

DIRECTORATE GENERAL BORDER ROADS  
GENERAL REPAIR INSTRUCTION NO 61  
ON  
ROLBA R-1200 ROTARY SNOW PLOUGH

**Introduction**

1. The ROBA R-1200 Rotary Snow Plough is the first equipment with hydrostatic transmission device introduced in the Organisation. The hydrostatic transmission system is very sensitive, therefore, needs special attention to carry out the repairs.

**Aim**

2. To list out correct methods of checking the problems on Hydrostatic system of ROLBA R-1200 as recommended by manufacturer and to diagnose causes of problems and to suggest remedial measure.

**Action By**

3. (a) Projects / Units: SO1 / SO2 EME Projects to organize Training of mechanics held on unit establishment maintaining ROLBA Snow clearance equipment, centrally under Projects arrangements in the Field Workshops (GREF)
- (b) Field Workshops (GREF): To follow a correct sequence of diagnosis and evolve techniques to pin-point defects by the process of elimination. This would minimize repair efforts.

**Details**

4. A list of probable defects and their remedies on Hydrostatic system of ROLBA R-1200 Rotary Snow Plough are tabulated at appendix 'A' to this Instruction. Field Workshops (GREF) should improve upon the same from the experience gained on the equipment to help pin-point defects and intimate improvement to HQ DGBR (E4-Tech).

**HQ DGBR GRI No 61**  
**Dated 07 Feb 74**

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**HYDRO – TRANSMISSION**

(Hydrostatic Motor and Pump plug their all  
Lines, valves, filters, control etc)

OF

**ROLBA R-1200 SNOW PLOUGH**

SI No	Defect	Probable Cause (s)	Suggested Remedy
1	2	3	4
1.	Hydrostatic Motor and pump not operating in either direction	(a) System having low oil level.  (b) Faulty Control Linkage to pump.  (c) By-pass valve (if used) stuck  (d) Disconnected Coupling.	(i) Check oil level in reservoir and replenish, if necessary (ii) Locate and fix leak or leaks causing the loss of oil.  Check the entire linkage to make sure it is connected and free to operate as it should.  Make sure the By-Pass or dumping Valve is closing properly.  <u>Note</u> :- Do not confuse By-Pass Valve with the high pressure relief valves located in the motor manifold.  Check to see that the coupling from the prime mover to the pump and the coupling from the motor shaft to the driven mechanism is not slipping or broken.

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(e) Low or Zero Charge.

(i) Install pressure gauge (capable of 600 PSI) in either the 1/8 N.P.T. in the charge pump or in the side of the main pump.

Note: - Charge pressure may also be taken by attaching a pressure gauge to the port on the rear of the motor manifold. This port, however, is blocked by the shuttle valve when the hydrostatic system is in neutral position ; therefore, the system must be operating either in the forward or reverse direction to obtain a pressure reading at this port. Operating pressure may also be taken at the manifold as explained.

(ii) Set pump speed to at least 500 r.p.m. charge pressure should read at least 120 PSI or more when main pump, control lever is in pumping position and fluid motor is operating.

(iii) Low charge pressure may be caused by :

- (aa) Charge pressure relief valve in charge pump stuck open.
- (bb) Filter or suction line clogged.
- (cc) Charge pump drive shaft is sheared.
- (dd) Internal damage to pump or motor.

1	2	3	4
		<p>(f) Low and <u>Fluctuating</u> charge Pressure.</p> <p>(g) Faulty Check Valves.</p> <p>(h) Internal Damage to pump or Motor.</p>	<p>(i) Air in system. Air will also cause system to be noisy. Check all fittings, especially ground filter, in the suction line and locate the point where air is being drawn into the system. Tighten fittings and joints where air leaks exist.</p> <p>(ii) Charge pressure relief valve <u>in the motor manifold</u> stuck open. Pressure will be normal when the pump is in neutral but low when in stroke.</p> <p>(iii) Internal damage to pump or motor.</p> <p>(i) Remove the two ball check valves located in the end cap of the pump under the charge pump and check the followings :-</p> <p style="padding-left: 40px;">(aa) Check valve to see if poppet, or ball is missing.</p> <p style="padding-left: 40px;">(bb) Check to see if the valve seat is eroded.</p> <p><u>NOTE</u> :- If any of the above conditions exist, replace both check valves.</p> <p>(i) Low or zero charge pressure (See 1-e) Charge pressure may also fluctuate rapidly.</p>

1	2	3	4
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(ii) Maximum obtainable operating pressure in both forward and reverse is less than the normal relief valve setting. Charge pressure, which will also be lower than normal, will drop to zero when the maximum pressure is reached.

