

**DIRECTORATE GENERAL BORDER RODERS**  
**GENERAL MAINTENANCE INSTRUCTION NO – 200**  
**ON**  
**APOLLO BITUMEN SPRAYER (PRESSURE DISTRIBUTOR)**

**1. INTRODUCTION**

Bitumen pressure Distributor manufactured by M/S APPOLLO Earth Mover Pvt Ltd. is having a self heating arrangement with bitumen pump and full circulating sprayer bar fitted with nozzles designed to spray bitumen uniformly (unbroken spray) at the specified temperature and rates. Bitumen capacities 3000/4000 and 6000 ltrs mounted on TATA TRUCK 4X2 chassis having WB-4225 mm. It has newly inducted in the BRO.

Regular servicing and preventive maintenance are essential to prolong the life of equipment, to ensure timely repairs, to attest defects from developing into major once, to optimize operation minimum breakdown and down time losses.

**2. AIM**

To enumerate the details of periodic and preventive maintenance and lubrication of APOLLO BITUMEN SPRAYER (PRESSURE DISTRIBUTOR) having 3000/4000/6000 ltrs capacity.

**3. ACTION BY**

- (a) USER UNITS: To carry out periodic inspection, regular servicing and preventive maintenance task as laid down.
- (b) FIELD WORKSHOP (GREF) :-
  - (i) To check the record of “Maintenance and Lubrication “in the log book of equipment during its inspection and repairs if carried as per maintenance and lubrication schedule given in this instruction.
- (c) MOBILE MAINTENANCE TEAM : To carry out maintenance and preventive maintenance as per schedule laid down and Commander TF/OC wksp be apprised about short comings.

**4. DETAILS:-**

These instructions cover the following:-

- (a) Maintenance schedule including DO's and Donots - Appendix 'A'
  - (b) Cleaning procedure of Bitumen spraying lines and Technical specification/ data - Appendix 'B'
5. For the regular maintenance and preventive repair of Tata Vehicle, please refer GMI No 177.
6. Please ack receipt.

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Dated: 18/Jan/1995

**PERIODICAL MAINTENANCE SCHEDULE**

**1. DAILY OR 8-10 OPERATING HOURS OF OPERATION**

- 1.1 Clean the bitumen spray line at the end of days works or in case if pause of more than one hour (See cleaning procedure in Appendix 'B')
- 1.2 Clean oil burner filter.
- 1.3 Grease nearing of the bitumen pump by 1.2 turn of grease cups which are painted red (use servo grease HP)
- 1.4 Check and clean compressor air filter of dusty.
- 1.5 Check and clean compressor. Top up with correct grade of oil if required (SAE40)
- 1.6 Clean piston rod of the slew cylinder at spray bar with diesel oil.
- 1.7 Check all screws nuts fastening points and tight ended or replaced, if necessary.
- 1.8 Drain water from air receiver of compressor.
- 1.9 Check compressor belt tension, if required adjust it.

**2. WEEKLY OR 50 HOURS OF OPERATION**

- 2.1 Clean oil tank to remove solid oil sediments.
- 2.2 Clean control valve of burner more frequently.

**3. MONTHLY OR 125 TO 200 HOURS OF OPERATION**

- 3.1 Clean air reservoir by the drain plug.
- 3.2 Clean suction filter of compressor at every 200 hrs run or earlier depending upon dust contents.

**4. THREE MONTHLY OR 500HRS OF OPERATION**

- 4.1 Change air compressor oil
- 4.2 Clean breather valve compressor checked for perfect seating.

**DO AND DO NOTS**

**DO's.**

1. Only person who exactly know how to use the sprayer are allowed to start it.
2. If anything fails the operator has to shutdown the engine immediately.
3. When heating up the bitumen take care that fire tube are still covered with at least 100mm of bitumen.
4. Before heating up makes sure that the filling of the tank does not exceed 90% of maximum.
5. Always stop heating before starting spraying operation.
6. When starting sprayer under cold condition pump and safety valve have to be PREHEATED.
7. In order to avoid sticking of sprayer valves and nozzles it is essential to preheat the sprayer properly.
8. When spraying with full spray bar width the engine must work on maximum number of revolution in order to maintain spraying pressure of 3 bars.
9. prior to starting the bitumen pump must be filled with bitumen of the delivery side. Three way cock (between bitumen pump and filter) is to be put into position "spraying".
10. When pause less then approx five minutes, close the nozzles by air valve (for opening and closing of the bar nozzles) disengage clutch.

