

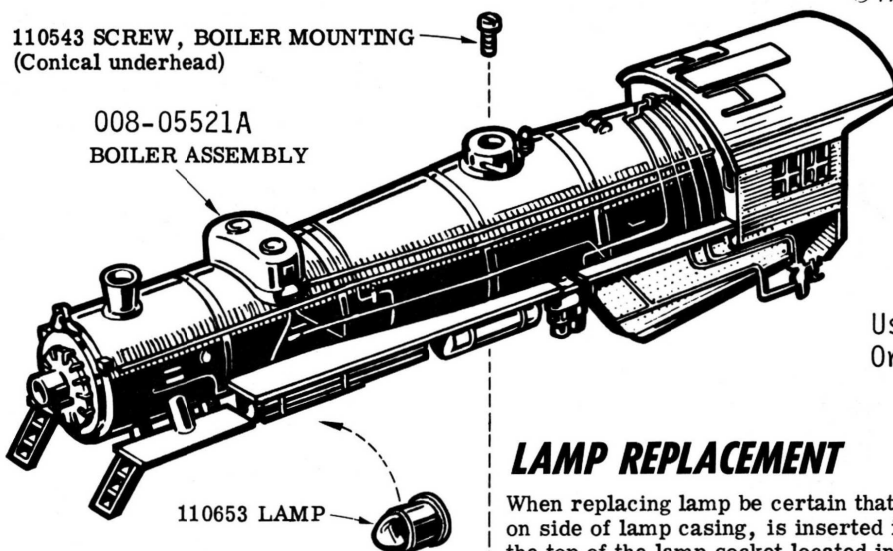
# MAINTENANCE & REPAIR MANUAL



## N USRA Mikado Loco

The *Rivercross* USRA 2-8-2 locomotive has been carefully assembled and tested prior to leaving the factory. It will provide virtually maintenance-free service however normal wear from extended usage will necessitate occasional replacement of lamps, motor brushes and traction tires. ALL LUBRICATION AND REPLACEMENT OPERATIONS CAN BE ACCOMPLISHED WITHOUT NEED FOR MAJOR DISASSEMBLY OF THE CHASSIS.

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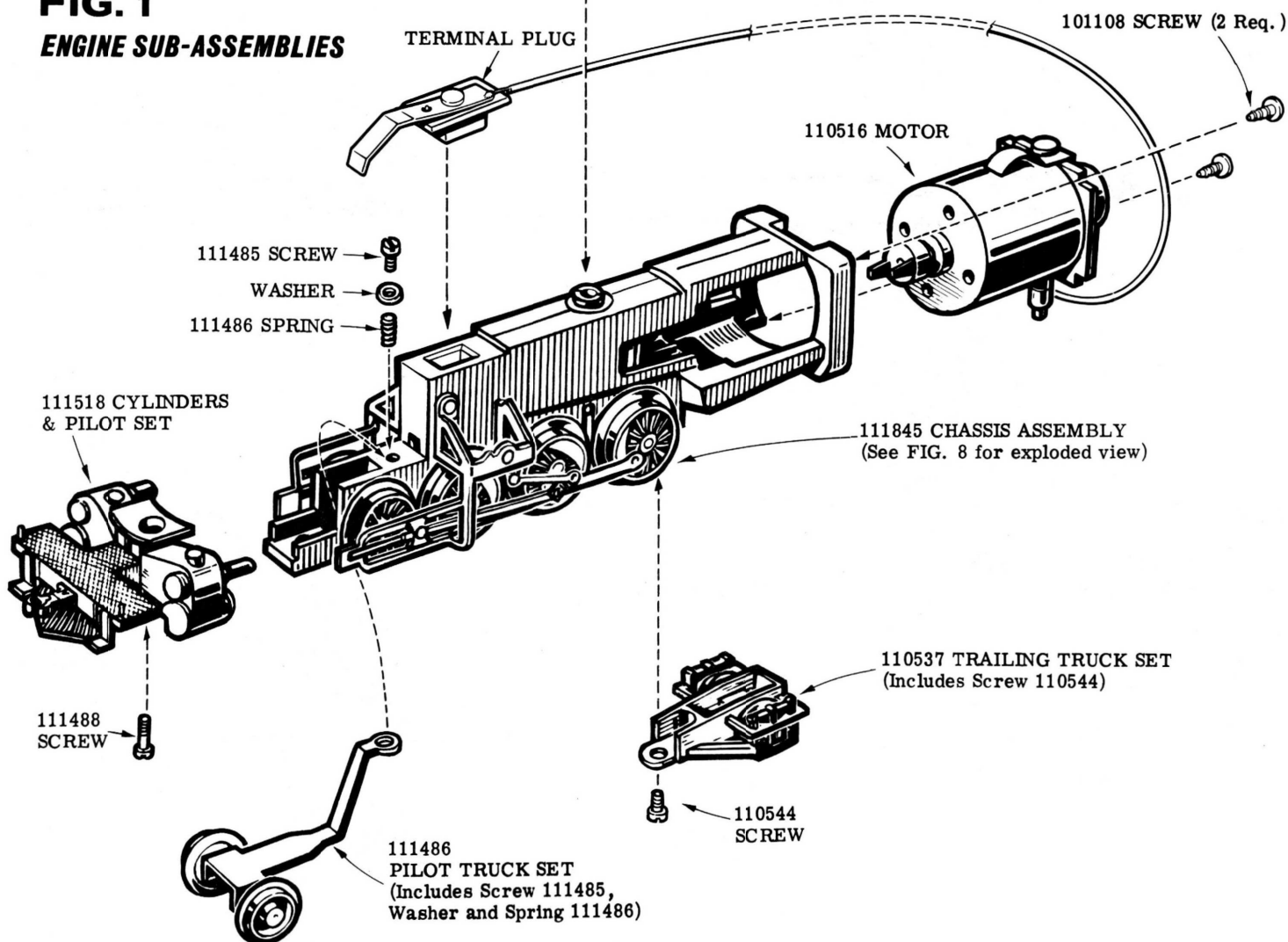


