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THE WILDERNESS TRAIL BIKES GREASE GUARD ™ SYSTEM

Wilderness Trail Bikes has applied for United States and foreign patents on a componentry system incorporating bearing protection called Grease Guard, which is equally effective with cup and cone or cartridge bearings. This system effectively solves the problem of bearing wear in bicycles due to contamination.

We proudly introduce the Wilderness Trail Bikes Grease Guard Hubset as part of our full line of WTB Grease Guard bicycle components which includes the Grease Guard Bottom Bracket, Headset, and Geoser Grease Gun. The design, materials, precision machining and care of assembly in the WTB Grease Guard Hubset are unequaled. Its performance combined with the revolutionary WTB Grease Guard Bearing System is setting new standards of excellence for components on all-terrain and touring bicycles.

Following is an explanation of what the WTB Grease Guard System is and how it works:

Active cyclists know how quickly the bearings on a bicycle can rust, wear, and degrade to the point where they require adjustment or replacement. Too much time and expense has been required to maintain the bearings on an actively used bicycle, especially one used under all-weather conditions. Improved bearing seals have helped to solve the problem but their effectiveness is limited. No matter how good the bearing seals are on any given component, water and contaminants always find a way in and begin doing damage.

A common example of seal failure is found when the bike is at ambient air temperature and is then brought in contact with cool water, (rain, stream crossings, and wash water are typical). The cooling effect of the water causes the air in the bearing cavities (3) and nearby tube chambers (4) to contract which in turn sucks water and abrasive contaminants past even the best seals into the bearing. This situation is common on all bikes and demonstrates why seals alone have not provided adequate bearing protection.

HOW GREASE GUARD DIFFERS FROM COMMON GREASE SYSTEMS

The idea of simply filling the whole cavity between the bearings with grease is not new. It has been around for decades on motor vehicles, farm equipment, and industrial machinery where there is plenty of power to spare.

Wilderness Trail Bikes has designed a new bearing lubrication and protection system especially designed for bicycles. It differs in several important ways from the older, less efficient systems.

LESS FRICTION FROM GREASE SHEAR IN THE GREASE GUARD SYSTEM:

Bicyclists don't need more friction, they need less. A normal cyclist has only about one-quarter to one-half of a horsepower at his or her disposal. Unlike motor vehicles, cyclists can't afford to waste their output overcoming excess friction. With the Grease Guard System, which is designed especially for bicycles, the inner Grease Guard seal barely contacts the moving parts during use. Only during greasing does it contract around the axle or steerer to prevent leakage of grease between the bearings. The result is extra-low bearing friction, and exceptionally long life.

The cruder systems fill the whole cavity which causes large amounts of grease to constantly be "sheared" as the parts turn. Your precious energy goes into churning grease which is akin to turning the handle on an ice cream

maker, especially on cold days. This is fine for motor vehicles with lots of horsepower to waste but not for bicyclists.

GREASE GUARD INSURES UNIFORM CLEANING AND REPACKING:

WTB's Grease Guard System is very different from the cheaper "stone age systems". It is designed by people who care enough to do it right. We believe that each bearing must be independently lubricated. Grease Guard prevents air voids or grit from being left in either bearing after greasing. This reduces bearing wear and makes it harder for contaminants to re-enter the bearing. With Grease Guard the grease flows through each bearing uniformly from the inner protected side to the outer exposed side. In cruder systems one of the two bearings usually does not get adequate grease due to pressure variations. Where the contamination is worst within the bearing is where the most resistance to fresh grease will be. The other systems fail to put the grease where it is needed most.

WEIGHT:

Considering the effort and expense bike builders and users put into having light and efficient bikes, adding a pound or so of grease to the frame doesn't make sense. It may not be noticed by novice riders but it is unacceptable to most experienced riders. *Grease Guard puts grease only in the bearings.*

PATENTED AND LICENSED BY WTB

The seal designs which produce these differences are significant improvements over previous technology. Wilderness Trail Bikes has obtained a U.S. patent on these advances and has patents pending on additional designs in the U.S. and foreign countries. The benefits of the Grease Guard System are available only from WTB and SunTour who has been granted exclusive license to manufacture Grease Guard Compenents.

USE *ONLY* WTB GOOSE GREASE IN YOUR GREASE GUARD COMPONENTS

Original WTB Goose Grease is engineered to insure optimal performance in Grease Guard Components. Special additives and microscopic Teflon in Goose Grease provide exceptional water resistance and corrosion protection. The tiny particles of Teflon actually combine chemically with the surface of the bearing metal under pressure to form a super slippery coating that helps eliminate corrosion.

Conventional greases can cause the outer bearing seals to dislodge from excess viscosity. Other greases can react chemically with the inner Grease Guard Seals causing swelling which leads to excess friction or leakage. Some common bicycle greases can also react with water to form weak acids which corrode the bearings.

Goose Grease is unusually low viscosity for two reasons. For low friction and because the bearing is filled frequently. The high friction, high viscosity greases which are normally used for long duration service are not needed or wanted in the Grease Guard System.

