



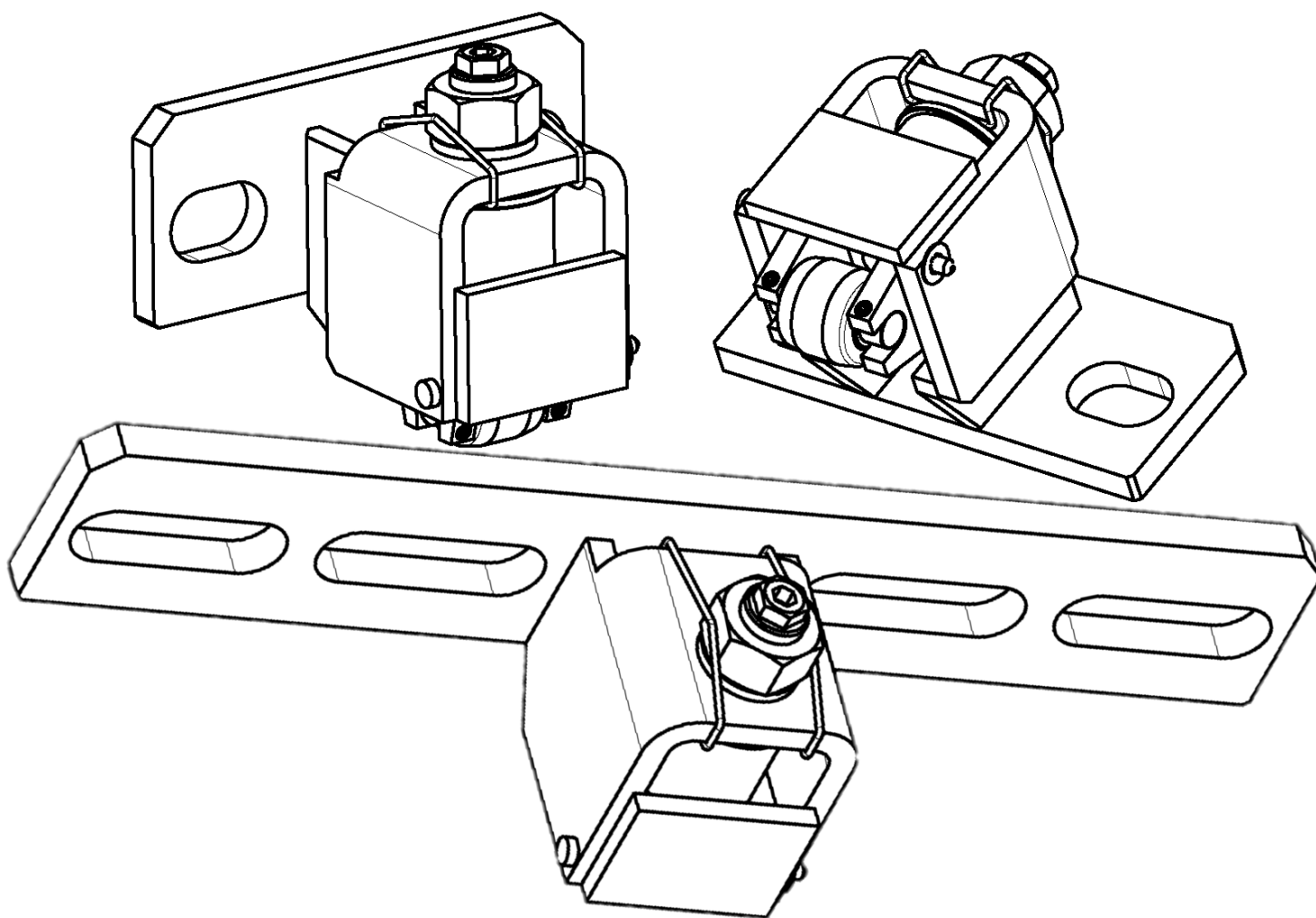
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ekoslide

Instruction Manual



EKOSLIDE: Installation and Adjustment

**ENSURING THE SMOOTH MOVEMENT OF SWITCHES
WITHOUT THE NEED FOR TIE PLATE LUBRICATION**

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Step 1: Prerequisites

Getting Started:

1. New to EKOSLIDE? This manual should be thoroughly reviewed before first-time installation.
2. Review the recommended tool list below and arrange for the relevant tools to be available for the installation team.
3. Examine one of the Ekoslides before starting installation in order to get a “feel” for the product. See Page 10.
4. All Ekoslides have elongated holes to allow for more flexibility in bolt spacing and placement.
5. Note the info on bolts on Page 7. For bolts with cotter pins, longer bolts or thinner washers may be required.
6. Make sure you use the correct number of Ekoslides per switch. For a shorter switch (#8), use four Ekoslides. For medium length (#15), use six. For longer (#20), use eight. See Page 4.

Basic EKOSLIDE Steps

Planning
(Pages 3 - 4)

Measuring
(Pages 5 - 7)

Installation
(Page 8)

Adjustment
(Page 9)

Finished!

Recommended Tools for Installation

Often, EKOSLIDE can be installed with only wrenches. However, the following tools are recommended to make installation the quickest and easiest:

