



HO Structure Kit **UNITED PETROLEUM REFINING** 933-3705

Thanks for purchasing this Cornerstone Series® kit. Please read all instructions before starting. All major parts are made of styrene plastic, so use compatible paints and glue to finish your new model. Some detail parts included in this kit are made of metal and must be attached with CA adhesive. They may be painted with any hobby paint.

Thousands of products we use everyday are made from crude oil. In addition to petroleum products like gasoline and lubricants, petrochemicals derived from oil are used to make plastics (like those used in this kit) paint, nylon, cosmetics, pharmaceuticals, insecticides, fertilizers and much more. Propane, benzene, and natural gas are also derived from the refining process.

Refineries can be found in both oil-producing and using areas throughout the world. Location of the complex is usually determined by the distance to the supply of crude oil, proximity to water for shipping and manufacturing purposes and the distance to the market for the finished products.

The process begins with the recovery of crude oil from wells. At this stage, oil consists of thousands of hydrocarbons (combinations of hydrogen and carbon) which must be separated in a process known as distillation or fractioning.

Crude oil arrives at the refinery via pipelines, tank cars (unit trains are used in some applications) ocean-going ships, or barges. The oil is pumped into holding tanks until needed and routed within the refinery through a network of pipelines.

The refining process begins by pumping crude oil into a "pipe still" where a furnace heats it, and some fractions begin to vaporize. The heated mixture of vapor and liquid is then piped into an upright cylinder called a "fractioning tower." Live steam is fed into the base of the tower to speed the process. As the heated vapors rise, the fractions separate. Each cools at a different temperature and condenses at a different level within the tower. Lighter fractions rise to the top as gases, while the heavier residues drop to the bottom and are used as asphalt and fuels.

The various materials are drawn off and piped to other areas in the refinery where wax, sludge, heavy materials and other impurities are removed. To obtain more desirable products, some heavier and less useful fractions may undergo a conversion process, where they may be heated and pressurized or mixed with other materials. This method is used to produce gasoline from heavier materials and is also a key process in making high octane gasoline and aviation fuel. From here, the

various products may be blended with other materials, such as detergents in gasoline.

The finished products are then piped to tank farms for storage. Each tank is connected to a long network of piping, some of which supplies loading facilities for rail cars or trucks at the refinery, or long distance pipelines that supply regional oil terminals.

ON YOUR LAYOUT

This model is based on a facility in Wyoming, typical of most major operations from the 1950s on. When completed, your Refinery will be a busy customer for your railroad and additional Cornerstone Series® kits are available to build a complete operation.

Oil wells can be modeled with the Walking Beam "Horse Head" Pump (933-3170). Based on a typical American design, the model can be animated with the Universal Gearbox & Motor Drive Kit (933-1050), sold separately. This unit is fully assembled and designed for drop-in mounting with this kit.

Crude oil or finished petroleum products can be stored on-site in the Tall (933-3168) or Wide Oil Storage Tank (933-3167). These easy-to-build models are complete with one-piece plastic tanks, spill containment berms, add-on vents, curved stairway and decals. Prototype tanks are connected by a series of supply pipes which can be modeled with the Piping Kit (933-3105).

Trucks making local deliveries of gasoline, diesel fuel or heating oil can be filled at the Loading Rack (933-3169) which includes a canopy, tanks, pumps and platforms. Your dealer can supply a wide range of suitable tank trucks; check the Vehicles Section in the current HO Reference Book or at www.walthers.com for ideas.

To simulate empties in/loads out traffic moving by rail, ask for Walthers assembled Funnel-Flow® Tank Cars in 16,000 Gallon (932-7200 series single cars and 932-27201 series two-packs), 23,000 Gallon (932-7250 series single cars and 932-27251 series two-packs) as well as 33,000 Gallon LPG Tank Cars (932-7300 series single cars). These tankers will look great spotted at the Oil Loading Platform (933-3104).

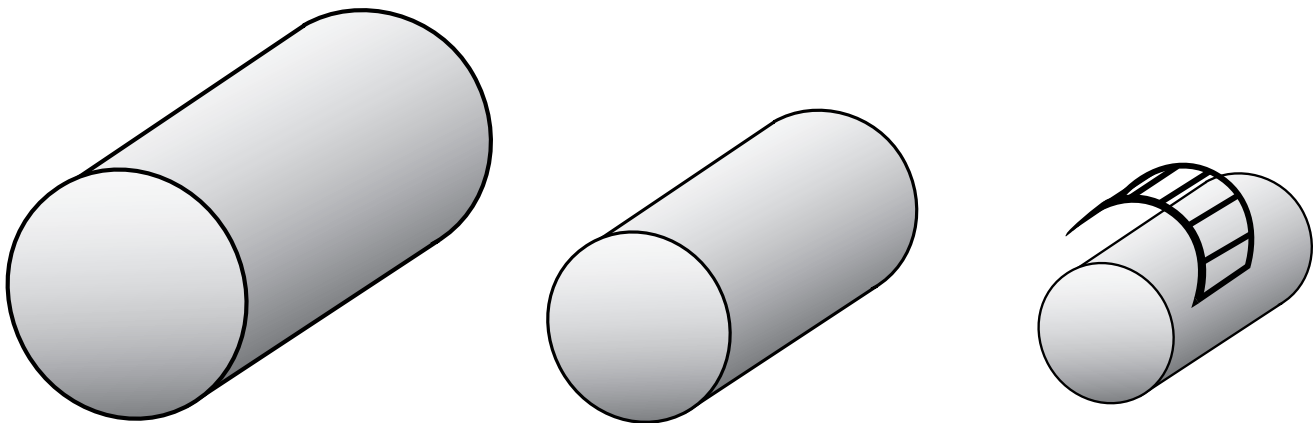
Additional vehicles such as fire engines or service trucks, figures or a switch engine painted in company colors will add more detail and realism to your new refinery operations.