11. When pause of five minutes to approx one hour, circulate the material through spray bar to avoid cooling it down. Low RPM of engine advisable, Keep the clutch engaged.

**DO NOTs**

1. Do not start the bitumen sprayer before having checked all safety and service devices.
2. Do not run engine while overhauling or servicing the sprayer. Check all devices before starting again.
3. Under working conditions and at warm temperature no preheating is necessary.
4. Never start the bitumen pump with closed three way cock (between bitumen pump and filter).
5. Do not draw in solid matter content when sucking in material from external tanks
6. Do not neglect routines attentions
7. Do not allow any leakage in the system.
8. Do not needle with any adjustment or setting un-necessary.
9. Do not use cleaning agent when changing oil.

**CLEARING OF THE BITUMEN SPRAYING LINES WITH DIESEL OIL**

While the bitumen pump keeps on running slowly, change over the valves as follow:-  
Three –way cock (between bitumen pump and filter (Blue) in position “spraying” .

Return valve, (regulating valve for spraying pressure (red) in position “Closed)”

Three-way cock, (at the tank) in position “Closed)”.

Air + diesel valve, in position “Open” cleaning through nozzle.

The complete filling of the Diesel tank is to be used few cleaning thoroughly the whole bitumen circuit. Afterwards all valves must be closed accordingly. Finally both elbows of the bitumen circuit, placed below the spray bar are to be dismantled, cleaned a reinstalled.

**CLEANING WITH “PRESSURE CLEANING SYSTEM” (PCS)**

While the bitumen pump keeps on running slowly change over the valves as follows:-  
Diesel valve in position “closed”.

Three way cock, 2”(between bitumen pump and filter (Blue) in position “Spraying”.

Return valve, (regulating valve for spraying pressure (red) in position open “

Three –way cock, 3” (at the tank (green) kin position “Closed” ,

Wait for a few minutes until the bitumen nearly stops flowing back to tank, Go on:-

Return valve (regulating valve for spraying pressure) in position “Closed”

Solenoid valve, in position “Open” cleaning through nozzles, air valve , in position “Open”

Now air pressure pushes remnants of bitumen out through spray bar nozzles.

After application of the “pressure cleaning system” close air valve.

Technical Specification for Apollo Bitumen Pressure Distributor Model ATN 3000/4000

**1. BITUMINE TANK**

- (a) Capacity : 3000/4000 Liters
- (b) Thickness : 4mm
- (c) Shape : Rectangular/over shape
- (d) Insulation : Light resin bonded Rock wool mattress having 100 kgs/ cum density with 3/4' x 24 gauge wire netting one side and 2" size on the other.
- (e) Man Hole : 600 mm dia
- (f) Filter : Removable screen filter.
- (g) Filling of tank: - : (i) Through manhole  
: (ii) Self priming by own pump
- (h) Temperature: - : Dial type thermometer of range 0-250 degree C
- (j) Tank contents measurement : With calibrated dip stick.

**2. AUXILLARY ENGINE**

- (a) Engine : Single stage twin cylinder air cooled diesel engine of 14.3/25HP at 2000 RPM "KIRLOSKAR" Engine model HA 294/TA2.
- (b) Bitumen pump : Gear type 380 to 450 ltrs per minute.
- (c) Compressor : Double cylinder 3HP PR 9/10 kg/sq cm maximum 13,5 CFT capacity 368 ltrs, make SLGI Model SC -30/3 WCP.

**3. HEATING**

- (a) Type of Burner : Single high pressure oil burner for adequate heating of viscose binder, oil consumption 20 ltrs/ hrs (Make: - Vacunair Engg co Ahmedabad)
- (b) Tank capacity : 50 ltrs
- (c) Fire tube : (230 mm dia x 5500 mm long)/ 4000 ltrs capacity.

**4. SPRAY BAR**

- (a) Type : Folding type fitted with pressure gauge regulating valve etc.
- (b) Width : Variable width from 2.4 mtrs to 4.2 mtrs extension bar.
- (c) Adjustment of width : By closing nozzles.
- (d) Adjustment of height : Mechanical
- (e) Pre-heating of spray : By full circulation of preheated bitumen.
- (f) Distance of nozzles : 225 mm
- (g) Spraying pressure : To be adjusted 0-6 bar.
- (h) Hand lances : 2 Nos
- (j) Cleaning : (i) By air pressure

(k) Rate of application : (ii) By diesel oil.  
0,3 to 1,0 kg per sq mtr , Calibration chart is provided inside the driver' s cabin and at the operator' s platform.

**5. OPERATION**

: The operation of the Spray bar is from operator' s platform at the rear.