Sumitomo Drive Technologies

EASY GRIP™

HOW CAN IT SAVE ME MONEY?

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Easy-Grip™ – How can it save me money?

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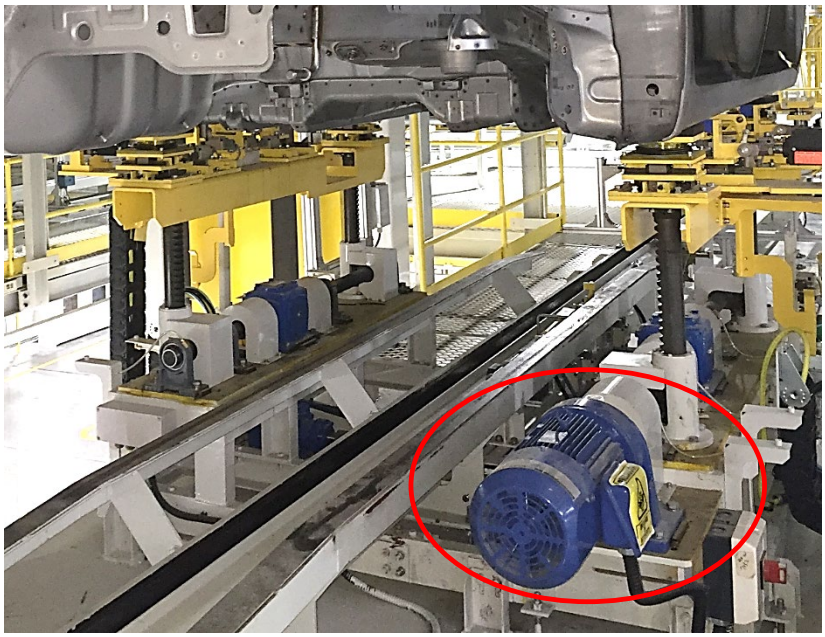
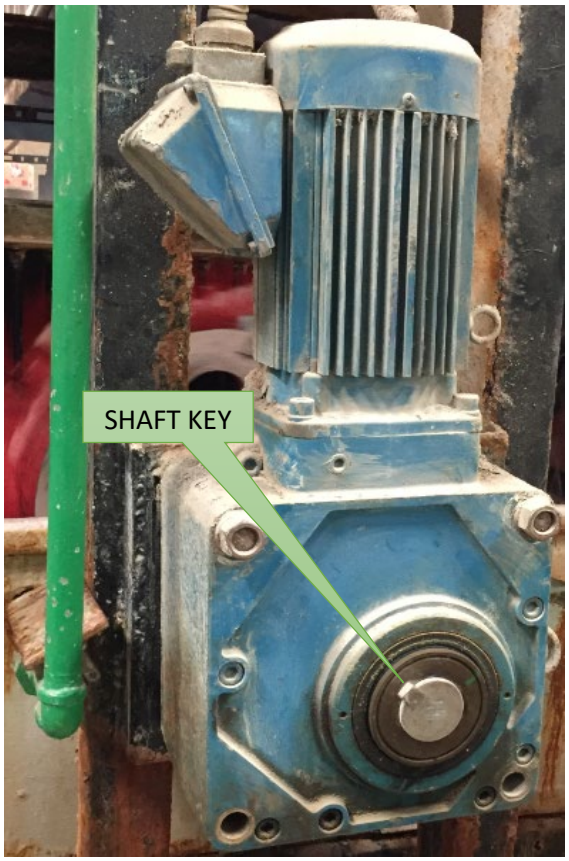
Sumitomo EASY-GRIP™



Strategically thinking about gearbox selection can pay real dividends. Depending on the space available and the operation being performed, an optimal choice will reduce the total life cycle costs and can increase uptime. This is true regardless of the size or type of the gear reducer as this directly relates to the cost and difficulty of the installation, system efficiency, spares requirements and the amount of production downtime. The larger the gear unit size or the larger the quantity the more critical it is to develop an optimal plan.

Traditionally the gear drive connects to the machine via couplings, belt(s) with sheaves, chain(s) with sprockets, or another external mechanism. The image above shows a blue, foot-mounted in-line Cyclo® 6000 gearmotor installed in a car manufacturing plant lifting and lowering of the car chassis via a coupling with a white protective guard – a very common mounting method for connecting the foot mounted drives to the driven machinery.

As LEAN Manufacturing concepts gained popularity many OEMs switched to mounting the units directly onto the driven shaft so they could conserve floor space and shrink their machinery profile and weight where applicable.



The cost savings gained by shaft mounting were quickly realized and appreciated by many equipment designers and users, as this concept eliminated the cost of the coupling, protective guard, the mounting structure, the need for precise alignment, cut the parts count and lessened the labor associated with the installation.

When it comes to shaft mounting, the most common industrial practice is by the means of a shaft key engaging both the driven shaft and the gearmotor's hollow output bore, as shown in the left example photo. While this design can reduce costs as opposed to the foot-mounted counterpart, it still has several cons, for instance:

1) Both the driven shaft and the gearmotor hollow output shaft must have matching and precisely machined keyways ($$).

