

**DIRECTORATE GENERAL BORDER ROADS**  
**GENERAL MAINTENANCE INSTRUCTION NO.118**

**ON**

**MAINTENANCE, PREVENTIVE MAINTENANCE AND LUBRICATION**  
**OF**  
**ROTARY SNOW PLOUGH ROLB R-1200 “ MONOFORCE’**

Introduction

1. Regular servicing and preventive maintenance are essential to prolong the life of the equipments, ensure timely repairs to arrest defects from developing into major ones, to work equipment efficiently at all timers, minimize breakdown and downtime losses.

Aim

2. (a) To ensure the details of periodic and preventive maintenance and lubrication of ROLB-ROTARY SNOW PLOUGH R-1200 ‘MONOFORCE’.
- (b) Issue CHECK CARD for use by Mobile Maintenance Team.

Action by

3. (a) User Units. To carry out periodic inspection, regular servicing and preventive maintenance tasks as laid down.
- (b) Field Workshop (GREF)
- (i) To check the record of ‘Maintenance and Lubrication’ in the log book of the equipment during its inspection and repairs if carried as per maintenance and lubrication schedules given in this instruction .
- (ii) Advice user units in respect of any discrepancy/short comings noticed.
- (c) Mobile maintenance Team. To ensure that proper maintenance is carried and report accordingly to OC Filed Workshop for necessary action.

Details

4. Details of Maintenance and Lubrication alongwith the periodicity have been tabulated in Appendix ‘A’ to this instruction.

Appendix 'A' to GMI No. 118 dt 30 Mar 74  
MAINTENANCE, PREVENTIVE MAINTENANCE AND LUBRICATION OF ROTARY  
 SNOW PLOUGH ROLBA R-1200 'MONOFORCE'

S/No.	Item/Assemblies	Maintenance Instructions	Lubricant	No of points
1	2	3	4	5
<u>10 HOURS MAINTENANCE TASK</u>				
1.	General	(a) Check oil and fuel for leakage.  (b) Check for exhaust smoke colour, noise or vibration.  (c) Check reading of all gauges and meters.  (d) Check all bolts and nuts for tightness, loose or deficient.		
2.	Crankcase	Check oil level and top up if necessary	Engine Oil	1
3.	Air Cleaner	Check and clean oil bath air cleaners (It may be necessary to clean the air cleaner at shorter intervals in dusty working condition)	Engine Oil	2
4.	(a) Fuel Tank	Drain sediments and water from drain plug every day before starting the engine.	Diesel Oil	1
	(b) Cabin Heater fuel tank	Check fuel oil level	-do-	1
5.	Hydraulic Oil Filter	Change hydraulic oil filter after 10, 40, 100, 500 and 1000 hours of first operating hours and after every 1000 hours		3
6.	Hydraulic system	(a) Check hydraulic Oil level	Hydraulic oil	1
		(b) Check hydraulic cylinder for oil leaks from seals.	-do-	6
		(c) Check all piping and hose connection for oil leaks or damage.		
		(d) Check for leaks at Hydraulic pumps	Hydraulic oil	5
		(e) Inspect control/manifold valves for leaks and efficient function.		

1	2	3	4	5
7.	Plough Equipment	(a) Check cutter blades for distortion, cracks or damage.  (b) Check scraper blade for wear and tear  (c) Check nuts and bolts for proper tightness  (i) Cutter drum holding bolts  (ii) Nuts and bolts holding cutter Blade  (iii) Cutter drive gear box side cover bolts (d) Check all pins and bushing for war and tear.		          6  59  16
8.	Batteries	(a) Check electrolyte level, add distilled water.  (b) Check for clear vent holes.  (c) Check battery terminals for wear and tear.		
9.	Steering system	Check steering linkage for war and tear, loose or missing of nuts and bolts.		
10.	Wheels	Check tyre pressure		
11.	FIP and Governor	Check for leaks		
12.	Oil Cooler	Check for Oil leaks :-  (a) Engine Oil (b) Hydraulic Oil		
13.	Wiring	Check for cracked or frayed insulation, broken wire or loose connection.		
14.	Grease Nipples:- (a) Bearing of Lifting ram top (b) Adjusting bracket bottom	Grease  Grease	Grease  Grease	

