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#GL15 - 06/25/99

SHOCK MOUNTING & ADJUSTMENT TIPS FOR HONDA GL1500

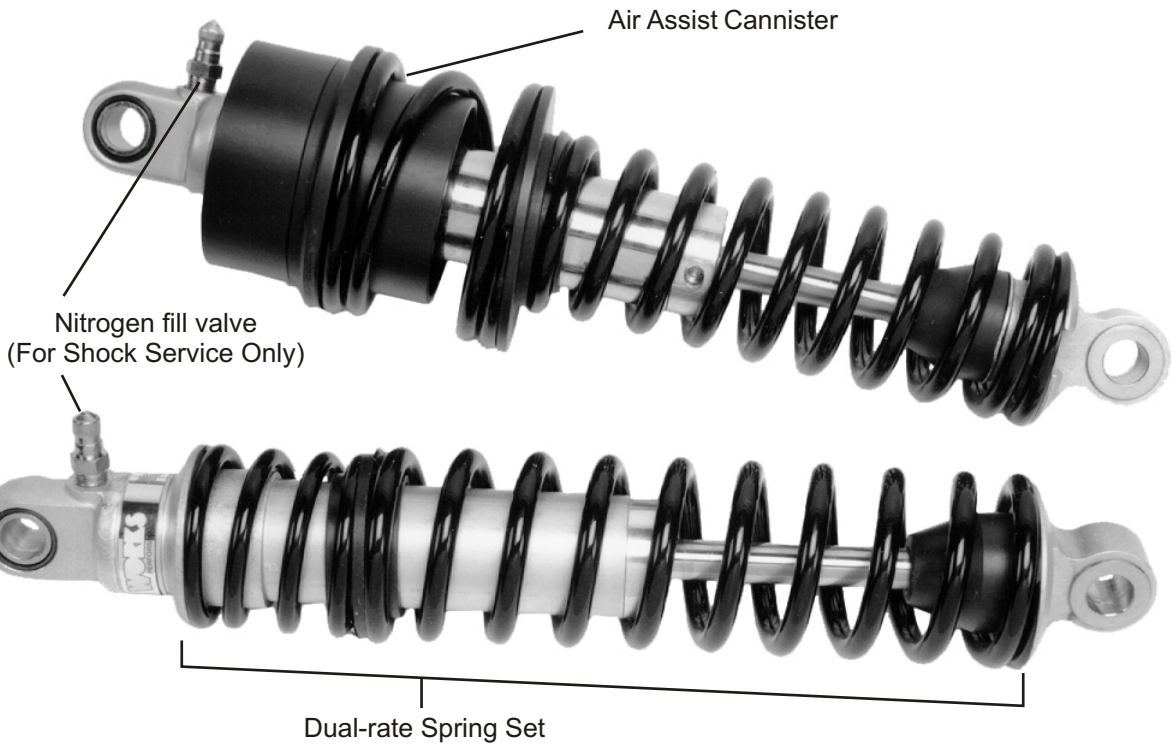

Fig. 1. Works Performance shocks for the GL1500 GoldWing feature an air-assisted shock for the right side and a preload adjustable shock for the left side. The nitrogen fill valves are not part of the adjustments on the shock and are utilized only for servicing the shock at time of overhaul.

Thank you for choosing Works Performance shock absorbers. These simple instructions and helpful installation tips will enable you to enjoy maximum performance for years to come.

CAUTION: Both shocks are pressurized to 250 psi nitrogen. (This should not be confused with the air-assist cannister which is shipped with zero pressure and is pressurized after installation.) The nitrogen pressure is not an adjustable feature of the shock. Unless there is a leak, the shock should not normally lose pressure. If the shock damping becomes soft or mushy (after an extended period of time or number of miles) the shock may need to be serviced, which includes shock oil and a nitrogen charge. In this situation, re-pressurizing the shock alone may not improve the action of the shock. The shock should be returned to Works Performance Products, Inc., or to a qualified shop that has the appropriate tools, training and nitrogen handling equipment. Do not attempt to fill the shock from service station air pumps

GENERAL INFORMATION

Works Performance shocks for the GoldWing consist of a pair of dual-rate spring, nitrogen charged hydraulic shocks. One has an air-cannister crossover system and the other has threaded preload adjustment. The shocks are designed to be utilized with the stock air pump and fittings. These shocks are gas emulsion type and should be mounted with the body up in order to function properly. This is the opposite of the stock or most of the aftermarket shocks available for this vehicle. The

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shocks are re-buildable and can be serviced by the owner, the factory or a qualified service shop.

