



WORKS PERFORMANCE PRODUCTS, INC.  
21045 Osborne St., Canoga Park, CA 91304  
818.701.1010 fax 818.701.9043  
www.worksperformance.com

FKSPG--05/07/2003

## FORK SPRING INSTALLATION AND TUNING TIPS



The perfect complement to Works Performance rear shocks are the dual-rate fork spring sets for street bikes. These adjustable dual-rate fork springs provide a soft initial rate for small bumps and pavement seams, but then "cross over" to a higher rate for potholes and other bad pavement.

Unlike progressively wound springs which have the progression preset into the springs, most of the dual-rate sets allow the rider to choose the point at which the springs go from the soft initial rate to the stiffer final rate. This accommodates various rider weights, riding styles, road or track conditions and personal preference.

### DUAL-RATE FORK SPRINGS

Works Performance adjustable dual-rate fork springs allow the rider to choose the point at which the springs go from the softer initial rate to the stiffer final rate. This is to accommodate various rider weights, riding styles, road or track conditions and personal preference. One set of springs for one fork tube consists of a long spring, a short spring, pre-load spacer material (in most cases), separating washers and three different pairs of metal spacers that determine the "cross-over" point of the spring set. The shortest length causes the spring set to transition later, so the forks remain softer longer. The longest length causes the spring set to transition sooner resulting in the stiffer overall rate. The medium-length spacer provides the best average for most conditions, and we suggest you start with them when tuning the suspension. (See "Selecting the Correct Crossovers" on Page 2.

### SPRING KIT IDENTIFICATION

Works Performance fork spring kits are designated by a series of numbers and in some cases letters. These kit numbers are direct identifiers to the spring set. The first two numbers are the outside diameter of the springs. The second two digits

Continued on next page.

refer to the length of the pre-load spacer in the kit as measured in one-quarter inch intervals. As an example, kit #3408 would be 34mm diameter springs with 2-inch spacers ( $8 \times 1/4" = 2"$ ). Kits with an "H" designation at the end, indicate a heavy spring set designed for certain bikes. The kits are either a "custom kit" or a "universal kit." The type of kit will determine what procedures to follow before installation. A description of each kit follows.

### CUSTOM KITS

Works Performance fork spring kits that are supplied with a number as the last two digits in the part number (i.e. 3408) have pre-cut pre-load spacers included in the kit. This set can normally be installed without modifying any of the parts. Occasionally, manufacturers' mid year specification changes, or supplier changes can invalidate the spacer lengths. It is best to compare the spring stack with the stock springs as shown in the Universal "X" Kits, below.

