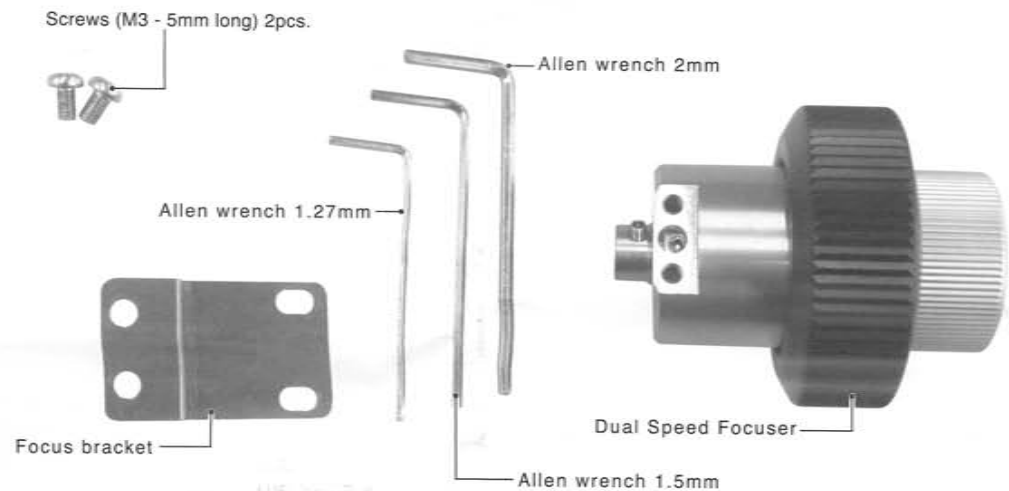


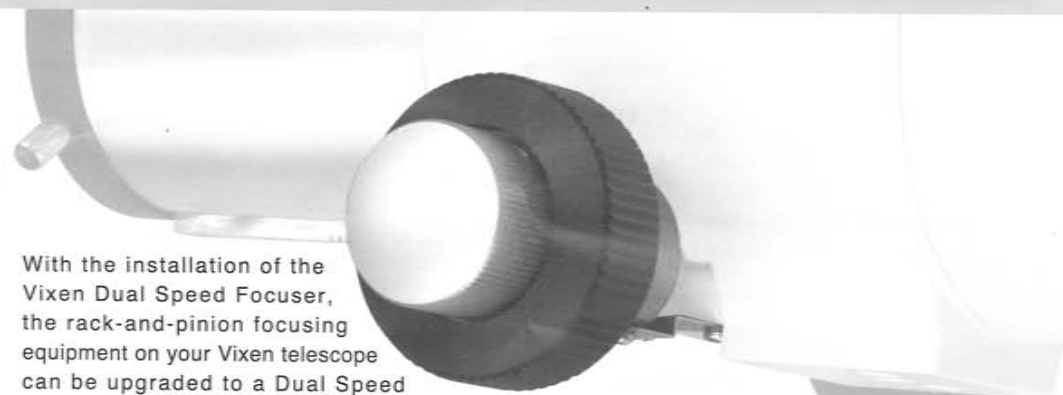
# Contents



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# Vixen®

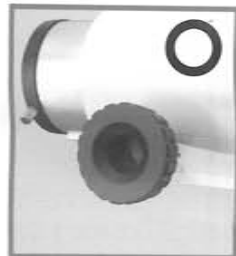
## Dual Speed Focuser Instructions



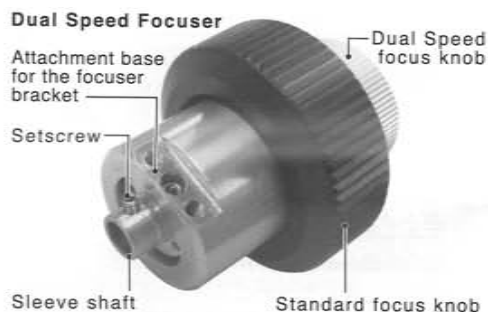
With the installation of the Vixen Dual Speed Focuser, the rack-and-pinion focusing equipment on your Vixen telescope can be upgraded to a Dual Speed Focuser for finer focus adjustments. The Dual Speed Focuser can be retrofitted to the rack-and-pinion focuser by removing one of the focusing knobs attached to it. The Dual Speed Focuser allows 1/7th-speed focusing and it can be attached on either side of the focusing shaft.

