

**DIRECTOR GENERAL BORDER ROADS**  
**GENERALS MAINTENANCE INSTRUCTION NO. 84**  
**ON**  
**MAINTENANCE AND LUBRICATION**  
**OF**  
**TRACTOR KOMATSU D80 A8**

**Introduction:-**

1. Regular servicing and periodical maintenance are essential to prolong its life of the equipment, ensure timely repairs to arrest defects from developing into majors ones, to work the equipment effectively at all times, minimize inopportune breakdowns and downtime losses

**Aim :-**

2. (a) To enumerate the details of periodic and preventive maintenance and lubrication of TRACTOR D-80-A8 KOMATSU.
- (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 Workshops (GREF) :-
  - (i) To check the 'Record of Maintenance and Lubrication' in the log book of the eqpt during its inspection and repairs, if carried out as per Maintenance and Lubrication schedules given in this instruction.
  - (ii) Advise user units in respect of any discrepancy noticed.

**Details:-**

4. Details of Maintenance and Lubrication along with the periodicity have been tabulated in Appendix 'A' to this instruction.

**PREVENTIVE MAINTENANCE – TRACTOR D-80 A-8 KOMATSU**

S/No.	Item/Assys	Maintenance Instruction	Lubrication	No of points
1	2	3	4	5
		<b><u>10 HOURS TASK</u></b>		
1	General	(a) Check oil, water or gas for leaks (b) Check for exhaust smoke colour, noise or vibration (c) Read all gauges & meters (d) Check all bolts and nuts if loose or deficient		
	<b><u>Oil levels</u></b>			
2	Engine sump	Check oil level in oil sump and top up if necessary	Engine oil	1
3	Main clutch	Check oil level and top up if necessary	Engine oil	1
4	Hydraulic Booster case	Check oil level and top up if necessary	Engine oil	1
5	Transmission case (incl bevel gear shaft compartment)	Check oil level & top up	Gear oil	1
6	Fuel tank	Drain sediments and water from sediment trap drain plug		1
7	Fuel filter	Drain sediments and water from sediment trap drain plug		1
8	Cooling system	Top up coolant level		1
9	Fuel tank starting engine	Check fuel level		1
10	Final drive	Check for oil leaks and rectify		2
11	Under carriage	(a) Remove and clean (b) check rollers and idlers for oil leaks (c) Check rollers and idlers for wear.		
12	Blade Equipment	(a) Check blade 'C' frame for distortion cracks or damage (b) Check all cutting edges and bits for wear/damage (c) Check upper and lower starts pins and bushes for wear and tear (d) Check all mounting bolts and bushings for looseness or wear		1 4 or 5 1
13	Hydraulic system	(a) Check cylinder for oil leaks (b) Check all piping and hose connection for oil leaks or damage		2

**LUBRICANTS & GREASE**

Note :-

1. Engine oil

(a)	Above 10 <sup>0</sup> C	-	Use SAE 30 ¼ HD 30
(b)	+ 10 <sup>0</sup> C to - 20 <sup>0</sup> C	-	Use SAE 10/HD 10
(c)	Below - 20 <sup>0</sup> C	-	Use SAE 10/HD 10 +10% KERO

2. Gear oil

- |     |  |   |                             |
|-----|--|---|-----------------------------|
| (a) | Above 35 <sup>0</sup> C                    | - | Use SAE 140                 |
| (b) | + 35 <sup>0</sup> C to - 20 <sup>0</sup> C | - | Use SAE 10/HD 10            |
| (c) | Below - 20 <sup>0</sup> C                  | - | Use SAE 10/HD + 10% KEROOil |

3. To prevent oil leakage, tighten up all nuts & bolts of the final drive compartment. If not rectified, suggest unit to report to the field wksp.

4. If leak is not rectified, suggest unit to report to fields' workshop for repairs

5. There are two end bits and 3 cutting edges in tractor serial 1001 to 3409 and two and bits and two cutting edges on tractor serial No. 4001 and above.

6. Refueling of fuel tank must be carried out during last parade so as to give enough time for sediment and water to settle down into the sediment trap.

