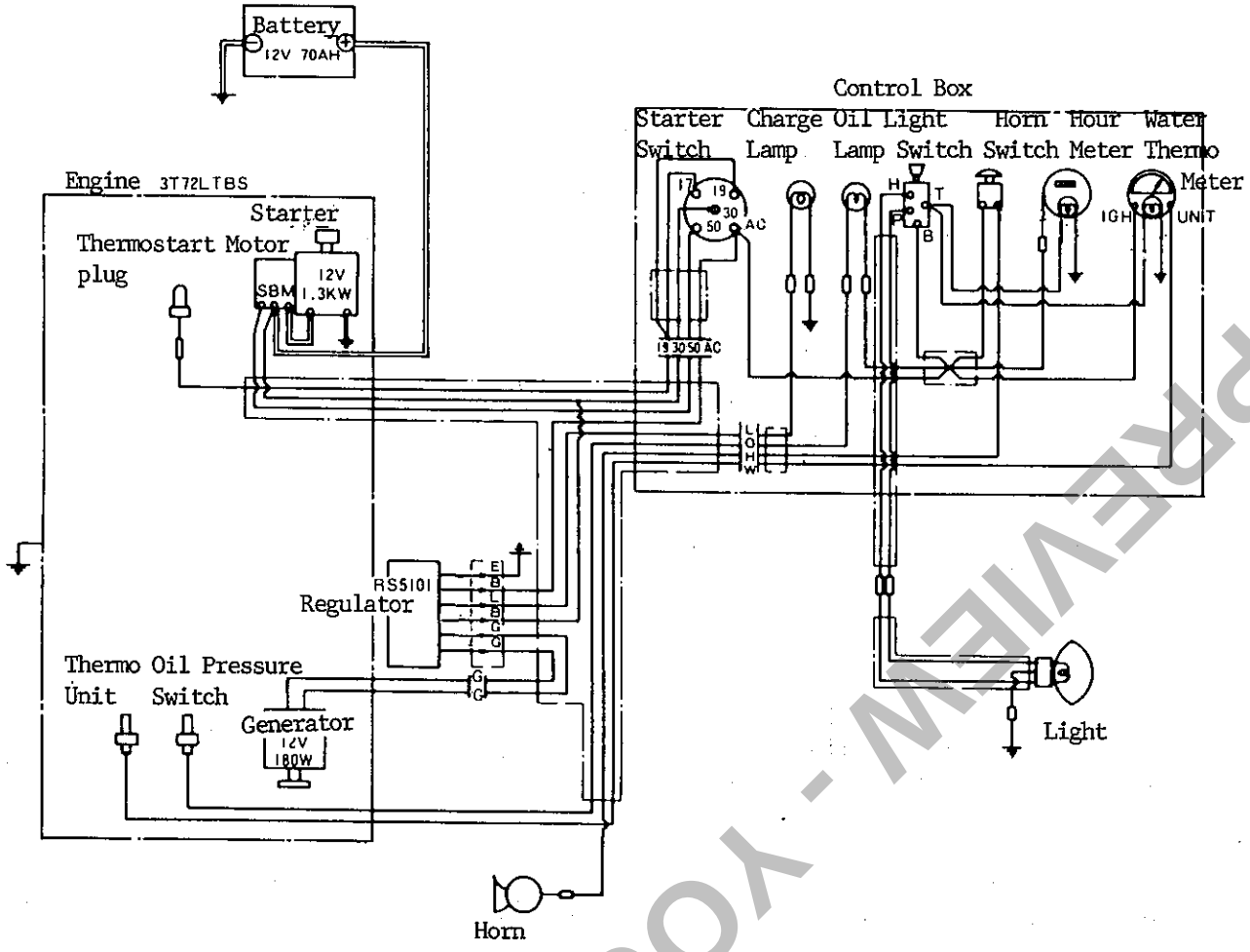
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17. ELECTRIC CIRCUIT (Electric Diagram)



