



SERVICE MANUAL

EXCAVATOR
JS115, JS115 [T2/3],
JS130, JS130 [T2/3], JS145

EN - 9813/7050 - ISSUE 1 - 04/2018


This manual contains original instructions, verified by the manufacturer (or their authorized representative).

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Foreword

The Operator's Manual


You and others can be killed or seriously injured if you operate or maintain the machine without first studying the Operator's Manual. You must understand and follow the instructions in the Operator's Manual. If you do not understand anything, ask your employer or JCB dealer to explain it.

Do not operate the machine without an Operator's Manual, or if there is anything on the machine you do not understand.

Treat the Operator's Manual as part of the machine. Keep it clean and in good condition. Replace the Operator's Manual immediately if it is lost, damaged or becomes unreadable.

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Introduction

The left and right track assemblies are installed on the machine undercarriage.

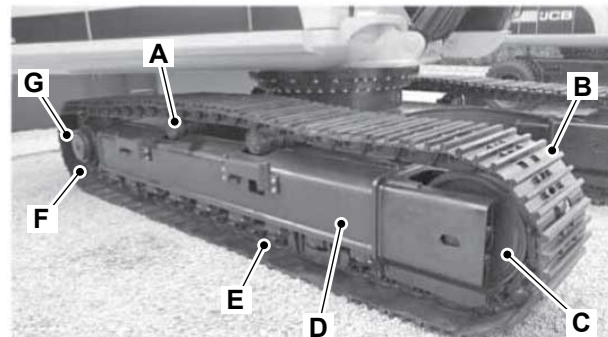
Each track consists of a chain and a series of bolt on shoe plates.

The gearbox sprocket is engaged with the chain and transmits the drive from the track motor gearbox to the chain.

The chain runs on several bottom rollers mounted on the undercarriage. The rollers carry the weight of the machine. Top rollers keep the chain clear of the undercarriage. The number of top and bottom rollers is dependent on the machine variant. A track guide prevents the chain being forced sideways off the bottom rollers.

The chain runs on an idler wheel at the opposite end of the carriage. The idler wheel bracket mounting can slide forwards and backwards in the undercarriage. This allows the chain to be tensioned using a grease cylinder. A spring loaded recoil unit acts as a shock absorber. This allows the idler wheel to move in the carriage if the track is subjected to shock loads, when travelling over rough ground for example.

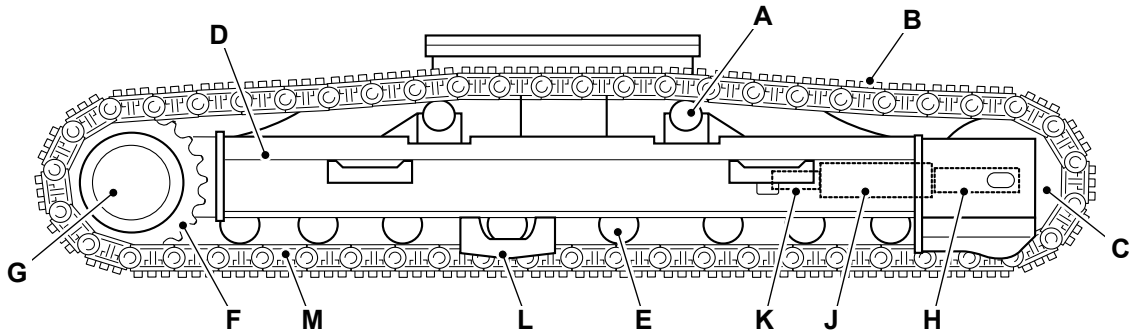
Figure 329. Typical track installation



- A** Top roller
- B** Shoe plate
- C** Idler wheel
- D** Undercarriage
- E** Bottom roller
- F** Gearbox sprocket
- G** Track motor gearbox

Component Identification

Figure 330. Typical track installation



- A** Top roller
- C** Idler wheel
- E** Bottom roller
- G** Track motor gearbox
- J** Recoil unit
- L** Track guide (if installed)

- B** Shoe plate
- D** Undercarriage
- F** Gearbox sprocket
- H** Idler wheel bracket mounting
- K** Grease cylinder
- M** Chain

Check (Condition)

The track assembly is subjected to high forces and operates in a harsh environment. To enable the maximum service life, check the condition of the assembly at regular intervals as follows.

