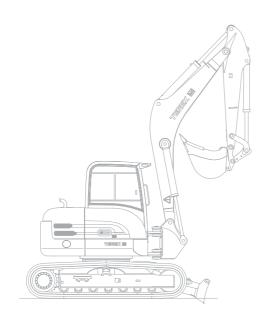
# TC 60 SERVICE - MANUAL

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Main pressure relief valve (high idle): max. bar 165

#### LINE RELIEF PRESSURES

- travel left (valves in the motor):	bar	
- travel right (valves in the motor):	bar	
- slewing (valves at the slew motor):	bar	Δ Ρ = 93 <sup>± 3</sup> bar;
		(high idle, service temperature, $\Delta$ P between M1 and M2 )
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	210 / 160
<ul> <li>breaker / slew bucket / grab rotation:</li> </ul>	bar	
- articulation:	bar	anti cavitation
- dozer blade:	bar	

#### **CYCLE TIMES**

Boom up / down to the ground:	S	3.0 / 2.9
Dipperstick extend / retract:	S	2.6 / 2.9
Bucket extend / retract:	S	2.1 / 2.4
Slew speed (max.)	min⁻¹	10

#### LUBRICANTS

	and anging instruction back
Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5,
	SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over
	170° C. With lithium.

#### **MAINTENANCE PARTS**

#### CAPACITIES

Fuel: Engine oil, engine and filter: Hydraulic oil, tank and system: Hydraulic oil tank: Travel gear: Slew gear: Cooling agent: see operation manual

#### ltr.

approx.	30.0	diesel
approx.	3.4 + 0.2	HD-oil (change)
approx.	35.0	hydraulic oil
approx.	25.0	hydraulic oil (change)
approx.	0.3	transmission oil, each
approx.	0.1	transmission oil
approx.	4.2	water with anticorrosive
		and anti-freeze agent

The values stated are approximate. The level indicator is always decisive.

#### **DIESEL ENGINE**

Manufacturer: Type:		Mitsubishi L 3 E - W 262 KL
Performance acc. to DIN 70020 + ECE-R24:	kW	13.0 at 2,250 min <sup>-1</sup>
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm³	952
High idle:	min <sup>-1</sup>	2.450 <sup>+35</sup> / <sub>-10</sub>
Low idle:	min⁻¹	1.020 +50
Spec. fuel consumption (full load):	g/kWh	247
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	0	17 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85
		M 8: 20 – 30
Electric fuel pump	bar	0,18
	l/min	0,37
Injection pressure (valve opening pressure):	bar	140
Further data:		see engine operating manual

#### ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 1.7
Starting aid: Lighting:		3 glow plugs, glow time controlled working headlight H3

#### TRANSMISSION

Travel motors:		make/type	SOM MOR 15
Travel gears:		make/type	SOM PGR 132 N
Travel speed:	tortoise	km/h	0 to 2.7
-	rabbit	km/h	0 to 4.5

### EXCAVATOR AND TRAVEL HYDRAULICS

Hydraulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	33,6 + 19,2
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	125 <sub>-5</sub> (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 5
Flow at additional circuit	l/min	at 100 bar 🗲 approx. 33
		at 140 bar 🗲 approx. 30

#### SLEW DRIVE

Slew motor with gearbox:	make	SOM RCG-35
Slew pressure (valves at slew motor):	bar	155 (high idle and service temperature, measured <b>at pressure port P1</b> )

Main pressure relief valve (high idle): max. bar 180

#### LINE RELIEF PRESSURES

<ul><li>travel left (valves in the motor):</li><li>travel right (valves in the motor):</li></ul>	bar bar	180 / 180 180 / 180
- slewing (valves at the slew motor):	bar	155 (high idle and service temperature, measured <b>at pressure port P1</b> )
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	230 / 160
<ul> <li>breaker / slew bucket / grab rotation:</li> </ul>	bar	
- articulation:	bar	anti cavitation
- dozer blade:	bar	

#### **CYCLE TIMES**

Boom up / down to the ground:	S	3.0 / 2.9
Dipperstick extend / retract:	S	2.6 / 2.9
Bucket extend / retract:	S	2.1 / 2.4
Slew speed (max.)	min <sup>-1</sup>	10

#### LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5,
	SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over
	170° C. With lithium.

