Constellation Miniatures

by Alexandre Karadimas

Make your own 1:64 miniatures with common household tools and materials

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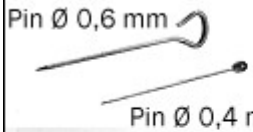
Booklet 02 – GAZ-64 Version 2.1 – April 2026

Tooling, Materials and Production aspects

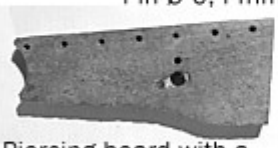
T01 Tools required for all Constellation Miniatures designs



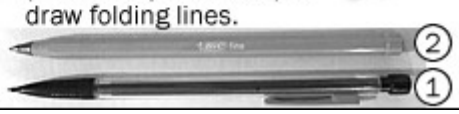

Pair of nail scissors


Small "snap-off blade" utility knife


Pair of thin pliers with a wire-cutting capability


Piercing board with a Ø 4 mm hole drilled through it, larger holes are useful

(1) Mechanical pencil Ø 0,7 mm or less (2) Roller pen (even a depleted one) to draw folding lines.



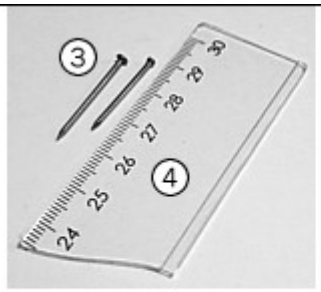
(*) Use a toothpick to apply glue to parts

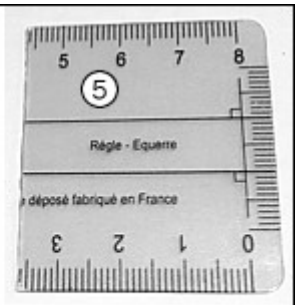
(3) Set square in metric (4) Stationery hinge clips (5) Household glue, in liquid or gel form (*)

T02 Tools required for this design


Hole punch Ø 6 mm (preferred) or Ø 5,5 mm

(1) Metal file to deburr wire after cutting. (2) Permanent marker to mark metal wire. (3) Ø 1,4 mm nail, or object of a comparable diameter.





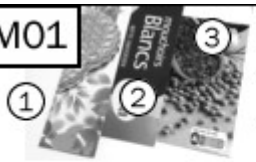
Recommended: a segment of a transparent ruler (4). (5) This ruler of the "aleph.pro" brand has matching measures on both sides, making it a small set square.

Always cut downwards on a cutting board and never towards any part of your body.

Please don't cut yourself.

The cutting board can be a flat piece of wood, MDF or any other suitable material.

M01



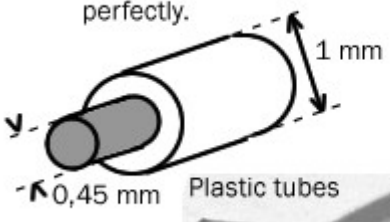
Cardboard used in packaging is technically called "thin cardboard". We will distinguish between "very thin" cardboard, as can be found for instance in packaging for biscuits (1), "regular" cardboard found for instance in breakfast cereal boxes or tissue boxes (2) and "thicker" cardboard (3).

Glue works better on the porous side of cardboard packaging. The smooth, printed side is better suited to be painted over. Glueing two smooth sides together doesn't work well.

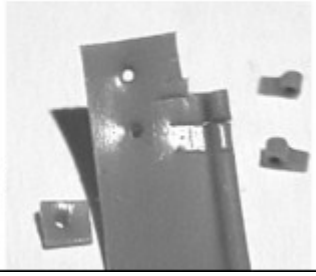

When accumulated in a front grille, the difference between regular and very thin cardboard becomes quite visible.

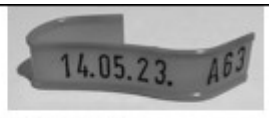
M02

Double Wire Clips can be found in bread packaging for instance, they have very malleable wire. DWC plastic can be transformed into parts that match the wire perfectly.

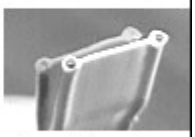



Plastic tubes

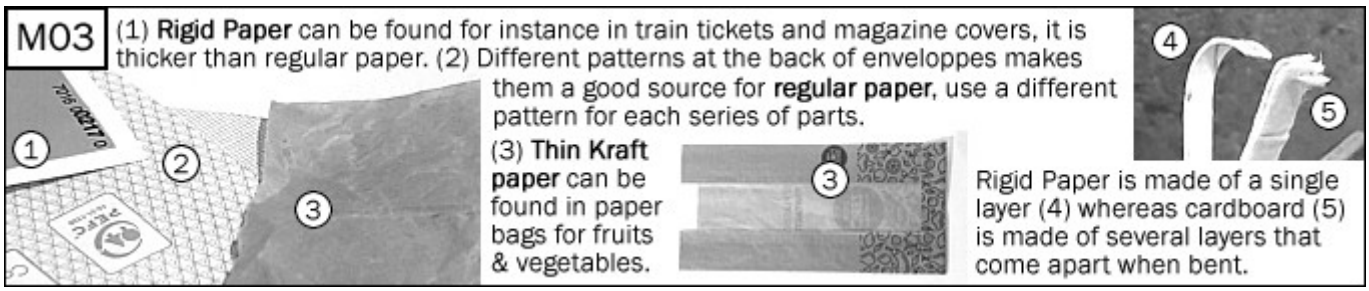


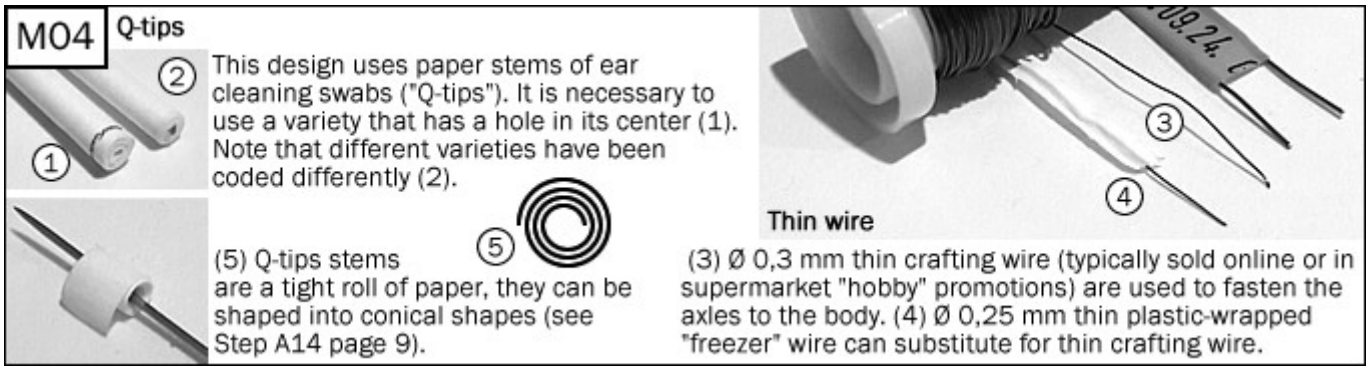


If you have double wire clips of slightly different thickness, sort them out and use only the thinner ones for this project.



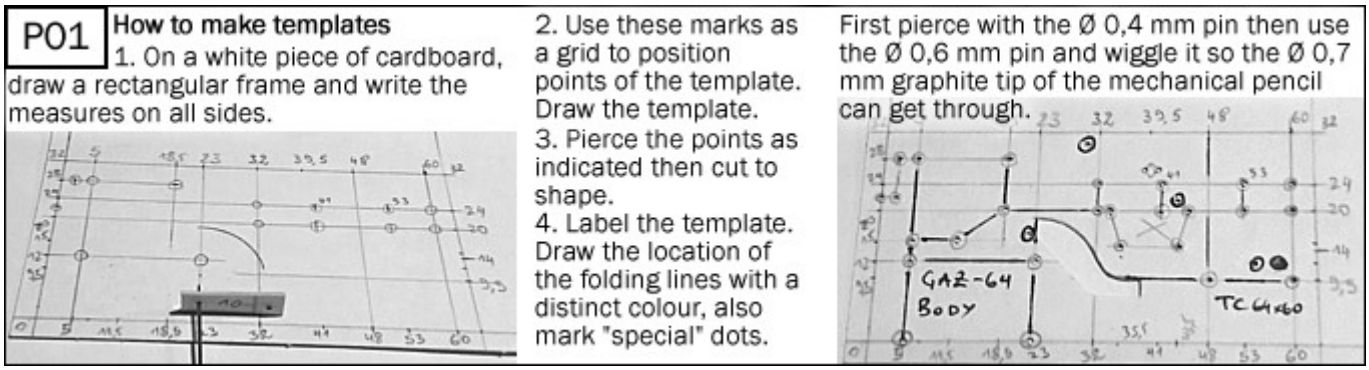
The basic car miniature will require at least three double wire clips, some special versions even more.



