

M3A2 U.S. ARMoured PERSONNEL CARRIER

M3A2 HALF TRACK

1/35 MILITARY MINIATURE SERIES NO 70

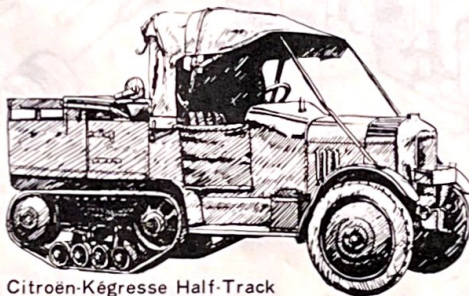
KIT NO.M.M.170



The half track first appeared as a regular weapon in World War II and served as the main personnel carrier of U.S. and German armoured divisions. It adorned war history with its numerous variations and characteristic designs. As an accompanying vehicle of the tank, it showed its mobility to the full.

There were big differences as follows between the U.S. and German half tracks. In the U.S. half track, engine power was transmitted also to the front axle and steering was made only through the front wheels. In the German half track, the front wheels had no brake, and the vehicle controlled the direction of travel by changing the angle of the front wheels or by fractionally idling the sprocket wheel on one side through the link according as steering angle was under or over 15°. These differences arose because the Americans originally made their half track by replacing the rear wheels of a truck by tracks, while the Germans originally made theirs by adding wheels to the front of a full-track vehicle in order to make its body longer. The Americans designed their half track as an armoured fighting vehicle from the beginning. On the other hand, the Germans used the very same chassis both for their non-armoured vehicle and armoured fighting vehicle, which put their half track at a disadvantage. Although it showed desired performance on European roads, its mobility was much limited in the field, particularly in muddy places, because the front wheels were not driven and the engine did not offer sufficient power.

It had been known since World War I that the tractive force of a truck with two rear axles would remarkably increase if tracks were fastened round its rear wheels. A number of nations had continued their own efforts to study and develop the half track, rear suspension for the tracks being the main object of their study. Under these circumstances, a Citroën-Kégresse half-track vehicle succeeded in running across the Sahara Desert, which renewed their enthusiasm for developing the half track. In the United States, the Ordnance Bureau of the



Citroën-Kégresse Half-Track

Department of the Army started earnest study and development of the half track in 1925 when it purchased two Citroën-Kégresse vehicles from France. The P17 half-track tractor purchased from France in 1931 had a very great influence on the American designs and ideas of the half track. The first U.S. military half track was the T1 experimental half-track reconnaissance car made in December 1932 by Jos. Cunningham, Son & Co., of Rochester, New York which was then developing the T1 experimental light tank. The new half-track vehicle had an open-top body and an improved version of Citroën-Kégresse running gear.

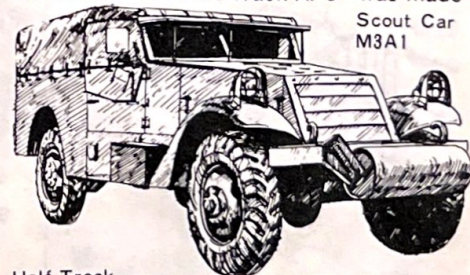
By 1937, non-armoured half tracks, T1 - T9E1, for reconnaissance, hauling weapons, carrying personnel and transporting material were trial-manufactured by Cunningham, Linn, GMC and Marmon-Herrington. These were intended to be used mainly by mechanized cavalry and artillery. The half tracks T9 - T9E1 trial-manufactured by Marmon-Herrington were based on the chassis of the Ford 1½-ton 4x2 truck of model 1936 and combined front drive with rear-bogie tracks. These half tracks had Kégresse type bogies which were full of faults. In the meanwhile, Marmon-Herrington, and one other manufacturer jointly developed suspension for rubber tracks of one-piece belt type devised by B.F. Goodrich. The suspension achieved very good results in tests and was adopted by the Department of Defense. It later became the basic suspension of the M2 and M3

half track series and further the standard equipment of all U.S. half tracks.

Realizing that the German mobile troops for the blitzkrieg tactics at the beginning of World War II mainly consisted of full- and half-track vehicles, the Americans, who already had the suspension with high productivity, started manufacturing half tracks in large quantities. There were a great variety of American half tracks. Their basic types mass-produced and actively used were as follows:

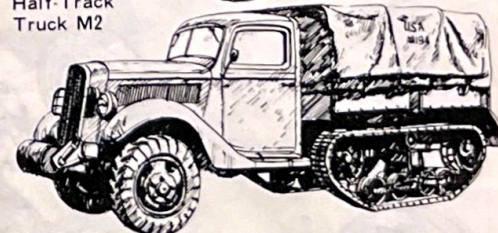
Half Track M2:

The first production half track officially adopted by the U.S. Army. In 1939, an experimental vehicle named "T14 Half Track APC" was made by



Scout Car
M3A1

Half-Track
Truck M2



Diamond T. Motor on the basis of the body of a wheeled armoured car which was being used by armoured cavalry. In September 1940, the experimental vehicle was accepted for production as the Half Track M2. From 1940 to 1943, Autocar manufactured 2,992 and White Motor Company 8,423, which made a total of 11,415. Half Track M2A1:

A modified version of the Half Track M2. On the upper right of the driver seat, it carried a ring

mount M45 (often called "Pulpit") for a 0.50-inch (12.7 mm) Browning heavy-barrelled machine gun M2. From October 1943 to March 1944, a total of 1,643 were manufactured.

Half Track M3:

This was intended to carry personnel and material of various units in armoured divisions. Autocar and Diamond T. Motor Car Company produced a total of 12,499 in parallel with the Half Track M2. Both the M3 and M2 were supplied to the Allies including the Soviet Union and Britain as well as to the U.S. Army.

Half Track M3A1:

A modified version of the M3. Like the M2A1, it carried an anti-aircraft ring mount M45 (for a 0.50-inch Browning) on the upper right of the driver seat. From October 1943 to March 1944, a total of 2,862 were manufactured by White, Autocar and Diamond T. Like the M3, the M3A1 was used in World War II by units in U.S. armoured divisions as an armoured command car,



Half-Track M2

armoured ambulance car, armoured radio car and armoured general purpose car. The M3A1 was also used by British armoured troops. A variation with a recovery jib on the front was also used by the British as an armoured recovery car.

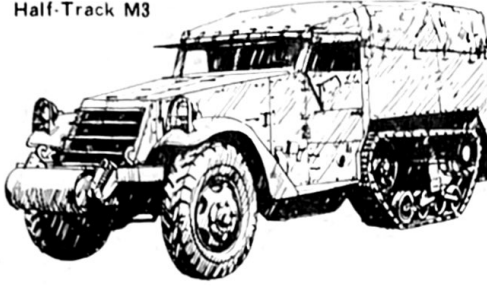
Half Track M3A2:

The final production version of the M3. This was an M3-based "general purpose car" intended to be used in place of the existing M2, M2A1, M3 and M3A1. In July 1943, a prototype named "T29" was completed and, in October 1943, accepted for production as the Half Track M3A2. This was a much polished vehicle. From 1944 on, the M3A2 saw active service as the main vehicle of armoured infantry in armoured divisions. The M3A2, like the M2 and M3 series, was a light armoured fighting vehicle with open-top body, to which hard-faced armour plates were welded or bolted. Armour was 6.25 - 12.7 mm in thickness, the nose of the vehicle being protected with relatively thick steel plate. The M3A2 accommodated 5 - 12 men i.e. one fully equipped platoon.

The M3A2 carried the standard weapons consisting of an anti-aircraft 0.50-inch Browning heavy-barrelled machine gun M2, 0.30-inch Browning machine gun M1919A4, 2.36-inch rocket launcher (bazooka) M9 or M9A1, 0.45-inch submachine gun M3, twelve 0.30-inch rifles and twelve Garand rifles. In stowage boxes

inside the vehicle, the following ammunition was carried: 330 rounds of 0.50-inch machine-gun ammunition, 2,000 rounds of 0.30-inch machine-gun ammunition, 6 A/T rockets M6, 24 mines M1, 48 hand grenades and 180 rounds of 0.45-inch machine-gun ammunition.

Half-Track M3



When necessary, additional machine-gun ammunition (600 rounds for the 0.5-inch Browning and 6,000 rounds for the 0.30-inch Browning) was carried in place of two seats.

The M3A2, like the M2 and M3 series, had a White 160 AX, 4-cycle, series 6-cylinder, water-cooled, gasoline engine offering 143 hp/3,000 rpm. Engine power was transmitted through the dry-type single-plate clutch, constant mesh transmission with 4 forward and 1 reverse speeds, 2-speed transfer case and banjo-type rear axle to the sprocket wheels. The vehicle used all-wheel drive system in which the front axle of the split type received power from the transfer case if necessary. The vehicle carried 227 litres of fuel and fuel consumption ratio was 1.49 km/l. Maximum cruising range was 320 km and maximum speed on good road reached 72 km/h.

Front suspension was the same in construction as that of a usual car. Rear suspension had the following construction: Two rows of four road wheels — each wheel had a rubber tyre, 305 mm in diameter and 105 mm in width, which was peculiar to American half tracks — were connected through links to the bogie assembly equipped with vertical volute springs. The belt-type rubber track was supported by top rollers at the top of the bogie assembly and by the idler wheel serving as rear body support. The sprocket wheel engaged with guides in the centre of the track to drive it.

