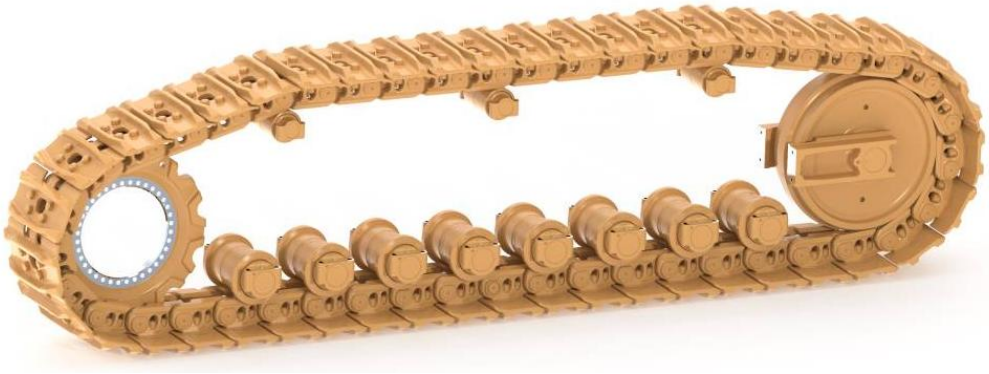
Caterpillar Hydraulic Shovel Undercarriage Measurements

Contents



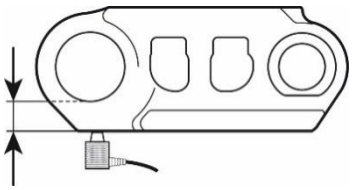
1. Models: 6015B

1.1. Link

Link - Ultrasonic

1 – Measure the rail over the bush strap or the bush end of the link.

2 – Twist probe to ensure proper signal.



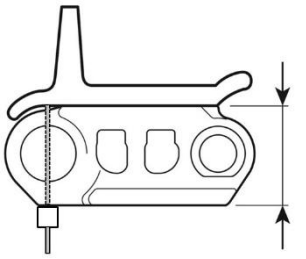
Link – Depth Gauge

1 – Measure amount of material between the rail and bush.

2 – Make sure under surface of shoe is clean.

3 – Place the depth gauge on the bottom of the rail with pin passing directly through the centre of the bush and touching the undersurface of the shoe.

4 – Measure pin length with a tape measure.

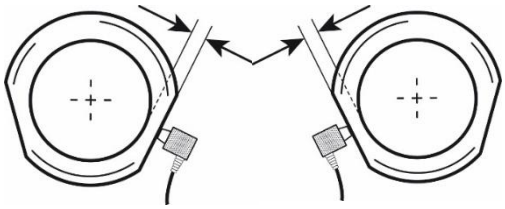


1.2. Bush

Bush Caliper

1 – Measure the forward wear surface, as per the diagram. Check the measurement with a tape measure.

2 - Measure the reverse wear side. Check the measurement with a tape measure.



Bush Ultrasonic

1 – Measure both sides of the bush with the ultrasonic tool.

2 – Test several points on both sides of the bush until you find the lowest reading.

3 - Use the lowest value to calculate the percentage worn.

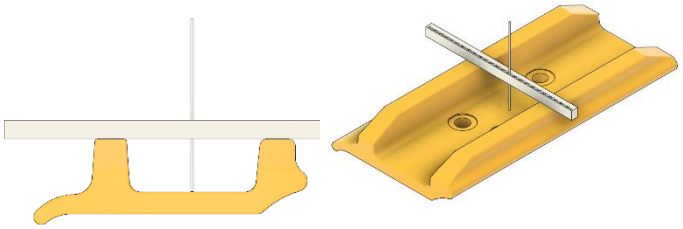
1.3. Shoe

Shoe Ultrasonic

1. Check that the grouser bar has not been re-welded. If so, the ultrasonic tool cannot be used for this measurement. Use a depth gauge instead.
2. Find the midpoint of the grouser bar.
3. Find the midpoint between the edge and the middle of the grouser for the measurement.
4. Place Couplant at this point on this point of the grouser bar.
5. Measure the depth with the ultrasonic tool.

