

TYCO
Service
Manual

TYCO

HO Scale Electric Trains
TYCOPRO Racing System



SERVICE INSTRUCTIONS

1. SCOPE

This manual provides service instructions and parts identification for TYCO's HO scale Model Railroad Locomotives. The service instructions include parts removal and replacement, trouble shooting, cleaning, and lubrication. Each locomotive is illustrated showing its various assemblies in an exploded view. Callouts on each exploded view indicate the location of replacement parts, and these parts are listed in a table which gives the part number, name, and price of each. Illustrations and data for the various locomotives are arranged in numerical order by model number.

2. SERVICE PROCEDURE

The following procedure should be followed whenever a locomotive is returned for repair:

a. Determine the country of origin from stampings (U.S. Blank).

b. Determine the nature of the customer's complaint and the reason the locomotive has been returned.

c. Attempt to operate the locomotive to make certain that it is actually defective and that the customer's trouble is not a faulty track or power source. During this operation, look for additional faults not mentioned by the customer.

d. Based upon the problem discovered, use the trouble-shooting chart to assist in localizing the cause of malfunction. Isolate the trouble by examination, testing and, if necessary, a process of elimination.

e. Remove the defective part, using the removal and replacement procedures in this manual. Identify the part on the exploded view and determine its part number from the parts-list table. Replace the defective part with a new item from stock.

f. Clean and lubricate the locomotive in accordance with the procedures given in this manual.

g. Operate the locomotive again to make certain the repair is complete and the locomotive is in good mechanical condition.

3. REMOVAL AND REPLACEMENT

3.1 MOTOR ACCESSIBILITY

The motor of a steam locomotive is made accessible by removing the boiler and cab assembly from the chassis assembly. These two assemblies of most steam locomotives are held together with a single screw. In the larger locomotives, the head of this screw can be reached through the smoke stack. In the other steam locomotives, the head of this screw is located on the bottom of the chassis assembly directly under the smoke stack. In either case, remove this one screw and lift the boiler and cab assembly from the chassis assembly of most steam locomotives. Two additional screws on the bottom under the cab must be removed from the Mikado 2-8-2 and the Pacific 4-6-2 before the two assemblies can be separated.

The motor of a diesel locomotive is located on the power truck assembly and is made accessible by removing the powered truck assembly. On every diesel, this assembly snaps into the body of the locomotive. Simply unsnap the truck assembly and lift it from the body.

3.2 COUPLER REPLACEMENT

Depending upon the locomotive, any one of four different methods of coupler mounting may be used. Coupler removal and replacement procedures for each method are given below.

3.2.1. SNAP-IN.

a. Grasp coupler with thumb and forefinger, twist to clear pin, and pull to remove (see figure 1).

b. To replace, push in coupler and twist over pin.

SERVICE INSTRUCTIONS

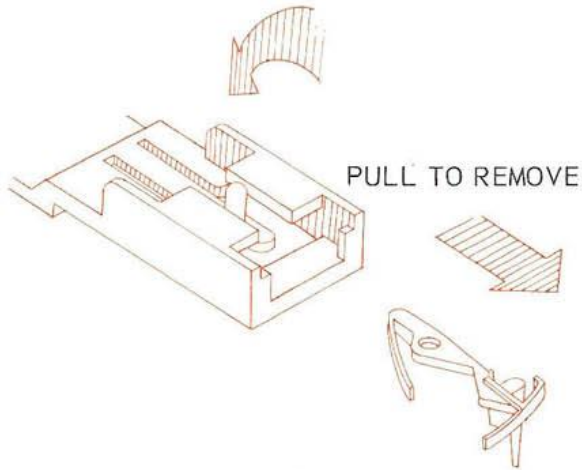


FIGURE 1

3.2.2 STAKED

a. Insert screwdriver blade into coupler pocket, pry upward, and lift out coupler (see figure 2).

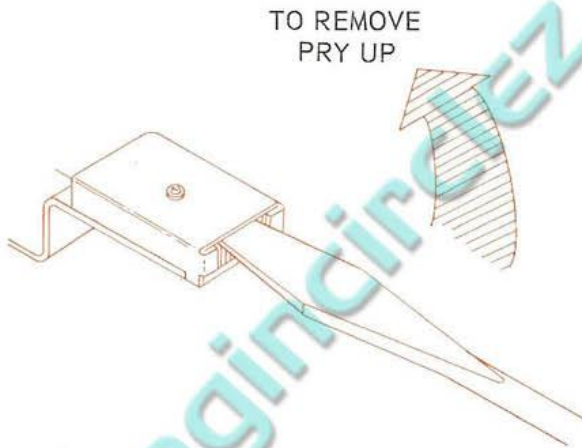


FIGURE 2

b. To assemble, place coupler pocket assembly on a metal block, position coupler over pin, which is part of the pocket assembly, and place retainer plate over this pin. Then tap end of pin lightly with center punch until pin is peened over (see figure 3).

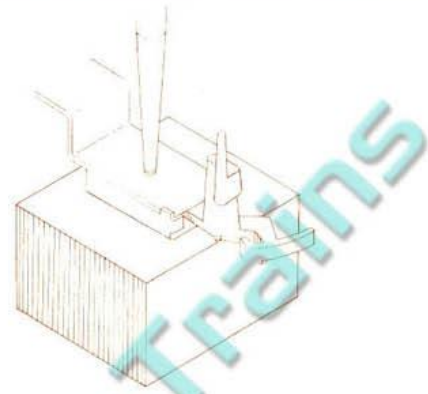


FIGURE 3

3.2.3 SCREWED (THERE ARE TWO TYPES OF SCREW MOUNTED COUPLERS)

a. Remove screw holding coupler pocket and remove coupler pocket and coupler.

b. Install new coupler in pocket and reassembly by replacing screw.

3.2.4 PINNED

a. Insert small, flat screwdriver blade under head of pin and twist screwdriver to remove pin (see figure 4).

b. Place new coupler in position and replace pin.

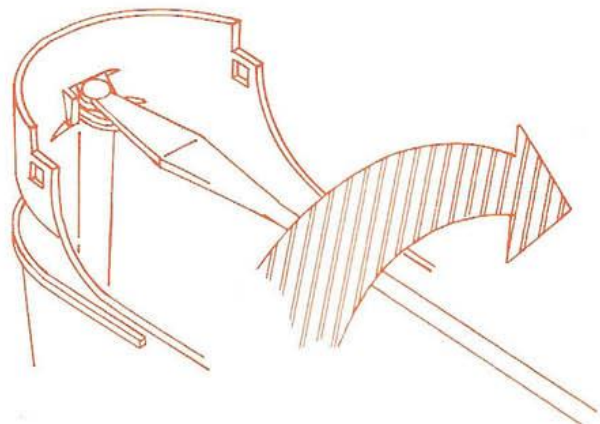


FIGURE 4

SERVICE INSTRUCTIONS

3.3 BRUSH REPLACEMENT

The locomotive may be powered by a motor manufactured in U.S., Hong Kong, or Austria. The procedure for removing the brushes varies slightly depending upon the model. U.S. models may be identified by a single screw located between the brush arms and by brush springs consisting of lengths of spring wire. The Hong Kong and Austrian models use compression coil springs between the brush arms.

	PM-1	MU-2	H.K.	Aus.
Part No.	18931	18927	60-326-014A	5160-36

3.3.1 U. S. MODELS

- Disassemble locomotive to gain motor accessibility. (see para. 3.1).
- Release brush springs from brush arms and slide brush assemblies from brush plate.
- If commutator is dirty or tarnished, clean it with fine emery cloth and apply one drop of contact cleaner.
- Insert new brushes and reassemble in reverse order.

3.3.2. HONG KONG AND AUSTRIAN MODELS

- Disassemble locomotive to gain motor accessibility (see para. 3.1).
- For a diesel locomotive, unsnap yoke and mounting plate of powered truck assembly (see figure 5).
- Slide out brush arm holders. On Austrian model, it is necessary to unsolder lead from one brush arm holder.
- Remove brush holders. One brush will now drop out of the Hong Kong model. Both brushes will drop out of the Austrian model. On the Hong Kong model, unsolder contact lead from

other brush and the second brush will also drop out.

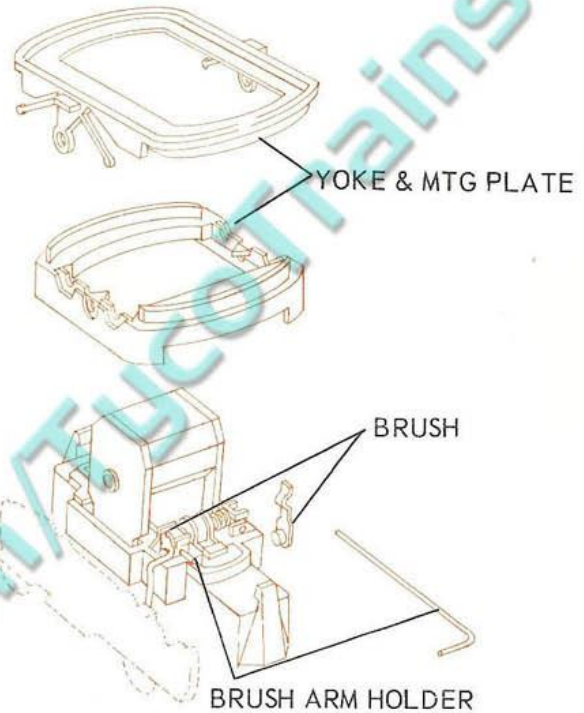


FIGURE 5

- If commutator is dirty or tarnished, clean it with fine emery cloth and apply one drop of contact cleaner.
- Insert new brushes and solder lead on Hong Kong model. Reassemble in reverse order.

3.4 VALVE GEAR REPLACEMENT

MODEL NO.	PART NO.
208	18491 - 18492
212	18493 - 18494
234	18495 - 18496

CAUTION

Side rod screws are set in Lok-Tight. If any screw does not back out readily, do not apply heavy pressure or the screw will break. Heat the screw with a low-wattage soldering iron to soften the Lok-Tight and then remove the screw.

SERVICE INSTRUCTIONS

a. Remove cab and boiler assembly from chassis assembly (see para. 3.1).

b. Using 0-80 socket wrench, remove main rod screw from side of driver.

c. Lift cylinder unit and remove old valve gear.

d. Assemble cylinder unit and cross head guides by inserting piston rod in cylinder followed by inserting single point end of crosshead guide into hole above it. See figure 6, 7, or 8, depending on locomotive.

e. Hold assembled unit in position over frame and place notched end of crosshead guide between protecting pins at bottom of guide bracket. When in proper position, the cylinder unit will drop into the slot in the frame. Make certain that crossheads slide freely on guides.

f. Slip end of main rod over shouldered bushing.

g. With eccentric crank placed over end of bushing, replace main rod screw. The eccentric is now clamped between the end of the bushing and main rod screw. The eccentric crank may be set at any angle from 0° to 30° as shown in figure 6, 7, or 8. The 0° setting allows a minimum of movement and results in a minimum of wear; the 30° setting allows a maximum of movement and results in more wear.

h. Apply a drop of fine, light oil to each rivet and the crosshead guide.

i. Operate locomotive for about 15 minutes to run-in mechanism.

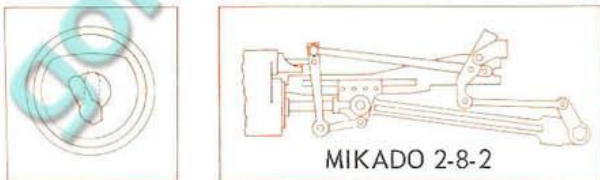


FIGURE 6

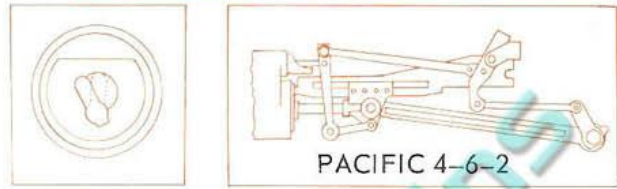


FIGURE 7

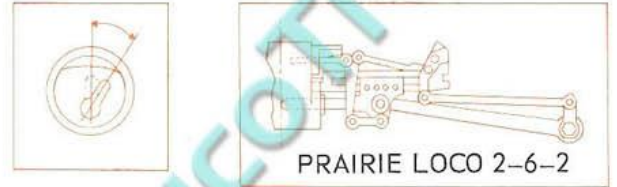


FIGURE 8

3.5 TRACTION RING REPLACEMENT

MODEL	PART NO.			
	7740	7907	7934	50-108-202
209			●	
210		●		
218			●	
224 (U.S.)	●			
224				●
228	●			
233		●		
234			●	
235	●			
238			●	
242		●		

3.5.1. STEAM LOCOMOTIVE

a. Using an 0-80 socket wrench, remove side rod screw from wheel with traction ring and swing side rod(s) out of way.

SERVICE INSTRUCTIONS

- b. Using a pointed tool, remove old traction ring from wheel.
- c. Install new ring on wheel, making sure it is seated all around wheel.
- d. Replace side rod(s).

3.5.2 DIESEL LOCOMOTIVE (U.S. MOTOR)

- a. Unsnap power truck assembly and lift it from body.
- b. Using a pointed tool, re- move old traction rings from wheels.
- c. Using same tool, stretch new ring across each wheel and snap ring into place, making sure it is seated all around wheel.
- d. Snap power truck assembly into body.

3.5.3. DIESEL LOCOMOTIVE (HONG KONG) OR AUSTRIAN MOTOR)

- a. Remove two screws on underside of power truck assembly, which hold retainer plate to motor housing. Lift off retainer plate with both side frames attached.
- b. Remove conductor strip which extends from axle to axle, and lift out wheel and axle assemblies.
- c. Using a pointed tool, remove old traction rings from wheels.
- d. Install new ring on each wheel, making sure it is seated all around wheel.
- e. Place wheel and axle assemblies into position on motor housing. The brass wheels must be on the opposite side of the brass wheels on the non-powered truck assembly.
- f. Replace conductor strip and re-install retainer plate.

3.6 LAMP AND LEAD REPLACEMENT

3.6.1 DIESEL LOCOMOTIVE

- a. Unsnap truck assemblies from body.
- b. Disconnect lamp lead from powered truck assembly by bending brush spring loop and sliding out lead on U.S. model, or by unsoldering lead on Austrian or Hong Kong model.
- c. Snap bulb out of lamp clip.
- d. Install new lamp and lead assembly in reverse order of removal.
- e. Snap truck assemblies into body.

MODEL NO.	PART NO.					
	5547	5573	5574	5575	5580	90-009-108A
208		●		●		
212		●		●		
224 (U.S.)					●	
224 (H.K.)						●
224 (AUS.)						●
228					●	
233	●					
234	●					
235	●					
237	●					
238	●					
241			●			
242	●					

SERVICE INSTRUCTIONS

3.6.2 STEAM LOCOMOTIVE

- a. Disassemble boiler and cab assembly from chassis assembly to gain access to motor (see para. 3.1).
- b. Bend brush spring loop and slide out lamp lead.
- c. If locomotive boiler is plastic, gently pry out smoke box front, slide out boiler weight, remove heat sink covering bulb, and thread lamp and lead assembly out of weight.
- d. If locomotive boiler is die cast, remove lamp and socket retainer, withdraw socket and lead wire assembly, and unscrew bulb.
- e. Reverse above procedure to install new lamp and lead assembly.
- f. Re-assemble boiler and cab assembly to chassis assembly.

3.7 DRAWBAR REPLACEMENT

- a. Remove screws attaching drawbar to locomotive and tender and discard old drawbar.
- b. Remove any tarnish or rust from lug on motor lead.
- c. Using drawbar replacement kit, attach new drawbar to locomotive and attach motor lead lug under screw that attaches drawbar to tender.

3.8 MOTOR LEAD REPLACEMENT

3.8.1 STEAM LOCOMOTIVE

- a. Remove screw retaining drawbar to tender.
- b. Remove boiler and cab assembly from chassis assembly to gain access to motor (see para. 3.1).

- c. Unsolder old lead from motor and discard.
- d. Solder new lead to motor terminal and extend lead to rear of chassis assembly.
- e. Install boiler and cab assembly to chassis assembly.
- f. Replace drawbar, placing lug of lead and lug assembly under screw which attaches drawbar to tender.

3.8.2 DIESEL LOCOMOTIVE WITH U.S. MOTOR

Only those diesel locomotives with U.S. motors are equipped with motor lead and lug assemblies. Diesel locomotives with Hong Kong or Austrian motors have wire leads, soldered at both ends, which may be removed and new wire soldered in their places. To remove and replace the motor lead and lug assembly on a diesel locomotive with a U.S. motor, proceed as follows:

- a. Unsnap truck assemblies from body.
- b. Unsolder one end of lead and lug assembly from motor.
- c. Disconnect lug from non-powered truck assembly by removing screw at top center of assembly. (This step is not applicable for industrial switcher).
- d. Disconnect lug from lamp clip by removing screw holding lamp clip. Discard old lead and lug assembly.
- e. Install new lead and lug assembly in reverse order of removal.
- f. Snap truck assemblies into body making certain that the brass wheels of the non-powered truck assembly are on opposite side of the brass wheels on the powered truck assembly.

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PART NO.	MODEL NO.														
	208	210	212	218	224 (U.S.)	224 (H.K.)	224 (AUS.)	228	233	234	235	237	238	241	242
16757				●					●	●				●	●
16761		●													
16768	●		●												
16770					●										
16772								●							
16778														●	
17942											●				
85-009-017						●	●								

3.8.3 MOTOR LEAD REPLACEMENT (DIESEL LOCOMOTIVE WITH HONG KONG OR AUSTRALIAN MOTOR)

- Unsnap truck assemblies from body.
- Unsolder the wire from the motor that connects the non-powered truck to the motor.
- Unsnap retainer plate from non-powered truck assembly and lift off retainer plate with both side frames attached.
- Remove wheel and axle assemblies and lift off conductor strip to which two wires are soldered.
- Unsolder motor lead wire from conductor strip. Discard old wire lead.
- Solder one end of new lead to conductor strip.
- Place conductor strip in position, replace wheel and axle assemblies over strip, and snap retainer plate over wheel and axle assemblies to non-powered truck assembly.
- Solder other end of new lead to motor.
- Snap truck assemblies into body making certain that the brass wheels of the non-

powered truck assembly are on opposite side of the brass wheels of the powered truck assembly.

3.9 LAMP RETURN LEAD REPLACEMENT (DIESEL LOCOMOTIVE WITH H.K. OR AUS. MOTOR)

- Unsnap non-powered truck assembly from body.
- Unsolder wire from lamp clip.
- Remove screws holding retainer plate to motor housing.
- Unsnap retainer plate from non-powered truck assembly and lift off retainer plate with both side frames attached.
- Remove wheel and axle assemblies and lift off conductor strip to which two wires are soldered.
- Unsolder wire from conductor strip. Discard old wire lead.
- Solder one end of new lead to conductor strip.

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h. Place conductor strip in position, replace wheel and axle assemblies over strip, and snap retainer plate over wheel and axle assemblies on to non-powered truck assembly.

i. Solder other end of new lead to lamp clip.

j. Snap non-powered truck assembly into body making certain that the brass wheels are on opposite side of the brass wheels on the powered truck assembly.

