Brassmasters Scale Models

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LONDON & NORTH EASTERN RAILWAY

STREAMLINED NON-CORRIDOR TENDER KIT

Designed by Martin Finney

4MM SCALE
OO - EM - P4

INSTRUCTIONS AND PROTOTYPE NOTES

PO Box 1137 Sutton Coldfield B76 1FU

1: BRIEF HISTORICAL DETAILS

The 23 tenders which form the subject of this kit were built at Doncaster under four Tender Order numbers as follows:

Order No.	Numbers	Date Built	Built for	Front handrail
62	5576-5579	6/36-9/36	P2 class 2003-2006	4’ 3”
66	5636-5645	12/36-6/37	A1 and A3 classes – to replace corridor tenders transferred to A4 class	4’ 3”
67A & 68	5667-5675	11/37-5/38	A4 class	4’ 6”

Tenders 5636, 5638, 5639, 5641 and 5642 were transferred to new A4 class locomotives 4902, 4464, 4903, 4901 and 4468. Their front handrails were unaltered at 4’ 3”.

From about 1942 the built-up slatted coal gates were gradually replaced by ones cut from sheet steel.

From 1948 the height of the tender canopy on the five tenders still attached to classes A1 and A3 was reduced to 12’ 1”.

The preserved A4s, 4468 *Mallard*, 60008 *Dwight D. Eisenhower* and 4464 *Bittern* have this design of tender.

For a more detailed history of these tenders Part 2A of Locomotives of the L.N.E.R. published by the R.T.C.S. is essential reading.

Other valuable sources of information and photographs are:

Isinglass Drawing - Drg. N^{O}.335
Yeadon's Register of L.N.E.R. Locomotives - Volume One - Irwell Press
Yeadon's Register of L.N.E.R. Locomotives - Volume Two - Irwell Press
Locomotives Illustrated 25 - Ian Allan
Locomotives Illustrated 38 - Ian Allan
The Power of the A1s, A2s and A3s - J.S.Whiteley & G.W.Morrison - Oxford Publishing Co.
The Power of the A4s - Brian Morrison - Oxford Publishing Co.
The Gresley Pacifics - O.S.Nock - David & Charles
East Coast Pacifics at work - P.N.Townend - Ian Allan
The A4 Pacifics - P.N.Townend - Ian Allan

SECTION 2: CONSTRUCTING THE CHASSIS

Note that many of the components handed left/right and care must be taken to ensure the correct component is used. I have not always identified left/right components separately but with care and common sense no problems should arise.

Start by opening up the holes in the chassis frames and centre spacer (parts C1, C2 & C4) as follows:

1/16" to fit the compensation beam pivots
0.45mm to fit the wire for the brake hanger pivots & scoop stays - to fit the scoop casting
1.2mm to fit the front brake cross shaft
0.7mm in the brackets to fit the rear scoop cross shaft.

Fold over the axle slot reinforcing plates on the chassis frames, through 180°, with the half-etched line on the outside of the fold. Widen the slots so that the axles are a sliding fit.

Fold up the appropriate (for the gauge being modelled) spacers (parts C3, C4 & C5) with the fold lines on the inside and solder in place in the chassis slots checking that the chassis is straight and square.

Construct the front compensation beam by soldering the two halves (part C6) together. Cut a piece of 3/32" brass tubing to fit between the sides of the chassis frames and solder the beam in place, centrally. Fit the beam using a piece of 1/16" brass wire as the pivot. Similarly fit the rear beams to two pieces of tubing so that they pivot independently. They are soldered to the tubing near one end so that they will clear the axle slot reinforcing plates.

Make up the wheel sets carefully setting the back to back measurement with a gauge. **Check that the beams are the correct way up**, fit the wheel sets and test that the chassis works correctly. Wheel side control is limited by using the washers part C18. **Clearance between the wheels and the outside frames is limited, especially in P4, so it is probably wise to assemble the outside frames now so that clearances can be checked.**

Solder the brake hanger pivots, from 0.45mm wire, in place.

Fold down the brackets for the rear scoop cross shaft on part C4 and assemble the water scoop as shown in Fig.2. Do not fit parts C16 & C17 at this time. Refit the wheel sets and retain as shown in Fig. 2.

Assemble the brake hangers (parts C7, C8 & C9) and attach the hangers to the pivot wires. Check the clearance between the brake shoes and the wheels making any necessary adjustments. Complete the brake gear as shown in Fig.3. Lastly, attach parts C16 & C17 soldering the front end of part C17 to the wire from part C13.

SECTION 3: CONSTRUCTING THE FRAMES / BUFFERBEAM / DRAGBEAM ASSEMBLY

First emboss all the rivets on the frames (part F1) and part F2 and solder in place part F13 as shown in Fig.5. The embossing process on part F2 does tend to distort the metal making the component grow longer! This can be minimised by doing the embossing carefully and before the component is removed from the main fret.

Fold up and solder together part F1 (see Fig.5), with all fold lines on the inside. Fold out the upper part of the footplate support brackets. Fold out the lower part of the brackets from part F2 and solder part F2 in place on the frames. Slide the bracket webs (part F3) into the grooves in the brackets and solder in place.

Solder parts F6 and F7 to the front and the bufferbeam overlay (part F8) to the rear. Add part F9 through the slots in the bufferbeam overlay and solder in place before adding part F11. Fold up part F10 and solder in place. Solder together the two coupling hook laminations (part F15) and attach to the rear bufferbeam.

Assemble the buffers and solder in place. Clearance for the buffer shank is very tight, it is designed to move in the slot in part F1.

Fold up the steps (parts F4 & F5) and solder in position. Solder part F12 in the slots below the rear bufferbeam and attach the vacuum tank (part W2) with the straps (part F14). Lastly attach the remaining castings (W1, B1 & B2). The locating spigots on the axlebox castings will need to be cut off flush with the inside of the frames to clear the wheels.

SECTION 4: CONSTRUCTING THE BODY

Drill the appropriate upper front handrail holes (0.8mm diameter) as shown in Fig. 6. The centres can be determined by one of these ways:

- Measuring from the lower hole – the dimensions are in millimetres.
- Using Fig. 6 as a template.
- Using the cab side from the loco kit as a template.

Forming the curve in the top of the sides over a 4mm (5/32”) diameter rod. Check that the curve fits parts U7, U19, U20, U21, U22 & P6 or D2. Solder parts U4 & U19 in place as shown in Fig. 7.