WORKING WITH BRASS ETCHINGS

Although working with brass on modeling projects is different than working with plastic, it need not be difficult. By following some simple suggestions, you will be able to combine these two modeling mediums, utilizing the advantages of both materials. The first consideration is the removal of the parts from the “fret” (the metal equivalent of a sprue). Use a piece of glass for a cutting board. The surface must be hard to prevent bending the brass when cutting. Place the fret on the glass and, using a sharp flat bladed (#18) hobby knife, cut through the tabs holding the piece on the fret, as close to the piece as possible. Consult the instructions for the correct part numbers. Use a flat metal file to clean up any rough edges. Once the piece is removed and cleaned, it can be glued to the edge of the plastic platform. Start with the straight railing that goes on the inside edge of the platform. Lay the platform on the glass topside facing up. Use the glass as a guide for the bottom of the railing, making sure it's perpendicular to the platform. Apply a small drop of medium viscosity/slow setting CA type adhesive (which will give you time to adjust and align parts before it dries) on the joint between the brass and the plastic parts. On longer parts, a drop at each end and in the middle will be enough to secure them.

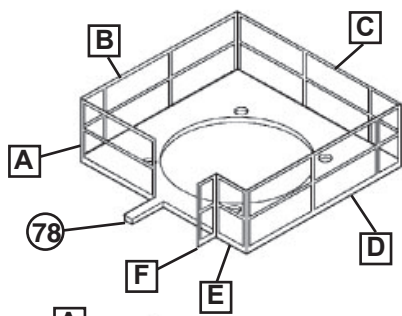


Curved sections are easy to make using bottles, cans or wooden dowels as bending jigs. You'll need to find three items; one larger, one about the same size and one slightly smaller than the curved platform where the railing will be attached. After the parts are removed from the fret and the edges are cleaned, start by bending the railing on the larger object. Next, bend it over the medium sized item. Finally, bend it on the smaller form-this last step will put a little “spring” into the railing so it will fit tighter to the platform. Align one railing on the edge of the platform and apply a small drop of your medium viscosity/slow setting CA type adhesive. NOTE: As you become more familiar with how to bend these parts, you may be able to skip directly to the small jig.

