



Presentation for National Slag Association 2022 Annual Meeting

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SENEBOGEN[®]

Agenda:

Hydraulic material handlers

Heavy duty crawler cranes

Product support

Sennebogen covers the drop ball market with two product lines:

Hydraulic material handlers

Heavy duty crawler cranes



Sennebogen hydraulic material handlers:

Sennebogen first experience with drop ball was in 2010:

870 M (rubber tired) C series in Argentina

Ball: 7 tons

Machine was replaced in 2019 with 46,000 hours

Currently over 160 units operating in drop ball

Ball: 4 to 14 tons

Configuration: Rubber tired, crawler, crawler gantry, rail gantry

Available with diesel or electric drive



Basic design criteria of the Sennebogen material handlers:

Simple design for easy operation and maintenance from the ground

Very modern hydraulic system without electronic controls

Large section main control valve reduces pressure losses and increases overall efficiency of the hydraulic system

Independent hydraulic coolers, water radiator and turbo intercooler equipped with hydraulic driven fan, reversible

Hydraulic oil filtration through return filters plus Hydroclean system (2 micron) eliminating water and impurities from the oil and extending the life of the main hydraulic components

Basic design criteria of the Sennebogen material handlers:

Baldor / Hubbell generator system

Nonproprietary components reduce operating costs and increase uptime

High standardization of components simplify spare parts supply

Centralized hydraulic test ports for easy troubleshooting

Drive train guards

Safety items standard – cab access catwalk, handrails uppercarriage, bullet proof glass front and top, top and front guards







Sennebogen heavy duty crawler cranes:

Sennebogen first experience with drop ball was in early 2000's:

6100 R-HD (130 ton crane)

Ball: 12 tons

Model was further developed to the current model

Available with single and double drum

Ball: 10 to 18 tons

Available with diesel or electric drive





Basic design criteria of the Sennebogen cranes:

Simple design for easy operation and maintenance

Independent pumps for all major functions operating in open circuit

(lower operating pressure, eliminate charge pump, far more efficient oil cooling extending oil and pump life)

Large section main control valve reduces pressure losses and increases overall efficiency of the hydraulic system

Two hydraulic coolers, both with hydraulic driven fans

Hydraulic oil filtration through return filters plus Hydroclean system (3 micron) eliminating water and impurities from the oil and extending the life of the main hydraulic components



Basic design criteria of the Sennebogen cranes:

Easy trouble shooting done by reading pressures on the main hydraulic circuits through centralized hydraulic test ports

Easy daily maintenance from the ground

Automatic central lubrication system for the uppercarriage and central lubrication for swing bearing





Engine starter easy accessible

Centralized hydraulic test port

Centralized grease fittings



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Basic design criteria of the Sennebogen cranes:

Operator friendly large cab with air suspended seat, heating and air conditioning

Operator protection according to the customer requirements – bullet proof glass, front and top guards

