

ZETOR

10011 • 10045 • 16045

OPERATOR'S MANUAL

1/79

DEAR OWNER OF THE NEW TRACTOR ZETOR!

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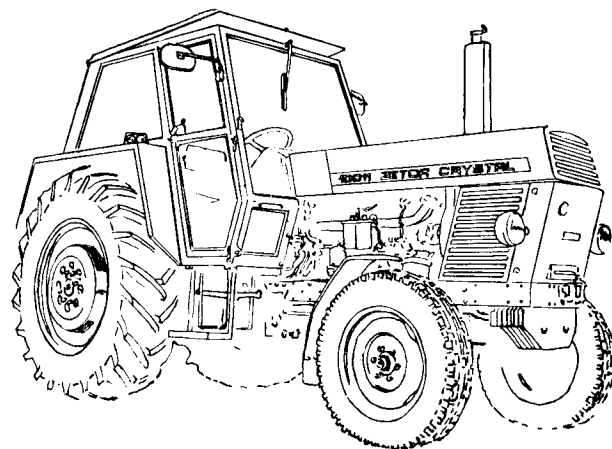
The present manual contains many valuable and important items of advice for correct operation, exploitation and maintenance of tractors Zetor. When observing all these items of advice referred in the present manual, you will assure troublefree performance, safe run, economical exploitation and long life of your tractor.

Since our products keep on being improved, texts and illustrations may not always be identical with the machine supplied.

All items of information about the weights of the tractors mentioned in this manual are of informative character only.

ZETOR

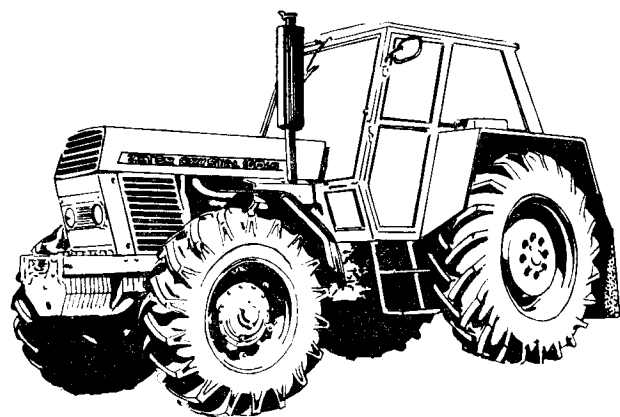
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ZETOR 10011



ZETOR 10045



ZETOR 16045

Tractors	Z 10011	Z 10045	Z 16045
Engine - model	Z 8002		Z 8602
Type of engine	supercharged four stroke in line diesel engine with direct fuel injection, liquid-cooled		
No. of cylinders	4		6
Bore	110 mm		
Stroke	120 mm		
Compression ratio	17		
Engine power output class	70 — 5 0/0 kW (95—5 0/0 hp)	110 — 5 0/0 kW (149,6 —5 0/0 hp)	
Cylinder liners	wet		
Cylinder head	common for all cylinders		
Fuel injection order	1—3—4—2	1—5—3—6—2—4	
Nominal revolutions	2200 rpm		
Injection timing	24°+2° before TDC		
Injection pressure	15,7 MPa (160 atp)		
Nozzles	DOP 150 S 535 - 4360		
Air cleaner	IFE MANN 500	IFE MANN 750	
Cooling system	forced circulation water cooling with thermostat		
Oil pump	geared		
Oil cleaner	centrifugal full-passage type		
Turbo-blower HOLSET	3 LD — 12	3 LD — 9	
Fill up data:			
in engine — oil	10 litres	19 litres	
in air cleaner — oil	2,1 litres	2,1 litres	
in gearbox — oil	50 litres		
in rear half-axes — oil	8 litres		
in power steering system — oil	7 litres	8 litres	
in front axle main transmission housing — oil	3,5 litres		
in front wheel reducers — oil	2×1,25 litre (2,5 litres)		

	Z 10011	Z 10045	Z 16045
in cooling system — liquid			
without heating	21 litres	23 litres	
with heating	23 litres	25 litres	
Liquid in brake liquid tank		0,2 litre	
Fuel in fuel tanks (together)	125 litres	195 litres	
Engine weight	490 kg	620 kg	
II. Clutch	single-disc, dry		
	dia — 325 mm	dia — 380 mm	
		with plate spring	
III. Gearbox			
Gear changing	4 roads speeds	3 road speeds	
	4 reduced speeds	3 reduced speeds	
	4 reverse speeds	3 reverse speeds	
	In case that the tractor is provided with torque multiplier, number of speeds is doubled		
Speeds:			
Higher speed range	tyre 18,4/15-34	tyre 18,4/15-34	
I. speed	7,16 km/h	9,33 km/h	
II. speed	11,28 km/h	15,20 km/h	
III. speed	17,93 km/h	25,51 km/h	
IV. speed	25,51 km/h		
Transmission ratio for reduction speeds	2,917	3,134	
Lower speed range			
I. speed	2,45 km/h	2,98 km/h	
II. speed	3,84 km/h	4,85 km/h	
III. speed	6,15 km/h	8,14 km/h	
IV. speed	8,74 km/h		
Reverse range			
I. speed	3,35 km/h	3,50 km/h	
II. speed	4,97 km/h	5,70 km/h	
III. speed	8,40 km/h	9,57 km/h	
IV. speed	11,94 km/h		

IV. Steering System

V. Brakes

Foot-operated brakes	disc-type dry, controlled by ball spacing mechanism with servoeffect (power effect), double pedal control
Hand brake	disc-type, mechanically controlled with braking effect compensator

VI. PTO Shaft Drive

Standard revolutions of PTO shaft	540 rpm at 1890 rpm of the engine with Z 10011 and Z 10045 1012 rpm at 2200 rpm of the engine with Z 10011, Z 10045 and Z 16045
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Dependent revolutions of PTO shaft	with tractors Z 16045 at 2200 rpm of the engine
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Higher speed range	without multiplier	with multiplier
I. speed	880,46	658, 12
II. speed	1434,49	1072,25
III. speed	2406,25	1798,61
Lower speed range		
I. speed	280,91	209,97
II. speed	457,68	342,10
III. speed	767,72	573,85
Reverse speeds		
I. speed	330,17	246,79
II. speed	537,94	402,09
III. speed	902,34	674,48

VII. Hydraulic Power Lift Unit

Operating pressure	15,7 MPa (160 kp/cm ²)
Output of hydraulic power lift pump at 1870 rpm of the engine and pressure of 15,7 MPa	31 litres/min

Output of hydraulic power lift piston pump at 1000 rpm of PTO shaft of 17,6 MPa 3,8 litres/min

Lifting power at lower link extremity 33,3 kN (3400 kp) 39,2 kN (4000 kp)

VIII. Electrical Equipment

Storage battery 2 batteries 12 V à 100 Ah

Alternator 14 V/35 A

Voltage regulating relay 14 V

Starter motor 12 V/3 kW (4 hp) 24 V/4,4 kW (6 hp)

Battery switch — 12 V/24 V

X. Tyre Sizes

Front tyre — standard 7,50-20 12,4/11-24 14,9/13-24

Rear tyre — standard 16,9/14-34 18,4/15-34

Rear tyre — optional 18,4/15-34 — —

Double mounting — optional 2×16,9/14-34 2×18,4/15-34

2×12,4/11-38

2×18,4/15-34

X. Main Dimensions and Weights

Overall length (without coupling linkage) 3945 mm 3945 mm 4600 mm

Overall width (rear wheel track — standard) 1930 mm 2190 mm

Ground clearance 420 mm 425 mm

Height of the swinging bar in basic position 395 mm 395 mm

Wheel base 2385 mm 2695 mm

Front wheel track Z 10011 adjustable to four positions from 1350 mm to 1800 mm (each 150 mm)

Z 10045, Z 16045 fixed — 1630 mm

Rear wheel track 16,9/14-34 (adjustable by disc rotation) 1500 or 1725 mm —

18,4/15-34 (adjustable by disc rotation) — 1500 or 1725 mm

Height up to the upper exhaust orifice 2355 mm 2945 mm

Front axle ballast weights basic I (3 pcs) 80 kg

basic II (7 pcs) 160 kg

additional (4 pcs) 120 kg 400 kg (11 pcs)

Rear wheel ballast weights 2 pcs + 6 discs 285 kg 610 kg (2+14 pcs)

Water filling in rear tyres 720 kg (2×360 kg) 18,4/15-34

500 kg (2×250 kg) 16,9/14-34

Maximum weight of the tractor, with hydraulic power lift unit, with all ballast weights, cab, but without water in tyres 4320 kg 4880 kg 6270 kg

where pressure force on: front axle 1620 kg 2250 kg 2890 kg

rear axle 2700 kg 2630 kg 3380 kg

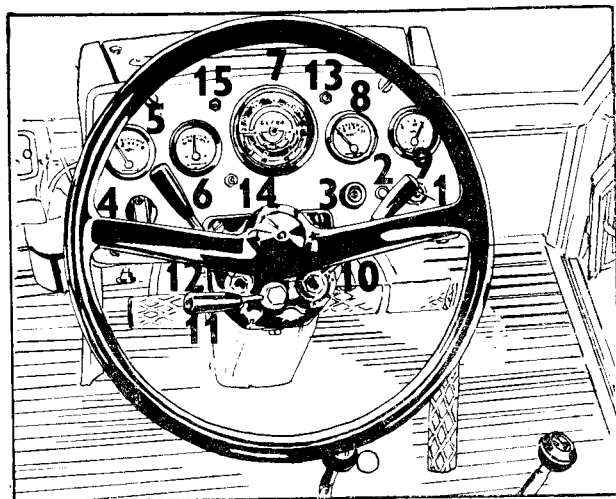
XI. Force

Maximum tractive force of the tractor with additional ballast weights and with water in rear tyres at height of the coupling linkage of 815 mm, on concrete 41 kN 43 kN 54 kN

(4100 kp) (4300 kp) (5400 kp)

Dashboard

- switch box with key (pict. 1/1)
fully inserted key:
 - position 0 — starting circuit, windscreen wipers, fan of the heating system, ceiling lamp, pilot lamp of the charging (which is off when the engine is running) are switched on
 - position 1 — clearance and tail lights as well as illumination of instruments (via the switch) are on
 - position 2 — distance lights, distance light pilot lamp and tail lights are on
 - position 3 — dimmed lights as well as tail lights are on
 - Half-inserted key — circuits of the positions 1, 2 or 3 may be switched on.
 - dashboard illumination switch (pict. 1/2)
 - starter button (pict. 1/3)
 - direction indicator switch with horn button (pict. 1/4)
- Function of direction indicators is checked with help of green pilot lamps.



Pict. 1

- a) Defect of any direction indicator of the tractor is signalled by change of flashing frequency of tractor pilot lamp.
- b) Defect of any direction indicator of the trailer is signalled by switching-off of the pilot lamp. For technical reasons the inspection of trailer direction indicators has been solved in such a way that in case of switching-off of the pilot lamp, the defect can be found on the other side than where the direction indicator switch has been switched on.

- Oil pressure gauge (pict. 1/5) — correct oil pressure ranges from 0,2 to 0,55 MPa
- Water thermometer (pict. 1/6) — operating temperature shall vary within the range from 80 to 95° C (over-pressure radiator plug opens the cooling circuit at 106—111° C)
- Engine hour counter with speed indicator (pict. 1/7)
- Air pressure gauge (pict. 1/8) — operating pressure is 0,6 MPa
- Fuel level indicator (pict. 1/9)

Fuel level indicator shows amount of fuel in the main tank.

Fuel in the main tank having been consumed, level of the fuel in additional tank may be observed in the thick translucent hose connecting the main tank with the additional one.

- a) The additional tank — with types Z 10011 and Z 10045 — is able to hold amount of fuel sufficient for cca 2 hours of middle difficult ploughing.
 - b) The additional tank — with type Z 16045 — is able to hold amount of fuel sufficient for cca 3,5 hours of middle difficult ploughing.
 - Hand control lever of injection pump dose (pict. 1/10)
 - Control lever of torque multiplier engagement (pict. 1/11).
- If the lever is in its rear position (towards the driver), the torque multiplier is engaged (turtle). If the lever is in its forward position (in the sense of the travel direction), the torque multiplier is disengaged (hare).