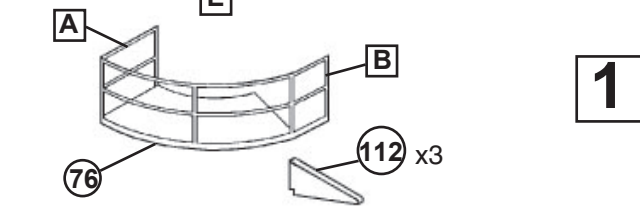


DECALING

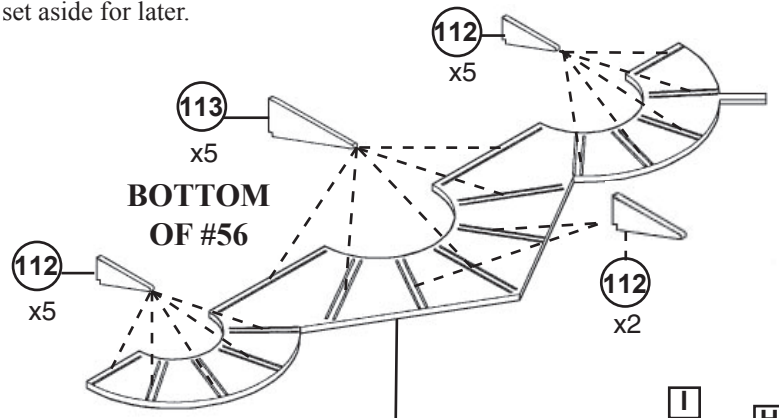
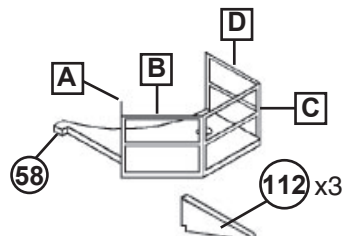
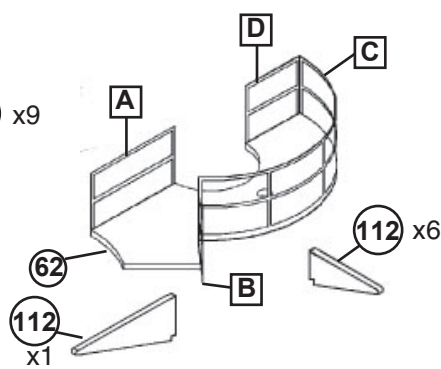
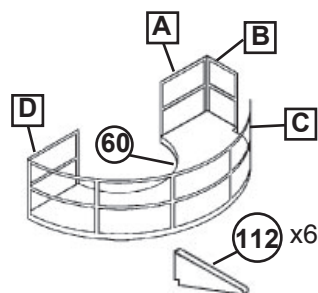
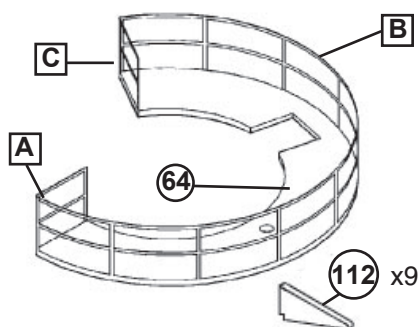
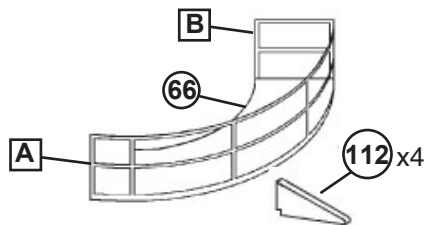
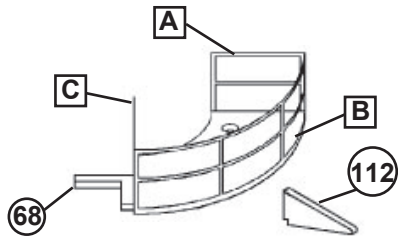
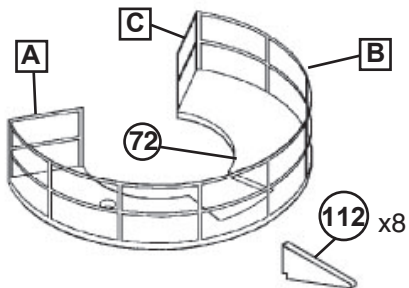
1. After cutting out the decal, dip in water for 10 seconds, remove and let stand for 1 minute. Slide decal onto surface, position and then blot off any excess water.
2. Lightly brush on Micro Sol® on top. This will soften the decal allowing it to conform to irregular surfaces. DO NOT TOUCH DECAL while wet!
3. When the decal is thoroughly dry, check for any trapped air bubbles. Prick them with the point of a small pin or hobby knife blade and apply more Micro Sol®.



