

Assembly Instructions for WP2000 Waterpillar

(Refer to last page to identify fasteners and fastener locations. Most fasteners are shipped loosely attached to their associated members)

These instructions are for a Waterpillar shipped in a crate 45 inches width x 69 inches length x 88 inches height. (Fig. 1)



Figure 1

1. Begin by removing the side panel on the longer side of the crate. This can be accomplished by removing the screws along the perimeter of the panel with a Philips bit (Fig. 2, 2a.)



Figure 2



Figure 2a

2. Next remove the two hoops and the blue and yellow plastic segments that will make up the wheels. There are 6 yellow and 6 blue segments. If you have ordered special colors there will be 12 segments total) Also remove the two hoops from the opposite side of the crate.



Figure 3

3. In this step you will assemble the wheels. (Fig. 3) There is a package inside the crate marked fasteners. Remove this from the crate and open it. Remove the package marked wheel hardware. This package contains:

For attaching the wheel segments to each other-
24 pc. 2"x1/4" ss button head bolts
48 pc 5/8" ss washers
24 pc 1/4" brass nylon insert nuts

For attaching the wheel segments to the hoop-
24 pc. 3/8 x 3/4 ss socket head screws



Figure 4

Before beginning the wheel assembly process, examine the wheel segments. The inner part of each wheel segment has two brass nut inserts. Directly beside these brass nut inserts is a raised shoulder of plastic. When assembled this plastic 'shoulder' rests against the side of the hoop. (Refer to Fig. 4) As you attach alternating yellow and blue segments to the large hoops, you must also alternate which side of the hoop this raised section aligns on. When completely assembled, all yellow segments should overlap one side of the hoop and all blue segments should overlap the other side of the hoop.



Figure 4a



Figure 4b

3a. Now begin attaching the segments to the hoop using the 3/8 x 3/4 stainless steel socket head screws. This process is easier if a second person helps align the hoop and segment while the first person gently inserts the screw through the inside of the hoop and gently twists the T-handle allen wrench clockwise. (See fig. 4a and 4b) If you have difficulty lining up a hole, leave it

until later as it will line up in a future step. Be sure to attach at least one of the button head screws in each wheel segment. Once the first wheel is complete, repeat for the second wheel.

3b. Next you will bolt the blue and yellow wheel sections to each other. This is accomplished with the 2" x 1/4" bolts. The paddles that go between each section will also be installed during this process. See figure 5. With the wheel lying flat first place a paddle between two sections as shown in Fig. 5. Next insert a bolt through a washer and then insert it thru the two adjoining wheel segments and the paddle. Now place a washer on the end of the bolt and finally place a nyloc nut on this and tighten 'finger tight'. Do the same to the remaining five adjoining wheel segments with bolt/washer/washer/nut assemblies and tighten all 'finger tight'.



Figure 5

Next, you will bolt the other side of the wheel together. To do this, begin by lifting one edge of the assembled wheel until it is standing upright like a wheel. Then slowly lay it back down on the opposite side of the wheel. Place short supports (3 1/2" x 3 1/2" x 10" cardboard provided) under the wheel in three places to support the wheel above the paddles. Now repeat the process of bolting the wheel segments to each other by insert remaining bolt/washer assemblies and tightening 'finger tight'. Ensure that the bolts also pass thru the hole in the paddle during this step. When all bolts have been installed, tighten all nuts until the plastic of each segment touches. Now tip the wheel back on the other side and tighten nuts on the opposite side.

At this point you have a completed wheel. If you were unable to 'line up' any of the 3/8 by 3/4 inch bolts in step 3a, inspect the holes to see if some of these now 'line up' and insert and tighten the ones that were missed. All the wheel segments swell and shrink depending on temperature and this process may have to be performed in the cool of the morning or heat of the day to get all bolts installed. (These bolts are actually an assembly tool and safety factor since they are not actually required once all blue and yellow segments are bolted tightly together. If you have difficulty bolting 2 or three on each wheel do not worry as they are not essential. The Waterpillar is operational and safe with none installed)

4. In this step you will assemble the aluminum frame and mount the seats and pedal assemblies. Remove all remaining parts from the crate and set aside.



Figure 6

To aid in assembly you will first reconstruct the packaging crate into a bench as shown in Figure 6.

Begin by removing all screws attaching the crate to the pallet (remove all screws in lower 6 inches of the crate) Now tip the packing crate on its side. Remove the screws holding one of the remaining side panels to the bottom. Slide this panel over until each end panel is approximately 4 feet apart and reattach with screws removed earlier. You will now have a work space that looks something like Figure 7.



Figure 7

You are now ready to begin assembling the remaining frame.

Place the main drive assembly on the modified crate as shown in Figure 6. Figure 6 shows small hoops attached)

Begin assembly process by attaching a small hoop on each end of the main drive assembly as shown in figure 6. To accomplish this, identify the 2 small hoops (42 inch diameter or approximately 1.1 meter diameter) Each hoop has 6 holes. Locate the section of the hoop that has two widely spaced holes, and place it on top of the outer brace of the main drive assembly to line up with the holes in the outer brace of the main drive assembly. Insert 2 each 5/16 x 3 inch bolts thru the holes, place 5/16 brass nylocs on the threaded end and tighten finger tight. Repeat for opposite end.

