

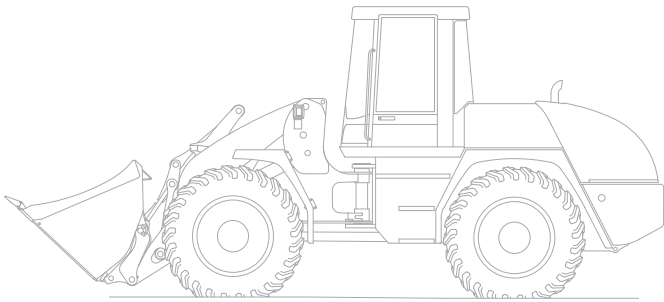


TEREX®

SKL 200 SERVICE - MANUAL

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DIESEL ENGINE

Manufacturer:		Deutz
Type:		F4M 2011
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	44 at 2,400 min ⁻¹
Construction:		4 cylinders in line
Cooling:		external oil cooling
Injection:		direct injection
Capacity:	cm ³	3,100
High idle:	min ⁻¹	2,550 ⁺⁵⁰
Low idle:	min ⁻¹	850 ⁺⁵⁰
Spec. fuel consumption under full load:	g/kWh	218
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs (only in case of repair):	Nm	30 / 80 / 160
Further data:		Tightening angle 90° see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 80 / 720 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation ("StVZO") and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	max. cm ³ /rev.	56
Travel motor	20/36 km/h version: type	51D080 Danfoss
Displacement	20/36 km/h version: max. cm ³ /rev.	80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 70:	20 km/h - version:			
	tortoise / rabbit	km/h	0 to 7.0	/ 0 to 20
TL 70 S:	36 km/h - version:			
	Gearbox position 1, tortoise / rabbit:	km/h	0 to 6.5	/ 0 to 18
	Gearbox position 2, tortoise / rabbit:	km/h	0 to 13	/ 0 to 36

Cardan shaft rev. at 20 km/h - version			adjustment at nominal speed
tyres			tortoise / rabbit
standard:	12,5-20:	min ⁻¹	650 / 2,100
option:	335/80 R20 SPT 9:	min ⁻¹	650 / 2,050
	335/80 R20 XM 27TL:	min ⁻¹	650 / 2,080

Cardan shaft rev. at 36 km/h - version			adjustment at nominal speed
tyres			tortoise / rabbit
standard:	12,5-20:	min ⁻¹	1./2. gear / 1./2. gear
option:	335/80 R20 SPT 9:	min ⁻¹	635 / 1,300 / 1.860 / 3,780
	335/80 R20 XM 27TL:	min ⁻¹	635 / 1,300 / 1.800 / 3,680
			635 / 1,300 / 1.840 / 3,750

PRESSURE AND SETTING VALUES

Suction pressure:	max. bar	0.5 ^{±0.1}
Charge pressure (high idle):	bar	30 ^{±1}
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min ⁻¹	2,300 ⁻⁵⁰ at 180 bar (see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min ⁻¹	1,150
Engine stalling (rabbit) - dynamic:	min ⁻¹	2,200 ⁻¹⁰⁰ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	Danfoss OSPC 250 LS dyn.
Steering pump:	make	Cassappa
Displacement:	l/min	37
Steering pressure (high idle):	bar	175
Priority valve:	type	Danfoss OLS 80 dyn.

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min	65 (= slewing 28 l/min and steering 37 l/min summation)
Valve bank:	type	Parker P 70 CF
Servo-controlled valve:	type	Brown PRSV

PRESSURE AND SETTING VALUES

	working	(at high idle)
Main pressure relief valve I:	max. bar	250
Line relief pressures:		
- lifting frame lift: (B2)	bar	280
- lifting frame lower: (A2)	bar	anti-cavitation
- shovel dump in: (B3)	bar	280
- shovel dump out: (A3)	bar	130
- additional control circuit: (A1+Y9 / B1+Y8)	bar	230 / 230
Main pressure relief valve II:	max. bar	250
Line relief pressures:		
- slewing left: (A1+Y31)	bar	230
- slewing right: (B1+Y32)	bar	230
- pilot pressure (charge pressure):	bar	30 ^{±1}

WORKING CYCLES

Lifting frame lift:	s	4.7
Lifting frame lower:	s	3.3
Shovel dump in:	s	---
Shovel dump out:	s	---
Slewing right / left:	s	3.2 to each side

AXLES

Front axle: with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle: with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 010
Front axle: with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 009
Rear axle: with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 011