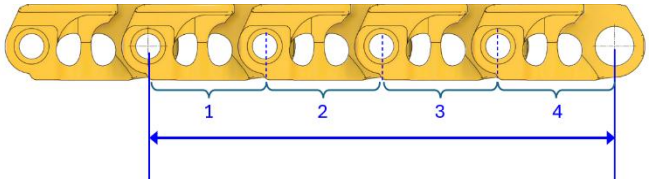
Shoe Depth Gauge

6. Place the depth gauge across two flat shoes from grouser to grouser.
7. Place the pin through the depth gauge to the top of shoe.
8. Measure pin length with a tape measure.



1.4. Track Elongation

Track Pitch - Four Links

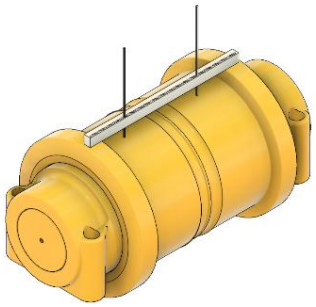


1. This is the most important measurement for determining whether there is pin wear.
2. When measuring, this can be tricky as the distance over 4 pins can be quite large.
3. The tape measure is the best method of accurately measuring this.
4. Measure from the middle of the pin, or from the edge of the pin, but just ensure that both the beginning and the end points on the pin measurement point are the same.

1.5. Lower Roller

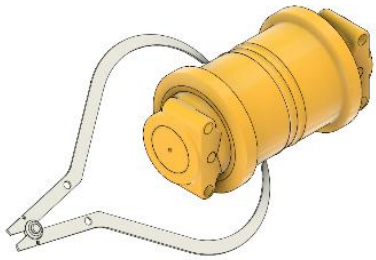
Lower Roller Depth Gauge

1. Place depth gauge locating pin on rear of flange.
2. Press pins down to roller tread surface.
3. Measure length of each pin to get an average length.



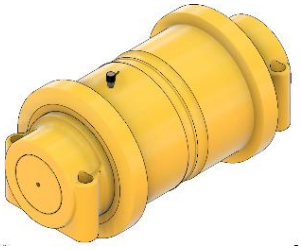
Lower Roller Caliper

1. Place callipers at right angle to the track roller.
2. Find the lowest points of measurements with the tips of the callipers.
3. Measure the gap of the calliper tips using a ruler



Lower Roller Ultrasonic

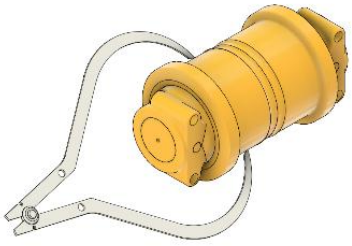
1. Measure different points using the ultrasonic tool.
2. Find and record the lowest reading.
3. Ensure measurement is not over a bolt hole.



1.6. Upper Roller

Upper Roller Caliper

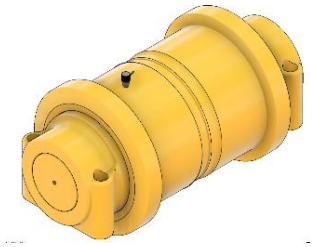
1. Place callipers at right angle to the track roller.
2. Find the lowest points of measurements with the tips of the callipers.
3. Measure the gap of the calliper tips using a ruler



Upper Roller Ultrasonic

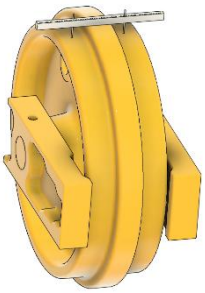
1. Measure different points using the ultrasonic tool.
2. Find and record the lowest reading.

Ensure measurement is not over a bolt hole.



1.7. Idler

Idler – Depth Guage

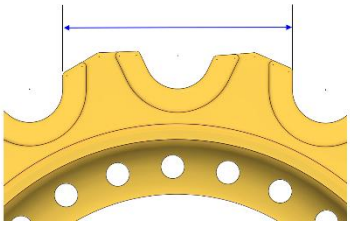


1. Brush idler clean of debris.
2. Lay depth gauge bar onto flat surface of the idler.
3. Push pins down to the wear surface, ensure there is no riding.
4. Measure each of the pins to obtain the average measurement.