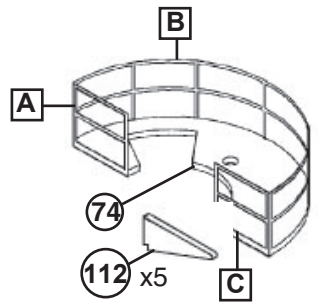
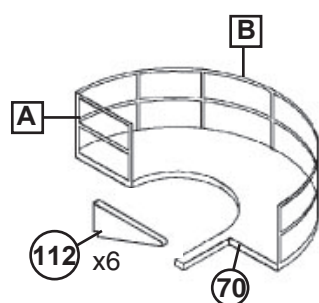
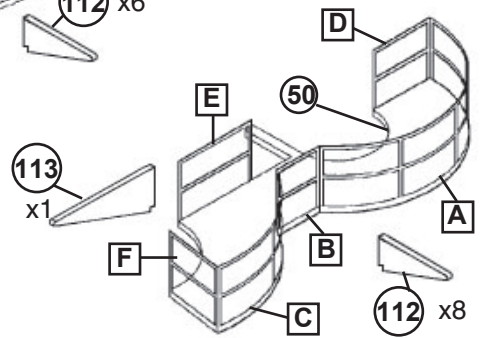
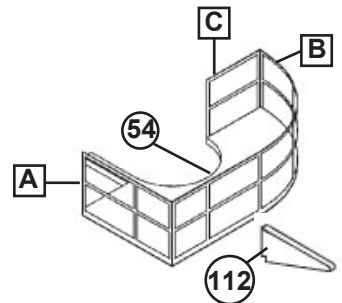
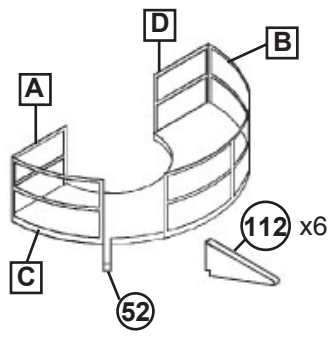
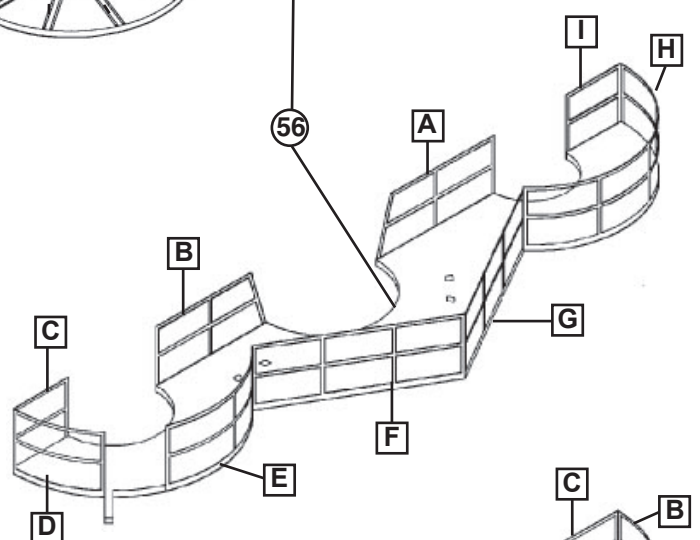
1. Following the directions under "WORKING WITH BRASS ETCHINGS", glue the brass railing sections to the plastic platforms as shown on this page. Match up the part numbers on the brass fret with the corresponding platform numbers. Then, using the lettering system found on the fret, position the individual railings around the platform as illustrated. After the railings are in place, glue the gussets (112, 113) in place on the bottom, between the ridges and along the ends, of the platform. Make sure that they are flush with the inside circumference of the platform's hole and the notched out area is against the bottom of the platform. NOTE: Only platform #'s 50, 56 and 62 use the larger gusset #113. After assembled, set aside for later.



