Locomotive Assembly Instructions

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LOCOMOTIVE ASSEMBLY INSTRUCTIONS

The success of this construction depends on the correct sequence of steps, therefore it is essential to read and follow these instructions in the stages listed. Essential tools – A small electrical screwdriver, a pair of small electrical pliers, a small pozidrive screwdriver. Desirable tools – 6 BA spanner (an ignition set from a motor accessory shop is ideal), small adjustable spanner.

The major parts are displayed in the front box or within the packaging and foam. All other items are in numbered bags (see Parts List). Before starting each stage ensure the appropriate components have been located. Right and left hand are when viewed from the rear of the model.

Stage 1

CHASSIS ASSEMBLY/SUB ASSEMBLY – CYLINDER PORT FACE RIGHT

Small items for this stage are found in Bag 2.

Take the cylinder (item 1) and place on the port face (item 2). Fit the trunnion spring (item 5) over the bolt (item 4). Insert bolt and spring through the rear centre hole of the port face and screw tight into cylinder. Repeat for cylinder and port face left side.

FRAME AND CYLINDER ASSEMBLY RIGHT HAND

Small items for this stage are found in Bags 1 & 2.

Take 1 gasket (item 3) and fit to rear of the cylinder and port face assembly. Place on frame (item 7) locating the bolt and spring through the hole. Align the screw holes and fit 5/16” long brass screws (item 28) and nuts (item 26) through the two rear holes and secure to frame.

PLEASE REFER TO DIAGRAM 1A if building in Gauge ‘1’, use 1 gasket (item 3) and fit to rear of the cylinder and port face assembly. Then place brass spacer block (item 57) against the gasket with the 4 holes to the blank front end of the cylinder. The longer brass fixing screws to be used.

WHEEL AND MAINFRAME ASSEMBLY

Small items for this stage are in Bags 1 & 3.

Take both frame and cylinder assemblies and place back to back. Take the leading axle assemblies (item 54) (long crank pins) and slide the axles into the front slots ensuring brass bearings are outside the frames. Repeat with the trailing axle assembly (item 55) (short crank pins) and fit to the rear slots.

Pull the frames apart; this will locate bearing bushes into the location holes. Fit the spacer (item 8) in between the side frames with two 3/16” short brass screws (item 6).

REVERSING VALVE ASSEMBLY

Small items for this stage in Bags 1, 4 & 9 (Gauge ‘O’).

Take reversing block (item 12) and insert 2 small ‘O’ rings (item 13) into the counter-bored holes in the rear. Fit the spring (item 17) on to the large reverse lever bolt (item 18). Pass the bolt through the centre hole in the retainer plate (item 14) and through the rear centre holes of the reversing block and screw into the reversing lever (item 11) ensuring alignment in the retainer plate with the rubber ‘O’ rings. Do not fully tighten the bolt at this stage.

Take the reversing valve assembly and secure to the main frame end using four 5/16” long brass screws (item 28) locate in the front cylinder port face assembly holes. When done, check that both front and rear cylinder screws are tight. If building in Gauge ‘1’ use four longer screws. These will be found in Bag 3.

WHEEL AND COUPLING ROD ASSEMBLY

Small items for this stage in Bag 4.

Place one s/steel washer (item 20) over leading and trailing crank pins on the wheels, then place a coupling rod (item 21) over the pins. Place each of the remaining s/steel washers over the pins and secure in position with four circlips (item 22). Spring out piston ends to go over the leading pins on the front wheels. Revolve wheels to ensure a free motion.

EXHAUST AND STEAM PIPE

Small items for this stage in Bag 4.

Check that the end of the pipe is burr free, and smooth if necessary.

Take the exhaust pipe (item 15) and place 'O' ring (item 13) approx. 6 mm (1/4") down the long length of the pipe. Put a spot of oil or fairy liquid on the opposite end and push into the 'O' ring on the right hand side of the reversing block (item 12). This is a tight fit and care must be taken not to damage the 'O' ring. It may be necessary to further slacken reverse bolt, to ease pipes into 'O' ring. Next take the steam pipe and locate in the 'O' ring on the left hand side of the block, with the long end pointing upwards. Now fully tighten reverse bolt which will secure a seal around pipes.