1	2	3	4	5
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OIL AND GREASE ASSEMBLY WISE USE OF

1. DEUTZ Engine
  - (a) Above + 20<sup>0</sup> C - Use SAE-30 Engine Oil
  - (b) From + 20<sup>0</sup> C to – 10<sup>0</sup>C - Use SAE 20W/20 Engine Oil
  
2. Transmission, Final drive cutter and Impeller drive gear box oil
  - (a) Above + 20<sup>0</sup> C - Use SAE-90 Gear Oil
  - (b) Below + 20<sup>0</sup> C - Use SAE 80 Gear Oil
  
3. Hydraulic Oil - Use only KENDALL Hyken Super Black Hydraulic Oil as recommended by the manufacturer
  
4. Grease Grades
  - (a) Above + 15<sup>0</sup> C - Use Grease No.2
  - (b) From + 15<sup>0</sup> C to -10<sup>0</sup> C - Use Grease No.1
  - (c) Below –10<sup>0</sup> C - Use Grease No. 0

Note :-

1. Refueling of diesel tanks must be done at the end of days work to give enough time for settling down the water and sediments.
2. If excessive foam is seen in the Hydraulic tank, it may be due to poor quality of oil or use of too little oil. Change hydraulic oil or refill as required.
3. Do not attempt to adjust the FIP and Governor since it is not a normal Field Repairs.
4. Clean grease nipples and lubricate with high pressure pump (replace damaged nipples)

50 HOURS MAINTENANCE TASK

1. General Carryout 10 hours maintenance task
  
2. Air Cleaner Clean Air Cleaner filter and bowl assys. 2
  
3. Brake Fluid Check fluid level and refill if necessary. 1

Contd.....4

1	2	3	4	5
4.	Check following nuts and bolts for proper tightening :-			
(a)	Engine mounting bolts			6
(b)	Bolts fastening mounting plates on front axle			12
(c)	Bolts holding mounting plates on rear axle			4
(d)	Chassis frame mounting bolts on fuel tank			4
(e)	Wheel nuts			32
(f)	Front lights bracket screw			44
5.	<u>Grease Nipples</u>			
(a)	Suspension bolt front	Grease	Grease	1
(b)	Suspension bolt rear	-do-	-do-	2
(c)	Propeller shaft front	-do-	-do-	3
(d)	Propeller shaft rear	-do-	-do-	3
(e)	Steering stub bearing rear axle	-do-	-do-	6
(f)	Tie rod end	-do-	-do-	2

OIL AND GREASE GRADES ASSEMBLY WISE USE OF

Same as under 10 hours Maintenance task.

- Note:-
1. Refueling of diesel tanks must be done at the end of day's work to give enough time for settling down the water and sediments.
  2. If excessive foam is seen in the Hydraulic tank it may be due to poor quality of oil or use of little oil. Change Hydraulic oil or refill as required.
  3. Do not attempt to adjust the FIP and Governor since it is not normal
  4. Clean grease nipples and lubricate with high pressure pump (replace damaged nipples)
  5. Replace the bolts, nuts or screw which are missing or damaged e.g. head rounded, elongated, cross threaded.

Contd...5

1	2	3	4	5
<b><u>100 HOURS MAINTENANCE TASK</u></b>				
1.	General	Carry out 10 and 50 hours maintenance task.		
2.	Engine Oil	Change engine oil when engine is hot (Change engine oil after first 20, 40 hours and after every 100 hrs in case of new or overhauled engine)	Engine Oil	1
3.	Engine Oil Filter	Change oil filter		2
4.	Crankcase breather	Clean crankcase breather		2
5.	Cutter Gear box	Check oil level and for pollution, if necessary top up or change	Gear Oil	1
6.	Impeller Gear Box	-do-	-do-	1
7.	Distributor Gear Box	-do-	-do-	1
8.	Planetary Gear Box	Change Oil	-do-	2
9.	Differential	Check oil level and for pollution, if necessary top up or change	-do-	2
10.	Portal Gear	Check oil level	-do-	4
11.	Gear Box	Check oil level and for pollution, if necessary top up for change oil.	-do-	1
12.	Distributor Gear Box	-do-	-do-	1
13.	Pre-filter fuel	Clean filter		1
14.	Hydraulic Oil Tank	Drain 1 litre of Hydraulic Oil and check for pollution	Hydraulic Oil	1
15.	Check following nuts and bolts for proper tightening :-			
	(a)	Fly wheel housing bolts		12
	(b)	Engine mounting bracket bolts		24