AIR SHOCK VERSUS AIR-ASSISTED CROSSOVER

The Works shocks for the GoldWing are designed to be a stand-alone, dual-rate sprung pair of dampers. This means that without any pressure at all the shocks will support the weight of the machine, rider and passenger. If there were a pump failure, or other leak-down of the system, this means that you are not broken down at the side of the road or limping along on a half-flat set of shocks. The air system is designed to allow tuning for increases in load or changing road conditions.

The Works air-assisted shock is not a typical air spring shock, wherein the air is utilized for a large percentage of the spring rate that suspends the bike and riders. Normally with a typical air spring shock, fairly high pressures are necessary to make the shocks work for regular weight riders and loading. These high pressures cause the pressure seals to naturally exert more lip pressure on the seal sliding surface. This pressure on the seal causes the action of the shocks to feel “sticky.” This is known as “stiction.” This is felt on the bike as an initial stiffness that then “breaks away.” High pressures also create spring rate changes when the ambient air and shock temperatures change.

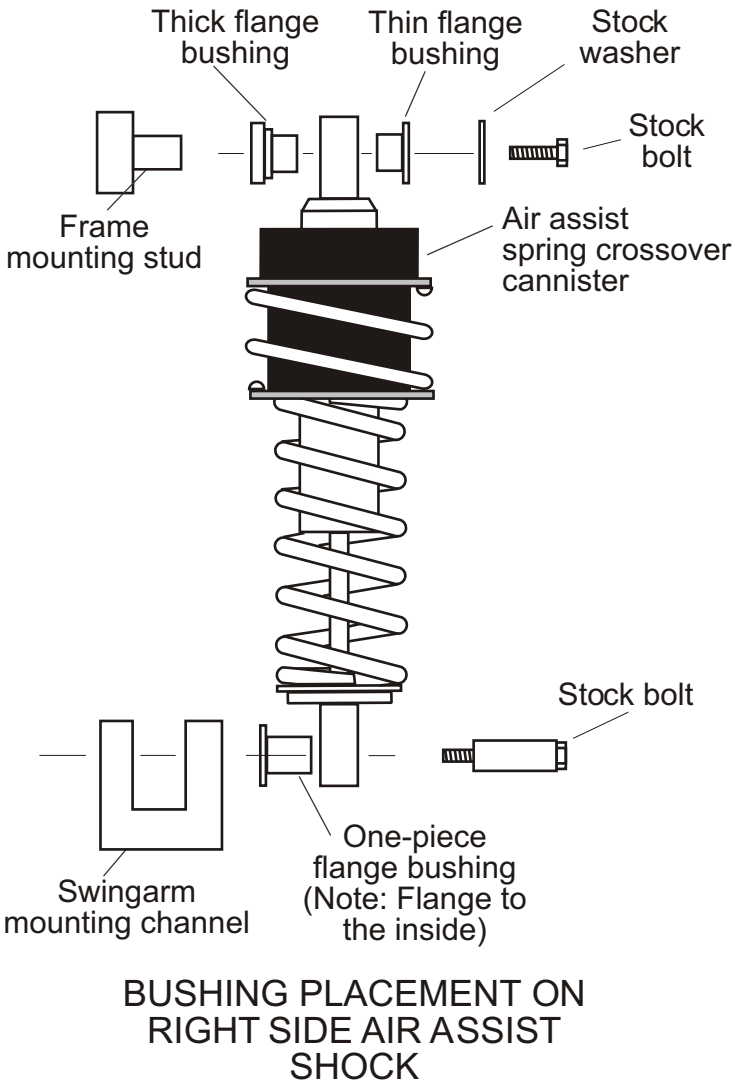

Fig. 2. Bushing positions on the right side air-assist shock. The view is from the rear of the bike. The thick flanged upper bushing is positioned inboard of the shock eye.

The Works air-assist cannister is designed to work with the dual-rate spring set. Dual-rate springs are just that-- a spring set with two separate rates. This is done with a short spring stacked on a longer spring. As both springs collapse they produce a soft, or initial, rate. The spring set will maintain this initial rate until the short spring stops compressing. At that point, the spring rate “crosses over" to the stiffer-- or final-- rate. This dual-rate system allows a soft initial rate for comfort on small bumps, but has the capability of soaking up the big pot-holes and other road hazards.