Emboss all the rivets on parts U15, U17, U26, U27 & U30.

Solder parts U7, U8 & U9 together as shown in Fig. 9. Fold up the rear steps (part U11) and solder in place. Fit the rear handrails and lamp brackets as shown in Figs. 7 & 11.

Solder parts U14 & U15 together ensuring accurate alignment. Fit the lifting ring eyes (part U23) to the tank top forming the rings around a 2.5mm rod.

Solder parts U26, U27 & U28 together as shown in Figs. 7 & 9.

Open up the holes for the vent pipes in the coal space hopper, then fold the coal hopper up, making the top bends first before soldering the hopper edges together.

Solder 10 BA nuts, for body fixing, over the holes front and rear in the footplate (part U1).

The tender body, **with most of the soldering done from inside**, can now be assembled in the following order.

First fix one side and the back into the slots in the footplate. Solder the division plate into the slots in the tank top and fix in place parts W4, before fixing in place in the half etched slots in the tank side and back. Now attach the second side before soldering the hopper in place.

Fix part U30 in place as shown in Fig. 7. Fit the lifting rings (part U23, U24 & U25) to the coal hopper and parts U20, U21 & U22 as shown in Fig.7.

Now assemble the appropriate front plate as shown in Figs. 7,8 & 9.

The design uses two layers. Bear in mind the following:

The front plate is made in two separate assemblies (upper and lower) before soldering the two assemblies together.

Open up the various holes to fit the castings first.

Emboss all rivets and fold out the brackets for the water valve handles, the shovelling plate and the shovelling

plate sides.

Bend up and fit the fire iron brackets and fit parts P3, P4, P5, P8, P9 & P10 as appropriate before soldering the laminations together **around their edges**.

When you have assembled the front plate fit it in place in the slots in the footplate. Soldering need only be done under the footplate and to the sides at the top.

Fit the raised footplate support (part P16) before fitting the raised footplate (part P15).

Attach the vertical handrails at the front using 0.45mm wire.

Anneal the cab door hinges (part U5) by heating in a flame and bend to shape around a piece of 0.45mm wire. The hinge pins have been made too long so that they can be bent over to stop the doors falling off! The brackets to clip the tender and engine doors together can be made from wire.

The remaining parts can now be fitted as shown in the diagrams.

I hope you enjoy building and using your tender as much as I have enjoyed researching and designing it. If you have any problems with the kit or any criticisms or suggestions please contact Brassmasters.

Martin Finney May 1998

WHITEMETAL CASTINGS

W1. Axlebox/Spring - (8)
W2. Vacuum tank
W3. Water scoop - 4 parts
W4. Scoop dome - (2)
W5. Water filler

BRASS CASTINGS

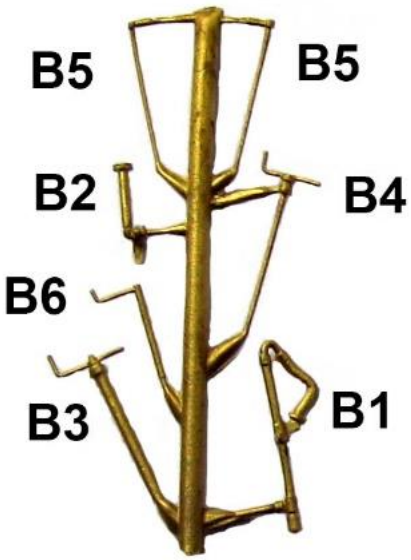
B1. Vacuum pipe
B2. Steam heating pipe
B3. Brake column
B4. Scoop column
B5. Water valve handle - (2)
B6. A4 smokebox doors crank

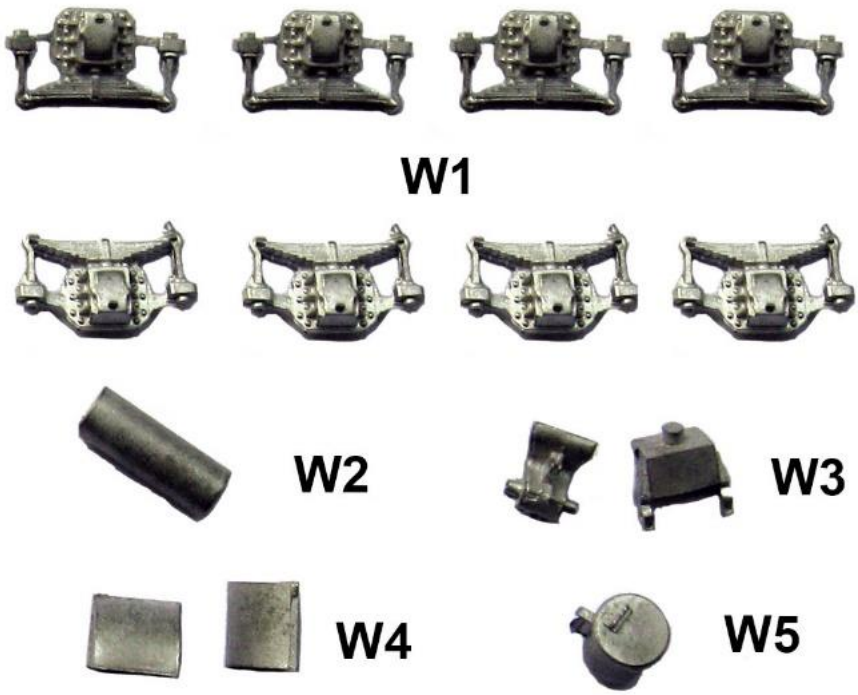
OTHER COMPONENTS

10 B.A. screw - (2)
10 B.A. nut - (2)
1/16" brass wire for compensation beam pivots
3/32" diameter brass tube for compensation beams
Handrail knob - (10)
Brass wire - 0.3mm - for lifting rings and water scoop indicator
Brass wire - 0.45mm - for handrails, scoop stays, water gauge & brake cross shafts
Brass wire - 0.7mm - for water scoop pivot and cross shaft
Brass wire - 1mm - for vent pipes
Brass wire - 1.2mm - for front brake shaft
Buffer housing, buffer & spring - (2)

COMPONENTS NOT PROVIDED

Wheel 4' 2" diameter - Disc - (8)
2mm diameter plain axle - (4)


