

These instructions provide photographs of completed model, exploded view drawings, diagrams and step-by-step instructions. If for reasons beyond our control, any shortage or faulty part is found, write directly to the manufacturer, including name of your dealer and date of purchase. Return any defective parts for exchange. The builder should study the instructions and drawings to attain a working knowledge of proper procedure. Assembly work should be in sequence outlined in this manual to assure proper construction. We have included some extra parts in case you misplace or drop them on the floor. DO NOT RUN THE MECHANISM OR ENGINE UPSIDE DOWN.

## 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 screwdriver (a set is convenient), a 6" flat file with a fairly fine cut, knife, pliers, flush cut nippers like Mascot #413 and tweezers.

BEFORE PAINTING YOUR MODEL OR DETAILING THE BOILER, WE RECOMMEND THAT YOU BUILD THE COMPLETE MECHANISM ATTACH THE UNDECORATED BODY AND THOROUGHLY TRACK TEST IT.

## STEP #1

Clean flash from frames. Assemble drivers to frames.

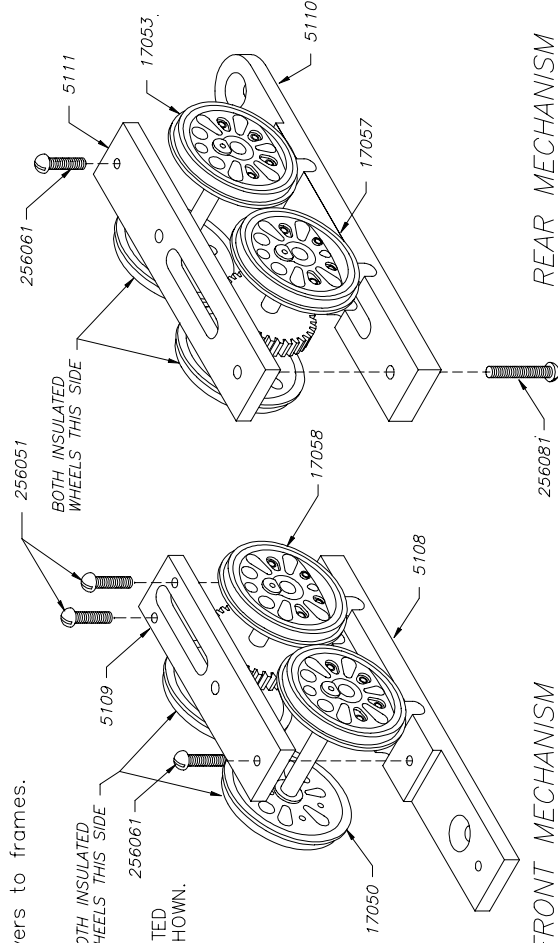
CLEAN ALL FLASH FROM EDGES OF BEARING SLOTS OF UNDERFRAME AND COVER PLATE FILE MATING SURFACES ON A FLAT FILE. CHECK TO SEE THAT FRAME IS STRAIGHT.

ASSEMBLE DRIVERS TO FRAME. ASSURE INSULATED WHEEL IS POSITIONED TO SIDE OF FRAME AS SHOWN. OIL LIGHTLY. WHEELS MUST SPIN FREELY.

