

4 TRACTOR PRE-OPERATION

4.1 GENERAL REQUIREMENTS

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Prior to putting a new tractor into service, perform the following procedures:

- wash the tractor;
- make a thorough inspection of the tractor, check the completeness of its sets and units; remove the storage batteries, make them ready for operation, and place them back into their place;
- check the threaded connections for tightening and, if necessary, retighten them;
- check the oil level in the engine crankcase, power transmission housing, FDA casing, hub drive reduction gear boxes, hydraulic system and HPS oil tanks and replenish oil, if necessary.
- drain all fuel from the fuel tanks and fill the fuel tanks with fresh settled fuel: in winter – with that of winter grade, in summer – with that of summer grade;
- check the brake fluid levels in the master cylinders of hydrostatic actuators of the clutch and service brakes; replenish, if necessary.
- fill in the engine cooling system with coolant to the upper end-face of the radiator filler neck;
- check and adjust as necessary the tension of the alternator drive belt;
- lubricate the tractor mechanisms and assemblies in accordance with Appendix 11.8;
- check the air pressure in the tires and bring it to the normal value, if required.

CAUTION! Prior to putting the tractor into operation, make sure that the protective enclosures are in place (rear PTO shaft-end enclosure, etc.)

4.2 PROCEDURE OF PRE-STARTING AND STARTING THE ENGINE

Start-Up Under Normal Conditions

- Apply the parking brake of the tractor;
- Open the fuel tank cock;
- Prime the fuel-feeding system with fuel and bleed air therefrom;
- Set the fuel feed control lever to its middle position, and the PTO control lever to the “Brake” position;
- Set the gearshift and gearbox range levers to their neutral positions;
- Set the battery disconnect switch to the ON position.

ATTENTION! Start the engine from the operator’s working seat only.

IMPORTANT! Never start the engine unless its cooling system is filled with coolant.

- Turn the starter switch to the “I” position (fixed). Therewith, the following pilot lamps light up: those of the glow plugs and HPS emergency oil pressure in the pilot lamps cluster; and the warning light of emergency engine oil pressure (a buzzer signal sounds), air pressure indicator (if the it is lower than that admissible one), voltage indicator and the fuel level indicator (if fuel in tanks is at a reserve level) in the combined instrument cluster dial;
- As soon as the glow plug pilot lamp starts flashing, turn the starter switch key into “II” position. As this takes place, an engine start pilot lamp lights up (amber). Should the starter fail to start with the key turned into “II” position, and the pilot lamp is running in a flashing mode at low frequency (about 1.5 Hz), it means that the GB handle is not in the neutral position or, possibly, the engine start interlock circuit is open. Blinking of the pilot lamp at higher frequency (about 3 Hz) signals about a fault in the phase winding of the alternator (“W” terminal).

Hold the key in the II position until the engine starts, but no longer than for 15 s. If the engine fails to start, repeat the procedure after not less than 30...40 s. If the engine would not start after three attempts of starting, then locate and eliminate the trouble.

- With the engine running, check all the pilot lamps for proper operation and instrument readings (coolant temperature, oil pressure in the engine and the GB, storage batteries charging, etc.). Let the engine run at 1000 rpm until the pressure is stabilized within the operating range.

IMPORTANT! Your tractor is equipped with a turbocharged engine. The operation of the turbo-charger at high rotational speed requires reliable lubrication when starting the engine. When starting the engine for the first time or after a long-term storage, resort to cranking the shaft by the starter for about 10 s with the fuel feed shut off to ensure the lubrication of the turbo-charger bearings. Let the engine run idling for 2...3 min before putting it under load.

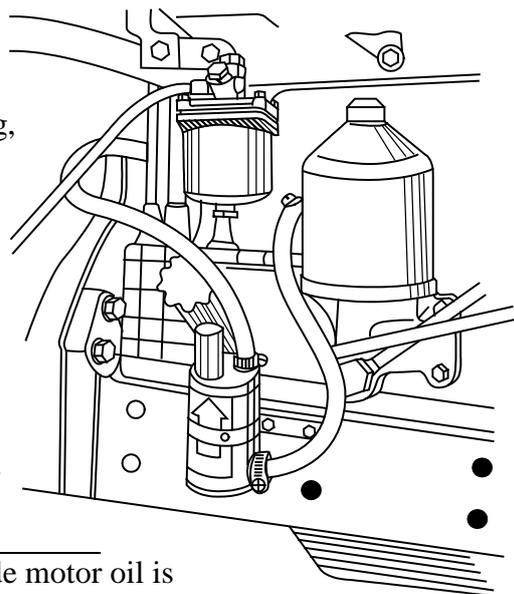
4.3 Starting the Engine at Low Temperatures (+4°C or below)

IMPORTANT! To avoid any damage in the power train, never push or pull the tractor to start the engine by towing

- Turn the starter switch key to its “I” position (i.e., the glow plugs). As this takes place, the pilot lamp on the pilot lamp block lights up to signal that the glow plugs are ON.
- Hold the key in this position. When the lamp starts flickering, the engine is ready for starting up;
- Turn the starter key to its “II” position and follow the above instructions for the engine start procedure under normal conditions. On starting the engine, the pilot lamp goes out and the audible signaling turns off.

