

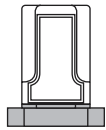
# Wrap Spring Products

Many clutch-brake applications can benefit from the ability to adjust the time of acceleration and deceleration. For instance, a sorting conveyor carrying glassware requires a soft start-stop feature to prevent breakage of the product. A conventional control with torque (voltage) adjust offers a crude form of acceleration and deceleration. However, this method of limiting output voltage could actually cause the clutch-brake to fail to provide the maximum torque required to start and/or maintain movement. Dynacorp's more sophisticated digital controls can provide full torque output, as well as bring the conveyor slowly up to speed. Available on Model D2750.

## Customer Switches

All Dynacorp® controls require some type of customer input logic that determines whether the clutch or brake is activated. This can be simple switches, relays, etc. These must be dry contacts. On more sophisticated systems the logic can be accomplished by the customer supplying 3-30 VDC from a personal computer or other microprocessor to the opto-coupled units. Opto-coupled inputs are standard on D2550, D2750 and D2950.

Dynacorp® controls come in three mounting configurations. These are:

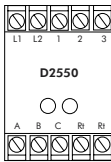


**Plug-In**

Control plugs into socketed base. Customer wiring is attached to socket.



**In-Line or "I" Box Mounting**  
Control is mounted in-line between AC voltage supply and clutch/brake assembly. Control lead wires must be spliced to customers.



**Din Rail**

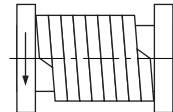
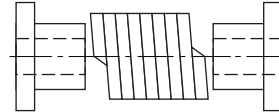
Control is designed for mounting in din rail. Wiring is to terminal.

## How Dynacorp® Wrap Spring Products Operate

Wrap spring products are simple mechanical devices used to control motion such as starting and stopping, indexing and positioning. Most are electrically actuated but others are strictly mechanical.

In comparison to friction clutches, wrap springs offer a high torque to size ratio, provide fast and accurate repetitive engagement, are inexpensive, generate little heat and positioning error is non-cumulative. Wrap spring products are speed and inertia sensitive.

The wrap spring clutch consists of three basic driving parts... an oil impregnated input hub, output hub and a close wound helical spring... all joined together. Plastic collars are placed over the springs to keep contamination out of the unit.



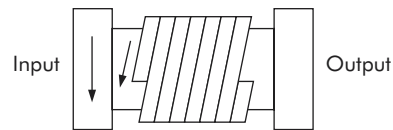
The spring has an inside diameter that is just slightly smaller than the outside diameter of the hubs. Thus, it exerts a force on the hubs when it is slipped over them. Rotation of the input hub in the direction of the springs helix wraps the spring tightly on the hubs. This gripping action generates torque which drives the output hub. The oil impregnated hubs function as a bearing to allow rotation.

The greater the torque to the input, the greater the torque at the output hub. However, rotation in the opposite direction unwraps the spring from the hub and no torque is transmitted.

Three basic clutch designs are available to satisfy most control applications... OR, SS and SR.

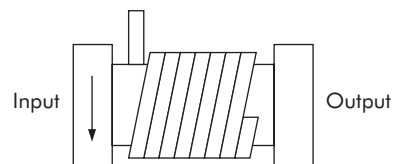
## Overrunning/One Way Clutch (OR)

This basic form of the wrap spring clutch generates torque in one direction. The output hub freewheels or overrides after the input hub stops. In this form, a wrap spring clutch can also be used in indexing or backstopping applications.



## Start/Coast Clutch (SS)

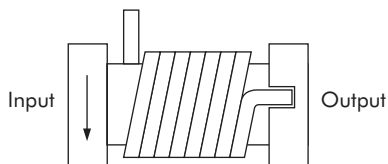
By bending the end of the spring radially upward on the input side, a tang is formed that can be used to control torque. Releasing the tang allows the spring to wind tight on the hubs to provide the torque. Engaging or stopping the tang, opens the spring and the transmission of torque ceases. This is accomplished by the use of a slotted control collar with an external cam to contain the tang. The output hub then coasts to a stop.



