

Western-Cullen-Hayes Derails

A derail is a device designed to limit the movement of railroad rolling stock into areas where they could cause personal injury or damage to other equipment or structures. The greatest use of derails is in the area of worker protection. Any time employees are working on the track or in or around rolling equipment, they must be protected by an effective derail. Western-Cullen-Hayes manufactures several styles of derails and accessories for railroad and industrial applications.

WCH Derails function by lifting the flange of the wheel up and deflecting it laterally to drop the wheel clear of the rail head, on the field of the track. Movement of the rolling equipment is halted by the wheels becoming imbedded in the track ballast.

All Western-Cullen-Hayes Derails are light weight, welded alloy steel, designed to give years of effective service at minimal cost.

Model HB Sliding Derails are designed to operate on and off the rail in sliding motion and require an operating stand or other device, such as our ELDO or Delectric, to move them. Model HB Derails can be equipped with circuit controllers for position indication read back, if required.

Model EB Hinged Derails do not require an operating stand of any type to move them. The derail block is lifted by hand in a vertical semi-circle on and off the rail head. Model EB Derails are typically installed on industrial sliding and other light traffic locations. Model EB Derails can be equipped with circuit controllers for position indicator read back, if required.

All Model HB and EB Derails are sized to fit particular rail heights. The size number is stamped on the nameplate and indicates the distance in inches from the top of the rail to the surface on which the derail is secured. To select the proper size derail, simply measure the height of the rail and tie plate, if used. This height may not be in even inches; so to achieve an even numbered height, it may be necessary to shim the derail up or adz the cross tie down. Never shim or adz more than 1/2".

To select a left or right hand stand between the rails; look in the direction of the area to be protected and determine if the rolling equipment should be derailed to the right or left. Remember, a right hand derail will be mounted on the right hand rail and conversely with the left. Derails are always mounted on the gauge side (inside) of the rail.

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Sliding Derails - Models HB and HBXS

The Model HB is comprised of two welded assemblies mated to become a derailing unit. The derail functions by the block having a shoe with a deflector bar that covers the running rail. These parts cover the head of the rail and they lift the wheel and flange over the rail head allowing the wheel to drop to the field side of the rail and retard forward movement. The guide box which is fixed to the ties on the gauge side of the rail, directs the movement of the derailing block on and off the rail.

Symbols:

All HB's have three connection lugs for operating or monitoring accessories. Model HBXS is a bi-directional derail for use in special locations where one-way derails cannot be utilized. The former Model HBP features have been incorporated into the Model HB.

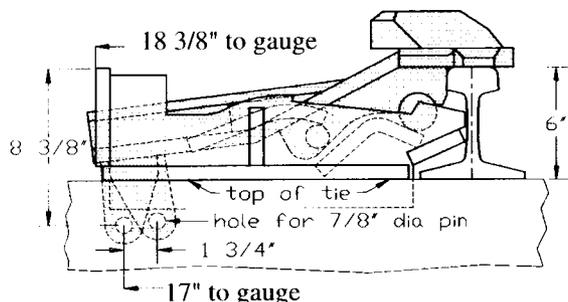
Size:

The size number follows the model designation on the name plate on the derail guide box. This number indicates the distance in even inches from the top of the rail to the surface on which the derail guide box must be placed.

Derail Size	For Rail (and Tie Plate) Measuring
4	3-1/2 to 4-1/2 inches high
5	4-1/2 to 5-1/2 inches high
6	5-1/2 to 6-1/2 inches high
7	6-1/2 to 7-1/2 inches high
8	7-1/2 to 8-1/2 inches high

Positioning the derail:

It is very important that the derail be placed properly in respect to the rail.