When the air cannister is pressurized, it changes the crossover point of the dual-rate springs on that shock. The air is used to fine-tune the ride, ride height and load capability. Depending on the rider/passenger load, an average rider may only run 8 to 30 psi under normal conditions with a passenger. Some riders may not use any pressure at all. Others may only want to increase the pressure when the road gets really choppy.

INSTALLATION TIPS

The shocks will bolt right on without requiring any modifications. However, if you have modified the area around the shock mounts on the frame and swingarm, or added any accessories that change the clearances around the shocks, it is imperative that you examine your particular motorcycle for any interference with the shocks throughout the suspension movement.

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The air assisted shock is intended to be mounted on the right side (riders orientation) of the bike. Refer to Fig. 2 as a guide to proper mounting. The shock with threaded preload adjustment is designed to be fitted on the left side of the bike. See Fig. 3 as a guide to proper mounting. The high strength, high rotation bearings at each end of the shocks are fitted with slip-in bushings. The top shock eye is fitted with a two-piece bushing set. There is one thick and one thin flanged bushing. The thick-flanged bushing has a relief machined into the back of it to allow clearance to a flared portion of the upper chassis shock mounting stud. The thickness of the spacers relates to the appropriate mounting alignment of the shock. The lower shock mounting eye is a one-piece smooth bushing. The air cannister shock should be positioned with the air hose port toward the back of the bike. The nitrogen fill valve can point in either direction.

NOTE: The shock bushings are designed to have a certain side-to-side “float” to keep them from binding. As a result, do not grind or file the inner or outer edges of the bushings to make them narrower. The amount of "float" in the bushing set is necessary to ensure smooth operation of the damper assembly. If the shock eyes are tightened metal-to-metal (the outer faces of the eyes to the flanges) this will lead to a harsh, stiff or choppy ride and premature seal leakage.

