenger service on common carrier railroads. They were versatile machines that were easy to operate and maintain.

CLIMAX FEATURES

Your Bachmann Climax is a precision 1 to 20.3 scale model with features and details found on the prototype (see facing page).



Mechanical

- fully operating Stephenson valve gear with operating piston valves, Johnson bar and linkage
- twin, diecast I-beam construction
- two precision 5-pole can motors
- modular gear box with metal motor mounts
- eight sealed ball bearing races (two per axle)
- all-wheel drive
- gear reduction for prototypical slow-speed operation
- smoke generator with on-off switch

Exterior Detail

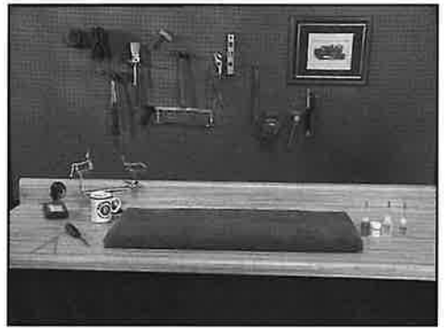
- diecast coal load
- separate, finely detailed stack base with bolts
- cast metal whistle
- machined brass bell with metal clapper
- machined brass pop valves
- photo-etched brass builder's plate
- blackened metal handrails and piping
- super-detailed diecast air pump with air tanks, unions, valves and metal piping
- water siphon hose
- "poling pockets," front and rear
- woodgrain detail on planking
- end beams with nut, bolt and washer detail
- scale coupler pockets
- fully detailed trucks with brake beams, hangers and shoes
- metal coil springs on trucks
- two ball bearing races for each stainless steel axle
- chemically-blackened, machined-metal wheels with spokes

Cab Detail and Lighting

- directional, LED headlight and backup light
- interior cab light
- load-synchronized LED's in firebox and ashpan for realistic fire glow
- operating cab doors, windows and roof hatch
- diecast cab steps
- painted engineer and fireman figures
- complete backhead detail including steam gauge with piping, turret, throttle, sight glass fittings, injectors and operating firebox door
- operating coalboard
- miscellaneous tools and accessories

Support Material

- comprehensive video on Climax history and model maintenance
- owner's and maintenance manual



LUBRICATION PREPARATION

Gather all the items you'll need to perform the lubrication procedure. Then find a large, sturdy work surface to hold your locomotive. Your kitchen table or a workbench will do very well.
You will need:

- a thick towel or a piece of foam to act as a cushion for the Climax
- a #1 Phillips screwdriver
- a cup for holding the screws which you will remove
- a thin wooden applicator, tooth pick or coffee stirrer
- and the necessary lubricants.

BACHMANN E-Z LUBE® LUBRICANTS FOR THE 21ST CENTURY

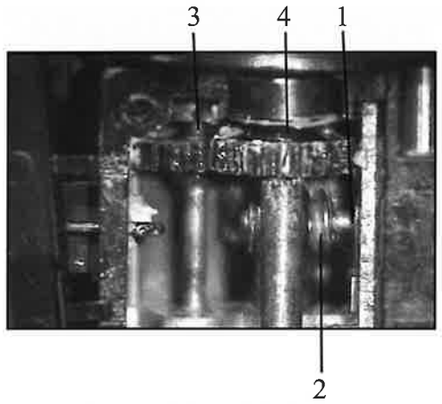
We recommend Bachmann's line of *E-Z Lube*® plastic-compatible lubricants. *E-Z Lube*® products are available at your local hobby retailer.

LUBRICATION PROCEDURES

Place the towel or foam on your work surface. Gently lay the locomotive on its side so that the cylinder on the engineer's, or right side, is facing up towards the ceiling.

Remove the cover plate of the rear truck. (Before you do this, notice the rubber plugs on the cover plate. These are quick-access field lubrication plugs that you will want to use later. To use them, grasp between your thumb and finger and pull. To replace the plugs, simply push in.) Now, hold the rear truck firmly. Using your screwdriver, carefully take out the screws holding the cover plate. Place all screws in a cup or other container to prevent them from rolling away.

