

English's Model Railroad Supply

21 Howard Street, P.O. Box 322, Montoursville, PA 17754
Mechanism Kit #3-200 For Bachmann PRR K-4 Pacific 4-6-2

These instructions provide exploded-view drawings, diagrams, step-by-step instructions and an itemized parts list. If for reasons beyond our control, any shortage or faulty part is found, write directly to manufacturer, including name of your dealer and date of purchase. Return any defective parts for exchange.

The builder should first familiarize himself with various parts by comparing them with the drawing, and he should also study instructions to attain a working knowledge of proper procedure. Assembly work should be done in sequence outlined in this manual to assure proper construction.

TOOLS

This is a builders kit, you will need a few tools. You will find use for the following: small hammer, several assorted pattern files, jewelers screwdrivers, knife, pliers and tweezers. Also a #50 drill and a 3/16" drill.

BEFORE YOU PAINT THE MODEL, WE RECOMMEND YOU BUILD THE COMPLETE ENGINE AND THOROUGHLY TRACK TEST IT.

MOUNTING DRIVE WHEELS IN FRAME

Clean flash from underframe (6956). One driver on each axle is insulated. It is difficult to determine visually which wheels are insulated. One method to determine this is to use two wires from your power source with rheostat on LOW and touch one wire to axle and one to tire. If there is no spark, that is the insulated wheel. The insulated wheel has a gray strip of insulation between tire and black wheel center. **KEEP ALL INSULATED DRIVERS TO LOCOMOTIVES LEFT.**

Lay drive wheel assemblies (16000 & 16030) in bearing slots in frame, making sure bearings seat in frame with flat side of bearing even with edge of frame. Be sure insulated wheels are on locomotives LEFT. Apply a drop of light oil in each bearing. Hold bottom plate (81120) in place with a 2-56 x 3/16" screw (256031) through front and rear holes in bottom plate and proper hole in frame. Adjust bottom plate so edges are in line with frame and tighten screws. **DRIVERS MUST TURN FREELY BEFORE PROCEEDING.** If they do not, recheck to be sure axle slots are free of dirt and flash.

MOUNTING SIDE RODS

Face of side rod (871) is indented. File burrs from back of rods. Hold rods in place on drivers with square bosses upward. With tubular socket wrench (35) turn shouldered crankpin screw (1720) into tapped hole in front driver on both sides. Make sure shoulder of screw enters hole in rod and does not pinch rod against wheel.

Slip main crankpin spacer (874) over main crank pin (804) and turn pin into tapped hole in center drivers on both sides. Draw head of screw tight against spacer, making sure spacer has entered hole in side rod and does not pinch rod against wheel.

The drivers and side rods must turn freely before proceeding. Turn gently with finger tips and you should be able to feel any bind. Binds are caused by burrs in spacers or crank pin holes of side rods. Be sure crank pin does not draw down on side rod so that it will not turn. Side rods should dangle loosely on either crankpin.

Only if absolutely necessary, holes in side rods may be elongated slightly with a small round file to eliminate bind.

Assemble side rods to rear driver with crank pin (1720) and test again to be sure drivers and side rods run freely.

MOUNTING CYLINDER & LEAD TRUCK

Clean body spacer (6950) and cylinder block (6951). Cylinder must rest level on the underframe.

Fasten body spacer to cylinder using a 2-56 x 3/8" round head screw (256061). A drop of Goo or Ambroid cement will keep the parts from vibrating loose.

Remove flash from lead truck frame (855) particularly where axles are to be seated. Install wheel and axle assemblies (619) by screwing cover plate (856) in place with a #2 x 3/16" screw (2623). Lubricate with light oil. Wheels must spin freely.

Cylinder block is mounted with same screw which acts as pivot for lead truck. To make assembly, use a 2-56 x 5/8" screw (256102) and put these pieces on it in the following order:

- # 25 Washer
- # 855 Lead Truck Frame
- # 25 Washer
- # 854 Spacer
- #5203 Spring

Pass end of screw through proper hole in frame and turn into tapped hole in center of cylinder block casting. Draw screw tight against spacer, being sure not to pinch washers or spring.