1	2	3	4	5
	(c)	Cutter Drive motor and Planetary gear assembly mounting bolts		9
	(d)	Impeller Drive motor and planetary gear assembly mounting bolts		9
	(e)	Impeller Housing		30
	(f)	Front and rear propeller shaft		38
16.	<u>Grease Nipples</u>			
	(a)	Throttle lever	Grease	Grease 1
	(b)	Universal Joint cooling blower drive shaft.	Grease	Grease 1

**OIL AND GREASE GRADES ASSEMBLY WISE USE OF**

**DUETZ ENGINE**

1. (a) Above + 20<sup>0</sup>C - Use SAE 30 Engine Oil  
 (b) From + 20<sup>0</sup>C to -10<sup>0</sup>C - Use SAE 20W/20 Engine Oil
2. Transmission Final drives, Cutter and Impeller Drive Gear Box Oil  
 (a) Above + 20<sup>0</sup>C - Use SAE 90 Gear Oil  
 (b) Below + 20<sup>0</sup>C - Use SAE 80 Gear Oil
3. Hydraulic Oil - Use only KENDALL Hyken Super Black Hydraulic Oil as recommended by the manufacturer.
4. Grease Grades  
 (a) Above + 15<sup>0</sup>C - Use Grease No.2  
 (b) From + 15<sup>0</sup>C to -10<sup>0</sup>C - Use Grease No.1  
 (c) Below -10<sup>0</sup>C - Use Grease No.0

**Notes :-**

1. Refueling of diesel tanks must be done at the end of day's work to give enough time for setting down the water and sediments.

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1	2	3	4	5
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2. If excessive foam is seen in the Hydraulic tank, it may be due to poor quality of oil or use of too little oil. Change Hydraulic oil or refill as required.
3. Do not attempt to adjust the FIP and Governor since it is not a normal Field Repairs.
4. Clean grease nipples and lubricate with high pressure pump (replaced damaged nipples).
5. Replace the bolts, nuts or screw which are missing or damaged( eg. Head rounded, elongated, Cross threaded)
6. Watch for metal particles or other foreign material in the drained oil, report accordingly to Workshop.

#### 250 HOURS MAINTENANCE TASK

- |    |  |   |    |
|----|--|---|----|
| 1. | General                                | Carry out 10, 50 and 100 hours maintenance task.                                    |    |
| 2. | Engine                                 | Check valve clearance (initially after 20 hrs in case of new or overhauled engine). | 20 |
| 3. | Cooling blower                         | Clean hydraulic filter bowl of cooling blower.                                      | 1  |
| 4. | Alternator and Hydraulic pump V Belts. | Check 'V' Belt tension  | 1  |

#### OIL AND GREASE GRADES ASSEMBLY WISE USE OF

##### DUETZ ENGINE

1. (a) Above + 20<sup>0</sup>C - Use SAE 30 Engine Oil  
 (b) From + 20<sup>0</sup>C to -10<sup>0</sup>C - Use SAE 20W/20 Engine Oil
2. Transmission Final drives, Cutter and Impeller Drive Gear Box Oil  
 (a) Above + 20<sup>0</sup>C - Use SAE 90 Gear Oil  
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3. Hydraulic Oil - Use only KENDALL Hyken Super Black Hydraulic Oil as recommended by the manufacturer.



