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SAFETY REQUIREMENTS

1.1. GENERAL

- 1.1.1. Strict observance of the requirements ensures safe operation of the tractor and improves its reliability and durability.
- 1.1.2. Only persons not younger than 17, holders of a tractor driving license, who have been briefed on accident and fire prevention, may be admitted to operate the tractor.
- 1.1.3. Prior to operating the tractor, read carefully the Operator's Manual. Insufficient knowledge of tractor controls and servicing is a potential of likely accidents.

1.2. SAFETY REQUIREMENTS FOR TRANSPORTATION AND DE-PRESERVATION

- 1.2.1. When transporting and handling the tractor, follow the requirements specified under Section 8.
- 1.2.2. When performing the depreservation of the tractor and optional equipment, follow the fire prevention instructions and sanitary requirements when dealing with chemicals, rag wastes and oiled paper.

1.3. REQUIREMENTS FOR TECHNICAL CONDITIONS OF THE TRACTOR

- 1.3.1. The tractor should be run in, in accordance with the requirements under Subsection 6.5.
The tractor should be completely outfitted and in good working order.
- 1.3.2. DO NOT allow dismantling of design-stipulated protective enclosures and/or safeguards from the tractor, as well as other parts and/or assembly units which af-

fect its safe operation (protective grille of the fan, rear PTO enclosure, etc.)

- 1.3.3. The technical condition of the braking system, steering controls and running gear should conform to safety requirements of relevant standards and the present Manual.
- 1.3.4. The trailed agricultural machines and harvest trailers shall be fitted with a rigid towing coupler which excludes swaying and/or colliding thereof with the tractor during the transportation.
- 1.3.5. The tractor controls shall be provided with reliable locking in their operative positions.
- 1.3.6. Keep all the warning decals on the tractor clean and readable. If damaged or lost, replace them with new ones.
- 1.3.7. No leaks of electrolyte, water, fuel and/or oil shall be allowed.
- 1.3.8. Make proper use of summer- and winter-grade fuels. Refill the fuel tank at the close of each working day to reduce the moisture condensation at night.

The tractor cab is a cylindrical structure with a rigid protective framework, thermo-, noise- and vibration-isolated featured by the improved interior design, convex (panoramic) tinted injury-safe glasses, a sun-protective blind, more comfortable location of handles on the side control desk, an additional folding-back seat and additional rear window.

The cab is fitted with rear-view mirrors, electrical windscreen and rear-screen wipers. A frameless door and glued windscreens assure clear visibility.

The natural ventilation is achieved through the side and/or rear windows.

The two fuel tanks with the total capacity of 250 l are located beneath the cab floor and on the right-hand side of the tractor.

The engine is covered with a tilt-forward bonnet, with removable side panels.

When open, the engine cover is fixed with a stay.

On the customer's order, the tractor can be equipped with extra options (a RHL cross-bar, additional seat, auxiliary spacer-ring member for installing twinned wheels, PTO-driven front hitch mechanism, etc.)

The BELARUS-1523B/1523B.3 tractors are equipped with a reversible control station, designed for a long-term operation in the reversal, with agricultural machines attached to the rear hitch linkage.

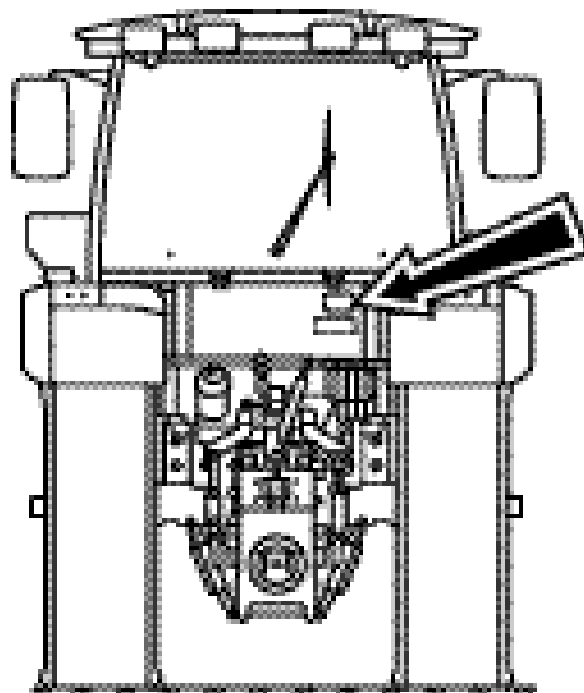
The BELARUS-1523.3 tractors is a further modified version of the basic model BELARUS-1523 equipped with a Д-260-1S2 engine certified to the 2nd stage of Directive 2000/25EC.

Serial Numbers of Tractor Components

A nameplate with the tractor and engine Serial Nos. is fastened in the right-hand at the rear of the cab. Beneath the nameplate, there is a plate indicating the Serial number of the cab.



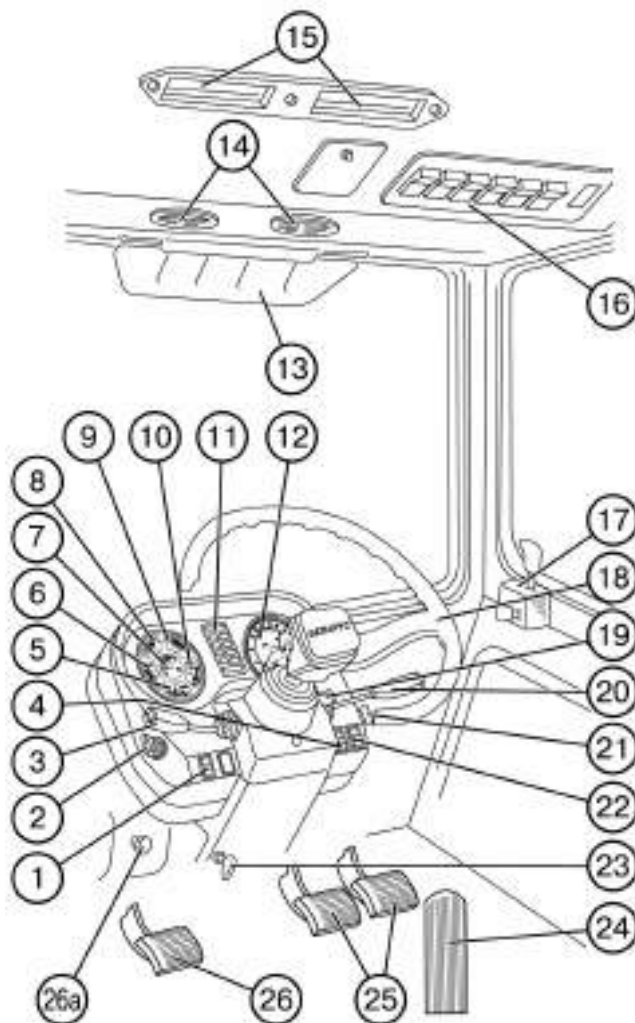
Минский тракторный завод	Minsk Tractor Works
БЕЛАРУС	BELARUS
№ трактора	Tractor No.
Масса	Weight
№ двигателя	Engine No.
Год выпуска	Year of production
ЗРОБЛЕНА У БЕЛАРУСІ	MADE IN BELARUS