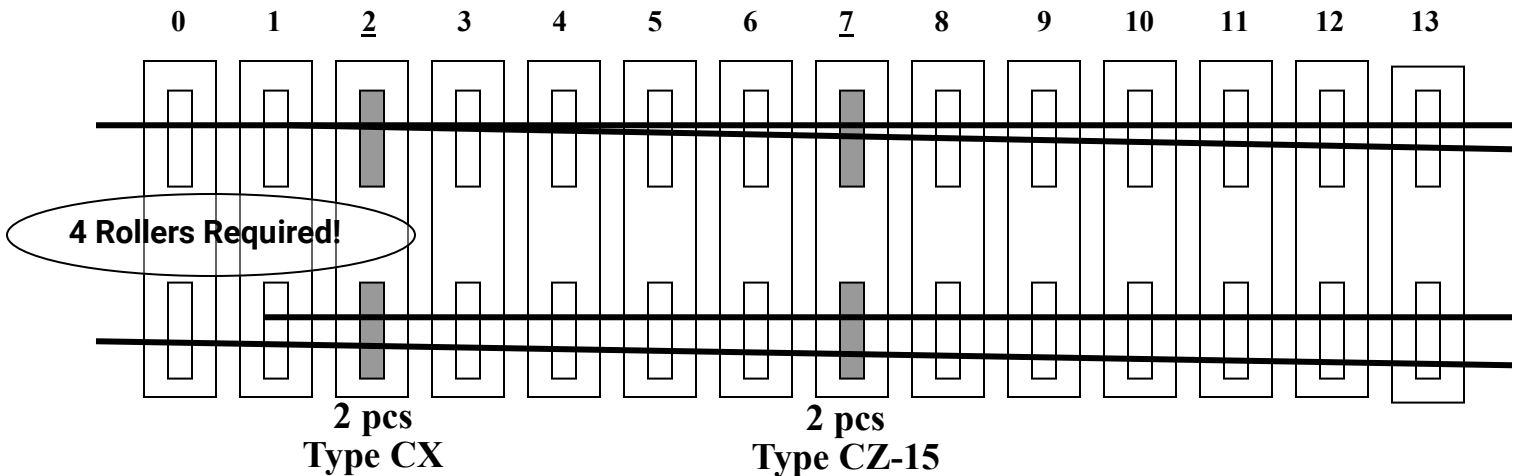
- Wrenches (sized for your nut/bolt sets)
- EKOSLIDE Yellow Adjustment Gauge (included with every pair of Ekoslides)
- Switch Broom (for cleaning tie plates)
- Pliers (for cotter pins)
- Tape Measure
- Impact (makes install faster & easier)
- Rail Jack (for inserting longer bolts)
- Long Track Wrench (for leverage)
- Spike Lifter (if spike removal is needed)
- Rail Saw or Torch (for rivet removal)
- Pick (for rivet removal)

Step 2: Identify EKOSLIDE Locations

- 1) A minimum of four Ekoslides (two per side) are required per switch.
- 2) EKOSLIDE locations for retrofitting existing switches can vary, but specific layouts for new switches are predetermined. Check with IAT or standards department.
- 3) First pair of Ekoslides must be closer to the front of the point, and each additional pair should be 3-6 ties away from the previous pair. See examples below.

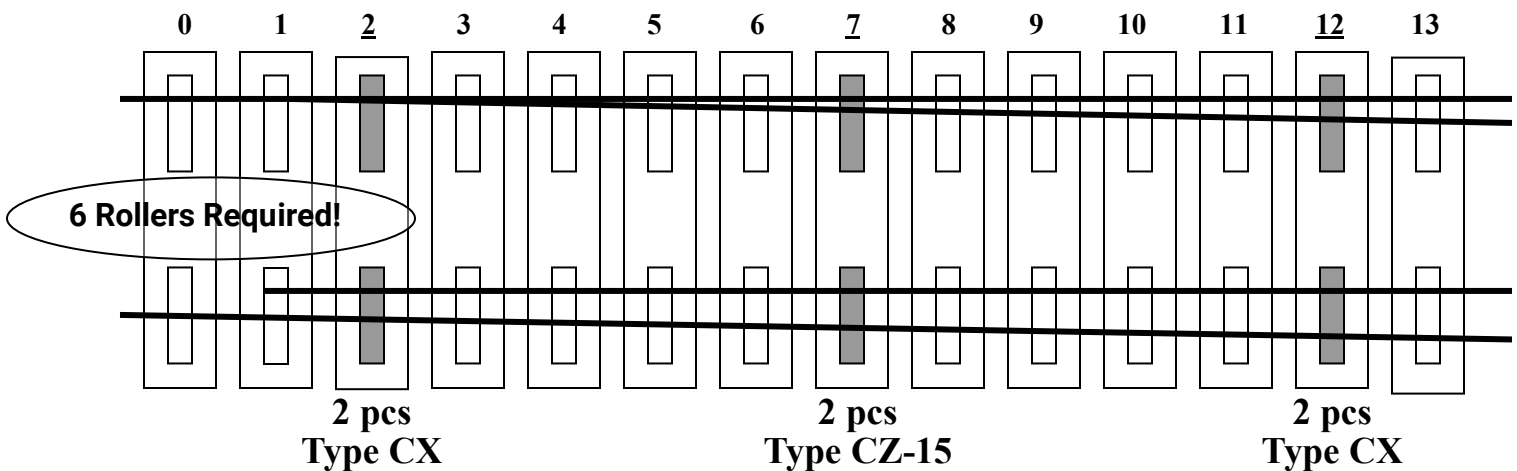
Samples of #8, #9, #10, #11 Switches (EKOSLIDE in shaded blocks below)

(examples only - actual types/locations could vary)



Samples of #14, #15, #16 Switches (EKOSLIDE in shaded blocks below)

(examples only - actual types/locations could vary)



Note: What about a #20 or #24 Switch???

Plan for 8 rollers. Similar to the #15 above, plus an extra pair around the 16th tie.

Helpful Hint! Remember the “4 & 4” Rule! Put the first Ekoslide pair before the 4th tie and the next pair at least 4 ties away (but never up to 8 ties away).

Step 3: Determine EKOSLIDE Type

1) Bolt Spacing (on Switch Point)

Measure the distance between the bolts over the ties. How many inches apart are the bolt holes?

