PANZER 38(t)

No. 807

HISTORY

When the Germans occupied Czechoslovakia in 1938, they acquired one of Europe's most modern and efficient armament and automotive industries. Among the weapons taken over was the TNH light tank, which was just about to enter service with the Czech army when the Germans marched in. In need of modern tanks, the Germans ordered mass production of the TNH, redesignating the tank *Panzerkampfwagen 38(t)*, the "38" denoting the year in which it came into German service, and the "t" standing for Czechoslovakia. Approximately 1500 *Panzer 38(t)*'s were built in the next years.

The *Panzer 38(t)* equipped two German Panzer Divisions for the invasion of Poland in 1939, while three of ten Panzer Divisions used them during the invasion of France in 1940. They also saw action in the invasions of Norway, Yugoslavia, and Greece. The vehicles gave excellent service, were fast, reliable, and needed little maintenance. Their armor and armament was adequate, and they were popular with their crews.

In the hard fighting on the Eastern Front, the *Panzer 38(t)* proved to be no match for the Soviet tanks. They suffered heavy losses and were hurriedly replaced as battle tanks by the *PzKpfw. III* and *IV*. Those remaining were used against the partisans or as reconnaissance or observation post vehicles; they were converted to other roles such as self-propelled mounts for anti-tank and anti-aircraft guns, howitzers, and as ammunition carriers. The chassis and running gear formed the basis of the highly successful *Hetzer* tank-destroyer (Testor kit #809) built in 1944-1945.

SPECIFICATIONS

Crew	4
Weight	10.45 tons (9.5 metric tons)
Length	15.12′ (4.61m)
Width	7.02′ (2.14m)
Height	7.9′ (2.4m)
Engine	Praga EPA 6-cylinder, water-cooled, 125 hp
Transmission	Manual, 5 forward, 1 reverse
Speed	26 mph (42kmh)
Range	155.3 miles (250km)
Armament	One 3.7cm KwK 38(t) L/47.8 (Skoda A7) Two 7.92mm MG37(t) machine guns
Turret traverse	360 degrees (manual)
Elevation	– 10 degrees to + 25 degrees
Armor	Maximum, .98″ (25mm) Minimum, .31″ (8mm)

Reference Sources

PzKpfw. 38(t) in Action, Charles K. Klimant & Hilary L. Doyle (Squadron/Signal)

Encyclopedia of German Tanks of W.W.II, Chamberlain & Doyle (Arco)

Czechoslovak Armored Fighting Vehicles, 1918-1945, H.C. Doyle & Charles K. Klimant (Bellona)

AFV Weapons Profile No. 22 (Profile Publications)

BEFORE STARTING

1. Study the illustrations and sequence of assembly before beginning.
2. Decide how much detail you wish to add to your model and whether or not you intend to modify or "convert" the basic model in any way. Study carefully all available reference material before beginning to ensure an authentic model.
3. Due to the amount of parts in this kit, do not detach the parts from the runners (sprue) until you need them. This helps avoid confusion and lost parts.
4. When cementing the parts together, check the way in which one part fits together with another. This ensures a neat job.
5. Always remember, when working with plastic model cement and paint, make sure your work is well-ventilated. The fumes from plastic modeling products can be harmful if inhaled.

PREPARATION OF PARTS

1. Never tear parts off the runners (sprue). Use a Testor Hobby Knife, nail clippers, or small wire cutters.
2. It is possible some parts may require a little attention with a file or sandpaper to ensure a proper fit and neat appearance. Hobby files and Testor Hobby Sandpaper appropriate for model-building are available in most good hobby shops.
3. If you desire, you may fill any seams (where parts go together) or imperfections with Testor Contour Putty for Plastic Models which is also available at good hobby shops.

PAINTING

You can obtain an excellent finish on your model using Testor Enamels. Parts of the model are painted individually, and then the entire model is oversprayed when you have finished construction.

First of all, be sure your brushes are soft, clean and flexible. (Keep them that way by cleaning them thoroughly with Testor Paint thinner.) Never use inexpensive brushes! A selection of Testor Shed-Proof Brushes will serve you well.

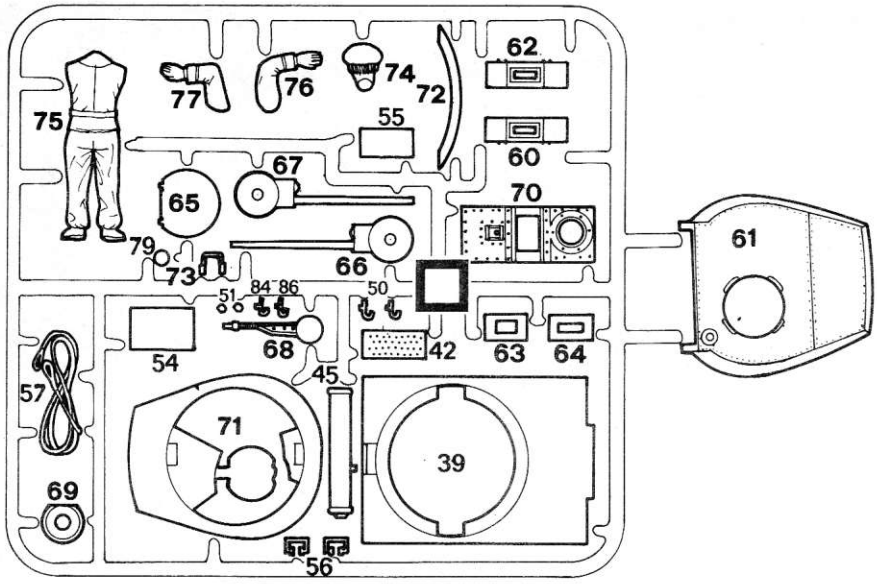
Wash plastic parts before detaching them from the sprue. Warm water and liquid detergent remove the oils left from the manufacturing process. Let the parts dry and avoid excessive handling. Immediately before painting, wipe the parts with a "tac rag" (available at automotive centers) to remove dust and lint.

Most parts are best painted while still attached to the sprue or they may be detached and held with tweezers or "magic" type transparent tape. Paint in one direction only. If your paint is the correct consistency, brush strokes will disappear as the color dries. If the paint seems too thick, thin it with Testor Paint Thinner. Wheels may be detached from the sprue and fit onto toothpicks or matchsticks for painting. Then just hold the paintbrush against the edge of the wheel and rotate the wheel to obtain a neat clean finish.