1. Clean off mud and debris from the track and undercarriage.
2. Check that the track tension is correct.
[Refer to: PIL 27-36-03.](#)
3. Check the gearbox sprocket teeth for excessive wear.
 - 3.1. Make sure the fixing bolts are installed and tightened to the correct torque.
4. Check the steel track chain for defective pins, bushes and links.
 - 4.1. Measure the wear status.
[Refer to: PIL 27-36-03.](#)
5. Check that the shoe plates are not excessively worn or distorted.
 - 5.1. Make sure the fixing bolts are installed and tightened to the correct torque.
6. Check the condition of the top and bottom rollers.
 - 6.1. Check that the wearing diameters are within the wear limits.
 - 6.2. Check that the fixing bolts are installed and tightened to the correct torque.
 - 6.3. Check that there are no oil leaks.
 - 6.4. Check that the rollers rotate with the chain.
7. Check the condition of the track guide (if installed).
 - 7.1. Check that it is free from distortion and excessive wear.
 - 7.2. Check that the fixing bolts are installed and tightened to the correct torque.
8. Check the condition of the idler wheel.
 - 8.1. Make sure that the idler wheel rotates with the chain.
 - 8.2. Check the wearing diameter for excessive wear.
 - 8.3. Check that there no oil leaks.
 - 8.4. Check that the axle mounting bracket fixing bolts are installed and tightened to the correct torque.

9. Check the condition of the tensioner / recoil unit.
 - 9.1. Make sure the recoil spring is free from packed material such as soil, clay and sand.
 - 9.2. Make sure the recoil spring is not broken.
 - 9.3. Check that the grease cylinder seals and check valve maintain the pressure in the grease cylinder.

If the track components show signs of premature wear or failure, investigate the operating conditions.

1. Make sure the machine is being operated as intended, especially with the track motors at the rear when travelling or excavating.
2. Make sure that the applicable maintenance schedule is being followed.
[Refer to: PIL 78-24.](#)
3. Make sure that the correct shoe plates are installed for the operating environment.
4. Make sure that packed material is being removed from the undercarriage when necessary. Excessive packing of materials such as soil, clay and sand causes premature wear of the track and undercarriage components.
5. If the machine is stored in a harsh environment, such as wet freezing conditions, make sure the operator follows the correct procedures.
[Refer to: PIL 27-36-03.](#)

03 - Steel Track

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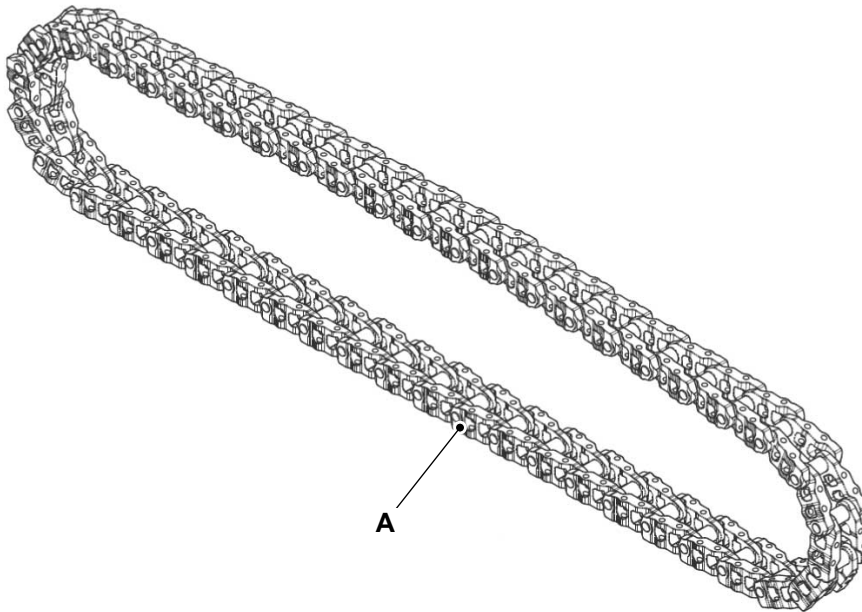
Introduction

The steel track consists of track links which are connected using pins and bushes to form a chain.

The ends of the chain are connected by means of a removable master pin. This enables removal and installation of the track. The master pin has a tapered recess in the centre of its diameter to enable identification.

The steel track is a wear item. When it is at the end of its service life it must be replaced. It is possible to extend the service life of the pins and bushes by dismantling the chain and assembling with the pins and bushes rotated to present new wear surfaces, this is known as 'turning'. The time involved may make this uneconomical, it may be more cost effective to replace the chain assembly with a new one.

Figure 331.

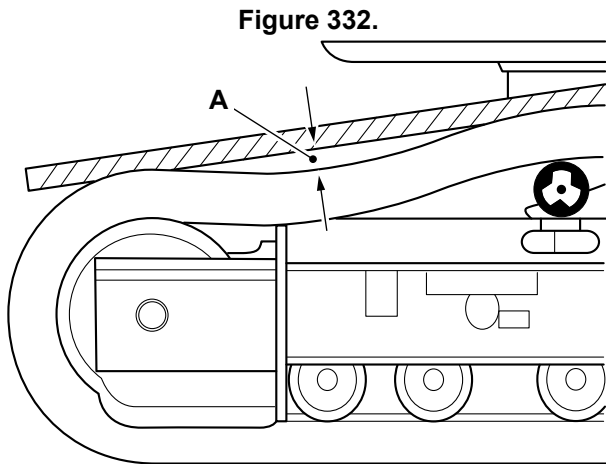


A Steel track chain

Technical Data

Track Tension

Measure the track tension and compare the measurement with the data in the table. Adjust the tension if necessary. Refer to: [PIL 27-36-03](#).