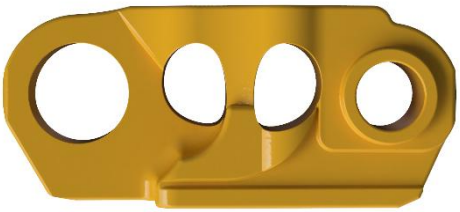
1.8. Sprocket

Sprocket – Tape measure/Calipers

1. Measure the sprocket as shown in the diagram. Ensure the measurement is taken from the end of the pocket, skip 1 pocket and measure to the beginning of the next pocket



2. Models: 6020B

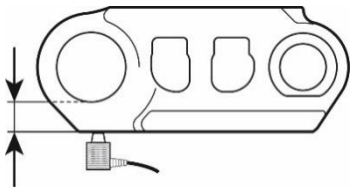


2.1. Link

Link - Ultrasonic

1 – Measure the rail over the bush strap or the bush end of the link.

2 – Twist probe to ensure proper signal.



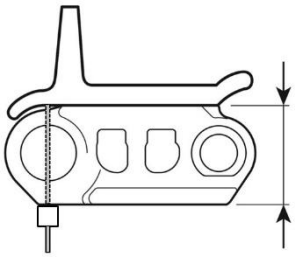
Link – Depth Gauge

1 – Measure amount of material between the rail and bush.

2 – Make sure under surface of shoe is clean.

3 – Place the depth gauge on the bottom of the rail with pin passing directly through the centre of the bush and touching the undersurface of the shoe.

4 – Measure pin length with a tape measure.

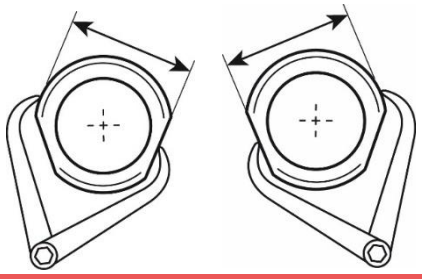


2.2. Bush

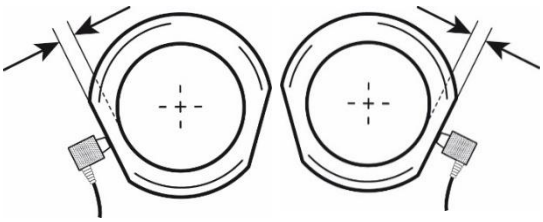
Bush Caliper

1 – Measure the forward wear surface, as per the diagram. Check the measurement with a tape measure.

2 - Measure the reverse wear side. Check the measurement with a tape measure.



Bush Ultrasonic



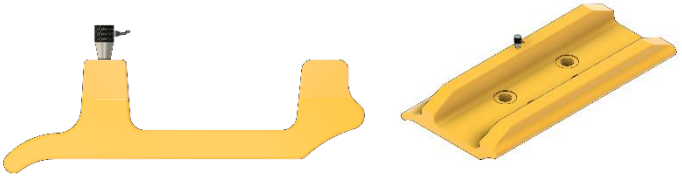
1 – Measure both sides of the bush with the ultrasonic tool.

2 – Test several points on both sides of the bush until you find the lowest reading.

3 - Use the lowest value to calculate the percentage worn.

2.3. Shoe

Shoe Ultrasonic



1 - Check that the grouser bar has not been re-welded. If so, the ultrasonic tool cannot be used for this measurement. Use a depth gauge instead.

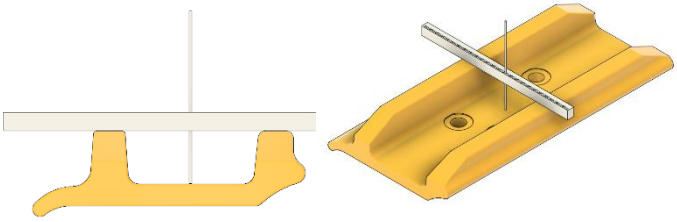
2 - Find the midpoint of the grouser bar.

3 - Find the midpoint between the edge and the middle of the grouser for the measurement.

4 - Place Couplant at this point on this point of the grouser bar.

5 – Measure the depth with the ultrasonic tool.

