HO Locomotive and Rolling Stock Couplers

A key part of having a smooth-running train is properly adjusted couplers. This includes matching height to a coupler height gauge as well as setting magnetic trip pin height and dressing the shank, face and inside of the coupler body and any coupler boxes. It is also strongly recommended to mechanically attach the coupler to the model by use of a screw.

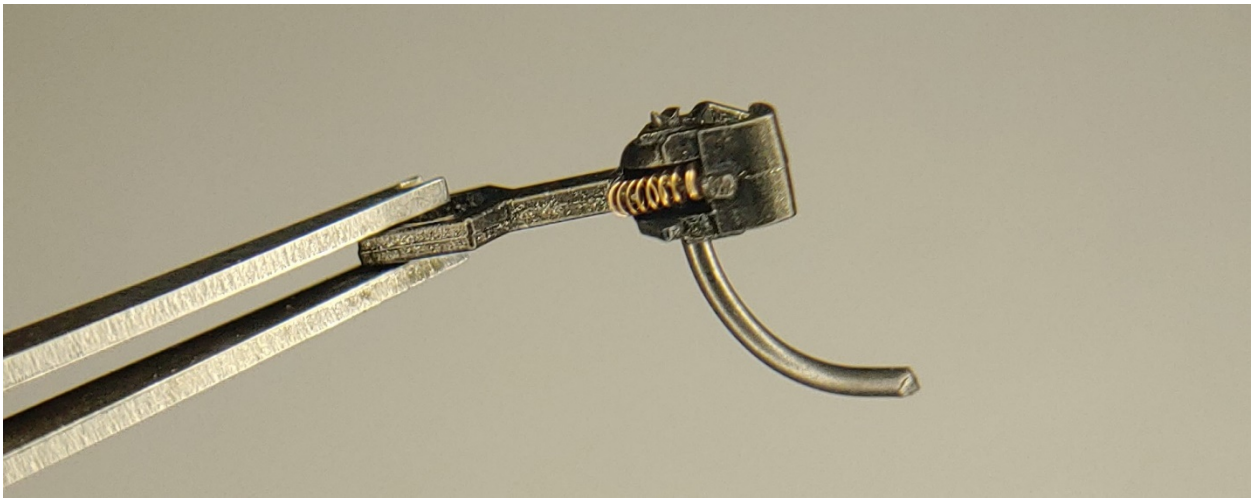
Dressing the Coupler

In order to ensure smooth operation, it is recommended to detail the coupler in the following areas:

<u>Coupler knuckle face/inside</u>

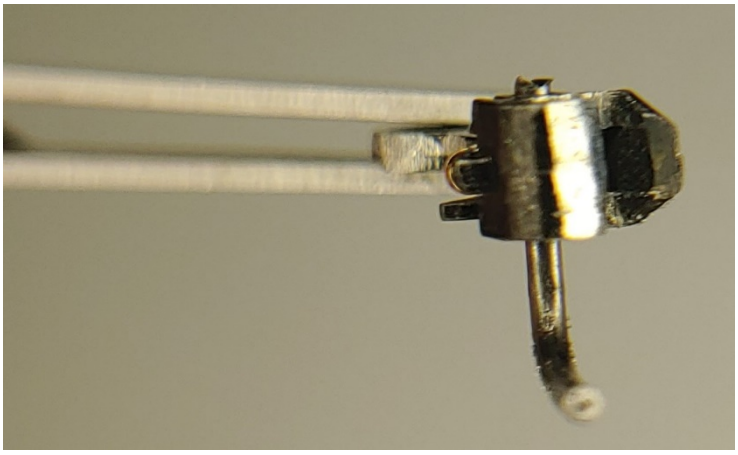
- Using a fine hobby file, grind down the knuckle outer face, knuckle inner face, and the inner receiver of the coupler being sure to remove casting lines and to provide a flat, smooth surface. This will help the mating surfaces smoothly interact when connecting rolling stock or locomotives. If needed, a magnifying stand can aid in observing these smaller parts.