To start the engine at ambient temperatures below minus 20 deg C, it is a good practice to use a special circulatory heater for coolant in conjunction with starting the preheating means.

The installation of the circulatory heater is shown in the figure.



NOTE: The circulatory heater of coolant should only be used for cooling circuits filled up with antifreeze.

At settled low temperatures, use winter-grade oils (if no winter-grade motor oil is available, the use of a mixture of summer motor oil with 10-12% of diesel fuel is permitted) in the engine crankcase, transmission, hydraulic system and HPS, following the instructions of this Manual. Always keep the storage batteries fully charged.

Use clean winter-grade diesel fuel with no admixture of water. To avoid faults, drain the sludge from the fuel gravitation-filter and fuel tanks on a daily basis.

IMPORTANT! To exclude the possibility of condensate forming inside the tanks, refill the fuel tanks at the end of each working day.

ATTENTION! The tractor is equipped with a single seat. DO NOT admit outsiders to the cab when operating the tractor.

4.4 GETTING THE TRACTOR MOVING AND DRIVING BELARUS 1523/1523B (GB 16F+8R)

To bring the tractor in motion, proceed as follows:

- slow down the engine;
- step on the clutch pedal as far as it will go and select a required GB speed range;

To do this:

- move the lever (1) to its rightmost (spring-loaded) position and pull or push it to select the I (lowest) or II (highest) speed range, respectively;
- return the lever to the neutral (“N”) position and further move it to the left to choose the required speed in accordance with shift pattern diagram I;

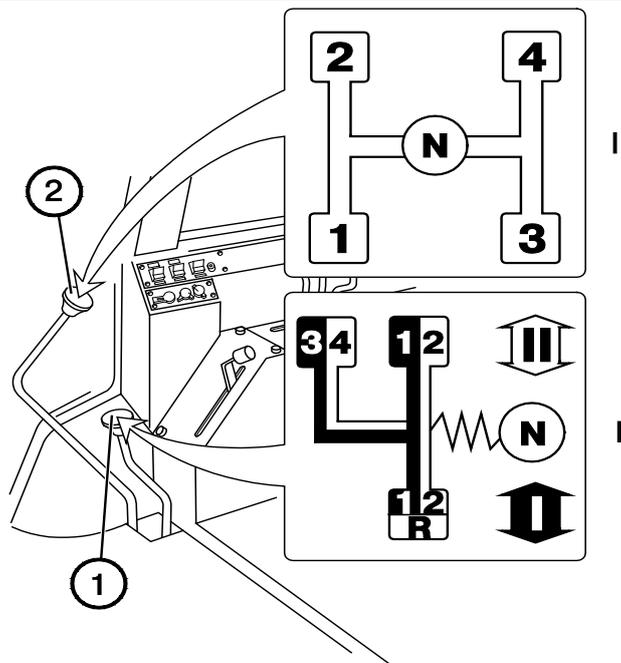
- choose the required gear by means of the lever (2) in accordance with shift pattern diagram II;
- release the parking brake and ease up the clutch pedal smoothly while increasing simultaneously the engine rotational speed. The tractor will start to move.

IMPORTANT! To shift in the gear smoothly (without abrupt jerks), move the gear-shift lever (2) in accordance with diagram II and hold it in this position with slight pressure until the gear is in full mesh.

ATTENTION! Prior to setting the required speed range or to shifting in the gear in the GB, make sure that you have stepped on the clutch pedal.

IMPORTANT! To avoid noisy change-over, shift the range select lever (1) when the tractor is at complete standstill only.

When driving the tractor, **DO NOT** keep your foot on the clutch pedal, since this would cause clutch slippage, its overheating and failure.



Starting movement with high tractor load (e.g., with a plough deep in soil) should be avoided. With the gear in mesh, release the parking brake and ease off on the clutch pedal. With the tractor moving off, smoothly increase fuel supply.