Access and maintenance platforms as required

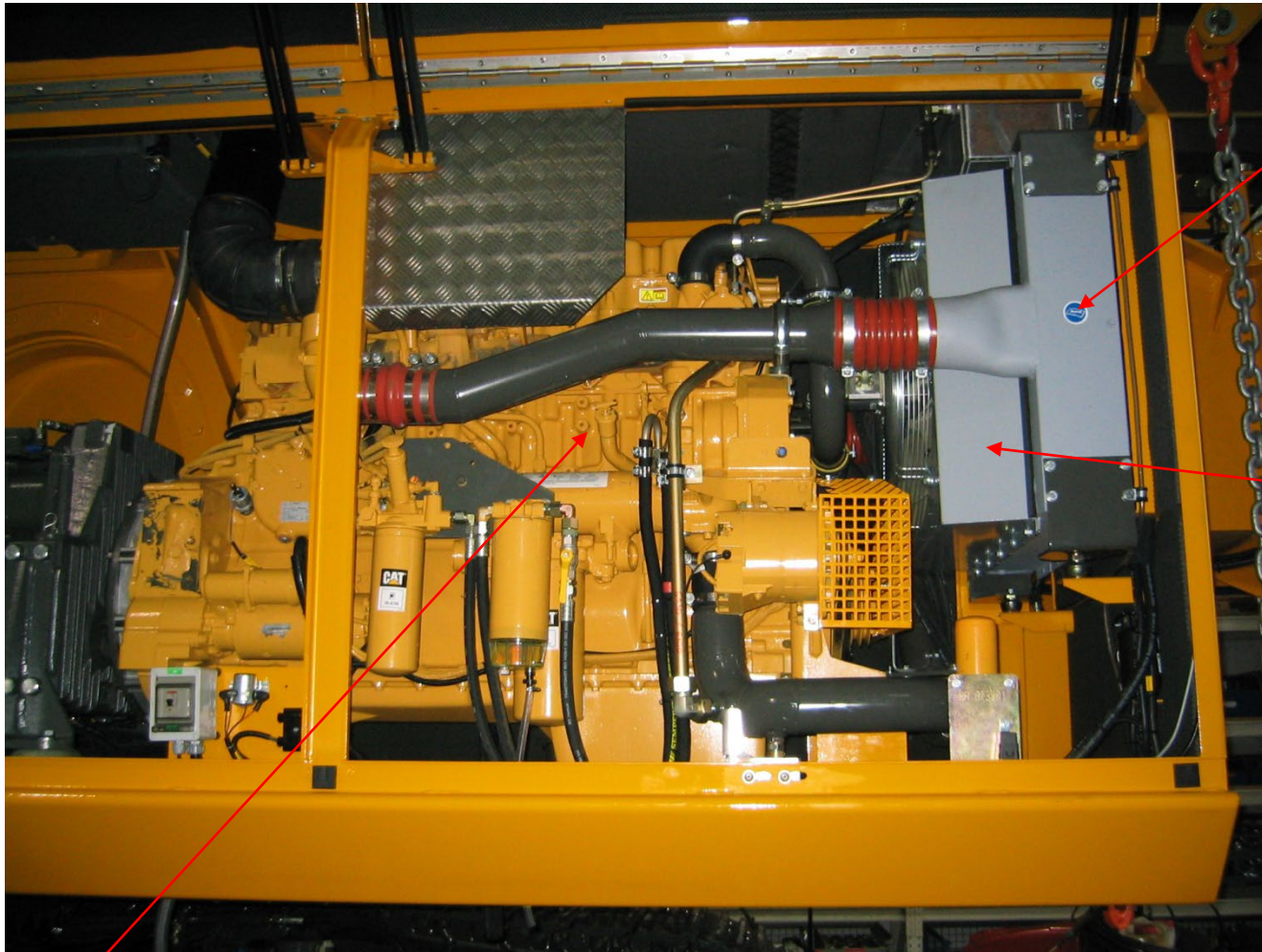
Counterweight on the undercarriage



Engine compartment

Main and auxiliary pumps

Electrical cabinet



Turbo intercooler

Water radiator

Caterpillar C15 diesel engine, 480 HP



Main pumps

Hydroclean – Ultra fine hydraulic oil filter – 2 micron

Swing out electrical panels



Counter weight lowering system
with remote control
(option)

Turbo intercooler



Rear hydraulic oil cooler,
hydraulic driven



Diesel refueling pump

Diesel tank

Batteries

Hydraulic oil tank



Main hydraulic
valve block

Hydraulic driven
front winch

Front hydraulic oil cooler,
hydraulic driven



Front hydraulic oil cooler, hydraulic driven

Rear hydraulic oil cooler, hydraulic driven

Main hydraulic valve block

Central greasing system for swing gear

Typical Technical specification of 6100 HD:

Boom length – 80' (24.4 m)

Working radius – 40' (12.2 m)

Lifting capacity – 44,000 lbs @ 40' (20,000 kg @ 12.2 m)

Ball weight – 26,500 lbs (12,000 kg)

Magnet – 17,500 lbs (8,000 kg)

Raising height – 62' (19 m)

Time to raise the ball – 23 s

Time to lower the magnet – 18 s (no free fall)

