D49 ASSEMBLY INSTRUCTIONS

The method and order of assembly is the way I like to do it. You can do it differently if you wish.

Fig. 1. Chassis Construction

The chassis can be built rigid or compensated so decide now which one you are going to make. If building a compensated chassis remove the sections from the front and rear axle holes and follow the compensation section.

Take the frames (1) and solder the 1/8th axle bearings (2) into the frames **(rigid only)**. Fold the chassis frames up and solder the frame spacers (3) in position.

Solder a 2mm bearing (5) into the rear face of the cylinders. Solder the rear cylinder cover (6) over the bearing, making sure that the slidebar slots line up. Bend the cylinder block (4) along the etched fold lines, and then solder the block into the slots in the front end of the frames. Take the cylinder sides (7), curve the lower end to match the cylinders, then solder in place.

Fit the front cylinder covers (8).

Fig. 1a. Compensation beams

Beam compensation requires a fixed point, so that when the loco is on the track it remains level and is a huge benefit on a 4-4-0 with no balancing required. With this chassis the fixed point will be the bogie.

Solder the 1/8th axle bearings (2) into the compensating beams (9). The compensating spindle should be cut from the 0.7mm brass wire (11). The beams are held apart by the compensation spring (10). It is very important that no parts of this mechanism are soldered in a fixed position other than the spindle to the mainframe. Both beams must move independently of each other. The assembly of the beams is otherwise very simple. Make sure you fit the beams so that the large hole is over the rear brake pilot hole.

Fig. 1b. Brake Gear.

Solder two lengths of the 0.7mm brass wire (11) into the holes in the chassis to form the brake mountings (take care not to get solder on the compensation mechanism). Take the brake hangers (12) and solder the brake blocks (13) onto the hangers. Solder the assembled brakes to the wire 2mm from the frames. Study the brake actuating rods (14) and levers (16 & 17) diagram carefully. Pass more brass wire through the bottom of the brakes and then through the actuating rods. Solder these joints. At the rear pass 0.9mm wire (15) through the large hole in the mounting bracket, then through the lever and then through the bracket on the other side. Cut the 0.9mm wire flush with the chassis frames.

Fit the cylinder drain cocks (49) to the underside of the cylinders.

Fig. 2. Shire Only

First remove the Lentz valve gear mounting bracket as indicated.

Carefully cut out the detailed spring overlays (18) and solder them in position. Solder the ashpan sides (21) under the frames. Fold the slidebar support bracket (22) so it is double thickness, and then solder it into the slot in the frame tops. Fold the ends of the main motion bracket (23) at 90 degrees and do the same with the front motion bracket (24). Add solder into the folds for added strength. Solder both these into their slots in the frame tops.

Fold up the sandboxes (19 & 20), fill the joints with solder, and then fix the sandboxes into the slots in each frame. Using low melt solder fit the front and rear valve guides (29 & 30) in place.

Fig. 3. Hunt Only.

Fold the Lentz valve gear mounting bracket down so that it is at 90 degrees to the frames. Add some solder into the folds.

Carefully cut out the detailed spring overlays (18) and solder them in position. Solder the ashpan sides (21) under the frames. Fold the slidebar support bracket (22) so it is double thickness, and then solder it into the slot in the frame tops.

Fold up the sandboxes (19 & 20), fill the joints with solder, and then fix the sandboxes into the slots in each frame. Fold the mechanical lubricator linkage bracket (25), again adding solder into the folds, and fit to the frames. Solder together the two parts of the camshaft cover (26 & 27) and solder centrally to the right hand cylinder side. Using low melt solder fit the front and rear spring covers (28) in place.

Fig. 4. Bogie.

Solder the four 2mm bearings (5) into the axle holes in the bogie (31). Fold the bogie sides down and solder the front and rear spacers (32) into the slots. Solder together the nut and washer (33 & 34), this will be the plate that the bogie will rest on and locates onto the front body fixing screw, but you can fit a nut and screw to the chassis for testing. Fit the wheels (to the bogie and chassis) so you can test the compensating mechanism and when satisfied that all works O.K. remove the wheels and the bogie and put them to one side.

You can paint the chassis now if you are doing a Shire, but for a Hunt I would wait until the R/H Lentz gear is attached.

D49/1, Walschaerts valve gear

Solder the pairs of coupling rod halves (35) together, place the rods on the crankpins and check that the wheels revolve freely. Fit the smaller end of one of the connecting rods (36) to its corresponding crosshead (37), then take the slidebar (38 & 39) for that side, and bend on the fold lines, fitting the crosshead into the slidebar at the same time. Now slide the assembly into the cylinder, put the large end of the connecting rod on the front crankpin, and fix the slidebars into the cylinders, after checking that the piston rod is not too long, and shortening first, if necessary. Solder the rear end of the slidebar to the slidebar support (22). Now repeat this procedure on the other side of the chassis.

Now assemble the valve gear using the rivets provided, studying closely the valve gear assembly diagram. Rivet the parts indicated and then attach them to the chassis with the 14BA nuts and screws.

D49/2, Lentz rotary cam gear

Fit the front half of the drive shaft (40) into the hole in the rear face of the RH cylinder and then to the slidebar support bracket (22). Solder the rear section of the drive shaft (41) to the back of the front half and to the Lentz valve gear bracket that was folded down earlier. The chassis can now be painted and then the wheels fitted.

Fit one of the return cranks to the leading crankpin. Turn to the LH side of the loco and rivet together the three parts of the mechanical lubricator linkage (54, 55 & 56). Attach the linkage with 14BA nut and screw and then solder the crank to the forward RH crankpin.