3.10 CONTACT REPLACEMENT

3.10.1 DIESEL INDUSTRIAL SWITCHER

a. Unsnap body from powered truck assembly.

b. Push pick-up wire off retainers on chassis by inserting a small screwdriver blade through slot in bottom of chassis and pressing.

c. Remove wire lead from pick-up.

d. Unsolder lead from brush spring post.

e. Wrap new lead wire around pick-up as shown in figure 9.

f. Re-insert pick-up wire around retainers on chassis, making certain wire lead falls into groove provided.

g. Solder new lead to brush spring post.

h. Snap body onto powered truck assembly.

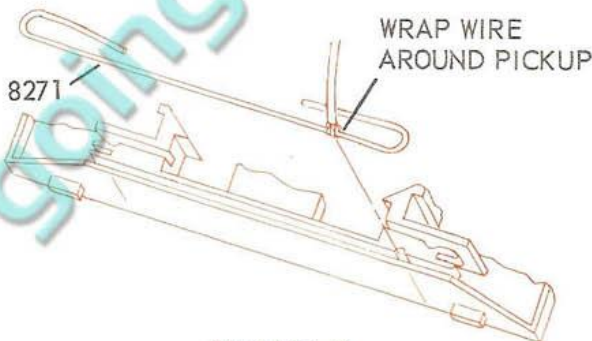


FIGURE 9

3.10.2 TROLLEY

a. Remove four (4) screws retaining body to powered chassis assembly.

b. Remove screws retaining pick-up brackets.

c. Unsolder lead connection on brush spring post and remove pick-up.

d. Install new pick-up and re-assemble in reverse order.

3.10.3 BOOSTER II (KITS — BOOSTER, LITTLE SIX)

a. Disassemble boiler and cab assembly from chassis assembly to gain access to motor (see para. 3-1).

b. Rotate brush spring and slide out pick-up lead wire. This lead is the shorter of the two leads shown in figure 10.

c. Remove insulating sleeve covering connection between lamp lead and other pick-up lead, the longer lead shown in figure 10.

d. Remove screw holding pick-up assembly to frame and remove pick-up.

e. Install new pick-up and reassemble in reverse order.

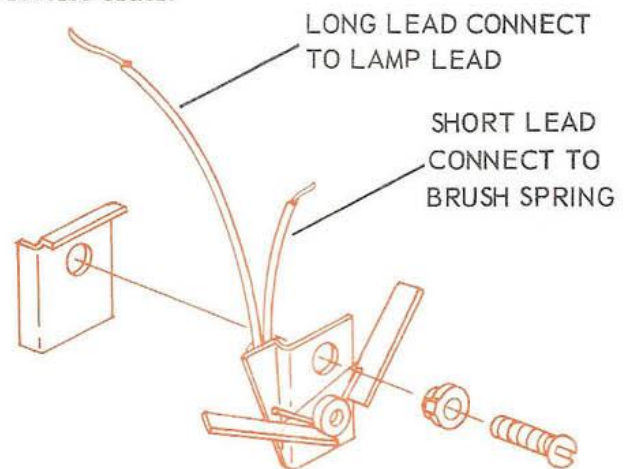


FIGURE 10

TYCO[®]
INDUSTRIES

A CONSOLIDATED FOODS COMPANY
RESPONSIVE TO CONSUMER NEEDS

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SERVICE INSTRUCTIONS

4. CLEANING

CAUTION

Do not use steel wool for cleaning purposes. Small bits of steel wool will be attracted to the motor magnet and weaken it.

4.1 METAL WHEELS

- a. Apply power to motor.
- b. Hold fine emery cloth against contact surfaces of driver wheels. Do not press too hard or motor will stall.
- c. Remove power from motor.
- d. Hold fine emery cloth against each leading, trailing, and tender truck wheel while rotating wheel by hand.
- e. Wipe all wheels clean with track cleaning fluid.

4.2 PIVOT POINTS

Use a soft brush or an air hose to remove dirt from the pivot points of side rods, valve gear, and wheel axles. Use a mild solvent, one which will not mar the paint, to remove any dirt or sludge which will not brush away.

4.3 MOTOR

- a. Remove brush plate and brushes (see para. 3.3).
- b. Remove dirt from commutator with soft brush or air hose.
- c. Clean tarnished commutator with fine emery cloth and apply one drop of contact cleaner.
- d. Replace any worn parts at this time. On PM type motors, remove any thread which may have built up on motor shaft.
- e. Reassemble locomotive.

5. LUBRICATION

- a. Disassemble locomotive so that motor bearings, worms, and gears are accessible (see para. 3.1).
- b. Apply a fine, thin oil to side rods, valve gear, axle bearings, and motor bearings.
- c. Apply a small amount of Lubriplate to worms, gears, and truck yokes.

CAUTION

Apply Lubriplate sparingly. Over-lubrication will cause the locomotive to pick up dust and lint which will jam the gears.

6. ORDERING

When ordering decorated parts be sure to include model number with alphabetical suffix. See table below.

MODEL	DISC.	ROADNAME
208A	MIKADO	PENNSLYVANIA
208C	MIKADO	SANTA FE
212B	PACIFIC	BALTIMORE & OHIO (BLACK)
212D	PACIFIC	UNION PACIFIC
212G	PACIFIC	BALTIMORE & OHIO (BLUE)
212H	PACIFIC	CANADIAN PACIFIC
212F	PACIFIC	SOUTHERN CRESENT LTD.
214B	TROLLEY	MAIN STREET
214D	TROLLEY	NOB HILL
214E	TROLLEY	WABASH AVENUE
214G	TROLLEY	BROADWAY
224A	F-9-A	BALTIMORE & OHIO
224B	F-9-A	CANADIAN PACIFIC
224D	F-9-A	SANTA FE (FREIGHT)
224H	F-9-A	SANTA FE (PASS)
224K	F-9-A	CANADIAN NATIONAL
224N	F-9-A	UNION PACIFIC

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MODEL	DISC.	ROADNAME
224R	F-9-A	PENN CENTRAL
224T	F-9-A	C.P. RAIL
224U	F-9-A	AMTRAK
225A	F-9-A DUMMY	BALTIMORE & OHIO
225D	F-9-A DUMMY	SANTA FE
225H	F-9-A DUMMY	SANTA FE (PASS)
225N	F-9-A DUMMY	UNION PACIFIC
225R	F-9-A DUMMY	PENN CENTRAL
225T	F-9-A DUMMY	C.P. RAIL
228A	GP-20	BURLINGTON
228B	GP-20	SANTA FE
228C	GP-20	UNION PACIFIC
228K	GP-20	CANADIAN NATIONAL
228L	GP-20	PENN CENTRAL
228M	GP-20	ILLINOIS CENTRAL
230A	F-9-B	BALTIMORE & OHIO
230D	F-9-B	SANTA FE
230H	F-9-B	SANTA FE (PASS)
230K	F-9-B	CANADIAN NATIONAL
230R	F-9-B	PENN CENTRAL
233A	1890	PENNSYLVANIA
233B	1890	SANTA FE
234A	PRAIRIE	PENNSYLVANIA

MODEL	DISC.	ROADNAME
234B	PRAIRIE	SANTA FE
235A	ALCO 430	BURLINGTON
235C	ALCO 430	SANTA FE
235D	ALCO 430	CANADIAN NATIONAL
235G	ALCO 430	PENN CENTRAL
235J	ALCO 430	ILLINOIS CENTRAL GULF
235K	ALCO 430	CHESSIE SYSTEM
235L	ALCO 430	SOO LINE
237A	BOOSTER	NEW YORK CENTRAL
237C	BOOSTER	SANTA FE
237D	BOOSTER	CANADIAN NATIONAL
238A	SHIFTER	PENNSYLVANIA
238C	SHIFTER	SANTA FE
241A	SWITCHER	PENN CENTRAL
241C	SWITCHER	SANTA FE (PASS)
241D	SWITCHER	C.P. RAIL
242A	DIXIE BELLE	WESTERN & ATLANTIC
243A	ALCO 630	ILLINOIS CENTRAL GULF
243B	ALCO 630	SANTA FE (PASS)
244	SPIRIT '76	SEABOARD COAST LINE
287A	ALCO 630	DELAWARE & HUDSON
287B	ALCO 630	CHESSIE SYSTEM

SERVICE INSTRUCTIONS

7. TROUBLESHOOTING

The following chart lists the most common troubles encountered when a locomotive is

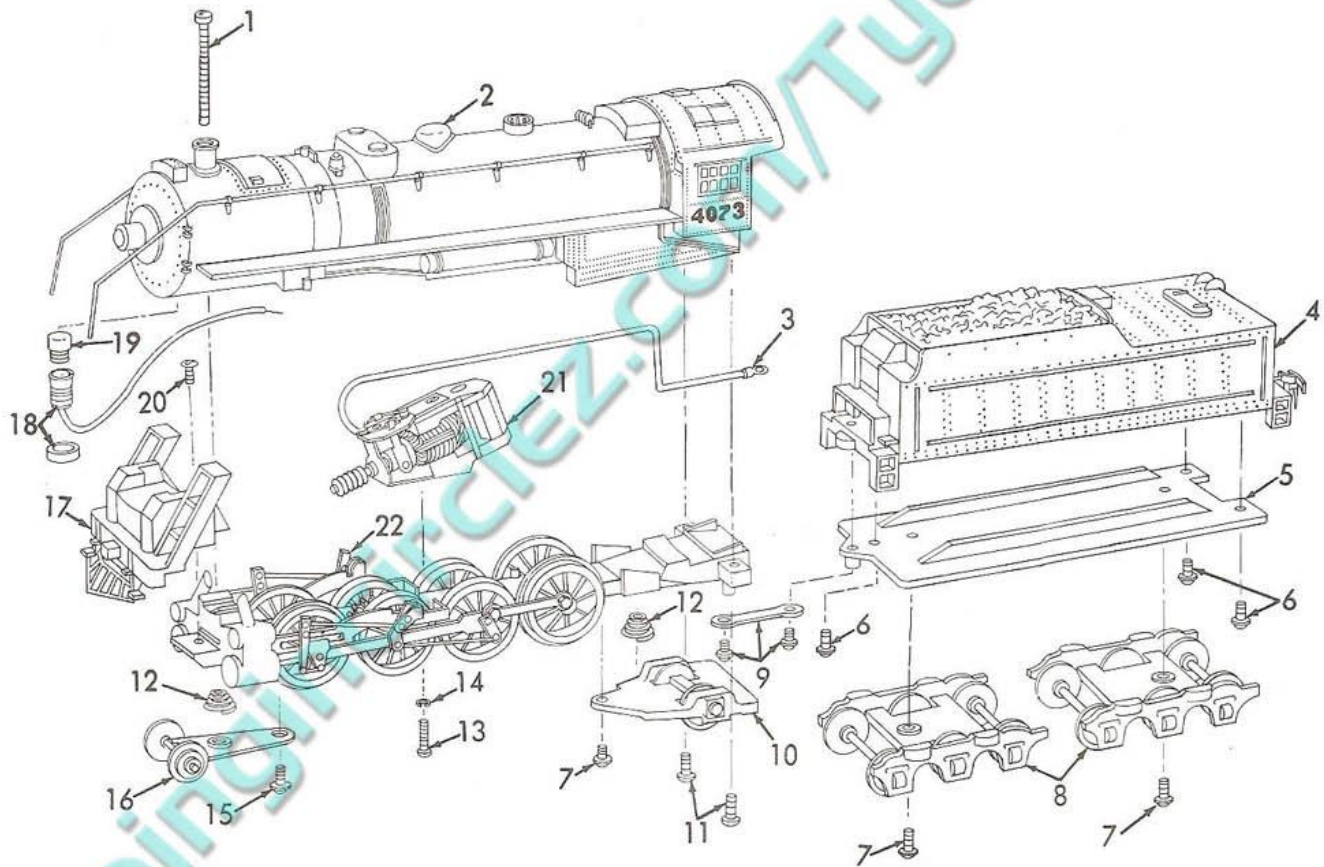
returned for repair, gives the probable causes of each trouble and indicates the corrective action to be taken.

TROUBLESHOOTING CHART		
Trouble	Probable Cause of Trouble	Corrective Action
Headlight does not glow	Burnt out bulb	Replace lamp and lead assembly
	Lamp out of lamp clip	Re-install lamp in lamp clip
	Broken connection	Repair
Headlight flickers	Poor connection	Repair
	Short circuit in lamp lead	Replace lamp and lead assembly
	Dirty wheels or pick-up	Clean
Motor will not run	Worn out brushes	Replace brushes
	Burnt out armature	Replace motor
	Non-powered truck installed backward	Re-install truck correctly
	Broken connection to motor	Repair
	Short circuit in motor lead	Replace lead and lug assembly
Motor runs erratically	Dirty wheels or pick-up	Clean
	Worn brushes	Replace brushes
	Worn pick-ups	Replace pick-ups
	Weak brush spring	Adjust spring tension
	Stripped gear on motor	Replace power truck assembly
	Stripped gear on chassis assembly of steam locomotive	Replace chassis assembly
	Stripped gear on power truck assembly of diesel locomotive	Replace power truck assembly
Steam locomotive sluggish	Paint on truck mounting post	Remove paint

ITEM	PART NO.	DESCRIPTION
1	7320	SCREW 2-56 x 1-1/4
2	52321	BOILER & CAB ASSEMBLY
3	16768	LEAD & LUG ASSEMBLY
4	52189	BODY ASSEMBLY (TENDER)
5	3275	FRAME
6	7153	SCREW 2-56 x 5/16
7	7494	SCREW 2-56 x 3/16
8	54664	TENDER TRUCKS
9	56618	DRAWBAR REPLACEMENT KIT
10	54676	TRAILING TRUCK ASSEMBLY
11	7504	SCREW 2-56 x 3/8
12	7008	SPRING, CONICAL
13	7283	SCREW 2-56 x 1/2 R.H.
14	7573	WASHER, LOCK
15	7152	SCREW 2-56 x 3/16
16	24807	LEAD TRUCK ASSEMBLY
17	3675	PILOT
18	5573	SOCKET & LEAD ASSEMBLY
19	5575	LAMP
20	7152	SCREW 2-56 x 3/16
21	33578	MOTOR ASSEMBLY
22	53199	CHASSIS ASSEMBLY
	52606	COUPLER REPLACEMENT KIT



MODEL 208 MIKADO

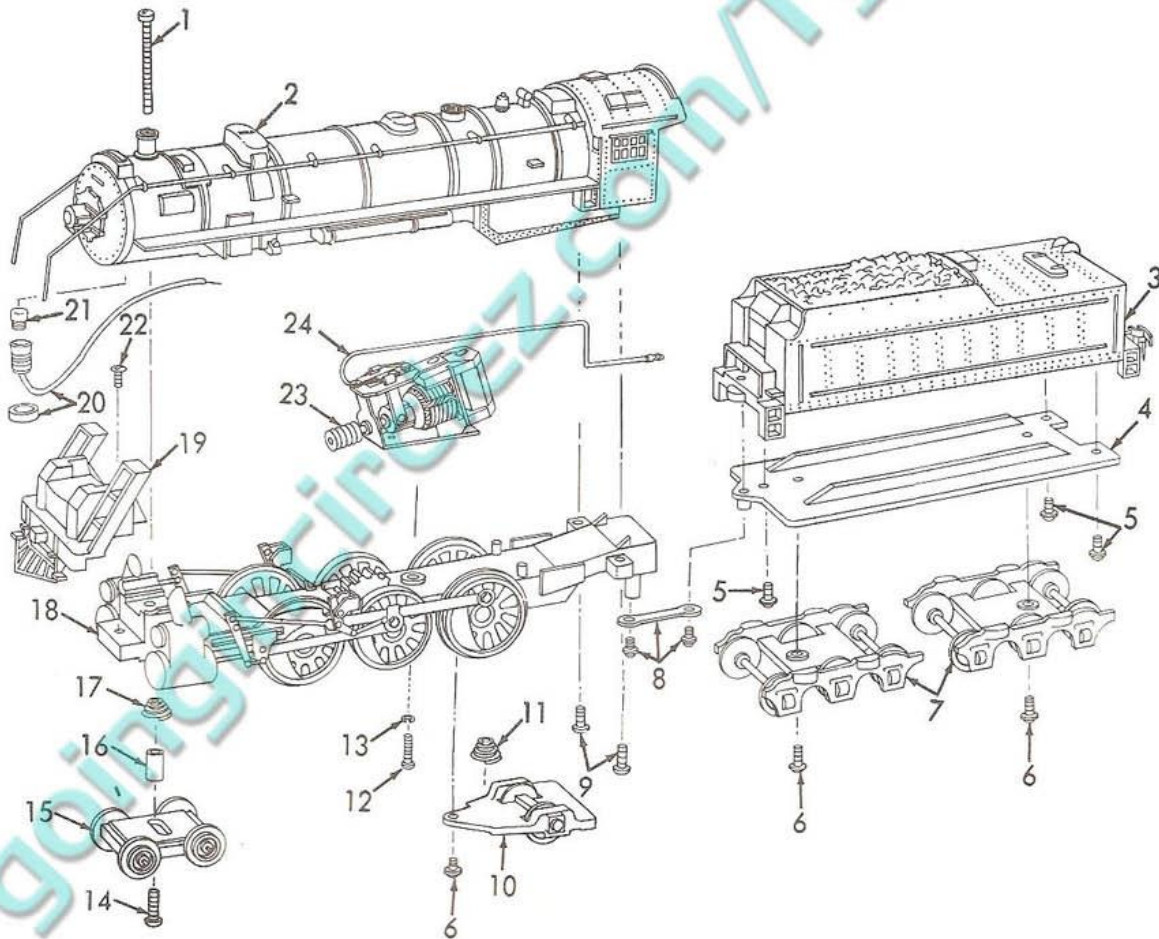


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	7291	SCREW 2-56 x 1 R.H.
2	52322	CAB & BOILER ASSEMBLY
3	52189	BODY ASSEMBLY (TENDER)
4	3275	FRAME
5	7153	SCREW 2-56 x 5/16
6	7494	SCREW 2-56 x 3/16 W.H.
7	54664	TENDER TRUCKS (PR)
8	566118	DRAWBAR REPLACEMENT KIT
9	7504	SCREW 2-56 x 3/8 S.T.R.H.
10	54675	TRAILING TRUCK ASSEMBLY
11	7008	SPRING, CONICAL
12	7283	SCREW 2-56 x 1/2 R.H.
13	7573	WASHER, LOCK
14	7284	SCREW 2-56 x 9/16 R.H.
15	24731	LEAD TRUCK ASSEMBLY
16	6936	SPACER, LEAD TRUCK
17	7008	SPRING, CONICAL
18	53198	CHASSIS ASSEMBLY
19	3675	PILOT & STEP UNIT
20	5573	SOCKET & LEAD ASSEMBLY
21	5575	LAMP
22	7152	SCREW 2-56 x 3/16
23	33578	MOTOR ASSEMBLY
24	16768	MOTOR LEAD & LUG ASSEMBLY
	52606	COUPLER REPLACEMENT KIT