Attention! In case of torque multiplier damage <https://tracmanualshub.com/>

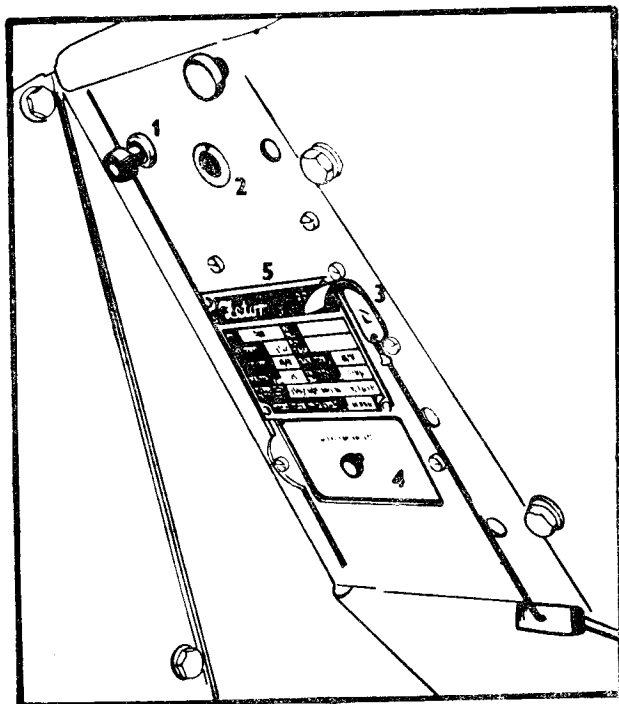
multiplier slippage — the tractor does not move) in position "hare" or at drop of oil pressure lower than 0,8 MPa — red pilot lamp is on — shift the torque multiplier lever in the position "turtle" (until the defect is removed).

— PTO clutch lever (pict. 1/12)

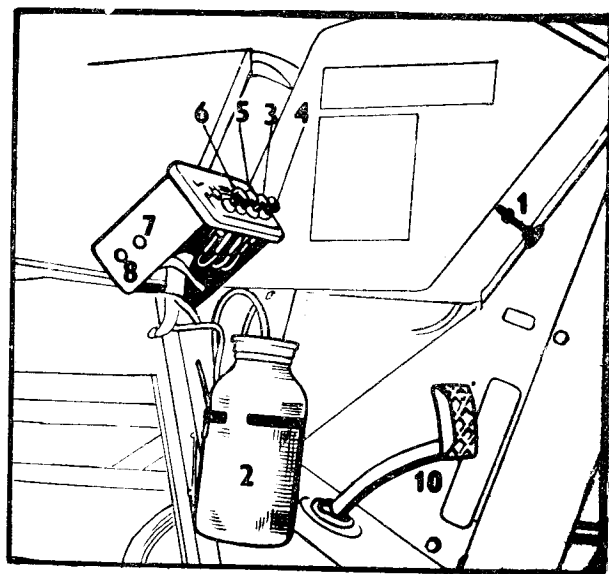
If the lever points to the back (towards the driver) — the PTO clutch is engaged (small brake is disengaged). If the lever points forwards (in the travel direction) — the PTO clutch is disengaged (the small brake is engaged).

reserve pilot lamp — orange colour (pict. 1/13). The pilot lamp having been switched on, the tank contains amount of fuel sufficient for cca 1 hour run of the tractor.

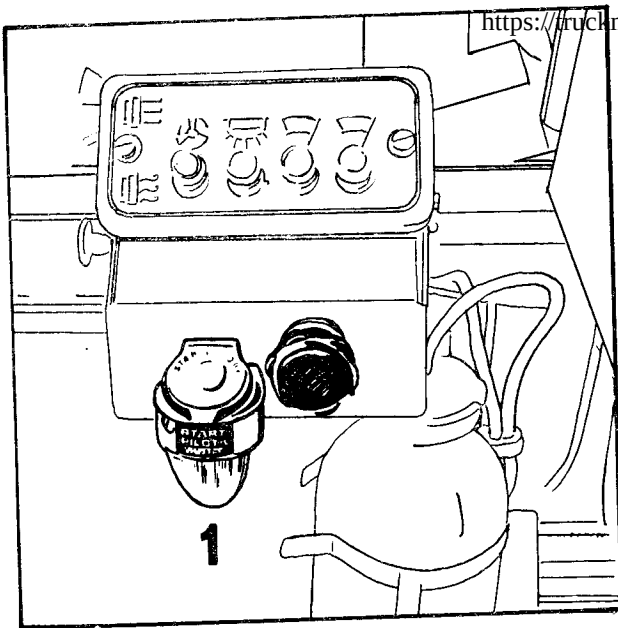
- Pilot lamp of disengaged hand brake — red colour (pict. 1/14)
- Switch of the headlamp for night work (pict. 2/1)
- Socket for hand lamp — for mounting purposes (pict. 2/2)
- Radiator shutter control (pict. 2/3)
- Fuse box (pict. 2/4)
- Identity plate of the tractor (pict. 2/5)
- Front windscreen sprayer button (pict. 3/1)
- Front windscreen sprayer tank (pict. 3/2) — fill with antifreeze in winter
- Rear windscreen wiper switch (pict. 3/3)
- Front windscreen wiper switch (pict. 3/4)
- Switch of cab ceiling lamp (pict. 3/5)



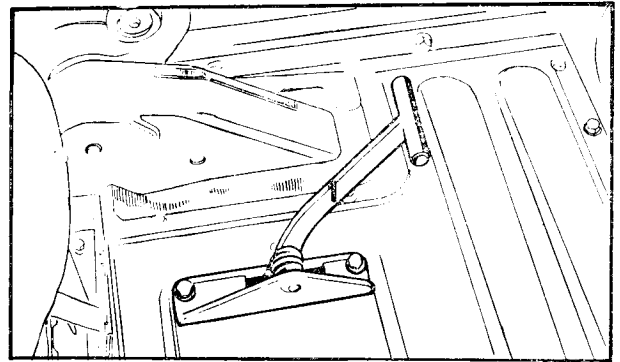
Pict. 2



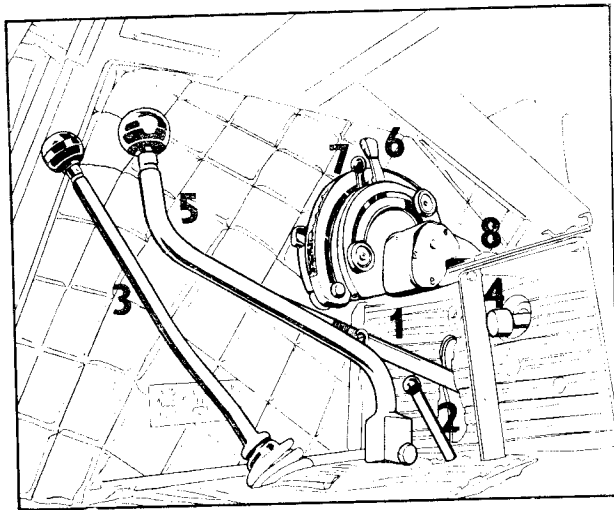
Pict. 3



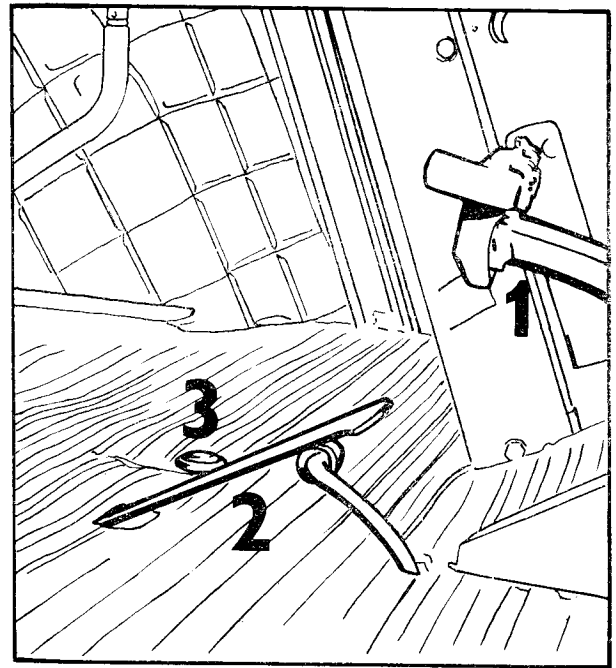
Pict. 3a



Pict. 5

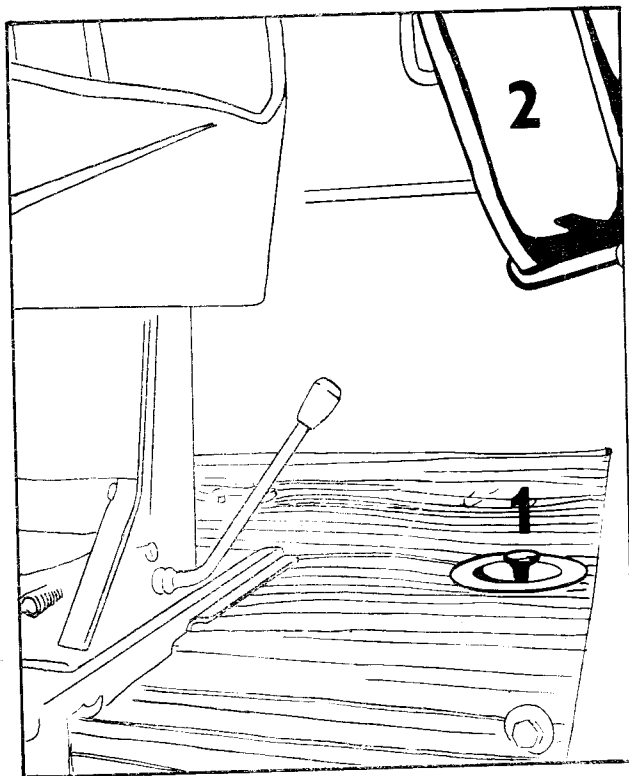


Pict. 4

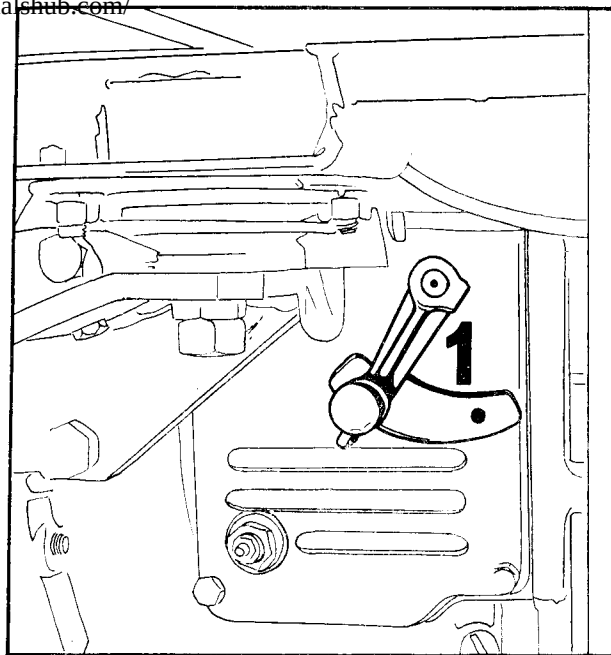


Pict. 6

- Switch of the heating system and cab ventilation (pict. 3/6)
 - Remote control of hot water heating system water tap (pict. 3/7)
- If the heating system is in operation, the tie rod has to be in its slid-in position
- Auxiliary device for better starting — "START PILOT" (pict. 3a/1) for foreign countries; "JIKOV" (pict. 20) for CSSR
 - Hand brake lever (pict. 4/1)
 - Shifting lever of PTO shaft dependent and independent revolutions (pict. 4/2)