From May 1941 to 1945, the United States produced as many as 45,044 half tracks including the officially designated versions and experimental versions of self-propelled mortars, self-propelled cannons, self-propelled howitzers, self-propelled multi-barrelled guns, etc. as well as the M2 and M3 series. This total was made up as follows: 37,164 personnel carriers and 7,880 self-propelled guns. These vehicles were used in all theatres of war by 16 armoured divisions, independent mechanized cavalry groups, independent tank destroyer groups, independent armoured groups and some units in infantry divi-

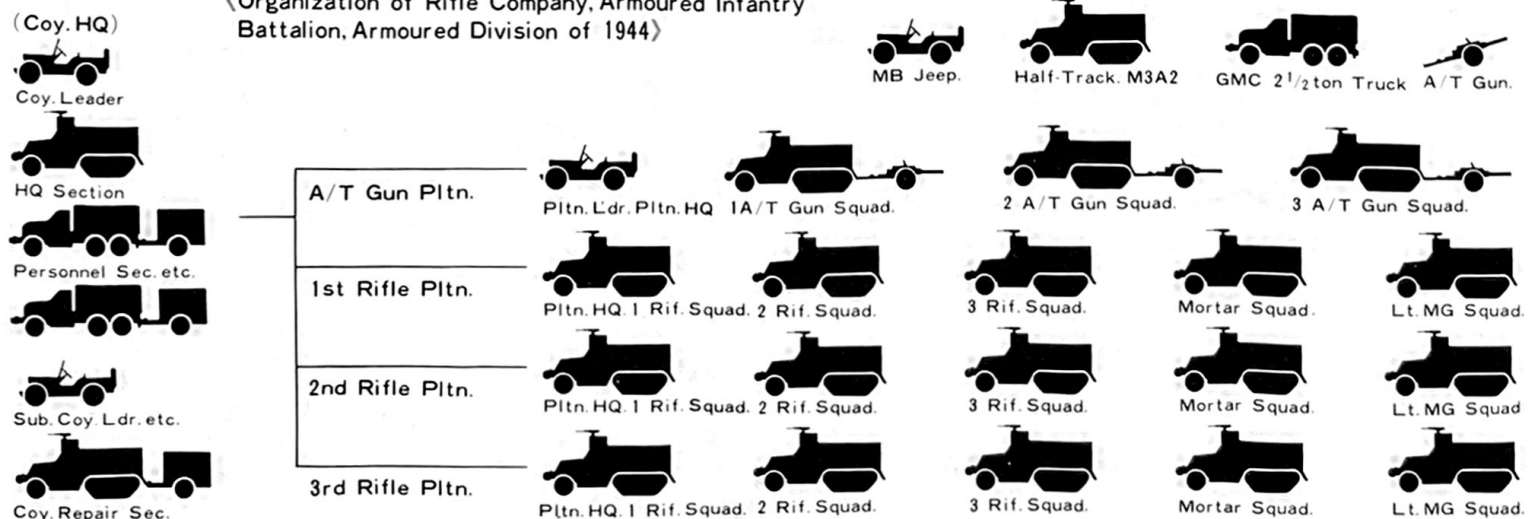
sions.

In the case of the M3A2, 448 vehicles were used per armoured division. They were allotted to units in the division at the approximate rate as follows: 72 to each of the three armoured infantry battalions; 20 to each of the three rifle companies; 11 to the headquarters; 11 to the headquarters company; and 1 to the service company. Details of vehicle allotment to the rifle companies in the armoured infantry battalion of the armoured division in 1944 are tabulated as follows:

The rifle squad vehicle accommodated the driver and nine squad members consisting of one squad leader, one assistant squad leader, five riflemen, one automatic rifleman and one ammunition carrier. The platoon leader's vehicle carried 12 men including the platoon leader and his sergeant. The mortar squad vehicle accommodated eight men consisting of one squad leader, two gunners, two ammunition carriers, two riflemen and one driver. The light machine gun squad vehicle carried 13 men consisting of one squad leader, one assistant squad leader, four riflemen, two machine gunners, two assistant machine gunners, two ammunition carriers and one driver. The anti-tank squad vehicle carried seven men consisting of one squad leader, two gunners, two ammunition carriers, one rifleman and one driver.

From the Korean War on, The United States gradually replaced their half tracks with full-track M113 series vehicles. Today, about 30 years after the end of World War II, armies of many countries including the Self Defense Forces of Japan are still using half tracks as fighting vehicles. We often receive the news that these half tracks were running about in the Mideastern War, Vietnam War and riots in South America. In the United States, however, these vehicles are merely kept in museums or by enthusiasts.

Organization of Rifle Company, Armoured Infantry Battalion, Armoured Division of 1944





Please read this before commencing assembly.

★This is a kit of the U.S. Half Track M3A2 with nine model figures, eight to be placed in the vehicle and one in a standing posture. Be sure to read the following instructions carefully before assembling them.

★You will need a sharp knife, a pair of pliers, a file, and a pair of tweezers.

★Painting should be started after assembling has been completed. First, paint the hull with model figures, steering wheel, machine gun, front wheels and tracks removed. Then, paint the model figures and accessories one by one and fix them in place after the paint on the hull has become dry.

★For overall painting, marking and parts, see the accompanying sheet.

In the assembly drawings, complicated surfaces to be cemented are printed in this way. Also, surfaces indicated with arrows should be cemented.

This shows the colour this part should be painted. Instructions for overall painting are given in the accompanying sheet. Instructions for painting model figures are given at the left of 10.

(Converting Into M3A1)

You can build the M3A1 from this kit by changing some parts. Refer to page 9 and "Painting".

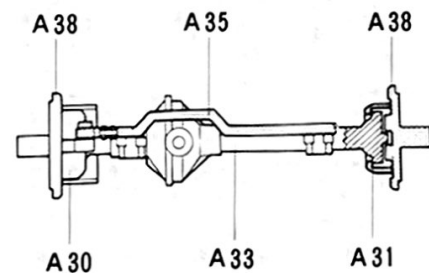
2 (Fixing of Chassis Parts)

Cement two pieces of C21 together and fix them to Chassis by means of C22 and C23. Do not cement C21 to C22 or C23.

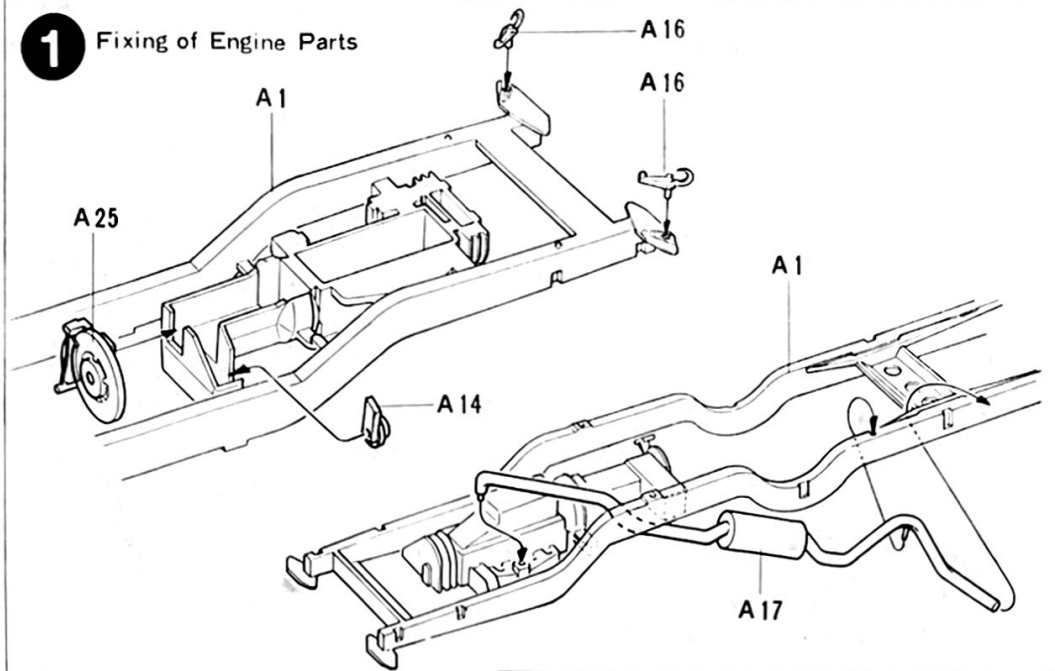
3 (Construction of Axles)

Be careful of surfaces to be cemented. Never put cement on movable parts.

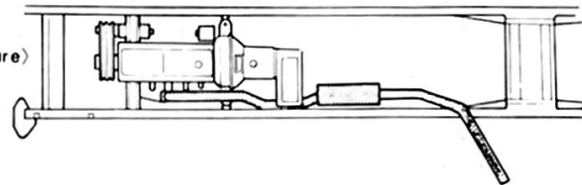
(Front Axle Fixing Figure)



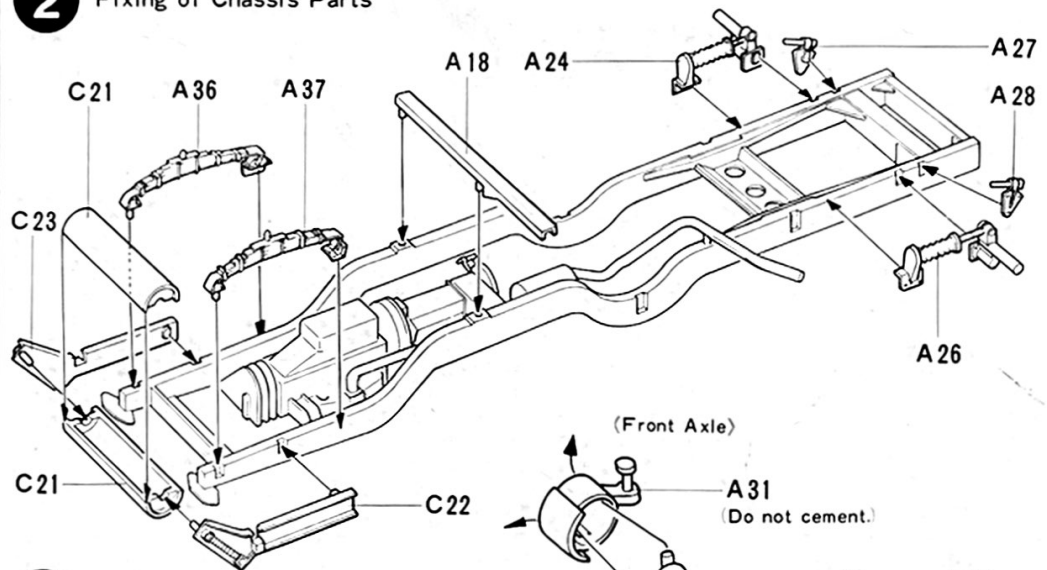
1 Fixing of Engine Parts



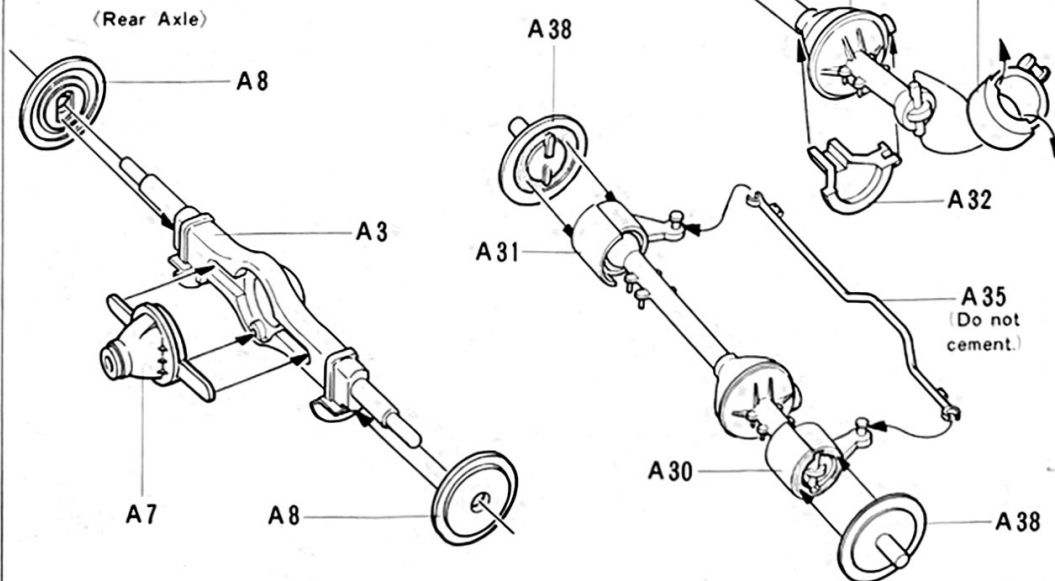
(Muffler Fixing Figure)



