DIRECTORATE GENERAL BORDER ROADS
GENERAL MAINTENANCE INSTRUCTION NO 189
ON
G 1420L WHEEL LOADER : MANUFACTURE BY MS BHARAT EARTH MOVERS LIMITED

INTRODUCTION

1. Regular servicing and preventive maintenance are essential for optimal use of equipment to extract maximum life for planning and timely repair to arrest defects from developing into major one, whereby minimizing the down time and production losses.

2. This instructions are issued as guide lines for periodic and preventive maintenance and lubrication of wheel loader G 1420 L manufacture by M/S BEML.

ACTION BY

3. (a) User units - To carry out periodic maintenance, inspection, regular servicing and preventive maintenance task as laid down.

(b) Field Workshop (GREF) – (i) To monitor the record of maintenance, and lubrication in the log book of the equipment during its inspection and repairs, when carried out as per maintenance and lubrication schedules given in this instructions.

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

DETAILS

4. Details of preventive maintenance instruction lubricant, maintenance scheduled chart, general specification and storage of machine are given in Appendixes 'A' to 'E' attached with this instructions.

Appendix 'A' to GMI No 189

Preventive Maintenance Instructions

1. Scheduled maintenance is necessary to provide proper and efficient machine operation. The maintenance interval shown is based on operational hours indicated by the service meter. A more practical schedule should be developed for each work situation. The type of work a unit is doing, the rate at which it is worked and how it is used are variable that will set the pattern for maintenance.

2. Under severe operating conditions more frequent service is required.

GENERAL PRECAUTIONS OF MAINTENANCE

1. Park the machine on a level ground, have the bucket resting on the ground and apply the parking brake before working or around it.

2. Use the lock plate (Safety bar).

3. If it is necessary to make any checks with the engine running, use two men, one man must in the operator's compartment to safe guard, the second man making checks or adjustments.

4. Use only clean oil, fuel and grease stored in clean containers.

5. Use clean fill equipment such as grease gun, oil pump etc to prevent entrance of dirt or dust.

6. Wipe always clean on or around the dipstick gauges, fill-openings to prevent entrance of dirt or dust.

7. Use specified oil, fuel and grease. Select carefully proper grade of oils which is different from ambient temperatures at Job sites.

8. Use genuine filters and parts to ensure proper operation & life.

9. For changing or adding oil, select the least dusty area.

10. Greasing is done always after grease fittings are wiped clean. Hand grease gun is recommended. Apply grease until old grease is ejected and new grease appears. After grease up wipe the fitting.

11. It is highly recommended to clean the entire machine at periodic interval of 400 hrs. Steam cleaning is best recommended. If any commercial solvent is used in cleaning, select one that does not damage painting or does not rust metal surface.

12. Starter motor and alternator must be covered from water Jets.

CHECKS BEFORE STARTING (to be carried out daily)

The " daily checks before starting " corresponds to "10 hrs maintenance operation ". A few preliminary checks of the machine prior to each day's work will lessen the possibility of machine trouble and assure more efficient operation of the unit.

VISUAL INSPECTION

Before operating every day, check the following:-

1. Engine oil level: Park the machine on level ground and check the level before starting the engine or after 10 to 15 minutes after the engine stops. Remove the oil level gauge and wipe clean. Insert the gauge completely but do not tighten. The correct oil level is between two level marks. Head clean and correct oil from the filter pipe as required and checked the level again.

2. Transmission oil level: Before starting the engine, look at the high and low plug to see there is oil. After the engine is operated for three to five minutes, check the oil level with engine idling. Do not check the transmission oil level or add oil unless the machine halves are securely locked with the safety bar (loc plate) and pins provided. Have a second person at the machine controls while checking the oil. Add clean and correct oil from the filler pipe as required and check level again.

3. Hydraulic oil level: Park the machine on level ground and place the bucket on the ground and stop the engine. Check the hydraulic system oil through sight gauge level if required add oil.