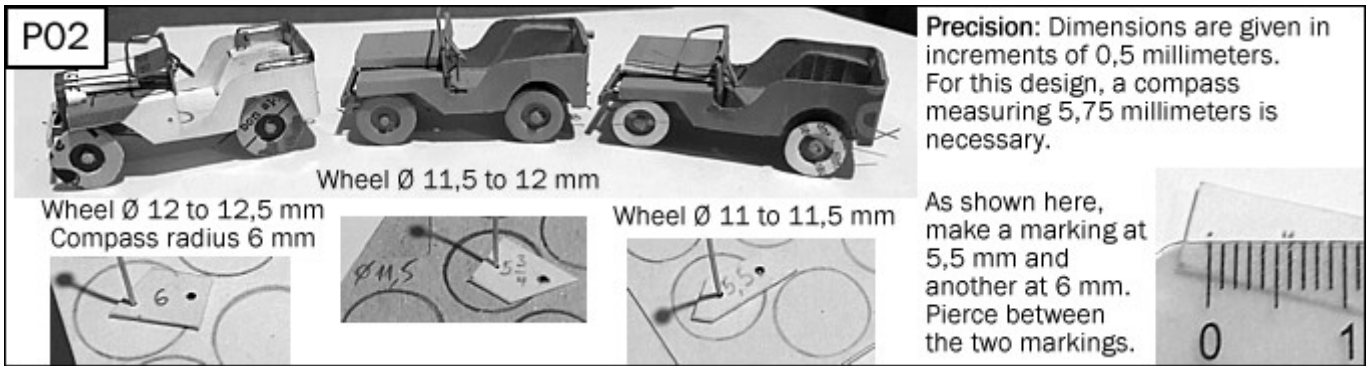


Some parts have a simple design and are best draw in batches, using a ruler. Severals examples are shown in the Steps illustrations.

Other parts have a complex design, which would be too time-consuming to draw from scratch. In these cases we will first make a **template**, a piece of cardboard with all the markings needed to replicate these parts, as well as indications to modify and position them precisely afterwards.



Most templates are on the central pages (pages 6 & 7)

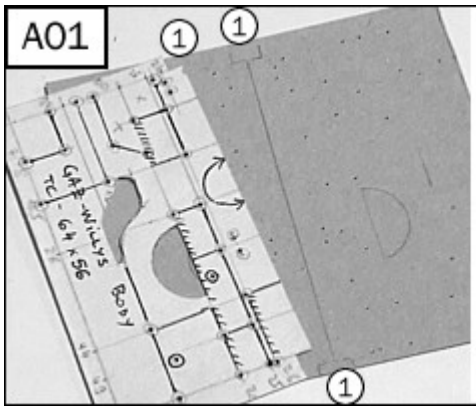


It is more time-efficient to build these miniatures designs in **batches**. It takes about 18 hours to assemble three miniature cars of this design, not counting the time necessary to make the templates and the part batches.

Part A - the car's body

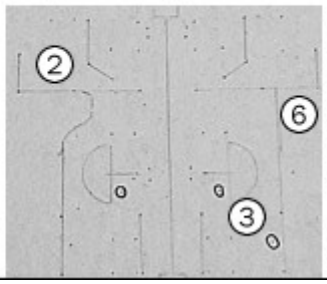
Most images are for the simpler "GAZ-Willys" version, Steps from A12 on are for the GAZ-64.

A01

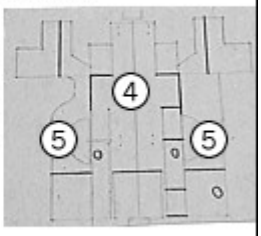


(1) These notches are also replicated on the part, they allow correct alignment when the template is flipped to the other side.

(2) Connect the dots from the outside towards the inside.
(3) Mark special dots.

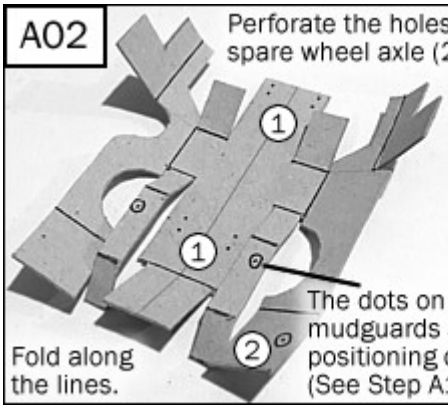


(4) Draw the folding lines with a ballpoint pen.
(5) Some dots don't have a "local twin" to draw the line. The design is symmetric, use the dot from the other side.

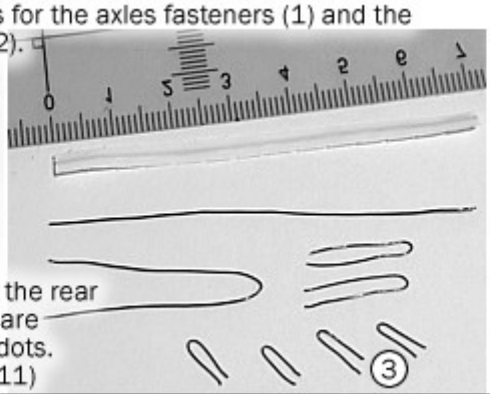


(6) This part is for the Holden Field Ambulance, which has no passenger access.

A02



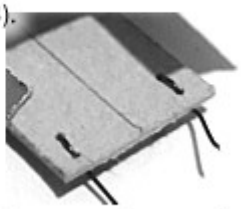
Perforate the holes for the axles fasteners (1) and the spare wheel axle (2).



Fold along the lines.

The dots on the rear mudguards are positioning dots. (See Step A11)

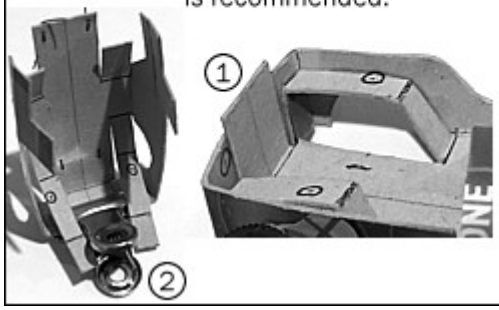
Take7 mm of thin wire (the length of "freezer wire"), bend it in two and cut. Repeat the process with the cuts to obtain four axle fasterners (3).



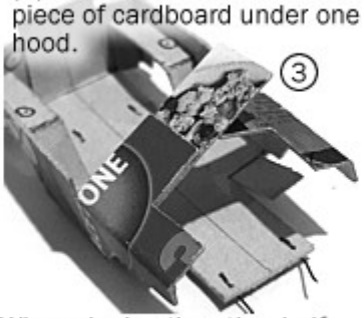
Insert the fasteners and spread them out to keep them in place.

A03

Glue the back flaps as pictured. Use the flipping line (1) to make the flaps meet symmetrically.
The use of a hinge clip (2) is recommended.



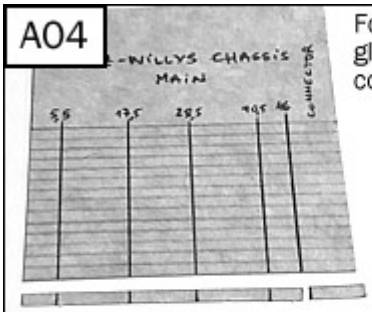
(3) Glue the smooth side of a 21 x 8 mm piece of cardboard under one half of the hood.



When glueing the other half, make sure that the hood is level.

The "pedal" parts stabilize the hood so it remains centered. First glue half of a 10x 6 mm strip of thin kraft paper to each pedal. When the glue is dry, glue the other halves and the pedals themselves to the hood connector.

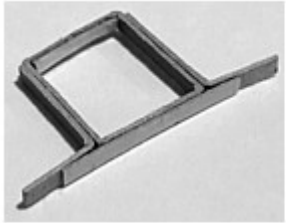
A04



It is more efficient to draw several pieces in advance.

Fold the chassis main part and glue it shut using the connector, one side at a time.

Use the markings on the bumper part to glue the chassis to it.



