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BALDWIN LOCOMOTIVE WORKS

CLASS 4 - 50 – I - C

50HP 'GAS-MECHANICAL' TRACTOR

HISTORY

The Baldwin Locomotive Works of Philadelphia, USA constructed 126 50HP Gas-mechanical* locos in 1917 for the American Expeditionary Forces (AEF) for use in France. In addition a number of dimensional smaller, 35HP versions were also built. The French Army had around 600! 50HP locos built to the same design for use on its Artillery railways in mainland France and its colonies. Also the Imperial Russian Government had 350 76cm gauge locos built to a very similar design. The locos were fitted with 4 cylinder petrol engines driving the 4-coupled wheels via a two-speed gearbox and rod coupling. Speed was a stately 4 mph (6.4 kmph) in bottom gear and 8 mph (12.9 kmph) in top gear. The locos weighed in at 14,000 lb (6350 kg). Fuel carried in the 30-gallon (113.6 liter) tank was used up at 3 miles per gallon (12 km per liter) Quite thirsty!!

Like the British Simplex locos the Baldwins were used on the frontline areas of the supply networks constructed by the engineers in the AEF sectors, mainly in the Argonne region of the southeastern France. Quite at home on roughly laid track their main job was the delivery of ammunition and troops and the return of empty rolling stock to interchange yards. With the cessation of fighting in 1918 much of the remaining locos, including steam, and rolling stock were left in Europe to be stored and disposed of. Some never made it to Europe and saw use in the US Army bases.

Available cheaply by disposal board and via war-surplus dealers locos were bought up by industrial railway operators throughout France. The large number surviving today on the 'touristique' and preserved lines is an indication of their popularity. Two examples to find their way to Britain – one was purchased by the Festiniog Railway in 1925 for use as a shunter In a modified form and re-engined with a diesel unit, 'Moelwyn' is in use today. The other was purchased by the Penlee Quarry in Cornwall (date unknown).

* The term 'Gas-mechanical' is used in the American context of describing a small non-steam locomotive. (See 'Narrow Gauge to No Mans Land, page 105) A more apt term in use at the time of building would be gas(oline)/petrol-tractor, a term used by the British Armies WDLR in referring to its Simplex locos.

BIBLIOGRAPHY

Recommended sources of further information: -

La Voie de 60 Militaire de la Guerre de 14-18 en France. (The 60cm Military Railways of WW1 in France) by Dr. Christian Cenac, This large volume contains line drawings to a constant 1/35th scale of all of the locomotive, rolling stock and track systems used by the French Artillery Railways. Also included are those used by the AEF and the American built steam locomotives of the British War Department Light Railways. Published in France by the author. Dr. Christian Cenac, 23, Rue de Martyrs de la Liberation, 31400 Toulouse, France. ISBN 2 – 9505403 – 4 – 1. E-mail:- cenac.christian@wanadoo.fr

A fuller history of the AEF's use of 60cm. railways may be read about in "Narrow Gauge to No Man's Land" by Richard Dunn, published in the U.S.A. by Benchmark Publications, P.O. Box 26, Los Altos, CA 94023 ISBN 0 - 9615467 - 2 – 7.

Both these publications are highly recommended to the modeller and historian.

<http://perso.club-internet.fr/appeva/>

Information on the P'tit train de la Haute Somme includes photographs of their Baldwin 50hp and of the museum of Military and Industrial Narrow Gauge Railways.

About this kit.....

This kit has been prepared using the drawings and information contained in Christian Cernac's publications and by the Meridian 'research' team on its frequent forays in France to study the prototypes at first hand. Additional dimensions and details have taken from the surviving locos', most notably those at the P'tit train de la Haute Somme at Froissy and the Tacot de Lac at Grez-sur-Loing. <http://www.trains-fr.org/unecto/tacotdeslacs/>. Credit for the initial design development work of this model must be given to Roger Chivers. Thanks are also due to David Gander and David H. Smith. Text, drawings, illustrations and diagrams are copyright Meridian Models. Dr. Christian Cenac's drawings are copyright and are reproduced with his kind permission.