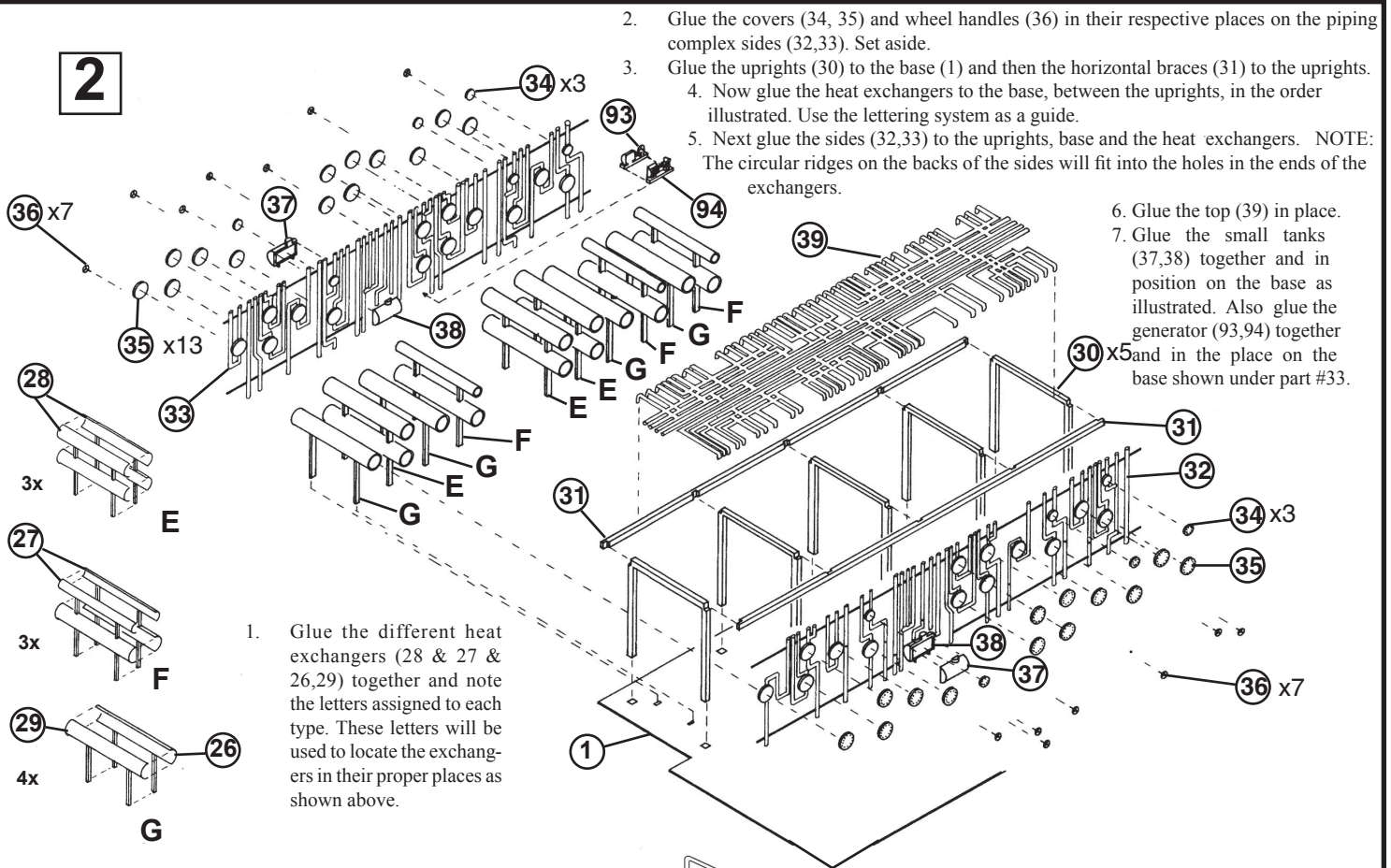
1



**BOTTOM
OF #56**



2

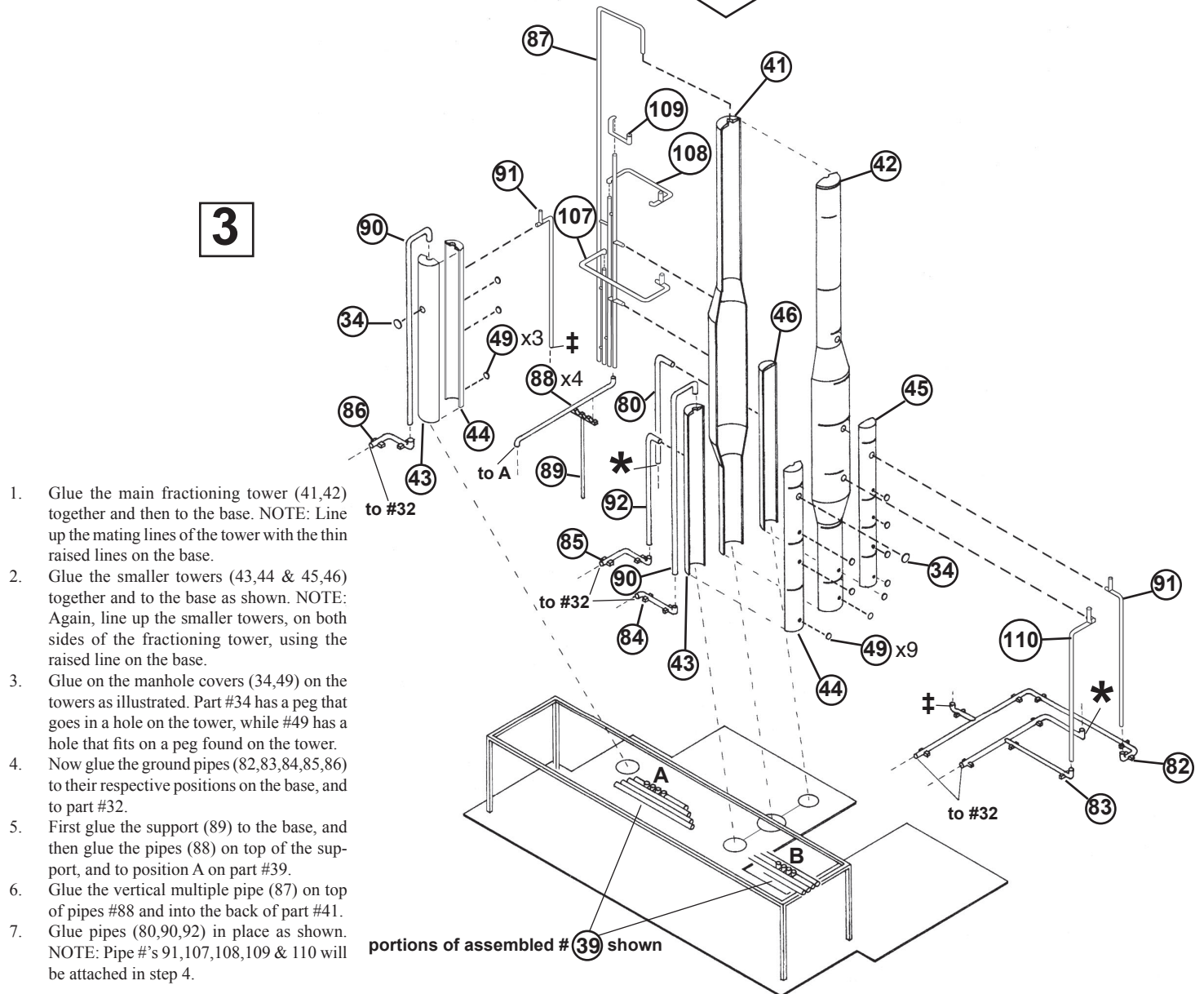


1. Glue the different heat exchangers (28 & 27 & 26,29) together and note the letters assigned to each type. These letters will be used to locate the exchangers in their proper places as shown above.

