Miniîncărcător SUNWARD SWL4538

Manual de operare și întreținere

UTILBEN

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Lețcani

OIL AND COOLANT AT CORRESPONDING ENVIRONMENTAL TEMPERATURE

	AMBIENT TEMPERATURE	SPECIFIED CAPACITY	SUPPLEMENTARY CAPACITY
	-22 -4 14 3 104 °F -30 -20 -10 0 10 2 °C		
ENGINE OIL	SAE 20W-50 (Tropic) SAE 15W-40 (All seasons) SAE 10W-30 (All seasons) SAE 30 SAE 10W(Winter) SAE 0W-40 (Synthetic)		
HYDRAUIC OIL	MAT 3509 (Factory fill) SAE 10W-30 SAE 0W-40 (Synthetic)		
BUTTER	NLGI No.2		
COOLANT	ADDING ANTIFREEZE		

■ **NOTE**

Engine Oil :

- **Refer to the following table for the suitable American Petroleum Institute (API) classification of engine oil according to the engine type (with internal EGR, external EGR or non-EGR) and the Fuel Type Used : (Low Sulfur, Ultra Low Sulfur or High Sulfur Fuels).**

Fuel Type	Engine oil classification (API classification)	
	Engines with non-EGR Engines with internal EGR	Engines with external EGR
High Sulfur Fuel [0.05 % (500 ppm) ≤ Sulfur Content < 0.50 % (5000 ppm)]	**CF** (If the "CF-4, CG-4, CH-4, or CI-4" engine oil is used with a high-sulfur fuel, change the engine oil at shorter intervals. (approximately half))	–
Low Sulfur Fuel [Sulfur Content < 0.05 % (500 ppm)] or Ultra Low Sulfur Fuel [Sulfur Content < 0.0015 % (15 ppm)]	**CF**, **CF-4**, **CG-4**, **CH-4** or **CI-4**	**CF** or **CI-4** (Class CF-4, CG-4 and CH-4 engine oils cannot be used on EGR type engines.)

EGR : Exhaust Gas Re-circulation

W1024941

- **CJ-4 classification oil is intended for use in engines equipped with DPF (Diesel Particulate Filter) and is Not Recommended for use in Kubota E3 specification engines.**
- **Oil used in the engine should have API classification and Proper SAE Engine Oil Viscosity according to the ambient temperatures where the engine is operated.**
- **With strict emission control regulations now in effect, the CF-4 and CG-4 engine oils have been developed for use with low sulfur fuels, for On-Highway vehicle engines. When a Non-Road engine operates on high sulfur fuel, it is advisable to use a "CF or better" classification engine oil with a high Total Base Number (a minimum TBN of 10 is recommended).**

Fuel :

- **Cetane Rating : The minimum recommended Fuel Cetane Rating is 45. A cetane rating greater than 50 is preferred, especially for ambient temperatures below –20 °C (–4 °F) or elevations above 1500 m (5000 ft).**
- **Diesel Fuel Specification Type and Sulfur Content % (ppm) used, must be compliant with all applicable emission regulations for the area in which the engine is operated.**
- **Use of diesel fuel with sulfur content less than 0.10 % (1000 ppm) is strongly recommended.**
- **If high-sulfur fuel (sulfur content 0.50 % (5000 ppm) to 1.0 % (10000 ppm)) is used as a diesel fuel, change the engine oil and oil filter at shorter intervals. (approximately half)**
- **DO NOT USE Fuels that have sulfur content greater than 1.0 % (10000 ppm).**
- **Diesel fuels specified to EN 590 or ASTM D975 are recommended.**
- **No.2-D is a distillate fuel of lower volatility for engines in industrial and heavy mobile service. (SAE J313 JUN87)**
- **Since KUBOTA diesel engines of less than 56 kW (75 hp) utilize EPA Tier 4 and Interim Tier 4 standards, the use of low sulfur fuel or ultra low sulfur fuel is mandatory for these engines, when operated in US EPA regulated areas. Therefore, please use No.2-D S500 or S15 diesel fuel as an alternative to No.2-D, and use No.1-D S500 or S15 diesel fuel as an alternative to No.1-D for ambient temperatures below –10 °C (14 °F).**

1) SAE : Society of Automotive Engineers
2) EN : European Norm
3) ASTM : American Society of Testing and Materials
4) US EPA : United States Environmental Protection Agency
5) No.1-D or No.2-D, S500 : Low Sulfur Diesel (LSD) less than 500 ppm or 0.05 wt.%
No.1-D or No.2-D, S15 : Ultra Low Sulfur Diesel (ULSD) 15 ppm or 0.0015 wt.%

CAPACITIES

ITEMS	*CAPACITY (Litre)*
Model	SWL4538
Hydraulic oil tank	45
Sprocket oil tank	30
Engine coolant	9
Engine oil	11
Fuel tank	85

CODIFICATION OF THE MAIN CHANGED PART

The following table shows the codification of the parts need changing frequently.