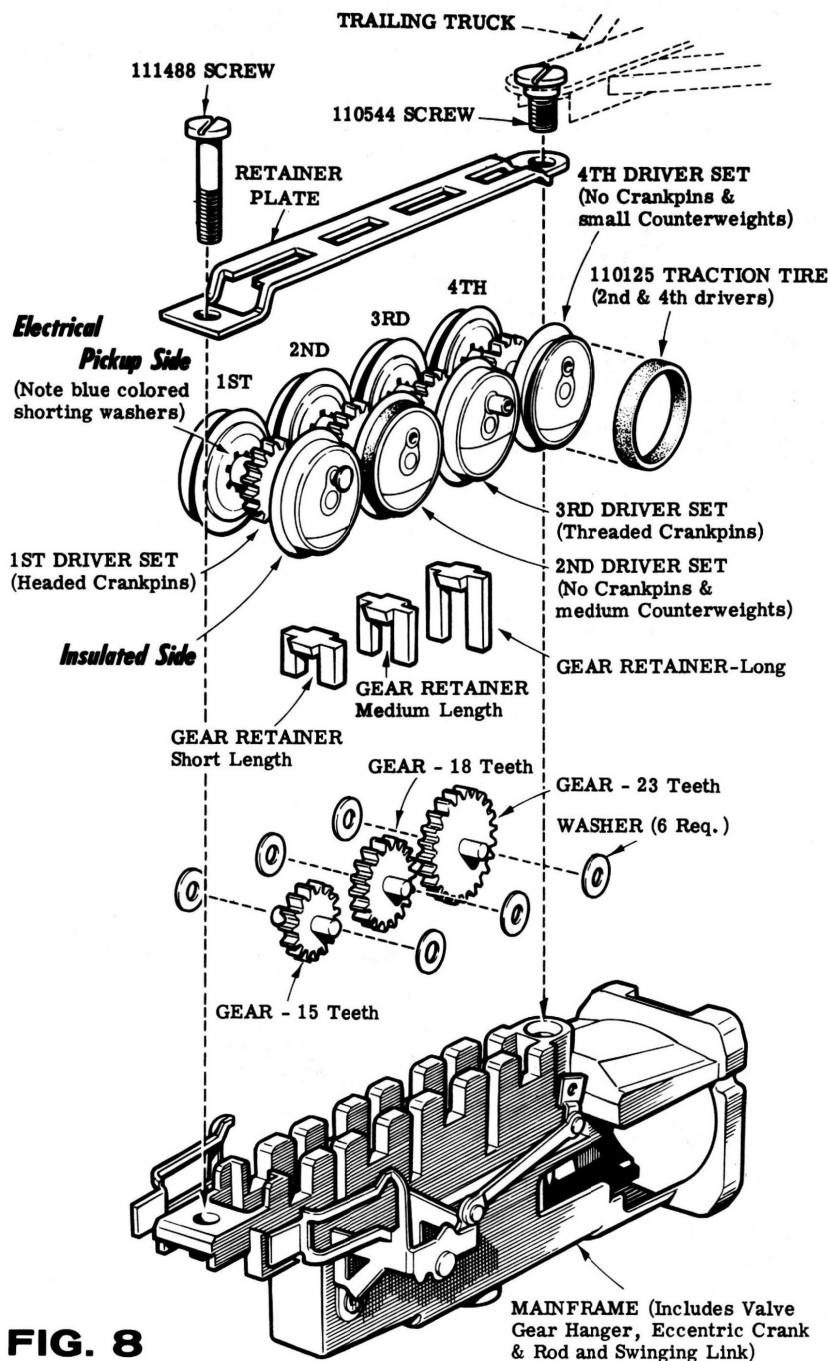
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### LAMP REPLACEMENT

