

TAIMI's TECHNOLOGY EXPLAINED

Taimi has developed and patented a technology that overcomes the weaknesses present in the ordinary ball bearing design swivels.

HOW CAN TAIMI PRODUCTS ELIMINATE THESE MAJOR PROBLEMS? WITH SIMPLE, YET VERY EFFICIENT MECHANICAL CONCEPTS!

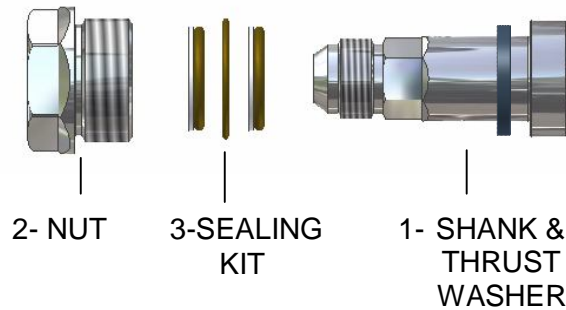
Here are the seven benefits of the Taimi design:

- A- BETTER WEAR RESISTANCE
- B- BETTER SIDE LOAD RESISTANCE
- C- NO DISMANTLING (INCLUDING ASSOCIATED DOWNTIMES AND OIL SPILLS)
- D- FEWER HYDRAULIC LEAKS
- E- QUICKER, CHEAPER AND EASIER MAINTENANCE
- F- WORKS WELL UNDER HIGHER PRESSURE
- G- POSSIBLE INTEGRATION INTO MANIFOLD DESIGNS

The following explains how each individual benefit will help make your life easier, help reduce downtime and operate your machine safer.



We will first explore the different components integrated into the Taimi **"Ball-Less"** swivel design, which provides such excellent results.



Our exclusive shank-nut assembly (cartridge) is key to the effectiveness of our design.

1. The long span of the shank will allow for optimal load distribution. This shank is inserted through the bottom of the nut. The slick thrust washer is built out of a low friction self-lubricating polymer yielding very high performance shock absorption characteristics.
2. The sturdy nut will securely fasten the rotating shank to a housing, a block or a manifold, and prevent it from ever dismantling during operation.
3. Superior sealing is achieved in two stages; first by contact under pressure between the thrust washer and the nut, and then by two (2) sets of oversized Viton o-rings and backups, completing the assembly for unmatched reliability.

We will now explain each benefit of the Taimi design:

A- BETTER WEAR RESISTANCE

Class leading contact surfaces and the long span of the shank allow our Swiwells to better absorb and distribute the energy and shocks transferred from hydraulic fluid and outside loads. The contact surfaces inside the Taimi design are big and well cushioned by a shock absorbing thrust washer. This is the reason why the Taimi Swiwell will outlast all ball bearing products.

Ball bearings have lower load capacity due to the smaller contact area between the balls and races. In an ordinary swivel, the entire load is supported by the hair thin arcs of the ball bearings; both the balls and the races will wear out quickly.

This wear will increase the torque needed for rotation and could even bring the product to failure, jamming the initial free rotation of the swivel. This will have a direct effect on hydraulic hoses creating torsion and reducing their lifetime.

B- BETTER SIDE LOAD RESISTANCE

The side loads which often go unnoticed in hydraulic applications are the worst enemy to any swivelling product. The huge contact surfaces and the long span of the shank of the Taimi design which yield better load distribution are the reasons why our Swiwell products efficiently support side loads.

Inside ball bearing design products, the energy transmitted from side loads will be absorbed by the very small contact surfaces of just a few ball bearings in position when loads are applied.

Furthermore, swivels are usually not submitted to constant pressure and continuous rotation that would help distribute the loads equally. The rotation is often confined to the same 5° to 45°, causing excessive wear to ball bearings located in those areas. This excessive wear will have a direct effect on the ease of rotation; the balls gradually becoming out of shape, creating more and more resistance.

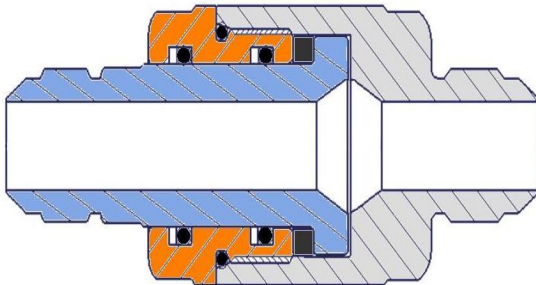
C- NO DISMANTLING (INCLUDING ASSOCIATED DOWNTIMES AND OIL SPILLS)

The design of the shank, and the way it is pushed through the bottom of the nut before being assembled to the housing, make this assembly impossible to pull apart in operation.

