

**PARTS & SERVICE NEWS**

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**SUBJECT:** ESCO bucket tooth system

**PURPOSE:** Hints for handling

**APPLICATION:** PC4000; PC5500; PC8000

**FAILURE CODE:** 7168Z9

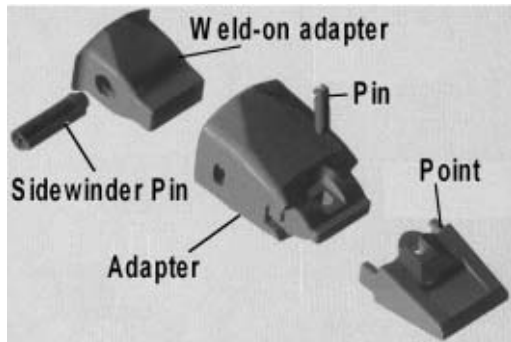
**DESCRIPTION:**

Introducing the new "Posilok" bucket tooth system. Parts, Service and Maintenance information is included.

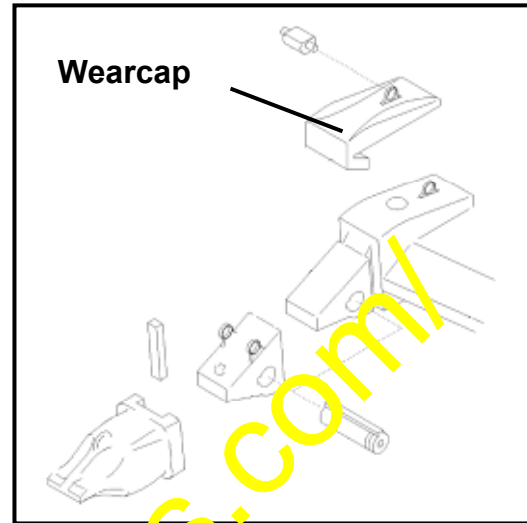
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1. Overview

1.1 Komatsu standard version



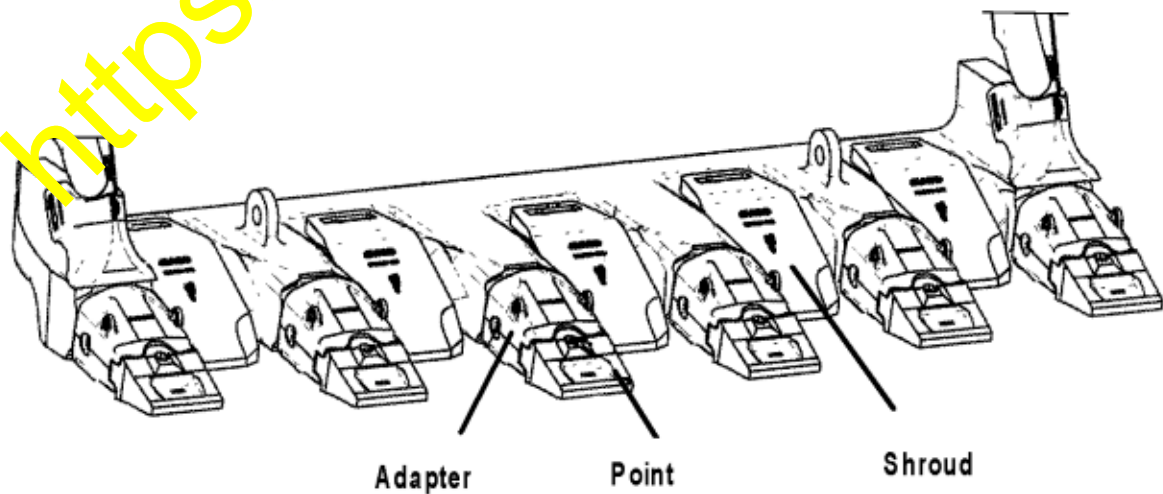
Additional wearcap for plate lips version (PC4000)



1.2 Optional version



- For changing to optional version new points, new adapters and the wearcaps are required.



