

Competitive Information

Hydraulic Excavator

INTERNAL USE ONLY

FIELD TEST REPORT

CI-J-102-E0
Sep., 1987

KOMATSU PC280LC-3 vs. POCLAIN 170CKB



Subject: Performance comparison between KOMATSU PC280LC-3 and POCLAIN 170CKB
Objective: To evaluate the working performance of both machines
Study date: June, 1987
Location: Moha, Belgium
Equipment studied:

Item	Model	KOMATSU PC280LC-3	POCLAIN 170CKB
Operating weight	kg (lb)	27600 (60,850)	31900 (70,330)
Flywheel horsepower	PS (kW)/rpm	170 (125)/2100	160 (118)/2150
Bucket capacity (CECE)	m ³ (cu.yd)	1.2 (1.57)	1.4 (1.83)
Arm length	mm (ft.in)	3050 (10')	3200 (10'6")
Track length on ground	mm (ft.in)	4045 (13'3")	3680 (12'1")
Track gauge	mm (ft.in)	2580 (8'6")	2600 (8'6")
Shoe width	mm (in)	710 (28")	850 (33")
Service meter	Hour	10	603

Test results at a glance:

Ditching:
 Hourly production: KOMATSU PC280LC-3 (S-mode) is 25% higher than the POCLAIN 170CKB.
 Fuel consumption: KOMATSU PC280LC-3 (L-mode) is 17% less than the POCLAIN 170CKB.
 Fuel efficiency (m³/ltr.): KOMATSU PC280LC-3 (S-mode) is 28% more efficient than the POCLAIN 170CKB.

Loading:
 Hourly production: KOMATSU PC280LC-3 (S-mode) is 25% higher than the POCLAIN 170CKB.
 Fuel consumption: KOMATSU PC280LC-3 (L-mode) is 19% less than the POCLAIN 170CKB.
 Fuel efficiency (m³/ltr.): KOMATSU PC280LC-3 (L-mode) is 37% more efficient than the POCLAIN 170CKB.

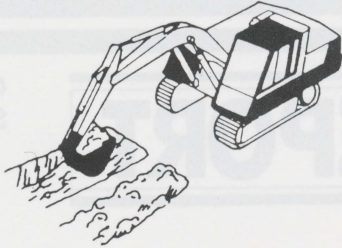
Lifting capacity: The lifting capacity of the PC280LC-3 is 20% larger than that of the POCLAIN 170CKB.

 **KOMATSU**

High productivity and economy

Featuring two-mode selection : STANDARD mode and LIGHT-DUTY mode.
The more suitable mode can be selected in response to the user's demand.

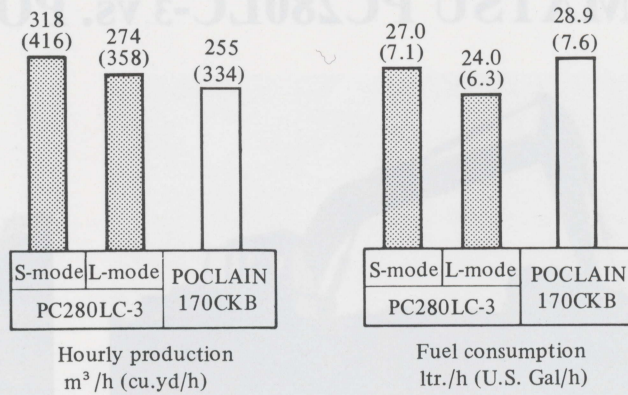
Ditching



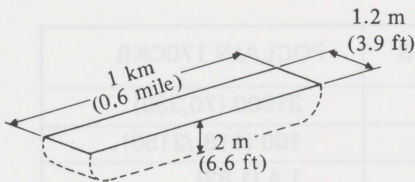
The productivity of the PC280LC-3 in the S-mode is one class higher than the POCLAIN 170CKB.
For projects which demand economy, the fuel consumption of the PC280LC-3 in the S-mode is 33% less than the POCLAIN 170CKB.