TECHNICAL DATA

Description	Unit of measurement	Value			
GENERAL DATA					
Tractor type	–	Universal, row-crop			
Tractor make	–	BELARUS			
Tractor model	–	1523/1523B/1523.3/1523B.3			
Calculated speed of movement on the 520/70R38 tyres at the rated engine crankshaft rotational speed:					
Forward running in:		(16F+8R)		(24F+12R)	
			Range		Range
1st gear	km/h	1.74	I	1.7	I
2nd gear		2.44	I	2.3	I
3rd gear		3.35	I	2.9	I
4th gear		4.58	I	3.8	I
5th gear		3.77	II	4.9	I
6th gear		5.29	II	6.3	I
7th gear		7.26	II	3.3	II
8th gear		9.94	II	4.4	II
9th gear		5.70	III	5.7	II
10th gear		7.99	III	7.3	II
11th gear		10.97	III	9.4	II
12th gear		15.01	III	12.2	II
13th gear		12.37	IV	5.1	III
14th gear		17.34	IV	6.7	III
15th gear		23.80	IV	8.8	III
16th gear		32.58	IV	11.3	III
17th gear				14.5	III
18th gear				18.8	III
19th gear				9.8	IV
20th gear				13.0	IV
21st gear				16.9	IV
22nd gear				21.8	IV
23rd gear				28.0	IV
24th gear				36.3	IV
Reversing in:					
1st gear		2.73	I	2.5	I
2nd gear		3.83	I	3.2	I
3rd gear		5.26	I	4.1	I
4th gear		7.20	I	5.3	I
5th gear		5.93	II	6.8	I
6th gear		8.31	II	8.9	I
7th gear		11.41	II	4.6	II
8th gear		15.61	II	6.1	II
9th gear				8.0	II
10th gear				10.3	II
11th gear				13.2	II
12th gear				17.1	II

DRIVE CONTROLS AND INSTRUMENTATION



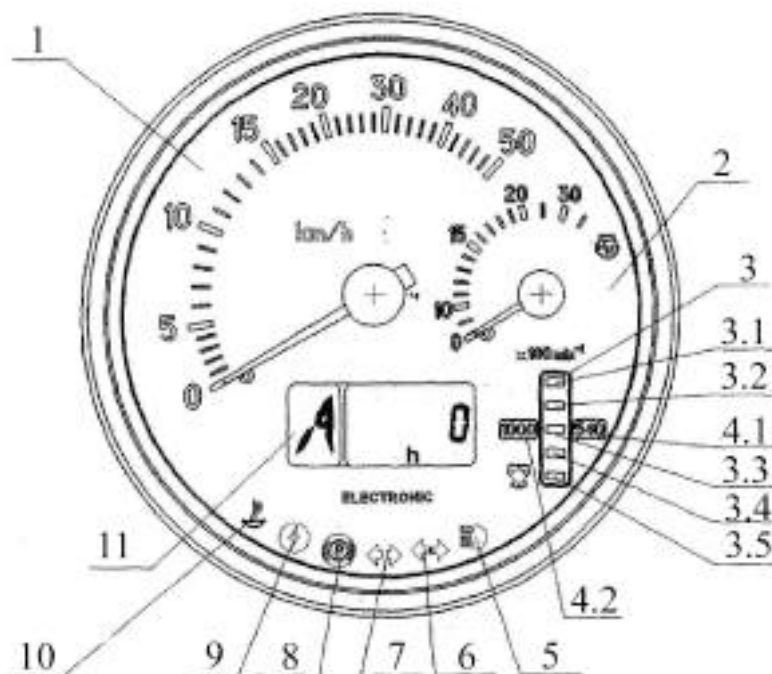
1. Battery remote disconnection switch
2. Starter and instrumentation switch
3. Multi-function control stalk (turn indicators, high-low beam, horn)
4. Front floodlights switch
5. GB oil pressure gauge
6. Pneumatic system air pressure gauge
7. Fuel-level gauge
8. Voltage indicator
9. Coolant temperature gauge
10. Engine lubrication system oil pressure gauge
11. Pilot lamp panel
12. Combined indicator
13. Sun visor
14. Air distributors

15. Air recirculation gate outlets
16. Switch in-line block (floodlights, heater fan, rear window wipers, "Road train" light)
17. Door lock
18. Steering wheel
19. Indicator control panel
20. Windscreen wiper and washer lever switch
21. Fault signalling push-button
22. Central light switch
23. Steering wheel tilt adjustment lever
24. Fuel feed control lever
25. Service brake pedal
26. Clutch pedal
- 26a. Knob handle for engine stoppage emergency shutdown

Combined indicator

The combined indicator (hereinafter referred to as the TSM) displays the information on the operating parameters of the systems and units of the tractor and provides the operator with the data on a disturbance of the operation or failure of any systems.

The TSM comprises the following indicators and signalling lamps:



- 1 – speed gauge (pointer indicator);
- 2 – engine rotational speed gauge (pointer indicator);
- 3 – PTO rotational speed gauge (light indicator);
- 3.1, 3.5 – segments of the PTO rotational speed scale (yellow);
- 3.2, 3.3, 3.4 – segments of the PTO rotational speed scale (green);
- 4.1, 4.2 – indicators of the ranges of the PTO rotational speed scales (yellow);
- 5 – light indicator of switching on the high beam of the headlights (blue);
- 6 – light indicator of switching on the trailer turn indicators (green);
- 7 – light indicator of switching on the tractor turn indicators (green);
- 8 – light indicator of application of the parking brake (red);
- 9 – light indicator of application of overvoltage of the on-board electric circuit (red);
- 10 – light indicator of application of the low level of the coolant (yellow);
- 11 – multifunctional indicator;

Safety Fuse Blocks

Two blocks of electric circuit safety fuses БП-1 and БП-2 are mounted under the dashboard.