Subkit 101003  
FULL SIZE



256081 256061 256051






FRONT MECHANISM

REAR MECHANISM

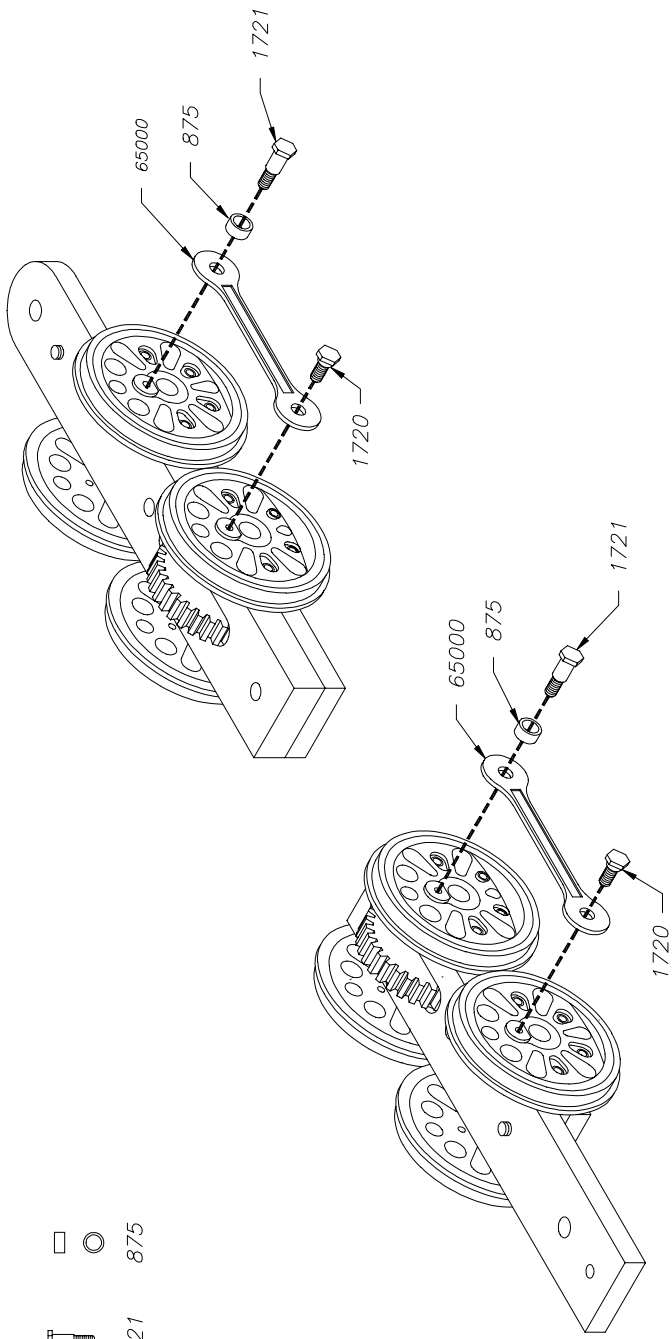
# STEP #2

Assemble side rods to drivers.  
You may have to file back of side rods and enlarge holes to eliminate any binding.  
Oil lightly.

Subkit 101001  
FULL SIZE

- 1720  1721
-   875

Drivers must spin freely before proceeding.



FRONT MECHANISM

REAR MECHANISM

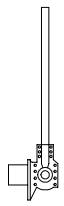
# STEP #3

Install cylinders, guides, hangers and crossheads.  
Install main rods.  
Oil lightly.

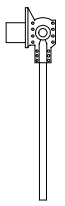
Subkit 101001, 101004

FULL SIZE

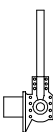
Mechanism must roll freely before proceeding.  
CYLINDER 5115 HAS (6) HOLES  
DRILLED IN THE BOTTOM FOR DRAIN VALVES



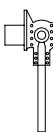
66002



66001



66022



66021



256



256102



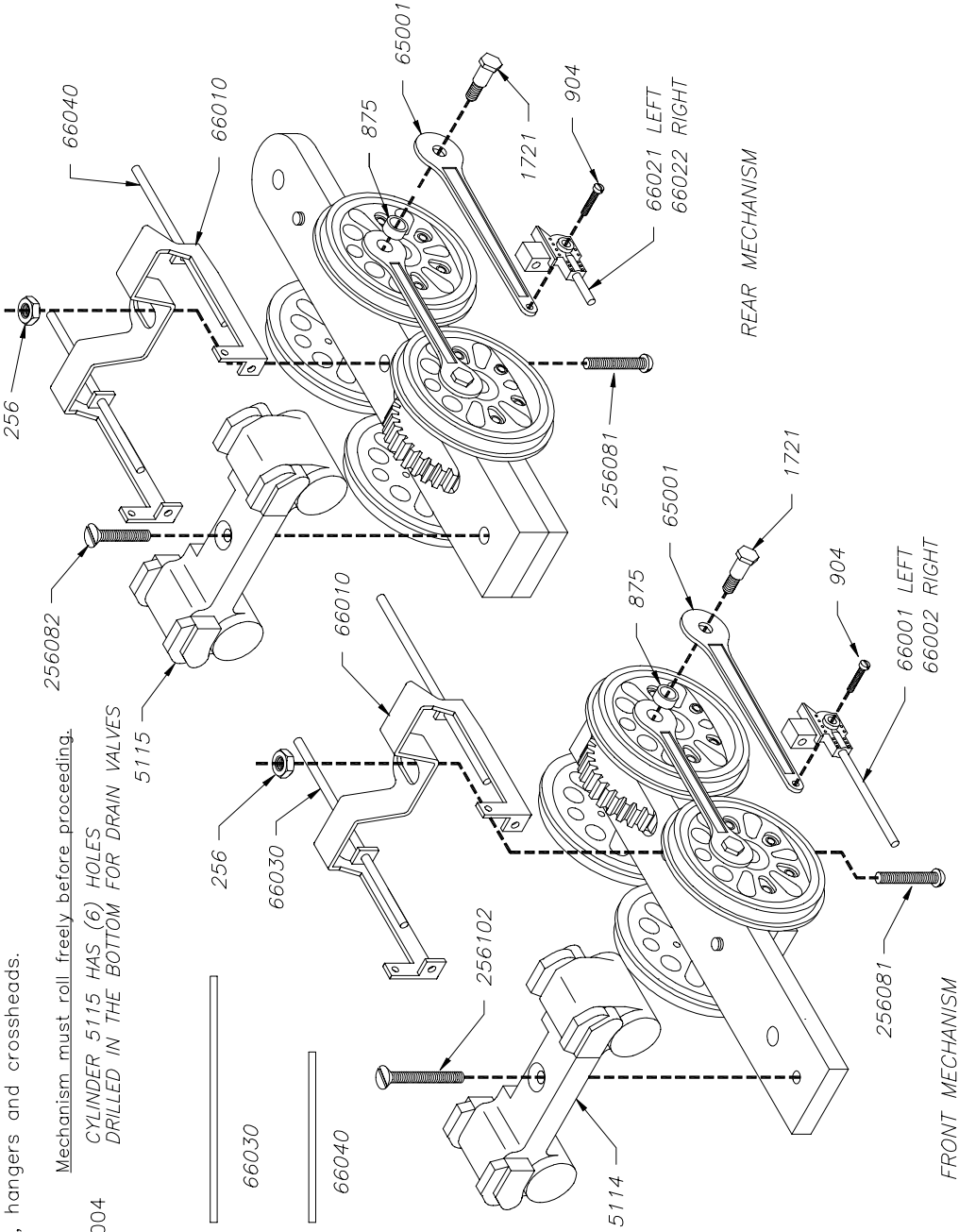
256082



904



256081



REAR MECHANISM

FRONT MECHANISM

# STEP #4

Rivet valve gear together assuring it is free to move.  
Install valve gear to hanger and main rod.  
Oil lightly. Mechanism must roll freely.