B5
B5
B2
B4
B6
B3
B1


W1
W2
W3
W4
W5

ETCHED COMPONENTS

CHASSIS

D1. Chassis frame - left side
D2. Chassis frame - right side
D3. Chassis stretcher - front - 3 widths
D4. Chassis stretcher - centre - 3 widths
D5. Chassis stretcher - rear - 3 widths
D6. Compensation beam - (4)
D7. Brake hanger/shoe lamination - front axle - (4)
D8. Brake hanger/shoe lamination - second axle - (4)
D9. Brake hanger/shoe lamination - rear axles - (8)
D10. Brake pull rod - (4)
D11. Brake cross-shaft
D12. Front brake pull rod lamination - (4)
D13. Lever lamination - brake cylinder to cross-shaft - left - (2)
D14. Lever lamination - brake cylinder to cross-shaft - right - (2)
D15. Water scoop lever lamination - Scoop/rear cross-shaft - (2)
D16. Water scoop lever - Cross-shaft/pull rod
D17. Water scoop pull rod
D18. Washer - wheel side control

FRAMES

F1. Frame/footplate brackets - (2)
F2. Frame/footplate brackets webs - (16)
F3. Frame steps - upper - (4)
F4. Frame steps - lower - (4)
F5. Drag beam overlay
F6. Drawbar pocket overlay - (4)
F7. Bufferbeam overlay
F8. Bufferbeam/frame web - (4)
F9. Bufferbeam/frame bracket - (2)
F10. Overlay beneath buffers - (2)
F11. Coupling plate beneath bufferbeam
F12. Brake hanger pin retainer - (8)
F13. Vacuum tank strap - (2)
F14. Coupling hook lamination - (2)
F15. Screw coupling
F16. Frame/bufferbeam/drag beam assembly
F17. Drawbar

UPPERWORKS

U1. Footplate
U2. Tank side – left
U3. Tank side – right
U4. Cab door hinge - (4)
U5. Cab door - (2)
U6. Water gauge bracket
U7. Tank back
U8. Tank back - inner overlay

UPPERWORKS (continued)

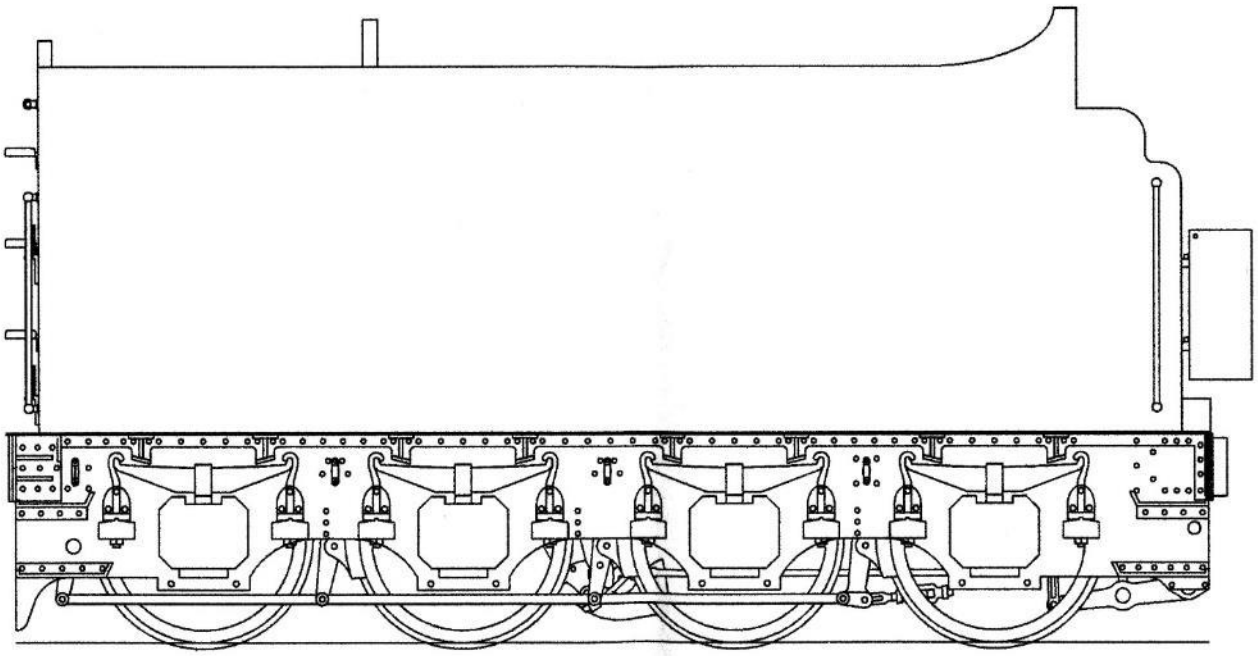
U9. Tank back - inner overlay angle – (2)
U10. Angle piece – back
U11. Rear step - (3)
U12. Lampbracket - lower section - (4)
U13. Lampbracket - upper section - (4)
U14. Tank top
U15. Tank top overlay
U16. Water filler catch
U17. Coal space hopper
U18. Vent pipe flange - (2)
U19. Coping plate strengthening rib 1 – (2)
U20. Coping plate strengthening rib 2&3 – (4)
U21. Coping plate strengthening rib 4 – (2)
U22. Coping plate strengthening rib 5 – (2)
U23. Lifting ring - eye - (4)
U24. Front lifting ring base plate - (2)
U25. Front lifting ring bracket – (2)
U26. Division plate – front lamination
U27. Division plate – rear lamination
U28. Division plate - angle - (2)
U29. Angle piece - division plate
U30. Sloping coal plate