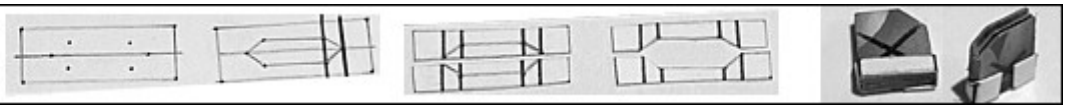
Glue the side parts to the assembly. When the glue has dried, trim the excess.

Make two marks on the assembly at a 5 mm distance from the bumper.

Use these marks, which have to be aligned with the body's border, to glue the chassis to the body.

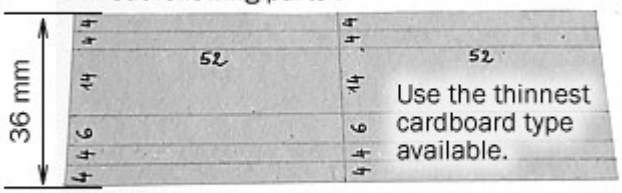
B07 Jerrycan holder

(This step has been inserted here to save space.)



A05 Front grille - Captive Cardboard Method

Cut following parts :

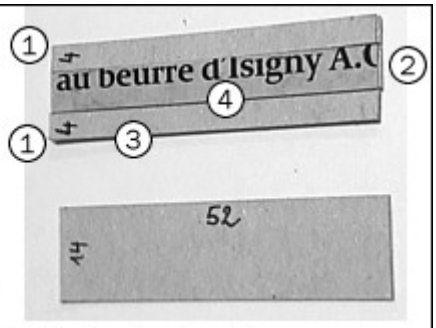


Smooth side

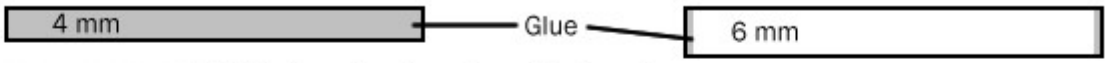
Porous side

(1) Glue the 4 mm strips in pairs, in a stacking order:

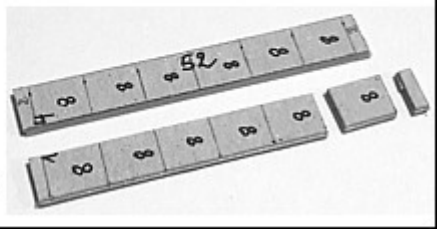
(2) Glue the 6 mm strips together on their porous sides:



(3) Apply glue on one of the 4mm double-strip's entire porous side, and glue it to the border of a 14 mm part.
(4) Apply just 1 mm of glue on the top and the bottom of the 6 mm double-strip, and align it against the glued 4 mm part.

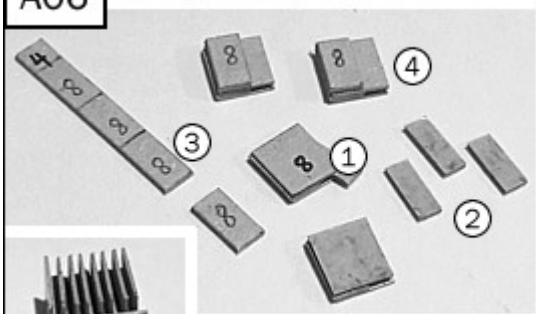


Similarly, apply glue only on the top of the 4 mm strips, and a thin line on the top and bottom of the 6 mm strip. Place the second 14 mm part over the assembly, smooth side down, so its porous side is showing.



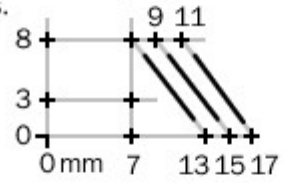
Draw two 2 mm lines at the top and the bottom, divide the rest in 8 mm strips. It is important to **first** cut the assembly in two **vertically**.

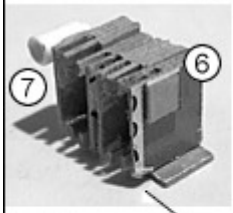
A06 Front grille - Captive Cardboard Method



(1) For one grille, cut four pairs of grille elements. Remove the "captive cardboard" part only after cutting.
(2) Keep the discarded parts, since they are all of the same dimensions, to make ration packs or similar items out of them.
(3) Divide the two other 4 mm double-strips in 8 mm segments. One grille needs 3 of these parts.
(4) Glue each 4 mm part to a pair of grille element, in stacking order (smooth against porous) then while the glue is still fresh assemble these parts as pictured (the last pair of grille element has its smooth side outwards). (5) Press the assembly against a straight object to align all parts.

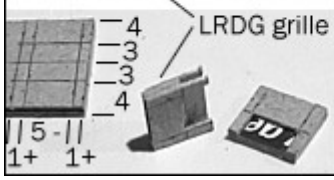
Glue the smooth side of a 12 x 5 mm piece of regular cardboard underneath.





(6) Glue a 3x3 mm piece of regular cardboard (porous side towards the headlight) to the grille assembly. Glue it at least 1 mm away from the border so it doesn't show. This part creates a gap between the headlights and the grille.

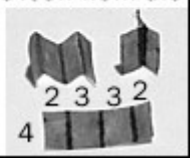
Glue the **engine cover** on the sides of the grille assembly, the folds make the part adapt to the model's length.



(7) Glue the 4mm-long headlights (see Step A14) flush with the grille's front & top.

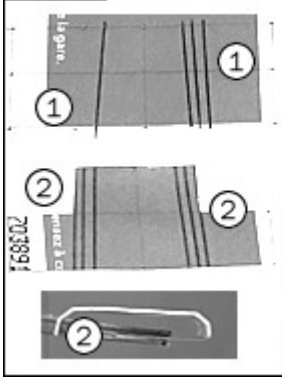
After priming the miniature, paint the grille's inner walls with dark grey, wipe it off from the front surfaces.

(8) This piece of thin kraft paper will hold the LRDG condenser. Fold as pictured and glue it to the inner wall.

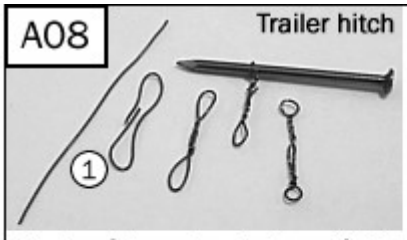


A07 GAZ-Willys hood

The hood part has to be made from rigid paper and not from cardboard.
(1) Use the dots to draw two folding lines, then draw the third line between these two.
(2) Glue the flaps together so that the walls are vertical.
(3) Use nail scissors to trim the excess. Glue, flush with the rear of the body's hood.

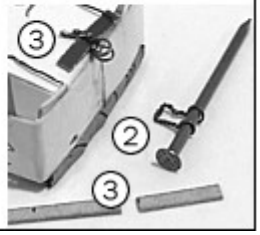


A08 Trailer hitch

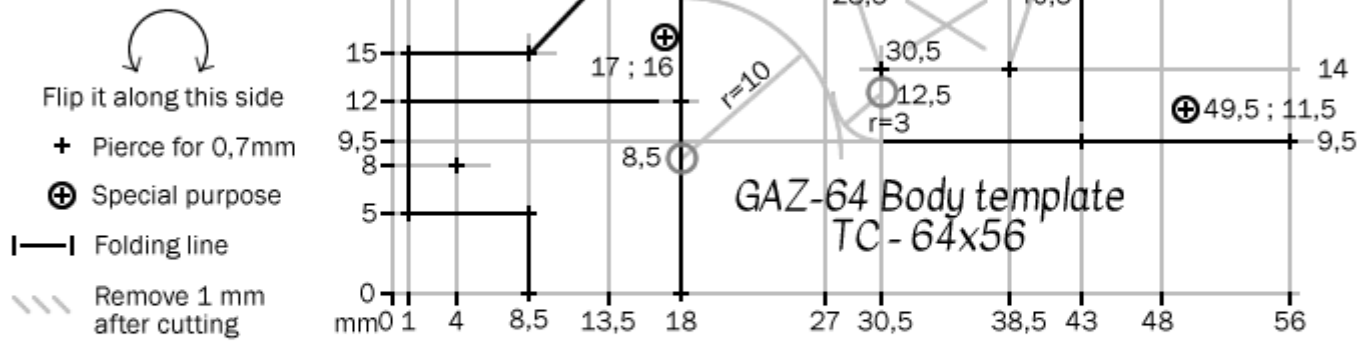


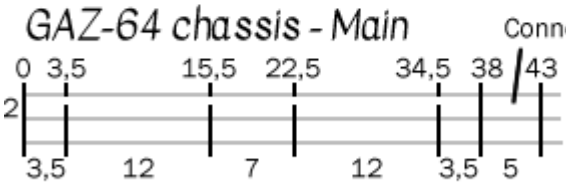
Bend a 35 mm long piece of thin wire in three (1). Twist into two loops, then use a nail with a 1,4 mm diameter to create round loops. (2) Bend it in a bracket shape, use the nail to make sure the loops are aligned.