Subkit 101005  
FULL SIZE



904

T

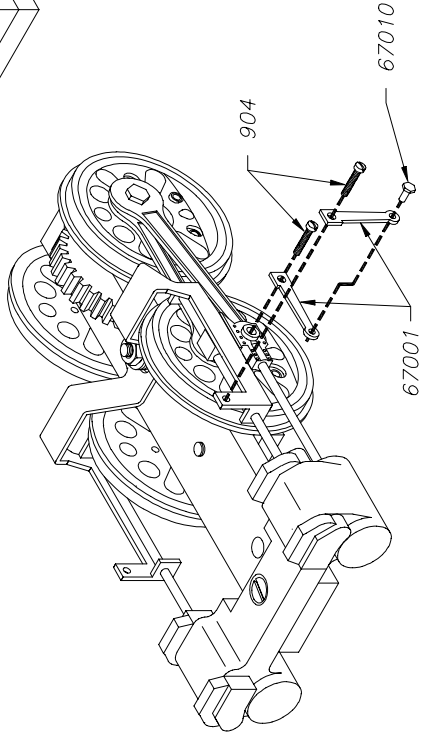
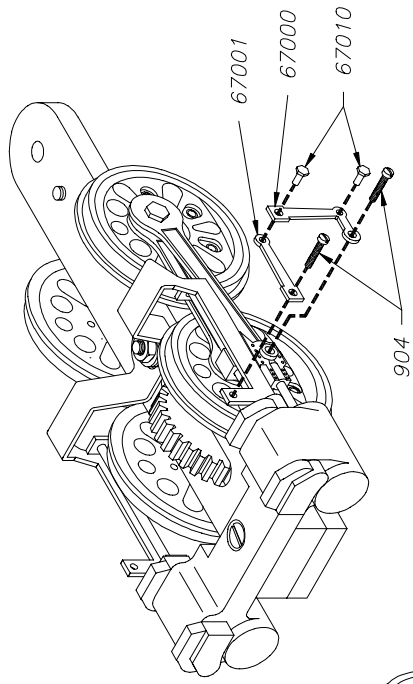
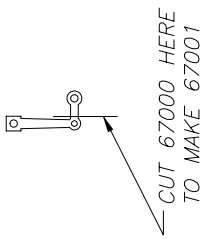
67010



67001



67010



PUT GLUE ON THREADS OF 904  
AFTER ASSEMBLY. CUT OFF SCREW  
CLOSE TO MAIN ROD.

FRONT MECHANISM

REAR MECHANISM

# STEP #5

Install motors. Adjust gear mesh by using #27 washers. Refer to drawing at bottom of page. Oil lightly and test.