FRONT PLATE

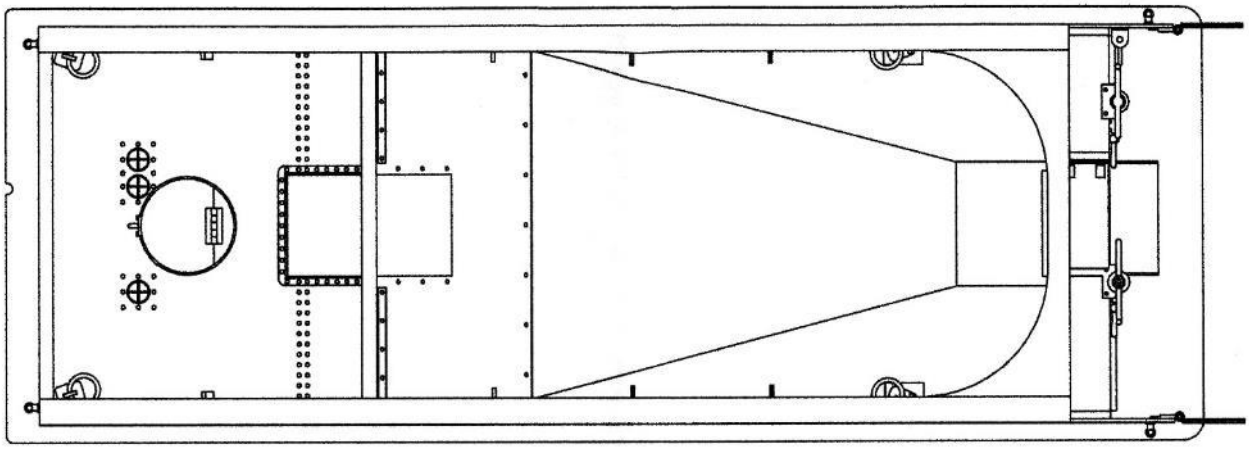
P1. Front plate - lower - inner overlay
P2. Front plate - lower - outer overlay
P3. Locker hinges - (4)
P4. Locker rainstrip - left
P5. Locker rainstrip - right
P6. Front plate - upper - inner overlay
P7. Front plate - upper - outer overlay
P8. A4 smoke box doors handle bracket – (2)
P9. Rib between side and front plate – (2)
P10. Coal door angle strip
P11. Vertically hinged flap
P12. Spare lamp bracket – (2)
P13. Vent pipe bracket - (2)
P14. Front fairing
P15. Raised footplate
P16. Raised footplate support

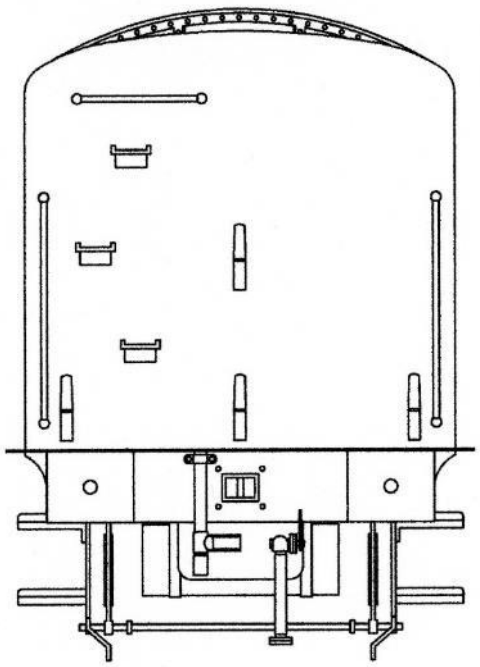
CUT DOWN FRONT PLATE

D1. Front fairing
D2. Front plate - upper - inner overlay
D3. Front plate - upper - outer overlay
D4. Coal door
D5. Shovelling plate door