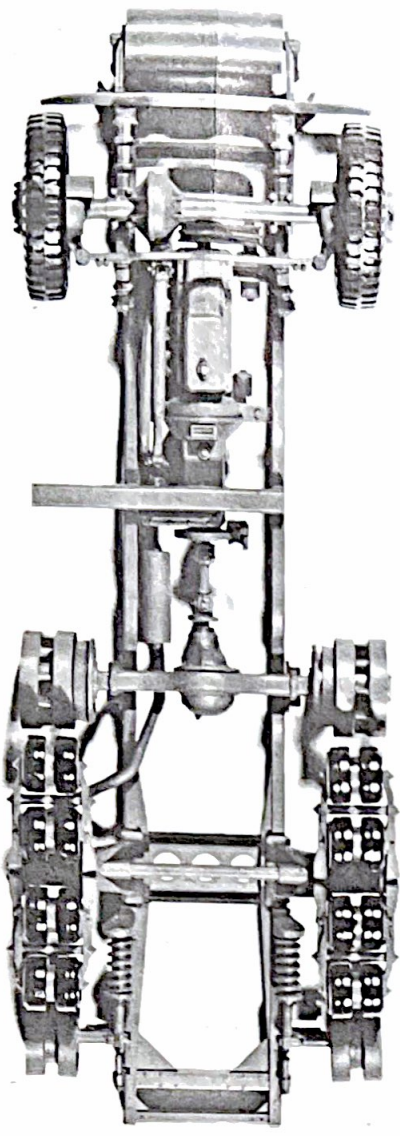
2 Fixing of Chassis Parts



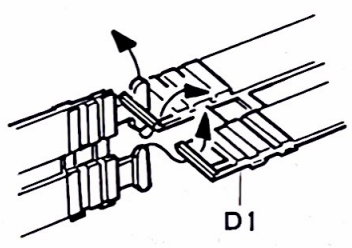
3 Construction of Axles



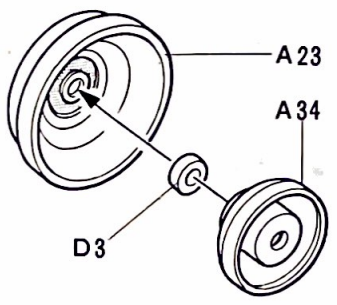
4 <Fixing of Axles>



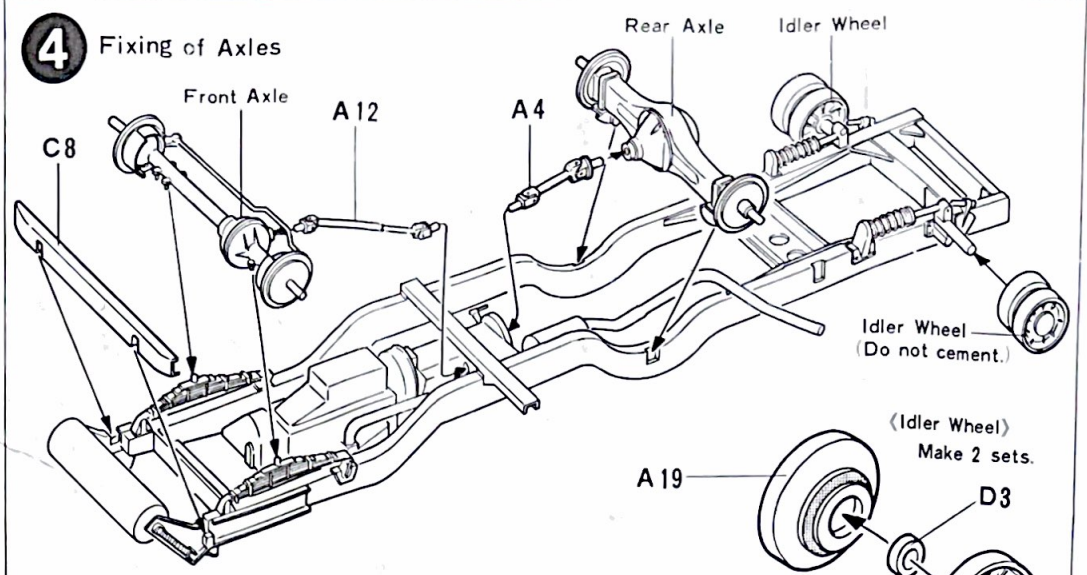
<Construction of Tracks>
Make 2 sets.



<Front Wheel>
Make 2 sets.

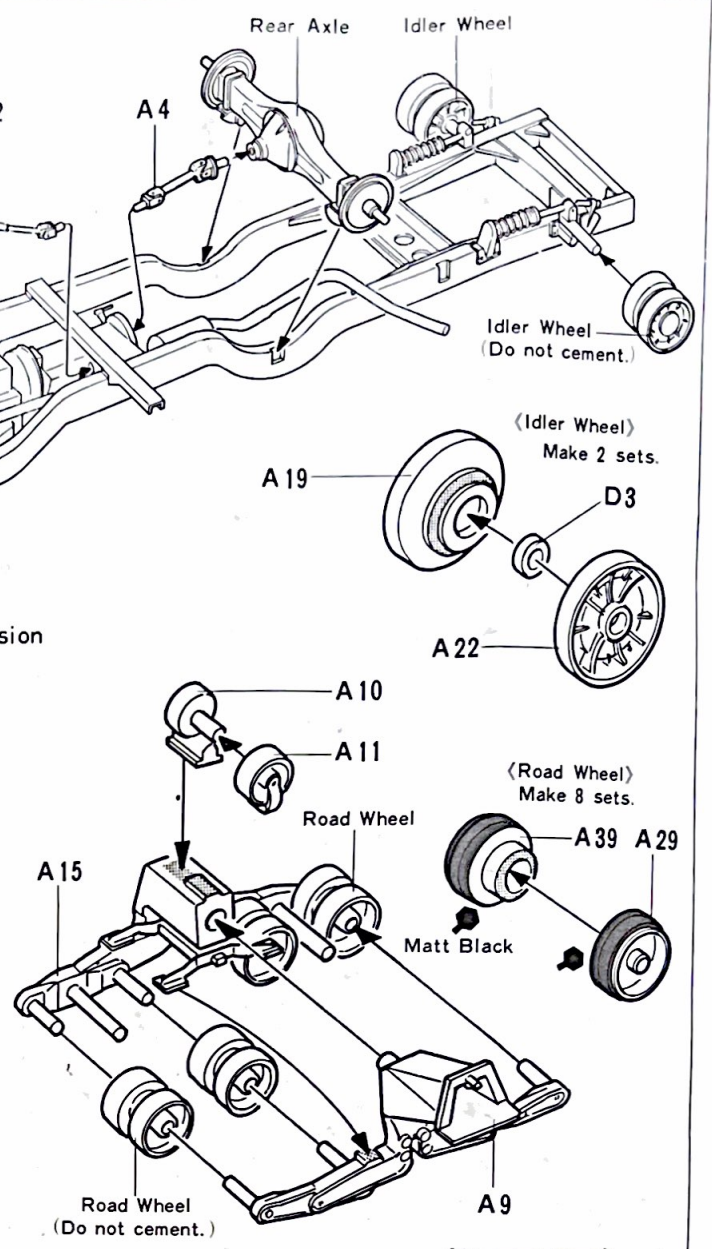
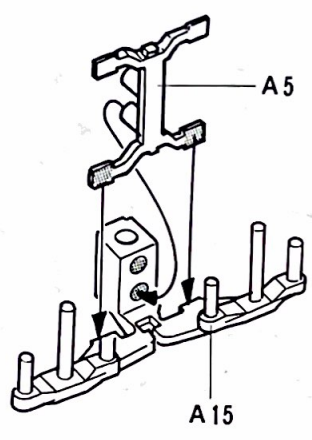


4 Fixing of Axles

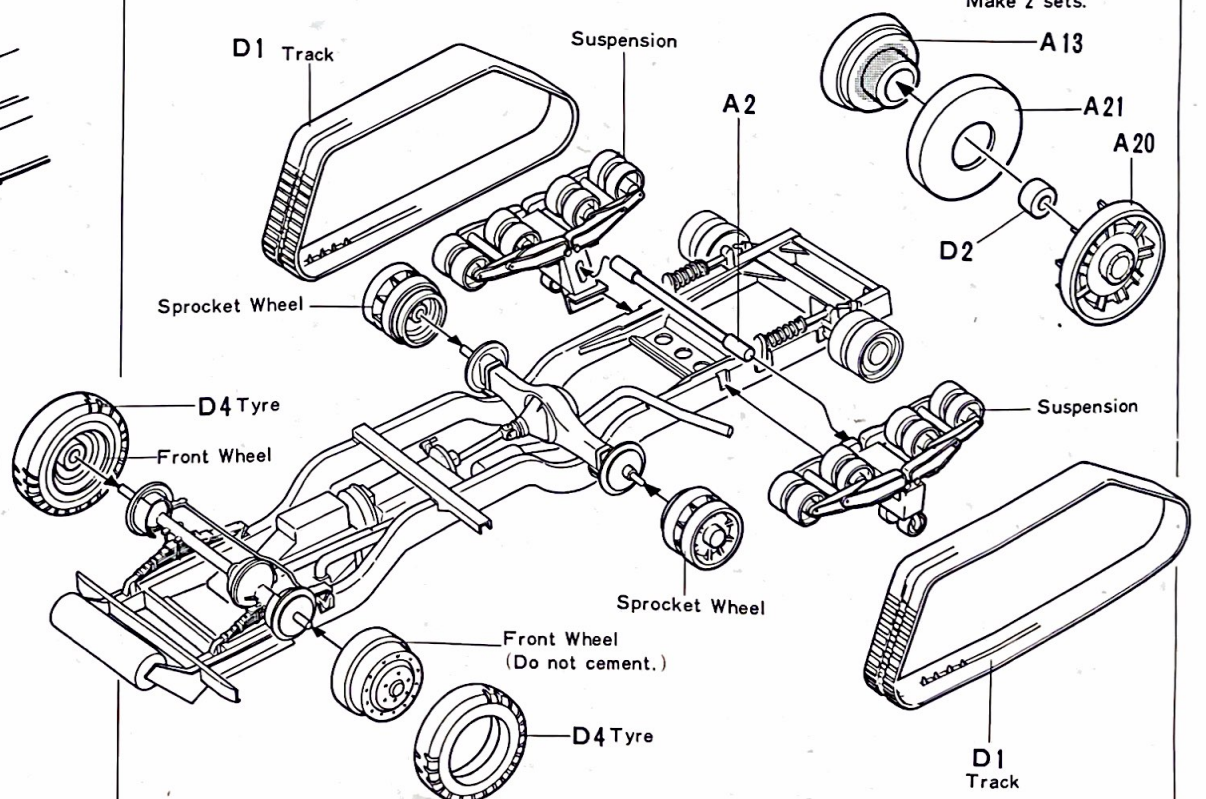


5 Construction of Suspension

Make 2 sets.