Subkit 101003

FULL SIZE



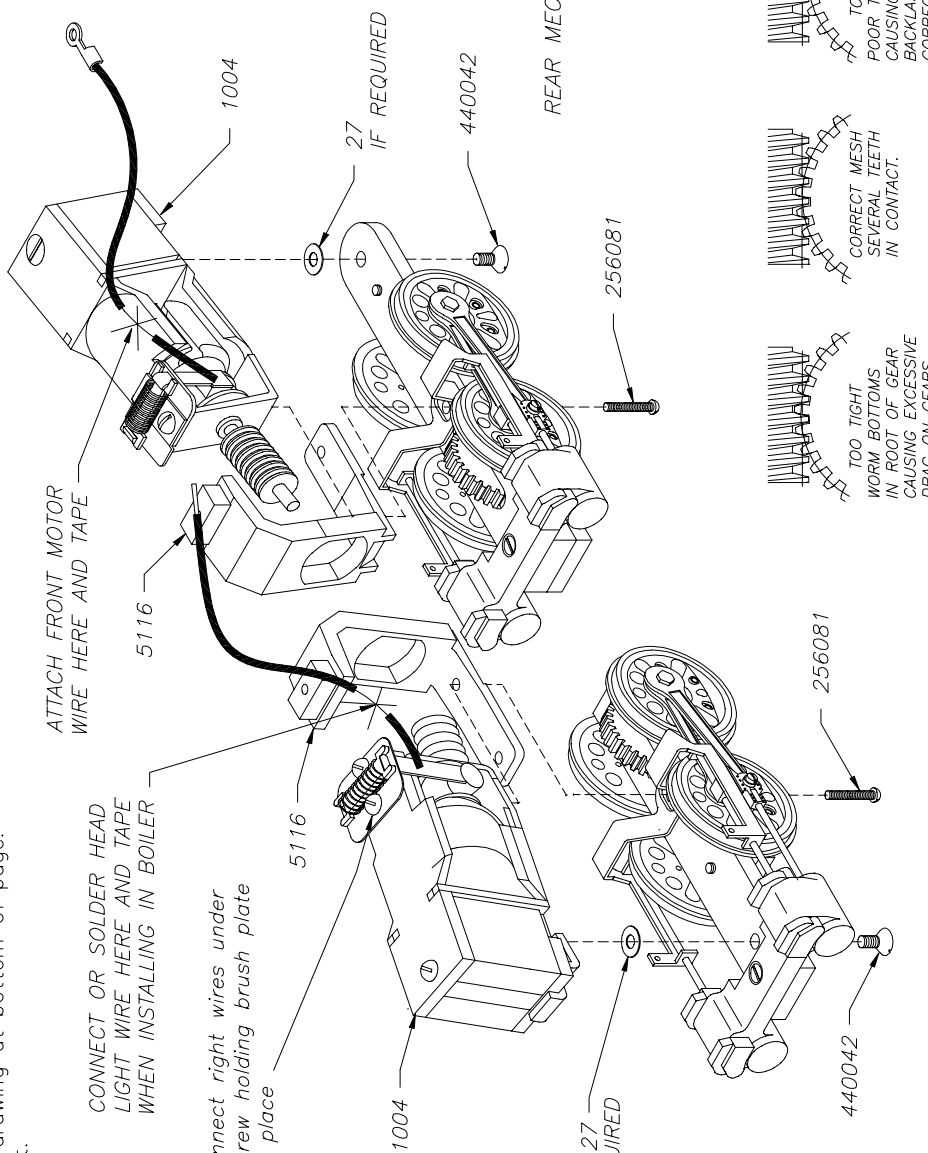
440042



256081



27



FRONT MECHANISM

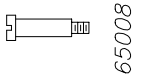
REAR MECHANISM

# STEP #6

Attach drawbar to underside of boiler.  
Place both mechanisms on a piece of level track with all drivers on the rails and obtain a distance as shown between both boiler mounting brackets. Install drive coupling between armature shafts being sure to maintain dimension shown. Install boiler. Assure mechanisms pivot freely.  
Track test.

#1015 Flex coupling (black neoprene) must be trimmed to length so it does not spring motors apart

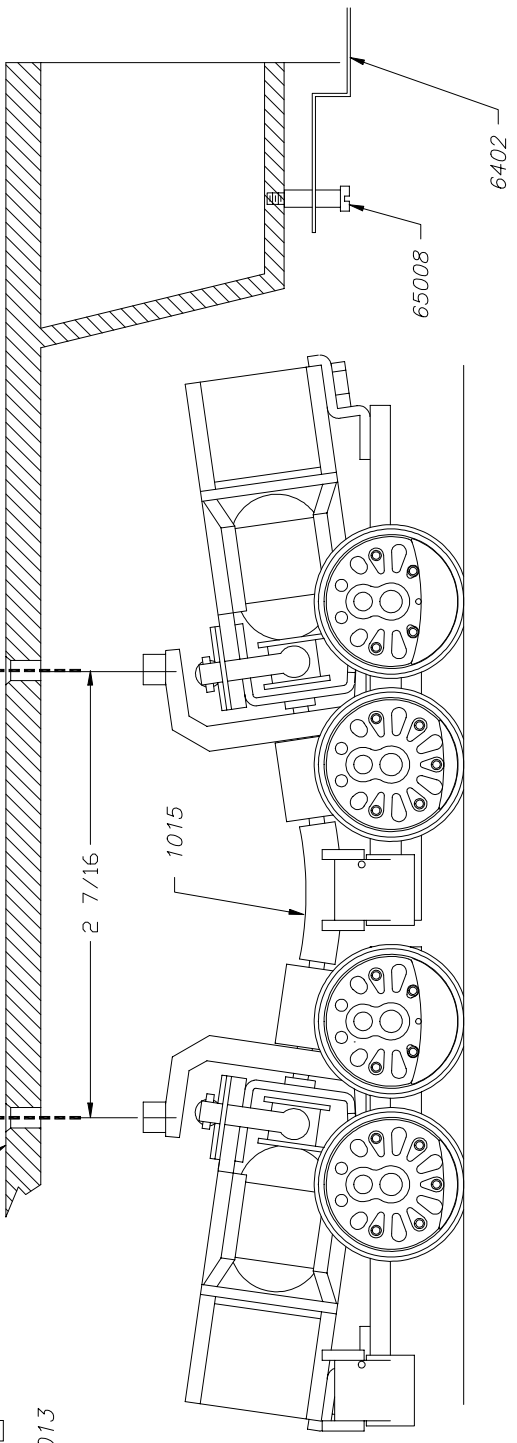
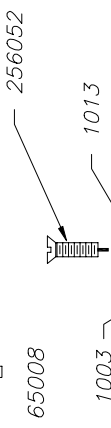
Subbit 101003  
FULL SIZE



256052



1013



# STEP #7

Assemble and install lead truck.  
 Assemble and install trailing truck.  
 Oil lightly and test.