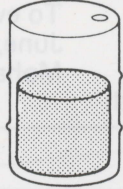
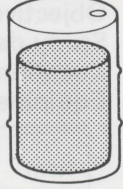
Conditions

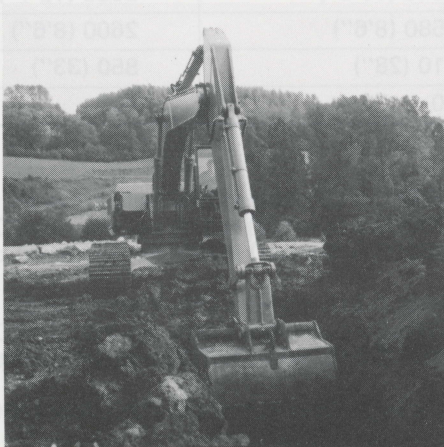
- Banked sticky soil with rock.
- Ditch depth : 2 m (6.6 ft.)
- Ditch width : The same as bucket width
- Excavated soil deposited at side of ditch
- Dumping at 30° swing



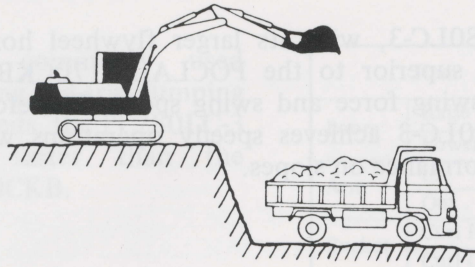
When the PC280LC-3 and the POCLAIN 170CKB were used under test conditions to dig a ditch 1 km (0.6 mile) in length, the fuel and time required were as shown in the chart on the right.



Item	KOMATSU PC280LC-3		POCLAIN 170CKB
	S-mode	L-mode	
Fuel required	 204 ltr [100%] (53.9 U.S.Gal)	 210 ltr [103%] (55.5 U.S.Gal)	 272 ltr [133%] (71.9 U.S.Gal)
Time required	7 h. 33 min [100%]	8 h. 46 min [116%]	9 h. 25 min [125%]



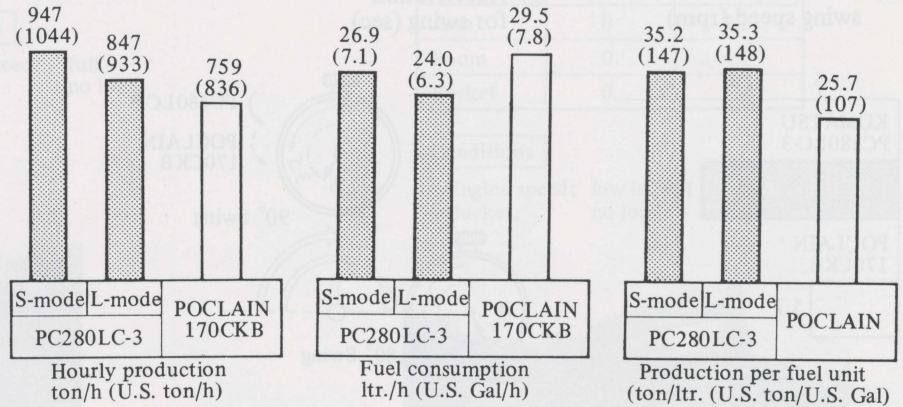
Loading



The productivity of the PC280LC-3 is one class higher than the POCLAIN 170CKB.
The efficiency of the PC280LC is also far superior to that of the POCLAIN 170CKB.

Conditions

- Loose soil with gravel
- Excavator and dump truck on different ground
- Loading at 90° swing
- 18 ton (20 U.S. ton) dump trucks (MAN trucks made in West Germany)
- 7 buckets loading



When the PC280LC-3 and the POCLAIN 170CKB were used under test conditions for one day's operations, the number of dump trucks which could be loaded and the fuel required for one dump truck were as shown in the chart on the right. The PC280LC-3 is far superior.

