Vehicle/Equipment Operator Preventive Maintenance Checks, South Pole Station

OP-S-344

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Approved by [redacted]

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Active Divisions/Departments:
South Pole Area Directorate

Raytheon Polar Services Company
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Purpose

This document provides guidelines for operator-conducted vehicle/equipment preventive maintenance checks at South Pole Station.

Scope/Applicability

All heavy equipment and light vehicle operators are responsible for performing these preventive maintenance checks.

Terms and Definitions

ATV
All-Terrain Vehicle

Daily Checklist (OP-S-344a)
Sheet used to do visual checks and fluid level checks before start of each shift

PM
Preventive Maintenance

ROPS
Roll-over Protective Structure

VMF
Vehicle Maintenance Facility

Responsibilities

All Vehicle/Equipment Operators
Perform preventive maintenance checks in accordance with this procedure. All vehicle/equipment operators are responsible for familiarization with the operator's manual and manufacturer recommendations for performing these tasks.

Complete a Daily Checklist (Attachment 1) at the beginning and the end of each shift verifying fluid checks and visual inspections. At the end of each shift, submit the Daily Checklist to the VMF for recordkeeping.

Track scheduled PM intervals and report the "Next Service Due" meter reading on the Daily Checklist. Do not operate equipment due (or overdue) for PM without express permission from the Operations Manager or his/her designee.

Fill equipment fuel tanks at the end of each shift (unless the machine is going into the VMF for PMs/repairs.)

Clean equipment of excessive snow and ice at the end of each shift and prior to maintenance or repair cycles.

Discussion

All operators are required to complete a walk-around check of the vehicle/equipment at the beginning and the end of each shift. Detailed instructions for the various types of vehicles/equipment are included in the following pages.

General Guidelines for all Vehicles/Equipment

Visually inspect the outer surface, hoses, attachments, suspension, tracks or tires and the underside of the machine for reportable conditions.

Check the engine compartment: check fans and blades for tightness on their mounts, fan belt tension and condition, presence of trash, ice or snow buildup, or leaking fluids. Check vacuum gauges on air cleaner systems that include them and/or visually inspect the air cleaner element for snow and ice buildup. Correct as needed.

Check the engine oil, transmission fluid, hydraulic fluid, glycol, transfer case oil, balderson hitch, and fuel. (Fluids are checked cold for quantities acceptable to support startup.)

Follow manufacturer's instructions for hot or running checks when the machinery has come up to operating temperature. An engine at idle is not hot, nor has it heated the transmission or the hydraulic system. All fluids will expand significantly when hot.

Note In order to ensure proper heating of transmission and hydraulic systems, first allow the equipment to idle until running temperature has been achieved, then drive slowly while cycling hydraulic systems. After transmission and hydraulic systems have been properly cycled and heated, check the fluid levels and add fluids if necessary.

Maintain vehicle/equipment cabs in a functional, tidy, and safe operating state.

Complete the Daily Checklist after each walk around, and submit the checklist to the VMF at the end of the shift.

Pickups, Vans

DAILY, OR EVERY 10 HOURS OF OPERATION:

1. Complete pre-op and post-op walk-around visual inspections of outside surfaces, suspension, and undercarriage for any leaks or damage.
2. Check the engine oil, transmission, coolant, and fuel levels.
3. Check for damaged or under-inflated tires.
4. Complete the Daily Checklist and submit it to the VMF at the end of the shift.

WHILE OPERATING THE VEHICLE:

1. Note any changes in the sound of the exhaust or any smell of exhaust fumes in the vehicle.
2. Check for vibrations in the steering wheel. Note any increased steering effort, looseness in the steering wheel, or change in its straight-ahead position.
3. Note if the vehicle constantly turns slightly or pulls to one side when traveling on a smooth, level road.
4. When stopping, listen for strange sounds and note if the vehicle is pulling to one side, or if there is increased brake pedal travel or if the brake pedal is harder to push.
5. If any slipping or changes in the operation of the transmission occur, check the transmission fluid level.
6. Check automatic transmission PARK function.

7. Check parking brake. Read and understand the instructions for operating the auxiliary "Micro-lock" parking brake if supplied.
8. Report any deficiencies to VMF.