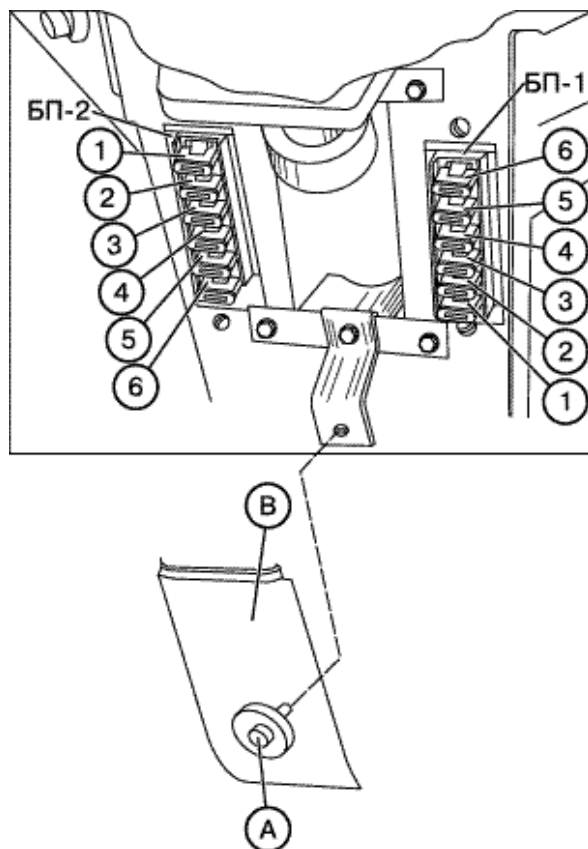
To gain access to the safety fuses, turn out the screw (A) and remove the cover (B). Eleven safety primary fuses protect the following electric circuits from over-load:

БП-1:

- 1 – instrumentation supply (15 A);
- 2 – turn-signal light interrupter (7.5 A);
- 3 – right-hand headlight low beam (7.5 A);
- 4 – left-hand headlight low beam (7.5 A);
- 5 – right-hand marker lights and dashboard backlight (15 A);
- 6 – left-hand marker lights (7.5 A).

БП-2:

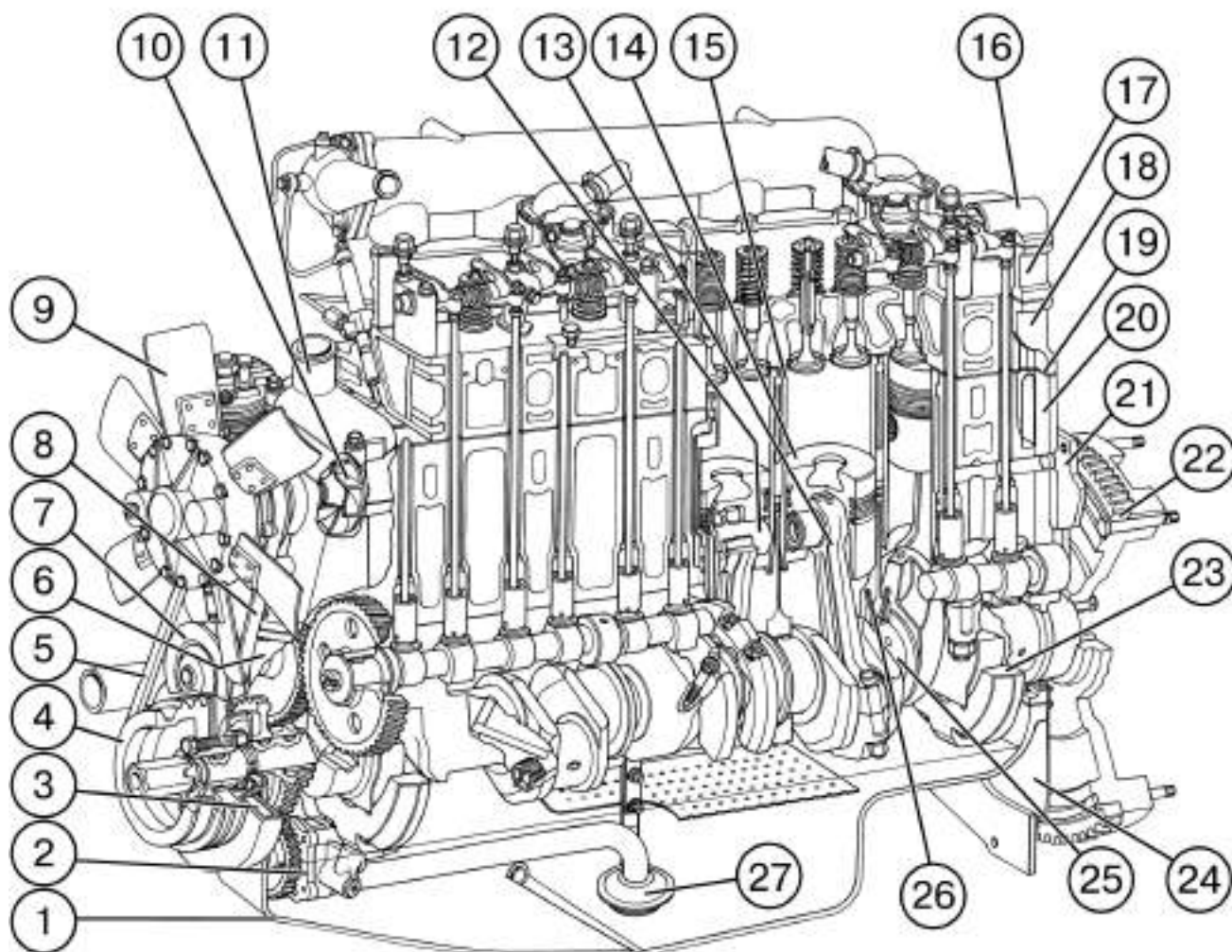
- 1 – headlight high beam (25 A);
- 2 – horn (15 A);
- 3 – fault signalling light (15 A);
- 4 – fault signalling light (15 A);
- 5 – windscreen wiper and washer (15 A);
- 6 – stop light (15 A).