Whilst we have taken great care in preparing this kit for ease of assembly, if you find you would like further information and advice please contact us on pwilson@meridian44.freemove.co.uk . For PC users the building sequence illustrations can also be made available as a pdf file.

BEFORE YOU BEGIN

Please read and study thoroughly the recommended sequence of building and the instructional notes. Try to become as familiar as possible with all the parts and components supplied and their purposes before commencing building. Check the assembly at each stage to ensure accuracy. All parts and supplies are sub-packed in order of requirement for the recommended sequence of building and to avoid loss should not be opened until needed. Refer to the parts list for further details

Until it is required keep the motor away from the work area. This avoids contamination from metal filings.

Work on a clear area under a good light source. Have all the recommended tools to hand before starting. Do not rush the assembly stages or attempt them out of order. Clean any 'flash' or moulding lines from castings only after checking that to do so will not interfere with the fit or appearance of the part. A sharp knife will remove most flash. Only use files on parts with care as the white metal is easily marked by careless or overzealous work with cutting tools. Use wet and dry paper wherever possible and a final polishing with a fibreglass pen or scratch stick.

TOOLS REQUIRED

We recommended that you have a good quality set of Swiss needle files, wet and dry abrasive paper of various grades. Sharp knife, pin chuck, small drills, fine long nose pliers and tapered broaches. An 'N' scale or 009 back-to-back gauge and / or a good quality Vernier gauge would be most useful. A square of flat thick card or wood is a useful surface to work on.

The primary, and strongest method, of assembly for this kit is by soldering which due the design of this kit, has been kept to a minimum to facilitate ease of assembly. Etched metal parts; - nickel-silver chassis components - brass engine casing and cab can really only be successfully assembled by soldering - preferably applied using a temperature controlled electric soldering iron or a 12 volt iron with the temperature regulated via a power controller. The white-metal detail parts may also be fitted by using low-melting point solders and matching fluxes. Soldering gives an uncompromisingly quick and robust result and is a technique well worth mastering and is not such a daunting method as is imagined by some. With the white-metal parts an additional bonus is that the searching action of properly applied solders acts as filler. Some small components can be glued into place, in particular the smaller cast detail parts, thus preventing possible damage through excessive heat.

ETCHINGS

The etched metal frets supplied with this kit are in 12 thou brass for the engine casing and cab - 15 thou nickel silver for the frames and drive components. The etching process leaves a fine raised lip or cusp on the edge of parts; this may be removed with gentle strokes of a fine cut **CLEAN** file. But do this before bending up of any parts. Remove parts from frets **ONLY** as and when required. This not only keeps them flat but also helps to prevent part loss. Parts should be cut out using a SHARP craft knife cutting onto a wood board (plywood or chipboard) Hold gently with hand pressure and cut away from fingers! We can replace kit parts but not digits.

NOTE: - When cutting out etches your eyes should be protected, use safety glasses or eye shields.

Bending up of etched parts requires hand and finger pressure only, holding parts with tools if needed with packing card to protect raised detail.

SOLDERING

Etched brass, nickel-silver and lost-wax detail parts: -
Carr's 145 C melting point solder with Green Label flux.
15 - 18 Watt electric soldering iron 1/8th inch bit max.

White-metal detail parts: -
Carr's 70 C melting point solder with Red Label flux
12 volt or temperature controlled electric soldering iron

Remember to thoroughly clean the finished soldering work up as you go as the mildly corrosive action of fluxes can tarnish the metalwork in short time. A solution of domestic scouring powder, Ajax etc., and warm water applied with an old toothbrush is quite effective. Rinse well and leave to dry.

PAINTING AND FINISHING

We highly advise the use of an air-brush for painting, even the most basic of which will give a much better finish than hand brushing and will avoid that 'just dipped in a tin' look. Thinly airbrushed coats of acrylic paint will also not obscure the fine surface detail on castings and etched parts.

RECOMMENDED BUILDING SEQUENCE

CHASSIS

Please note that all fold lines are on the inside unless advised otherwise. During construction any binding or tight spots must be eradicated **BEFORE** proceeding to the next stage to ensure a smooth running chassis.

