

**TECHNICAL  
BRIEF**

180 River Road • Rio Vista, CA 94571 • Tel 707-374-6800 • Fax 707-374-6801  
Email: info@barriersystemsinc.com • Website: barriersystemsinc.com

## **24" (600mm) Series 200 and 300 QMB BARRIER DEPLOYMENT**

### **GENERAL:**

Quickchange<sup>®</sup> Moveable Barriers can be deployed in approximately the same length of time as temporary concrete barriers. There are two principal differences, however, in the handling of the Quickchange<sup>®</sup> Moveable Barrier. The load must be evenly distributed if it is picked up under the "T" head to avoid chipping of the lifting surface and the slack between each set of barrier hinges must be adjusted by applying a light tension or compression during the installation process. Both of these points are very important to the transfer operation and care must be taken that each is accomplished. These will be detailed further below:

### **HANDLING**

There are two ways of handling the barrier. One is using a forklift with "side shift" and a lifting device. Another is using a double barrier tong. It is most important that non-approved methods are not used because damage can result to the bottom of the "T" head. Any damage to the bottom of the "T" head will cause excessive damage to the conveyor wheels and possible damage to other parts of the machine.

### **HANDLING TECHNIQUE**

Typically the barriers are shipped to the project site with two barriers pinned together. There are two preferred methods of installation. One method is to use a forklift and the forklift-handling device. The other method is to use a crane type lifting device and a set of tongs. Using a forklift will require one person less than using a tong. A crew should be able to set between 300' and 400' (90m and 120m) of barrier an hour. As much as 600' (180m) per hour has been achieved. A crane using tongs will require four people and they should be able to set between 150' (45m) and 250' (76m) of barrier an hour.

Lindsay Transportation Solutions (LTS) does not recommend handling more than 2 barriers at a time since it is difficult to control the hinge spacing on more than 2 barriers.

### **FORKLIFT HANDLING DEVICE**

Two forklift handling devices are typically furnished with each job. This handling device is shown in Figure 1 below. This device is a fork extension that is held in the proper width and the length will handle two barriers at a time. The lifting portion of this device is padded with a urethane material to protect the bottom of the barrier "T" head. Two barriers weigh approximately 2900 pounds (1315 kg) and can easily be handled by suitable forklifts. The length from end to end of the two barriers is approximately seven feet (2.2m) so that they fit across an eight-foot (2.4m) truck bed.

**TB 941025-Rev. 5**  
**Page 2 of 5**  
**BARRIER DEPLOYMENT**

The forklift operator picks up the barrier and drives towards the end of the barrier wall. He lowers the barrier and aligns it with the end of the wall using the "side shift" capability of the forklift. The barrier is moved into position and another person inserts the pin into the hinge joint to connect the barriers. The forklift operator can then slightly pick up the barriers and exert any necessary force (extension / compression) to the wall. A video is also available from LTS outlining how this process works.



Figure 1 Forklift Handling Device

**BARRIER TONGS LIFTING DEVICE**

Barrier tongs will work on one barrier or two barriers pinned together. (See Figure 2 below) Tongs allow for movement of barrier using standard equipment such as a small crane or backhoe, etc. If these are used, padding is not required as the steel tubing is smooth and the design of the tongs assures that no load will be applied to the outer corners of the "T" head. The operator can accomplish tensioning or compressing the barriers by simply pulling or pushing on the supporting chains as he is lowering the barriers to the ground. Be sure that the tongs are fastened to the lifting machine so that they do not pull off during this procedure. Extra care is needed when using this method to obtain the proper tension / compression on the wall because there is no direct contact between the barrier and the crane.

**TB 941025-Rev. 5**  
**Page 3 of 5**  
**BARRIER DEPLOYMENT**

Using tongs is typically slower than a forklift and should only be used on jobs with lane width constraints where using a forklift would not be possible.



Figure 2 Barrier Tongs

**LABOR REQUIREMENTS**

	<b>Lift Device</b>	<b>Tongs</b>
<b>Lift device</b>		
Forklift / crane operator	<b>1</b>	<b>1</b>
Ground crew	<b>2</b>	<b>2</b>
Truck deck man	<b>0</b>	<b>1</b>
E clip (If required)	<b>1</b>	<b>1</b>
<b>TOTAL</b>	<b>4</b>	<b>5</b>

**TB 941025-Rev. 5**  
**Page 4 of 5**  
**BARRIER DEPLOYMENT**

**INITIAL PLACEMENT**

The hinges are designed in a manner that allows for a total of 1" (25mm) movement of the hinge pin. When the barrier is sitting in a neutral position the hinge pin is centered. That means it can travel each direction a total of 1/2" (13mm). In neutral there is no force on the pin. Any time the hinge pin is moved from the center position there is a tension or compression force exerted on the pin. This expansion and contraction room is present so that the barrier can be transferred through a curve. This is required because when the barrier is moved outward in a curve the circumference of the arc length increases, and when the barrier is transferred inward the arc length decreases. As a general rule the following rules will apply to managing the hinge pin movement.

- Barriers set on the inside of a curve will be compressed.
- Barriers set on the outside of a curve will be tensioned.
- Barriers in a straight away will be set in neutral

As the barrier is being placed on the roadway it is critical to maintain a certain amount of tension or compression in the hinges. The proper amount of tension will be provided by LTS applications engineering staff prior to the deployment. In extremely tight radii or when the transfer is in excess of 24' (7.2m) the curve may require the use of variable length barriers (VLBs) for additional expansion capability. If VLBs are required they will also be specified on the deployment instructions.

**E-CLIP INSTALLATION**

For permanent installations only, after the barrier hinge pins are installed, an "E" clip must be inserted in the groove located towards the bottom of the pin with a washer above it. (See Figure 3 below)

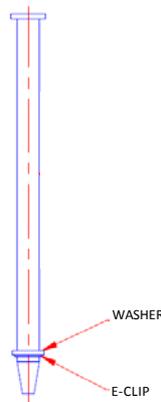


Figure 3 QMB pin and washer, and E-clip assembly

**TB 941025-Rev. 5**  
**Page 5 of 5**  
**BARRIER DEPLOYMENT**

**MISCELLANEOUS.**

- Prior to installation, the LTS Engineering Department (001-707-374-6800) should be contacted to discuss any potentially critical areas in the installation that may require special treatment. Curves, slopes and super elevations are examples of areas that might require special treatment
- The barrier wall must be installed parallel to its deployed position. If it is not, you can end up with more barriers in the line than are needed, which will cause problems in the transfer operation.
- Care should be taken to install the barrier wall accurately to within +/- one inch (25mm) of a pre-established reference line.
- During the installation procedure, the end barrier should always be moved with a pry bar on the lower hinge plates to accurately line up with the pre-established line. This is easily accomplished by the man on the ground and requires less accuracy from the heavy equipment operator, which results in a faster assembly.
- Two each 6' heavy-duty pry bars are required with all of the above techniques, in addition to the tools supplied by LTS.
- Before starting the deployment of barrier, the road surface must be clear of gravel sand and other debris.