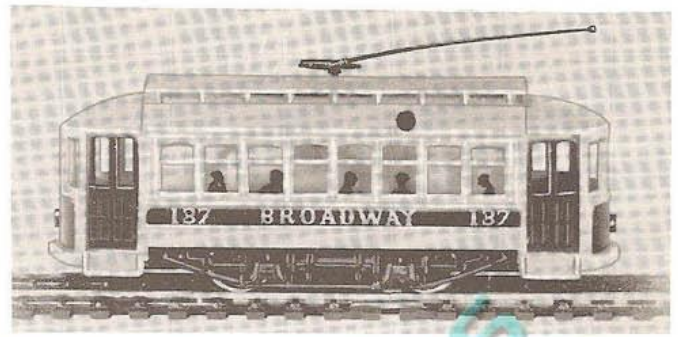


MODEL 212 PACIFIC

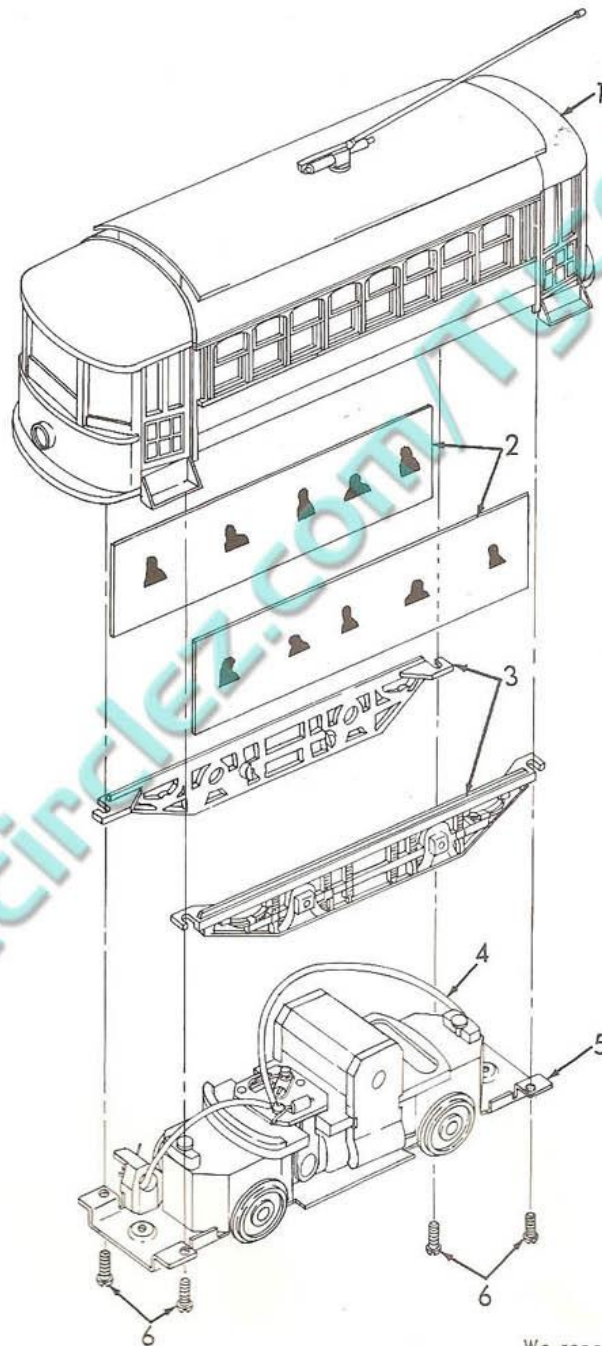


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ITEM	PART NO.	DESCRIPTION
1	52188	BODY ASSEMBLY
2	7755	WINDOW STRIP
3	4732	TRUCK SIDE FRAME
4	28269	PICK-UP & LEAD WIRE ASSEMBLY
5	54851	POWER TRUCK ASSEMBLY
6	7169	SCREW 0-80 x 5/16 R.H.



MODEL 214 TROLLEY

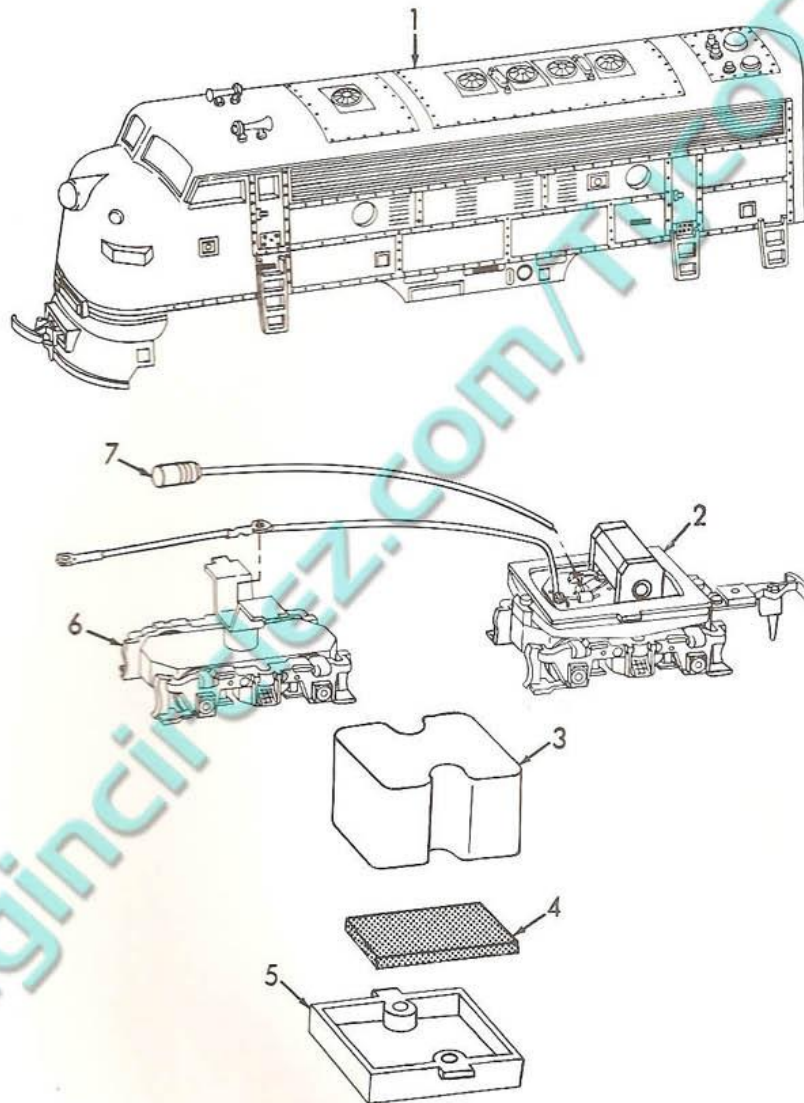


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	52187	BODY ASSEMBLY
2	94897	POWER TRUCK ASSEMBLY
3	4912	WEIGHT
4	6949	WEIGHT CUSHION, SPONGE
5	7762	BATTERY HOUSING & FUEL TANK
6	54670	NON-POWER TRUCK ASSEMBLY
7	5580	LAMP & LEAD ASSEMBLY
	52605	COUPLER REPLACEMENT KIT



MODEL 224 F-9-A (U.S.)

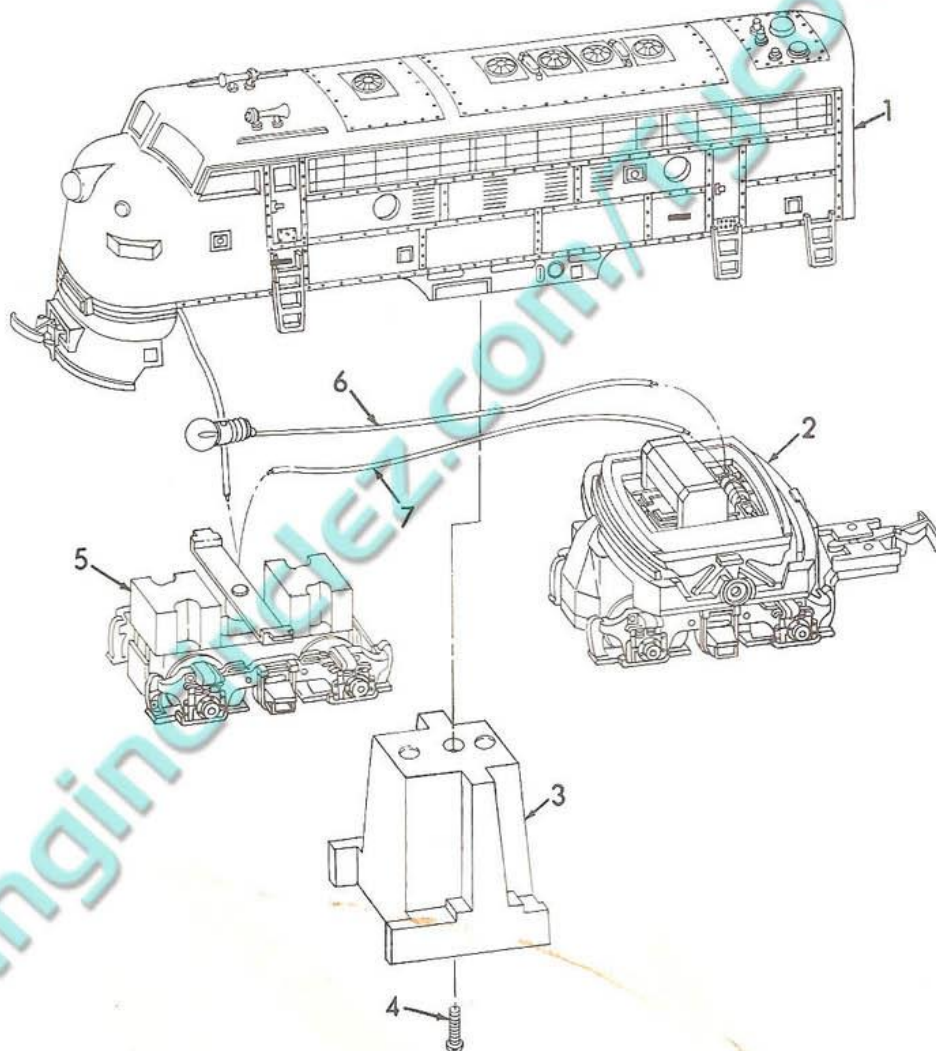


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	50-112-001A	BODY ASSEMBLY
2	50-131-101B	POWER TRUCK ASSEMBLY
3	87-419-001	WEIGHT
4	50-216-301	SCREW
5	50-121-105B	NON-POWER TRUCK ASSEMBLY
6	90-009-108A	LAMP & LEAD ASSEMBLY
7	85-009-017	LEAD
	52605	COUPLER REPLACEMENT KIT



MODEL 224 F-9-A (H.K.)

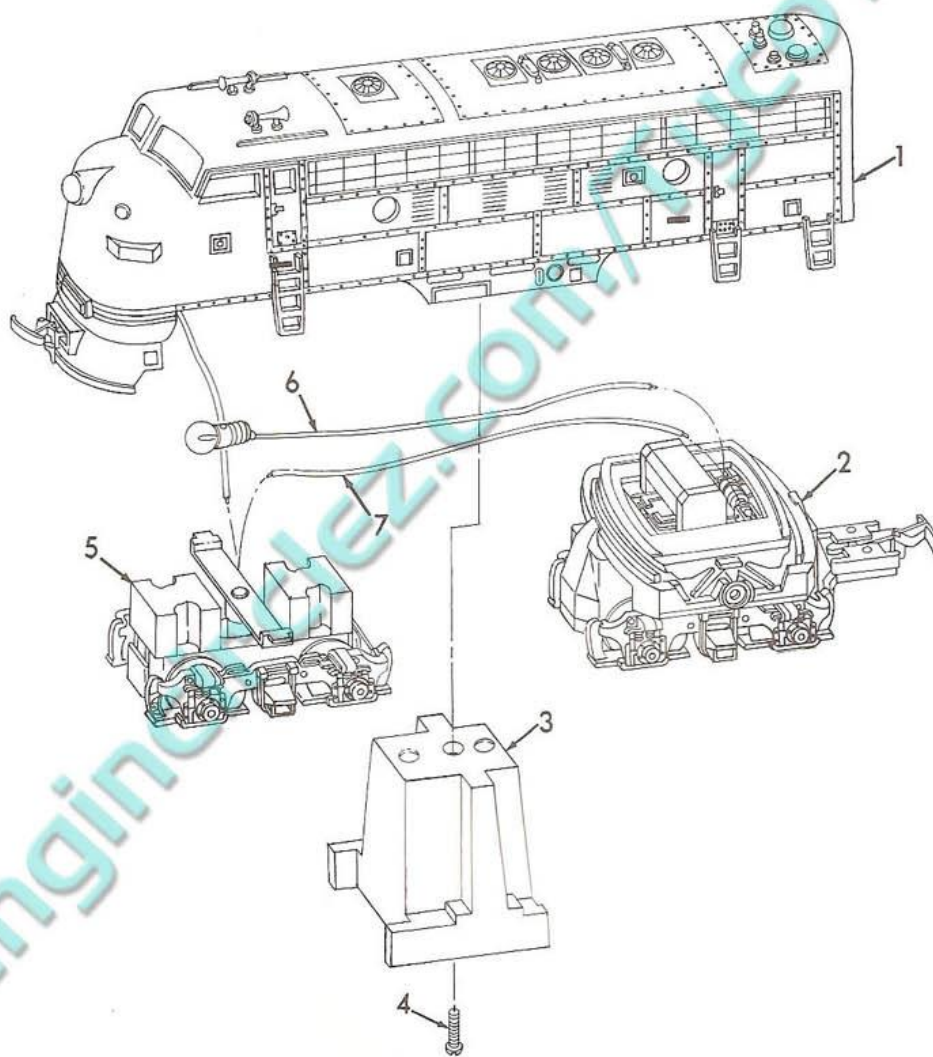


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	50-112-001A	BODY ASSEMBLY
2	50-131-101B	POWER TRUCK ASSEMBLY
3	87-419-001	WEIGHT
4	50-216-301	SCREW
5	50-121-105B	NON-POWER TRUCK ASSEMBLY
6	90-009-108A	LAMP & LEAD ASSEMBLY
7	85-009-017	LEAD
	52605	COUPLER REPLACEMENT KIT



MODEL 224 F-9-A (AUS.)

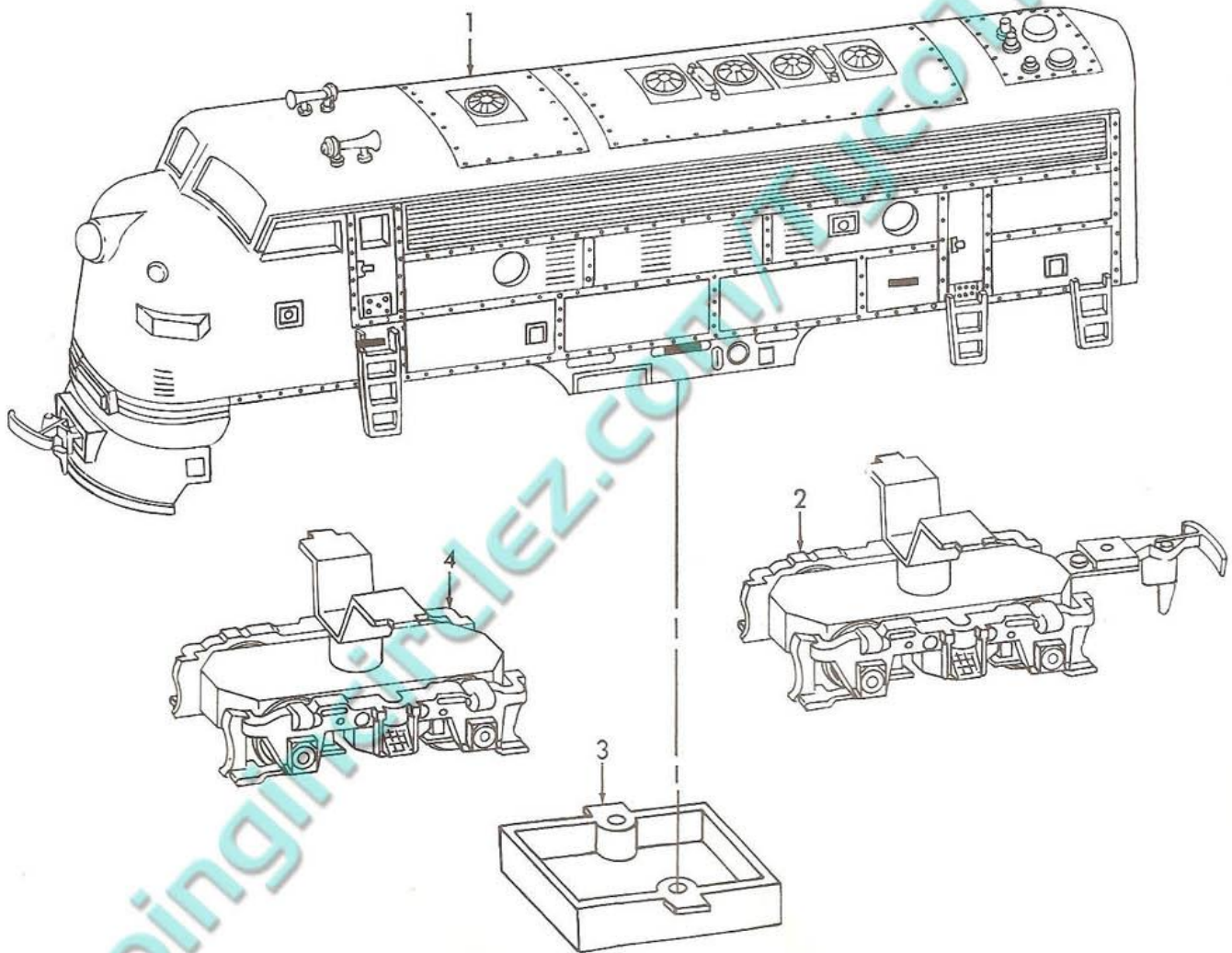


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	52185	BODY ASSEMBLY
2	54668	DUMMY TRUCK ASSEMBLY W/COUPLER
3	7762	BATTERY HOUSING & FUEL TANK
4	54669	DUMMY TRUCK ASSEMBLY
	52605	COUPLER REPLACEMENT KIT



MODEL 225 F-9-A (U.S.)