4. Drain condensation from air tank: After each day's work, drain condensation from air reserve wire. After draining close, the drain cocks without fail. In high humid operating areas, moisture in air will be condensed and air system component have a chance to rust if not drained. In extreme cold area, condensation will freeze and may damage components and piping.

5. Drain sediment from fuel tank: Open the drain cocks of the fuel tank, to drain condensation, accumulation and water.

6. Drain fuel filter: Loosen the drain cocks and drain water and condensation from the duel filter. After draining, retighten the drain cocks securely.

7. Tyre and wheel:

Tyre - Proper tyre inflation pressure varies with size of tyre and working condition. Under inflation will decrease tyre life due to flexing. Over inflation causes the centre of the tyre tread to wear rapidly. Check tyres for cuts break, imbedded

stones and repair small injuries immediately. Correct tyre pressure check should be done before starting daily work or when tyre repaired.

Tyre size (Pattern)	Ply rating	Pressure (Kg/Cm^2)
18x25 (PG6D)	24	4.2

Use air inflation hose to inflate tyres, connecting one end of tyre inflator located near air tank on LH fender. Haul road or working area should always be kept clean to avoid tyre damage and to provide longer tyre life.

Wheel: Loose wheel nuts will cause a serious problem. Check nuts for looseness and tighten as required. Specified torque of the nut : 900 to 1000 Nm. Check wheel rim for damage. The working motions of the machine tend to loosen wheel assembly, stud nuts and wear wheel rim clamp ring. Loose stud nut will cause elongation of wheel mounting. Rust streaks starting from the stud nut ball seats are a definite indication of loose mounting.

8. Radiator Coolant level - Coolant level should be level with the bottom of the filler neck and add coolant as required. Coolant should be soft water (city water etc) and not hard water (river water etc). Do not add coolant into the radiator of an overheated engine unless necessary. However if necessary add coolant slowly with engine running at low idle speed. When water is added, confirm the level after 10-15 minutes of operation. In cold weather, use anti-freeze additive (Refer to cold weather operation).

9. Air cleaner - Each day before starting the engine, clean air cleaner dustpans.

10. Fill fuel tank - Check fuel level with the fuel gauge and ensure that fuel is sufficient for the day. Add clean fuel from the filler tube as required. Before removing the filler cap, wipe around the cap and clean to prevent dirt or dust from entering. If the fuel strainer in the filler tube is found with foreign material, remove and clean it. Fill the fuel tank at the end of each work sift to keep moisture condensation to a minimum (moisture in the fuel tank will condensed after work and will mixed in fuel).

MAINTENANCE AFTER EVERY 50 HOURS MAINTENANCE OPERATION

Batteries – Open the battery box covers and check cable terminals are clean and tight. If the terminals are corroded, clean with a wire brush and coat with petroleum jelly, Remove filler caps and check electrolyte level, which should be 10 to 20 mm above the plates. Add pure distilled water as required. Before replacing filler caps, clean vent holes. Never use regular water fro batteries instead of distilled water. Mineral contents in regular water will damage batteries. Acid or electrolytes must never be added except by a skilled battery man. When a hard engine starting is notices due to low starter r.p.m. Check specific gravity of battery, remove the plugs. Batteries give off highly inflammable gas. Never allow sparks or open flame near the batteries. Avoid spilling any electrolyte on hands or clothing. If spilled over hands or cloth, clean immediately in water and in ammonia

EVERY HOURS MAINTENANCE OPERATION

1. Clean Air Cleaner Outer element **–** The dry type air cleaner equipped has two elements outer and inner. The outer element can be cleaned for a limited number of times before replacement. While the inner element must be replaced when clogged. Never remove

the elements from the air cleaner while the engine running. Before installing the outer element, check the element 'O' ring for deterioration. If damaged or deteriorated, replace the element 'O' ring.

2. Cleaning the element - The paper element in the air cleaner may be cleaned several times by using a compressed air jet to blow off dirt. Do not hold air jet too close to paper element otherwise it will damage the element. Carefully tap the side or end of the element against the palm of your hand to remove loose dust. Air pressure at the nozzle must not exceed 7 Kg/Cm². Directly clean with dry compressed air up and down the pleats on the clean side (in side) of the element. Inspect the filter element for leaks or damage by placing a bright light in side the element, inspection of the element on the outside will disclose any holes where concentrated light shines through. The slightest rupture requires replacement of the element.