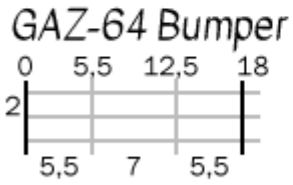
(3) Cut a 10 x 2 mm piece of thin cardboard, slide it into the backet and glue it to the underside of the body.

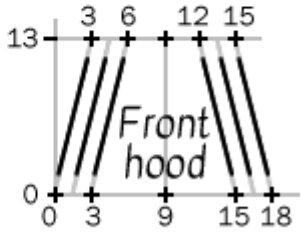


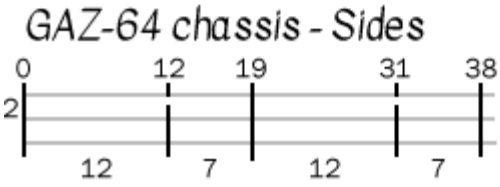
GAZ-64
Templates
Scale 1:64
Page 1/2

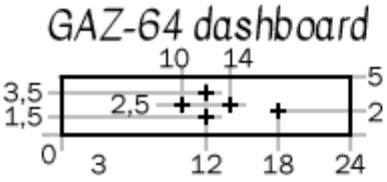


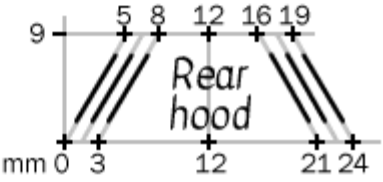


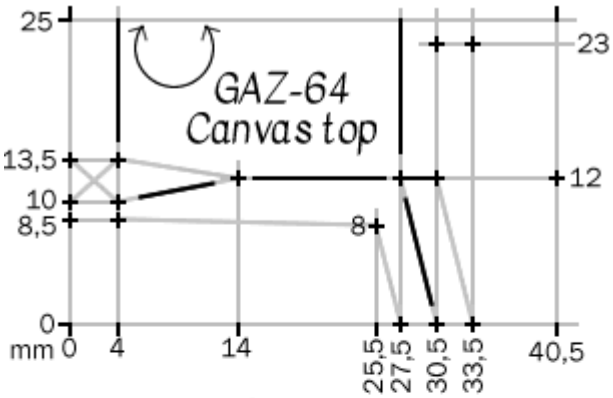


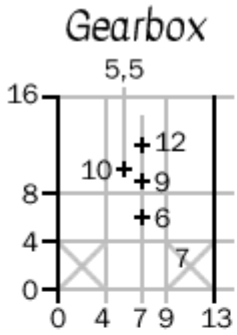


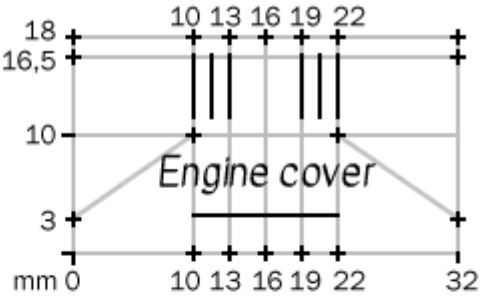


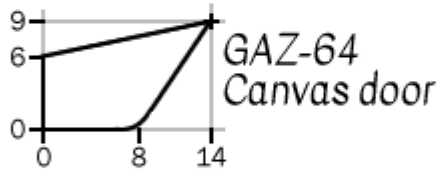


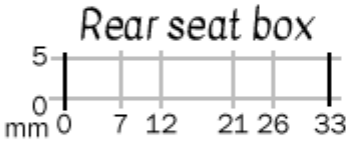


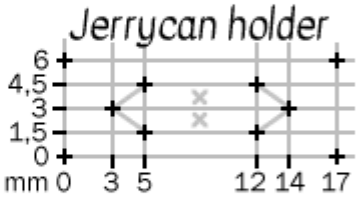


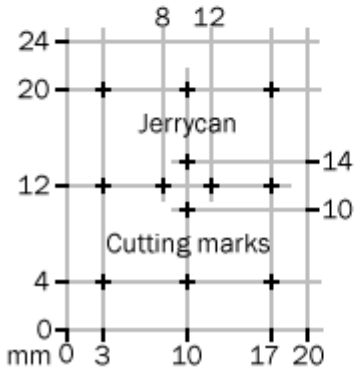




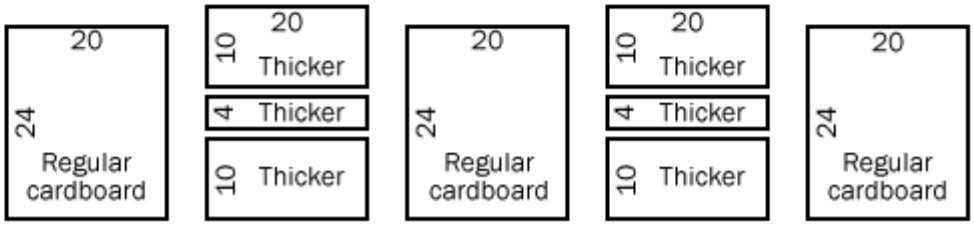








Elements to obtain four jerrycans (Captive Cardboard Method)



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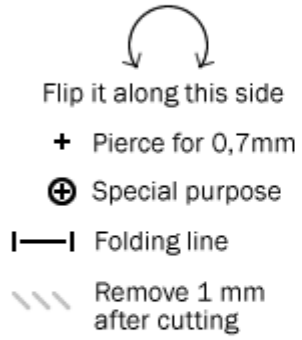
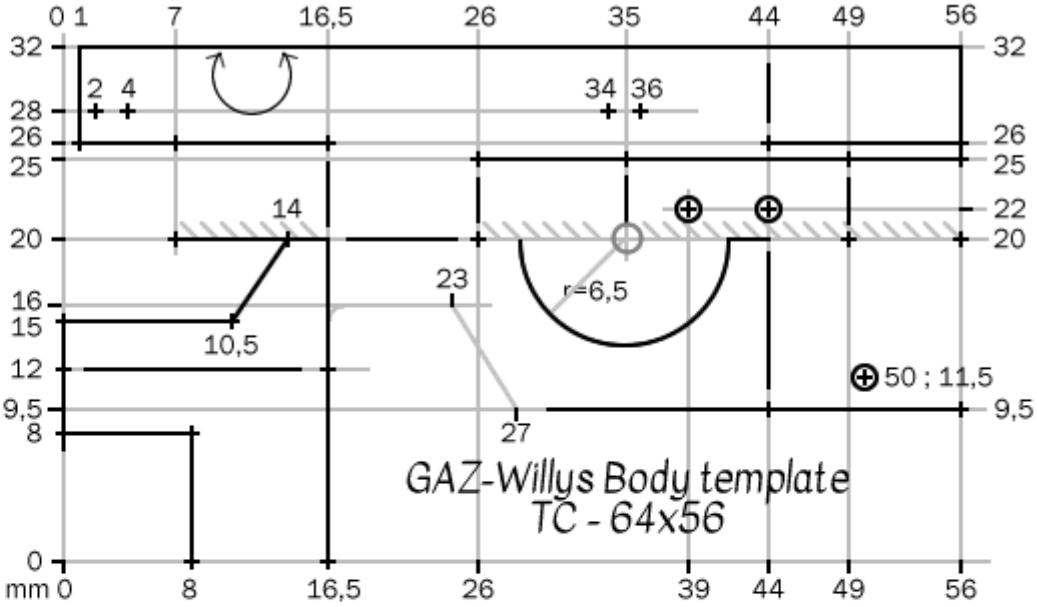
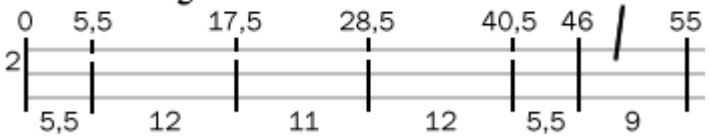
GAZ-Willys
Templates
Scale 1:64
Page 2/2