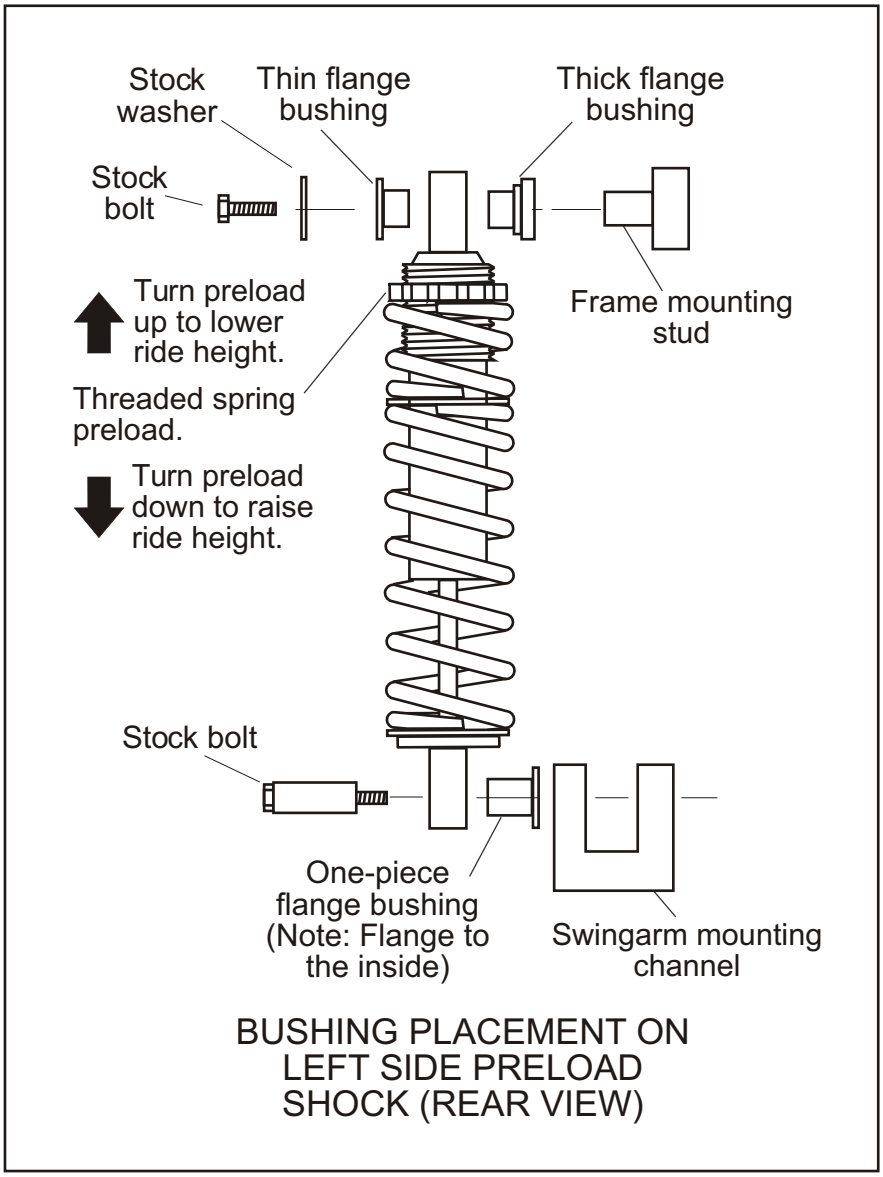

Fig. 3. Bushing orientation for left side shock with threaded spring preload. No lubrication is required for these bushings.

INSTALLATION TIPS: (1) Install the thick flange bushing on the stud first, and position the shock so that the lower eye is over the mounting channel on the swingarm. Then push the eye over the bushing. (2) Leave all the mounting bolts finger tight until both shocks are installed. (3) Sparingly apply a thread locking compound to the threads on the shock mounting fasteners and tighten them to the manufacturer’s torque specifications. Over-tightening the fasteners can damage the bushings and cause the shock to bind. This results in harsh, choppy performance and premature seal failure. (4) If you encounter an excessive amount of play on the lower bushings, it may be necessary to replace the lower shock mount bolts. In the design Honda has chosen, the bolt does not “capture” the shock bushings as in most designs. This means that the bolt acts as a bearing surface and can be worn undersize. (5) Before installing the bags and body work, fit the seat in place and set the ride height appropriately for the solo rider. This is done with the threaded preload on the left side shock. See below for details on the preload adjustment and checking the ride height.

PRELOAD ADJUSTMENT-- DO THIS BEFORE YOU INSTALL THE BAGS AND BODYWORK!—

Threaded preload is standard on the left side shock. This allows the adjustment of the ride height of the motorcycle. The preload is changed by turning the threaded nut down towards the spring (higher ride height) or up away from the spring (lower ride height). The nut is a right-hand thread. It is used primarily to set the ride height for solo riding, as the air-assist feature would be employed when adding a passenger or extra weight.

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CHECKING RIDE HEIGHT—

1. With the bike unloaded on the center stand and the shock fully extended, have an assistant measure from a point at the axle (center point) to a point on the frame, fender or bodywork directly above it. Record this measurement.

2. With the bike off the stand and the rider in the seat, bounce on the suspension and let the bike settle. Have the assistant measure from the same two points. Subtract the second measurement from the first.

3. For models equipped with the stock length shock, the difference should be between 1-1/4 inches (minimum) and 1-5/8 inches (maximum). The amount of settle, or “sag” is a function of the wheel travel. It should normally be between 1/4 and 1/3 of the total travel. The amount of sag is also a rider preference issue.

4. If the difference is less than the minimum, reduce the spring preload. Measure the distance again starting with Step 2. Adjust again if necessary.

5. If the difference is more than the maximum, increase the spring preload. Measure the distance again starting with Step 2. Adjust again if necessary.