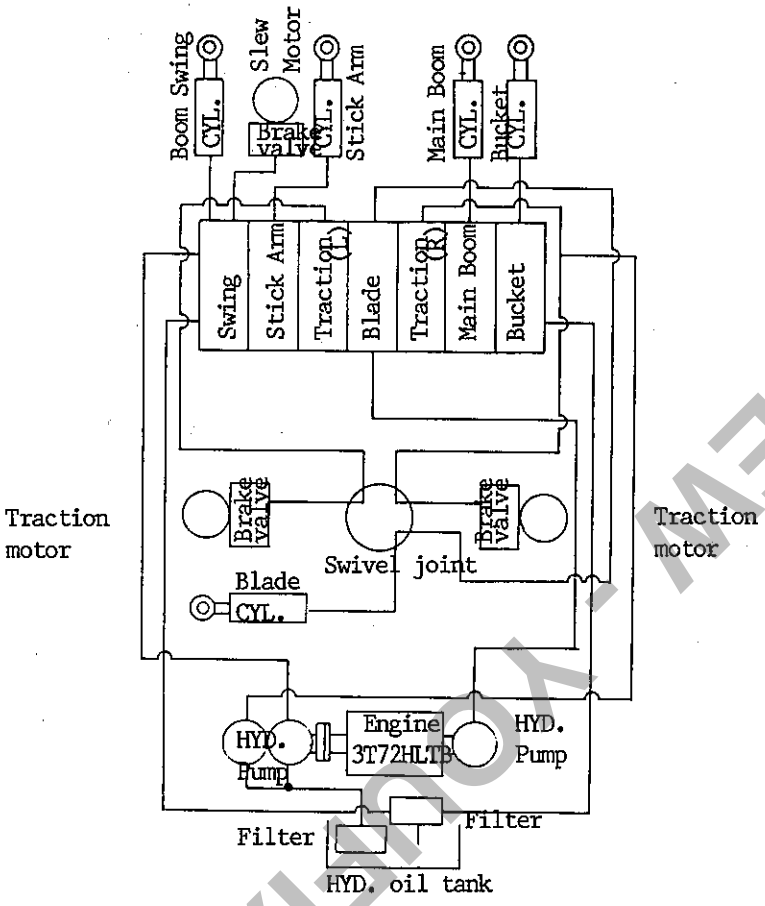
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16. Hydraulic system

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All the working operations (Traction, Boom, Dozering with Blade, Upper machine slew, Main Boom, Stick Arm up/down) are driven by hydraulic system.

Oil pressure driven by tandem gear pump directly connected to the engine flows into control valve through 2 channels.



Control valve operates by various operations of levers.

Control valve controls oil flows to each cylinder and each motor by orders of control levers.

16-1. Tandem gear pump

The pump is 2 gear twin type which has a suction port and a discharge port. Driven by the engine directly providing a coupling between the engine and pumps so as to produce a high pressurerized hydraulic oil system.

Driving gear and driven gear engages to each other in a pump. As that rotate (see fig. below), oil is transferred from the suction port to the discharge port.

There becomes no clearance between the cogs of the 2 gears at the discharge port so that oil is pushed out further.