3. Inner filter element service – Replace the inner elements with every third service of the outer elements or when clogged.

4. Brake valve – Remove the rubber boot under the brake pedal and lubricate with few drops of clean engine oil. Wipe excessive oil too.

5. Loader linkage – Place the bucket on ground when lubrication is done. Lubricate all the Pinpoints in the linkage.

6. Change engine oil and filter – Oil should be drained while it is at operating temperature. The most satisfactory method for determining when to change lubricating oil is by oil analysis. Drain engine lubricating oil and change the full flow oil filter element at the same time. Filter element must be replaced by the kit which includes an 'O' ring. 'O' ring between the filter header and the case should be lubricated with clean engine oil before installing. After the filter element is replaced, fill clean engine oil to the specified level into the engine. Run the engine for 15 minutes and recheck the level.

7. Change Transmission filter element – Clean around the sump screen and filter to prevent dust or dirt from entering. Drain oil at 65 to 95°C, remove the sump screen. Clean screen thoroughly and replace using new gaskets, loosen the filter center bolt and remove the case. Install the new element. Be sure to replace 'O' ring together with element. Refill transmission to full mark. Run engine ay 500 to 600 RPM to prime converter lines. Recheck oil level with engine running at 500 to 600 RPM and oil to bring level to full mark when oil temperature is hot 80 to 90°C make final oil level check.

8. Lubricate electric system – Lubricate alternator by adding five or six drops of SAE 20 lubricating oil cups. Add five or six drops of clean SAE 30 lubricating oil in crawing motor bearing. **CAUTION:** Avoid over lubrication, which is useful to isolation.

9. Clean Transmission breather – Clean around the breather located at the top of the transmission. Install the breather in place. In dusty or sandy and rough or slop working area, more frequent cleanings or changes may be required.

10. Oil level in Axle – The machine should be parked on a level ground to check the oil level. Remove the oil level plug from front and rear axle planetary ends and check the level which should be flush with the plug hole. If required add oil through filler hole at one of the planetary ends, till oil overflows through oil level plug at the other end.

11. Clean fuel tank breather – Clean around the breather. Remove the breather and wash thoroughly in commercial solvent and dry with compressed air. Install the breather at place. In dusty or sandy and rough or slope working area, more frequent cleanings or changes may be required.

EVERY 500 HRS MAINTENANCE OPERATION

1. Change fuel filter element – Clean around the filter case to prevent dust or dirt from entering. After opening the drain cock, drain the fuel. Remove the element and clean inside of the filter case. Install the new element and fill the case with clean diesel fuel, and then install it to the header. The head gasket must be replaced. Torque the bolt 2.8 to 3.5 Kg. Removed element must be discarded. Under extreme dusty condition, the filter frequency may be changed earlier.

2. Adjust belt tension – Check the tension of the new engine or newly replaced belt more frequently (1 hour, 10 hours, 50 hours) until new belts seat properly. If a set of belts are used (to a pulley) replace them as a set at any time. Do not replace on e belt in this case. If belt tension gauge is nit not available, Check and adjust the belts tension using index finger pressure (6 Kgs) proper deflection will be approximately equal to thickness of the belt for each 0.3 M of free span. When the fan belt is adjusted, check also alternator belt for proper deflection.

3. Change corrosion resister – Close shut off valves on inlet and drain lines. Unscrew drain plug at bottom of housing. Remove cover cap screws cover. Remove plate-securing element. Lift element from housing and discard. Remove plate below element. Lift spring from housing.

4. Polish Plates – If less than half of actual plates can be exposed by polished install new plates. Replace spring and lower plate. Install element in housing. Replace upper plate gasket and cover. Replace drain plug and open shut off valves in inlet and drain lines.