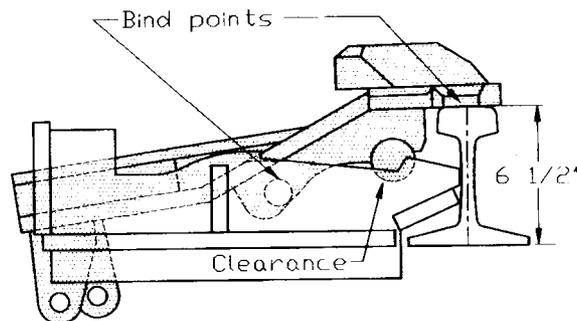


Model HB Size 6 on 6" Rail

figure 1

Figure 1 shows a size 6 derail. In this correct installation the derail is placed so that the surface under the horizontal tie flange of the guide box is just 6 inches below the top of the rail. With a size 5 derail this distance must be 5 inches, 7 inches for size 7 and 8 inches for size 8. Any Hayes derail can be made to accommodate a rail one-half inch lower to one-half inch higher than the size of the derail indicates by adapting the track to allow proper height placement.

Where the height of the rail in inches is the same as the size number of the derail both the rail and the derail are placed on the same surface. But, if the rail height is not the same as the size number of the derail, adjustment for height may be made by placing steel plates under the rail or the derail or by adzing the ties. Using steel plates is preferable. The use of standard tie plates, however, requires cutting them off at the base of rail on the gauge side. **The derail must set level and not cocked by the edge of tie plates or by out of level adzing.**



Model HB Size 6 on 6 1/2" Rail

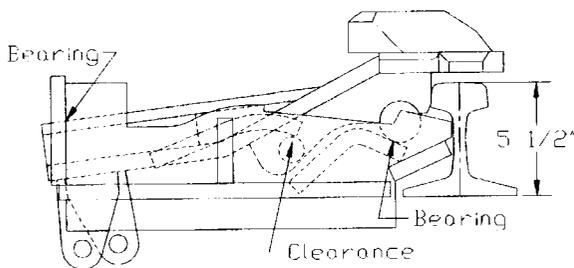
figure 2

Figure 2 shows the result of trying to install a size 6 derail on a rail 6-1/2 inches high without properly adjusting the guide box 1/2 inch to make the surface on which the derail is secured 6 inches below the top of the rail.

Notice there is a binding between the head of the rail and the bearing points between the guide box and the block. There is also an unwanted clearance under the block thrust shaft and the guide box seat. The derail is designed to lift approximately one inch when being removed from the rail, when installed correctly. This lift creates a form of lock that resists removal of the derail under the car wheel.

When a derail is installed as fig. 2 illustrates, this lift is reduced and a free horizontal slide can occur that sets up the condition that the side pressure against the deflecting bar is unrestricted. The block can be shoved back into the guide box instead of derailing the car wheel.

The derail can also be damaged since forces are applied against parts not designed to absorb impact. In addition the derail may not cover the head of the rail because the full stroke of the derail is impeded by the binding of components before the derail was fully positioned.



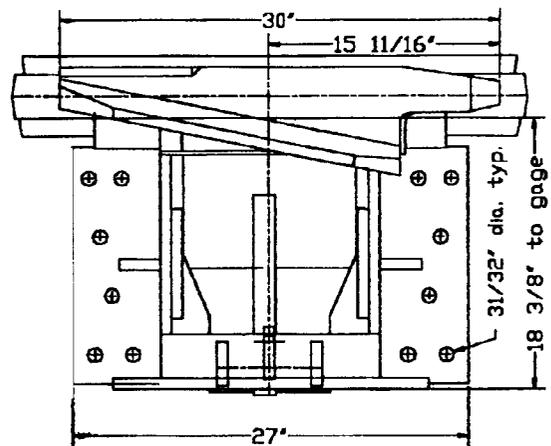
Model HB Size 6 on 5 1/2" Rail

figure 3

Figure 3 shows a size 6 derail installed on a rail 5-1/2 inches high without proper adjusting of the mounting surface. In this case the shoe is above the head of the rail. The internal design doesn't

allow for this much deviance from it's stated size. The derail was designed to have the weight of the car carried through the rail. The weight of a car is too much for any applied accessory to carry unless existing track components are employed.