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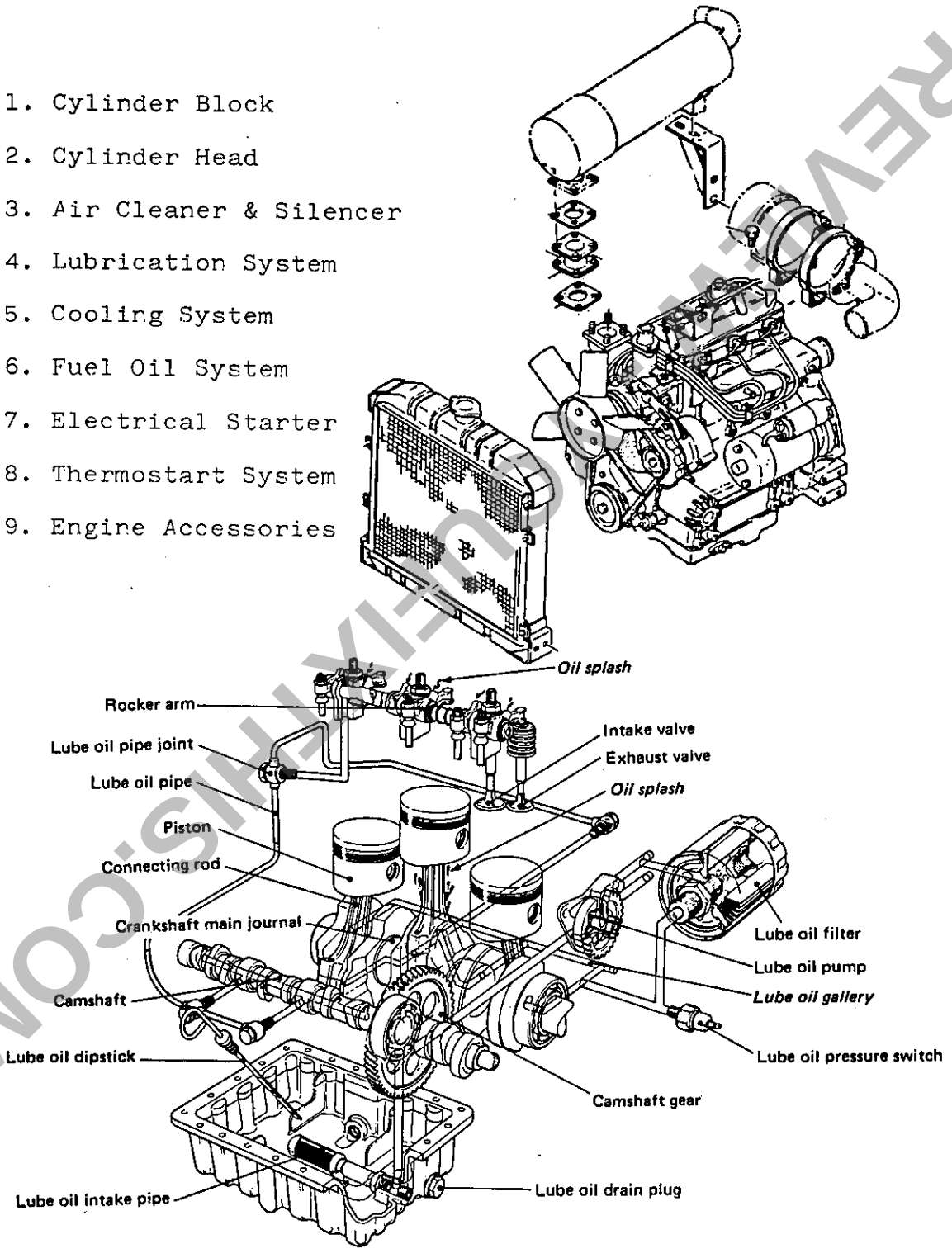
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APPENDIX

THE DETAILS OF ENGINE FOR MAINTENANCE

(3T72LTB engine)

1. Cylinder Block
2. Cylinder Head
3. Air Cleaner & Silencer
4. Lubrication System
5. Cooling System
6. Fuel Oil System
7. Electrical Starter
8. Thermostart System
9. Engine Accessories



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14. PERIODICAL CHECKS & MAINTENANCE CHART

＊: CHECK 0: RESUPPLY ＃: REPLACE +: ADJUST (CLEAN) X: OIL & GREASE

CHECK & MAINTENANCE ITEM			EVERY DAY	EVERY 50 h	EVERYV 100 h	EVERY 250 h	EVERY 600 h	EVERY 1000h
GENE-RAL	CHECK FOR DEFECTIVE & BROKEN PARTS		＊					
	TIGHTEN LOOSE NUTS & BOLTS		＊					
	ENGINE CONDITION		＊					
	CLEAN		+					
F.O. SYSTEM	CHECK OIL LEVEL RESUPPLY		0					
	FUEL FILTER ELEMENT	CLEAN			+			
		REPLACE					＃	
	DRAIN WATER & SEDIMENTS IN FO.TANK			+				
COOL-ING WATER SYSTEM	COOLING WATER	INSPECT, RESUPPLY	＊					
		CHECK WATER LEAKS	＊					
	INSPECT /CLEAN RADIATOR FINS						+	
	INSPECT /DRAIN /CLEAN THE SYSTEM						+ within a year	
	CHECK /ADJUST FAN BELT TENSION		＊			+		
AIR ELE-MENT	CHECK /CLEAN AIR CLEANER		＊					
	ELEMENT	CHECK /CLEAN				+		
		REPLACE					＃	
LUBLI-CATING OIL	ENGINE OIL	CHECK /RESUPPLY	＊					
		REPLACE		＃1st time		＃		
	REPLACE ENGINE OIL FILTER			＃1st time		＃		
	SWIVELLING GEAR CASE OIL	CHECK /RESUPPLY				0		
		REPLACE						＃
	DRIVING GEAR CASE OIL	CHECK /RESUPPRY				0		
		REPLACE						＃
HYD. SYSTEM	HYDRAULIC OIL	CHECK /RESUPPLY	＊					
		REPLACE						＃
	CLEAN INTAKE FILTER					+		
	REPLACE RETURN FILTER					＃		
	CHECK HYDRAULIC OIL PUMP		＊					