6 Completion of Chassis

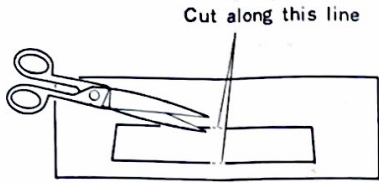


*Do not cement but just fit each wheel

7 (Construction of Driver's Seat)
Put each Lever in place and fix it with cement. The end of Levers B30, B31 and B37 should be painted in Matt Black.

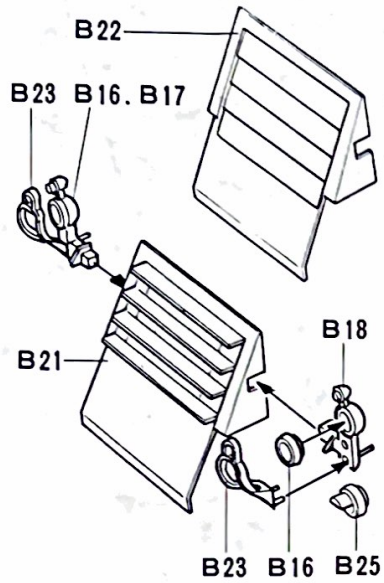
8 (Fixing of Bonnet)
Transparent part for Windscreen should be cut out with a knife or scissors as shown in the figure below. In painting, Windscreen should be removed or masked with tape.

(Cutting out Windscreen)



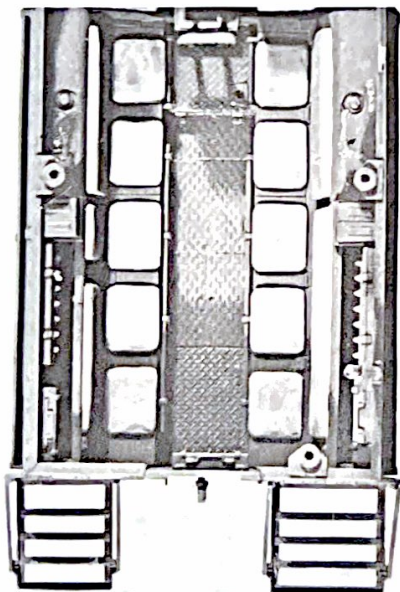
(Construction of Radiator)

★Select either Radiator Grille B22 or B21 and fix various parts.

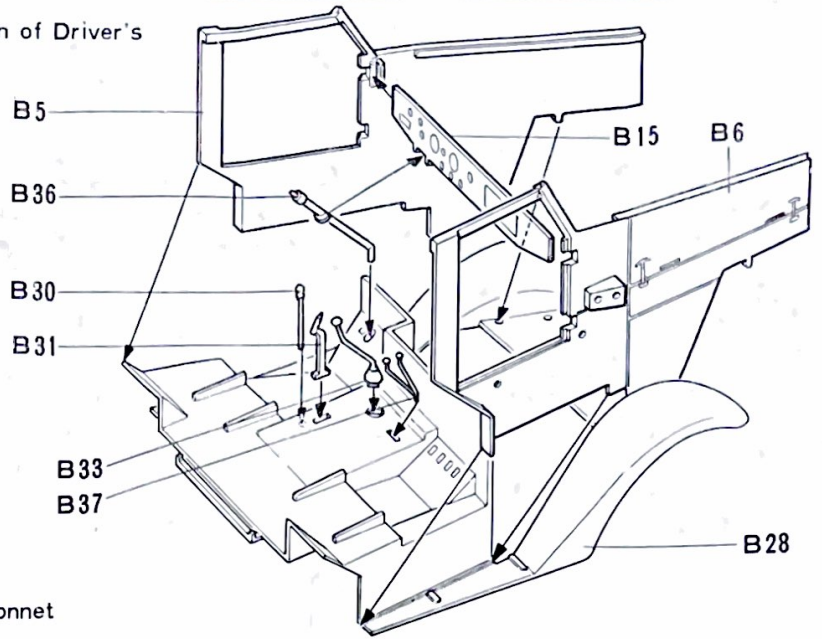


★Choose B16 or B25 and fix.

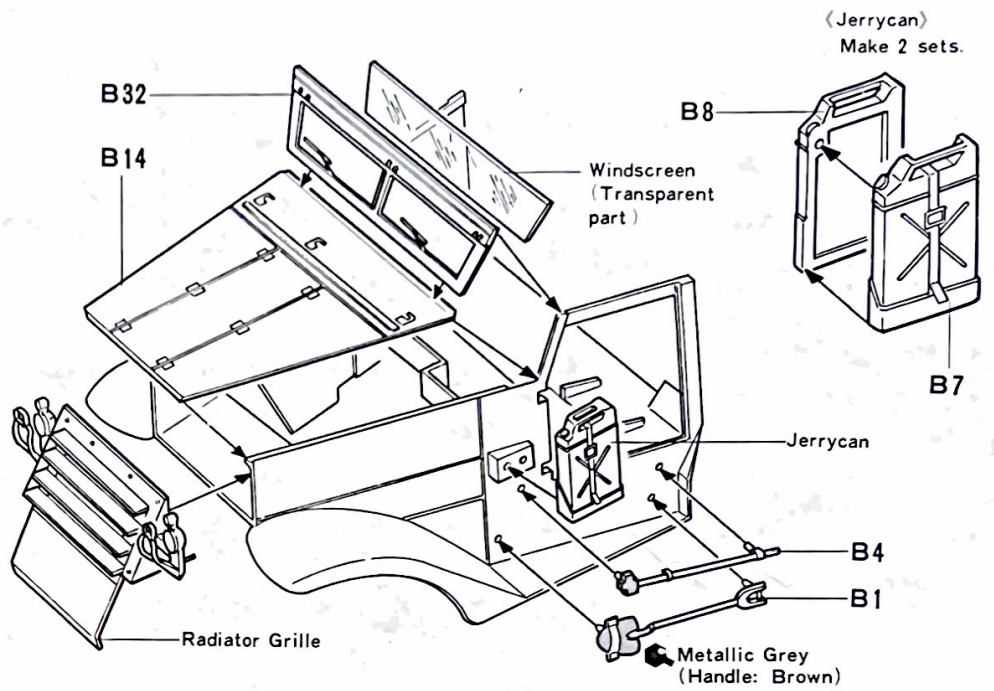
9 (Construction of Rear Seats)



7 Construction of Driver's Seat

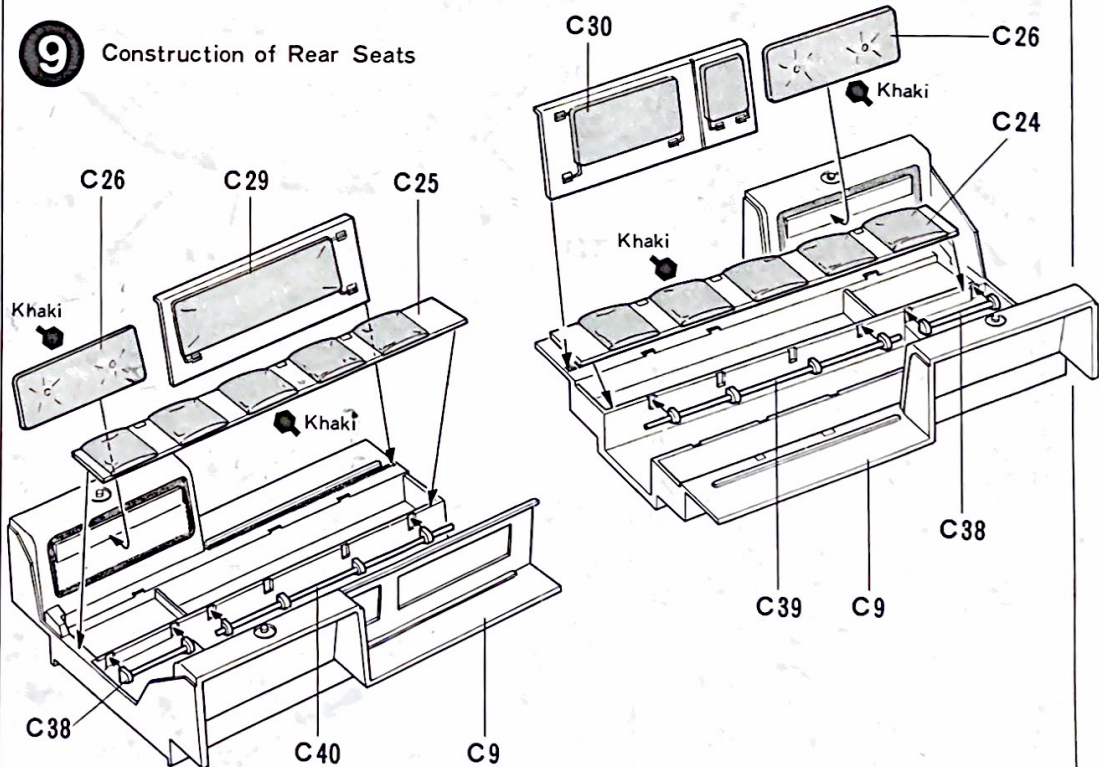


8 Fixing of Bonnet



(Jerrycan)
Make 2 sets.