WARNING! To prevent the tractor electric wiring from burning, **NEVER** use the fuses with ratings exceeding those specified above. If a safety fuse gets blown out frequently, find out the cause and rectify the fault before fitting a new one.

CONSTRUCTION AND OPERATION OF TRACTOR COMPONENTS

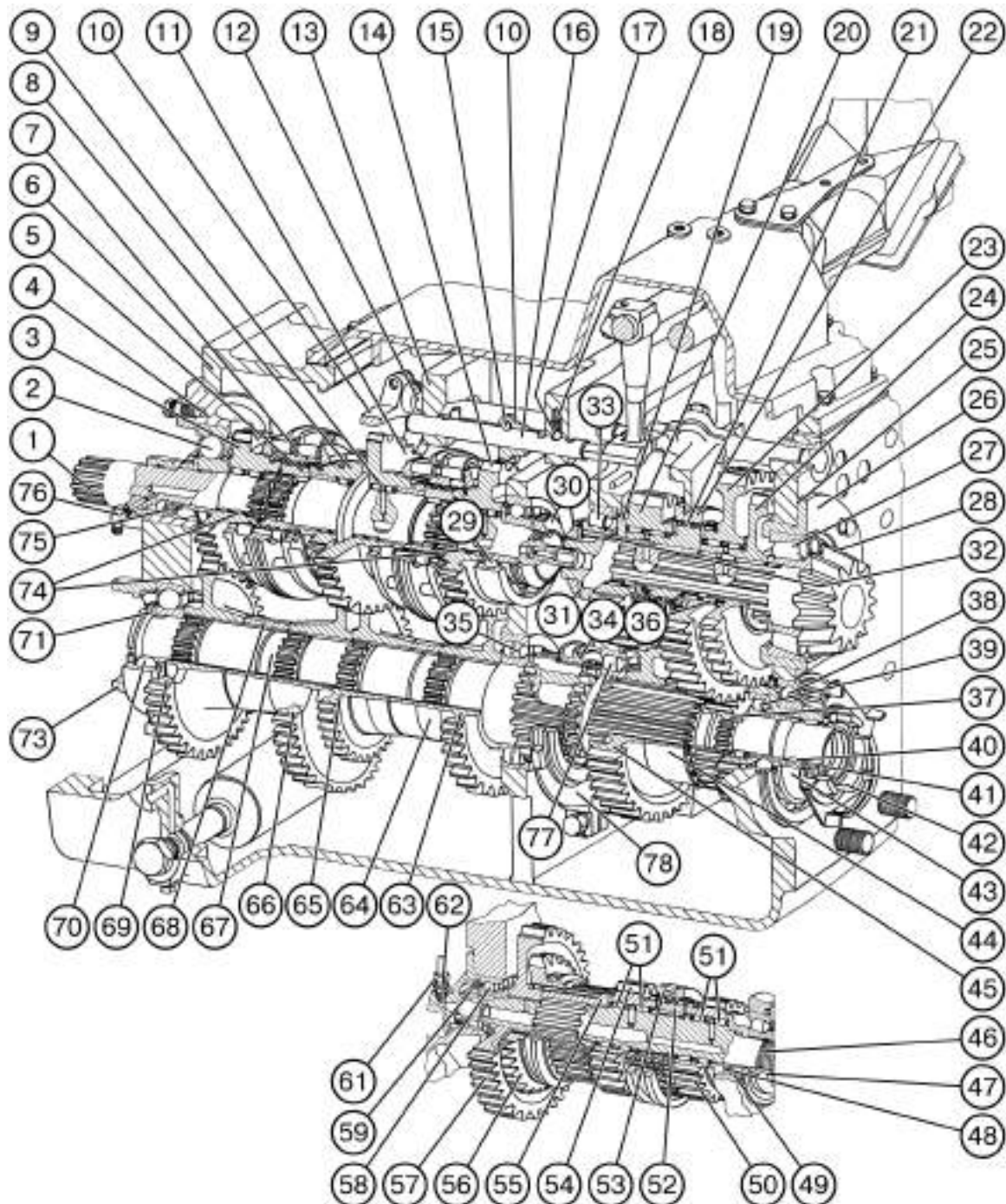
ENGINE



1 – crankcase; 1 – oil pump; 3 – torsional vibrations damper; 4 – crankshaft pulley; 5 – fan driving belt; 6 – valve-timing gearing cover; 7 – tensioning jockey; 8 – alternator driving belt; 9 – fan; 10 – water pump; 11 – thermostats housing; 12 – piston pin; 13 – connecting rod; 14 – piston; 15 – cylinder sleeve; 16 – cap hood (2 off); 17 – cylinder head cover (2 off); 18 – cylinder head (2 off); 19 – cylinder head gasket (1 off); 20 – cylinder block; 21 – rear sheet; 22 – flywheel; 23 – counterweight; 24 – cover; 25 – crankshaft; 26 – piston cooling jet ; 27 – oil pick-up.

GEARBOX

Gearbox (16F+8R)



1 – primary shaft; 2, 29, 33, 27, 38, 39, 40, 49, 58, 35, 70, 77 – bearings; 3, 8, 11, 14, 20, 23, 24, 37, 45, 50, 54, 56, 57, 63, 65, 66, 69 – pinions; 4, 26, 62, 73 – sleeves; 5, 44, 48, 55, 64, 68, 19, 32, 52 – bushings; 6 – housing; 7 – synchronizer; 9, 36, 51, 74 – needle bearings; 10 – fork; 12, 16 – dogs; 13 – fork body; 15 – bolt; 17 – ball; 18 – spring; 21 – semi-coupling; 22, 53, 34 – toothed couplings; 25, 31 – adjusting shims; 28 – secondary shaft; 30, 47, 59, 71, 75 – nuts; 41 – gear-cluster shaft; 42 – synchronous PTO pinion; 43 – check ring; 46 – reduced gear shaft; 61 – pipeline; 67 – intermediate shaft; 76 – lubricant feed bush; 78 – fork.