Stage 2

SIDE TANK AND CAB FITTINGS

Small items for this stage in Bag 1.

Take the cab (item 37) and fix right hand side tank (item 36) to the hole above the lugs in the front of the cab. Fix with a short screw (item 6) and nut (item 26). Repeat operation for left hand side tank take two further screws (item 6) and nuts (item 26) and secure into bottom holes in cab.

BOILER AND CAB ASSEMBLY

Small items for this stage in Bags 1, 5 & 6.

Take combustion chamber (item 33) and insert between the side tanks and secure to the cab with two 3/16" short screws (item 6) and nuts (item 26) using the formed lugs. Take whistle valve assembly (item 47) and fit an ally washer (item 34) to thread end. Place (item 48) bracket over the thread end and then another ally washer and secure to boiler (item 32). Fit top lever (item 46) with brass screw (item 28) and nut (item 26). Only after the boiler has been located to the cab assembly. Slide the boiler into the combustion chamber, this is a tight fit and it may be necessary to clear any excess paint, ensuring that the side tank lugs nest in the slot between the boiler and the front smokebox casting, and that the whistle lever locates into the cab. Secure both side tanks to the front end with two black pozidrive screws (item 49).

Fit the sight glass 'O' ring (item 39) into the inner rim of the boiler end which will form a gasket.

Place the sight glass (item 40) on top of the 'O' ring, then carefully fit the sight glass gauge (item 42) over the glass, and secure with two 3/16" short screws (item 6). It is essential that great care is taken over this operation to ensure a steam tight seal. It is advisable to hold the Backhead/Sight gauge firmly in position with your thumb, and screw down each screw one turn at a time.

CAB ROOF AND CAB BACK ASSEMBLY

Small items for this stage in Bags 1 & 7.

Locate two grab rails (item 41) through the tank sides and cab and secure with four nuts (item 51).

Fit the other two grab rails (item 41) to the cab back (item 43) in the same way.

Fit two 3/16" short screws (item 6) and two nuts (item 26) to the underside of the cab.

Take the roof clip (item 45) and screw to the underside of the roof (item 44) with two black screws (item 61) and nuts (item 60).

Ensure that the roof clip tags face downwards and towards the rear of the cab. Then fit the roof to the cab with four black screws (item 61) and nuts (item 60).

FINAL ASSEMBLY

Small items for this stage in bags 1, 5 & 8.

Take the chassis assembly and cab assembly, and carefully feed the cab assembly over the steam and exhaust pipes, at the same time locating the reversing lever in its slot at the front of the smoke box. This operating can best be done by holding the cab assembly at approx. 45 degrees to the chassis and offering the cab over the pipes and reversing lever.

Finally, ensure correct location by pressing with both thumbs on the underside of the chassis by the base of the reversing block, squarely fixing the side frames to the outside of the casting tags.

Fit two 3/16" short brass crews (item 6) to the holes in front of the cylinder port faces, to secure the side frames to the casting. This may prove a little difficult. It is best to dip the screw driver into grease or vaseline to make the screw adhere to the screw driver.

Take the drag beam (item 9) and fit to the rear of the side frames. Fit buffer beam (item 10) and buffer stock (item 24) and buffers (item 25) (bag 5) with nuts (items 26), then fit the coupling link (bag 5) by prising open (such as with a key ring) and feed onto the bottom section of the coupling bracket. Also fit the second set to the front of the smoke box. Fit two short brass screws (item 6) to secure the side frames to the drag beam. Then two 3/16" short brass screws (item 6) and nuts (item 26) to secure the cab to each side frame.

Fit a small 'O' ring Item 13) over the steam pipe which protrudes through the top of the boiler followed by the brass washer (item 52). Locate the bronze spring (item 29) on top of the washer. Take dome (item 31) and screw into the boiler. With a spanner or adjustable spanner, tighten, but do not over tighten as this will result in breaking the solder joint. Items for this stage in bag 8.

