

1 Background and Outline

Precise positioning of extra-large and heavy components, represented by tooling of a work-piece onto a machine tool, and assembling and/or maintenance-working for an electric dynamo and a vessel engine, is quite important and essential technology in industry. Whilst the hydraulic jack has been utilized in vertical positioning for more than a century, horizontal positioning still relies on heavy labor with hammers and jigs based on experience and intuition of skillful workers.

Magical-slide is a unique unit, capable of positioning a heavy component in horizontal direction precisely and effectively without any special knowledge and skill.

The unit has contributed to work load reduction from eight hours to just an hour for positioning and fixing the 100 ton component in certain application. Furthermore, some units have been installed inside industrial equipment for successful standardization of precise positioning process.

2 General Arrangement

Fig.1 shows the general arrangement of Magical-slide. When vertical load due to a heavy component is applied on Magical-slide, the small amount of oil kept between internal slide planes floats the heavy component in high pressure condition more than 30 MPa, and thus reduces friction in horizontal direction. This allows the side jack screw, which is an attachment of Magical-slide, to feed the heavy component quite easily in horizontal direction.

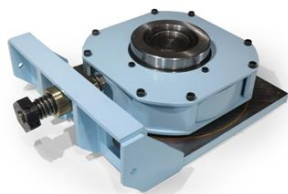


Fig.1 General Arrangement of Magical-Slide (Type : 25 ton)

Fig.2 shows the constitution of Magical-slide.

Its pressure generation mechanism consists of a base plate, a horizontal traverse plate and also a special seal ring to keep oil inside slide planes and hold its hydraulic pressure quite high. Although the amount of oil is very few compared to conventional hydrostatic system, it can float the heavy component with self-generated hydraulic pressure because of incompressible characteristic of oil itself. Furthermore, since the seal ring

eliminates oil leakage in slide motion, the mechanism can enhance consistency of high pressure, endurance performance and environmental friendly behavior.

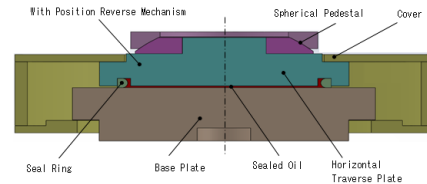


Fig 2 Constitution of Magical-Slide

3 Performance

Fig.3 shows practical positioning procedure of Magical-slide.

It is recommended in standard positioning procedure to arrange several units of Magical-slide, each of which should be charged the weight less than 25 ton. After loading a heavy component on the units, the slide jack screw on each unit allows the heavy component to be fed in horizontal plane two dimensionally. A series of process can be observed in the following URL ; <https://www.youtube.com/watch?v=KbaXT8pixMU>

Magical-slide does not require special knowledge and any attachment such as optional rig nor oil supply house, whilst its simplicity leads to obvious advantage of both less damage of components and easy maintenance procedure.



Fig.3 Positioning Procedure of Magical-slide

4 Sales History and Market Share

72 sets of Magical-slide have been sold for various types of positioning work, and also some of them have been installed inside industrial machines. Meanwhile, there is no competitive unit, which has the same positioning function and accuracy.

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