

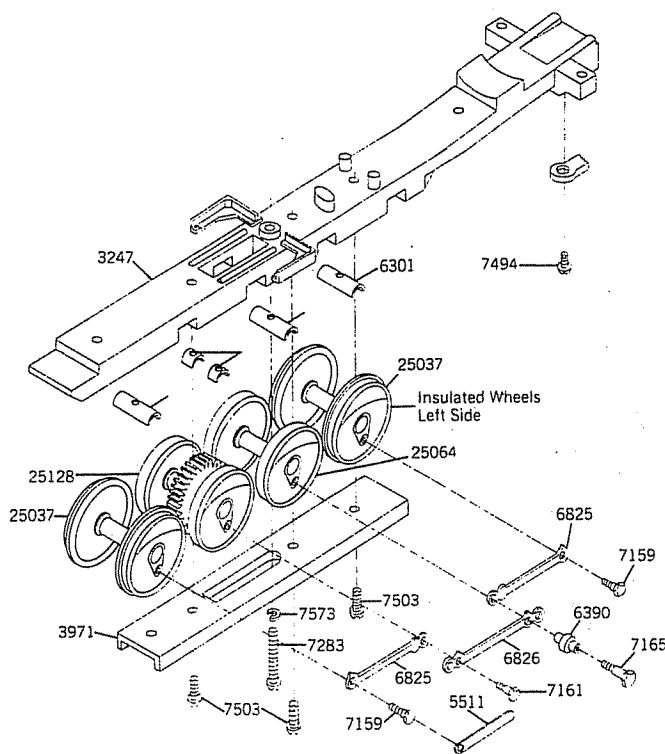
# MANTUA



## 2-8-2 MIKADO with POWER DRIVE

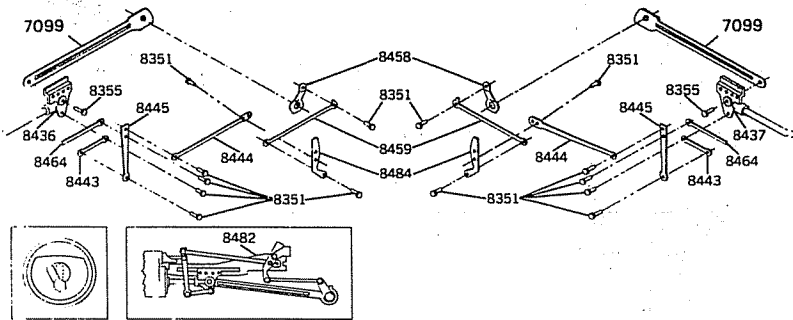
### MECHANISM ASSEMBLY

1. Check all parts with the Replacement Parts List. Study drawings to identify the parts. Read instructions through before starting and **BE SURE** you understand **HOW** each part is to be mounted and avoid disappointing and expensive errors. Smooth edges of all castings with a knife or fine file to remove all flash and burrs.
2. Assemble three No. 6301 Long Axle Bearings and two No. 6302 Short Axle Bearings in No. 3247 Frame making certain they are located on pins and properly seated in bearing slots of frame.
3. Place one pair No. 25037 Driving Wheels in the first and fourth slots in No. 3247 Frame, one pair No. 25128 (with blind rims and worm gear) in the second slot and one pair No. 25064 (with blind rims) in the third slot. **ALL INSULATED WHEELS** must be on the left side (See drawing). Apply a few drops of oil to each axle.
4. Place No. 3971 Retainer in position and secure with three No. 7503 Screws, #2-56x $\frac{1}{4}$  R.H.S.T. as shown.
5. Make certain that each pair of wheels revolves freely in its bearing.
6. Assemble two No. 6825 and one No. 6826 Side Rods, one No. 6390 Shouldered Bushing on Drivers with two No. 7159 #0-80 Short Shouldered Side Rod Screws, one No. 7161 #0-80 Intermediate Shouldered Side Rod Screw and one No. 7165 #0-80 Hex Head Main Rod Screw in positions designated on drawing. Use No. 5511 #0-80 Socket Wrench to tighten screws. **DO NOT USE PLIERS**. Drawing shows left side of assembly. Assemble the right side in the same manner. The Main Rod Screws No. 7165 must be in each side of the No. 25064 pair of drivers.
7. Check rotation of coupled drivers. Tight spots in side rods may be freed by reaming slightly with a round needle file. **DO NOT REAM** any more than is absolutely necessary. Assembled mechanism should roll freely.
8. Assemble Gear Box as follows:
  - A. Place steel thrust washers on shaft at each end of worm. Next place bearing on each end of shaft against washers.
  - B. Assemble gear box by placing shaft and bearings in cavities provided in lower half and fastening top half with four #0 self tapping screws. There is a locating pin and cavity to align the two parts.