On 18" radius curves the front lead truck wheel may touch the inside of cylinder (causing a short circuit). If so, file cylinder for clearance.

MOUNTING CROSSHEAD GUIDE SUPPORT, CROSSHEADS & MAIN RODS

Remove all burrs from crosshead guide support (8620). Clean crossheads (66021 & 66022), be sure a 00-90 screw will pass through the hole in the middle of piece. Loosen the cylinder mounting screw. Pass front tabs over ends of crosshead guide rods, then slip crossheads (66021 & 66022) in place on rods. Slide support forward until ends of guide rods project through rear tabs of support, guiding piston rods into holes in cylinder block. Make sure crossheads slide freely on rods and are not pinched between rods and support. File crosshead if necessary. Tighten cylinder mounting screw. Crosshead guide support should be held to frame with 2-56 x 3/16" screw (256031). Crosshead must slide freely before proceeding.

Face of main rod (872) is indented. File back of rod to remove rough edges. Mount front of main rod, using 00-90 x 1/4" screws (904) through crosshead and mount main rods to main crank pins (804) as shown in diagram, with indented face outward. The spacer 874 and main rod must be a loose fit. This screw should already be holding side rods in place. Crosshead and main rod are a loose fit. Parts now assembled must roll freely before proceeding.

MOUNTING PILOT

Clean pilot (810) and coupler (817). File the pilot to rest level on underframe. Pilot is attached to front of locomotive frame with a 2-56 x 3/16" screw (256031). Attach coupler to pilot using 00 x 5/32 self-tapping screw (2603).

ASSEMBLYING VALVE MOTION

Riveting must be done very carefully. Your Bowser kit contains a Rivet tool (36) which will make this job much easier. Put rivet through proper holes in rods and lay assembly down with rivet head on a solid object. Set rivet tool with center point in hole in end of rivet and tap with hammer until rivet is properly flared. Gently, gently, gently, feel your way. Be careful not to make joints too tight.

See Fig. 2. Assemble valve hariger (8883) to reverse lift (8890) using valve gear rivets (67010). Ends of radius rod (8840) have been formed as in Fig. 3a. Make RIGHT HAND and LEFT HAND sub-assemblies of the eccentric crank (8870), eccentric rod (8860) and radius link (8850). Rivet these sub-assemblies to their respective sides of valve hanger, keeping radius link inside ends of hanger. These parts must dangle loosely on rivets.

Make RIGHT HAND and LEFT HAND sub-assemblies of radius rods (8840), lift link (8830), combination lever (8820), valve rod (8810) and crosshead link (8830). Keep large end of lift link up, riveting small end to radius rod. Again all parts should dangle freely before proceeding with assembly. If they do not hang loosely, rivets are too tight.

Now hang pre-formed ends of radius rods (8840) in slots in radius links (8850) and bend inside tabs partially closed as in Fig. 3b. Rivet lift links (8830) to lift lever (8890) with the head of the rivet on the inside of the lift hanger. This is the only rivet with the head on the inside.

MOUNTING VALVE MOTION

Do one side at a time. Slip ends of valve rods (8810) into top holes in rear face of cylinder block. Hold valve gear assembly in place with valve hanger over hole just in front of gear slot and secure with screw (256031). Make sure hanger is square across frame and draw tight.

Remove crosshead screw and reassemble with crosshead link in place. The main rod, crosshead, and valve link must be a loose fit to allow free movement. Use a small drop of glue in threads to keep screw from backing out. Cut off excess screw.

Remove 804 screw from driver, pass through eccentric (8870), spacer (874), main rod (872) and screw into driver. Locate eccentric so that it is approximately 15 degrees forward of vertical centerline of main drivers when crankpin is at bottom. See figure 4.

Test to be sure mechanism is free of binds before proceeding with this assembly on opposite side. Repeat assembly of other side thus completing the mechanism. Check for smooth operation.

MOUNTING MOTOR

Motor (1004) is supplied with worm and wire soldered in place. Set motor in place on frame, making sure worm and gear mesh properly. Turn a 256031 screw into front motor mount and a 440031 screw into rear motor mount. Draw screws tight carefully, alternating between front and rear. Turn armature by hand from time to time to make sure gears do not mesh too tightly. See Figure 5 for worm and gear mesh information. Use washers (29) to shim the motor to get the proper gear mesh. Lubricate gears with light grease.