Clutch Housing (for the GB 16F+8R)

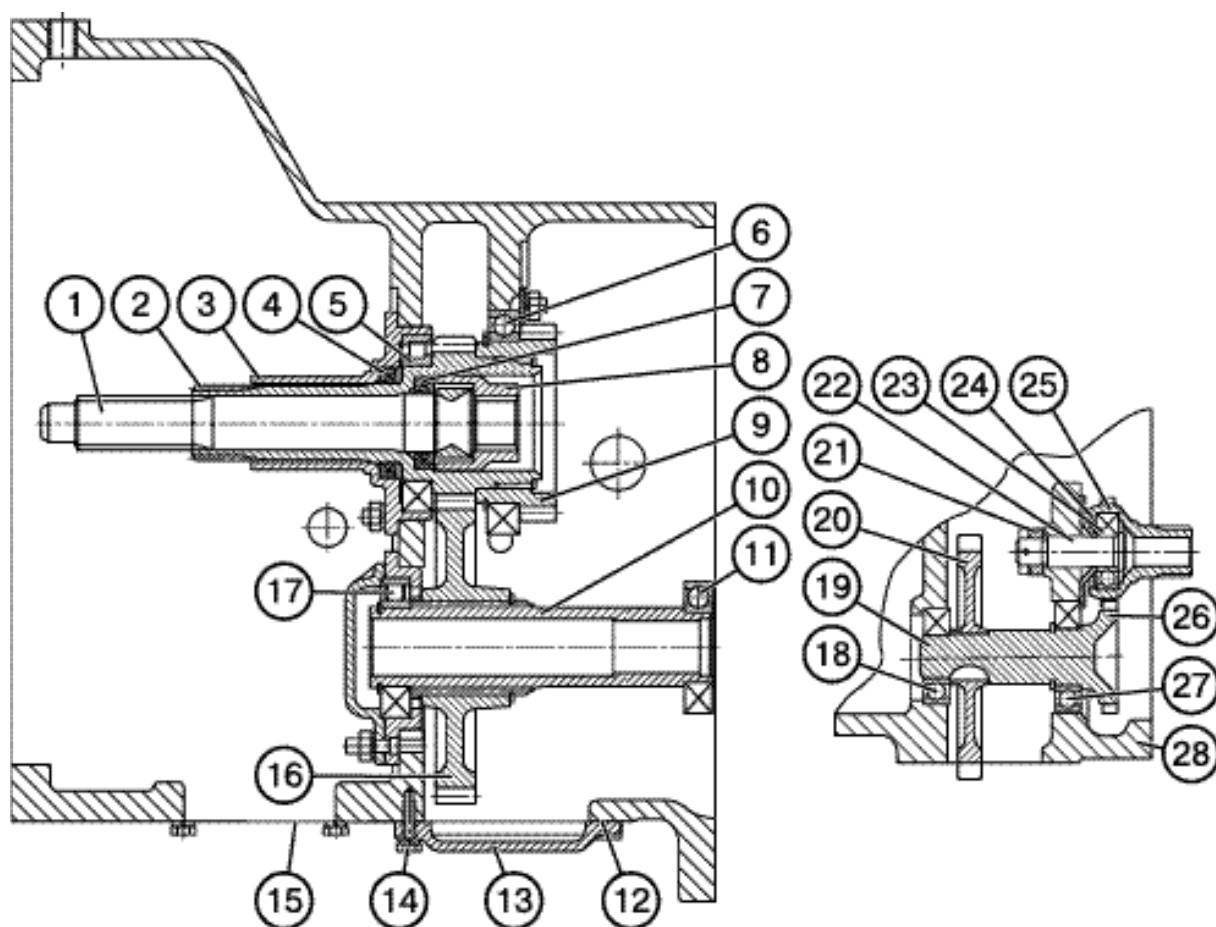
The **clutch housing** accommodates the drives of the independent PTO, HLL pump and a pump of the transmission hydraulic system.

The driving shaft (2, 9) of the independent PTO drive supported in bearings (5, 6) has two ring gears. A pinion (16) of the independent PTO drive is in constant mesh with the smaller ring gear, while a gear (20) of the pump of the transmission

hydraulic system and that of the HLL is in mesh with the other ring gear.

The pump of the transmission hydraulic system is driven from the driving shaft (2, 9) through gears (20, 26, 25).

With the clutch engaged, the torque from the clutch actuator plates is transmitted to the gearbox primary shaft through the shaft (1) and the bushing (8).



1 – force-transmission shaft; 2, 9 – PTO driving shaft; 3 – clutch release shifter support; 4, 7 – collars; 5, 6, 17, 18, 23, 27 – bearings; 8 – splined bushing; 10 – PTO driven shaft; 11 – bearing; 12 – packing liner; 13, 15 – covers; 14 – bolt; 16 – pinion; 19, 26 – pinion-shaft; 20 – HLL and transmission pumps drive gear; 21 – spindle; 22 – axle; 24 – check ring; 25 – pinion-shaft; 28 – housing

GEARBOX REDUCTION GEAR CONTROL SYSTEM

The Electrohydraulic System incorporates a control panel (1) located in the tractor cab to the right of the operator, lever (3) for shifting gears and selecting the reduction gear stages, GB neutral position sensor (5), transducers (7) and (8) installed on the reduction gearshift hydraulic cylinder, electrohydraulic distributor (6) mounted on top of the GB cover and connecting cables (4) with terminal blocks (9). The system is energized from the on-board electric circuit through a safety fuse box (2). The electrical power is supplied to the system before starting the engine (after turning the starter and instrumentation switch to the "Instrumentation Supply" position). The buttons (10, 11) and annunciators (LEDs) (13, 12) for engaging the lower and higher stages of the reduction gear are fitted on the handle of the lever (3), respectively.

The warning lights (15 and 14) of engagement of the lower and higher stages of the reduction gear and the reduction gear control relay are located on

the panel (1).

ATTENTION! This system allows the reduction-gear stages to be selected only provided the lever (3) is in neutral position (i.e. the sensor (5) contacts of the GB neutral are closed). The reduction gear stages shall be switched over on the stopped tractor.

