



भारत सरकार
रेल मंत्रालय

**GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS**

प्लाइन्ट एवं कासिंग टैम्पिंग मशीन (यूनीमैट) की निरीक्षण जांच सूची

**CHECK LIST FOR INSPECTION OF P&C TAMPING MACHINE
(UNIMAT)**

रिपोर्ट संख्या—टी.एम.—71
Report No.TM-71

सितम्बर —2004
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अनुसंधान अभिकल्प और मानक संगठन
लखनऊ—226011
**RESEARCH DESIGNS & STANDARDS ORGANISATION
LUCKNOW- 226 011**

Check List For Inspection of P&C Tamping Machine (UNIMAT)

Name & designation of Inspecting :
 Official :

Date of inspection :

Machine no. :

Base station :

ITEMS TO BE CHECKED

S. No	Item	Agent/Description	Prevailing conditions
1.	Oil/Coolant Level in Tank/ Container:		
i)	Hydraulic oil tank	Servo system-68	Ok/Less
ii)	Radiator	Coolant	Ok/Less
iii)	ZF gear box	API CF4 15W40	Ok/Less
iv)	Diesel oil	HSD	Ok/Less
v)	Distribution gear box	SAE90	Ok/Less
vi)	Intermediate Bearing	SAE90	Ok/Less
vii)	Reduction gear box	SAE90	Ok/Less
viii)	Engine lube oil	API CF4 15W40	Ok/Less
ix)	Axle gear boxes	SAE90	Ok/Less
x)	Compressor oil	API CF4 15W40	Ok/Less

S. No.	Item	Prevailing Conditions
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2. **Engine:**

	Engine model & no:	Engine Hours:
i)	Starting problem	Yes/No
ii)	Condition of smoke	White/Black/Normal
iii)	Engine temperature during working	°C
iv)	Leakage in Head-gasket	No /Yes (Head No.)
v)	Electrolyte level in batteries	Ok/Less
vi)	Specific gravity of electrolyte (min.1.24)	Ok/Less
vii)	Self starter	Working/Not working
viii)	Compressor working	Satisfactory/To be attended
ix)	Belt tension (Min15 mm at mid point)	Ok/Less
x)	Condition of Engine Hoses	Ok/ To be replaced (give location)
xi)	Leakage in water pump seal	No/Yes
xii)	Condition of battery terminal	Ok/To be repaired
xiii)	R.P.M. of the Engine (rated = -----)	Actual -----
xiv)	Engine Oil Pressure	Actual -----
	Rated :	
	(a) At low R.P.M. 1.5 Kg/Sq cm	Actual -----
	(b) At high R.P.M. 2.5 Kg/Sq cm	Actual -----
xv)	Last change of Air Cleaner filters	Dated Engine hrs
xvi)	Last change of Engine oil	Dated Engine hrs
xvii)	Last change of Engine oil filters	Dated Engine hrs
xviii)	Last change of Diesel filters	Dated Engine hrs
xx)	Condition of Radiator	Clean/Clogged

S. No.	Item	Prevailing Conditions
xxi)	Battery charging	Ok/ To be charged
xxii)	Last change/repair of batteries	Dated
		Engine hrs
xxiii)	Last top overhauling of the Engine	Dated
		Engine hrs
xxiv)	Last calibration of fuel injection pump	Dated
		Engine hrs
xxv)	Last calibration of Fuel Injectors	Dated
		Engine hrs
xxvi)	Last repair/replacement of self starter and alternator	Dated
		Engine hrs
xxvii)	Whether Working Gauges are in order	
a)	R.P.M.	Yes/No
b)	Oil pressure	Yes/No
c)	Temperature	Yes/No
d)	Battery charging	Yes/No
xxviii)	Any abnormal sound	Yes/No
xxix)	Function of engine safety circuit	
a)	Low lub oil pressure	Ok / Defective
b)	High temperature	Ok / Defective
xxx)	Last attention given by Service Engineer to Engine	Dated
		Engine hrs