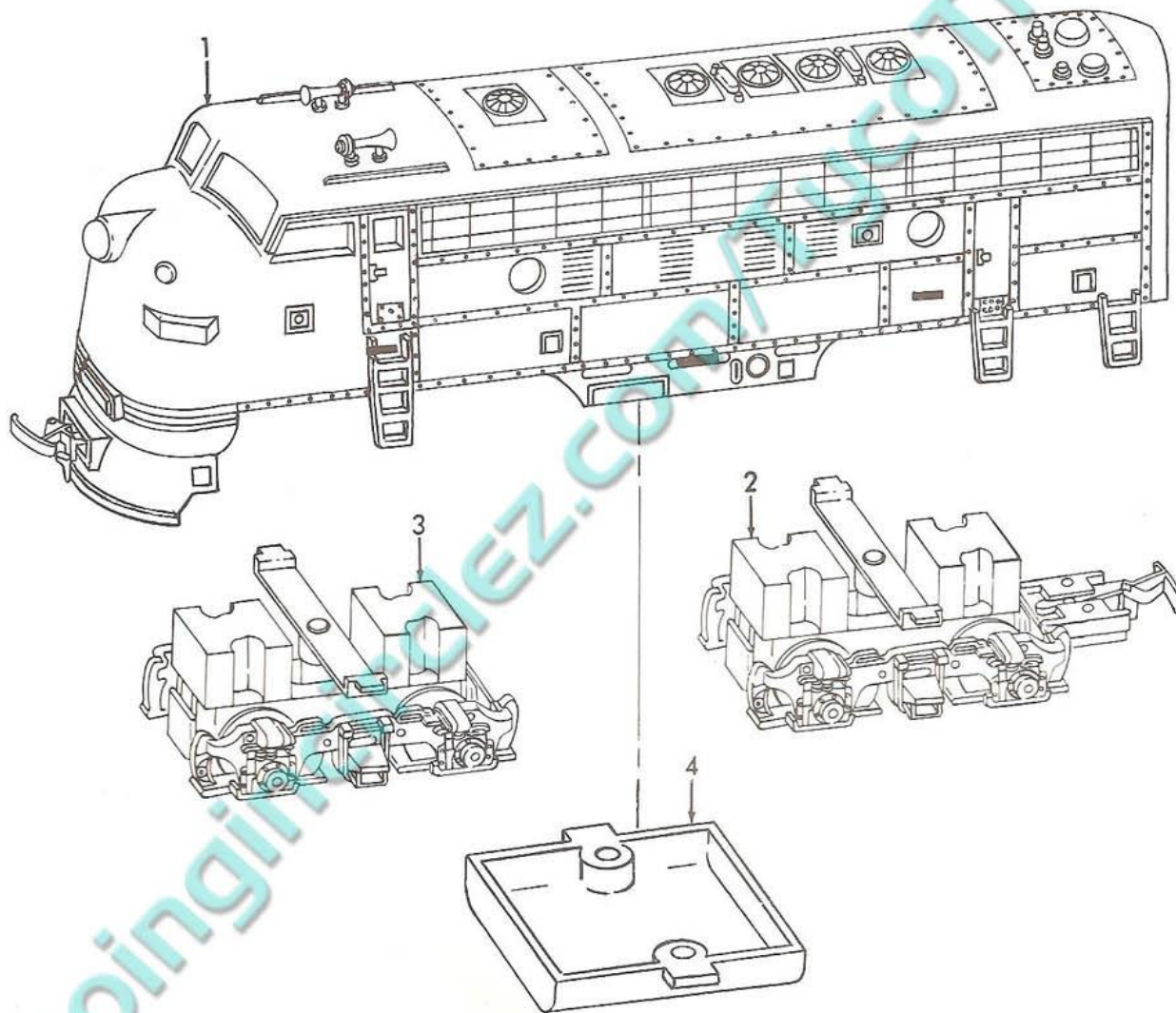


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	50-112-001B	BODY ASSEMBLY
2	50-121-105C	NON-POWER TRUCK ASSEMBLY W/COUPLER
3	50-121-105D	NON-POWER TRUCK ASSEMBLY W/OUT COUPLER
4	7762 52605	BATTERY HOUSING & FUEL TANK COUPLER REPLACEMENT KIT



MODEL 225 F-9-A (H.K.)

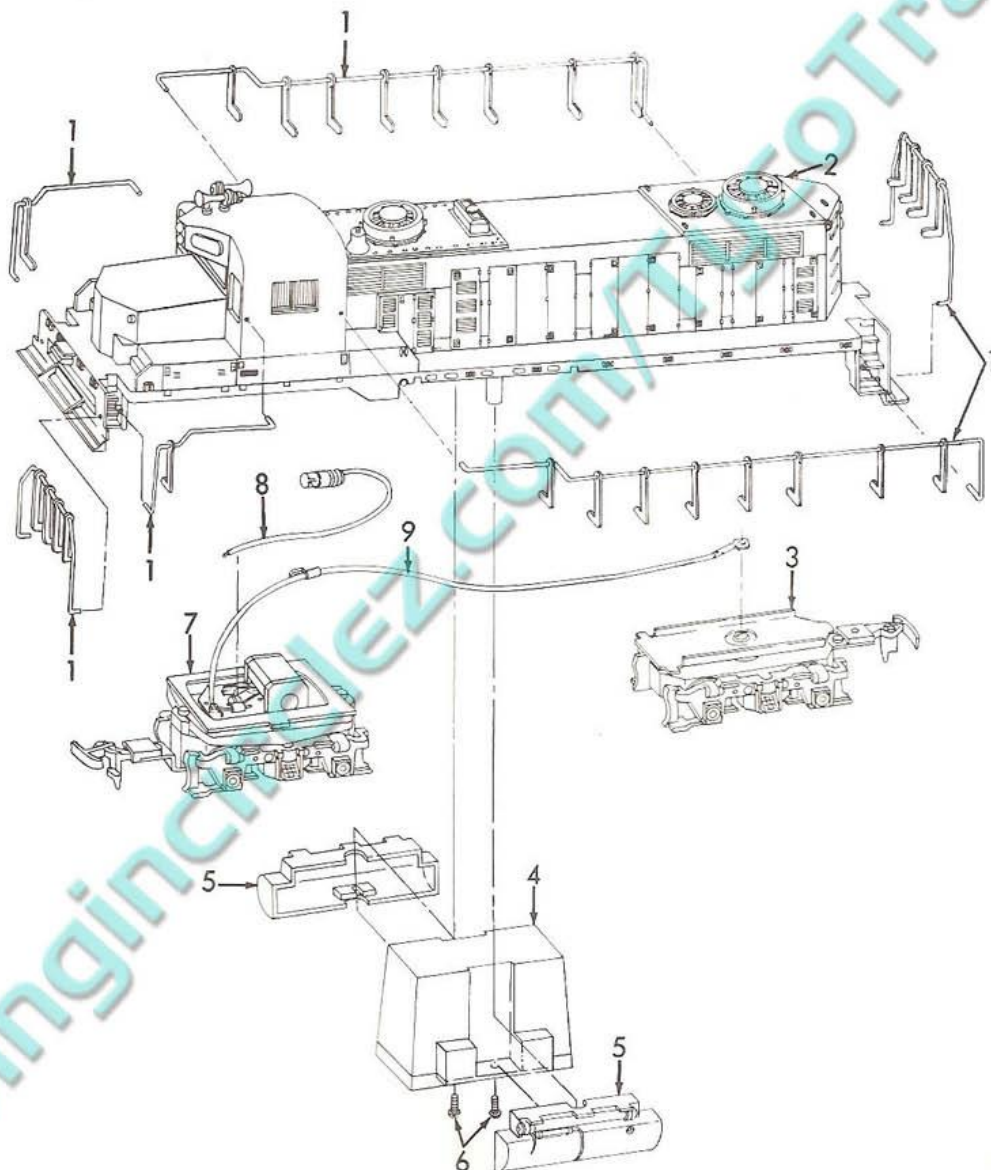


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	17584	HANDRAIL KIT
2	52184	BODY ASSEMBLY
3	54667	NON-POWER TRUCK ASSEMBLY
4	4913	WEIGHT
5	7788	TANK UNIT
6	7487	SCREW 2 x 3/8
7	34848	POWER TRUCK ASSEMBLY
8	5580	LAMP & LEAD ASSEMBLY
9	16772	MOTOR LEAD
	52605	COUPLER REPLACEMENT KIT

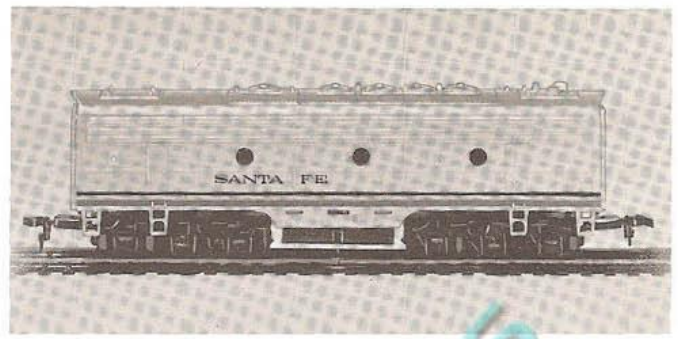


MODEL 228 GP-20

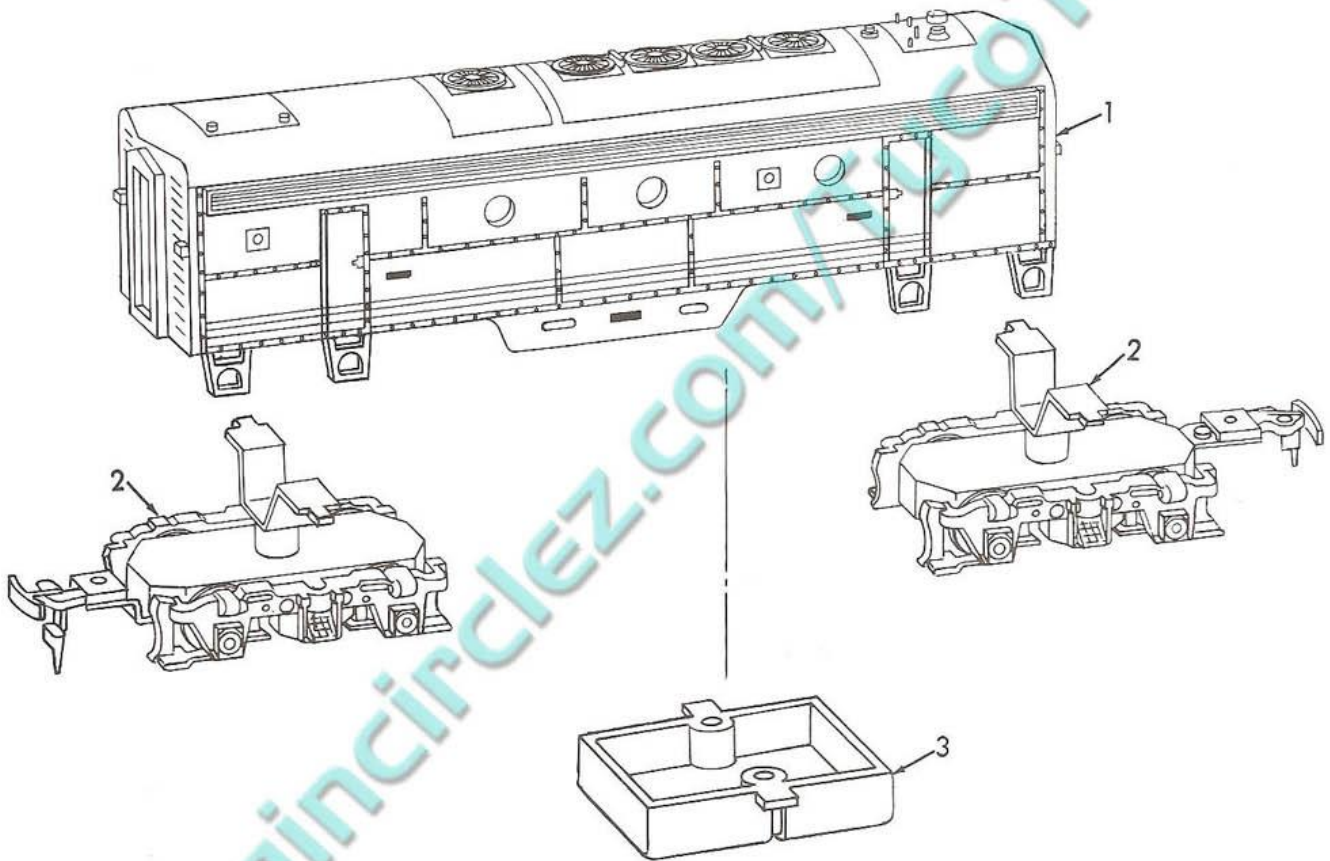


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	2256	BODY ASSEMBLY
2	54668	NON-POWER TRUCK ASSEMBLY W/COUPLER (2)
3	7762 52605	BATTERY HOUSING & FUEL TANK COUPLER REPLACEMENT KIT



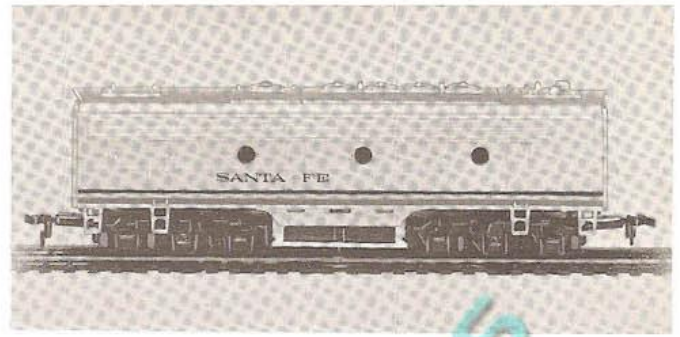
MODEL 230 F-9-B (U.S.)



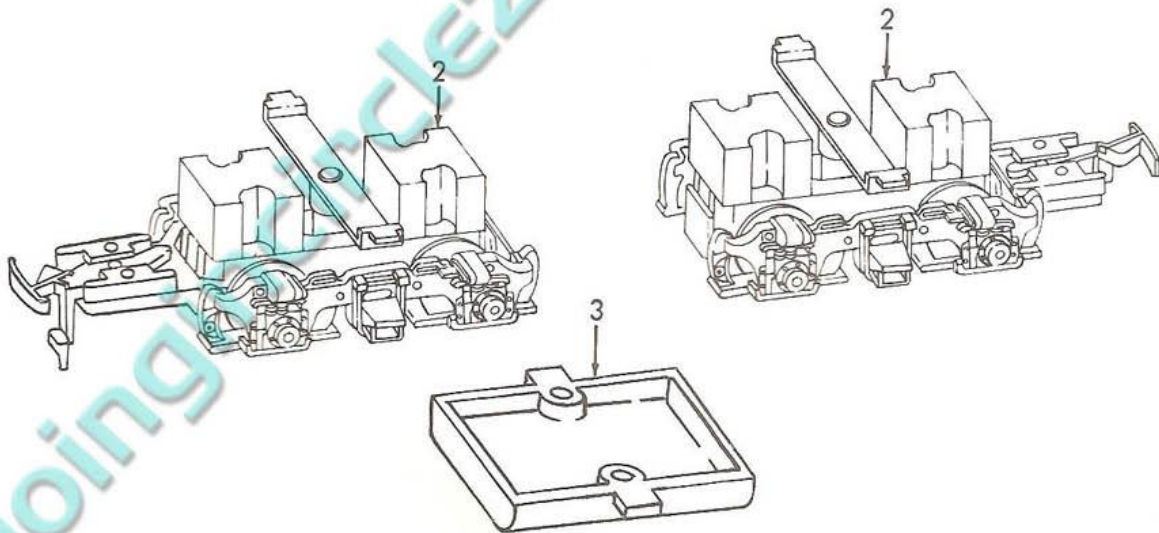
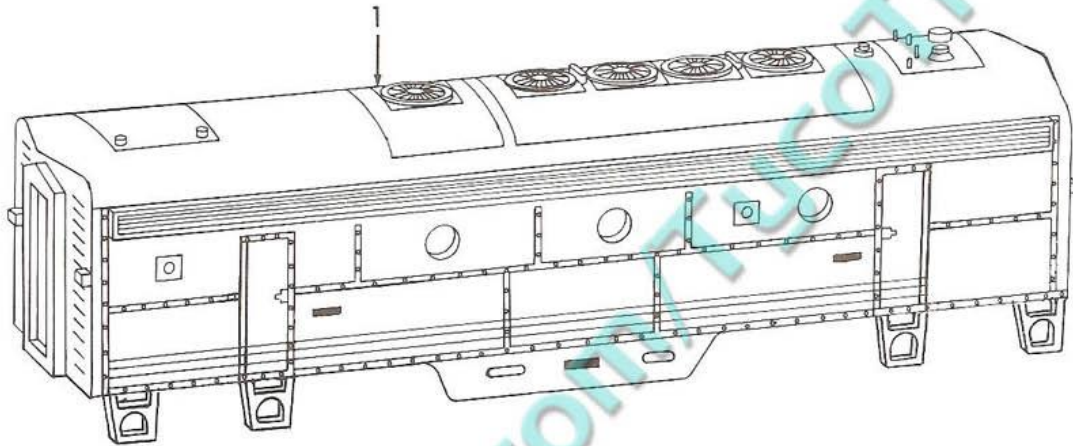
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ITEM	PART NO.	DESCRIPTION
1	50-112-002	BODY ASSEMBLY
2	50-121-105C	NON-POWER TRUCK (2)
3	7762	BATTERY HOUSING & FUEL TANK
	52605	COUPLER REPLACEMENT KIT



MODEL 230 F-9-B (H.K.)