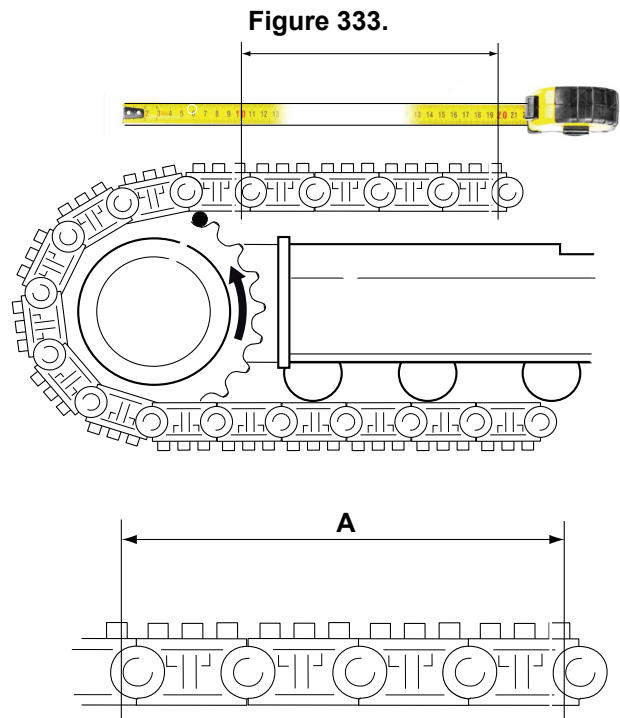
A Measurement - track tension

Table 133.

Minimum	Maximum
30 mm	25 mm

Pin and Bush Wear Guide (Track Pitch)

Measure the track pitch and compare the measurement with the data in the table. Follow the correct procedure.



A Dimension A

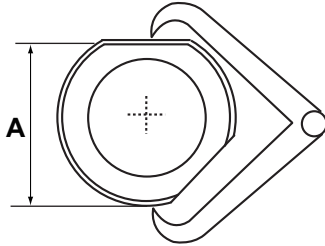
Table 134.

	110 - 145 series	160 - 235 series
Pitch (new condition)	171.05 mm	190 mm
Wear %	Dimension A mm	Dimension A mm
0	686.8	761.0
10	688.0	762.3
20	689.2	763.6
30	690.4	764.9
40	691.6	766.2
50	692.6	767.5
60	694.0	768.8
70	695.2	770.1
80	696.4	771.4
90	697.6	772.7
100	698.8	774.0
110	701.6	776.5
120	704.2	779.5

Bush Wear Guide

Measure the minimum bush diameter and compare the measurement with the data in the table. Follow the correct procedure.

Figure 334.



A Dimension A

Table 135.

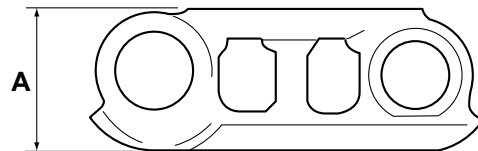
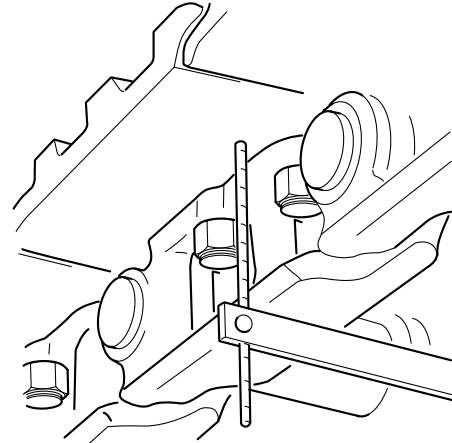
	115, 130 series	130HD - 235 series
Diameter (new condition)	50.8 mm	58.7 mm
Wear %	Diameter A - Normal / High impact mm ⁽¹⁾	Diameter A - Normal / High impact mm ⁽¹⁾
10	50.5 / 50.6	58.4 / 58.4
20	50.4 / 50.5	58.0 / 58.1
30	50.0 / 50.2	57.6 / 57.9
40	49.7 / 50.0	57.1 / 57.4
50	49.2 / 49.6	56.8 / 57.1
60	48.8 / 49.4	56.4 / 56.9
70	48.5 / 49.1	56.0 / 56.6
80	47.7 / 48.6	55.6 / 56.5
90	46.6 / 48.0	54.9 / 56.3
100	45.6 / 47.4	54.1 / 55.9
110	44.8 / 46.7	53.2 / 55.2
120	43.8 / 46.1	54.8 / 52.5

(1) Wear allowance depends on the operating ground conditions. When operating on hard ground components are subject to high impact loads, allowable wear is reduced to avoid component failure.

