



## SLIP-ECCENTRIC VALVE-GEAR

This kit contains parts to construct a set of slip-eccentric valve-gear as used on ROUNDHOUSE locomotives.

It is an inside valve-gear designed for use with an outside framed locomotive and has rocker shafts which transmit the drive to the outside of the frames.

Though it is designed for use with the ROUNDHOUSE cylinder set, any cylinders requiring a valve travel of 1/8" (3.2mm) could be adapted.

1/4" diameter axles are required.

### List of Contents

The kit contains the following parts:-

2 Stop collars.

2 Eccentrics with drive pins fitted.

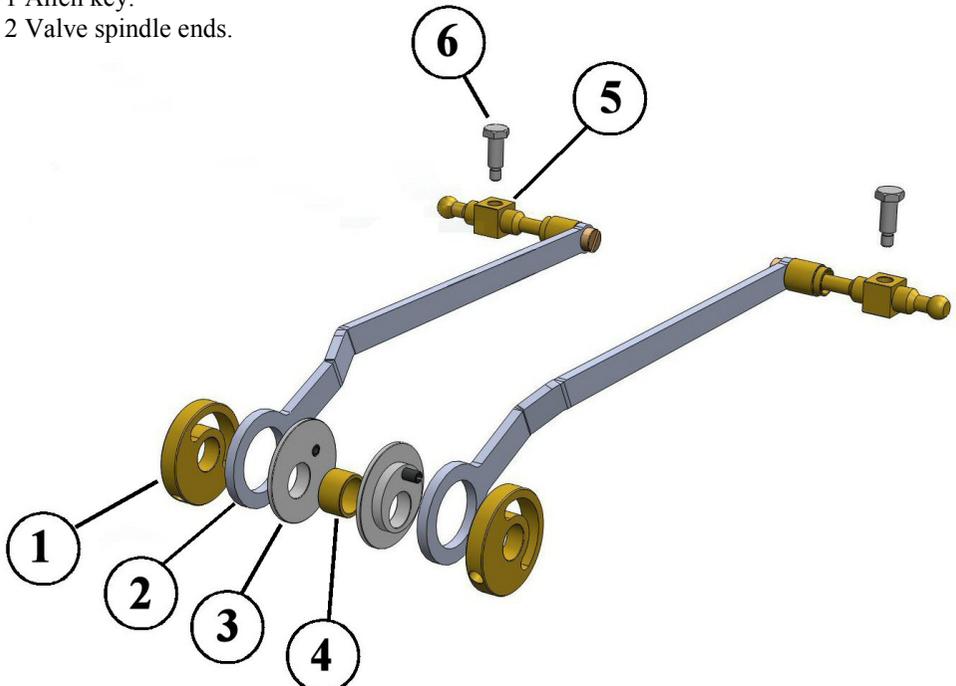
1 Spacer.

2 Eccentric rods (left and right hand) complete with ball sockets and rocker arms fitted.

2 Pivot screws.

1 Allen key.

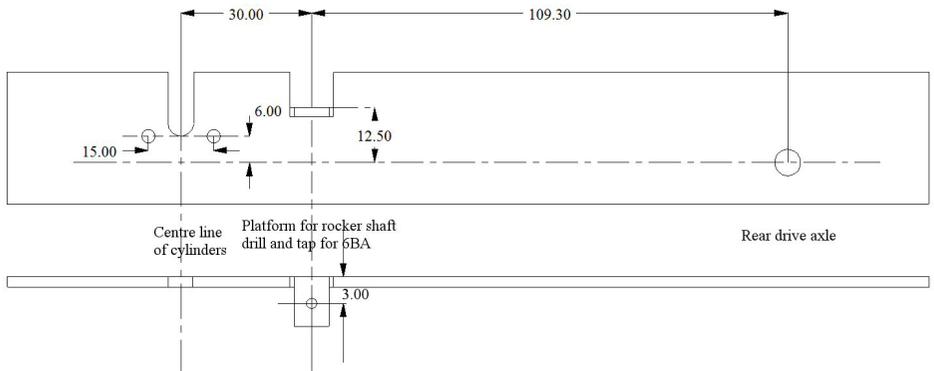
2 Valve spindle ends.



1/ Stop collar.    2/ Eccentric strap.    3/ Eccentric.    4/ Spacer.    5/ Rocker Arm.  
6/ Pivot Screw.

## Construction

If making your own frames, ensure that the rear drive axle, rocker shaft platform and cylinder mounting holes (if using Roundhouse cylinders) are set out as shown in diagram 2.



**Diagram 2**

Assembling the valve gear is simply a matter of sliding the parts on to the axle, in the correct order, as it is pushed through the frames.

Please note that if you are using current Roundhouse driving wheels, the fixing boss on the back of the two drive wheels will require machining down to 3/16" (4.70mm) thick and new grub screw holes drilling and tapping.