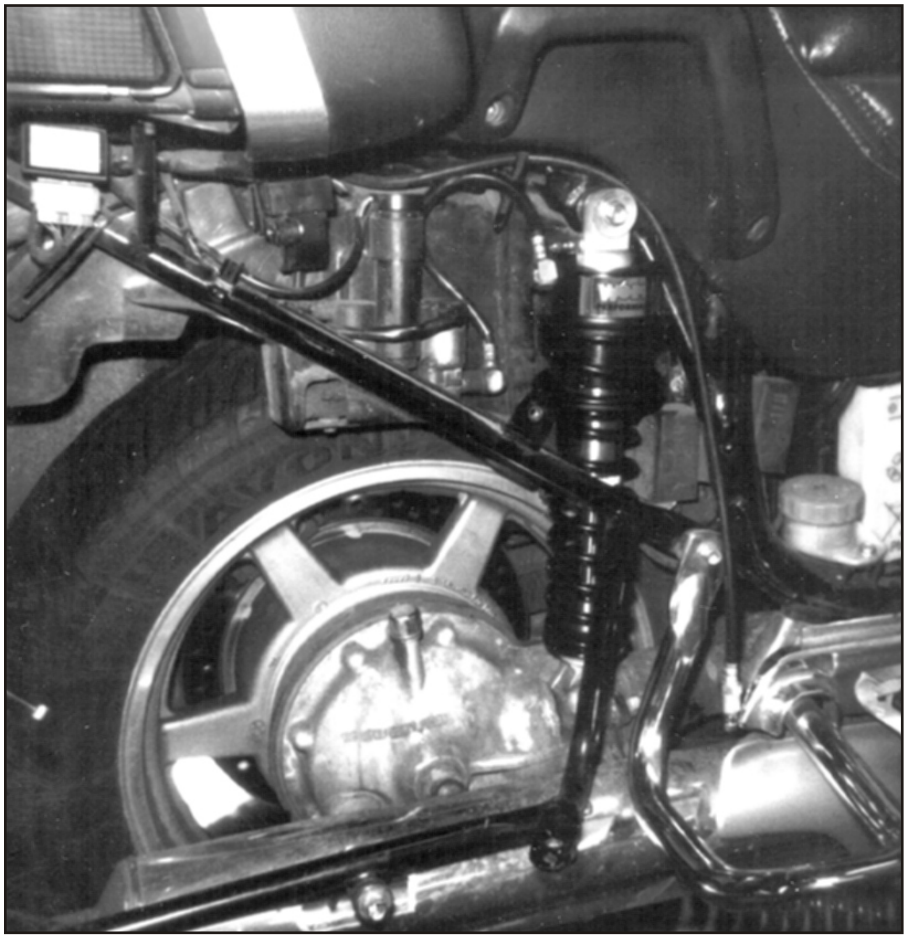

Fig. 4. The standard hose is attached with the stock banjo bolt and sealing O-ring. If you have are replacing an aftermarket system with two air shocks, remove the hose from the splitting tee before attaching to the cannister.

Note: If the ride height is too low, the shock will bottom unnecessarily, resulting in a harsh ride. If the ride height is too high, the shock will “top out” too easily when rebounding from a bump or under hard deceleration.

NITROGEN PRESSURES IN EMULSION SHOCKS

CAUTION: The pressure in these shocks cannot successfully be checked. Concerns with the gauge volume and the gas volume in the shock body create a situation where you cannot accurately determine what pressure was in the shock. In addition when the pressure is lowered (i.e. checking the pressure) the gas and some of the shock oil escapes into the gauge. It is possible to lose a large percentage of the shock oil by depressing the core of a charged shock to the atmosphere.

Please note that in order to check the pressure, some of the gas must escape and fill the gauge assembly. The volume of the gas pocket is about half the size of your thumb, so a very small volume change results in a large pressure drop. Because the gauges' volumes vary, it is not possible to deduce the actual pressure in the shock prior to attaching the gauge. Therefore it is imperative that any attempt to check pressure be accompanied by the capability of refilling the shock. In other words: If you don't have a nitrogen source handy, don't check the pressure!

PRESSURIZING EMULSION SHOCKS

The pressure setting for Works gas shocks is 250 p.s.i. of dry nitrogen. To pressurize a shock with some residual pressure in it, bring the gauge manifold up to 250 p.s.i. and depress the core with the T-handle. This will either equalize the pressure or refill the shock without transferring oil from the shock into the gauge assembly.

The best gauges for this purpose screw on to the valve and incorporate a T-handled core depressor to isolate the shock from the gauge. This allows a leak-free separation once the desired pressure is reached. For simplified operation, an