Shoe Depth Gauge



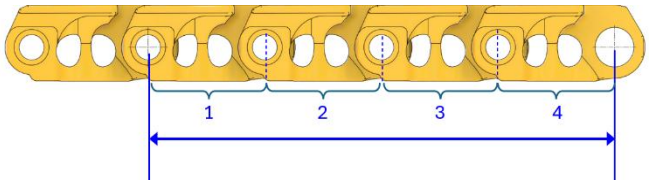
1 - Place the depth gauge across two flat shoes from grouser to grouser.

2 - Place the pin through the depth gauge to the top of shoe.

3 - Measure pin length with a tape measure.

2.4. Track Elongation

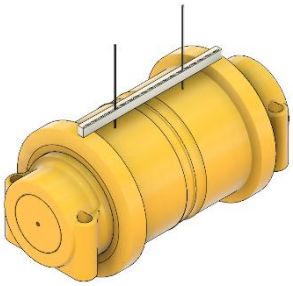
Track Pitch - Four Links



5. This is the most important measurement for determining whether there is pin wear.
6. When measuring, this can be tricky as the distance over 4 pins can be quite large.
7. The tape measure is the best method of accurately measuring this.
8. Measure from the middle of the pin, or from the edge of the pin, but just ensure that both the beginning and the end points on the pin measurement point are the same.

2.5. Lower Roller

Lower Roller Depth Gauge

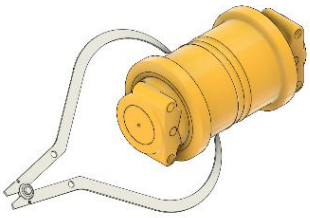


1 - Place depth gauge locating pin on rear of flange.

2 - Press pins down to roller tread surface.

3 - Measure length of each pin to get an average length.

Lower Roller Caliper

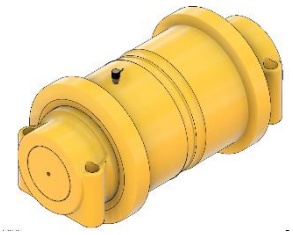


1 - Place callipers at right angle to the track roller.

2 - Find the lowest points of measurements with the tips of the callipers.

3 - Measure the gap of the calliper tips using a ruler

Lower Roller Ultrasonic



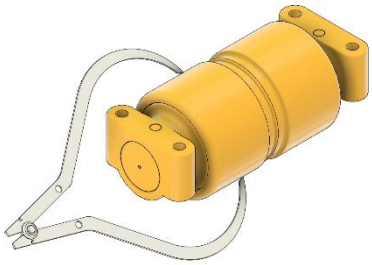
1 - Measure different points using the ultrasonic tool.

2 - Find and record the lowest reading.

3 - Ensure measurement is not over a bolt hole.

2.6. Upper Roller

Upper Roller Caliper

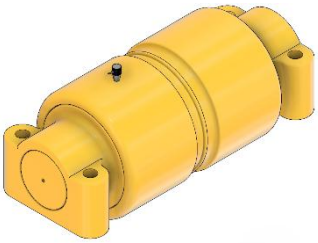


1 - Place callipers at right angle to the track roller.

2 - Find the lowest points of measurements with the tips of the callipers.

3 - Measure the gap of the calliper tips using a ruler

Upper Roller Ultrasonic



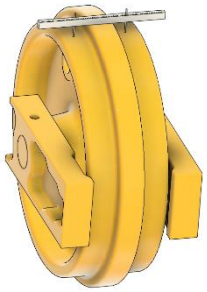
1 - Measure different points using the ultrasonic tool.

2 - Find and record the lowest reading.

3 - Ensure measurement is not over a bolt hole.

2.7. Idler

Idler – Depth Guage



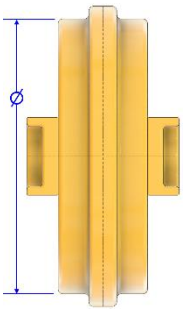
1 - Brush idler clean of debris.

2 - Lay depth gauge bar onto flat surface of the idler.

3 - Push pins down to the wear surface, ensure there is no riding.

4 - Measure each of the pins to obtain the average measurement.