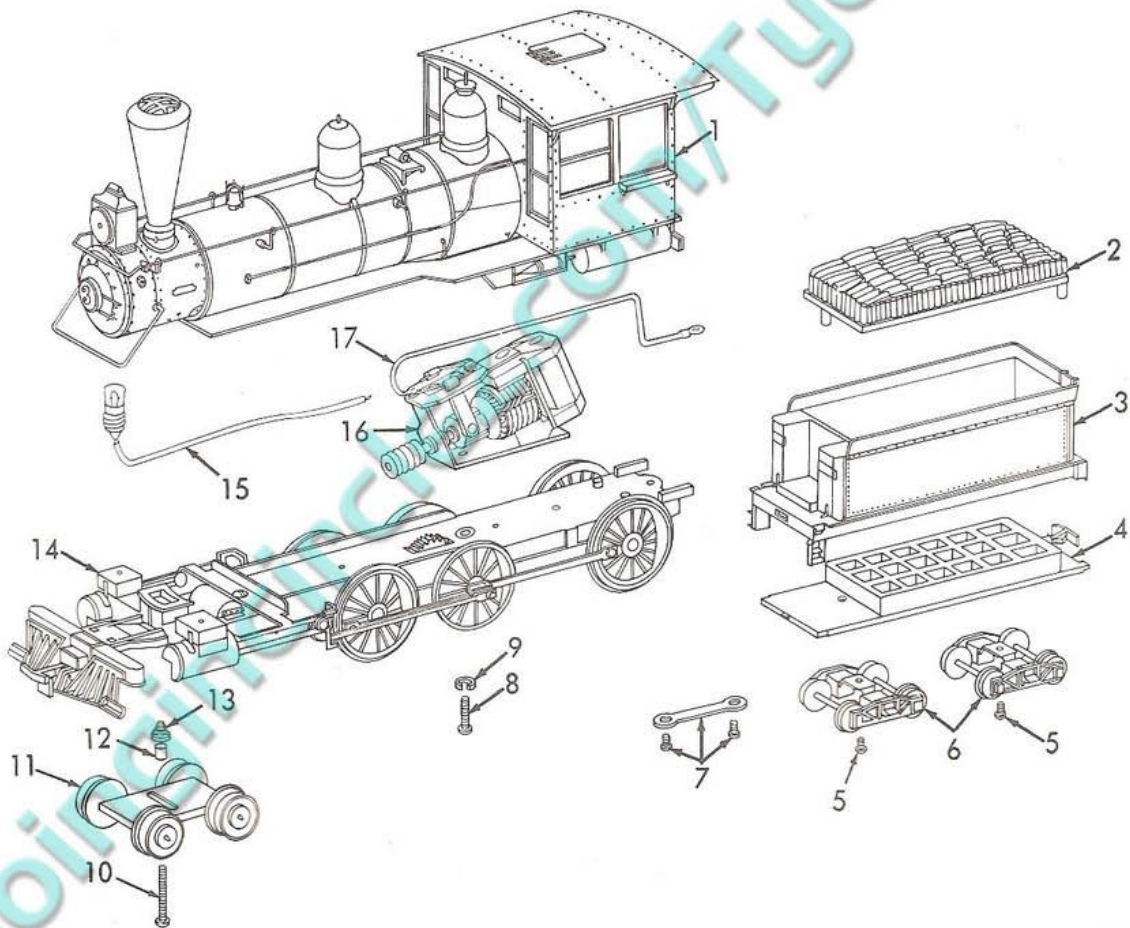


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	52323	BOILER & CAB ASSEMBLY
2	7921	WOOD PILE
3	2289	TENDER BODY
4	3273	FRAME
5	7494	SCREW 2-56 x 3/16
6	34882	TRUCKS (PR)
7	56618	DRAWBAR REPLACEMENT KIT
8	7502	SCREW 2-56 x 7/16 R.H.
9	7573	WASHER, LOCK
10	7501	SCREW 2-56 x 13/16 R.H.
11	24731	LEAD TRUCK ASSEMBLY
12	6938	SPACER
13	7008	SPRING
14	53197	CHASSIS ASSEMBLY
15	5547	LAMP & LEAD ASSEMBLY
16	33578	MOTOR ASSEMBLY
17	16757	LEAD & LUG ASSEMBLY
	52606	COUPLER REPLACEMENT KIT



MODEL 233 "1890" LOCO

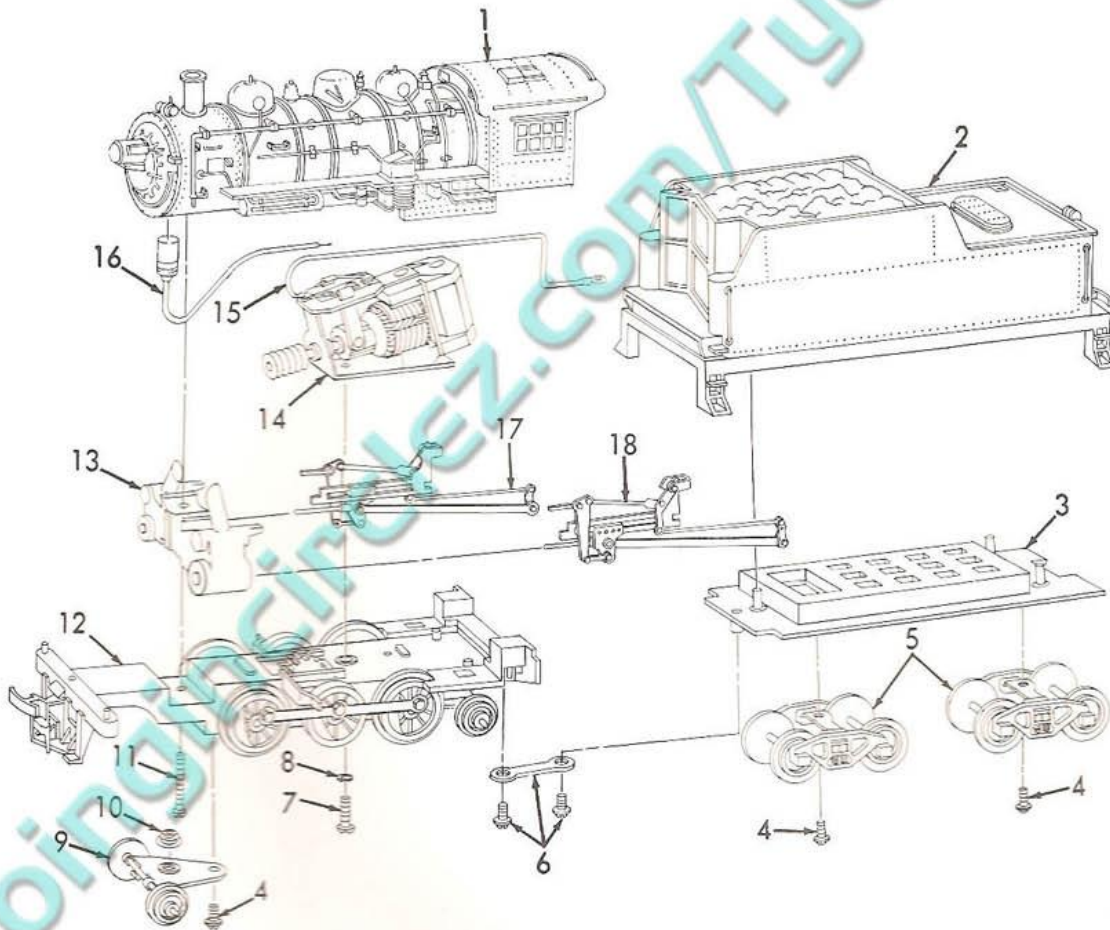


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ITEM	PART NO.	DESCRIPTION
1	52324	BOILER & CAB ASSEMBLY
2	2292	TENDER BODY
3	3285	FRAME
4	7494	SCREW 2-56 x 3/16
5	34803	TRUCKS (PR)
6	56618	DRAWBAR REPLACEMENT KIT
7	7281	SCREW 2-56 x 3/8 R.H.
8	7573	WASHER, LOCK
9	24691	LEAD TRUCK ASSEMBLY
10	7008	SPRING, CONICAL
11	7501	SCREW 2-56 x 13/16 R.H. S.T.
12	53196	CHASSIS ASSEMBLY
13	2656	CYLINDER UNIT
14	33578	MOTOR ASSEMBLY
15	16757	LEAD & LUG ASSEMBLY
16	5547	LAMP & LEAD ASSEMBLY
17	18496	VALVE GEAR ASSEMBLY, R.H.
18	18495	VALVE GEAR ASSEMBLY, L.H.
	56618	COUPLER REPLACEMENT KIT

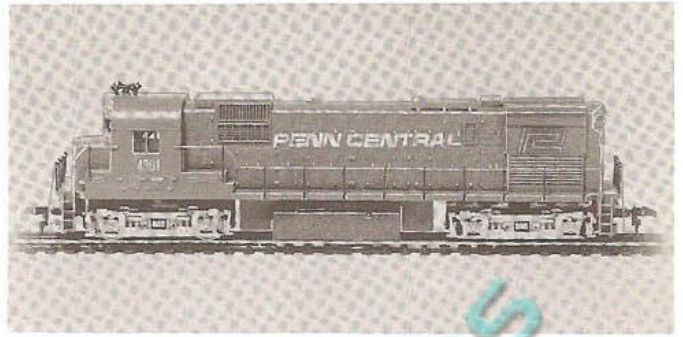


MODEL 234 PRAIRIE

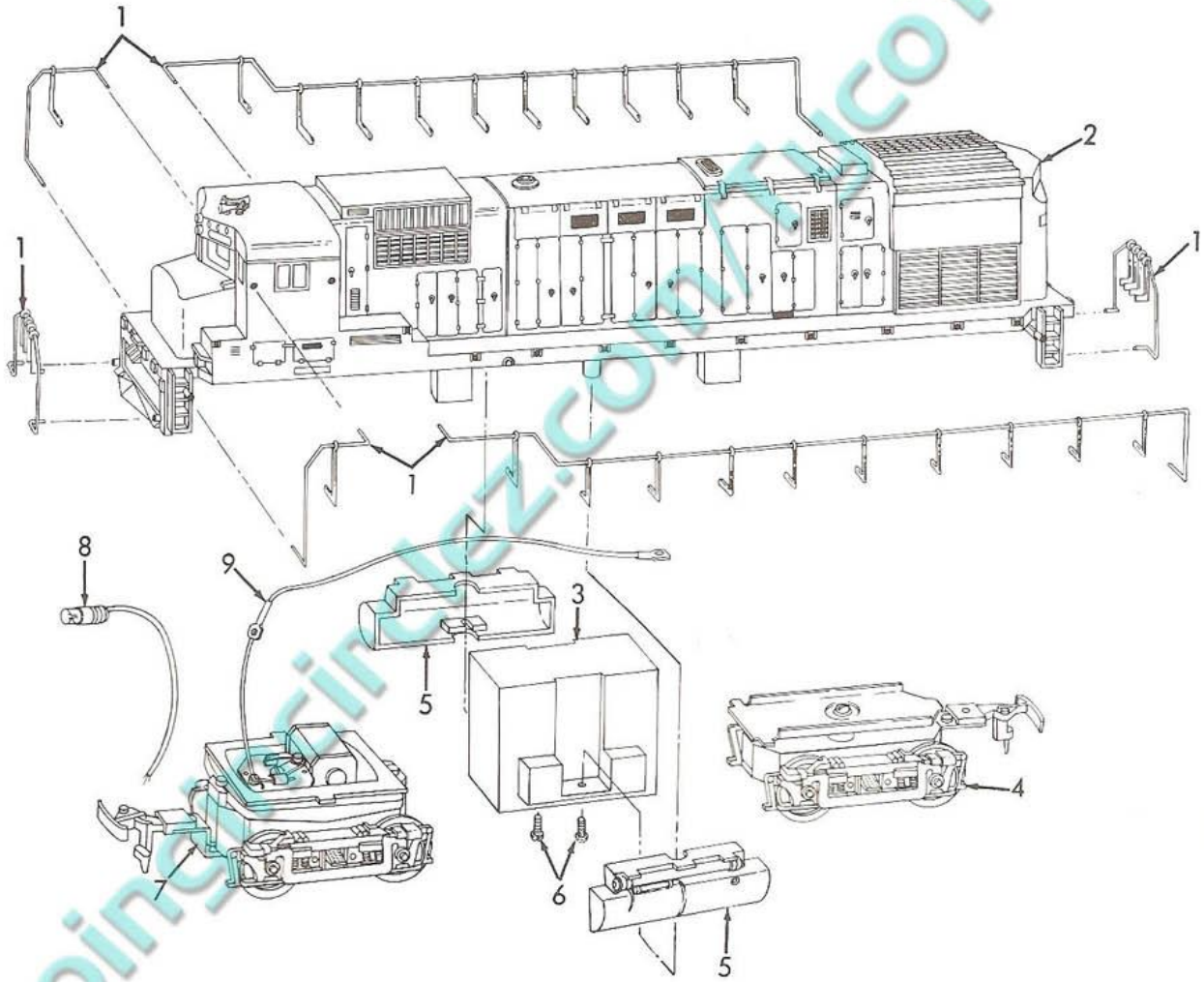


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	17555	HANDRAIL KIT
2	52183	BODY ASSEMBLY
3	4913	WEIGHT
4	54666	NON-POWER TRUCK ASSEMBLY
5	7788	TANK UNIT
6	7487	SCREWS 2 x 3/8
7	34694	POWER TRUCK ASSEMBLY
8	5580	LAMP & LEAD ASSEMBLY
9	17942	MOTOR LEAD
	52605	COUPLER REPLACEMENT KIT

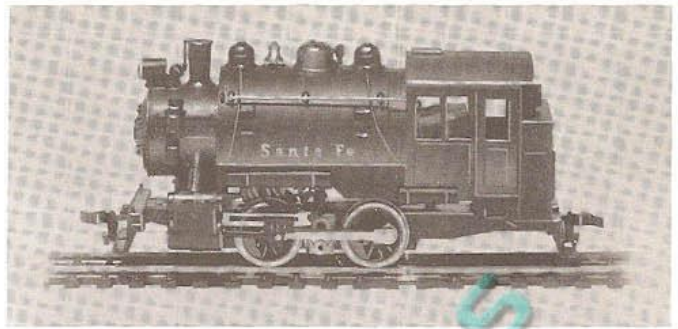


MODEL 235 ALCO 430

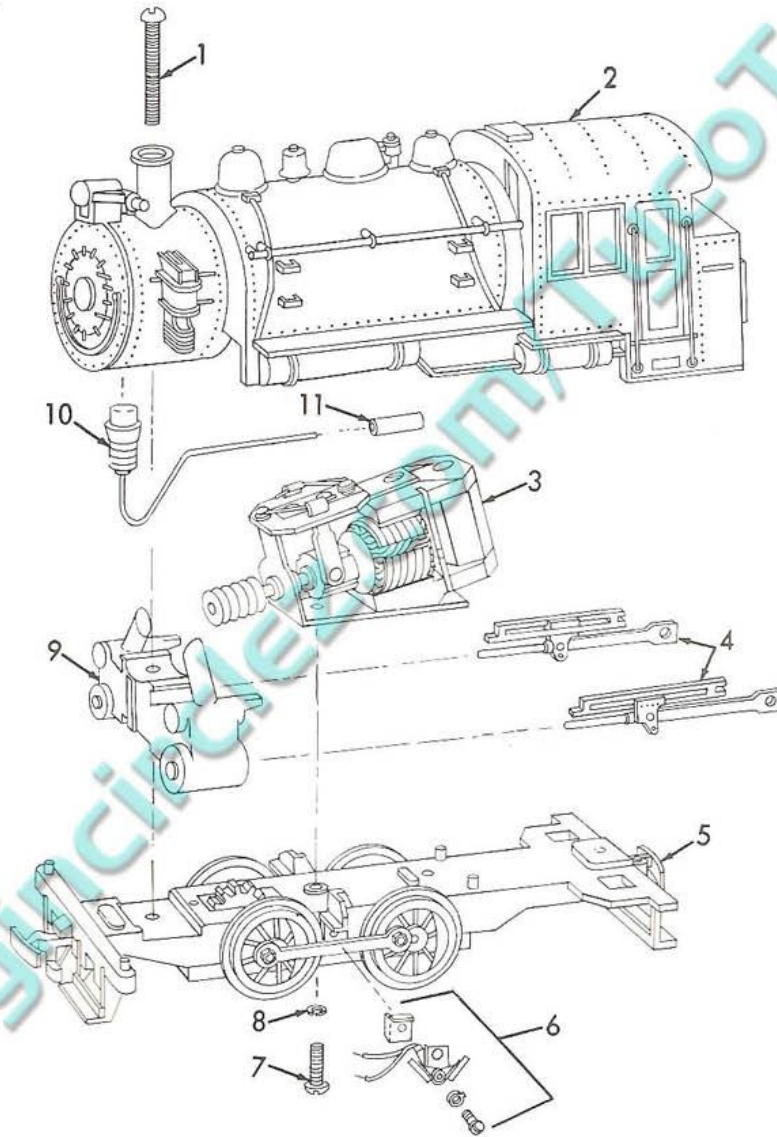


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ITEM	PART NO.	DESCRIPTION
1	7501	SCREW 2-56 x 13/16 R.H.
2	52325	BODY ASSEMBLY
3	33578	MOTOR ASSEMBLY
4	58499	CROSSHEAD ASSEMBLY (PR)
5	53195	CHASSIS ASSEMBLY
6	57877	PICK-UP ASSEMBLY
7	7281	SCREW 2-56 x 3/8 R.H.
8	7573	WASHER, LOCK
9	2658	CYLINDER UNIT
10	5547	LAMP & LEAD ASSEMBLY
11	7811	SLEEVE INSULATOR
	52606	COUPLER REPLACEMENT KIT



MODEL 237 BOOSTER II

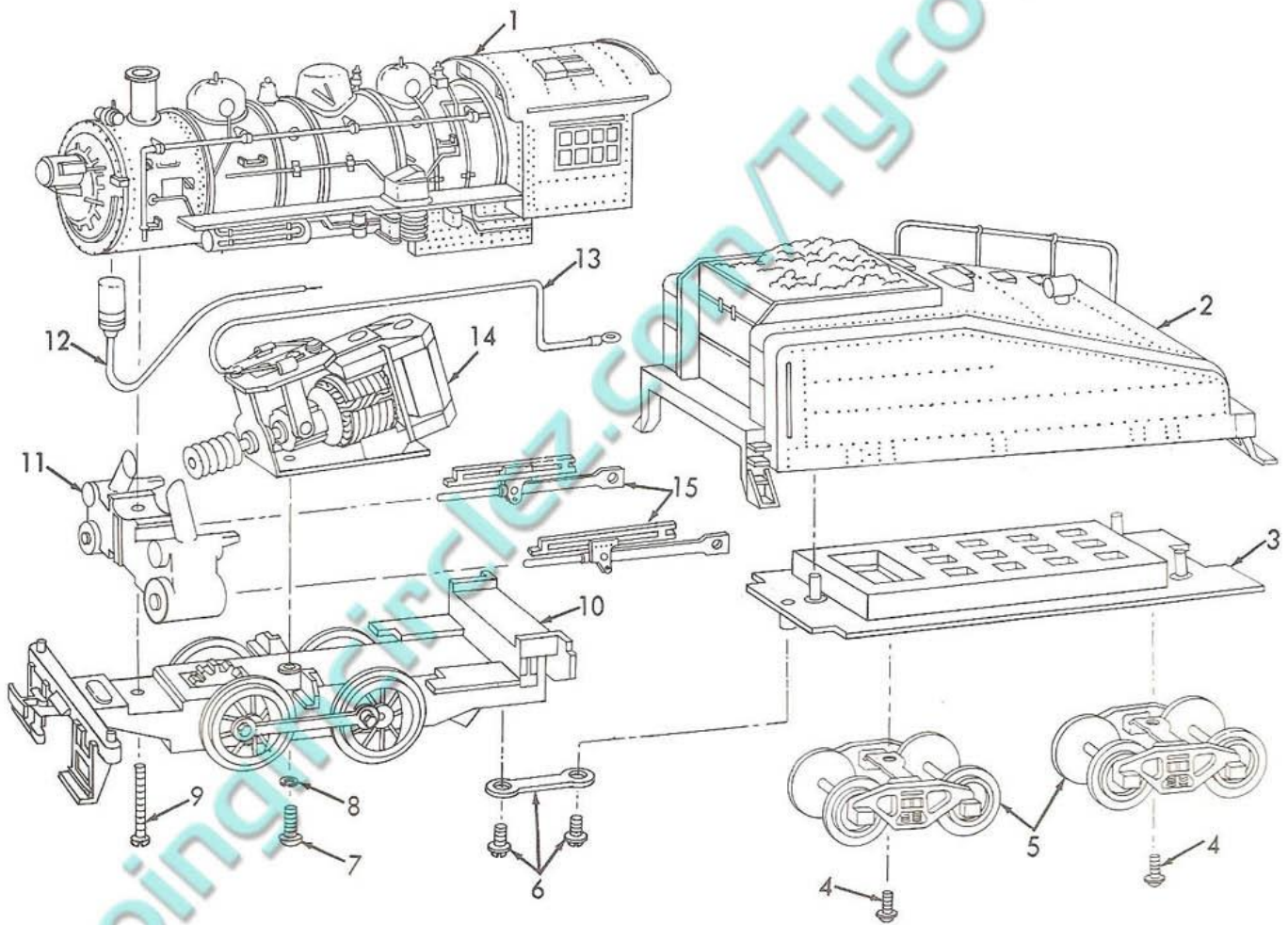


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ITEM	PART NO.	DESCRIPTION
1	52326	BOILER & CAB ASSEMBLY
2	52181	TENDER BODY ASSEMBLY
3	3276	FRAME
4	7494	SCREW 2-56 x 3/16
5	34803	TRUCK (PR)
6	56618	DRAWBAR ASSEMBLY KIT
7	7281	SCREW 2-56 x 3/8
8	7573	WASHER, LOCK
9	7501	SCREW 2-56 x 13/16 R.H.
10	53194	CHASSIS ASSEMBLY
11	2656	CYLINDER UNIT
12	5547	LAMP & LEAD ASSEMBLY
13	16757	MOTOR LEAD & LUG
14	33578	MOTOR ASSEMBLY
15	58499	CROSSHEAD ASSEMBLY
	52606	COUPLER REPLACEMENT KIT