2) The key and keyways can wear over time and need replacement or maintenance.

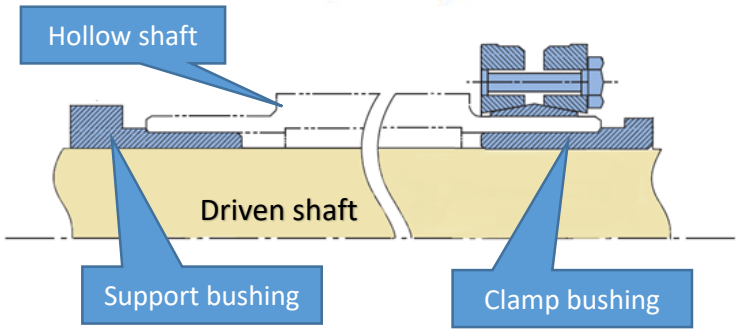
3) To allow assembly, the fit between the shaft and the bore is not a tight fit, consequently, fretting or micro-corrosion could develop between the contacting surfaces which could lead to a unit stuck on the shaft.

4) If the driven shaft diameter varies on the similar machinery equipment throughout the plant, the facility owner would need to stock different spares for each shaft diameter.

For instance, in a package sorting hub if there are twenty conveyor designs throughout the hub that use the similar speed ratio and horsepower but varying only in the shaft diameter, then there would be twenty unique part ID for each of the drives, simply due their different bore diameters.

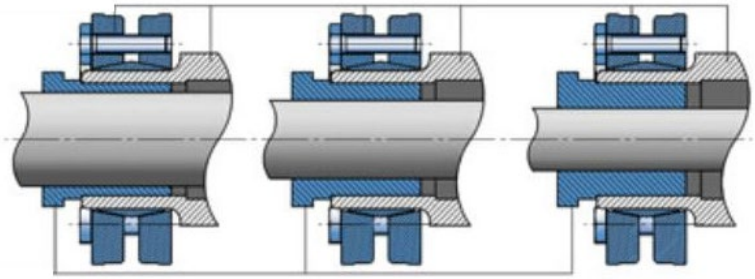
Sumitomo's solution is to provide customers with a shaft mounted unit without the disadvantages of a keyed hollow design with the new *Easy-Grip™ Keyless mounting system, which consists of a shrink disc and a pair of bushings in a simple, easy to install kit*, as shown on the right.

The **Easy-Grip eliminates the need for a key and the cost for a key slot** in the head shaft. Torque is transmitted to the driven equipment via the compression force generated by the shrink disc. The working principle is based on the support bushing maintaining proper relative positions, whereas the shrink disc clamps securely around the gearbox hub, causing it to compress concentrically around the Easy-Grip clamp bushing. This force causes the clamping bushing to engage with the driven shaft. Through concentric forces the total Easy-Grip™ system engagement is analogous to an interference fit, which in turn totally locks tightly around the driven shaft – without any clearance or movement among these components after the proper initial set up. With the tight "squeezing" or "locking" from Easy-Grip™ onto the driven shaft**, it eliminates any potential chance for fretting**, therefore, simplifying removal in the future and by eliminating two potential points of failure (the key and keyway), **prolongs the usage life of the gear box and its driven equipment**.



To maximize system reliability, the recommended machining tolerance requirement for the driven shaft is considered "precision" or "tight" for a typical keyed hollow shaft unit, such as, the ISO k6. *For example, a 1.5" diameter shaft the k6 machining tolerance would require the customer's machine shop to control it (with allowable deviation) within only 0.016".* Typically, narrower machining tolerances cost more to make than commercial tolerances. Obviously not every machinist has the same skill or proficiency level; if the shaft is accidently made too large or too small, then it would be either scrapped or reworked, and this could translate to high potential scrap costs. Customers that switched to Easy-Grip benefit from an **immediate cost saving because the specified shaft diameter machining tolerance is opened up to h11 tolerance, providing 10x more room for allowable deviation** – and this equates to less scrap, less time on machining, and most importantly, lowers the cost of the shaft manufacturing process.

Same Shaft & Shrink Disc



Interchangeable bushings for varying shaft diameters

Lastly, one of the major benefits in cost-saving using the Easy-Grip is the ability to use multiple diameter bushings with the same Shrink Disc and gearmotor hollow shaft, as shown on the left. As previously mentioned, in order to keep the production running with minimal downtime typically customers would stock spare units for all of their essential machinery. With Easy-Grip, the investment associated with stocking the spares could be greatly reduced for all drives of the same frame size, which would be equipped with the same shrink disc, regardless of head shaft diameter. Because only the bushing bores are changing, multiple shaft diameters can be accommodated by simply changing the bushing kits. The Easy-Grip option is now available in both gearmotor and reducer models on the following Sumitomo right-angle products: Hyponic, Fortress, and BBB-H. For more information, please visit our website: https://us.sumitomodrive.com/en