The drawbar (51) and drawbar pivot (52) are fixed to the chassis with the same screw used to secure the rear end of the chassis to the superstructure.

Superstructure Assembly

Remove the footplate (1) and valances (2) from the fret and, using the half-etched lines, bend down and curve each end of the footplate to match the valances, and then solder the valances into the half-etched groves in the underside of the footplate. Solder the buffer beam (3) and drag beam (4) in place, and then solder the buffer beam overlay (5) to the buffer beam. Slot the front frame pieces (6) into the front end of the footplate and solder in place, then bend up the steps on the two front step plates (7) and solder them behind the buffer beam. Those with reasonably large radius curves in their track can fix them in the half etched grooves, in prototype position. However, those with tightly curved track will find it better to fix them directly behind the valances, to give the bogie wheels more clearance. Now fix the steps (8) into the slots in the step plates. Bend down the sides of the front footplate step (9) and fix this into the slot between the frame pieces. Bend up the splasher sides, then take the combined upper frame pieces and smokebox saddle sides (10) and solder these into the grooves in the footplate, making sure the saddle sides line up with the grooves for the front and rear of the saddle, which can then be fixed in place (11). Now curve the leading splasher tops (12) and solder these to the splashers with the half-etched recess in the edges over the edge of the splasher sides. Repeat this with the rear splasher tops (13), then solder an 8BA screw (14) into the two chassis fixing holes in the centre of the smokebox saddle and under the rear of the cab.

Take the cab sides/front (15), bend the sides at right angles to the front, check that it sits square and then solder in place on the footplate, with the tabs on the sides slotted into the footplate. Fold the cab floor (17) into shape as shown in the assembly diagram and solder this between the cab sides, about 0.5mm from the rear edge of the running plate. Fold up the LH and RH splashers for inside the cab (16), and fit these to the inside of the sides and to the cab floor. Fold the cab seats () and, noting that they are marked left and right, solder them on top of the cab splashers level with the rear edge. Fit the fall plate (18) onto the cab floor. Bend up the steps on the rear step plates (19) and fix these up against the drag beam into the half-etched grooves in the footplate, then bend and fit the two steps (20) to the step plates. Carefully remove the cab window frames (21) from the fret and fix these to the cab sides, then very carefully cut the cabside beadings (22) off the fret and fix these into the recesses along the cab edges. If modelling a D49/1 (Shire) fold up the expansion link covers (23) and fix these to the footplate forward of the leading splashers.

Turn now to the boiler/firebox (24) and bend out the sides of the firebox base so that they are 17 mm apart at their base, then solder up the seam of the boiler. Roll the riveted smokebox overlay (25) and solder this over the half-etched front section of the boiler/firebox unit, then solder the smokebox front (26) in place, with the handrail knob hole at the top. Take the four boiler bands (27) and fit these to the boiler and firebox, trimming to length where necessary, then bend up and fit the two small steps (28) into the recesses in the smokebox front. The boiler/firebox can now be fitted to the footplate/cab. Check everything for squareness and correct alignment before soldering in place. The boiler handrail can now be formed from the 0.45mm wire (29) and fitted to the boiler with the handrail knobs (30). Make the ejector pipe (31) from 0.9mm wire and fit to the LH side of the boiler. Solder the washout plugs (32) over the holes in the firebox. Take the smokebox door (33), fit the door handles (34), and then fit the door to the smokebox front. Fit the upper lamp bracket (35) to the top of the smokebox front directly above the handrail knob.

Turn back to the cab, take the backhead (36), fit the regulator handle (37) to it, and then fix the backhead into the cab. Curve the cab roof (38) to match the cab front, and solder it to the cab. Curve the riveted cab roof plate (39), and the roof vent (40) to match the roof, and then fix these and the two rain strips (41) in place. Fit the small cast steps (42) to the footplate either side of the cab. If modelling a D49/1 (shire) fit the etched reversing lever and bracket (43) to the LH side of the loco. If modelling a D49/2 (Hunt) use some of the 0.9mm wire to make the reverser rod (44), drill out the small cast bracket, and fit these and the cast shaft and bevel gearbox (45) to the LH side of the boiler. Fit the sandbox fillers (46) into their holes in the footplate. If modelling a D49/1 (Shire) fit a mechanical lubricator (47) into the hole in the LH side footplate. If modelling a D49/2 (Hunt) drill out the half-etched hole in the footplate and fit both lubricators. Also, if modelling a D49/2 (Hunt), fit the steam pipes (48) either side of the smokebox.

Turn to the front end of the footplate, and make and fit the two small handrails, then fit the three front lamp brackets (49), followed by the buffers (50) and vacuum pipe (51). Now turn to the boiler and fit the boiler fittings, starting with the small cover against the cab front followed by the whistle (53), Ross pop safety valves (54), dome (55), anti-vacuum valve (56), and chimney (57).

Finally, fit the injector (61) behind the LH rear step, and fit the rocking grate operating lever cover (62) to the top of the RH rear splasher, up against the firebox side.