Mechanism can now be tested by applying direct current, no more than 12 volts. Check all moving parts to be sure no binding occurs.

MOUNTING TRAILING TRUCKS

Clean trailing truck frame (6957). Install wheels (838) in trailing truck frame using retainer plate (856) and a 2-56 x 3/16" round head screw (256031). Place spring (1134) in motor mounting screw hole. Mount truck using shouldered screw (325).

MOUNTING MECHANISM TO BODY

Remove Bachmann mechanism from the body. You will use only the body. Turn body upside down and elongate the slot for the reverse lift (8890) as in Fig. 6.

Clean loco weights. Slide weights (6958 & 6959) into front of body. Glue in place. Glue rear weight (6960) to the inside of the cab bulk head. This will be just behind the motor.

Slide the mechanism into the body. Ream rear mounting hole in the plastic body with a #50 drill. Attach rear of frame to the body by passing a 2-56 x 7/16" round head screw (256071) through washer (27), spacer (70033), Bachmann drawbar, washer (27) and turn into the body. Motor wire will be attached to tender.

TENDER

Remove tender floor from body. Remove the plastic Bachmann trucks. Remove the weights from the tender floor.

Drill 3/16" hole in tender floor as in Fig. 7. Drill truck mounting holes with a #50 drill.

See Fig. 8. Screw two wires (6992) and pick bar (6953) to weight (6954) using a #2 x 1/4" self tapping screw. Glue weight to floor.

Pass wire through holes in floor and fasten to tender trucks (318) using 0-80 x 1/8" round head screw (806). Pass shoulder screw (65007) through tender truck, washer (27) and turn into tender floor. Truck must pivot freely. Insulated wheels must be on tender's right side.

Cut notch in front of tender as in Fig. 9. This allows the pickup bar to protrude from tender body for easy motor wire connection.

Fasten tender body to floor using Bachmann screws.

OPERATING INSTRUCTIONS

Couple tender to loco, you will want to make a test run. This model is built to run on Direct Current, not to exceed 12 volts. Lubricate all wheels and motor bearings with light oil and make sure gears and axles are well lubricated at all times.

If loco does not operate satisfactorily, check assembly and electrical connections. See that motor is mounted securely and clear of rear drivers, with gears properly meshed. Make sure all insulated locomotive wheels are on loco's LEFT and all insulated tender wheels are on tender's RIGHT.

On extremely short turns, the front lead truck wheel may touch cylinder block. If this occurs on your layout, file cylinder at point of contact until wheel clears.

PAINTING PARTS

The Pennsylvania Railroad used Brunswick Green.

We suggest that you do not paint your loco until it is thoroughly track tested as disassembly and handling generally ruins a paint job. Take your locomotive apart so that the various parts may be painted without getting paint on moving parts. Valve gear, side rods, bearings, lead truck, etc. will not operate properly if paint gets into the joints of moving parts.

Parts to be painted should be degreased with a solvent like paint thinner and pickled in vinegar for several hours (this etches the metal) before applying paint. You may use a fine sand blast to etch the metal.

CAUTION: Do not immerse wheels in acid solution or cleaners. Drivers are preblackened and can be touched up, after removing flash, without using cleaner or acid.

Apply a smooth, uniform coat of good grade model railroad paint. Work carefully to avoid piling up paint around small details. Painting exposed surfaces of main frame will add to final appearance of model, but be careful not to get paint in any bearings.