AS BUILT FOR A4 CLASS WITH 4" 6' FRONT HANDRAILS





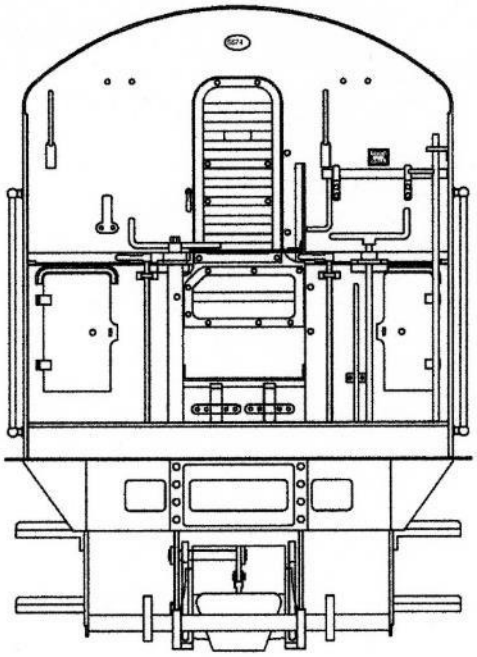


FIG. 2

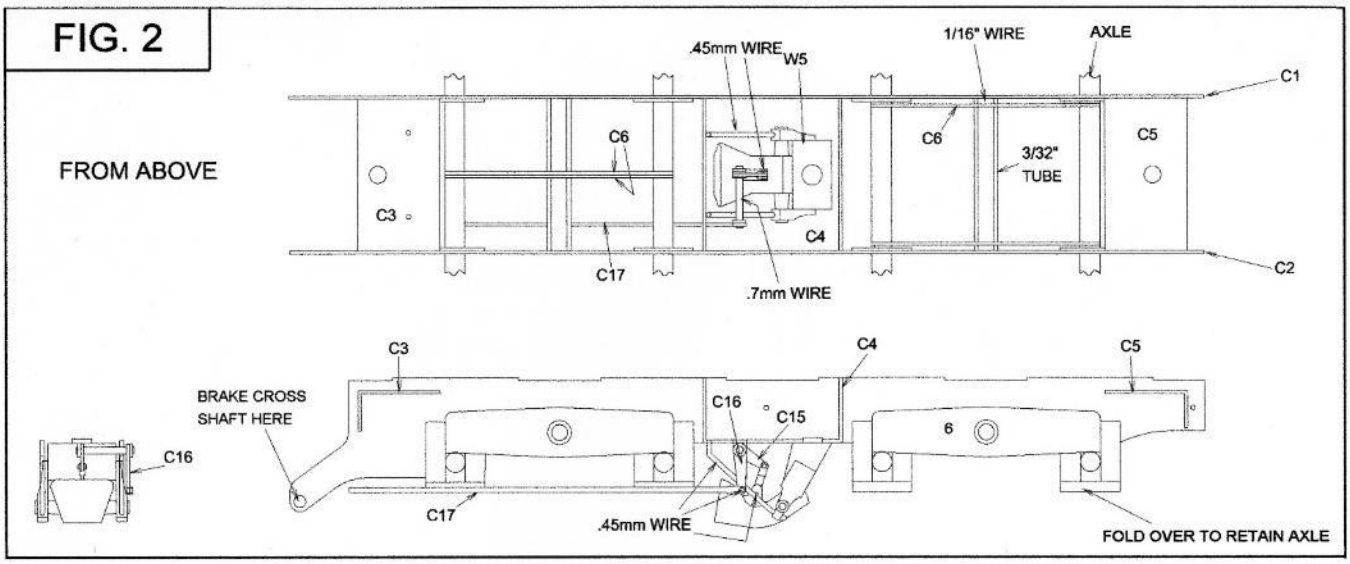
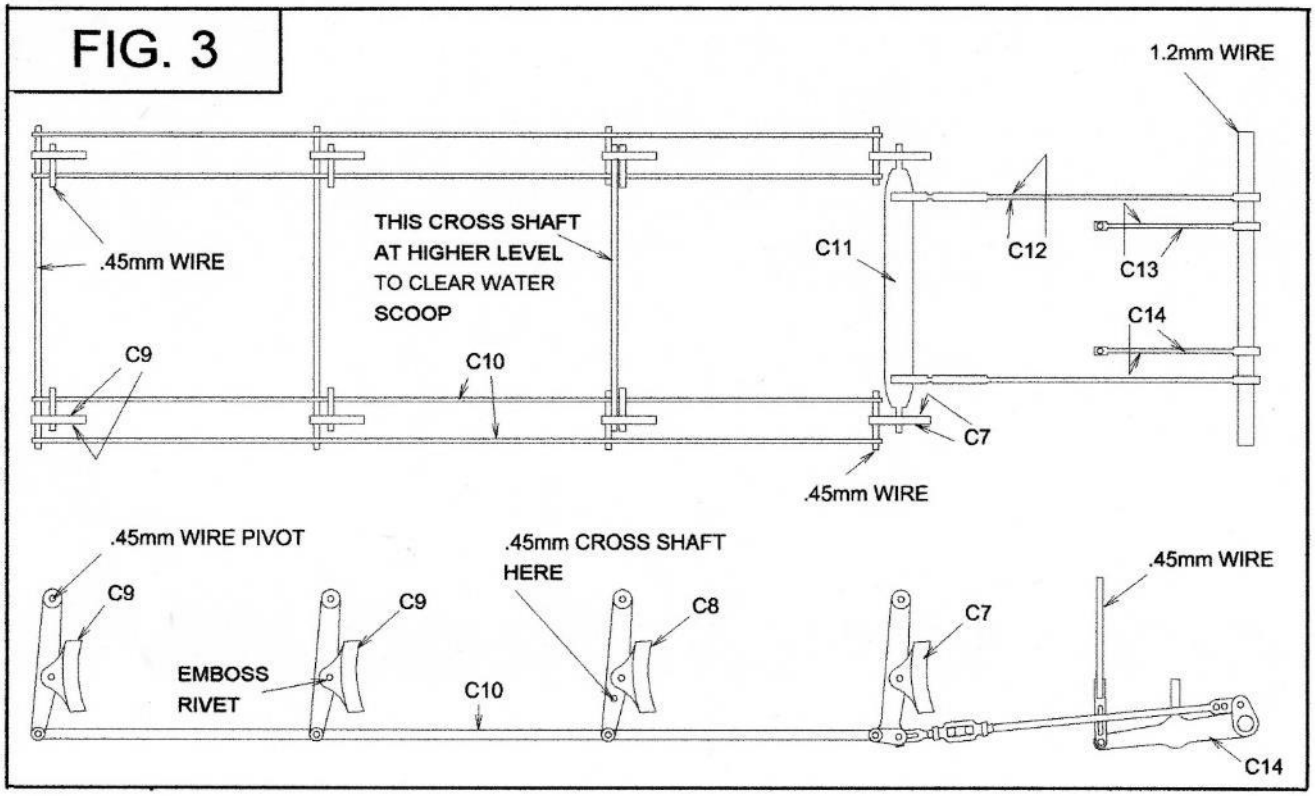