• Bolt Spacing Approximately 5"

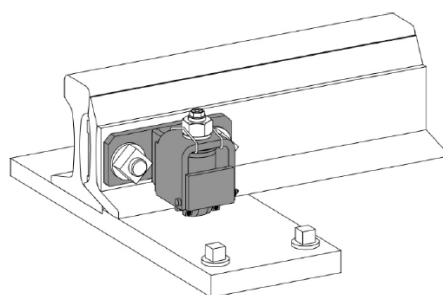
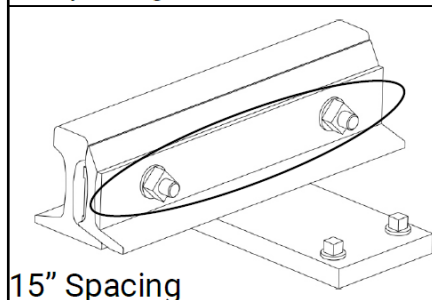
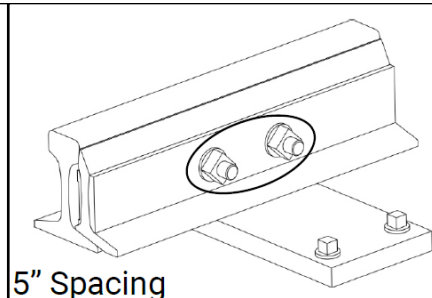
- Range: 4 $\frac{3}{4}$ " to 5 $\frac{3}{4}$ " apart
- Plan for CX (or CZ-5 → see below)

• Bolt Spacing Approximately 10"

- Range: 5 $\frac{3}{4}$ " to 12" apart
- Plan for CZ-10

• Bolt Spacing Approximately 15"

- Range: 12 $\frac{7}{8}$ " to 17 $\frac{1}{4}$ " apart
- Plan for CZ-15

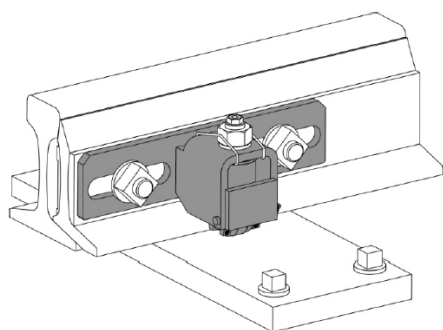


EKOSLIDE Type "CX" and Type "CZ-5"

- Holes => 1 $\frac{1}{2}$ " Wide, 5 $\frac{1}{4}$ " Apart (center-to-center)
- Slotted Holes for 4 $\frac{3}{4}$ " to 5 $\frac{3}{4}$ " Bolt Spacing
- Back Plate Thickness => $\frac{1}{2}$ "

HEIGHT is the difference between CX and CZ-5:

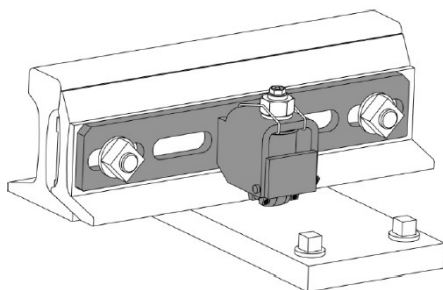
CX is default and used most often (ABR drilling 2 $\frac{7}{8}$ " and over). CZ-5 is only for lower bolt height (ABR drilling under 2 $\frac{7}{8}$ "). CZ-5 is used for UP/BNSF/KCS "common standard" turnouts but ONLY at the front-most location. CZ-5 has GREEN stickers.



EKOSLIDE Type "CZ-10"

- Holes => 4 $\frac{5}{8}$ " Wide, 8 $\frac{5}{8}$ " Apart (center-to-center)
- Slotted Holes for 5 $\frac{3}{4}$ " to 12" Bolt Spacing
- Back Plate Thickness => $\frac{1}{2}$ "

Helpful Hint! Location (Page 4) and Bolt Spacing (above) are the two primary requirements for choosing EKOSLIDE quantity and type



EKOSLIDE Type "CZ-15"

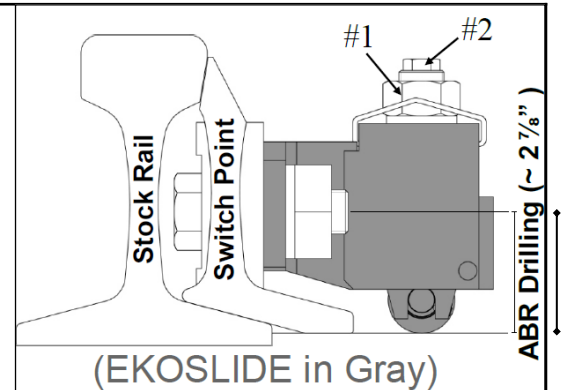
- Holes => 3 $\frac{1}{4}$ " Wide, 15" Apart (center-to-center)
- Slotted Holes for 12 $\frac{7}{8}$ " to 17 $\frac{1}{4}$ " Bolt Spacing (Added interior holes for 5" to 9 $\frac{5}{8}$ " Bolt Spacing)
- Back Plate Thickness => $\frac{5}{8}$ "

Step 4: Check EKOSLIDE Height

(Skip this page if NO height issues exist)

