Modeling AB Brakes
Recreating the brake equipment, with all of its rodding and piping, can be a very daunting prospect to many modelers. I have been building resin freight car kits for almost fifteen years and I finally feel that I am able to adequately represent all of the components. One can choose to model the brakes in several degrees of complexity and it is my intention to cover all of them here, from the simplest to the most detailed. In this installment we will only cover a typical ‘AB’ brake system. Please note that the location of the brake gear does vary by prototype and it is important to consult reference...
material to identify the proper location for each car. The ‘K’ variants will be covered in a subsequent issue.

The simplest representation of the brake components is to glue the four main parts (three parts to a modeler), the cylinder, the emergency and auxiliary reservoirs and the ‘AB’ or ‘control’ valve, on to the underframe (see the diagram of these parts.) This is the bare minimum anyone should consider, as anything else looks naked. All that is required with this degree of simplicity is to properly locate the parts on the underbody of the car. This is shown in Figure 3.

The next incremental increase in complexity is to add the two brake levers. Like the three main parts, this requires very little extra work as one lever rests in the clevis of the cylinder (see photo) and the other lever (the ‘floating’ lever) sits on a fixed point around which it can pivot.

Adding the brake rods between the levers is the next step. 0.012" wire is used to simulate brakes rods. Some model levers have holes located in them. This allows the modeler to bend the wire that simulates the rod and glue it in the holes. This is effective and relatively easy. The other solution is to try to create something that simulates a clevis. Turnbuckles with one end cut off are quite effective in this role. They are also cored to ‘receive’ wire, making it easy to insert wire in them to represent the brake rods. Where these rods go is also a modeling consideration. On the prototype, the two that extend from the levers connect to the brake gear on the trucks. As such, they should appear as if they connect to the truck, rather than to the body bolster. This requires some bending to simulate the connection, without actually connecting to the truck, which might create issues with the operation of the truck. The rod that emanates from the cylinder is connected directly to the a device at the bottom of the B end that, in turn, transfers this connection to the hand brake. This rod should appear to run between the truck and the bolster. Also, the rod is not connected directly to the cylinder, but is rather attached through a chain connection. The connection can be recreated using wire and chain as shown in Figure 5. The open piece of chain is slipped over the brake lever at the point where the cylinder clevis meets this lever. It is then secured in place with ACC. The accompanying photo shows the bolster at the B end and how these two types of rods can be modeled. It is easier to run the rods that connect to the trucks diagonally from the levers to the center sill of the car. However, on the prototype, the
Figure 6 - This photo shows the two types of rods; the top one simulates the brake rod that connects to the brake equipment in the truck while the bottom rod represents the rod that runs from the cylinder to the hand brake at the B end of the car.

rods ran parallel to the center sill. It is difficult to see where the rod goes when looking at the underside of a car, so either way should suffice.

The last, and most complex step is the brake piping. This involves pre-drilling the parts to accept wire (0.010" for all, except 0.008" for the pipe to the retainer) and also a cursory understanding of where all the piping is connected. Figure 8, of the AB valve, illustrates where each of the pipes should go. These photos illustrate the location of the three main pipes that connect the cylinder and the reservoirs to the AB valve.

The two additional pipes connecting the Train Pipe and the retainer valve to the AB valve along with “complete” AB brakes as modeled, are shown in Figures 9 and 10. The pipe to the retainer runs all the way to the car end. Most modelers simply run wire from the retainer to the underside of the end and terminate the wire there rather than running it the entire way to the AB valve. The connection between the AB valve and the trainline has a dirt collector attached to it. This is the separate part attached to the AB valve. Most modelers choose to ignore the connection between the AB valve and the trainline, as it is not easily seen. These photos provide two views of the same thing, from opposite sides and at different angles to provide additional clarity (as things can get complex and cluttered!)

The last detail is the release rod that connects to the release valve. This is very rarely modeled. However, in the next installment of Essential Freight Cars, this will be addressed for both the AB and K type brakes.

Above, right, Figure 7 - The piping between the main brake components and the AB Valve is illustrated.