PARTS AND SERVICE

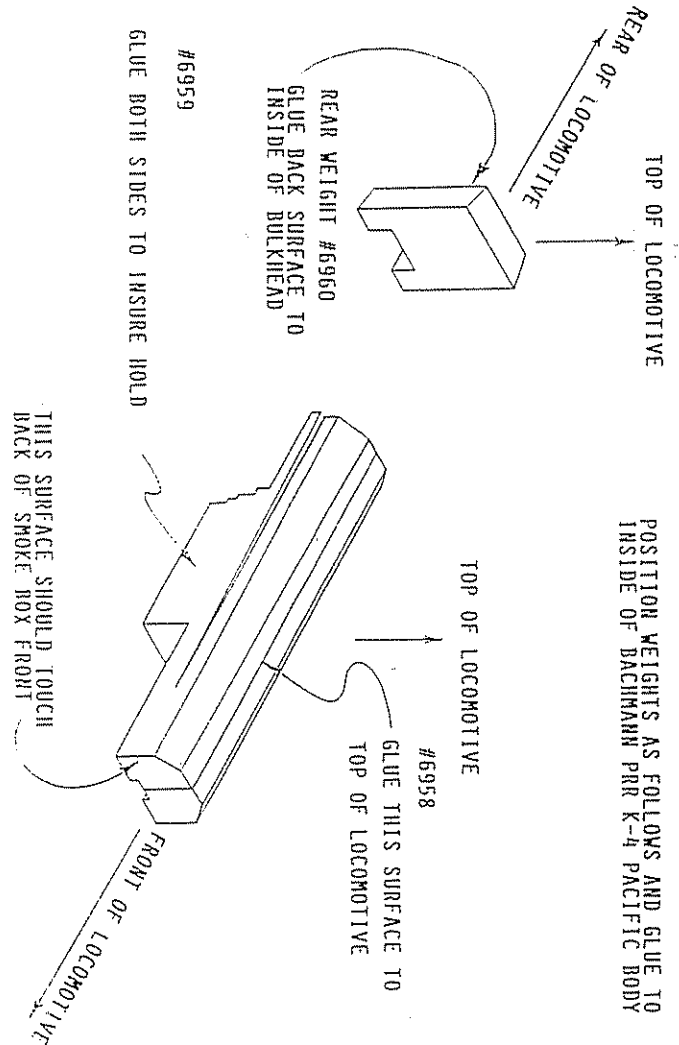
Contact your local dealer for Bowser parts. If he does not carry them, or if your dealer is too far away to readily contact him, you may order directly from the factory.

English's Model Railroad Supply

A Division of Bowser Mfg. Co. Inc.

21 Howard Street
P.O. Box 322
Montoursville, PA 17754
717-368-2516

PA Residents include 6% Sales Tax
Include the Current Shipping and Handling Charges
Visa, Master Card and Discover Card Accepted



English's Model Railroad Supply

A Division of Bowser Mfg. Co. Inc.

21 Howard Street
P.O. Box 322
Montoursville, PA 17754
717-368-2516

PA Residents include 6% Sales Tax
Include the Current Shipping and Handling Charges
Visa, Master Card and Discover Card Accepted