Photo 1

Parts required for the gearbox assembly from A / Gear Bag plus one wheel set from B / Wheel Bag.

Photos 2 - 4 Gearbox

Solder brass bearings with the flanges on the inside face of the gearbox frame (Left hand of photo 2). Fold up etch making sure that the sides are parallel. Insert the intermediate gear and 7mm long steel gear shaft (Photo 3) making sure that the fibre washer is placed between the larger gear and the gearbox frame. Fit axle and press fit gear making sure the insulated wheel is on the right hand side, as illustrated, with a back-to-back measurement of 7.4mm (Photos 3 &4).

Photos 5-7 Frames

Parts required from B / Wheel Bag. Fold outer frames as shown and fit brass bearings for the jackshaft removing any excess from the inside face. Please note that the holes in the etched frames may need reaming out with a broach.

Photo 8

Press the remaining wheel onto the axle. Place the brass bearings (flanges on the outside) on the axles with a fibre washer on the insulated side between the wheel and the bush.

Photo 9

Wheel-sets are placed into the slots with the insulated wheels on the side with the pick-up mounting bracket. Ensure that with the bearings are seated correctly and that chassis sits squarely on a flat surface such as piece of glass. Tack-solder the bearings into place making sure that the wheels rotate freely.

Photo 10

Parts required from C / Crank Bag. Fit crank pins into cranks with the heads on the recessed side. Remove coupling, connecting rods and inner chassis from the fret. Note that there is a spare set of coupling and connecting rods supplied.

Photos 11-13

Fold inner frame as shown in photos.

Photos 14-15

Offer up and trial fit inner and outer frames (Photo 15). When satisfied with fit tack-solder the four corners and middle of frames top and bottom.

Photos 16-17

Prepare the coupling rods, reaming out the holes as necessary so that the crankpin bushes fit with the flange on the inside. The front bush is filed nearly flush with the front face of the rod. Fit cranks (Photo 16) referring to scale drawing as to which pattern of cranks go onto which axle. Ensure that the cranks are pushed on until just flush with the end of the axles. Using the 14BA nuts provided fit the rods onto cranks.

Photos 18-19

With the right hand cranks at 6 o'clock fit one left hand crank at 3 o'clock (approx 90 degrees). Using the coupling rod as a guide fit the other crank. Adjust this crank until you have a smooth and bind free running chassis.

Photo 20/21

Replace the nuts on the front wheels with etched washers. This is done easily by placing a damp piece of paper over the crankpin and then the washer on top. Flux the washer and crankpin and using 145 solder, a **QUICK** touch of the soldering iron to secure. Carefully cut off the excess crankpin and file flat.

Fit one crank on the jackshaft axle followed by two axle bushes the first with the flange facing the crank the second with the flange facing the frames (this is repeated on the other side) and are used to space out the jackshaft cranks.

Prepare the connecting rods, noting that the crankpin bushes are filed nearly flush. Fit one side and quarter the other using the connecting rods and spare nuts. Check that you still have a free running chassis. When satisfied replace the nuts with etched washers one side at a time.

Photos 21-24

Parts required from D / Pickup Bag. Super glue the plastic insulating bush into place from the underside and trim off the top leaving 0.5mm remaining. Trim the etched pick-up wiper by 3mm at each end. Solder 12BA nut over top hole, as shown in photo 21, to the pick-up. Bend pickup to shape (Photo22). Photos 23 & 24 show the pickup fitted.

Photos 25-29

Parts required from G / Body Detail Parts Bag (W). Fix gearbox casting flush with the back edge of the frame cross member. Next fold up front and rear buffer beams. The front beam is a 'Z' bend with the top bend having angled corners and folded away from the half etched line. Gearbox cover - Using the slot in the front of the chassis as a guide, align this with the slot in the gearbox cover using a coupling part to locate and bend over the frames. The two tabs on the rear edge can be bent over to secure.

