

Simplified Machine/Electrical Checklist for Part 36



Approval Applications

U.S. Department of Labor

Mine Safety and Health Administration

Approval and Certification Center



SAMPLE

THIS BLOCK FOR MSHA USE ONLY

ME # _____

REV LEVEL _____

MACHINE/ELECTRICAL CHECKLIST

Make and Model No. ABC Inc. Model 997

Machine Type Load-Haul-Dump Unit

If an MSHA Part 36 approval plate has been affixed to this machine, it must meet the requirements of Part 36, Title 30, Code of Federal Regulations. It is the responsibility of the user to ensure that this machine is maintained in permissible condition in accordance with this checklist.

ALL INSPECTIONS AND TESTS SHALL BE PERFORMED IN FRESH AIR.

PERMISSIBILITY:

1. For a complete permissibility evaluation, this checklist must be used in conjunction with a power system checklist.
2. The design of the exhaust conditioner limits permissible operation to grades not exceeding 12 %.
3. Due to braking capability limitations, this machine shall not be operated on grades greater than 25 %.

NOTE: When operated in areas which do not require permissible machines, this machine can be operated on grades greater than the 12 % grade limitation due to the design of the exhaust conditioner, Manufacturer's Drawing No. _____ Rev. _____ ,
but in no case can the machine be operated on grades greater than 25 %, due to braking capability limitations.

4. The approval plate specifies a ventilation rate of _____ CFM.

Manufacturer's Drawing No. _____ Rev. _____

Sht 1

NO CHANGES ARE PERMITTED WITHOUT PERMISSION FROM MSHA

SAMPLE

A. FUEL SYSTEM:

1. () There are no fuel leaks.
2. () The fuel filler cap (1)* is vented and the vent is not plugged (see Figure 1).
3. () The fuel filler cap is self-closing and is attached to the tank in a manner which will prevent loss during refueling.

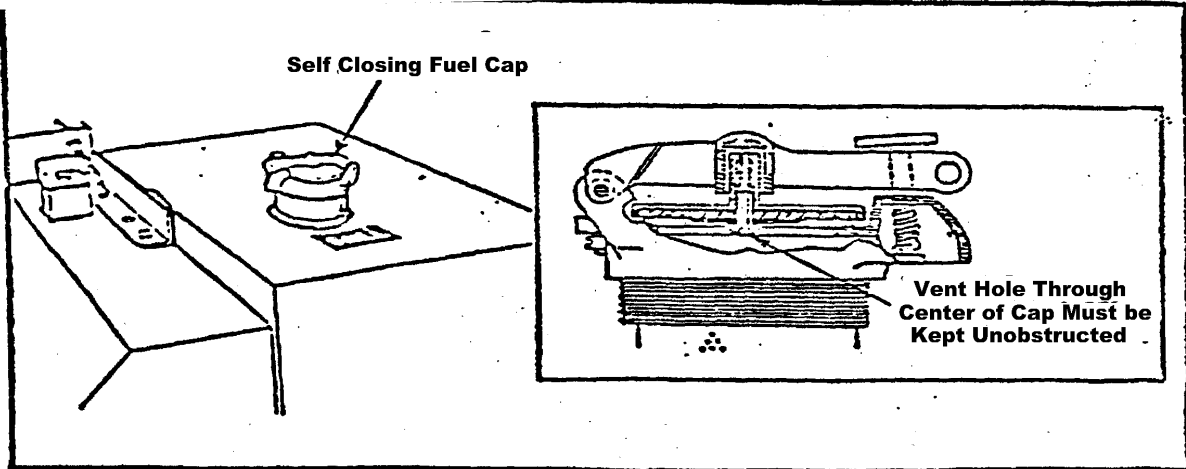


Figure 1

*Referenced items shown on Machine Layout Diagram.