Engine Cat C15 - 480 HP

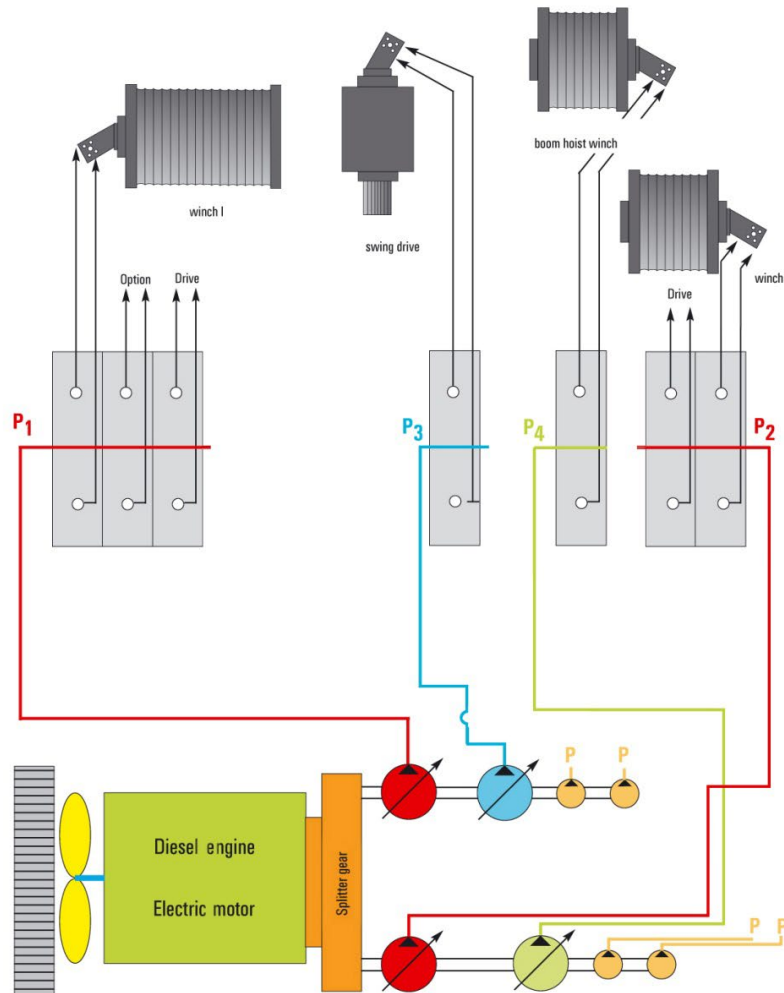
Time to raise the ball with **double winch** – 13 s

Time to lower the magnet with **double winch** – 9 s (no free fall)