2. Glue the covers (34, 35) and wheel handles (36) in their respective places on the piping complex sides (32,33). Set aside.
3. Glue the uprights (30) to the base (1) and then the horizontal braces (31) to the uprights.
4. Now glue the heat exchangers to the base, between the uprights, in the order illustrated. Use the lettering system as a guide.
5. Next glue the sides (32,33) to the uprights, base and the heat exchangers. NOTE: The circular ridges on the backs of the sides will fit into the holes in the ends of the exchangers.

6. Glue the top (39) in place.
7. Glue the small tanks (37,38) together and in position on the base as illustrated. Also glue the generator (93,94) together and in the place on the base shown under part #33.

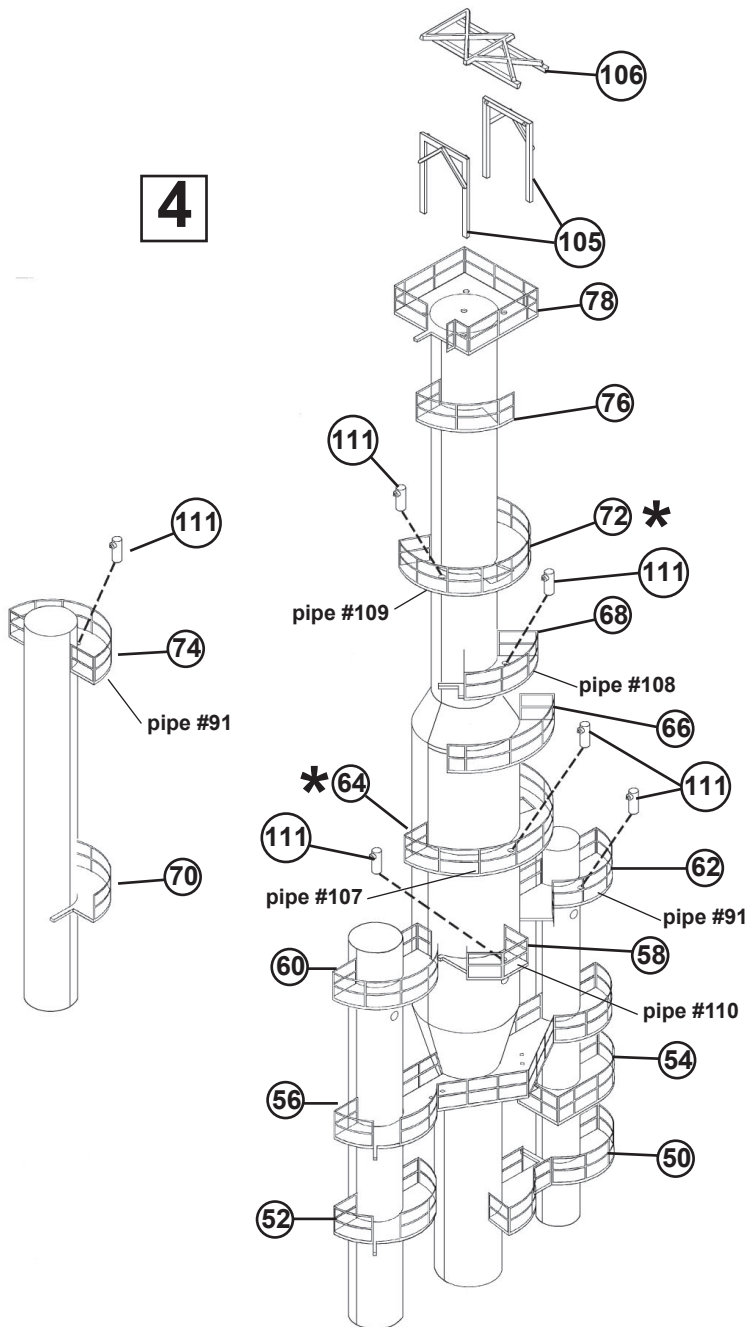
3



portions of assembled #39 shown

1. Glue the main fractioning tower (41,42) together and then to the base. NOTE: Line up the mating lines of the tower with the thin raised lines on the base.
2. Glue the smaller towers (43,44 & 45,46) together and to the base as shown. NOTE: Again, line up the smaller towers, on both sides of the fractioning tower, using the raised line on the base.
3. Glue on the manhole covers (34,49) on the towers as illustrated. Part #34 has a peg that goes in a hole on the tower, while #49 has a hole that fits on a peg found on the tower.
4. Now glue the ground pipes (82,83,84,85,86) to their respective positions on the base, and to part #32.
5. First glue the support (89) to the base, and then glue the pipes (88) on top of the support, and to position A on part #39.
6. Glue the vertical multiple pipe (87) on top of pipes #88 and into the back of part #41.
7. Glue pipes (80,90,92) in place as shown. NOTE: Pipe #'s 91,107,108,109 & 110 will be attached in step 4.