Fit safety valve (item 35) into boiler.

Locate the burner tray under the boiler, between the frames, from inside the cab.

Locate the cab back (item 43) into the slots at the back of the cab and roof clip.

Locate reversing lever protecting cover (item 62) over reversing lever (item 11).

AS A FINAL CHECK

1) Oil all moving parts, piston rods, port faces, reverse lever, wheel bearings and bushes.
2) Make sure all screws and nuts are tight.
3) Revolve wheels with palm of hand to make sure everything is in order.

BEFORE STARTING ENGINE, CAREFUL STUDY OF THE INSTRUCTIONS BELOW IS ESSENTIAL, IF YOU ARE TO OBTAIN SATISFACTORY PERFORMANCE. PLEASE REMEMBER YOU HAVE BUILT AN ENGINE AND ENGINES NEED LOTS OF OIL AND CAREFUL RUNNING IN.

DURING THE FIRST FEW RUNS, WATER CONSUMPTION IS NORMALLY EXCESSIVE AND MAY ISSUE BACK THROUGH CYLINDER AND OTHER FACES. THIS WILL REDUCE AS UNIT SETTLES DOWN.

Boiler Cleaning: The boiler must be thoroughly washed out before running a new engine. Remove safety valve, half fill boiler with hot water and add a few drops of washing up liquid. Replace valve and shake vigorously for 30 seconds. Remove valve and empty contents (depress whistle lever to allow water to escape freely). Repeat several times, using hot water only, until all trace of soldering deposits are removed.

Handling: Please note that most parts of the loco will be too hot to touch with bare hands while raising steam and soon after running. It is advisable to place the loco on track for filling and lighting, to avoid excess handling. If handling the loco while hot, it must be held by the cab roof at the rear and with the coupling ring at the front.

Boiler Filling: Remove cab back by depressing catch and withdrawing to the rear, to allow access to the burner and boiler sight glass. Remove safety valve and using the funnel, fill boiler with hot water to MAX on the sight glass.

Firing: Use only MSS solid fuel with this engine. Remove burner tray by lifting and withdrawing to the rear. Break or cut one tablet and place both halves into the burner tray. Light tablet from the front end and hold burner at an angle, to allow the rear half to ignite. Slide burner tray under the boiler by guiding front tags into slots and clip rear end, into the cab floor. The cab back must be securely replaced before running.

Starting: Allow about 2 minutes to raise steam. Water will appear around the cylinders and steam will issue from the chimney (control lever open). A gentle push in the required direction will set the loco in motion. Water consumption may be excessive during initial running, due to priming. The water level must be checked carefully and if the water level falls to the 'MIN' mark on the sight glass, the burner must be removed immediately. It is recommended that distilled water be used for the boiler in hard water areas.

Running In: As with any engine, the best performance will only be achieved after a period of running in. While the loco is new, performance may be sluggish and several runs will be required before full power is achieved. Water loss around the cylinders and reverse valve (priming) will only cease when the unit is fully run in.

Priming: This is characteristic of most steam engines. This is water loss through the cylinder or reversing face. It is quite normal during early runs and varies with each unit. This will gradually reduce as the unit settles in. Careful observation of the instructions, lubrication in particular is essential.

Lubrication: Axles, crankpins, cylinder faces, piston rods and valve face must be well oiled, before each run. The piston rods and cylinder faces should be oiled occasionally, during each run. MSS steam oil is recommended.

Control: Excessive speed will result in derailment and careful use of the speed control is essential to avoid this. Speed and direction is controlled by the lever at the front of the loco. With the lever in a vertical position (off) no steam is admitted to the cylinders. Moving the lever to the right (as seen from the front) gives forward direction and to the left, backwards. Movement of this lever gives progressively more steam to the cylinders and thus more speed. Due to the many variables of load and conditions, familiarization with the control lever setting is required to give the steadiest performance.