#### **MAINTENANCE PARTS**

#### CAPACITIES

Fuel: Engine oil, engine and filter: Hydraulic oil, tank and system: Hydraulic oil tank: Travel gear: Slew gear: Cooling agent:

The values stated are approximate. The level indicator is always decisive. see operation manual

#### ltr.

approx.	30.0	diesel
approx.	3.4 + 0.2	HD-oil (change)
approx.	35.0	hydraulic oil
approx.	25.0	hydraulic oil (change)
approx.	0.3	transmission oil, each
approx.	0.1	transmission oil
approx.	4.2	water with anticorrosive
		and anti-freeze agent

#### **DIESEL ENGINE**

Manufacturer: Type:		Mitsubishi L 3 E - W 262 KL
Performance acc. to DIN 70020 + ECE-R24:	kW	13.0 at 2,250 min <sup>-1</sup>
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm³	952
High idle:	min <sup>-1</sup>	2.450 +35/-10
Low idle:	min⁻¹	1.020 +50
Spec. fuel consumption (full load):	g/kWh	247
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	0	17 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85
		M 8: 20 – 30
Electric fuel pump	bar	0,18
	l/min	0,37
Injection pressure (valve opening pressure):	bar	140
Further data:		see engine operating manual

#### ELECTRICAL SYSTEM

Voltage:	V	12
Battery:	V/Ah	12 / 74 / 680 (EN)
Generator:	V/A	12 / 40
Starter:	V/kW	12 / 1.7
Starting aid: Lighting:		3 glow plugs, glow time controlled working headlight H3

#### TRANSMISSION

Travel motors:		make/type	SOM MOR 15
Travel gears:		make/type	SOM PGR 132 N
Travel speed:	tortoise	km/h	0 to 2.7
-	rabbit	km/h	0 to 4.5

### EXCAVATOR AND TRAVEL HYDRAULICS

Hydraulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	33,6 + 19,2
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	125 _5 (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 5
Flow at additional circuit	l/min	at 100 bar 🗲 approx. 33
		at 140 bar → approx. 30

#### SLEW DRIVE

Slew motor with gearbox:	make	Nachi PCR-01B-05A
Slew pressure (valves at slew motor):	bar	130 (high idle and service temperature, measured <b>at pressure port P1</b> )

Main pressure relief valve (high idle): max. bar 180

#### LINE RELIEF PRESSURES

<ul><li>travel left (valves in the motor):</li><li>travel right (valves in the motor):</li></ul>	bar bar	180 / 180 180 / 180
- slewing (valves at the slew motor):	bar	155 (high idle and service temperature, measured <b>at pressure port P1</b> )
- dipperstick:	bar	210 / 210
- bucket:	bar	210 / 210
- boom lift / lower:	bar	230 / 160
<ul> <li>breaker / slew bucket / grab rotation:</li> </ul>	bar	
- articulation:	bar	anti cavitation
- dozer blade:	bar	

#### **CYCLE TIMES**

Boom up / down to the ground:	S	3.0 / 2.9
Dipperstick extend / retract:	S	2.6 / 2.9
Bucket extend / retract:	S	2.1 / 2.4
Slew speed (max.)	min <sup>-1</sup>	10

#### LUBRICANTS

Engine oil:	see engine instruction book
Hydraulic oil:	see operation manual
Transmission oil:	MIL-L-2105 B or API-GL5,
	SAE 85 W 90 LS or SAE 90 LS
Multiple-purpose grease:	acc. to DIN 51825. Dripping point over
	170° C. With lithium.