9. Secure front of gear box with #7503 screw, 2-56x $\frac{1}{4}$ ". Run a #7283 screw, #2-56x $\frac{1}{2}$ " up through frame to hold rear of gear box.
10. Place #M0330 adapter on frame with front touching pins on frame and place #M10304 motor on adapter and secure with #7283 screw, #2-56x $\frac{1}{2}$ " up through frame and into motor as shown. Use #7573 lock washer.
11. Align motor and shafts and tighten. Place flexible tubing over shafts and check for free movement from motor to wheels.
12. The right hand lead wire is fastened under the washer head screw #7494 on the top of the motor. The left hand lead wire is twisted together with the light wire and wire from the tender and #7811 insulator is placed over the bare wires.
13. Check unit with 12 Volts, D.C. Power in both forward and reverse motion.
14. Attach No. 6612 Drawbar from Tender to rear of Frame with No. 7494 Screw, #2-56x3/16" Lg. Washer Hd. S.T.
15. Lubricate worm and gear with Lubriplate or any good light grease. Apply a drop of light oil to all other moving parts. Turn mechanism upside down and in this position run-in mechanism for not less than 30 minutes with 12 volts, D.C. power. Reverse the direction of rotation one-half of the run-in period.



### VALVE GEAR ASSEMBLY

1. Check all parts with the replacement parts list. Riveting the valve gear links together requires a reasonable amount of care and study.
2. On a sheet of white paper, place all the valve gear parts just as they will be assembled on the locomotive. The drawing shows the exact relation of the parts to each other. Check your layout over again with the drawing as each part must overlap the other as shown.
3. A few tools will be required for the riveting operation:
  - A small flat block of steel as an anvil.
  - A flat fine cut needle file.
  - A small center punch.
  - A light hammer.
4. To become more familiar with the riveting — start with the No. 7099 Main Rods, No. 8436, L.H. side and No. 8437 R.H. side Crosshead Assemblies using No. 8355 Long Crosshead Rivet. Insert a small center punch in the hollow end of the rivet and tap lightly until the rivet is flared out. Then tap rivet lightly with the flat face of the hammer until it pulls the main rod and crosshead snugly but not tight. All the rods and levers must operate freely before assembling them on the locomotive frame.

