## KAMBEROLLER® GUIDING
## INSTALLATION AND DESIGN SPECIFICATIONS

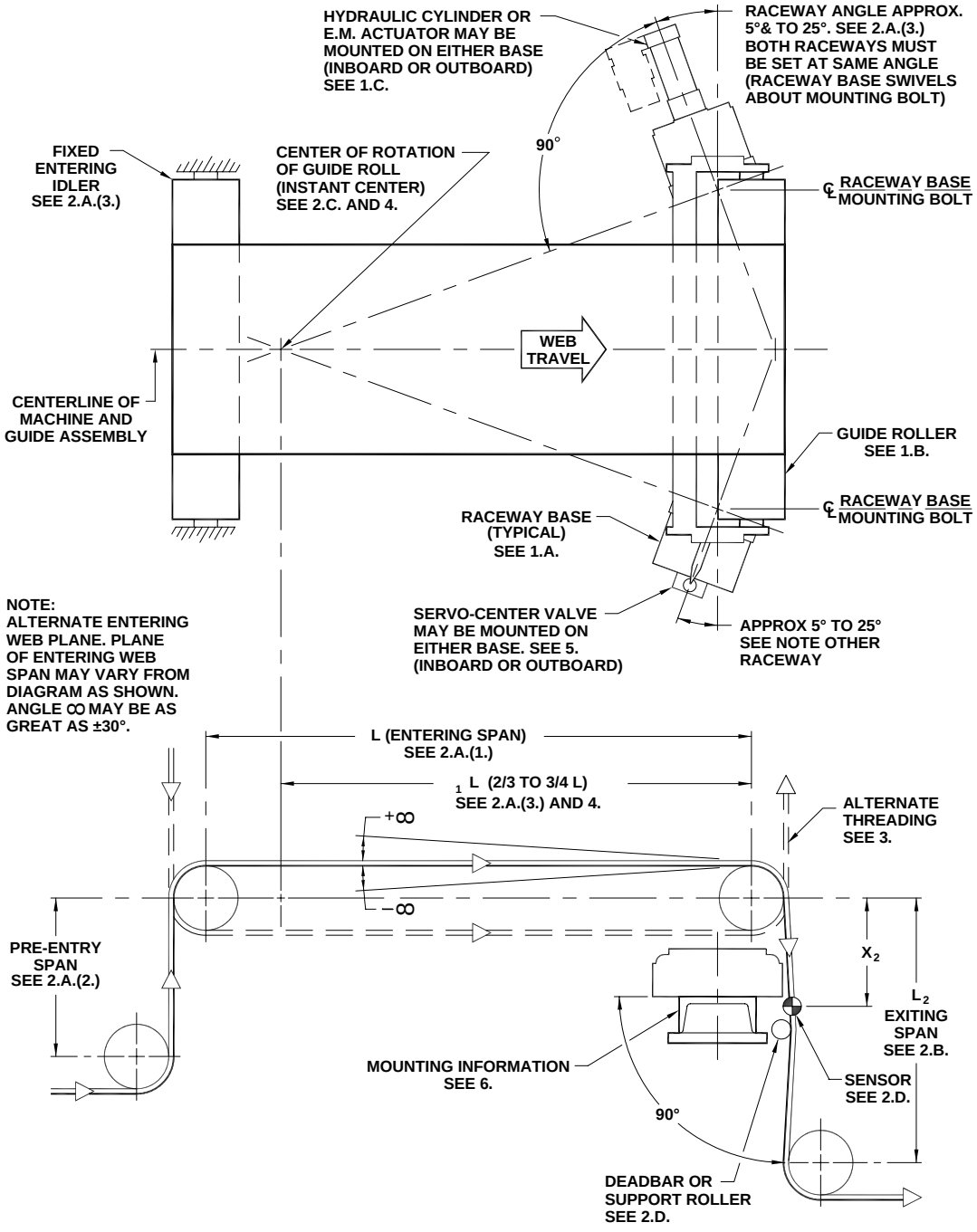


**Figure 1.**
**KAMBEROLLER® INSTALL DESIGN SPECIFICATIONS**

**1. Assembly**

The KAMBEROLLER® assembly consists of three essential components which are:

**A.** Raceway Assembly
The Raceway Assembly is sized to suit exact loading conditions. Standard raceway bushings are antifriction and are prelubricated for life.