1	2	3	4	5
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4. Grease Grades

- (a) Above + 20<sup>0</sup>C - Use Grease No.2
- (b) From + 20<sup>0</sup>C to -10<sup>0</sup>C - Use Grease No.1
- (c) Below -10<sup>0</sup>C - Use Grease No.0

Notes :-

1. Refueling of diesel tanks must be done at the end of day's work to give enough time for setting down the water and sediments.
2. If excessive foam is seen in the Hydraulic tank, it may be due to poor quality of oil or use of too little oil. Change Hydraulic oil or refill as required.
3. Do not attempt to adjust the FIP and Governor since it is not a normal Field Repairs.
4. Clean grease nipples and lubricate with high pressure pump (replaced damaged nipples).
5. Replace the bolts, nuts or screw which are missing or damaged( eg. Head rounded, elongated, Cross threaded)
6. Watch for metal particles or other foreign material in the drained oil, report accordingly to Workshop.
7. Check and adjust valve clearance when engine is cold.

300 HOURS MAINTENANCE TASK

1. General Carry out 10, 50, 100 and 250 hours maintenance task.
2. Cutter Change Oil (When gears run warm) Gear Oil 1
3. Gear Box Impeller -do- -do- 1
4. Gear Box Distributor -do- -do- 1
5. Gear Differential -do- -do- 2
6. Gear Portal -do- -do- 4
7. Main Gear Box -do- -do- 1
8. Transfer case main gear box -do- -do- 1
9. Fuel filter Change fuel filter element 2

1	2	3	4	5
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DUETZ ENGINE

1. (a) Above + 20<sup>0</sup>C - Use SAE 30 Engine Oil  
 (b) From + 20<sup>0</sup>C to -10<sup>0</sup>C - Use SAE 20W/20 Engine Oil
2. Transmission Final Cutter and Impeller Drive Gear Box Oil  
 (a) Above + 20<sup>0</sup>C - Use SAE 90 Gear Oil  
 (b) Below + 20<sup>0</sup>C - Use SAE 80 Gear Oil
3. Hydraulic Oil - Use only KENDALL Hyken Super Black Hydraulic Oil as recommended by the manufacturer.
4. Grease Grades  
 (a) Above + 15<sup>0</sup>C - Use Grease No.2  
 (b) From + 15<sup>0</sup>C to -10<sup>0</sup>C - Use Grease No.1  
 (c) Below -10<sup>0</sup>C - Use Grease No.0

Notes :-

1. Refueling of diesel tanks must be done at the end of day's work to give enough time for setting down the water and sediments.
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3. Do not attempt to adjust the FIP and Governor since it is not a normal Field Repairs.
4. Clean grease nipples and lubricate with high pressure pump (replaced damaged nipples).
5. Replace the bolts, nuts or screw which are missing or damaged( eg. Head rounded, elongated, Cross threaded)
6. Watch for metal particles or other foreign material in the drained oil, report accordingly to Workshop.
7. Check and adjust valve clearance when engine is cold.

Contd...10

1	2	3	4	5
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500 HOURS MAINTENANCE TASK

1.	General	Carry out 10, 50, 100, 250 and 300 hours maintenance task.		
2.	Hydraulic Oil	Change Hydraulic Oil after first 500 hrs of operation and then after every 1000 hours	Hydraulic Oil	1
3.	Flame type heater	Test flame type heater plug		2
4.	Temperature indicator	Test temperature indicator for efficient working		1
5.	Injectors	Check Injectors and adjust if required as per manufacturer's recommendation.		10

OIL AND GREASE GRADES ASSEMBLY WISE USE OF DUETZ ENGINE

1. (a) Above + 20<sup>0</sup>C - Use SAE 30 Engine Oil  
 (b) From + 20<sup>0</sup>C to -10<sup>0</sup>C - Use SAE 20W/20 Engine Oil
2. Transmission Final Cutter and Impeller Drive Gear Box Oil  
 (a) Above + 20<sup>0</sup>C - Use SAE 90 Gear Oil  
 (b) Below + 20<sup>0</sup>C - Use SAE 80 Gear Oil
3. Hydraulic Oil - Use only KENDALL Hyken Super Black Hydraulic Oil as recommended by the manufacturer.
4. Grease Grades  
 (a) Above + 15<sup>0</sup>C - Use Grease No.2  
 (b) From + 15<sup>0</sup>C to -10<sup>0</sup>C - Use Grease No.1  
 (c) Below -10<sup>0</sup>C - Use Grease No.0

Notes :-

1. Refueling of diesel tanks must be done at the end of day's work to give enough time for setting down the water and sediments.