#### **MAINTENANCE PARTS**

#### CAPACITIES

Fuel: Engine oil, engine and filter: Hydraulic oil, tank and system: Hydraulic oil tank: Travel gear: Slew gear: Cooling agent:

The values stated are approximate. The level indicator is always decisive. see operation manual

#### ltr.

approx.	30.0	diesel
approx.	3.4 + 0.2	HD-oil (change)
approx.	35.0	hydraulic oil
approx.	25.0	hydraulic oil (change)
approx.	0.3	transmission oil, each
approx.	0.1	transmission oil
approx.	4.2	water with anticorrosive
		and anti-freeze agent

#### **DIESEL ENGINE Tier 4**

Manufacturer:		Mitsubishi
Туре:		L 3 E - W 462 KL
Performance acc. to DIN 70020 + ECE-R24	: kW	13.1 at 2,250 min <sup>-1</sup>
Construction:		3 cylinders in line
Cooling:		water / anti-freeze agent
Capacity:	cm³ ِ	952
High idle:	min⁻¹	$2.450 + \frac{1}{2} - \frac{1}{10}$
Low idle:	min⁻¹	1.020 +50
Spec. fuel consumption (full load):	g/kWh	272
Fuel bleeding:		automatic
Tappet clearance - inlet / exhaust:	mm	0.25 (cold)
Injection timing:	0	15 before upper dead centre
Torque of cylinder head studs:	Nm	M 10: 75 - 85
		M 8: 20 – 30
Electric fuel pump		
	l/min	0,9
Injection pressure (valve opening pressure):		
Further data:		see engine operating manual
ELECTRICAL SYSTEM		
Voltage:	V	12
Voltage:	v V/Ah	
Battery: Generator:	V/An V/A	12 / 74 / 680 (EN) 12 / 40
Starter:	V/A V/kW	12 / 40
	VINV	
Starting aid:		3 glow plugs, glow time controlled working headlight H3
Lighting:		WUKING NEAUNGHT HS

#### TRANSMISSION

Travel motors:		make/type	SOM MOR 15
Travel gears:		make/type	SOM PGR 132 N
Travel speed:	tortoise	km/h	0 to 2.4
	rabbit	km/h	0 to 4.2

#### **EXCAVATOR AND TRAVEL HYDRAULICS**

Hydraulic pump:	make	Haldex WP 09 A2
Flow rate:	l/min	31,5 + 18
Cut off valve:		pump integrated
Cut off pressure (high idle):	bar	125 <sub>-5</sub> (service temperature)
Pilot pressure (high idle):	bar	28 (service temperature)
Pressure reducing valve with accu	make	Hydac
Valve bank:	type	Rexroth 9 SX 10
Cross servo control stick:	type	Rexroth 4TH 5
Elever et e delitie e el elevert	•••	
Flow at additional circuit	l/min	at 100 bar 🗲 approx. 33
Flow at additional circuit	l/min	at 100 bar  ➔ approx. 33 at 140 bar  ➔ approx. 30

#### SLEW DRIVE

Slew motor with gearbox: Slew pressure (valves at slew motor):	make bar	Nachi PCR-01B-05A 132 <sup>±4</sup> (high idle and service temperature, measured at pressure port P1)
		measured at pressure port P1)

Main pressure relief valve (high idle): max. bar 180

#### LINE RELIEF PRESSURES

<ul> <li>travel left (valves in the motor):</li> <li>travel right (valves in the motor):</li> <li>slewing (valves at the slew motor):</li> </ul>	bar bar bar	180 / 180 180 / 180 Δ P = 105 <sup>± 3</sup> bar; (high idle, service temperature, Δ P between M1 and M2 )
<ul> <li>dipperstick:</li> <li>bucket:</li> <li>boom lift / lower:</li> <li>breaker / slew bucket / grab rotation:</li> <li>articulation:</li> <li>dozer blade:</li> </ul>	bar bar bar bar bar bar	210 / 210 210 / 210 230 / 160  anti cavitation 
CYCLE TIMES		
Boom up / down to the ground: Dipperstick extend / retract: Bucket extend / retract: Slew speed (max.)	s s min <sup>-1</sup>	3.0 / 2.9 2.6 / 2.9 2.1 / 2.4 10
LUBRICANTS		
Engine oil: Hydraulic oil: Transmission oil:		see engine instruction book see operation manual MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS

Multiple-purpose grease:

#### **MAINTENANCE PARTS**

#### CAPACITIES

Fuel: Engine oil, engine and filter: Hydraulic oil, tank and system: Hydraulic oil tank: Travel gear: Slew gear: Cooling agent:

The values stated are approximate. The level indicator is always decisive. see engine instruction book see operation manual MIL-L-2105 B or API-GL5, SAE 85 W 90 LS or SAE 90 LS acc. to DIN 51825. Dripping point over 170° C. With lithium.

see operation manual

#### ltr.

approx.	30.0	diesel
approx.	3.4 + 0.2	HD-oil (change)
approx.	35.0	hydraulic oil
approx.	25.0	hydraulic oil (change)
approx.	0.3	transmission oil, each
approx.	0.1	transmission oil
approx.	4.2	water with anticorrosive
		and anti-freeze agent

#### **DIESEL ENGINE Tier 4**

Manufacturer: Type: Output acc. to DIN 70020 and ECE-R24: Construction: Cooling: Capacity: Torque High idle: Low idle: Spec. fuel consumption (full load): Fuel bleeding: Tappet clearance - inlet / outlet: Injection timing: Engine oil pressure: Torque of cylinder head studs (in case of repair): Injection pressure Further data:	kW cm³ Nm min <sup>-1</sup> g/kWh mm bar Nm	Mitsubishi S $3L 2 - W 463 KL (Tier 4)$ $17.4 at 2,200 min^{-1}$ 3 cylinders in linewater / anti-freeze agent $1,31878,4 at 1,800 min^{-1}2,400^{+30}/_{-25}1,160^{+25}260automatic0.25 (cold)15^{\circ} (before upper dead centre)1,0 at 1160 min^{-1}83 to 92 (M10)see engine operator's manual$
ELECTRICAL SYSTEM		
Voltage: Battery: Generator: Starter: Starting aid: Lighting:	V V/Ah V/A V/kW	12 12 / 74 / 680 (EN) 12 / 50 12 / 1.7 3 Glow plugs. Glow time: temperature independent preglowing: 6 sec continuous postglowing: 4,5 sec continuous working headlamp H3, additional headlamp (optional)
TRANSMISSION		
Travel motors with travel gear: Travel speeds:	make/type km/h	Nachi PHV-3B-35A 0 to 2.7 / 0 to 4.4
EXCAVATOR AND TRAVEL HYDRAULICS		
Variable displacement pump:	make	Bosch Rexroth
Flow rate: Pilot pressure (high idle):	type cm³/rev. bar	A 10 VNO 28 0 – 28 (max. 67 l/min) 30 (service temperature)
Valve bank:	type	9 SX 10
Cross servo control stick: Travel pedal Control lever boom offset Control lever add.circuit	type type type type	4 TH5 4 TH5 NR Hydrocontrol HC-RCM Hydrocontrol HC-RCM