MODEL 238 SHIFTER II

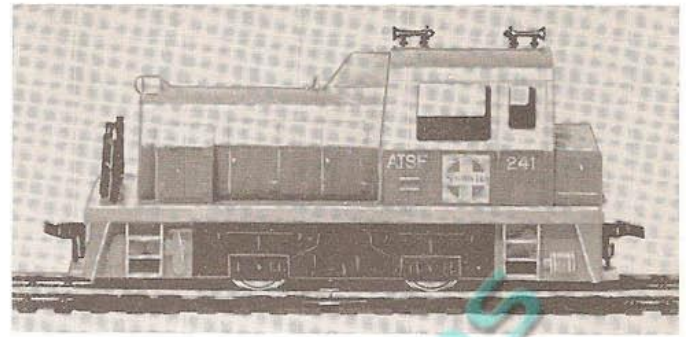


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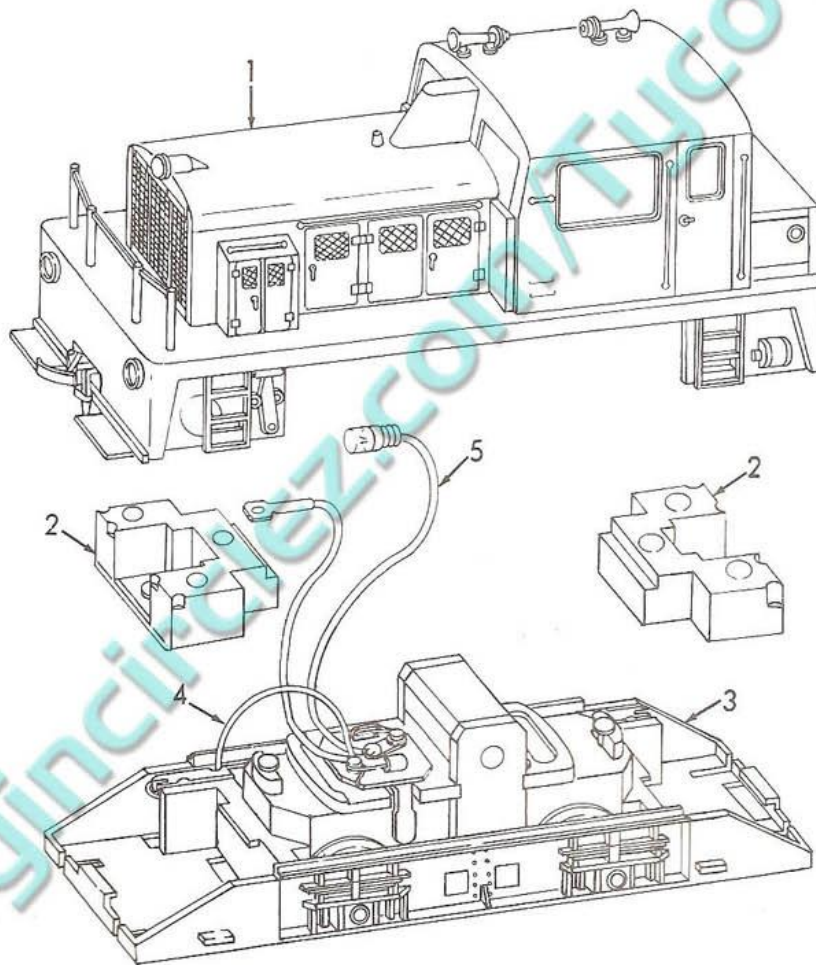
TYCO
INDUSTRIES

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RESPONSIVE TO CONSUMER NEEDS

ITEM	PART NO.	DESCRIPTION
1	52182	BODY ASSEMBLY
2	4429	WEIGHTS
3	94673	POWER TRUCK ASSEMBLY
4	8271	PICK-UP
5	5574	LAMP & LEAD ASSEMBLY
	52605	COUPLER REPLACEMENT KIT

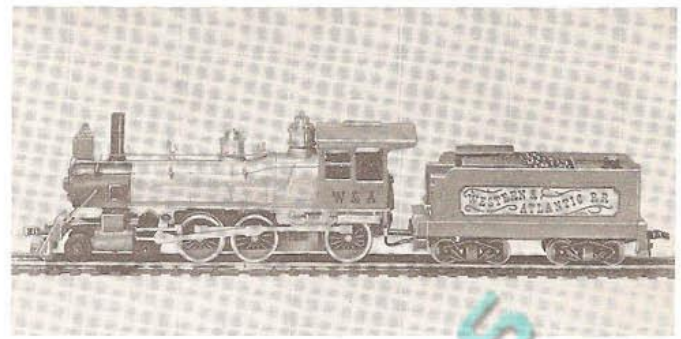


MODEL 241 SWITCHER

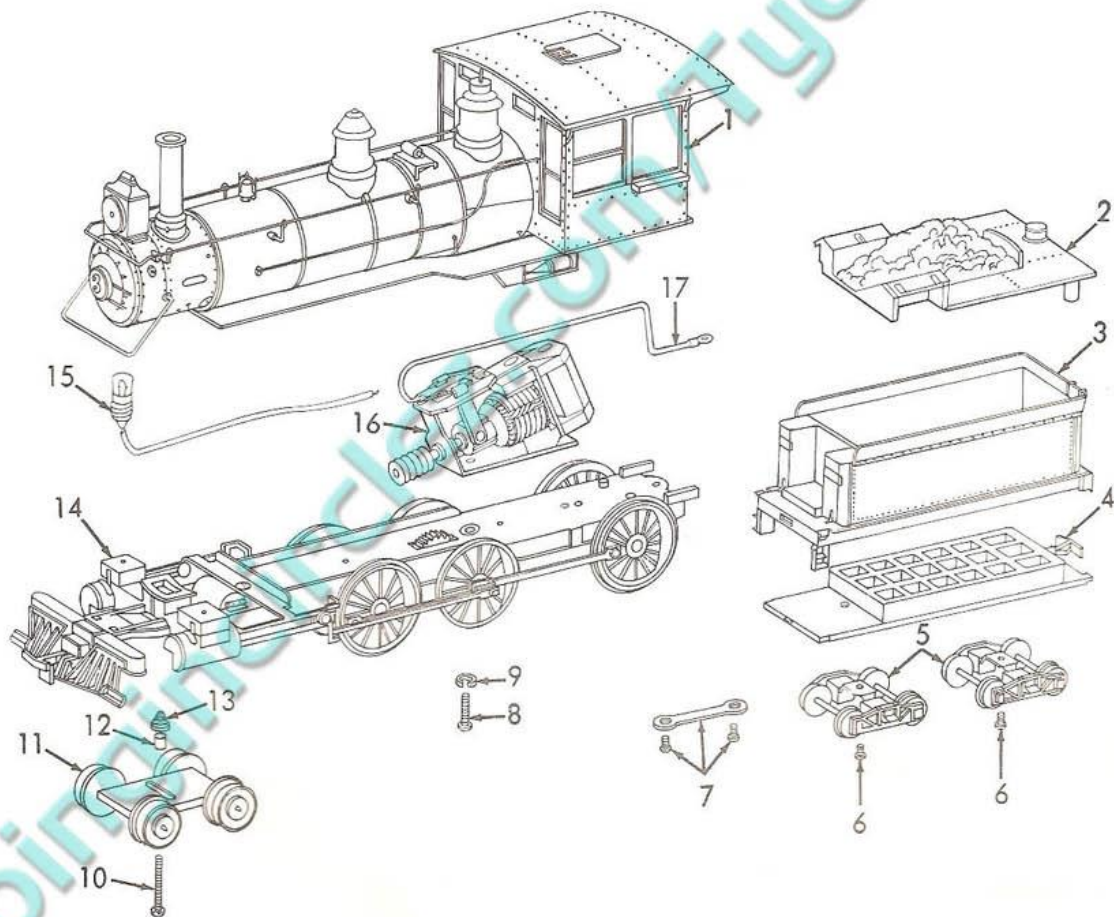


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	52327	BOILER & CAB ASSEMBLY
2	7922	COAL PILE
3	2289	BODY, TENDER
4	3273	FRAME
5	34882	TRUCKS (PR)
6	7494	SCREW 2-56 x 3/16
7	56618	DRAWBAR REPLACEMENT KIT
8	7502	SCREW 2-56 x 7/16
9	7573	LOCKWASHER
10	7501	SCREW 2-56 x 13/16 R.H.
11	24731	LEAD TRUCK ASSEMBLY
12	6938	SPACER
13	7008	SPRING
14	53193	CHASSIS ASSEMBLY
15	5547	LAMP & LEAD ASSEMBLY
16	33578	MOTOR ASSEMBLY
17	16757	MOTOR LEAD & LUG ASSEMBLY
	56618	COUPLER REPLACEMENT KIT



MODEL 242 DIXIE BELLE



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REPLACEMENT UNITS

<u>Qty/ Pack</u>	<u>Model No.</u>	<u>Description</u>	<u>Price/ Pack</u>
1	208A	Mikado - Pennsylvania	\$32.00
1	208C	Mikado - Santa Fe	32.00
1	212B	Pacific - Baltimore & Ohio (Black)	30.00
1	212D	Pacific - Union Pacific	30.00
1	212G	Pacific - Baltimore & Ohio (Blue)	30.00
1	212H	Pacific - Canadian Pacific	30.00
1	212F	Pacific - Southern Crescent Ltd.	30.00
1	214B	Trolley - Main Street	10.00
1	214D	Trolley - Nob Hill	10.00
1	214E	Trolley - Wabash Avenue	10.00
1	214G	Trolley - Broadway	10.00
1	224A	F-9-A - Baltimore & Ohio	13.00
1	224B	F-9-A - Canadian Pacific	13.00
1	224D	F-9-A - Santa Fe (Freight)	13.00
1	224H	F-9-A - Santa Fe (Pass)	13.00
1	224K	F-9-A - Canadian National	13.00
1	224N	F-9-A - Union Pacific	13.00
1	224R	F-9-A - Penn Central	13.00
1	224T	F-9-A - Canadian Pacific Rail	13.00
1	224U	F-9-A - Amtrak	13.00
1	225A	F-9-A - Dummy Baltimore & Ohio	5.00
1	225D	F-9-A - Dummy Santa Fe	5.00
1	225H	F-9-A - Dummy Santa Fe (Pass)	5.00
1	225N	F-9-A - Dummy Union Pacific	5.00
1	225R	F-9-A - Dummy Penn Central	5.00
1	225T	F-9-A - Dummy Canadian Pacific Rail	5.00
1	228A	GP-20 - Burlington	15.00
1	228B	GP-20 - Santa Fe	15.00
1	228C	GP-20 - Union Pacific	15.00
1	228K	GP-20 - Canadian National	15.00
1	228L	GP-20 - Penn Central	15.00
1	228M	GP-20 - Illinois Central	15.00
1	230A	F-9-B - Baltimore & Ohio	5.00
1	230D	F-9-B - Santa Fe	5.00
1	230H	F-9-B - Santa Fe (Pass)	5.00
1	230K	F-9-B - Canadian National	5.00
1	230R	F-9-B - Penn Central	5.00
1	233A	1890 - Pennsylvania	25.00
1	233B	1890 - Santa Fe	25.00
1	234A	Prairie - Pennsylvania	25.00
1	234B	Prairie - Santa Fe	25.00
1	235A	Alco 430 - Burlington	18.00
1	235C	Alco 430 - Santa Fe	18.00
1	235D	Alco 430 - Canadian National	18.00
1	235G	Alco 430 - Penn Central	18.00
1	235J	Alco 430 - Illinois Central Gulf	18.00
1	235K	Alco 430 - Chessie System	18.00
1	235L	Alco 430 - S00 Line	18.00

REPLACEMENT UNITS

<u>Qty/ Pack</u>	<u>Model No.</u>	<u>Description</u>	<u>Price/ Pack</u>
1	237A	Booster - New York Central	14.00
1	237C	Booster - Santa Fe	14.00
1	237D	Booster - Canadian National	14.00
1	238A	Shifter - Pennsylvania	18.00
1	238C	Shifter - Santa Fe	18.00
1	241A	Switcher - Penn Central	11.00
1	241C	Switcher - Santa Fe (Pass)	11.00
1	241D	Switcher - Canadian Pacific Rail	11.00
1	242A	Dixie Belle - Western & Atlantic	25.00
1	243A	Alco 630 - Illinois Central Gulf	19.00
1	243B	Alco 630 - Santa Fe (Pass)	19.00
1	243C	Alco 630 - Chessie System	19.00
1	243D	Alco 630 - Delaware & Hudson	19.00
1	244	Spirit '76 - Seaboard Coast Line	18.00

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SERVICE INSTRUCTIONS

1.0 SCOPE

This manual provides service instructions and parts identification for TYCOPRO Electric Racing Cars. The service instructions include parts removal and replacement, troubleshooting, cleaning and lubrication. Each item is illustrated showing its various assemblies in an exploded view. Callouts on each exploded view indicate the location of replacement parts and these parts are listed in a table which gives the part number and name of each. Illustrations and data for various racing cars are arranged in numerical order by model number.

2.0 SERVICE PROCEDURE

The following procedure should be followed whenever an item is returned for repair:

a. Identify the racing car series with illustrations of the electrical pick-up system below.



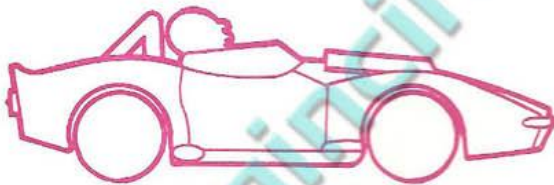
8800 SERIES



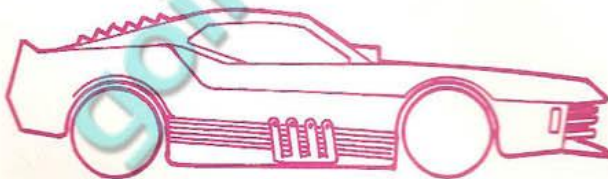
8600 SERIES

FIGURE 1

b. Determine wheel base of racing car by placing racing car on diagrams below:



1.5" CHASSIS



1.7" CHASSIS

FIGURE 2

c. Determine the nature of the customer's complaint and reason the item has been returned.

d. Attempt to operate the item to make certain that it is actually defective and that the customer's trouble is not a faulty track or power supply. During this operation, look for additional faults not mentioned by the customer.

e. Based upon the problem discovered, use the troubleshooting chart to assist in localizing the cause of the malfunction. Isolate the trouble by examination, testing and, if necessary, a process of elimination.

f. Remove the defective part, using removal and replacement procedures in this manual. Identify the part on the exploded view and determine its part number from the parts list table. Replace the defective part with a new one from stock.

g. Clean and lubricate the item in accordance with the procedures given in this manual.

h. Operate the item again to make certain the repair is complete and the item is in good mechanical condition.

3.0 REMOVAL AND REPLACEMENT

3.1 ACCESSIBILITY—CARS

The body snaps onto the chassis. To remove, turn car upside down. Hold outside of rear wheels securely between the thumb and the first finger of your left hand. Place the blade of a small screwdriver inside the rearward edge of the front wheel well of car body. Press outward and downward on car body with screwdriver blade, and at the same time, twist rear wheels upward with your left hand. Body will snap apart from chassis.

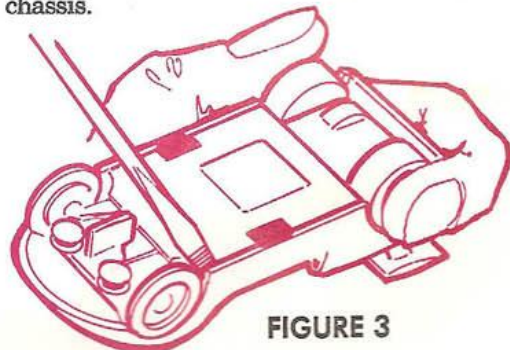


FIGURE 3

SERVICE INSTRUCTIONS

3.2 REAR AXLE AND CROWN GEAR REPLACEMENT

Gently pry rear axle and crown gear assembly up and out with small screwdriver. Snap new assembly in. Gently turn rear wheels, to be sure nothing is binding. If one of the wheel hubs is binding against the chassis, slide wheel outwards on axle. If pinion and gear are binding, press pinion onto motor shaft.

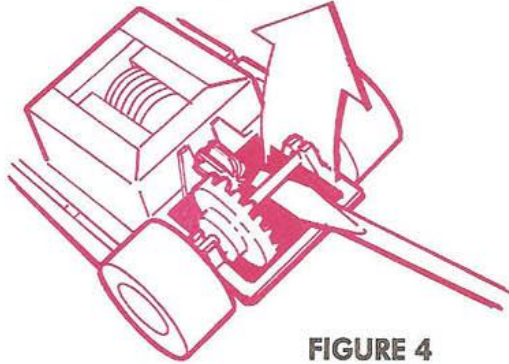


FIGURE 4

3.3 MOTOR REPLACEMENT

To gain access to the motor, follow the procedure outlined in paragraph 3.1 and 3.2. Remove the motor by snapping the gear end of motor upward. To install new motor, place front of motor in position with electrical pick-up terminals contacting brass motor-brush tubes and magnet "colors" upward. Snap rear end of motor down in place. Replace rear axle assembly.

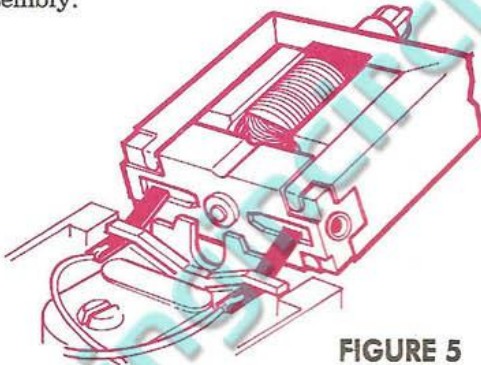


FIGURE 5

Should unit not operate, check to insure that the pick-up terminals are in firm contact with the motor-brush tubes.

