

DIRECTOR GENERAL BORDER ROADS
GENERAL MAINTENANCE INSTRUCTION NO. 175

ON
MAINTENANCE AND LUBRICATION OF MOTOR GENERATOR D.C. ARC
WELDING MODEL 352 P

AIM

1. This instruction lays down the details of maintenance and lubrication of Advani Oerliken Motor Generator DC Arc welding model 352 P and to guide the user units to maintain / operate the equipment to achieve maximum life.

Action by -

(a) **Project / Task Force**

To instruct and check up the units under command for complying with instructions.

(b) **User Units**

All units holding the equipment will study the instructions carefully and will carry out maintenance and lubrication.

2. Follow operating instructions and enter the periodical tasks to be carried out in the log book.

(c) **Field Workshop**

To check the 'Record of maintenance and lubrication in the log books of the equipment during its inspection and repair, for compliance of instruction. Advise user units, if any discrepancy is noticed.

Applicability

These instructions are applicable to "Advani Oerliken " D.C. Arc welding Set with the following discrepancies :-

(a) Model : 352 P

Contd---P/2

- (b) Engine make and type : SIMPSON's Perkins 3 Cylinder diesel engines type P-3 (Industrial)
- (c) Max rated out put : 350 Amps.
- (d) Max permissible RPM : 2000 on no load.

Note:- Various operating specifications given under heading "General Heading".

Details of Instructions

- (a) General operation and maintenance instructions are as per Appendix 'A' to this instruction.
- (b) Periodic maintenance and lubrication instructions attached as Appendix 'B'

DIRECTORATE-GENERAL BORDER ROADS

GMI NO. 175

ON

Advani-Oerliken Make Motor Generator DC Arc Welding Set

GENERAL

1. A new machine requires careful operation during the first 100 hours. The machine should not be loaded for more than 2 / 3rd of its rated output for first 50 hours.
2. the best result will be obtained only if the operating and maintenance personnel responsible for the equipment are familiar with these instructions:-
 - (a) Close the drain cock of the radiator. Remove the cap of the radiator and fill radiator with clean and soft water upto the over flow pipe and tighten the cap.
 - (b) Check that the storage battery is fully charged. Manufacturers are generally supplying batteries without sulphuric acid and in dry uncharged condition to avoid spillage of acid and subsequently damage during transit. Proper procedure for initial charging of batteries should be adhered to while charging of such batteries.
 - (c) Oil level in the crank case should be neither below low level, nor more than high level mark.
 - (d) Fill the fuel tank with clean and filtered Diesel.
 - (e) Check electrical connection for loose connection, tighten if necessary.
 - (f) Fuel system should be bleed i.e. all traces of air to be remove from the fuel line.
 - (g) The air passes and cooling fins of radiator are free from foreign matter.

(h) Check that all nuts and bolts are tight and there is no cotton waste rages in vicinity.

(j) Battery polarity : This set has been provided with battery (-ve) earth system. Negative of the battery is earthed to body. Otherwise it will burn the Cut out .

3. STARTING PROCEDURE (General Instructions)

(a) Before starting " Pull to stop" Knob be pushed all the way in (IN).

(b) Do not hold the push button pushed for more than 20 Sec. Press the start push button for starting.

(c) Immediately after starting the engine, observed the oil pressure gauge (on the panel of engine control side) no pressure is indicted after 10-15 Sec, stop the engine and check the lubrication system .

(c) Engine should not be started on load.

(d) Engine should not be stopped on load.

(e) Commutator protective cover of welding generator should always be closed.

(f) Never open the radiator cap when the engine is running.

(g) Keep the electrodes and earthing connections tight.

(h) Never do grinding work near the generator especially near the shield side.

(j) Never run the machine without blowing inside the generator with compressed air, once a week when installed by dusty environments.

(k) Machine should be installed in true horizontal level.

(l) Brushes should not be used without bedding them on commutator.

(m) Brushes when worn out to 1 / 4 of normal size should be replaced.