Boiler Specification: Volume: 120 cc. Maximum operating pressure: 0.7 bar. The above operating instructions must be followed, if you are to obtain the best performance, from your locomotive.

Whistle: The whistle should not be used during the first two minutes of running. Frequent and prolonged use of the whistle results in reduced steam to the cylinders.

Safety:

DO NOT hold down the safety valve or tamper with it in any way.

DO NOT remove the safety valve while there may still be pressure in the boiler. (Release remaining steam by operating the whistle).

DO NOT overfill the burner or boiler.

DO NOT allow the loco to run at excessive speed, which may cause derailment. This model is designed for adults and outdoor use and because fire and boiling water is in use due care must be taken at all times.

DO ensure that a suitable metal container is at hand to place the burner tray that may have unused burning fuel. This locomotive is for outside use only.

PARTS LIST

Main Box

Item 1	Cylinder piston assembly	(2 off)
Item 2	Cylinder port face	(2 off)
Item 7	Side frame	(2 off)
Item 9	Drag beam	(1 off)
Item 10	Buffer beam	(2 off)
Item 12	Reversing block	(1 off)
Item 31	Steam dome	(1 off)
Item 32	Boiler assembly	(1 off)
Item 33	Combustion chamber	(1 off)
Item 58	Fuel	(1 off)
Item 59	Burner Tray	(1 off)
Item 36	Side tank	(2 off)
Item 37	Cab front	(1 off)
Item 42	Backhead/Sight gauge	(1 off)
Item 44	Cab roof	(1 off)
Item 50	Filler funnel	(1 off)

Bag 1

Item 6	6BA x 3/16” Brass screws	(16 off)
Item 26	6BA Brass nuts	(17 off)
Item 28	6BA x 5/16” Brass screws	(9 off)

Bag 2

Item 3	Gaskets	(2 off)
Item 4	Trunnion bolt	(2 off)
Item 5	Trunnion spring	(2 off)

Bag 3	G ‘O’ Locomotives	
Item 54	Leading axle (long pin)	(1 off)
Item 55	Trailing axle (short pin)	(1 off)
Item 8	Spacer	(1 off)

Bag 3	G ‘1’ Locomotives also has	
Item 56	6BA x 1/2” Brass screws	(8 off)
Item 57	Brass blocks	(2 off)

Bag 4

Item 17	Reversing lever spring	(1 off)

Bag 4 (cont'd)

Item 18	Reversing lever bolt	(1 off)
Item 14	Pipe & 'O' ring retainer plate	(1 off)
Item 20	Stainless Steel coupling washer	(8 off)
Item 21	Coupling rod	(2 off)
Item 22	Circlips	(4 off)
Item 15	Exhaust pipe	(1 off)
Item 19	Steam pipe	(1 off)
Item 13	Small 'O' ring	(3 off)

Bag 5

Item 23	Coupling link	(2 off)
Item 25	Brass buffer	(4 off)
Item 24	Buffer stock (Black)	(4 off)
Item 47	Whistle Valve assembly	(1 off)
Item 34	Small ally washer	(2 off)
Item 48	Whistle bracket	(1 off)
Item 46	Whistle lever	(1 off)

Bag 6

Item 16	Smokebox handle	(1 off)
Item 49	Pozidrive screws	(3 off)
Item 39	Sight glass 'O' ring	(1 off)
Item 40	Sight glass (Remove film)	(1 off)