D49 parts list

Chassis

1.	Frames.
2.	1/8th Driving Axle Bearings.
3.	Frame Spacers.
4.	Cylinder Block.
5.	2mm Bearings.
6.	Cylinder Rear Covers.
7.	Cylinder Sides.
8.	Cylinder Front Covers.
9.	Compensation beams.
10.	Compensation Spring.
11.	0.7mm Brass Wire.
12.	Brake Hangers.
13.	Brake Blocks.
14.	Brake Rods.
15.	0.9mm Brass Wire.
16.	Small Brake Lever.
17.	Large Brake Lever.
18.	Detailed Spring Overlays.
19.	L/H Sandbox.
20.	R/H Sandbox.
21.	Ashpan Sides.
22.	Slidebar Support Bracket.
23.	Main Motion Bracket. **(Shire).**
24.	Front Motion Bracket. **(Shire).**
25.	Lubricator Mechanism Bracket.
26.	Camshaft Cover Base. **(Hunt).**
27.	Camshaft Cover. **(Hunt).**
28.	Cylinder Spring Covers. **(Hunt).**
29.	Rear Valve Guides. **(Shire).**
30.	Front Valve Guide Covers. **(Shire).**
31.	Bogie.
32.	Bogie Spacers.
33.	Washer.
34.	8BA Nuts and Screws.
35.	Coupling Rods.
36.	Connecting Rods.
37.	Crossheads.
38.	R/H Slidebar.
39.	L/H Slidebar.
40.	Front Half of Drive Shaft. **(Hunt).**
41.	Drive Shaft and Gearbox. **(Hunt).**
42.	Drive Shaft Link. **(Hunt).**
43.	Expansion Links. **(Shire).**
44.	Eccentric Rods. **(Shire).**
45.	Return Cranks. **(Shire).**
46.	LH & RH Valve Rods. **(Shire).**
47.	Anchor Links. **(Shire).**
48.	Combination Levers. **(Shire).**
49.	Cylinder Drain Cocks.
50.	Balance weights
51.	Drawbar
52.	Drawbar pivot
53.	14BA Nuts and Screws.
54.	Short Link. **(Hunt).**
55.	Long Link. **(Hunt).**
56.	Crank. **(Hunt).**

Superstructure

1. Footplate.
2. Valances.
3. Buffer Beam.
4. Drag Beam.
5. Buffer Beam Overlay.
6. Front Frame Pieces.
7. Front Step Plates, LH & RH.
8. Steps.
9. Footplate Step.
10. Upper Frame Pieces/Saddle Sides.
11. Smokebox Saddle Front and Rear.
12. Leading Splasher Tops.
13. Rear Splasher Tops.
14. 8BA Nuts and Screws.
15. Cab Sides and Front.
16. Cab Splashers, LH & RH. #
17. Cab Floor. #
18. Fall Plate. #
19. Rear Step Plates, LH & RH.
20. Steps.
21. Cab Window Surrounds.
22. Cabside Beading.
23. Expansion Link Covers. #
24. Boiler/Firebox.
25. Smokebox Overlay. #
26. Smokebox Front.
27. Boiler Bands. #
28. Smokebox Front Steps.
29. 0.45mm Brass Wire.
30. Handrails Knobs.
31. Ejector Pipe, 0.9mm Brass Wire.
32. Washout Plugs. #
33. Smokebox Door.
34. Smokebox Door Handles.
35. Upper Lamp Bracket.
36. Backhead.
37. Regulator Handle.
38. Cab Roof.
39. Roof Plate.
40. Roof Vent. #
41. Rain Strips. #
42. Small Cabside Steps (Two Parts). #
43. Standard Reversing Lever and Bracket. **(Shire). #**
44. Reverser Bevel Gearbox. **(Hunt).**
45. Reverser Rod Shaft, 0.9mm Wire. **(Hunt).**
46. Sandbox Fillers.
47. Mechanical Lubricators.
48. Steam Pipes, **(Hunt).**
49. Front Lamp Brackets.
50. Buffers.
51. Vacuum Pipe.
52. Whistle Manifold Cover.
53 Whistle.
54. Ross Pops.
55. Dome.
56. Anti-Vacuum Valve.
57. Chimney.
58. Reversing Bar Strengthener. #
59. Cowlairs Reversing Bar. #
60. Reverser Shaft Bracket. **(Hunt).**
61. Injector.
62. Rocking Grate Lever Covers.
63. Cab Seats, L/H & R/H. #
64. Firebox Side Washout Plugs. #

Parts denoted # are now on the new chassis etch.

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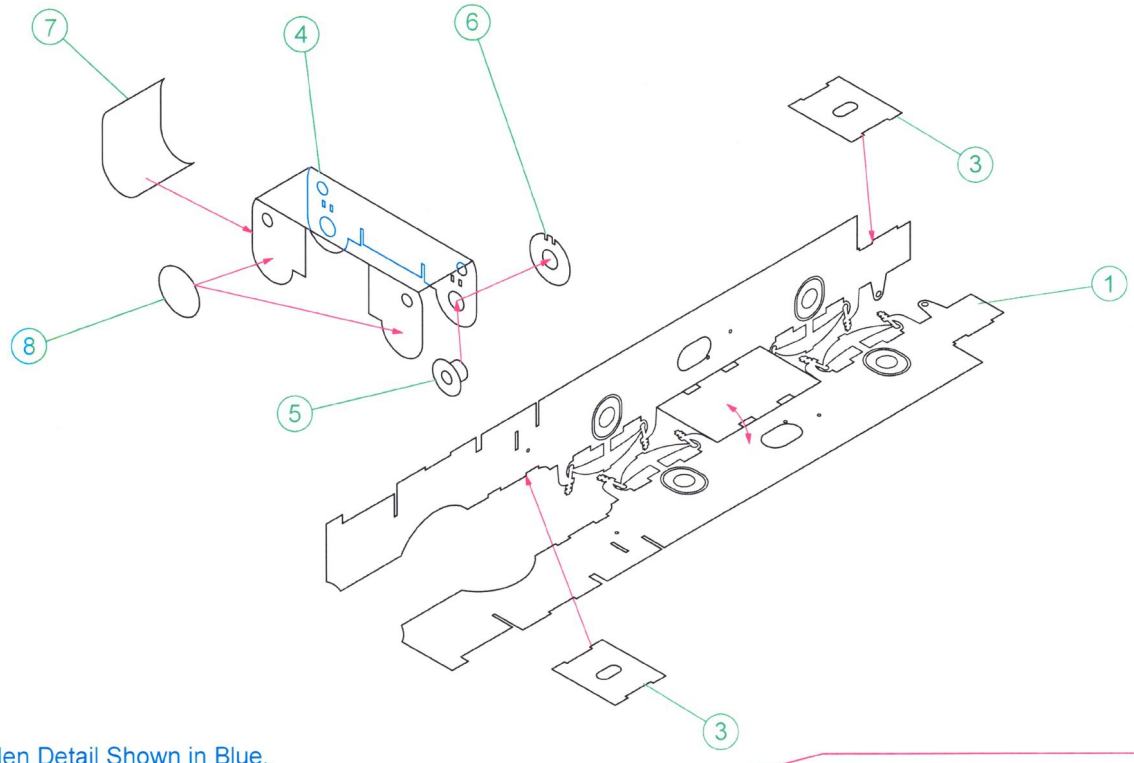
Fig. 1. Chassis Construction.



