

**DIRECTORATE GENERAL BORDER ROADS**

**GENERAL MAINTANENCE INSTRUCTION No 196**

**OF**

**STEYR- DIAMLER PUCH AG 83 TK SNOW CLEARING MACHINE**

**ON**

**MAINTENANCE PREVENTIVE MAINTENANCE AND LUBRICANTIONS**

**1. Introduction:-**

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

**2. Aim:-**

(a) To enumerate the details of periodic and preventive maintenance and lubrication of STEYER-DIAMDER PUCH AG 83TK SNOW CLEARING MACHINE.

(b) Issue CHECK CARD for use by Mobile Maintenance Team

**3. Action by.**

(a) User Units. To carry out periodic inspection regular servicing and preventive maintenance tasks as laid down.

(b) Field Workshops (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) Advise user units in respects of any discrepancy/ short comings noticed.

(c) Mobile Maintenance Team. To ensure and lubrication maintenance is carried and report accordingly to OC Filed Workshop for necessary action.

**4. Details**

This instruction cover the following :-

(a) Periodic maintenance task and safety Precaution - Appendix 'A'

(b) Oil and lubrication capacity and Periodicity and check card. - Appendix 'B'

(c) Technical Performance DATA - Appendix 'C'

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For Dir Gen Border Roads

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**LUBRICATION OF STEEYR – DIAMLER AG 83TK SNOW CLEARING MACHINE****Daily Checks**

1. Check engine oil level. Read off the oil level when engine is stopped and eqpt standing on level ground.
2. At low air temperature pay attention to the viscosity of the engine oil. Start the engine, only when viscosity range of the oil and prevailing air temperature allows the same.
3. Check cooling water level. The cooling agent must come upto the lower edge of the filler neck.
4. Fill up fuel tank at the end of the day to prevent condensation, when the air in the tank cools. Fill up daily, where possible.
5. Clean pre-filter on fuel delivery pumps, this is essential daily in case of serious impurities in the fuel.
6. Check brake, lights, flasher etc , tyre condition and air pressure.
7. Check carefully all indicators light on dash board.
  - (a) If hydraulic oil filter indicator glows 'RED' It means filter element requires change.
  - (b) Engine oil pressure indicator bulb (RED) must go out when engine is running
  - (c) If dry air filter indicator glows orange it means require servicing.
  - (d) Charging controls (red) must go out when engine is running.
8. Check often the tight fit if the wheels.

### INTERNAL 30 HRS MAINTENANCE TASK

S/No	Items/Assy	Maintenance instruction
1.	Engine	(a) Change engine oil (1 st change 30 hrs run subsequently at every 250 hrs Run) (b) Change oil filter element (c) clean fuel prefilter at the supply pump (d) Dry air filter-test electro, vacuum indicator (atleast once a year) (e) Check condition and tension of V- belts (f) Check and adjust valve clearance. (g) Check mixture and speed control lever for correct adjustment.
2.	Transmission (mechanical drive gear box, side gear boxes four wheel drive, change gear for power lift take-off)	(a) Check oil level, refill if required. (b) clean breather.
3.	Hydraulic systems (Traction drive, power lift and steering )	(a) Check hydraulic oil level (top up if necessary). (b) Check hydraulic line for tightness ( visual check)
4.	Brakes	(a) Check function of brake system. (b) Check break fluid level.
5.	Front axle	(a) Check oil level. (b)Check Toe-in. (c) Clean breather.
6.	General	(a) Check Roadworthiness, restore if necessary (b) Re-tighten all accessible fixing bolts and flange connections. (c) Re-tighten connections for fuel; coolant intake exhaust' hydraulic, steering and brake lines. (d) Functional check of all controls. (e) Lubricate all pressure- lubrication point. <u>Note This Task should carried at every 60 hrs of weekly</u> (f) Check freedom of movement of all control levers. (g) Re-tighten wheel nuts. (h) Functional check of electrical system, battery and acid level.

<b><u>250 HRS MAINTENANCE TASK</u></b>		
1.	Engine	(a) Carry out 30 hrs maintenance task (b) Clean dry air filter (c) Check and adjust injection nozzle pressure.
2.	Transmission	(a) Change transmission oil. Note:- 1 <sup>st</sup> change at 250 hrs run subsequently at every 250 hrs run
3.	Hydraulic System	(a) Check hydraulic oil level top up if necessary. (b) Check hydraulic lines for tightness
4.	Brakes	Carry out 30 hrs maintenance check.
5.	Front axle	Clean breather.
6.	General	Carry out 30 hrs maintenance check