Contd...11

1	2	3	4	5
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2. If excessive foam is seen in the Hydraulic tank, it may be due to poor quality of oil or use of too little oil. Change Hydraulic oil or refill as required.
3. Do not attempt to adjust the FIP and Governor since it is not a normal Field Repairs.
4. Clean grease nipples and lubricate with high pressure pump (replaced damaged nipples).
5. Replace the bolts, nuts or screw which are missing or damaged( eg. Head rounded, elongated, Cross threaded)
6. Watch for metal particles or other foreign material in the drained oil, report accordingly to Workshop.
7. Check and adjust valve clearance when engine is cold.

1000 HOURS MAINTENANCE TASK

1.	General	Carry out 10, 50, 100, 250, 300 and 500 hours maintenance task.		
2.	Hydraulic Oil	Change Hydraulic Oil	Hydraulic Oil	1
3.	Alternator	Check alternator		
4.	Starter Motor	Check starter motor		
5.	Hydraulic Pumps	Inspect repair or replace worn out parts.		4
6.	Control valves and linkage	Check and carry out necessary repair or replace defective parts.		
7.	Hydraulic cylinders hose and fittings	Inspect and repair/replace defective component.		
8.	Cutter drum and cutter blades	-do-		
9.	Impeller	Inspect and repair as required.		
10.	Bowl assy	Repair/rebuild/replace worn out components.		
11.	Injection pump	Check Injection Pump		

Contd....12

1	2	3	4	5
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OIL AND GREASE GRADES ASSEMBLY WISE USE OF DUETZ ENGINE

1. (a) Above + 20<sup>0</sup>C - Use SAE 30 Engine Oil  
 (b) From + 20<sup>0</sup>C to -10<sup>0</sup>C - Use SAE 20W/20 Engine Oil
2. Transmission Final Cutter and Impeller Drive Gear Box Oil  
 (a) Above + 20<sup>0</sup>C - Use SAE 90 Gear Oil  
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3. Hydraulic Oil - Use only KENDALL Hyken Super Black Hydraulic Oil as recommended by the manufacturer.
4. Grease Grades  
 (a) Above + 15<sup>0</sup>C - Use Grease No.2  
 (b) From + 15<sup>0</sup>C to -10<sup>0</sup>C - Use Grease No.1  
 (c) Below -10<sup>0</sup>C - Use Grease No.0

Notes :-

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4. Clean grease nipples and lubricate with high pressure pump (replaced damaged nipples).
5. Replace the bolts, nuts or screw which are missing or damaged( eg. Head rounded, elongated, Cross threaded)
6. Watch for metal particles or other foreign material in the drained oil, report accordingly to Workshop.
7. Check and adjust valve clearance when engine is cold.

**CHECK CARD : PREVENTIVE MAINTENANCE**  
**ORIGINAL/DUPLICATE**

- |                     |                        |   |  |
|---------------------|------------------------|---|--|
| 1. Project .....    | 4. Make & Type of Eqpt | ROTARY<br>SNOW<br>PLOUGH<br>ROLBA<br>R-1200 | <u>Action</u><br>After carrying out the preventive Maintenance Task, Mobile maintenance Team will enter its date in the months column below and initial. |
| 2. Task Force ..... | 5. BA/EM No. ....      |   |  |
| 3. Unit .....       | 6. Location .....      |   |  |

S/No.	Task	J	F	M	A	M	J	J	A	S	O	N	D
1	<u>10 Hours</u>												
	(a)												
	(b)												
	(c)												
	(d)												
2	<u>50 Hours</u>												
	(a)												
	(b)												
	(c)												
	(d)												
3	<u>100 Hours</u>												
	(a)												
	(b)												
4	<u>250 Hours</u>												
	(a)												
	(b)												
5	<u>300 Hours</u>												
	(a)												
	(b)												
6	<u>500 Hours</u>												
	(a)												
	(b)												
7	<u>1000 Hours</u>												
	(a)												

Signature of SO-1/SO-2 EME Project .....

Date .....

Remarks

.....

Note : Columns 'J' to 'D' stands for months of the year.