Using the coupling etch locate front buffer beam onto chassis and secure into position, repeat for the rear buffer beam/coupling. Bend up the buffing face of the coupling hook, angling back slightly the outer edges. Adjust to suit your rolling stock. Refer to scale drawing to position and fix the toolbox casting. Bend up the jackshaft crank guards, and secure tab to slot in frames (see drawing) and secure bottom of this to the back edge of the buffer beam and file off any excess. Photos 28-29 show the completed chassis.

Photo 30-32

Ream out the worm until it is push fit on the motor shaft (mounting screw end). Trail fit motor to chassis and align worm so that it meshes centrally with the gear. Secure worm onto shaft with a drop of Loctite 601 Retaining Compound. Ensure that no retaining compound comes into contact with the motor. Cut off surplus shaft, at the bush gear end leave 1mm long. To avoid metal filings getting into the motor wrap in cling film before cutting. Solder motor lead wires - one to the pick-up and the other to the chassis. Fit motor into chassis and test run.

BODY – ENGINE CASING AND CAB

Photos 33 - 37

Cut out the bonnet etch and bend up as shown in photos 33 and 34. Form the bonnet sides to 90 degrees by folding down and around the radiused corners with the aid of the half etched score lines. They will take up the correct radius with no effort (Photos 35,36). Finally bend over tabs at the front to secure the sides and hold in place while the joint is reinforced with 145 solder (Photo 37).

Photos 38 - 43

Take the cab etch and carefully fold the cab sides and floor in photos 38 and 39. Solder captive 12 BA nuts to the cab floor over the holes provided (Photo 40). Next mate the bonnet assembly to cab using the tabs & slots provided and bend over the tabs to secure the assemblies. Fit cab interior details next:- Cab 'back head' arch, gear selector pedestal (short lengths of brass wire may be added to this detail to represent gear levers) and drivers seat are all white-metal details from G / Bag. The clutch pedal may also be fitted at this stage (LWB) from H / Bag. Details are shown in photos 41 & 43 and by referring scale drawing for correct positions.

Photos 44 - 50

Offer up and check fit of cab back, this locates with tabs and into slots in the cab floor, a neat butt joint will fit the back to the sides. Solder to secure in place. Fix fuel tank (LWB) into place as shown in photo, with the filler cap nearer the cab front (Photo 44). Fix exhaust chimney and front headlamp (LWB) add also two sand box filler caps (W) using the etched locating holes in the top of the bonnet (Photos 44 – 47) Lastly fit radiator (W) into place, mounted centrally the top of the casting should be flush with bonnet top (Photo 48). Bend up the front grab rail from 0.45 wire and fit into position, angled upwards as shown on the scale drawing (Photo 49). Locate and fix starting handle support (LWB) into locating hole in cab rear entrance (Photo 50). Note that casting is fitted offset leaving the boss central. One small part left to fit is the reversing/gearbox linkage detail (LWB), this is secured to the frames on the right hand side in front of the engine casing.

Photos 51 – 55

Prepare the roof by thinning down the casting (W) at the sides and in the sharp radius of the ends, check for fit and when satisfied add the rear lamp (LWB) by drilling a shallow locating hole (Photo 51). The rolled up weather screens (LWB) are shown fitted (Photos 52 to 54). The two side screens require to be shortened to fit, file flat on the back of all three before fixing into place. Works plates may be fitted also to the cab side at this stage, lastly to be fitted is the cab side entrance foot step, fold up the etched part and fix into place as shown (Photo 55).