| <u>PART #</u> | <u>DESCRIPTION</u> | <u>PCS.REQD.</u> <u>IN KIT</u> |
|---------------|--|-----------------------------------|
| 40032 | MISCELLANEOUS PARTS KIT | |
| 27 | PK. 20 BRASS WASHER .087X.250X.010 | 2 |
| 29 | PK. 20 FIBER WASHER .280X.126X.010 | 2 |
| 810 | CAST PILOT | 1 |
| 817 | COUPLER ARM | 1 |
| 2603 | PK. 12 SELF TAPPING SCREW 00X5/32" | 2 |
| 6950 | CYLINDER WEIGHT | 1 |
| 70033 | LEAD TRUCK SPACER | 1 |
| 256031 | PK. 20 ROUND HEAD SCREW 2-56X3/16" | 1 |
| 256061 | PK. 20 ROUND HEAD SCREW 2-56X3/8" | 1 |
| 256071 | PK. 12 ROUND HEAD SCREW 2-56X7/16" | 1 |
| 440031 | PK. 12 ROUND HEAD SCREW 4-40X3/16" | 1 |
| 40033 | TRAILING TRUCK KIT | |
| 325 | SHOULDER SCREW | 1 |
| 838 | 50" SPOKE WHEEL WITH AXLE | 1 |
| 856 | LEAD TRUCK RETAINER | 1 |
| 1134 | SPRING | 1 |
| 6957 | TRAILING TRUCK FRAME | 1 |
| 256031 | PK. 20 FLAT HEAD SCREW 2-56X3/16" | 1 |
| 40034 | TENDER KIT | |
| 27 | PK. 20 BRASS WASHER .087X.250X.010 | 3 |
| 806 | PK. 12 ROUND HEAD SCREW 0-80X1/8" | 2 |
| 2623 | PK. 12 SELF TAPPING PAN HEAD SCREW, 2 X 3/16" | 1 |
| 2624 | PK. 12 SELF TAPPING PAN HEAD SCREW 2 X 1/4" | 1 |
| 6953 | PICK UP BAR | 1 |
| 6954 | TENDER WEIGHT | 1 |
| 6992 | WIRE W/ 2 TERMINALS | 2 |
| 65007 | SHOULDERED SCREW | 2 |
| 256031 | PK. 20 ROUND HEAD SCREW 2-56X3/16" | 1 |
| 100501 | SIDE ROD KIT | |
| 804 | PK. 12 HEX HEAD SCREW 0-80X1/4" | 2 |
| 871 | SIDE ROD | 2 |
| 872 | MAIN ROD | 2 |
| 874 | SPACER | 3 |
| 904 | PK. 15 SCREW 00-90X1/4" | 2 |
| 1720 | SHORT CRANK PIN | 5 |
| 8620 | CROSSHEAD GUIDE SUPPORT | 1 |
| 8630 | CROSSHEAD GUIDE ROD | 2 |
| 66021 | LEFT CROSSHEAD | 1 |
| 66022 | RIGHT CROSSHEAD | 1 |

| | | |
|---------------|-------------------------------------|----|
| 100504 | LEAD TRUCK KIT | |
| 25 | PK. 20 STEEL WASHER | 2 |
| 619 | 33" INSULATED WHEEL W/ 3/32" AXLE | 2 |
| 854 | SPACER | 1 |
| 855 | 4 WHEEL LEAD TRUCK FRAME | 1 |
| 856 | LEAD TRUCK RETAINER | 2 |
| 2623 | PK. 12 PHILISTER HEAD SCREW 2X3/16" | 2 |
| 5203 | LEAD TRUCK SPRING | 1 |
| 256102 | PK. 12 FLAT HEAD 2-56 X 5/8" | 1 |
| 100505 | VALVE GEAR KIT | |
| 8810 | VALVE ROD | 2 |
| 8820 | COMBINATION LEVER | 2 |
| 8830 | CROSSHEAD LINK | 4 |
| 8840 | RADIUS ROD | 2 |
| 8850 | RADIUS LINK | 2 |
| 8860 | ECCENTRIC ROD | 2 |
| 8870 | ECCENTRIC CRANK | 2 |
| 8880 | VALVE HANGER | 2 |
| 8883 | VALVE HANGER | 1 |
| 8890 | REVERSE LINK | 1 |
| 67010 | PK. 20 VALVE GEAR RIVETS | 24 |

PARTS NOT PACKED IN POLY BAGS

| | | |
|-------|--|---|
| 35 | HEX HEAD SCREW 0-80 | 1 |
| 36 | RIVET TOOL | 1 |
| 318 | TENDER TRUCKS | 1 |
| 1004 | MOTOR W/ 1010 WORM & WIRE | 1 |
| 6951 | CYLINDER BLOCK | 1 |
| 6956 | MAIN UNDERFRAME | 1 |
| 6958 | BOILER WEIGHT LEFT | 1 |
| 6959 | BOILER WEIGHT RIGHT | 1 |
| 6960 | CAB WALL WEIGHT | 1 |
| 16000 | 80" LIGHT SPOKE DRIVERS | 2 |
| 16030 | 80" HEAVY SPOKE DRIVER W/ GEAR 1011 & BEARING | 1 |
| 81120 | BRASS BOTTOM PLATE | 1 |