**Classification of the Tooth Systems to the Excavator Types**

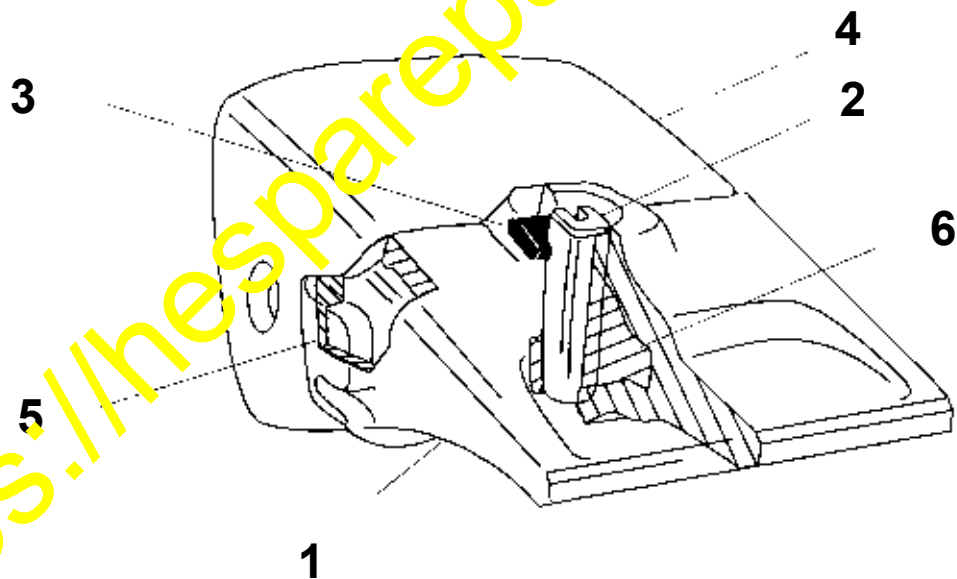
| Type of Excavator | Shovel Version | Backhoe Version |
|-------------------|----------------|-----------------|
| PC4000            | S 110          | S 95            |
| PC5500            | S 130          | S 130           |
| PC8000            | S 145          | S 145           |
| - ( 12030)        | S 130          | -               |
| - ( 12034)        | S 130          | -               |

**Component Preparation**

Prior to installing the new tooth system components:

- Thoroughly clean all bearing surfaces on the tooth base, adapter and pin.
- Visually inspect top and bottom of tooth base for wear, refer to following sections.
- Replace all damaged components.

**2. The points**



- 1 Point
- 2 Posilok Locking Pin
- 3 Integral rubber lock
- 4 Adapter
- 5 Mating rails between point and adapter
- 6 Stabilizing flats

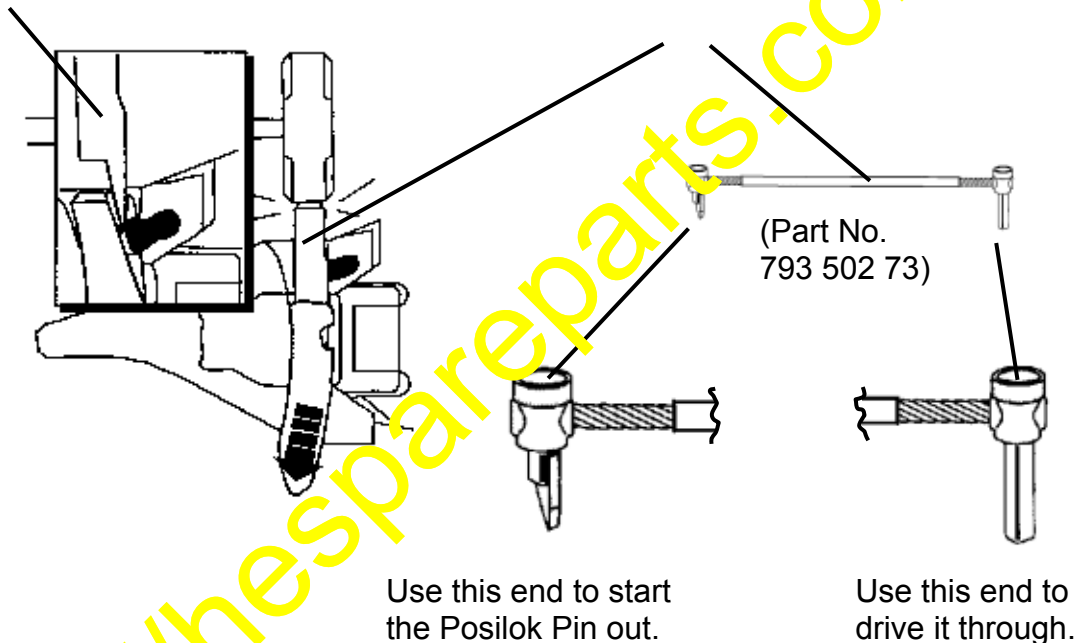
## 2.1 Removing the points



- All persons performing maintenance work should wear a approved hard hat, safety glasses, steel-toed shoes and gloves.
- To avoid injury to others, keep people not directly involved well out of the way.

1. Removal tool between the Posilok Pin and the lock

2. Drive the Posilok Pin out using a removal tool



- Remove the vertical drive-through pin using a hammer and a pin removal tool (Part No. 79350273).
- Make sure to insert the tip of the removal tool between the Posilok Pin and the rubber lock.
- In order to loosen the point for removal from the adapter, it may be necessary to tap the sides of the point to loosen fines.

## 2.2 Installing the points

### Preparation

Prior to point replacement, make sure adapters are clean and free of damage.

