

**PROJECT FOR RESEARCH AND DEVELOPMENT OF DEMINING
RELATED EQUIPMENT IN CAMBODIA**

No. 4

**REPAIR &
MAINTENANCE**

KOMATSU MACHINE

13. GENERAL MAINTENANCE WORK

13.1. TOOLS AND EQUIPMENTS

13.1.1. GENERAL EQUIPMENT FOR THE PROJECT

Table 55: General equipment for the project

No.	Name of the item, etc.	Period	Number	Remarks
1	Vehicle with driver	4 month	2	Pajero type
2	Vehicle for back up with driver	4 month	3	CMAC ambulance is acceptable. But without medical equipment
3	Trailer with driver	3 times	3	35 tons Drop bed type
4	Crane	4 weeks	2	Lifting capacity 25 ton
5	Fork lift	2 weeks	2	1 unit is OK. from workshop of CMAC
12	Hand tools set (1 set)	4 month	1	It is from w/shop Battambang
15	Diesel Fuel	Initially	22	22 drums (Total : 4400Litre)
16	Gasoline (for Generator) 1 Drum	Initially	1	
17	4ton (isuzu truck) 4WD with owing	4 to 6 month?	1	For JICS mobile office
18	Generator	4 to 6 month?	1	handy for JICS

13.1.2. GENERAL TOOLS FOR THE PROJECT FROM W/SHOP BATTAMBANG

Table 56: General tool from CMAC workshop in Battambang

No.	name of tool	Qty
1	Mechanic vise	1
2	Bolt cuter	1
3	Big size of box wrench	1
4	working lamp	1
5	Electrical welder kit	1
6	Big size hummer	1
7	Wire ropes	2
8	Caliper	1
9	Chisel kit	1
10	High speed cutter	1
11	Dolly (trolley) for pallet	1
12	Chain wrench for oil filter	1
13	Mechanic table	1
14	Generator 20KVA or more	1

13.1.3. ASSISTED TOOL FROM CMAC

Table 57: Assisted tools from CMAC

No.	Name of the item, etc.	Period	Cost bear to CMAC	Cost bear to Manufacture	Remarks
1	Vehicle with driver from outside of CMAC	4 month		2	Pajero type (Less than 1,000\$ with driver, fuel, overtime work)
2	Vehicle for back up with driver	4 month	1		CMAC ambulance is acceptable. But without medical equipment
3	Trailer with driver	3 times	Depends on condition		35 tons Drop bed type
4	Crane	4 weeks	Depends on condition		Lifting capacity 25 ton

No.	Name of the item, etc.	Period	Cost bear to CMAC	Cost bear to Manufacture	Remarks
5	Fork lift	2 weeks	1		
6	Truck with driver	4 month	1		4 ton
7	PPE (10 sets)	4 month	1		
8	Transceiver (4 sets)	4 month	1		
9	Generator	4 month	1		Handy
10	Welding machine	4 month	1		Electric
11	Air compressor	4 month	1		
12	Hand tools set (1 set)	4 month	1		
13	Gantry crane & chain block	4 month	1		
14	Interpreter (English to Cambodian)	4 month		1	
15	Diesel Fuel (initial use only) 5 drums			1	

◆ Accommodation: US\$30-(w/ Air conditioner, Internet) for 4 persons from July 15 in Siem Reap

◆ Two (2) Vehicles are required from July 15.

13.2. PERFORMANCE & ACCEPTANCE TESTS

Maintenance is implemented every morning by joint CMAC machine operators and manufacturers. The maintenance duration is taken approximately thirty to sixty minutes.

13.3. SURVIVABILITY TEST

There is well prepared and send for the test.

14. GENERAL REPAIR WORK

14.1. PERFORMANCE & ACCEPTANCE TESTS

For the repair of demining machine push type during acceptance test, please see section 5.4.3.

14.2. SURVIVABILITY TEST

14.2.1. GENERAL ASSESSMENT

- There is no damage done to the cabin
- There is no damage done to the engine
- There is no damage done to the body of the machine
- There is some damages done to the attachment

14.2.2. DAMAGE TO THE ATTACHMENT OF KOMATSU

- 2 pits are broken
- 2 hydraulic holders are dislocated
- Tiller drum is hollowed due excessive force of the blast

Because of time, tools, cost and with other valid reasons, manufacturer team (Komatsu) decided not to repair the damaged drum but instead replaced it with a brand new tiller drum (spare). The tool used to replace the tiller drum is listed in section 13.1.

DAMAGES IN PICTURES

a) General view after the explosion



Figure 110: General view of the Komatsu machine after explosion

b) Hydraulic holders



Figure 111: Hydraulic holders are dislocated

c) Broken pits and hollow drum



Figure 112: broken pits and a hollow drum