Only by using Goose Grease in your Grease Guard Components are you assured of proper function and warranty protection. Using other greases can result in malfunctions and will definitely void the WTB warranty.

Each bearing in the Wilderness Trail Bikes Grease Guard Hub has a small ball-check grease fitting. If your hubs get wet during a ride, the bearings should be greased immediately upon your return. Also, grease them if they get wet during hose cleaning. First clean the fitting with a Q-Tip, check to be sure there is no grit in the depression of the fitting and then inject grease with the Wilderness Trail Bikes Gooser. Before using the Gooser, to be sure that the tip is clean, pump a small amount of grease out. You should pump enough Goose Grease through each bearing to push the dirty grease out and fill it with clean grease. The amount varies according to how dirty or wet it got and how long it has been since the last greasing. Grease with slow, even pumps; until clean grease appears from the bearing. You can clean the bearing with less grease by rotating the axle while pumping the grease. This is the preferred method. The skewers must be loosened to accomplish this. Removing the wheels makes the job easier.

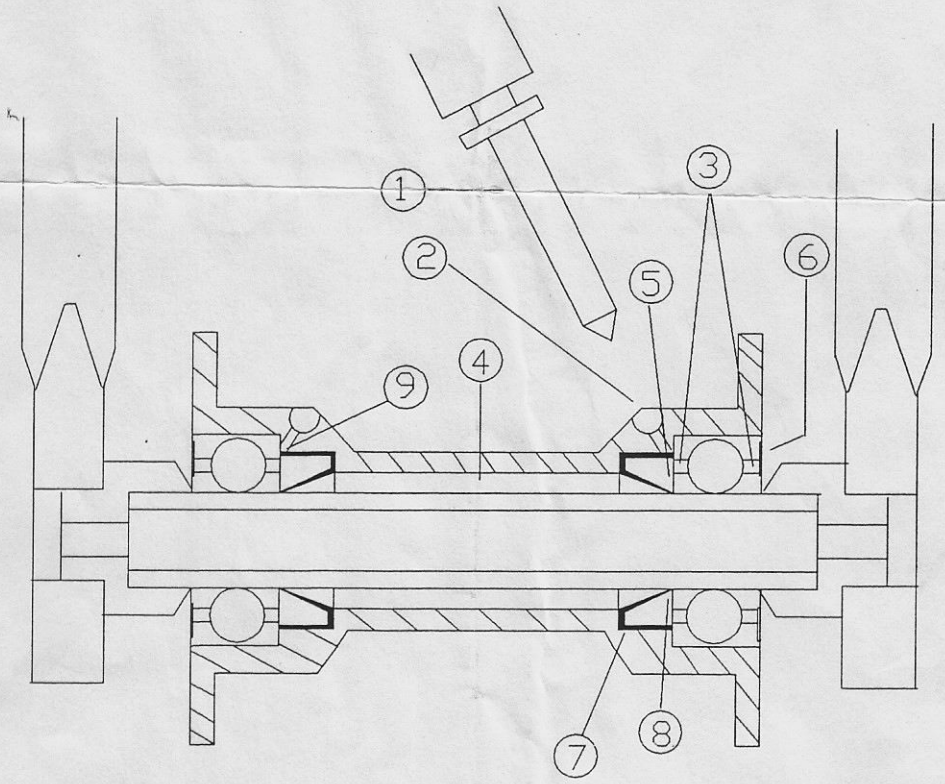
In dry weather the hub bearings need lubricating less frequently. The idea is to keep the grease that is in them clean. In dry, dusty conditions, once very 50 miles is enough to insure maximum bearing life. The freewheel side hub bearing is more protected than the others. It can be greased about one third as often as the other hub

bearings in dry conditions only. Purge each bearing until you see clean grease. Then wipe away excess grease after greasing, being careful to keep it off the rims.

HOW WTB GREASE GUARD WORKS

The following example illustrates one of the proprietary WTB Grease Guard seal designs. In the Grease Guard hub shown, the grease begins flushing from the inside edge of the bearing (5) and moves through the bearing and then under the outer seal (6), pushing contaminants ahead of it and filling the bearing with fresh clean grease. Some Grease Guard components use a flexible seal (7) which makes *minimum contact* with the axle mating surface (8) until actual greasing takes place. Only during greasing does hydraulic pressure cause the seal to squeeze around the axle, positively forming the inner seal which prevents grease leakage into the chamber (4) between the bearings.

Wilderness Trail Bikes Grease Guard Hub Cutaway View



1. WTB Gooser and Goose Grease for injecting lubricant through the aircraft ball check valve in hub shell

2. Aircraft ball check valve

3. Bearing Cavities

4. Tube Chamber

5. Inside edge of bearing

6. Outer seal

7. WTB Grease Guard plastic elastomer seal

8. Minimum contact area

9. Flapper valve

The WTB Grease Guard components give you control over bearing wear in your bicycle. There is a definite satisfaction in being more self-reliant. WTB Grease Guard components are designed to help you spend less time and money replacing worn out bearings or paying someone else to do it. We believe our new Grease Guard Hubset is the best available and we appreciate any feedback from our customers and fellow enthusiasts.