Calculation conditions :

Daily hours of operation : 8 hours

Job efficiency : 0.75

Bucket capacity :

PC280LC-3 1.2 m³ (1.57 cu.yd)

POCLAIN 170CKB

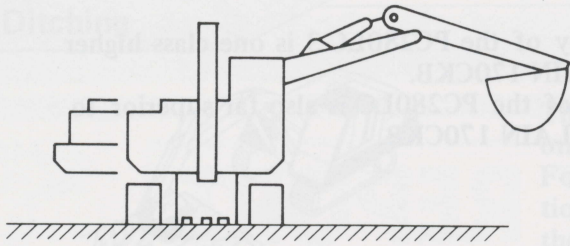
1.4 m³ (1.83 cu.yd)

Bucket factor : 1.0

Item Model	No. of 18-ton dump trucks which can be loaded = 20	Fuel consumption per dump truck
PC280LC-3 S-mode	316 [100%]	0.51 liter (0.13 U.S. Gal) [100%]
POCLAIN 170CKB	253 [80%]	0.70 liter (0.18 U.S. Gal) [137%]

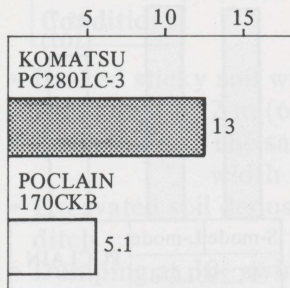


Excellent swing performance

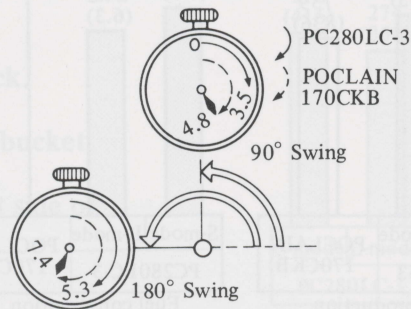


The PC280LC-3, with its larger flywheel horsepower, is superior to the POCLAIN 170CKB in both its swing force and swing speed. Therefore, the PC280LC-3 achieves speedy operations with good performance on slopes.

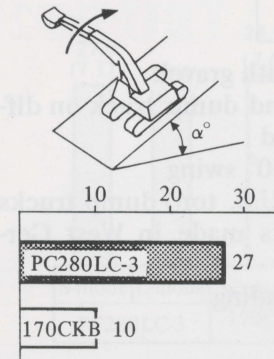
① Stationery swing speed (rpm)



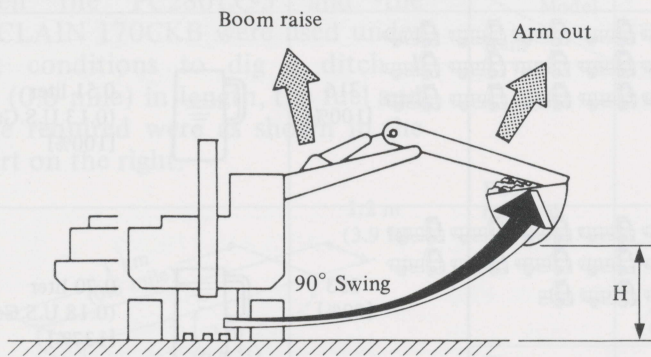
② Acceleration for swing (sec)



③ Swing gradeability (°)

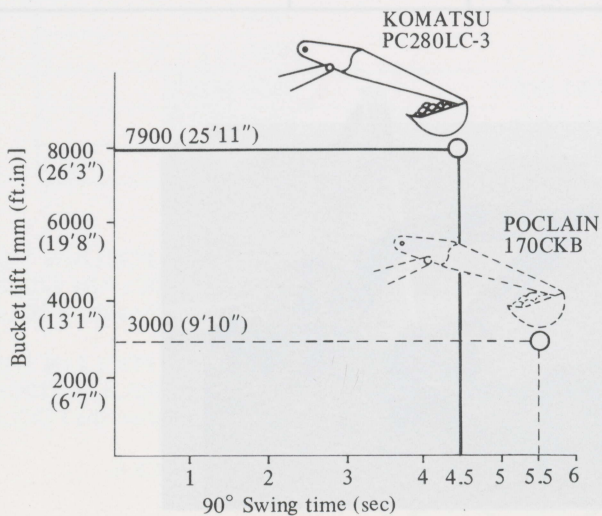


Outstanding simultaneous ability



Conditions

Swing, boom raise & arm out are controlled simultaneously with the bucket loaded. The bucket raised height "H" and the 90° swing time were measured.