5. Thermostats – The thermostats valve have two functions gain rapid engine warm up. Control water temperature. The thermostats are non-adjustable type. Engine overheating is some times due to an inoperative thermostat. Remove and check the thermostat. The thermostat opening and closing temperature are 170°F and 185°F respectively.

EVERY 1000 HRS MAINTENANCE OPERATION

1. Change Axle oil – Drain axle oil while it is warm. Remove drain plugs of differential and final drive and the fill-check plugs of the axle housing. Move the machine so as to locate the final drive drain plug of the other wheel and the fill check plugs of the axle housing. Drain plug of the other wheel to the bottom and drain oil. Do the same for the other axle (front or rear) after draining install the cleaned drain plugs of the final drives and differential. Change also 'O' ring. Fill clean gear oil through the fill-check plug at both the axle housings. As axle gear oil is filled through the one-fill, holes filling may take time to settle oil all over the axle. The axle breather must be cleaned at this time.

2. Change hydraulic system oil and filter- This service should be done at dust free area, such as workshop or under shade. Drain while oil is warm.

3. Oil draining – Lower the bucket on level ground. Remove the plug fitted to the drain valve and install the insert and vinyl hose. The other end of the hose should be in a suitable size of container, loosen the cap to release pressure and then remove the cap. Always loosen the filler cap slowly to gradually release any pressure build up in the reservoir. Turn the drain plug. After oil is drained from the tank replace the plugs.

4. Changing filters – Before removing the cover, clean outside of the cover to prevent dirt or dust from entering. Remove the bolts and the cover. Remove the spring, the valve and pull out the filter, which must be discarded. Removed elements must be checked it foreign materials or particles are struck inside the element. Install the element the valve and the spring. Replace the 'O' ring and install the cover. Close the bottom drain plug. Fill clean hydraulic oil through the cap. Operate boom, bucket and steering cylinders to fill the entire system with fresh oil and recheck the oil level.

5. Lubrication – lubricate 'O' ring with engine oil and position in groove of filter cap. Position new screen assemblies on spring and cap, install in core of fuel pump housing. Secure with snap ring. 'O' ring must be replaced.

6. Water pump and fan hub – use only a hand grease gun for 1 to 2 times as pressure or excessive grease will damage the water pump seal.

7. Crank case breather – Clean crank breather, under extreme dusty conditions clean the breather at every 500 hrs.

ADDITIONAL MAINTENANCE OPERATION

1. Engine cooling water – The proper operation of cooling system will be assured by clean soft water. Seasonal changes at spring and autumn will be the good opportunity to clean and check the system.

2. Cold water operation – Cummins engine requires replacement of the corrosion resister element when engine-cooling water is changed. Use the pre-charge element at this time.

3. Cooling system hoses - Inspect cooling system hose and hose connection for leaks and for deterioration. Particles of deteriorated hose can be carried through cooling system and restrict or clog small passages, especially radiator core, and slow or partially stop circulation. Replace as required.

4. Replace breather on hydraulic reservoir – The valve assy must be replaced at every 2000 working hours or less. In dusty or sandy and rough or slope working area, more frequent changes may be breather and bust in air may plug it.

5. Adjust steering – When excessive plug or rough operation is felt at the steering wheel consult your authorised BEML representative for check and adjustment.

6. Adjustment of steering wheel play – The standard play of the steering wheel is 20 to 70 mm on circumference.

7. Adjustment of service brake – With minimum air pressure and with brake fully activated and applied, adjust at slack adjuster to obtain 38 mm travel on the brake chamber push rod when brakes are released. Adjust all slack adjusters on machine for same travel distance.

8. Adjustment of articulation pivot – when noise or excessive frame vibration or frame wobble is felt during steering or loading centre hinges pins may need adjustment. Consult your authorised BEML representative.

9. Starter motor and alternator – One in a year, starter motor and alternator will require lubrication and check of bearing and / or brusher wear.

