

Unibilt® Enclosed Track  
and Webb Towveyor®  
Chain Conveyors

Gradall Industries, Inc.

# Unibilt® and Towveyor® make the grade at Gradall Industries, Inc.

New paint finishing systems put Gradall Industries excavators in an industry-leading position.

Gradall Industries, Inc. manufactures excavating equipment for the highway, industrial, railroad and mining industries. Gradall is known worldwide for the versatility and uniqueness of its products. That uniqueness was born during World War II when Gradall – a leading highway contractor in Cleveland, Ohio then known as Ferwerda-Werba-Ferwerba – suffered a severe manpower shortage due to wartime enlistment, forcing them to mechanize embankment grading, the most labor intensive task. Traditionally, embankments were graded by hand to achieve the relatively smooth finish of the slope – a task not possible with heavy equipment. Facing those challenges, Gradall developed an early “telescoping” boom that could reach up the slope from the road surface. This landmark development became an instant success in the excavating industry.

Over the years, Gradall continued to develop its line of excavators by adding improvements, especially in the development of their hydraulic systems in response to the market demands. In 2006, Gradall sought assistance from Herr Industrial, a well-respected paint finishing systems contractor, to help them select new powder coating paint systems for their large and small parts lines.

As is the case with many construction and agricultural equipment manufacturers, small parts for Gradall range up to 2,500 pounds. Large parts, on the



other hand, range up to 9,000 pounds. The sheer size and mass of large equipment parts present a unique challenge for paint system designers, primarily with material handling systems.

After thorough analysis, Gradall and Herr Industrial turned to Jervis B. Webb Company, a leading provider of material handling solutions.

For the small parts line, Gradall selected a Webb Unibilt® enclosed track power & free conveyor system to process up to six carriers per hour. The three trolley carrier system utilizes a lowerator to improve the ergonomics in the load/unload process. When necessary, the carrier is lowered closer to the floor, enabling heavy parts to be loaded directly from their pallets, thus reducing the amount of lifting required for the operators. The carriers are then transported at 40 fpm



to the washer entrance, where they are smoothly transferred to a 3 fpm process line using Webb’s proprietary Wide Wing® trolley design. The carriers stay on the process line through the washer, dry-off and powder booths. The higher speed transport conveyor is used to deliver the carriers to the dry-off oven, cure oven and cooling tunnel. The oven and tunnel times are adjusted at the control panel. When a carrier “times out,” the oven doors automatically open and the carriers are released. The control logic ensures that only one set of doors are opened at a time to prevent wholesale heat loss out of the ovens. For added efficiency, the cure oven and cooling tunnel are shared with the large parts line.

To improve product flow and production management, Gradall preferred to keep both the small and large part



systems in the same area. Unfortunately, the area that would best serve incoming unpainted product had two different floor levels separated by 30 inches. This predicament left two choices for the large part line: raise the plant floor, which meant bringing in nearly 7,000 cubic yards of fill and concrete, or elevate the conveyor. Based upon relative cost, Gradall decided to raise the conveyor and install a Webb Towveyor® towline conveyor system with custom tow carts.

The four swivel wheels of the custom tow carts ride in two steel channel tracks elevated 30 inches above the floor on steel supports that incorporate the Towveyor channel for much of the system. At the load/unload station, the tow carts are on the concrete shop floor to enable induction and removal of the tow carts by forklift. The conveyor chain take-up was also incorporated into this section of concrete floor. The design was cost effective and provided access to the conveyor for cleaning and maintenance, which is not usually available when the conveyor is embedded in concrete. However, the elevated design also required that the conveyor be designed with considerations more common to an overhead conveyor. For example, a take-up unit was required as well as oven expansion joints.

The Towveyor tow carts engage the conveyor with a front tow pin and rear guide pin, permitting close tracking around turns. The carts were built with a universal design that accepts a wide variety of removable fixtures. To minimize material handling and reduce paint damage, the carts were also designed to be taken off the conveyor and towed to the assembly line with a forklift. Special wheels were needed that could ride on steel and concrete, carry the heavy part load as well as withstand an oven temperature of 450°F.

Because of the severe weight conditions, the large parts line employs a “stop and release” Towveyor system that can handle an excavator chassis measuring up to 10’ wide x 13’ high x 25’ long. Similar to an “index-style” system, the tow carts are towed from point to point. However, this system differs by allowing carts to move ahead individually rather than “en masse” based upon completion of each process step and a vacant downstream position. Process steps can involve human input, such as blasting, masking and painting, or they can be automatic, such as flashing, curing or cooling. For operator controlled steps, the operator pushes a “ready to release” button when their work is done. If the next position is vacant, the cart automatically moves to the next stop. At the automatic stops, the release is based upon a set time in the control program. The conveyor is interlocked with automatic doors on the booths and ovens, which open prior to product movement.

The tow carts are loaded with an overhead bridge crane or forklift on the upper floor level and positioned over the conveyor slot with a tigger. The carts then travel at 40 fpm to one of three “buffer” stops for accumulation, prior to a stop in the manual blast booth.

When blasting is complete, the cart is released from the stop and travels to the blow-off and masking platform, followed by the powder booth. The bottom of the Towveyor chain case is removed from the path through these processes to allow shot and powder to pass by the conveyor chain and be reclaimed. Additionally, an automatic conveyor chain blow-off is used to remove excess shot.

The blast booth and powder booth utilize manlifts to access tall parts. After leaving the powder booth, the carts travel through a series of three stops in the cure oven, followed by three stops in the cooling tunnel before returning to the load/unload area.

The system was commissioned in July 2007 and met all its intended goals. The two new powder coating lines have enabled Gradall to powder coat all of the parts necessary for three shifts of assembly in a single shift of powder coating. Product flow has improved considerably and the amount of required rework has been significantly reduced. The extremely durable coating is a key selling point for Gradall’s equipment and adds to its aesthetic appeal. The systems have put Gradall in an industry-leading position as the only large excavator to have its products totally powder coated.



HERR Industrial, Inc. is a Jervis B. Webb Company Channel Partner.