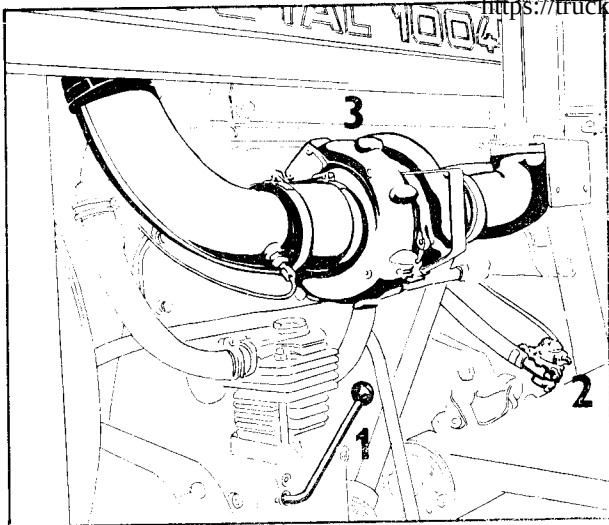
Pict. 7



Pict. 8

Lever position: forwards — independent revolutions of PTO shaft (540 or 1000 rpm)
 central — neutral
 backwards — dependent revolutions of PTO shaft (not mounted at present)

- Gear shift lever of 1st, 2nd, 3rd and 4th speeds (pict. 4/3) — Z 10011, Z 10045
 (Gear shift lever of 1st, 2nd and 3rd speeds — Z 16045)
- Control lever for single-axle trailer coupling (pict. 5/1)
- Throttle valve (pict. 4/4)
- Clutch pedal (pict. 3/10)
- Latched brake pedals (pict. 6/1)
- Pedal of foot actuated fuel control (pict. 6/2) — accelerator

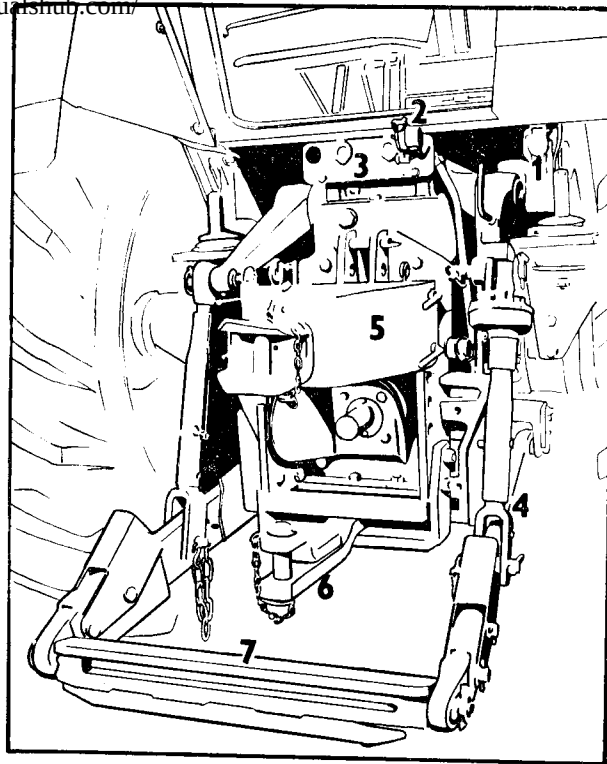


Pict. 9

- Rear axle differential lock pedal (pict. 6/3)
 - Road, reduced and reverse speed gear shift lever — I, II, R (pict. 4/5)
 - Hydraulic power lift outer circuit control lever — square (pict. 4/6)
 - Hydraulic power lift inner circuit control lever (pict. 4/7)
 - Selecting lever of hydraulic power lift unit control (pict. 4/8)
 - Front axle drive engagement — the front axle drive can be engaged by pulling out the bowden a little (pict. 7/1)
- Gear shifting can be carried out at road as well as at reduced speeds, both at rest and on the run of the tractor.

- Engagement lever of hydraulic power lift pump (pict. 8/1)

The engagement of hydraulic power lift pump is to be carried out at rest of the engine by unlocking the lever (by pulling-out the locking pin in the cover a little) and shifting it in position "in (engaged)". The lever is held in the engaged position (in forward direction) by a

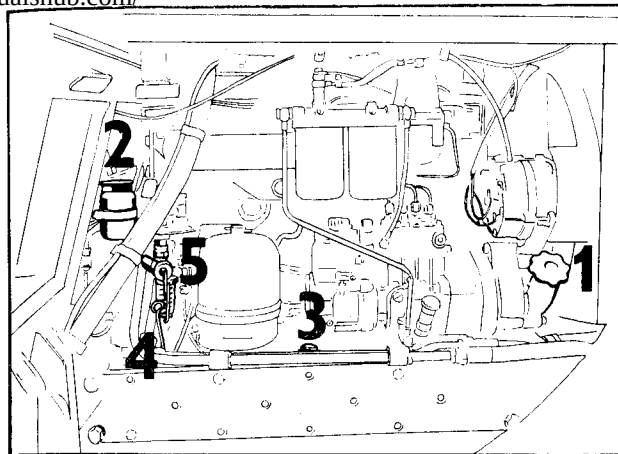


Pict. 10

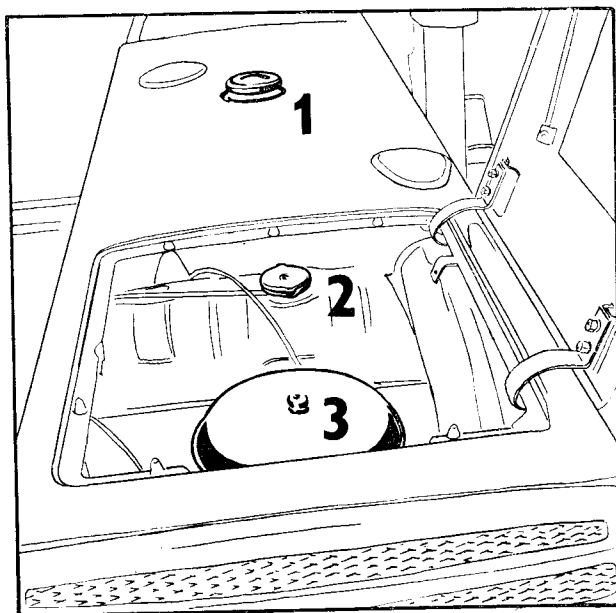
spring. Disengage the pump in case you do not use the hydraulic power lift unit.

- Compressor engagement control lever (pict. 9/1)
The engagement of the compressor is to be carried out at idle run of the engine by shifting the control lever downwards (to horizontal position).
- Seven pole plug socket (pict. 10/1) serves for connection of the electrical equipment of the trailer or semi-trailer
- Air coupling hose (pict. 10/2) interconnects the air system of the trailer or semi-trailer
- Quick coupling (pict. 10/3) serves for attachment of trailer hydraulic cylinders.

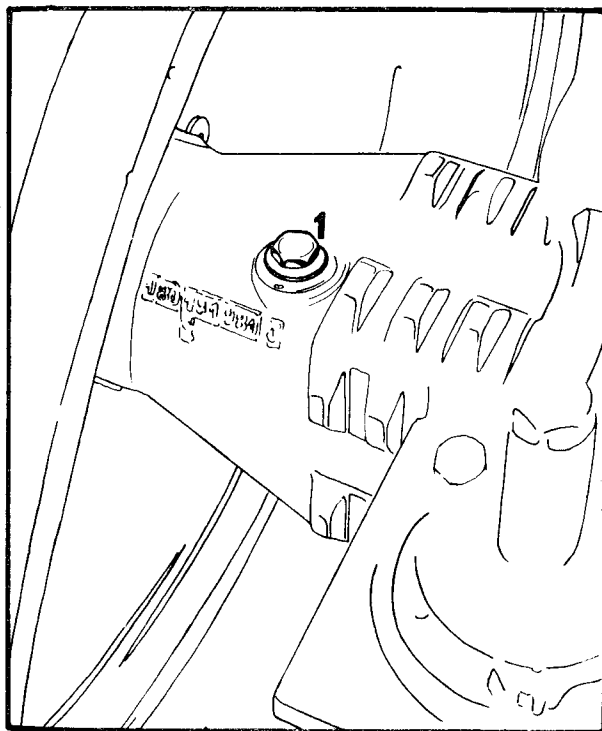
- Filling neck of fuel tank (pict. 11/1)
- Neck serving for tanking the coolant (pict. 11/2)
- Neck for filling oil in engine (pict. 13/1)
- Filling orifice of brake liquid tank (pict. 13/2)
- Filling orifice of power-steering tank (pict. 13/3)
- Oil level indicator in engine (pict. 13/4)
- Oil filling orifice in gearbox and main transmission housing is placed under the cover on the floor of the cab — the plug of the filling orifice serves, at the same time, as oil level indicator
- Oil filling orifice in rear axle body — the plug serves as oil level indicator at the same time (pict. 14/1)



Pict. 13

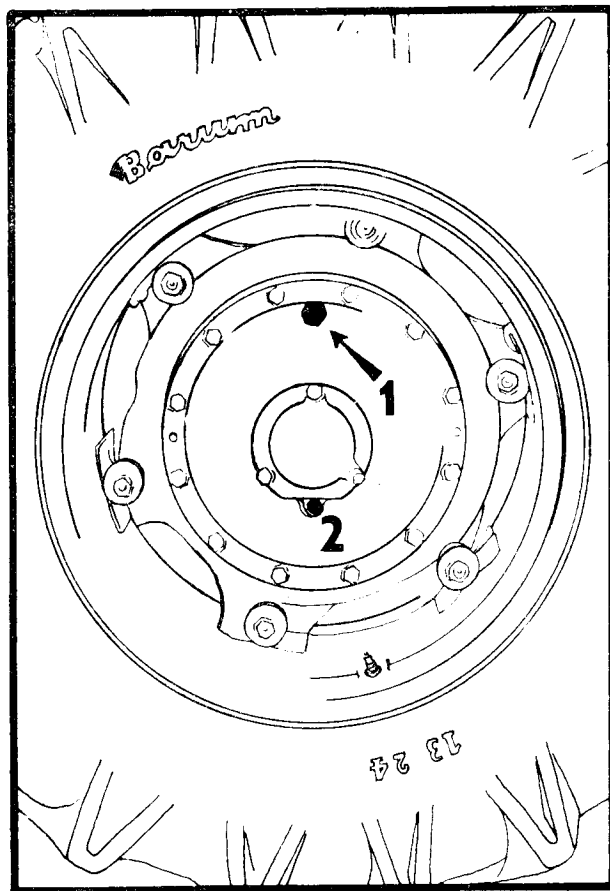


Pict. 11

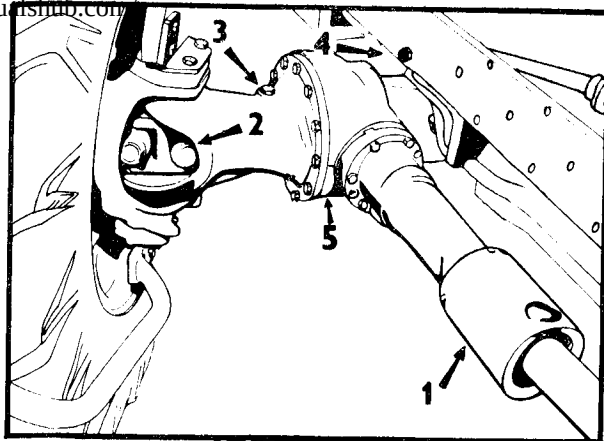


Pict. 14

- Oil filling orifice in front wheel reducers (Z 16045) (pict. 15/1)



Pict. 15



Pict. 16

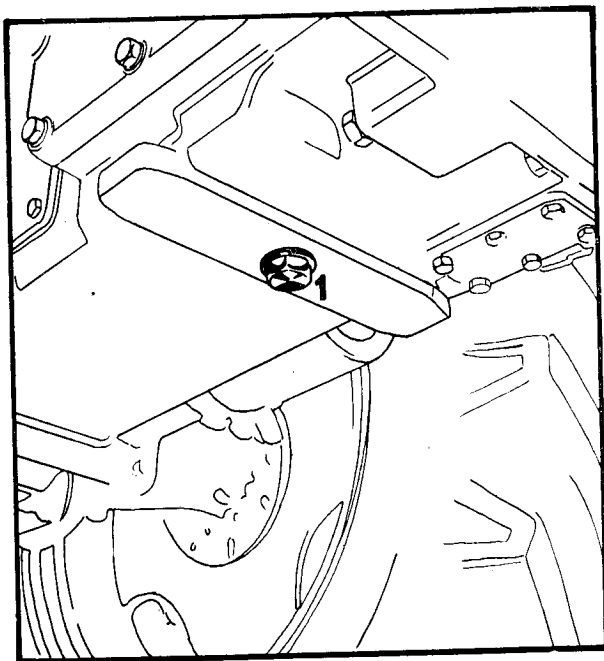
- Oil filling orifice in front driving axle body (pict. 16/3)
- Coolant draining orifice from the heating system (pict. 9/2)
- Orifice for draining water from radiator and heat exchanger (on exchanger cover)
- Orifice for draining oil from engine pan (on the bottom of the pan)
- Oil draining orifice from power steering tank (on the bottom of the tank)
- fuel cock — horizontal position — supply is closed (pict. 14/5)
- upward or downward position — supply is open
- Inspection hole of front driving axle oil filling (pict. 15/2)
- Oil draining orifice from front driving axle body (pict. 16/5)
- Orifice for draining oil from front wheel reducers (pict. 15/1)

When checking oil amount in reducers, adjust level orifice in bottom position of vertical axis of the wheel.