- (n) Machine should not be used with sparking commutator.
- (o) Welding cables should be used with lugs and good insulation wherever necessary.
- (p) Welding cables should not be allowed to be loose.
- (q) Machine should not be attended to brake down / repairs without a thorough study of the manual.
- (r) Proper grade of lubricants should be used.
- (s) Keep a check on the temperature of the cooling water. It should not be allowed to boil.

Periodic Maintenance

This machine has been fitted with a (Simpson Make Perkins P5 (I)) engine assy. Proper lubrication and maintenance assures trouble free operation and long machine life.

Maintenance Schedule

General lubrication :-

The following type / make of lubricants and oil should be used in machine and or the welding generator side :-

Company	Brand	0 0 F to 30 0 F Temperature	30 0F to 80 0 F Temp.	Over 80 0 F Temp
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Indian Oil Corp.	Servo Super	10	20	30
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Trailer lubrication :-

Only the axle bearings and leaf spring shakles need to be lubricated with grease.

Periodic Maintenance (Daily)

1. Check fan belt adjustment. On pressing the fan belt with the thumb as the centre point between the water pump pulley and the crank shaft pulley in a side ways.

Direction - The amount of movement of the fan belt should be $\frac{3}{4}$ inches or 20 mm if correctly adjusted.

2. Check oil level in the pump.
3. Check electrolyte level in battery and top up.
4. Fill the fuel tank with clean and filtered diesel.

5. Check electrical connections for loose connections, tighten them if necessary.
6. The fuel system may be bled ie for all traces
7. Check that all nuts and bolts are tight.
8. Check water in Radiator.
9. Check drive coupling.
10. Check tyre pressure.

Every 50 Hours

In addition to the above carry out the following :-

- (a) Lubricate door, door hinges and grease spring shackles.

Every 100 Hours

In addition to the above instructions carry out the following also :-

- (i) Clean pre filter to fuel lift pump (when fitted)
- (ii) Examine air cleaner and replenish oil.
- (iii) Drain oil from sump and refill.
- (iv) Clean and treat the battery terminals and coat the terminals with mineral jelly.
- (v) Renew element in fuel oil filter.

Every 250 Hours

1. Remove, Clean and attend the air cleaner.
2. Clean the strainer in sump. Remove lub oil filter element.
3. Clean and check atomizer pressure setting at which the spray breaks should as 120 Atomsphere.
4. Clean gauges trap in fuel oil filter
5. Inspect all wires and terminals for damage wear and looseness.
6. Examine and test the starter and switches.
7. Inspect the commutator and brushes for dirt and signs of wear of charging generator.

8. Check the amperage and the voltage of generator delivered. An ammeter to indicate the welding current and a voltmeter to indicate the voltage are supplied in separate enclosures. The volt meter on open circuit should indicate 35 to 83 volts but should drop to 25-45 voltage (Arc voltage) while welding.
9. Examine the carbon brushes of exciter for signs of wear and tear. Proper spring and freedom of action in brushes boxes. Spring pressure for big brushes 800 to 900 grams and small brushes 500 to 600 grams.
10. (a) Examine the brushes holders for cleanness.
(b) Refill grease on grease cup on dynamo.
11. Check commutators for roughness and for low, high or loose bars.
12. Check all wiring connections, switches, instrumental and control for free movement.

A. Check tappet and valve springs.

Direction :- Tappet Clearance -

Inlet and exhaust valve clearance.

(In hot) - .010 "

(In cold) - .012 "

B. Clean and check Atomisers. The atomizer pressure be adjusted to 120 atmospheres.

C. Check the valve timing.

D. Inspect valve rocker shaft assy for lubrication.

1500 hours

Open the generator assy and clean to remove dust. Check bearings for serviceability and replace if necessary.

Note :- This instruction applied in normal working conditions. In case of high altitude / extreme winter condition / desert condition, specific care and precaution as per GMI Nos 51 to 56 will be taken.

Sd/-

(JL SAGHAL)

Lt Col

SO-I / E4 tech

For Dir. Gen Border Roads