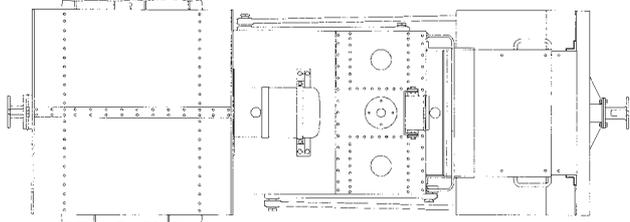
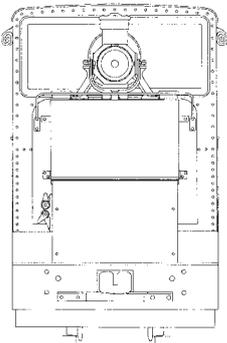
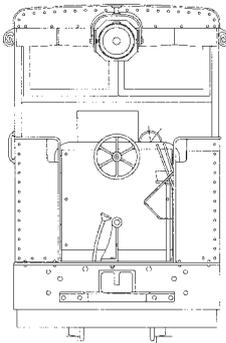
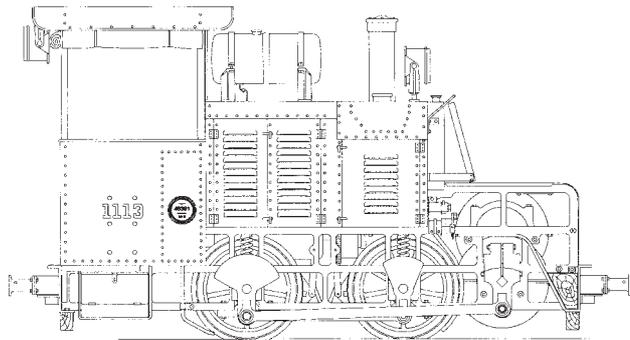
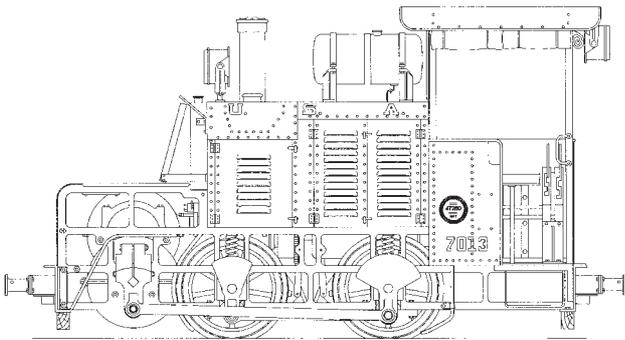
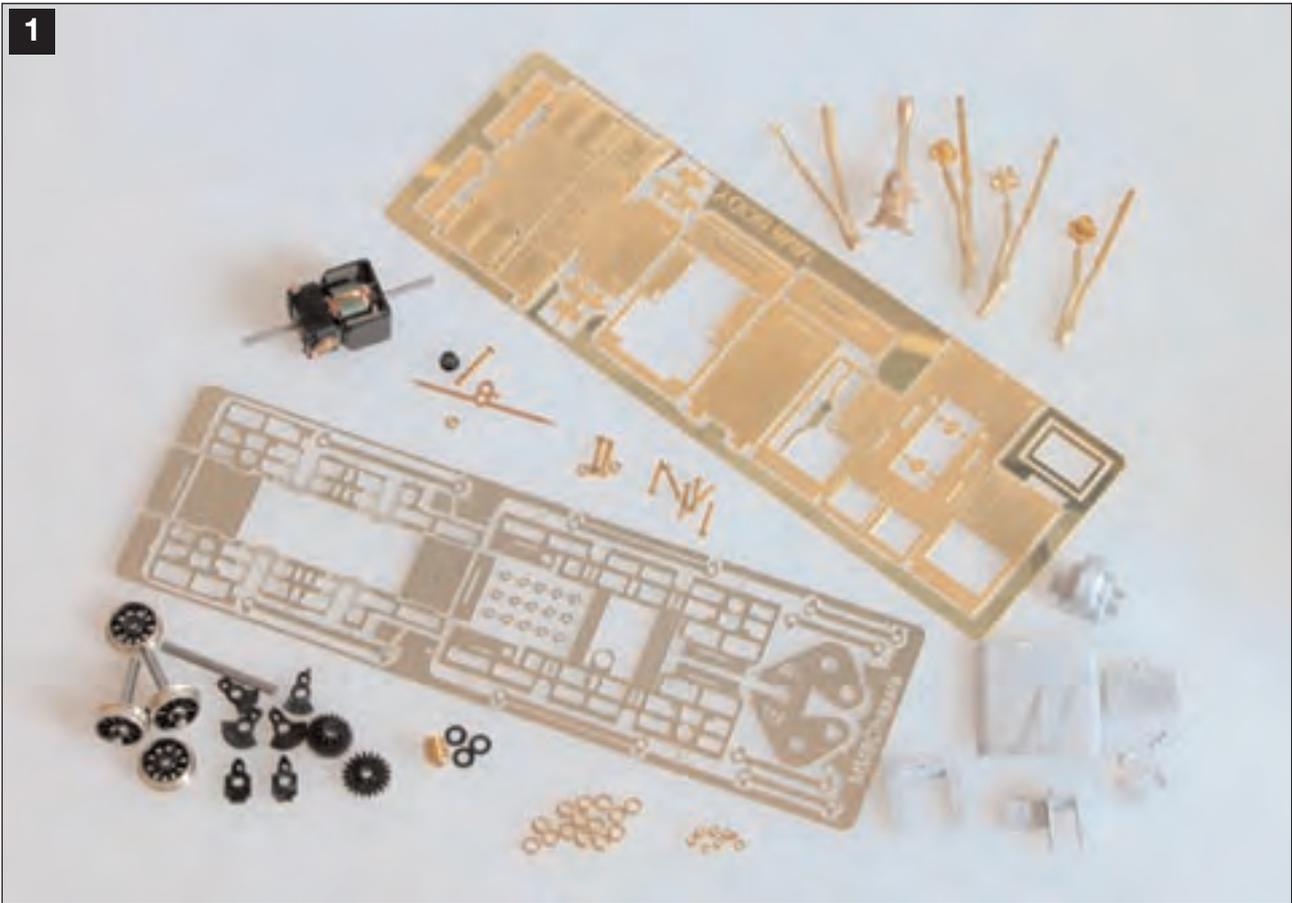
Photo 56 Final Assembly – Painting and Lettering