When replacing lamp be certain that small bead of solder, on side of lamp casing, is inserted into the narrow slot at the top of the lamp socket located inside the boiler.

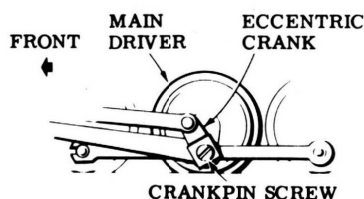
**FIG. 1**  
**ENGINE SUB-ASSEMBLIES**





**FIG. 9**

Adjust the eccentric crank, on both sides of the engine, to lean slightly forward.



## CHASSIS DISASSEMBLY

Major chassis disassembly will rarely be necessary and IS NOT RECOMMENDED FOR THE NOVICE.

The correct procedure for dismantling the chassis is as follows:

A. Using a jeweler's screwdriver (preferably magnetized) remove Crankpin Screw 110269 (FIG. 10); swing away eccentric crank; lift off main rod, Crankpin Washer 110171 and side rod. Repeat for opposite side of engine.

B. Remove Front Retainer Screw 111488 and Trailing Truck Screw 110544 to release retainer plate.

C. Drivewheels, gear retainers and internal gears may now be lifted out of the mainframe. BE CAREFUL not to lose the small washers on both sides of each internal gear.

## CHASSIS REASSEMBLY

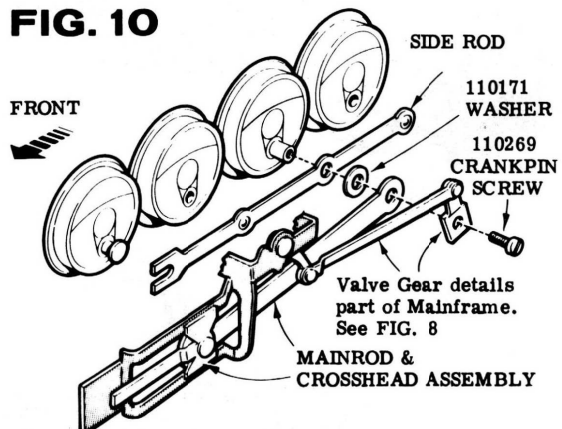
The above procedure is reversed for reassembly. IT IS EXTREMELY IMPORTANT TO HEED THE FOLLOWING PRECAUTIONS and to check all notations in FIG. 8.

