ESCO Construction Products Usage & Maintenance

Ultralok®, Super V®, Vertalok®, and Helilok® Tooth Systems; Weld-on, Bolt-on, Zipper Lip®, and Horn-Style Adapters; Zipper Lip and Horn-Style Lip Rebuild Instructions; and Ripper System Maintenance
Ultralok Tooth System Removal

The Ultralok tooth system is designed for quick and easy replacement of teeth in the field. Just follow these step-by-step instructions to remove old teeth, inspect the nose and install new teeth. If you have any questions, please contact your ESCO representative.

**Step 1** – Clean the lock cavity of fines on the top and bottom of the lock.

**Step 2** – Insert the pry bar into the top side of the lock and rotate the pry bar upward and toward the centerline of the point. Clean the fines from the second groove in the lock that is now exposed.

**Step 3** – Insert the pry bar into the second groove and again push the pry bar toward the centerline of the point until all three grooves are visible. The lock will still be attached to the point.

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**General/Safety Information**

The practices described in this manual are meant as guidelines for safe operation under most conditions and are meant to supplement any safety rules and/or laws which may be in force in your area. Your safety and the safety of others results from putting into practice your knowledge of the correct operating procedures.

**IMPORTANT:** ESCO’s warranty is void when points and adapters have been weld-repaired or hardfaced.
Ultralok® Tooth System Removal Continued

**Step 4** – In some applications, packed fines may inhibit point removal. Use the pry bar at the rear shoulder of the point to work it loose from the fines.

**Step 5** – Once the point is loose on the nose, slide the point off.

**Step 6** – Clean the nose of fines and dirt. After cleaning, inspect the nose for excess wear and peening. If necessary, weld-repair or replace the adapter to ensure trouble free performance.

Ultralok Tooth System Installation

**Step 1** – Install the new point onto the nose. Make sure the lock is in the unlatched position before installing.

**Step 2** – Insert the pry bar into the lower side of the lock and the point wall. Push the pry bar toward the centerline of the point until the lock clicks into place. The distinctive click ensures the lock is properly installed.

**Step 3** – In the fully locked position, the lock face will be recessed from the surface of the point.

*Note:* Once all of the points are replaced, double-check to be sure all locks are fully installed.

⚠️ **WARNING:** When performing the work described in these instructions, always work safely and use proper safety equipment to help avoid injury. Always wear hard hat, gloves, safety shoes, eye protection, hearing protection and fall protection per regional, national and site requirements (e.g., OSHA, MSHA) when performing maintenance work. To avoid injury to others, keep bystanders well out of the way.
Installing ESCO Rippers and Rip-A-Pak™ Kits

Ripper Nomenclature Guide

Point Installation

The mining ripper point is held in place by a single Uni-Lok™ pin. Before installing the point, clean the nose and pin hole thoroughly with a wire brush. Next install the point onto the nose and align the pin holes. Finally insert the pin into the pin hole on the point and drive the pin in until it is flush using a 2-4 lb. hammer.

Construction rippers use a pin and a snap ring (RC style) or bushing (R style). For construction rippers, place the snap ring in the recess on the side of the nose (RC style) or insert the bushing in the nose pin hole (R style).

To remove the point from the nose, drive the existing pin out of the nose using the ESCO removal tool and remove the point.

*Note:* Pins ARE NOT designed to pull points or shrouds tight on shank.

Shroud Installation

The shroud is held in place by two Uni-Lok pins. Install the shroud by driving in the lower pin first, using a 2-4 lb. hammer.

Remove the pins with a pin removal tool and a 2-4 lb. hammer.

Check for Nose Wear

Check the nose for wear periodically to help prevent point loss and breakage. The best way to do this, is to cut a window into the side of a new point as shown.

Hold this cutaway point on the nose and check the flats at the end of the nose, as well as the ear recesses for wear. Also, check to see that the conical nose surfaces bear against the box section of the point. Make sure the point does not butt up against the rear shoulder of the nose.

When wear on the flats are 3mm/0.13in. as measured between the new point and the worn nose or if the bearing is on the rear shoulder of the nose instead of the conical surfaces, the nose should be replaced.

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## Maintenance & Performance Problems

### Shank Breakage
1. Check to see if the clevis pocket is properly maintained and the shank is securely attached. Wear should not leave a gap of more than 6mm/0.25in. per side. Shim or weld buildup as needed.
2. Has the shank been misused, such as backing up while ripping or side slipping on a hill?
3. Has the machine been turning while the ripper is engaged in the ground?

### Shroud Breakage
1. Check to see if shroud is worn out.
2. Has the proper ESCO point been used with the shroud?
3. Change shrouds before the center part wears through or the sides wear too thin to protect the shank.

### Point Breakage or Loss
1. Is the nose worn beyond reasonable use?
2. Do ripping conditions require a shorter point?
3. Is the ESCO point being used with the proper shroud?
4. Is the machine backing up or turning while the ripper is in the ground?

### Check for Worn Pins
The one-piece locking pins for shrouds are reusable, but should be inspected every time you change shrouds. If the rubber bonding is loose or the metal inserts are bent or become dislodged from the pin, install a new pin.

## Rip-A-Pak Kit Installation

**Note:** Use welding rod AWS E-7016 or E-7018 5mm/0.19in. diameter. Be sure rod is completely dry. Refer to Welding Instructions on page 5.