FIG. 3



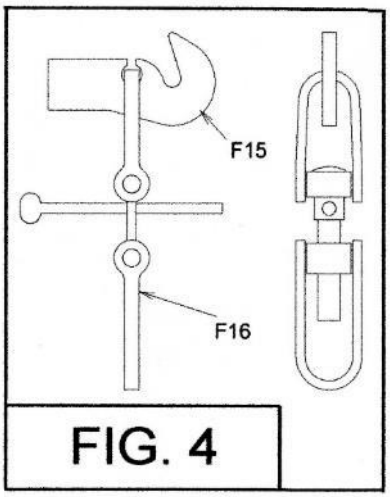


FIG. 4

FIG. 5

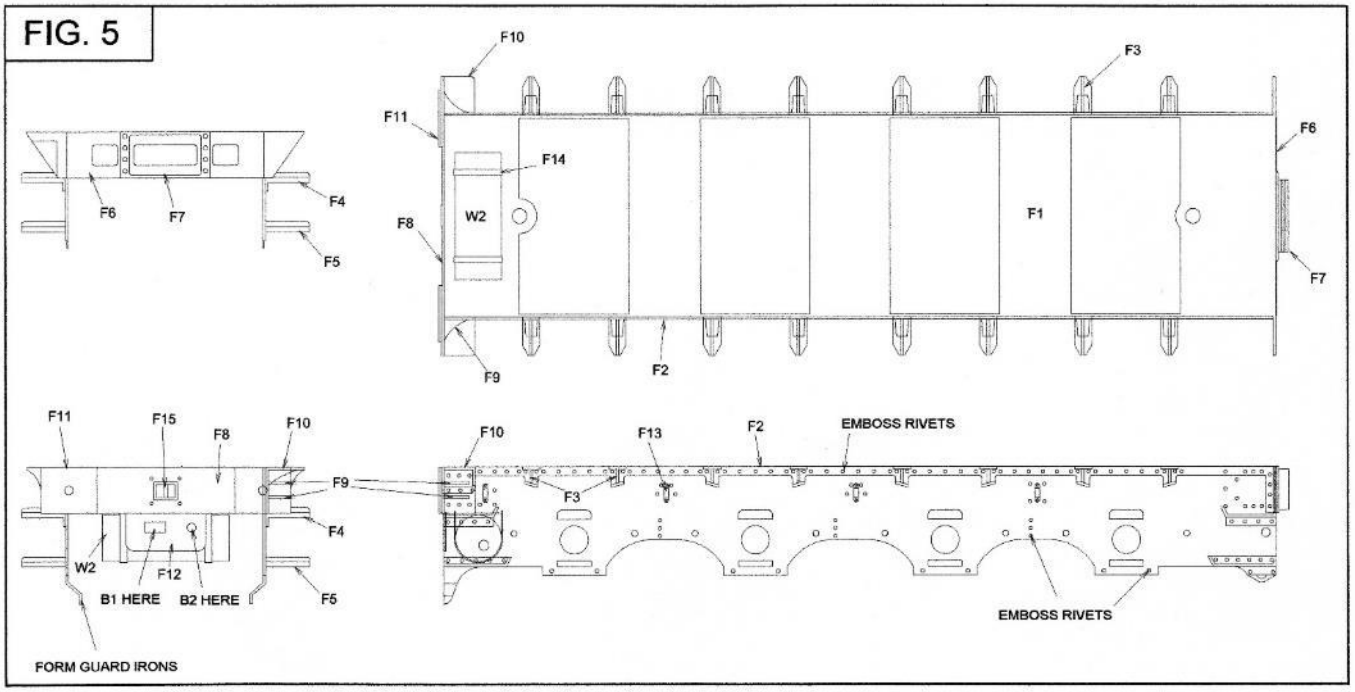


FIG. 6

HANDRAIL HOLES

4' 3" 4' 6"

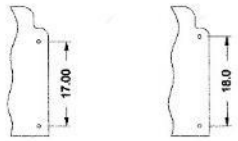
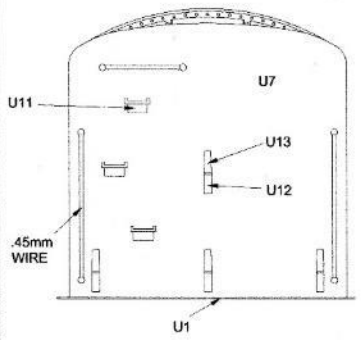
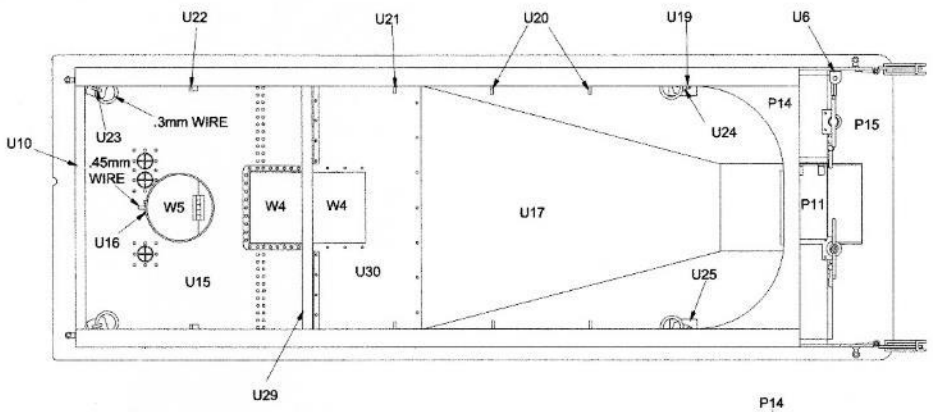
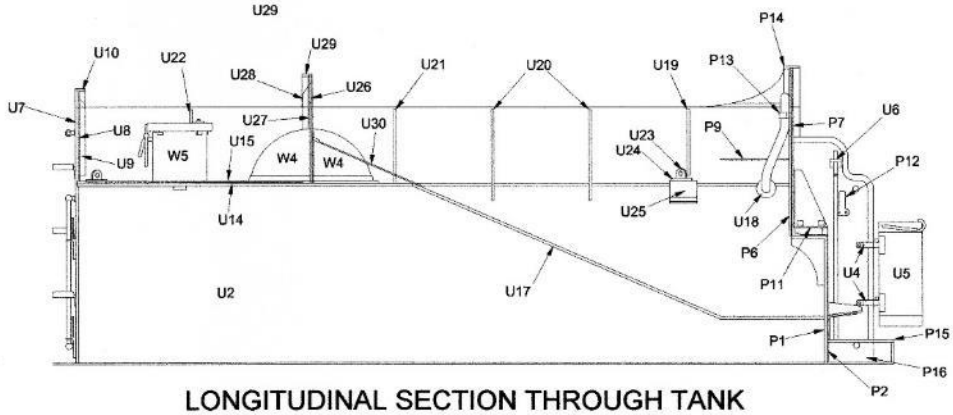