With your thumb and forefinger, pull off the cover plate. DO NOT REMOVE ANY OTHER PARTS. REMOVAL OF THE COVER PLATE IS ADEQUATE TO PERFORM ALL LUBRICATION. Now that the gear box is exposed, you are ready to lubricate the Climax. It is important to know that over-lubrication can be more damaging to a locomotive than no lubrication at all. Use care in the application of lubrication. NOTE: For clarity, only one half of each power truck is shown. Be sure to lubricate parts on both sides of each truck.



LUBRICATING THE CLIMAX

Our objective in this section is to completely lubricate the motor bearings, axle bearings, all bearing surfaces, intermediate and idler gears, and apply additional conductive lubricant behind each wheel and on the ball bearing contacts to increase electrical pickup. With the gear box exposed, and using Bachmann's *E-Z Lube*® Heavy Duty Gear Oil, place 1 or 2 drops of lubrication on the bearing where the motor shaft passes through the metal motor support housing on each side of the motor.[1]

Put 1 drop of oil on each of the worm gears.[2]

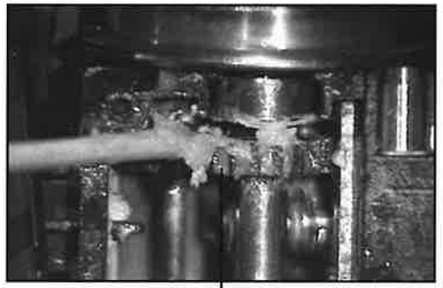
Put 1 drop of oil on each idler gear shaft and the area where the gear sits on the shaft.[3] (Note: There are two idler axles for each drive axle.) Finally, put a drop of oil on each side of the block bearing where the drive axle rests in the truck side frame.[4]

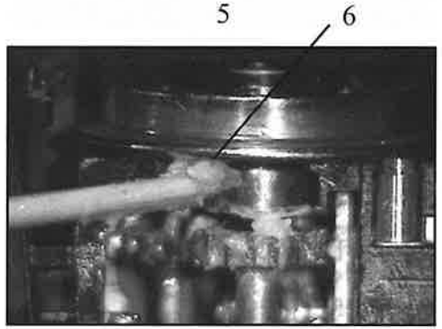
For the next step, use Bachmann's *E-Z Lube*® Heavy Duty Gear Grease. The best method to apply this material is by using a thin wooden applicator. If you don't have one available, then a toothpick or coffee stirrer will do.

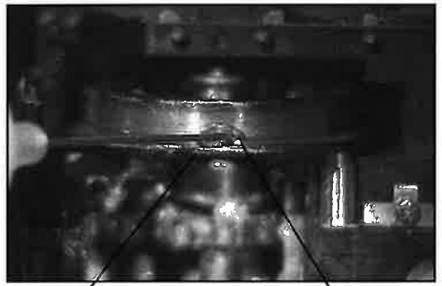
Place a liberal amount of grease on the gears, working it well onto the entire part.[5]

When you run the Climax, the grease will be distributed around and into the idler gears. Be careful not to overload or overpack the grease. You want to make sure that it is evenly coated all the way around the gears.

This lubrication is adequate for 20 hours of operation. Now put some gear grease behind each wheel.[6]







THE CONDUCTIVE LUBRICANT

Now we are ready to apply the conductive lubricant. Bachmann's *E-Z Lube*® Conductive Contact Lubricant enhances electrical conductivity, and decreases the amp draw of your Climax by lubricating the rear of the wheels where the heavy duty ball bearing contacts carry electricity to the motor. THE LUBRICANT IS HIGHLY CONCENTRATED. Just put 1 drop on the back of each wheel[7] and on the wheel tread.[8] You should perform this electrical conductive maintenance every 5 to 6 hours of operation, or as needed.

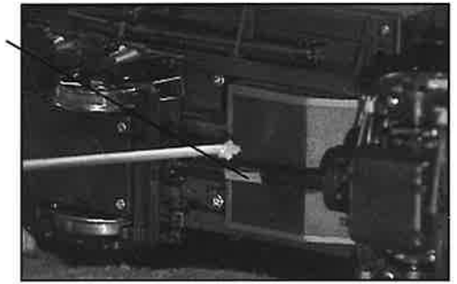
When operating outdoors under high temperatures and other environmental conditions, there is a lot of friction, wear and evaporation. More frequent lubrication may be necessary.