Next refer to Figures 9a, 9b, 9c, and 9d to familiarize yourself with the general orientation of the upper front and rear members and the diagonal supports.



Figure 9a



Figure 9b



Figure 9c



Figure 9d

In preparing to install the upper front and upper rear members you will first attach the lower end of the diagonal braces. There are two types of braces. The ends are marked to simplify assembly. Place the lower ends of the braces on the main drive assembly and finger tighten the 2 bolts in each.



Figure 8

This next step will require two people.

Identify the front cross member from figure 8. “Front” and “Back” are identified on the center of the frame of the main drive assembly.

With each person holding one end, orient the member as shown in fig. 8 and place on the small hoops as shown in figure 9a. being careful to install the nylon bushings during the process. 5/16 x 4 inch bolts are used to attach by being inserted from the top, first passing through the cross member, then through the nylon bushing, then through the small hoop and finally through the diagonal brace. Now finger tighten the nyloc as before. Next identify the rear cross member (Fig. 9a) and attach in the same manner as you did with the front member.

5. You will now attach the pedal assemblies. See (Fig. 10, 11, 11a) There are two identical pedal assemblies provided. Begin by placing each on top of the seat bracket as shown in figure 10. Clip the wire ties holding the belts on the drive train and place them over the pedal drive gear as shown in figure 11a. Now attach the back end of the pedal assemblies to the seat bracket (Figure 11) by loosely fitting the 5/16 x 2 ½ inch bolts in the rear holes and finger tighten with 5/16 nyloc nuts.



Figure 10



Figure 11



Figure 11a

5a. Identify the two black pipes that are 1 ¼ inch diameter by 27 inches. Using 1 ½ inch x ¼ inch button head screws attach these to the front of the pedal assemblies as shown in figure 12 and 12a. Repeat on upper end. Finger tighten with ¼ inch nyloc nuts.



Figure 12



Figure 12a

5b. Now you will install the belt tightener. Identify the installation shown in figure 13. The belt tightener is lifted up under the belt and into the two holes in the front bar of each seat bracket. You may have to wiggle the seat assembly to accomplish this. Place two 9/16 inch brass nylocs on each tightener and tighten finger tight.



Figure 13

You will now attach the steering handles to the front upper cross member. Begin by cutting the strap holding the handles and cables to the frame. Next locate them on the front cross member as shown in Figure 14 and tighten with allen wrench provided.



Figure 14

With the exception of guide roller covers and drive covers your Waterpillar frame is now complete. Go back to item 1 and tighten all nut/bolt assemblies. The final assembly to be tightened is number 5b. When the belt tighteners are adjusted correctly the belt should deflect $\frac{1}{2}$ inch when pulled hard (15 pound force applied perpendicular to the belt surface) and the roller should be parallel with the frame. While on the temporary stand rotate pedals by hand to ensure the the belt rides straight over the rollers. If the tightener roller makes the belt pull to one side or the other, loosen or tighten one side or the other as appropriate to rectify this situation.

Your frame is now complete and ready to have the wheels mounted.

With one person on each end, lift the frame assembly off the stand and set it on the ground. Remove the outer bottom guide rollers and set aside. At this point one or two people will pick up one end of the frame high enough for the wheel to be installed. This is accomplished by tilting the wheel inward far enough for the wheel's hoop to align between both front and rear top guide roller assemblies. When these are lined up lift the frame straight up until the wheel is lifted off the ground slightly. The wheel will swing into place with the hoop directly under the drive wheel. Replace the bottom guide rollers previously removed.

Now repeat this process on the opposite wheel.



Figure 15



Figure 15a

Install upper guide roller covers as shown in figures 15 and 15a using 1 $\frac{3}{4}$ x $\frac{1}{4}$ inch bolts and nuts.

Install the drive covers previously removed. Be sure to orient them with the opening for the steering cables facing forward.

This completes the assembly of your Waterpillar. Assembly time with 2 people working is 2 to 3 hours.

Fastener List

All fasteners are of 18-8 Stainless Steel. Retainers are Nylon Insert Nuts. Fasteners requiring regular removal are retained by brass nylon insert nuts.

1/4" x 1/2"	Button Head	6/WP	cranks to drive gears
1/4" x 1 3/4"	Button Head	8/WP	guide covers & center post
1/4" x 2"	Button Head	24/WP	wheel segments
1/4" x 2 1/2"	Button Head	4/WP	belt covers
5/16" x 1 3/4"	Button Head	8/WP	seat bkts to undercarriage
5/16" x 2 1/4"	Hex	20/WP	bearing bkts & angle braces
5/16" x 2 1/2"	Hex	8/WP	seat yokes
5/16" x 3"	Hex	4/WP	small hoops
5/16" x 3 1/2"	Hex	8/WP	guide wheel bolts
5/16" x 4 1/2"	Hex	8/WP	straight bar bolts
5/16" x 1 3/4"	Carriage	4/WP	blue seat
5/16" x 4"	Carriage	4/WP	blue seat
5/16" x 1 1/2"	Button Head	16/WP	guide wheels
5/16" x 7/8"	Coupling Nut	16/WP	guide wheels
3/8" x 3/4"	Button Head	24/WP	wheel segments
3/8" x 5"	Threaded stud	4/WP	belt tighteners
3/8" x 7"	Hex	4/WP	steering arms
5/8" Alum collar		2/WP	
5/8" x 1 1/2"	Fender washers	2/WP	