4. () Auxiliary fuel tank capacity has not been added to the vehicle.
5. () Fuel filters (2)* are properly installed and are not damaged.
6. () The fuel injection rate adjustment mechanism (3)* and the engine governor setting are locked and sealed (see Figure 2).

Sht 2

NO CHANGES ARE PERMITTED WITHOUT PERMISSION FROM MSHA

SAMPLE

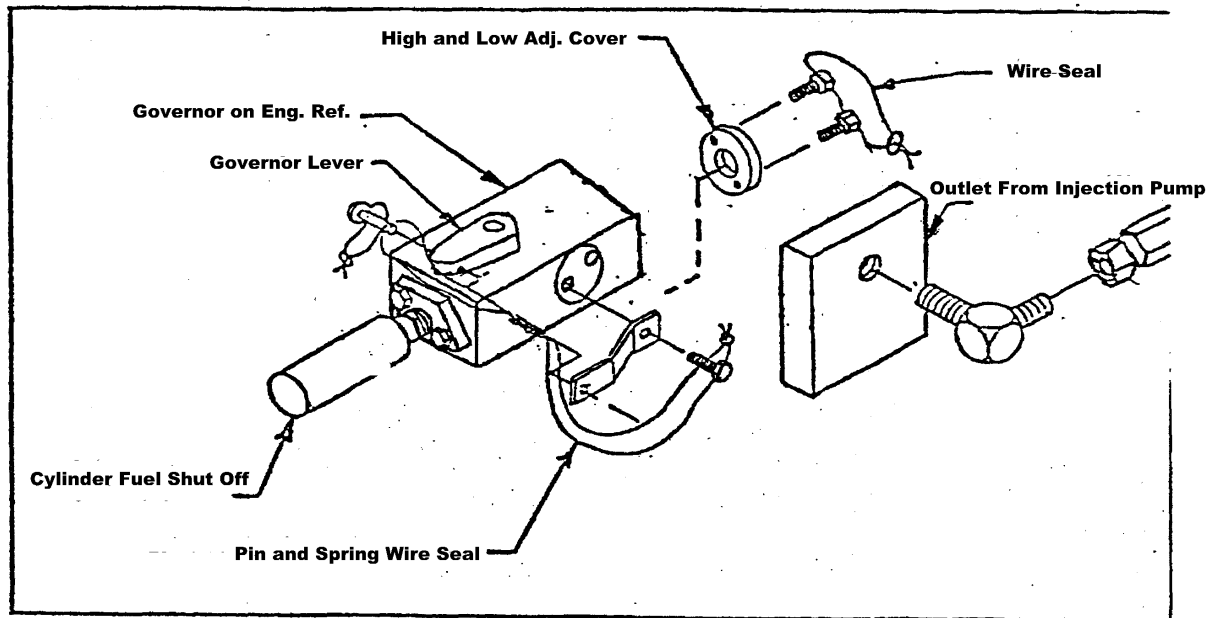


Figure 2

*Referenced items shown on Machine Layout Diagram.

7. () The fuel shutoff valve (4)* in the fuel supply line is operable.
8. () The drain plug (5)* in the fuel tank is locked in position. (Pipe plugs are considered "locked in position" when tight.)

NOTE: The following checks may be performed if the fuel lines have been repaired or replaced.

9. () Fuel lines are not routed near or connected to hot exhaust components and are protected from external damage.
10. () Fuel lines are secured

*Referenced items shown on Machine Layout Diagram.

Sht 3

NO CHANGES ARE PERMITTED WITHOUT PERMISSION FROM MSHA

SAMPLE

B. BRAKING SYSTEM:

WARNING: Brake tests are to be conducted on a relatively level surface, away from traffic areas where other machines or persons may be moving about. Consider the possible consequences of testing a machine with assumed braking inadequacies, and select an area where the test machine would not cause an accident due to these inadequacies.