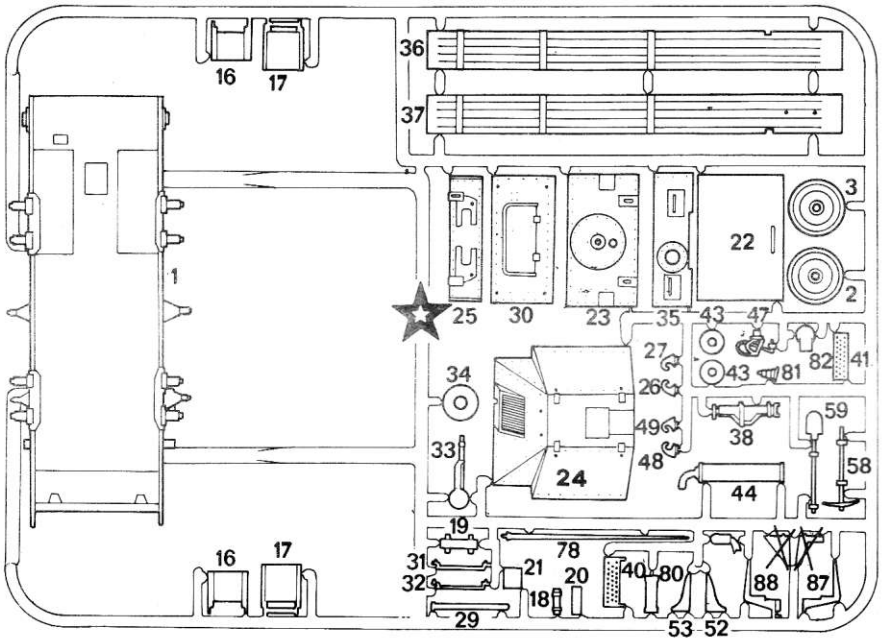
Let the paint dry completely before handling. When the parts are dry, assemble the model, following the directions closely. Remember cement will not stick to painted surfaces. Using your Testor Hobby Knife, carefully remove paint from all surfaces to be cemented. After you have assembled your model you may touch up areas where cement has marred the finish.

When your model is completed, apply a coat of Testor Dullcote #1260 to the entire model. This will give it an authentic, dull finish and protect the surface of the model.

Remove this page from the instruction sheet by cutting along indicated line. Use the drawings of the complete sprue as a part-locating reference when building the model.



Parts from this section are identified with this symbol: □



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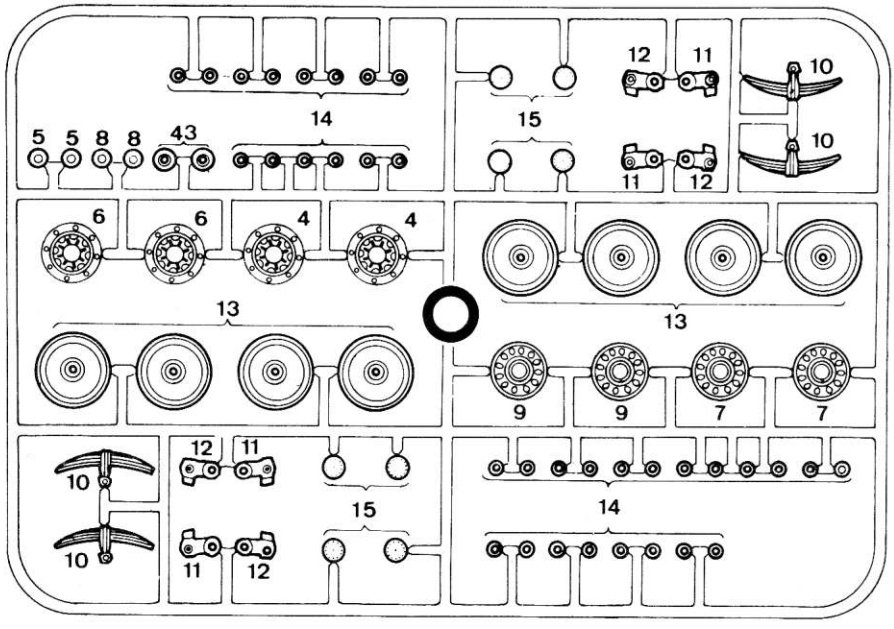

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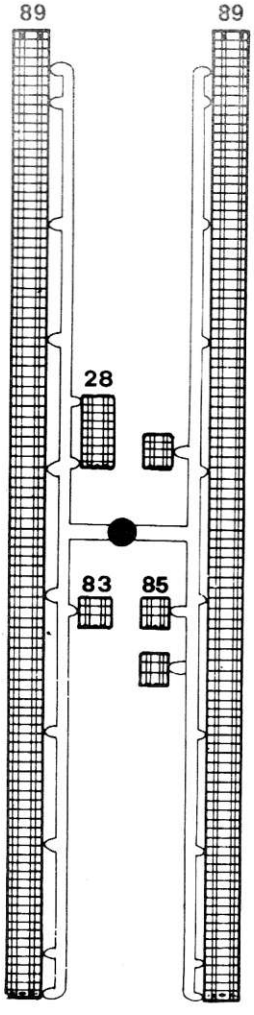

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Cut and remove this sheet.

Tweezers will be useful in assembling the many small parts in this kit. The type used by postage stamp collectors is recommended.

Liquid cement, Testor #3502, is recommended for construction since it can produce the neatest, quickest, and strongest glue joints. Apply small amounts of cement, using the tip of a 00 brush, to the surfaces to be joined while holding the parts in place. Do **not** use large amounts of cement.

NOTE: The *Panzer 38(t)* can be assembled with the hatches cemented closed, as the tank would appear in action. If you wish to build your model with hatches closed, discard all interior parts and ignore all interior painting instructions. Construction will be greatly simplified, yet your model will be completely authentic.

The *Panzer 38(t)* may be painted **"Panzer Gray"** or **"Dark Green."** Instructions for mixing these colors are given on page 6. All parts not singled out in **Preliminary Painting** should be painted the primary body color before removing them from the parts tree. Select your color scheme now.