9 Construction of Rear Seats

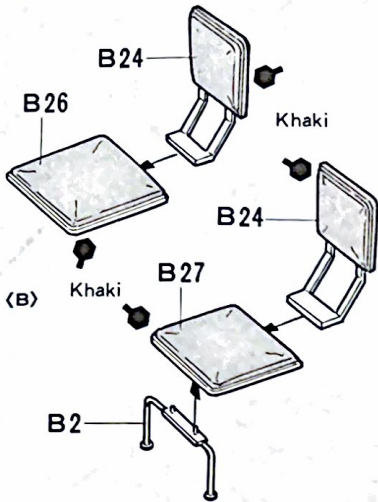


10 Construction of Side Panels

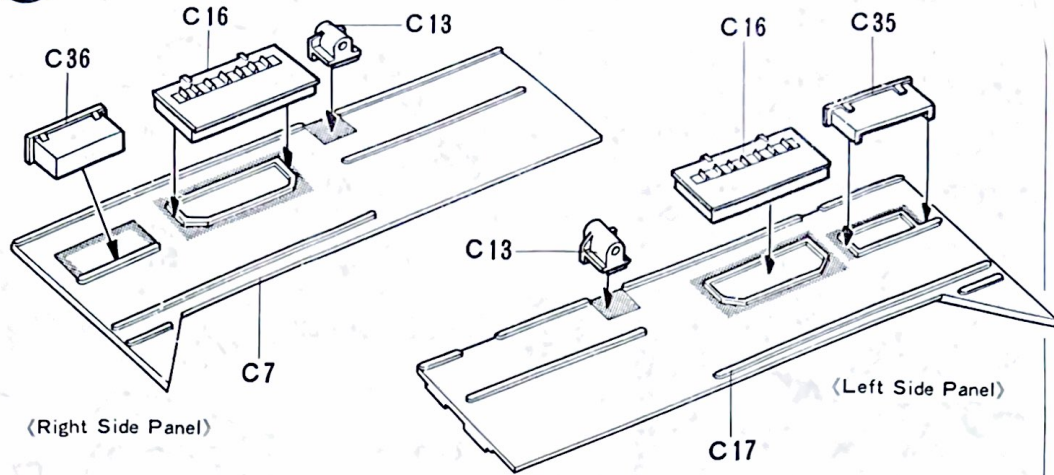
Make sure of parts to be fixed to Side Panels.

<Construction of Seats>

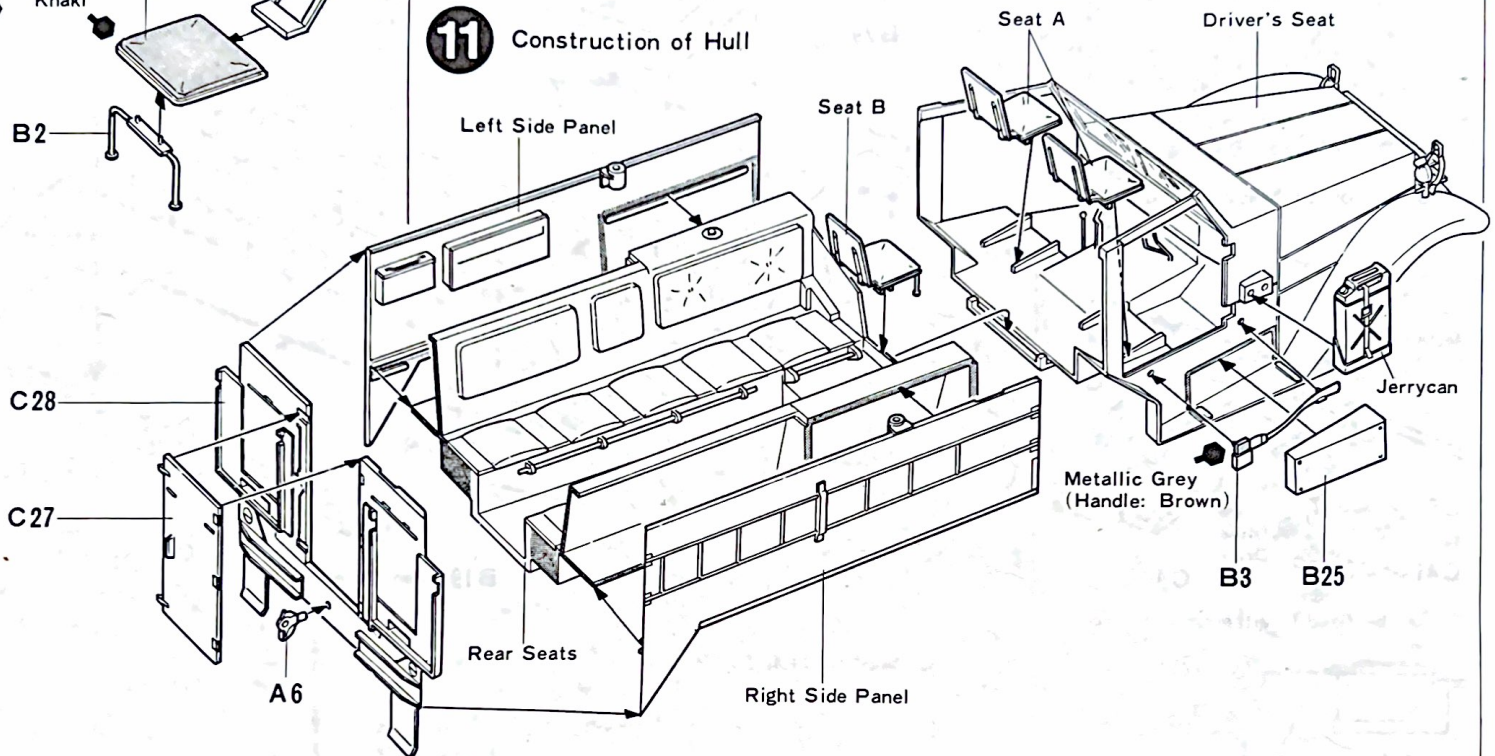
(A) Make 2 sets.



10 Construction of Side Panels



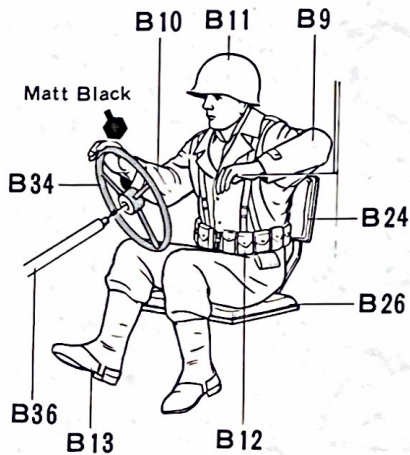
11 Construction of Hull



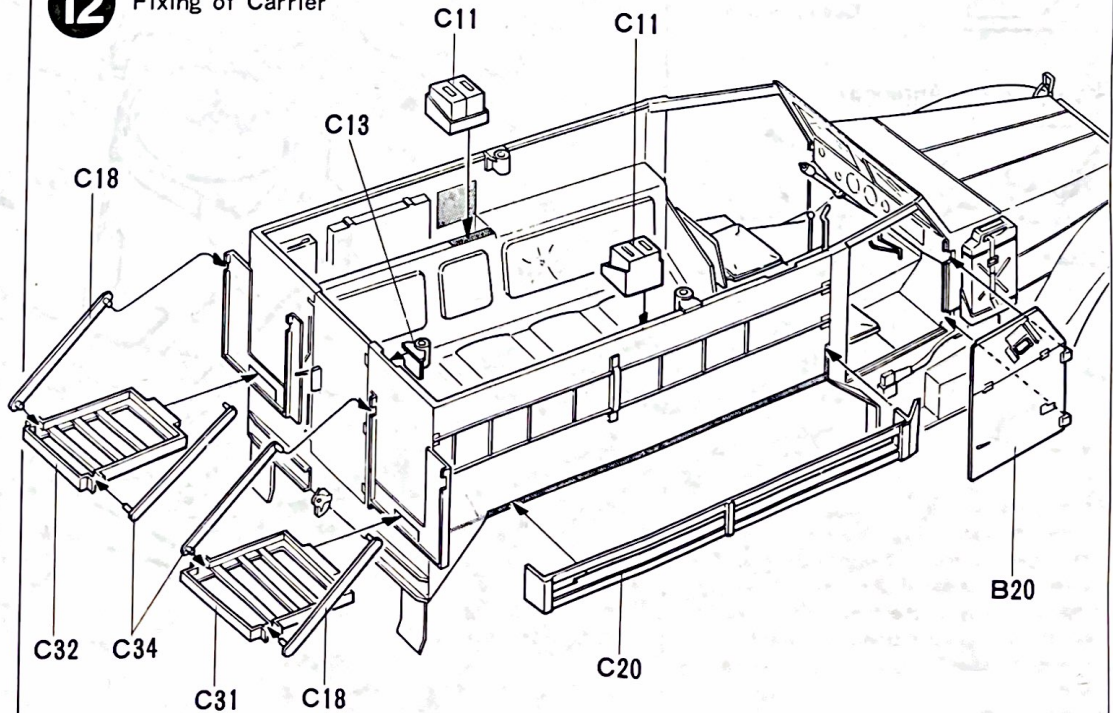
12 Fixing of Carrier

Concerning Carrier Hinges C18 and C34, you can tell which is inside or outside by the guide pin. Make sure of their numbers.

<Construction of Driver>



12 Fixing of Carrier



★Refer to Page 8 for painting.

(Closing of Doors)

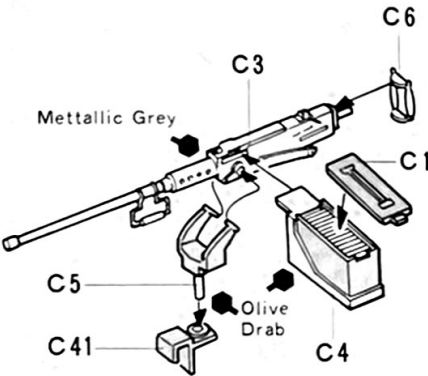
Be sure to mount Driver. Left Door
be kept open.

14 (Completion of Hull)

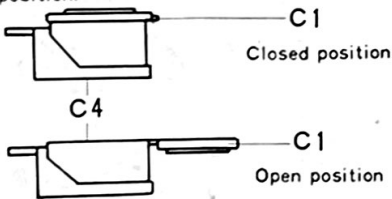
★Place the driver's figure as shown in
the photo below.



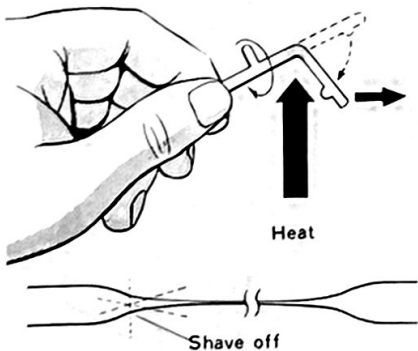
(Construction of Machine Gun)



★C4 can be fixed in either one of two
position.