Track Link Wear Guide

Measure the link height and compare the measurement with the data in the table. Follow the correct procedure.

Figure 335.



A Dimension A

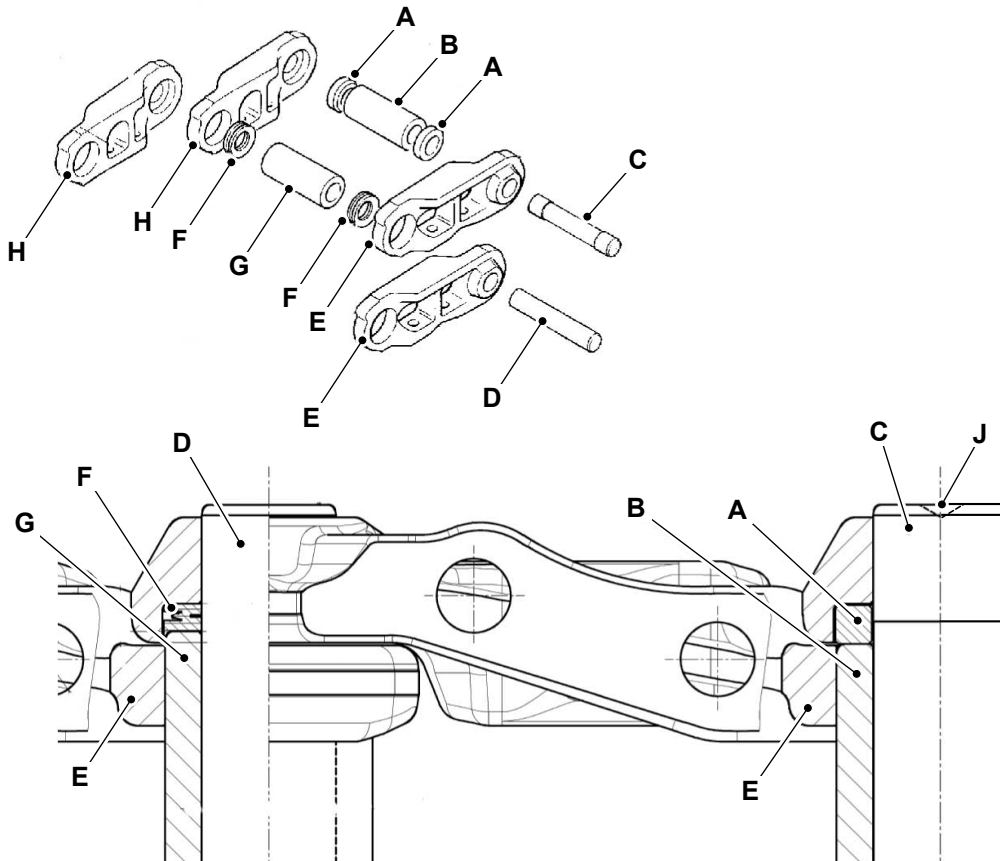
Table 136.

	110 - 145 series	160 - 235 series
Wear %	Dimension A mm	Dimension A mm
0	96.0	106.0
10	95.4	105.3
20	94.9	104.6
30	94.3	103.9
40	93.7	103.2
50	93.3	102.5
60	92.6	101.9
70	92.1	101.1
80	91.4	100.2
90	90.8	99.5
100	90.0	98.8
110	89.3	97.8
120	88.6	97.0

Component Identification

The illustration shows a chain link with a normal pin, bush and sealing washers. The single master pin, master bush and spacer assembly is also shown.

Figure 336. Typical track link assembly



- | | |
|--------------------------------|-----------------------|
| A Spacers (master bush) | B Master bush |
| C Master pin | D Pin |
| E Links (right) | F Seal washers |
| G Bush | H Links (left) |
| J Tapered recess | |

Check (Condition)

Measuring the Normal Wear Status

To check the normal wear status of the steel track chain proceed as follows.

1. Make the machine safe.
Refer to: PIL 01-03.
2. Clean the tracks and undercarriage. It will not be possible to get accurate wear measurements if there is an accumulation of dirt and debris on the components.
Refer to: PIL 01-33.

Link Rail Surface Wear Status

As the link rail surface wears the distance between the rail and the underside of the shoe plate reduces.

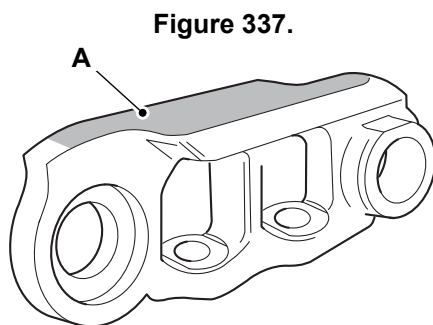


Figure 337.