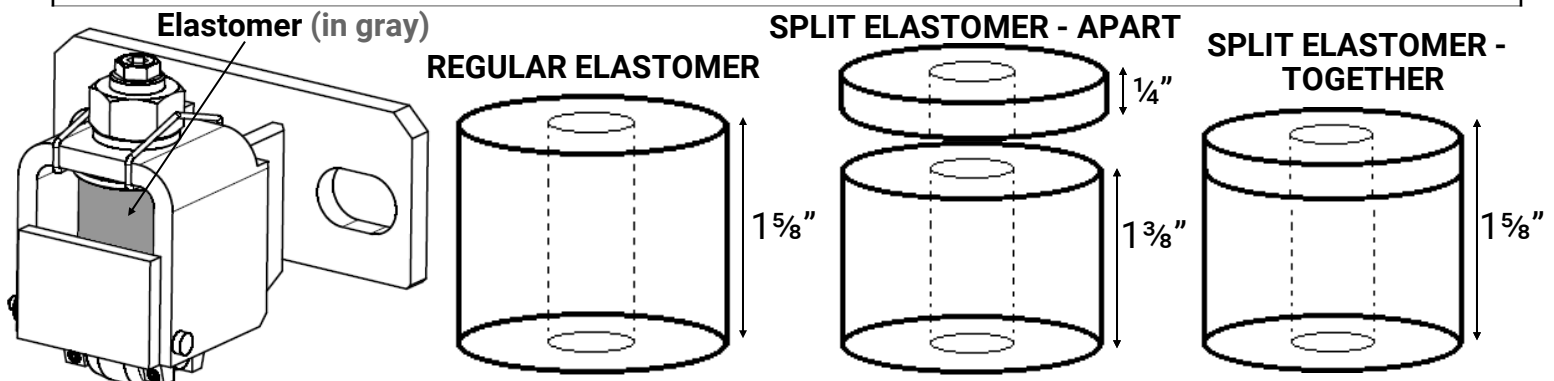
Standard Height Considerations

1. Line up the bolt holes on the Ekoslides to ensure that their bolt holes are in alignment with the bolt holes on the switch point. Bolts must be able to go thru the switch point holes and the Ekoslide holes.
2. **Most likely, Ekoslides have the correct height by default.** They are sized for the most common above-base (ABR) bolt drilling heights in North America.
3. Ekoslides allow up to $\frac{3}{4}$ " vertical height adjustment, providing significant versatility.
4. ABR drilling height for bolt holes in switch points of AREMA standard turnouts range $2\frac{7}{8}$ " to $3\frac{3}{32}$ ", which is ideal for Ekoslide Type CX, CZ-10, and CZ-15.
5. The most frequent exception to this AREMA drilling height is the "Common Standard" turnout utilized by BNSF/UP/KCS, which uses $2\frac{3}{8}$ " ABR drillings in the front section of the switch point. Ekoslide CZ-5 is designed for this lower drilling height.
6. In summary: For ABR bolt hole height of $2\frac{7}{8}$ " & above, start with CX, CZ-10, CZ-15. For bolt drilling height below $2\frac{7}{8}$ ", start with CZ-5.



Elastomer Height Adjustments

1. The "Elastomer" is the red bushing inside EKOSLIDE serving as a spring mechanism
2. There are two Elastomer variations:
 - "Regular" Elastomer => $1\frac{5}{8}$ " Height
 - "Split" Elastomer => Allows for either $1\frac{5}{8}$ " or $1\frac{3}{8}$ " height
3. "Regular" Elastomer at $1\frac{5}{8}$ " is for CX, CZ-10, & CZ-15: made for the standard ABR drilling heights of AREMA switch points and is most common in North America
4. The bottom section of the "Split" Elastomer at $1\frac{3}{8}$ " is default only for CZ-5, due to lower ABR drillings ($2\frac{3}{8}$ ") for "Common Standard" turnouts towards front. This lower height may be required over the first tie (gauge) plate or lower profile rail (like 85-lb).
5. To raise the height of the Ekoslide, stack the $\frac{1}{4}$ " elastomer slice on top of the bottom $1\frac{3}{8}$ " elastomer, as shown in diagram below. All CZ-5 models have this extra $\frac{1}{4}$ " piece.
6. New elastomers can be exchanged for all models. For example, "regular" elastomers may be used with CZ-5 and "split" with CX. Note this changes the height accordingly.

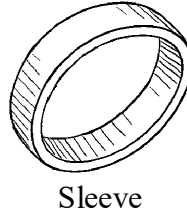


Step 5: Hardware/Accessories

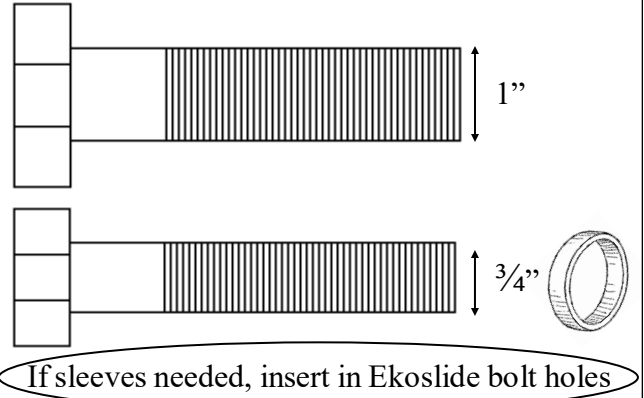
Bolt Diameter and Sleeves

EKOSLIDE bolt holes accommodate the most common bolt diameters: 1", 7/8", 3/4", and 5/8". Sleeves are included (to insert in EKOSLIDE bolt holes) for 3/4" & 5/8" diameter bolts.

- **Bolt Diameter = 3/4" OR 5/8"**
 - Use included sleeves
- **Bolt Diameter = 1" OR 7/8"**
 - No sleeves required



Sleeve



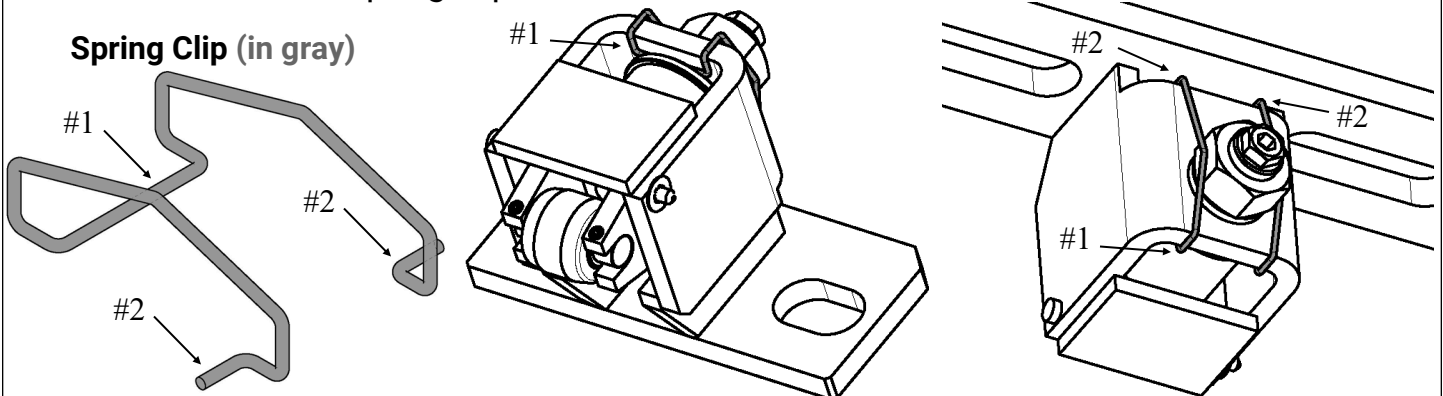
Bolt Length: Existing bolts can be re-used. However, the backplates of EKOSLIDE are 1/2" to 5/8" thick (depending on type), which means they take up 1/2" to 5/8" of bolt length. This could impact bolts with cotter pins, for example. Therefore, longer bolts (up to 1/2" to 5/8") or thinner washers may be required. See Page 5 for backplate thickness of each type.