- Orifice for draining oil from suction strainer body in suction branch of the gearbox (pict. 25/1)
- Orifice for draining oil from gearbox and main transmission housing (pict. 17/1)
- Orifice for draining oil from rear axle body (in the bottom part of the body).

Attention:

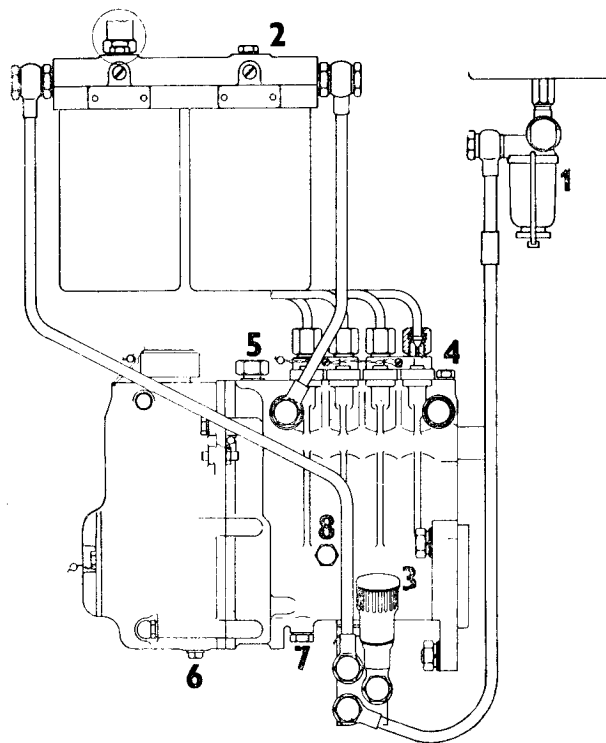
It is necessary — when draining oil or water — to place the tractor on horizontal (plain) ground.



Pict. 17

BLEEDING OF THE FUEL SYSTEM (pict. 18)

1. Open fuel cock of fuel tank so that the prefilter tank may (pict. 18/1) be filled up without air bubbles.
2. Loosen fuel filter (pict. 18/2) screw and pump — with help of bucket-type pump (pict. 18/3) — until fuel oil flowing out of both filters is free from air bubbles. Tighten up the filter screw and keep on pumping for some time.
3. Loosen the bleeder screw (pict. 18/4) on injection pump and pump manually until fuel oil without air bubbles escapes around the screw. Keep on pumping and, at the same time, tighten up gradually the bleeder screw of injection pump. Having finished the bleeding operation, clear the engine of fuel.

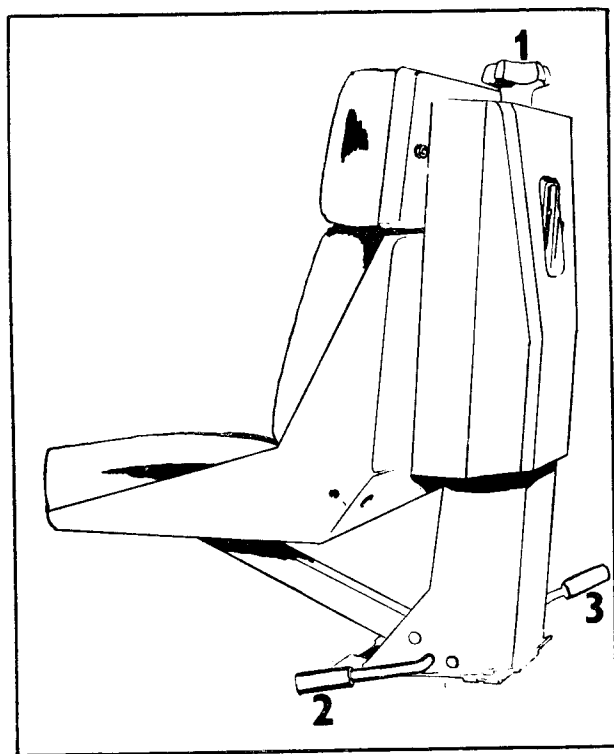


Pict. 18

The seat is sprung and adjustable (with help of revolving wheel) according to driver's weight from 60 to 120 kg. (Revolving wheel — (pict. 19/1.)

The seat is adjustable in its longitudinal axis from its central position of 70—75 mm forwards or backwards (pict. 19/2, 3).

Fellow-driver's seat (pict. 7/2) is placed on LH side behind the driver. The seat can be folded toward the mudguard, if necessary.



Pict. 19

Storage Battery

Storage batteries are charged automatically on the run. Two types of storage batteries are used on the tractors.

1. Dry-charged, designated with a green letter "N" pressed in the sealing compound on the surface of the battery.
2. Standard — without any designation.

The "dry-charged" battery differs from the "standard" one in the method of its first charging. Both types work identically when in operation. Another difference between these two types of batteries lies in the fact that the "dry-charged" battery is provided with gaskets situated under the plugs of the batteries. These gaskets may be removed only prior to putting the battery into operation.

Hints for Battery Performance:

Bear in mind when handling the battery that electrolyte is an alkali capable to injure not only your sight but also your skin etc. Use protective aids when handling the battery.

Remember that — when charging — an explosive mixture has been formed in the battery which explodes in contact with open fire. Specified density of electrolyte in question is 1,28—1,285, i. e. 32° Bé. The electrolyte (after a long time of battery operation) is to be topped up with distilled water only. The battery may be refilled with electrolyte only if it has been evidently poured out of the cells. The cells shall be refilled with distilled water prior to travel or prior to charging outside the vehicle so as to ensure proper mixing (with electrolyte). Level of the electrolyte shall be checked within two weeks in summer and four weeks in winter (at the latest) and kept maximum 5 mm above the perforated insert.

Attention! Because the type of battery may be changed, do always follow instructions of the manufacturer of storage batteries delivered together with the tractor.

Starter Motor

The maintenance of the starter motor is restricted to re-

gular inspections, where the following principles are to be respected:

1. The supply cable terminals must be tightened well and protected with a thin film of grease so as to avoid their corrosion. Damaged cables should be replaced by new ones.
2. Check commutator, carbon brushes and carbon brush thrust springs every half a year.
3. Have the starter motor tested in a specialized repair workshop at the occasion of the middle repair (MR) of the tractor.

Alternator

Practically no maintenance of alternators is needed, when in operation. It is, however, necessary to observe the following instructions:

1. The battery has always to be connected by its minus pole to earth (frame), by its plus pole to the alternator outlet.
2. Disconnect the battery if you replace any part of the charging circuit.
3. Never short-circuit (event at high speed) any alternator or regulator terminal, when in operation.
4. It is not allowed to disconnect the battery, when in operation.
5. Disconnect all wires from the alternator and protect the wire "plus B" against short-circuit when welding with electric arc.
6. It is not allowed to excite the alternator using any source outside the alternator mains — such as regulating relay.
7. Burnt charging pilot lamp has to be replaced at once, otherwise correct alternator excitation may not be ensured. When replacing, use the pilot lamp of the same input.
8. Take care of perfect electrical connection on connecting terminals and of perfect earthing of both the alternator and the regulator.
9. When washing and cleaning the tractor with oil, prevent water or oil penetration into the alternator.

Voltage Regulator

is a vibrating device operating only in connection with alternator. Do not disassemble it in case of any defect.

Storage Battery Switch

serves for short-time battery connection to 24 V when starting (only with tractors Z 16045).

HOW TO PREPARE THE TRACTOR FOR TRAVELLING

Every day, prior to putting the tractor into motion, check and/or refill:

1. State of the steering system — steering arm unions, tightening of bolts and nuts, level of oil in power steering tank and/or check the toe-in.
2. Amount of coolant in radiator.
3. Fuel amount in the tank.
4. Brake fluid amount (Syntol HD 190 — green, specification SAE 1703 C).
5. Amount of oil fillings.
6. Tightening of important joints (particularly discs, wheel beads etc.).
7. Function of brakes — whether some resistance is felt when depressing latched or unlatched pedals.
8. Condition of electrical equipment — check of lights, direction indicators etc.
9. Pressure in tyres.
10. Efficiency of both the hand and foot brakes. Brake pedals have to be latched.
11. Tension of compressor V-belt.

How to Start the Engine

Prior to starting the engine make sure that the speed gear shift levers as well as those of auxiliary drivers are in their neutral positions and that the hand brake is on.

Then:

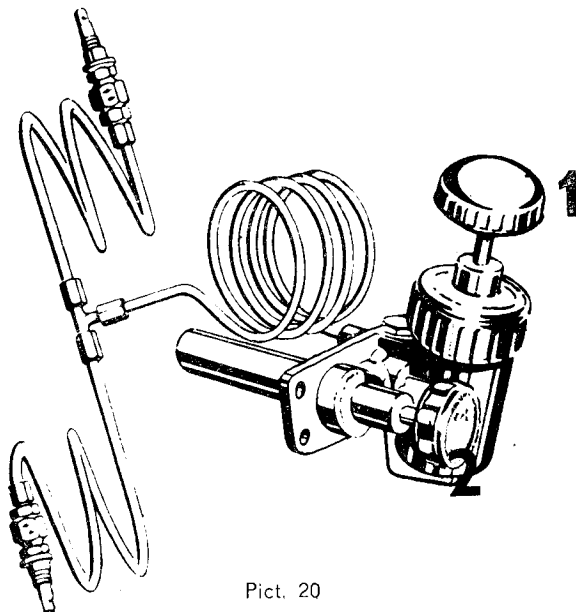
— insert the key into the switch box in its "0" position (the key is to be fully inserted);

- declutch the pedal, shift the multiplier lever in position "turtle" and shift PTO shaft rev. lever in neutral position;
- open the fuel throttle to its maximum;
- depress starter motor button.

Attention: Do never start longer than for 10 sec. If the engine fails to start immediately for the first time, repeat starting after 30 seconds only, particularly in winter season. Do never help to stop the engine with help of the starter motor. Wait until the engine stops completely.

Note: According to the fact that the tractors are provided with start breaker, starting without pedal declutching cannot be realized.

Attention: Having started the engine, let it run without load for 3 min at 800—1000 rpm. The engine must not be loaded until the oil pressure exceeds 0,25 MPa. Intermittent violent increase of engine revolutions is inadmissible!



Pict. 20

How to Start the Engine in Winter Season

It is advisable to preheat the engine at first by means of hot water in the season of lower temperatures lukewarm water flows out from the crankcase drain cock as well as through the orifice in the bottom cover. It is possible to use standard engine Diesel oil at permanent temperature higher than -5°C , but it is necessary to use special winter Diesel oil at temperatures permanently lower than -5°C . Having started the engine, let it run in higher devolutions at covered radiator shutter until the temperature reaches 50°C .

Starting Device — Injector JIKOV (CSSR)

1. Loosen injector tank plug (pict. 20!1) and lift the piercing needle in upward direction.
2. Insert ampule (starting hub) by its collar up in injector tank.
3. Close the injection tank.
4. Pressing on piercing needle head, pierce the ampule so that the needle head may touch the plug of the tank.

How to put the Engine into Operation

Put starter motor of the engine in motion. As soon as it starts to turn the engine, use injector pump (pict. 20/2) and carry out (relatively quickly) two or three strokes. The engine having admitted injected mixture, continue pumping (slow regular strokes). Having reached necessary revolutions of the engine, stop pumping. Run of the engine can be supported with help of several slow strokes, if necessary.

Tractor Starts Running

In case that your tractor is equipped with the device controlled by air brakes, wait till the pressure on air pressure gauge reaches minimum value of 0,45 MPa.