Idler – Diameter – Tape Measure

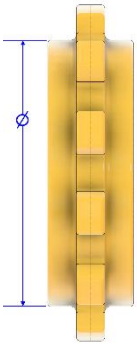


1. Brush idler clean of debris.
2. Using a Tape Measure, measure the diameter on the wear surfaces as shown in the diagram.
3. This is typically a difficult measurement to take

2.8. Sprocket

Sprocket Diameter

1. Using a tape Measure, measure the diameter of the surface where the link rail will run. This might be extremely difficult when the sprocket is in the machine

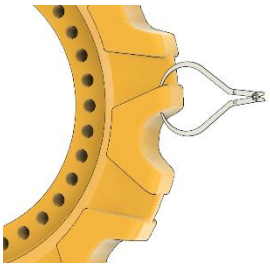


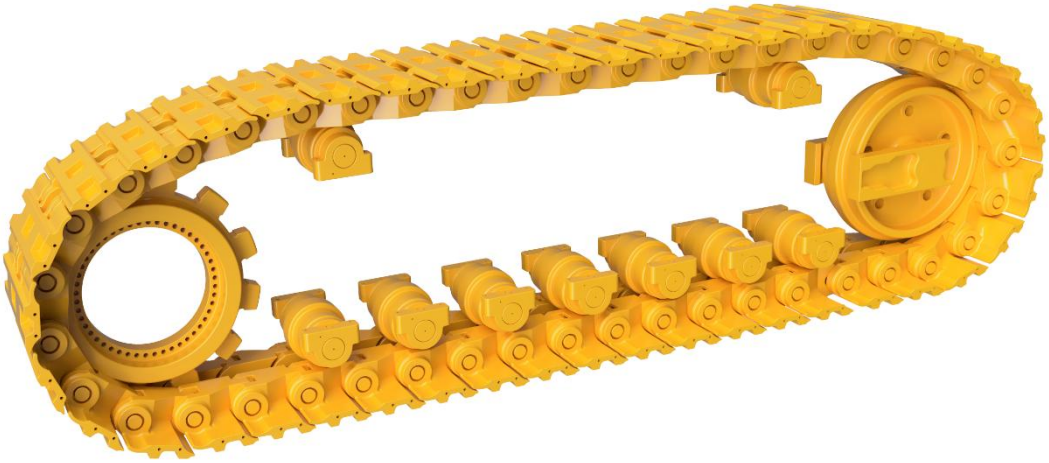
Sprocket Forward

2. Use Calipers to measure the thickness of the material where it will come into contact with the bush when the machine is moving in the forward direction.
3. Use a ruler to measure the difference between the gap of the Caliper teeth

Sprocket Reverse

1. Use Calipers to measure the thickness of the material where it will come into contact with the bush when the machine is moving in the forward direction.
2. Use a ruler to measure the difference between the gap of the Caliper teeth

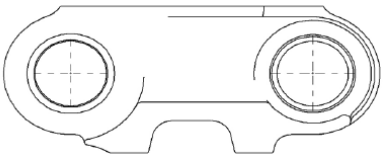




3. Models: 6030, 6040, 6060, 6090

3.1. Monoblock Shoe or Link

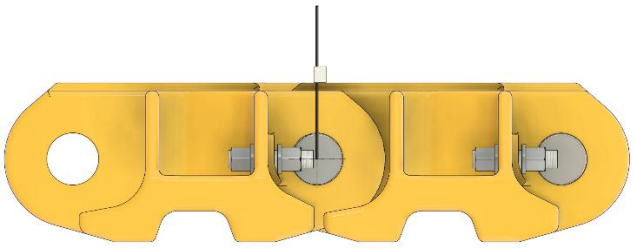
Note: in the TrackTreads system, Monoblock shoes are treated and named as links. This is because the TrackTreads system always requires a link to be present and uses the link to track the chains.