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:		see engine instruction book
Hydraulic oil:		see Schaeff hydraulic oil recommendation table
Transmission oil:		MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:		acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:		ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

		litr.	
Engine oil with oil filter and oil cooler - change:	approx.	13.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx.	55.0	hydraulic oil
Hydraulic oil tank (change):	approx.	46.0	hydraulic oil
Fuel tank:	approx.	75.0	diesel
Front axle - central housing:	approx.	4.0	transmission oil
Front axle - wheel hub:	approx.	0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx.	4.5	transmission oil
Rear axle - wheel hub:	approx.	0.3	transmission oil, each
Service brake:	approx.	0.25	ATF oil

DIESEL ENGINE Tier 3

Manufacturer:		Deutz
Type:		D 2011 L04W
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	44 at 2,400 min ⁻¹
Construction:		4 cylinders in line
Cooling:		water
Injection:		direct injection
Capacity:	cm ³	3,600
High idle:	min ⁻¹	2,350 ⁺⁵⁰
Low idle:	min ⁻¹	850 ⁺⁵⁰
Spec. fuel consumption under full load:	g/kWh	225
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs (only in case of repair):	Nm	30 / 80 / 160
Further data:		Tightening angle 90° see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 100 / 850 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation ("StVZO") and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	max. cm ³ /rev.	56
Travel motor	20/36 km/h version: type	51D080 Danfoss
Displacement	20/36 km/h version: max. cm ³ /rev.	80

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 70:	20 km/h - version:			
	tortoise / rabbit	km/h	0 to 7.0	/ 0 to 20
TL 70 S:	36 km/h - version:			
	Gearbox position 1, tortoise / rabbit:	km/h	0 to 6.5	/ 0 to 18
	Gearbox position 2, tortoise / rabbit:	km/h	0 to 13	/ 0 to 36

Cardan shaft rev. at 20 km/h - version			adjustment at nominal speed
tyres			tortoise / rabbit
standard:	12,5-20:	min ⁻¹	650 / 2,100
option:	335/80 R20 SPT 9:	min ⁻¹	650 / 2,050
	335/80 R20 XM 27TL:	min ⁻¹	650 / 2,080

Cardan shaft rev. at 36 km/h - version			adjustment at nominal speed
tyres			tortoise / rabbit
			1./2. gear / 1./2. gear
standard:	12,5-20:	min ⁻¹	635 / 1,300 / 1.860 / 3,780
option:	335/80 R20 SPT 9:	min ⁻¹	635 / 1,300 / 1.800 / 3,680
	335/80 R20 XM 27TL:	min ⁻¹	635 / 1,300 / 1.840 / 3,750

PRESSURE AND SETTING VALUES

Suction pressure:	max. bar	0.5 ^{±0.1}
Charge pressure (high idle):	bar	30 ^{±1}
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min ⁻¹	2,300 ⁻⁵⁰ at 230 bar (see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min ⁻¹	1,150
Engine stalling (rabbit) - dynamic:	min ⁻¹	2,000 ⁻¹⁰⁰ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	Rexroth LAGC100-15/LD240-1
Steering pump:	make	Cassappa
Displacement:	cm ³ /rev.	29
Steering pressure (high idle):	bar	175
Priority valve:	type	Rexroth LPS80RM/LD7-643-0

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min	65 (= slewing 28 l/min and steering 37 l/min summation)
Oil flow divider	type	Kracht KM1/14+KM1/11
Valve bank:	type	Parker P 70 CF
Servo-controlled valve:	type	Brown PRSV

PRESSURE AND SETTING VALUES

	working	(at high idle)
Main pressure relief valve I:	max. bar	250
Line relief pressures:		
- lifting frame lift: (B2)	bar	280
- lifting frame lower: (A2)	bar	anti-cavitation
- shovel dump in: (B3)	bar	280
- shovel dump out: (A3)	bar	130
- additional control circuit: (A1+Y9 / B1+Y8)	bar	230 / 230
Main pressure relief valve II:	max. bar	250
Line relief pressures:		
- slewing left: (A1+Y31)	bar	230
- slewing right: (B1+Y32)	bar	230
- pilot pressure (charge pressure):	bar	30 ^{±1}

WORKING CYCLES

Lifting frame lift:	s	4.7
Lifting frame lower:	s	3.3
Shovel dump in:	s	---
Shovel dump out:	s	---
Slewing right / left:	s	3.2 to each side

AXLES

Front axle: with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 200
Rear axle: with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 201
Front axle: with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 200
Rear axle : with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 // 4472 025 202

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:		see engine instruction book
Hydraulic oil:		see TEREX hydraulic oil recommendation table
Transmission oil:		MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:		acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Brake medium:		ATF type A Suffix A or Dexron II D

MAINTENANCE PARTS

see instruction book

CAPACITIES

		ltr.	
Engine oil with oil filter - change:	approx.	9.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx.	55.0	hydraulic oil
Hydraulic oil tank (change):	approx.	46.0	hydraulic oil
Fuel tank:	approx.	75.0	diesel
Front axle - central housing:	approx.	4.0	transmission oil
Front axle - wheel hub:	approx.	0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx.	4.5	transmission oil
Rear axle - wheel hub:	approx.	0.3	transmission oil, each
Service brake:	approx.	0.25	ATF oil
Coolant fluid	approx.	15,0	water with anti-corrosive and anti-freeze agent