**B.** Roller (or Rollers)
Rollers are designed to suit material, width, and tension. Standard roller deflection is limited to no more than 0.005 inch per inch of roller face based on stated tension. Standard roller bearings are prelubricated for life.

**C.** Hydraulic Cylinder or Electromechanical Actuator
The cylinder or actuator is sized to handle the load at the required correcting speed.

**2. Installation**

**A.** Entering Span (L)
The KAMBEROLLER® must be installed according to the following:

(1.) After a long, free, entering span. The length of the span is determined by the required maximum correction to be made and the line tension, as well as the characteristics and dimensions of the material to be guided. Typical entering spans for normal correction requirements are:

| | |
|---|---|
| WovenTextiles | 1 to 2 Web Widths |
| Plastic Films | 1.5 to 3 Web Widths |
| Paper and Board | 2 to 5 Web Widths |
| Metals | 10 to 30 Strip Widths |

(2.) It is desired that the free span (pre-entry) just prior to the entering span be shorter than the entering span. This will prevent undesirable feedback through the web or strip. Such undesirable feedback may induce large errors in the same direction the KAMBEROLLER® is correcting, causing it to go to the extreme of its stroke, thus passing through large uncorrected errors.

(3.) It is desirable that the web wrap the fixed entering idler a minimum of 45°,and preferably 90° or more.

**B.** Exiting Span ($L_2$)
This span is the free span from the guide assembly to the next idler roller with sufficient wrap so the guide roller action cannot cause web slippage across it. The length of the span required is a fraction of the entering span, and for a 90° KAMBEROLLER® installation can be as little as 1/3 web width for woven textiles to 2 strip widths or greater for metals

**C.** Center of Rotation
The point about which the guide assembly rotates in reaching the angular position required for a given correction is the Center of Rotation. Generally, locating the Center of Rotation of the KAMBEROLLER® from 2/3 to 3/4 of the entering span length ahead of the guide roll will assure satisfactory dynamic performance. (Distance $L_1$ on the diagram on page 1 of this Figure Sheet.)

**D.** Sensor and Deadbar or Support Roller
The sensor should be fixed and located as near to the guide as possible. Generally, any location in the half span closest to the guide roller assures satisfactory results. To minimize the effect of edge curl or flutter of the web, as well as reduce plane change, a deadbar or support roller may be installed. Web support fingers mounted directly on the sensor may be satisfactory in some installations. The web support should be located as close to the sensor as practical. The angle of wrap of the web over support must be an absolute minimum, and in no case over 15°. A wrap angle sufficient to prevent slippage of the web at the support can be detrimental to guiding results, and possibly damaging to the web.

**NOTE:**
**Refer to the Figure Sheet specific to the sensor being used for instructions on prope rmounting and operation.**

**3. Threading Arrangements (Alternate)**

In addition to the preferred 90° wrap, straight-through threading styles are available for certain instances. Because of the steering effect in the exiting span, the accuracy that can be expected is less than that for a 90° wrap. Also, maximum correcting ability is more limited. Typical straight-through threadings are shown in the diagram on page 3 of this Figure Sheet.

The lengths of the entering and exiting spans vary considerably with the material being guided. The spans indicated in the diagram are in keeping with recommended good practice.

**NOTE:**
**The three arrangements shown on page 3 of this Figure Sheet are more limited in their successful application than 90° wrap installations.**

**4. Dynamics**

The KAMBEROLLER® is a steering-type guide in that the roller is moved laterally and simultaneously swiveled to accomplish correction. This action steers the strip laterally in the entering span. The lateral movement of the roll assures the ability of the guide to correct continuous steady-state errors (errors of constant displacement at the entering idler).

The location of the Center of Rotation is critical in determining system stability. When the Center of Rotation is properly located, the roll laterally transports the material instantaneously when making transient corrections. The angular position of the roll created by this lateral movement will then sustain a continuing, or steady-state, correction for as long as necessary.