A Link rail surface wear area

Measure the distance as follows.

1. Use a suitable depth gauge to make the measurements as shown.

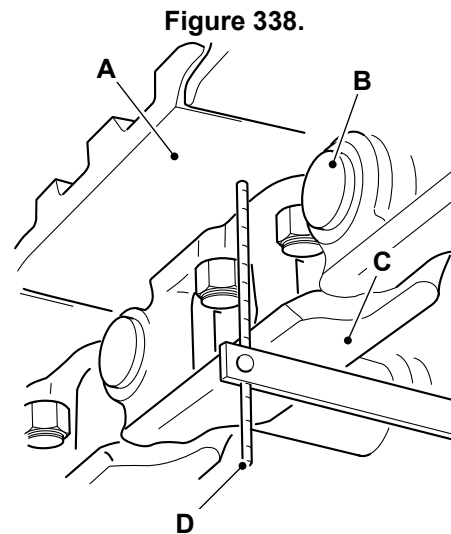


Figure 338.

- A** Shoe plate underside
- B** Track pin
- C** Track link - rail wear face
- D** Depth gauge

- 1.1. Position the gauge on the outside of the links in-line with the ends of the track pins.
- 1.2. Make sure the gauge is flat against the rail surface and perpendicular to the underside of the shoe plate
- 1.3. Take measurements to the specified degree of accuracy.

Length/Dimension/Distance: 0.25 mm

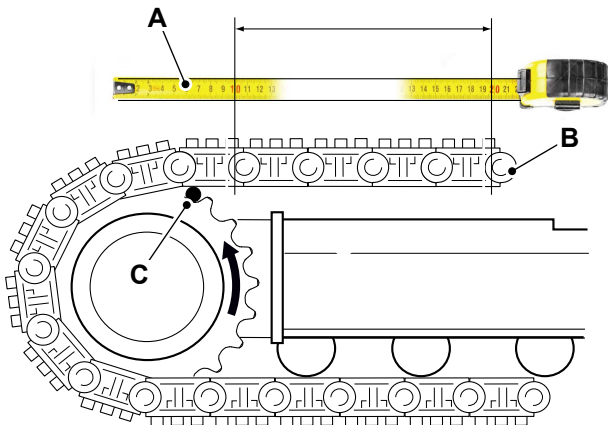
2. Compare the measurements with the track link wear guide given in Technical Data (PIL 27-36-03).
 - 2.1. Use the data to obtain the wear percentage value.

Track Pitch (Internal Wear Status)

As the internal mating faces of the track pins and bushes wear, the pitch distance of the track chain links increases. Measure the distance as follows.

1. Use an old track pin or suitable bar to stretch the chain as shown.
 - 1.1. Place the pin on the gearbox sprocket and slowly operate the track motor so that the chain is tensioned. Do not operate the track motor past the position shown. Get the help of an assistant.
2. Use a suitable tape measure calibrated in the increments specified and measure the distance over four chain links.

Length/Dimension/Distance: 0.5 mm

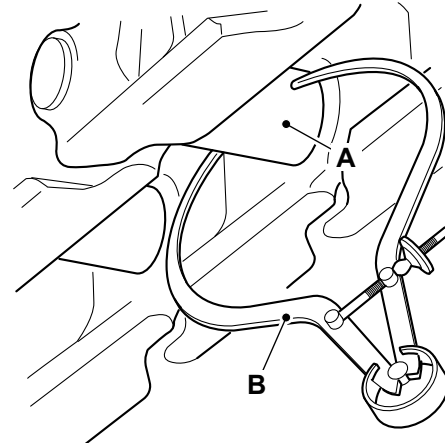
Figure 339.


- A** Tape measure
- B** Track pin
- C** Old track pin

- 2.1. Measure from one side of a track pin to the same side of the 5th pin away (four chain links).
- 2.2. Make sure the master pin is at least three links away from the section being measured.
- 2.3. Do not place the end of the tape measure at the first pin. Start the measurement at a convenient increment along the tape.
3. Repeat the process for at least two different sections of the track.
4. Divide the results by four to obtain the chain link pitch.
5. Compare the measurements with the pin and bush wear guide given in Technical Data (PIL 27-36-03).
 - 5.1. Use the data to obtain the wear percentage value.

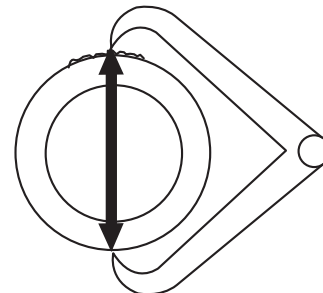
Bush External Wear Status

As the external mating face of the bushes engage with the gearbox sprocket the bush surface wears. Measure the wear as follows.