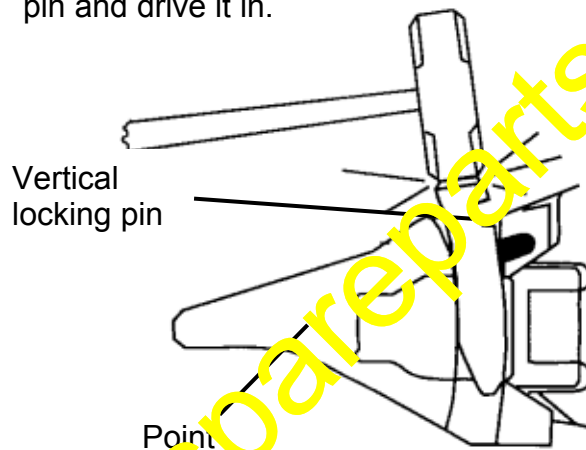
Carefully inspect adapters for excessive wear.

If the nose is worn or if insufficient wear metal remains to see adapters through their work cycle, they should be replaced with new ones.

**Vertical locking pins:** Locking pins may be reused provided they do not show signs of significant wear, damage or distortion.

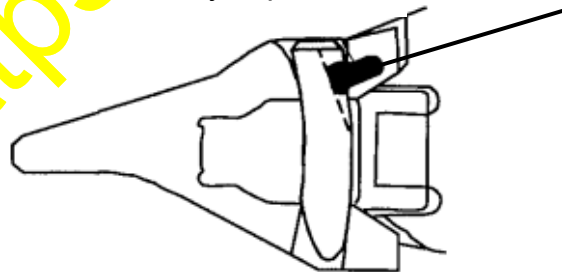
**Points:** If you are going to install new points, make sure the rubber lock is installed so the arrows embossed on the surface of the lock are pointing forward (toward the tip of the point).

Position the locking pin and drive it in.

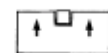
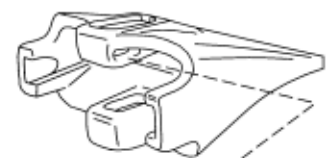


- Install the points onto the adapters.
- After positioning a point onto its adapter, drive in the vertical locking pin using an 4 kg (8lb) hammer.

The rubber lock keeps the Posilok Pin securely in place.



Posilok Pin engages the lock.



Topside and forward

- Drive in the Posilok Pin until it engages the lock. When the Posilok Pin is correctly in place, the rubber lock fits into the slot of the Posilok Pin to secure it.

### 3. The adapters

#### 3.1 Adapter removal



Prior to using an adapter tool be sure that the following safety precautions are followed at all times:

- Always wear proper safety equipment including hardhat, gloves, safety glasses and steel-toed shoes.
- Never exceed the lifting capacity of the tool.  
Lifting tool 122K (Part No. 793 503 73) rated capacity 270kg (600lb)  
- for the S145 tooth system.  
Lifting tool 112K (Part No. 793 504 73) rated capacity 230kg (500lb)  
- for the S130 tooth system.
- Tool is intended for vertical lift only.
- Always stand clear of the raised adapter.
- Never allow anyone to work under the adapter until it is secured to the lip by the appropriate locking mechanism.
- Always use the safety features (lock and safety pin) as indicated. Never use hand tools or other fastener to secure the sleeve. Never use anything other than the sleeve provided to support the adapter.
- Replace the tool when it becomes visibly damaged or distorted. Do not attempt to repair a damaged tool.

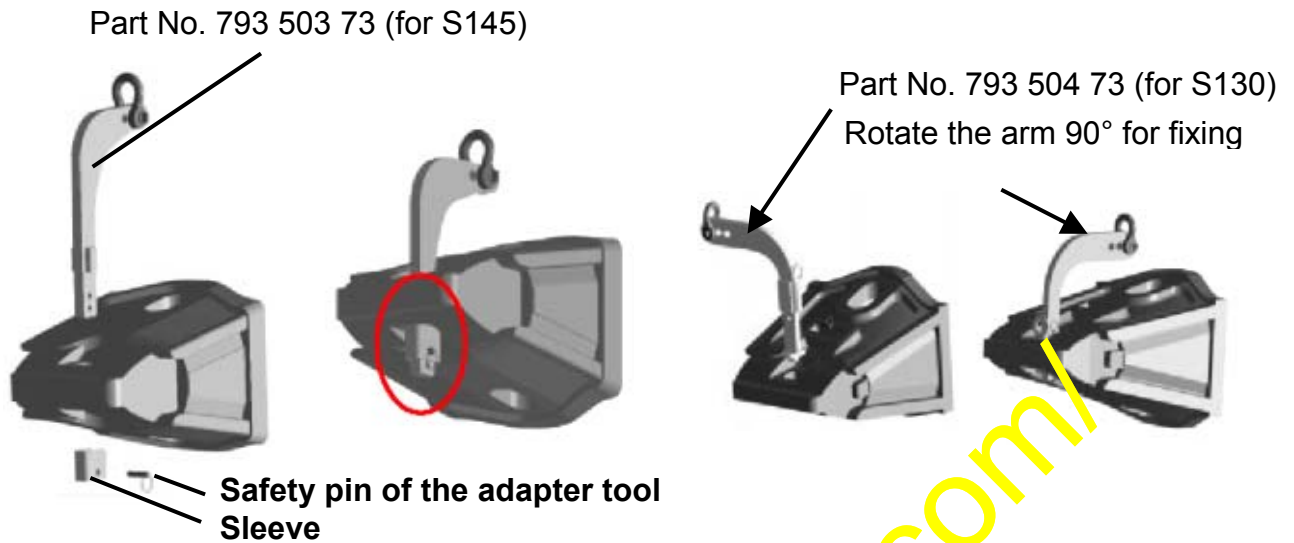
- Position the bucket with the nose tilted slightly upward.
- Clean debris from adapter Sidewinder Pin head slot and remove cap from Sidewinder Pin head.  
(The fastening Sidewinder Pin may become frozen in the nose hole by cemented fines. **In this event**, use either a hammer and drift or a porta-power, applied directly against the end of the Sidewinder Pin sleeve, to force the Sidewinder Pin out. Use a striking plate, as needed, to avoid hammering the end of the Sidewinder Pin base. With body completely retracted, insert drift that fits inside hex recess and hammer Sidewinder Pin through nose hole. Alternately, drift can be placed against outer sleeve. Avoid hammering over hex recess and thereby peening over the edges of this recess.)