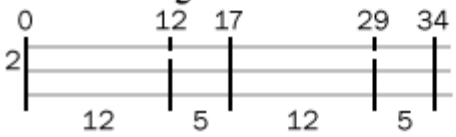


GAZ-Willys Body template
TC - 64x56

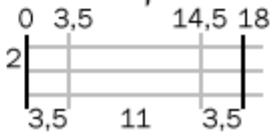
GAZ-Willys chassis - Main



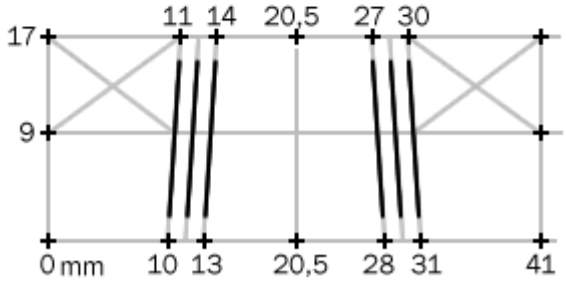
GAZ-Willys chassis - Sides



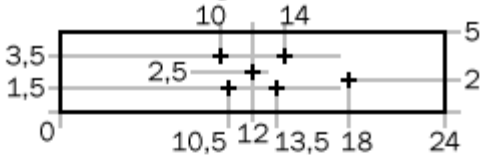
Bumper



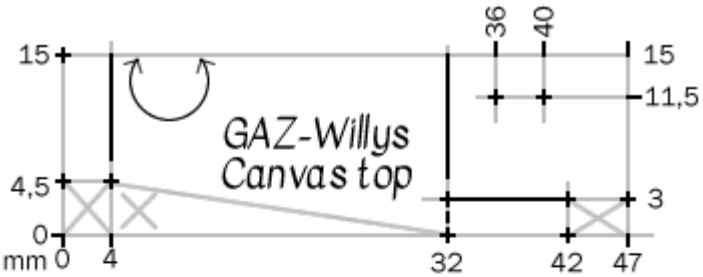
GAZ-Wi llys Hood - RP 41x17



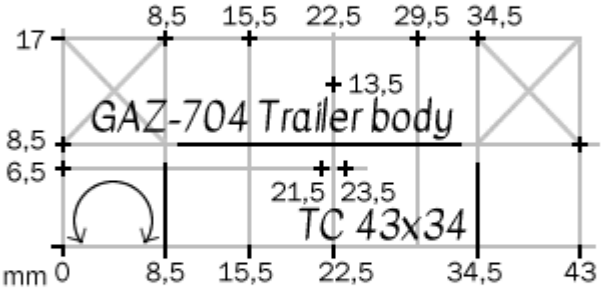
GAZ-Willys dashboard



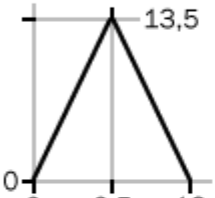
GAZ-Willys
Canvas top



Holden structure legs

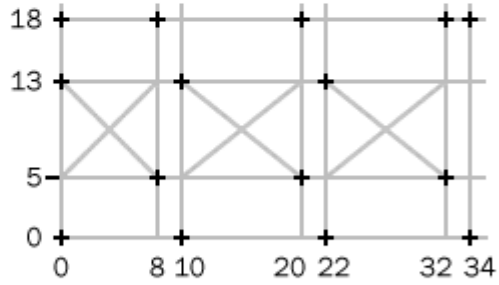


GAZ-704 Trailer body
TC 43x34

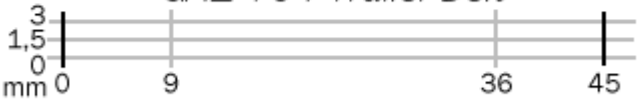


GAZ-704
Wire shape

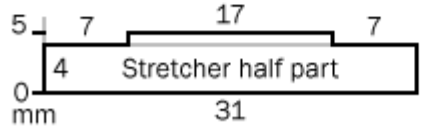
Holden stretcher structure

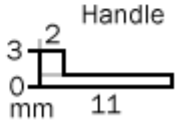


GAZ-704 Trailer Belt

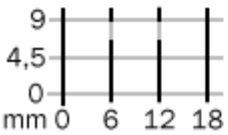


Dimensions for the strecher





GAZ-704
Fender



Round (US)
trailer fender

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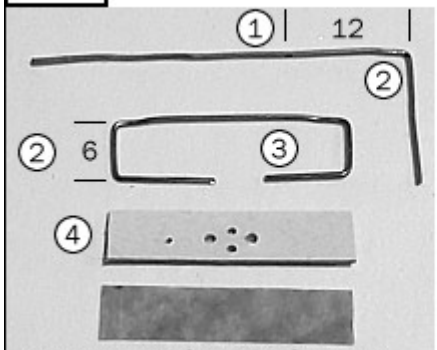
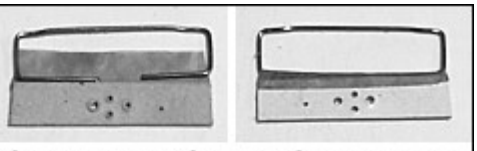
A09 Windshield and dashboard

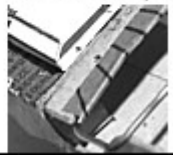


5 mm strip of thin kraft paper

(1) On a straightened piece of DWC wire, measure the middle point (usually at 25 mm) and from there measure 12 mm on both sides.
(2) Fold the sides from these points and measure 6 mm on both sides.
(3) Fold the remainder of the piece of wire as depicted.
(4) Use the template to create the dashboard part from a 5 mm strip.



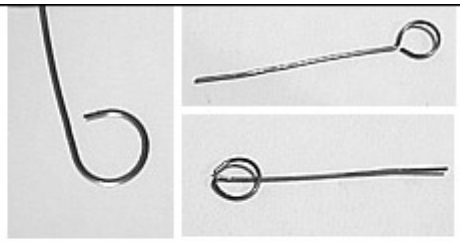
Glue the strip of thin kraft paper to the upper side of the dashboard, then insert the windshield frame and glue the remainder to the other side.



Align the assembly with the front of the body and make a marking inside the hood where the steering wheel shaft will be.
Using the nail scissors, cut a notch (through three layers of materials) at this position.

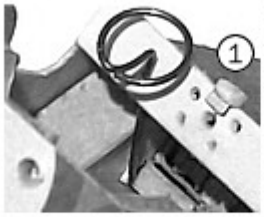
A10 Steering wheel

Wrap a piece of DWC wire around a 5 mm nail. A 5 mm tube as shown here makes the process easier.



Using the pliers, fold the part as depicted.

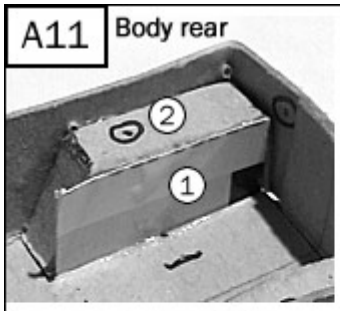
The steering wheel shaft is about 15 mm long. Trim to length to adjust in several cut.



For the GAZ-Willys, the steering wheel rests against the chassis part on the front and the "pedal" on the side.
(1) Notice the sun compass.

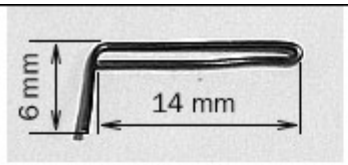
(2) For the GAZ-64, the steering wheel is inserted in the "pedal" through a hole and held in place with a DWC tube.

A11 Body rear



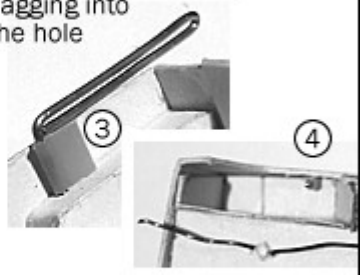
(1) The rear mudguard cover is a 17 x 10 mm piece of smooth paper. Apply glue to the side and to the bottom.

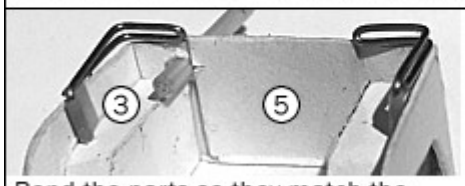
(2) Use the positioning dot to locate where to pierce through the mudguard, about 1 mm away from the side.



Measure 14 mm on a piece of DWC wire and fold it there. Fold the overlapping piece over at a straight angle. Cut so the part is 6 mm high.