The derail block is subject to deformation or breaking; the guide box can leverage the pulling of the spikes at the rear of unit as the car wheel forces the shoe down against the rail head as there is nothing to counteract the forces.

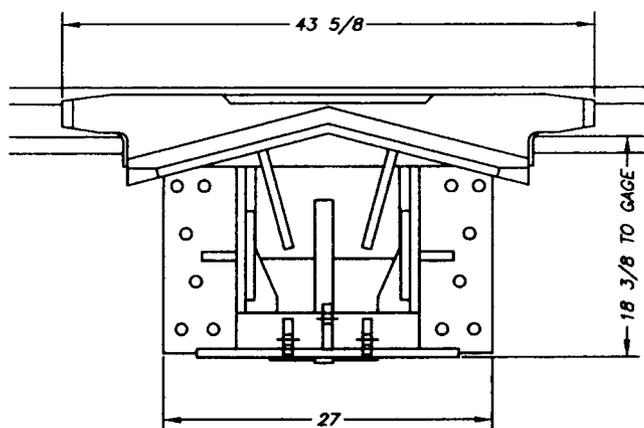


Model HB Right Hand Derail Plan View

figure 4

Right hand, left hand or bi-directional:

A single throw derail, figure 4, is recommended because it has a longer derailing surface with less angle of change for the wheel. Looking in the direction of movement of a car to be derailed, a right hand derail goes on the right rail, and derails toward the right; conversely with the left. Possible hazards or obstructions must be taken into consideration when selecting a derail's direction; buildings, walls, clearance points with other tracks and ditches must be avoided.



Model HBXS Plan View

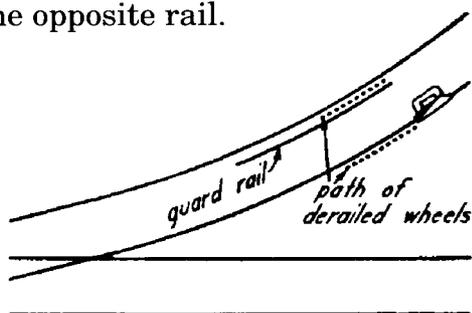
figure 5

Bi-Directional:

Two-way derails, figure 5, will derail from either direction; therefore, they can be placed on either rail. Again, evaluate any incumbrances that may affect the derailing direction. The distance of the derail from the clearance point should be determined by the probable distance the car might run after being derailed. This depends on length of the track, the grade, soil and ballast conditions.

Derails on curves:

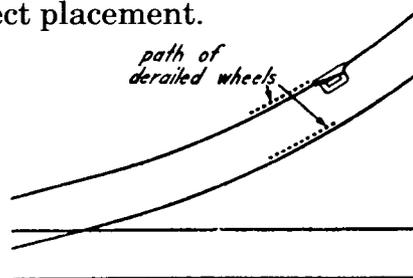
A derail should not be placed where the wheels have a tendency to bind against the opposite rail.



Correct Location of Derail On Curve

figure 6

Figure 6 should be followed where curves are encountered. Here, the straightest path for the wheels is allowed by placing the derail on the outside rail of the curve. Placing the derail on the rail against which the wheels tend to bind assists the derail in doing it's work, placing the derail on the opposite rail hinders derailment. Figure 7 shows an incorrect placement.