MECHANISMS SHOWN WITHOUT  
 BOILER FOR CLARITY

Subkits 101004, 101007

FULL SIZE



854



256081



70033



1134



256



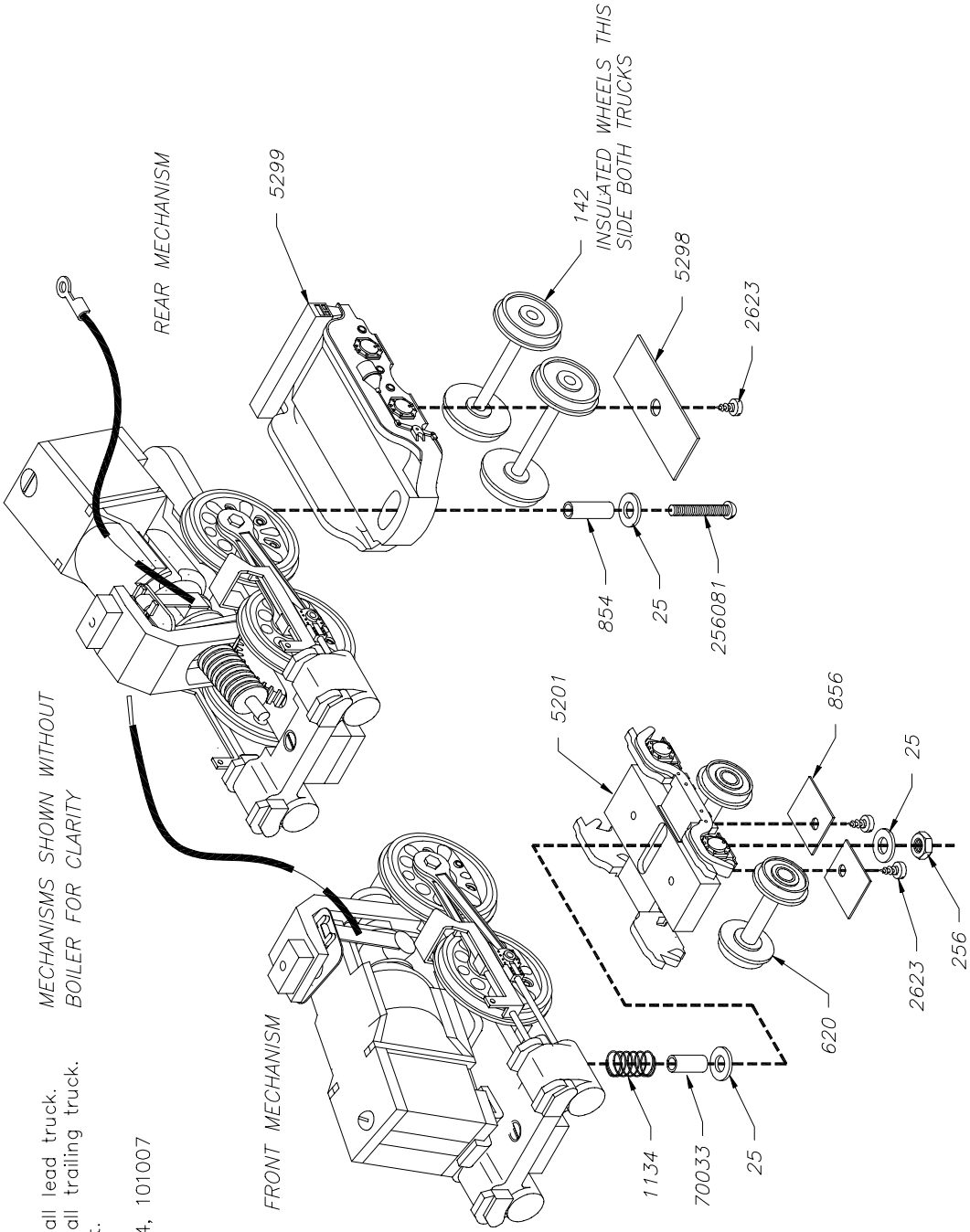
2623



25

FRONT MECHANISM

REAR MECHANISM



# STEP #8

Assemble tender.