### The Dual Speed Focuser is available for the following rack-and-pinion focusers of your Vixen telescopes.

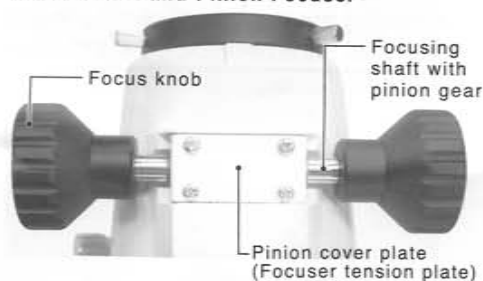
The focus knobs are made of metal.



The focus knobs are made of plastic.



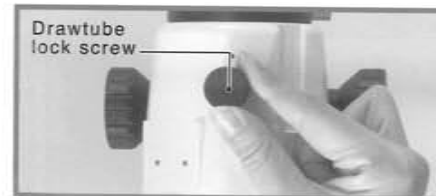
#### ED81S Rack-and-Pinion Focuser



If your telescope has cylindrical plastic focus knobs as shown on the left, you need to exchange the focusing shaft and the knob with new ones. The new focusing shaft and knob will be available separately as optional parts.

## Installation

1. Loosen the draw tube lock screw on upper part of the focuser assembly as shown in the photo.



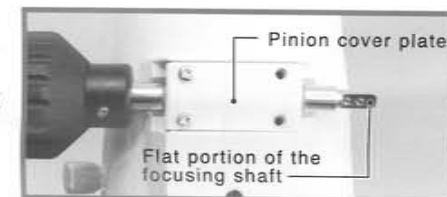
2. Remove one side of the original focus knobs where you want to attach the Dual Speed Focuser. The focus knobs are held on the focusing shaft with two setscrews which



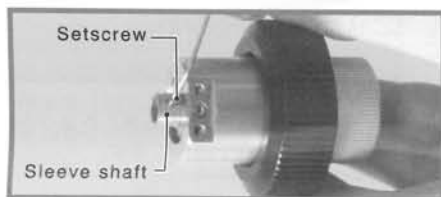
are screwed vertically. Remove the upper setscrew and loosen the setscrews underneath with a 2mm Allen wrench (for metal focus knobs) or a 1.5mm Allen wrench (for plastic focus knobs).

**Take care not to lose the setscrews.**

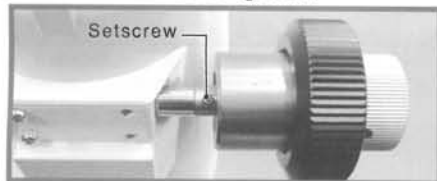
3. Remove two screws on the pinion cover plate covering the focusing shaft. These two screws are on the side where you want to install the Dual Speed Focuser. Take care not to lose the screws as they are used again later. Never loosen another two screws on the pinion cover plate.



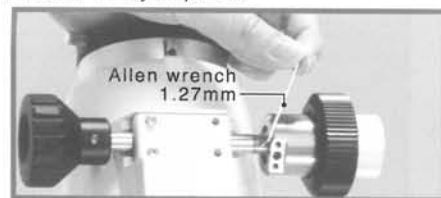
4. Loosen the setscrew of the sleeve shaft on the Dual Speed Focuser with a 1/2inch Allen wrench until the tip of the setscrew no longer extends into the inner diameter of the sleeve.