1 PARTS 1-24 ASSEMBLY OF SUSPENSION AND INTERIOR

Preliminary Painting

☆**16-17** cushions only:
#1164 **Flat Olive Drab Green**

☆**1** inside of hull only; ☆**16**, ☆**17** remainder of seats; ☆**18**, ☆**19**, ☆**20**, ☆**21**, ☆**22**:
#1168 **Flat White**

○**13** rubber tire around rim only:
#1183 **Rubber**

Assembly

☐1. Cement ☆**2** into hole on left side of ☆**1**. Cement ☆**3** into hole in right side of ☆**1**. Cement ○**5** to the center of ○**4**, and then push the pin on ○**4** through ○**6**, as shown, and cement in place, making certain that the locating bar near the center of ○**4** engages the slot on ○**6**. Push the pin on ○**4** through the hole in ☆**2**, and secure in place by carefully cementing ○**14** over the tip of the pin. Use cement sparingly, or the wheel will not turn. Repeat this procedure on the right side.

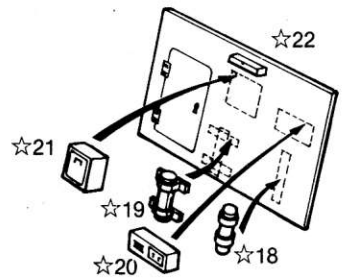
☐2. Push the pin on ○**7** through ○**9**, and cement in place, making certain that the locating bar on ○**7** engages the slot on ○**9**. Cement ○**8** to the center of ○**7**, and then push the pin on ○**7** through the rear-most hole in the left hull-side and secure in place by cementing ○**14** to the tip of the pin. Use cement sparingly, or the wheel may not turn. Repeat this procedure on the right side.

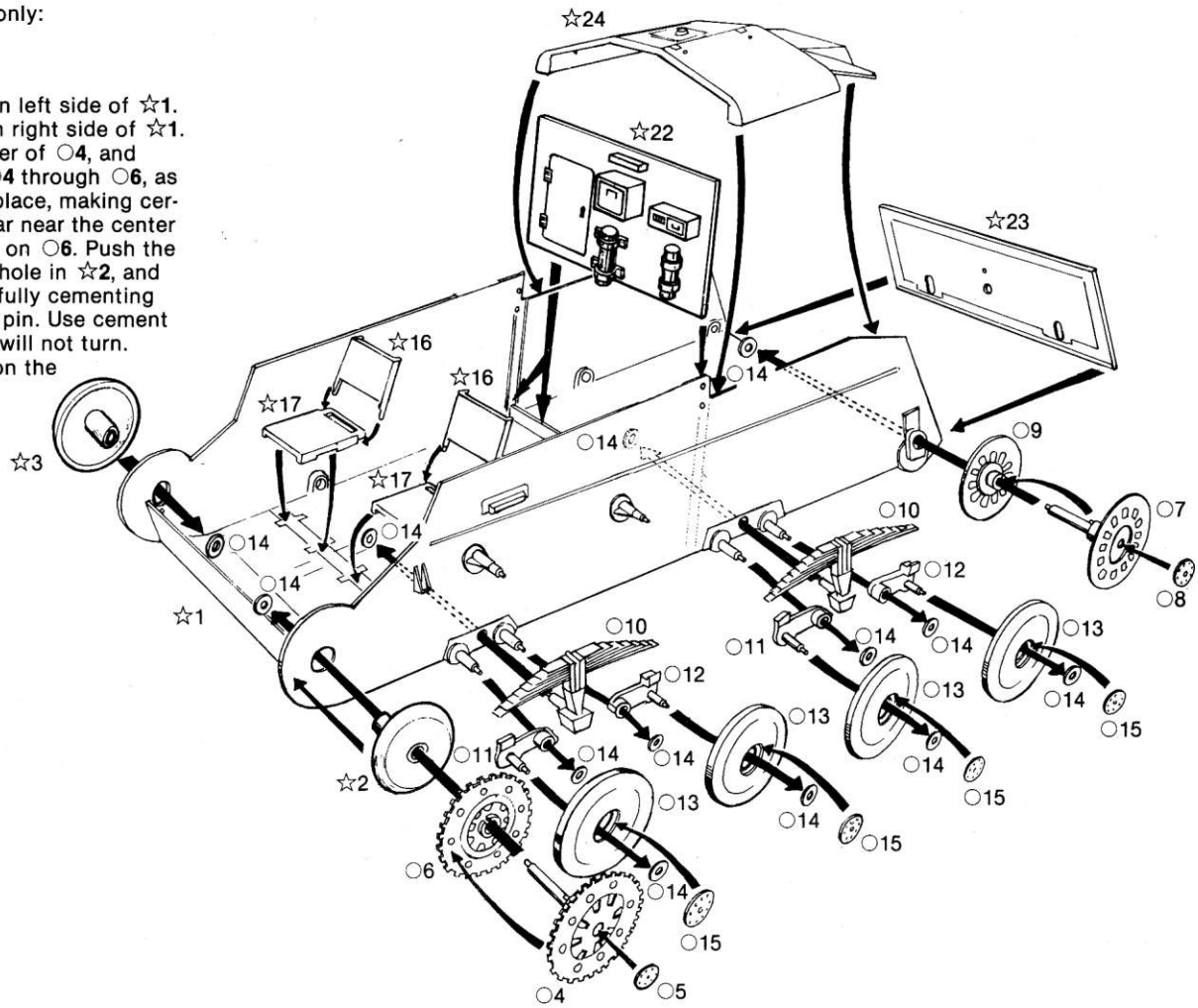
☐3. Push the pins on two ○**10** through the holes in the left side of the hull, and secure in place by carefully cementing one ○**14** over the tip of each pin. Push two ○**11** and two ○**12** over pins on hull side as shown, and secure in place by carefully cementing one ○**14** over the tip of each pin. Repeat this procedure on the right side.

☐4. Push one ○**13** over each of the axles on ○**11** and ○**12**, and secure in place by cementing one ○**14** over the tip of each axle. Cement one ○**15** over each wheel hub as shown. Repeat this procedure on the right side.

☐5. Cement one seat back ☆**16** to each of two seats ☆**17** as shown, and then cement both ☆**17** to hull floor. Cement ☆**18**, ☆**19**, ☆**20**, and ☆**21** to the detailed side of ☆**22**, as shown, and, when all parts have dried, cement ☆**22** into hull *between vertical guide-rails* provided on hull sides.

☐6. Cement ☆**24** to top of hull and to rear side of ☆**22**, and then cement ☆**23** to rear of hull with the two holes near the bottom. Check box photos of the completed model to make certain these parts have been correctly assembled. Allow all parts in this step to dry thoroughly.