ATVs

LMC 1200, LMC 1800, Pisten Bully

BEFORE STARTING THE ENGINE:

1. Complete pre-op walk-around visual inspection of outside surfaces, suspension, and undercarriage for any leaks or damage
2. Check oil, coolant, and fuel levels.
3. Inspect fan and pump belts.
4. Check radiator hoses.
5. Inspect tires and wheels for damage.
6. Inspect tracks for proper tension and any damage from previous use.

AFTER ENGINE IS STARTED:

1. Recheck for leaks.
2. Check accessories.
3. Maintain the cab in a tidy and safe operating condition.
4. Check safety equipment, proper function of controls, and gauges.
5. Check hours. Report hours, and next PM due, to VMF.
6. Report any deficiencies to VMF.

AT THE END OF THE SHIFT:

1. Complete the Daily Checklist and submit it to the VMF.

Loaders

Track Loaders

Always keep a close watch for leaks. If leaking is observed, find the source and report to VMF. Check the fluid levels more frequently than the recommended periods if leaking is suspected or observed.

DAILY, OR AT THE BEGINNING OF EACH SHIFT:

1. Complete pre-op walk-around visual inspection of outside surfaces, suspension, and undercarriage for any leaks or damage.
2. Inspect all attachments, cylinders, hoses and linkage for damage, excessive wear, snow or ice build up.
3. Inspect and report any hydraulic system leaks to VMF. Inspect hoses, seals, and around flanges.
4. Inspect fuel system water separator and drain.
5. Visually inspect the tracks. Check for wear and excessive ice build-up on track components.
6. Check track tension. Typical rule of thumb for track sag is 1" to 3" between support rollers. Check with VMF if unfamiliar with adjusting tension.
7. Inspect the engine pre-cleaner for debris build-up. Remove any snow or debris.
8. Inspect transmission for leaks. Report any found to VMF.
9. Inspect the final drives under the machine for leaks. Report any found to VMF.
10. Be sure covers, shields and guards are firmly in place. Inspect for damage or for loose and missing bolts.
11. Inspect the lights for broken bulbs or lenses. Report deficiencies to VMF.
12. Inspect the steps and handholds for their condition and cleanliness. Inspect the Roll-over Protective Structure (ROPS) for damage. Tighten any loose bolts.

13. Check Fluids and Compartments:
    a. Check engine oil, transmission, hydraulic, balderson hitch fluid, coolant and fuel levels, pump drive gear box level. (963 has only a transfer case to check.)
    b. Inspect fan belt(s) for condition and tension.
    c. Inspect and remove any trash, ice or snow build-up in the engine compartment.
    d. Inspect the cooling system for leaks, faulty hoses and trash build-up. Report any leaks to VMF and remove any debris from the radiator fan shroud and belt area.
    e. Inspect and report any engine compartment leaks to VMF. Check around all seals and covers.
14. Operator's Cab:
    a. Inspect operator's compartment for cleanliness and remove all trash accumulation. Store tools in compartments.
    b. Test indicators, gauges, lights, and brakes.
    c. Inspect seat belt and mounting hardware.
    d. Test back-up alarm, horn (if equipped).
    e. Check engine hours. Report hours, and next PM due, to VMF.
15. Report any deficiencies to VMF.

Wheel Loaders

START OF EACH SHIFT:

1. Check engine oil, transmission, hydraulic, balderson hitch, and fuel levels.
2. Drain moisture and sediment from air reservoir. Check with VMF if the machine's air system is charged with a drying agent such as alcohol.
3. Perform walk-around inspection:
    a. Inspect engine pre-cleaner bowl and remove accumulated debris. Verify air cleaner element is not clogged by viewing the vacuum gauge or exposing the filter element. Clean or replace as needed.

b. Inspect the bucket/fork, and linkage for damage, excessive wear, and ice or snow buildup. Remove as necessary.

c. Remove trash, snow or ice built up in the engine compartment.

d. Check fuel system water separator and drain.

e. Inspect the cooling system for leaks and faulty hoses. Remove any trash, ice or snow, from the radiator, fan shroud and belt area.

f. Inspect hydraulic tank, cylinder rod seals, hoses, tubes, plugs, joints, and fittings for leaks.

g. Inspect the differentials and final drives under the machine for leaks.

h. Inspect tires for damage and proper inflation.

i. Inspect transmission for leaks.

j. Inspect covers and guards for damage and correct placement.

k. Inspect steps, walkways, handholds, for condition and cleanliness.

l. Operator's cab

   i. Check safety equipment, controls, and gauges for proper function.

   ii. Adjust rear view mirrors for best vision.

   iii. Test backup alarm.

   iv. Check engine hours. Report hours, and next PM due, to VMF.