Subkit 101003, 40008

FULL SIZE



65007



25

BRASS



256031



189

FIBER



1134



256041



35103

WIRE TO MOTOR

256031

189

6402

189

35103

1134

25

65007

7006

7012

7001

256031

256031

70362

256041

1134

25

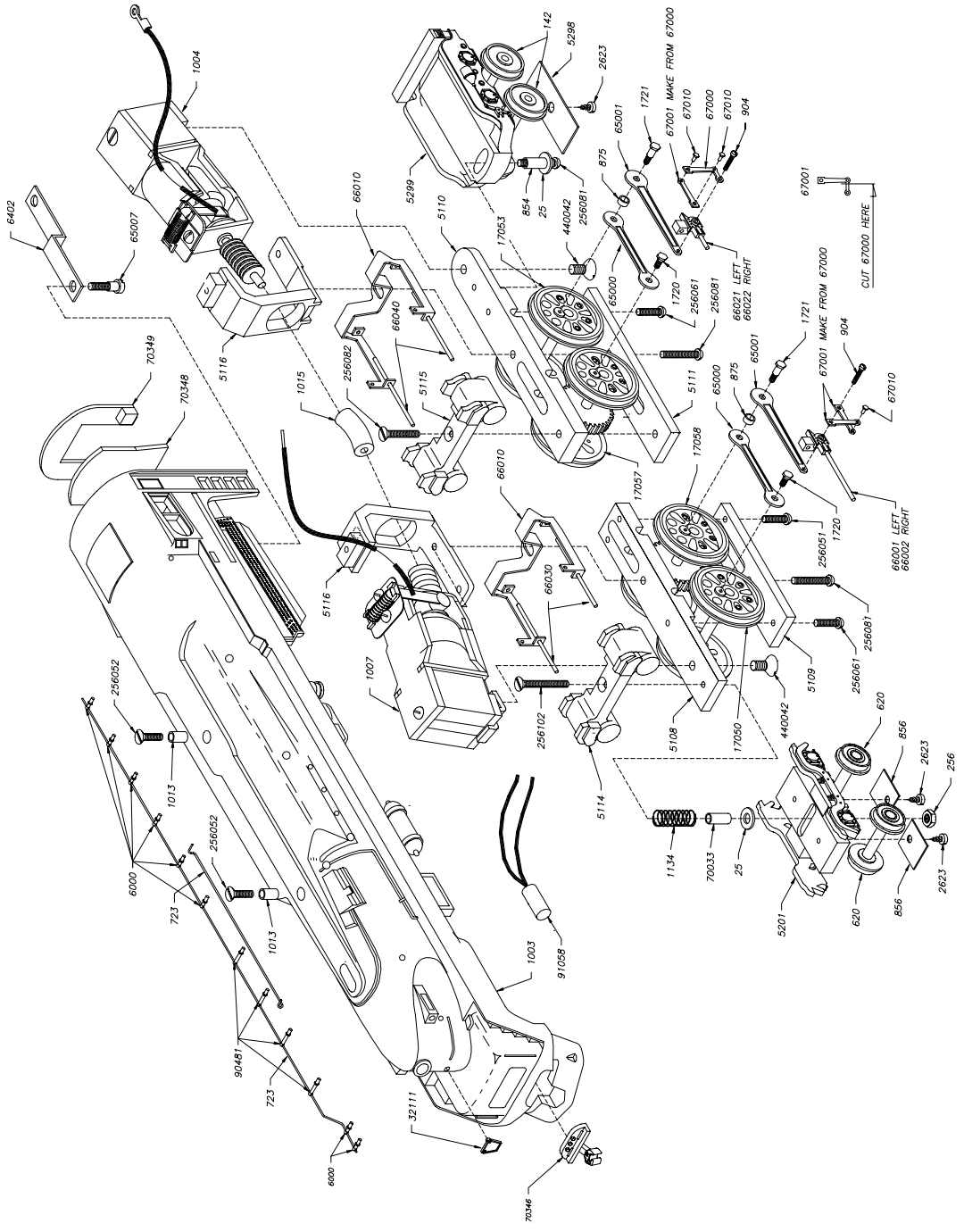
65007







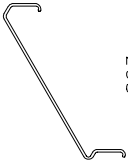

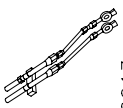
ALL INSULATED WHEELS ON THIS SIDE OF BOTH TRUCKS

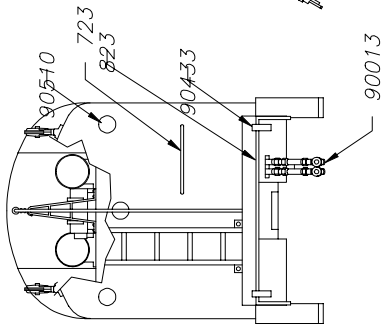
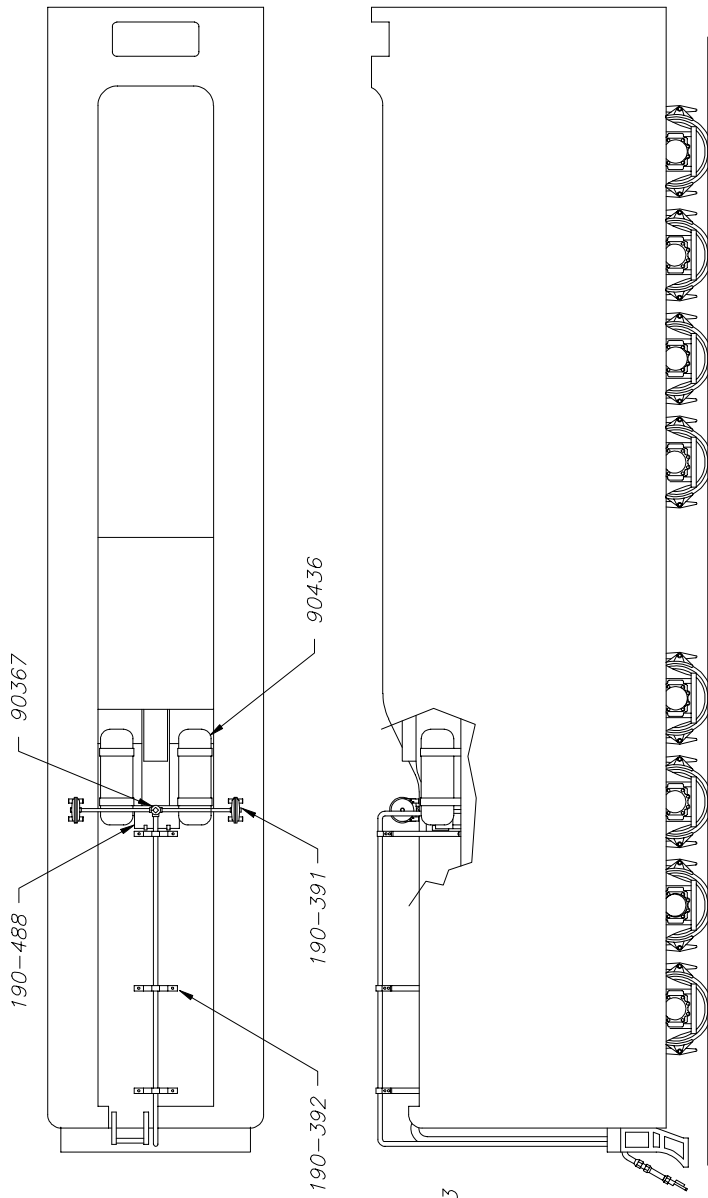
70360 RIGHT  
70361 LEFT