Nuts for Bolts: For 1" diameter bolts, hexagon nuts are recommended for **CX & CZ-5**, as hex nuts provide more space for sockets and wrenches than square nuts.

Helpful Hint: What about Tie Plates? Ekoslide requires a flat surface to roll, so the best plates for Ekoslide are simple, flat plates. If being installed on an existing plate with a hump or riser, ensure Ekoslide rolls only on the flat portion of the plate.

Spring Clip: (in gray below)

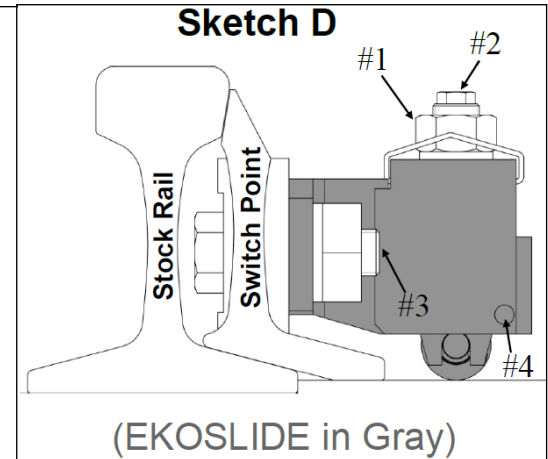
1. EKOSLIDE has a spring clip (as of 2022) to better secure the top nut from backing out.
2. The spring clip should be left in place, during both EKOSLIDE installation & adjustment
3. Although the spring clip was designed to be left installed, it can be removed by: (a) pry the front of the clip (#1 below) forward and away from the housing, (b) lift the clip up and over the top nut, (c) squeeze the back hooks (#2 below) closer together, (d) while pulling the back portion (#2 below) out of the housing.
4. If needed, the spring clip is installed by: (a) squeeze the back hooks (#2 below) closer together and (b) insert into the back of the housing, (c) pull the clip up and around both sides of top nut, and (d) insert the front of clip (#1 below) into the front of the housing.
5. Note there are two spring clip sizes : one for CX & CZ-5 and another for CZ-10 & CZ-15



Step 6: Installing EKOSLIDE

The Basic Installation:

1. EKOSLIDE must be installed on BOTH sides of the switch point using the correct number of Ekoslides (see "Location" diagrams on Page 4).
2. Clean any build-up off the tie plates using a switch broom, most importantly cleaning the tie plates on which EKOSLIDE will be rolling.
3. Install on the side of the switch point in the open position, starting from the front.
4. Remove existing bolts (or rivets) at each of the planned EKOSLIDE locations. (Existing bolts can often be re-used. See Page 7 for details on bolts, along with the cotter pin note at the bottom of this page.)
5. Back each EKOSLIDE all the way out of adjustment, if they are not already. To do so, loosen the top nut (#1 in Sketch D) and turn the adjustment bolt (#2 in Sketch D) all the way counter-clockwise.
6. Mount EKOSLIDE by inserting bolts thru the holes in the switch point and the matching holes in EKOSLIDE's backplate (#3 in Sketch D). Two bolts are required to attach each EKOSLIDE.
7. Ensure EKOSLIDE wheels are firmly on tie plates. Center of plates is preferred.
8. Secure EKOSLIDE to the bolts with a washer and nut on each bolt.
9. While tightening the nuts on the bolt, ensure the Ekoslides are level with the switch point. If they are tilted/off-balance, wheel wear will be greater.
10. After EKOSLIDE units are completely mounted on the first side, throw the switch. Repeat steps 2-9 on other side (now open side) of the switch point.
11. If final EKOSLIDE adjustment is being done now, leave the top nuts (#1 in Sketch D) loose until after adjustment (as described on Page 9). However, if adjustment will be at a LATER date, top nuts must be tightened down.
12. To allow for maximum adjustment in the future, remove the plastic security pin (#4 in Sketch D) by tapping the side of the pin that has a star-lock washer. This step is only optional but advised for ABR drilling exceeding 3".
13. Once EKOSLIDE is installed on both sides of switch, adjustment is next. Adjustment may be on a later date but must be BEFORE the switch goes live.



Helpful Hint! The installation does NOT need to be completed all at once, so traffic does NOT have to be stopped. However, it is important to keep each Ekoslide out of adjustment until all Ekoslides have been attached. See Step 5 above.

Note: Cotter Pins and Lock Nuts

The use of cotter pins or lock nuts is recommended for the bolts used to mount the Ekoslides. Always follow relevant railroad policy (and FRA policy if applicable) regarding the approved methods for securing bolts/nuts.

Step 7: Adjustment

Helpful Hint!