10. Check fuel pump calibration – Check fuel pump calibration on engine at 4000 working hours if required.

COLD WEATHER OPERATION

In cold weather, it is frequently experienced that even such an engine, which will start easily in summer, is difficult to start and in the worst case the engine becomes frozen. Greater care should therefore be exercised in cold weather maintenance and handling of the machine as suggested below:-

(1) Use lubrication with a correct viscosity rating. Since lubricating goes down, oil should be replaced with viscous ones for cold weather use.

(2) Use fuel whose pour point is lower than that used in the normal atmospheric temperature. Where atmospheric temperature is below 10°C (14°F) diesel fuel ASTM 975 No ID or equivalent must be used to ensure satisfactory fuel flow through lines and filters.

(3) The capacity of a battery fir holding electricity is low when it is cold. This means that the battery is more liable to run down than in warm weather. For detailed information regarding the battery, refer to the topic electrical system.

(4) Avoid freezing of the cooling system. Where freezing temperatures are excepted during over night parking of the machine, be sure to drain the cooling system after the engine is shut down. The botheration of daily draining of the cooling system can be avoided by using anti freeze compound in.

CARE AND USE OF ANTI FREEZE COMPOUND

1. Although many brands of anti freeze compound are available the use of a permanent type of ethylene glycol is recommended.

2. The amount of Anti freeze depends on the atmospheric temperature and this relations is shown in the table below.

3. Before pouring the anti freeze compound into the radiator drain and clean the system completely. (see the 500 hrs service operation for details).

4. First fill upto 80% of fuel capacity of the cooling system, and start the engine there after. When the coolant is warmed upto the balance temperature, refill the remaining the coolant upto the specified level.

5. It is a wise practice to attach a tag to the radiator indicating the date of mixture preparation and anti freezing point.

6. As anti freeze compound is flammable, keep it away from open fire.

Min. atmospheric Temperature	(°C)	-5	-10	-15	-20	-25	-30	-35
	(°F)	23	14	X5	-4	-13	-22	-31
Anti freeze	litres	15	20	24	27	30	33	35
Water	litres	50	45	41	38	35	32	30

Starting of the engine in cold Weather:-

In Cold Weather, it may occasionally arise that the engine is not started by means of the normal starting procedure. The engine starting, however, is not difficult by the aid of the intake air pre-heater. Proceed as follows prior to starting the engine make sure that all preparative items or engine stating are take of-

i) Unlock the priming pump knob and pump with it two or three times slowly (While the air remains in the fuel system) the knob will move lightly and the fuel pressure gauge pointer does not move. When the air is completely purged out of the system, more effort is required to move the knob and the pointer begins to move. As soon as the pointer moves, stop operating the hand primer.

ii) Place the toggle switch in on position. The glow plug indicates will be lighted keep the switch in on position for approximate 20 seconds.

iii) After the indicator has glown bright, place the compression release lever to start position and turn the starting switch key to start position to crank the engine or approximate 20 seconds.

iv) As soon as the starting motor starts rotating operate the hand primer to let the fuel pressure gauge pointer start with in the operating pressure range viz 80 to 100 PSI.

v) In such case stop cranking the engine and operating the priming pump repeat steps 2, 3 and 4 again.

vi) After the starting motor has been rotated for approx 20 seconds release the compression release lever and the engine will start.

vii) When the engine has started properly, stop operating the priming pump, lock the knob, and push the air cleaner pre-heater switch in.

viii) Keep the warm up run and after idle running becomes smooth, further keep the warming for about five minutes with the throttle pedal pushed half way of its stroke.

ix) After making sure that the pointer of the water temperature gauge is within the operating range i.e. with in 75°C and 90°C. Start driving the leader with three quarter throttle. Begin with low speed and gradually increase the driving speed.