2 PARTS 14, 25-43 ASSEMBLY OF HULL DETAILS

Preliminary Painting

●**28**:
#1180 **Steel**
☆**33**:
"Gunmetal" (Mix 1 part #1149 **Flat Black** with 1 part #1180 **Steel**)
☆**35** inside surface only:
#1168 **Flat White**
☆**43** rubber tire around edge only:
#1183 **Rubber**

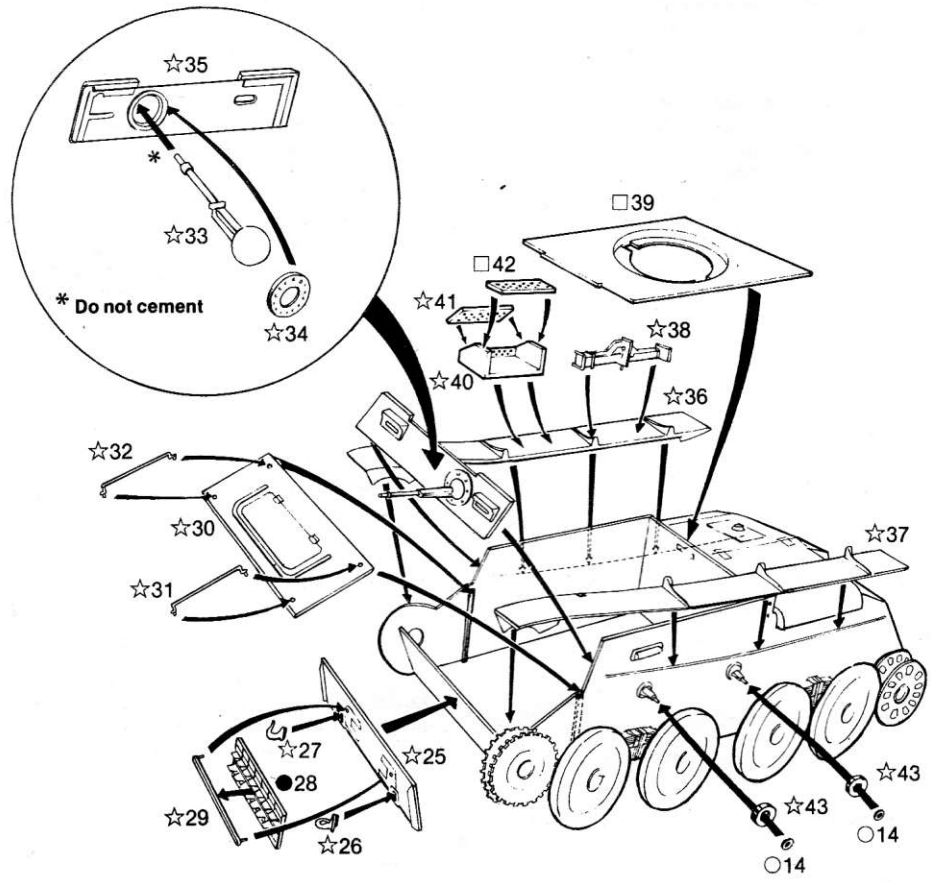
Assembly

☐1. Cement ☆**25** to front of hull with the rectangular holes nearer to the hull bottom than the top. Cement ☆**26** and ☆**27** to ☆**25**. Place ☆**29** over ●**28**, and then cement ☆**29** to ☆**25** so that ●**28** is secured in place. Cement ☆**30** to upper hull front so that the beveled edge faces towards rear of model. Cement ☆**31** and ☆**32** to ☆**30**.

☐2. Push (but *do not cement*) ☆**33** through ☆**35**, and secure in place by carefully cementing ☆**34** to ☆**35** as shown. Make sure that the ribbed barrel on ☆**33** faces upwards. Cement ☆**35** to upper hull front as shown.

☐3. Cement ☆**36** to right side of hull, and cement ☆**37** to left side. Cement ☆**38** to ☆**36**. Cement ☆**41** and ☐**42** to ☆**40**, and then cement ☆**40** to ☆**36**. Finally, cement ☐**39** into top of hull. Make sure the protruding tab on ☐**39** engages the cut-out in the top of ☆**35**.

☐4. Push ☆**43** over each of two pins on either side of hull, and cement ○**14** over tip of pin, taking care not to get cement on ☆**43** or axle will not turn.



3 PARTS 44-59 ASSEMBLY OF FURTHER HULL DETAILS

Preliminary Painting

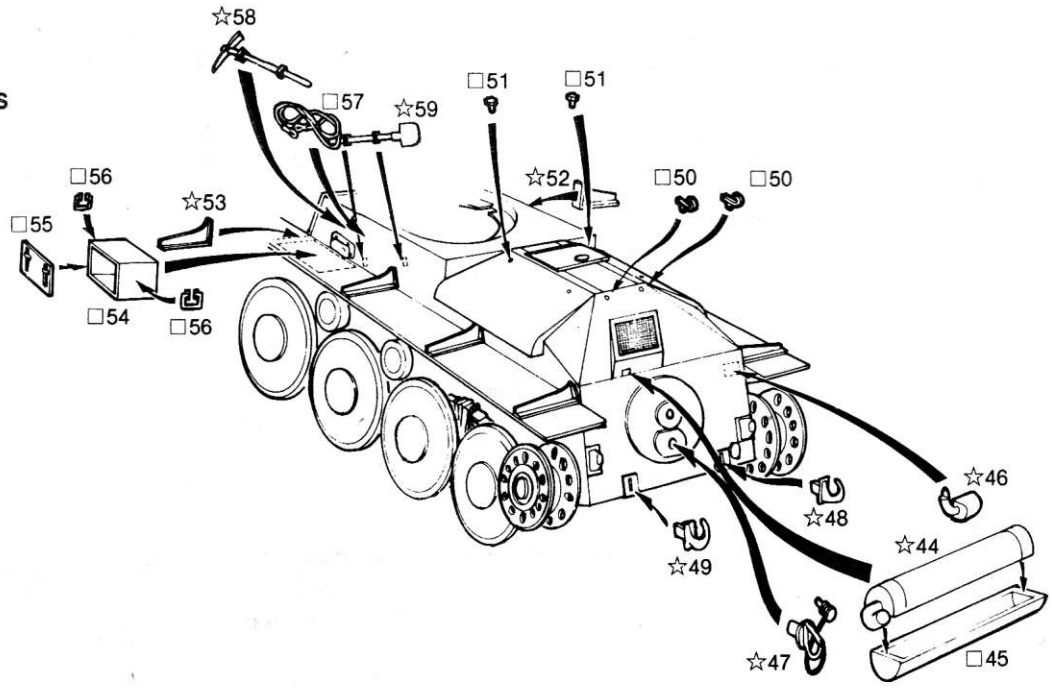
☆**44**, ☐**45**, ☆**46**:
#1185 **Rust**
☆**44** tip of exhaust pipe only:
#1149 **Flat Black**
☐**57**; ☆**58**, ☆**59** steel parts of tools:
#1180 **Steel**
☆**58**, ☆**59** wooden parts of tools:
#1166 **Flat Military Brown**

Assembly

☐1. Cement ☆**44** to ☐**45**, and then cement ☐**45** to rear of hull. Cement ☆**46** to rear of hull and to muffler. Cement ☆**47**, ☆**48**, and ☆**49** to hull rear.