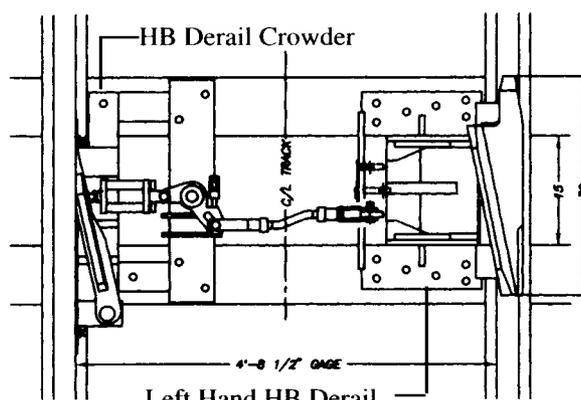


Incorrect Location of Derail on Curve

figure 7

Derail Wheel Crowder:

Special locations where it is absolutely necessary to derail to the inside rail of a curve or where higher speeds are anticipated, Western-Cullen-Hayes recommends the use of the Derail Wheel Crowder, figure 8, which assists derails by crowding the wheels into the throat or entering toe of the derail. This is significantly lower in cost than switch-point and stock rail type derails. Please write for information regarding its application and use.



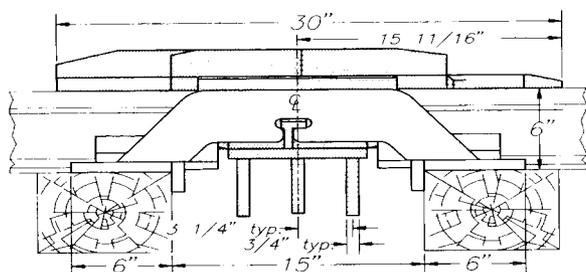
Left Hand HB Derail

figure 8

Installing the Derail:

After determining the location of the derail and selecting the proper size and/or making proper accommodations for the size derail, the following should be reviewed: The ties should be sound and well tamped. Lay the derail in place. Shove the derail guide box against the web of the rail and fasten the guide box down to the ties. The heel end of the derail shoe should overhang a 3 inch rail head by 1/2 inch.

When properly placed the derail block will drop neatly onto the top of the rail at the end of the forward stroke. The weight of the wheel will be carried through the derail block directly to the rail. If this does not occur, readjust the mounting of the guide box.



Rear View of HB Showing
Connecting Lugs and Dimensions

figure 9

Operating the Derail:

Operating and locking connections must be placed at right angles to the rail and in direct line with the movement of the derail block. A standard HB derail has a working stroke of 6-1/4 inches. To have a proper operation, this stroke must not be impeded.

There are HB's that have a special shorter stroke but they have a designation of "SS" affixed to the stainless steel nameplate and the serial number stamped in the top of the deflecting bar of the block.

Lubricate the derail as needed and be certain the guide box and the operating rods are not fouled by trash, ballast, blowing sand, ice or snow.

Inspection and Maintenance.

Derails should be given the same inspection and maintenance that other track and signal devices receive. Whenever the derail is encountered it should be inspected to ensure that all components are sound. The guide box should be securely fastened to the ties and the rail snug against the ties just as advised in the original installation procedure instructions.

The derail should be at a right angle to the rail and the derail shoe covering the rail head and overhanging a 3 inch wide head by at least 1/2 inch. If the efficiency of the derail is questioned please record the model and size derail; the rail section; track configuration; gauge of track; tie condition; vertical distance from top of rail to mounting surface of the derail guide box; also record spiking pattern and if spikes are seated. Each derail block is mated with the guide box. The serial number stamped on the top of the deflecting bar and the number stamped in the stainless steel nameplate on the guide box should match. Send us your findings and we will assist you in getting the results you expect.