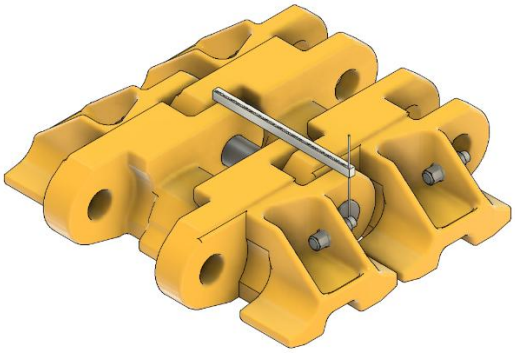


Track Pad Pass – Depth Gauge

UT Measurement/Depth Gauge

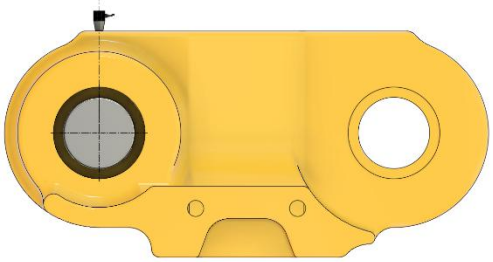
1. Place the depth gauge across the top of the rail perpendicular the link rail.
2. Push the depth gauge pin down to the mid-point of the pin.
3. Measure the length of the pin using a ruler

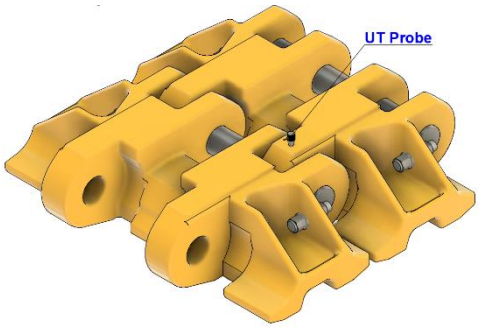




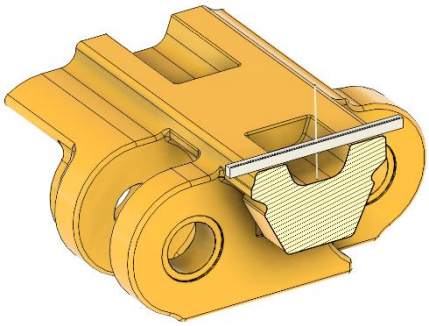
Track Pad Pass – Ultrasonic Tool

1. UT Probe must be directly over the mid- point of the pin hole. Ensure probe is clear of dirt and debris.



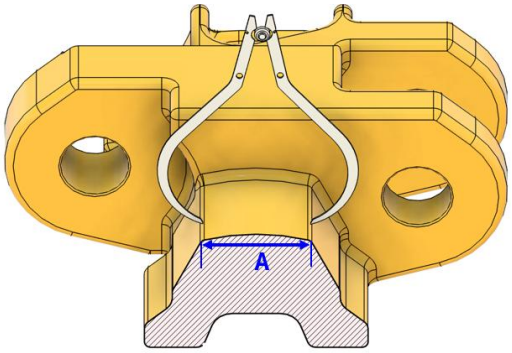


Track Pad Grouser Height



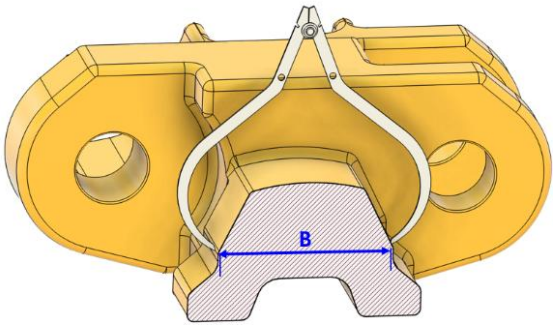
1. In order to measure the Grouser height, only use a Depth Gauge.
2. Clean all dirt from between the grouser area to be measured.
3. Take into account any metal deformation which can cause readings to differ.
4. Place the depth gauge across the grousers and push the pin to the bottom to measure the distance x in the diagram below.

Track Pad Cam A



1. There is 1 measurement for the Drive lug in position A.
2. Use a set of Callipers to measure at position B.
3. Note in the comments, the wear on both the forward drive side of the lug as well as the reverse side of the drive lug. This will give a clear indication of the amount of propelling.

