

SECTION 5: **OPERATING INSTRUCTIONS**

GENERAL

It is important that the operator is fully trained in the operation and functions of the "Hydro-Excavator" system and has complete understanding and knowledge of guidelines set down within this manual.

IMPORTANT

Ensure the following key factors are adhered to, for safety of both the operator and system.

- **NEVER** turn "off" truck engine while PTO is engaged
- **NEVER** turn "off" system power while PTO is engaged
- **NEVER** carry out any maintenance or service with engine running or PTO engaged
- **NEVER** attempt any maintenance on "rear door" or "collector body" without securing safety props in position.
- **NEVER** override any of the "Hydro-Excavator's" safety systems, they are there to protect you!

DAILY MAINTENANCE

The following maintenance checks should be performed daily prior to departing depot

- a) Water pump oil level
- b) Vacuum pump oil level
- c) Hydraulic oil level
- d) Clean Water Pump filter
- e) Clean vacuum pump filter
- f) Ensure there is adequate diesel fuel
- g) Perform truck engine checks as per manufacturer's guidelines
i.e. oil, coolant etc.

In addition to the above a general visual inspection should be carried out to check for water and/or oil leaks, loose wiring and hoses etc.

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USEFUL HINT

It can be of assistance if you carry some quantities of lubrication to suit water and vacuum pumps and hydraulic oil, along with a grease gun for top-ups or emergencies when on site.

SPOTTING AND SET UP

1. Position truck close as practical to work site, remembering the boom assembly has a working radius of 180°, with 90-degree rotation either side centre of rear door.
2. With truck in position, secure park brake, select neutral gear and activate rotating beacons, (optional equipment) and work lights if required (optional equipment).
3. Alight from cab and position appropriate safety signage and witches' hats in accordance with Company policy.
4. Connect hydrant fill hose (not supplied with system) to water tank fill point, a 50mm male camlock, located at the rear of the unit of left-hand side. Before connecting other end to hydrant point, run hydrant for a few seconds to allow any contaminants located in the hydrant immediate section to escape.
5. Check water tank drain valve is in "off" position and water tank overflow valve is in "on" position. Both valves are located left hand side forward of the rear axle group.
6. Ensure hydro pump water filter isolation valve is in "on" position, located centre of rear axle group on the left-hand side.

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7. Turn hydrant "on" and when water tank is approximately $\frac{1}{4}$ to $\frac{1}{2}$ full return to truck cabin to engage system.

8. **A VOLVO Engagement Procedures** (Manual and "I" Shift Transmissions)
 - a) With engine at idle and park brake secure select neutral gear
 - b) Check air pressure is at 600 kPa before proceeding.
 - c) Fully depress clutch and hold down – manual only
 - d) Switch system power to 'ON' - Switch No 1 L/H side
 - e) Switch PTO control to 'ON'- Switch No 2 R/H side
 - f) Select: 6th gear high for main hose reel – manual only.
 3rd. gear high for small $\frac{1}{2}$ " hose reel – manual transmission
 Select: "A" if "I" Shift
 - g) Slowly release clutch – manual only
 - h) The system is now fully functional.



Note: Turn No 1 System Power switch "ON" then No2 PTO Engage switch "ON" if the light in No2 switch does not come ON then there is a problem with the system, blown fuse, emergency stop depressed, park brake OFF, not in neutral.

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8 B HINO Engagement Procedure (Allison 3200 Series Transmission)

- a) With engine at idle & park brake secure, ensure neutral is selected
- b) Check air pressure is at 600 kPa before proceeding
- c) Turn system power switch to 'On' – Yellow Switch
- d) Wait until boom light is flashing. Turn PTO work mode switch to 'On' – Red Switch
- e) Wait 5 seconds, then select 'D' on Allison control panel
- f) If successful, the Allison transmission will have selected 4th gear, if not, re-select neutral, wait a further 5 seconds, and try again
- g) The system is fully functional after the engine speed has settled at 900rpm



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SETTING TO WORK

9. For Remote Control operation turn remote transmitter 'ON' and to activate Remote follow button log-on engagement sequence as per diagram within this section. The system may also be operated via the Touch Screen
10. Remove blanking transit cap from boom hose end and boom hose retaining chain.
11. Using the remote depress 'BOOM UP' button till boom clears transit carrying cradle.
12. Depress boom 'ROTATION' either left or right to best suit working position for job.
13. Depress 'BOOM OUT' to align boom hose end to best suited work position
14. If using Vacuum Extension Pipes, select pipe lengths required and attach to boom hose end fitting and secure pipes with quick release clamps. It is recommended that the fluidizing pipe section is used thus allowing better air flow at vacuum pick up point resulting in greater loading rates. Alternatively, flexible hose may be used in place of the pipes (not supplied with system)

HINT:

Use of the boom UP and DOWN function will assist in assembly of vacuum pipes.