DIESEL ENGINE Tier 3

Manufacturer:		Deutz
Type:		D 2011 L04W
Performance according to (ECE-R24/ISO1585/ISO9249):	kW	44 at 2,400 min ⁻¹
Construction:		4 cylinders in line
Cooling:		water
Injection:		direct injection
Capacity:	cm ³	3,600
High idle:	min ⁻¹	2,350 ⁺⁵⁰
Low idle:	min ⁻¹	850 ⁺⁵⁰
Spec. fuel consumption under full load:	g/kWh	225
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Torque of cylinder head studs (only in case of repair):	Nm	30 / 80 / 160
Further data:		Tightening angle 90° see engine instruction book or chapter 3

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 100 / 850 (EN)
Generator:	V/A	14 / 95
Starter:	V/kW/PS	12 / 2.3 / 3.1
Cold start aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation ("StVZO") and Euronorm. H4 halogen headlamp. Two working lights at the front.

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	max. cm ³ /rev.	56
to Se. No. TL0070373		
Travel motor 20/36 km/h version:	type	51D080 Danfoss (80 cm ³ /rev.)
to Se. No. TL0070374		
Travel motor 20/36 km/h version:	type	A6VM80 Hydromatik (80 cm ³ /rev.)

TRAVEL RANGE

Two/ four pre-selectable travel ranges, electro-hydraulically controlled:

TL 70:	20 km/h - version:			
	tortoise / rabbit	km/h	0 to 7.0	/ 0 to 20
TL 70 S:	36 km/h - version:			
	Gearbox position 1, tortoise / rabbit:	km/h	0 to 6.5	/ 0 to 18
	Gearbox position 2, tortoise / rabbit:	km/h	0 to 13	/ 0 to 36

Cardan shaft rev. at 20 km/h - version			adjustment at nominal speed
tyres			tortoise / rabbit
standard:	12,5-20:	min ⁻¹	650 / 2,100
option:	335/80 R20 SPT 9:	min ⁻¹	650 / 2,050
	335/80 R20 XM 27TL:	min ⁻¹	650 / 2,080

Cardan shaft rev. at 36 km/h - version			adjustment at nominal speed
tyres			tortoise / rabbit
			1./2. gear / 1./2. gear
standard:	12,5-20:	min ⁻¹	635 / 1,300 / 1.860 / 3,780
option:	335/80 R20 SPT 9:	min ⁻¹	635 / 1,300 / 1.800 / 3,680
	335/80 R20 XM 27TL:	min ⁻¹	635 / 1,300 / 1.840 / 3,750

PRESSURE AND SETTING VALUES

	travel	to Se. No. TL00700373 (Danfoss)
Suction pressure:	max. bar	0.5 ^{±0.1}
Charge pressure (high idle):	bar	30 ^{±1}
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start, dynamic:	min ⁻¹	230 bar
Start-up speed:	min ⁻¹	1,150
Engine stalling (rabbit) - dynamic:	min ⁻¹	2,000 ⁻¹⁰⁰ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

PRESSURE AND SETTING VALUES (Hydromatik)

	travel	from Se. No. TL00700374
Suction pressure:	max. bar	0.5 ^{±0.1}
Charge pressure (high idle):	bar	30 ^{±1}
High pressure (SV):	bar	430
Pressure cut-off:	bar	410
Case pressure at + 50° C:	max. bar	2.5
Regulation start:	bar	2,100 ⁻⁵⁰ at 200 bar HP
		(see setting instructions, chapter 5, measuring method 2)
Start-up speed:	min ⁻¹	1,150
Engine stalling (rabbit) - dynamic:	min ⁻¹	2,000 ⁻¹⁰⁰ at 220 bar HP
Brake inching beginning / end:	bar	5 - 13
Pressure switch (hydrostatic brake):	bar	22

STEERING

Steering unit:	type	Rexroth LAGC100-15/LD240-1
Steering pump:	make	Cassappa
Displacement:	cm ³ /rev.	29
Steering pressure (high idle):	bar	175
Priority valve:	type	Rexroth LPS80RM/LD7-643-0

WORKING HYDRAULICS

Working pump:	make	Cassappa
Displacement:	l/min	65
		(= slewing 28 l/min and steering 37 l/min summation)
Oil flow divider	type	Kracht KM1/14+KM1/11
Valve bank:	type	Bucher HDM19
Servo-controlled valve:	type	Brown PRSV