Bag 7

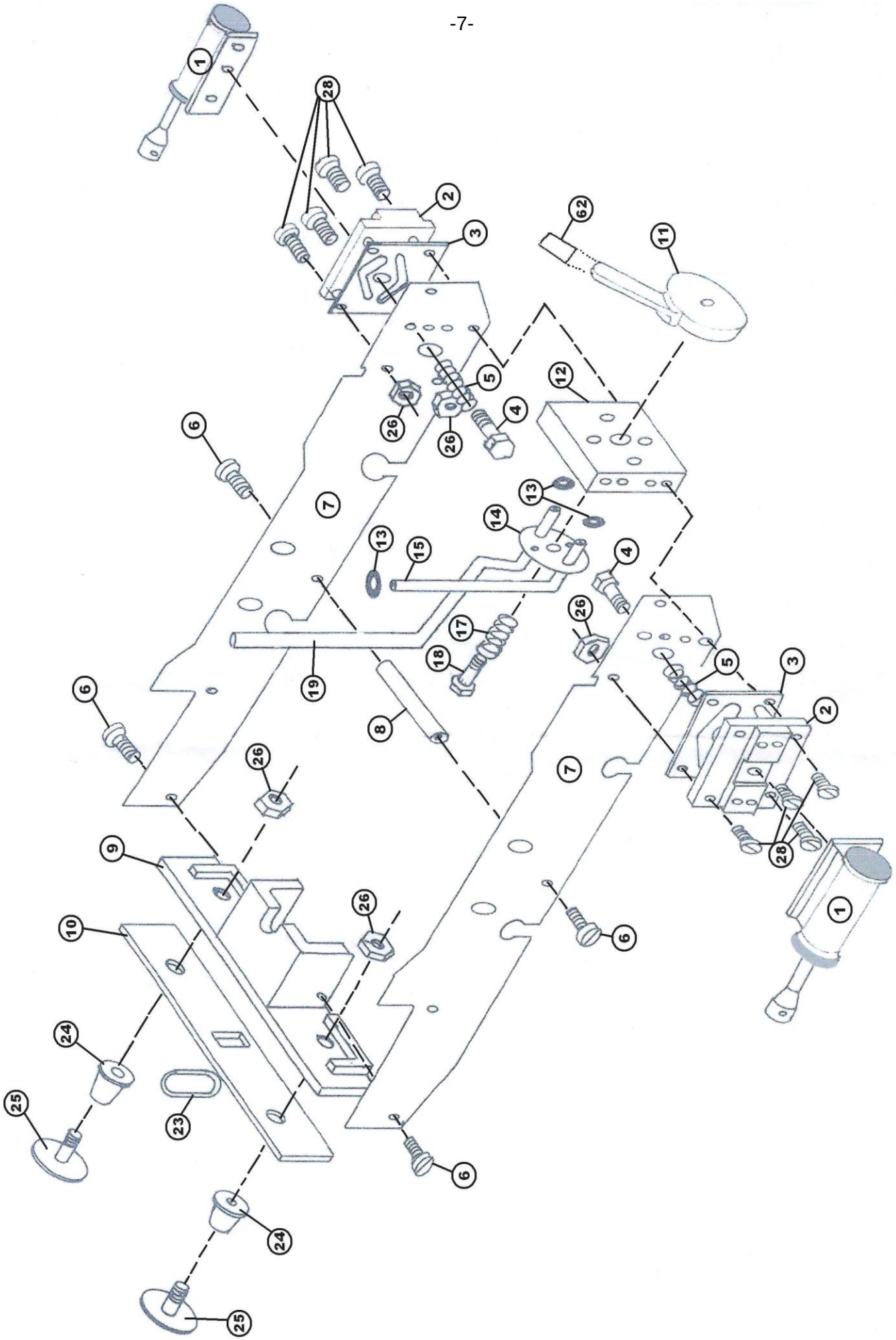
Item 41	Grab rail	(4 off)
Item 51	Grab rail nut	(8 off)
Item 45	Roof clip	(1 off)
Item 60	Black m3 nuts	(6 off)
Item 61	Black m3 x 3/16" screws	(6 off)

Bag 8

Item 13	Small 'O' ring	(1 off)
Item 52	Brass washer	(1 off)
Item 29	Bronze spring	(1 off)