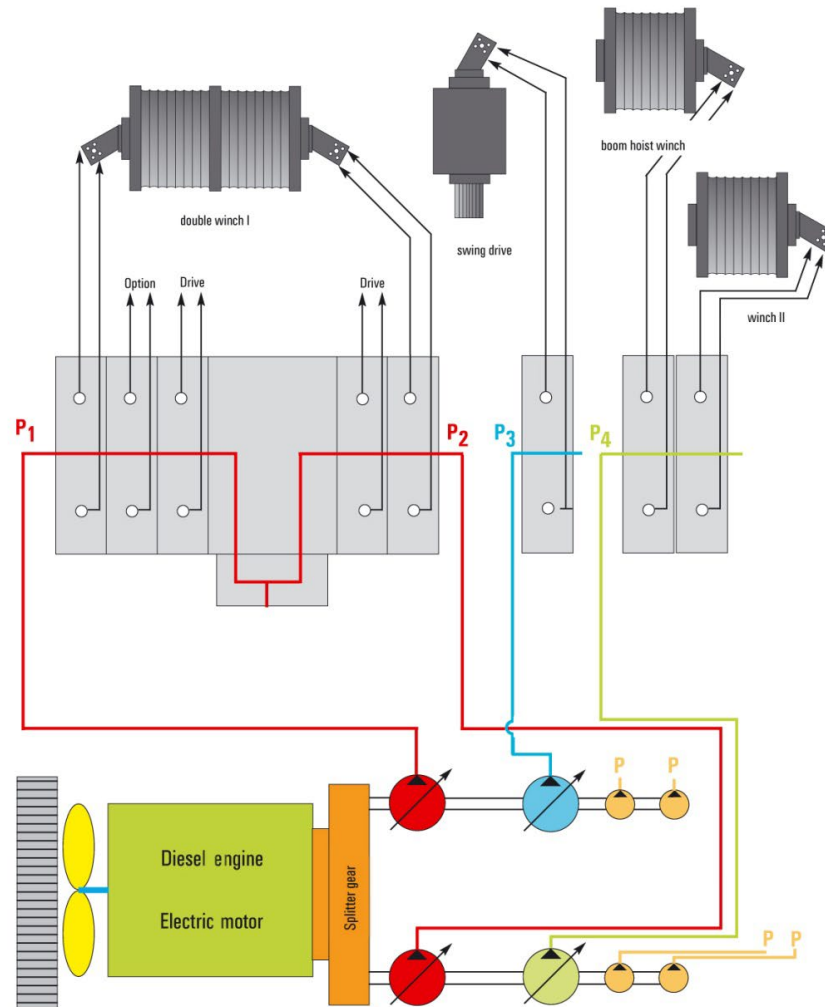
Engine Cat C18 - 640 HP

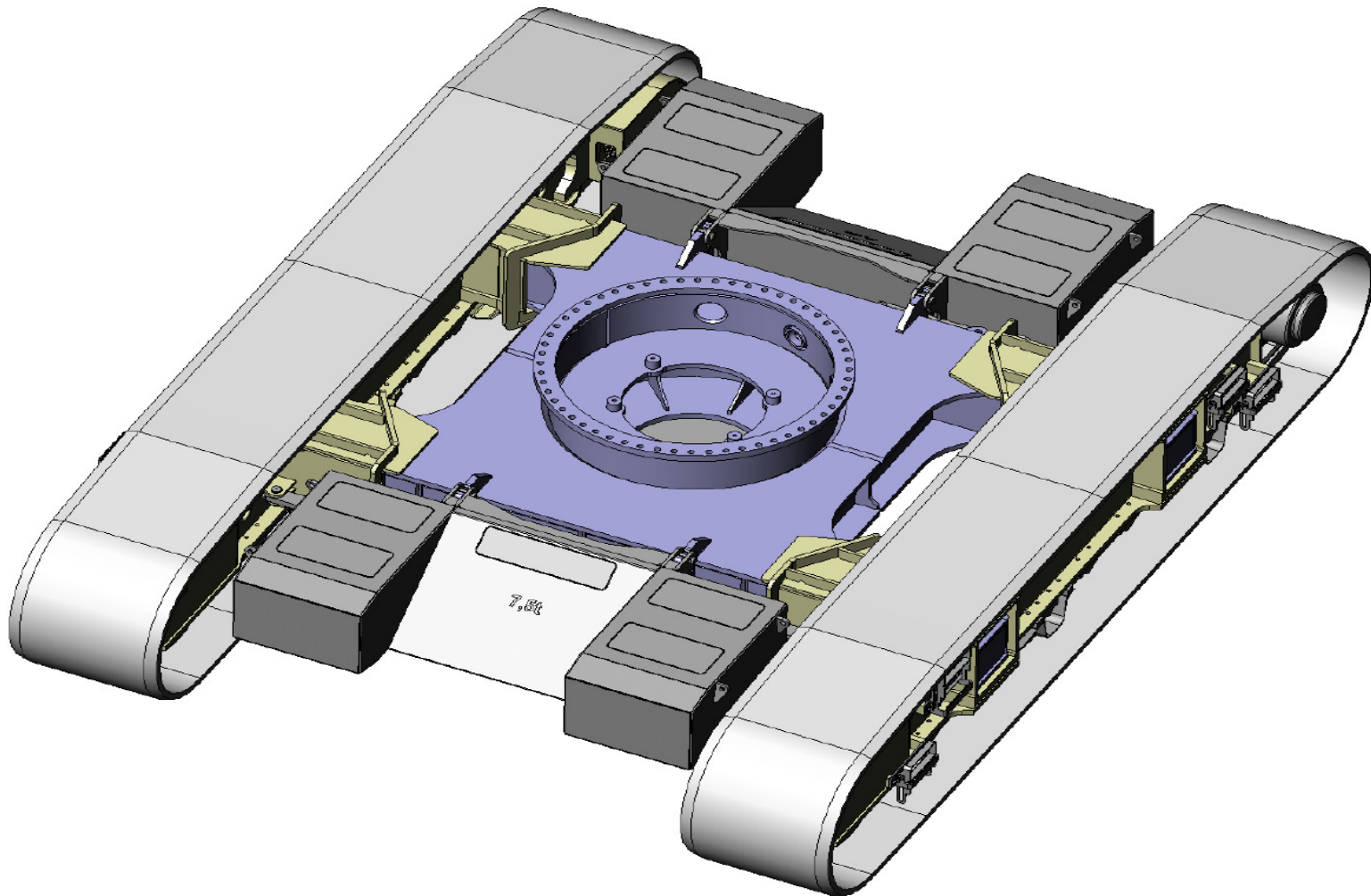


Duty Cycle Crawler Cranes



Duty Cycle Crawler Cranes





Sennebogen customer service and product support offerings :

Dealer network – 32 dealers with 200 locations in NA

Authorized service provider (ASP) network with 130 locations in NA

Technician training free of charge at the same level as dealers / ASP's

Learning hub

Sennebogen technicians available free of charge if dealer / ASP cannot solve the problem in 24 hours

Customer Experience Specialist (CXS) to visit customer 4 to 12 weeks after delivery of the machine – operation and maintenance support - free of charge