PRESSURE AND SETTING VALUES

	working	(at high idle)
Main pressure relief valve I:	max. bar	250
Line relief pressures:		
- lifting frame lift: (B2)	bar	280
- lifting frame lower: (A2)	bar	anti-cavitation
- shovel dump in: (B3)	bar	280
- shovel dump out: (A3)	bar	130
- additional control circuit: (A1+Y9 / B1+Y8)	bar	230 / 230
Main pressure relief valve II:	max. bar	250
Line relief pressures:		
- slewing left: (A1+Y31)	bar	230
- slewing right: (B1+Y32)	bar	230
- pilot pressure (charge pressure):	bar	30 ^{±1}

WORKING CYCLES

Lifting frame lift:	s	4.7
Lifting frame lower:	s	3.3
Shovel dump in:	s	---
Shovel dump out:	s	---
Slewing right / left:	s	3.2 to each side

AXLES

Front axle: with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 or MT-L 3020
Rear axle: with self-locking differential - 20 km/h-version:	make/type	ZF / AP – R – 720 or MT-L 3020

Front axle: with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 or MT-L 3020
Rear axle : with self-locking differential - 36 km/h-version:	make/type	ZF / AP – R – 720 or MT-L 3020

BRAKE SYSTEM

Service brake:		hydraulically operated drum brake, front axle
Parking brake:		drum brake at the front axle
Master cylinder:	make	ATE (mineral oil)

LUBRICANTS

Engine:	see engine instruction book
Hydraulic oil:	see TEREX hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B or API-GL 5 resp., SAE 85 W 90 LS or SAE 90 LS acc. to DIN 51825. Dripping point over 170° C. Lithium-saponified.
Multi-purpose grease:	ATF type A Suffix A or Dexron II D
Brake medium:	

MAINTENANCE PARTS

see instruction book

CAPACITIES

	litr.	
Engine oil with oil filter - change:	approx. 9.0	engine oil
Hydraulic oil (tank and system) - first filling:	approx. 55.0	hydraulic oil
Hydraulic oil tank (change):	approx. 46.0	hydraulic oil
Fuel tank:	approx. 75.0	diesel
Front axle - central housing:	approx. 4.0	transmission oil
Front axle - wheel hub:	approx. 0.3	transmission oil, each
Rear axle - central housing and reduction gearbox:	approx. 4.5	transmission oil
Rear axle - wheel hub:	approx. 0.3	transmission oil, each
Service brake:	approx. 0.25	ATF oil
Coolant fluid	approx. 15,0	water with anti-corrosive and anti-freeze agent

	(Gramm)	
Air condition:	approx. 800 (1.764 lb)	R134a

DIESEL ENGINE

Manufacturer:		KHD
Type:		F 4 M 2011
Performance according to DIN 70020:	kW	44 at 2,400 min ⁻¹
Cooling:		engine oil / air; external oil cooling
Injection:		direct injection
Capacity:	cm ³	3,100
High idle:	min ⁻¹	2,550 · ⁵⁰
Low idle:	min ⁻¹	850 · ⁵⁰
Spec. fuel consumption under full load:	g/kWh	235
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Engine oil pressure (at Service-Temp. 110°C)	bar	1,4 at 900 min ⁻¹ 2,2 at 1,800 min ⁻¹ 3,0 at 2,550 min ⁻¹
Torque cylinder head studs: (only in case of repair):	Nm	30, 80, 160°
Further data:		Tightening angle 90° see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 110 / 850
Generator:	V/A	14 / 95
Starter:	kW/PS	2.3 / 3.1
Starting aid:		heater plug
Lighting:		acc. to German motor vehicle construction and use regulation and Euronorm

TRANSMISSION

Travel pump:	type	A 4 VG 40 DA with pressure cut-off
Displacement:	cm ³ /rev.	0 to 40
Travel motor:	type	A 6 VM 55 DA
Displacement:	max. cm ³ /rev.	55
Servo-controlled valve, pedal:	type	Rexroth 2TH6 RP20

TRAVEL RANGE

TW 70	20 km/h version		
Symbol	tortoise / rabbit:	km/h	0 to 6 / 0 to 20
TW 70	30 km/h - Version:		
4 pre-selectable travel ranges, electro-hydraulically operated:			
Gearbox position 1,	tortoise / rabbit:	km/h	0 to 6 / 0 to 17
Gearbox position 2,	tortoise / rabbit:	km/h	0 to 11 / 0 to 30
Cardan shaft rev.	20 km/h version		adjustment at nominal speed tortoise / rabbit
with standard tyres:	365/70 R18:	min ⁻¹	795 / 2,560
option:	8.25-20:	min ⁻¹	735 / 2,370
	500/45-20:	min ⁻¹	770 / 2,490
Cardan shaft rev.	30 km/h version		adjustment at nominal speed tortoise / rabbit
			1 st / 2 nd gear / 1 st / 2 nd gear
with standard tyres:	365/70 R18:	min ⁻¹	300 / 1,305 / 855 / 3,560
option:	8.25-20:	min ⁻¹	300 / 1,305 / 855 / 3,560
	500/45-20:	min ⁻¹	300 / 1,305 / 855 / 3,560