- Insert Allen hex bit (14; 17 or 19 mm) into the head of Sidewinder Pin and turn counterclockwise (only for S 95 clockwise) until the Sidewinder Pin body is fully retracted. Do not continue to turn after “stop” is felt.  
The Sidewinder Pin is designed for operation with a ratchet wrench and should not normally require use of an air-impact wrench.



- For removing the adapter the Sidewinder Pin need not to remove out off the adapter base if it is in good condition.
- If the Sidewinder Pin have to be removed the end opposite the hex socket must be removed at first.
- **Lifting tools (refer to drawing next page):**
  - 122K (793 503 73):** (for S145)
    - Remove the safety pin of the adapter tool and slide the sleeve off the arm.
    - Guide the arm through the square hole in the nose of the adapter.
    - Arm must be pointed towards rear of the adapter.
    - Slide the sleeve onto the arm, align the holes in the arm and sleeve and install safety pin.
  - 112K (713 514 73):** (for S120)
    - Guide the lug on the end of the arm through the D-shaped hole in the nose of the adapter.
    - Rotate the arm towards the rear of the adapter until the tool is aligned with the adapter 90° and slide the lock down through the D-shaped hole and insert the safety pin.

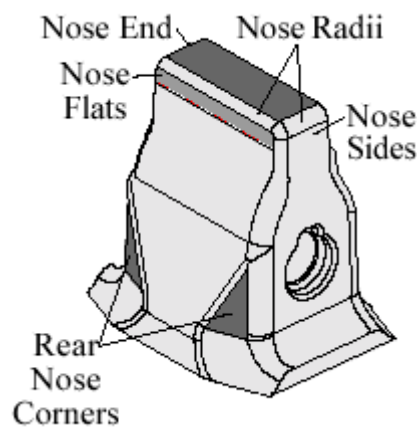


- Using a boom rated at 270 kg (600 lb) or greater (PC5500 and PC8000) or a boom rated at 230 kg (500 lb) or greater (PC4000), hook into the shackle at the top of the arm and remove the adapter.

### 3.2 Nose rebuild

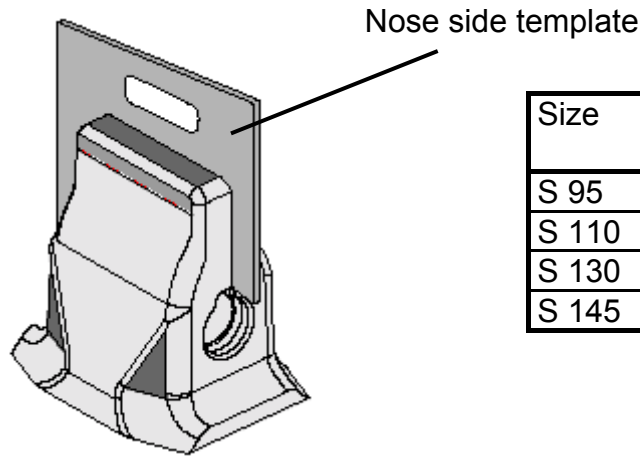
Nose fit: This tooth system is designed to operate with movement of the adapter on the nose. However, movement may become excessive over long term service because of nose wear. In this event, the nose can be rebuilt in the indicated areas with welding and grinding.

#### 3.2.1 Nose end and sides rebuild





- Place the nose side template on the centerline of nose.