NOTE: REPEAT ALL OF THE PROCEDURES LISTED ABOVE ON THE OTHER POWER TRUCK

Now replace the truck cover plate by first making sure the cover's support bracket is positioned *toward the drive shaft* and under the spiral gear. (See the exploded view on page 30 for illustration.) Then snug it in place by tapping evenly on the bottom of the plate.[9] Replace the screws, but do not over tighten, so the next time you need to lubricate they will be easy to remove.

FIGURE 9

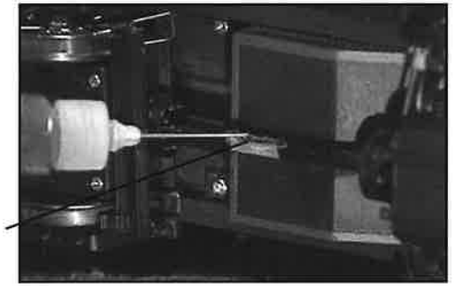
10



DRIVE LINE LUBRICATION

The drive shaft is one of the most important areas on your Climax. It's from this point that all the power to the pistons is applied.

IT RUNS AT A VERY HIGH RPM, SO KEEPING THIS PART WELL LUBRICATED IS IMPERATIVE.



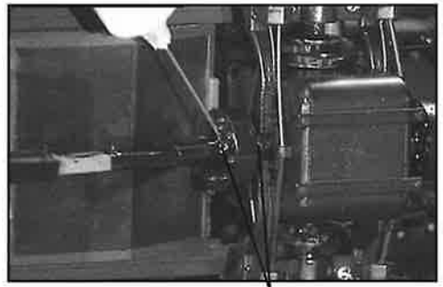
11

Using a moderate amount of grease, lubricate the shaft junction.[10] Work the shaft in and out, and then remove any excess grease. Add a small drop of heavy duty gear oil and work that in also.[11]

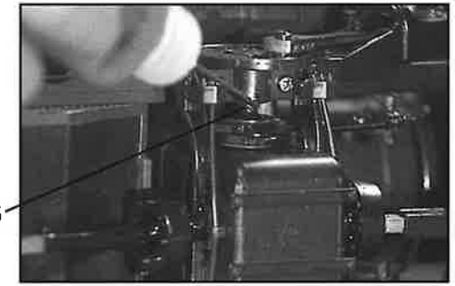
Now, using *E-Z Lube*® Heavy Duty Gear Oil, place 1 drop along all bearing surfaces of the exposed drive line. This includes where the drive shaft connects to the power trucks and the center gear box.[12]

Repeat these steps for the other drive line shaft as well.

Lubricate the flywheel drive shaft where it leaves the center gear box and passes through the locomotive frame.[13]

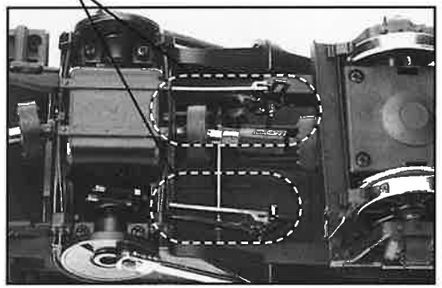


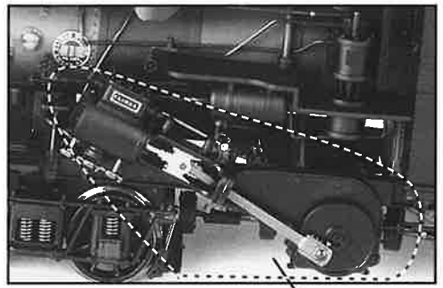
12



13

14



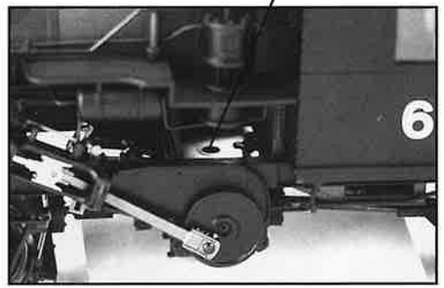


15

Add a drop of heavy duty gear oil to all the moving parts of the Stephenson valve gear linkage.[14]

Now bring the Climax to an upright position and lubricate all of the cylinders' moving parts and valve gear with a slight drop of oil. These include all piston rods, piston valves and valve guides.[15] Don't forget to lubricate the cylinders and valve gear on BOTH sides of the Climax. Again, do not over lubricate.