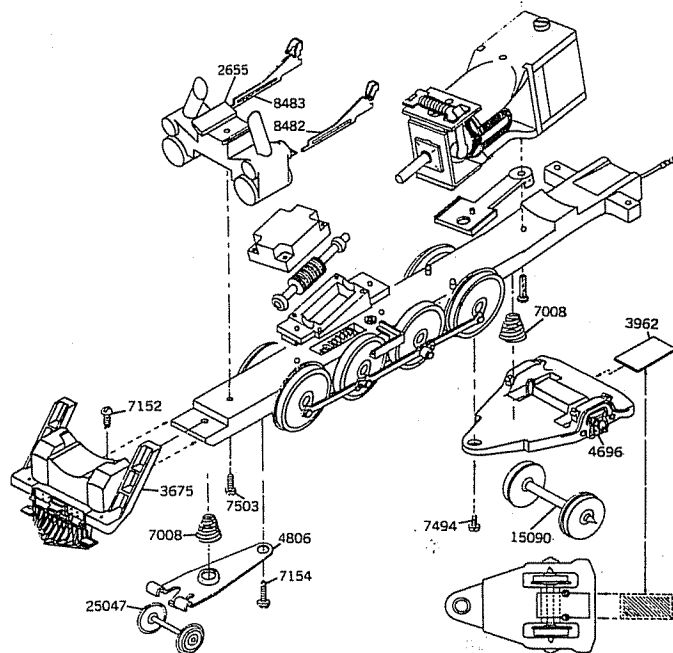


## MECHANISM ASSEMBLY

When the parts shown on this drawing have been installed the Mechanism will be completely assembled.

1. Fasten No. 3675 Pilot and Step Unit to main frame with No. 7152 Screw, #2-56 x 3/16" S.T.
2. Place No. 25047 Wheel Assembly in bearing slots of No. 4806 Truck Frame. Bend tab up to hold wheels in position, allowing suitable running clearance. Sand axle points after assembly.
3. Place large end of No. 7008 Spring over boss on truck frame, then place truck frame on Boss on Retainer No. 3971 and secure with No. 7154 Screw, #2-56 x 5/16" Lg. S.T.
4. Place one pair of No. 15090 Wheels and Axle in slots of No. 4696 Truck Frame. Slide No. 3962 Retainer Plate through slots in Pins forward until plate snaps into place (see drawing). Insert small or top end of No. 7008 Spring in the recess in bottom of No. 3247 Loco Frame, at the rear. The large or bottom end of Spring will slide across the center piece of No. 4696 Trailing Truck. Insert one No. 7494 Screw, #2-56 x 3/16" S.T. Washer Hd. through mounting hole in end of Trailing Truck and screw into place in rear of Frame.
5. The following parts shown on this drawing for better illustration have been installed as follows:
  - Valve Gear Assembly, Step 13 and 14.
    - 1 No. 8482 Crosshead Guide and Reverse Link Hanger L.H.
    - 1 No. 8483 Crosshead Guide and Reverse Link Hanger, R.H.
    - 1 No. 2655 Cylinder Unit
    - 1 No. 7503 Screw, #2-56 x 1/4" R.H.S.T.

5. After both sides of the main rod and crosshead assemblies are finished rivet together the No. 8458 eccentric crank and the No. 8449 eccentric rod, using No. 8351 rivet. Finish both sides before going to the next step, being careful to keep the projecting lug up, thus distinguishing the left from the right side assembly. **IMPORTANT NOTE:** All No. 8351 rivets are placed with the head outside except the two rivets used to rivet part No. 8444 to part No. 8484. A few extra rivets are supplied for your convenience.
6. Left Side — Rivet no. 8449 to No. 8484  
Right Side — Rivet No. 8449 to No. 8484.
7. Left Side — Rivet No. 8484 to No. 8444.  
Right Side — Rivet No. 8484 to No. 8444.
8. Left Side — Rivet No. 8444 to No. 8445.  
Right Side — Rivet No. 8444 to No. 8445.
9. Left Side — Rivet No. 8445 to No. 8464.  
Right Side — Rivet No. 8445 to No. 8464.
10. Left Side — Rivet No. 8445 to No. 8443.  
Right Side — Rivet No. 8445 to No. 8443.
11. Left Side — Rivet No. 8443 to No. 8436.  
Right Side — Rivet No. 8443 to No. 8437.
12. Rivet the No. 8484 Reverse Links to No. 8482 L.H. and No. 8483 R.H. Crosshead Guide and Reverse Link Hanger. Use No. 8351 Short Valve Gear Rivet (see insert drawing).
13. Assemble crosshead and No. 8482 L.H. and No. 8483 R.H. crosshead guide and reverse link hanger as shown in final mechanism assembly drawing. Small end of guide pointing the same direction as the piston rod.
14. Assemble No. 2655 Cylinder Unit and crosshead guides by inserting piston rod in cylinder, followed by the single point end of crosshead guide into the hole above it. Hold completed unit in position over frame and place notched end of crosshead guide between protecting pins at bottom of guide bracket. When in proper position cylinder unit will drop in slot in frame. A No. 7503 Screw #2-56x1/4" R.H.S.T. is used to hold cylinder on Frame. Check crossheads making certain that they slide freely in the guides.
15. Remove the No. 7165 main rod screw from each side of the pair of No. 25064 drivers. Slip the end of the No. 7099 main rod over the No. 6930 Shouldered bushing. Now with the No. 8458 eccentric crank placed over the end of the bushing, replace the long hex head main rod screws. The eccentric crank is thus clamped between end of bushing and the underside of the hex head screw. The eccentric crank may be set at any angle from 0 degrees to 30 degrees. The 0 degree setting allows a minimum amount of movement of the valve gear. a 30 degree setting allows a maximum amount of movement and also more wear on the valve gear. Insert drawing shows 0 degree angle in dotted line position and 30 degree angle in solid line.
16. Put a drop of oil on each bearing (Rivet) run-in mechanism the same as mentioned in the mechanism assembly.