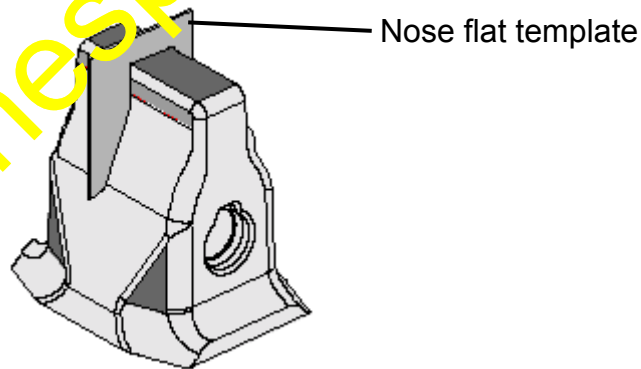


| Size  | Nose Side Template | Nose Flats Template |
|-------|--------------------|---------------------|
| S 95  | 79350573           | 79350673            |
| S 110 | 79350773           | 79350873            |
| S 130 | 79350973           | 79351073            |
| S 145 | 79400373           | 79400473            |

- Weld–rebuild nose end surface and grind flat until gage end nose align with front edge of pin hole. Weld stringer beads should run parallel to the nose width.
- Rebuild nose end radii as necessary.

### 3.2.2 Nose flats rebuild

- Place the nose flats template over the nose as shown.
- Weld buildup nose flats and radii and grind flat until template contacts nose end.



### 3.2.3 Rear corner rebuild

- Weld rebuild rear corners of nose.
- Chalk or paint weld buildup areas, place adapter as far as possible on nose and then remove. High spots will be indicated by missing chalk or paint.
- Grind weld buildup areas until a new adapter has a little or no movement up and down.
- Grind blend smoothly into rear shoulders.

### 3.3 Adapter installation



Prior to using an adapter tool be sure that the following safety precautions are followed at all times:

- Always wear proper safety equipment including hardhat, gloves, safety glasses and steel-toed shoes.
- Never exceed the lifting capacity of the tool.  
Lifting tool 122K (Part No. 793 503 73) rated capacity 270kg (600lb)  
- for the S145 tooth system.  
Lifting tool 112K (Part No. 793 504 73) rated capacity 230kg (500lb)  
- for the S130 tooth system.
- Tool is intended for vertical lift only.
- Always stand clear of the raised adapter.
- Never allow anyone to work under the adapter until it is secured to the lip by the appropriate locking mechanism.
- Always use the safety features (lock and safety pin) as indicated. Never use hand tools or other fastener to secure the sleeve. Never use anything other than the sleeve provided to support the adapter.
- Replace the tool when it becomes visibly damaged or distorted.  
**Do not attempt to repair a damaged tool.**

- The Sidewinder Pin must be fully retracted in the adapter base. Sidewinder Pin can be inserted from either side of base. Recommend corner positions be installed from inside.
- Position the bucket with the nose tilted slightly upward.
- Use a lifting tool and a lifting boom for the movement of the adapter as described in section 3.1. Test lift the adapter to check for satisfactory adapter tilt angle.



- **The adapter should tilt downwards at the rear for easy installation onto the nose.**

- Lower the adapter and reposition the shackle as needed to achieve appropriate tilt angle.
- Lift the adapter and slide it onto the nose. With the lifting boom still holding the adapter, install the adapter locking pin:



- **For applications where soil fines pack and harden, it is recommended that the outer sleeve of the pin be covered in grease.**

- Using hex bit and socket drive, turn hex socket end of Sidewinder Pin clockwise to extend the pin into the pin hole in the opposite side of the adapter. Tighten to the specified torque value shown below.

| Size         | Allen type wrench size | Recommended pin torque     |
|--------------|------------------------|----------------------------|
| <b>S 95</b>  | 14 mm                  | 160-200 Nm (120-150ft-lb)  |
| <b>S 110</b> | 17 mm                  | 200-260 Nm (150-190ft-lb)  |
| <b>S 130</b> | 19 mm                  | 260-390 Nm (190-290 ft-lb) |
| <b>S 145</b> | 19 mm                  | 260-390 Nm (190-290 ft-lb) |

- Insert the Sidewinder Pin cap to prevent the pin hex socket from filling with soil fines. Cap should snap into place.

### 3.4 Retighten Sidewinder Pin

Retighten the Sidewinder Pin every 600 to 1200 hours of operating service depending on the severity of application.



- Some loosening of pin  $\frac{1}{2}$  -  $\frac{3}{4}$  turns is normal. It is not necessary to keep it tightened to the recommended torque.**

## 4. Wear Caps

### 4.1 Lock style wear caps (PC4000)

#### 4.1.1 Removal

- Clean debris from the gap around the wearcap lock. Do not strike corners or edges with hammer!
- Rotate Lock : Use a drift and a 2-4 kg/4-8 lb hammer to rotate the lock to the unlocked position.



- It may be necessary to partially rotate the lock in both directions to break loose soil fines, before fully rotating it.



- Lock must be rotated completely (180 degrees) to release the wearcap.**
- Lock can rotate either way.**

### Remove Wearcap:

Slide wearcap out of adapter slots. Use appropriate lifting devices to support and remove wearcap. It may be necessary to place a pry bar between the adapter and the rear inside face of the wearcap to lift and free it from soil fines.