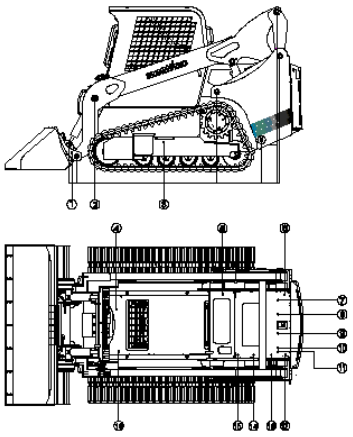
SWL4538		
PART	SUPPLIER	CODE
Engine Air Filter (1)	Kubota	750201013571
Engine Air Filter (2)	Kubota	750201013572
Oil-water Separator Filter	Kubota	750201013448
Engine Oil Filter	Kubota	750201013570
Engine Fuel Filter	Kubota	750201013450
Hydraulic Oil Filter	Kai Cen	730403000484

TORQUE FOR SCREWS

Unless other specification, tighten the nuts and bolts according to the torques shown in the below table. Tighten the goods by the wrenches with gauge.

Thread Diameter (mm)	**Quality 8.8 Torque (Nm)**	**Quality 10.9 Torque (Nm)**
M 6	**9~12**	**13~16**
M 8	**22~30**	**30~36**
M 10	**45~59**	**65~78**
M 12	**78~104**	**110~130**
M 14	**124~165**	**180~210**
M 16	**193~257**	**280~330**
M 18	**264~354**	**380~450**
M 20	**376~502**	**540~650**
M 22	**512~683**	**740~880**
M 24	**651~868**	**940~1120**
M 27	**952~1269**	**1400~1650**
M 30	**1293~1723**	**1700~2000**

LUBRICATION POINTS



△ Check and clean.
□ Check and fill up
○ Replace

Attention

Fuel and Lubricant Chart

Item	Description	Maintenance Interval (hours)						Oil Symbol	Maintenance points
		10	100	250	500	1000	2000		
1	Quick hitch	□						PGL	2
2	Working device pins	□						PGL	12
3	Sprocket wheel box	□			□			GO	2
4	Panel and indicator lights	△							1
5	Hydraulic oil return filter				○				1
6	Fuel level	□						DF	1
7	Coolant	□					○		1
8	Radiator	□							1
9	V belt tension	□							1
10	Engine oil level	□			○			EO	1
11	Hydraulic oil level	□					○	HO	1
12	Oil and water separator	△							1
13	Engine oil filter				○				1
14	Fuel filter				○				1
15	Air filter		△			○			1
16	Accumulator(electrolyte)	□							1

Attention:

1. Oil symbol
   EO: Engine oil SAE#CF-4/SH15W-40
   GO: Gear oil SAE#85W140GL-5
   HO: Hydraulic oil ISO VG46(for cold)of VG68(for warm)
   PGL: Grease NLG1#2
   DF: Diesel oil
   Coolant: 50/50 water and antifreeze
2. Refer to manual book to use hydraulic oil and gear oil.
3. Stop engine when fill up.
4. Don't open the cover or oil plug when coolant or oil temperature high, beware of scald.
5. Open covers slowly to release pressure.
6. Please refer to maintenance book for other details.

Remarks:

It must check and maintain following parts for the first 50 hours and every 250 hours operation.
1. Engine set bolt.
2. Hydraulic pump set bolt.
3. Travel motor set bolt.
4. Tyre set bolt.
5. Axle bolt.
6. Other bolts for important parts.