## BOILER ASSEMBLY

1. Screw No. 5575 Lamp into No. M0385 Socket and Wire Assembly. Thread Lead Wire through hole in No. 4008 Lamp Socket Retainer. Insert No. M0385, No. 5575 and No. 4008 into hole provided in No. 2307 Boiler. Insert No. 8252 Lens in front of boiler.
2. Mount No. 2427 Cab on No. 2307 Boiler with No. 7488 Screw, #2 x 1/4" Lg. R.H. Self Tapping inserted through Lug at top of rear end of Boiler. Make sure that the bottom front edge of Cab fits into slots provided.

## MECHANISM PARTS

No. in Kit	Description	Part No.
1	Frame, Loco	3247
3	Bearings, Long Axle	6301
2	Bearings, Short Axle	6302
2	Wheel & Axle, 61½" Flanged	25037
1	Wheel & Axle, 61½" Blind with No. 663 Gear, 34T, 56P	25128
1	Wheel & Axle, 61½" Blind Retainer	25064
1	Retainer	3971
3	Screws, #2-56x¼" R.H.S.T.	7503
4	Side Rods (End)	6825
2	Side Rods (Center)	6826
2	Shouldered Bushing	6390
4	Screws, Short Side Rod	7159
2	Screw, Intermediate Side Rod	7161
2	Screw, Hex Head Side Rod	7165
1	Washer, Lock	7573
1	Motor Lead and Lug Assembly	16768
1	Wrench, #0-80	5511
1	Pilot and Step Unit	3675
1	Screw, #2-56x3/16" R.H.S.T.	7152
1	Cylinder Unit	2655
1	Screw, #2-56x¼" R.H.S.T.	7503
1	Wheel and Axle Assembly (Ins.)	25047
1	Truck Frame	4806
1	Spring, Conical	7008
1	Screw, #2-56x5/16" W.H.S.T.	7154
1	Truck Frame - Trailing	4696
1	Wheel and Axle Assembly, 40"	15090
1	Retainer Plate	3962
1	Spring, Conical	7008
1	Screw, #2-56x3/16" W.H.S.T.	7494
1	Lower Gear Case	M0325
1	Upper Gear Case	M0326
1	Worm Shaft Assembly	M10276
2	Bearing	M0293
2	Washer	7556
1	Screw, #0x5/16" S.T.	7169
1	Screw, #2-56x¼" S.T.	7503
1	Screw, #2-56x½"	7283
1	Adapter Plate	M0330
1	MG-81 Motor	M10304
1	Flexible Coupling, 7/8" long	M0277
2	Screw, #0x7/32" S.T.	7477

## VALVE GEAR PARTS

No. in Kit	Description	Part No.	Unit
2	Main Rods, 1.600" Centers	7099	
1	Crosshead Assembly L.H.	8436	
1	Crosshead Assembly R.H.	8437	
2	Rivets, Crosshead, Long	8355	
2	Eccentric Crank	8458	
2	Eccentric Rod	8449	
16	Rivets, Valve Gear	8351	
2	Reverse Link	8484	
2	Radius Rods	8444	
2	Combination Lever	8445	
2	Valve Rod	8464	
2	Crosshead Link	8443	
1	Hanger L.H. Crosshead Guide & Reverse Link	8482	
1	Hanger R.H. Crosshead Guide & Reverse Link	8483	

ICES SUBJECT TO CHANGE WITHOUT NOTICE.