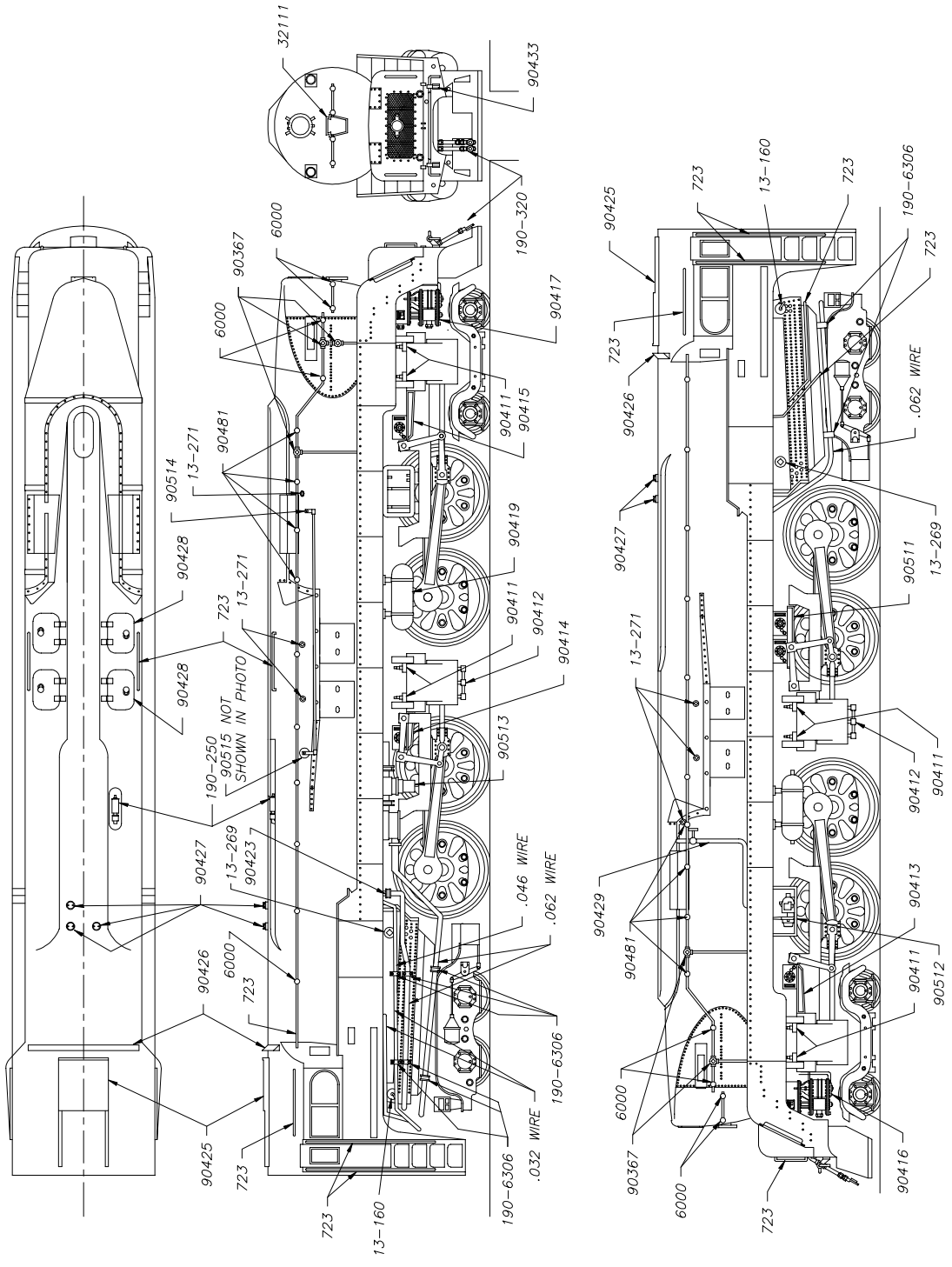
221

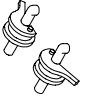



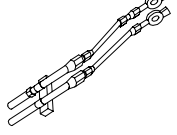






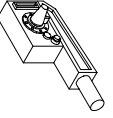
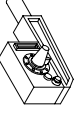
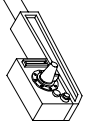
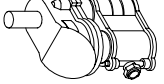
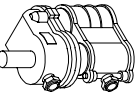

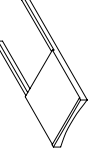
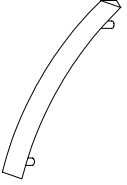