Hidden Detail Shown in Blue.

Fig. 1a. Compensation Beams.

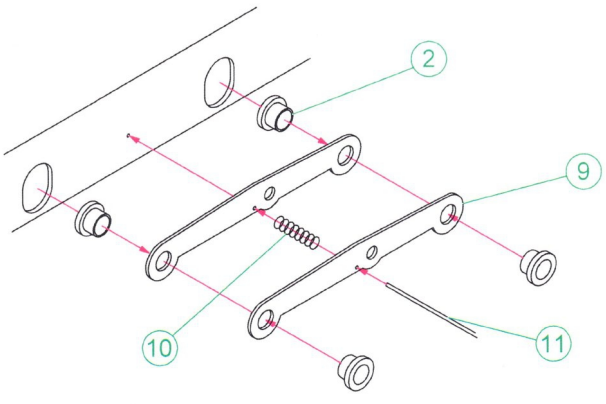


Fig. 1b. Brake Gear.

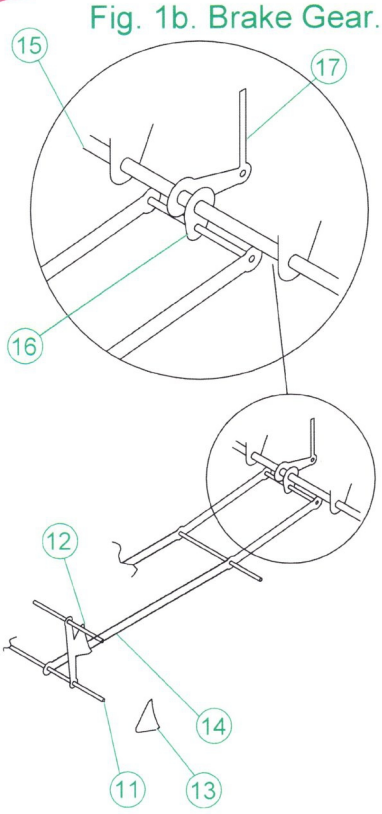


Fig. 2. Shire Chassis Only.

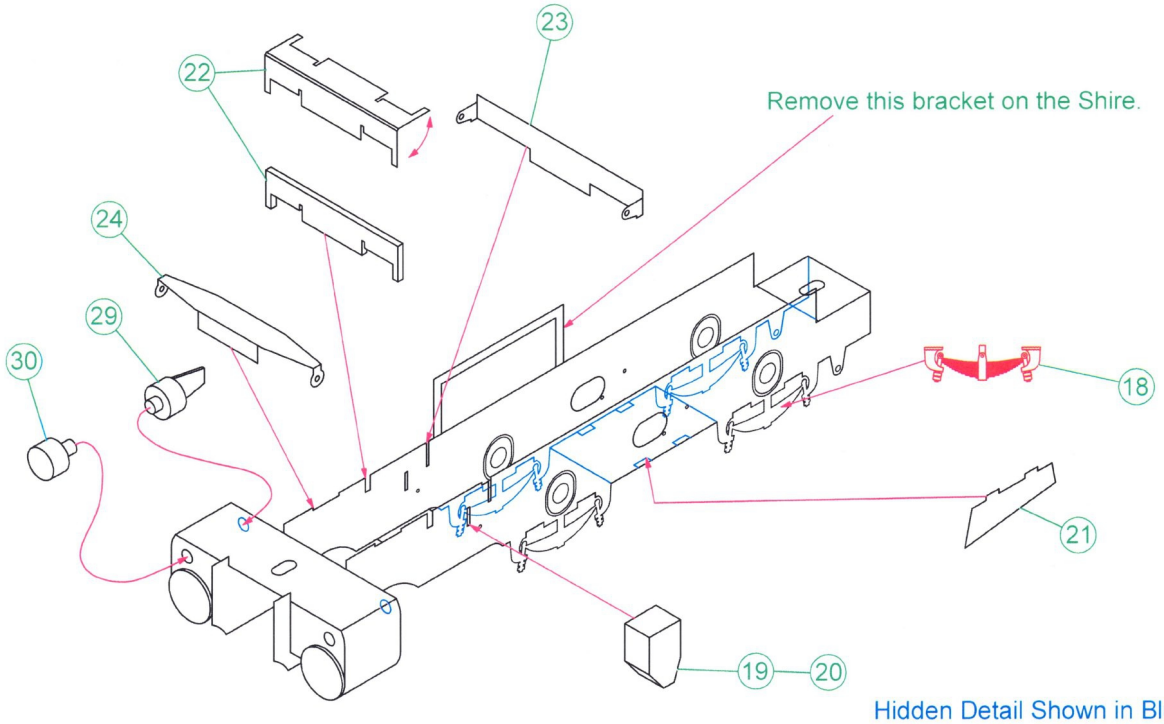


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Fig. 3. Hunt Chassis Only.