15. Un-coil hydro gun jetting hose from the hose reel and attach handgun and lance assembly, ensuring fittings are tight.
IMPORTANT – Hose must be fully un-coiled from Hose Reel to prevent reel damage during operation – not doing this will void reel warranty.

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SETTING TO WORK (Cont'd)

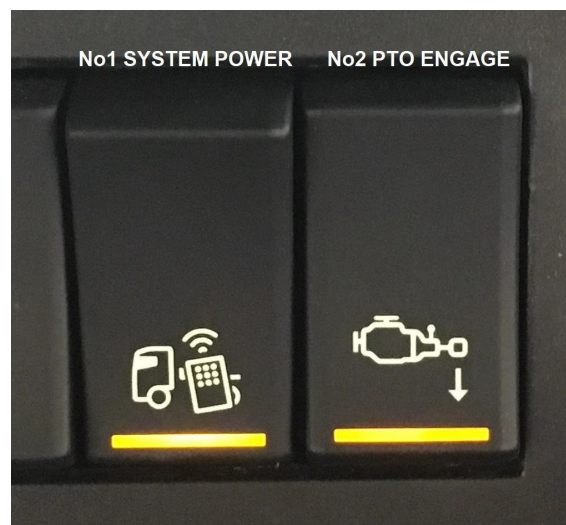
16. The system is ready for "Setting to work".
- 17.. Check water tank sight gauge to ensure the water tanks are full requirements.
18. The system is now ready to be set for operation.
19. Using the Remote Control turn Hydro Water Pump to 'ON' and Vacuum Pump to 'ON' positions.
20. Position vacuum pick-up point just above surface being excavated and then using the handgun begin to break ground surface up for vacuum extraction and slowly lower vacuum tube or hose into excavated area whilst jetting.

WARNING – Extreme caution must be observed to ensure all body parts and loose clothing are kept well clear of vacuum point-up point and handgun is only used when pointed to the ground.

21. Upon completion of work or when high debris level shut down occurs turn hydro water pump and vacuum pump 'OFF'.
22. Release line pressure in hydro gun hose.
23. Reverse operating procedure on job completion.

24 A. VOLVO Disengagement Procedures (Manual and "I" Shift Transmissions)

- a) With engine at idle depress clutch and hold down (Manual only)
Select neutral – "I" Shift
- b) Switch PTO control to 'OFF' position – Switch No 2 R/H side
- c) Switch system power to 'OFF' position – Switch No 1 L/H side
- d) Slowly release clutch. (Manual only)
- e) Turn off beacons and work lights (Optional)



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HINO Disengagement Procedure (Allison 3200 Series Transmission)

- a) With engine at idle, select 'N' on Allison control panel
- b) Ensure Allison transmission is in neutral, then turn PTO work mode switch to 'Off' – Red Switch
- c) Turn system power switch to 'Off' – Yellow Switch
- d) Turn off beacons and work lights (Optional)



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UNLOADING PROCEDURE

1. Position truck on stable terrain

NOTE: If "EXCESSIVE WATER" light comes on water tanks must be drained until "EXCESSIVE WATER" light stops flashing to allow to tip.

OPERATION

Push unloading button on the Touch Screen to change the system from Extract Mode to Unload.

NOTE: The unloading icon at the bottom of the screen must be illuminated red before entering the unloading screen. If this has not been done the unloading functions will not work.

1. Raise the boom until it reached full tilt. This should illuminate the "Boom position" icon in the bottom right corner.
2. Press and hold the "Door unlock" button. The function beeper will sound for 5 seconds before the locks will move. The "ON" button will light up green to indicate the hydraulic function of the locks. Once fully up the "Door Lock Open" icon will illuminate yellow.
3. Press and hold the "Door Open" button. The function beeper will sound for 5 seconds before the door will move. The "ON" button will light up green to indicate the hydraulic function of the door opening. Once the door is fully open the "Door Fully Open" icon will illuminate yellow
4. Press and hold the "Tank Raise" button. The function beeper will sound for 5 seconds before the debris tank will raise. The "ON" button will light up green to indicate the hydraulic function of the tank.

NOTE: Any interruption to this sequence and the system will freeze. The only way to reset the system is to manually override the hydraulics and return the out of sequence functions to their correct position.

This operation should only be carried out by trained personnel.

5. Prior to closing check rear door seal and sealing area is clean and clear of debris so not to damage door seal.
6. Reverse procedure and system are now ready for next task.