## BOILER PARTS

No. in Kit	Description	Part No.	Unit
1	Boiler, Die Cast	2307	
1	Cab	2427	
1	Screw, #2x¼" R.H.S.T.	7488	
1	Bell, Brass with Mtg. Lug	8186	
12	Handrail Posts	7694	
2	Wire, Steel Handrail, 8" Lg.	7609	
1	Smokestack Rim	6881	
1	Screw, #2-56x1¼" Fill. Hd.	7320	
2	Screws, #2-56x3/8" R.H.S.T.	7504	
1	Lens Headlight	8252	
1	Lamp, w/Midget Screw Base Type B	5575	
1	Socket & Leadwire Assy.	5573	
1	Lamp, Socket Retainer	4008	

## TENDER PARTS

No. in Kit	Description	Part No.	Unit Price Each
1	Body Tender	2290	
1	Underframe, Tender	3275	
3	Screws, #2x5/16" Long, R.H.S.T.	7153	
1	Coupler Pocket	2603	
1	Coupler	2601	
1	Screw, #0x7/32" Long, R.H.S.T.	7477	
2	Truck Frame, Tender	4730	
2	Wheel & Axle, Pivot Point 33" ins. 2 sides	25047	
4	Wheel & Axle, Pivot Point 33" ins. 1 side	25048	
2	Retainer Plate	3963	
1	Drawbar, Fibre	6612	
4	Screw, #2-56x3/16" Lg.		
	Washer Hd. S.T.	7494	
1	Coupler Ezy-Op	M0328	
2	Wave Washer	M0143	

## REPLACEMENT PARTS

See your Hobby Dealer. If he cannot supply them you may order from the factory. Please send check or money order for parts required, plus \$1.00 for postage and handling.

## DEFECTIVE PARTS

RETURN PARTS ONLY — NOT COMPLETE MODEL. Any defective part will be replaced at no charge. If complete or partially completed model is returned only the defective part will be replaced, not installed.

Please enclose check or money order for \$1.00 to cover the cost of postage and handling.

## OUR GUARANTEES

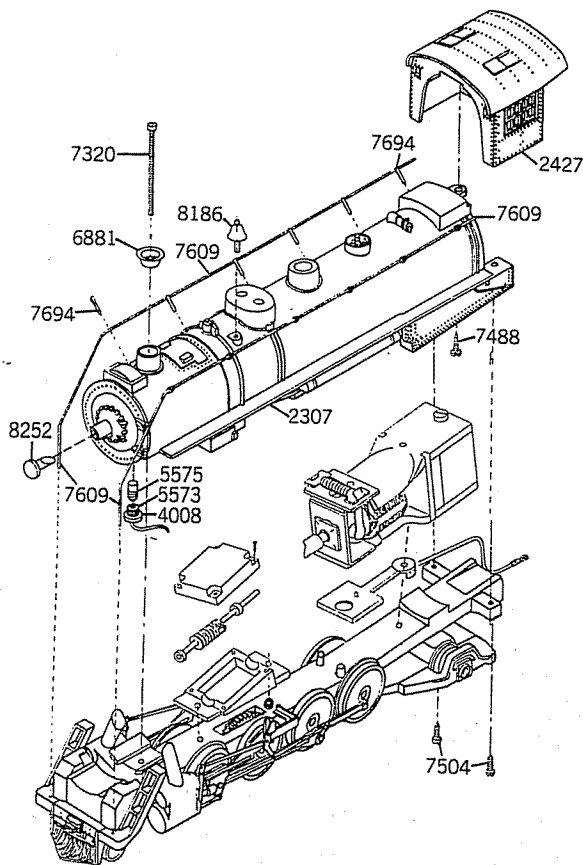
Because of the workmanship of the Mantua product, we are able to offer a **Limited Lifetime Warranty**. As the owner of Mantua products, you'll enjoy a commitment to product dependability few companies can offer.