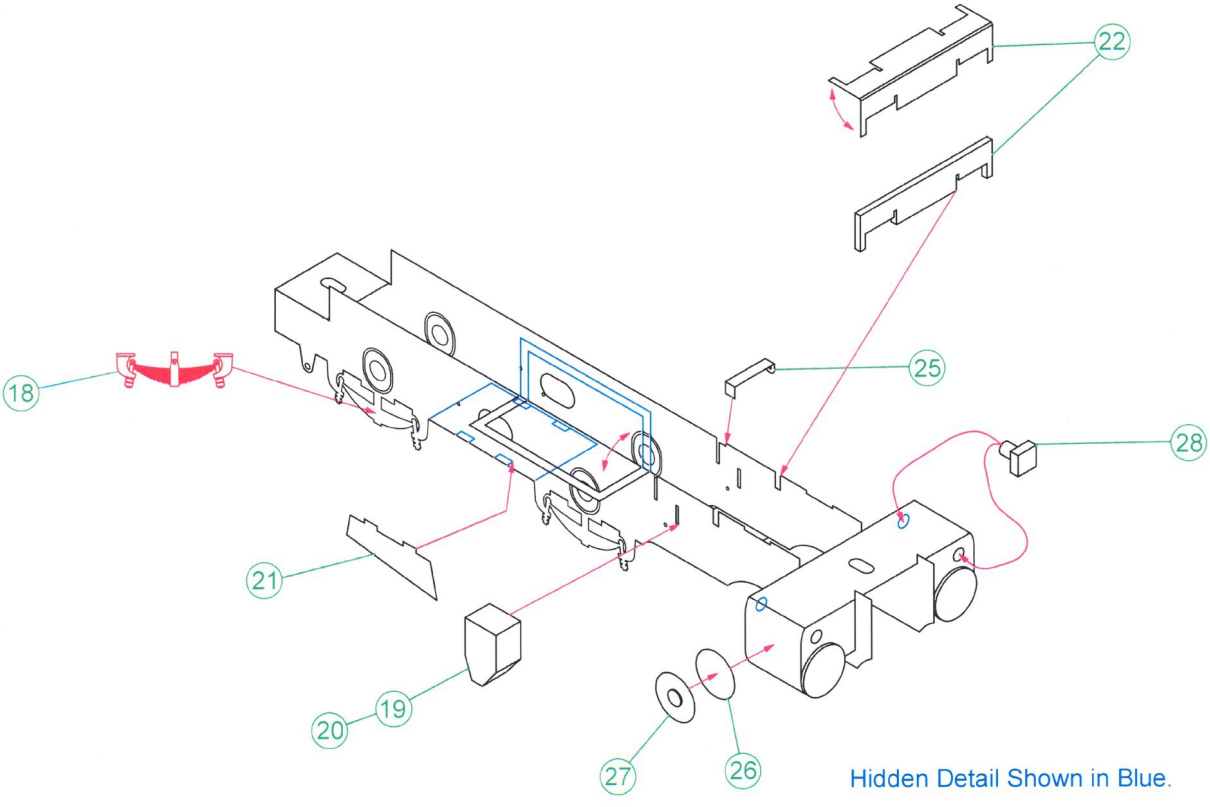

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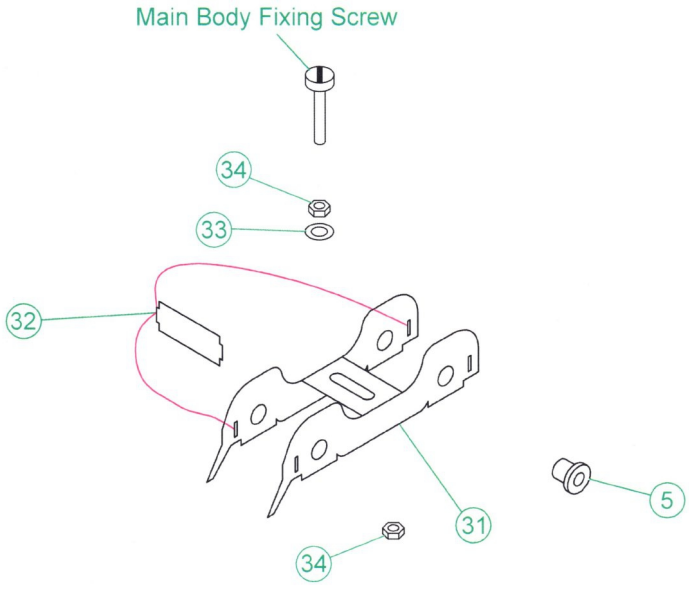