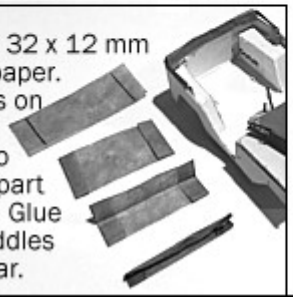
(3) Cut a flag-shaped piece of Double Wire Clip plastic so the loop is above the vehicle's side. This part also prevents the **top bow assembly** from sagging into the hole





Bend the parts so they match the vehicle's corners.
(5) See step A14 for the "rear seat box"

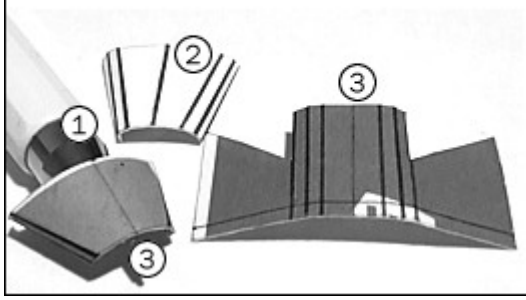
Rolled canvas top: 32 x 12 mm strip of thin kraft paper. Fold 4 mm inwards on both sides. Fold in half lengthwise two times, to obtain a part about 2,5 mm tall. Glue this part so it straddles the parts in the rear.



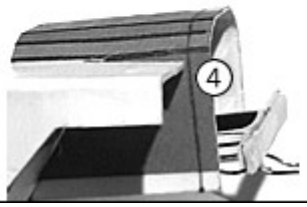
(4) A 1 mm long piece of DWC tube on the other side holds the part in place. The part is very small, use pliers to bring it into position.

A12 GAZ-64 hoods

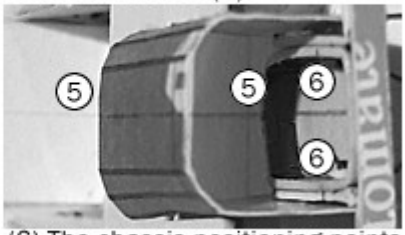
(1) Use a conical object to give the rear hood a more curved shape.



(2) Fold then unfold the "front hood" part in two in the middle to create a visible fold.
(3) The other parts are not folded in the middle but have a positioning line.

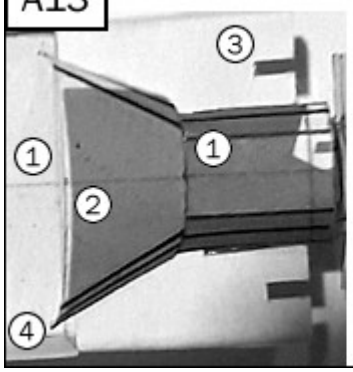


Glue the "engine cover" part using the positioning line so it protrudes by 1,5 mm (4) and the body's central line as a reference (5).

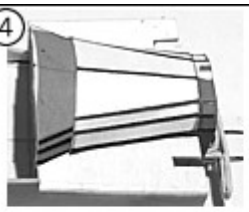


(6) The chassis positioning points are also 5 mm from the front.

A13



(1) Glue the rear hood part to the engine cover part and the underlying body, using the positioning line and body's central line. (2) The parts center has also to be vertically aligned with the body's hood.
(3) Notice the 2 mm wide slits for the headlights.
(4) Trim the excess.



Glue the front hood part to the assembly, aligned with the body's front, leaving 1,5 mm of the engine cover protruding.

Use three pairs of grille elements, 7 mm high. The bottom plate is 8 x 5 mm.

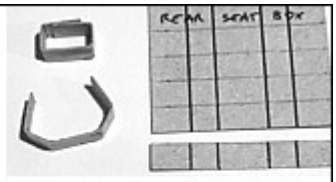
(Note: the front hood shown above was made like a GAZ-Willys hood, with tabs. Its sides are more vertical.)

A14 Final GAZ-64 details

Cut 2 mm from the stem of a Q-tip, then use the point of a nail to push its center in. Glue both headlights so they are parralel.

Bend about 10 mm of medium wire into a U-shaped **hook** with a 6 mm long side. After painting, leave it permanently on the trailer hitch. Move it with tweezers when connecting a trailer.

Rolled canvas door: after painting insert half of 100 mm of thread into the side hole. Roll a 8 mm wide strip of thin kraft paper into a tube. Cut a 8 mm piece from it and glue it to the side. Tie a double knot, keep 4 mm of both ends. Paint the assembly.

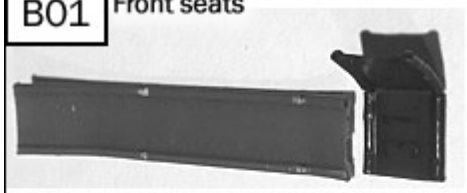


Glue the **rear seat box** to the body rear.

Part B - the car's body

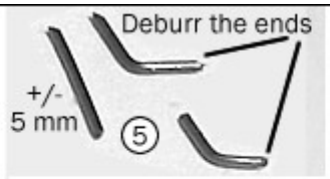
Subassemblies to be painted separately

B01 Front seats



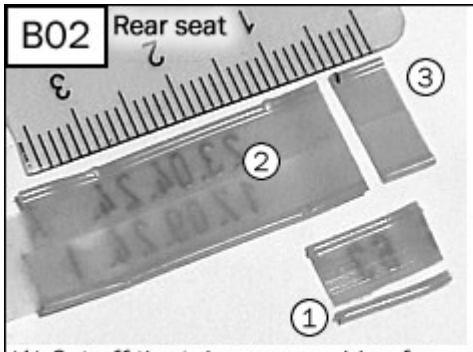
The DWC plastic sheath is 7,5 mm wide. Use one as a reference to cut the 7,5 x 7,5 mm parts that are needed for the front seats.

(1) Cut a 14 mm long piece of medium wire (DWC wire) and bend a corner at one end. Insert it into a 6 mm piece of Q-Tip stem then bend it at a right angle (2). Mark it at 5 mm from the bottom of the Q-Tip (3) and bend it backwards so it can be inserted into the seat part (4).

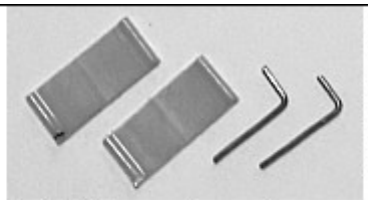


(5) Use wire snippets about 5 mm long, bend them at an angle and use them to connect the seat parts together. (6) Glue the porous side of a 7 x 5 mm piece of thin cardboard to the underside of the Q-tips, so that the sitting surface is 5 mm from the ground. The trapezoidal shape stabilizes the seat.

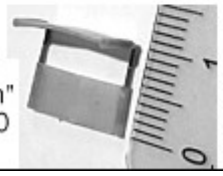
B02 Rear seat



(1) Cut off the tube on one side of a DWC plastic part. (2) Glue two such parts together using adhesive tape on both sides. (3) Cut 5 mm segments.

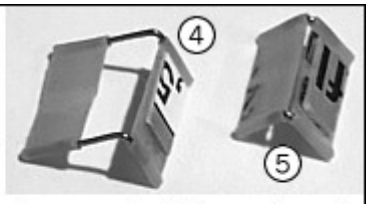


Cut 12,5 mm pieces of medium wire (1/4th of DWC length), bend 3,5 mm at a right angle.



The "Willys" and "Holden" seats are 10 mm high.

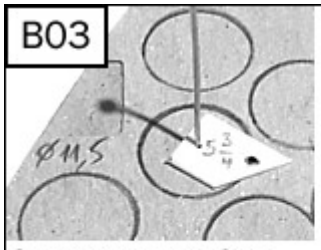
(5) The GAZ-64 rear seat is assembled like the front seats.



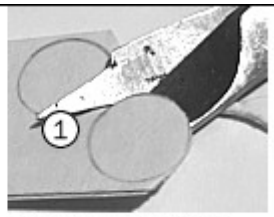
(4) Glue a 8 x 4 mm part of thin cardboard underneath the rear seat. Use it to glue the GAZ-64 rear seat to the box.

For the Willys rear seat, use another part of thin cardboard (11x5 mm) to cover the visible gap in the rear seat box.

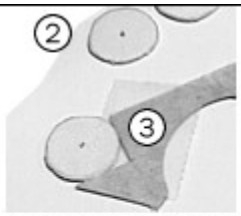
B03



Glue two pieces of thin cardboard together, use a 5,75 mm compass to draw circles (see Step P02, p.3).



(1) Cut so the line remains visible to you, this ensures smaller cuts and a more regular shape.