Machine inspections – once a year - free of charge

Spare parts inventory – over \$50 million in Charlotte, NC – 98% parts availability

24/7 parts hotshot service

Site optimization consultancy – free of charge

PM kits

Uptime kits



Sennebogen uptime kits





159707

SE-No.	Description	Quantity	SE-No.	Description	Quantity	SE-No.	Description	Quantity
009728	plug base	1	037603	pressure switch	1	067085	fuse	10
009729	relay	2	037767	sensor	1	067086	fuse	10
014000	plug	1	038468	lighting	2	067092	adapter plug	3
014008	switch	1	038490	relay	1	067105	casing	1
014009	pilot lamp	1	030346	control switch	1	067284	fuse	1
014010	lamp socket	5	040158	bulb	1	067816	relay	1
014258	relay	1	043706	switch	1	067888	switch	1
014474	pressure switch	1	044129	plug	1	067901	fuse	1
015215	switch	1	045265	switch	1	068767	diode	1
018237	pressure switch	1	045336	bush	1	069449	relay	1
020068	pressure switch	1	045337	casing	1	069720	relay	1
022081	plug base	1	046338	crimp type contact	2	072550	switch	1
022406	pressure switch	1	048315	switch	1	072611	contact block	1
023102	magnet coil	1	051759	cable	1	075816	magnet coil	1
027101	ignition lock	1	050556	lighting	1	080158	pressure switch	1
027107	resistance	1	051779	cable	1	086321	potentiometer	1
027594	plug	1	051793	cable	1	086707	relay	1
031258	relay	1	054109	sensor	1	087740	potentiometer	1
032482	resistance	1	057419	coupling (flexible)	1	088488	button	1
033723	switch	1	061689	fuse	1	088873	heat-shrinkable tubing	1
036401	control switch	1	067081	fuse	1	093976	pressure switch	1
037608	multimeter	1	067083	fuse	10	093977	protective cap	1
037688	plug	1	067084	fuse	10			
037690	plug	1						



Order Blank

159707

SE-No.	Description	Quantity	SE-No.	Description	Quantity	SE-No.	Description	Quantity
009728	plug base		037693	pressure switch		067085	fuse	
009729	relay		037767	sensor		067086	fuse	
014000	plug		038488	lighting		067092	adapter plug	
014005	switch		038490	relay		067105	casing	
014009	pilot lamp		039346	control switch		067284	fuse	
014010	lamp socket		040136	bulb		067818	relay	
014258	relay		043706	switch		067898	switch	
014474	pressure switch		044129	plug		067901	fuse	
016215	switch		045265	switch		068767	diode	
018237	pressure switch		045336	bush		069449	relay	
020098	pressure switch		045337	casing		069720	relay	
022081	plug base		045338	crimp type contact		072550	switch	
022406	pressure switch		048315	switch		072611	contact block	
023102	magnet coil		049607	relay		079816	magnet coil	
027101	ignition lock		050656	lighting		080158	pressure switch	
027107	resistance		051759	cable		086331	potentiometer	
027594	plug		051779	cable		086707	relay	
031255	relay		051793	cable		087740	potentiometer	
032492	resistance		054109	sensor		088456	button	
033723	switch		057419	coupling (flexible)		089673	heat-shrinkable tubing	
036401	control switch		061689	fuse		093976	pressure switch	
037608	multimeter		067081	fuse		093977	protective cap	
037688	plug		067083	fuse				
037690	plug		067084	fuse				





SENNEBOGEN Service Training

SENNEBOGEN > LEVEL 1

Time: 5 days
Students: Minimum 6 / Maximum 10 per class
Required: Basic Technical Knowledge
Content: Machine Safety, Operation & Functions
 Preventive Maintenance
 Read & Understand Hydraulic Schematics
 Read & Understand Electric Schematics
 Basic Trouble Shooting
 – Magnet System
 – Hydraulics
 – Electrics

SENNEBOGEN > LEVEL 2

Time: 5 days
Students: Minimum 4 / Maximum 6 per class
Required: Completion of Level 1 Class
Content: Remote Trouble Shooting
 Component Training & Repair
 Failure Analysis
 In Depth Trouble Shooting
 – Magnet System
 – Hydraulics
 – Electrics

The Level 2 classes are smaller and more intensive and build on Level 1.

Courses available from SENNEBOGEN

- Level 1 D-Series
- Level 2 D-Series
- Level 1 E-Series
- Level 2 E-Series
- Parts Training
- Operator Familiarization
- Sales Training

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