S. No	Item	Agent/Action	Prevailing Conditions
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3. Lubrication (As per schedules)

3.1 Tamping Bank

i)	Tamping unit guide column	Servo system-150	Done / Not done
ii)	Tamping unit guide bushing	Servo system-150	Done / Not done
iii)	Tamping arm bearing	Servo system-150	Done / Not done
iv)	Vibration shaft main bearing	Servo system-150	Done / Not done
v)	Connecting rod bearing of squeezing cylinder	Grease	Done / Not done
vi)	Tamping unit main pin bearing leakage (if yes, mention no. of bearing.)		Yes/No
vii)	Vibration Shaft gear case seal leakage.		Yes/No
viii)	Vibration shaft gear case breathers.		Clean/ clogged

3.2 Lifting/Lining Unit:

i)	Clamp pivot	Grease	Done / Not done
ii)	Lifting unit guide column	Grease	Done / Not done
iii)	Lining rollers	Grease	Done / Not done
iv)	Clamp carrier	Grease	Done / Not done
v)	Lining cylinder pivot	Grease	Done / Not done
vi)	Locking device of lifting/ lining unit	Grease	Done / Not done
vii)	Swivelling frame	Grease	Done / Not done
viii)	Rope pulley	Grease	Done / Not done
ix)	Sliding plate	Grease	Done / Not done
x)	Telescopic slide	Grease	Done / Not done

3.3 Cardon Shaft:

i)	Engine to ZF gear box	Grease	Done / Not done
ii)	ZF to Distributor gear box	Grease	Done / Not done
iii)	Engine to Pump distributor gear box	Grease	Done / Not done

S. No	Item	Agent/Action	Prevailing Conditions
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|------|---|--------|-----------------|
| iv) | Distributor gear box to Reduction gear box | Grease | Done / Not done |
| v) | Reduction gear box to Intermediate shaft drive | Grease | Done / Not done |
| vi) | Intermediate shaft drive to Driving axle gear box | Grease | Done / Not done |
| vii) | Working drive reduction gear box to ZF gear box | Grease | Done / Not done |

3.4 Miscellaneous

- | | | | |
|------|----------------------------------|--------|-----------------|
| i) | Middle feeler rod | Oiling | Done / Not done |
| ii) | Torque arm pivot | Grease | Done / Not done |
| iii) | Brake linkage | Grease | Done / Not done |
| iv) | All the pivot joints of trollies | Oiling | Done / Not done |

S.	Item	Prevailing Conditions
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No.		
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4. **Hydraulic Hoses:**

- i) General condition Ok/Leaking (location)
- ii) Hoses required to be changed (no. & sizes)
- iii) Clamping of hoses Proper / Improper
- iv) Stock of hoses with the machine Adequate/Less
- v) Stock of hose fittings Adequate/Less

5. **PCB**

- i) Requirement of PCB if any Part no.
- ii) Defective/ Released PCB available with the machine Part no.

6. **General**

- i) Condition of tamping bank Smooth/ Noisy
- ii) Tilting of Tamping Tools Ok/ Unsatisfactory
- iii) Condition of Tamping Tools (max. 20% of wear on area basis is allowed) Ok/ To be replaced (Nos)
- iv) No. of tamping arms developed play (Identification nos.)
- v) Actual number of tools with which the machine is workingNos
- vi) Leakage in hydraulic system No/Yes (location)
- vii) Air Oiler working properly Yes/No
- viii) Water separator working properly Yes/No
- ix) Condition of Lights (head light & back light) Ok/ to be attended
- x) Braking System Satisfactory/Unsatisfactory
- xi) Condition of brake shoes Satisfactory/ To be replaced
- xii) Clearance between Brake shoe and wheel at the centre (min 3 - 5 mm permissible) Actual.