MARK	POINT OF LUBRICATION	CAPACITY IN LITRES	LUBRICATION SPECIFICATION	LUBRICANT		
				IOC	ESSO	SHEEL
EO	Engine Crank Case	18	MIL-L 2104C 40°F and above	Servo Super 30	Shell Rotella Toils	Esso-Lub HDX
ATO	Transmission System	25	Type C-2 Transmission Fluid	Servo Ultra 10	Esso Torque Fluid	Donex T-5
HEO	Hydraulic System	130	-10°F & above Type C-2	Servo Ultra 10	Esso Torque Fluid	Donex T-5
HGO	Axle related	24 (each)	Gear oil Multipurpose MIL-C-2105C, Below 32°F Above 32°F	Servo Gear 80 Servo Gear 90	Esso Gear GP 80 Esso Gear GP 90	Shell Spire EP 80 Shell Spire EP 90
G	Pins of steering, Lift & Dump cylinders, shovel linkage and intermediate drive etc.	(as required)	Molybdenum disulphate All temperatures	Servo Nolese	Beacon Q-2	Ratinax AM
F	Fuel system	185	ASTM 975 No 2D (Cetane No 45 Min Sulprur 1.2 % max) 50°F and above. ASTM 975 No ID (Cetane No 40 Min Sulprur 1.1 % max) 50°F and below.	High Speed Diesel Oil High Speed Diesel Oil	High Speed Diesel Oil High Speed Diesel Oil	High Speed Diesel Oil High Speed Diesel Oil
W	Cooling system	45	Pure water	-	-	-

SCHEDULED		MAINTENANCE CHART					
S/No	MAINTENANCE	10 Hrs	50 Hrs	200 Hrs	500 Hrs	1000 Hrs	Additional Maintenance
1	Check engine oil level	0	-	-	-	-	-
2	Check Transmission oil level	0	-	-	-	-	-
3	Check hydraulic oil level	0	-	-	-	-	-
4	Drain condensation from Air Tank	0	-	-	-	-	-
5	Drain sediment from fuel tank	0	-	-	-	-	-
6	Drain fuel filter.	0	-	-	-	-	-
7	Check tyre and wheel	0	-	-	-	-	-
8	Check Radiator coolant level	0	-	-	-	-	-
9	Check air cleaner	0	-	-	-	-	-
10	Fill fuel tank	0	-	-	-	-	-
11	Check Batteries	-	0	-	-	-	-
12	Lubrication	-	0	-	-	-	-
	i) Articulatation joints	-	0	-	-	-	-
	ii) Steering Cylinders	-	0	-	-	-	-
	iii) Axle cradle.	-	0	-	-	-	-

13	Lubrication	-	-	0	-	-	-
	i) Drive shafts	-	-	0	-	-	-
	ii) Loader linkage	-	-	0	-	-	-
	iii) Brake Treadles	-	-	0	-	-	-
14	Change engine oil and filter	-	-	0	-	-	-
15	Change transmission filter element	-	-	0	-	-	-
16	Lubricate electric system	-	-	0	-	-	-
17	Clean transmission breather	-	-	0	-	-	-
18	Check oil level in axle	-	-	0	-	-	-
19	Clean fuel breather	-	-	0	-	-	-
20	Check and adjust belt tension	-	-	-	0	-	-
21	Change corrosion resister	-	-	-	0	-	-
22	Check thermostat	-	-	-	0	-	-
23	Check axle oil	-	-	-		0	-
24	Check hydraulic sys oil & filter.	-	-	-	-	0	-
25	Clean crank case breather	-	-	-	-	0	-
26	Lubricate water pump and fan hub	-	-	-	-	0	-
27	Engine cooling water	-	-	-	-	-	0
28	Inspect cooling system hoses	-	-	-	-	-	0
28A	Cold weather operation	-	-	-	-	-	0
29	Replace breather on hyd reservoir	-	-	-	-	-	0
30	Check and adjust steering	-	-	-	-	-	0
31	Adjust service brakes	-	-	-	-	-	0
32	Adjust articulation pivot.	-	-	-	-	-	0
33	Check starter motor.	-	-	-	-	-	0
34	Check fuel pump calibration	-	-	-	-	-	0