PRESSURE AND SETTING VALUES

Suction pressure:	bar	- 0.25
Charge pressure (high idle):	bar	30 ⁺²
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start (dynamic):	bar	290 ⁺⁴⁰
Start-up speed:	min ⁻¹	1,100 ⁺⁵⁰ (50 bar HP)
Engine stalling (tortoise, dynamic):	min ⁻¹	2,300 ⁺⁵⁰ / ₋₁₀₀ at 280 ⁺¹⁰ bar HP

Travel**STEERING**

Steering unit:	type	Rexroth LAGC SD 160
Steering pump:	make	Kayaba P3
Displacement:	cm ³ /rev.	18 (≈ 43 l/min)
Steering pressure (high idle):	bar	120
Priority valve:	type	Rexroth LPS 80

WORKING HYDRAULICS

Working pump (variable displacement pump):	type	Kayaba PSVD2-26E
Displacement:	cm ³ /rev.	2 x 26 (≈ 2 x 62 l/min)
Gear pump: P3	type	Kayaba
Displacement:	cm ³ /rev.	18 (≈ 43 l/min)
Main relief valve: P1 + P2	bar	245
Main relief valve: P3	bar	205
Servo-controlled valve (joystick) right / left:	type	Rexroth 4TH5 E70
Servo-controlled valve, linear lever (stabilising):	type	Hydro – Control HC-RC11
Servo-controlled valve, pedal (intermediate boom / articulation)	type	Rexroth 2TH6 RP20
Valve bank:	type	Kayaba KVSE-72-9

PRESSURE AND SETTING VALUES**Working****Valve bank - KVSE-72**

Main relief valve P1 + P2	bar	245
Line relief pressures:		
- Boom - articulated boom (raise / lower):	bar	280 / 280
- Dipperstick:	bar	280 / 280
- Bucket:	bar	280 / 280
- Intermediate boom - articulated boom / circular boom in / out:	bar	280 / 150
- Additional control circuit / breaker:	bar	280 / 280
Main relief valve P3	bar	205
Line relief pressures:		
- Slewing (valves at slew motor):	bar	205 / 205
- Articulation:	bar	---
- Stabilising:	bar	---
Pilot pressure (charge pressure) - high idle:	bar	30 ⁺²

SLEW DRIVE

Slew gear with slew motor:	type	Kayaba MSG-27P-23E-2
Slew pressure (valves at the slew motor):	bar	205 (high idle)

CYCLE TIMES

Articulated boom -	raise / lower:	sec.	4.5 / 4.5
Intermediate boom -	raise / lower:	sec.	4.1 / 3.2
Dipperstick -	in / out:	sec.	3.5 / 2.9
Bucket -	in / out:	sec.	2.6 / 2.1

AXLES

Front axle:	20 km/h version	make/type	Clark-Hurth	211 / 52
Rear axle:	20 km/h version	make/type	Clark-Hurth	315 / 111 / 61
Front axle:	30 km/h version	make/type	Clark-Hurth	211 / 52
Rear axle:	30 km/h version	make/type	Clark-Hurth	357 / 111 / 237

BRAKES

Brake pump:	make	Kayaba
Displacement:	cm ³ /rev.	18
Brake shut-off valve:	make	Wabco 477
Switching range:	bar	120 - 150
Foot brake valve:	make	Wabco 467
Brake pressure:	bar	45
Beginning/ end of inching:	bar	5 - 13
Parking brake:		spring-loaded brake in the front axle
Service brake:		oil-immersed multi-disk brake, front and rear axle

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B / API-GL 5, SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170°C. Lithium-saponified. NLGI grade 2 with EP additives

MAINTENANCE PARTS

see operating manual

CAPACITIES

	litr.	
Engine oil (change):	approx.	13.0 engine oil
Hydraulic oil (tank and system):	approx.	180.0 hydraulic oil
Hydraulic oil (change):	approx.	110.0 hydraulic oil
Fuel tank:	approx.	150.0 diesel
Steering front axle - central housing:	approx.	4.0 transmission oil
Rear axle - central housing:	approx.	4.4 transmission oil
Reduction gear:	approx.	0.7 transmission oil
Wheel hubs front axle:	approx.	0.9 transmission oil, each
Wheel hubs rear axle:	approx.	0.9 transmission oil, each
Swing gear:		lubrication by circulation of the hydraulic oil
Service brake:		connected to the hydraulic system
Cooling agent:		engine oil