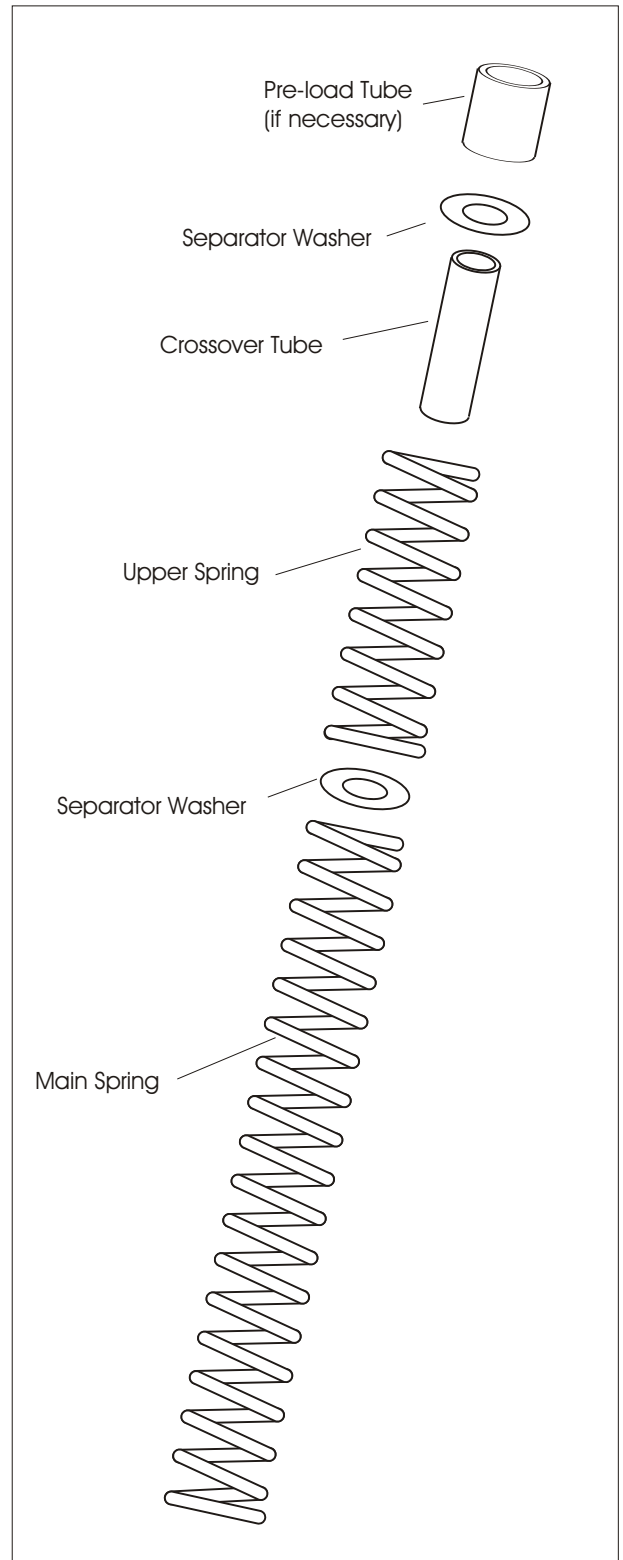
### UNIVERSAL "X" KITS

Kits that have the letter "X" in place of the fourth digit (i.e. 340X) are universal kits that do not include a spacer that is pre-cut to a specific length. If your bike is listed on the application chart with a spacer length, then cut the spacer material to that length with a hacksaw.

If your machine is listed on the chart as an "X", then you'll have to determine the length of the pre-load spacer by comparing the spring sets. Place a stock spring and pre-load spacer -- if any-- on the work bench end to end, just as they came out of the fork tube. Place the main spring, separator washer and upper spring end to end along side the stock spring components. The difference in length between the two spring sets is the length of the spacer that you need to cut from the material supplied. In some cases the stock spacer is the correct length and can be used as is. Keep in mind that in older bikes the springs may have taken a "set" which means that they may be  $1/4$  to  $3/8$ -inch or so shorter than their original height.

### SELECTING THE CORRECT CROSSOVER SPACERS

With the stock springs removed and the pre-load spacers (if necessary) cut to the proper length, the new kit is ready to install. Most dual-rate kits come with tubular metal spacers ("crossovers") of three different lengths. The intermediate length tube is the average spacer for most riders in most conditions. However, if you are substantially heavier, or ride aggressively, or ride on bad potholed roads, you may choose the longest spacer to achieve the highest final rate. Effectively, the fork spring set will transition (crossover) from the soft to the stiffer rate at about  $1/3$  of the fork travel. Conversely, if you are substantially lighter than average, ride casually, or ride on very smooth roads, you may choose the shortest spacer, which allows the softest overall final rate. This set effectively transitions in the last  $1/3$  of the fork travel. (The intermediate length



**Dual-Rate Fork Spring Set**  
Shown is the typical component installation sequence. In some pre-load adjustable forks, the stock pre-load disc should be fitted atop this stack.

Continued on next page.

spacer effectively allows a transition half-way through the fork travel.)

### **INSTALLING THE DUAL-RATE SPRINGS**

Note: No change in the manufacturer's recommendations for fork oil viscosity or capacity is necessary with the Works Performance dual-rate fork spring kit. Since all forks vary in oil capacity and viscosity, you should research your owner's manual or local dealership for the proper specifications if you plan to change the fork oil at the time you install the fork spring kit.

1. Slide the long spring into the fork tube.
  2. Place a separating washer on top of the spring.
  3. Slide the short spring into the fork tube.
  4. Put the crossover spacer (tube) inside the short spring.
  5. Put the second washer on top of the short spring.
  6. Install the pre-load spacer (if necessary).
  7. If you have pre-load adjustable forks install the stock pre-load actuation disc on the pre-load spacer.
- Install the fork cap.

### **DETERMINING CORRECT PRE-LOAD**

Too little pre-load will allow the bike to sit lower, but it may "bottom-out" more easily on bumps and transmit this harshness into the handlebars. Too much pre-load will increase the ride height (and ground clearance) but may cause the forks to "top-out" too easily under acceleration.

The correct amount of settle, or suspension "sag," is based on personal preference, but it should be somewhere between  $\frac{1}{4}$  and  $\frac{1}{3}$  of the total suspension travel. Many street bikes have about 4-1/2 to 5 inches of fork travel. The amount of sag would be approximately 1 to 1-3/4 inch. It is also important that the bike settle equally front and rear to maintain good suspension balance. A shorter pre-load spacer on top of the spring set reduces the amount of spring pre-load and allows the bike to settle more. A longer pre-load spacer increases the pre-load on the spring set and makes the bike sit higher. The pre-load material included in most of the fork kits is schedule 80 PVC tubing that is available from plumbing and hardware stores nationwide.

### **MEASURING RIDE HEIGHT (SAG)**

1. Place the bike on the center stand (or over on the side stand if not equipped with a center stand), so that the fork is fully extended and the wheel is off the ground. Take a measurement from the lower triple clamp to the edge of the fork slider or seal lip.
2. Take the bike off the stand, sit on the seat with as much weight as you can (one foot off the floor, at least) and have an assistant measure from the same two points. Subtract the second measurement from the first and you have determined the amount of sag in the front suspension.
3. To raise the bike (decrease the amount of sag) add pre-load spacer length.
4. To lower the bike (increase the amount of sag) reduce the pre-load spacer length. Roughly, a 1-inch longer spacer will produce 1-inch less sag; and a 1-inch shorter spacer will result in 1-inch more sag.