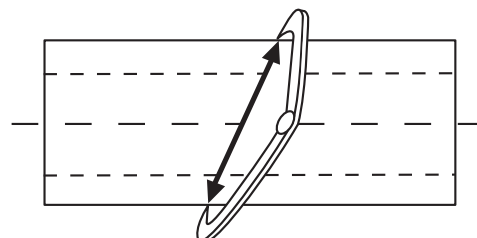
Figure 340.


- A** Bush
- B** Caliper

1. Use a suitable caliper to measure the smallest diameter of the bushes. Avoid false readings as follows.
 - 1.1. Make sure the bush diameter surface is clean.

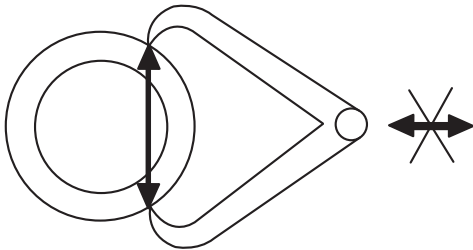
Figure 341. Debris on bush


- 1.2. Keep the caliper perpendicular to the axis of the bush.

Figure 342. Caliper at wrong angle


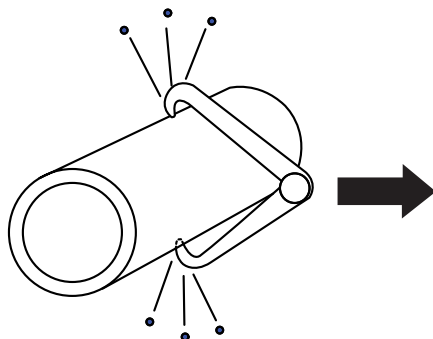
- 1.3. Make sure the caliper is passed completely over the bush.

Figure 343. Caliper not passed over the bush



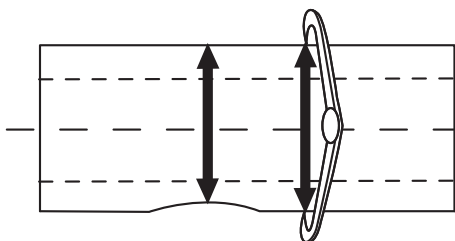
1.4. Do not force the caliper over the bush diameter, the caliper can spread and then spring back. The reading will be less than the bush diameter.

Figure 344. Caliper forced over the bush



1.5. Make sure to measure the smallest diameter on the bush. Inspect it carefully, there may be more than one worn area.

Figure 345. Caliper not measuring smallest diameter



1.6. Practise using the caliper on a bush removed from a track. Make sure you can get repeatable results to the necessary accuracy.

Length/Dimension/Distance: 0.25 mm

2. Compare the measurements with the bush wear guide given in Technical Data (PIL 27-36-03)

2.1. Use the data to obtain the wear percentage value.

General Wear Assessment

In addition to checking the steel track components for normal wear a general assessment of their

overall condition should be carried out. This can help identify operational issues and if the use of repair procedures to extend the service life of the chain are applicable. Repair procedures may not be suitable if components are worn beyond their service limit, or show excessive defects not caused by normal wear for example. In addition, the condition of the other undercarriage components must be assessed before repairing or replacing the track chain.

Track Link Condition Assessment

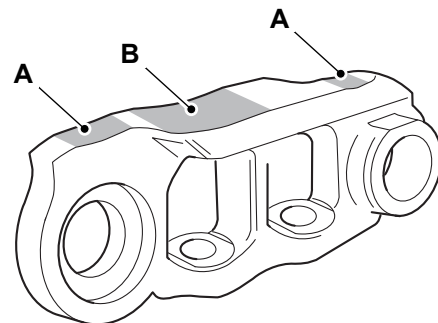
Check the track links for the following.

Scalloping

The rail surface is worn with uneven scallops typically caused by over tensioning or snaking track. Can be repaired in most cases.

Check the track chain tension.

Figure 346.



A Wear - due to reduced contact area with idler wheel

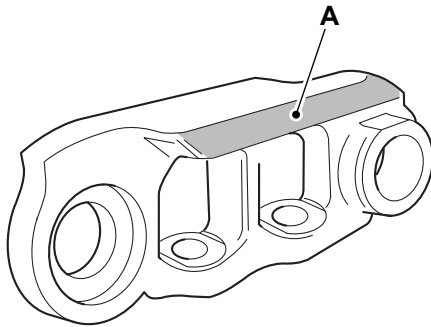
B Wear - due to reduced contact area with bottom rollers

Side Wear

The side of the rail is worn excessively. Typically caused by over tensioned or snaking track, frequent traversing the side of steep slopes, frequent turning or over sized shoe plates. Repair not recommended.

Check the track chain tension. Check the shoe plate width is compatible with the operating environment.

Figure 347.