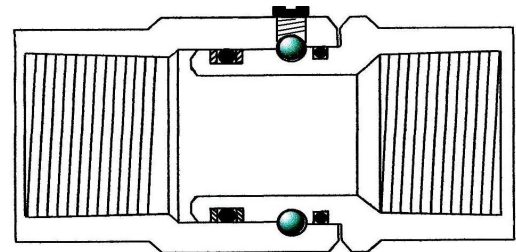
In opposition, the gradual wear to ball bearings and races in an ordinary swivel will create an increasing play between components.

That play alone can create a leak, but even worse, when the wear becomes excessive, the diameter of the ball bearings will be reduced to a point that, when a hydraulic pressure peak or a sudden pull on the hose occurs, the worn parts will not keep metal parts assembled.

The ordinary swivel will then suddenly pull apart, creating a safety hazard, a costly downtime, and often a heavy oil spill, sometimes reaching up to 40 gallons in larger hose diameters. This spill will have to be cleaned and the oil in the reservoir will also have to be replaced, increasing operation costs even more.



TAIMI SWIWELL



ORDINARY BALL BEARING SWIVEL

D- FEWER HYDRAULIC LEAKS

Better wear resistance, better side load resistance, high pressure design and no pulling apart means fewer hydraulic leaks, less downtime, cleaner and safer hydraulic systems, reduced oil consumption and more money in your pocket. Fewer leaks also means less oil in the environment !

From its initial installation, a ball bearing design swivel will be sensitive to hydraulic fluid leaks. This is mainly because the basic design provides inefficient performance particularly at pressure higher than 3,000 psi.



E- QUICKER, CHEAPER AND EASIER MAINTENANCE

Maintenance is a huge hurdle for the end users. When you are out working, you want your equipment to work efficiently with minimal downtimes.

Taimi has a replacement factor of up to 1:10 compared to standard ball bearing design products. The reality is that you will not have to replace or even service our products for a very long period.

Our Swiwells will not let you down. Because they will not dismantle in operation, they will never require emergency maintenance. You will never be down again because of a swivel.

But nothing is forever. When they do start seeping, servicing is done in a snap. No balls to fumble with! It takes less than five (5) minutes to replace inexpensive seals on our Swiwells. A huge benefit when every minute counts !

In comparison, the lifetime of ordinary ball bearing design swivels are relatively short and when you spend time replacing one ordinary swivel, your time is not being used productively.

Their seal kits are expensive and difficult to work with (removing at times a damaged set screw from housing, removing greasy worn balls from a small hole and having to replace them, one by one...).

It is in fact so difficult to service these products, that people will usually replace them when they leak. A very short service life equals a very expensive product!

F- WORKS WELL UNDER HIGHER PRESSURE

All products developed by Taimi can withstand the high hydraulic pressures of today's equipment. Our Swiwell sizes 06 to 16 are rated for 6,000 psi (410 bar) working pressure.

Furthermore, cycling pressures and vibrations create a hammering effect inside the swivel. These will not damage the thrust washer, which has better shock absorption characteristics than hardened steel ball bearings.

Most ordinary ball bearing swivels are not designed to work over 3,000 psi. Some are rated for higher pressure, but will most likely not perform very well.

The hammering effect of cycling pressure and vibration will damage balls and races quickly.

A large number of new hydraulic equipment is now equipped with systems developing pressure of 4,000 – 5,000 psi and even higher.

G- POSSIBLE INTEGRATION INTO MANIFOLDS, PUMPS, CYLINDERS AND MOTORS

The Swiwell cartridges have been initially designed to be integrated into manifolds. They simply screw in, and come out of the manifold as a very short and sturdy swivelling coupling that will endure heavy side loads and allow for an effective and long lasting connection between a static (manifold or block) and a dynamic component (hose).

As previously described, ball bearing designs are usually not appropriate for side load applications.

If an ordinary swivel is installed in a manifold, it will be fixed into a metal block. In this configuration, it will usually have to carry more side loads than if it had been installed in-line.

These products will have a very difficult time in those conditions, and in a short period of time, they will fail. No matter which ball bearing product you install in these conditions, it is just a matter of time before it leaks, seizes or even dismantles.