<b><u>500 HRS MAINTENANCE TASK</u></b>		
1.	Engine	(a) Change engine oil (b) Change oil filter (c) Clean fuel filter (d) Replace fuel pre-filter at supply pump. (e) Clean dry air filter when signal lights up on dashboard. (f) Check condition and tension of V-belts (g) Check and adjust valve clearance.
2.	Transmission	(a) Check oil level top up if necessary (b) Clean breather
3.	Hydraulic system	(a) Check hydraulic lines for tightness. (b) Change hydraulic intake filter cartridge and filter element (top up oil if necessary )
4.	Brakes	(a) Carry out 250 hrs maintenance task
5.	Front axle	(a) Carry out 30hrs maintenance task
6.	Generals	(a) Carry out 250 hrs maintenance check

### **750 HRS MAINTENANCE**

1.	Engine	(a) Change engine oil (b) Change oil filter (c) Clean the fuel pre-filter at the supply pump. (d) Clean dry air filter when signal lights up on Dash board. (e) Check condition and tension of V-belts.
2.	Hydraulic system	(a) Check hydraulic oil level.
3.	Generals	(b) Lubrication all pressure lubrication points every 60 hrs or weekly.

<b><u>1000 HRS MAINTENANCE</u></b>		
1.	Engine	(a) Carry out 500 hrs maint task (b) Test electr vacuum indicator of DRY AIR FILTER (at ;east once a year ) (c) Check functional of Thermostat by thermometer. (d) Check mixture and speed control levers for correct adjustment
2.	Transmission	(a) Change oil ( at least every 2 years ) (b) Clean breather.
3.	Hydraulic system	(a) Carry out 500 hrs maintenance task.
4.	Brake system	(a) Carry out 500 hrs maintenance task.
5.	Front axle	(a) Change oil (drive and planetary gears) (Frequency of oil change is at every 1000 hrs)
6.	General	(a) Carry out 500 hrs maintenance task.
<p>Note :- (a) Replace safety cartridge in dry air filter after cleaning after cleaning main cartridge 5 times or every two year. (b) Change engine coolant fluid at 1000 operating hrs or every two years. (c) Lubricants all pressure lubrication points every 60 hrs operating hrs or weekly.</p>		

### **SAFETY PRECAUTION**

When working always bears safety in mind, because an accident means loss of working time.

- (a) Wear the right work cloths, tight fitting, so that they cannot get caught in moving or projecting parts.
- (b) Always use steps when entering or leaving the cab.
- (c) Before starting, make sure that nobody is standing near the equipment.
- (d) DO NOT JUMP ON OR OFF WHILE DRIVING.
- (e) Maintenance jobs to be done with stopped engine only.
- (f) Do not pour away carelessly operating agents such as mineral oils, benzene, antifreeze, fuel residues, paints thinners, solvents.
- (g) Never fill any operating agents in beverage bottles store break fluid and battery acid in adequately leveled original containers only.
- (h) Be-cautions when handling get increased fire hazard. Never do any refilling of fuels close to open flames or igniting sparks. Do not smoke while re-filling fuels, stop engine.
- (j) Do not operate eqpt when engine speed is below 1000 RPM
- (k) Do not start the engine until indicator lamp “START”
- (l) Do not run the engine will full load while it is cold.

**FREQUENCY OF OIL/FILTER CHANGES INDICATING EQUIVALENT OIL BY IOC LTD**

S.No	Assy	Capacity in ltrs	Periodicity of changes in Hrs/Run		Ambient temp	IOC	Remarks
			Oil	Filter			
1	2	3	4	5	6	7	8
1.	STYER 83TI Snow clearing machine ENGINE	19	1 <sup>st</sup> change 30hrs 2 <sup>nd</sup> change 250 hrs	30 hrs 250hrs	+30 <sup>0</sup> to -20 <sup>0</sup>	Servo super multigrade Low-30	
			Thereafter 250 hrs	250hrs	+5 <sup>0</sup> to - 30 <sup>0</sup> c	Multigrade Servo Super 5w 30	
					-5 <sup>0</sup> to below -30 <sup>0</sup> c	Multigrade Servo Super 5w 20	
<b>2. TRANSMISSION SYSTEM</b>							
	(Mechanical drive gear box side gear box, four wheel drive change gear for power take off )		1 <sup>st</sup> change 250 hrs 2 <sup>nd</sup> change 1000 hrs		All temp	Servo gear super 90	Clean breather 1 <sup>st</sup> 30 hrs thereafter 250 hrs
<b>3.HYDRAULIC SYSTEM</b>							
	(Traction drive power lift & steering )	58	1 <sup>st</sup> change 250 hrs run or once in a year	30 hrs 2 <sup>nd</sup> change 250hrs *Thereafter 500 hrs	All temp	Servo gear Super-90	*Hydraulic intake filter can trudge & filter element to be changed