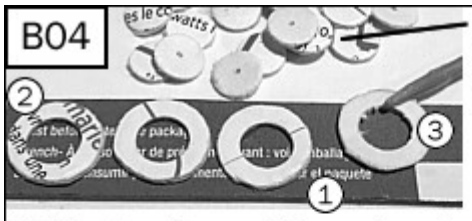


(2) Draw a dot on the center, then attach it to a piece of cardboard with an angle (3) using adhesive tape.

(In order to avoid the visual tricks created by hard shadows, avoid direct light.)

Turn the hole punch upside down (4) and use the piece of cardboard (3) to bring the wheel in position. Use the dot to position it in the hole's center.

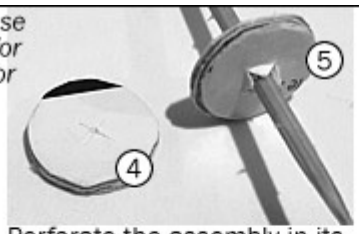
B04



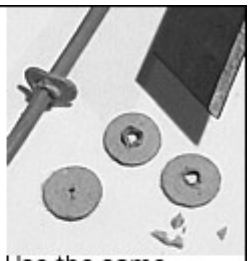
(1) Glue two pieces of thin cardboard together and cut them in 14 mm strips. (2) Glue the perforated wheels on the strip. (3) Use a toothpick to apply glue on the porous side and also to fold the hole's irregularities inwards.

You may want to keep these snippets as road wheels for such vehicles as the LVT or the Churchill tank.

Cut the assembly using the perforated part as a guide.



Perforate the assembly in its center with a thin pin. On the backside, cut a cross across the hole (4), then use a toothpick to enlarge the hole (5).



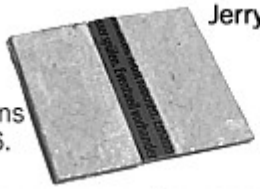
Use the same procedure on a pair of single-thickness round snippets. Remove the excess.

Use the same excess removal procedure on a pair of wheels for the forward axle. The excess will not be visible on the rear axle.

For the axles, cut two 23 mm pieces of toothpick. For the **forward axle**, first slide the snippets on the axle so their smooth sides are showing, these are **wheel hubs**. Then slide the wheel assemblies on the axle.
The **spare wheel** axle is 4 mm long.

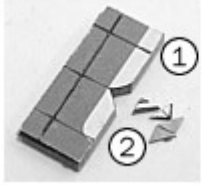
B05

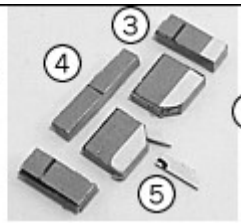
Dimensions on page 6.



Jerrycans - Captive Cardboard Method

As with the grille assembly, apply glue on the side elements and only at the very limits of the central strip. The outer panels are showing their smooth side.

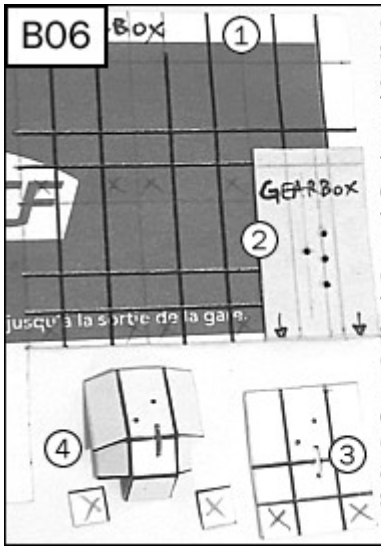




Use the cutting template, draw lines between dots as illustrated.

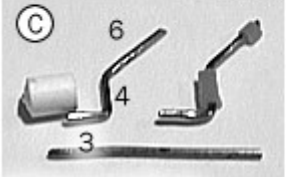
(1) First cut the assembly in two along the long central line. (2) Cut away the material at the center. (3) Remove the lateral margins then the remaining margin (4). (5) Remove the captive cardboard. (6) With a roller pen, draw a X on each side.

B06

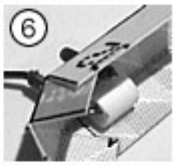


(1) Draw the lines for several **gearboxes** on a piece of rigid paper. The dimensions are provided with the template schematics on page 6. Draw over the folding lines with a roller pen.
(2) Align the template to the bottom and sides, draw the dots.
(3) Perforate. Cut a slit between the two holes on the bottom right.
(4) Cut the side lines and fold so the shorter sides are below the larger sides.

(A) **Front axle engagement lever**: 5 mm of DWC wire, 2x DWC tube 2 mm.
(B) **Hand brake lever**: 10 mm of DWC wire, bent at 2 mm, 2 mm of Q-tip stem.



(C) **Gear shifting lever**: 13 mm of DWC wire, 3 mm of Q-tip stem, DWC tube 3 mm and 1 mm.



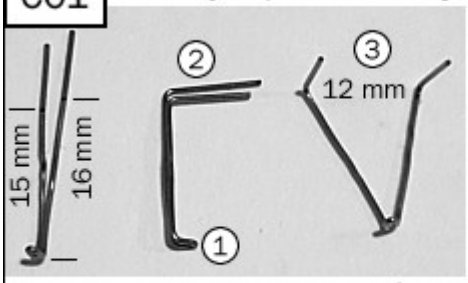
(5) Insert A from underneath and C from above.

(6) Insert Q-tip into C then glue to the paper. Glue the side tabs (about 45°)
(7) Insert B into Q-tip and glue the latter into the fold, with the wire sticking out of the slit. Glue a 12 x 5 mm bottom piece of cardboard to the sides.

Part C

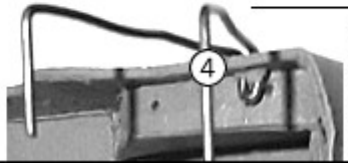
Assembly after painting - Special versions

C01 GAZ-Willys top bow assembly



Bend medium wire in two. Bend 3 mm at a right angle (1). Make a 15 mm mark (front pole) and 16 mm mark (rear pole).

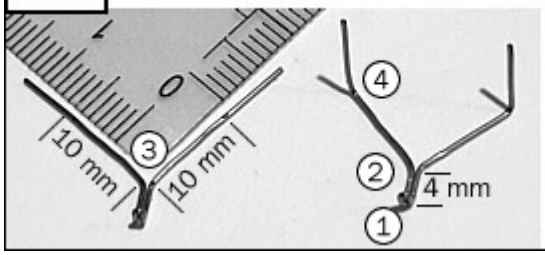
(2) Bend at the marks, in the same direction than the foot. Remember the part for the other side is mirrored.
(3) Spread the two ends 12 mm apart.



(5) Slide 15 mm long DWC tubes into the assemblies' tips.
(6) Bend a 35 mm piece of thin wire in two and insert it so the loop straddles the assembly's foot.
(7) Twirl the wire then hide it under the rear fender.

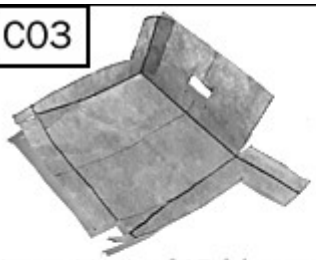
(4) Perforate the rear positioning dot and make another hole 1 mm rearwards from it. Perforate the body wall and enlarge with the tip of the utility knife so that the assembly's foot can enter.

C02 GAZ-64 top bow assembly

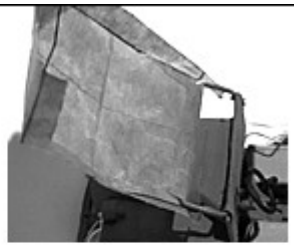


Bend medium wire in two. Bend 3 mm at a right angle (1). Make a 4 mm mark on both poles, then bend each pole at a 45° angle (3), the angle between both poles is 90°. (4) Bend the remaining wire in the same direction as the foot. The rest of the procedure is the same as the GAZ-Willys tob bow assembly (Step C01).
The top bow has to be assembled before priming and painting.

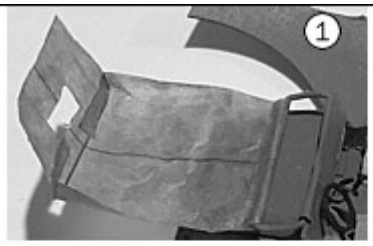
C03



Assemble the GAZ-64 canvas top as shown. Trim the 4 mm tab in the front so it can slide inside the windshield.



Fold the windshield on the hood. Slide the tab inside then apply glue to its extremity. Fold the tab so it connects with the underside of the canvas top. The assembly procedure for the GAZ-Willys is similar.