Below, right, Figure 8 - This photo illustrates how the 0.010" brass wire that simulates the brake piping is oriented on the AB Valve. This view is “upside down” compared to Figure 1.
Modeling ‘KC’ Brakes and Release Rods

In the previous Essential Freight Cars installment, I described how I model ‘AB’ brakes. Here, I will describe how I model ‘KC’ brakes and release valves and release rods. For those with an interest, the less common ‘KD’ brakes will be covered in a future installment.

All of the cars covered in this series that were built prior to 1934 (with the exception of some PRR X29s built in 1932) were equipped with either ‘KC’ or ‘KD’ brakes. The main difference between the two being that the ‘KC’ brakes had the brake cylinder, reservoir and triple valve integrated into a single ‘unit’ (see photo of Red Caboose ‘KC’ brake part in Figure 11) while the ‘KD’ brakes separated the brake cylinder from the other two main components.

The major difference in modeling ‘KC’ brakes versus ‘AB’ brakes is the actual brake components. The brake rods and levers and brake pipe are placed in the same locations regardless of brake type. The important thing to understand is how the brake components are connected to the retainer valve and the brake pipe since these are different on the ‘KC’ brake. The photo of the Red Caboose ‘KC’ brake illustrates the points at which these two connections occur. The following photo shows them as actually connected on the SP box car. The pipe to the retainer valve is modeled with .008” brass wire while the pipe to the branch pipe tee (and the Train Pipe) is .015” brass wire. While I simply glued the connector pipe directly to the brake pipe, there are small ‘tee’ connectors available as HO parts, from manufacturers such as Precision Scale.

The two photos (Figures 12 and 13) of the underbody after the primer coat had been applied show two additional views of how the brake components are connected. Careful observation also reveals a thin rod that runs across the car from side sill to side sill. This is the release rod and it is a feature that is very seldom modeled as it is practically invisible once the model is on the track. The release rod was connected to the release valve on the brakes (all types). Its function, as its name implies, is to release air (pressure) in the brake system. On ‘KC’ brakes, the release valve was located on the top of the brake cylinder (top if the car is on the rails – refer to the Red Caboose ‘KC’ brake part photo). On the ‘AB’ brakes it was part of the AB valve.

Modeling the valve is actually quite simple. I take a piece of .008” brass wire and crimp it around a #78 drill bit. This
Above, Figure 12 - The pipe running above the KC brake is the pipe to the retainer. The “L” shaped 0.015 "brass wire that connects the Triple Valve to the Train Line simulates the same connection that was present on the prototype.

Below, Figure 13 - Another view of the same brake components.
creates a loop in the wire. I then drill a #78 hole in the proper location on the AB valve (see photos) or on the top and center of the reservoir on the ‘KC’ brakes. I insert the brass loop into the hole and glue it making sure that the ‘eye’ of the loop faces the side sills of the car so that I can thread wire through it.

Once the loop to simulate the release valve is in place, I add .006” brass wire to simulate the rod. The tricky part with this is replicating the mounting used on the prototype. On the SP car in this article, the release rod was hung from the bottom of the side sill on both sides. In some instances, the rod passed through the side sill. In others, there were brackets from which the release rod was hung (the bracket pictured here is strip styrene with a #79 hold drilled in it glued to the car side. The rivet that attaches the bracket to the car side was shaved off an Athearn box car and glued on to the styrene strip.) On cars with AB brakes, on the side where the AB valve was located, the release rod simply came out from the release valve and had no support other than its connection the valve. As the photos illustrate, the ends of the release rod had ninety degree bends.

The next few times you are at a layout, take a look at the freight cars, or more specifically, the underbodies of the cars. Chances are you will see a lot of empty space. The prototype had components that occupied space (and served a function!) You now have the know-how to recreate all of the components that will make your freight cars look complete and eliminate some of that “empty look”.

Figure 14 - This view illustrates the completed AB brake system including a release rod made from 0.006”

Figure 15 - This closeup illustrates how the release valve and release rod can be replicated on a model

Figure 16 - On some cars the release rod passed through the side sill, as shown on this Westerfield model of a New York Central USRA design steel box car.

Figure 17 - Another method of supporting the release rod was to attach a simple bracket on the side sill, as shown on this Sunshine Models New York Central gondola.

Left, Figure 18 - This is a piece of wire that will be inserted into the brake part to simulate where the release rod attaches to the release valve. Consult Figure 15 above to see how this is inserted into an AB valve.