Adjustment Videos on the Web:
www.youtube.com/ekoslide

Check EKOSLIDE adjustment:

- (a) At the time of installation
- (b) Quarterly on-going basis (four times a year)
- (c) After tamping or switch maintenance (e.g. switch stand change)

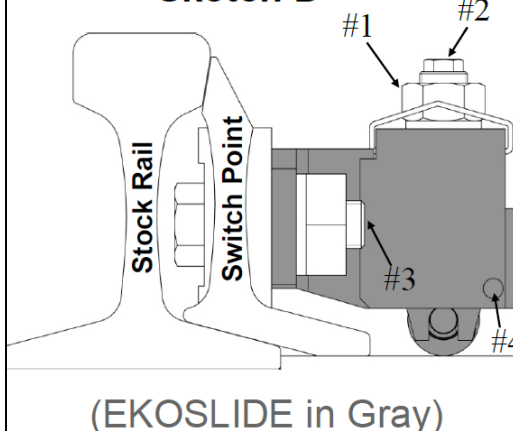
IMPORTANT: The purpose of adjustment is to raise the switch point just enough to prevent the point from rubbing on the ties, but not lifting more than you need.

- 1) Installation of EKOSLIDE is performed on the side of the switch in the open position. Adjustment of EKOSLIDE is performed on the side of the switch in the closed position, **starting at the front of the switch point and then progressing towards the back.**
- 2) Remove the top nut (#36mm = $1\frac{7}{16}$ ") of the EKOSLIDE (#1 in Sketch D below) in order to have access to the adjustment bolt (#2 in Sketch D below).
- 3) Turn the adjustment bolt (#2 in Sketch D) clockwise with a wrench ($17\text{mm} = 1\frac{1}{16}$ ") or Allen key (size 8 = $\frac{5}{16}$ ") to lift the switch point 2mm off the tie plate. Measure using the yellow gauge (#5 in Detail - Sketch E below). (1 gauge step = 1 mm)
- 4) If all ties are not level, you may already have 2mm clearance over a particular tie plate. If so, turn adjustment bolt until there is pressure, lifting 1mm above starting height.
- 5) Using the yellow gauge, check that the 2-3 closest ties on both sides of the EKOSLIDE location have clearance (1mm or more) between the tie plate and switch point. If not, increase the height of the nearest EKOSLIDE.
- 6) Throw switch. Repeat Steps 2-5 on the other side (newly closed side) of the switch.
- 7) After adjusting both sides of the switch, ensure there is clearance between the tie plates and switch point on ALL tie plates. If a tie plate without rollers has:
 - Too Little Height: Height may not be 2mm across entire switch, so ensure point is not rubbing on any of the plates. If so, increase height of the EKOSLIDE nearest that plate.
 - Too Much Height: Conversely, it is OK if there is more than 2mm height on a plate without rollers, as long as the plates with EKOSLIDE have the proper adjustment.
- 8) Throw switch back and forth to verify the switch is closing properly on both sides.
- 9) Finally, put the top nut (#1 in Sketch D below) back in place and tighten.

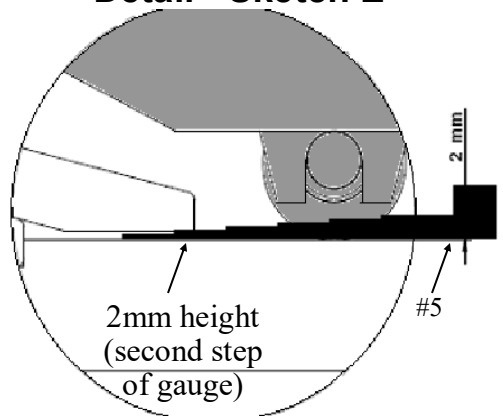
The adjustment process only takes about 5 minutes per switch!

Note on Security Pin (#3):
 Remove the plastic security pin (#3 in Sketch D) by tapping the side of the pin that has the star washer. The pin may be left in place if there is no interference, but removal is advised, especially for ABR drilling exceeding 3".