MAINTENANCE PLAN

TASKS	BS	50	100	250	500	1000	2000	WR
5.5.1.1 CHECKING ENGINE OIL LEVEL	**X**							
5.5.1.2 CHECKING ENGINE COOLANT LEVEL	**X**							
5.5.1.3 CHECKING FUEL LEVEL	**X**							
5.5.1.4 CHECKING HYDRAULIC OIL LEVEL	**X**							
5.5.1.5 CHECKING THE ELECTRIC CABLES	**X**							
5.5.1.6 CHECKING THE TRACK	**X**							
5.5.1.7 CHECKING THE SEAT BELT	**X**							
5.5.1.8 CHECKING THE LEAKING OF OIL	**X**							
5.5.1.9 CHECKING THE QUICK COUPLER	**X**							
5.5.1.10 CHECKING THE WATER AND SEDIMENTS SEPARATOR	**X**							
5.5.2.1 CHECKING THE COOLER PIPES		**X**						
5.5.2.2 CHECKING THE COOLANT LEVEL		**X**						

5.5.2.3 CREASING THE PINS OF BOOM AND CYLINDERS		**X**						
5.5.2.4 CHECKING THE WHEEL NUTS DRIVING TORQUE		**X**						
5.5.3.1 CLEANING THE TERMINALS OF THE BATTERY			**X**					
5.5.3.2 CLEANING THE OIL TANK'S BREATHER			**X**					
5.5.3.3 CHECKING THE CYLINDER RODS			**X**					
5.5.3.4 GREASING ALL OF PINS			**X**					
5.5.4.1 CHECKING THE TENSION OF THE TRACK				**X**				
5.5.4.2 ADJUST THE TENSION OF THE TRACK AS NEEDED				**X**				
5.5.4.3 CHECKING THE FAN BELT				**X**				
5.5.4.4 CLEANING THE RADIATOR				**X**				
5.5.4.5 CHANGING THE ENGINE OIL				**X**				
5.5.4.6 CHANGING THE ENGINE OIL FILTER				**X**				
5.5.4.7 CHANGING THE FUEL FILTER				**X**				
5.5.4.8 CHECKING THE NUT TORGUE OF THE HYDRAULIC MOTOR AND DRIVING WHEEL				**X**				
5.5.5.1 CLEAN THE FUEL-WATER SEPATATOR					**X**			
5.5.5.2 CLEAN THE TIGHTENESS OF PUMP FIXING SCREWS					**X**			
5.5.5.3 CHECKING THE BATTERY FLUID LEVEL					**X**			
5.5.5.4 CHANGING THE HYDRAULIC OIL FILTER					**X**			
5.5.6.1 CHANGING THE HYDRAULIC OIL AND CLEAN THE SUCTION						**X**		
5.5.6.2 CHANGING THE AIR FILTER						**X**		
5.5.6.3 CHECKING THE PRESSURE						**X**		

OF PUMP AND VALVE								
5.5.6.4 CHANGING THE HYDRAULIC OIL TANK BREATHER						**X**		
5.5.6.5 CHECKING THE TIGHTNESS OF CYLINDER HEAD SCREW						**X**		
5.5.6.6 CHECKING THE LOOSENESS OF VALVE						**X**		
5.5.7.1 CHANGING THE COOLANT							**X**	
5.5.7.2 CHANGING THE SUCTION FILTER							**X**	
5.5.7.3 CHECKING THE STARTER AND ALTERNATOR							**X**	
5.5.8.1 DRAINING THE FUEL TANK								**X**

TROUBLE SHOOTING

Trouble	Cause	Solution
Electric system		
Lamps do not work properly even with engine running at high speed	• Fault cables	• Check and repair any loose terminal and connection
Lamps come on intermittently with engine running	• Faulty fan belt tension	• Check the belt tension and adjust it or change it if it is necessary
Charge warming light dose not go out when the engine running, even at high speed	• Faulty alternator • Faulty cables	• Change • Check and repair
Alternator emits abnormal noise	• Faulty alternator	• Change

Trouble	Cause	Solution
Starter does not work with key in START position	• Faulty cables • Battery charge insufficient • Faulty main fuse	• Check and repair • Charge battery • Change
Starter pinion engages and disengages while starting engine	• Battery charge insufficient	• Charge battery
Engine oil pressure warming light does not come on when engine is stopped	• Faulty bulb • Faulty pressure sensor	• Change • Change
Charging warming light dose not come on when engine is stopped	• Faulty bulb • Faulty cables	• Change • Check and repair
Hydraulic system		
Pumps emit abnormal noise	• No oil in the tank • Faulty pump • Hydraulic oil unsuitable for the temperature	• Refill oil • Check, then repair or change • Change the oil
Equipment moves only at low speed	• Faulty pump • Max. pressure valve setting incorrect, or valves closed due to impurities • Dirty drain filter	• Check, then repair or change • Reset or change • Change
Power system		
Oil pressure warming light remains on even with engine at high speed	• Oil level too low • Oil filter clogged • Oil unsuitable for the ambient environment	• Refill • Change filter • Change
Steam comes out of radiator breather. The engine coolant temperature indicator reaches overheating range	• Coolant fluid level low • Radiator leakage • Fan belt slacked • Mud or limestone accumulated in cooling system	• Refill • Repair • Check belt tension and adjust • Change coolant and clean cooling system