  Casting Marks



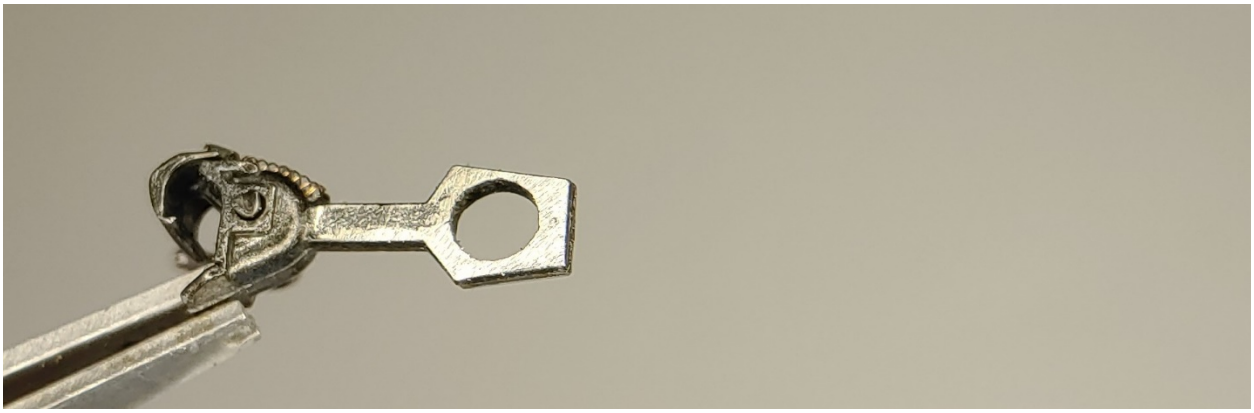
- Be sure to take care when working around the knuckle to not dislodge the knuckle return spring on those so equipped. However, if you do knock it loose, a small flat bladed jewelers screwdriver or X-Acto knife blade can be used to capture and reset the spring.
  Similarly, when working with whisker style couplers, be sure to avoid bending or breaking the whiskers.

Dressed knuckle face and inner face



<u>Coupler Shank</u>

- The coupler shank on most couplers also needs dressing as the surface can be irregular. Additionally, the sides of non-whisker type couplers will also have casting lines and paint on them. Careful dressing of both of these surfaces will insure smooth side to side movement as well as good spring returns.
- Use a fine hobby file to grind the paint and casting lines off of the shank where it travels inside its coupler box.
- Use a fine hobby file to grind the paint and casting lines off of the rear and sides where the coupler will interface with the return spring.



Coupler Trip Pin

- The coupler trip pin should also be cleaned up and pre-set for proper height while it is off of the model.
- With a small hobby file, smooth the tip of the trip pin to remove any cutting burrs. This can be somewhat difficult due to the size of the part as well as the tendency of the file to catch on the edges of the tip. Have patience.
- Once the trip pin has been de-burred, you can pre-bend the pin itself before placing on the model. Using a pair of trip pin bending pliers such as MicroMark item 80600, or KayDee #237, gently squeeze the trip pin, reducing the curvature by about half. Once done, take a pair of straight pliers and flatten out the curve so that is relatively flat. With enough repetition, you can get the pin close to normal running height and reduce the number of adjustments performed while the coupler is installed on the model, avoiding damage to the model.

Installing The Coupler

The physics applied to model railroad rolling stock are very similar to the forces applied to the prototype. In some cases, these forces can even be more severe due to the lighter weight of equipment. As modelers, we can experience broken coupler knuckles or shanks just like the prototype. We can eliminate most of these problems by properly installing couplers and performing regular inspections of mating parts on our models.

Clip Style Coupler Retention

Some models come with a metal pocket bottom that clips into the car frame. While a quick and convenient method of affixing the coupler to the frame, they can be difficult to install properly and can come loose during operation and are not recommended.

Screw Attachment

Securing the coupler to the model with a metal screw is the recommended method as this provides a solid mechanical bond that is separate from the pocket cover.

Some models come pre-installed with screws affixing the coupler to the car body or locomotive pilot. In these cases, after adjusting trip pins and coupler height we can move on to other tuning steps. For those that do not have pre-installed screws, a little more work is needed:

Drill the screw hole

- Center punch the coupler guide shank with an X-Acto knife
- Using a #50 (.070mm) drill bit, gently drill through the plastic or metal. For metal work, be sure to back the bit out frequently to clear the bit shank.
- On models such as covered hoppers avoid drilling through the deck if possible. If this does happen, color matching a bit of paint on the screw can hide this in most cases.

Tap the screw hole

- For plastic models, a 2-56 screw can be used to tap the hole.
- For metal models, you will need to use a 2-56 tap to cut threads.

Install the coupler

- For models that do not have a pre-installed coupler box, you will need to prepare one. Most coupler kits will include the parts needed for this. Follow the directions for assembly but take care to file the inner surface of the box where the coupler shank will move to ensure that no casting irregularities in the box may exist.
- Install the return spring if needed, and then place the coupler in the box and install the cap.
- Once the cap is installed, install the screw and gently tighten until it is sung against the cover. *If the screw does not seat and the tapped hole has become stripped, a thin layer of super glue in the screw hole can be used to build back the material needed to tighten.
  If this is not effective, a styrene plug will have to be glued into the hole and a new hole tapped.
- Ensure that the coupler returns freely in both directions. If the coupler does not return, back the screw out until it springs back to center in both directions on its own.