4

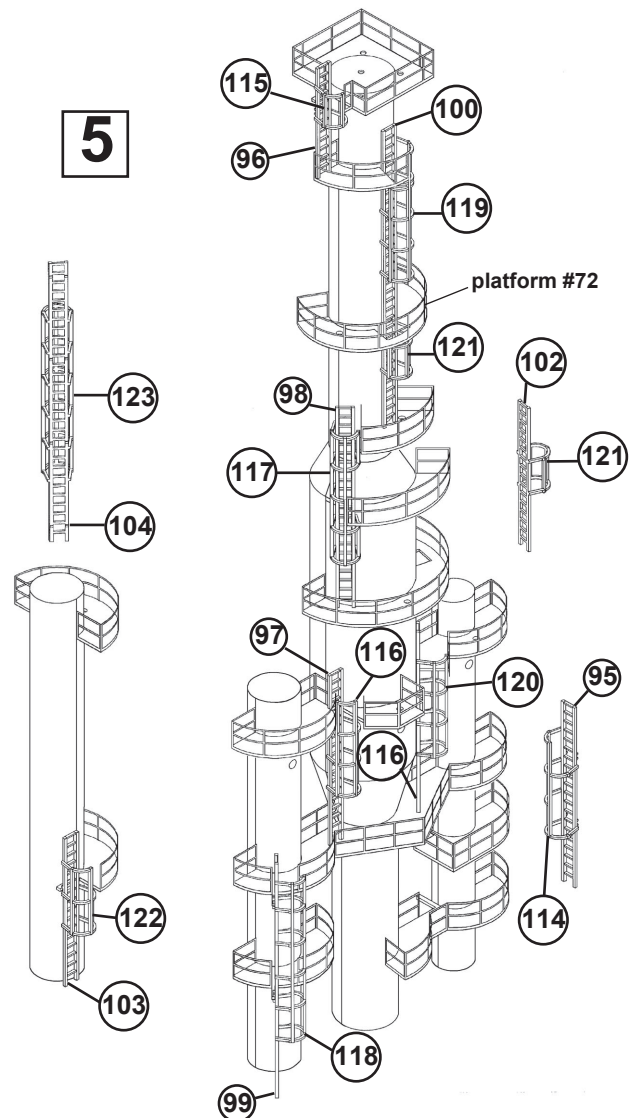


1. Install the platforms completed in step 1. NOTE: Platform #72 must be installed first - slide it into position from the top of the tower and glue in place. Install platforms #76 & 78 as shown. Install platform #64 by sliding it down the widest part of the tower into position and glue in place. Install platform #66 as shown. Allow the platforms to dry.
2. With the platforms installed, glue pipes (107,108,109) onto the main pipe #87, as shown in step 3. Glue pipes (91,110) to the ground pipes as shown and under the platforms. Glue top pipes (111) into the holes in the platforms as shown.
3. Glue the hoist support sides (105) into the holes in platform #78. Glue the hoist top (106) to the sides - make sure the pins on the bottom of part #106 are outside of the pins on #105.

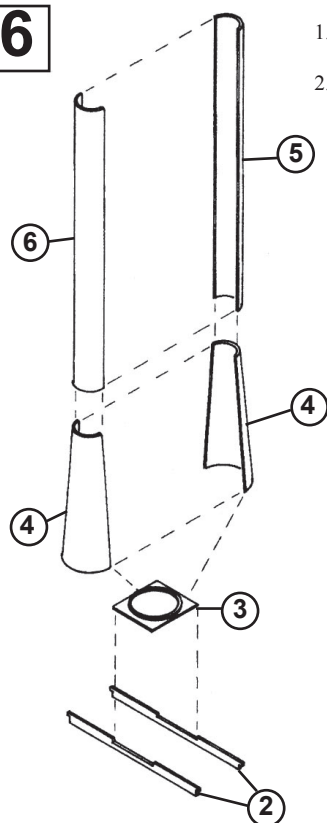
THE PIPING FROM THE PREVIOUS STEP IS NOT SHOWN FOR EASE OF VIEWING

5

1. Begin assembly of the safety cage ladders by gluing on the top cage (119) to ladder #100 and then inserting it through platform #72 and glue in position. Then glue on the bottom cage (121) to the ladder. Assemble the remaining ladders as shown.
2. Glue all the caged ladders in place.