3.4 TIRE REPLACEMENT

3.4.1 REAR TIRE REPLACEMENT

To remove rear tires, grasp old tire with thumb and forefinger and pull off. To replace, press tire onto hub

until tire is fully seated. Exercise caution to insure that edge of tire which slips onto hub does not fold under or tear.

3.4.2 FRONT TIRE REPLACEMENT

Press tabs on front axle together and slide tire and hub assembly off. To replace, snap new tire and hub assembly on, with hub to inside.

3.5 PICK-UP REPLACEMENT

Identify series from illustrations in figure 1. Although 8800 series wipers may be replaced with an 8600 series pick-up and guide shoe assembly, the 8800 series wipers are available for those customers who desire them.

3.5.1 8800 SERIES WIPER REPLACEMENT

Replacement wipers are supplied as a single unit, consisting of the wiper itself, lead wire, and terminal, which is at the other end of the wire. To remove old wipers, first remove the motor (see paragraph 3.3). Use fingers to carefully lift arm retaining terminals. With tweezers, loosen terminals from mounting post on bottom of retainer arm and pull straight out. With tweezers, push wipers forward from rear, out of their retaining boxes on guide shoe.

To install new wipers, first slide wipers into place on guide shoe until they lock into place, then insert terminals through slots on chassis until they lock into place. Make sure leads are crossed (right wiper connects to left side of motor, left wiper to right). Bend rear portion of terminals slightly upwards. Place front of motor in position with terminals contacting brass motorbrush tubes. Snap rear end of motor in place. Be sure terminals are in contact with motorbrush tubes. **VERY IMPORTANT—SHAPE WIPERS TO THE PROPER ANGLE AND POSITION AS ILLUSTRATED. BE SURE BOTH WIPERS ARE PARALLEL. DO NOT KINK WIPERS. THIS CAUSES EXTREMELY RAPID WEAR.**

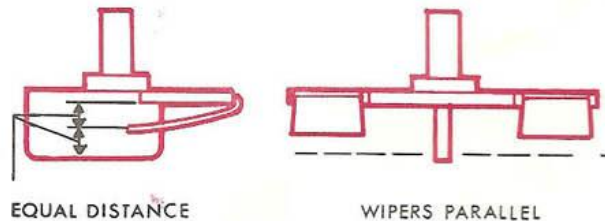


FIGURE 6

SERVICE INSTRUCTIONS

3.5.2 8600 SERIES PICK-UP REPLACEMENT

Replacement pick-ups are supplied as part of the pick-up and guide shoe assembly. To remove old assembly, first remove the motor (see paragraph 3.3), use fingers to lift arm retaining terminals. Use tweezers to loosen terminals from mounting post on bottom of retainer arm and pull straight out. Press prongs which protrude through weight together, and snap pick-up and guide shoe assembly out.

To install new wipers, first snap guide shoe assembly into the weight. Then insert terminals through slots on chassis, until they lock in place. Make sure leads are crossed (right pick-up connects to left side of motor; left pick-up connects to right), bend rear portion of terminal slightly upwards. Place front of motor in position with terminals contacting brass motorbrush tubes. Snap rear end of motor down into place. Replace rear assembly.

3.6 LAMP REPLACEMENT

Replacement lamps are supplied as part of the pick-up and guide shoe assembly Part No. 8858. This assembly is the replacement for all lighted cars. Follow the instructions in paragraph 3.5.1 or 3.5.2 for removal and installation. When installing body on chassis, be sure to insert bulb in light block at front of body first.

4.0 CLEANING

CAUTION

Do not use steel wool for cleaning purposes. Small bits of steel wool will be attracted to the motor magnet and will weaken it.

4.1 ELECTRICAL WIPERS (8800 SERIES)

Turn car upside down. Place a piece of card stock between wiper and guide shoe. Holding long end of card stock against the pan, use pencil eraser to polish contact surface of wiper, polish in one direction only—from front of car toward rear wheels. Repeat this procedure for other wiper. Check wiper shape and angle as illustrated in figure 6.

CAUTION

Use care to avoid bending wipers too severely.

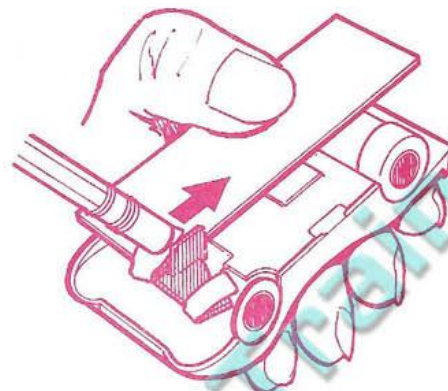


FIGURE 7

4.2 ELECTRICAL PICK-UPS (8600 SERIES)

Turn car upside down. Use pencil eraser to polish contact surface of pick-ups. Use a soft brush to remove dirt or lint from pick-up springs.

4.3 MOTOR

- Remove motor from chassis (see paragraph 3.3).
- Remove dirt from commutator with soft brush or by blowing gently.
- Remove any thread which might have built up on the motor shaft behind the pinion.

4.4 REAR WHEELS

Wipe tire surface with a cloth dampened with water to remove most dust.

5.0 LUBRICATION

Remove chassis from body (see paragraph 3.1) so that motor bearings and gears are accessible. Since the majority of bearing surfaces are molded of self-lubricating plastics, only a very light film of oil is desirable. Light oil should be applied to front axles, rear axle bearings, motor bearings (front and rear) and to the gear teeth only.

CAUTION

Apply lubricant sparingly. Over-lubrication will cause the racing car to pick up dust and lint which will jam the gears.

SERVICE INSTRUCTIONS

1.0 TROUBLESHOOTING

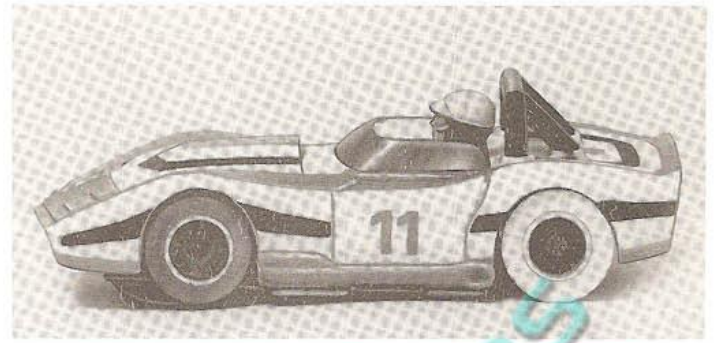
The following chart lists the most common troubles encountered when a racing car is returned for

repair, gives the probable cause of each trouble and indicates the corrective action to be taken.

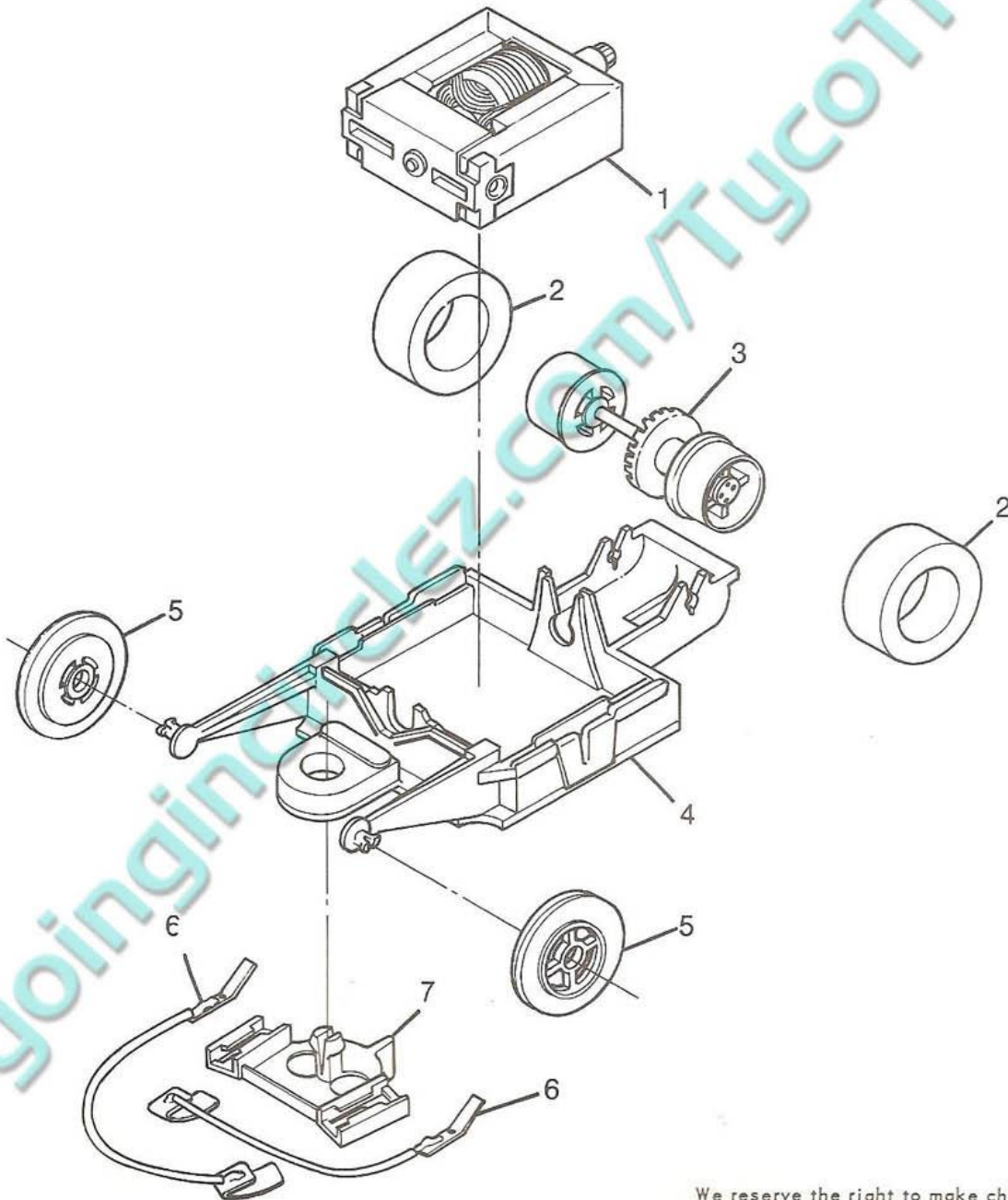
TROUBLESHOOTING CHART		
Trouble	Probable Cause of Trouble	Corrective Action
Headlights don't glow	Burnt-out bulb	Replace
	Broken connection	Repair
Headlights flicker	Poor connection	Repair
	Dirty wipers or pick-ups	Clean
	Short circuit in lamp lead	Replace
	Lamp leads touching shoe weight†	Adjust
Motor will not run	Wiper angle incorrect	Adjust
	Wipers or pick-ups worn out	Replace
	Broken connection to motor	Repair
	Wheel/body interference	Repair
	Gear/wheels binding	Repair
	Burnt-out armature	Replace motor
	Worn-out brushes	Replace motor
	No terminal/brush tube contact	Adjust
Motor runs erratic	Dirty wipers or pick-ups	Clean
	Wiper angle incorrect	Adjust
	Lack of lubrication	Lubricate
	Stripped gear on motor	Replace motor
	Stripped crown gear	Replace rear axle assy.
	Worn brushes	Replace motor
Car runs too fast and deslots easily	Wiper angle too great	Adjust
Car runs slow and erratic	Wiper angle too small	Adjust
Car runs erratic on straights and stalls on either right or left turns	Wipers not parallel	Adjust

ITEM	PART NO.	DESCRIPTION
1	8872	HT-50 MOTOR W/PINION GEAR
2	8889	RTV TIRES (4)
3	8873	REAR AXLE W/CROWN GEAR AND 2 HUBS
	8885	1.5" CHASSIS, PAN AND WEIGHT
5	8877	FRONT TIRE AND HUB ASS'Y. (2)
*6	8887	GUIDE SHOE
*7	8888	WIPER, LEAD AND TERMINAL ASS'Y. (2)

*INTERCHANGEABLE WITH PART NO. 8869



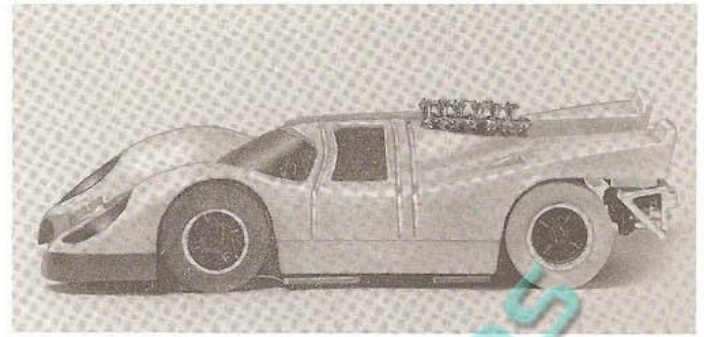
MODEL 8800-8819 SHORT CHASSIS



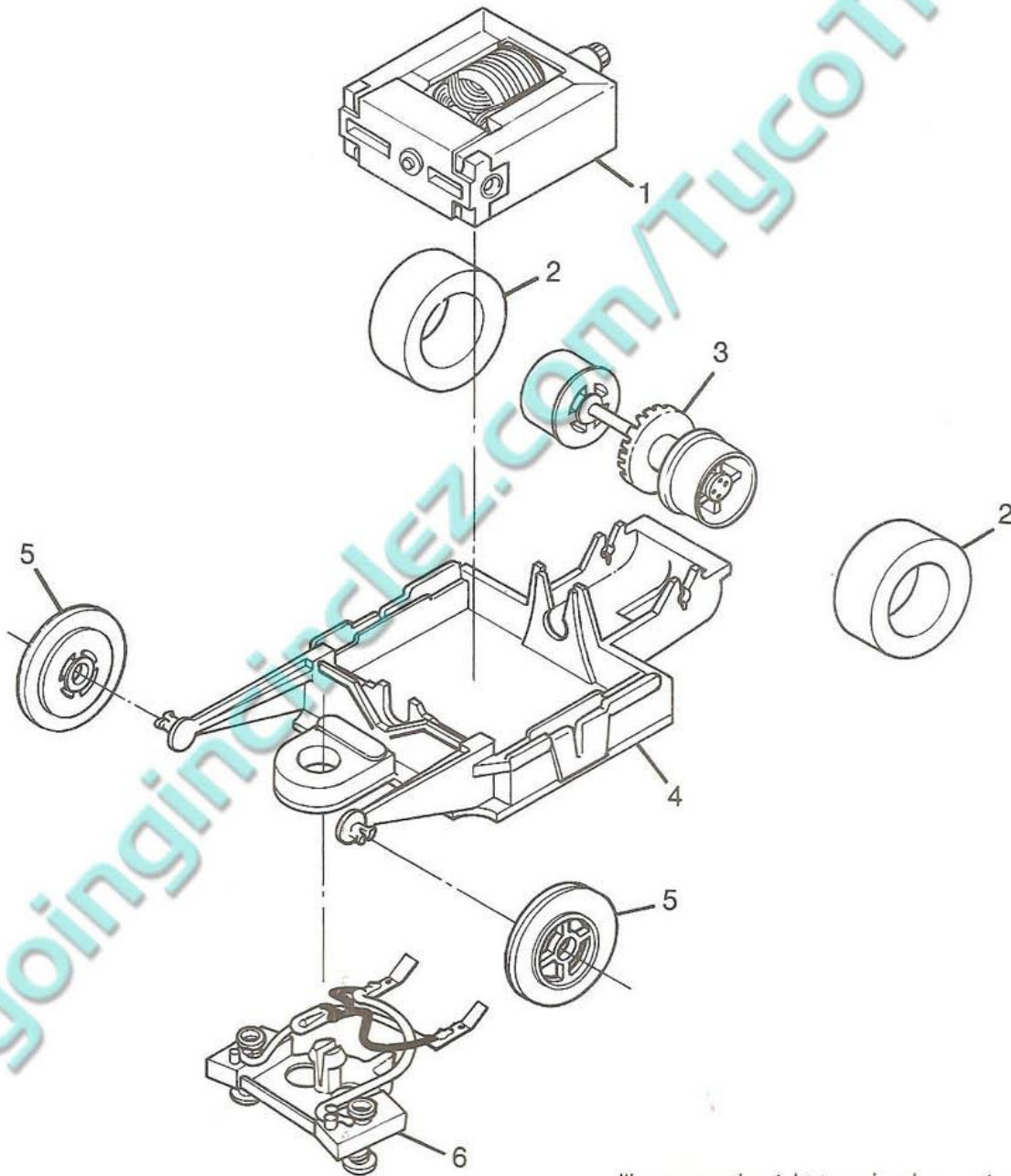
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ITEM	PART NO.	DESCRIPTION
1	8872	HT-50 MOTOR W/PINION GEAR
2	8889	RTV TIRES (4)
3	8891	REAR AXLE W/CROWN GEAR AND 2 HUBS
4	8885	1.5" CHASSIS, PAN AND WEIGHT
5	8877	FRONT TIRE AND HUB ASS'Y. (2)
*6	8858	PICK-UP AND GUIDE SHOE ASS'Y. W/LAMP

*ONLY AVAILABLE WITH 8600 SERIES PICK-UPS



**MODEL 8820-8829
SHORT CHASSIS — LIGHTED**



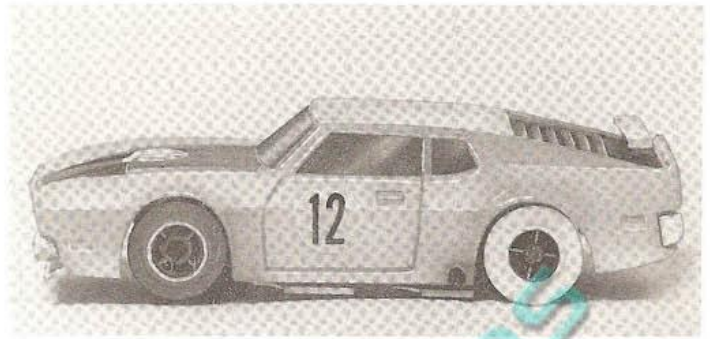
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INDUSTRIES