The compound operation of swing, boom raise and arm out is one of the most frequently used movements in daily operations. The PC280LC-3 has the best match of bucket lift and swing time. The 170CKB has a longer swing time, and the bucket is lifted almost 1/3 as high as the PC280LC-3.

Speedy work equipment

In commonly used swing and arm dumping speeds, the PC280LC-3 is faster than the 170CKB.

Item			Model		
			PC280LC-3	170CKB	
Boom	Raise	sec	3.3	5.2	
	Lower	sec	3.0	2.8	
Arm	In	sec	4.5	5.3	
	Out	sec	3.0	3.6	
Bucket	Curl In	sec	4.2	3.4	
	Curl Out	sec	2.5	2.7	
Total			sec	20.5	23.0

Conditions

Engine speed; full
Bucket; no load



It is difficult for the POCLAIN 170CKB to perform finishing operations because the work equipment speed is slow and the time lag is large when operating the bucket or arm in a vertical position.

Time lag

Unit: sec

	PC280LC-3	170CKB
Arm	0	9.1
Boom	0	4.1
Bucket	0	7.2

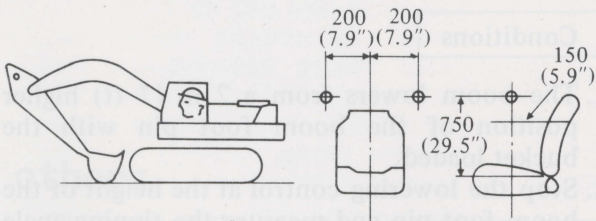
Conditions

Engine speed; low idling
Bucket; no load



Noise

1. Noise at operator's ears

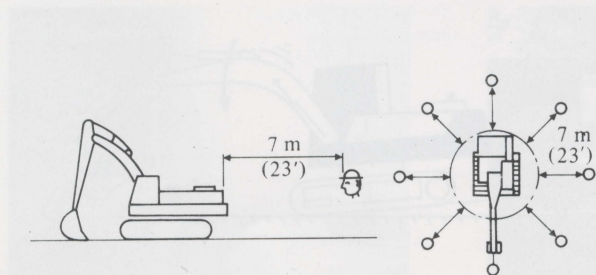


Noise level at operator's ears

unit: dB (A)

KOMATSU PC280LC-3	78
POCLAIN 170CKB	78.5
Engine high idling	

2. Noise around the machine [7 m (23 ft.)]



Noise level at 7 m (23') from machine surface

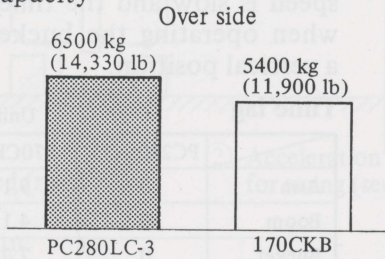
KOMATSU PC280LC-3	75.5
POCLAIN 170CKB	77
Engine high idling	

Note: 170CKB equipped French noise suppression kit.
Though PC280LC-3 is standard machine, the noise level is low.

High stability

The PC280LC-3 has outstanding hydraulic power and is well-balance. Due to this, the lifting capacity and dynamic stability of the PC280LC-3 are the best in its class.

1. Lifting capacity



The lifting capacity of the PC280LC-3 is 20% larger than that of the POCLAIN 170CKB, so a stable operation is possible even when a large capacity bucket or long arm is equipped.