A. The internal gears are all different, as are the gear retainers, and must be installed as shown in FIG. 8, i.e.; the 15 tooth gear and short retainer in the forward gear slot; the 18 tooth gear and medium retainer in the center gear slot and the 23 tooth gear and long retainer in the rearmost gear slot. If difficulty is encountered when installing the 1st and 2nd driver sets it is almost certain that the gears have been incorrectly placed.

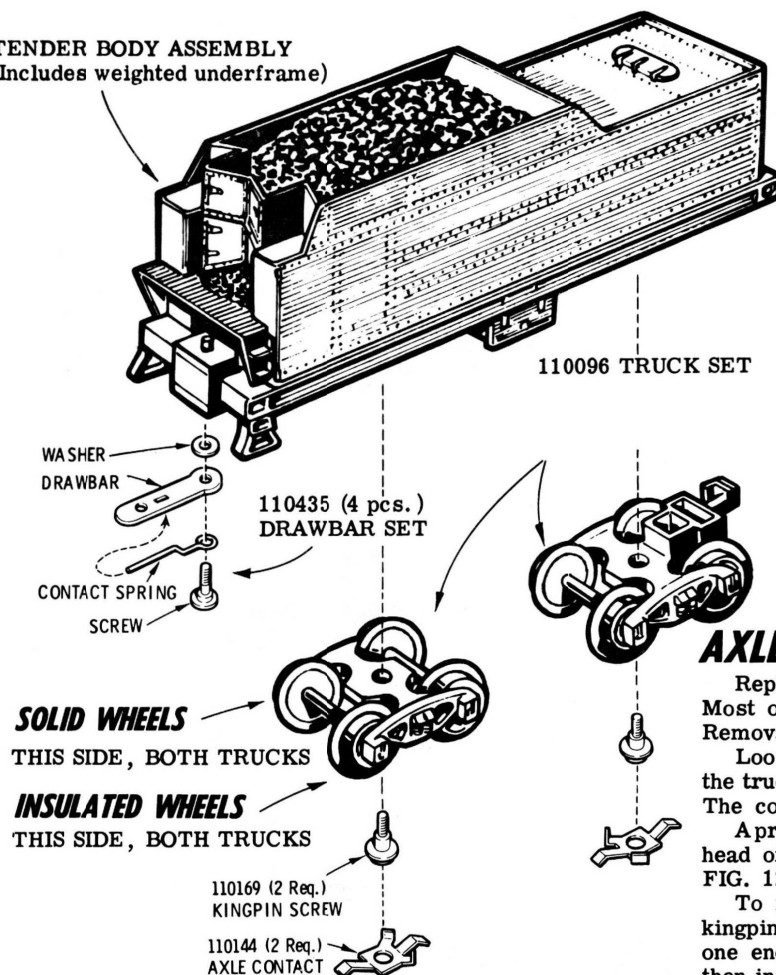
B. The drivewheels are not interchangeable and must be installed in the arrangement shown in FIG. 8. Further, ALL INSULATED DRIVERS MUST BE ON THE SIDE INDICATED. The wheels can be installed starting at either end and progressing toward the other or by starting with the middle two and working out to the ends. IT IS VIRTUALLY IMPOSSIBLE TO INSTALL THE DRIVEWHEELS CORRECTLY BY STARTING AT THE ENDS AND WORKING TOWARD THE CENTER. Be certain that all crankpin bosses point exactly the same way.

C. When replacing the retainer plate be certain that it is straight and lies uniformly across all four axles. If bowed away from the middle two axles the gears may drop out of mesh. Straighten the plate if necessary. Also make certain that the edges of the small washer faces on each side of the drivewheel gears (not the internal gears) are not pinched under the edges of the slots in the retainer plate. This can be assured by wiggling each driver set sideways before final tightening of Retainer Screw 111488 and Trailing Truck Screw 110544.