S.No.	Item	Prevailing Conditions
xiii)	Thickness of brake shoe (minimum 13 mm at any point)	Ok/Less
xiv)	All log books filled properly	Yes/No
xv)	Condition of Machine working tools (spanner set etc.)	Satisfactory/To be changed
xvi)	Hydraulic oil temperature	°C
xvii)	Condition of oil coolers	Clean/Clogged
xviii)	Brake pressure (3.6bars)	Actual.
xix)	Adjustment of track lifting roller height:	Ok/To be adjusted
xx)	Play in torque arm pivot	Ok/To be attended
xxi)	Change of ZF gear box oil	Dated
xxii)	Change of ZF gear box filter	Engine hrs
xxiii)	Change of servo valve filter	Dated
xxiv)	Change of proportional valve filter	Engine hrs
xxv)	Change of hydraulic suction filter	Dated
xxvi)	Change of hydraulic return filter	Engine hrs
xxvii)	Function of limit switches	Dated
7.	Safety Item	Engine hrs
i)	Safety equipment as per annexure-I	Working/Not working
ii)	Safety items for the machine such as tamping unit locking indicator, safety limit switches, lifting unit locking indicator, working properly	(Location)
iii)	Competency certificate of the Operator	Available/Deficient
		Yes/No
		Current/Expired

S.No.	Item	Prevailing Conditions
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8. During Block Working:

i)	Location of the block working	Km/TP
ii)	Pre & post tamping operations being done	Yes/No
iii)	Duration of block (hrs/minutes)	
iv)	Output of work	Turn out /Sleepers
v)	Depth of tamping tool (min 15 mm)	Actual
vi)	Condition of ballast	Clean / Cacked
vii)	Depth of clean cushion under sleeper (required min. is 150 mm)	Actual / Less
viii)	Track readings mainly cross level & alignment after tamping	Ok/Not ok

9. Staff:

i)	Strength of Staff	Full/Deficient
ii)	Group performance	Excellent /V.good/Good/ Average
iii)	Cost awareness	Excellent /V.good/Good/ Average
iv)	Safety awareness	Excellent /V.good/Good/ Average
v)	Staff due for medical	
10.	General condition of the machine	Excellent /V.good/Good/ Average
11.	Control chart of output	Displayed/Not displayed
12.	Breakdown (permissible unit 3 days)	Within limit/Beyond limit
13.	Hydraulic pressure (bars)	Rated Actual
i)	System pressure	130-140
ii)	High pressure system for squeezing	100

S.No.	Item	Prevailing Conditions	
iii)	Squeezing pressure for sleepers (bars)	Normal	Actual
a)	CST-9/Steel sleepers	80 – 90	
b)	Wooden sleeper	100 – 110	
c)	Concrete sleeper	120 – 135	
iv)	Accumulator pressure (bars)		
a)	High	100 (max.)	
b)	Working	65 (max.)	
v)	Vibration circuit pressure	150 bars	
vi)	Air pressure (kg/cm sq)	6-7	
vii)	ZF oil pressure (12 - 14 bars)	Actual	
viii)	ZF oil temperature (80 - 110°C)	Actual	
14.	Pending maintenance schedule and reasons		
15.	Availability of spares and tools as per annexure-II	Full/Deficient	
16.	Any other remark by the Inspecting Official		

(Signature of Inspecting Official)

Name:

Designation:

Date:

Annexure-I

List Of Safety Tools

Sl. No.	Description	Qty
1.	Detonators	1 box
2.	HS flags (red)	2 Nos
3.	HS Flag (green)	1 No
4.	HS lamps	2 Nos
5.	Chain & pad lock	1 set
6.	Terfor (2 t capacity)	1 No
7.	25t jack with traverser	1 No
8.	Crow bars	4 Nos
9.	Beaters	4 Nos
10.	Wooden blocks off sizes	8 Nos
11.	Gauge cum level	1 No
12.	Rail thermometer (dial type)	1 No
13.	Portable control phone	1 No
14.	Walkie –Talkie set	1 No
15.	Banner flag	2 Nos
16.	Skids	4 Nos
17.	First aid box	1 No