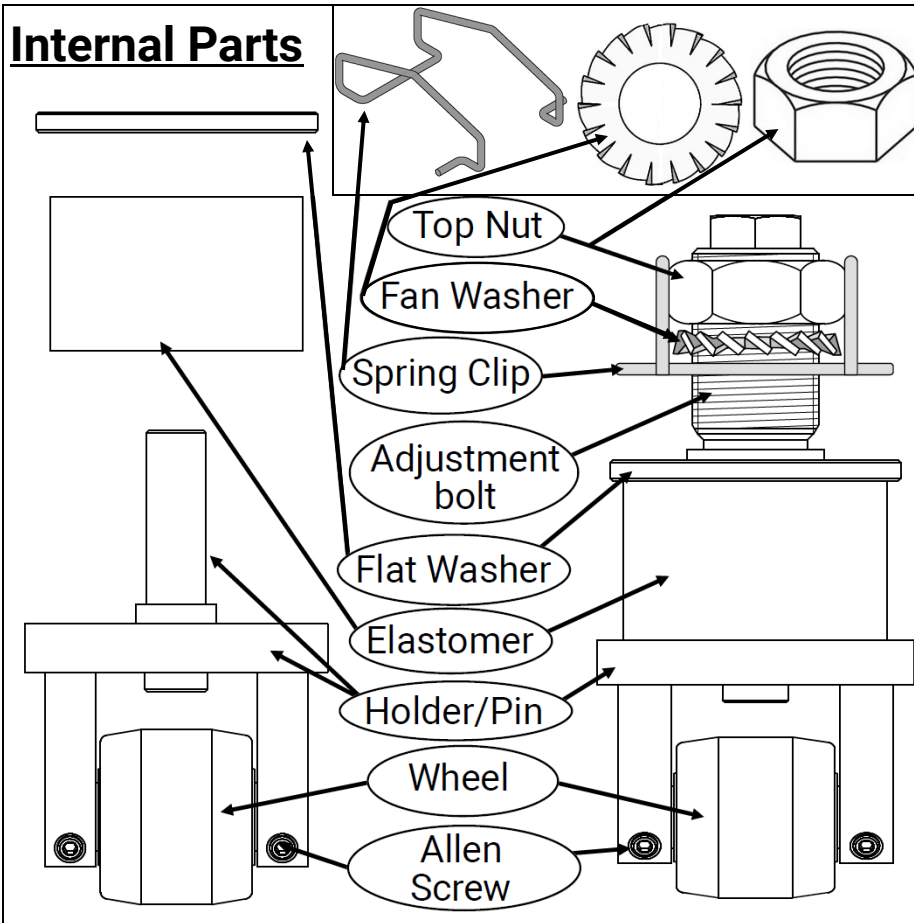
Sketch D



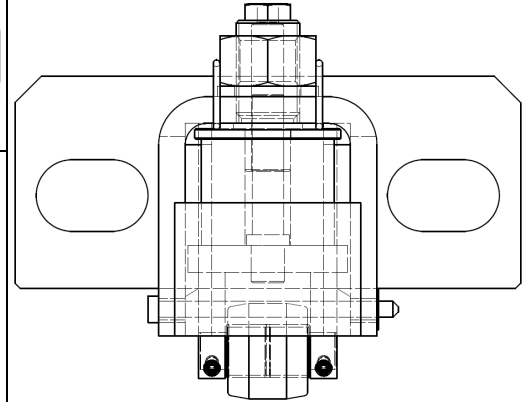
Detail - Sketch E



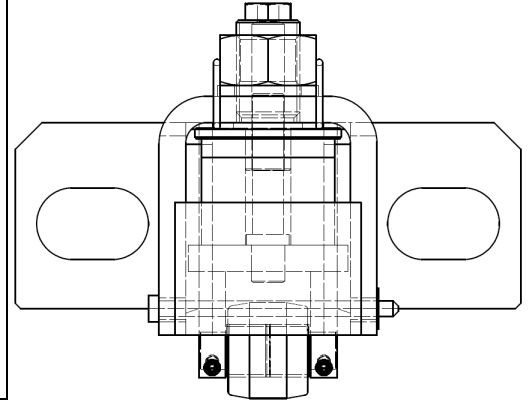
Appendix 1: Parts & Assembly



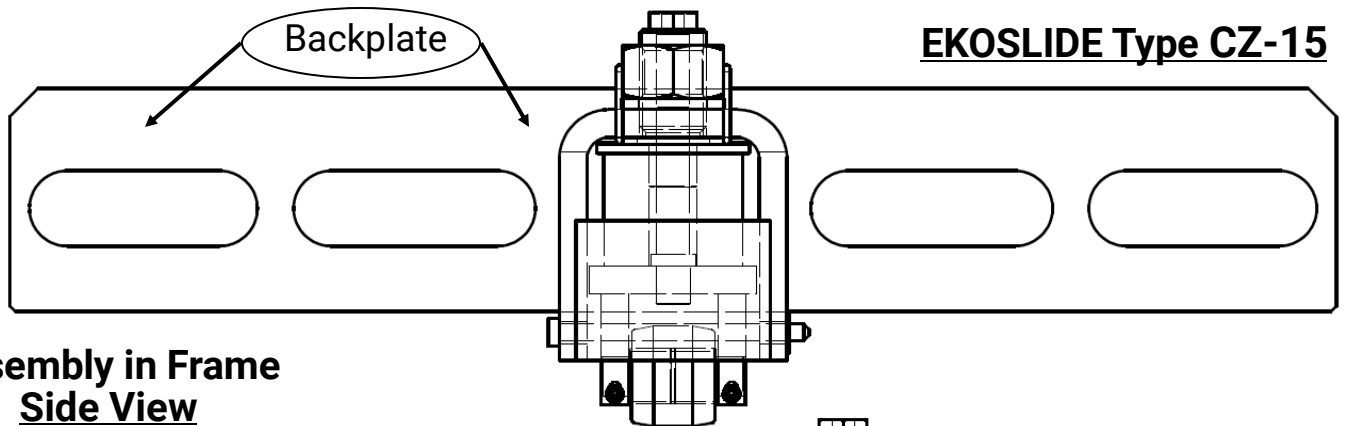
EKOSLIDE Type CX



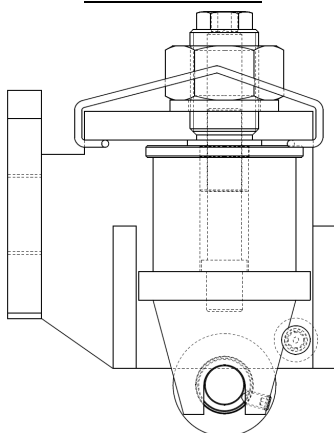
EKOSLIDE Type CZ-5



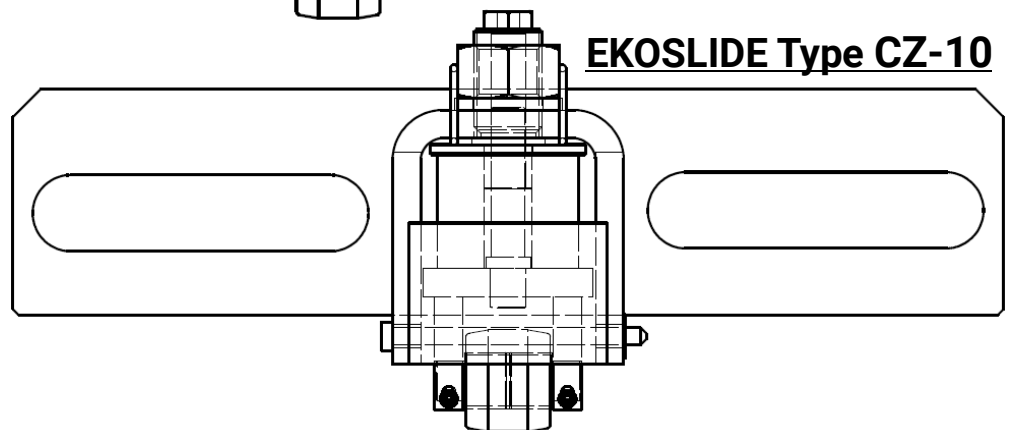
EKOSLIDE Type CZ-15



**Assembly in Frame
Side View**



EKOSLIDE Type CZ-10



Appendix 2: Frequently Asked Questions (FAQ)

1. How long does it take to install Ekoslides?

A crew with previous EKOSLIDE experience and the correct tools can perform a complete EKOSLIDE installation in ½ hour to an hour, depending on track conditions.