M/s KIRLOSKAR CUMMINS has recommended use of series 2 Engine oil only.US Mil specification and their equitant recommended are as under :-

Grade	US Mil	Indian Oil	Burmah Shell
SAE 30	L-2104A	1130	Rotella 30

EVERY 50 HOURS MAINTENANCE TASKS

1	-	Carry out 10 hours maintenance tasks.	
	Oil Levels	Check oil levels if necessary replenish	
2	Staring engine		1
	(a) Oil pan	Check and top up oil level	
	(b) Transmission case	Check and top up oil level	
3	Air cleaner Main engine	Clean interior of dust case	1
4	Cooling system	Clean radiator core	
5	Battery	Check electrolyte level and top up	2
6	Steering clutch	Drain sediment and water	2
7	Final drive	Drain out water	2
8	Under carriage	(a) Remove and clean (b) check rollers and idlers for oil leaks (c) Check rollers and idlers for wear.	2
9	Hydraulic system	Clean filter elements	1
10	<u>Grease Nipples</u>		
	(a) Steering clutch yoke	Grease	Grease No. 2 2
	(b) Diagonal brace	-do-	-do- 2
	(c) Upper struts (Brace)	-do-	-do- 4
	(d) Universal joints (Hydraulic pump drive)	-do-	-do- 3
	(e) Cylinder support shaft	-do-	-do- 5
	(f) PTO shaft universal	-do-	-do- 2
	(g) Shave shaft	-do-	-do- 5

Note :-

1 Engine oil (Grades)

below Above 10<sup>0</sup> C – SAE 30/HD 30, + 10<sup>0</sup> C to minus 20<sup>0</sup> C-SAE 10 HD10, and minus 20<sup>0</sup> C, use SAE 10/HD 10 + 10% of Kero oil

2. Gear oil (Grades)

Above 35<sup>0</sup> C – SAE 140, + 35<sup>0</sup> C to minus 20<sup>0</sup> C- SAE 90, and below minus 20<sup>0</sup> SAE 85

3. Grease Grade

Above 10<sup>0</sup> C – Grease No. 2, and below 10<sup>0</sup> Grease No. 4 Clean every 10 hours in very dusty operating condition

S/No.	Item/Assys	Maintenance Instruction	Lubrication	No of points
1	2	3	4	5

100 Hours Maint

1	Carry out 10 hours 50 hours task			
2	Engine	Change oil	Engine oil	1
3	Clean crankcase	Clean/change		1
4	Oil filter	(a) Change filter element (Full flow) (b) Clean filter element (Screen type)		1
5	Air cleaner	(a) Check air and vent tube connections (b) Clean dry type cleaner element		2
6	Hydraulic governor	Check oil level		
7	Generator	Lubricate generator	Engine oil	

Note :-

1 Engine oil (Grades)

below Above 10<sup>0</sup> C – SAE 30/HD 30, + 10<sup>0</sup> C to minus 20<sup>0</sup> C-SAE 10 HD10, and minus 20<sup>0</sup> C, use SAE 10/HD 10 + 10% of Kero oil

2. Gear oil (Grades)

Above 35<sup>0</sup> C – SAE 140, + 35<sup>0</sup> C to minus 20<sup>0</sup> C- SAE 90, and below minus 20<sup>0</sup> SAE 85

3. Grease Grade

Above 10<sup>0</sup> C – Grease No. 2, and below 10<sup>0</sup> Grease No. 4 Clean every 10 hours in very dusty operating condition