1. Place shank to be repaired on side, draw a line through the centerline of the shank mounting pin holes (see illustration on previous page). If the pin holes are not on centerline of the shank body and shank is badly worn back 50mm/2.00in. or more from original contour, rebuild worn areas.

2. After the rebuild or if shank is not overly worn, place the Rip-A-Pak replacement nose so back edges are lined up. Mark the shank with a burn-off line using the Rip-A-Pak replacement nose as a guide or select the proper burn-off angle from the chart below, see Figure 1.

3. Burn off broken section of the shank and burn weld bevel on each side, see Figure 2. Make a lip with weld beads along the point of bevel.

4. Align the weld-on nose so the bevel of the shank and nose piece have a 3mm/0.13in. gap between them and the forward edges are in line. Tack weld as shown in Figure 2.

5. Preheat the assembly to 177°C/350°F, 204°C/400°F. Check with Tempilstick before welding. Preheat before starting any additional welding if castings have cooled.

6. Run a root bead the length of gap. Be sure to get 100% penetration. Remove all slag. Peen each bead lightly. Turn the shank over, grind the root of the weld clean to sound metal.

7. Weld 2-3 beads on one side, removing slag and peen after each bead. Turn shank over and repeat until job is completed. This procedure is necessary to keep nose piece in proper alignment with the shank. Use stringer beads only and weave not more than 3 times the electrode diameter. **DO NOT USE WIDE WASH BEADS!**

8. Remove porous metal that has accumulated at either end of the weld by burning or grinding to solid metal. Remove all notches or pockets in the metal, see Figure 3.

9. Grind or burn-off the rebuilt area until a smooth transition from shank to nose piece is obtained. The finished surface should be as smooth as possible since stresses concentrate at any depressions or irregularities.

10. Dye-check all exposed weld to detect cracks. All cracks must be ground to remove dye-check indications. Reweld, using outlined procedure.

11. Torch heat the weld and areas adjacent to weld on both sides of shank to 177°C/350°F-204°C/400°F. Allow to air cool slowly. Repeat Steps 7 and 8, if necessary.

### Rip-A-Pak Kits

<table>
<thead>
<tr>
<th>35-6R WNS</th>
<th>39-5R WNS1</th>
<th>39-5R WNS2</th>
<th>39-5R WNS3</th>
<th>49-5R WNS</th>
<th>59-5R WNS</th>
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<tbody>
<tr>
<td>Nose Angle</td>
<td>Burn-Off Angle</td>
<td>Nose Angle</td>
<td>Burn-Off Angle</td>
<td>Nose Angle</td>
<td>Burn-Off Angle</td>
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<td>28°</td>
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<td>35.5°</td>
<td>30°</td>
<td>35.7°</td>
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Installing ESCO Toolbox Rippers

<table>
<thead>
<tr>
<th>Size / Break Out Force</th>
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<tr>
<td>V33 / 23,000 lb. or less</td>
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<tr>
<td>V39 / 30,000 lb. or less</td>
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<tr>
<td>V51 / 30,000–45,000 lb.</td>
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<td>V59 / 45,000–64,000 lb.</td>
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**Locating Rippers**

*Note: Illustration shows details as described below.*

Single toolbox rippers should be mounted on the bucket’s centerline. Dual or multiple rippers should be mounted symmetrically about the centerline with corner installations no closer to the edge of the bucket than 13mm/0.50in. Also, multiple rippers should be installed with the attachment pins aligned to ease their installation and removal.

Generally, all rippers should be installed so that shanks are parallel to the bucket centerline. However, corner rippers may be pitched outward slightly to provide additional ripping width; left hand and right-hand toolbox alterations will be required accordingly.

**Mounting Pads**

Each toolbox ripper should be welded to a mounting pad which may be either an existing bottom runner or a pad specially installed for the purpose (mounting pads are not required on ESCO SHDC buckets).

Special mounting pads should be as thick as the runners, should extend at least 76mm/3.00in. above and below the toolbox, and should be formed to match the bucket’s profile. In addition, each pad should extend at least 19mm/0.75in. beyond each side of the toolbox.

If the toolbox is to be mounted to a runner, material may have to be added adjacent to it in order to achieve this 19mm/0.75in. minimum. An ideal pad will fit snugly between runners. Install pads by welding both sides with a full-depth groove weld and both ends with 13mm/0.50in. fillet weld.

*Continued on the next page.*

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Plug Weld Slots
If, for any reason, a mounting pad extends beyond 38mm/1.50in. on either side of the toolbox (whether the pad is an existing runner or a special pad), the pad should be plug welded in four places to provide needed additional strength.

To prepare plug-weld slots, position the tool box in place and trace its outline on the mounting pad. Remove the toolbox and burn four slots through the mounting pad 19mm/0.75in. wide by 50mm/2.00in. long. The slots should be 25mm/1.00in. from the ends of the toolbox.

Preparing the Toolbox
The ripper toolbox is cast from ESCO alloy 12M steel and is heat-treated to low hardness to ease burning.

The toolbox should be positioned so that the ripper shank(s) provides the desired depth and that the angle between the ripper shank and the bucket top plate is 45-55°.

Burn the tool box to match the appropriate bucket profile. Any gap between the tool box and the bucket should be no more than 3mm/0.12in. Grind burned edges to remove carbon and slag.

Final Installation
Reposition the ripper assembly and weld the toolbox in place with a 16mm/0.63in. fillet weld all around.

As a final step, burn off the toolbox lower gusset to a blending radius, as shown by the diagram.

Additional welding information can be found on page 5 of this book.