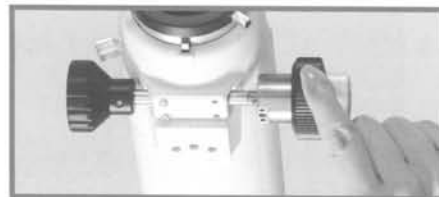
5. Orient the sleeve shaft so that the setscrew is over the flat portion of the focusing shaft. Slide the sleeve shaft on the Dual Speed Focuser over the focusing shaft.



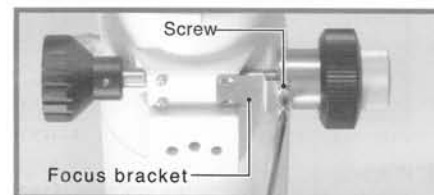
6. Tighten the setscrew to hold the Dual Speed Focuser firmly in place.



7. Turn the standard focus knob so that the attachment base for the focuser bracket on the Dual Speed Focuser is parallel with the level of the pinion cover plate.



8. Attach the focuser bracket to the attachment base with the supplied two screws as shown in the photo. Orient the focuser bracket so that its round screw-holes side fits the attachment base. Insert the screws into the holes and tighten firmly with a Phillips-head screw driver.

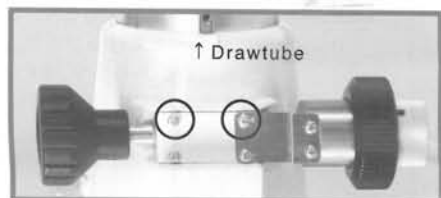


9. Insert the original screws you removed from the pinion cover plate into the oval screw-holes on the focuser bracket and screw down each of them with a Phillips-head screw driver.



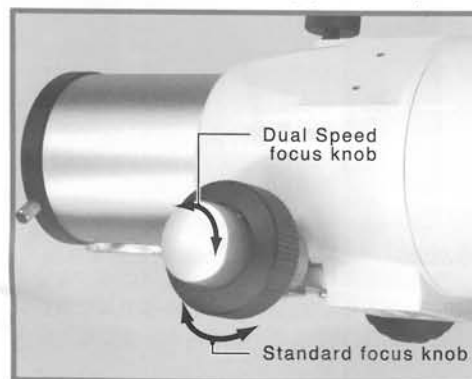
Tighten the screws while you rotate the standard focus knob so that you can make the tension of the focusing appropriate for your operation. You are ready for operating the Dual Speed Focuser.

## Operation



### Shown with the focuser on the ED81S

Bring your object into coarse focus by turning the standard focus knob. The dual speed focus knob allows fine focus adjustment on the object. The dual focus knob is designed to reduce the rotation in the ratio of 1:7 approximately.



### Important:

The pinion cover plate (focuser tension plate) works to push the pinion gear as a leaf spring. You can tighten two screws on the cover plate firmly that are located on the near side of the telescope's objective lens, but the other two screws located on the side of the drawtube are used to adjust the pressure of the pinion gear against the rack gear. Screw down the former screw firmly in place and screw down the latter screw slowly while turning the standard focus knob back and forth until the focusing becomes not too loose or too tight.

### Note:

- The torque (force of rotation) of the standard focus knob will be increased after you install the Dual Speed Focuser. If you feel it is too heavy, readjust the tension of the four screws that are fastening the pinion cover plate (focuser tension plate) in small increments with the Phillips-head screw driver.
- The 1:7 reduction is an approximate with no load. As this is a mechanism using friction, the ratio will be increased as you adjust the rotation of the standard focus knob to be

heavier and/or you attach heavy optional parts to the tip of the drawtube.

- The movement of the dual speed focus knob is limited and it stops turning at ends of its movement. Do not turn the dual speed focus knob with excess force. This will strip the dual speed focus knob and it may cause a failure in the mechanism.
- Do not lubricate the product with grease.
- Do not disassemble the product more than the condition of your purchase of it.
- Do not shock the product and do not put pressure on the product.
- Do not use the product in a wet environment.