### 4.1.2 Installation



- **Wearcap tabs, adapter tab slots, and lock recesses must be thoroughly cleaned. Inspect all components for damage. Replace any damaged parts.**

- **Position Wearcap Lock**

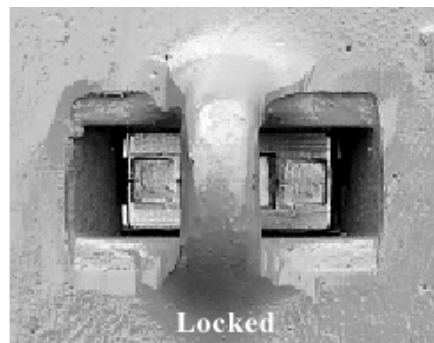
First place the lock flat side down against the inside of the wearcap, adjacent to the lock opening. Slide it toward the wearcap lug. One of the lock shafts will enter the hole in the lug. Push the lock up tight against the lug. Then, using a drift placed in one of the lock pockets, tap the drift with a hammer to cause the lock to rotate halfway around, until the flat side of the lock is facing you and is lined up with the inside face of the wearcap.

- **Wearcap Installation**

Place the wearcap on the adapter. The tabs on the inside of the wearcap fit into the tab slots in the adapter.

- **Lock Wearcap**

Use an suitable tool and hammer to rotate the lock to the locked position. If lock resists rotation, this indicates more cleaning of the adapter slots is required. When flat is facing out, the lock is in a locked position.



## 4.2 Non lock style wear caps (Option PC4000; PC5500; PC8000)



- For using of these kind of wear caps special points and special adapters are required.

### 4.2.1 Removal

- Drive out the point pin and remove the point.
- Slide the worn wearcap off the adapter.



- If soil packs tightly between the wearcap and the adapter, it may be necessary to strike the flat sides of the wearcap several times with a hammer, to loosen it for removal.
- Do not strike corners or edges with hammer!

### 4.2.2 Installation

- Inspect all components for damage. Replace any damaged parts.
- Slide wearcaps onto the adapter top and bottom surfaces, so that the wearcap rear central and two forward side tabs insert fully into the respective slots of the adapter.
- Install and pin the point.

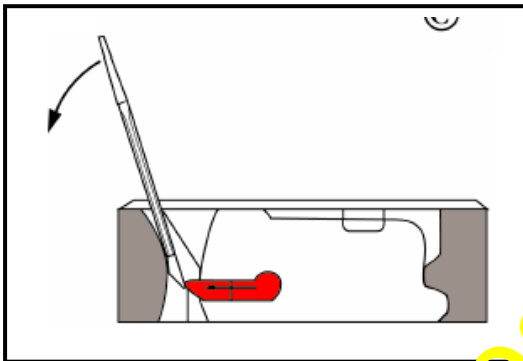


## 5. The Shrouds

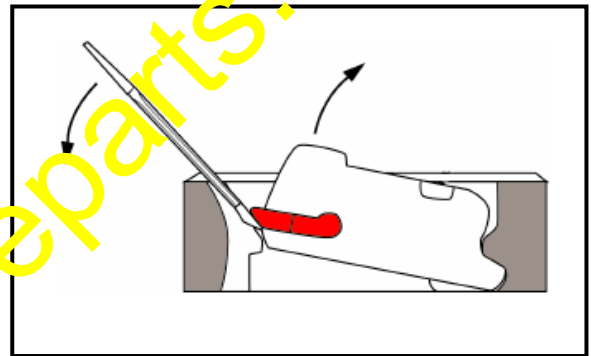
### 5.1 Remove the shrouds

The Toplok shroud system is engineered to make change-out easy. Before following these simple steps shown to the Figures, it's important to clean fines from pin area by tapping the shroud to loosen them, then scraping them using a chisel or needle gun (if fines are heavily packed).

- Use a small bar with flat end (19 mm wide maximum) to retract the latch and lift the pin out.
- Pins can be reused if not worn below the locator flange and the insert latch rubber is fully bonded to the steel tip and fully seated in the pin body.



Place a pry bar or pinch bar behind the latch as shown, as a lever to compress it.



Lift out and remove the lock. Slide the shroud off the lip base.



- In severe applications assist removal by inserting a pry bar under the lock from the rear of the shroud and lifting up the latch end of the pin while prying as shown.

## 5.2 Installing the shroud

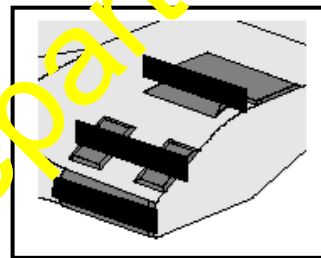
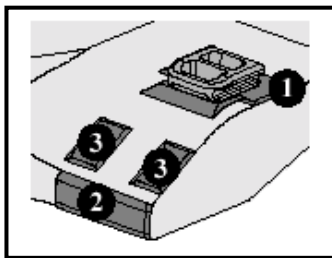
### 5.2.1 Prepare the surface

In order to provide sufficient support for the boss as well as its pin, the mounting surface must:

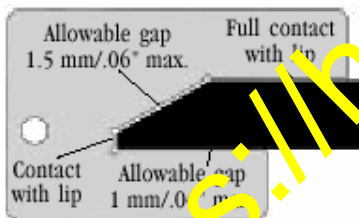
- Be relatively smooth and free of debris, weld spatter, and other irregularities.
- Have a profile that produces a gap no greater than 3 mm or 1/16" at the boss weld. Any gap greater than 3 mm or 1/16" must be shimmed.