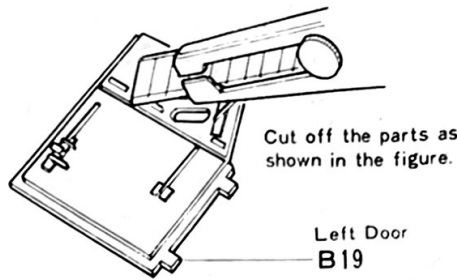
(How to Make Antenna)



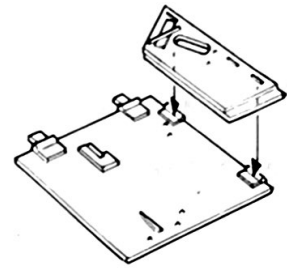
★Heat one of runner gradually while
turning around. When the center por-
tion began to melt, stop heating and
stretch both ends of the runner slowly
to opposite way to the thinness wanted.
Hold it in that position for about 15
seconds to cool, and cut it to a 3 cm
piece.

★Caution: Be careful in handling fire.

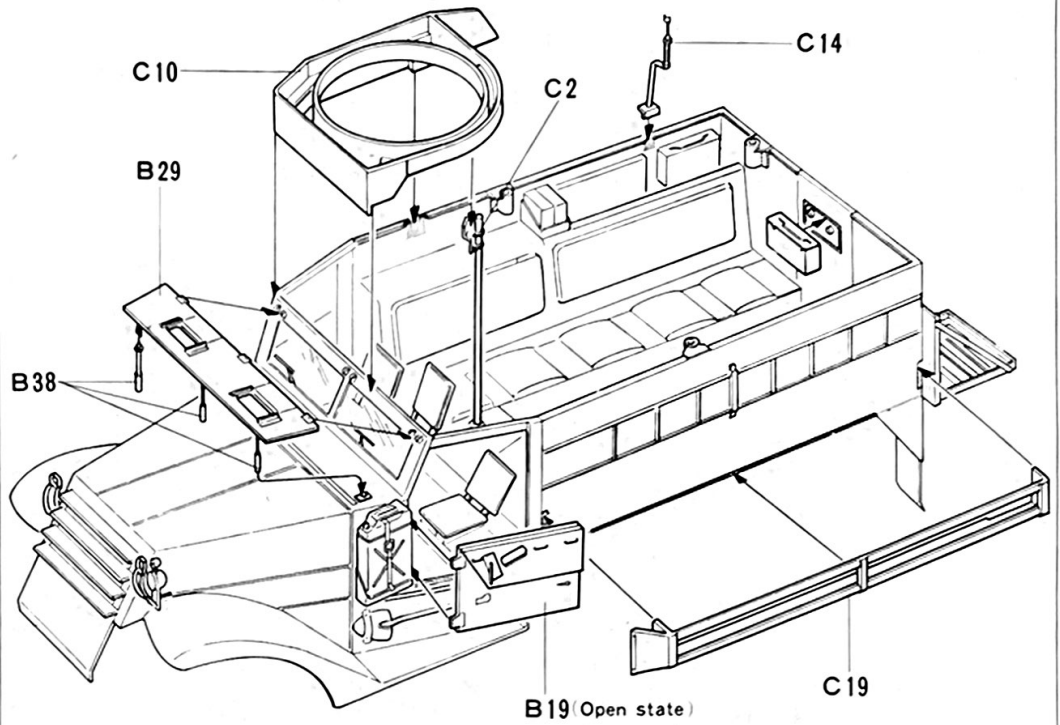
13 Fixing of Doors



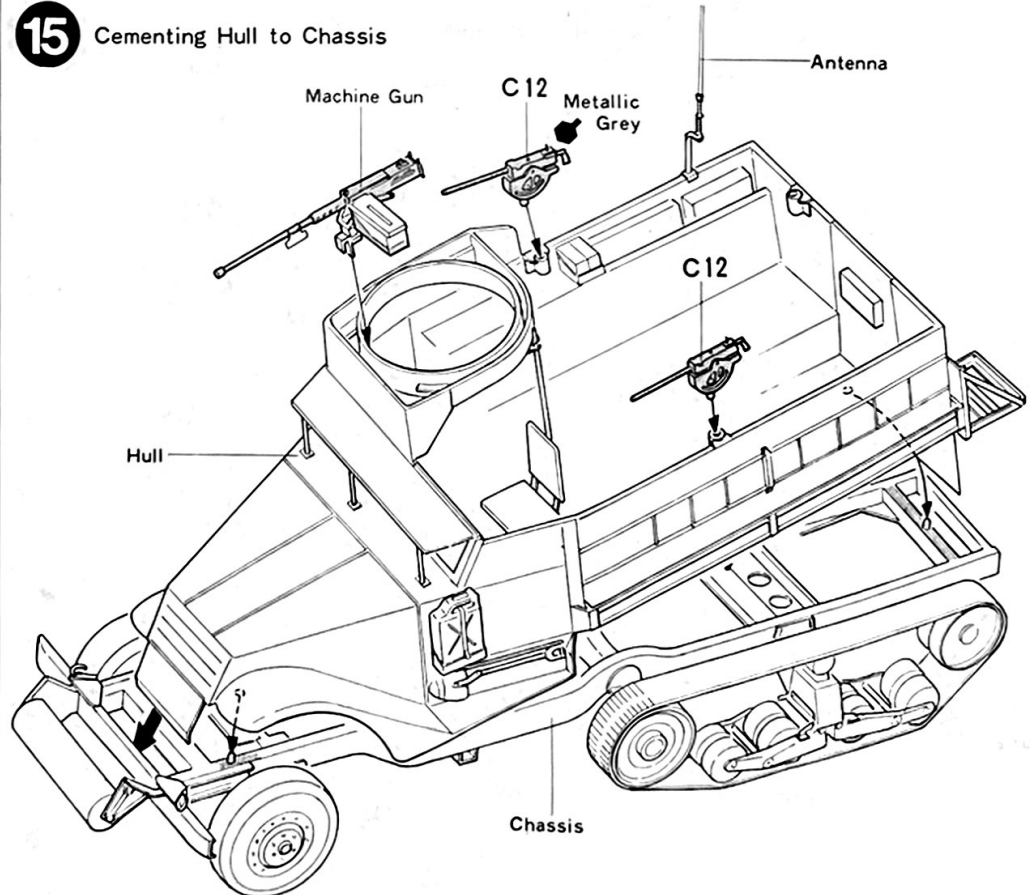
★Cement the cutted part
in the folded position.



14 Completion of Hull

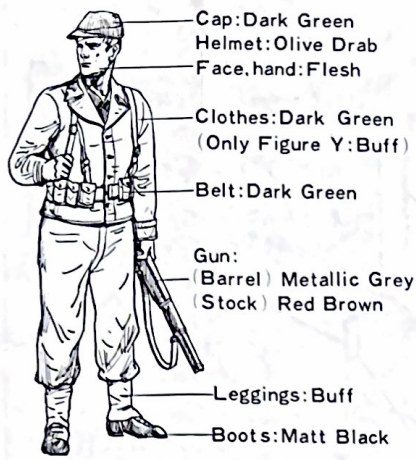


15 Cementing Hull to Chassis

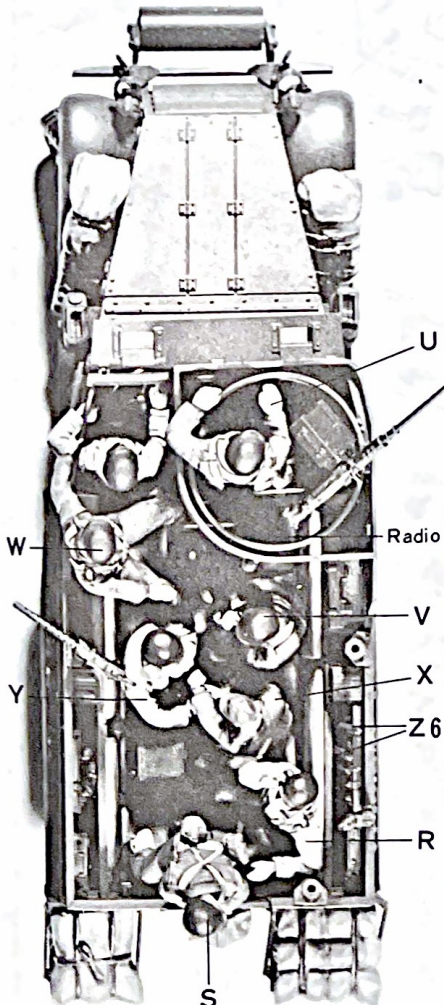
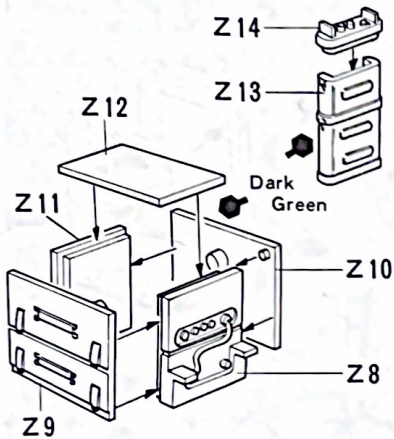