Coupler Installed

Coupler Height Adjustment

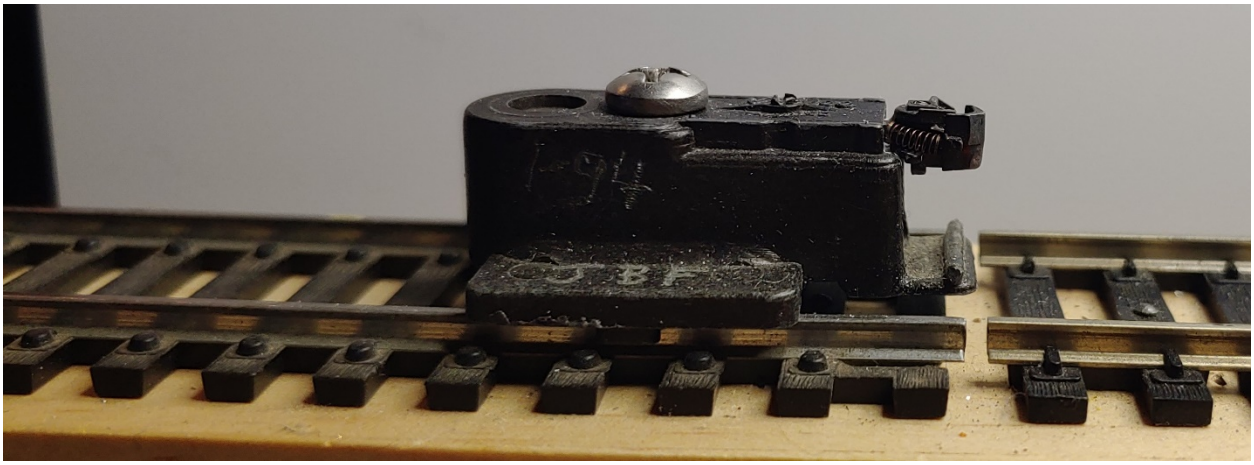
Coupler height is very important to smooth and trouble-free operation. Mismatched heights can cause uncoupling and over time can lead to broken knuckles due to stresses off the plane of the pin which the coupler knuckle rotates.

Getting this right starts with a standardized coupler height. Kaydee sells a height gauge for your home workshop, or you can use one of the club gauges if needed. Kaydee is the industry standard for HO scale couplers, and it is strongly recommended to use their gauge regardless of what brand of coupler you run on your train.

Setting The Coupler Height Gauge

After assembling your model and placing on a test track, coupler height can be measured. To ensure that coupler trip pins don't catch on frogs or ties, a modified coupler height gauge is recommended. Using a spare Kaydee coupler, cut the trip pin at the knuckle. Take the cut pin and remove the curvature by gently tapping with a hammer on an anvil or hard surface. Once the pin is straight, glue it to the base of the height gauge. This extra height is well suited to avoiding track irregularities while still allowing magnematic activation on layouts that utilize that feature.

Modified Coupler Height Gauge



Setting Coupler Height

Previously, we pre-bent the trip pin. This was done to get the pin near a normal ride height before installing on the model. The trip pin will likely need more adjustment once the coupler knuckle height has been set. When taking measurements of the coupler height, some times it may not be possible to fully close the gap between the coupler and the gauge due to pin interference. In these cases, get the coupler close before making final adjustments to the trip pin.

Filing note. Some of the adjustment techniques require filing of material to adjust the resting height of the coupler. Take care when filing material off of your model, whether it is the truck guide shank or pilot, etc. A flat mating surface will eliminate frustration in getting a coupler to sit level in its pocket and measuring against the height gauge. A sagging coupler box will result in a sagging coupler which will be difficult to measure against and will likely lead to issues with other rolling stock and locomotives.

- Place the model on a test track and set the modified coupler height gauge in front of the model. Gently roll the model towards the height gauge and note the height of the model coupler as it approaches the gauge. Ideally, the height on the top and bottom of the coupler should be within 1mm or less. While this may seem very finite, the more this is adhered to, the less variance between models will be, which will help to ensure that rolling stock or locomotives do not become uncoupled when moving across joints or elevation changes in track.