(iii) Pieces or flakes of brass in the reservoir and filter.

(iv) Noisy unit 9pump or motor).

NOTE :- If either unit is considerably worn or damaged, the other unit should also be carefully checked.

2. System operates in one direction only.

(a) Faulty Control Linkages.

(i) Check the entire linkage to make sure it is connected and free to operate as it should.

(ii) Make sure the control "stop", if used, is not out of adjustment.

(b) High Pressure Relief valve stuck open.

Switch the two high pressure relief valves. If the system operates in the direction in which it would not operate before, one of the high pressure relief valves is stuck open. Both relief valve / disassembled and cleaned. Reinstall both relief valves and retest system.

{should be examined And the stuck relief valve}

(c) One Check valve faulty.

Follow instructions given in 1 (g).

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(d) Faulty Directional control valve  
(located on pump)

NOTE :- Do Not change the position of any of the hex nuts or slotted plug on the end of the control unless it is necessary to remove the control valve spool.

Disconnect control linkage at directional control arm. Move the control arm back and forth by hand. If it moves freely with no resistance, the control valve should be removed, and checked for broken parts or a bent control shaft.

3. Neutral difficult or impossible to find.

(a) Faulty Linkages.

Disconnect control linkage at directional control arm. If system now returns to neutral, the linkage to the control is out of adjustment or binding in some way.

(b) Control Valve out of adjustment.

(i) See 2 (d) NOTE.

(ii) If the hex nuts and slotted plug have been moved out of adjustment, the following steps must be taken.

(aa) Disconnect control linkage at the control.

(bb) Remove the two 1/8" pipe plugs on the rounded part of the control housing.

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(cc) Loosen the smaller of the two jam nuts and back the slotted plug off two turns (counterclockwise).

(dd) Turn the slotted plug in (clockwise) until you feel it make contact with the spring seat on the control spool. It should just barely touch the spring seat.

(ee) Hold the slotted plug with a large screwdriver to prevent it from moving and tighten the small jam nut.

(ff) Loosen the largest of the two jam nuts.

(gg) Turn the hex behind this jam nut in or out until by looking into the two 1/8" N.P.T's, the lands on the control spool appear to be symmetrically located in each hole.

(hh) Replace pipe plugs and start system. If system creeps in either direction turn hex behind large jam nut in or out until neutral is found.

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(c) Servo Cylinder out of Adjustment.

(jj) Hold hex to prevent it from moving and tighten large jam nut.

(kk) Reconnect control linkage.

(i) Remove the two sleeve retainers.

(ii) Return the servo cylinders to their original position. When the proper position of the servo cylinders was established at the factory, both the servo cylinder and the pump housing were parked with corresponding scribed lines. Matching these lines will return the cylinder or cylinders to their original position and re-establish neutral.

(iii) Re-install the two sleeve retainers and restack, if necessary.

NOTE :- Servo cylinders do not move out of position on their own. If they get out of adjustment, it has to be done by human hands.

4. System operating hot (reservoir temperature above 180<sup>0</sup>FC).

(a) Oil level low.

Replenish oil supply.

(b) Oil cooler clogged.

Clean cooler air passage.

(c) Oil cooler being By-Passed.

Cooler By-Pass valve, if used, stuck open.

1	2	3	4
		<p>(d) Clogged Filter or suction line.</p> <p>(e) Internal leakage (Usually accompanied by loss of acceleration and power)</p>	<p>Replace filter. Clean or replace suction line.</p> <p>(i) One of the high pressure relief valves may be stuck partially open. Install gages and read the charge pressure and operating pressure in both directions. If the operating pressure is 200 PSI or more, lower than normal in one direction and normal in the other, switch the high pressure relief valves. If the low pressure also switches to the opposite side of the circuit, disassemble, check and clean the faulty (low) relief valve. Re-install and check. Charge pressure should be normal at all times.</p> <p>(ii) Internal parts of pump or motor (or both) worn. Maximum obtainable operating pressure lower than the normal high pressure relief valve setting in both directions. When this pressure is reached, charge pressure will drop to or very near to zero. System will also be noisy at this point with the most noise issuing from the unit that is most worn. If either units is considerably worn or damaged, the other unit should also be carefully checked. Replace the worn parts in the units affected or replace the complete unit.</p>