### Checking the Fit Pad Areas

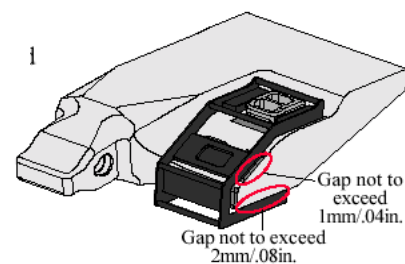
- The fit pad surface (1) & (2) should be perpendicular to each other.
- Make sure 70% of the fit pad surfaces (1) & (2) are in contact with the gauge.
- After achieving this, the fit pad surface (3) should be checked.
- Use a straight edge to help check the surface consistency.



#### Plate lips (PC4000)



#### Cast lips (PC5500 and PC8000)



### Templates Part numbers for checking and preparation the lips

| Type of Excavator | Shovel Version              |            | Backhoe Version |            |
|-------------------|-----------------------------|------------|-----------------|------------|
|                   | Lip Shroud                  | Template   | Lip Shroud      | Template   |
| PC4000            | 654 547 40                  | 794 005 73 | 654 627 40      | 794 006 73 |
|                   | 654 548 40                  |            | 654 628 40      |            |
|                   |                             |            | 654 629 40      |            |
| PC5500            | 655 867 40 or<br>907 281 40 | 794 007 73 | 655 867 40      | 794 007 73 |
|                   |                             |            |                 |            |
| PC8000            | 907 006 40                  | 794 008 73 | 907 448 40      | On request |

## 5.2.2 Position the bosses

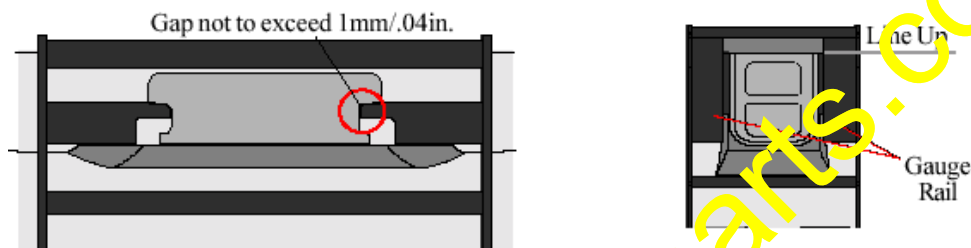
### Checking the Boss Position

To insure the boss is located correctly, the gap between the gauge and the boss rails should not exceed 1mm/.04in. If the gap exceeds 1mm/.04in., the boss has to be removed and a new boss installed (see below).

The back of the boss should line up with the back of the gauge rail.

If the boss does not line up with the back of the gauge rail, then two repair options are possible:

- (A) If the gap does not exceed 1.5mm/.06in., build up the back of the boss; or
- (B) Weld build the leading edge fit pad (2). This may result in the ramp fit pad (3) also requiring weld build up.



### Weld Rebuilding Fit Pads

When weld rebuilding fit pads ensure the weld surface is clean and free of any contamination that might prevent a good weld. Follow the preheat, interpass and post heat guidelines below.

### Summary of Welding Specifications

- Electrodes: E7016 or E7018 low hydrogen (keep dry!)
- Wires: E70T-5, E71T-1, or E70T-1 with CO<sub>2</sub> gas.
- Preheat: 200°F/95°C (350-400°F/175-205°C if air temperature is 40°F/5°C or lower.)
- Interpass: Maintain interpass temperature less than 500°F/260°C.
- Postheat: If air temperature is 40°F or lower, postheat 350-400°F, then let air cool.
- Remove slag after each pass and peen each bead.

### New Boss Installation

- Set the boss onto the gauge rails and locate the back of the boss with the back of the gauge rails. If no gauge is available, use a new shroud to locate the boss.
- Move the gauge onto the lip, making sure the gauge is centered between the nose bases and the gauge is in contact with fit pad surfaces (1) & (2).
- Practice has shown, that the boss will suck down 1/16" during welding. To equalize this use a 1/16" shim under the boss, even if there is no gap between the fit pad (1) and the boss. This will ensure the boss height is correct after welding.
- If there is a gap between the fit pad surface (1) and the boss, use a thicker shim accordingly.



### 5.2.3 Welding the bosses

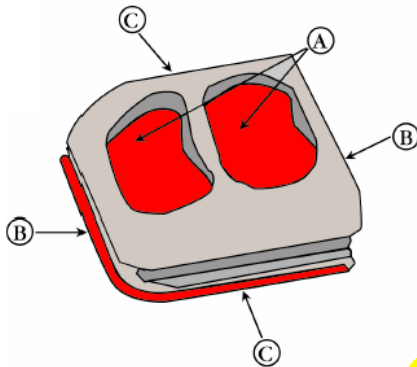
The weld surface must be clean and free of any contamination that might prevent a good weld. Follow the preheat interweld and post heat guidelines below.