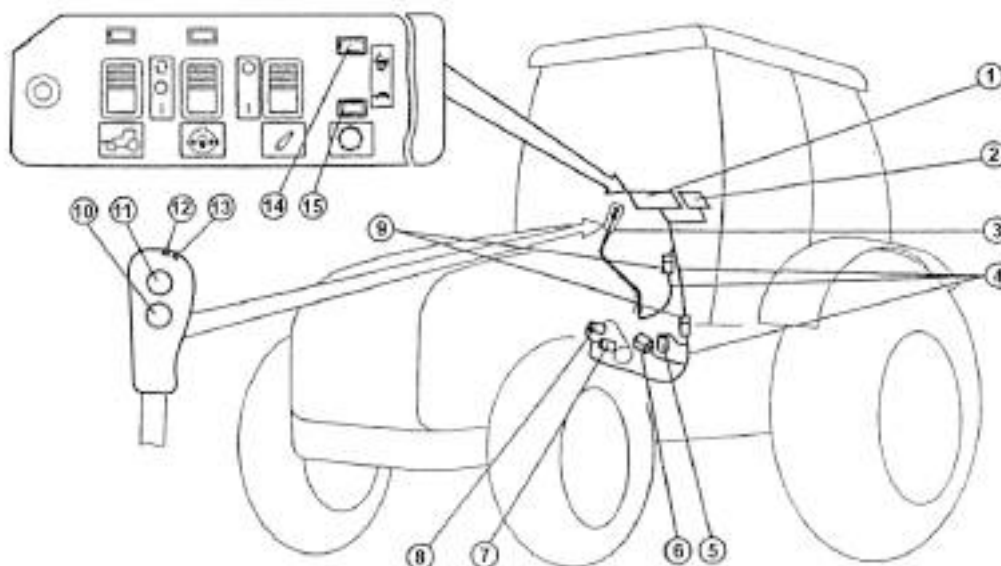
The signals are sent to the annunciators (13, 12) and warning lights (15, 14) from the respective pressure transducers (8 and 7).

After starting the engine, the reduction gear lower stage is initially engaged. When it will be done, the annunciator (13) and the warning light (15) shall light up.

Upshifting to the reduction gear higher stage is achieved by pressing the button (11). At the same time, the lights (13 and 15) shall go out and the annunciator (12) and the warning light (14) shall light up.

Downshifting from the higher to lower stage is done by pressing button (10).

The electric diagram of the GB reduction gear, differential interlock and FDA controls is shown in the Section "Appendix".

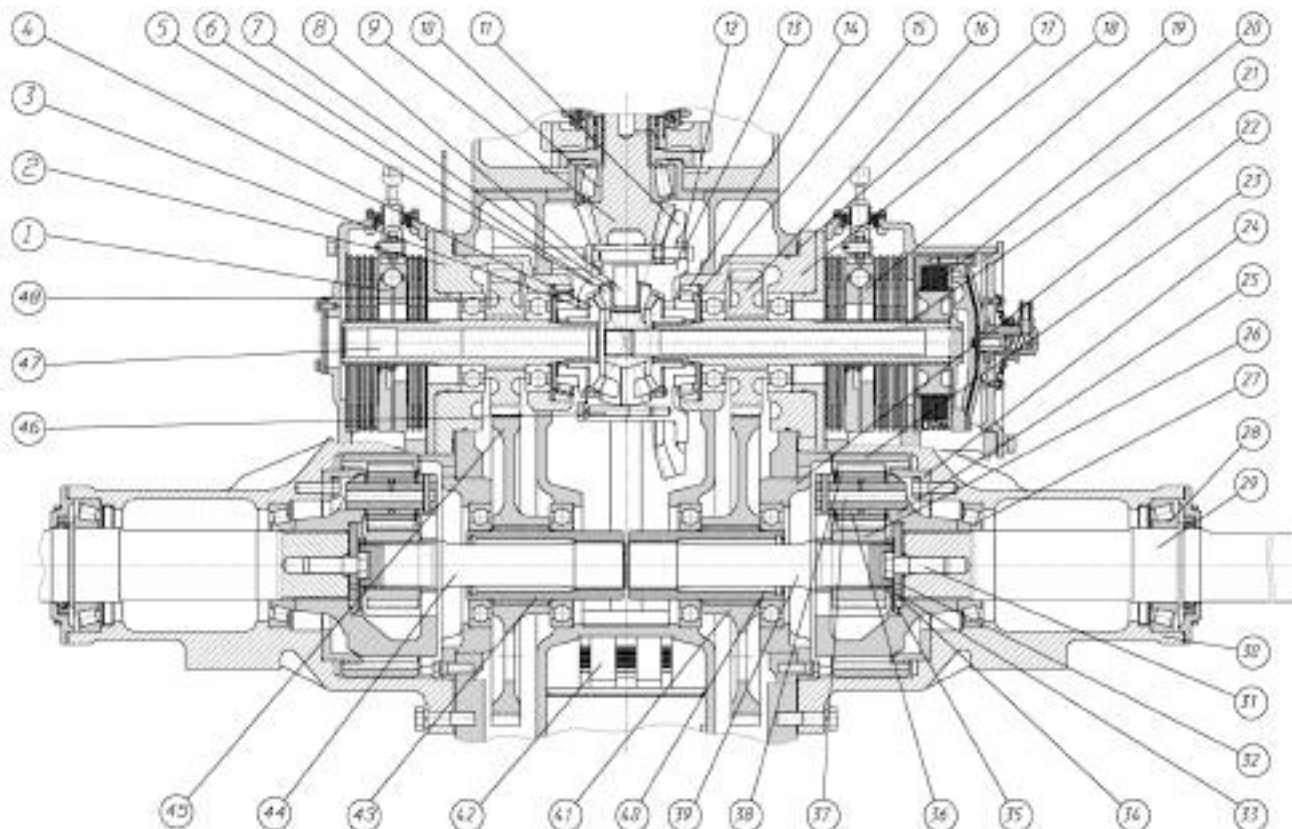


1 – control panel; 2 – safety fuse box; 3 – lever for shifting gears and selecting the reduction gear stages; 4 – connecting cables; 5 – GB neutral sensor; 6 – electrohydraulic distributor of the reduction gear; 7 – higher stage pressure transducer; 8 – lower stage pressure transducer; 9 – terminal blocks; 10 – lower stage selection button; 11 – higher stage selection button; 12 – light-emitting diode (LED) of the higher stage; 13 – light-emitting diode (LED) of the lower stage; 14, 15 – warning lamps.