1. Choose — with help of preselecting lever located in the middle in front of the seat — road speeds - II
reduced speeds - I
reverse speeds - R
2. Reduce engine revolutions down to idle run and declutch the pedal completely.

Attention: Do not reduce the idle run <https://truckmanualshub.com/> below 600 to 700 rpm according to the speed indicator on the dashboard. When loading the engine below 300 rpm, you run a risk of changing engine sense of rotation.

3. Engage the first speed gear by means of the shifting lever located besides the driver's seat on RH side. If you do not succeed to engage the first speed gear immediately, release the clutch a little. Declutch again and engage the first speed only after the synchronizing small brake stops braking.
4. Declutch slowly the pedal while simultaneously depressing the accelerator pedal thus increasing engine revolutions so that the tractor may start smoothly. Release the hand brake while simultaneously engaging the travel clutch and increasing engine revolutions, if the tractor is on the slope.
5. Speed change from lower to higher ones should be carried out as follows:
 - declutch the pedal while simultaneously releasing the accelerator
 - disengage the gear shift lever and slide it to its neutral position
 - release the clutch pedal
 - declutch the pedal again
 - shift higher speed
 - release slowly the clutch pedal and, at the same time, depress the accelerator.

Speed change from higher to lower ones is to be carried out as follows:

- release accelerator pedal and/or, in addition to it, brake with help of service brake pedal, if necessary
- declutch the pedal
- shift the gear shift lever to its neutral position
- release the clutch pedal
- depress the accelerator pedal (thus increasing engine revolutions so that circumferential velocities of gearbox gear wheels may level and noiseless gear shifting may be reached)

- release accelerator pedal and declutch the pedal again
- shift lower speed slightly in
- release slowly the clutch pedal and accelerate slightly so as to avoid jerking.

6. Engagement of the front drive of tractors Z 10045 and Z 16045 is carried out from driver's seat by pulling the push button of distributor tie rod as far as the stop (stroke length is approximately 15 mm) (pict. 7/1). The engagement may be carried out even if the tractor is at rest, but the engagement of the front drive takes place only having started the engine, when necessary oil pressure has been produced in the hydraulic circuit.

Running-in of the New Tractor or the Tractor after its Complete Overhaul

1. Neither load the tractor nor engage any auxiliary drives for approximately 10 performance hours.
2. Do not load the tractor more than to its half output and do not work with the tractor at full engine revolutions during next 20 performance hours. Use such implements only that do not overload the tractor (i. e. sowing machines, harrows, drags, weeders, etc.). Clean gearbox oil filter (pict. 25/3) and replace oil filter (pict. 25/5).
3. Do not load the tractor more than to its $\frac{3}{4}$ output during its following next 20 performance hours (i. e. 50 engine hours). Do not use the hydraulic power lift unit during the running-in period of the tractor (i. e. up to 50 engine hours).

After 50 engine hours drain oil from the engine and heat exchanger, clean rotor of centrifugal oil cleaner and change oil. After the first 200 engine hours carry out all operations of Technical Inspection 2, change oil in gearbox and clean the fine filter of gearbox hydraulic circuit as well as the coarse filter of hydraulic pump suction. Change oil in half-axes, reduction gears and front driving axle housing, set up valve plays (0,3 mm), having tightened the head by the torque of 17—19 kpm.

The pump of hydraulic power lift unit is located on LH side of tractor intermediate housing and its control is carried out by means of a control lever (pict. 8/1). The tractor is also equipped with a single-piston micropump fitted in hydraulic power lift circuit. This pump is permanently engaged, its revolutions being identical with those of the PTO shaft (540 or 1000 rpm). Hydraulic power lift piston pump suction is connected to the discharge branch from gearbox oil radiator, the delivery is led to the throttle valve situated in hydraulic power lift cover.

By means of the selector lever (pict. 4/8) the following controls may be selected:

a) position control

With position control engaged, the attached implement is automatically held in the specified position with respect to the tractor;

b) draft control

With draft control engaged, the attached implement is automatically held in the position corresponding to the constant specified tractive force in the bottom links of the three-point linkage;

c) mixed control

With mixed control engaged, combination of position and draft control is carried out;

d) pressure control (not manufactured at present)

or trailer are lightened by permanent specified force.

With pressure control engaged, agricultural implement

The inner circuit control lever (pict. 4/6) controls:

a) lifting and lowering of implements

b) setting-up of three-point linkage height at position control

c) setting-up of tractive force at draft and/or mixed control

d) setting-up of hydraulic cylinder pressure intensity for pressure control

e) setting-up of so-called floating position, when working with implement provided with its own thrust wheel.

The outer circuit control lever (pict. 4/7) controls the supply of pressure oil to outer circuit outlets provided

couplings and back to the tractor. Following positions can be selected:

a) lifting (single- or double-acting cylinder)

b) stop position

c) floating position

d) forced lowering (double-acting cylinder)

Control lever labels designate the above mentioned functions of individual positions (see page 60).

Additional Outer Hydraulic Circuit

Additional single-section three-position distributor, controlling oil feed in another pair of outer circuit outlets with quick couplings on the rear wall of hydraulic power lift cover may be mounted optionally. Additional circuit uses gearbox oil filling and standard oil pump of hydraulic power lift unit. Additional distributor is mounted in front of the master distributor of hydraulic power lift unit. Control lever of additional outer hydraulic circuit distributor has three positions:

a) lifting (single- or double-acting cylinder)

b) STOP position

c) forced lowering (single- or double-acting cylinder)

Additional Cylinder of Hydraulic Power Lift Unit

(pict. 24/1)

Additional cylinder of hydraulic power lift unit is mounted on tractors Z 10011 and Z 10045. Its purpose is to increase the lifting force of hydraulic power unit (two cylinders with Z 16045) (pict. 22/4).

Gearbox Oil Radiator

is placed in front of the water radiator and serves for cooling of gearbox oil. In the cooling circuit there is a safety valve set up to pressure of 0,5—0,7 MPa.

Brakes

Foot brakes are controlled hydraulically with help of two pedals (pict. 6/1). Having unlatched the pedals, LH or RH pedal can brake LH or RH wheel separately. When driving the tractor on the road, the pedals have to be latched. The hand brake serves for securing the tractor

in rest position. It can be put into operation by moving the control lever (pict. 4/1) upwards (toward the driver). Releasing of the control lever should be carried out in such a way that moving it slightly upwards at first (toward the driver), depress simultaneously its lock and return it back in its previous lower position.

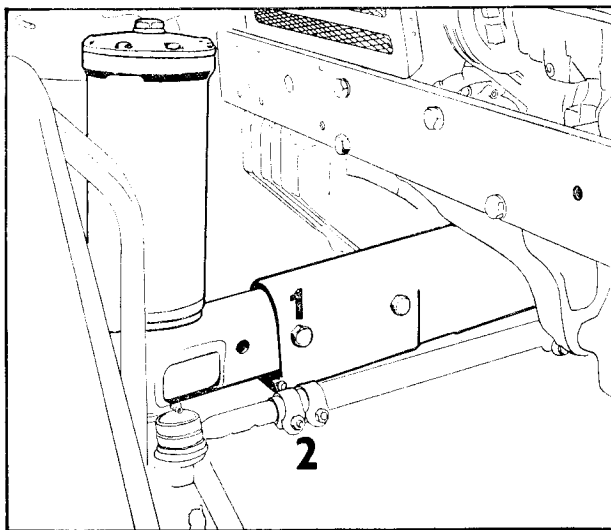
Differential Lock

If one of the tractor rear wheel slips in the terrain, apply the differential lock (pict. 6/3). The differential lock puts the differential out of operation so that both rear wheels have then the same revolutions but only when the pedal is depressed. The front driving axle differential is not provided with a lock.

Important! The differential lock should never be applied, when driving the tractor in a curve.

Front Axle

The extensions with wheels may be sprung or unsprung, the change of front wheel track being possible. The tractors Z 10045 and Z 16045 have swivel seating of the housing, the front wheel track remains unchanged. In-

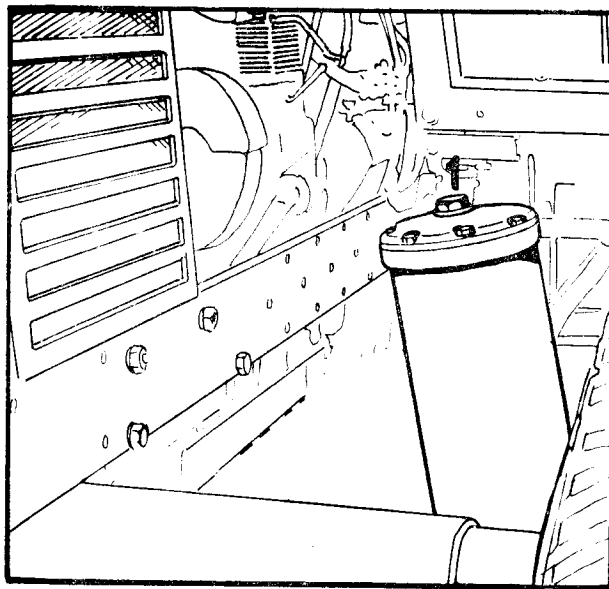


Pict. 20a

track adjustments are referred to in technical data of the tractor in the foregoing part of this Manual. Manufacturer's works always adjusts basic wheel track. Any change of front wheel track shall be carried out as follows:

1. Put a jack under the front axle.
2. Unscrew two nuts (pict. 20a/1) of front axle extension bolts and remove them.
3. Unscrew two bolts from RH and LH interconnecting rod of the steering system and pull them out (pict. 20a/2).
4. Pull out both extensions up to the required wheel track and lock them again with bolts and nuts.
5. Screw and lock bolts on RH and LH interconnecting rod of the steering system.
6. Check front wheel toe-in and/or toe-out.

Only having changed stop I for stop II and screwed the screw in (pict. 21/1), change of sprung extension for unsprung (locked) one can be carried out.



Pict. 21

It is measured on front wheel rims and is 6 ± 4 mm on tractors Z 10011. The front wheel toe-out on tractors Z 10045 and Z 16045 is 12—15 mm. The wheel position has to be set up in such a way so that the turning radius of LH and RH wheel may be always identical.

Attention! It is always necessary (for safety reasons) to use the jig included as tractor accessories in the tool box when dismantling the sprung extension cover.

Tractors Z 10045 and Z 16045 are provided with bevel gear with differential located in front axle body from where the drive is led with help of double joints via epicyclic gears (situated in front wheels of the tractor) to the front wheels of the tractor.

Bevel reduction gear is 2,83; epicyclic reduction gear is 5,18.

Rear Wheels

Rear wheel track is adjustable.

Individual tracks are included in tractor technical data in the foregoing part of this Manual.

Tyre size	Inflating in KPa	Carrying capacity of 1 tyre in kg	Kind of work
7,50-20	250	850	for transport
	300	1700	for work with front loader at maximum travel speed up to 6 km/h
12,4/11-24	170	1200	for transport and field labour
14,9/13-24 8 PR	170	1700	for transport and field labour
16,9/14-34	110	1870	for field labour
	150	2240	for transport
18,4/15-34	110	2220	for field labour
	140	2565	for transport

The carrying capacity of rear tyres can be increased of 20% at the maximum travel speed up to 20 km/h (permissible pressure forces of the axle must not, however, be exceeded).

It is necessary to disengage the compressor — with tractors equipped only with air compressing device for tyre inflating without air tank — immediately after the tyre has been inflated, otherwise it could be damaged.

When inflating, the wing nut on tyre inflator is unscrewed and a tyre inflating hose is mounted instead. The tyres having been inflated, it is necessary to screw the wing nut on again.

Tyre Filling with Water

Increase of tractor adhesion and thus of its tractive force can also be obtained by filling the inner tubes of tyres with water (with antifreeze in winter). Although it is possible to fill tyres with water also with help of normal valve, the inner tubes are — for this purpose — provided with a special valve which facilitates quick and easy filling with water.

Filling Technique

Ease the tyre by the jack put under the tractor and swivel the tyre so that the valve faces upwards. Deflate the air completely. Connect the valve with the tank containing the liquid by means of a hose and pump the solution into the inner tube. Then inflate the tyre to the specified pressure.