Hydrocontrol HC-RCM Hydrocontrol HC-RCM

#### **SLEW DRIVE**

Slew motor with gearbox: Slew pressure (valves at slew motor):	make bar	180 <sup>+5</sup>	Kayaba MSG-27P-10E-19 (• p between M1 and M2; high idle; service temperature)
PRESSURE AND SETTING VALUES			
Pump safety relief valve: Main relief valve - LS: Stand-by (free flow circuit): • p (P minus LS pressure)	bar bar bar bar	250 24,2	(high idle, service temperature) (high idle, service temperature) (high idle, service temperature) (high idle, service temperature)
LINE RELIEF PRESSURES			
- slewing (valves at the slew motor):	bar	180 <sup>+5</sup>	(• p between M1 and M2, high idle, service temperature)
- dozer: - travel left: - travel left:	bar bar bar	 	
- bucket: - boom lift / lower: - boom offset: - dipper stick: - breaker / slew bucket / grab rotation:	bar bar bar bar bar	270 / 2 270 / 1 anti-ca 270 / 2 210 / 2	60 vitation 70
CYCLE TIMES			
Boom up / down - to the ground (without damping) Dipper stick cylinder out / in: Bucket cylinder open / close: Slew speed	sec. sec. sec. min⁻¹	2.5 / 2. 2.2 / 2. 1.8 / 2. 10	5
LUBRICANTS			
Engine oil: Hydraulic oil: Transmission oil: Multiple-purpose grease:		see op MIL-L-2 SAE 85 acc. to	gine instruction book eration manual 2105 B or API-GL5, 5 W 90 LS or SAE 90 LS DIN 51825. Dripping point over . With lithium.
MAINTENANCE PARTS		see op	eration manual
CAPACITIES	ltr.		
Fuel: Engine oil, engine and filter: Hydraulic oil, tank and system: Hydraulic oil tank: Travel gear: Slew gear: Cooling agent: The values stated are approximate.	approx. approx approx. approx. approx. approx.	40 5,7 40 34 0.6 Iubricat 4.8	diesel HD oil (change) hydraulic oil hydraulic oil (change) transmission oil, each tion by circulation of the hydraulic oil water with anti-corrosive and anti-freeze agent

The level indicator is always decisive.

#### **DIESEL ENGINE**

DIESEL ENGINE			
Manufacturer: Type: Output acc. to DIN 70020 and ECE-R24: Construction: Cooling: Capacity: Torque High idle: Low idle: Spec. fuel consumption (full load): Fuel bleeding: Tappet clearance - inlet / outlet: Compression ratio: Injection timing: Engine oil pressure: Torque of cylinder head studs (in case of repair): Injection pressure Further data: ELECTRICAL SYSTEM Voltage: Battery:	kW cm³ Nm min <sup>-1</sup> g/kWh mm bar bar bar Nm bar V V	Mitsubishi S 4L 2 - Y 263 KL - TIER II 23.8 at 2,100 min <sup>-1</sup> 4 cylinders in line water / anti-freeze agent 1,758 105 at 1,500 min <sup>-1</sup> 2,300 $_{50}$ 1,000 $^{+25}/_{-25}$ 258 automatic 0.25 (cold) 27 - 30 17 (before upper dead centre) 3.5 $^{+0.5}$ (high idle, service temperature) M 10 $\rightarrow$ 83 to 92 140 $^{+5}$ see engine operator's manual 12 12 / 74 / 680 (EN)	
Generator: Starter:	V/An V/A V/kW	12 / 50 12 / 2.0	
Starting aid: Lighting:		Glow plugs, glow time controlled, working headlamp H3, additional headlamp (optional)	
TRANSMISSION			
Travel motors with travel gear: Travel speed: shift I shift II	make/type km/h km/h	SOM PGR 402 0 to 2.7 0 to 4.6	
EXCAVATOR AND TRAVEL HYDRAULICS			
Variable displacement pump:	make type	Rexroth A 10 VO 45 DFLR	
Flow rate: Pilot pressure (high idle):	cm³/min. bar	0 – 45 (0 - 94.5 l/min) 28 (service temperature)	
Valve bank:	type	Rexroth 9 SX 12	
Cross servo control stick:	type	Rexroth 4TH6	
SLEW DRIVE			

#### Slew motor with gearbox: make Slew pressure (valves at slew motor):

Kayaba MSG-27P-10E 250<sup>+5</sup> (• p= 200<sup>+5</sup> between M1 and M2; high idle; service temperature) bar

Thank you very much for reading. This is part of the demo page. GET MORE:

Diesel Engine, Hydraulic System, Setting Instructions, Functional Description, Electrical System And more.....

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