☐2. Cement two ☐**50** to top of engine deck. Cement two ☐**51** to top front corners of engine deck, and then cement ☆**52** to right side of hull and right fender. Cement ☆**53** to left side of hull and left fender.

☐3. Cement ☐**55** and two ☐**56** to ☐**54** as shown, and then cement ☐**54** to left fender. Cement ☐**57**, ☆**58**, and ☆**59** to left side of hull as shown.



4 PARTS 60-77
ASSEMBLY OF TURRET, FIGURE

Preliminary Painting

☐**63**, ☐**64** inside of vision slot only: ☐**66**, ☐**67** inside of muzzle only:
#1149 **Flat Black**

☐**68**:
"Gunmetal" (Mix 1 part #1149 **Flat Black** with 1 part #1180 **Steel**)

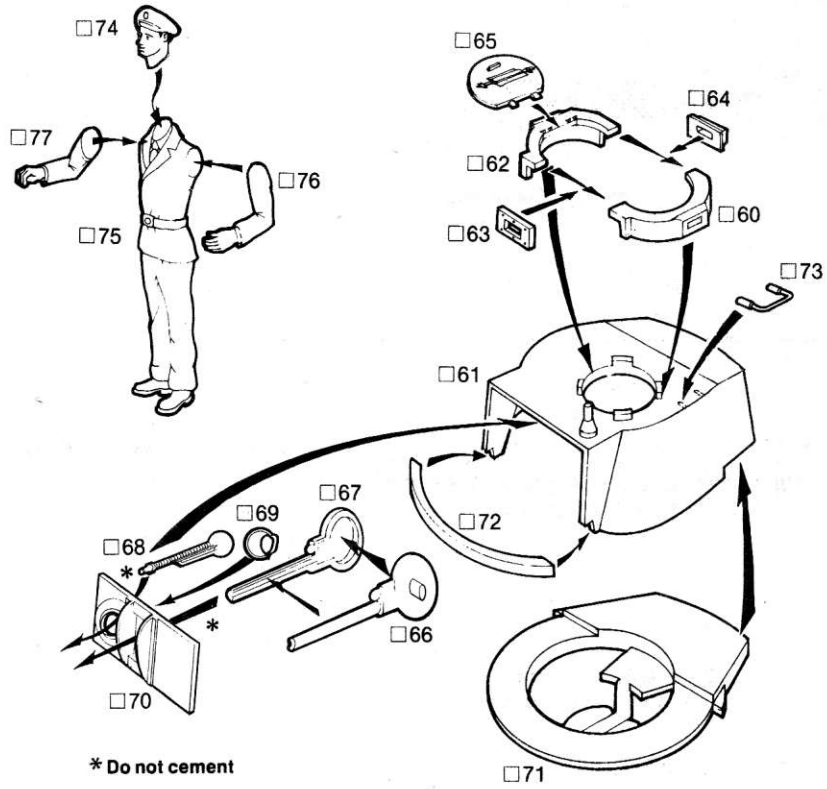
NOTE: It is recommended that the figure be completely assembled before painting. See the **FIGURE PAINTING** section on page 8 about how to paint figures.

Assembly

☐1. Cement ☐**60** to ☐**62**. Cement ☐**63** and ☐**64** into ☐**60-62** as shown. Cement ☐**60-62** to top of turret. Cement ☐**65** to ☐**62** in either open or closed position. Cement ☐**61** to ☐**71**, and then cement ☐**72** to front of turret. Cement ☐**73** to left side of turret roof.

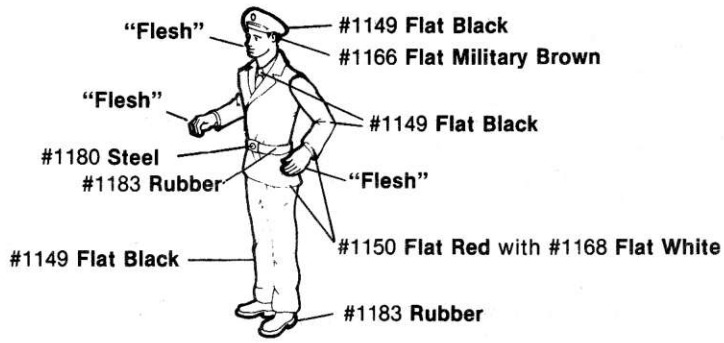
☐2. Cement ☐**66** to ☐**67** and clamp together until dry. When dry, carefully push (but *do not cement*) the completed barrel through the center hole in ☐**70** as shown. Push (but *do not cement*) ☐**68** through hole on right side of ☐**70**, and secure in place by carefully cementing ☐**69** over ball on ☐**68**. Finally, cement ☐**70** to turret front so that the machinegun (☐**68**) is on the *right side of the turret.*

☐3. Cement ☐**74** to ☐**75**. Cement ☐**76** to left shoulder of ☐**75**, and cement ☐**77** to right shoulder. When completed, the figure may be placed inside the turret hatch so that his feet touch the seat on ☐**71**, or he may be placed atop the tank, near it, etc.