Draining Technique

ATTENTION — water spatters out, when unscrewing the valve air section. Underpressure can occur in the tyre when draining water from it and therefore it is necessary to swivel the wheel slightly from time to time so as to get the valve to its upper position. Screw water valve body on the bottom valve section and the inner tube valve air section on the body. Inflate the inner tube with air until water stops flowing out of the tube in the body. Having drained the inner tube, screw off the water valve.

Rims

Wheel rims for both the rear and front wheels are of Wide Base type. When replacing the tyres, the same size of Barum mark is to be applied. When employing tyre casings of foreign marks, only such types can be used

rolling radius of which corresponds with the specified rolling radius of the tractor. The coupling for semi-trailer (pict. 22/2) is designed for Czech tyre sizes.

Attention! From the point of view of an excessive wear of front tyres it is not advisable to drive the tractors Z 10045 and Z 16045 with engaged front drive on rigid pavement (transport on the Z 10045 and Z 16045 are mounted so that from roads etc.). The front tyres of the tractors Z 10045 and Z 16045 are mounted so that from the front view (on the tractor) the arrows of the pattern must converge upwards.

SUSPENSIONS

Four-wheel Trailer Coupling (pict. 22/3)

Trailer mouthpiece is adjustable in height in two positions:

- a) lower position — basic
- b) upper position — facilitates operations with propeller shaft

When operating with the three-point linkage and the implement of 460 mm high stand, the frame carrying coupling mouthpiece is tilted around the main pin. The trailer eye is suspended in coupling mouthpiece and interconnected with help of a pin automatically locked (after having been slid in), with a lock on its lower end.

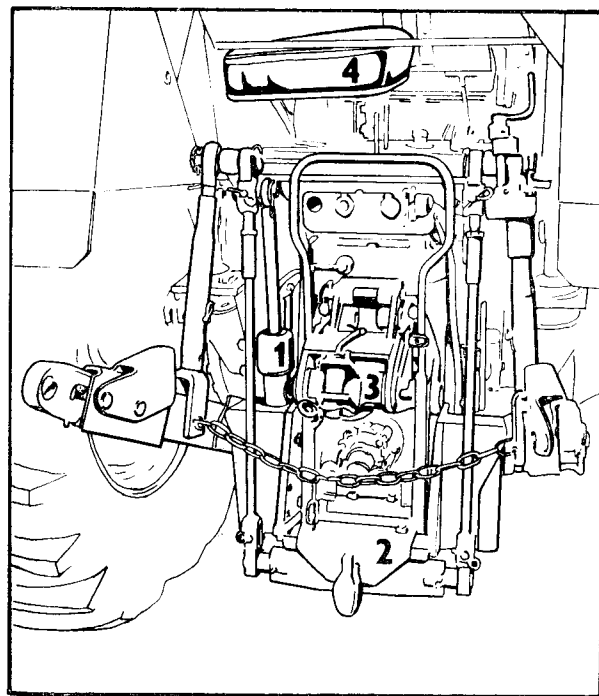
Three-point Linkage (pict. 10/4)

The three-point linkage consists of lower links, lifting links, upper links and two stops with wedges limiting side wings of the lower links. Each of the lower links is provided with two orifices serving for interconnection with lifting links. Lifting links are suspended on outer pins of lifting arms. They may continuously modify their length. The upper link of the three-point linkage is fixed by means of a pin in one of the three orifices of the linkage bracket for four-wheel trailer or for multistage linkage.

Multistage Linkage (pict. 23/1)

serves for attachment of the trailer and semi-trailer. It is vertically adjustable in four positions. Permissible vertical static load is 10 kN.

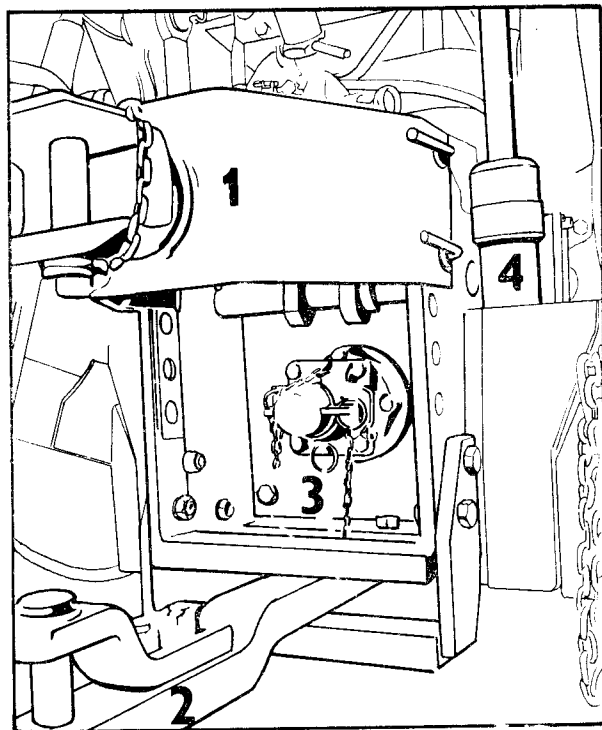
Coupling for semi-trailer serves for automatic attachment of semi-trailer to the tractor. The hook with trailer shaft is lifted with help of lifting mechanism and links until the hangers fit into hook arms. The coupling is controlled with help of a control lever (pict. 5/1). When uncoupling the trailer, the hook has to be lifted a little with help of the lifting mechanism and the hangers have to be bent away (by means of hand lever) in such a way that the hook may be lowered. Maximum permissible vertical static load of coupling for semi-trailer is 15 kN or 18 kN in case that the rear wheels are not provided with ballast weights.



Pict. 22

The swinging drawbar can be horizontally adjusted in five positions and locked by two bolts in the bracket slot. It can be also adjusted in four positions vertically. When using propeller shaft, free space may be assured only if the fork is in its lowest position. The distance between the mouthpiece pin of the swinging drawbar and the end of the PTO shaft for 540 rpm is set up to 355 mm. It is necessary to adjust the drawbar to the distance of 400 ± 5 mm when working with PTO shaft for 1000 rpm. Permissible vertical static load of the swinging drawbar is maximum 5 kN.

It is possible to adjust the distance of mouthpiece pin of the swinging drawbar from the end of PTO shaft to 400 ± 5 mm or 500 ± 5 mm with Z 16045. Permissible vertical static load of the swinging drawbar is 7 kN max.



Pict. 23

The drawbar is fixed in bottom hinges of three-point linkage. It is hydraulically adjustable in height by means of the lifting mechanism within the whole stroke of the three-point linkage.

Only such types of agricultural machines that apply a permanent load to the drawbar (in downward direction) may be attached to the drawbar. Permissible vertical static load of the drawbar is 7 kN (Z 10011, Z 10045) or 9 kN (Z 16045).

Remove multistage coupling carrier with mouthpiece, when working with the drawbar.

Rear PTO Shaft for 540 and 1000 RPM for Tractors Z 10011, Z 10045 (pict. 23/3)

It consists of four parts. The first part is situated in the intermediate housing containing gears for 540 and 1000 rpm. The drive for independent revolutions of the PTO shaft is firmly joined with the engine. The gear shifting of these independent revolutions of the PTO shaft is carried out only if the engine is out of operation. The endpiece for 540 rpm is six-splined, for 1000 rpm twenty-one-splined. When mounting one endpiece on the PTO shaft (for respective number of revolutions), the other endpiece is fitted in the orifice on RH side of the clutch housing. In case that no endpiece is put into the orifice of the clutch housing, a spring shifts the fork in position of 540 rpm of PTO shaft. The gear shift lever of dependent and independent revolutions of PTO shaft is illustrated in pict. 4/2. Gear shifting of the drives has to be carried out at very low engine revolutions and de-clutched PTO shaft. Dependent revolutions must be shifted at declutched engine. The clutch and brake of the PTO shaft are controlled hydraulically by pressure oil by means of a control lever located under the steering wheel (pict. 1/12).

Attention! The allowed power transmission of the PTO shaft end piece for 540 rpm is only to 36,75 kW (50 hp). The allowed power transmission of the PTO shaft end piece for 1000 rpm is only to 74 kW (100 hp).

Rear PTO Shaft for Tractors Z 16045

Similar construction as with Z 10011 and Z 10045, but only one type of revolutions — 1012 rpm at 2200 rpm of the engine. PTO shaft is provided with exchangeable end pieces. Dia of the first one is 35 mm (21 splines); this end piece is capable of transmitting output of max. 74 kW (100 hp). The other one: dia — 45 mm, 20 splines is capable of transmitting the whole output of the engine. The replacement is to be carried out with help of a screw situated in end piece axis.

Torque Multiplier

It is in principle planet gear reducer enabling to carry out change of the speed under load, i. e. without interrupting of the transmitted engine output on rear wheels of the tractor. Its engagement and disengagement is carried out by means of a control lever (pict. 1/11). The ratio of the reduced transmission is 1:1,34.

Air Brakes

The pneumatic equipment consists of the compressor, combined pressure equalizer, tyre inflator with safety valve, pressure air tank, brake valve, air pressure gauge, brake valve control being carried out by brake pedal as well as by hand brake, coupling head and connecting pipes. The brake valve lever system controlled by hand brake control lever is set up in such a way that the trailer may be braked simultaneously with the tractor, when engaging the air brakes. The mechanical connection of tractor foot brakes with trailer air brakes should be set up in such a way that the trailer air brakes might act approximately of 0,2 sec. earlier than the brakes of the tractor. The working pressure of the braking system is 0,6 MPa. Attachment of the trailer to the tractor should be carried out only if the tractor has been braked with hand brake so that the relief valve might not be under pressure. When travelling, the air pressure gauge has to be watched. Air pressure must not drop below 0,58 MPa, otherwise it is sign of a defect which is to be immediately removed.

Cab

The frame of the cab is fixed to the self-carrying floor. The cab is fully glazed all around its circumference with

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It is provided with an efficient heating system, the output of which is 2600 W (2200 kcal). The amount of supplied warm air can be controlled by means of flap valves so that part of warm air may be delivered on the front windscreen or on the driver's legs. The circulation of air in the cab in summer is ensured by removable side windows, ventilation rear window and/or by lifting the roof. In order to improve ventilation of the cab, the heating system fan may be used; in this case the hot water supply to the heating system radiator must be closed. The door may be half-open as well, when driving the tractor, and latched in this position. The cab is provided with two driving mirrors, both front and rear windscreen wipers as well as with inner illumination.

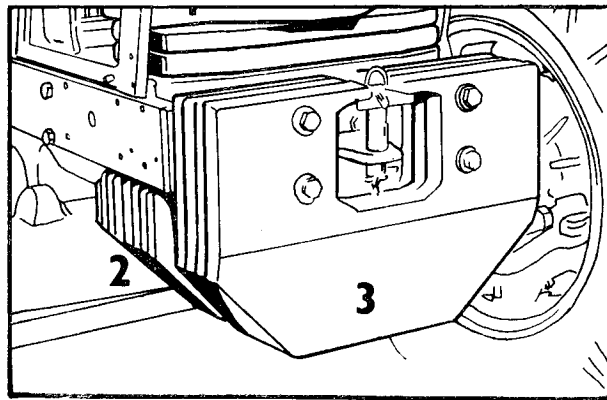
Attention! Repaired crashed cab (or considerably corroded cab) may not be mounted on the tractor for safety reasons.

Front Mudguards

Front mudguards may be mounted on all types of the tractors.

Searchlight for Night Ploughing

It is fitted on the RH rear mudguard and its switching on is to be carried out by a switch (pict. 2/1).



Pict. 24

Front ballast weights serve for surcharge of the tractor. They can be placed in front of the radiator on the frame, under the frame (pict. 24/2) or on the front hook (pict. 24/3). Rear ballast weights are fixed to rear half-axes by bolts. The number of individual ballast weights may be changed.

Performance of the Tractor under Special Conditions

Do observe the following principles, when driving the tractor in tropics:

1. Never close the radiator shutter.
2. Every day check amount of coolant in radiator as well as seat packing of the overpressure plug.
The temperature of the coolant may reach 105°C, but for a short time only. Above 106°C the overpressure plug gets open — the loss of overpressure results in loss of the coolant.
3. Clean the air filter every day if you work in humid and dusty surroundings (check oil filling, when using oil filters).
4. Check amount of electrolyte in the battery every day.

Survey of individual operations of the technical maintenance.