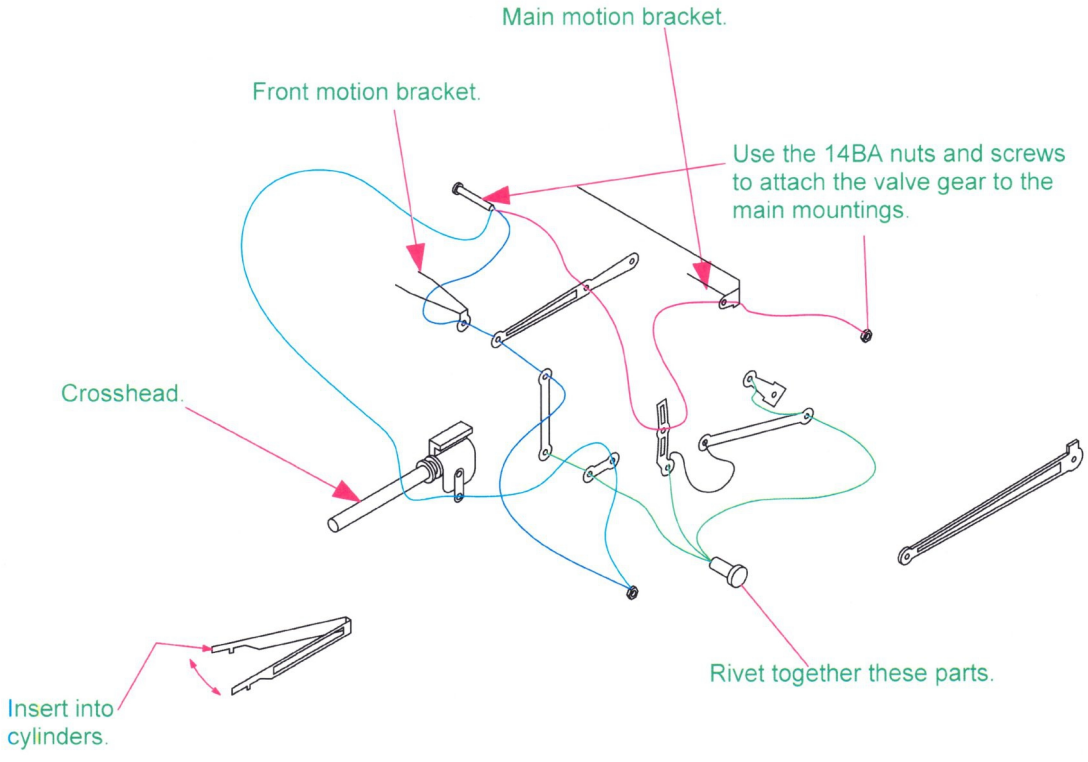
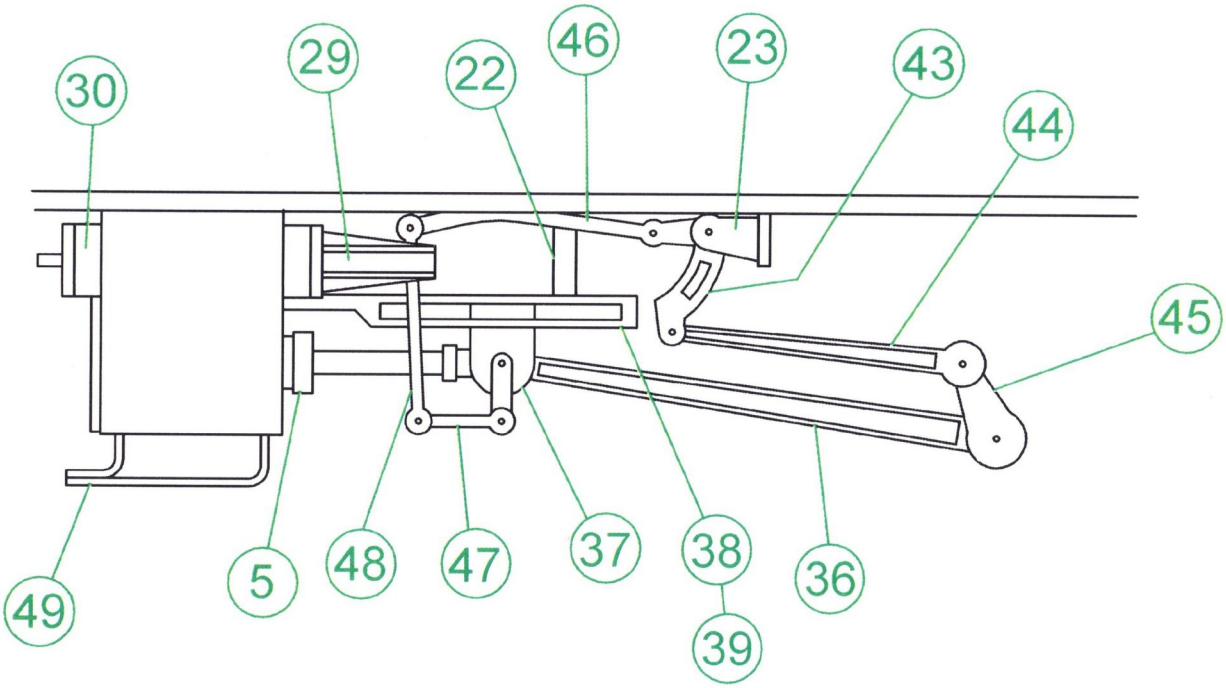
Fig. 4. Bogie.