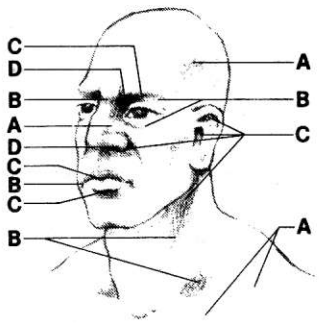
Suggested painting for figures

Pants, coat, shirt, tie, hat:
#1149 **Flat Black**
Shoes, belt:
#1183 **Rubber**
Belt buckle, decorations:
#1180 **Steel**
Piping on jacket:
(Mix 6 parts #1150 **Flat Red** with 1 part #1168 **Flat White**)
Face, hands:
"Flesh" (Mix 2 parts #1167 **Flat Desert Tan** with 1 part #1168 **Flat White**)
Hair:
#1166 **Flat Military Brown** (or your choice)



Color Key for Face Painting

A: 1 part #1185 **Rust** and 2 parts #1170 **Flat Light Tan**
B: 2 parts #1185 **Rust** and 1 part #1170 **Flat Light Tan**
C: #1185 **Rust**
D: 1 part #1185 **Rust** and 1 part #1183 **Rubber**
Highlights (white areas): 2 parts #1170 **Flat Light Tan** and 1 part #1168 **Flat White**



5 PARTS 78-89
ASSEMBLY OF FINAL DETAILS

Preliminary Painting

●**83**, ●**85**, ●**89**:
#1180 **Steel**

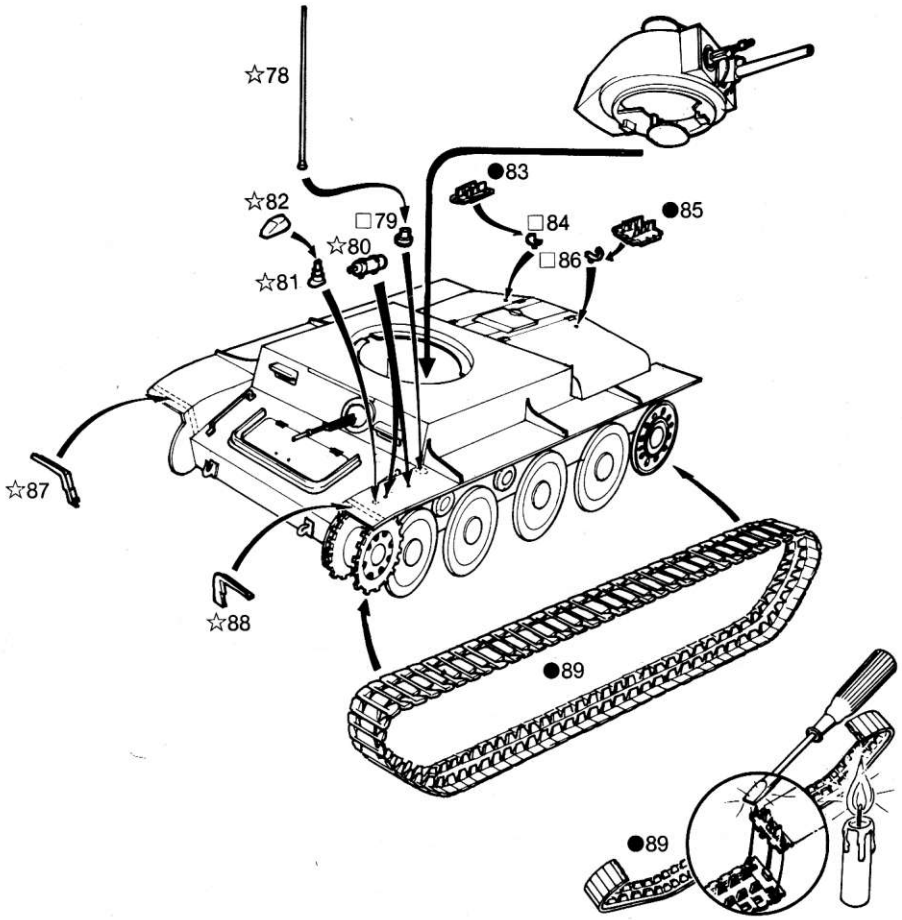
Assembly

☐1. Cement ☆**78** to ☐**79**, and when dry, cement ☐**79** to left front fender. Cement ☆**80** to left front fender. Cement ☆**82** to ☆**81** as shown, and then cement ☆**81** to left front fender.

☐2. Cement ☐**84** and ☐**86** to sides of engine cover as shown, and, when dry, carefully attach ●**83** and ●**85** to ☐**84** and ☐**86**. Cement ☆**87** to right front fender, and cement ☆**88** to left front fender.

☐3. Push the pin at one end of the track ●**89** through the hole at the opposite end, and secure in place by flattening the head of the pin with the flat blade of a screwdriver heated over a flame. (Cement will not hold the tracks together.)

☐4. Study photos of the completed model to determine the correct direction in which to attach the tracks — there is a forward and reverse pattern to the tracks. Begin by carefully pushing the tracks around the teeth of the drive sprocket, then over the bogey wheels, and finally over the rear idler wheel and return rollers. Try to stretch the tracks as little as possible; too much pressure may break them. Repeat for the other track. Finally, assemble the turret to the hull by pushing the projections on either side of the turret ring through the cut-outs in the hull, and swiveling the turret in any direction.

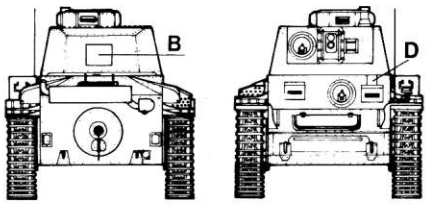


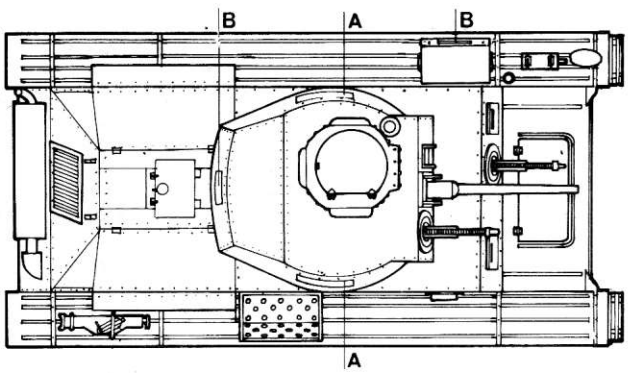
CAMOUFLAGE

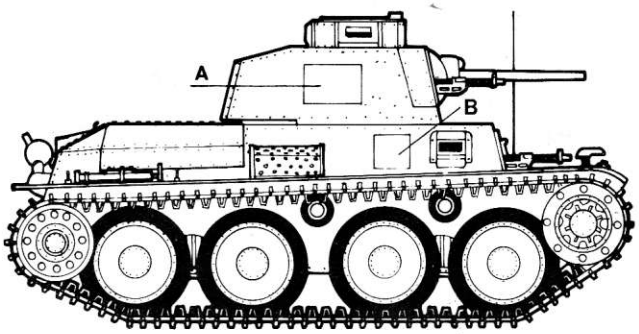
"Panzer Gray" (Mix 10 parts #1149 **Flat Black,** 10 parts #1163 **Flat Battle Gray,** and 3 parts #1172 **Flat Sea Blue**)