All Mantua items are thoroughly inspected and tested prior to shipment. They are guaranteed to operate satisfactorily, and to be free from defects in material and/or workmanship.

If it fails to perform because of defects in material or workmanship, Mantua will replace it free of charge.

This guarantee does not apply to (a) electric bulbs, (b) damage caused by customer accident, abuse, mishandling or dropping; or (c) products which have been subject to unauthorized repairs. We cannot assume responsibility for the replacement of any parts that have been altered, or assembled and painted, unless, in our opinion, the defect did not become apparent until after the assembly.

3. Insert mounting lug on No. 8186 Bell into hole in top of boiler as shown in drawing. Place a small block of wood on top of the bell and tap into position.
4. Assemble the handrail on the boiler using 12 No. 7694 Handrail Posts. Grip Posts with a needle nose plier and start in place in the six holes on each side of the boiler. To secure a nice radius for the front end of the No. 7609 handrail wire, as shown in drawing, bend over a round rod 1/8" in diameter. Insert thru holes in the six posts on each side of the boiler. All handrail posts should be lightly tapped home with a hammer.
5. Press No. 6881 Smokestack Rim into place in top of smokestack.
6. Place completed boiler on frame, making certain that it seats properly on the cylinder block and rear of main frame. Insert two No. 7504 Screws, # 2-56 x 3/8" S.T. through rear of main frame and screw into boiler. DO NOT TIGHTEN.
7. Form the second bend in the handrail as shown on drawing. Raise front end of boiler and insert handrails in holes on beam plate of No. 3675 Pilot and Step Unit. Snip off ends even with the bottom of the beam place. DO NOT BEND WIRES OVER.
8. Insert one No. 7320 Screw, #2-56 x 1 1/4" Fill. H. through smokestack and screw into cylinder block. If boiler is seating properly, screw up on all three screws until boiler is tight on cylinder block and main frame.
9. Check the assembly and make sure the boiler is clear of the motor assembly.



## LONG HAUL TENDER ASSEMBLY

1. Check all parts with the Replacement List.
2. Assemble No. 3275 Underframe to No. 2290 Tender Body with three No. 7153 Screws, #2-56 x 5/16" Long S.T. Insert No. 7477 Screw, #0 x 7/32" Lg., into Hole in No. 2603 Coupler Pocket and also into Hole in No. 2601 Coupler as shown in drawing. Fasten to No. 2290 Body. Be sure Tabs on Coupler Pocket are fitted into openings provided in Tender Body.
3. Insert one Pair of No. 25048 Wheels & Axles, insulated on one side, in each end of the two No. 4730 Tender Truck Frames, making certain that the insulated Wheels are placed on the right hand side, as the truck stands on the Rail (see drawing). Insert one pair of No. 25047 Wheels & Axles insulated on two sides in the center. Place No. 3963 Retainer Plate on trucks, line up small Holes to fit pins on Truck. Place Truck on something solid and peen over Pins to hold Retainer in place. Wheels must Rotate Freely. Using two No. 7494 Truck Screws, #2-56 x 3/16" Lg. Washer Hd. S.T. install assembled trucks on frame in the hole provided with the long end of trucks bolster towards center. Place #M0143 wave washer between truck and tender frame.
4. Slip end of No. 6612 Drawbar over Boss at front end of Frame and screw in place with one No. 7494 Screw, #2-56 S.T.W.H. inserted thru the Lug on end of No. 16768 Motor Lead & Lug Assy.

Rear View Of Assembled Tender