2. Do the Ekoslides require any lubrication?

No. Lubricant should not be applied to EKOSLIDE. Also, lubricant should not be applied to tie plates after EKOSLIDE installation, as long as EKOSLIDE is being adjusted.

3. What about cold weather? Snow and ice?

Ekoslides have been installed throughout Northern Europe, Canada, and even Siberia. In fact, EKOSLIDE has more experience in cold weather than any other climate.

4. Can Ekoslides be installed in wet applications, such as ports and tunnels?

Yes, EKOSLIDE is far superior to traditional lubricants in wet areas and are already being utilized for just this purpose in tunnels and embedded track all over the world.

5. Do I need special tie plates?

No, the best tie plates for installation are long, flat standard plates. EKOSLIDE requires a flat surface for the movement of their rollers.

6. Why don't bolts come in the box with EKOSLIDE?

EKOSLIDE has many customers with many different bolt suppliers and varying bolt requirements. It is not possible to pre-package Ekoslides with bolts that meet all customers' requirements. However, agreements with third-party companies have been reached to create bolt kits for certain customers.

7. May I use the existing bolts in the turnout?

Existing bolts may be used for installation if they are long enough. EKOSLIDE requires an extra ½" or ⅝" of bolt length. In many cases, bolts are already long enough. If not, longer bolts (up to ½" or ⅝") or thinner washers may be required.

8. There is a spike in the way of the roller. What do I do?

Most railroads allow a spike to be removed in order to give EKOSLIDE room to roll, particularly if there is another available spike hole on the plate. Check with your standards /engineering contact or EKOSLIDE point person.

9. EKOSLIDE is adjusted properly. Why is the switch is still hard to throw?

The most likely culprit is the connecting rod near the switch stand or switch machine. Ensure that the top of the rod is not rubbing against the bottom of the stock rail. If so, the rod may need to be re-adjust slightly to lower it away from the stock rail.

10. Will I hurt the switch by raising the point 2mm?

No, the EKOSLIDE "elastomer" is a spring, which is compressed when the weight of the train hits the switch. When under pressure, the switch point height drops to zero, so the switch point will rest across all the ties, exactly like the switch was designed to do.

11. Will EKOSLIDE or any parts ever wear out?

Use the drawings on Page 10 for reference. The wheel, elastomer, and holder/pin may wear out over years of use. These parts should be checked for wear, and if needed, can be replaced with a spare part kit. The frame will last the lifetime of the unit.

12. Does EKOSLIDE need to be perfectly centered on tie plates?

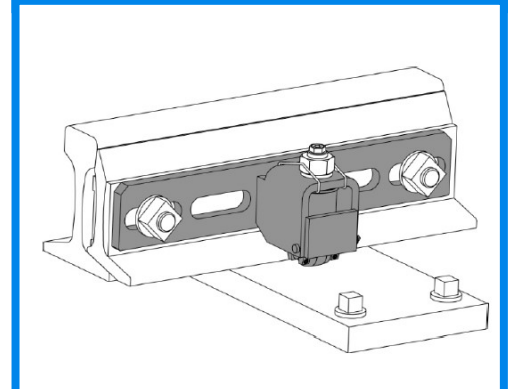
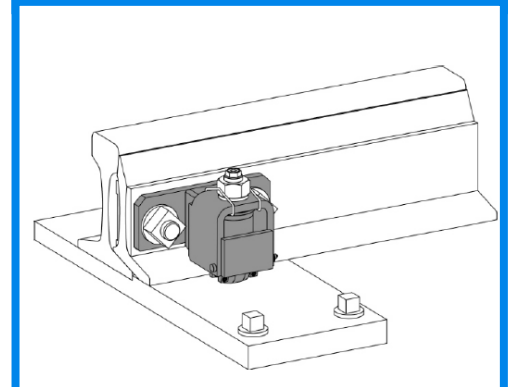
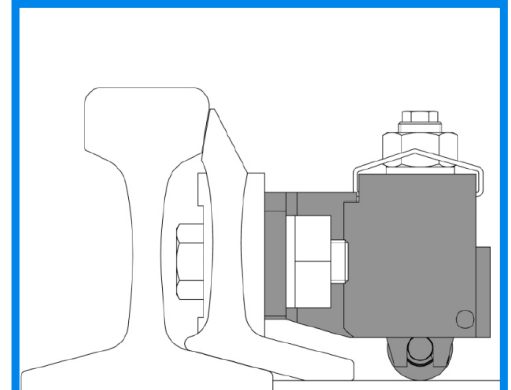
No, centering EKOSLIDE on tie plates is ideal but doesn't need to be exact. Make sure wheels are rolling firmly on plates with enough room to cover environmental shifting.

Why Use EKOSLIDE?

- Improves Safety
- Reduces Risk of Injury
- Eliminates Need for Lubrication
- Improves Switch Reliability
- Stops Traffic Errors
- Extends the Life of Switch Machines
- Electrical Savings
- Environmentally-Friendly
- Reliable in ANY Weather or Environment

Economic Benefits

- Savings on Lubrication
 - Lubricant, Tools, Labor, & Clean-Up
- Savings on Switch Failures
 - Prevents Train Delays & Labor Cost
- Savings on Switch Machines
 - Greatly reduces strain on motors
- Savings on Traffic Errors
 - Speeds up & improves switch throws
- Savings on Electricity
 - Decreases power & related costs



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US Patent: 9,309,629 +
 US Patent: 8,430,364
 (and foreign equivalents)
 PCT Patent: CZ93/00026
 EUR Patent: 0700474
 CZ Patent: 279264