Trouble	Cause	Solution
	• Radiator fins damaged or closed • Faulty thermostat • Radiator cap loosen or broken • Working at too high altitude	• Repair or clean • Change • Tighten cap or change unit
Coolant temperature indicator always at the end of right scale	• Faulty instrument	• Change
Coolant temperature indicator always at the end of left scale	• Faulty thermostat • Faulty instrument	• Change • Change
Engine dose not start with starter running	• No fuel • Air in fuel system • Compression defect	• Refuel • Bleed system • Adjust valve clearance
Exhaust gases white or light blue	• Too much oil in oil pan • Unsuitable fuel	• Drain some oil • Change with correct fuel
Exhaust gases occasionally tend to be black	• Air cleaner clogged • Faulty injectors • Faulty compression	• Clean or change • Change • Adjust valve clearance
Combustion noise occasionally resembles a blow	• Faulty injectors	• Change
Abnormal noises (during combustion or in mechanical parts)	• Fuel with low cetane rating • Overheating • Exhaust silencer inside damaged • Excessive valve clearance	• Change with correct fuel • • Change • Adjust valve clearance
Transmission system		
Machine moves neither forward nor reverse	• Oil level insufficient • Suction filter clogged • Faulty flexible coupler • Max. pressure valves faulty or dirty	• Refill • Change • Change coupler • Clean or change valves

Trouble	Cause	Solution
	• Positioning hydraulic connection interrupted	• Restore connection
	• Travel motor faulty	• Repair or change
Machine moves with delay (with abnormal noise)	• Oil level too low	• Refill
	• Presence of foam	• Use the recommended oil
	• Suction pipe tightness	• Check and eliminate leakage
	• Suction filter clogged	• Change
	• Travel motor faulty	• Repair or change
Traction force in the two travel directions is insufficient	• Endothermic engine does not reach max. speed	• Change diesel oil filter and check injection pump
	• Auxiliary fuel pump (gear pump) faulty	• Repair or change
	• Max. pressure valve setting incorrect	• Reset
	• Connection to servo control faulty or lever angle incorrect	• Restore connection or shift lever to correct position
	• Pressure relief valve setting incorrect	• Reset
	• Excessive oil temperature	• Check oil lever and clean exchanger
	• Travel motor faulty	• Repair or change
Traction force is insufficient in only one direction	• Endothermic engine strongly overloaded	• Reduce loads due to lifting
	• Incorrect setting of the max. pressure valve relevant to that direction	• Set valve
Oil overheating	• Oil level too low	• Refill oil
	• Exchanger clogged or dirty	• Check and change if necessary
	• Unsuitable oil	• Change with correct oil
	• Suction pipe tightness	• Check and eliminate leakage
	• Setting and operation of the max. pressure valves	• Check setting, repair or change
	• Travel pump faulty	• Repair or change

Trouble	Cause	Solution
	• Pressure relief valve with high setting • Travel motor faulty	• Set valve • Repair or change
Machine dose not reach max. speed	• Suction filter clogged • Endothermic engine dose not reach max. speed • Auxiliary pump (gear pump) faulty • Pilot pressure insufficient • Pressure relief valve setting incorrect	• Change • Change diesel oil filter and check injection pump • Check, repair or change • Set • Set to rated value
Machine decelerates discontinuously	• Mechanical connection with servo control lever too hard	• Check if rotation is smooth
Machine accelerate slowly	• Engine power drop • Pressure relief valve setting incorrect	• Check clogging of fuel filter, injection pump and valves • Set to rated value
Oil leakage from engine propeller shaft and/or pump	• Sealing rings faulty • Counter pressure in pump casing • By-pass valve setting too high	• Change • Drain pipes clogged or damaged • Check and restore
Others		
Fuel completely depleted	• Fuel runs out of	• Refuel and bleed the system before start the engine again
Battery completely depleted	• Alternator faulty	• Repair or change
	• Consume electric power when the engine is stopped	• Charge the battery • Or start the engine with booster cables
Machine gets stuck in mud	• Can not get out by itself	• Use a wire rope suitable to remove the machine through the tow hook