FIG.7



ORIGINAL CONDITION





LONGITUDINAL SECTION THROUGH TANK

FIG.8 ORIGINAL CONDITION

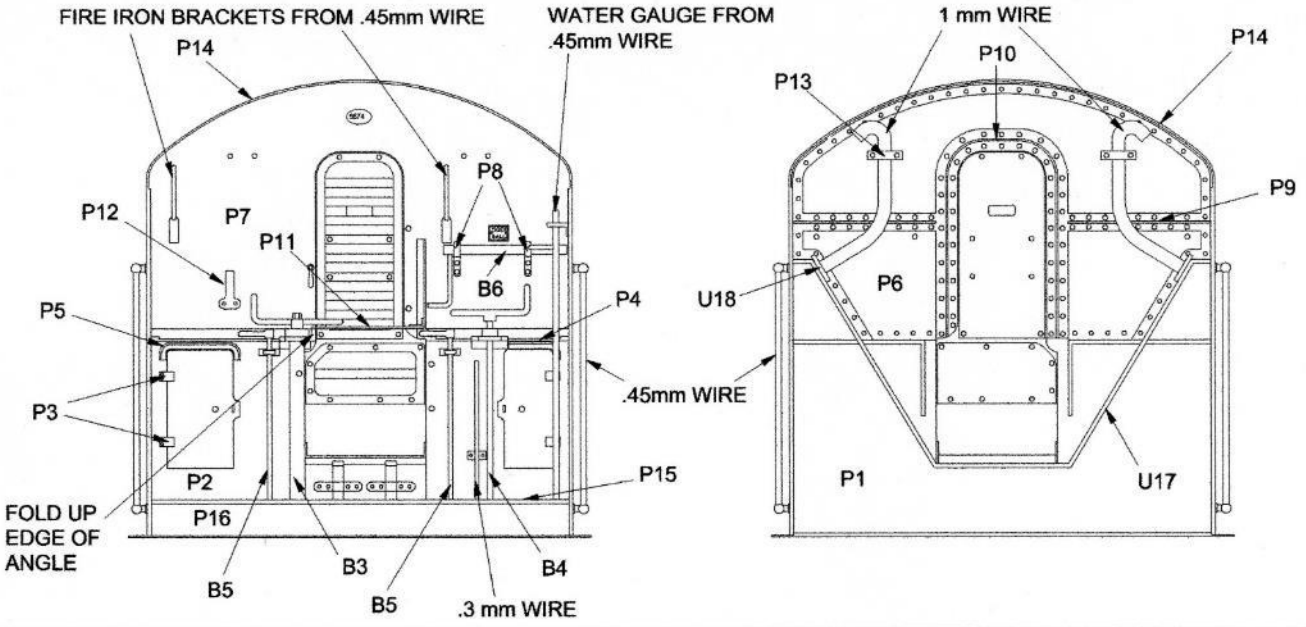


FIG. 9

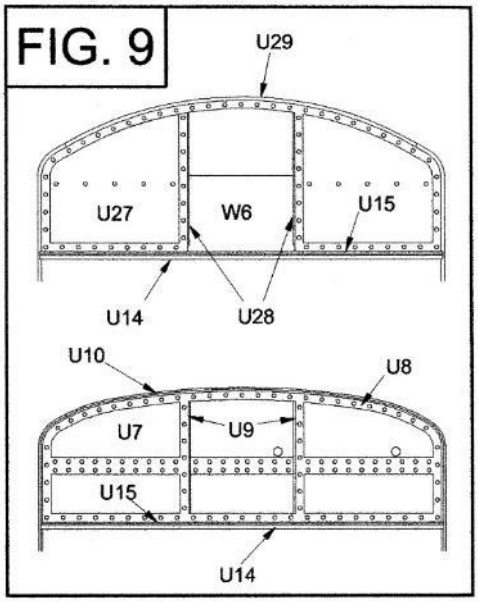
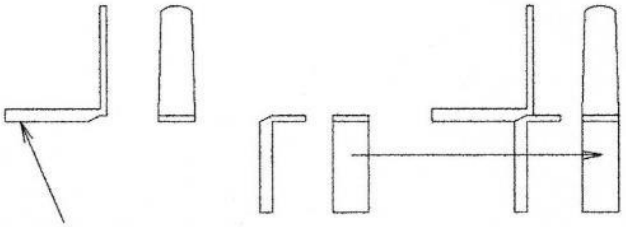


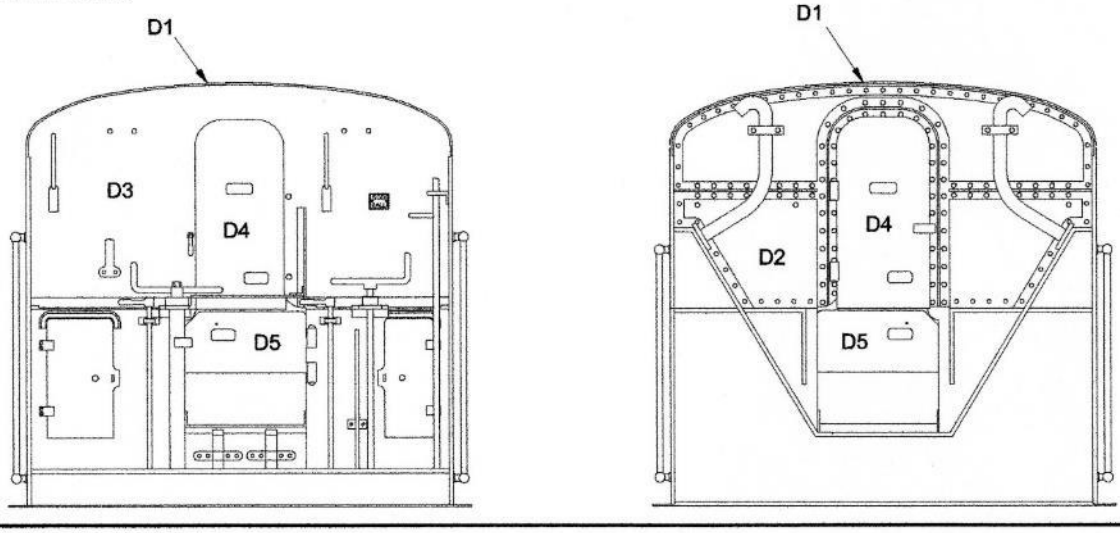
FIG. 11

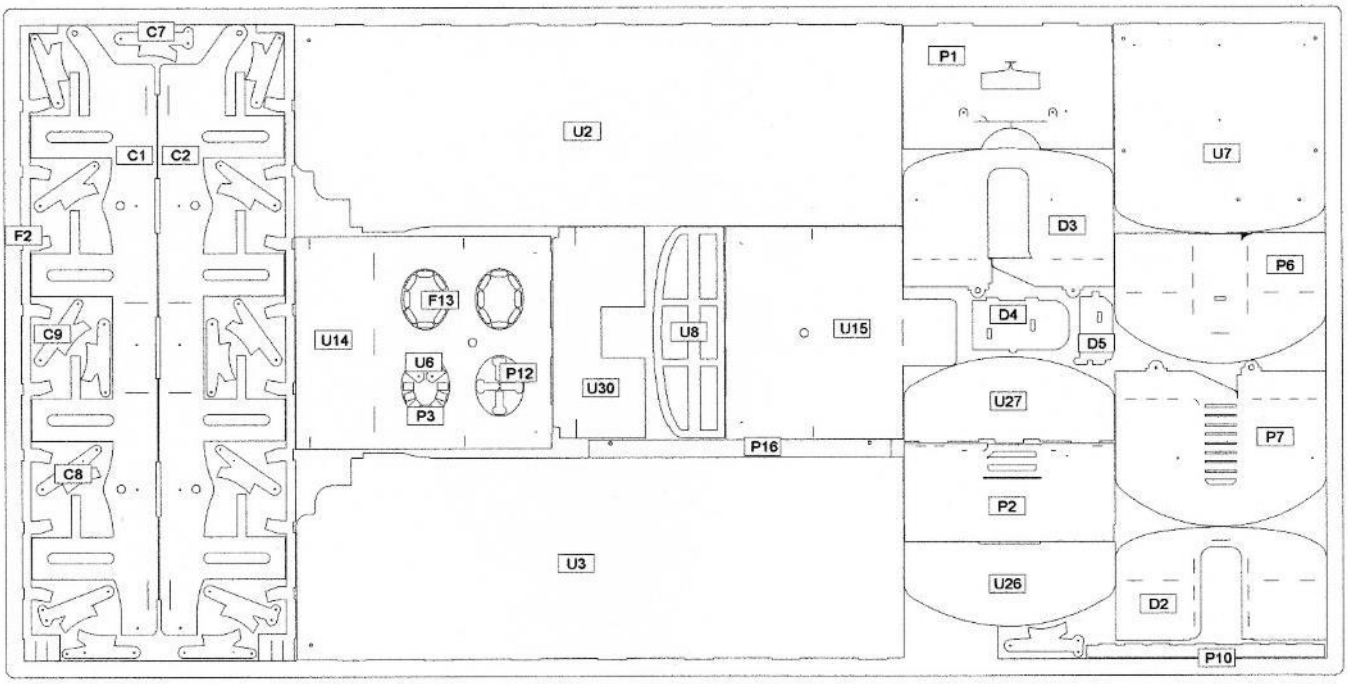
1. FOLD UP AND FIX TO TANK REAR
2. FOLD UP LOWER PIECE
3. FIX IN PLACE ON TANK REAR