4 Under extremely dirty or dusty conditions, performance more frequent, interval.

S/No.	Item/Assys	Maintenance Instruction	Lubrication	No of points
1	2	3	4	5

### 250 Hours tasks

1	Carry out 10 hours 50 hours and 100 hours task			
2	Injectors	Carry out 1 <sup>st</sup> servicing clean all injectors		6
3	Inlet and exhaust valve	Adjust valve clearance		24
4	Starting engines clutch case	Drain oil and refill	Engine oil	1
5	Cranking handles helical gear case	Check oil level, Top up if necessary	Engine oil	1
6	Final drive case	Check oil level. Top up if necessary	Gear oil	2
7	Hydraulic system	Check oil level, Top up if necessary	Hydraulic oil	1
8	Crankcase Breather	Replace paper element		1
9	Oil filter	Replace filter element		1
10	Fuel float	Clean Breather		1
11	Fan belt	Check and adjust tension		3
12	Charging generator fan belt	Check and adjust tension		1
13	Battery	(a) Check specific gravity and recommend for recharge, if low		2
14	Starting engine air cleaner	Clean element		1
15	Main clutch	Inspect for functioning adjust clutch brake, if necessary		1
16	Final drive	Check sprockets bearings for running clearance and adjust if necessary		2
17	Hydraulic system	Check piston rod and cylinder for damage		2
18	<u>GREASE NIPPLES</u>			
	(A) Cooling fan	Grease		1
	(b) Engine	-do-		1
	(c) Starting engine	-do-		1
	(i) Transmission lever	-do-		1
	(II) Idler gear brg	-do-		1
	(d) Front Idler adjuster (Hyd)	Add Grease, if required to adjust track slack		2

### LUBRICANTS AND GREASE

Note :-

1. Engine oil (Grades)
  - (a) Above 10<sup>0</sup> C - Use SAE 30 HD 30
  - (b) + 10<sup>0</sup> C to - 20<sup>0</sup> C - Use SAE 10/HD 10
  - (c) Below - 20<sup>0</sup> C - Use SAE 10/HD 10 +10% KEROoil

- 2     Gear oil (Grades)
- (a)   Above 35<sup>0</sup> C                                 -     Use SAE 140  
(b)   + 35<sup>0</sup> C to minus 20<sup>0</sup> C                 -     Use SAE 90  
(c)   Below - 20<sup>0</sup> C                                 -     Use SAE 85

- 3     Hydraulic oil (Grades)
- (a)   Above + 35<sup>0</sup> C                                 -     Use Hyd Oil 140  
(b)   Below+ 35<sup>0</sup> C                                 -     Use Hyd Oil 90  
(c)   Below - 20<sup>0</sup> C                                 -     Use SAE 85

- 4     Grease Grades
- (a)   Above 10<sup>0</sup> C                                 -     Use Grease No 2  
(b)   Below 10<sup>0</sup> C                                 -     Use Grease No. 1

EVERY 500 HOURS TASKS

1	-	Carry out 8 hours, 100 hrs and 250 hours tasks.		
2	Starting motor	Add a few oil drops	Engine oil	1
3	Starting engine oil pan	Drain and refill engine oil	Engine oil	1
4	Oil filter	(a) Replace by pass filter element		1
5	P.T Pump	Inject fuel pump screen and magnet		1
6	Fuel filter	Disassemble, clean interior and replace element		1
7	Corrosion resister	Check element and replace if necessary		1
8	Fuel filter starting engine	Clean strainer		1
9	Steering clutch	Check bearings for running clearance		2
10	Final drive	Retighten case securing bolts		All bolts

Note :-

1.     Engine oil (Grades)

(a)   Above 10 Degree C                                 -     Use SAE 30 /HD 30  
(b)   + 10 Degree to- 20 Degree C                 -     Use SAE-10/HD 10  
(c)   Below - 20 Degree F                                 -     Use SAE-10/HD10+10% KRRO Oil
2.     (a) Change engine oil early under adverse working conditions.  
  
(b) Park the equipment on a level ground and drain engine oil after warming up engine.  
  
(c) Inspect drained engine oil for metal particles. If any found suggest unit to report to field workshop immediately. DO NOT RUN ENGINE OL RECTIFIED.

S/No.	Item/Assys	Maintenance Instruction	Lubrication	No of points
1	2	3	4	5

1000 Hours Maint

Carry out 10, 50, 100, 250, AND 500 hours maintenance task

1	Main clutch case	Drain and refill	Engine oil	1
2	Final drive case	Drain and refill	Gear oil	1
3	Transmission case (Including bevel gear shaft)	Drain and refill	Gear oil	1
4	Air cleaner	Insect and clean inner element		1
5	Fuel tank	(a) Clean interior (b) Clean oil filter opening strainer		1
6	Thermostat	Check for functioning		1
7	Charging generator	Clean brushes and commutator		1
8	Fuel tank (Starting engine)	Clean the interior		1
9	Starting motor	Inspect bushes and commutator		
10	Main clutch	Clean strainer and breather		2
11	Steering clutch	Check bevel gear for backlash		1
12	Under carriage	Check track shoe grousers, pins and links for wear		Both trace assy
13	<u>Grease Nipples</u> Water pump	Grease		1