4. Report any deficiencies to VMF.

Rubber Track Tractors (MT865, Challenger 55)

1. Check engine oil, hydraulic, coolant and fuel level. Remove any snow or trash buildup in tracks stairway and cab platform.
2. Check engine cooling system for leaks and faulty hoses.
3. Inspect alternator and water pump belts for looseness.
4. Inspect tracks for tension, or damage; rips, tears, missing grousers.

5. Check for oil leaks in the following areas:
    a. Hydraulic track tension cylinder
    b. Idler and drive wheel hubs
    c. Rear axle area
    d. Engine compartment
    e. Transmission case
    f. Hydraulic implement control valve
6. Check cover guards are in place.
7. Inspect drawbar.
8. Inspect all hydraulic hoses for leaks or wear.
9. Check front grill for ice or snow buildup, remove as necessary, and check proper positioning of cooling air inlet flap.
10. Inspect cab for cleanliness, adequate function of controls, computer, gauges, and safety devices.
11. Check engine hours. Report hours and next PM due to VMF.
12. Report any deficiencies to VMF.

Bulldozers

1. Inspect area around the machine for loose bolts, all fluid leaks , and ice and snow buildup, remove as necessary, check for broken or worn parts.
2. Inspect tracks , track roller frames, idlers and support rollers for breakage, oil leaks, excessive wear, and evidence of heat.
3. Inspect condition of blade, dozer arm, trunnion, and hydraulic components
4. Check engine oil, hydraulic, transmission, coolant, and fuel levels. Also check transfer case and wet clutch case, if present.
5. Inspect fan blades and hub, check fan belts for tension and condition.
6. Inspect radiator fan shroud for ice build up and coolant leaks.
7. Check primary air filter vacuum indicator. Change filter if iced up.

8. Check winch oil level and cable condition when present.
9. Inspect stairs, cab platform and inside of cab for ice buildup; remove as necessary.
10. Maintain cab in a tidy condition, and keep windows clean.
11. Check safety equipment, seat belts, alarms, gauges and controls for adequate function.
12. Check lights for functionality (winter).
13. Check engine hours. Report hours, and next PM due, to VMF.
14. Report any deficiencies to VMF.

Mantis Cranes

1. Check engine oil, hydraulic, fuel, winch oil levels. (3010 only: check transfer case fluid.)
2. Check condition and tension of fan belt.
3. Perform a walk-around inspection looking for oil or coolant leaks, loose fasteners, missing or damaged guards, track frame tightness and alignment, track condition and tension, snow and report any deficiencies to VMF.
4. Check for ice and snow buildup and remove as necessary.
5. Record inspection in log book in cab.
6. Check engine hours. Report hours and, next pm due, to VMF.
7. Verify proper lift chart is present. Read, understand and FOLLOW chart.
8. Grease crane rotor bearing as required. Do not over grease. Do not grease headache ball swivel.
9. Record inspection observations, and maintenance actions in log book.

Excavator

1. Inspect machine for snow and ice build up on tracks and undercarriage, remove as necessary.

2. Look for loose bolts , track adjustment, broken or worn parts.
3. Check levels, engine, transmission, hydraulic, coolant, fuel.
4. Check boom and bucket for worn/broken parts, loose parts, missing pins, snow and ice buildup.
5. Check hydraulic hoses for leaks, tears or worn areas.
6. Check air filter.
7. Maintain cab in a tidy condition, glass clean.
8. Check proper function of safety devices, controls, gauges.
9. Check engine hours. Report hours and next PM due, to VMF.