ENGLISH'S MODEL RAILROAD SUPPLY

21 Howard Street, P.O. Box 322, Montoursville PA. 17754

DRAWINGS FOR ENGLISH'S MECHANISM KIT #3-200 FOR BACHMANN PRR K-4 PACIFIC

FIGURE 1

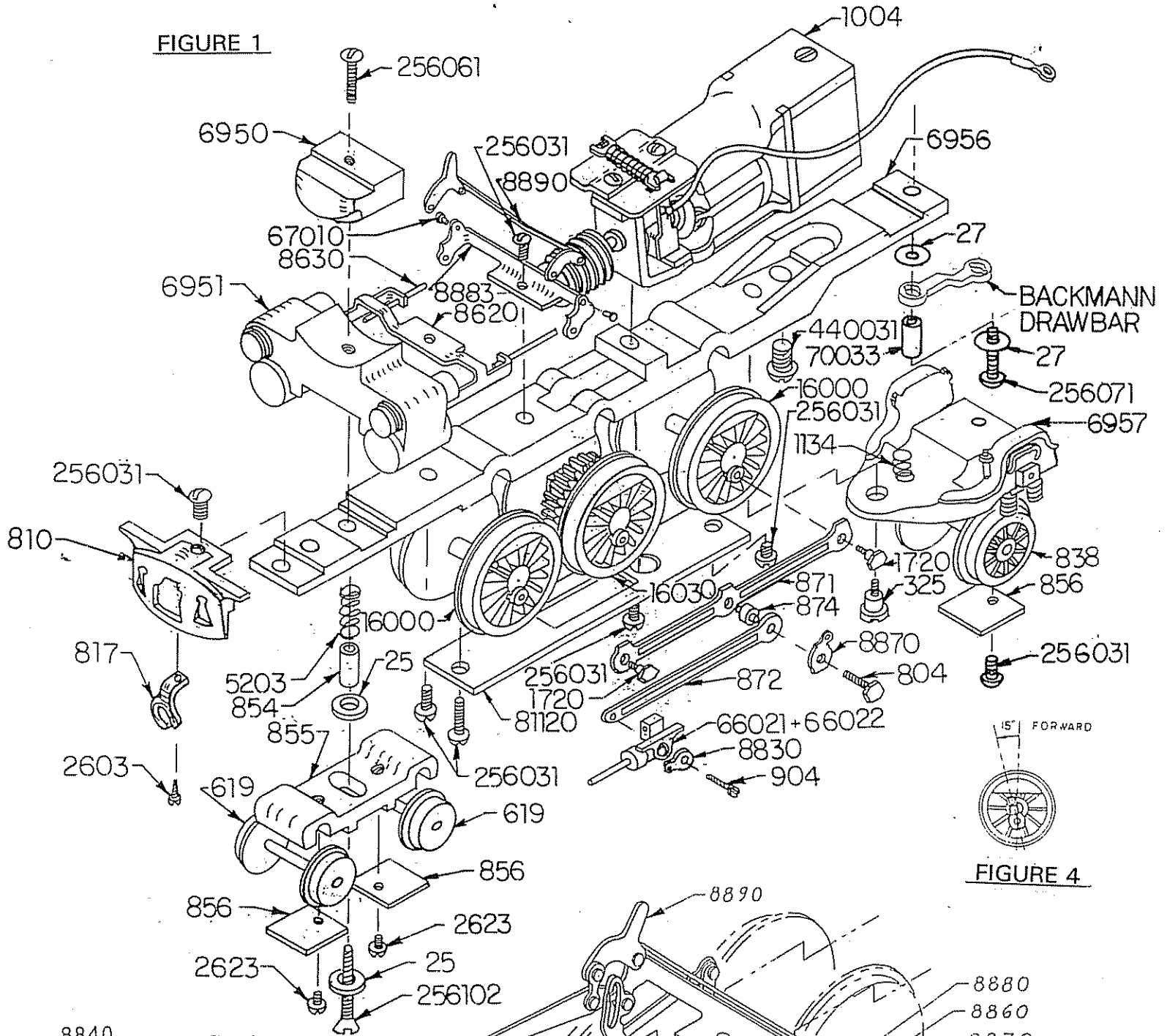


FIGURE 4

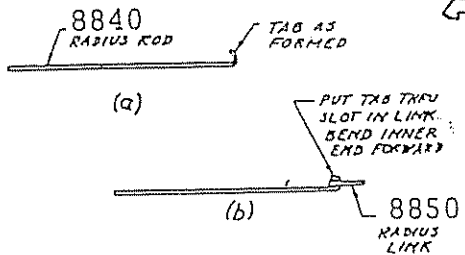
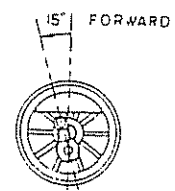