<Construction of Figures>

<Painting of Figure>



<Construction of Radios>



16 Construction of Figures

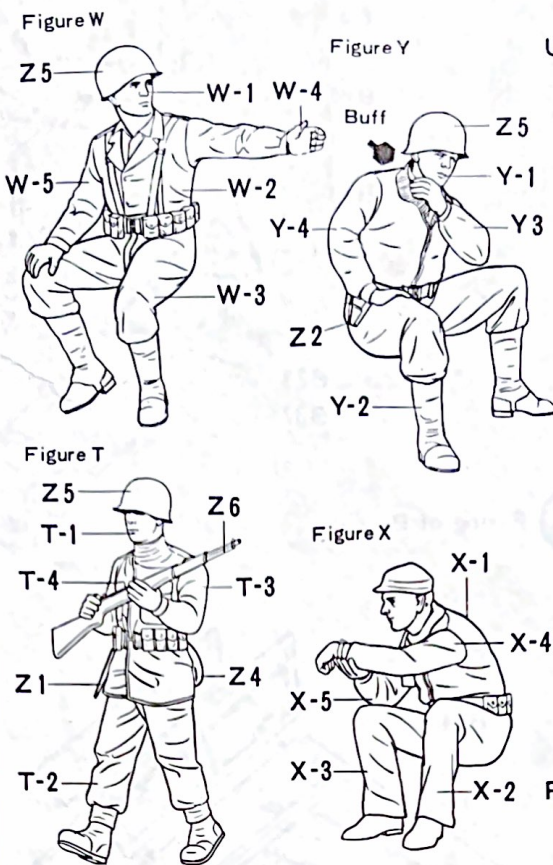
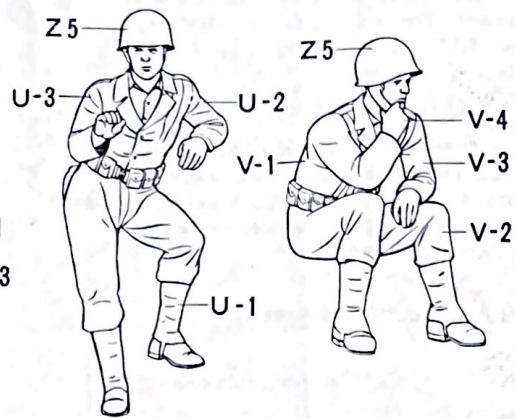
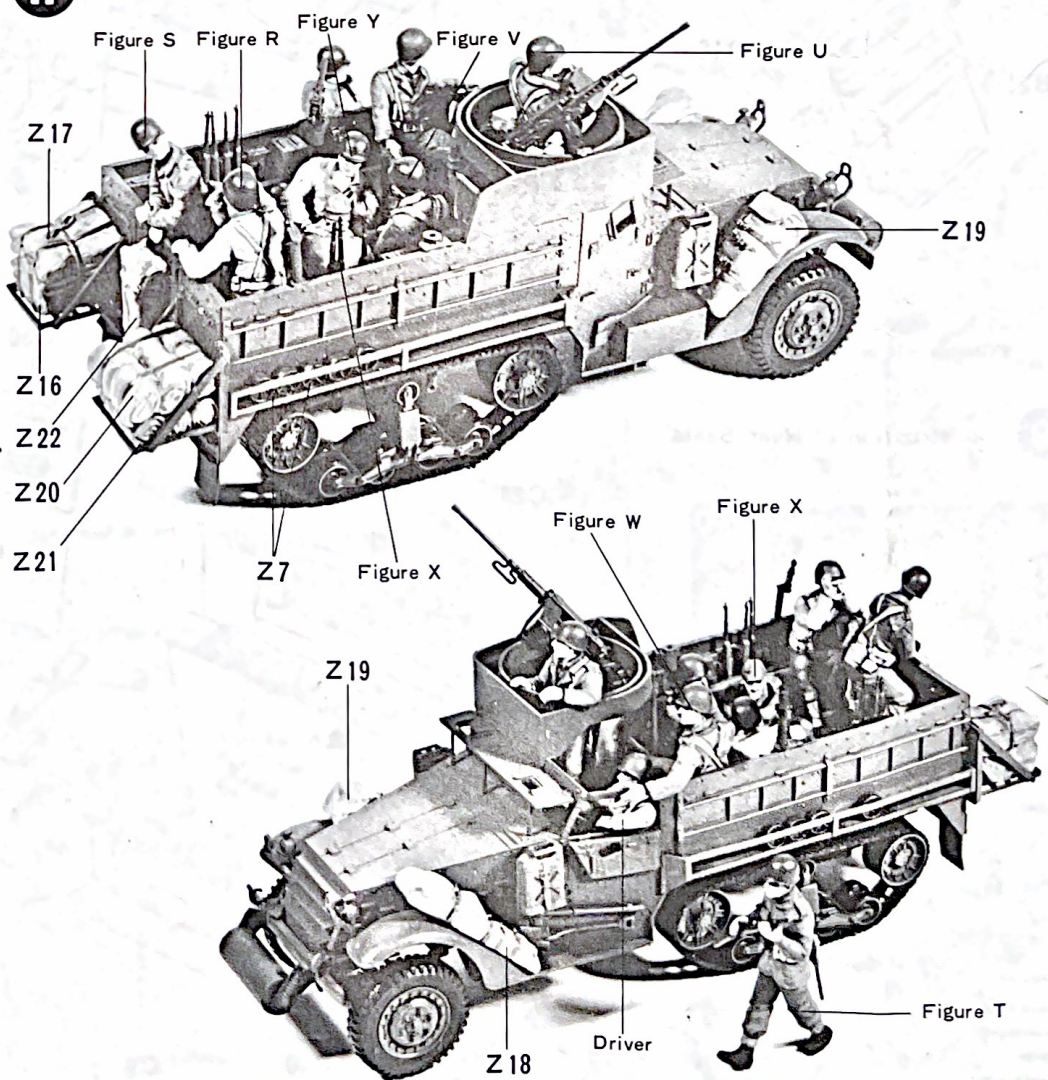


Figure U

Figure V



17 Fixing of Accessory Parts and Figures



PAINTING



APPLYING DECALS

〈Marking of the M3 Personnel Carrier〉

The M3 wore unit numbers ("9Δ27-1" for example) and vehicle numbers as well as star marks symbolic of the U.S. Army. To cite instances, "1Δ6-1, A-3" meant No.3 vehicle of the A Company, 6th Infantry Battalion, 1st Armoured Division and "9Δ27-1, A-11" represented No.11 vehicle of the A Company, 27th Infantry Battalion, 9th Armoured Division.

〈Painting of the M3 Personnel Carrier〉

The M3 Personnel Carrier, like other military vehicles of the U.S. Army, was painted overall in Olive Drab.

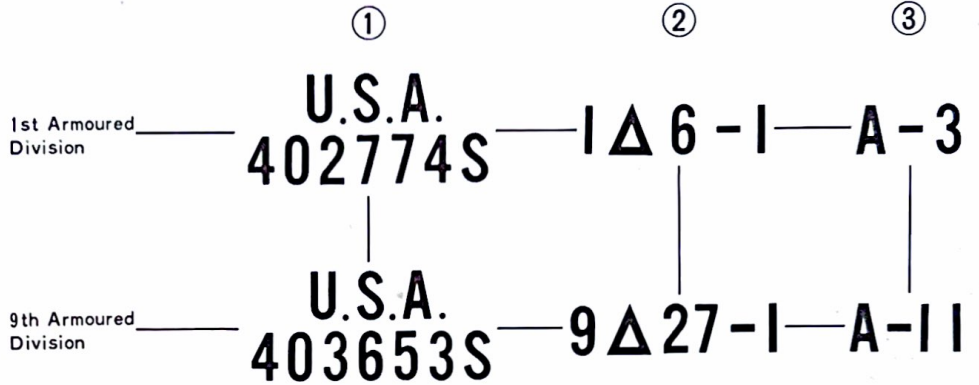
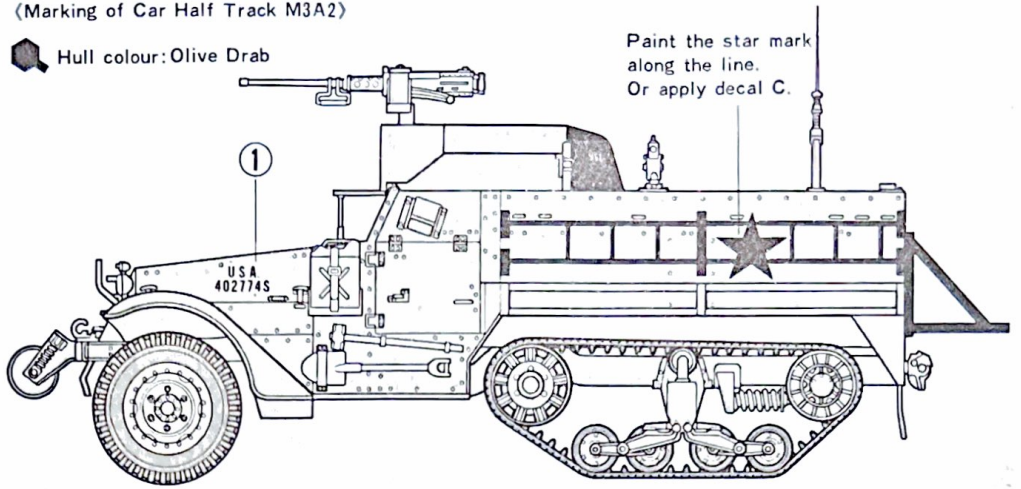
★What we call "weathering" is a good way to lend additional realism to your military vehicles. It may be interesting to represent the following, for instance: dirt which stuck to the vehicle in a desert, swamp, etc.; and bullet marks made in actual fighting.

★The following are different in colour from the body: headlights (Silver), machine gun (Metallic Grey) and seat (Khaki). It may be interesting to paint tools differently according to the action of the vehicle.

〈Marking of Car Half Track M3A2〉

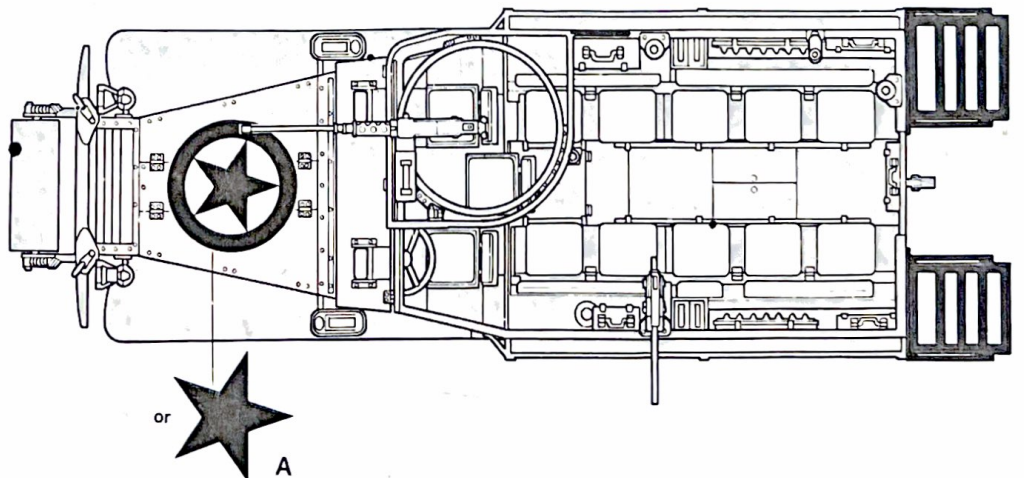
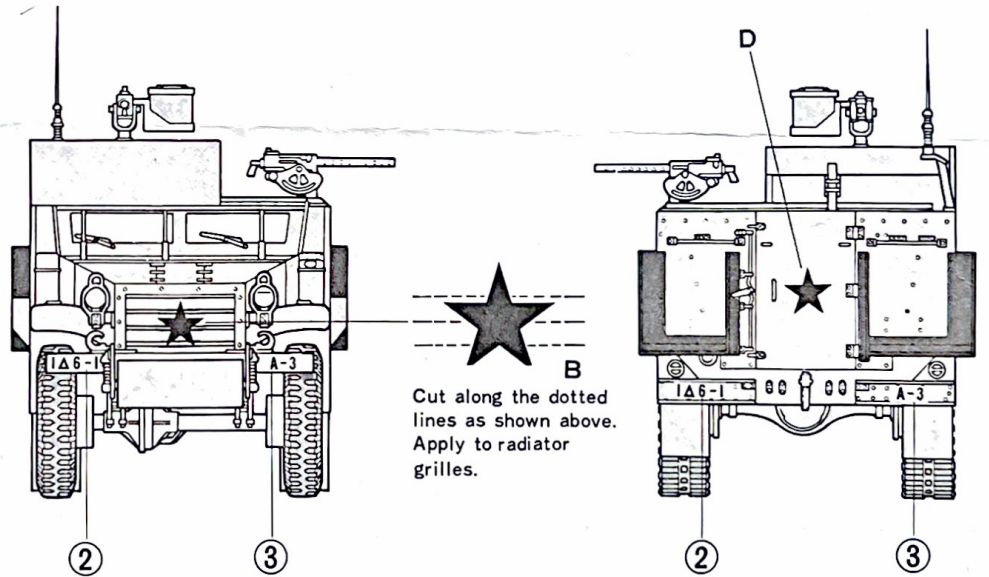
Hull colour: Olive Drab

Paint the star mark along the line.
Or apply decal C.