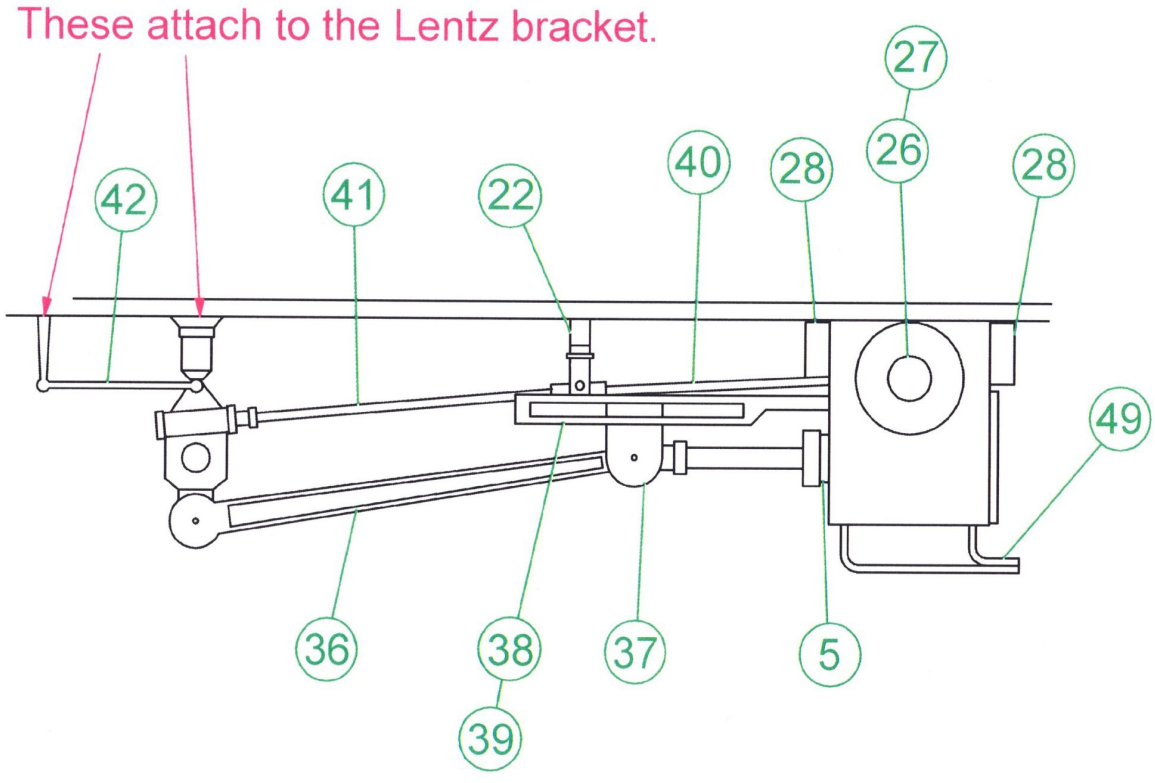
VALVE GEAR ASSEMBLY.