#1168 **Flat White**

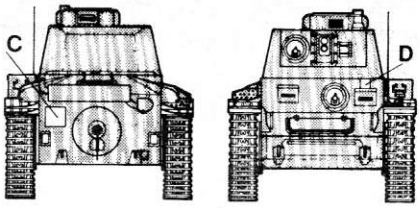
"Dark Green" (Mix 5 parts #1165 **Flat Army Olive** with 1 part #1149 **Flat Black**)

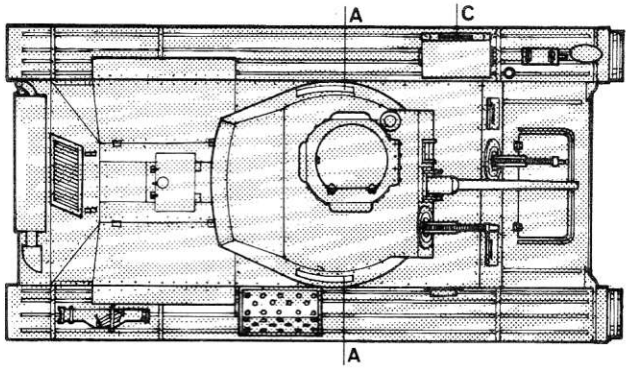


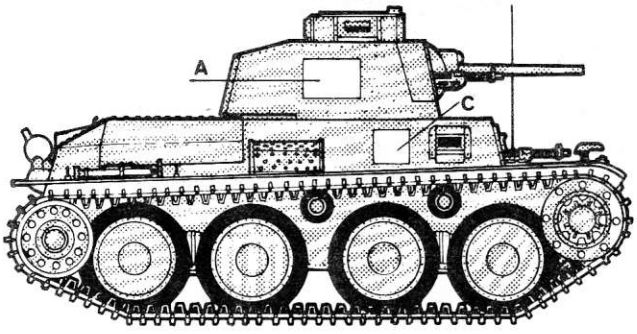




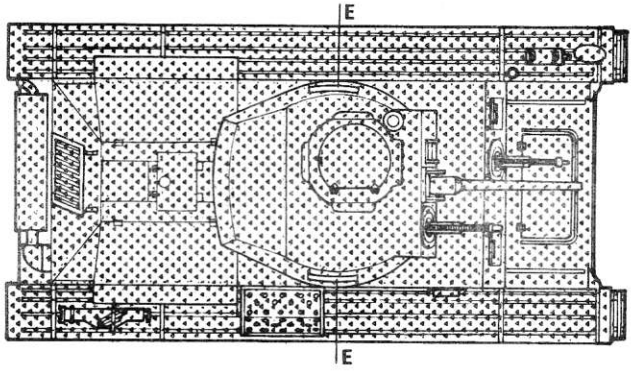
A: 5th tank, 3rd platoon, 6th company; 8th Panzer Division. Overall color: **"Panzer Gray"**

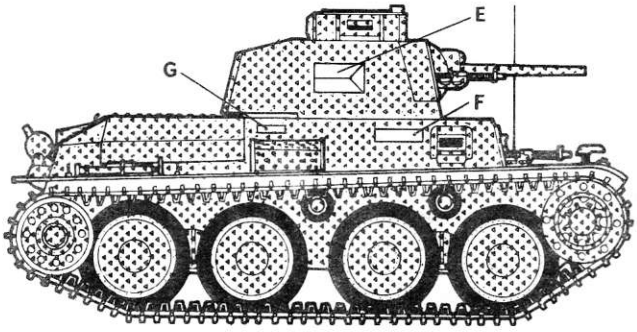






B: 4th tank, 1st platoon, 5th company; 7th Panzer Division. Overall color: **"Panzer Gray"** Winter overpainting: **"White"**





C: *PzKpfw.38(t)* preserved today in Czechoslovakia as a memorial. It was used in combat against the Germans during the Slovak National Uprising, 1944. Still in running condition. Overall color: **"Dark Green"**

MARKINGS

635
1A: Tactical Identification Numbers

514
2A: Tactical Identification Numbers


3B: German National Insignia


4C: German National Insignia


5D: 7th Panzer Division, 1939-40


6D: 8th Panzer Division, 1939-40


7D: 10th Panzer Division, 1941-45


8D: 11th Panzer Division, 1941-45


9D: 12th Panzer Division, 1941-45


10D: 14th Panzer Division, 1941-45


11E: Czech flag insignia

UV833
12F: Czech Army ID Number

75944
13G: Czech serial number

FIGURE PAINTING

Figures add dimension and life to your models. Painting figures is considered by many to be the most difficult aspect of modeling. However, if you are willing to take your time and practice, it can become the most rewarding.

After you have assembled your figure, it should be primed with a coat of #1168 Flat White. Use Testor spray paint or an airbrush if you have one. It is nearly impossible to get proper coverage with a brush. Accessories may be glued on at this point, but this sometimes makes certain areas of the figure difficult to reach with a brush. In these cases it is more convenient to paint these pieces separately and attach them to the finished figure.

Always use flat paints. Testor Flat Paints are manufactured for use on military vehicles and airplanes. However, when using Flat Paint for clothing on the figures, it is necessary to add talcum powder to the paint in order to make the painted surface appear really flat. Add powder to the paint gradually, testing it until the paint has no gloss. A #0 brush with a fine point is best for painting figures. Smaller brushes do not hold enough paint. Put some #1170 Flat Light Tan on a pallette and mix in a little thinner so the paint flows smoothly off your brush. Apply an even coat over all the flesh areas. A second coat may be required for proper coverage. Now paint the eyes with #1149 Flat Black. These can be indicated by black slits, or if you wish, you can paint them as shown on the drawing. If they need shaping up, you can do this by painting around them with #1170 Flat Light Tan.

Begin shading by adding a very small amount of #1185 Rust with the Flat Light Tan. Fill in under the cheek bones and all areas indicated on the drawing. Proceed mixing progressively darker tones using Flat Light Tan and Rust until you finally use pure Rust. Use this color to outline all areas where the flesh meets the clothing (collar, cuffs, gloves, etc.). Finally, mix a small amount of #1183 Rubber with the Rust and paint fine lines in the mouth, nostrils, under eyebrows, inside ears and between fingers.

Add highlights by mixing Flat White with the Flat Light Tan. The drawing shows where these go. If you have any problems look at the photographs on the box.