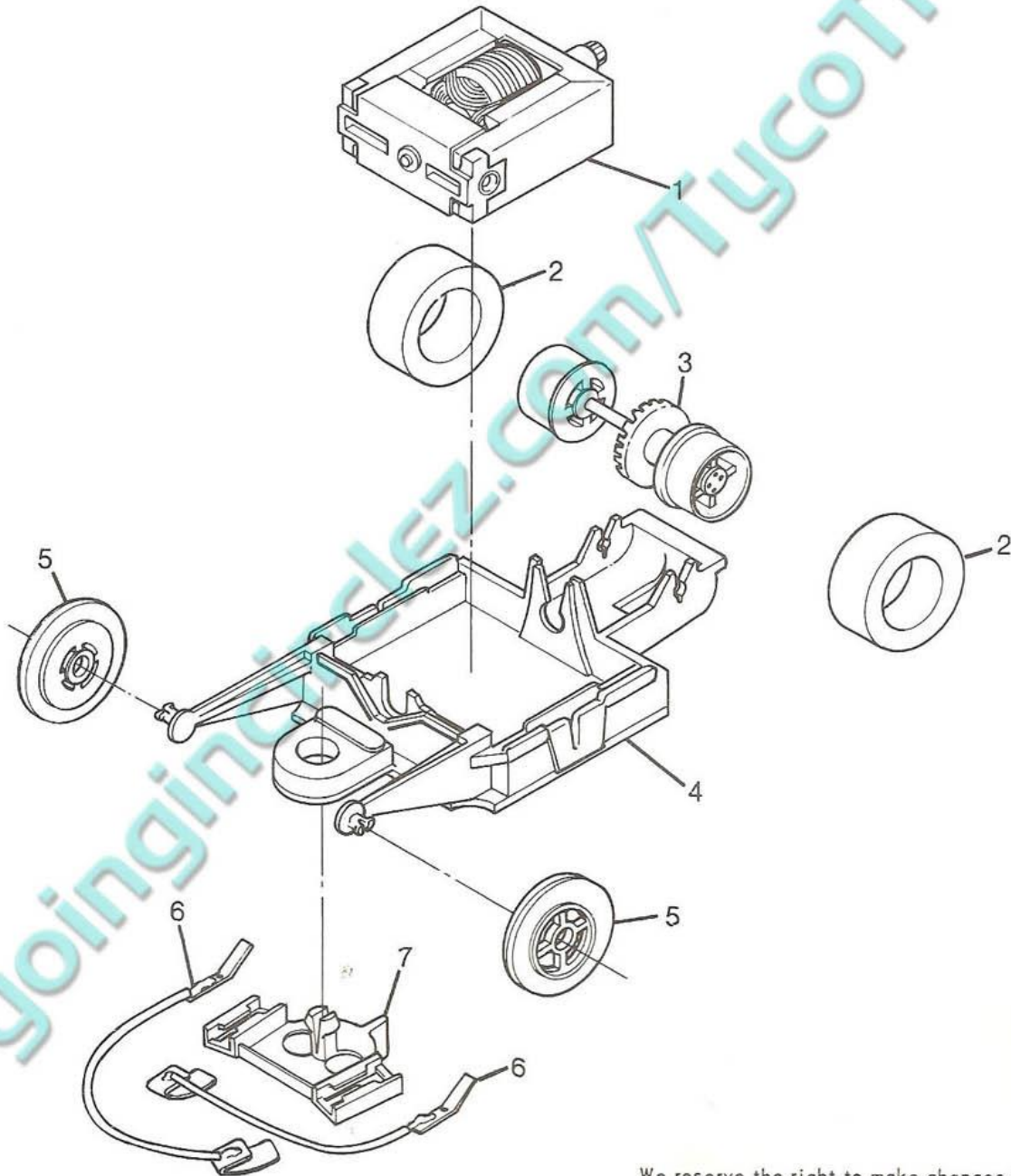
A CONSOLIDATED FOODS COMPANY
RESPONSIVE TO CONSUMER NEEDS

ITEM	PART NO.	DESCRIPTION
1	8872	HT-50 MOTOR W/PINION GEAR
2	8889	RTV TIRES (4)
3	8873	REAR AXLE W/CROWN GEAR AND 2 HUBS
4	8886	1.7" CHASSIS, PAN AND WEIGHT
5	8877	FRONT TIRE AND HUB ASS'Y. (2)
*6	8887	GUIDE SHOE
*7	8888	WIPER, LEAD AND TERMINAL ASS'Y. (2)

*INTERCHANGEABLE WITH PART NO. 8869

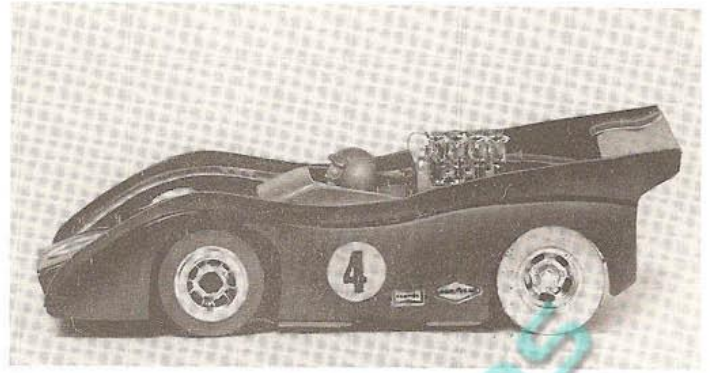


MODEL 8830-8839 LONG CHASSIS

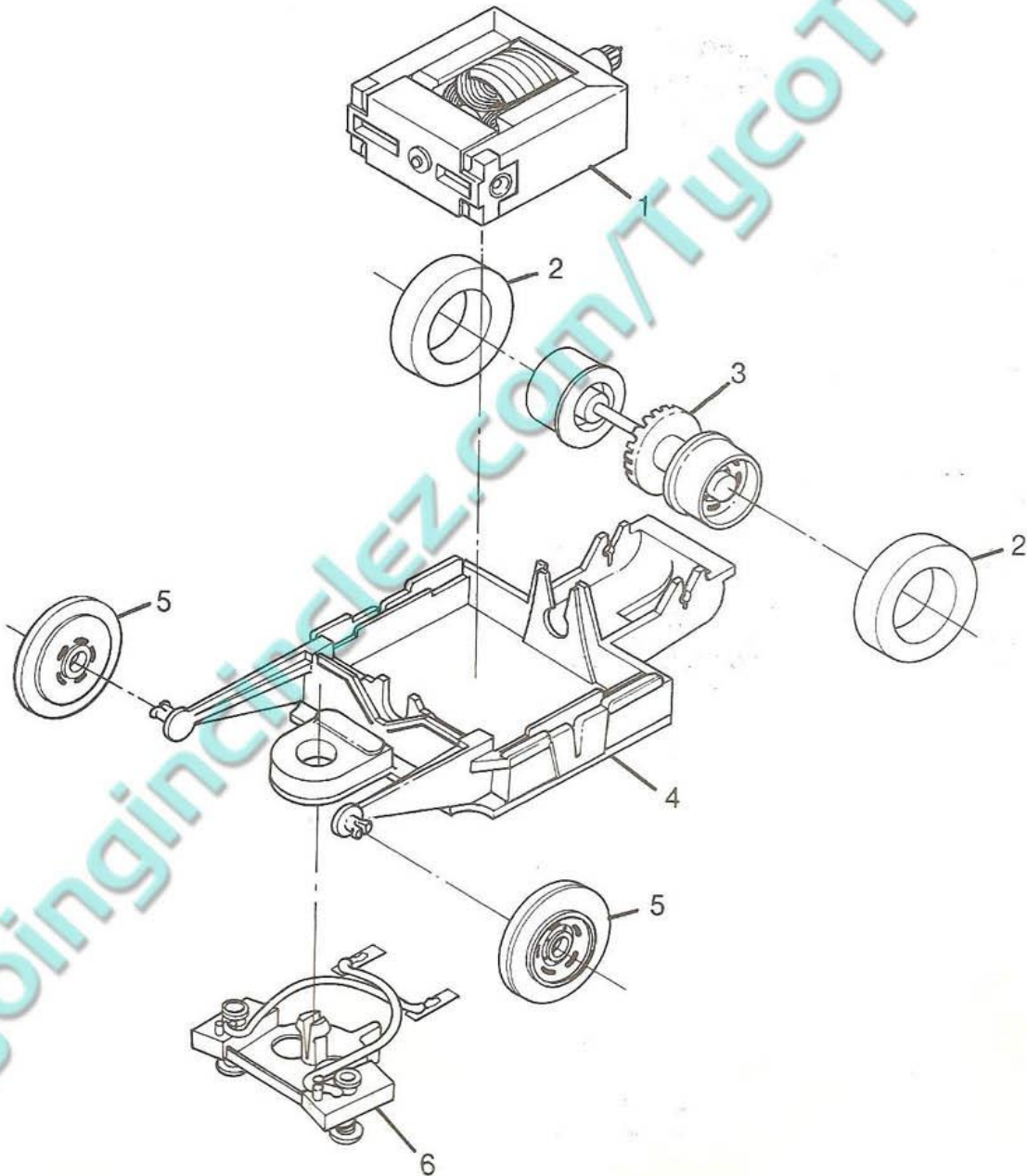


We reserve the right to make changes in design and/or prices without prior notice.

ITEM	PART NO.	DESCRIPTION
1	8872	HT-50 MOTOR W/PINION GEAR
2	8889	RTV TIRES (4)
3	8891	REAR AXLE W/CROWN GEAR AND 2 HUBS
4	8885	1.5" CHASSIS, PAN AND WEIGHT
5	8892	FRONT TIRE AND HUB ASS'Y. (2)
6	8869	PICK-UP AND GUIDE SHOE ASS'Y.



**MODEL 8600-8619
SHORT CHASSIS**



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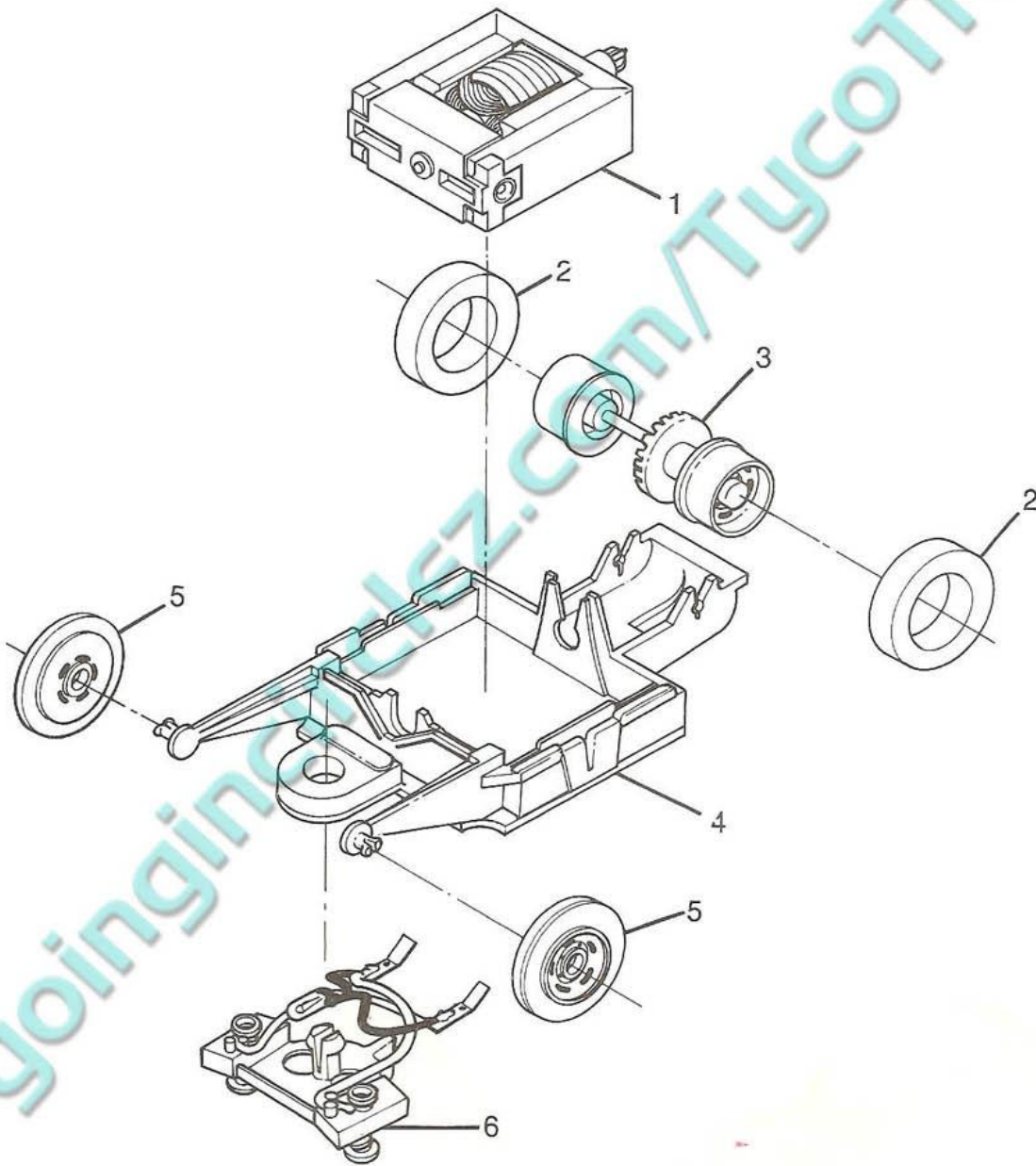
TYCO[®]
INDUSTRIES

A CONSOLIDATED FOODS COMPANY
RESPONSIVE TO CONSUMER NEEDS

ITEM	PART NO.	DESCRIPTION
1	8872	HT-50 MOTOR W/PINION GEAR
2	8889	RTV TIRES (4)
3	8891	REAR AXLE W/CROWN GEAR AND 2 HUBS
4	8885	1.5" CHASSIS, PAN AND WEIGHT
5	8892	FRONT TIRE AND HUB ASS'Y. (2)
6	8858	PICK-UP AND GUIDE SHOE ASS'Y. W/LAMP



**MODEL 8620-8629
SHORT CHASSIS—LIGHTED**

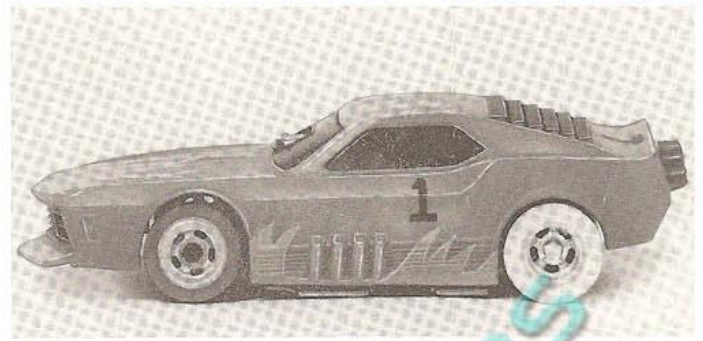


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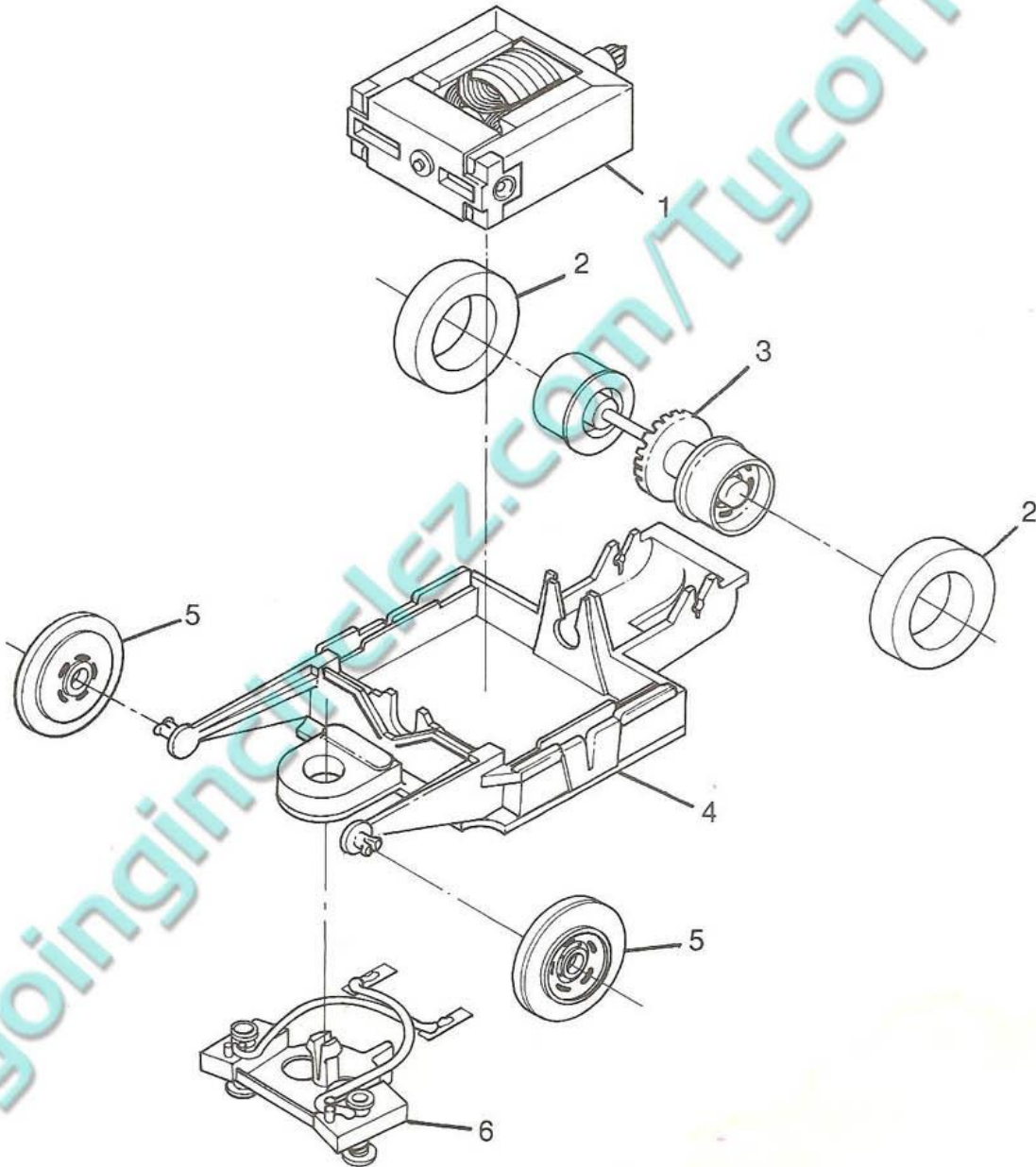
TYCO[®]
INDUSTRIES

A CONSOLIDATED FOODS COMPANY
RESPONSIVE TO CONSUMER NEEDS

ITEM	PART NO.	DESCRIPTION
1	8872	HT-50 MOTOR W/PINION GEAR
2	8889	RTV TIRES (4)
3	8891	REAR AXLE W/CROWN GEAR AND 2 HUBS
4	8886	1.7" CHASSIS, PAN AND WEIGHT
5	8892	FRONT TIRE AND HUB ASS'Y. (2)
6	8869	PICK-UP AND GUIDE SHOE ASS'Y.



**MODEL 8630-8649
LONG CHASSIS**



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Numerical Parts List

8869	Pick-up and Guide Shoe Assembly	.75
8872	HT-50 Motor w/pinion gear	2.00
8873	Rear axle w/crown gear and 2 hubs	.60
8877	Front hub and tire assy. (pr.)	.30
8885	1.5" Chassis, pan and weight	1.25
8886	1.7" Chassis, pan and weight	1.25
8887	Guide shoe	.30
8888	Wiper, lead and terminal assembly (pr.)	.50
8889	RTV Tires (4)	.50
8858	Pick-up and guide shoe assembly w/lamp	1.25
8891	Rear axle w/crown gear and 2 rear chrome hubs	.60
8892	Front chrome hub and tire assy. (pr.)	.30

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