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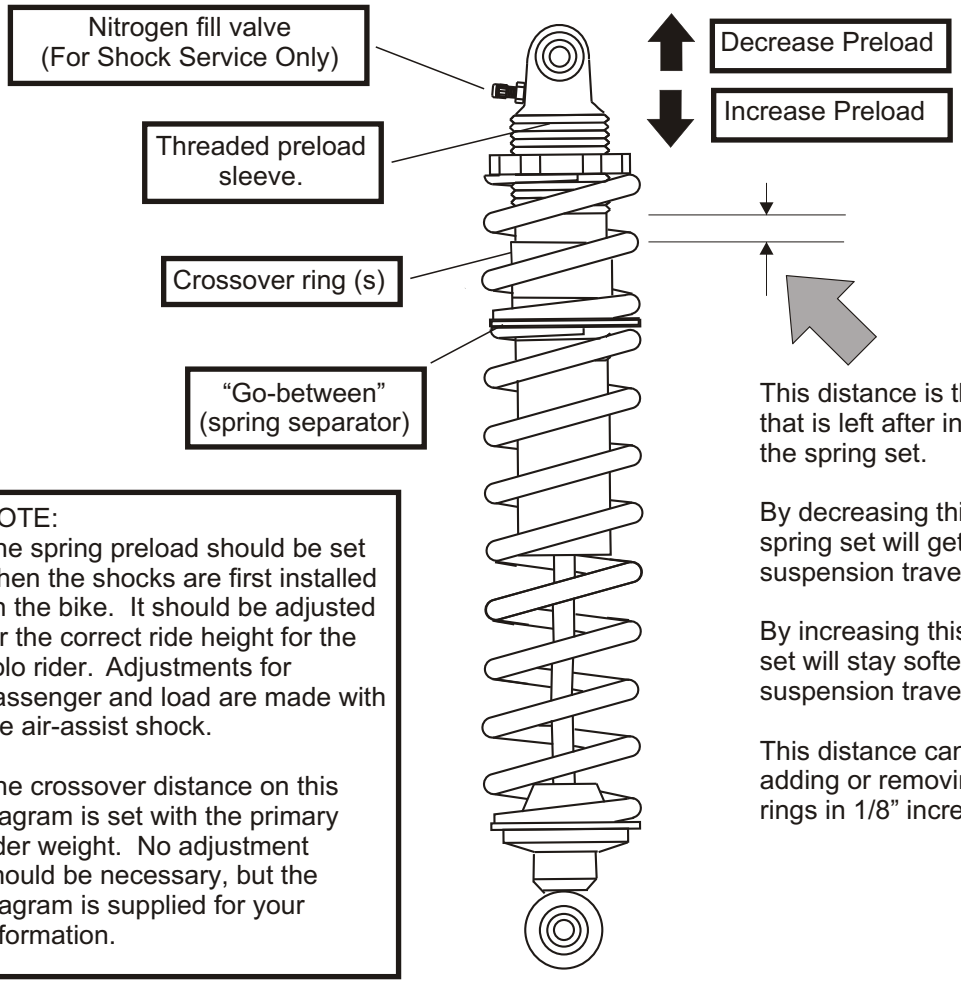
Threaded Spring Preload and Crossover Diagram for Left Side Shock



This distance is the crossover space that is left after installed preload on the spring set.

By decreasing this distance, the spring set will get stiffer sooner in the suspension travel.

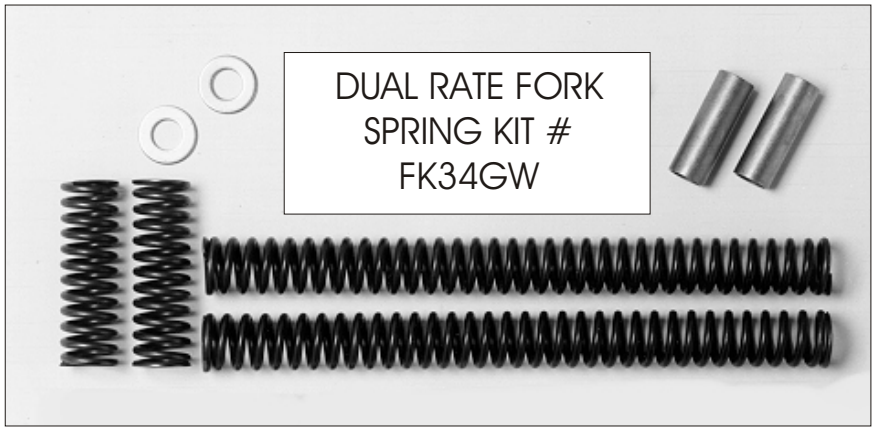
By increasing this distance, the spring set will stay softer longer in the suspension travel.

This distance can be changed by adding or removing the crossover rings in 1/8" increments.

NOTE:
The spring preload should be set when the shocks are first installed on the bike. It should be adjusted for the correct ride height for the solo rider. Adjustments for passenger and load are made with the air-assist shock.

The crossover distance on this diagram is set with the primary rider weight. No adjustment should be necessary, but the diagram is supplied for your information.

extra valve is provided for the filling apparatus, allowing pressure adjustment with the gauge in place. Works offers a suitable gauge for $89.00. Most motorcycle shops that deal with dirt bikes can pressurize the shock.



DUAL-RATE FORK SPRINGS

Like the dual-rate springs on the shocks, Works Performance 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, these dual-rate sets can be tuned 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. One set of springs for one fork tube consists of a long spring, a short spring, preload spacer material, separating washers and a pair of metal spacers that determine the "cross-over" point of the spring set. Part # FK34GW fits all GL1200 and GL1500 Honda GoldWings.