SPECIFICATIONS

ENGINE
- Model : NT-180
- FHP : 130 @ 2000 RPM
- Max torque : 58 Kg.M @ 1650 RPM

PERFORMANCE
- Struck : 1.7 CU.M - 1.3 CU.M
- Heaped : 2 CU.M - 1.6 CU.M
- Max loading capacity : 3200 Kgs
- Break out force : 13.500 Tons
- Max Run Pull : 10.183 Tons

TRAVEL SPEEDS : Forward & Reverse
- Ist : 6.0 KMPH
- 2nd : 12.3 KMPH
- 3rd : 20.7 KMPH
- 4th : 31.6 KMPH

Dump clearance 2900 MM

Dump reach 1070 MM

ELECTRICALS SYSTEM 24 V negative ground

DIMENSION IN MM
- i) Length with bracket : 6525
- ii) Width with bracket : 2750
- Width at tyre : 2500
- iii) Height upto exhaust muffler top : 3330
- Height upto exhaust muffler top : 2255
- Nos of Tyre : 4 Nos
- Size of tyre : 18X25 Ply 24
- Tyre pressure : 4.2 Kg/Cm2

STORAGE

Before storage: -Prepare the machine for storage to minimize deterioration. The type storage site, lowest expected temperature during storage and length of storage will determine the amount of preparation needed.

Select a dry storage site, If possible an enclosure that is dry and will protect the machine from rapid temperature changes will lessen the amount of condensation that takes place in the engine, hydraulic components, fuel tanks and final drives. If the tractor must be stored outside without wind protection, cover all breathers, air vents, the exhaust stock and other openings. This will help to keep water and dust from entering the working parts of the machine. Cover the machine with tarpaulin or other suitable covers if possible.

PRIOR TO STORAGE, LUBRICATE WITH COMPLETE MACHINE:-Tape or make a thin film of grease on the exposed parts of all hydraulic cylinder rods to prevent pitting and dirt accumulation on finished surface.

Apply fresh chassis grease at all grease fittings and fill the fuel tank.

Remove and clean the batteries. Tag the battery cables to ensure proper installation, store batteries in a dry room and keep them fully charged. Open the drain cock of the air tank to drain condensation, close after completely drained.

For prolonged storage, release the tension on all drive belts and insert heavy paper between the belts and their pulleys. This will keep belts from sticking to the pulleys and prolong the belt life. Tape the exposed part of all hydraulic cylinder rods to prevent pitting and dirt accumulations on finished surface.

Support the loader on adequate stands to remove all weight from the tyres and lower the buckets so that it rest on the ground. Steam clean the engine compartment and the interior and exterior of the loader. Touch up the scratches on all pointed surfaces before sparing the surfaces with a protective wax coating. Work the unit with a slight load until the oil in the engine, transmission, final drive and the hydraulic system fluid becomes warm. Drain all oil and cooling fluid while warm. Replace filter cartridges and refill the engine transmission, final drive and hydraulic system with the proper type of fresh lubricant. Flush the engine cooling system. Fill the system with the type of fluid needed to protect the system at lowest expected storage temperatures.

AFTER STROAGE

Prepare the stored machine for service check tyres for possible cuts or damage and replace or repair also make sure that they are properly inflated. Clean the chassis grease from the exposed portion of hydraulic rods. Install fully charged batteries and make the proper cable connections. Remove the coverings from the exhaust pipes, crank case breather pipe and air cleaner pipe, and install the air cleaner hood. Fill the cooling system with clean soft water and the type of fluid recommended by the engine manufacturers. Drain the accumulated water or sediment from the fuel tank and fill the fuel tank. Remove the engine valve cover and pour clean correct lubricating oil to valves and rocker arms. Drain the crankcase and fill with the specified lubricating oil. Be sure the lubricating oil filter has a new element before starting the engine.

Check all oil levels of hydraulic reservoir, brake tanks, transmission, axles and transfer drive and change oils of water or accumulation is found. Check all connections and mountings bolts/nuts for leaks or looseness. Allow the engine to run for 5 to 10 minutes for through distribution of the lubricating oil. Do not place the engine under load until normal oil pressure is reached.

After the machine is started for an extended period is put into operation, extra care of operation is recommended.

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