DIESEL ENGINE Tier 3

Manufacturer:		Yanmar
Type:		4 TNV98-ZPTX
Performance according to DIN 70020:	kW	49,3 at 2,400 min ⁻¹
Cooling:		water cooling
Injection:		direct injection
Capacity:	cm ³	3,300
High idle:	min ⁻¹	2,550 · ⁵⁰
Low idle:	min ⁻¹	850 · ⁵⁰
Spec. fuel consumption under full load:	g/kWh	220
Tappet clearance - inlet cold:	mm	0.30
Tappet clearance - outlet cold:	mm	0.50
Engine oil pressure (at Service-Temp. 110°C)	bar	1,4 at 900 min ⁻¹ 2,2 at 1,800 min ⁻¹ 3,0 at 2,550 min ⁻¹
Torque cylinder head studs: (only in case of repair):	Nm	30, 80, 160°
Further data:		Tightening angle 90° see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 110 / 850
Generator:	V/A	14 / 80
Starter:	kW/PS	3.0 / 4.1
Starting aid:		heater flange
Lighting:		acc. to German motor vehicle construction and use regulation and Euronorm

TRANSMISSION

Travel pump:	type	A 4 VG 40 DA with pressure cut-off
Displacement:	cm ³ /rev.	0 to 40
Travel motor:	type	A 6 VM 55 DA
Displacement:	max. cm ³ /rev.	55
Servo-controlled valve, pedal:	type	Rexroth 2TH6 RP20

TRAVEL RANGE

TW 70	20 km/h version		
Symbol	tortoise / rabbit:	km/h	0 to 6 / 0 to 20
TW 70	30 km/h - Version:		
4 pre-selectable travel ranges, electro-hydraulically operated:			
Gearbox position 1,	tortoise / rabbit:	km/h	0 to 6 / 0 to 17
Gearbox position 2,	tortoise / rabbit:	km/h	0 to 11 / 0 to 30
Cardan shaft rev.	20 km/h version		adjustment at nominal speed tortoise / rabbit
with standard tyres:	365/70 R18:	min ⁻¹	795 / 2,560
option:	8.25-20:	min ⁻¹	735 / 2,370
	500/45-20:	min ⁻¹	770 / 2,490
Cardan shaft rev.	30 km/h version		adjustment at nominal speed tortoise / rabbit
			1 st / 2 nd gear / 1 st / 2 nd gear
with standard tyres:	365/70 R18:	min ⁻¹	300 / 1,305 / 855 / 3,560
option:	8.25-20:	min ⁻¹	300 / 1,305 / 855 / 3,560
	500/45-20:	min ⁻¹	300 / 1,305 / 855 / 3,560

PRESSURE AND SETTING VALUES

Suction pressure:	bar	- 0.25
Charge pressure (high idle):	bar	30 ⁺²
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start (dynamic):	bar	230 ⁺⁴⁰
Start-up speed:	min ⁻¹	1,100 ⁺⁵⁰ (50 bar HP)
Engine stalling (tortoise, dynamic):	min ⁻¹	2,300 ⁺⁵⁰ / ₋₁₀₀ at 280 ⁺¹⁰ bar HP

Travel**STEERING**

Steering unit:	type	Rexroth LAGC SD 160
Steering pump:	make	Kayaba P3
Displacement:	cm ³ /rev.	18 (≈ 43 l/min)
Steering pressure (high idle):	bar	120
Priority valve:	type	Rexroth LPS 80

WORKING HYDRAULICS

Working pump (variable displacement pump):	type	Kayaba PSVD2-26E
Displacement:	cm ³ /rev.	2 x 26 (≈ 2 x 62 l/min)
Gear pump: P3	type	Kayaba
Displacement:	cm ³ /rev.	18 (≈ 43 l/min)
Main relief valve: P1 + P2	bar	245
Main relief valve: P3	bar	205
Servo-controlled valve (joystick) right / left:	type	Rexroth 4TH6 N
Servo-controlled valve, linear lever (stabilising):	type	Hydro – Control HC-RC11
Servo-controlled valve, pedal (intermediate boom / articulation)	type	Rexroth 2TH6 RP20
Valve bank:	type	Kayaba KVSE-72-9

PRESSURE AND SETTING VALUES**Working****Valve bank - KVSE-72**

Main relief valve P1 + P2	bar	245
Line relief pressures:		
- Boom - articulated boom (raise / lower):	bar	280 / 280
- Dipperstick:	bar	280 / 280
- Bucket:	bar	280 / 280
- Intermediate boom - articulated boom / circular boom in / out:	bar	280 / 150
- Additional control circuit / breaker:	bar	280 / 280
Main relief valve P3	bar	205
Line relief pressures:		
- Slewing (valves at slew motor):	bar	205 / 205
- Articulation:	bar	---
- Stabilising:	bar	---
Pilot pressure (charge pressure) - high idle:	bar	30 ⁺²