Daily Attendance (each 8—10 engine hours)

1. Clean both the tractor and implements.
2. Check and refill amount of fuel and inspect joints of fuel system for tightness.
3. Check level of the coolant and inspect joint of the cooling system for tightness.
4. Check oil level and inspect joints of the lubricating system for tightness.
5. Check amount of impurities in air prefilter (pict. 11/3) and/or carry out necessary attendance of air cleaner according to the attached instructions.
Empty the sump, if it is full of dust (as high as the specified gauge mark). Check of oil filling is to be carried out each 50 engine hours. Check the oil filling daily in case of operation in very dusty surroundings.
6. Check function both of the foot and hand brakes as well as the air pressure. Check pneumatic brake system for tightness and brake efficiency of the tractor coupled with a trailer.
7. Inspect the condition of electrical installation — check function of lights, direction indicators etc. Check regular run of the running engine, correct charging and lubrication pressure of engine oil.
8. Check air pressure both in front and rear tyres.
9. Check the hydraulic brakes for tightness, drain oil from tyre inflator.
10. Check the tightening of bolts and nuts on steering rods and levers as well as of front and rear wheel discs.
11. Check tension of water pump, compressor, fan and alternator V-belts.
12. Check joints in power-steering system for tightness.
13. Prior to driving the tractor with trailers or semi-trailers, check their state as well as the state and condition of coupling and locking elements.

Technical Inspection 1 (TI 1)

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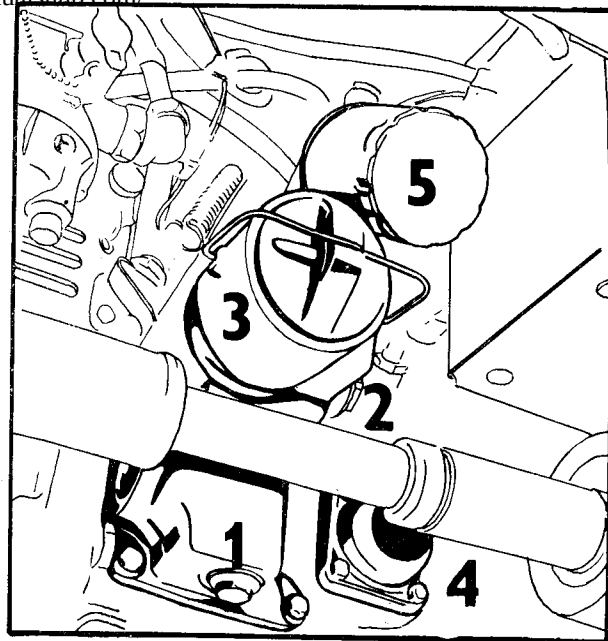
This inspection is to be carried out after each 100 engine hours.

14. Carry out daily attendance (see item 1—13).
15. Carry out operations according to the Lubrication Chart (see Annex).
16. Clean (drain) fuel top mud strap sump.
17. Check electrolyte level in the storage battery.
18. Check setting-up of clutch pedal idle run.
19. Check setting-up of gearbox synchronizing small brake.
20. Check tightening of bolts connecting front axle bracket with the engine.
21. Lubricate the water pump by swivelling the greasing nipple through one turn.
22. Replace air filter oil filling.

Technical Inspection 2 (TI 2)

This inspection is to be carried out after each 200 engine hours.

23. Carry out all operations of TI 1.
24. Clean rotor of the centrifugal oil cleaner.
25. Replace oil in engine, injection pump as well as in governor.
26. Check play in front wheel bearings, set up the play, if necessary.
27. Check suction strainer (pict. 25/3) and clean magnetic insert of hydraulic (power lift) pump suction strainer (pict. 25/2), if necessary.
28. Clean filtering insert of heating system fan, when working in dusty surroundings.
29. Check toe-in and/or toe-out of front wheels, set it up, if necessary.
30. Clean fuel filter inserts.
31. Check and clean or set up injection valves, if necessary.
32. Lubricate cross pins and grooving of propeller shaft of tractors Z 10045 and Z 16045.
33. Carry out operations according to Lubrication Chart (see Annex).
34. Clean radiator ribs.



Pict. 25

Technical Inspection 3 (TI 3)

This inspection is to be carried out after each 600 engine hours.

35. Carry out all operations of TI 2.
36. Replace fuel filter insert.
37. Check and/or set up the play between the drum and the brake band of the torque multiplier.
38. Check storage battery for its state of charging.
39. Check and/or set up foot and hand brake of the tractor.
40. Lubricate electromotor bearings of the heating system fan.
41. Check tightening of bolts fixing the cab to the floor.
42. Carry out operations according to Lubrication Chart (see Annex) and replace full-passage oil filter in drain branch of hydraulic power lift unit.

43. Tighten cylinder head bolts and check and set up valve play.
44. Carry out replacement of fine oil filter (pict. 25/5).
45. Check all joints serving for air supply as well as tightening of screws and nuts of suction manifold.

Technical Inspection 4 (TI 4)

This inspection is carried out after each 1200 engine hours.

46. Carry out operations of TI 3.
47. Clean filling (fuel) sieve as well as magnetic plug of power-steering circuit, replace oil filter.
48. Replace both the inlet and delivery valves in the compressor.
49. Carry out operations according to the Lubrication Chart (see Annex).

Middle Repair (MR)

The middle repair of tractors is carried out after each 2400 engine hours.

50. Carry out all operations of TI 4.
51. Grind engine valves in (tighten head stud bolts prior to mounting cylinder heads on the engine).
52. Clean and rinse engine cooling system.
53. Check and/or have the alternator, starter motor and voltage regulator repaired.
54. Drain mud from fuel tank.
55. Check the pins and the diaphragm of the driver.
56. Lubricate flexible rods of the heating system control and front drive engagement.
57. Lubricate door and back window pins, the door locks and the lifting mechanism of the roof.
58. Check and/or replace rubber hoses for water delivery.
59. Check silentblocks under the tank and bonnet — replace the damaged ones.
60. Check floor silentblocks — replace the damaged ones.
61. Check the pressure of quick couplings at 2000 rpm of the engine.
62. Check hydraulic power lift unit for proper function.
63. Check arrestment of outer circuit levers in floating position.

54. Check brake plates and replace them, if necessary.
55. Change brake fluid and rinse the braking system.
56. Replace sealing rings of braking cylinders.
57. Check clutch plate lining. If the thickness of the plate does not reach 6 mm, replace the plate.
58. Dismount compressor housing (pict. 9/3) of the turbo-blower along with filling pipe.
Clean (with help of a brush) deposited impurities in compressor housing and on compressor rotor.

Complete Overhaul (CO)

The tractor overhaul is to be carried out after 4800 to 6000 engine hours:

- a) if the reliability of individual parts of the tractor can no longer be assured and if the whole technical condition of the tractor jeopardizes the safety performance of it;
- b) if very many tractor parts need to be repaired;
- c) if further tractor performance is no more economical.

DESCRIPTION OF TECHNICAL MAINTENANCE OPERATIONS

As to 11. Tension of the V-belts has to be in such a state to allow maximum sag of 5—10 mm at the longest part of the belt under the pressure of the thumb (and max. 15 mm at the compressor belt).

As to 17. Prior to checking the electrolyte level in batteries, it is necessary to unscrew two bolts M 8 on battery cover on the cab floor and to remove the cover. For the maintenance of the battery see instructions given by the battery manufacturer.

As to 18. Setting-up of the clutch pedal idle run is to be carried out by means of a two-sided nut on the tie rod leading to the clutch disengaging shaft. The correct idle run of the clutch pedal shall be 35—40 mm. A distance of 3 mm between adjusting screws and the disengaging bearing corresponds to this clutch pedal idle run. If the

play is too higher, tighten the nut and vice versa.

As to 19. Correct setting-up of the gearbox small brake is reached if it begins to act 35 mm before the end of the clutch pedal stroke. A screw M 10 of the carrier fixed on the clutch pedal shaft is used for setting-up of the play in question. Increase of force on the clutch pedal signifies the start of brake acting.

As to 22. Replace oil filling of air filter sooner, namely, as soon as the bottom of the cover with oil filling is covered with mud of 10 mm. If the bottom part of the insert is contained heavily, remove it and wash in fuel oil or kerosene.

Important! Do not use petrol, benzol, alcohol or other organic solvents for washing.

As to 24. Unscrew the nut from the centrifugal oil filter cover, remove the cover and take out the filter rotor and disassemble it. Remove all sediments with help of a scraper. When reassembling the filter, it is necessary to align gauge marks on the cover so as not to disturb the dynamic balance. For that reason it is not permissible to interchange the upper and lower part of the rotor with that of another rotor.

As to 25. Having finished the operation with the tractor, change oil in the engine till it is warm. Drain plug is on the bottom cover of the engine housing. Clean the plug prior its mounting.

As to 31. Defect of chocked injection nozzle orifice can be remedied as follows: remove injection valve, unscrew the nut with help of wrench 20, take out the nozzle and, if necessary, clean it of carbon deposits with a needle for nozzle cleaning. When reassembling, it is necessary to take care of the mark stamped on injector body and on the nozzle which determine their mutual position. Defect of the injection valve can be found out in the following way:

1. Set up engine run to minimum revolutions.
2. Loosen the cap nut of the injection valve. If

the engine revolutions drop, the injection valve is not faulty. If the revolutions remain unchanged, the injection valve is damage. The injection pressure is 15,7 MPa (160 ± 3 atm).

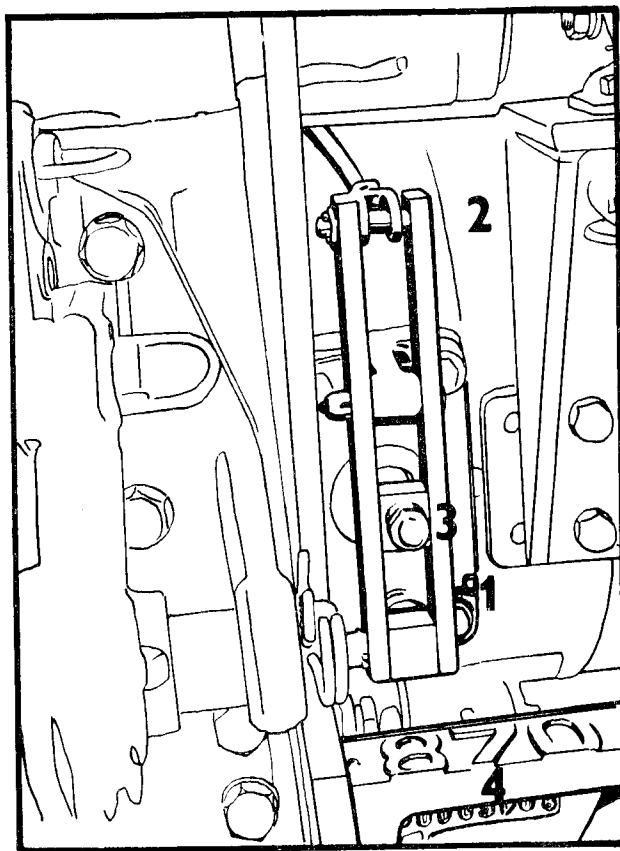
As to 37. Correct play between the brake band and the drum shall be 0,25—0,30 mm. The play is set up by three screws M 10 on LH, RH as well as on the top part of the gearbox which, following uniform tightening or loosening, adjust uniform band play around the whole drum circumference. Screw M 16×1,5 is located on the gearbox LH side and serves for general setting-up of the play. The setting-up of the play is to be carried out as follows:

1. If there is oil in the gearbox, stand the tractor on the slope (minimum 10°) in longitudinal plane and shift the gear shift lever to neutral. Brake the tractor by hand brake and secure the rear wheels by wedges.
2. Unscrew carefully four bolts on bottom cover, remove the brake cylinder spring and screw the cover with gasket on.
3. Tighten slightly the bolt M 16×1,5 to the stop and then loosen it through 1,5 turn and lock by means of lock nuts.
4. Tighten slightly three bolts M 10 on LH, RH and top parts of the gearbox to the stop and then loosen through $\frac{1}{4}$ turn. The bolts are to be immediately locked by nuts.
5. Check by hand whether the drum rotates.

As to 39. Setting-up of the brakes shall be carried out after the lock nuts on brake tie rods have been loosened (pict. 26/3). Tighten the nuts on LH as well as on RH side by the moment of 9,8 Nm. Set the hand brake control lever in the bottom position and adjust the play of tie rods in oval orifices by turning the tie rods (pict. 26/2) with help of a wrench.