BELARUS-1523.3/1523B.3 (GB 24F+12R)

To bring the tractor in motion, proceed as follows:

- slow down the engine;
- step on the clutch pedal as far as it will go and select a required GB speed range;
 - To do this:
 - move the lever (4) to one of the following positions: “A”, “B” or “R”, in accordance with range selection pattern diagram I;
 - press the pushbutton (1) to engage the lowest stage (L) of the GB reduction gear or the pushbutton (2) to switch on highest stage (H) of the GB reduction gear;
 - choose the required gear by shifting the speed lever (3) from its neutral “N” to one of the following positions: 1, 2, 3, 4, 5, 6 in accordance with shift pattern diagram “II”;
 - release the parking brake and ease up the clutch pedal smoothly while increasing simultaneously the engine rotational speed. The tractor will start to move.

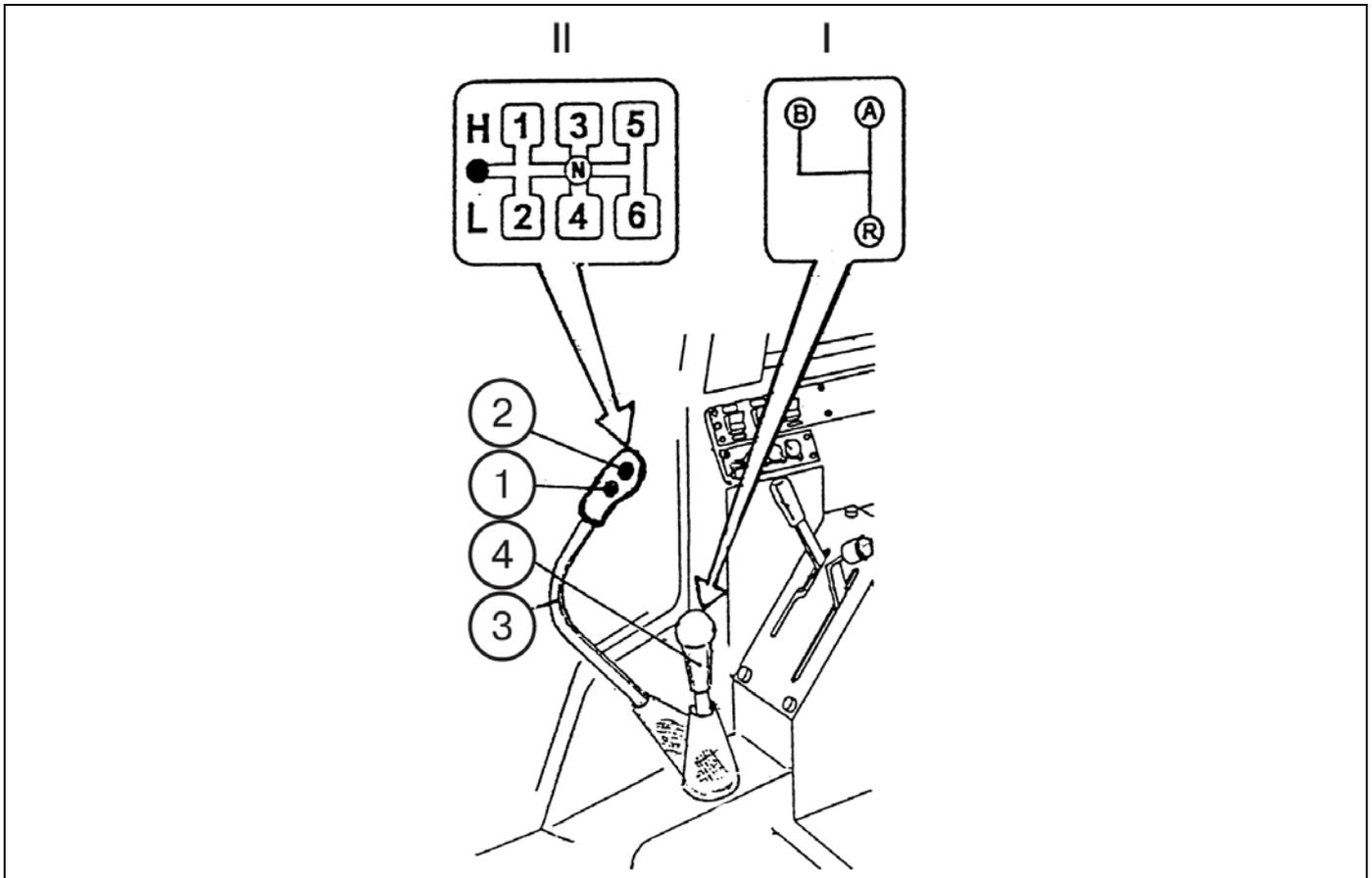
IMPORTANT! To avoid noisy change-over, shift the range select lever (4) when the tractor is at complete standstill only.