REAR AXLE

The rear axle consists of the rear-axle drive, differential with a hydraulically controlled lockup friction clutch, final drives

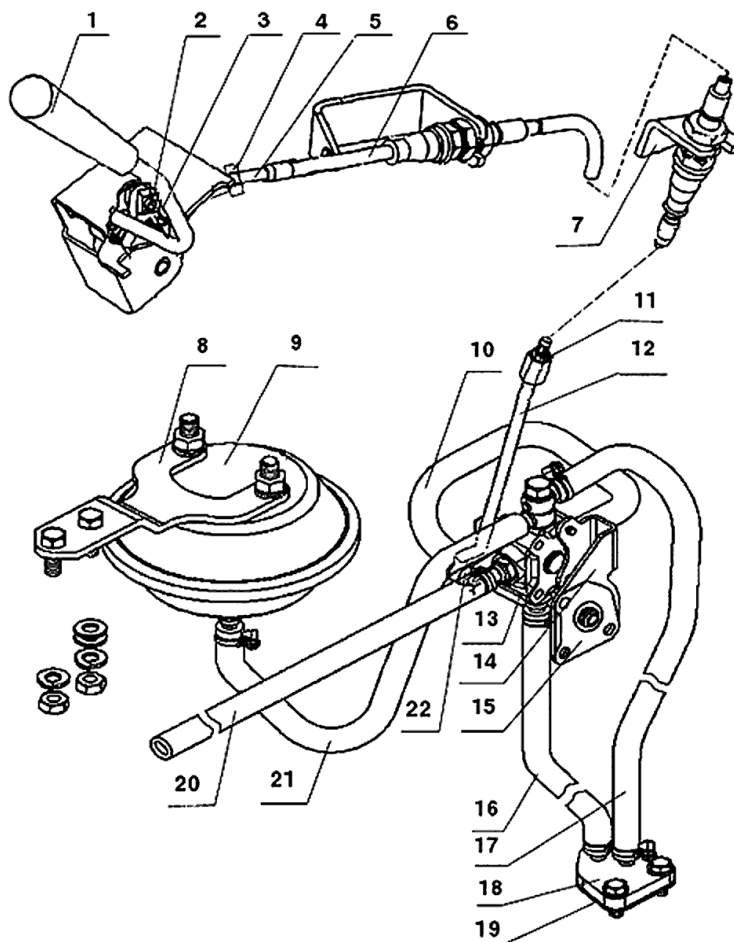
located in the rear-axle housing, and hub drives located in the axle-shaft housings.



1 – left-hand brake; 2, 18 – bearing shells; 3 – bearing washer; 4 – axle-shaft pinion; 5 – differential cover; 6 – satellite; 7 – spherical washer; 8 – differential spider; 9 – rear-axle drive pinion; 10 – tapered roller bearing; 11 – driven gear; 12 – differential housing; 13 – bolt; 14, 27, 28 – tapered roller bearing; 15 – thrust ring; 16, 48 – hub drive driving pinion; 17, 32 – adjusting shims; 19 – right-hand brake; 20 – differential lockup clutch; 21 – right-hand driving pinion shaft; 22 – bearing shell; 23 – crown gear; 24 – crown gear boss; 25 – pinion carrier; 26 – sun gear; 29 – axle-shaft; 30 – axle-shaft housing; 31 – bolt; 33 – washer; 34 – check plate; 35 – washer; 36 – roller; 37 – satellite shaft; 38 – satellite; 39, 44 – torsion shaft; 40, 43 – driven gear bush; 41, 45 – driven gear; 42 – rear PTO; 46 – bolt; 47 – left-hand drive gear shaft.

link (5) (by screwing the fork (3) on and out having loosened preliminarily the locknut (4)) and rod (12) with the coupling (11) (by screwing it on or from the rod having loosened preliminarily the

locknut (4)), connect them by means of the pins and lock them with cotter pins. On completing the adjustment, tighten the locknuts (4).