Lock this position with a lock nut. Both levers of hand brake compensator have to be aligned. No play is permissible in this position. Loosen ball nuts (pict. 26/3) through $2\frac{1}{2}$ turns and lock them with lock nuts in this position.

When checking hydraulic brakes take care that no fluid escapes from the joints or brake cylinder. The play between the piston bar and the master cylinder piston has to be 1 mm which corresponds to the dead travel of the pedal (i. e. stroke of approximately 6 cm). Check brake efficiency for function. When braking with latched pedals, both wheels must be braked simultaneously. Check the braking of individual wheels (by means of one pedal) at reduced speed of about 10 km/h.



Pict. 26

Bleeding of the Brake System

If there is shortage of fluid in the tank or if any part of hydraulic piping has been dismantled, hydraulic system of the brakes may be filled with air. If there is no sufficient quantity of brake fluid, brake pedal is springy and brake efficiency is reduced; brake efficiency equals zero with such a quantity, where the pedal is springy in the whole stroke range.

Fill the equalization bowl with brake fluid and remove rubber cap from the brake cylinder bleeder screw. Slide small rubber hose on the bleeder screw and immerse the other end of it into a transparent bowl partially filled with brake fluid. Then loosen the bleeder screw, depress fully the brake pedal (to the stop) and retighten the screw. The brake pedal may be released only after the bleeder screw has been perfectly tightened. It is necessary to carry out this operation with a helper. Keep on depressing the brake pedal until only brake fluid free of bubbles flows out from the hose. During the bleeding operation the bowl with the brake fluid is to be kept in a very high position and the end of the small hose must be permanently immersed in the fluid.

The second wheel brake should be bled in the same way, too. The bleeding operation must be carried out with unlatched pedals, each wheel separately. Watch the movement of the fluid level in the bowl during the bleeding operation so as to prevent air suction in the system. Use new fluid only, when refilling.

As to 43. Valve running play

Running play is determined by valve play for both inlet and exhaust valves — 0,3 mm with cold engine. The play is checked between bearing pins of rocker arms and bearing surfaces of valve stems and adjusted with help of adjusting screw and nut.

While the rocker arm motion with one cylinder is changed, both valves with another one are adjusted (according to the diagram):

- Z 10011, Z 10045
- 1. cylinder changes — 4. cylinder is adjusted
 - 3. cylinder changes — 2. cylinder is adjusted
 - 2. cylinder changes — 3. cylinder is adjusted
 - 4. cylinder changes — 1. cylinder is adjusted

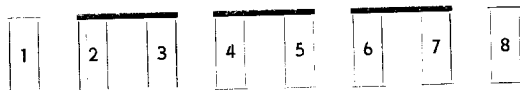
1. cylinder changes — 6. cylinder is adjusted
 5. cylinder changes — 2. cylinder is adjusted
 3. cylinder changes — 4. cylinder is adjusted
 6. cylinder changes — 1. cylinder is adjusted
 2. cylinder changes — 5. cylinder is adjusted
 4. cylinder changes — 3. cylinder is adjusted

As to 47. If the power-steering system is disassembled or in another way repaired, it is necessary to de-aerate the hydraulic circuit. This deaeration is to be carried out while the engine is in operation by continuous turning of the steering wheel from one to the other extreme position. The dead travel of the steering wheel may be max. 20° with power-steering pump at rest. If the engine and thus also the pump are in operation, the permissible play on the steering wheel periphery is 32 mm at about 2000 rpm.

As to 68. Whenever you adjust engine valves, dismount compressor body of turbo-blower (pict. 9/3). clean runner blades and compressor chamber with help of a brush. (Do not straighten deformed runner blades.)

Replace sealing ring in case of oil leakage from bearing box to the chamber. (This operation has to be entrusted to specialized workshop.) Carry out leakage test in joints of intake and discharge oil piping to turbo-compressor.

Fuse Connexion Diagram



- 1 — distance lights 56a (15A)
- 2 — LH dimmed light 56b L (8A)
- 3 — RH dimmed light 56b P (8A)
- 4 — LH tail light 58 L (8A), instrument lighting
- 5 — RH tail light 58 P (8A)
- 6 — starter button, cab wiper, heating system fan, ceiling light 54 (15A)
- 7 — direction indicator lights 54 (8A)
- 8 — horn, brake lights, socket — 30 (15A)

COMMON DEFECTS AND THEIR REMEDY

Engine Defects

Impossible to start the engine

Cause :

Remedy :

Discharged storage battery Charge the storage battery

Injection pump does not supply fuel:

- | | |
|--|-------------------------------|
| a) Fuel cock is closed | Open the fuel cock |
| b) Insufficiently bled fuel system | Deaeration of the fuel system |
| c) Fuel filters are contaminated | Clean fuel filters |
| d) Fuel supply regulation has not been set for full delivery | Set for full fuel delivery |

Irregular run of the engine

- | | |
|------------------------------------|---|
| a) Air in the fuel piping | Loosen cap nuts on injection valves and turn the engine until oil without air bubbles flows out |
| b) Clogged nozzle | Check and clean |
| c) Impurity in delivery valve seat | Remove and clean |

Insufficient engine output

- | | |
|---|---|
| a) Seized or clogged nozzle | Inspect and replace the nozzle, if necessary |
| b) Injection valves are not properly adjusted | Have them adjusted in a specialized service repair shop |
| c) Injection pump is not properly adjusted | Have the injection pump adjusted in a specialized service repair shop |
| d) Start of fuel injection is adjusted incorrectly | Adjust start of fuel injection to 24°+2° before TDC |
| e) Insufficient compression pressure in cylinders which may be caused by: | |
| 1. Untight valves | Regind the valves |
| 2. Incorrectly adjusted valve play | Adjust the correct valve play |

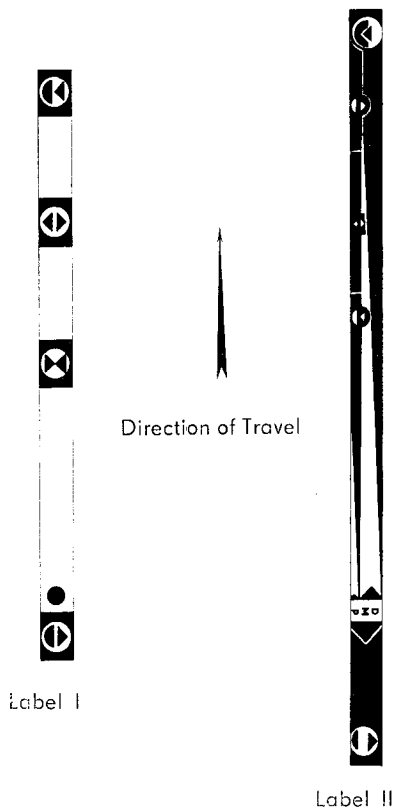
Cause :		Remedy : https://truckmanuals.com/	Remedy :
3. Damaged gasket under the cylinder head	Replace the gasket	d) Commutator is soiled	Clean it
4. Loosened cylinder head (stud) bolts	Tighten by specified torque	e) Defect in electromagnetic coil	Have it repaired in a specialized service repair shop
5. Sticked piston rings	Loosen the rings and clean the grooves in pistons		
Engine gets overheated		Slow run of the starter motor	
a) Little coolant in the radiator	Refill the radiator	Insufficiently charged battery	Charge the storage battery
b) Slack V-belt of the water pump	Take up the slack of the V-belt	Defects of Hydraulic Brakes	
c) Radiator clogged with water incrustation	Clean the radiator	Stroke of brake pedals is too long	
Defects on Electrical Equipment and its Accessories		Cause :	Remedy :
Insufficiently charged battery		a) Shortage of brake fluid	Refill the brake fluid
Cause :	Remedy :	b) Incorrectly set up brakes	Set up the brakes
a) Alternator drive belt slips	Carry out correct tensioning	Stroke of brake pedals is too long and the pedal springs, when depressed	
b) Damaged battery	Have it repaired in a specialized service repair shop	Air in brake system	Bleed the brake system
c) Voltage regulating relay is set up to low voltage	Have it repaired in a specialized service repair shop	Defects in Power-steering System	
d) Defective alternator	Have it repaired in a specialized service repair shop	Bad function of power-steering system	
Excessively charged storage battery		Cause :	Remedy :
Defective alternator	Have it repaired in a specialized service repair shop	Shortage of oil in the tank	Refill and deaerate
Starter motor does not work			
a) Connection cables are loosened	Tighten them		
b) Worn carbon brushes	Replace them by new ones		
c) Carbon brush spring is broken	Replace it by a new one		

INTERNATIONAL MARKING OF CONTROL LABELS OF HYDRAULIC UNIT ZETOMATIC

Label I — determinates signification of individual positions of outer hydraulic circuit control lever.

Signification of Symbols:

-  — Closed position — neutral. Control lever is arrested on the symbol.
-  — Free position — floating. Control lever is arrested on the symbol as well.
-  — Motion in one sense — lowering. Control lever is not arrested, it returns automatically to neutral (it is necessary to hold the lever in position).
-  — Motion in reverse sense — lifting. Control lever is not arrested, it returns to neutral (it is necessary to hold the lever in position).



Label II — determinates signification of individual positions of inner hydraulic circuit control lever.

- D — draft control
- M — mixed control
- P — position control
- ▲ — implement
- — eye level

- 1) At any engaged control of selecting lever shifting from the entering point, direction of the big red arrow — lifting of three-point linkage to the stop with maximum speed.
- 2) At engaged D or M control by shifting the selecting lever from the entering point forwards — direction of the black arrow — sinking of the implement (plough) with the highest value on LH extreme symbol.
- 3) a) At engaged P control by shifting the selecting lever from the entering point forwards, direction of the small red arrow — lowering of the three-point linkage to the stop (in the red field).
b) Position of the selecting lever in the yellow field enables motion of the three-point linkage in the whole stroke range (attached implement changes into the towed one).
c) Position of the selecting lever in the extreme LH red field enables application of antislip — lightening of the three-point linkage.

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LUBRICATION CHART

Lubrication point	Operation/No. of lubrication points	Type summer — winter
Daily after each 8–10 engine hours		
Engine	Inspection/1	SAE 30
Air cleaner (oil)	Inspection/1	SAE 30
Brake fluid tank	Inspection/1	HD190
TI 1 — each 100 engine hours		
Engine	Inspection/1	SAE 30
Gearbox, main transmission housing	Inspection/1	SAE 80
Air cleaner (oil)	Replacement/1	SAE 30
Front driving axle housing	Inspection/1	SAE 80
Reduction gears in wheels	Inspection/2	SAE 80
Rear wheel final gears	Inspection/2	SAE 80
Water pump	Turn through 1 turn	LITOL 24
Clutch disengaging bearing	Lubrication/1	SAE 30
Front axle bracket	Lubrication/2	LITOL 24
Front wheel extension bushings	Lubrication/2	LITOL 24
Steering ball pins	Lubrication/4	LITOL 24
Power-steering tank	Inspection/1	OL-N2
Three-point linkage strut	Lubrication/1	LITOL 24
Pedals	Lubrication/3	LITOL 24
TI 2 — each 200 engine hours		
Engine	Replacement/1	SAE 30
Cross pins and grooving of propeller shaft	Lubrication/2	LITOL 24
TI 3 — each 600 engine hours		
Front wheel hubs	Refilling/2	LITOL 24, NH2
Water pump	Refilling/1	LITOL 24
Compressor tightening pulley bearings	Refilling/1	LITOL 24, NH2
Joints of steering telescopic shaft	Refilling/2	LITOL 24, NH2
Cab door pins	Lubrication/4	SAE 80
Front driving axle double joint bearings	Refilling/2	LITOL 24, NH2
Heating system fan bearings	Refilling/2	OT 4C, NH2
Front driving axle RH half-axle bearing	Refilling/1	LITOL 24
TI 4 — each 1200 engine hours		
Gearbox, main transmission housing	Replacement/1	SAE 80
Rear wheel final gears	Replacement/2	SAE 80
Power-steering tank	Replacement-Rinsing/1	OL-N2
Front driving axle differential and reduction gears	Replacement/1	SAE 80
Reduction gears in front wheels	Replacement/2	SAE 80

Note: Amounts of fillings are given in Technical Data — in the introductory part of this Manual.