

DIRECTORATE GENERAL BORDER ROADS
GENERAL MAINTENANCE INSTRUCTION NO.209
ON
HYDROSTATIC PAVER FINISHER WITH SENSOR DEVICE
MODEL APOLLO BG-220

1. **INTRODUCTION**

Apollo Model BG-220 Hydrostatic Paver Finisher is a hydraulically operated self propelled equipment designed for laying a mat of premix material (bituminous mix) road base etc. It is designed as a variable width screed paving unit. It paves from 2.5 M to 4.75 M without the need of bolt on extensions. It can pave a max 6.00 M width with bolt on extensions.

It is powered with 6 cylinder Kirloskar HA-694 air cooled diesel engine developing 85 BHP at 2000 rpm. It is fitted with a cold starting device also .

2. **AIM**

To lay down the details of periodical maintenance and lubrication and safety precautions in respect of Apollo paver Finisher BG-220 with sensor to achieve enhanced life.

3. **ACTION BY**

a) **USER UNIT :-** To carry out periodic maintenance tasks as laid down in this maintenance instruction and also follow safety precautions for optimum utilization.

b) **FIELD WKSP (GREF)**

i) To check & ask user unit to update the records of maintenance and lubrication of the equipment during its inspection as per maint schedule given in this instruction.

(ii) To advise user units in respect of any discrepancy noticed.

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4. **DETAILS**

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|-----|---|------------|
| a) | General & Periodical service schedule | - Appx 'A' |
| b) | Lubrication chart & recommended | - Appx 'B' |
| (c) | Safety precautions before starting and during operation | - Appx 'C' |
| (d) | Do's and Don't's | - Appx 'D' |

Please ack receipt.

Sdxxxxxxx
(Hans Raj)
SE (E&M), SG
Director (Tech)
For Dir Gen Border Roads

Dated : 13 Aug 1999

Distribution :-

Normal

DETAILS OF GENERAL, PERIODICAL SERVICE SCHEDULE

1. **GENERAL**

- (i) Read and heed all machine mounted safety signs before starting, operating, maintaining, fueling or servicing the machine.
- (ii) Make sure that the machine is on a flat and firm base, when carrying out repair and maintenance work.
- (iii) Machine should not be serviced with anyone in the operator's seat unless they are qualified enough to operate the machine and are in the servicing
- (iv) Attach a warning sign to the steering wheel if the machine is defective.
- (v) Never place head, body, limbs, fingers, feet or hands into an exposed portion between uncontrolled or unguarded scissors points of machine without first providing secure blocking.
- (vi) never service or adjust a machine with the engine running
- (vii) Disconnect batteries and TAG all the controls to warn that work is in progress.
- (viii) Never check or fill fuel tanks, storage batteries or starter fluid near lighted smoking materials or open flame, due to the presence of inflammable fluid.
- (ix) Never align holes with finger or hands, use the proper aligning tool.
- (x) Remove sharp edges and burrs from the reworked parts.
- (xi) Lift and handle all heavy parts with a lifting device of proper capacity.
- (xii) Never place Gasoline or Diesel fuel in an open pan.

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- (xiii) Never use Gasoline or other flammable fluid for cleaning the parts of machine, Use authorized commercial nonflammable and nontoxic solvents for cleanings.
- (xiv) Do not run engine of this machine in closed area without proper ventilation to remove deadly toxic gases.
- (xv) Do not use an open flame as a lighted source to look for leakages or for inspection anywhere on the machine.
- (xvi) Move carefully under or near the machine during maintenance work
- (xvii) Do not pile oily and greasy rags as they may cause fire hazards. Store them in a container.
- (xviii) Do not carry loose parts that might fall unnoticed into open
- (xix) Before starting machine or moving attachments check and adjust and look operator's seat. Be sure all personnel in the area are clear before starting or moving machine and any of its attachments.

PERIODICAL MAINTENANCE

2. Every 8-10 operating hours/daily

- (i) Grease the Auger shaft Bearings.
- (ii) Grease the Vibrators shaft Bearings
- (iii) Check engine oil level and top up required
- (iv) Check hydraulic oil level
- (v) Grease the traction clutch shifter
- (vi) Oiling of all roller chains and steering should be done
- (vii) Grease the conveyor roller, main drive shaft (pedestal) and conveyor clutch shifter.