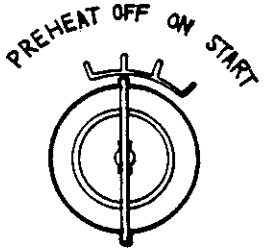
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7. OPERATION

7-1. How to start the engine & to stop it.

ENGINE START: Check and operate lever in the following order before touch the starter switch.

1. Let all Hydraulic Attachments touch the ground.
2. Check all levers are neutral.
3. Pull engine throttle lever to "Middle Position".
4. Plug in the key to the starter switch.
5. When engine starts up, keep the engine throttle lever to "Middle Position" without fail.
6. In order to protect cell motor battery, do not rotate it more than 5 seconds. If failed by first trial, switch it on again after 30 seconds interval



AFTER ENGINE STARTED: Do not operate the machine soon after engine started. Keep waiting ir the following procedures.

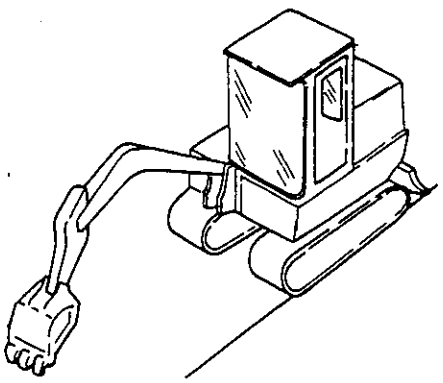
1. Keep engine throttle lever to low speed position and rotate engine without charges during 5 minutes to increase oil temperature.
2. Pull engine throttle lever to "Middle Position" and try many times the action, Bucket operation lever pull inside, keep it for 5 seconds and pull the lever neutral position.

   This means "WARM-UP" Operation.
3. Do not switch off the key switch while the engine is operating.

STOP THE ENGINE: Rotate the engine for 5 minutes at low speed to cool off gradually.

1. Let all Hydraulic Attachments touch the ground.
2. Push the throttle lever to "STOP" position.
3. Pull out the starter switch from "OFF" position after turn it to "OFF"