〈Converting Into M3A1〉

If you want to build the M3A1 by conversion, cut off the darkest-shadowed portions in the figure (ladders on sides, rear racks, a part of mold on MG mount).



PARTS

A PARTS

- | | |
|-------------------------------|---------------------|
| 1. Frame | 2. Cross Tube |
| 3. Rear Axle | 4. Rear Shaft |
| 5. Spring Arm | 6. Hooks |
| 7. Rear Axle Parts | |
| 8. Rear Brake Covers | |
| 9. Suspension B | 10. Top Rollers A |
| 11. Top Rollers B | 12. Front Shaft |
| 13. Rear Brake Drums | |
| 14. Transfer Parts | 15. Suspension A |
| 16. Front Hooks | 17. Muffler |
| 18. Battery Frame | 19. Idler Wheels A |
| 20. Drive Wheels A | 21. Drive Wheels B |
| 22. Idler Wheels B | 23. Front Wheels |
| 24. Idler Wheel Shaft (Left) | |
| 25. Discs | |
| 26. Idler Wheel Shaft (Right) | |
| 27. Idler Adjust Rod (Left) | |
| 28. Idler Adjust Rod (Right) | |
| 29. Road Wheels B | 30. Knackle (Right) |
| 31. Knackle (Left) | 32. Front Axle B |
| 33. Front Axle A | |
| 34. Front Brake Drum | 35. Tie Rod |
| 36. Leaf Spring (Left) | |
| 37. Leaf Spring (Right) | |
| 38. Front Brake Cover | |
| 39. Road Wheels A | |

B PARTS

- | | |
|-------------------------------------|-----------------------|
| 1. Shovel | 2. Seat Support |
| 3. Ax | 4. Hammer |
| 5. Front Side Panel (Left) | |
| 6. Front Side Panel (Right) | |
| 7. Spare Tank B | 8. Spare Tanks A |
| 9. Driver's Left Arm | |
| 10. Driver's Right Arm | |
| 11. Helmets | 12. Driver's Body |
| 13. Driver's Feet | 14. Bonnet |
| 15. Instrumentation Panel | |
| 16. Headlight B | |
| 17. Headlight A (Right) | |
| 18. Headlight A (Left) | |
| 19. Door (Left) | 20. Door (Right) |
| 21. Radiator Grille A | 22. Radiator Grille B |
| 23. Headlight Guards | 24. Seat Back Rest |
| 25. Battery Case | 26. Seat A |
| 27. Seat B | 28. Front Fender |
| 29. Windscreen Armour Plate | |
| 30. Lever B | 31. Side Brake Lever |
| 32. Windscreen Frame | |
| 33. Lever A | 34. Handle |
| 35. Headlight C | |
| 36. Steering Wheel Shaft | |
| 37. Twin Lever | |
| 38. Windscreen Armour Plate Support | |

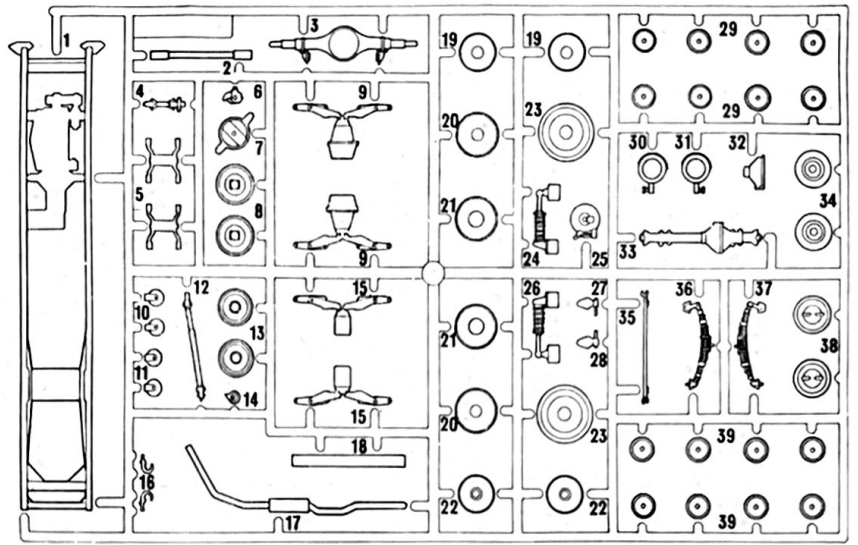
C PARTS

- | | |
|-----------------------------|--------------------|
| 1. Ammo Box Lid | 2. MG Base Stay |
| 3. 12.7 mm MG | 4. 12.7 mm MG Stay |
| 5. MG Mount B | 6. Ammo Box |
| 7. Rear Side Panel (Left) | |
| 8. Front Bumper | 9. Floor Panel |
| 10. Revolving MG Base | |
| 11. 7.7 mm Ammo Box | |
| 12. 7.7 mm MG | 13. MG Mount A |
| 14. Antenna Stay | 15. Box B |
| 16. Rifle Stay | |
| 17. Rear Side Panel (Right) | |
| 18. Rear Carrier Stay A | |
| 19. Side Carrier A | 20. Side Carrier B |
| 21. Roller | |
| 22. Roller Frame (Right) | |
| 23. Roller Frame (Left) | |
| 24. Bench Seat B | 25. Bench Seat A |
| 26. Seat Back Rest | 27. Rear Door |
| 28. Rear Panel | 29. Seat Panel A |
| 30. Seat Panel B | |
| 31. Rear Carrier (Right) | |
| 32. Rear Carrier (Left) | |
| 33. Box A | |
| 34. Rear Carrier Stay B | |
| 35. Box D | 36. Box C |
| 37. Box E | 38. Bar A |
| 39. Bar B (Left) | 40. Bar B (Right) |
| 41. MG Mount Holder | |

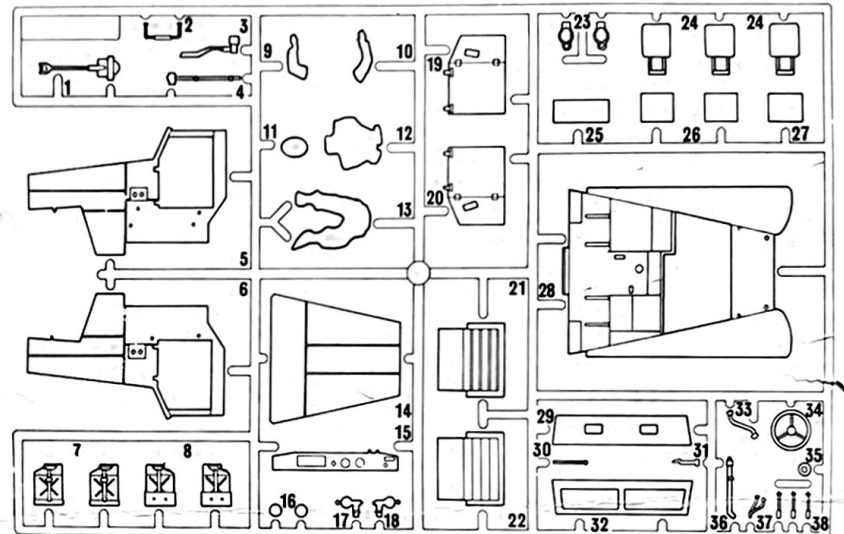
D PARTS

- | | |
|-----------------|-----------------|
| 1. Track | 2. Wheel Bush B |
| 3. Wheel Bush A | 4. Front Tyres |

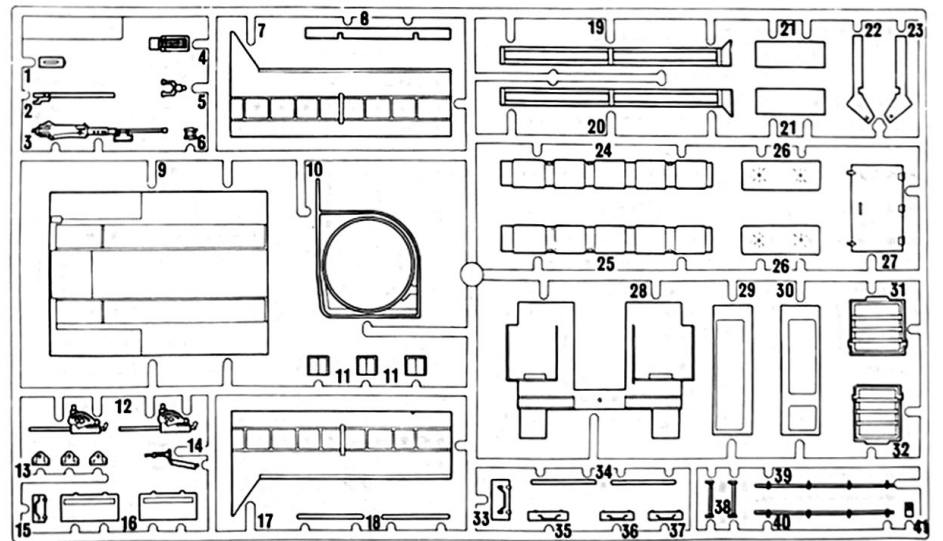
A



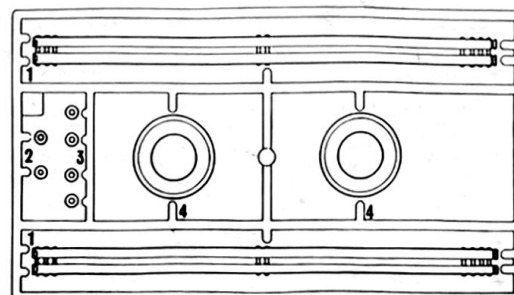
B



C



D



Transparent Part