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- (viii) Fill diesel tank after day's work to avoid condensation of water
- (ix) Grease chain sprocket bearing and screed shaft universal joints
- (x) Carry out visual inspection for any damage
- (xi) Check electrically operates, mentioned equipment/gauges for correct functioning.

3. **Every 50 operating hours/weekly**

- i) Carry out 50 operation hours maintenance tasks.
- ii) Grease the bush hollow front wheel rear wheel front king pln, bumper pin and hopper gear operating screw.
- iii) Air cleaner filter to be cleaned and fitted.
- iv) Check and fill hydraulic oil tank and the hydraulic tank filter
- v) grease the steering cylinders bearing (4 points)
- vi) Check and fill four speed gear box, differential gear box conveyor gear box and steering gear box with correct quantity or gear oil.
- vii) Clean out side of battery.
- viii) Check acid level of battery and top up with distilled water only, if required.
- ix) Apply mineral jelly coat to the cable terminals to prevent corrosion.

4. **Every 100 operating hours**

- (i) Carry out 10 & 50 operating hours tasks
- (ii) Clean the cooling system
- (iii) First change of engine oil

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5. **Every 250 operating hours**

- (i) Carry out 10, 50 and 100 operating hours maintenance
- (ii) Change engine oil
- (iii) Clean cooling pins of the engine
- (iv) First change hydraulic oil
- (v) Replace oil filter element
- (vi) Blow cooling with compressed air

6. **Every 500 operating hours**

- (i) Carry out 10,50,100 operating hours maintenance tasks
- (ii) Clean the fuel tank
- (iii) Grease the conveyor rollese
- (iv) Check electric exciter circuit

7. **Every 1000 operating hours**

- (i) Carry out 10,50,100,250 & 500 operating hours maintenance tasks
- (ii) Clean fuel pump strainer
- (iii) Replace Fuel Filter
- (iv) Change Gear Oil in Gear Boxes
- (v) Change Hydraulic Oil in Hydraulic Tank

Annexure –‘I’ to Appendix ‘B’ of GMI 209

RECOMMENDED OIL AND GREASE

Hydraulic Oil	Indian Oil Hindustan Petroleum	Servo System – 100 HENKLO – 100
Gear Oil	Indian Oil Hindustan Petroleum	Servo System HP-90/140 HP Gear EP 90/140
Engine Oil	Indian Oil	Servo Multi grade 20W 40
Grease	Indian Oil	Servo Grease MP/
Transmission Oil	Indian Oil	Servo Grease HP 90/140

Equivalent grades of other oil companies may also be used

SAFETY PRECAUTIONS BEFORE STARTING AND DURING OPERATION

1. **Safety precautions :-**

- (i) Make sure that you are familiar with all the accessories of your machines
- (ii) Do not give the machine until you are fully familiar with all the operating and control levers and know precisely how your machine works.
- (iii) Do not wear rings, wristwatches, jewelry, loose or hanging apparel such as ties. Torn clothing scarves unbuttoned jackets etc, that on moving parts. Do wear proper safety equipment as per requirements for the job.
- (iv) Familiarize yourself with the area where you will be working
- (v) Get off the machine only when it is strictly stopped
- (vi) Keep away from the machine's articulation area when the engine is running

2. **Prior to the start**

- (i) Check the machine for any obvious faults.
- (ii) Do not drive the machine if any instrument control element is defective.
- (iii) All protective devices must be properly secured
- (iv) Before climbing into the machine make sure that there are no person or obstacle near or under the machine
- (v) Keep the machine free of all oily or combustible materials

3. **Starting**

- (i) All control levers must be in neutral position before starting the engine
- (ii) Only start the engine from the operator's seat.
- (iii) Check all the indicators after starting the engine to make sure that everything is functioning properly.

- (iv) Machine case are toxic, always ensure an adequate supply of fuel when starting the engine indoors.
- (v) Do not leave the machine unattended with the engine in running time.
- (vi) Obey safety signals and signs.
- (vii) Never the starter fluid near lighted smoking materials or open flame or sparks as the starting fluid is flammable.
- (viii) Ensure that sensor unit is installed and required levels are adjusted in slops control and grade control units.