Note :-

1. Engine oil (Grades)

- |     |  |   |                                |
|-----|--|---|--------------------------------|
| (a) | Above 10 <sup>0</sup> C                    | - | Use SAE 30 HD 30               |
| (b) | + 10 <sup>0</sup> C to - 20 <sup>0</sup> C | - | Use SAE 10/HD 10               |
| (c) | Below - 20 <sup>0</sup> C                  | - | Use SAE 10/HD 10 +10% KERO oil |

2. Gear oil (Grades)

- |     |  |   |             |
|-----|--|---|-------------|
| (a) | Above 35 <sup>0</sup> C                        | - | Use SAE 140 |
| (b) | + 35 <sup>0</sup> C to minus 20 <sup>0</sup> C | - | Use SAE 90  |
| (c) | Below - 20 <sup>0</sup> C                      | - | Use SAE 85  |

3 Grease Grades

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

4. Inspect drained engine oil for metal particles . If any found, suggest unit to report to field workshop immediately. DO NOT RUN ENGINE TILL RECTIFIED.

5. Clean every 500 hours in very dusty operating condition.

S/No.	Item/Assys	Maintenance Instruction	Lubrication	No of points
1	2	3	4	5

2000 Hours maint

1	Carry out 10 hours 50 hours and 100 hours 250, 500 hours and maintenance task			
2	Hydraulic system	Drain and refill	Hydraulic oil	1
3	Air cleaner	Replace outer and inner element		1
4	Fuel float tank	Drain and clean tank		1

5	Injector	Drain and clean tank	1
		(a) Clean Injector	6
		(b) Adjust injection timing	6
		(c) Clean injector	6
6	Inlet and exhaust valve	Adjust valve Clearance	
7	Cooling system	Inspect and clean the system	1
8	<u>Grease Nipples</u>		
	(a) Main clutch yoke and intermediate shaft	Grease	3
	(b) Main shaft -do- universal joint		2
	(c) Brake counter lever shaft -do-		2
	(d) Steering clutch lever shaft -do-		2
	(e) Main clutch lever shaft -do-		2
	(f) Fuel control lever shaft -do-		4
	(g) Brake pedal shaft -do-		1
	(h) Blade control level shaft		

Note :-

1. Engine oil (Grades)

- |     |  |   |                                |
|-----|--|---|--------------------------------|
| (a) | Above 10 <sup>0</sup> C                    | - | Use SAE 30 HD 30               |
| (b) | + 10 <sup>0</sup> C to - 20 <sup>0</sup> C | - | Use SAE 10/HD 10               |
| (c) | Below - 20 <sup>0</sup> C                  | - | Use SAE 10/HD 10 +10% KERO oil |

2. Grease Grades

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

3. Ensure that 'Brake counter level shaft is not over greased, otherwise extra grease will overflow and fall on the Brake drum resulting into brake slippage.

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

- |                    |   |
|--------------------|---|
| 1. Project .....   | 4. Make & Type TRACTOR<br>D-80A-8 KOMATSU |
| 2. Task Force..... | 5. BA/EM NO. ....                         |
| 3. Unit .....      | 6. Location .....                         |

**Action**  
After carrying out the preventative maintenance Task, IC Mobile maintenance team will enter its date in the month's column below and initial.

Srl No.	Tasks	J	F	M	A	M	J	J	A	S	O	N	D
1	08 Hours												
	(a)												
	(b)												
	(c)												
	(d)												
	(e)												
	(f)												
	(g)												
	(h)												
	(j)												
2	100 Hours												
	(a)												
	(b)												
	(c)												
	(d)												
3	250 Hours												
	(a)												
	(b)												
	(c)												
4	500 Hours												
5	1000 Hours												
6	2000 Hours												

Signature of SO1/SO2 EME Project .....

Date .....

Remarks .....

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