16



LUBRICATION OF CENTER GEAR BOX

There is a lubrication access hole located on the top of the center gear box.[16] To lubricate the center gears, place just 3-4 drops of heavy gear oil in the access hole for every 12 hours of locomotive running time, or as needed. The oil will be distributed evenly with locomotive operation.

ADDITIONAL LUBRICATION PROCEDURES

Lubricate the power truck bearing surface with *E-Z Lube*® Heavy Duty Gear Oil. This is the half moon shaped part on the bolster, located between the frame and the top of the truck.[17]

If further illustration of any of the lubrication procedures is required, note that all of the Climax's parts and lubrication points can be seen in the exploded-view diagrams included in this instruction manual.

FIGURE 17

Now your *Spectrum*® Climax is ready for track testing and many years of enjoyment. We recommend that for breaking in you first run the Climax with little or no load at SLOW TO MEDIUM SPEEDS, checking to see that everything on the locomotive is operating properly. **This is the way prototype Climax locomotives were brought into service as well!**

Don't forget to fill out your warranty card and send it in as soon as possible. And remember, the key to maintaining your *Spectrum*® Climax for long life is to keep all the parts properly lubricated. Now it's time to enjoy your *Spectrum*® Climax!

OPERATION OF VALVE GEAR LINKAGE

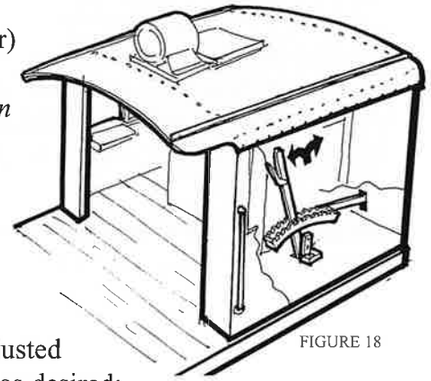


FIGURE 18

The locomotive is equipped with a Johnson bar (reversing lever) that adjusts the valve linkage and valve stroke. *The adjustments are representational only, and do not affect the actual operation of the locomotive.*

To access and move the reversing lever, open the cab door and cab window on the engineer's side of the locomotive. Using your fingers inserted through the cab door and window (one each side), locate the Johnson bar. (See figure 18 with a cutaway view of the cab interior.) The Johnson bar can be adjusted by pulling up slightly and then moving it forward or backward as desired; the valve gear adjusts accordingly. (Moving the bar toward the smoke stack represents forward motion of the locomotive. Moving it toward the coal bunker represents reverse motion.) For the longest piston strokes, move the Johnson bar either all the way forward or back.

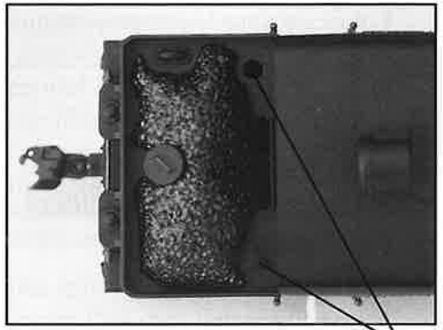
SMOKE GENERATOR

To operate the smoke generator, put 3 or 4 drops of smoke fluid down the smoke stack. The on-off switch for the smoke generator is behind the smokebox door. If you operate your locomotive without smoke fluid, be sure to turn off the smoke generator. FAILURE TO DO SO WILL BURN OUT THE SMOKE UNIT.

Also, it is not recommended to run your locomotive above 16 volts with the smoke unit turned on. This may cause the smoke unit to burn out.

SOUND INSTALLATION

The Climax locomotive is prewired to make the installation of after market sound systems easier. (See the wiring and superstructure diagrams.)