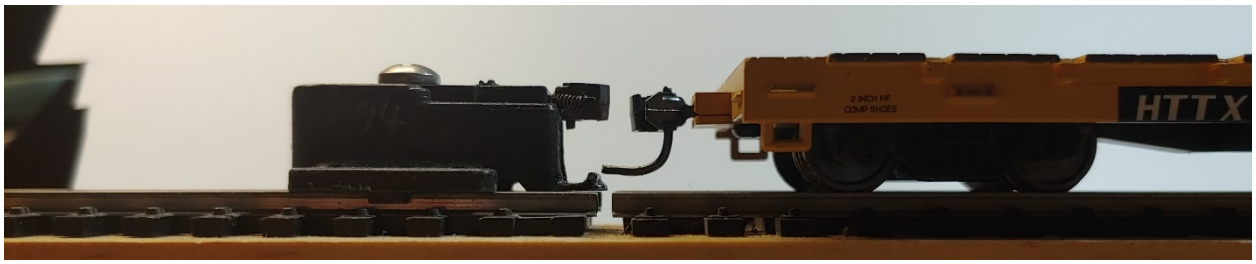
- Coupler too high:

    - For rolling stock, if the model allows it, the guide shank for the truck can be filed down to lower the overall model ride height. This lowers the interface height for the screw and the truck, thereby lowering the car body.
      If this isn't possible, the coupler pocket may be shimmed down at the mounting point of the coupler box using thin styrene sheets.
      If neither of these options work, an offset coupler can be used to lower the height. While not prototypical, this is an acceptable solution.
    - Additionally, changing the size of wheel set on the truck may lower the height of the rolling stock, but this also is less than prototypical and should be avoided if possible.
    - For locomotives, if body mounted couplers are in use, shimming the pocket down with styrene will achieve the desired results.

- Coupler too Low:

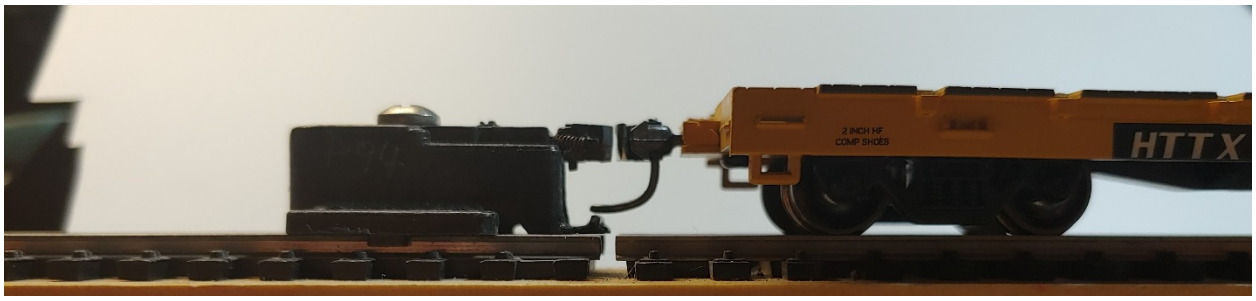
    - For rolling stock, the easiest way to bring the height up is to shim the truck guide shank. This can be done by using small 2-56 washers or Kaydee #209 fiber washers.
    - If this doesn't achieve the desired results, and if the model allows it, the body can be filed to remove material. However, if the height is too far off, there is risk of altering the appearance of the model.
    - For locomotives, this can be accomplished by reducing the material in the coupler pocket.
      If the coupler is body mounted, this is easily done by filing down the plastic.
      For older locomotives, or locomotives with metal frame mounted couplers, extra grinding will be needed.
    - In either case, if these techniques will not work, an offset coupler can be used.

Coupler Too Low



Add a 2-56 Washer

Correct Coupler Height



Set the Trip Pin Height

Now that the coupler height is correct, set the trip pin so that it barely clears the bottom of the height gauge.

- Pin Too Low
  Using your trip pin pliers, bend the pin slightly until the bottom of the curvature looks as though it will clear the guide. I like to straighten out the pin after this adjustment is made as it usually ends up with the pin hooking up too much. A pair of straight pliers will accomplish this.
- Pin Too High
  If the pin was bent too much, it can be bent back down by flipping the plier orientation and gently compressing the pin.

In both cases, be sure to handle the model as gently as possible to avoid damage. If this is difficult due to the models features, it is safer to remove the coupler and perform this work with it off of the model. While it takes more time, it is better to do it this wav vs damaging the model.

Weathering

Now that the mechanical aspects of mounting your coupler are complete, some modelers may want to weather their couplers for a more realistic look. Take care when performing these techniques to avoid gumming up the trip pin, return spring, and coupler shank. Thinned paint is best for these techniques. In general, avoid painting mating surfaces as this can lead to poor mating experiences when joining rolling stock and locomotives.