4	Front axle	Differential- 5 side gears 2x0.5	1 <sup>st</sup> change 250 hrs 2 <sup>nd</sup> change 1000hrs There after 1000hrs	Clean breather 1 <sup>st</sup> 30hrs, 2 <sup>nd</sup> 1000hrs thereafter 1000hrs	All temp	Servo gear super - 90	
5.	All pressurized lubricants point	1 <sup>st</sup> 30 hrs Thereafter every 60 hrs or weekly	-	-	All temp	Servo gear MP	

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

- |                    |                  |           |  |
|--------------------|------------------|-----------|--|
| 1 Project: _____   | 4 Make & Type of | Snow      | <u>Action</u> After carrying out the preventive Maintenance Task, Mobile Maintenance team will enter its date in the months column below and initial |
| 2 Task force _____ | Eqpt _____       | clearing  |  |
| 3 Unit _____       | 5 BA/EM _____    | Eqpt 83Tf |  |
|                    | 6 Location _____ | Styer     |  |

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Signature of SOI/ SOII EME (P) \_\_\_\_\_

Date: \_\_\_\_\_

Remarks \_\_\_\_\_

Note: - Column 'j' to 'D' stands for month of the year.

### **Technical Performance Data**

(a) Engine:-

STEYR 6- Cylinder – diesel WD 616, 87, WATERCOOLED, WITH DIRECT INJECTION and exhaust-gas- turbo-charger, intercooled.

(b) Performance: 310 SAE HP / 280 DIN HP –on sea –level, output decrease  
Because of turbo charger and inter cooler not suffering  
remarkable- 3,000 m altitude

(c) Clearing capacity: - 2,500 m altitude)  
75 to snow per liter fuel consumption.

(d) Clearing height: Continuous clearing up to 200 cms.  
In steps up to 10 m and more in accordance to the terrain.

(e) Clearing width: 270 cms (snow cutter with 2 chuts)

(f) Casting distance:  
- Snow cutter 10-30 m) depending on the  
- Snow blower (up to 50) snow density

(g) Clearing speed: 0, 1-20 km/hr – stepless

(h) Traveling speed: 0-35 km /hr-stepless

(j) Operating weight: STEYR 83 TK 5,500 KG  
Snow cutter 1,600 kg  
Snow Blower 1,200 kg  
4 Pcs. Snow chains 250 kg

(k) Fuel consumption: Minimum 15 ltr./hr  
Maximum 33 ltr/hr

(i) Turning radius: inwards: 5, 0 m  
Outwards 8.7m

### **2. STANDARD EQUIPMENT**

(a) Panoramic cab: - Modified design  
- Strengthened cab frame  
- Slide windows on both sides  
- Side screens protected by safety gurus  
- Roof with sliding hatch  
- Front, rear and side outside mirrors provided with electric heating-  
ventilation and heating system for cab

(b) Illumination: 5 Halogen working lights  
2. Rotating yellow warning lights

(c) Differential locks Rear and front axle- automatically

(d) Brakes: -Service brake  
Auxiliary braking system  
Parking brake  
Steering brake

(e) Steering: Hydraulic, power assisted steering.

(f) Tyres: Driving axle: 18, 4-34  
Steering axle: 14-5-20  
GOOD YEAR SURE GRIP LUG

(g) Cooling liquid With external generator

- Pre-heating
- (h) Fuel pre –heating
  - (j) Flam-quick –starting system
  - (k) Adjustable injection pump for different working conditions

### **3. CARRIER VEHICLE DRIVE**

Hydrostatic vehicle drive with reversible variable speed pump and hydraulic drive engine.  
Portal drive axle with preset 3-range-speed reduction gear:

- I : 0-5 km/h
- II : 0-20 km/h
- III: 0-35 km/h

### **4. CUTTER /BLOWER IMPELLER DRIVE**

Mechanically through p.t.o. shaft (1,000 rpm) with quick coupling device.

### **5. SNOW CUTTER K 1110/2700 (HEAVY DUTY CUTTER DRUM)**

- (a) Snow handling system: Single stage cutter system
- (b) Diameter cutter assembly: 110 cms
- (c) Lifting height: + 50 cms
- (d) Down depression: - 5 cms
- (e) Lateral tilting k: 6Digree LH/6 DIGREE RH
- (f) Front tilting : 6 Degree hydraulic and 5 degree mechanic
- (g) RPM of drum: 300/min
- (h) Casting distance: 10-30 m
- (j) Protection against overload: shear bolt

### **SNOW BLOWER KST 130 (HEAVEY DUTY NLOWER WHEEL)**

- (a) Diameter blower assembly: 130 cms
- (b) Lifting height: + 50 cms
- (c) Down depression: - 5 cms
- (d) Lateral tilting: 6<sup>0</sup> LH / 6<sup>0</sup> RH
- (e) Front tilling: 6<sup>0</sup> hydraulic and 5<sup>0</sup> mechanics
- (f) RPM: 330/ min
- (g) Casting distance: up to 50 m
- (h) Protection against overload: Shear bolt