19

To access the sound PC Board under the tender you need to:

- Loosen the two recessed Phillips head screws located under the tender water valves (access the screws by simply lifting the water valves off).[19]
  Note: screws may be tight.
- Tilt the coal bunker backwards until the tabs on the back of the bunker release.
- Lift the bunker shell up and off.
- For additional information, consult the manufacturer of your after market sound system.

GENERAL MAINTENANCE

Lubricate your locomotive regularly according to the schedules recommended in the lubrication section of this manual. However, remember that over lubricating can be worse than no lubrication at all. Set up a lubrication schedule and follow it just as you would do for your automobile.

Clean with a soft, lint-free cloth. Or use a new cosmetics brush that would be used to apply blush. Do not use any liquids or solvents to clean this locomotive. Do not leave your locomotive outdoors overnight or in inclement weather.

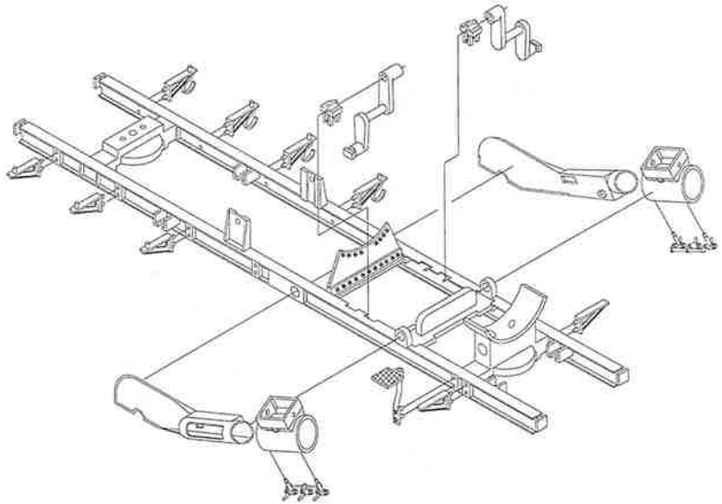
The heavy duty ball bearings and springs that provide electrical contact are subject to friction. It is unlikely that they will wear significantly if lubricated regularly under normal operating conditions.

Be advised that replacement of the ball bearings or electrical contact springs requires extreme caution. (Refer to Exploded View diagrams.)

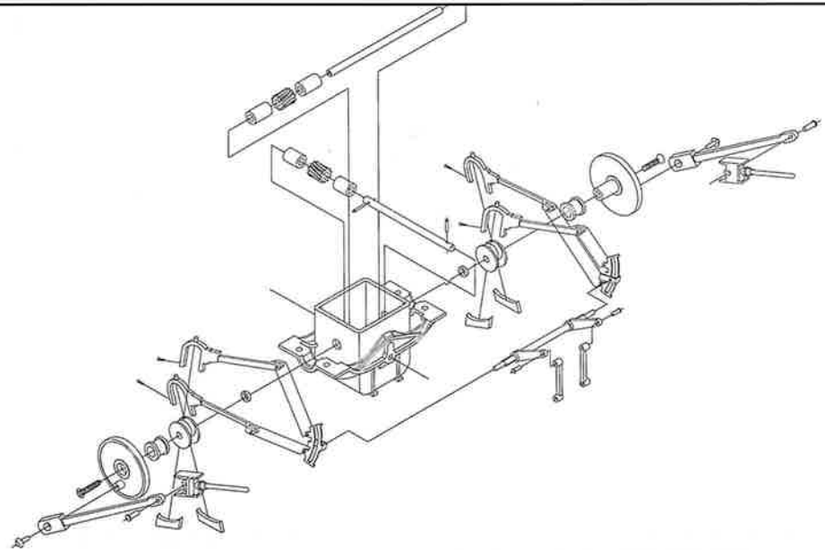
Care should be exercised as these ball bearings and springs are likely to become airborne, lost or misplaced. However, if they should require servicing we recommend that you send your power trucks to the Service Department at Bachmann Industries.