Conditions

Reach: 6 m (20 ft.) from swing center.
DIN standard lifting capacity of catalog value (Safety margin for tipping is 25%)

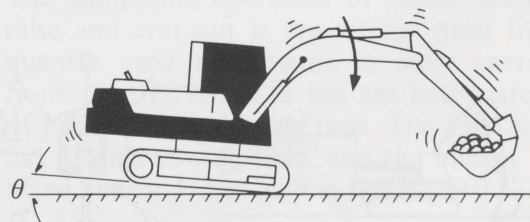


2. Dynamic stability

Item		Model	KOMATSU PC280LC-3	POCLAIN 170CKB
Dynamic stability	Lengthwise	deg	0.7	Tipping
	Transverse	deg	2.3	Tipping
Track length on ground		mm (ft.in)	4045 (13'3")	3680 (12'1")
Track gauge		mm (ft.in)	2580 (8'6")	2600 (8'6")

Conditions

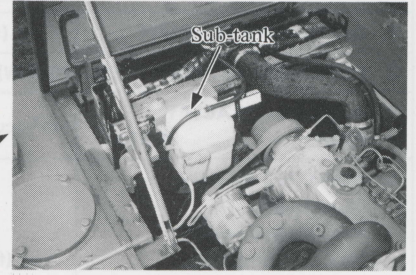
1. The boom lowers from a 2 m (7 ft) higher position of the boom foot pin with the bucket loaded.
2. Stop the lowering control at the height of the boom foot pin and measure the tipping angle " θ ".



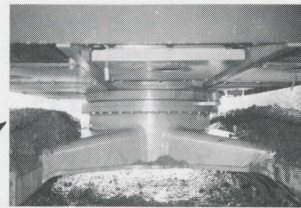
Structure and function comparison

	KOMATSU PC280LC-3	POCLAIN 170CKB
1. Water cooled engine	○	×
2. 6-Cylinder engine	○	○
3. Turbocharged engine	○	○
4. Sub-tank for checking engine water level	○	×
5. Variable-capacity piston pump	○	×
6. Function of O.L.S.S. system	○	×
7. 2-Mode selection system	○	×
8. In-shoe type travel motor	○	○
9. Internal swing circle gear	○	×
10. Grease-bath type swing circle	○	×
11. Centralized greasing points for swing circle	○	×
12. Centralized greasing points for work equipment (Boom cyl. top pin & arm cyl. bottom pin)	○	○

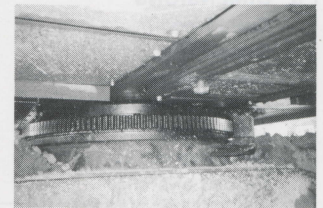
○: Equipped
 ×: Not equipped



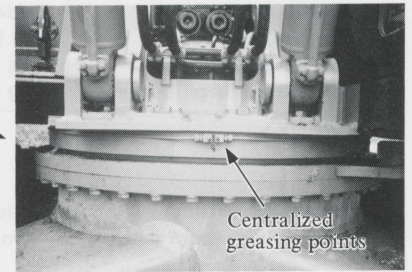
PC280LC-3



PC280LC-3



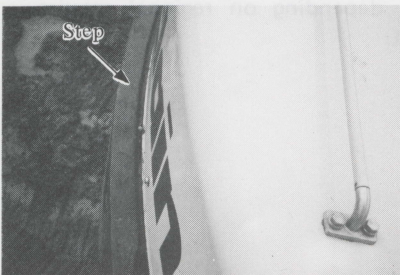
170CKB



PC280LC-3

others

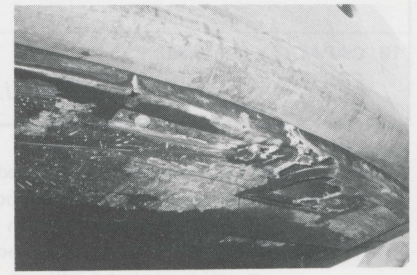
- The step on the counter weight is too narrow to open rear machine cover for maintenance. Therefore, it is very dangerous.
- The under cover of upper structure is made by synthetic resin. Therefore, it is very easy to damage.