Now begin shading the clothing. After the uniform is painted the proper color, hold it directly underneath a strong light. Notice where all the shadows fall. Mix #1149 Flat Black with your uniform color and fill in these areas, carefully following the sculpted wrinkles on the figure. You can blend the color on the uniform to this shadow color by lightly moistening your clean brush with thinner and carefully going over where these colors meet.

After you are satisfied with the shadows, hold the figure under the light again. Notice the areas where the light hits the strongest. Mix a little #1168 Flat White with the base color and carefully apply the highlights to these areas. Remember, the shadows go *under* the folds and the highlights go *on top* of the folds. Finally, you can outline all straps, belts, pockets, collars, and edges of clothing with a thin wash of #1149 Flat Black.

Observe real faces and clothing and notice how the light falls on them. Adapt these ideas to your figures, trying to make them as realistic as possible. You can also learn a lot from studying other people's figures. Don't be too subtle in your shading—contrast is what gives figures life.

Practice and experience are the best teachers, so do not be discouraged if you aren't pleased with your first few attempts. Always take your time and strive for a neat, crisp appearance. Have patience. It takes time to learn a new skill and it's worth it.

WEATHERING HINTS

Nearly all military vehicles show some signs of wear and tear. The process by which the modeler imparts this look to a model is referred to as *weathering.* Many times, the weathering, that is, the representing on the model of rust, mud, oil stains, dust, chipped paint, etc., can really make a model stand out and give it amazing authenticity.

Always try to be logical in applying weathering techniques. For instance, you wouldn't want to show rust on top of mud or dust on your vehicle, nor would you normally want to cover a vehicle supposedly operating in the desert with mud. Vehicles move *through* the land they operate on more than *over* that land, and you must weather your vehicle in such a way that it makes sense.

After you have painted your model in its basic colors, begin by sealing the paint with one or two coats of Testor Dullcote. When this dries, you can add shading to the model using washes. A wash is simply thinner which has been tinted by adding paint to it. Use a broad brush and apply an even wash of #1149 Flat Black (use #1183 Rubber if your model is painted "sand" or tan) over the entire model. Apply this quickly, and before it dries, carefully wipe it off with a soft lint-free cloth. This should leave subtle shadows around all the projections and details. If you like, you can darken these shadows in certain places by adding additional washes with a fine brush.

Always work slowly and carefully, trying not to overdo the weathering. A good rule of thumb is that too little weathering is always preferable to too much. Knowing when you have applied enough is sometimes difficult to determine, so pause often and inspect your model for the desired effect.

The next step is highlighting your model. For this, use a technique called drybrushing. Wide, flat, chisel brushes in various sizes are used. On a scrap of cardboard, mix a small amount of #1168 Flat White with your basic model color and then wipe your brush off on a clean cloth until there is barely a trace of paint left. Drag this drybrush across the surface of your model. Paint will begin to collect on all the edges and high points of the model. Use a scrubbing action at first and literally tint your model with this color. Add a little more Flat White to this color and drybrush again, this time applying the paint a little more subtly. Repeat this process one or two more times, lightening the color and applying more lightly each time. Don't get carried away, though, the effect should be restrained at this point. After the paint has dried, apply the decals and let them dry.

If you want your model to appear new, it can be left as is. If you want a dirty or dusty model, you can now begin to dirty it up. But if your vehicle is to represent a non-combat or peacetime vehicle, be especially light-handed. Use Testor #1166 Flat Brown or #1167 Flat Tan, and apply using the drybrush method. For a dusty appearance, drybrush lightly; for a grubby or filthy look, scrub the paint on in blotchy or streaked patches. Again add further highlights adding #1168 Flat White and #1169 Flat Yellow, lightening your dirt color and pressure on the brush with each succeeding layer. If your dirt color gets too washed out or yellowish, add a touch of #1185 Rust and #1165 Olive to it. When drybrushing always remember, a lighter color goes over a darker, and brush pressure gets lighter with each succeeding layer.

A little rust on mufflers and exhaust pipes is realistic, as is a hint of it on the metal parts of a vehicle's tracks. But as a rule, be sparing with it if you wish your vehicle to look authentic. Rust is one of the most overdone forms of weathering seen on models. Unless your model is supposed to be a wrecked or an abandoned vehicle, go very easy with the rust. To rust out a muffler, first apply a couple of heavy washes of #1183 Rubber. After this dries, mix some #1185 Rust with the Rubber and drybrush liberally. Follow this color with pure Rust, and if you wish you can add a touch of #1169 Yellow to this, drybrushing very lightly.

Dust is difficult to portray on a model unless you have the use of an airbrush. If you do, try shooting a light sand-colored paint at your model, with your airbrush held about two feet away from your model. If you do not have an airbrush dust may be simulated by the use of powdered artist's pastels carefully brushed onto your model a little at a time until the desired effect has been achieved. A similar effect can be had by using barbeque ashes just as they come out of your barbecue.

Occasionally there are areas on a vehicle where paint becomes scraped or scuffed off. Such areas include metal flooring, around hatches, grab handles, gun breeches, etc. Paint only rubs off under extreme wear, so keep this to a minimum. There are two ways to represent this. The first is by drybrushing *very lightly* with #1180 Steel or #1181 Aluminum. The second method is by applying graphite. You can do this by drawing directly on the area with a pencil, or by grinding the lead into a powder and applying with your fingers or a paint brush. This aspect of weathering is the easiest to overdo—so use it sparingly.

If you are building a tank, leave the tracks off until last and paint them separately. Use a touch of #1183 Rubber mixed with some #1166 Flat Brown. After this dries add a wash of #1149 Flat Black between the shoes, then, drybrush the shoes very lightly with #1181 Aluminum. Some tracks have rubber shoes—these areas should be painted Rubber.

Experienced modelers do several things to aid them in their hobby. One of the most helpful is attending meetings of their local International Plastic Modeling Society chapter. Here they see and discuss modeling techniques. Your local hobby shop will help you locate your local I.P.M.S. group. Serious modelers also collect books and photographs to use as reference when they finish their models. Again, your local hobby shop can help. Last, but certainly not least, your own observation will prove helpful. Visit museums. Look at buildings and vehicles around you. Notice how rust streaks a metal roof. See the oil and dirt on a piece of road grading equipment (almost identical conditions in which a tank runs). Study railroad boxcars and locomotives to see what the weather has done to them. Your own observation can be the best aid of all.

Remember: try not to overdo weathering—and *keep practicing.* Be patient, it takes time to discover and master all the tricks of this fascinating hobby.