The address is:

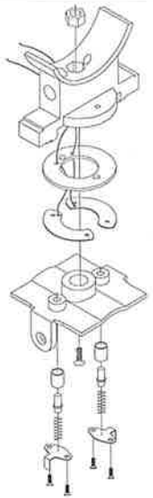
Service Department
Bachmann Industries, Inc.
1400 East Erie Avenue
Philadelphia, Pennsylvania 19124
1-800-223-3364 (Large Scale)
1-800-356-3910 (all other scales)



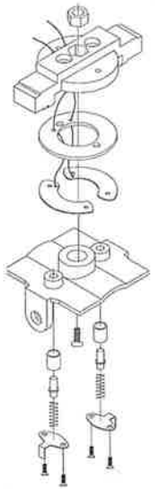
FRAME ASSEMBLY



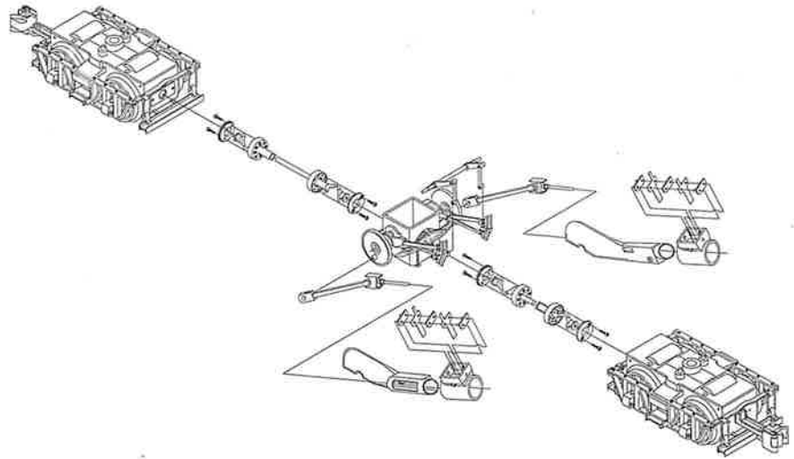
CYLINDER AND CENTER GEAR BOX ASSEMBLY



POWER TRUCK BOLSTER ASSEMBLY (FRONT)

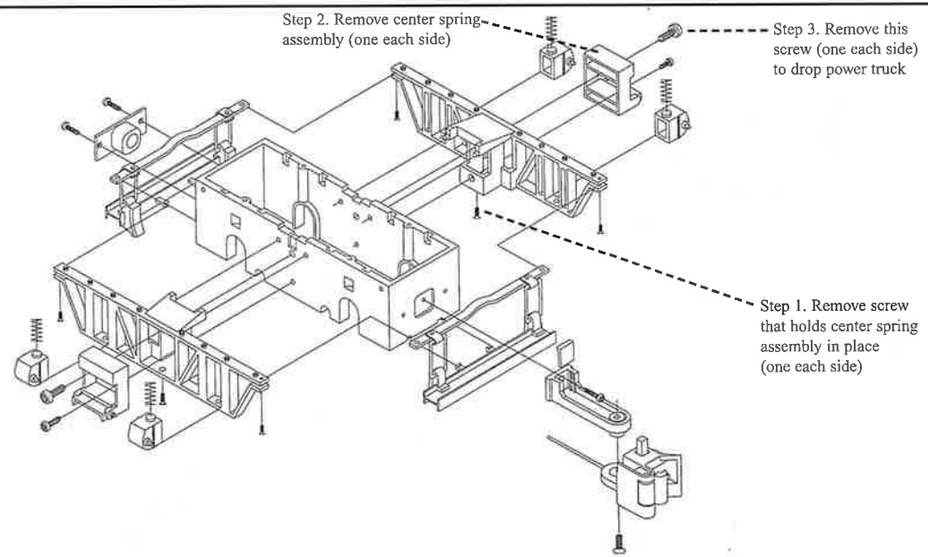


POWER TRUCK BOLSTER ASSEMBLY (REAR)