Man Lift

1. Check level of engine oil, hydraulic fluid, and fuel.
2. Check for evidence of hydraulic hose leaks, cuts, twisting, or deterioration.
3. Check tires for cuts and proper inflation.
4. Check platform, boom and vehicle for loose objects. Loose objects should be properly stowed.
5. Check all attachment points and retaining pins on platform are present, tight and properly positioned.
6. Check rotation bearing bolts fastening rotation bearing to vehicle and boom for loose or missing bolts.
7. Check all control mechanisms for maladjustment that would interfere with proper operation.
8. Check upper and lower boom for damage. Always make sure that any defect or apparent malfunction is corrected immediately.
9. Check personnel platform for cracks or damaged corners, edges, or attaching hardware.
10. Check engine hours. Report hours, and next PM due, to VMF.

Trencher ("Ditch Witch")

1. Check engine system:
    a. Crankcase oil level
    b. Fuel level
    c. Fuel filter drain
    d. Air cleaner indicator
    e. Radiator coolant level
    f. Battery
2. Check hydraulic system:
    a. Check oil level in reservoir.
    b. Check hoses and fittings for leaks or damage.
    c. Check valves and steering cylinder for leaks and proper function.
    d. Check engine hours. Report hours, and next PM due, to VMF.
3. Check tires for proper inflation and valve stem caps: look for damage.
4. Check digger chain and drive system:
    a. Check condition of cutters.
    b. Check idlers for side play. (Raise boom 6" above ground).
    c. Check condition and tension of digging chain.
    d. Check condition of drive sprocket.
    e. Check condition and tension of main belts.
5. Check safety devices:
    a. Check installation and condition of shields.
    b. Check starter interlock switches on clutch pedal and hydraulic drive direction control lever for proper operation and adjustment.
    c. Check condition of decals.
    d. Check operation of parking brake.

e. Check operation of lock valves on boom lift cylinders.

6. Report all deficiencies to VMF.

277 Skid Steer

1. Check engine oil, hydraulic, coolant, fuel levels.
2. Check radiator core for ice or snow buildup remove as necessary.
3. Check engine air filter.
4. Check fuel system water separator.
5. Lubricate axle bearings.
6. Lubricate lift arm and cylinder linkage.
7. Lubricate tilt cylinder bearings and bucket linkage bearings.
8. Inspect bogie and idler.
9. Inspect sprocket retaining nuts.
10. Inspect rubber track for proper tension, integrity.
11. Inspect quick coupler.
12. Inspect tool mounting bracket.
13. Keep cab tidy and glass clean.
14. Check for proper function of safety devices, controls, gauges.
15. Check engine hours. Report next PM due, to VMF.
16. Report all deficiencies to VMF.

Telehandler

1. Perform walk-around inspection looking for any fluid leaks, loose or worn, bent or broken parts.
2. Inspect boom, frame, fence and forks.
3. Inspect boom lift and telescopic cylinder for proper operation.
4. Inspect hydraulic hoses and cylinders for leaks or wear.

5. Inspect tires and suspension for damage, deficiencies. Tires are foam filled.
6. Check engine, transmission, hydraulic, coolant, fuel levels.
7. Check fuel system separator and drain.
8. Inspect engine air filter.
9. Inspect transmission neutralizer pressure switch.
10. Test backup alarm.
11. Check for loose wheel nuts.
12. Maintain cab in a tidy condition, glass clean.
13. Verify proper function of safety equipment, controls, and gauges, inspect rollover protective structure
14. Test braking system..
15. Verify proper lift chart present. Read and understand and FOLLOW lift chart.
16. Check engine hours. Report hours and next PM due, to VMF.
17. Report all deficiencies to VMF.

References

Caterpillar 277 operation and maintenance manual, SEBU7494-04 July 03

Caterpillar 950G operation and maintenance manual, SEBU7018-07 April 03

Caterpillar TH103 operation and maintenance manual, SEBU 7111-01 May 2000

Caterpillar 953C operation and maintenance manual, SEBU7115-05 March 2002

Records

Record Identification, Format, & Owner	Active Location	Facility Storage	Retention Time	Ultimate Disposition
Daily Vehicle Log Sheets: hardcopy kept in each vehicle.	Turned in to VMF once per shift. Available from VMF Supervisor.	Stored in VMF for one year.	One year	Recycle

Attachments, Appendices

Attachment 1 of 1: OP-S-344a, *Vehicle/Equipment Daily Checklist*