Annexure-II

List of Spares and Tools For Emergency

Sl. No.	Description	Qty
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Engine:

1.	Fuel filter	1 Set
2.	Lube oil filter	1 Set
3.	Air cleaner filter	2 Set
4.	Radiator hoses	1 Set
5.	Injector pipes	1 Set
6.	`V' belts	1 Set
7.	Fuel flexible hoses	1 Set

Tamping Unit:

1.	Piston for squeezing cylinder	2 Set
2.	Gland bush for squeezing cylinder	2 Set
3.	Seal set for squeezing cylinder	2 Set
4.	Piston Locking Screw	2 Nos
5.	Buffer stop	2 Nos
6.	Tamping unit Up / Dn cylinder seals	1 No
7.	Tamping unit Up / Dn cylinder piston rod	1 No
8.	Tamping tool (2W.81.418)	8 Nos
9.	Tamping tool (W .37 .1320)	8 Nos
10.	Tamping tool bolts	8 Nos
11.	Tamping tool cap	8 Nos
12.	Tamping tool bolt (G30, 42)	8 Nos
13.	Tamping depth transducer chord	8 mtrs
14.	Carrier tamping depth transducer	1 No
15.	35 mm pin with steel bush, nut & washer	1 No
16.	Squeezing cylinder piston rod	1 No
17.	Grub screw	2 Nos
18.	Gear ring for vibration coupler	1 No
19.	Tamping tool key	6 Nos
20.	Tool tilting cylinder	1 No
21.	Bolt (W.31.133A)	2 Nos
22.	Bolt (CU.37.632)	2 Nos
23.	Rubber ring (W.33.83)	6 Nos

Sl. No.	Description	Qty
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Hydraulic:

1.	Seal set for all hydraulic cylinders	1 set
2.	Proportional filters	1 No
3.	Servo filters	2 Nos
4.	ZF in-line filter	1 No
5.	Hydraulic suction filter	1 Set
6.	Hydraulic return filters	1 Set
7.	Hydraulic hoses 2781-4	5 mtrs
8.	Hydraulic hoses 2781-6	5 mtrs
9.	Hydraulic hoses-2781-8	5 mtrs
10.	Hydraulic hoses 2781-10	5 mtrs
11.	Hydraulic hoses 2781-12	5 mtrs
12.	Hydraulic hoses 2781-16	5 mtrs
13.	Hydraulic hoses 2781-20	5 mtrs
14.	Hydraulic hoses 1503-24	6 mtrs

Electrical:

1.	PCB EK813	1 No
2.	PCB EK132	1 No
3.	Relay ELT- 7002/S4	2 Nos
4.	Relay ELT-663	2 Nos
5.	Fuses 4A	4 Nos
6.	Head light & working light bulbs	2 Each
7.	Versine transducer carrier	1 No
8.	Versine transducer chord	8 mtrs

Miscellaneous:

1.	Track lifting roller	1 No
2.	Chord wire 2 mm	40 mtrs
3.	Pneumatic hose 6.3 mm	10 mtrs
4.	Pneumatic hose 12.5 mm	05 mtrs
5.	Brake shoes	8 Nos
6.	Brake cylinder seal	1 No

ACKNOWLEDGEMENT

Following officers and staff have made their valuable contribution in preparation of Inspection Check List of Points and Crossings Tamping Machine (UNIMAT).

Railway

1. S/Shri Atul Shrivastava Jr.Engineer/TMC/NE Rly/UNIMAT-8290
2. " Rajender Singh Section Engineer/TMC/N.Rly/UNIMAT-8250

RDSO

1. S/Shri A.K. Pandey DTM-V
2. " Neerendra Prasad, ARE/TM
3. " O.P.Kapoor SE/Drg/TM
4. " M.N.Siddiqui, SE/Engg/TM
5. " A.N. Shrivastva JRE-I/TM
6. " Prem K umar JRE-I/TM
7. Smt. Renu Pandey PA