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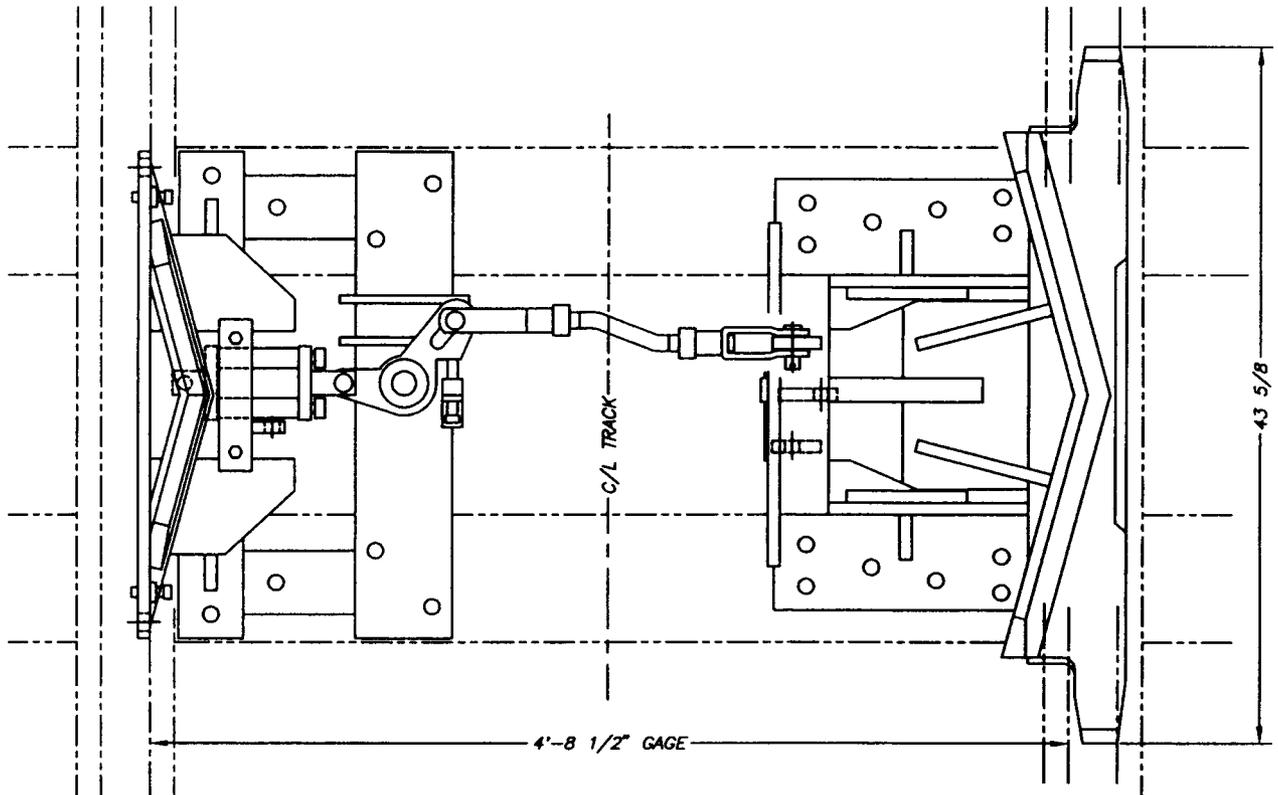


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Bi-directional Derail and Wheel Crowder



The Model HBXS Derail and Model WCX Wheel Crowder are derail products from Western-Cullen-Hayes that are designed specifically for use at locomotive and car repair facilities. Today's heavier and longer railroad vehicles require a different approach to facility protection. Western-Cullen-Hayes consistently recommends the use of single direction derails, but the necessity of derailing rolling equipment from both directions is a reality at some locations. In response, we now offer the HBXS and WCX products.

The Model HBXS and Crowder incorporate the bi-directional capabilities of our earlier designs but add significant length to the derailing block to ensure that today's heavier equipment is safely derailed. The longer derail block and crowder blade provide a bi-directional derail with a deflection angle similar to our single direction derails. Deflection angle is critical to the effective function of any derail devices.

The Model HBXS and Crowder can be retro-fit to any site where a Western-Cullen-Hayes sliding derail is currently in service. They can be used with our Delectric, WCHT-72, ELDO or Solar Tech Power Derail Operators. Model HBXS's can also be thrown with our HRS-100 manual High-Rise Operating Stands.

The HBXS and WCX are manufactured in sizes to fit today's most popular rail sections.

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