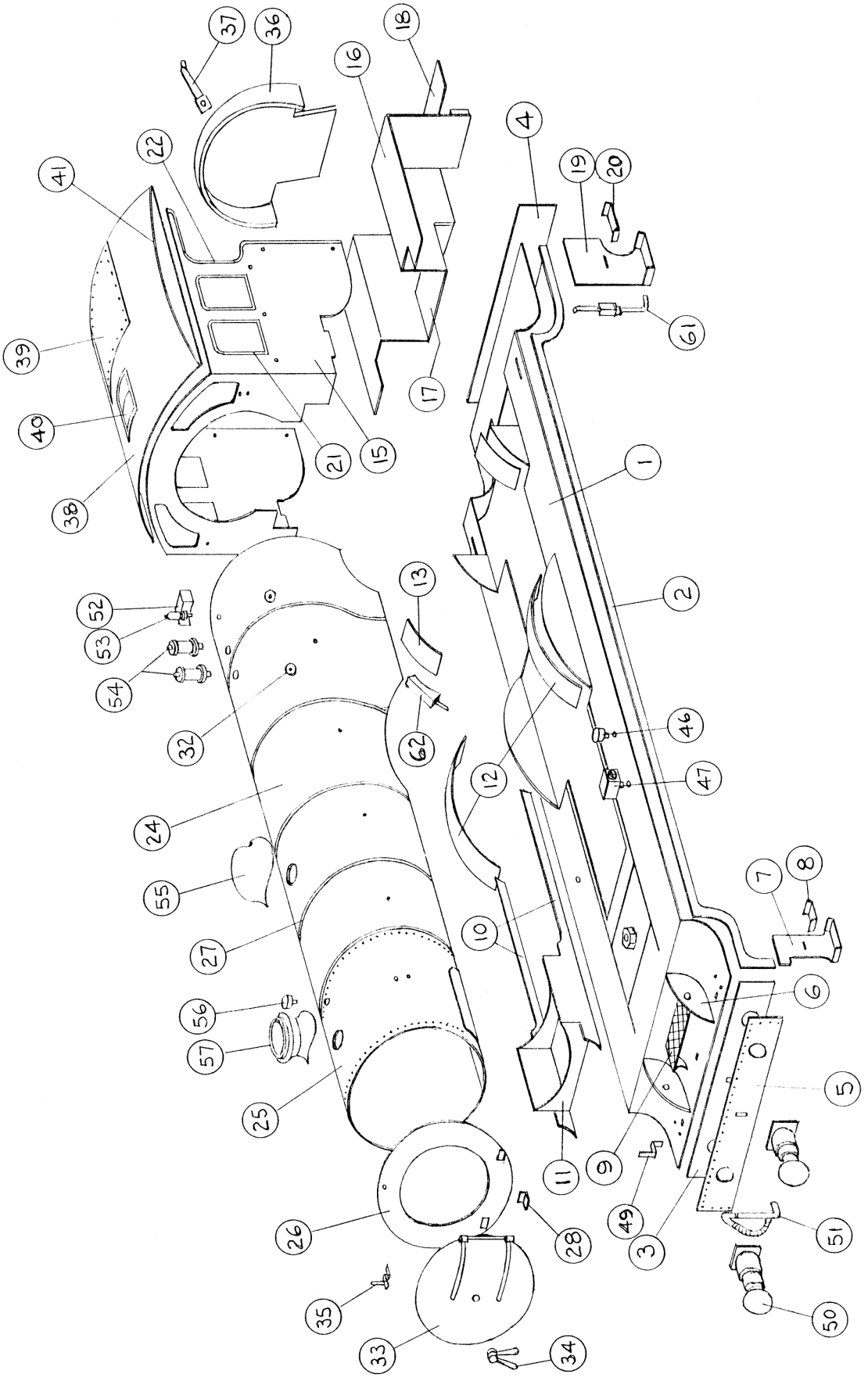
Walschaerts Valve Gear



Lentz Rotary Cam Valve Gear

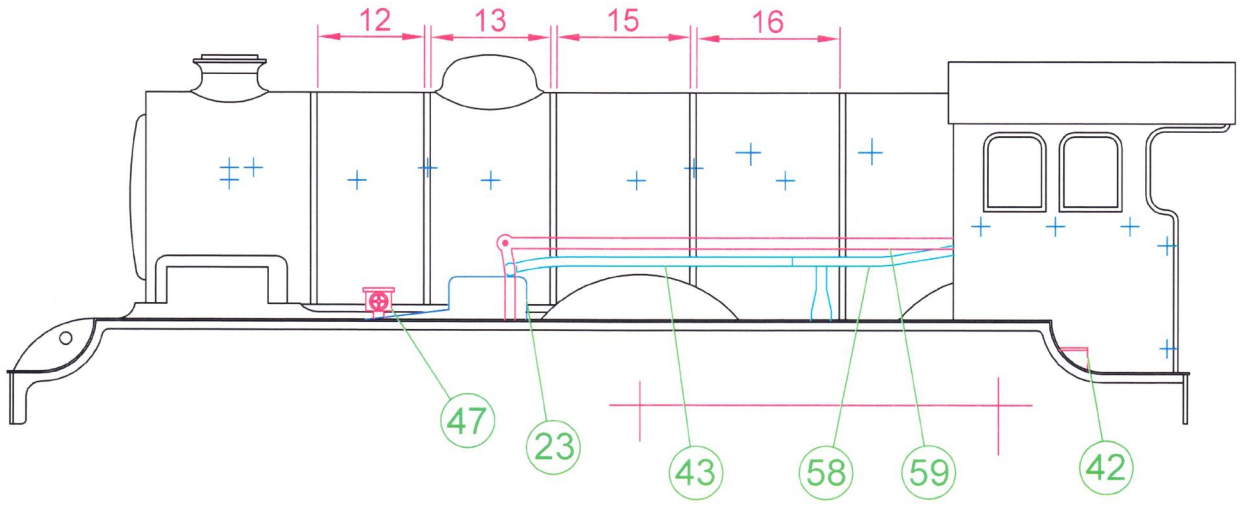


Superstructure Assembly

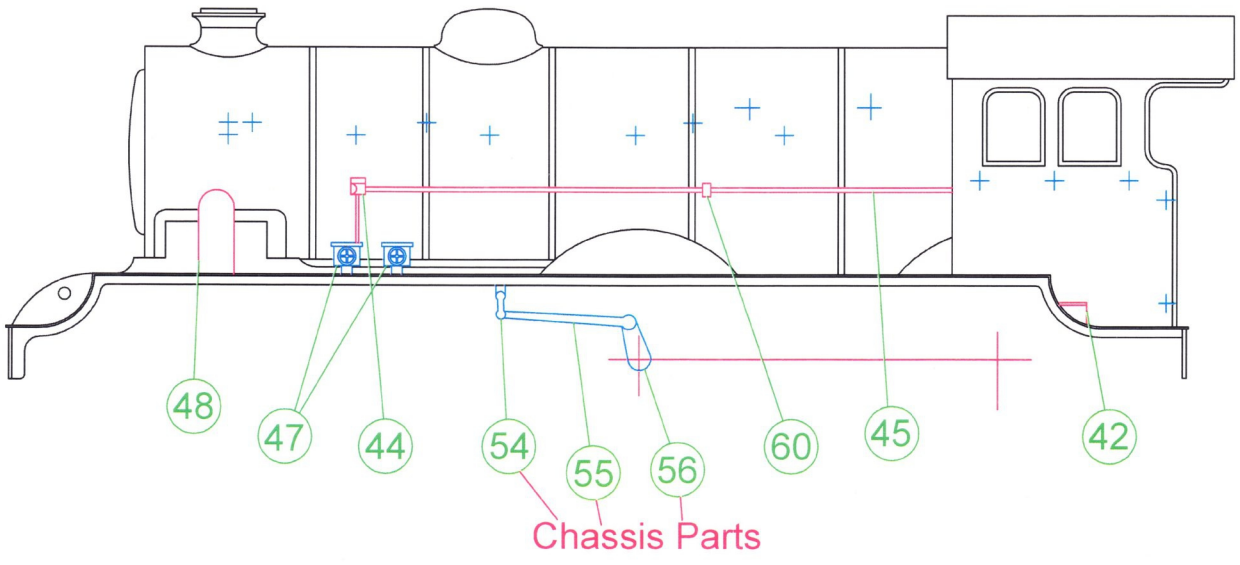


Detail Differences

D49/1 Shire



D49/2 Hunt



Chassis Parts