#### Summary of Welding Specifications

- Electrodes: E7016 or E7018 low hydrogen (keep dry!)
- Wires: E70T-5, E71T-1, or E70T-1 with CO 2 gas.
- Preheat: 200°F/95°C (350-400°F/175-205°C if air temperature is 40°F/5°C or lower.)
- Interpass: Maintain interpass temperature less than 500°F/260°C.
- Postheat: If air temperature is 40°F or lower, postheat 350-400°F, then let air cool.
- Remove slag after each pass and peen each bead.

Weld the boss to the lip. Make sure that the boss is shimmed, so that the height of the boss will be correct after welding.

Weld area (A) completely before welding areas (B) & (C).



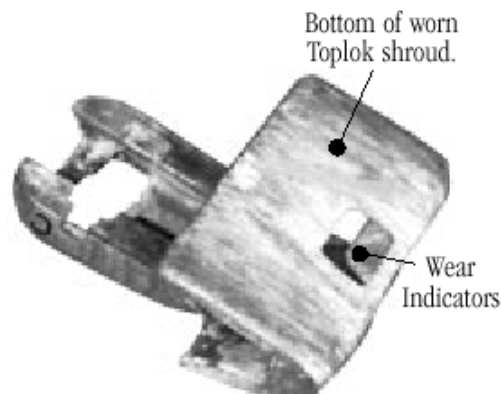
#### Welding Guide

| Weld Location | (A)                               | (B)                                  | (C)                                  |
|---------------|-----------------------------------|--------------------------------------|--------------------------------------|
| Boss          | Depth of weld plug holes<br>mm/in | Size of fillet weld-on ends<br>mm/in | Size of fillet weld-on ends<br>mm/in |
| TAB           | Plug Weld 10/.38                  | Fillet 10/.38                        | Fillet 3/.19                         |
| TPE           | Plug Weld 13/.50                  | Fillet 13/.50                        | Fillet 6/.25                         |
| TCF           | Plug Weld 16/.62                  | Fillet 13/.50                        | Fillet 6/.25                         |

### 5.3 Inspecting Worn Shrouds

Toplok shrouds protect the bucket lip and wings from abrasive wear. Use of ESCO 12S abrasion resistant alloy assures long life before change out.

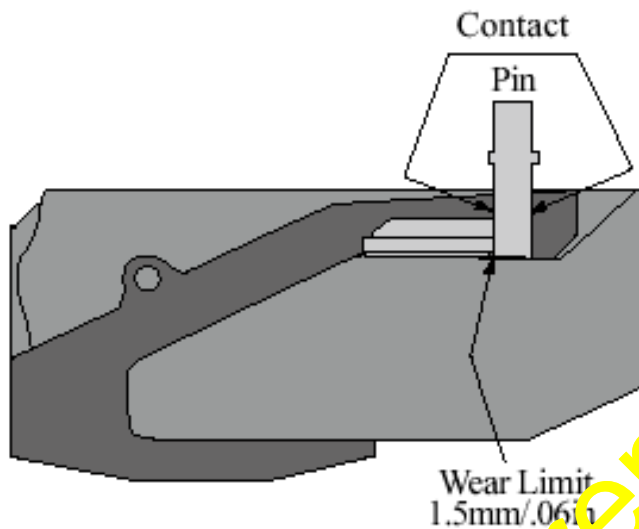
- Periodic inspection should be made to determine when to replace a shroud.
- Monitor high wear surfaces of the Toplok shroud for wear.
- Special "Wear indicators" are special panels that will open up to alert the user of the need for changing shrouds.



## 5.4 Installing

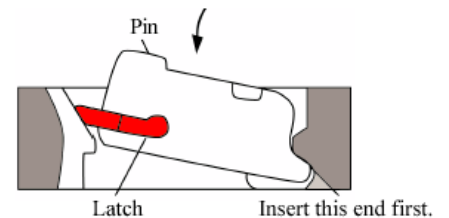
### Installing the shroud

- Slide the shroud over the lip and boss to install the pin. If installing a new shroud, the pin must have contact with the back of the boss and with the back of the shroud without losing contact at the leading edge.

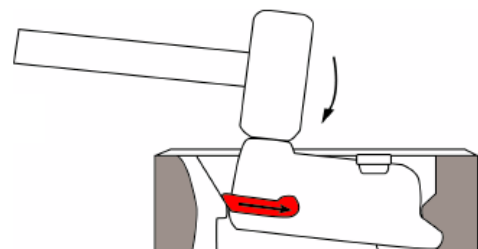


### Installing the pin

- Position the pin in the shroud cavity as shown.



- A light blow with a hammer will engage the pin.



- The shroud is now securely attached.