SLEW DRIVE

Slew gear with slew motor:	type	Kayaba MSG-27P-23E-2
Slew pressure (valves at the slew motor):	bar	210 (high idle)

CYCLE TIMES

Articulated boom -	raise / lower:	sec.	4.5 / 4.5
Intermediate boom -	raise / lower:	sec.	4.1 / 3.2
Dipperstick -	in / out:	sec.	3.5 / 2.9
Bucket -	in / out:	sec.	2.6 / 2.1

AXLES

Front axle:	20 km/h version	make/type	Clark-Hurth	211 / 52
Rear axle:	20 km/h version	make/type	Clark-Hurth	315 / 111 / 61
Front axle:	30 km/h version	make/type	Clark-Hurth	211 / 52
Rear axle:	30 km/h version	make/type	Clark-Hurth	357 / 111 / 237

BRAKES

Brake pump:	make	Kayaba
Displacement:	cm ³ /rev.	18
Brake shut-off valve:	make	Wabco 477
Switching range:	bar	120 - 150
Foot brake valve:	make	Wabco 467
Brake pressure:	bar	45
Beginning/ end of inching:	bar	5 - 13
Parking brake:		spring-loaded brake in the front axle
Service brake:		oil-immersed multi-disk brake, front and rear axle

LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see Schaeff hydraulic oil recommendation table
Transmission oil:	MIL-L 2105 B / API-GL 5, SAE 85 W 90 LS or SAE 90 LS
Multi-purpose grease:	acc. to DIN 51825. Dripping point over 170°C. Lithium-saponified. NLGI grade 2 with EP additives

MAINTENANCE PARTS

see operating manual

CAPACITIES

	litr.	
Engine oil (change):	approx. 10.0	engine oil
Hydraulic oil (tank and system):	approx. 180.0	hydraulic oil
Hydraulic oil (change):	approx. 110.0	hydraulic oil
Fuel tank:	approx. 150.0	diesel
Steering front axle - central housing:	approx. 4.0	transmission oil
Rear axle - central housing:	approx. 4.4	transmission oil
Reduction gear:	approx. 0.7	transmission oil
Wheel hubs front axle:	approx. 0.9	transmission oil, each
Wheel hubs rear axle:	approx. 0.9	transmission oil, each
Swing gear:		lubrication by circulation of the hydraulic oil
Service brake:		connected to the hydraulic system
Cooling agent:		engine oil

DIESEL ENGINE

Manufacturer:		KHD
Type:		BF 4 M 2012 - COM 2
Performance according to DIN 70020:	kW	60 at 2,000 min ⁻¹
Cooling:		water
Injection:		direct injection
Capacity:	cm ³	4,040
High idle:	min ⁻¹	2,150 ⁺⁵⁰
Low idle:	min ⁻¹	800 ⁺⁵⁰
Spec. fuel consumption under full load:	g/kWh	208
Tappet clearance - inlet cold:	mm	0.3 ^{+0.1}
Tappet clearance - outlet cold:	mm	0.5 ^{+0.1}
Torque cylinder head studs:	Nm	30, 80, 90°
Further data:		see engine instruction book

ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah/A	12 / 110 / 850
Generator:	V/A	14 / 95
Starter:	kW/PS	3.1 / 4
Starting aid:		heater flange
Lighting:		acc. to German motor vehicle construction and use regulation and Euronorm

TRANSMISSION

Travel pump:	type	A 4 VG 56 DA with pressure cut-off
Displacement:	cm ³ /rev.	0 to 56
Travel motor:	type	A 6 VM 107 DA
Displacement:	max. cm ³ /rev.	107
Servo-controlled valve, pedal:	type	Rexroth 2TH6 RP20

TRAVEL RANGE

TW 85	20km/h version		
Symbol	tortoise/rabbit	km/h	0 to 6 / 0 to 20
TW 85	36km/h version		
4 pre-selectable travel ranges, electro-hydraulically operated:			
Gear position 1:	tortoise/rabbit	km/h	0 to 5 / 0 to 15
Gear position 2:	tortoise/rabbit	km/h	0 to 11 / 0 to 36
Cardan shaft rev. with	20 km/h version		adjustment at nominal speed tortoise / rabbit
with standard tyres:	8.25-20:	min ⁻¹	395 / 1,480
	365/70 R18:	min ⁻¹	395 / 1,475
	500/45-20:	min ⁻¹	395 / 1,450
Cardan shaft rev. with	25 km/h version		adjustment at nominal speed tortoise / rabbit
with standard tyres:	8.25-20:	min ⁻¹	395 / 1,850
	365/70 R18:	min ⁻¹	395 / 1,840
	500/45-20:	min ⁻¹	395 / 1,810