** Stop the engine by "Starter switch key"



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SPECIFICATIONS

COMPACT EXCAVATOR, MODEL: TB650S

DIMENSIONS & WEIGHT	OVERALL LENGTH		3270 mm
	OVERALL WIDTH		960 mm
	OVERALL HEIGHT		2000 mm
	MINIMUM GROUND CLEARANCE		210 mm
	CRAWLER SHOE	DISTANCE BETWEEN DRIVE TUMBLER CENTER AND FRONT IDLER CENTER	1020 mm
		WIDTH	230 mm
		PITCH × PIECES (MM × PCS)	101.7×30
		GROUND CONTACT LENGTH	1020 mm
	COMPLETE MACHINE OPERATING WEIGHT		1100 kg
	GROUND PRESSURE		0.210 kg/cm²
PERFORMANCE	MAX. DIG HEIGHT		2875 mm
	MAX. DIG RADIUS		3325 mm
	MAX. DIG DEPTH		1700 mm
	MAX. DIG DEPTH: USING BLADE AS AN OUT RIGGER		1865 mm
	MAX. DIG DEPTH (VERTICAL)		1820 mm
	MAX. DUMP HEIGHT		1920 mm
	ROTATION DEGREE		360 ℃
	GRADUABILITY		30 ℃
	TRACTION SPEED		2.30 km/hr
	TRACTION FORCE		510 × 2 kg
	BUCKET CAPACITY		0.06 m³
	BUCKET WIDTH		400 mm
	MAX. DIG FORCE: BUCKET		1000 kg
	STICK		900 kg
	BUCKET PIN DIAMETER		30 mm
DOZER BLADE	DOZER BLADE SIZE (Width×Height)		960×250 mm
ENGINE (DIESEL)	MODEL		3T72LTBS
	TYPE		3CYL/4CYCL.
	OUT PUT (RATED)		12.5 ps
	ROTATION SPEED		2000 rpm
	FUEL OIL TANK CAPA.		21 lit.
	ENGINE OIL		3.0 lit.
	MAX. TORQUE (kg.m/rpm)		4.7/1600
	DISPLACEMENT		880 cc
	COOLING WATER CAPACITY		3.4 lit.
	LUB. OIL CAPACITY		3.0 lit.
	FUEL CONSUMPTION		3.6 L/H
	NOISE LEVEL (OPERATOR'S EAR)		79 db (A)
HYDRAULIC SYSTEM	HYDRAULIC PUMP		TANDEM GEAR PUMP
	MAXIMUM PRESSURE		150 kg/cm²
	HYD. OIL FLOW		16 × 2 LPM
			6 × 1 (Blade)
	HYD. OIL TANK CAPACITY (TANK INSIDE)		45 lit. (3.5 lit.)
BUCKET (A)	STANDARD BUCKET (WIDTH/CAPA)		250mm/0.04m³
	OPTIONAL BUCKET		350mm/0.05m³
			450mm/0.065m³
BUCKET (B)	EJECTABLE BUCKET (BUCKET WITH EJECTOR)		200mm/0.02m³
			300mm/0.03m³
			350mm/0.04m³
OPTIONAL LONGER STICK ARM	200MM LONGER ARM : MAX. DIG DEPTH		1900 (1995) mm
	(300MM LONGER ARM) MAX. DIG RADIUS		3430 (3540) mm
	MAX. DUMP HEIGHT		2020 (2073) mm

In accordance with our established policy of constant improvement, we reserve the right to emend this specification at any time without notice.

MDTN/11.9.84.

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*: CHECK O: RESUPPLY #: REPLACE +: ADJUST (CLEAN) X: OIL & GREASE

CHECK & MAINTENANCE ITEM		EVERY DAY	EVERY 50 h	EVERYV 100 h	EVERY 250 h	EVERY 600 h	EVERY 1000h
GREASE	CHECK GREASE UP POINT	X					
TRACTION	CHECK & ADJUST CRAWLER SHOE TENTION	*		+			
ELECTRICAL SYSTEM	LAMPS, HORN	*					
	HOURMETER	*					
	CHECK ELECTRIC WIRINGS	*					
	BATTERY SOLUTION CHECK & REPLACE	*					
	BATTERY SPECIFIC GRAVITY OF ELECTROLYTE CHECK & CHARGE					+	
	MONITOR LAMP	*					

15. CHECK POINT FOR TROUBLESHOOTING :

15-1. ENGINE

ABNORMAL PHENOMENA	MAIN REASON	TROUBLESHOOTING
Steam boiled out of Radiator top.	* Shortage of Cooling Water.	* Resupply water.
	* Fan Belt loosened too much.	* Adjust Tension.
	* Dust or Water Filth in Cooling system circuit.	* Replace the water clean inside.
Thermostat needle swing to the limit.	* Thermostat bad.	* Replace.
	* Radiator fin stopped up or Fin fallen down.	* Clean or repair.
	* Water temperature bad.	* Replace.
Thermostat needle swing to left too much.	* Thermostat bad.	* Replace
	* Thermometer bad.	* Replace
Engine dose not move start after drive Cell-motor.	* Fuel shortage.	* Supply fuel oil.
	* Air mixed in Fuel circuit.	* Repair the section where an air comes in.
	* Fuel INJ. pump or nozzle bad.	* Replace pump or Nozzle.
	* Less compression.	* Consult dealer.
Black smoking	* Air cleaner element stopped up.	* Clean or replace
	* Nozzle bad.	* Replace the nozzle.
	* Less compression.	* Consult dealer.
White or Bule-shaded exhaust gas.	* Too much oil in pan.	* Decrease it to rated amount.
	* Bad oil (Fuel)	* Replace correct fuel oil.
	* Defacement of Cylinder or piston ring.	