If the Center of Rotation is too close to the guide roll, the steady-state correction will exceed the transient correction made by the lateral shift and the guide can be unstable. This is because the angle assumed by the guide roller is greater than necessary to maintain the given correction, and with the material attempting to align itself in the entering span perpendicular to the axis of the guide roll, it will overshoot the amount of correction required, and instability may occur. It is especially true at high speeds and the symptom will disappear at lower speeds. In this case, the raceway angles should be decreased to move the Center of Rotation farther away from the guide assembly.

Conversely, if the raceway angles are too shallow, this means that the Center of Rotation is too far from the guide assembly, and a given lateral shift of the guide roller will not make a sufficient steady-state correction, causing the guide roller to move noticeably more than the correction to be made. To correct this condition, the raceway angles should be increased.

**NOTE:**
**It is sometimes possible to increase the raceway angles to obtain more correcting ability. This is only satisfactory provided that it does not cause instability. If instability occurs, and more correcting ability is required, a raceway assembly with longer actuator stroke is required.**

**5. Servo-Center**

The Servo-Center Assembly provides a fast, easy means of temporarily centering the guiding assembly during setup operations, width changes, splicing, threading, etc.

If the guide roll is not parallel to the other rollers in the machine when in Servo-Center position, the operating rod should be adjusted. This may be done by putting the guide in **CENTER** mode and adjusting the Servo-Center actuator until the roll is aligned properly and then securing the actuator in the new position.

**6. Mounting Bracket**

The mounting bracket deflection should be limited to no more than 0.0005 inch per inch of bracket length based on maximum load.

The mounting bracket and supporting member for bracket should have a natural mechanical frequency of 20 cps or greater in the direction of guide roller motion. Bracing may be required to assure guide stability.

Mounted KAMBEROLLER® raceways should be level and flat with each other within approximately 0.030 inch.

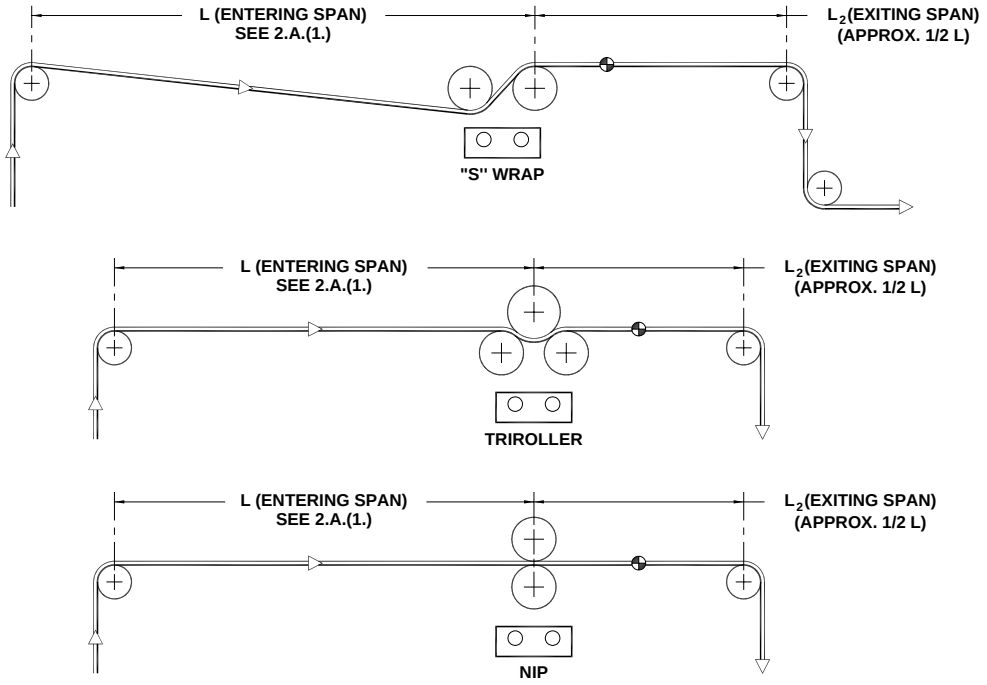


**Figure 2.**
**KAMBEROLLER® WRAP STYLES**

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