This shows the body fitted to the chassis, use the two 12BA brass bolts provided to fix in place. (Our pre-production model is shown which is not fitted with a cab step!) Painted in US Army Grey the model is lettered with 'rub-down' transfers as supplied with this kit, as are loco numbers, in black or white, both colours are correct. The numbers are supplied randomly therefore no two kits have the same code. Refer to the scale drawings left hand side elevation for correct location for US Army. The right hand side elevation shows a French Army version.

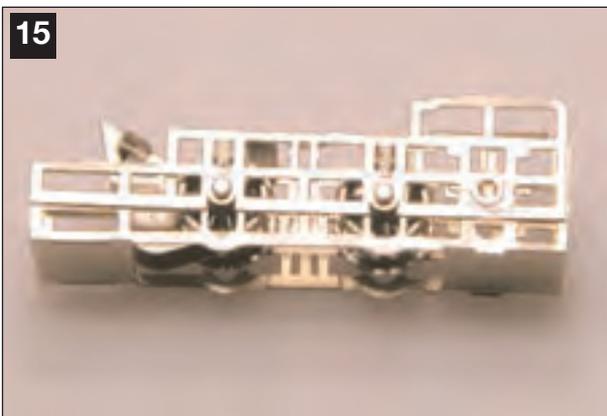
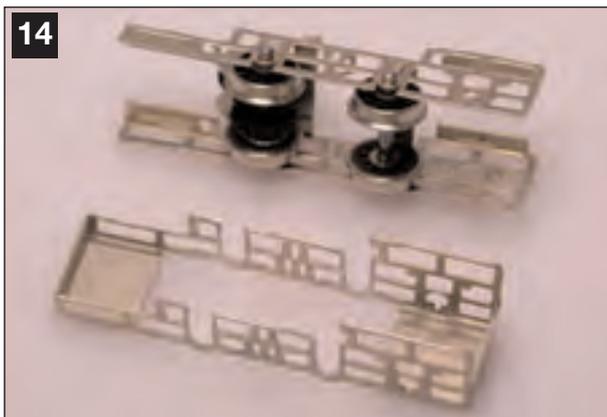
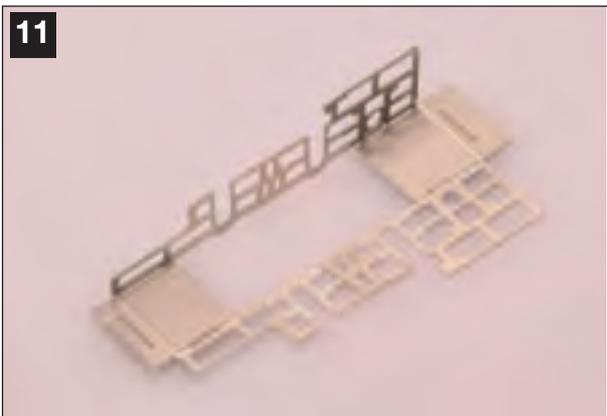
BALDWIN LOCOMOTIVE WORKS