Cardan shaft rev. with	36 km/h version		adjustment at nominal speed	
			tortoise	/ rabbit
			gear pos. 1 / 2	gear pos. 1 / 2
with standard tyres:	8.25-20:	min ⁻¹	350 / 850	1,105 / 2,660
	365/70 R18:	min ⁻¹	350 / 850	1,100 / 2,650
	500/45-20:	min ⁻¹	350 / 850	1,080 / 2,600

PRESSURE AND SETTING VALUES

Suction pressure:	bar	- 0.25
Charge pressure (high idle):	bar	30 ⁺²
High pressure (SV):	bar	480
Pressure cut-off:	bar	450
Case pressure at + 50° C:	max. bar	2.5
Regulation start (dynamic):	bar	270 ⁺⁴⁰
Start-up speed:	min ⁻¹	1,100 ⁺⁵⁰ (50 bar HP)
Engine stalling (tortoise, dynamic):	min ⁻¹	1,900 ⁺⁵⁰ at 320 ⁺¹⁰ bar HP

Travel

STEERING

Steering unit:	type	Rexroth LAGC 200-14/LD 200-140
Steering pump:	make	Casappa
Displacement:	cm ³ /rev.	16,6
Steering pressure (high idle):	bar	140
Priority valve:	type	Rexroth LPS 40 R11

WORKING HYDRAULICS

Working pump (variable displacement pump):	type	A 10 VO 071 DFLR
Displacement:	cm ³ /rev.	0 to 71
Triple gear pumps:	type	Casappa
Displacement:	cm ³ /rev.	16.6+11.1
LS-pressure relief valve:	bar	280 (valve bank 1)
LS-regulator (stand-by pressure):	bar	22 at 2,150 min ⁻¹ (variable displacement pump)

Servo-controlled valve (joystick) right / left:	type	Rexroth 4TH 6 N
Servo-controlled valve, linear lever (stabilizing):	type	Hydro – Control

MONO boom:		
Servo-controlled valve, pedal (articulation):	type	Rexroth 2TH 6 RP 20

With articulated boom and circular boom:		
Servo-controlled valve, pedal (intermediate boom / articulation)	type	Rexroth 2TH 6 RP 20

Valve bank 1, articulated boom and circular boom / MONO boom:	type	Rexroth 5 SX 14 / 4 SX 14
Valve bank 2:	type	Rexroth 4 SM 12

PRESSURE AND SETTING VALUES

Working

Valve bank 1 - SX 14

LS valve:	bar	280
Main relief valve:	bar	310
Line relief pressures:		
- Boom - articulated boom (raise / lower):	bar	300 / 300
- Boom - Mono boom (raise / lower):	bar	300 / 180
- Boom - circular boom (raise / lower):	bar	300 / 180
- Dipperstick:	bar	300 / 300
- Bucket:	bar	300 / 300
- Intermediate boom - articulated boom / circular boom in / out:	bar	300 / 150
- Additional control circuit / breaker:	bar	300 / 300

Valve bank 2 - SM 12

Main pressure relief valve 2 (high idle):	bar	230
Line relief pressures:		
- Slewing (valves at slew motor):	bar	100/250 / 100/250
- Articulation:	bar	----
- Stabilizing:	bar	----
- Option: front dozer blade:	bar	130 ⁺¹⁰ (Bosch safety valve in the undercarriage)

Cut-off valve:

Cut-off pressure (high idle):	make	Bergin
Pilot pressure (charge pressure) - high idle:	bar	110
	bar	30 ⁺²

SLEW DRIVE

Slew gear :	type	ZFP DR - 140
Slew motor:	type	A 2 FM 28
Slew pressure (valves at the slew motor):	bar	100 / 250

CYCLE TIMES

Mono boom -	raise / lower:	sec.	4.5 / 4.8
Articulated boom -	raise / lower:	sec.	4.5 / 4.5
Intermediate boom -	raise / lower:	sec.	4.0 / 3.0
Dipperstick -	in / out:	sec.	4.0 / 3.6
Bucket -	in / out:	sec.	2.6 / 2.0

AXLES

Front axle: standard	make/type	Clark-Hurth 311/212/99
Rear axle: standard	make/type	Clark-Hurth 162/53

Options:

Front axle: 4 wheel steering	make/type	Clark-Hurth 311/212/110
Rear axle: 4 wheel steering	make/type	Clark-Hurth 212/348
Front axle: "S"-version	make/type	Clark-Hurth 357/212/199
Rear axle: "S"-version	make/type	Clark-Hurth 162/53
Front axle: "S"-version, 4 wheel steering	make/type	Clark-Hurth 357/212/199
Rear axle: "S"-version, 4 wheel steering	make/type	Clark-Hurth 212/348

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