The order is as follows -

Wheel, stop collar, eccentric strap (with rocker shaft pointing outwards), eccentric (with pin pointing outward), spacer, eccentric (with pin pointing outwards), eccentric strap (with rocker shaft pointing outwards), stop collar, and finally, wheel.

The pins on the eccentrics should locate in the radial slots in the stop collars and there should just be sufficient clearance between each part for the eccentrics to rotate 180 degrees without binding.

Centralise the whole lot on the axle and lightly nip-up the grub screws in the two stop collars. Do not worry about their radial position at this time.

It is assumed that cylinders are already fitted to the chassis and have been set in correct position. If you are using current Roundhouse cylinders, the valve spindle fork ends will need changing for socket type included with this set. These are a screwed fitting and will benefit from a drop of 'Lockitie' or similar.

Fit the outer ball ends of the rocker shafts into the sockets of the valve spindle ends and fit the pivot pins through the holes in the rocker shafts and into the tapped holes in the platforms. Lightly nip-up pivot pins.

The outer ball end should coincide with the horizontal centre line of the valve spindle. If this is correct, the valve spindle should rotate a small amount around the ball end. If this is not the case, then the rocker arm is probably a little too high or too low. To adjust this, the platform on the chassis can be bent up or down a small amount by tapping with a hammer and punch.

Rotate the wheels and check for free operation without binding.

Check also for the free operation of the slip-eccentric mechanism. As stated previously, the eccentrics must rotate 180 degrees so that the pins can travel the length of the radial slots in the stop collars.

A liberal amount of lubricating oil on all working parts will help.

When you are happy that everything is operating freely, we can move on to setting the valve timing.

## **Valve Timing**

You will find it easier if you concentrate on setting one side at a time.

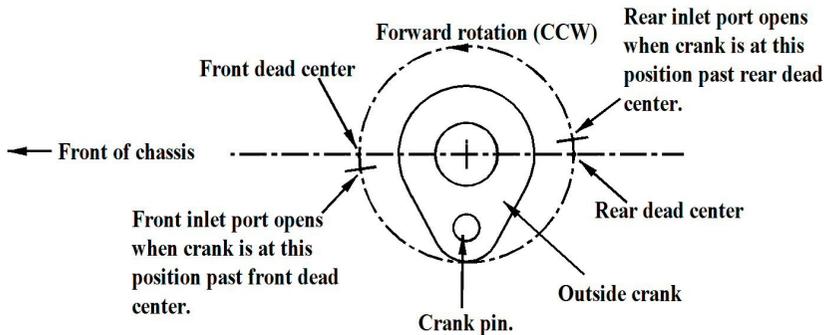
Remove the valve chest cover from the cylinder and replace a couple of screws to hold the valve chest in place. You can now look down into the valve chest and see exactly what happens.

Check the position of the slide-valve on the spindle by rotating the wheels and watching the valve movement. As you rotate the wheels, the valve moves backwards and forwards over the steam ports. There are three steam ports under the valve though you will only ever see two of them, the inlet ports. These are the ports that allow steam to travel to and from the ends of the cylinders. The third port, the exhaust, is always hidden under the centre of the valve and plays no part in the setting.

As the valve moves backwards and forwards, it should uncover both the inlet ports in turn and by the same amount. If it does not, adjust its position by unscrewing the rocker arm pivot screw, lift the rocker arm out of the valve spindle end socket, then screw the valve spindle in or out a little as required. This has the effect of moving the valve along the spindle. For instance, if the front inlet port was opening more than the rear one, then the spindle should be rotated anti-clockwise to move the valve forward along its length. Replace the rocker arm and check the valve movement again. Repeat the operation until equal opening is achieved. Note that when they are opening equally, the ports are not opening fully.

Timing the valves simply means ensuring that the correct port opens at the correct time, so that steam is admitted to push the piston along the cylinder just when it is needed and conversely, is allowed to exhaust up the chimney when it is done its work. The valve timing is controlled by the stop collar on the drive axle.

Rotate the driving wheels in the forward direction until the outside cranks on one side are a little after front dead centre.



**Diagram 3**

Holding the wheels in this position, slacken off the grub screw holding the stop collar on the same side and, whilst looking down into the valve chest, rotate the stop collar on the axle in the same direction. Keep turning the stop collar until the front edge of the front port is just visible (cracking open as it is known) as the slide valve is moving backwards. Gently tighten the grub screw. Rotate the wheels in the same direction whilst watching the valve. The rear inlet port should just start opening as the outside cranks are a little after rear dead centre.

Now rotate the wheels in the reverse direction and check where the outside cranks are when the ports are just cracking open. This should again be a little after dead centre. The idea is to get both ports opening when the outside cranks are at the same position after dead centre in both forward and reverse rotation. All adjustment to achieve this is done by moving the stop collar a little at a time and checking. Make sure that the eccentric is always free to "slip" on the axle as mentioned earlier so that forward and reverse gear are being fully set.

When all is correct, lock up the stop collar grub screw and replace the valve chest cover etc.

Repeat for the other side.

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