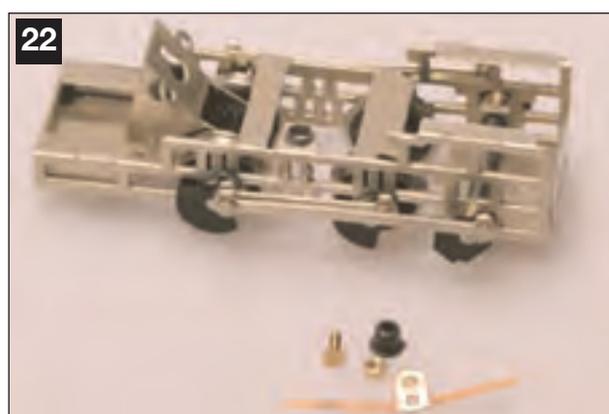
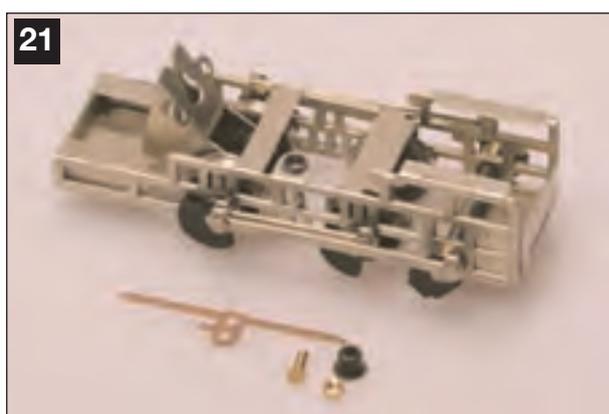
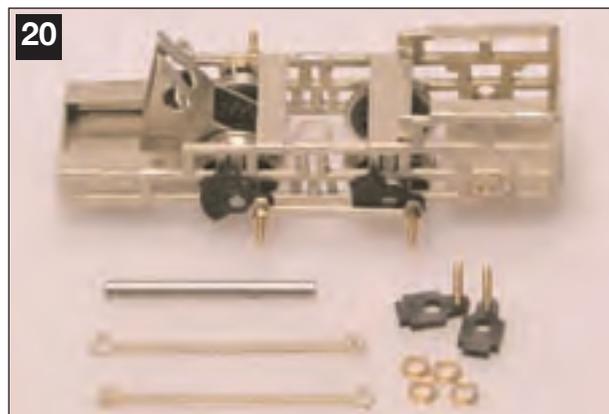
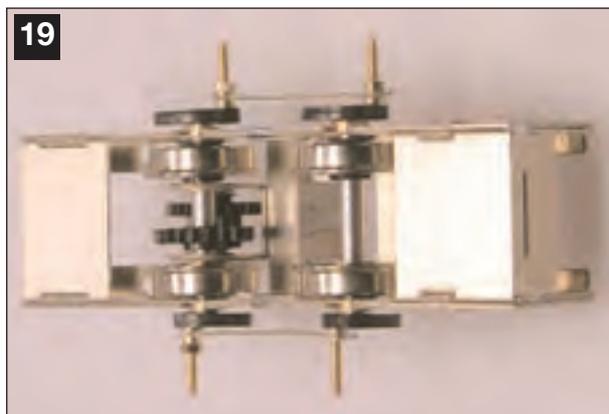
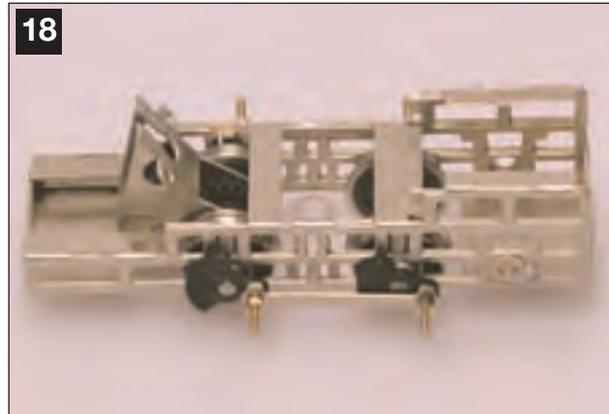
50HP 'GAS-MECHANICAL' TRACTOR CLASS 4-50-I-C