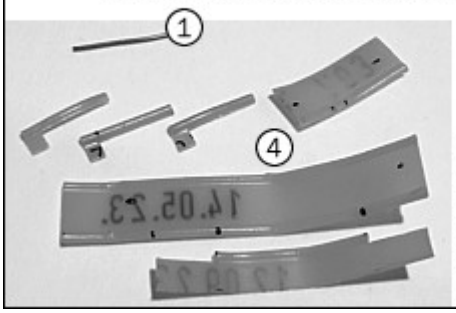


When painting the canvas, protect the hood underneath. Also paint the inside parts that will be visible from the outside.
(1) This piece of cardboard has been taped o the bottom of the body with adhesive tape, it helps when painting.

(2) After painting the body and the subassemblies, insert the **axles** between the thin wire strands and twirl these together, then bend them out of sight.
Assembly order **without a canvas top**: 1- Start by glueing the gearbox in place. 2 - The front seats 3 - The spare wheel 4 - The rear seat.
Assembly order **with a canvas top**: 1- The gearbox 2 - The front seats 3 - The rear seat 4 - The canvas top 5 - the spare wheel.

C04

Use the dimensions on page 7 to cut two **stretcher** halves and four handles from DWC plastic. Also prepare four pieces of medium wire (1) at least 12 mm long.



(2) Assemble the two halves together with a piece of adhesive tape on the top side. The piece of tape is more than 40 mm long, so its ends can be taped to the underside.

(3) Slide the medium wire into the central part, use longer wire parts if a bend in the plastic needs to be straightened (4).

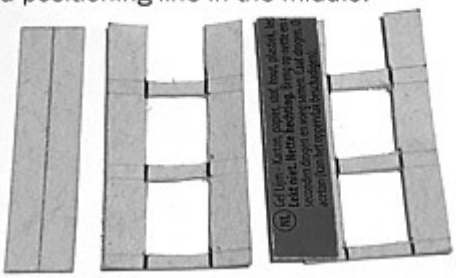
37 x 14 mm piece of thin kraft paper

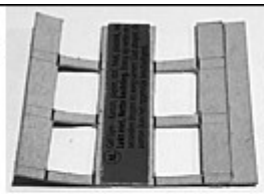
Handles are 5 mm long.

(5) Fold and glue the front and rear tabs last.

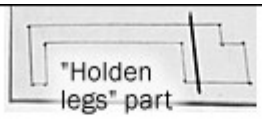
C05

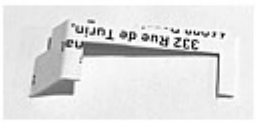
Use the dimensions on page 7 to cut two **ambulance structure** halves and two 34 x 2 mm pieces of cardboard with a positioning line in the middle.





Notice that there is a 1 mm gap on each side of the cardboard rectangle, allowing the stretchers to slide inside the structure and on top of it.

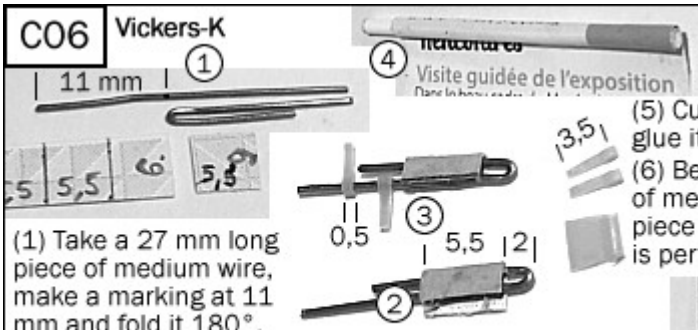




Glue a square of regular cardboard under the **spare wheel**, which will be glued to the front hood. After painting, glue the GAZ-Willys **rear seat** on the driver-side fender.

C06

Vickers-K



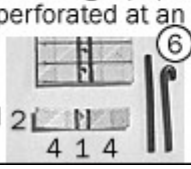
(1) Take a 27 mm long piece of medium wire, make a marking at 11 mm and fold it 180°.

(2) Fold a 6x5,5mm piece of rigid paper so that one end is flush with the top of the barrel. (3) Trim the excess.

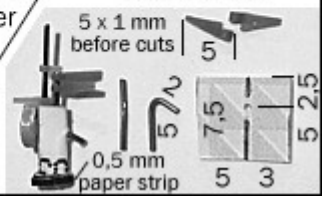
(4) Glue smooth paper (approx. 50 mm) on a Q-tip stem into a roll until it reaches a diameter of 3,5 mm.

(5) Cut a 1mm slice from that roll and glue it flush with the front of the receiver.

(6) Bend the end of a 10 mm piece of medium wire 180°. Insert it into a piece of rigid paper; notice the latter is perforated at an offset.



Vickers-K N°2 Mk1
Land Service

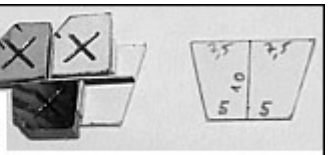


C07

LRDG features

For the **condenser**: cut 5 mm from the 3,5 diameter roll (see Step C06), insert 20 mm of thin wire with a small hook on one end.

For the **row of jerrycans**, glue 6,5 x 5 mm pieces of regular cardboard between each jerrycan. For the **hood jerrycans**, glue the jerrycans to a piece of cardboard as shown here, using 1 to 1,5 mm high interstitial strips.



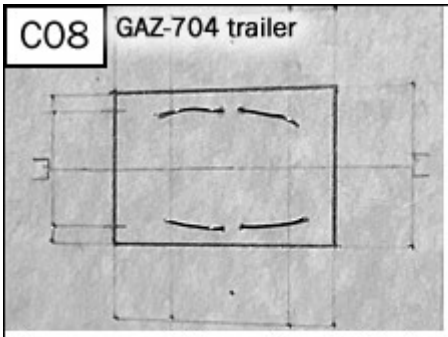
The LRDG jeep's **dashboard** is only 4 mm high and flush with the hood. A 0,5 mm slice of Q-tip is glued on it, it is the **Bagnold sun compass** (see step A10). The LRDG jeep has no top bow, no rear seat and no rear seat box.

(1) To insert the **front stand**, perforate the hood at 1 mm from the dashboard and 2 mm from the side. Glue a 1 mm slice of Q-tip over it, using a piece of medium wire to guide it.

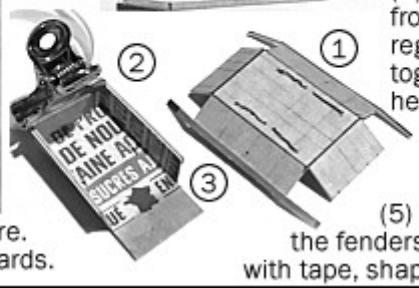
(2) For the **central stand**, perforate between the two starting points of the rear fenders. Bend a 16 mm piece of medium wire in two at 90°, glue the half underneath with thin kraft paper. Insert 14 mm of Q-tip stem.

C08

GAZ-704 trailer

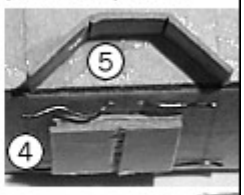


The porous side is on the outside here. Notice the axle wire is oriented outwards.



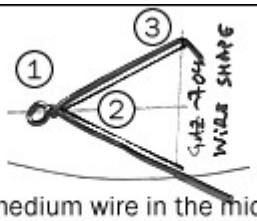
(1) Glue the belt parts to the sides, flush with the top. (2) Glue the ends to the front and rear. (3) Notice the open rear panel.

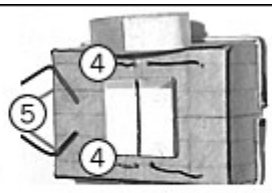
(4) 10 x 10 mm square from three layers of regular cardboard glued together. A "fold line" helps to position the axle. The toothpick for the **trailer axle** is **26 mm** long.



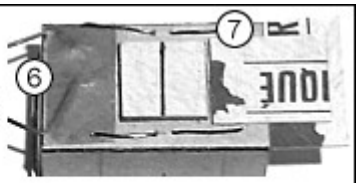
(5) Use the markings to position the fenders. (US version) Close the loop with tape, shape half of it into a semi-circle.

C09





Use the markings on the body to position it (4) and the central line (5) to make sure it is symetrical.



(1) Bend 50 mm of medium wire in the middle, use the Ø 1,4 mm nail to create a loop. (2) Bend the wire so it matches the "wire shape" reference. (3) Mark these intersections to bend the ends inwards.

(6) Glue thin kraft paper over the wire ends. (7) A separate rear panel glued with a small interstice is more realistic.