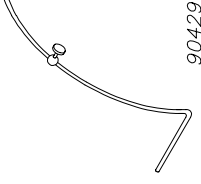




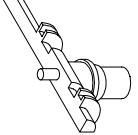






<p>190-391</p>  <p>2X SIZE</p> <p>2 PIECES</p>	<p>90367</p>  <p>1 PIECE</p>	<p>190-392</p>  <p>2X SIZE</p> <p>3 PIECES</p>	<p>90433</p>  <p>2 PIECES</p>	<p>190-488</p>  <p>1 PIECE</p>	<p>90436</p>  <p>2 PIECES</p>	<p>823</p>  <p>1 PIECE</p>	<p>90510</p>  <p>3 PIECES</p>	<p>90013</p>  <p>1 PAIR</p>
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 13-160 1 PAIR	 13-250 1 PIECE	 13-269 2 PIECES	 13-271 6 PIECES	 190-320 1 PIECE	 190-6306 8 PIECES
 32111 1 PIECE	 6000 20 PIECES	 90367 2 PIECES	 90411 8 PIECES	 90412 2 PIECES	 90413 1 PIECE
 90414 1 PIECE	 90415 1 PIECE	 90416 1 PIECE	 90417 1 PIECE	 90423 1 PIECE	 90425 1 PIECE
 90426 1 PIECE	 90427 3 PIECES	 90428 4 PIECES	 90429 1 PIECE	 90433 2 PIECES	 90481 8 PIECES
 90511 2 PIECES	 90512 1 PIECE	 90513 1 PIECE	 90514 1 PIECE	 90515 1 PIECE REMOVE UPPER ARM	PAGE 12

(2) PIECES .020 X 12" BRASS WIRE (1) PIECE .032 X 12" BRASS WIRE  
 (1) PIECE .046 X 6" BRASS WIRE (1) PIECE .062 X 6" BRASS WIRE

# Miscellaneous Building Tips

## TIP 1: Painting Metal

You may want to superdetail your loco before painting.

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, pony 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 acetic acid solution (vinegar) or oxalic acid solution (5%) for a few minutes before applying paint.

**DO NOT USE THIS VINEGAR FOR COOKING OR EATING.**

Rinse with clean water. Do not handle the surfaces to

be painted. CAUTION: Do not immerse wheels, underframe or cover plate in acid solution or cleaners. Brush cleaner and acid solutions on metal frames of lead and trailing trucks and on underframe surfaces to be painted (NOT ON WHEELS, AXLES OR BEARING SLOTS). Drivers are pre-blackened and can be touched up, after removing flash, without using cleaner or acid. I recommend a glossy paint be used (PRR locos were painted Brunswick Green). Apply a smooth, uniform coat of good grade model railroad paint. I like to spray paint my models. 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.

## TIP 2: Hex Head Wrench (Cheap and Easy)

Go to your hardware store and buy Socket Head Cap Screws or Set Screws in many different sizes. They have the hex shape machined in the head and will work for tightening hex head screws.

## TIP 3: Soldering Tips

Wear Eye Protection

First be sure everything is clean.

Put flux on both parts. Hold together and place solder iron at joint. The solder will flow to the hot area. Solder should not form a ball. This indicates the area was not hot enough. To tin your soldering iron so that solder will stick to it.

When cold clean the tip with a file. Put a little flux on tip. Turn on iron and apply solder to the tip as soon as it gets hot.

If this does not work. Clean the tip while hot and dip tip in a drop of flux (while hot) and immediately put solder on tip.

## TIP 4: Cleaning A File When the Grooves Fill

When filing parts, the grooves in a file will fill with the metal you are filing.

This metal can be removed quickly by using a small piece of thin steel (1/16 to 1/8" thick) and sliding the steel on the file in the direction of the grooves. The chips that remain can be removed by sliding a sharp knife in each groove. This may take awhile to clean each groove. I do this only as a last resort. To keep most of the chips from sticking while you file, apply a thin oil to the file before filing.

## TIP 5: Drilling Small Holes

To drill metal with small drills it is best to use powered tools. Dremel tool or a small drill press. Hand drilling with a pin vise will work but is much slower. You must drill straight. Drills do not bend they break. Use a lubricant on the drill. Cutting oil is best, but you can use a bar of Ivory Soap. Put the lube on the drill before starting. I recommend peck drilling.

(Drill about 1 or 2 times the diameter of the drill and remove the drill from the hole. Clean off the chips. Lube the drill and repeat.)

Take your time. It is very important to clean the chips from the flutes of the drill. When the flutes fill with chips the drill will break.

The smaller the drill the more you need to peck drill.

## TIP 6: Tapping a Drilled Hole

First be sure your hole is the proper size.

00-90 Taps #60

0-80 Taps #55

2-56 Tap #49

4-40 Tap #43

These drill sizes are one size larger than the charts.

We feel they work very well for steel, brass and zinc.

You must tap straight. Taps do not bend they break.

Use a lubricant on the tap. Cutting oil is best but you can use a bar of Ivory Soap.

Put the lube on the tap before starting.

Turn in tap to get it started (1 or 2 turns). Back off 1/2 turn. This breaks the chips that form when tapping.

Repeat above. As the hole gets deeper you will have to back off the tap more often. If you are tapping a very deep hole you will have to back off the tap after as little as 1/2 turn