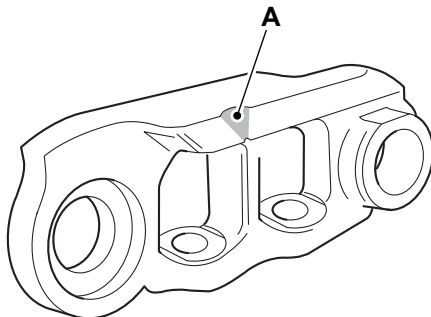
A Wear

Gouging

The side of the track link shows gouging from contact with the gearbox sprocket teeth. Typically caused by snaking track, frequent traversing the side of steep slopes, frequent turning or over sized shoe plates.

Check the alignment of the track and gearbox sprocket. Check the shoe plate width is compatible with the operating environment. Repair not recommended.

Figure 348.



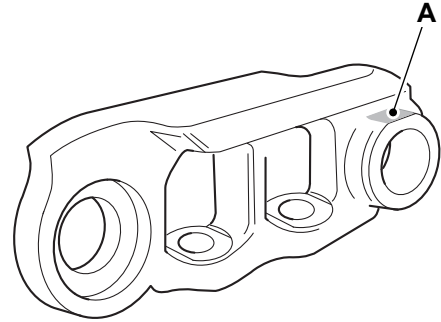
A Gouging

Pin Boss Wear

The top of the track link pin bosses are worn from contact with the bottom rollers. This can be caused by excessive bottom roller wear or the track link rail surface worn more than 100%. If the track pin retention is still effective repair the track link rail.

Check the wear status of the track links and bottom rollers. Replace the bottom rollers if applicable.

Figure 349.



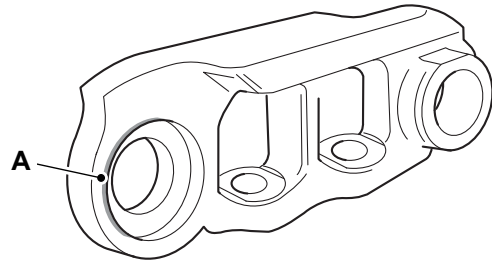
A Wear

Counterbore Elongation

The bush locating counterbores in the track links are elongated. Typically caused by elongated pitch due to internal wear on the pins and bushes.

Check the track pitch (internal Wear) status. Replace or turn the pins and bushes as applicable. If the bush retention is effective the links can be used.

Figure 350.



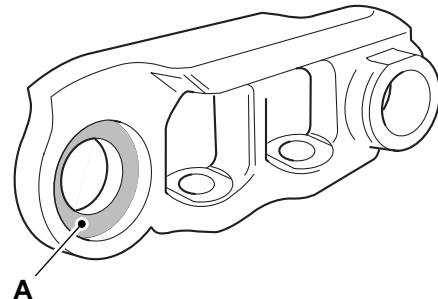
A Counterbore elongation

Face Wear

The track links are worn at their rotating faces. Typically caused by operating in highly abrasive material, frequent traversing on the side of steep slopes, frequent turning or over sized shoe plates.

Check the shoe plate width is compatible with the operating environment. Repair not recommended.

Figure 351.



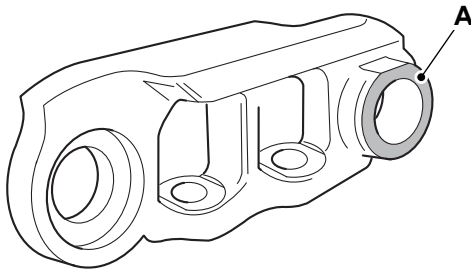
A Wear

Pin Boss End Wear

The ends of the pin bosses in the track links are worn due to contact with the track guides (if installed). Typically caused by bent track guides or incorrect chain tension.

Check the condition of the track guides, replace as applicable. Check the track chain tension.

Figure 352.



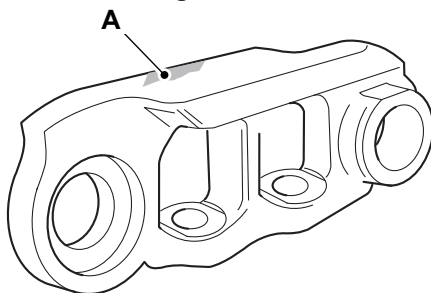
A Wear

Chipping or Flaking

The track link rail faces are chipped or flaking due to impact with the bottom rollers. This is normal especially on heavy machines.

Check the shoe plate width is compatible with the operating environment. Check the track chain tension.

Figure 353.



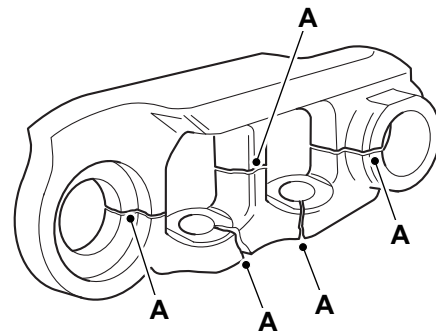
A Chipping / flaking

Cracks

The track link has cracks due to bending during high impact force with the bottom rollers.