4. **Operation**

- (i) Inspect wheel bolts and tracks for looseness before each shift. Tighten if required
- (ii) Keep operator's area clear of loose objects
- (iii) Be sure of exposed personnel in the area of operation are clear of the unit before moving the machine or its attachments.
- (iv) Never coast the machine down grades and slopes with transmission in neutral on power shift machine or clutch disengaged on manually shifted machines.
- (v) Do not operate the machine with breaks out of adjustment.
- (vi) To reduce the plunger of an uncontrolled machine choose a gear speed before proceeding down grade will hold the machine to proper speeds condition.
- (vii) Maintain a safe distance from machines. Provide sufficient clearance for ground and visibility conditions. Yield right of way to leaded machine.

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- (viii) Maintaining loar vision of all areas of travel
- (ix) If engine has a tendency to stall for any reason under load or late, report this for adjustment to a proper maintenance authority immediately. Do not continue to operate machines until condition has been corrected
- (x) Watch out for unusual noises or smoke when operating the machine.
- (xi) Operate machine at speeds appropriate to the area and surroundings and slowly enough to ensure complete control at all times.
- (xii) Always be aware of prossesure of people in the work site.

POINTS

1. No authorized person should be allowed to operate, service or maintain this machine.
2. Do not use controls or hoses as hand holds when climbing on off the machine
3. Do not put machine in motion with anyone standing on top of the machine, in the hopper or on the side arms.
4. When working on stress or highway, do not step in traffic lane before making sure that no car or trucks are approaching.

Note: - Separate instruction manual of Engine, Paver and Sensor unit have been issued with each Paver model BG-220, It is essential to follow the manufacturer's recommendations.

Appendix 'A' to GMI No.209

LUBRICATION CHART

S/No.	Assy/Components	Operating hours	Nos of points	Type of	Qty	Remarks
1	2	3	4	5	6	7
1.	Screw conveyer bearing	10	4	Servo Gen Grease No.2 to 3	50 gms	Grease while hot
2.	Feeder foot shaft bearing	„	4	-do-	„	-do-
3.	Feed head shaft bearing	„	4	-do-	„	-do-
4.	Hydraulic oil tank	„	1	-	--	Check level at sight guage
5.	Thickness control screw (upper bags)	50	2	Servo Gen grease No.2 & 5)	100 gms	
6.	Thickness control screw (THD body)	„	2	-do-	50 gms	
7.	Thickness control screw (U Joint)	„	2	-do-	50 gms	
8.	Clutch through out bearing	„		-do-	100 gms	
9.	Steering cylinder rod end	„	2 each side	-do-	100 gms	
10	Steering Gen Rod	50	4	Servo Gem Grease No. 2 & 5	100 gms	
11	Bogie wheel frame pivot	„	2	-do-	100 gms	1 each side
12	Hopper cylinder ends	„	2 each side	-do-	200 gms	

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1	2	3	4	5	6	7
13	Bogie wheel king pins	„	8	-do-	200 gms	
14	Feeder foot shaft take slides	„	-	-do-	--	Each wheel
15	Vibrator slip shaft U joint	„	3	-do-	100 gms	
16	Vibrator shaft bearing	„	4	-do-	200 gms	
17	Gear box	„	1	EP-90	-	Check level at
18	Cylinders	„	2	Super Duty Brake Fluid	-	Fill if low
19	Drive motor reducer	„	2 each side	EP-90	50 gms	
20	Wheel drive 2 –SP	„	1	HM	-	Check level
21	Hydraulic oil filter	250	All	-	-	Replace first 50 hrs and thereafter every 250 hrs
22	Wheel drive axle	500	2	Servo Grease No. 2 & 3	50 gms	-
23	Brake slave cylinder	„	2	-do-	50 gms	-
24	Bogic wheel	1000 or seasonal	4	-do-	-	Clean and repack
25	Drive chain	-	-	-		Coat with used oil
26	Drive motor reducer	„	2	EP-90	500 ml	Drain flush and refill. Do not pressure fill
27	Gear box	„	1	-do-	-	Drain flush and refill
28	Hydraulic oil tank	„	1	LNCIC 100	-	Drain flush and refill Clean strainer