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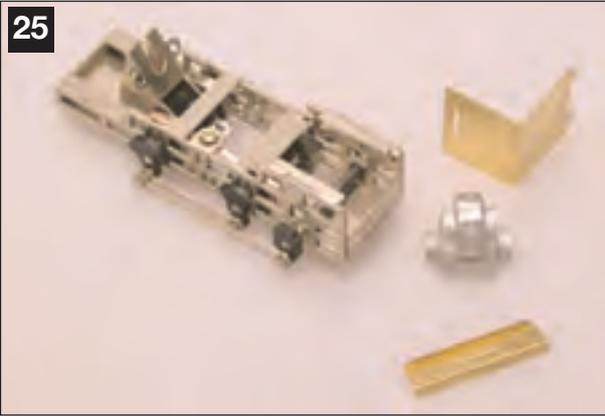




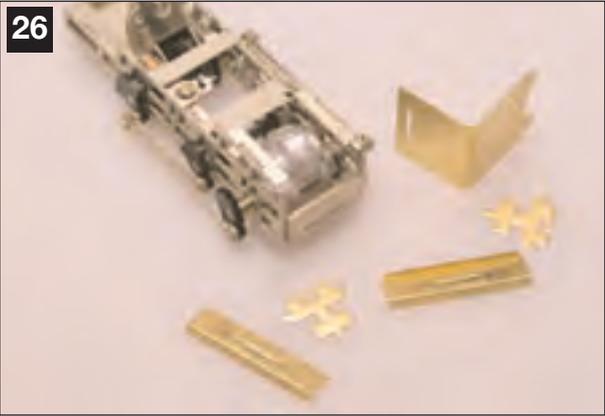




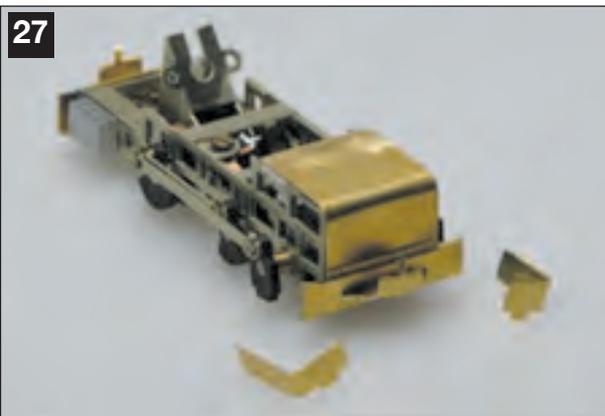
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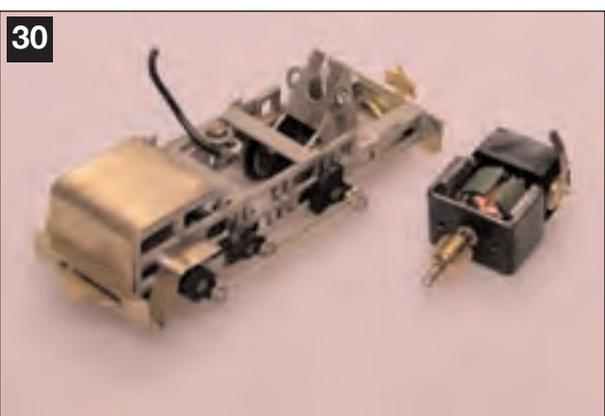
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