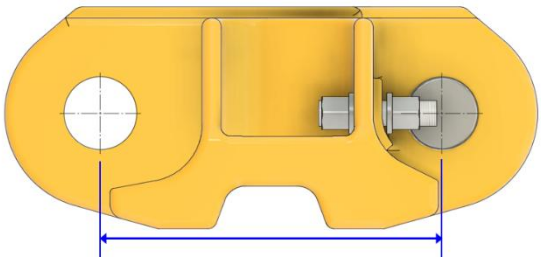
Track Pad Cam B



1. There is 1 measurement for the Drive lug in position B.
2. Use a set of Callipers to measure at position B.
3. Note in the comments, the wear on both the forward drive side of the lug as well as the reverse side of the drive lug. This will give a clear indication of the amount of propelling.

Track Pitch

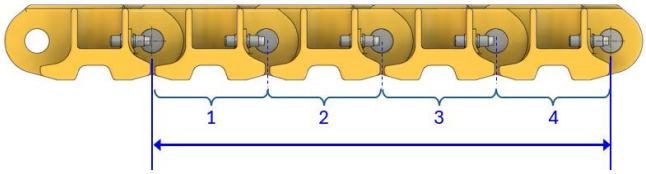
Track Pitch - Single Track Pad



1. This is the most important measurement for determining whether there is pin wear.
2. The tape measure is the best method of accurately measuring this.

3. Measure from the middle of the pin, or from the edge of the pin, but just ensure that both the beginning and the end points on the pin measurement point are the same.

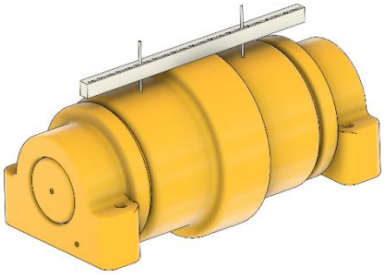
Track Pitch - Four Track Pads



9. This is the most important measurement for determining whether there is pin wear.
10. When measuring, this can be tricky as the distance over 4 pins can be quite large.
11. The tape measure is the best method of accurately measuring this.
12. Measure from the middle of the pin, or from the edge of the pin, but just ensure that both the beginning and the end points on the pin measurement point are the same.

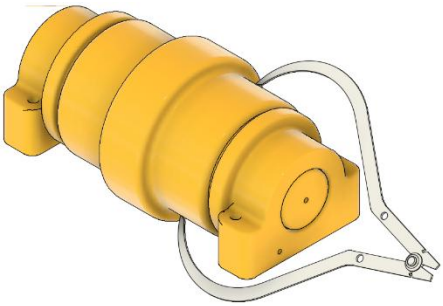
3.2. Lower Roller

Lower Roller - Depth Gauge



1. Use a Depth Guage placed across the ridge in the middle of the Track Roller.
2. Extend the pins until the reach the lowest points on the wear surface where link rail runs on the track roller.
3. Then use a tape measure the measure the length of the pins.

Lower Roller - Calliper

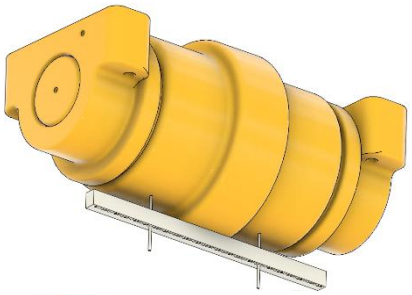


Use the calliper to just fit the wear area on the Lower roller surface. Ensure the calliper is reading the true diameter of the roller. The use a ruler to measure the gap in the Calliper

3.3. Upper Roller

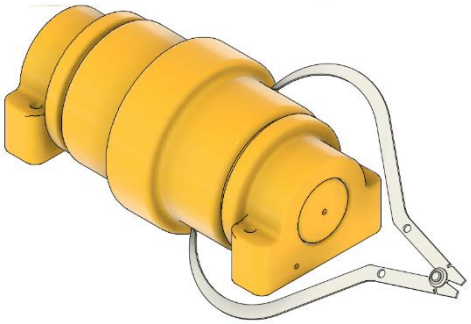
Upper Roller - Depth Gauge

1. Use a Depth Guage placed across the ridge in the middle of the Track Roller.
2. Extend the pins until the reach the lowest points on the wear surface where link rail runs on the track roller.
3. Then use a tape measure the measure the length of the pins.