**FIG. 10**



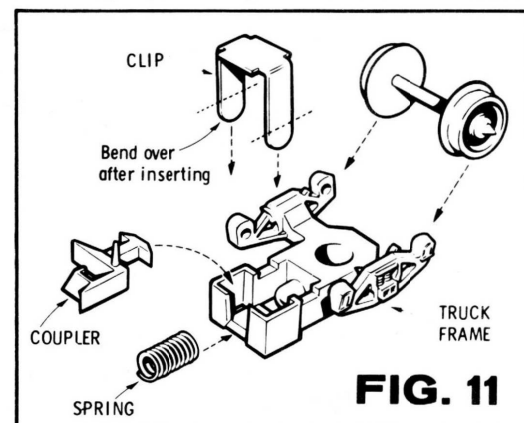
**TENDER BODY ASSEMBLY**  
(Includes weighted underframe)



**FIG. 13**  
**TENDER SUB-ASSEMBLIES**

## COUPLER REPLACEMENT

Loosen Rear Kingpin Screw 110169 and remove truck. Gently straighten ears of coupler retaining clip and withdraw it to allow removal of broken coupler. Install new coupler against spring (See FIG. 11), replace clip and bend ears to secure.



**FIG. 11**

## AXLE CONTACT REPLACEMENT

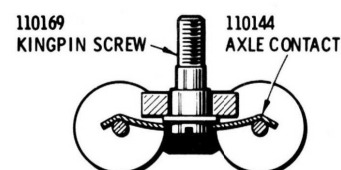
Replacement of Axle Contacts 110144 will rarely be necessary. Most often a distorted contact can be straightened and re-used. Removal and replacement WILL REQUIRE CARE.

Loosen kingpin screw and remove the truck. Very gently spread the truck sideframes just enough to allow removal of one wheel set. The contact can now be lifted away from the kingpin screw.

A properly formed contact will press upward against the flanged head of the kingpin and downward against the axles as shown in FIG. 12.

To reassemble, first install kingpin in bolster of truck. Hook one end of contact over its axle then install remaining wheel set. **CAUTION!** Be certain insulated wheels are on the correct side as noted in FIG. 13. Repeated flexing of truck's sideframes, to remove and replace wheels, may cause the frames to fracture.

**FIG. 12**



## TROUBLE SHOOTING CHECKLIST

The following list will assist in correcting any problems occasioned by hasty disassembly or reassembly.

### ENGINE RUNS WRONG WAY

Motor installed upside down. Remove motor, swap upper and lower brush assemblies around and reinstall.

### SHORT CIRCUITS

#### LOWER BRUSH TERMINAL LUG TOUCHES MOTOR MOUNTING SCREW

Swing lug away from screw then bend it up against the rear bearing plate of the motor.

#### INSULATED LOCO OR TENDER WHEELS ON WRONG SIDE

Correct as shown in FIGS. 8 and 13.

#### TENDER DRAWBAR SHORTS AGAINST MAINFRAME

Insulating bushing omitted. See FIG. 6 and replace.

### OPEN (INCOMPLETE) CIRCUITS

#### BRUSH HOLDERS NOT FULLY INSERTED

Use small screwdriver through rearwall to push upper brush holder down. Press lower holder upward.

#### TENDER CONTACTS BENT OR INCORRECTLY INSTALLED

See "Axle Contact Replacement" above.

#### DRAWBAR CONTACT SPRING BENT

Straighten spring so that it lies over center of front hole in drawbar. See FIG. 13.

### MECHANICAL PROBLEMS

#### DRIVE WHEELS ROTATE ONCE OR TWICE THEN LOCK-UP

(a) Drive wheel crankpins not aligned properly. See page 3, paragraph A.

(b) Retainer plate bent - center axles dropping out of mesh. See page 3, paragraph B.

#### DRIVE WHEEL(S) FEELS TIGHT - CANNOT BE WIGGLED

Edge of washer face on drive wheel gear pinched under retainer plate slot. See paragraph B on page 3.

#### PILOT TRUCK WILL NOT TRACK PROPERLY

Spring and washer incorrectly installed. Tongue of pilot truck must be installed first then Spring 111486, followed by Washer and Screw 111485 as shown in FIG. 1.

#### BOILER FRONT END CANNOT BE SEATED PROPERLY

(a) Headlight wire incorrectly arranged. Correct as shown in FIG. 7, page 3.

(b) Slot in bottom of headlight socket at front of boiler hangs up on pilot truck washer. With front end of boiler slightly elevated, press with tweezers against top of washer to slightly compress Spring 111486. Front of boiler now can be fully seated.