FIGURE 3

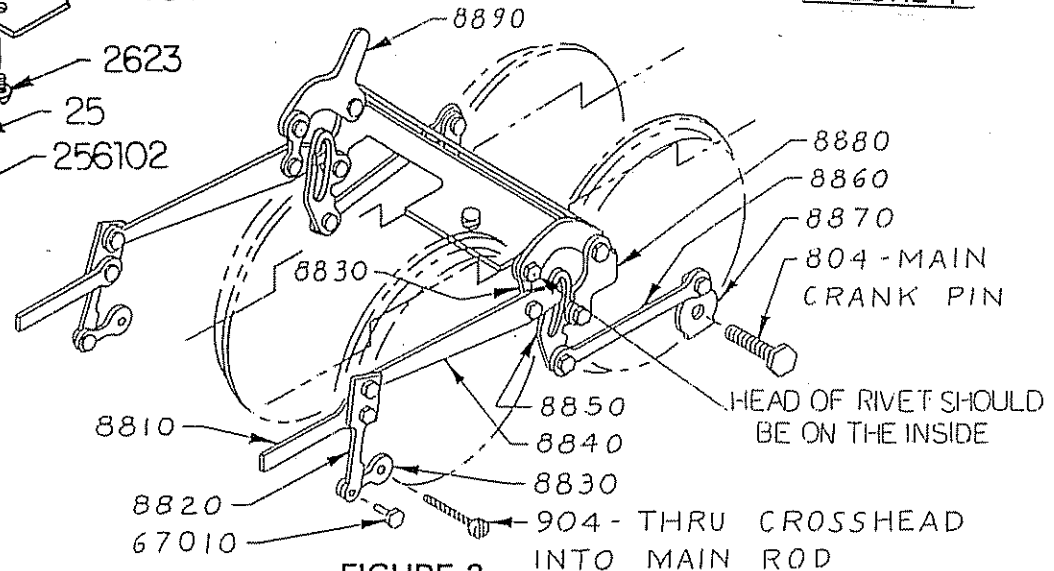


FIGURE 2

904 - THRU CROSSHEAD INTO MAIN ROD

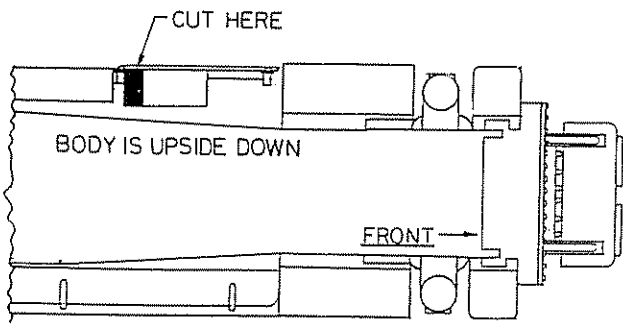


FIGURE 6

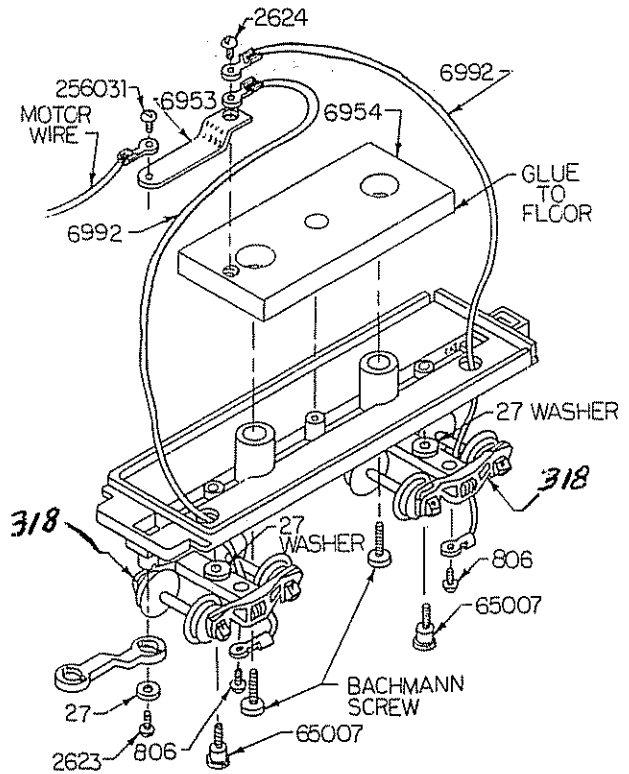


FIGURE 8

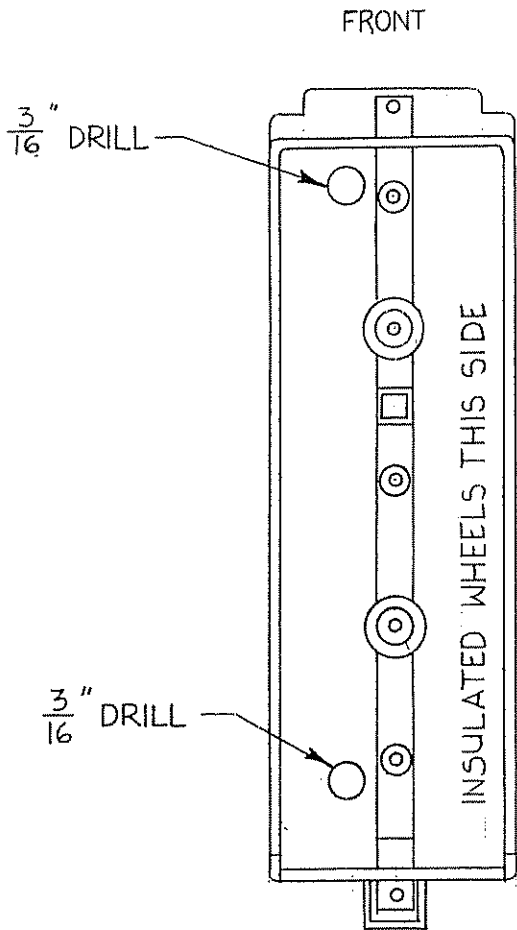


FIGURE 7

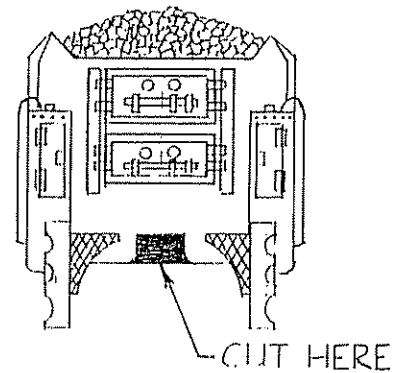


FIGURE 9

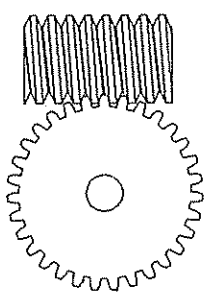


FIGURE 5a

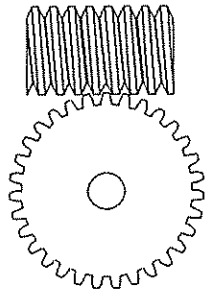


FIGURE 5b

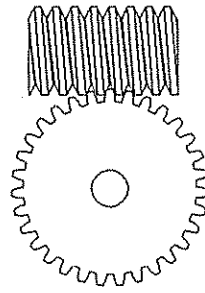


FIGURE 5c



FIGURE 5d

In figure 5a, gear and worm mesh is too Tight, gear teeth bottom in thread of worm.
 In figure 5b, gear and worm mesh is too Loose, teeth are not engaged.
 In figure 5c, gear and worm mesh is Correct, teeth of gear mesh with 1/2 to 2/3 of thread of worm.
 In figure 5d, gear and worm mesh is shown enlarged, from figure 5c