SPIGOT THROUGH HOLE IN TANK REAR

FIG. 10 REDUCED HEIGHT FRONT CANOPY




C7
C1
C2
F2
C9
C8
U2
U14
F13
U6
P12
P3
U30
U8
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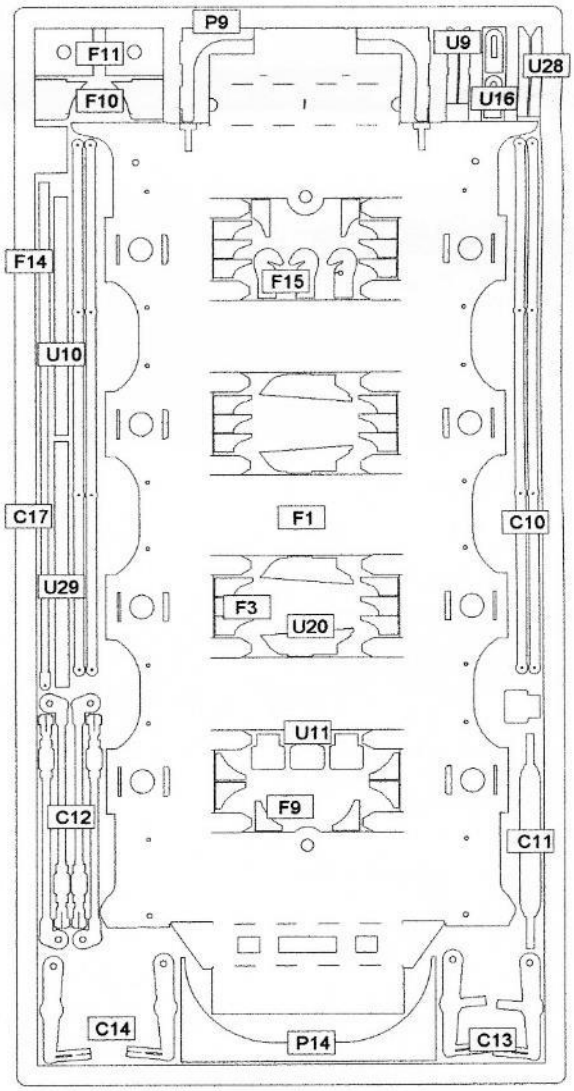
D5
U27
P7
P2
U26
D2
P10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F10
U9
U28
U16
F14
F15
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C10
U29
F3
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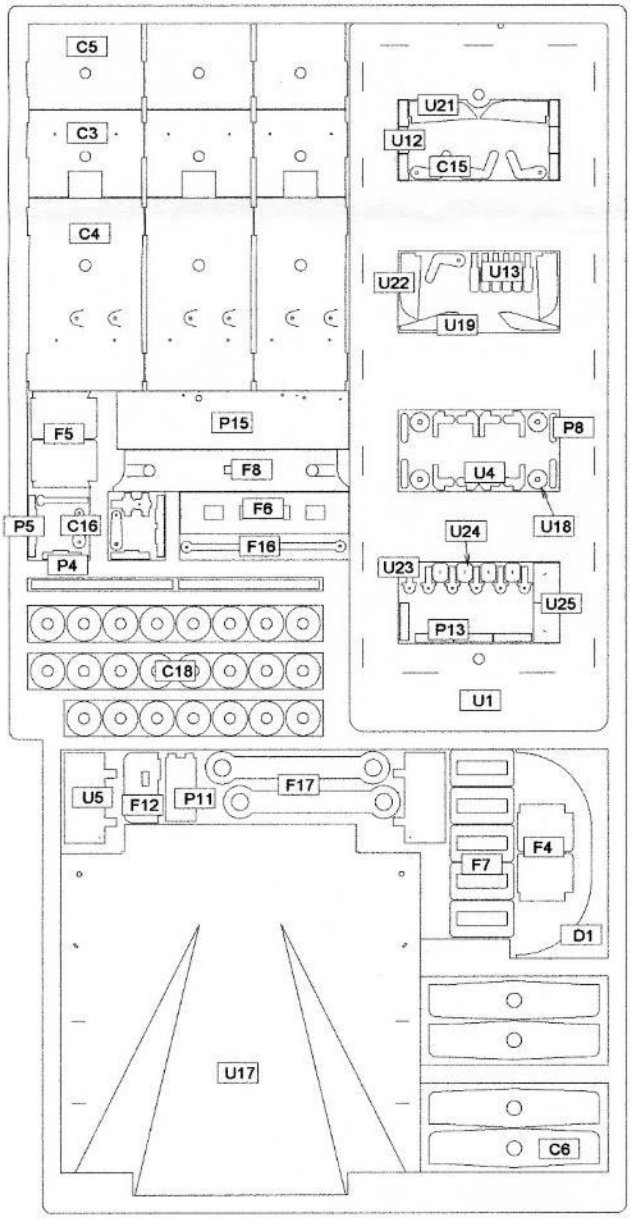
U11
F9
C12
C11
C14
P14
C13


C5
C3
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U13
U19
P8
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U25
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U1
U5
F12
P11
F17
F4
F7
D1
U17
C6