MAXIMIZING COKE BUCKET LIFETIME

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PRIMARY LIFETIME FACTORS

LUBRICATION
- REGULAR, EFFECTIVE LUBRICATION
- USE RECOMMENDED LUBRICATING MATERIALS

INSPECTION
- CATCHING PROBLEMS WHILE MINOR
- CHECKING FOR PHYSICAL DAMAGE
- COMPARING WEAR TO EXPECTATIONS

MAINTENANCE
- TIMELY REPLACEMENT OF PINS/BUSHINGS/BEARINGS
- REPAIR MINOR CRACKING
PRIMARY LIFETIME FACTORS

LUBRICATION
- Regular, Effective Lubrication
- Use Recommended Lubricating Materials

INSPECTION
- Catching Problems While Minor
- Checking for Physical Damage
- Comparing Wear to Expectations

MAINTENANCE
- Timely Replacement of Pins/Bushings/Bearings
- Repair Minor Cracking
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- Regular, effective lubrication
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- Catching problems while minor
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- Timely replacement of pins/bushings/bearings
- Repair minor cracking
EFFECTS OF CYCLES

WEAR AREA’S

- MAIN SHAFTS
- BOWL-ARM PINS / BUSHINGS
- SHEAVES / SHEAVE BEARINGS
- CORNER/EDGE WEAR PADS
- BOWL PLATE THICKNESS
- TIMING TEETH

FATIGUE AREA’S

- UPPER/LOWER BLOCK SECTIONS
- MAIN BOWL ARMS
- BOWL PLATES

Typical Bucket Structure Designed for 1,000,000 Cycles

*Buyer should specify when purchasing*
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3 PHASES OF COKE BUCKET LIFE BASED ON CYCLES OF OPERATION

Early Phase
To 500,000 Cycles

Mid Phase
500,000 to 800,000 Cycles

Late Phase
800,000 to 1,000,000 Cycles
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**EARLY PHASE ACTIONS**

LUBRICATE PER MANUFACTURER
8 HOUR INTERVALS
USE RECOMMEND LUBRICATION
CHECK AND REPLACE FASTENERS
STOCK PINS/BUSHINGS

**Early Phase**
To 500,000 Cycles

**Mid Phase**
500,000 to 800,000 Cycles

**Late Phase**
800,000 to 1,000,000 Cycles
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**Early Phase**
To 500,000 Cycles

**Mid Phase**
500,000 to 800,000 Cycles

**Late Phase**
800,000 to 1,000,000 Cycles

**MID PHASE ACTIONS**
- LUBRICATE PER MANUFACTURER
- TWICE WEEKLY INSPECTIONS
- REPLACE MAIN SHAFT AND LOWER ARM PINS
- STOCK UPPER/LOWER BLOCK
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**Late Phase**
800,000 to 1,000,000 Cycles

**Mid Phase**
500,000 to 800,000 Cycles

**Early Phase**
To 500,000 Cycles

**Late Phase Actions**

- Lubricate per manufacturer
- Daily inspections
- Replace main shaft and lower arm pins

Failure to do so will result in premature cracking.

Spare bucket highly recommended.
INSPECTION AREA'S

PINS AND BUSHINGS

A. INSPECT UPPER ARM PINS
CHECK FOR ALIGNMENT AND WEAR

B. INSPECT LOWER ARM PINS
CHECK FOR ALIGNMENT AND WEAR

C. INSPECT MAIN SHAFTS
CHECK FOR ALIGNMENT AND WEAR

LATE PHASE
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PINS AND BUSHINGS

A. INSPECT UPPER ARM PINS
CHECK FOR ALIGNMENT AND WEAR

B. INSPECT LOWER ARM PINS
CHECK FOR ALIGNMENT AND WEAR

C. INSPECT MAIN SHAFTS
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INSPECTION AREA’S

PINS AND BUSHINGS

PROPER ALIGNMENT

IMPROPER ALIGNMENT
INSPECTION AREA’S

PINS AND BUSHINGS

PROPER PIN/BRACKET

WORN PIN/BRACKET
Not all joints in the bucket pivot the same amount.

As the bucket opens, “A” pivots only about 20 degrees, while “B” and “C” pivot about 75 degrees each.

Also, “A” is more isolated from the coke and water than “B”.

“So if we tap pin “B” partially out, we can examine the wear, and consider this a reliable indicator of the wear at “C”.

“B” is easier to reach than “A”, and easier to disassemble than “C”.

MAXIMIZING COKE BUCKET LIFETIME WEAR AREA’S
MAXIMIZING COKE BUCKET LIFETIME

UPGRADES

ASTRALLOY PINS/MANGANESE BUSHINGS INCREASES LIFE BY 60%

PREVENTS CRACKING AND MISALIGNMENT
INSPECTION AREA’S

WEAR AREA’S

D. INSPECT CORNER WEAR PADS
REPLACE WHEN LESS THAN 30%

E. INSPECT BOTTOM WEAR PADS
REPLACE WHEN WEAR REACHES NOTCH

F. INSPECT BOLT ON EDGES
REPLACE WHEN GAP FORMS

G. INSPECT BOWL GEARS
CHECK FOR WEARING OF TEETH

LATE PHASE
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INSPECTION AREA’S

WEAR AREA’S

PROPER GEAR

WORN GEAR
INSPECTION AREA’S

SHEAVES AND BLOCKS

H. INSPECT CLUSTER SHEAVES
CHECK FOR SIDE PLAY

I. INSPECT UPPER/LOWER SHEAVES
CHECK FOR SIDE PLAY

J. INSPECT UPPER/LOWER BLOCKS
CHECK FOR CRACKING

K. INSPECT CORNER ARM FRAME
CHECK FOR CRACKING

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BOWL AND EDGES

L. MEASURE BOWL FOR THICKNESS
REPLACE WHEN LESS THAN 50%

M. INSPECT LIPS/EDGES
CHECK FOR WEAR

N. MONITOR UPPER GEAR
CHECK FOR EXCESSIVE MOVEMENT
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LATE PHASE
Control Feature Protection:

Sway Control:
Helps prevent bucket from swinging into hopper, pit walls, etc., preventing physical damage.

Zone Control:
(Restricted Areas) “Zones-Out” pit walls, hopper, pit/pad floors, to reduce damage/wear from contact.

MAXIMIZING COKE BUCKET LIFETIME
Control Feature Protection:

Slack Rope Control: Konecranes inverter controls sense the load on the ropes and maintain tension so ropes don’t go slack, which could snag on objects, or snap back when operator tries to raise bucket, damaging components.

Overload Protection: Konecranes hoists include load cells for overload prevention, reducing stress on machinery, increasing safety.
Control Feature
Protection:

Load Share Control: Konecranes bucket-hoist control is PLC-based to properly share the load between the two hoist machineries and synchronize their motion, reducing stress on the bucket.

Maximizing Coke Bucket Lifetime

Automation:
Automated cranes follow pre-set routes and routines, avoiding obstacles, optimizing movements and minimizing “operator effects” on control, machinery... and the bucket.
NOT JUST LIFTING
THINGS, BUT ENTIRE
BUSINESSES

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