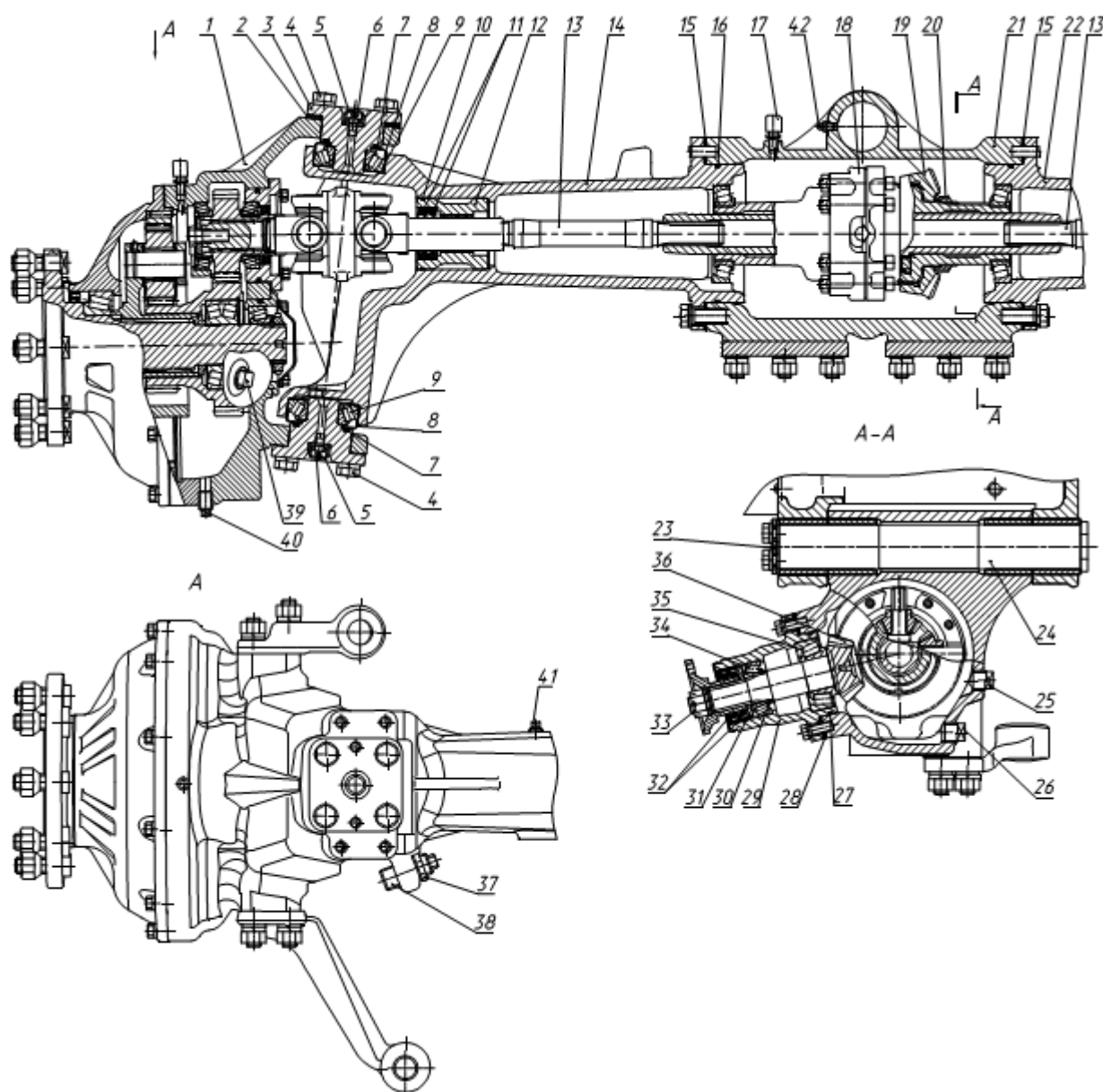
Rear PTO control

1 – control handle; 2 – pin; 3 – fork; 4 – locknut; 5 – cable link; 6 – cable; 7, 8, 14 – bracket; 9 – dumper; 10 – drain hose; 11 – coupling; 12 – rod; 13 – rear PTO control tap; 15, 19 – gasket; 16 – brake hose; 17 – friction hose; 18 – flange; 20 – oil supply hose; 21 – dumper hose; 22 – PTO control tap lever; 23 – switch.

Check the operation of the control mechanism. The control handle (1) shall move without jamming and fix positively in the three positions under the force of not more than 30 N (3 kgf) applied.

ATTENTION! When engaging the PTO, move the control lever smoothly to avoid breakages of the driving shaft, reduction gear parts and PTO tail-piece.

FRONT DRIVING AXLE (FDA)



1 – driven bevel gear; 2, 15, 28 – adjusting shims; 3 – steering knuckle pivot spindle; 4 – bolt; 5 – cap; 6 – lubricator; 7, 10, 16, 27 – rubber ring; 8 – sleeve; 9, 34, 35 – taper roller bearing; 11, 32 – collar; 12 – fixture; 13 – half-axle shaft; 14 – left-hand housing; 17 – breather; 18 – differential; 19 – driven bevel gear; 20 – nut; 21 – FDA casing; 22 – right-hand housing; 23 – washer; 24 – pivot; 25 – plug; 26 – draining plug; 29 – driving gear carriage; 30 – adjusting washers; 31 – wiper ring; 33 – nut; 36 – driving bevel gear; 37 – locknut; 38 – screw; 39 – filling plug; 40 – draining plug, 41 – filling plug, 42 – lubricator.

The front driving axle (FDA) is intended for transmitting the torque from the engine to the front steerable wheels of the tractor. It consists of the final drive, differential and wheel reduction gears.

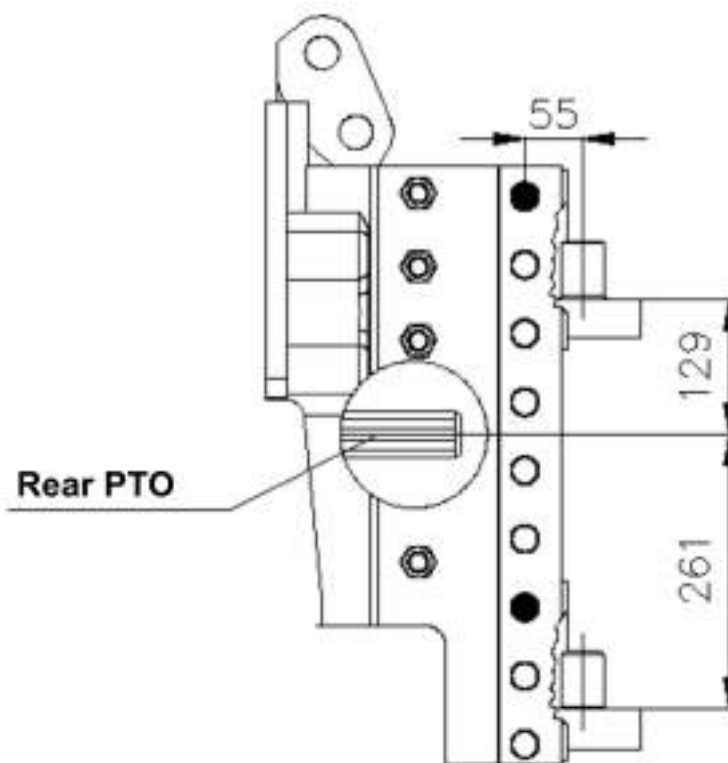
The left-hand (14) and right-hand (22) housings connected with the FDA cas-

ing (21) by means of bolts form the front axle beam. The FDA casing is provided with a breather (17) maintaining the normal pressure in the cavity of the axle and final drive beam.

The axle beam is filled with oil to the lower edge of the filling opening through the plugs (41) installed in the housings

Haul-and-Draw Coupler TCY-2P

For machines: semi-trailed (semi-trailers, fertilizer placers, etc.); pull-type (disk harrows, soil cultivation units, trains of coupled harrows, cultivators, seed planters, etc.).



Type of the hitch coupler	Coupler TCY-2P (Python)
	Cantilevered pin, free to be relocated stepwise in the vertical plane with the increments of 65 mm.
Position of the yoke for PTO-driven machines	Below or above the PTO axis
Distance from the PTO end-face to the mounting axis, mm	110(96*)
Coupling pin diameter mm	Ø40
Vertical load on the coupler, kN	25

* PTO 3 tail piece.

ATTENTION! NEVER install the above coupler at the 1st and 2nd holes from the bottom.