1. () Service Brake Test.
 - a. With the engine operating and the machine stationary, apply the service brake.
 - b. Release all other brakes.
 - c. Place the transmission gear selector in second gear and the directional control selector in forward or reverse.
 - d. Depress the accelerator to full throttle, allowing the engine to put the transmission torque converter into a stall condition.

If the service brake is operating satisfactorily, the unit will not move when the above procedure is followed. If movement is detected, the service brake must be repaired or adjusted.

2. () Parking Brake Test.
 - a. With the engine operating and the machine stationary, apply the parking brake (6)*.

*Referenced items shown on Machine Layout Diagram.

- b. Release all other brakes.
 - c. Place the transmission gear selector in third gear and the directional control selector in forward or reverse.
 - d. Depress the accelerator to full throttle, allowing the engine to put the transmission torque converter into a stall condition.

If the parking brake is operating satisfactorily, the unit will not move when the above procedure is followed. If movement is detected, the parking brake must be repaired or adjusted.

NOTE 1: As applicable, detailed override procedures are to be included in this section to effectively evaluate parking brake capability.

NOTE 2: Gear selection for these tests must insure service and parking brake capability equal to or greater than the maximum specified gradeability of the machine.

SAMPLE

C. ELECTRICAL LIGHTING SYSTEM:

ALL ELECTRICAL ENCLOSURES MUST MEET THE FOLLOWING:

1. () All electrical enclosures (i.e., alternator (7)*, headlight switch (8)*, headlight (9)*) have an MSHA plate attached that is clearly stamped with an MSHA certification number.

*Referenced items shown on Machine Layout Diagram.

2. () All electrical enclosures are securely mounted and all vulnerable electrical components are protected from physical damage.
3. () All electrical enclosures are intact (not cracked or broken); the headlight lenses are not loose. All shaft and/or pushbutton controls are operable.
4. () All threaded covers are secured from loosening by a locking screw, wire, or other means.
5. () Lockwashers or equivalent devices are provided for all bolts, screws, or studs that secure parts of the explosion-proof enclosures. All bolts, screws, and studs are in place and tightened.
6. () None of the fastenings used for joints on the explosion-proof enclosures are used for attaching non-essential parts or for making electrical connections.
7. () All joints forming the flame arresting paths (flanges and covers) are smooth and free from rust, corrosion, and pitting.
8. () Use feeler gauges of the appropriate size to insure the clearances in all accessible flame path joints, between the enclosures and corresponding covers, are not exceeded
9. () Headlight(s) is/are installed at each end of the machine and operable.
10. () Headlight switch must not control or operate any electrical circuits other than headlights.
11. () All lead entrances (packing glands) are assembled so that the cable jacket penetrates into the enclosure and when tightened, a 1/8" minimum clearance remains between the packing nut and stuffing box. All packing nuts and stuffing boxes are secured from loosening by a locking screw, wire, or other means
12. () All unused lead entrances are closed with metal plugs which are secured in place by spot welding, brazing, or equivalent

IF CABLES CONNECTING ELECTRICAL COMPONENTS ARE REPAIRED, REPLACED, OR OTHERWISE DISTURBED, THEY MUST CONTINUE TO BE:

13. () Clamped in place to prevent undue movement.

Sht 5

NO CHANGES ARE PERMITTED WITHOUT PERMISSION FROM MSHA

SAMPLE

14. () Protected from mechanical damage by position, flame resistant hose conduit, metal tubing, or troughs.
NOTE: Flexible or threaded rigid metal conduit is not acceptable.
 15. () Not subject to abrasion from sharp corners or edges.
 16. () Isolated from hydraulic lines and hydraulic components.
 17. () Isolated from fuel lines.
 18. () Flame resistant if not enclosed in hose conduit. This is indicated by "MSHA" markings on the cable.
 19. () If hose conduit is used, it must be securely clamped at both ends and MSHA markings appear as "Flame-Resistant, US MSHA, US MESA, or USBM 2G-(152)."
- NOTE: The following check may be performed when an electrical enclosure has been disassembled for whatever reason, or if there is cause to believe a problem exists within the enclosure.
20. () Provided with short circuit protection for each power conductor.
 21. () Electrical connections inside the electrical enclosures are secure (not loose) and are insulated where space is limited. The ground conductors are not broken and are securely attached.