Check the shoe plate width is compatible with the operating environment. Check the track chain tension. Repair is not possible, cracking can cause the track chain to separate.

Figure 354.



A Cracks

Pin and Bush Bore Enlargement

The track link has enlarged location bores for the pin or bush. Typically caused by the use of incorrect tooling when removing / installing the pins and bushes. In addition high bending forces can cause the pins and bushes to slide in the bores, causing wear.

Check the shoe plate width is compatible with the operating environment. Check the track chain tension. Check the tooling before removing / installing pins and bushes. Pin and bush retention is not effective, do not use the affected track links.

Track Bush Condition Assessment

Check the track bushes for the following.

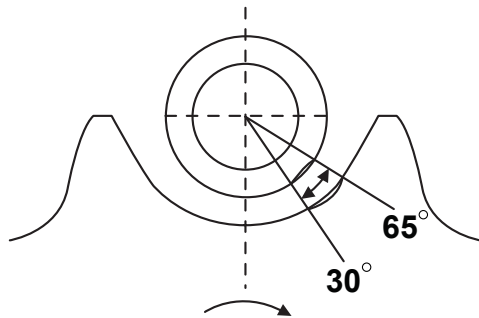
Reverse Side Drive Wear

When the machine operates in reverse travel direction the bush wears at its mating face with the gearbox sprocket between $30 - 65^\circ$ from vertical as shown. Excessive wear can cause cracks in the bush.

Measure the bush external wear status. Check the track chain tension.

When turning the bushes for extended service life, the reverse side drive wear will be closer to the forward drive side of the bush. Bushes worn close to 100 % or more, are less suitable for turning.

Figure 355.

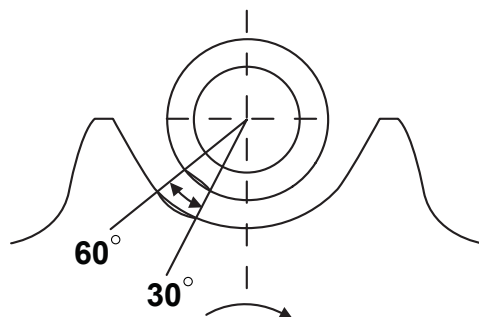


Forward Side Drive Wear

When the machine operates in forward travel direction the bush wears at its mating face with the gearbox sprocket between 30 –60 ° from vertical as shown. Excessive wear can cause cracks in the bush. Internal wear in the same position can cause the bush to wear completely through.

Measure the bush external wear status. Measure the track pitch. Check the track chain tension.

Figure 356.



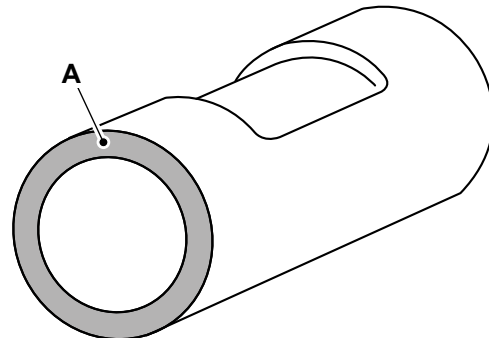
End Wear

The ends of the bushes are worn. Typically caused by abrasive material between the bush and the seals or high side loading from frequent traversing the side of steep slopes.

Check the shoe plate width is compatible with the operating environment.

When turning the bushes for extended service life, lubrication sealing may be defective.

Figure 357.

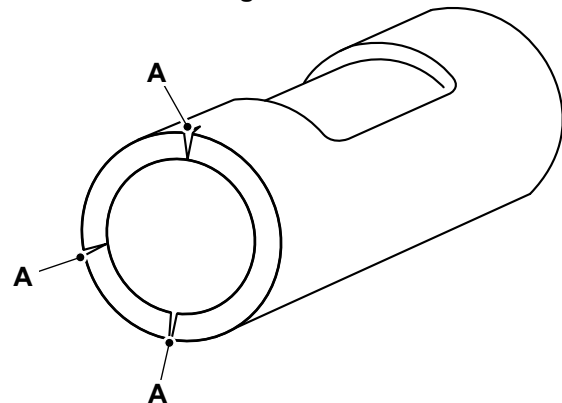


A Wear

End Cracks

The ends of the bushes have cracks. Typically caused by impact with the counterbore due to internal wear or track snaking. Repair not recommended.

Figure 358.



A Cracks

Counterbore Wear

The bush is worn at the ends of the outer diameter on its reverse drive side. This is caused by internal wear. As the pitch increases the bushes wear against the track links on the reverse drive side.

Check the track pitch.

When turning the bushes for extended service life, lubrication sealing may be defective.

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