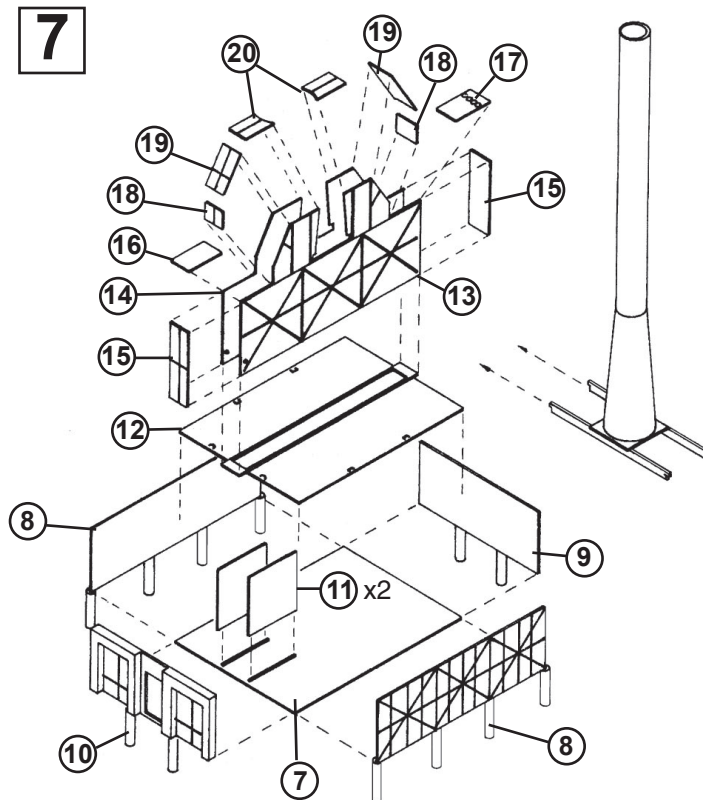


6



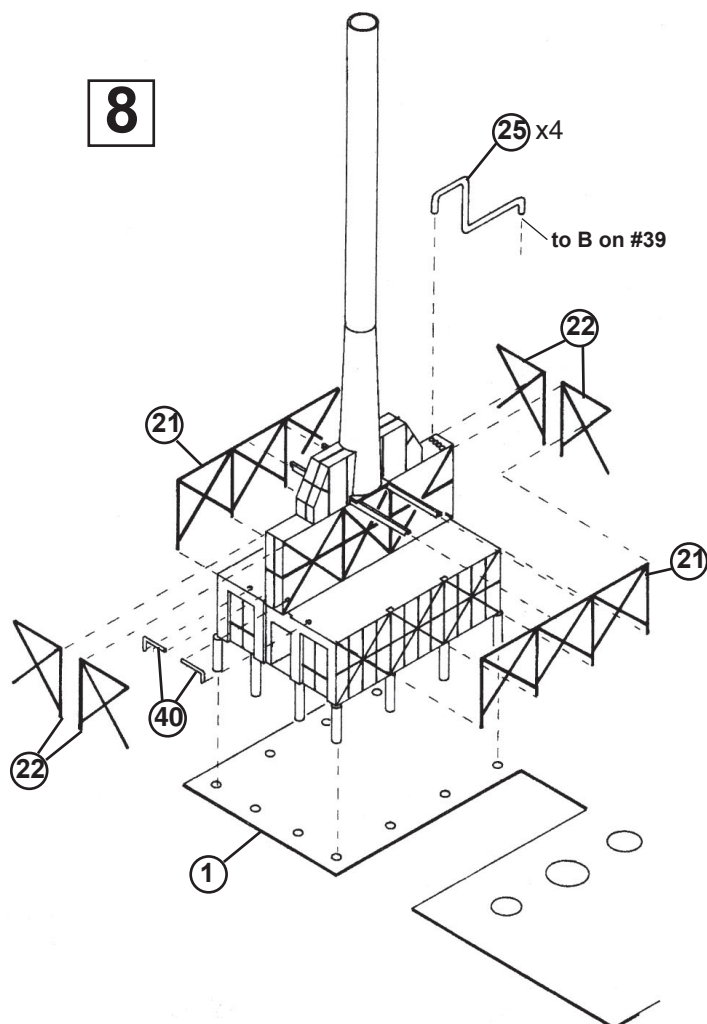
1. Glue the upper stack (5,6) and lower stack (4) together and then to its base (3).
2. Then glue the supports (2) to the bottom ends of the base. Set aside for use in next step.

7



1. Glue the inner walls (11) along the ridges on the furnace floor (7).
2. Glue the sides (8) and ends (9,10) to the floor. NOTE: Make sure #10 is at the same end as the inner walls. Next, glue on the roof (12) with the two holes on the one end over part #10.
3. Take the completed stack from step 2 and insert it in between the top walls (13,14).
4. Next glue all of the remaining end portions (15,16,17,18,19,20) on as illustrated.
5. Glue this completed assembly onto the roof. NOTE: Part #17 should be over end wall #9.

8



1. Glue furnace to the base (1).
2. Glue the pipes (40) into the holes on the top sides and to the locators on the roof.
3. Glue the bracing (21, 22) in place on the roof.
4. Glue four pipes (25) into the locators of part #17. NOTE: The other ends will be glued to the B location on part #39 shown in step 3.

IMPORTANT NOTE: Not all pieces included in this kit are used to build this model. You will have parts left over that you can use on other modeling projects.