D. METHANE MONITOR SYSTEM (IF SO EQUIPPED)

NOTE: For machines equipped with a methane monitoring system, the following checks apply. These checks are given as an example; actual checks should be based on the individual system used and the manufacturer's recommendations.

1. () The power supply (10)* and amplifier readout (14)* components bear a label or plate indicating the methane monitor system Certification No. 32A-XXXMD.

*Referenced items shown on Machine Layout Diagram.

2. () All explosion-proof enclosures in the methane monitoring system meet the checks noted for electrical enclosures stated in Section C, Electrical Lighting System.
3. () The methane monitor solenoid valve assembly is installed in the machine's safety shutdown system in the same area and manner as the other safety shutdown devices which automatically shut off the fuel supply to the engine when activated.

SAMPLE

4. () The sensor head (13)* is mounted in an area where it will not be exposed to a continuous water spray and where a free flow of air from the mine face is available. Also, the vent holes and filter(s) on the sensor head are not clogged with water, dust, or other material

*Referenced items shown on Machine Layout Diagram.

5. () The warning device can be seen (or heard) by the machine operator at all locations from which the machine is operated.
6. () Assure that the methane monitor meter or readout assembly is properly adjusted to indicate zero (0) percent methane when no methane is present
7. () Activate the test switch. A warning is given when one (1) percent methane is indicated on the meter or readout assembly. When two (2) percent methane is indicated on the meter or readout assembly, the engine shuts down and all electrical components are deenergized. Self-contained, battery-powered headlights, approved under Part 20, are exempt from this requirement.
8. () It is not possible to defeat the methane monitor and start the engine by holding or blocking the machine's reset switch in the start position.

E. MISCELLANEOUS:

1. () The machine is equipped with at least one 5 lb. dry chemical fire extinguisher (11)*. All fire extinguishers are fully charged.
2. For machines equipped with a fire suppression system, the fire suppression system is operable as determined by the following checks:

NOTE 1: These checks are given as an example; actual checks should be based on the individual system used and the manufacturer's recommendations.

- a. () Note general appearance of system components for mechanical damage or corrosion.
- b. () Check nameplate(s) for readability.
- c. () Remove fill cap.
- d. () Make certain tank is filled with free-flowing dry chemical to a level of not more than 2 inches from the bottom of the fill opening.