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18. OPTIONAL BUCKET:

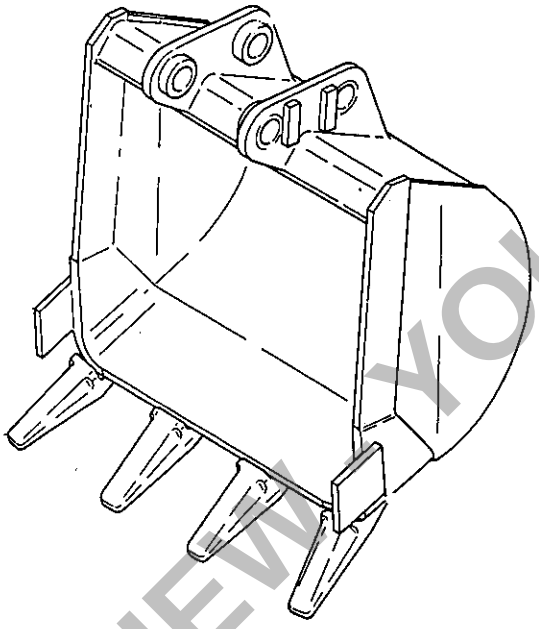
The following optional buckets are prepared for various usages in various working sites.

Select the most suitable bucket for your work site.

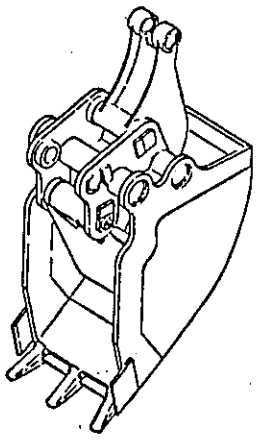
Bucket width(mm)	Capacity (m^3)
250	0.02
350	0.05
450	0.065

Ejectable Bucket

200	0.02
250	0.025
300	0.03
350	0.04

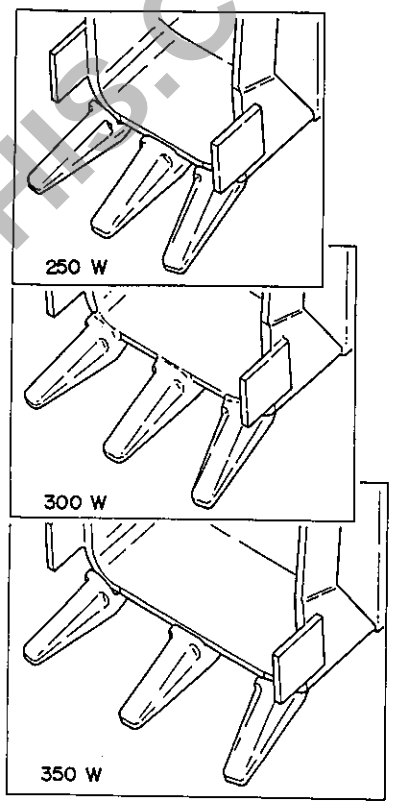


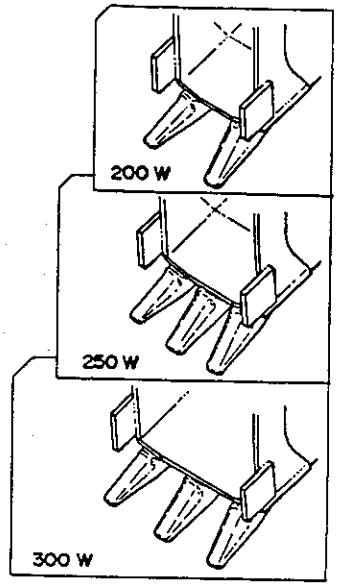
Bucket 450mm



Ejectable Bucket 350mm

Suitable digging at narrow work site!





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