# Wrap Spring Products

## Single Revolution (SR)

A second tang at the output of the spring, fastened to the output hub, permits a single revolution or predetermined stop action. Releasing the control tang winds the spring on the hubs providing torque. As before, when the control tang is stopped, the spring unwinds and torque ceases. Now, the output hub cannot override because it is secured to the output end of the spring. The stopping torque is only 10% of the driving torque for the SR style units.



They are used in the following industries and applications:

- Business office machines
- Assembly line equipment
- Conveyor systems
- Packaging equipment
- Medical equipment
- Electronic equipment
- Machine tools

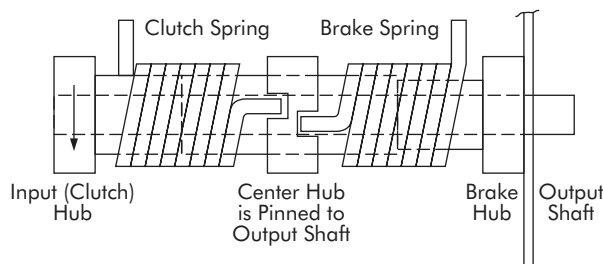
A control or stop collar must be intercepted or interfered with by some external means. On many models, an electrical solenoid actuator assembly is used to accomplish this. Coil voltages of 12,24, 90 VDC and 115 VAC are available.

The direction that a spring is wrapped will determine the driving direction of the output hub. A clockwise spring will tighten down on the hub when the input rotates clockwise and vice versa. Dynacorp® offers both clockwise and counterclockwise wrap spring clutches. Rotation is determined by viewing the free or pilot hub end.

Wrap spring clutches can be supplied as shaft input (hub output) or hub input (shaft output) to suit application requirements. Hubs can be connected to gears, pulleys, chains or belts as required. Wrap spring clutches can perform a braking action when the load is small and stop position is not critical.

Wrap spring products can also contain anti-back and/or anti-override features. Anti-back does not allow the output load to back up when stopped. Anti-override does not allow the output to override the input.

By adding an additional spring, hub and control collar to the clutch, it now becomes a clutch brake. The spring and hub have a slight clearance between them. The brake hub is rigidly bolted to a mounting plate that acts as a torque arm. When both the clutch and brake control collars are intercepted simultaneously, the clutch spring unwraps releasing the input and the brake spring wraps down on the brake hub and stops the output. Releasing the control collar reverses this process. The brake spring unwinds, releasing the output and the clutch spring wraps down on the clutch hub allowing transmission of torque from input to output.



When stop accuracy is required, the wrap spring clutch-brake is necessary. Anti-back and anti-override are standard on clutch-brake applications. Clutch-brakes are offered only as a hub input (shaft output).

Note: Wrap spring products are inertia (load) sensitive. They must be engineered to fit each new application by calculating system inertia.

Figure A

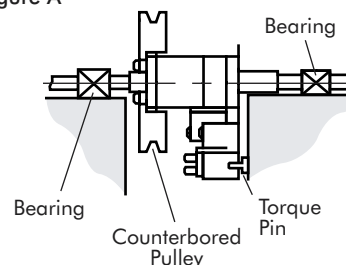
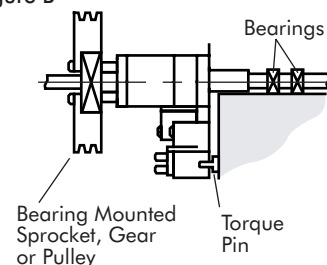


Figure B



## Mounting

Dynacorp® wrap spring clutches and brakes are factory assembled and tested before you receive them. All wrap spring products are to be mounted where they are fully supported by a shaft going completely through the unit... normally parallel shaft applications. They are secured to the shaft by pinning or by use of keys. The shaft must be properly supported.

When assembling sprockets, gears, or pulleys to the unit's hub, the radial bearing load capabilities must not be exceeded. Counterboring or bearing mounting of the sprocket, gear, or pulley may be required (Figures A and B).

The side plate on the DCB and DCB Super series are not to be rigidly bolted to anything. It must be restrained from movement by a torque pin or arm through one of the mounting holes. This precaution will eliminate internal bearing damage.