170CKB



170CKB



170CKB

Comparative specifications (Catalog value)

Item	Maker Model	Komatsu	Poclair
		PC280LC-3	170CKB
1. OPERATING WEIGHT*	kg (lb)	27560 (60760)	30930 (68190)
2. FLYWHEEL HORSEPOWER	PS (kW)/RPM	170 (125)/2100	160 (118)/2150
3. BUCKET CAPACITY RANGE (SAE)	m ³ (cu.yd)	0.44 ~ 1.4 (0.58 ~ 1.83)	1.05 ~ 2.0 (1.37 ~ 2.62)
4. WORKING RANGE (Arm length) Max. digging height Max. dumping height Max. digging reach on ground Max. vertical wall depth Max. digging depth	mm (ft.in)	(2500 (8'2")) 9085 (29'10") 6310 (20'8") 9490 (31'2") 4850 (13'11") 6040 (19'10")	(2500 (8'2")) 10200 (33'6") 6900 (22'8") 10650 (34'11") 6950 (22'10")
5. DIMENSIONS Overall length Overall height Overall width Length of track on ground Track gauge Tail swing radius Ground clearance	mm (ft.in)	9820 (32'3") 3200 (10'6") 3290 (10'10") 4045 (13'3") 2580 (8'6") 2900 (9'6") 530 (1'9")	11100 (36'5") 3650 (12') 3300 (10'10") 3680 (12'1") 2600 (8'6") 3160 (10'4") 550 (1'10")
6. PERFORMANCE Swing speed Max. travel speed Gradeability (Arm length) Max. crowd force (arm) Max. digging force (bucket)	RPM km/h (MPH) % (degree) (mm (ft.in)) kg (lb) kg (lb)	13 2.5 (1.6) 70 (35) (2000 (6'7")) 14990 (33050) 14700 (32410)	5.1 3.4 (2.1) 80 (39) (2000 (6'7")) 17080 (37650) 22950 (50600)
7. ENGINE Model Piston displacement No. of cylinder-bore x stroke	ltr. (cu.in) mm (in)	Komatsu S6D110 7.13 (435) 6-110 x 125 (4.3 x 4.9)	Deutz BF6L913 6.13 (374) 6-102 x 125 (4 x 4.9)
8. HYDRAULIC SYSTEM Hydraulic pump Max. oil flow Max. oil pressure (work equipment)	ltr. (U.S.Gal)/ min kg/cm ² (PSI)	Variable displacement piston pump 2 x 193 (51) 320 (4550)	Fixed displacement piston pump 306 (81) 320 (4550)/ 400 (5690)
9. TRACK SHOE WIDTH	mm (in)	610 (24") 710 (28") 760 (30") 810 (32") 860 (34")	500 (20") 600 (24") 700 (28") 850 (34")
10. CAPACITY (Refilled) Fuel tank Hydraulic tank	ltr. (U.S.Gal)	280 (74.0) 150 (39.6)	410 (108) 300 (79.2)

This information has been gathered to provide data on the performance of KOMATSU and competitive machines under actual job conditions. Every effort was made to ensure reliable results. However, because of the many variables peculiar to each job (including material characteristics, operator efficiency, labor and other costs, haul road conditions and altitude), neither KOMATSU LTD. nor any of its distributors can or does warrant expressly or implicitly that the Komatsu or competitive equipment referred to will achieve the performance or incur the costs indicated under other, though similar, circumstances.

The information contained herein is intended for circulation only to Komatsu employees and to those distributor employees, whose duties require knowledge of such reports and is intended solely for the information and training of these readers. UNAUTHORIZED USE OF THIS DOCUMENT IS HEREBY PROHIBITED AND THOSE RESPONSIBLE FOR SUCH USE SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGES WHICH THIRD PARTIES MAY INCUR AS A RESULT OF SUCH USE. Any reproduction of this release without the foregoing explanation is prohibited.

Standard and optional equipment may vary depending on regional requirement.

* Operating weight of each above mentioned machine is indicated as following
 PC280LC: 5.85 m (19'2") one piece boom, 2.5 m (8'2") arm, SAE 1.4 m³ (1.83 cu.yd) bucket and 710 mm (28") shoe
 170CKB : 6.5 m (21'4") one piece boom, 2.5 m (8'2") arm, SAE 1.45 m³ (1.90 cu.yd) bucket and 700 mm (28") shoe