Bag 9

Item 35	Safety valve	(1 off)
Item 11	Reversing lever	(1 off)
Item 62	Reversing lever Cover	(1 off)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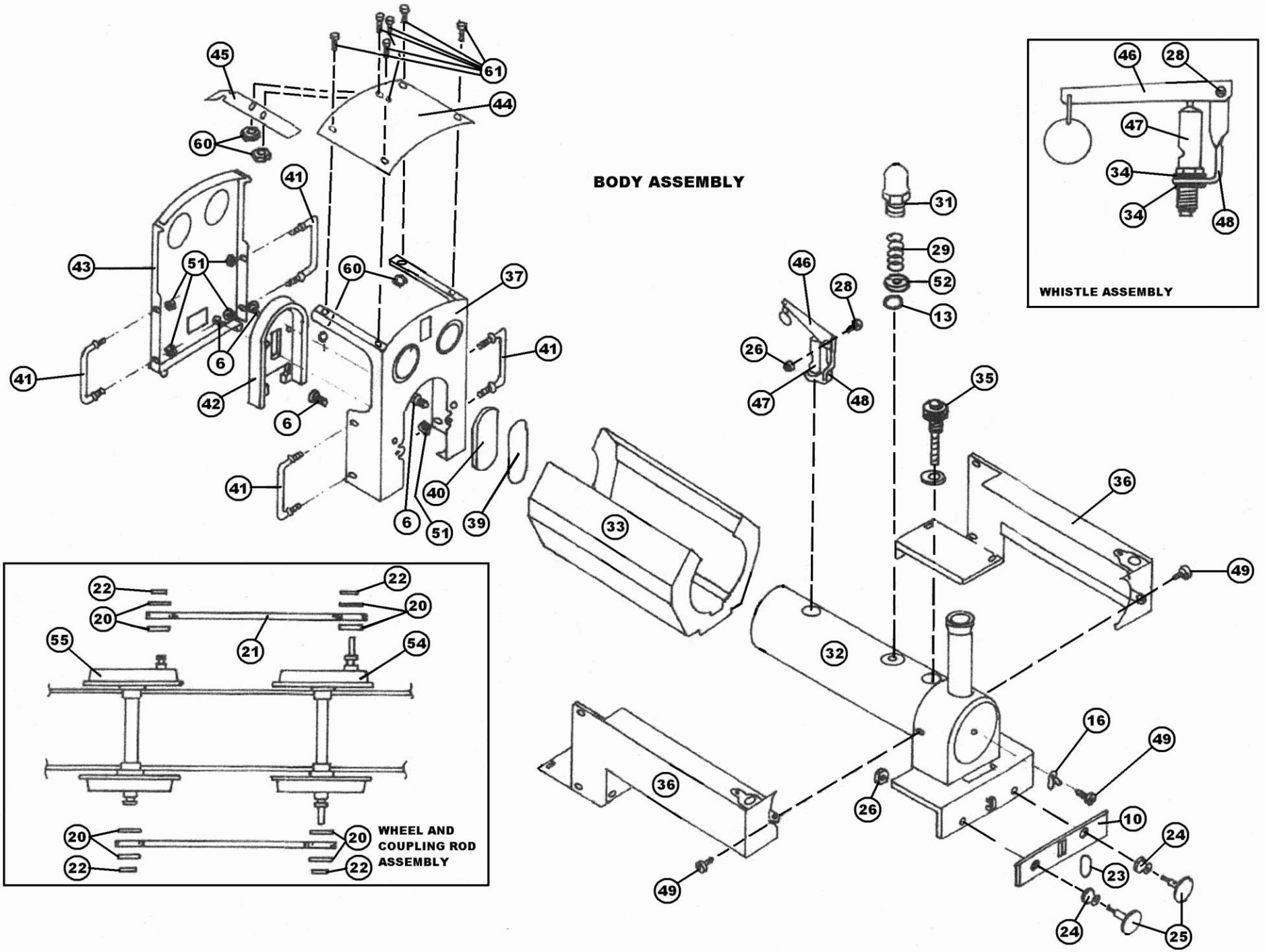
BODY ASSEMBLY
WHISTLE ASSEMBLY
WHEEL AND COUPLING ROD ASSEMBLY

DIAGRAM 1a
SHOWN: GAUGE 1.
LEFT HAND CYLINDER & BLOCK ASSY.