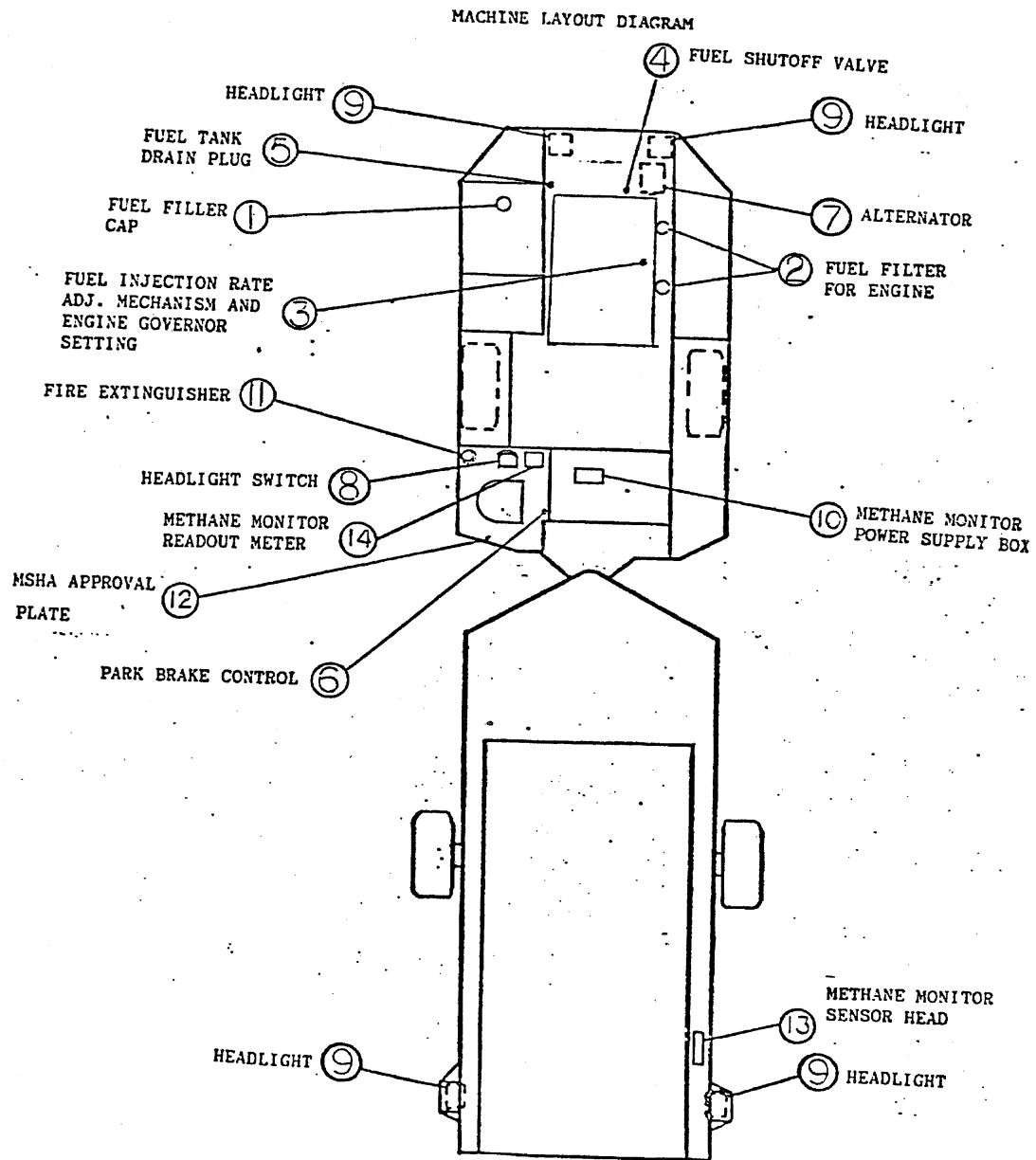
SAMPLE

- e. () Secure fill cap, hand tighten.

*Referenced items shown on Machine Layout Diagram.

- f. () Remove expellant gas cartridge and examine disc; seal should be unruptured.
- g. () Return cartridge to pneumatic actuator/cartridge receiver, hand tighten, and secure in bracket.
- h. () Check hose, fittings and nozzles for mechanical damage and cuts.
- i. () Check nozzle openings; slot on nozzle should be closed (capped) with silicone grease or covered with plastic blow-off cap.
- j. () Remove cartridge from manual actuator(s) and examine disc; seal should be unruptured.
- k. () Return cartridge to manual actuator(s) assembly; hand tighten.
- l. () Replace any broken or missing lead and wire seals.
- 3. () For machines equipped with an air system, the main air pressure gauge in the operator's compartment is operable.
- 4. () The machine has an MSHA Part 36 approval plate (12)* attached to it in the operator's compartment.
- 5. () The engine will not turn over unless the directional control selector is in the neutral position.
- 6. () The exhaust diffuser at the scrubber outlet is installed.

SAMPLE



Sht 9

NO CHANGES ARE PERMITTED WITHOUT PERMISSION FROM MSHA