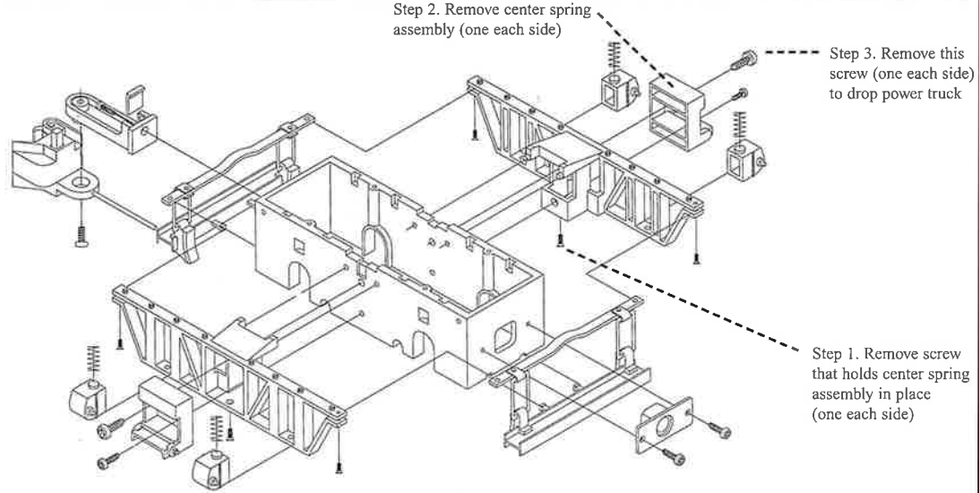
CYLINDER ASSEMBLY WITH SOUND CONTACTS AND DRIVE LINE

Note: To drop a power truck from the frame, it is only necessary to follow the three steps as indicated.

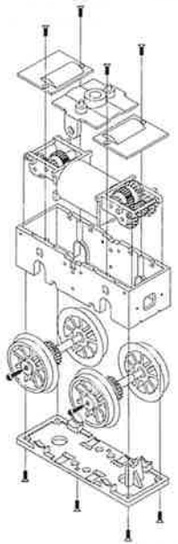


SIDE FRAME, BRAKE SHOE AND COUPLER ASSEMBLY (FRONT)

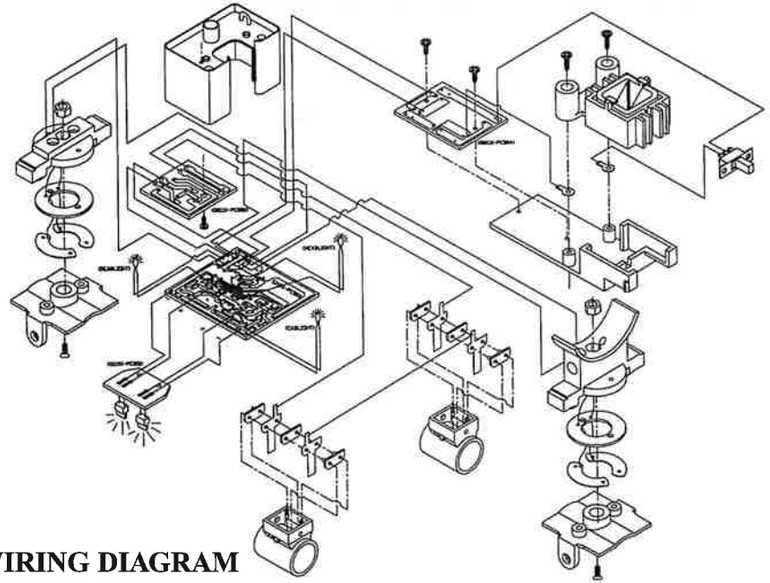
Note: To drop a power truck from the frame, it is only necessary to follow the three steps as indicated.



SIDE FRAME, BRAKE SHOE AND COUPLER ASSEMBLY (BACK)



POWER TRUCK, MOTOR, WHEEL AND AXLE ASSEMBLY



ELECTRICAL WIRING DIAGRAM

BACHMANN INDUSTRIES, INC.
1400 East Erie Avenue
Philadelphia, Pennsylvania 19124 USA
215-533-1600

GERMANY:
BACHMANN INDUSTRIES
EUROPE, LTD.
Niederlassung Deutschland
Am Umspannwerk 5
D-90518 Altdorf bei Nürnberg
GERMANY
Tel: 49-9187-9722-0
Fax: 49-9187-9722-22

UNITED KINGDOM:
BACHMANN INDUSTRIES
EUROPE, LTD.
Moat Way, Barwell
Leicestershire LE9 8EY U.K.
Tel: 44-1455-841756
Fax: 44-1455-841787