Upper Roller - Calliper

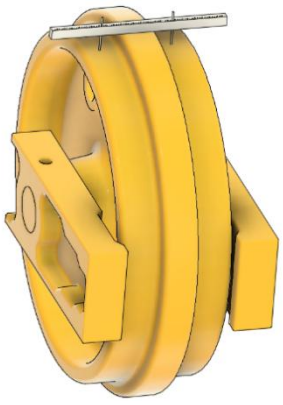
1. Use the calliper to just fit the wear area on the Lower roller surface.
2. Ensure the calliper is reading the true diameter of the roller. The use a ruler to measure the gap in the Calliper

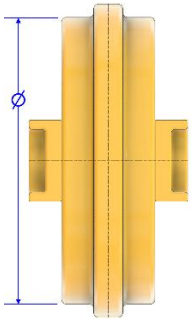


3.4. Idler Rim

Idler – Depth Gauge

1. Use a Depth Guage placed across the ridge in the middle of the Idler as shown above.
2. Extend the pins until the reach the lowest points on the wear surface where link rail runs on the Idler surface.
3. Then use a tape measure the measure the length of the pins.

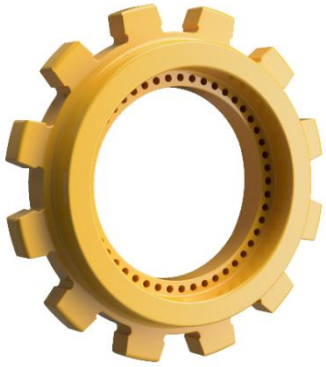




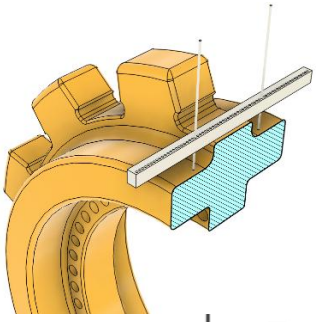
Idler – Diameter - Tape Measure

1. Use a tape measure to measure the diameter of the Idler.
2. This might be difficult in cases where the Idler is in the machine, and hence the Depth Gauge measurement might be easier.

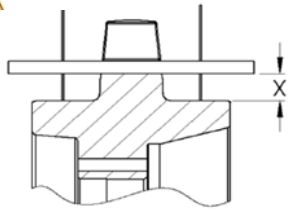
3.5. Sprocket



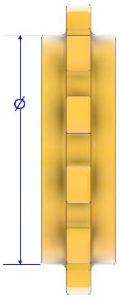
Sprocket Rim – Depth Gauge



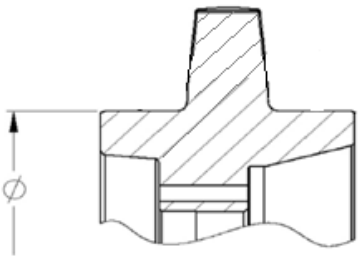
1. Use a Depth Guage placed across the ridge in the middle of the Sprocket, between the teeth as shown above.
2. Extend the pins until the reach the lowest points on the wear surface where link rail runs on the Idler surface.
3. Then use a tape measure the measure the length of the pins.



Sprocket Rim – Tape Measure

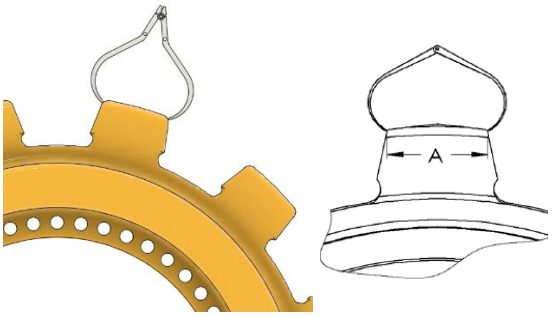


1. Use a tape measure to measure the diameter of the Sprocket Rim.
2. This might be difficult in cases where the Sprocket is in the machine, and hence the Depth Gauge measurement might be easier.



Sprocket Tooth - A - Caliper

1. Use a Calliper to measure the top dimension (A) of the tooth.
2. Consider any metal deformation when taking this measurement.



Sprocket Tooth - B - Caliper

1. Use a Calliper to measure the bottom dimension of the tooth (B).
2. Consider any metal deformation when taking this measurement.