When driving the tractor, **DO NOT** keep your foot on the clutch pedal, since this would cause clutch slippage, its overheating and failure.

IMPORTANT! The engagement of the reduction gear stages “L” or “H” is only possible when the gear-shift lever (3) is placed to its neutral position.

IMPORTANT! To shift in the gear smoothly (without abrupt jerks), move the gear-shift lever (3) in accordance with diagram II and hold it in this position with slight pressure until the gear is in full mesh.

ATTENTION! Prior to setting the required speed range or to shifting in the gear in the GB, make sure that you have stepped on the clutch pedal.



4.5 STOPPING THE TRACTOR

To stop the tractor, proceed as follows:

- lower engine crankshaft rotational speed;
- step on the clutch pedal as far as it will go;
- set the gear-shift lever and the range-shift lever into their neutral position;
- release the clutch pedal;
- stop the tractor using service brakes;
- apply the parking.

ATTENTION! For emergency stop of a tractor at the same time sharply press the clutch pedal and brake.

For stopping the engine:

IMPORTANT! Prior to stopping the engine, lower the attached agricultural implement on the ground and let the engine run at 1000 rpm for 3...5 min.; this allows the diesel coolant temperature to be reduced.

To stop the engine:

- put the fuel feed control lever to the rearmost position (corresponding to engine minimum idling rotational speed);
- pull the engine stop handle as far as it will go and hold it in this position until the engine fully stops;
- disengage the PTO;
- put all the distributor-valve handles to the neutral position;
- lower the mounted machine onto the ground;
- place the SB switch to its OFF position to avoid the discharge of the storage batteries.

4.6 RUNNING-IN

Important! The first 30 hours of operation of the tractor affect strongly the further performance and service life of the tractor, especially as regards its engine.

ATTENTION! For the first 15 hours of running-in operation, the tractor should be used on light-duty haulage jobs, while the rest of time – on light-duty field work involving the use of the hydraulic lift linkage (HLL).

During the 30-hour running-in period, observe the follows safety precautions:

- 1.Keep a constant watch over the readings of the instruments of the lubrication, cooling, and feed system. Monitor the level of oil and of other fluids in the tanks and bottles.
- 2.Check the external connections and joints for tightening; retighten them, if required.
- 3.Neither overload the engine, nor allow the engine to run with smoky exhaust or drop in the rotational speed. The signs of overloading are as follows: sharp drop in the rotational speed, fumes and failure of the engine to respond to the fuel-feed boost. Operation under load in higher gear causes excessive wear of engine rubbing parts.
- 4.Operation of the tractor at low load, in a too low gear, but at high rotational speed of the engine may result in excessive fuel consumption. The correct choice of gearing for specific condition of operation saves fuel and reduces the wear of the engine rubbing parts.
5. Avoid extended periods of operation of the tractor under no-load conditions at maximum or minimum rotational speed of the engine crankshaft.
- 6.To ensure the correct break-in of the rubbing parts of the clutch in the running process, smoothly engage and disengage the clutch more frequently.
- 7.Perform regularly the daily maintenance in conformity with the recommendations specified in Section 9 “Scheduled Maintenance” of this Operation and Service Manual.
- 8.Clean the coarse oil filter after 10 hours of running-in of the tractor.

4.7 POST-RUNNING-IN MAINTENANCE (30 hours of operation)

- 1.Inspect and wash the tractor.
- 2.Listen to all tractor units and components for normal running.
- 3.Check the tightening torque of the bolts attaching the cylinder head. Retighten them, if necessary.
- 4.Check the valve stem-to-rocker arm clearances. Readjust them, if necessary.
- 5.Clean the engine and gear-box centrifuge rotors.
6. Clean the gear-box screen filter.
- 7.Check tension of the alternator driving belt. Readjust, if necessary.
- 8.Drain sludge from the engine fuel tanks, coarse and fine filters.
- 9.Check and adjust, if necessary, the free travel of the clutch and brake pedals, and the pneumatic system.
- 10.Check the storage battery condition; clean the terminal connections and vent holes.
- 11.Change oil in:
 - the engine crankcase;
 - transmission;
 - the front PTO reduction-gear box (if installed);
 - hub reduction-gear boxes and the FDA beam casing;

12. Change the paper filtering elements of the engine oil filter.
13. Grease the clutch disengaging bearing.
14. Drain condensate from the pneumatic system receiver-bottles.
15. Check and restore, if necessary, the tightness of the air-cleaner and the air intake duct.
16. Check the functioning of the engine, steering control, brakes, driving controls, lighting and signaling systems.
17. Gun-grease all the lubrication points.

Note: Performing these operations is described in the section “Scheduled Maintenance”.